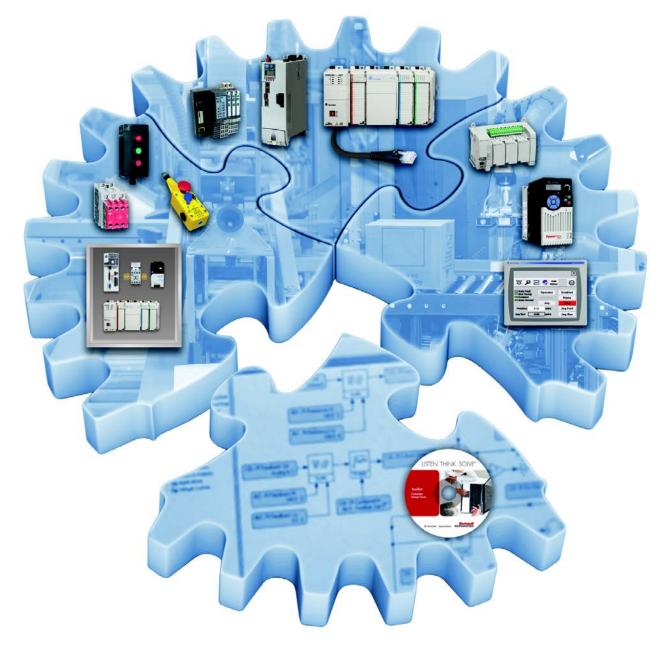


Energy Management Accelerator Toolkit

Energy Assessment and Monitoring Methods System Configuration and Wiring Energy Data Collector Configuration FactoryTalk EnergyMetrix Configuration and Maintenance Local HMI Integration





Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

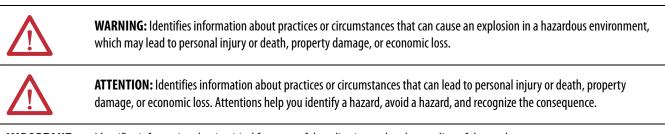
In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits, equipment, or software described in this manual.

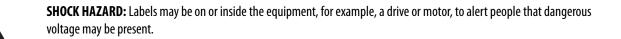
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Throughout this manual, when necessary, we use notes to make you aware of safety considerations.



IMPORTANT Identifies information that is critical for successful application and understanding of the product.

Labels may also be on or inside the equipment to provide specific precautions.





BURN HAZARD: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.



ARC FLASH HAZARD: Labels may be on or inside the equipment, for example, a motor control center, to alert people to potential Arc Flash. Arc Flash will cause severe injury or death. Wear proper Personal Protective Equipment (PPE). Follow ALL Regulatory requirements for safe work practices and for Personal Protective Equipment (PPE).

Allen-Bradley, CompactLogix, ControlLogix, FactoryTalk, FactoryTalk EnergyMetrix, PanelView Plus, Kinetix, PowerFlex, PowerMonitor, Studio 5000 Logix Designer, RSEnergyMetrix, RSLogix 5000, Rockwell Software, Rockwell Automation, and TechConnect are trademarks of Rockwell Automation, Inc.

Trademarks not belonging to Rockwell Automation are property of their respective companies.

10

This group is a domai

Value 3

Value 4

X

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Demand

Control

22:43:59

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Day Start Time: Stop Time: 07 00 23 00

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Thu Fri Sat Hol Holidays Enabled

Predicted

KW Demand

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KW Setpoint

100

De

Chapter 1 Energy Assessment and Monitoring Methods FactoryTalk® EnergyMetrix[™] Configuration and 4. Compressed Air System Maintenance Two Gardner Denver 400+ 750scfm-150 hp air compressors operate around the clock 7 days per week at full line pressure even if the plant is in a down condition on week ends or holidays. Several cost savings alternatives are novemble. Chapter 5 - Groups and Security Setup 4.1. Recommendation: Reduce line pressure when plant is in down condition to minimum Pre operating devices (safety systems etc...assume 80-85 psi). Chapter 6 - Device Setup a. Savings \$3,696 per year. atione (to operate 2 compressors 3 shift-6days-50xks yr) 500/yr-borth: X3 shibily X 12 days/ oper xk X (X8 Skw / .06 Skw) = \$345hp-yr 581/50x X 2 compressors = \$100,500/yr 581,750 X 2 compressors = \$100,500/yr 510,500 X 30 days/#54546day Chapter 7 - Meter and Tag Setup Chapter 8 - Alarm Setup sure (Psi) reduces energy requ Openating pressure 107 ppi - target pressure 80 psi=21psi reduction 21psi / 7 lb factor = 3 3 X.4% reduction factor = 12% total saving in energy 12% X \$345iday=\$42iday savings at 80 psi Chapter 9 - Reports and Charts Chapter 10 - Maintenance Group Setup System Meters Reports Custom Layout Save Restore Collapse Edit Add Delete System Status **Chapter 2** Parent group Effort Industres Plant 1 System Configuration and Wiring ports title line 1 Chapter 11 FactoryTalk View ME Energy Faceplates Efficient Plant 1_ Boiler House Device State Value 1 Value 2 Gas Main ACTIVE 9555.000 503.000 0.000 0.000 Boiler House Gas ACTIVE 7654.000 385.000 0.000 **Chapter 3** Propane HIGH FLOW 43225000 4.300 0.000 gal gpm Energy Data Collector Configuration Fuel Oil Boiler House Electric sult 0.000 0.000 0.000 —Energy_Gas_Digita⊢ Energy_Gas_Digital Boiler_House_Gas Inp_Pulse Local:1:1.Data.0 Set_Meter_Pulse_Factor 1.5 Set_Calc_Interval 1 Set_High_Flow 500 Chapter 12 Set Critical Flow 750 Demand Control Val_Total_Gas Val_Gas_Per_Calc_Interval 0.0 0.0 **Demand Control Status** Load Load 1-8 9-16 🌾 🏓 oad Load State State D 1 9 D 2 10 **Chapter 4** 3 11 FactoryTalk EnergyMetrix Software Installation D 4 5 6 12 13 14 Factory Talk EnergyMetrix 2.00.00 7 15 D View FT EnergyMetrix help files for installation instructions, release notes, etc. 8 16 Install Optional Software Adobe Acrobat Reader 9.1 Install Required Software Chapter 13 FactoryTalk Activation Manager 3.50 *
RSLinx Lite 2.57.00 *
NET Framework 3.5 SP1 Time of Day Control FactoryTalk EnergyMetrix 2.00.00 Load Configuration @ Attender - Instead Information X 🚸 🕓 🔳 Load Description Load 1 Load 1 Production TOD Control: TOD Control Copy Day Paste Day Save Day Undo Day Reset Day Changes Changes to Default

Follow this path to complete your energy management application.

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About This Publication

This quick start is designed to provide a framework for developing an energy management monitoring, analysis, and control application for your facility. Each section guides you through the tasks you need to plan, configure, program, and use your Rockwell Automation™ energy data collection and control devices and analysis software. An example application, named Efficient Industries Plant 1, is referenced throughout this quick start to guide you through these tasks.

To help in the design and installation of your system, application files and other information is provided on the Energy Management Accelerator Toolkit CD, publication IASIMP-SP014. The CD provides an energy data worksheet, layout and wiring drawings, data collection and control logic, and more. With these tools and the built-in best-practices design, you can focus on the design of your system and not on design overhead tasks.

IMPORTANT Before using this quick start and the CD, read the Terms and Conditions on the CD.

The beginning of each chapter contains the following information. Read these sections carefully before you begin work in each chapter.

- **Before You Begin** This section lists the steps that must be completed and decisions that must be made before starting that chapter. The chapters in this quick start do not have to be completed in the order in which they appear, but this section defines the minimum amount of preparation that is required before completing the current chapter.
- What You Need This section lists the tools that are required to complete the steps in the current chapter. This includes, but is not limited to, hardware and software.
- Follow These Steps This illustrates the steps in the current chapter and identifies which steps are required to complete the examples.

Conventions

The manual uses the following conventions.

Convention	Meaning	Example
Click	Click the left mouse button once to initiate an action. (Assumes cursor is positioned on object or selection.)	Click Browse.
Double-click	To initiate an action, click the left mouse button twice in quick succession while the cursor is positioned on object or selection.	Double-click the application icon.
Right-click	To initiate an action, click the right mouse button once while the cursor is positioned on object or selection.	Right-click the Ethernet port.
Drag and drop	Click and hold the left mouse button on an object, move the cursor to where you want to move the object, and release the mouse button.	Drag and drop a task into the blank plan.
Choose	Choose an option from a list of options.	From the Tools menu, choose Internet Options.
Select	Click to highlight an item.	Select the Devices folder.
Check or uncheck	Click to activate or deactivate a checkbox.	Check Enable device.
>	Shows nested menu selections as menu name followed by menu selection.	Choose File > New > Document.
Expand	Click the + to the left of a given item /folder to show its contents.	Expand the Main Task.

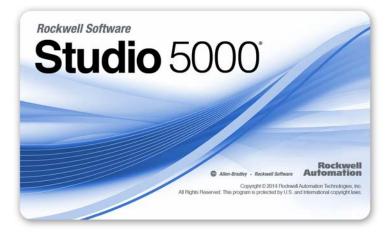
Software Requirements

You need the following software to use this toolkit.

Rockwell Automation Software	Version	Required For
Studio 5000™ Logix Designer application	21.00 or later	Power and energy management
RSLogix [™] 5000 • ControlFlash • BOOTP/DHCP utility • RSLinx [®] Classic	17.00 or later	applications
FactoryTalk View Studio for Machine Edition FactoryTalk Services RSLinx Enterprise RSLinx Classic 	5.0 or later	PanelView [™] Plus terminals
FactoryTalk [®] EnergyMetrix™ CD, cat. no. 9307-FTEMMENE	2.0 or later	FactoryTalk EnergyMetrix software
Energy Management Accelerator Toolkit CD	IASIMP-SP014	CAD files, wiring diagrams, application files, and other support information

Studio 5000 Environment

The Studio 5000 Engineering and Design Environment combines engineering and design elements into a common environment. The first element in the Studio 5000 environment is the Logix Designer application. The Logix Designer application is the rebranding of RSLogix 5000 software and continues to be the product to program Logix5000[™] controllers for discrete, process, batch, motion, safety, and drive-based solutions.



The Studio 5000 environment is the foundation for the future of Rockwell Automation engineering design tools and capabilities. It is the one place for design engineers to develop all the elements of their control system.

Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
PowerMonitor 1000 Unit Installation Instructions, publication <u>1408-IN001</u>	Provides information on installing, wiring, connecting, applying power and configuring the PowerMonitor™ 1000 unit.
PowerMonitor 1000 Unit User Manual, publication <u>1408-UM001</u>	Provides information on setting up communication with the PowerMonitor 1000 unit by using other applications and controllers.
PowerMonitor 3000 Master Module installation instructions, publication <u>1404-IN007</u>	Provides information on selecting an enclosure, installing, and wiring the PowerMonitor 3000 master module.
Bulletin 1404 PowerMonitor 3000 Display Module installation instructions, <u>1404-IN005</u>	Provides information on installing and wiring the PowerMonitor 3000 display module.
Bulletin 1404 PowerMonitor 3000 Unit User Manual, publication <u>1404-UM001</u>	Provides information on setting up communication with the PowerMonitor 3000 master module, firmware version 3.0 or later, by using other applications and controllers.
Bulletin 1404 PowerMonitor 3000 Unit User Manual, publication 1404-UM001D-EN-P	Provides information on setting up communication with the PowerMonitor 3000 master module, prior to firmware version 3.0, by using other applications and controllers.
Bulletin 1404 Series B Ethernet Communication Release Note, publication 1404-RN008	Provides information on using the PowerMonitor 3000 module with EtherNet/IP communication.
PowerMonitor Wireless 250 Monitor User Manual, publication 1425-UM001	Provides information on installing, wiring and setting up communication with the PowerMonitor Wireless 250 unit.
PowerMonitor 500 Unit User Manual, publication <u>1420-UM001</u>	Provides information on installing, wiring and setting up communication with the PowerMonitor 500 unit.
PowerMonitor 5000 Unit User Manual, publication 1426-UM001A	Provides information on installing, wiring and setting up communication with the PowerMonitor 5000 unit.
FactoryTalk EnergyMetrix User Manual, publication <u>FTEM-UM002</u>	Provides information on how to use FactoryTalk EnergyMetrix, a modular, scalable, web-enabled, client/ server energy information and management application.
Power and Energy Management Solutions Product Overview, publication <u>EMSE00-BR017</u>	Provides an overview of the Rockwell Automation suite of energy management services and solutions, including hardware and software, for monitoring, analyzing, controlling, and optimizing energy systems.
Power and Energy Management Solutions Selection Guide, publication <u>1400-SG001</u>	Provides information on selecting energy management services and solutions, including hardware and power management software.
Logix Common Procedures Programming Manual, publication <u>1756-PM001</u>	Provides information on programming Logix 5000™ controllers, including managing project files, organizing tags, programming and testing routines, and handling faults
Industrial Automation Wiring and Grounding Guidelines, publication <u>1770-4.1</u>	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, <u>http://www.ab.com</u>	Provides declarations of conformity, certificates, and other certification details.
http://www.rockwellautomation.com/solutions/integratedarchitecture/	Provides information on integrated architecture tools and resources including accelerator toolkits.
Rockwell Automation Configuration and Selection Tools, available at <u>http://www.rockwellautomation.com/en/e-tools/</u>	 These online tools install on your personal computer so that you can quickly access information on our products. CrossWorks Industrial Computer Selector Operator Interface Selection Tool Programmable Controller Family Selector

You can view or download publications at

<u>http://www.rockwellautomation.com/literature/</u>. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

Energy Assessment and Monitoring Methods

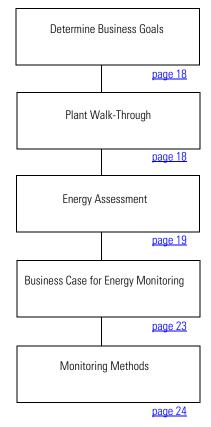
Introduction

This chapter introduces the fundamentals of creating an energy management plan that will help you to:

- determine your business goals.
- perform a plant walk-through.
- perform an energy assessment.
- understand the business case for energy monitoring.
- review the monitoring methods available when applying Rockwell Automation energy management hardware and software products.

Review These Steps

Review these concepts to create an energy management plan for your facility.



Determine Business Goals

Business today has changed and it added a color - green. Not only do you need to meet your business and production goals, but global dynamics are forcing you to pursue energy reductions. Many companies can help reduce energy consumption at their manufacturing facilities when a plan is implemented.

Determining your business goals is the first step in understanding and developing the scope of your energy and power management application. Your business goals may include:

- Energy cost reduction
- Operating equipment efficiency
- Usage based cost accounting
- Downtime reduction through power quality monitoring
- Sustainable production initiatives
- Driving energy cost accountability to the energy user
- Identifying and justifying energy cost savings projects

Plant Walk-Through

After determining your business goals, conduct a walk-through of your plant or campus. This will help you to identify the largest energy consumption uses and events.

To maximize the efficiency of the walk-through, gather pertinent facility documentation that is available.

- Facility one line diagrams for electricity, gas, water, steam, air, and other fuels
- Production equipment layout
- Electric power equipment list
- Other energy equipment documentation including boilers, air compressors, HVAC equipment, and process cooling equipment
- Energy meters and monitoring equipment

Plant walk-through steps include:

- 1. Listing large energy consuming equipment and processes.
- 2. Listing typical time of use or duty cycle.
- 3. Listing operational or production dependencies.
- 4. Identifying applications using variable speed drives.
- 5. Reviewing operation of air compressors, boilers, and chillers

Energy Assessment

The assessment process is a detailed analysis of the data collected during the walk-through. Identifying opportunities for energy savings and developing the return on investment for these projects is critical. Energy assessments should identify not only opportunities, but savings, project costs, and payback calculations. Projects should also be categorized as awareness or behavior changes, minor cost, and capital. This approach will help prioritize the steps in the energy savings plan.

Collect and Analyze Utility Bills and Rate Schedules

An important part of the energy assessment is to collect and analyze your current utility rate schedules and bills. This typically includes electric, natural gas, water, and sewer. Other fuels consumed may include fuel oil, propane, or steam. Understanding your bill is crucial in executing an appropriate energy management plan to maximize your energy savings investment.

Energy rate schedules from your local utilities can include, but are not limited to, line item charges such as:

- Demand Charges A variable monthly or yearly charge for the highest amount of energy consumed over a fixed period, typically 15 minutes. This charge can contribute significantly to overall energy costs.
- Energy Charge A variable monthly charge for the total energy that is consumed. This charge typically includes onpeak and off-peak rates, contracted minimums, alternative charges, ratchet demand penalties, or other special terms.

Here is an example of an electric bill and electric rate schedule. You can see that time-of-use and on-peak demand needs can significantly increase your overall energy costs.

Electric Billing Period: 06/05/07 to 07/04/07	42 Heating Degree I	Days 173 Cooli	ing Degree Da
10am to 10pm Actual Reading on 07/04/07		13994	
Actual Reading on 06/05/07		13779	
Meter Multiplier 4800			
Total Consumption		1,033 829 kWhrs	
Total On-Peak Consumption		413 729 kWhrs	
Total Off-Peak Consumption		620 100 kWhrs	
Actual On-Peak Demand	06/07/07@13:45	2770 500 kw	
Actual Off-Peak Demand Actual Reactive Demand	06/18/07@08:30 06/07/07@13:45	2676 400 kw 1537 900 kvar	
Total Usage Period : 06/05/07 to 07/04/07			
Total Usage Period : 06/05/07 to 07/04/07			
Current Period Power Factor		0 935 kw	
	9.594 800 * (1 - 5(. 935 - 85)) =	9187 000 kw	
Customer Demand 07/06/06 - 08/03/06		9774 400 kw	
	90,135 02,680		
	87,455		
Electric Charges Period : 06/05/07 to 07/04/07			
		•	
General Primary Service - CP1 29 Days			\$7.428
Customer Demand Charge > 12470 and < 13800		\$0 760000	
Customer Demand Charge > 12470 and < 13800 On-Peak Demand Charge > 12470 and < 13800	0 9 187 0 kw @ \$	\$10 380000	\$95,36
Customer Demand Charge > 12470 and < 13800 On-Peak Demand Charge > 12470 and < 138000 Facilities	0 9 187 0 kw @ \$		\$95,36 \$500
Customer Demand Charge > 12470 and < 13800 On-Peak Demand Charge > 12470 and < 138000 Facilities Non - taxable Customer Charge	D 9 1870 kw @ 3 29 days @ 3	\$10 380000 \$17 260270	\$95,36 \$500 \$200
Customer Demand Charge > 12470 and < 13800 On-Peak Demand Charge > 12470 and < 138000 Facilities Non - taxable Customer Charge On-Peak Energy > 12470 and < 138000	0 9 187 0 kw @ 3 29 days @ 3 1 902 680 kWh @	\$10 380000 \$17 260270 \$0 061270	\$95,36 \$500 \$200 \$116,577
Customer Demand Charge > 12470 and < 13800 On-Peak Demand Charge > 12470 and < 13800 Facilities Non - taxable Customer Charge On-Peak Energy > 12470 and < 138000 Off-Peak Energy > 12470 and < 138000	D 9 1870 kw @ 3 29 days @ 3	\$10 380000 \$17 260270	\$95,36 \$500 \$200 \$116,577 \$92,125
Customer Demand Charge > 12470 and < 13800 On-Peak Demand Charge > 12470 and < 138000 Facilities Non - taxable Customer Charge On-Peak Energy > 12470 and < 138000	0 9 187 0 kw @ 9 29 days @ 9 1 902 680 kWh @ 2 787,455 kWh @	\$10 380000 \$17 260270 \$0 061270	\$95,36 \$500 \$200 \$116,577

Sample Rate Schedules

RATE

Facilities Charge, including one meter \$1.52877 per day

Demand Charges

On-Peak Demand

Per kW of measured on-peak demand \$11.20500

For monthly on-peak hours of use less than 100, the monthly on-peak demand charge of \$11.20500 per kW will be reduced by \$0.06723 times the difference between 100 and the monthly on-peak hours of use. Monthly on-peak hours of use is the on-peak energy usage divided by the measured on-peak demand.

In the case of customers who have received an embedded credit, the minimum on-peak demand charge shall be established by contract.

Customer Maximum Demand	
Per kW of measured demand	\$1.75700
For Determination of Demand, see Sheet No	. 43
<u>Energy Charge,</u> per kWh	
On-Peak Energy (a)	\$0.07342

Off-Peak Energy (b)	\$0.05366

- (a) General Secondary on-peak energy usage is the energy in kilowatt hours delivered between 9:00 a.m. and 9:00 p.m., prevailing time, Monday through Friday, excluding those days designated as legal holidays for New Year's Day, Memorial Day, Independence Day, Labor Day, Thanksgiving Day and Christmas Day.
- (b) General Secondary off-peak energy usage is the energy in kilowatt hours delivered during all hours other than on-peak hours.

Sample Energy Assessment

Here is an example of a compressed air plant system assessment.

Sample Energy Assessment Document

4. Compressed Air System

Two Gardner Denver 460v- 750scfm-150 hp air compressors operate around the clock 7 days per week at full line pressure even if the plant is in a down condition on week ends or holidays. Several cost savings alternatives are possible.

4.1. Recommendation: Reduce line pressure when plant is in down condition to minimum Pressure required by non operating devices (safety systems etc...assume 80-85 psi).

a. Savings \$3,696 per year.

```
b. Calculations (to operate 2 compressors 3 shift- 6days-50wks yr)
$60/yr-hp-shift X 3 shits/yr X 1.2 days/ oper wk X (.08 $/kw / .05 $/kw) = $345/hp-yr
$345/hp-yr X 150 hp = $51,750/compressor-yr
$51,750 X 2 compressors = $103,500/yr
$103,500 / 300 days/yr=$345/day
```

Given every 7 lb reduction in pressure (Psi) reduces energy required by 4%

Operating pressure 107 psi - target pressure 80 psi=21psi reduction 21psi / 7 lb factor = 3 3 X 4% reduction factor = 12% total saving in energy 12% X \$345/day=\$42/day savings at 80 psi

88 down days/yr X \$42/day=\$3,696 /yr

4.2. Recommendation: Reduce Line pressure during operational periods from 107 to85-90 psi.(assume form fill machines require minimum of 85 psi)

a. Savings:\$12,041

b. Calculations

107 psi – 85 psi=22 psi 22psi / 7 lb factor = 3.14 3.14 X 4% reduction factor= 12.6% energy savings 12.6% X \$345/day X 277 production days**=\$12,041/yr**

4.3. Recommendation: Isolate devices that must stay on over week end & holidays. Feed with smaller dedicated compressor. Assume 1- 25 hp compressor

a. Savings: \$22,770

b. Calculations

88 days that large compressor is down (see above)= 24% of time 24% X \$103,500/yr= \$24,840 Less cost to operate small compressor =25hp/300hp=8.3% 8.3% \$103,500 X 24%=\$2,070 =\$22,770/yr **4.4. Recommendation**: Increase air leak detection program from 1time per year to 3 times per year to sustain gains. Utilize ultrasonic tools to provide most reliable results.

a. Savings: estimated at \$10,700/yr.

b. Calculations

annual kwh <mark>(6.5day/wk 24 hr day X</mark> 50 wk/yr)	Opening dia.	1/64		1/32	1/16	1/8	total
	air escaping at each leak (cfm) annual kwh(6.5day/wk 24 hr day X			1.5 cfm	6.5 cfm	26 cfm	
annual cost/leak (@.08 \$/kwh) \$51 \$155 \$672 \$2,689 \$3,56	50 wk/yr)		647	1940	8405	33620	
	annual cost/leak (@.08 \$/kwh)		\$51	\$155	\$672	\$2,689	\$3,567
	annual costileak (@.00 \$/kwn)		901	\$155	<i>4072</i>	φ2,003	0.0

4.5. Recommendation: Improve metering and recording of data on air compressor system. Complete program to install instruments and trend charts to track air consumption and peak usage. To further reduce air use and improve the overall efficiency of the existing compressors correlate spikes in demand with activities at the bag house, scales, silos, and waste treatment plant. All are major air users and have multiple devices pulsing at full line pressure. Further study may show installation of an air buffer tank or added storage tanks may reduce peak loads and therefore reduce overall load and cycling of the compressors.

How Rockwell Can Help

Rockwell Automation has a team of engineers that are experienced in conducting energy assessments for energy sources including, but not limited to, electricity, gas, water, air, and steam.

To help you identify energy cost savings opportunities, Rockwell Automation can perform a general energy assessment that will help you create a sustainable plan. If the scope of your needs is more extensive, a comprehensive assessment can be performed to best fit your requirements.

Rockwell Automation Energy Assessment Options

Energy Assessment Option	General 2 to 3 Days ⁽¹⁾	Comprehensive 2 to 3 Weeks ⁽²⁾	
Utility usage review	•	•	
Energy saving project identification	•	•	
Operations analysis of savings opportunities	•	•	
Utility usage review		•	
Detailed energy usage analysis		•	
Rates and tariffs analysis		•	
Detailed quotations for sustainability projects		•	
Prioritization of projects		•	

(1) Request a 1400-AUD services quote from your local Rockwell Automation distributor or the Rockwell Automation custom support and maintenance team.

(2) Request 1400-ATT services quote from your local Rockwell Automation distributor or the Rockwell Automation custom support and maintenance team.

To view a sample assessment, refer to the Energy and Utilities Site Assessment document in the Support Information section on the Energy Management Accelerator Toolkit CD.

Business Case for Energy Monitoring

Energy monitoring makes energy usage data visible so that it is included in the planning and execution of a business strategy along with other management information. Because utility bills can be a significant portion of business expense, it is important to understand how energy is used. Implementing a monitoring plan will help your business set goals for energy reduction that will translate into cost savings.

Typical energy users evolve through a number of energy awareness phases.

Ignorance is Expensive

In the first phase, energy is not considered a significant expense or important management information. Operations uses energy and accounts payable pays for it. Management begins to notice the higher costs and sets goals for energy reduction. If operation managers are not aware of the energy cost of their operations, energy savings will not be captured.

Metering the Envelope

In the second phase, energy monitoring is installed on the plant main feeds. Electricity, natural gas, water, and other feeds are recorded. The investment is relatively low. The monitoring system generates shadow bills to verify the utility billing. Major users of energy are identified. The relationship between operating schedules and plant demand becomes clearer. A few energy saving opportunities are identified and cost savings generated. However, monitoring only the entire plant has limitations addressed in the next phase.

Submetering the Processes

In this phase, submeters are installed on process lines and utility equipment such as air, compressors, and boilers. This phase requires a higher level of investment but provides a more detailed view of energy usage. Reports run daily or weekly provide a direct line of sight to the impact of operations decisions. Energy use can be correlated with key production indicators to identify peak producers and opportunities for improvement. Operations can be benchmarked within a plant or across an enterprise. More cost-saving opportunities are identified. Historical data is used to accurately forecast energy use, providing the basis for negotiating more favorable rates from energy providers. The same data is used in justifying capital projects to improve efficiency and further reduce energy usage, cost, and waste. Energy accountability grows.

Controlling Energy Use and Demand

The volume and accuracy of energy use information gathered in the preceding phases is useful in determining the next steps. Perhaps an automated demand control system would be effective in increasing energy efficiency and sustainability. Opportunities for heat recovery and onsite generation may be identified. Potential trouble spots might be avoided that would minimize unnecessary downtime.

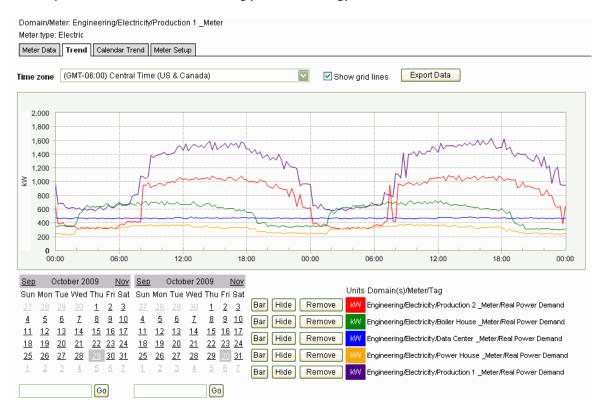
Monitoring Methods

Rockwell Automation power monitors and controllers collect data from your plant floor that can be used by FactoryTalk EnergyMetrix software for monitoring and analysis.

FactoryTalk EnergyMetrix software provides monitoring and reporting tools to help you understand usage patterns, optimize processes, and reduce utility costs in your organization. You can use these tools to monitor electrical loads, consumption, power quality, analyze demand, and generate billing and cost allocation reports.

Load Profiling

Load profiling is a method where electrical loads are monitored or profiled. Load profiling helps to identify peak demands so that you can reschedule loads accordingly to reduce energy costs.



Consumption Reporting

Consumption reporting typically monitors periodic utility usage, production, or other key performance indicators, and assists with the early detection of production/equipment problems such as leaks, inefficiencies, and production problems.

Demand Analysis

Demand analysis monitors the electrical demand of plant areas so that you can make energy saving production scheduling or demand control decisions.

Consumption R	Consumption Report			8/31/2009 12:00 AM to 9/1/2009 12:00 A		
Time Zone: (GMT-0	5:00) Central Ti	me (US &			Janua - Hondorford de Soudar de Hondorford	
Air (ID 22)						
Air						
		Air U	Jsage (cf)			
Air Flow _Meter			1,441			
Total(s):			1,441			
Electricity (ID 23)						
Electric						
LICONIO			al Energy Net (kWh)	Reactive Energy Net (kVARh)		
Electric Main _Mete	er		23,910	7,076		
Total(s):			23,910	7,076		
Fuels (ID 24)						
Fuel Oil						
i dei en		Fuel	Oil Usage			
			(Gal)			
Fuel Oil _Meter			0			
Total(s):			0			
ectrical Demand An	alysis			7/1/2009 12:00 /	AM to 8	1/2009 12:00 AM
me Zone: (GMT-06:00) Cer	ntral Time (US	& Canada)				
		, , ,				
W						
eak Demand Summary						
Boiler House Meter		665.5	kW	9.2%	7/22/200	9 1:30:00 PM
Power House _Meter		352.0	kW	4.9%	7/22/200	9 1:30:00 PM
Production 1 Meter		1,787.9	kW	24.7%	7/22/200	9 1:30:00 PM
Production 2 Meter		1,224.6	kW	16.9%	7/22/200	9 1:30:00 PM
Shipping/Receiving _Meter		3,222.4	kW	44.4%	7/22/200	9 1:30:00 PM
	Total	7,252.3	kW	100.0%		
orst Case Peak Demar	d Analysis					
Boiler House Meter		732.0	kW	9.8%	7/29/200	9 10:15:00 AM
Power House Meter		388.2		5.2%		9 10:30:00 AM
Desidentian 4 Mater		1 051 0	LAM	24.00/	7/1/2000	2.45.00 DM

1.851.8 kW

1.250.4 kW

3,236.0 kW

7,458.3 kW

Total

24.8%

16.8%

43.4%

100.0%

7/1/2009 3:45:00 PM

7/8/2009 11:45:00 AM

7/7/2009 4:00:00 PM

Production 1 _Meter

Production 2 _Meter

Shipping/Receiving _Meter

Shadow Billing

Shadow billing generates a replication of a monthly bill from your energy provider for comparative billing analysis and potential energy cost recovery.

Cost Allocation

Electric Billing Report

8/1/2009 12:00 AM to 9/1/2009 12:00 AM

Charge \$525.00

\$525.00

Charge \$64,533.81

\$5,939.46

\$70,473.27

Charge

\$54,851.06

\$40,412.02

\$95,263.08

Time Zone: (GMT-06:00) Central Time (US & Canada) Rate Schedule: WE General Primary Service TOU Cp1 Total Charge: \$175,405.72

Fixed Charges Description Quantity Rate Facilities Charge 1.0 525 Subtotal: Demand Charges Description Quantity Rate Demand, On-peak 7,400.7 kW 8.72 Demand, Customer Maximum 7,815.1 kW 0.76 Subtotal: Energy Charges Description Quantity Rate Energy, On-peak 1,585,749.1 kWh 0.03459 Energy, Off-peak 1,877,882.2 kWh 0.02152 Subtotal: Taxes and Fees

Description	Quantity	Rate	Charge
Sales Tax	166,261.4	0.055	\$9,144.37
		Subtotal:	\$9,144,37

Cost allocation monitoring lets you allocate energy costs based on actual usage that is based on production area submetering rather than other measurements such as square footage allocation. Effective cost allocation helps drive energy accountabilities to the user.

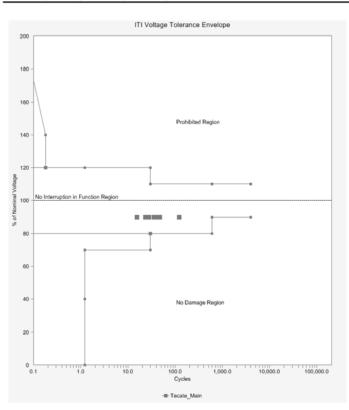
	A	В	С	D	E	F	-
1	Report name:	Electric Cost Allocation Report				8	-
2	Starting date/time:	8/1/2009 0:00		1			
3	Ending date/time:	9/1/2009 0:00					
4	Time zone:	(GMT-06:00) Central Time (US & Canada)					
5	Rate schedule:	Electric Cost Allocation		l III			
6	Total charge:	\$89,204.20					
7							
8		Real Energy Charge (kWh)		Subtotals			
9	Data Center	\$11,947.60		\$11,947.60			
10	Production 1	\$26,717.20		\$26,717.20			
11	Production 2	\$17,784.00		\$17,784.00			
12	Shipping/Receiving	\$32,755.40		\$32,755.40			
13				J.			
14	Subtotals	\$89,204.20		\$89,204.20			
15							

Power Quality

Power quality monitoring lets you capture power quality events or conditions that could cause a production shutdown like voltage sags, swells, and brownouts.

Electric Main Power Quality Report
Time Zone: (GMT-06:00) Central Time (US & Canada)

9/1/2009 12:00 AM to 10/1/2009 12:00 AM



Notes:

System Configuration and Wiring

Introduction

In this chapter, you will do the following:

- List energy data points based on your business goals and energy monitoring plan.
- Identify your existing energy meters and distribution systems.
- Select data collection hardware and create a meter layout.
- Create panel layouts and wiring for your data collection hardware.
- Select required software.

To help you with system configuration, an industrial plant example, named Efficient Industries Plant 1, is referenced in this and subsequent chapters.

Before You Begin

Complete an energy assessment and review monitoring methods in Chapter 1.

What You Need

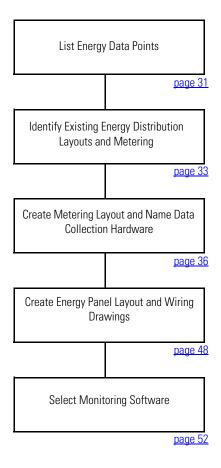
- Personal computer with internet access for downloading software and files
- AutoCAD program to open the .dwg files or Adobe Acrobat Reader software to open.pdf files

TIP Use AutoCAD Electrical to take advantage of advanced features.

- Energy Management Accelerator Toolkit CD, publication IASIMP-SP014, or visit the Integrated Architecture Tools and Resources website at http://www.ab.com/go/iatools to download toolkit files
- Power and Energy Management section of the Industrial Controls catalog, available at http://www.ab.com/catalogs/
- Microsoft Excel software

Follow These Steps

Follow this path to layout your energy panel and wiring, and select monitoring software.



List Energy Data Points

You will now review your business goals and energy monitoring plan, then enter your data points in the Energy Data Worksheet.

Review Business Goals and Energy Monitoring Plan

1. Review the business goals that you created in Chapter 1.

The Efficient Industries Plant 1 example, referenced throughout this quick start, is a midsized plant with two production areas. These are the business goals of the example plant:

- Reduce electrical energy demand charges
- Improve electrical energy efficiency through power quality monitoring
- Reduce fuels and steam energy usage by running boilers in accordance with production demand schedules
- Reduce air compressor energy use
- Provide energy cost allocation to production areas, shipping and receiving, and the data center
- 2. Review your monitoring plan based on the initial energy assessment findings.

These are the monitoring goals of the Efficient Industries Plant 1 example:

- Monitor electrical main power quality
- Track electrical consumption of production 1, production 2, shipping/receiving, boiler house, and data center
- Monitor gas main, boiler house gas, fuel oil, and propane fuel usage
- Monitor steam, air, and water flow

Enter Energy Data Points in Energy Data Worksheet

Enter your energy data points in the Energy Data Worksheet. The procedure demonstrates how to enter data points using the Efficient Industries Plant 1 example.

 Browse to the System Layout and Wiring folder on the Energy Management Accelerator Toolkit CD image.

🛎 C:\Documents and Settir	ngs\jwnovak\Desktop\Energy Manag	ement Accelerator	Toolkit\Files	
<u>Eile E</u> dit <u>V</u> iew F <u>a</u> vorites	<u>T</u> ools <u>H</u> elp			AL AL
🕝 Back 🔹 🅥 🕤 🏂	Search 🕞 Folders			
Address 🔂 C:\Documents and	Settings\jwnovak\Desktop\Energy Manageme	nt Accelerator Toolkit\Fil	es	🗸 🏓 Go
	Name 🔺	Size Ty	rpe Date	Modified
File and Folder Tasks	Senergy Input Logic	File	e Folder 11/3/2	2009 10:25 AM
	Faceplate Files	File	e Folder 11/3/2	2009 10:25 AM
Other Places	Sample Rate Schedules	File	e Folder 11/3/2	2009 10:25 AM
	System Layout and Wiring	File	e Folder 11/5/2	2009 10:04 AM

Right-click Energy Data Worksheet and open the file.
 When opening the spreadsheet, select Enable Macros.

Name 🔺 Size	Туре	Date Modified	
CompactLogix	File Folder	11/5/2009 10:04 AM	
PM1000	File Folder	11/5/2009 10:04 AM	
PM3000	File Folder	11/5/2009 10:04 AM	
Energy Data Worksheet 53 KB	Microsoft Excel Wor	11/3/2009 7:55 AM	

- 3. Click the Energy Point tab in the worksheet and enter an energy type and name for the first energy data point in your system.
 - a. Select a cell in the Energy Type column and click the pull-down list icon.
 - b. Choose an Energy Type.

For the Efficient Energy Plant 1 example, choose Electricity.

c. Select a cell in the Name column and enter a name for the energy data point.

For the Efficient Energy Plant 1 example, Electric Main is entered as the first Electricity data point.

4. Repeat step 3 for each data point with the same energy type selected in step 2.

For the Efficient Energy Plant 1 example, the Electricity energy point listing should look like this.

5. Repeat steps 3 and 4 for the remaining energy types in your system.

For the Efficient Energy Plant 1 example, the completed energy point listing should look like this.

MICROSOFT EXCEL - Energy Data worksneet												
×	<u>F</u> ile	<u>E</u> dit	<u>V</u> iew	Insert	F <u>o</u> rmat	<u>T</u> ools	<u>D</u> ata	<u>W</u> indow	<u>H</u> elp	Adoļ	<u>b</u> e PD	F
D	Ĩ	8	9	🗟 💞	X Be	12 -	1 N	• Cil +	4	Σ•	ê↓ 3	Z↓
čə		12	G	6	₽ @	₩ ₽Re	ply with ⊆	hanges	E <u>n</u> d R	eview	. .	×.
	A4	1	•	fx								
			- A	4				В				С
1				Ene	rgy P	oint	Listir	ng				
2												

3	Energy Type	Energy Data Point Name	
4			
5	Electricity		
6	Natural Gas Fuel Oil		
7	Propane		
8	Steam		
9	Air		
10	Water		

Energy Point Listing

Energy Type	Energy Data Point Name
Electricity	Electric Main

Energy Point Listing

Energy Type	Energy Data Point Name
Electricity	Electric Main
Electricity	Boiler House
Electricity	Power House
Electricity	Production 1
Electricity	Production 2
Electricity	Shipping/Receiving/DC
Electricity	Data Center

Energy Point Listing

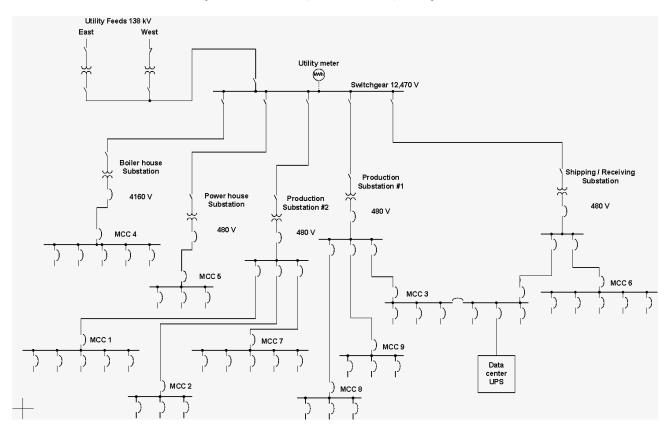
Energy Type	Energy Data Point Name
Electricity	Electric Main
Electricity	Boiler House
Electricity	Power House
Electricity	Production 1
Electricity	Production 2
Electricity	Shipping/Receiving/DC
Electricity	Data Center
Natural Gas	Gas Main
Natural Gas	Boiler House Gas
Fuel Oil	Fuel Oil
Propane	Propane
Steam	Steam Flow
Air	Air Flow
Water	Water Main

Identify Existing Energy Distribution Layouts and Metering

Follow these steps to help identify your existing energy distribution and metering systems.

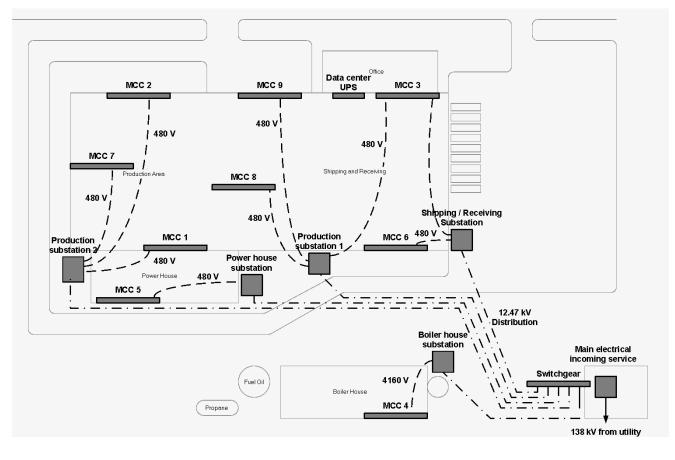
1. Gather existing electrical distribution single line drawings and label electricity data point substations and distribution points.

Efficient Industries Plant 1 Example - Electrical Single Line Drawing Example

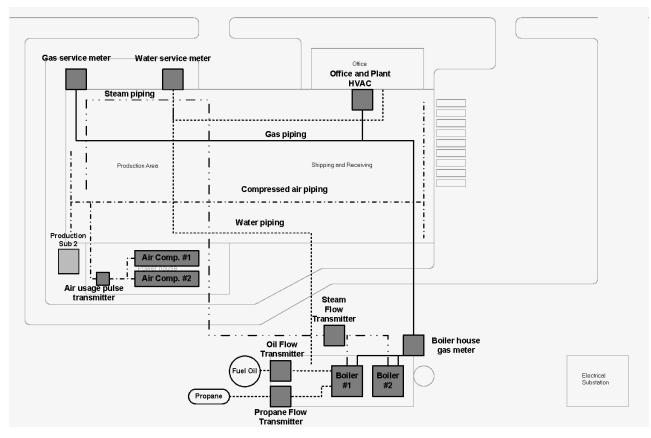


2. Gather or create the electrical distribution plant layout.

Efficient Industries Plant 1 Example- Electrical Distribution Layout



3. Gather or create other energy distribution plant layouts.



Efficient Industries Plant 1 Example - Other Energy Distribution Plant Layouts

Create Metering Layout and Name Data Collection Hardware

In this section, you will create a metering layout, then select and name your data collection hardware using the Energy Data Worksheet. The information entered in the worksheet will be used later in the FactoryTalk EnergyMetrix software configuration chapters.

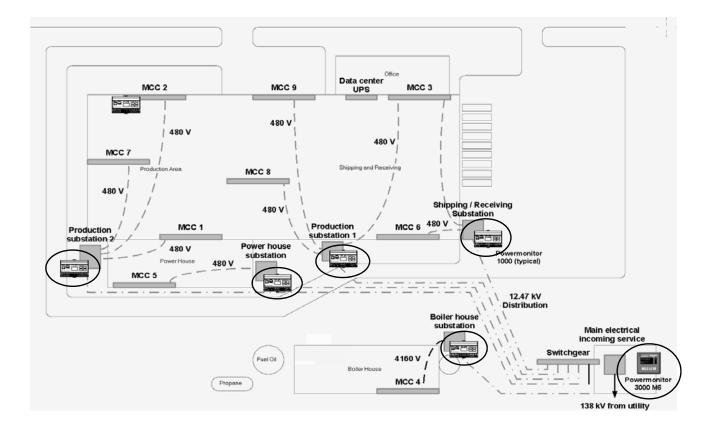
Create a Metering Layout and Select Data Collection Device Classes

Follow these steps to create a metering layout of your energy data collection devices.

1. Add PowerMonitors to your Electrical Distribution Layout drawing based on the electricity energy data points listed in the Energy Data Worksheet.

For the Efficient Industries Plant 1 example, these devices are added to the drawing:

- One PowerMonitor 3000 for the Electric Main to monitor power quality
- Five PowerMonitor 1000 devices to monitor electric consumption and demand for various plant departments, as listed in the Energy Data Worksheet



2. Browse to the System Layout and Wiring folder on your Energy Management Accelerator Toolkit CD image and open the Energy Data Worksheet.



3. Click the FactoryTalk EnergyMetrix tab and select a Device Class for each PowerMonitor added to the layout.

The device classes will be used in later chapters when configuring devices in FactoryTalk EnergyMetrix software and also determine the energy meter tag names.

- a. Select a cell in the Device Class column and click the pull-down list icon.
- b. Choose the appropriate PowerMonitor device class for each data point based on the Device Class Selection table.

Energy	Energy Data Point			
Туре	Name	Group Name	Device Class	Device Cat. No.
Electricity	Electric Main			~)
Electricity	Boiler House		Powermonitor 1000 on EtherNet/IP	4
Electricity	Power House		Powermonitor 3000 on EtherNet/IP ControlLogix on Ethernet	
Electricity	Production 1		OPC Server on Ethernet	
Electricity	Production 2			
Electricity	Shipping/Receiving/DC			
Electricity	Data Center			

Device Class Selection

Device Class	Energy Data Point Metering Requirements
PowerMonitor 1000 on EtherNet/IP	 Select this device class for: electricity data points requiring only consumption and demand monitoring. other energy data points in close proximity to a PowerMonitor 1000 device that can provide a digital contact output, for example, an existing utility meter with a pulse contact output. A maximum of two energy status inputs are provided on the PowerMonitor 1000 device.
PowerMonitor 3000 on EtherNet/IP	 Select this device class for: electricity data points requiring consumption, demand, and power quality monitoring. other energy data points in close proximity to a PowerMonitor 3000 device that can provide a digital contact output, for example, an existing utility meter with a pulse contact output. A maximum of two energy status inputs are provided on the PowerMonitor 3000 device.
PowerMonitor W250	Select this device class for: electricity data points requiring consumption monitoring in a wireless communication network
PowerMonitor 500 on Serial	Select this device class for: electricity data points requiring consumption monitoring
PowerMonitor 500 on EtherNet/IP	Select this device class for: • electricity data points requiring consumption monitoring • can also be used for demand monitoring
PowerMonitor 5000 on Ethernet/IP	 Select this device class for: electricity data points requiring consumption, demand, and power quality monitoring. other energy data points in close proximity to a PowerMonitor 5000 device that can provide a digital contact output, for example, an existing utility meter with a pulse contact output. A maximum of four energy status inputs are provided on the PowerMonitor 5000 device.

Energy	Energy Data Point					
Туре	Name	Group Name	Device Class	Device Cat. No.	Device Name	Meter Name
Electricity	Electric Main		Powermonitor 3000 on EtherNet/IP			Electric Main Meter
Electricity	Boiler House		Powermonitor 1000 on EtherNet/IP			Boiler House Meter
Electricity	Power House		Powermonitor 1000 on EtherNet/IP			Power House Meter
Electricity	Production 1		Powermonitor 1000 on EtherNet/IP			Production 1 Meter
Electricity	Production 2		Powermonitor 1000 on EtherNet/IP			Production 2 Meter
Electricity	Shipping/Receiving/DC		Powermonitor 1000 on EtherNet/IP			Shipping/Receiving/DC Meter

For the Efficient Industries Plant 1 example, the electricity energy data point listing would look like this.

4. Identify other digital energy data points in close proximity that you can connect to the status inputs of the PowerMonitors.

For the Efficient Industries Plant 1 example, the air flow digital pulse meter is near the Production 2 electrical substation so it can connect to the PowerMonitor 1000 named Production 2.

- 5. Select a Device Class and Meter Type on the FactoryTalk EnergyMetrix tab of the Energy Data Worksheet for the PowerMonitor status inputs identified in step 4.
 - a. Select the appropriate PowerMonitor Device Class.
 - b. Select PM Status Input for the Meter Type.

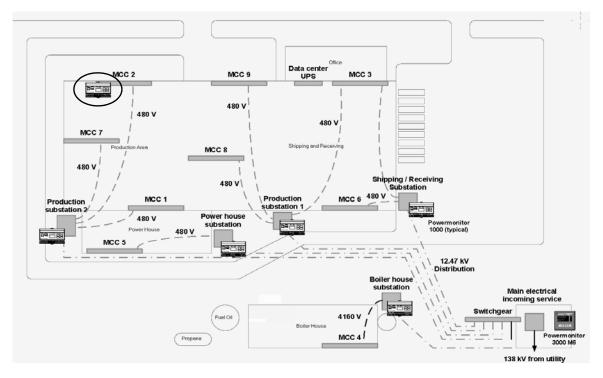
For the Efficient Industries Plant 1 example, the entries for the air flow data point would look like this.

Energy Type	Energy Data Point Name	Group Name	Device Class	Device Cat. No.	Device Name	Meter Name	Meter Tγpe
Electricity	Electric Main	oroup Humo	Powermonitor 3000 on EtherNet/IP	Dovide du. He.	Device Hame	Electric Main Meter	motor Type
Electricity	Boiler House		Powermonitor 1000 on EtherNet/IP			Boiler House Meter	
Electricity	Power House		Powermonitor 1000 on EtherNet/IP			Power House Meter	
Electricity	Production 1		Powermonitor 1000 on EtherNet/IP			Production 1 Meter	
Electricity	Production 2		Powermonitor 1000 on EtherNet/IP			Production 2 Meter	
Electricity	Shipping/Receiving/DC		Powermonitor 1000 on EtherNet/IP			Shipping/Receiving/DC Meter	
Electricity	Data Center					Data Center Meter	
Vatural Gas	Gas Main					Gas Main Meter	
Natural Gas	Boiler House Gas					Boiler House Gas Meter	
Fuel Oil	Fuel Oil					Fuel Oil Meter	
Propane	Propane					Propane Meter	
Steam	Steam Flow					Steam Flow Meter	
Air	Air Flow		Powermonitor 1000 on EtherNet/IP			Air Flow Meter	PM Status Input
Water	Water Main					Water Main Meter	

6. Identify other small groups (<3) of digital energy points in close proximity that can be collected by the digital status inputs of the PowerMonitor 1000 device.

This is a lower cost alternative to a CompactLogix[™] controller with a few digital inputs.

For the Efficient Industries Plant 1 example, the gas main and water main digital meters are somewhat isolated in the corner of the production area near MCC 2. A PowerMonitor 1000 named MCC 2 is added to capture these two digital meter inputs.



- 7. Select a Device Class and Meter Type on the FactoryTalk EnergyMetrix tab of the Energy Data Worksheet for the PowerMonitor status inputs identified in step 6.
 - a. Select a PowerMonitor 1000 Device Class.
 - b. Select PM Status Input for the Meter Type.

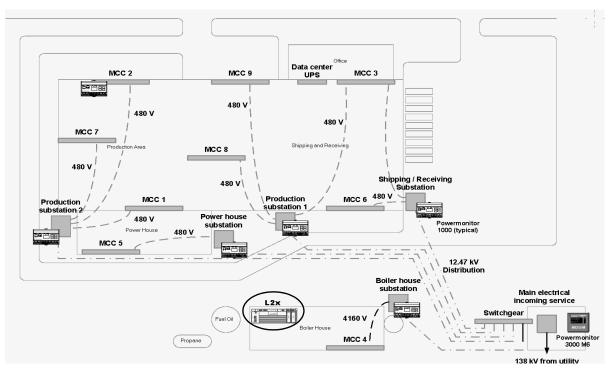
For the Efficient Industries Plant 1 example, the entries for the gas main and water main data points would look like this.

Ellergy	Energy Data Form						
Туре	Name	Group Name	Device Class	Device Cat. No.	Device Name	Meter Name	Meter Type
Electricity	Electric Main		Powermonitor 3000 on EtherNet/IP			Electric Main Meter	
Electricity	Boiler House		Powermonitor 1000 on EtherNet/IP			Boiler House Meter	
Electricity	Power House		Powermonitor 1000 on EtherNet/IP			Power House Meter	
Electricity	Production 1		Powermonitor 1000 on EtherNet/IP			Production 1 Meter	
Electricity	Production 2		Powermonitor 1000 on EtherNet/IP			Production 2 Meter	
Electricity	Shipping/Receiving/DC		Powermonitor 1000 on EtherNet/IP			Shipping/Receiving/DC Meter	
Electricity	Data Center					Data Center Meter	
Natural Gas	Gas Main		Powermonitor 1000 on EtherNet/IP			Gas Main Meter	PM Status Input
Natural Gas	Boiler House Gas					Boiler House Gas Meter	
Fuel Oil	Fuel Oil					Fuel Oil Meter	
Propane	Propane					Propane Meter	
Steam	Steam Flow					Steam Flow Meter	
Air	Air Flow		Powermonitor 1000 on EtherNet/IP			Air Flow Meter	PM Status Input
Water	Water Main		Powermonitor 1000 on EtherNet/IP			Water Main Meter	PM Status Input

8. Identify other larger groups of digital and analog energy data points in close proximity that can connect to an L23 CompactLogix controller data collection device.

The L23 CompactLogix controller can collect up to 16 digital inputs and 4 analog inputs.

For the Efficient Industries Plant 1 example, the remaining digital and analog energy data points are in the Boiler House so a CompactLogix controller is added to the metering layout.



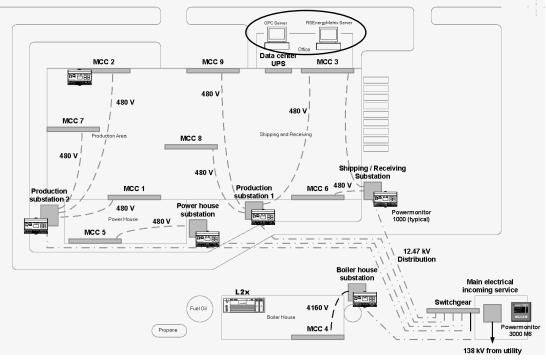
- **9.** Select a Device Class and Meter Type on the FactoryTalk EnergyMetrix tab of the Energy Data Worksheet for the digital and analog energy inputs identified in step 8.
 - a. Select ControlLogix® on Ethernet for the Device Class.
 - b. Select L2x Input for the Meter Type.

For the Efficient Industries Plant 1 example, the entries for the CompactLogix digital and analog energy data points would look like this.

Energy Type	Energy Data Point Name	Group Name	Device Class	Device Cat. No.	Device Name	Meter Name	Meter Type
Electricity	Electric Main		Powermonitor 3000 on EtherNet/IP			Electric Main Meter	
Electricity	Boiler House		Powermonitor 1000 on EtherNet/IP			Boiler House Meter	
Electricity	Power House		Powermonitor 1000 on EtherNet/IP			Power House Meter	
Electricity	Production 1		Powermonitor 1000 on EtherNet/IP			Production 1 Meter	
Electricity	Production 2		Powermonitor 1000 on EtherNet/IP			Production 2 Meter	
Electricity	Shipping/Receiving/DC		Powermonitor 1000 on EtherNet/IP			Shipping/Receiving/DC Meter	
Electricity	Data Center					Data Center Meter	
Natural Gas	Gas Main		Powermonitor 1000 on EtherNet/IP			Gas Main Meter	PM Status Input
Natural Gas	Boiler House Gas		ControlLogix on Ethernet			Boiler House Gas Meter	L2x Input
Fuel Oil	Fuel Oil		ControlLogix on Ethernet			Fuel Oil Meter	L2x Input
Propane	Propane		ControlLogix on Ethernet			Propane Meter	L2x Input
Steam	Steam Flow		ControlLogix on Ethernet			Steam Flow Meter	L2x Input
Air	Air Flow		Powermonitor 1000 on EtherNet/IP			Air Flow Meter	PM Status Input
Water	Water Main		Powermonitor 1000 on EtherNet/IP			Water Main Meter	PM Status Input

10. Identify and list any energy data points to be collected from an OPC server.

For the Efficient Industries Plant 1 example, Data Center energy consumption will be collected by an OPC server in the office area. The personal computer for the FactoryTalk EnergyMetrix server is also in this location. All energy data collection devices and the FactoryTalk EnergyMetrix server are connected to an EtherNet/IP network.



- 11. Select a Device Class and Meter Type on the FactoryTalk EnergyMetrix tab of the Energy Data Worksheet for the OPC server data point identified in step 10.
 - a. Select OPC Server on Ethernet for the Device Class.
 - b. Select OPC for the Meter Type.

For the Efficient Industries Plant 1 example, the entry for the OPC server data point would look like this.

-							
Energy	Energy Data Point						
Туре	Name	Group Name	Device Class	Device Cat. No.	Device Name	Meter Name	Meter Type
Electricity	Electric Main		Powermonitor 3000 on			Electric Main Meter	
			EtherNet/IP				
Electricity	Boiler House		Powermonitor 1000 on			Boiler House Meter	
			EtherNet/IP				
Electricity	Power House		Powermonitor 1000 on			Power House Meter	
			EtherNet/IP				
Electricity	Production 1		Powermonitor 1000 on			Production 1 Meter	
			EtherNet/IP				
Electricity	Production 2		Powermonitor 1000 on			Production 2 Meter	
			EtherNet/IP				
Electricity	Shipping/Receiving/DC		Powermonitor 1000 on			Shipping/Receiving/DC Meter	
			EtherNet/IP				
Electricity	Data Center		OPC Server on Ethernet			Data Center Meter	OPC
Natural Gas	Gas Main		Powermonitor 1000 on			Gas Main Meter	
			EtherNet/IP				PM Status Input
Natural Gas	Boiler House Gas		ControlLogix on Ethernet			Boiler House Gas Meter	
							L2x Input
Fuel Oil	Fuel Oil		ControlLogix on Ethernet			Fuel Oil Meter	L2x Input
Propane	Propane		ControlLogix on Ethernet			Propane Meter	L2x Input
Steam	Steam Flow		ControlLogix on Ethernet			Steam Flow Meter	L2x Input
Air	Air Flow		Powermonitor 1000 on			Air Flow Meter	
			EtherNet/IP				PM Status Input
Water	Water Main		Powermonitor 1000 on			Water Main Meter	
			EtherNet/IP				PM Status Input

Select Data Collection Hardware

Follow these steps to select your data collection hardware.

 Browse to the System Layout and Wiring folder on the Energy Management Accelerator Toolkit CD image and open the Energy Data Worksheet.



- **2.** Click the FactoryTalk EnergyMetrix tab then choose or enter energy device catalog numbers.
 - a. Select a cell in the Cat. No. column and click the pull-down list icon.
 - b. Choose the appropriate Cat. No. for each data point based on the PowerMonitor and CompactLogix Device Selection table.

To use a nonstandard energy device, select the blank at the bottom of the list and enter the catalog number.

Device	Cat. No.	Description	Communication	
	1408-EM1A-ENT	Provides kWh data, energy log, and status log only.		
PowerMonitor 1000 on Ethernet	1408-EM2A-ENT	Provides kWh, kVARh, kVAHh data, demand and projected demand values plus energy min/max, load factor, and status log.	Ethernet	
	1408-EM3A-ENT ⁽²⁾	EM2A-ENT plus separate voltage, current, frequency, and power factor parameters.		
PowerMonitor 3000 on Ethernet	1404-M505 <i>x</i> -ENT ⁽³⁾	Provides full consumption and demand value parameters, ten configurable setpoints, %THD, and K-factor harmonic analysis.		
	1404-M605 <i>x</i> -ENT ⁽²⁾⁽³⁾	Provides same parameters as catalog number 1404- M505x-ENT plus waveform capture capability, and 41st order harmonic analysis.	Ethernet	
	1404-M805 <i>x</i> -ENT ⁽³⁾	Provides same parameters as catalog number 1404- M605x-ENT plus transient detection and capture, and 63rd order harmonic analysis.		
PowerMonitor W250	1425-D1002-MOD	25-D1002-MOD PowerMonitor Wireless, 100A, 300V Delta		
	1425-D1002-M0D-480	PowerMonitor Wireless,100A,480V Delta	a serial to Ethernet gateway).	
	1425-W1003-MOD	PowerMonitor Wireless,100A,300V Wye		
	1425-D2002-MOD	PowerMonitor Wireless,200A,300V Delta		
	1425-W2003-MOD	PowerMonitor Wireless, 200A,300V Wye		
	1425-D5002-MOD	PowerMonitor Wireless, 500A, 300V Delta	-	
	1425-D5002-M0D-480	PowerMonitor Wireless, 500A, 480V Delta		
	1425-W5003-MOD	PowerMonitor Wireless, 500A, 300V Wye	-	
	1425-D10002-MOD	PowerMonitor Wireless, 1000A, 300V Delta		
	1425-W10003-MOD	PowerMonitor Wireless, 1000A, 300V Wye	1	
	1425-D20002-MOD	PowerMonitor Wireless, 2000A, 300V Delta		
	1425-D20002-M0D-480	PowerMonitor Wireless, 2000A, 480V Delta	1	
	1425-W20003-MOD	PowerMonitor Wireless, 2000A, 300V Wye]	

Device	Cat. No.	Description	Communication
PowerMonitor 500 ⁽¹⁾	1420-V <i>y</i>	Power Meter Indicator	No Comm
	1420-V <i>y</i> P	1420-VyP Power Meter - Pulse (digital) Output	
	1420-V <i>y</i> A	Power Meter - Analog Output	
	1420-V <i>y</i> -ENT	EtherNet/IP Power Meter	Ethernet
	1420-V <i>y</i> P-ENT	EtherNet/IP Power Meter - Pulse (digital) Output	
	1420-V <i>y</i> A-ENT	20-VyA-ENT EtherNet/IP Power Meter - Analog Output	
	1420-V <i>y</i> -485	1420-Vy-485 Serial Power Meter	
	1420-V <i>y</i> P-485	Serial Power Meter - Pulse (digital) Output	
	1420-V <i>y</i> A-485	Serial Power Meter - Analog Output	
PowerMonitor 5000	1426-M5E	Power Quality Meter	Ethernet
	1426-M5E-ENT	Power Quality Meter with 2nd Ethernet Port	
	1426-M5E-CNT	Power Quality Meter with ControlNet Port	
	1426-M5E-DNET	Power Quality Meter with DeviceNet Port	
	1769-L23E-QB1B	Provides 16 DC inputs/16 DC outputs	
CompactLogix L23 Controllers	1769-L23E-QBFC1B	Provides 16 DC inputs/16 DC outputs plus: 4 analog inputs 2 analog outputs 4 high speed counters	Ethernet

(1) The y in the catalog number designates device voltage, where 1 = 240V ACV-LL120V ACV-LN/208V ACV-LL and 2 = 400V ACV-LN and 690V ACV-LL.

(2) Preferred devices for use with this toolkit.

(3) The x in the catalog number designates device power, where A=120/240 VAC and B= 24 VDC.

For the Efficient Industries Plant 1 example, the catalog numbers for the data collection devices would look like this.

				$\langle \rangle$			
Energy	Energy Data Point						
Type	Name	Group Name	Device Class	Device Cat. No.	Device Name	Meter Name	Meter Type
Electricity	Electric Main		Powermonitor 3000 on EtherNet/IP	1404-M605x-ENT		Electric Main Meter	
Electricity	Boiler House		Powermonitor 1000 on EtherNet/IP	1408-EM3A-ENT		Boiler House Meter	
Electricity	Power House		Powermonitor 1000 on EtherNet/IP	1408-EM3A-ENT		Power House Meter	
Electricity	Production 1		Powermonitor 1000 on EtherNet/IP	1408-EM3A-ENT		Production 1 Meter	
Electricity	Production 2		Powermonitor 100D on EtherNet/IP	1408-EM3A-ENT		Production 2 Meter	
Electricity	Shipping/Receiving/DC		Powermonitor 1000 on EtherNet/IP	1408-EM3A-ENT		Shipping/Receiving/DC Meter	
Electricity	Data Center		OPC Server on Ethernet			Data Center Meter	OPC
Natural Gas	Gas Main		Powermonitor 1000 on EtherNet/IP	1408-EM2A-ENT		Gas Main Meter	PM Status Input
Natural Gas	Boiler House Gas		ControlLogix on Ethernet	1769-L23E-QBFC1B	1	Boiler House Gas Meter	L2x Input
Fuel Oil	Fuel Oil		ControlLogix on Ethernet	1769-L23E-QBFC1B	1	Fuel Oil Meter	L2x Input
Propane	Propane		ControlLogix on Ethernet	1769-L23E-QBFC1B	/	Propane Meter	L2x Input
Steam	Steam Flow		ControlLogix on Ethernet	1769-L23E-QBFC1B		Steam Flow Meter	L2x Input
Air	Air Flow		Powermonitor 1000 on EtherNet/IP	1408-EM3A-ENT		Air Flow Meter	PM Status Input
Water	Water Main		Powermonitor 1000 on EtherNet/IP	1408-EM2A-EM		Water Main Meter	PM Status Input

Name Data Collection Hardware

Follow these steps to create or select device names, meter types, and meter tag names for each energy data point. These names will be used later in the FactoryTalk EnergyMetrix software configuration chapters.

- 1. Click the FactoryTalk EnergyMetrix tab on the Energy Data Worksheet.
- 2. Enter a device name for each energy data point.
 - **TIP** It is recommended that you name the device with the same name as the energy data point when possible. If a device collects multiple energy data points, use a name related to the most significant data point or unique location.

For the Efficient Industries Plant 1 example, the device names for the first six PowerMonitor devices and the data center are the same as the energy data point names.

Energy	Energy Data Point						
Туре	Name	Group Name	Device Class	Device Cat. No.	Device Name	Meter Name	Meter Type
Electricity	Electric Main		Powermonitor 3000 on EtherNet/IP	1404-M605x-ENT	Electric Main	Electric Main Meter	
Electricity	Boiler House		Powermonitor 1000 on EtherNet/IP	1408-EM3A-ENT	Boiler House	Boiler House Meter	
Electricity	Power House		Powermonitor 1000 on EtherNet/IP	1408-EM3A-ENT	Power House	Power House Meter	
Electricity	Production 1		Powermonitor 1000 on EtherNet/IP	1408-EM3A-ENT	Production 1	Production 1 Meter	
Electricity	Production 2		Powermonitor 1000 on EtherNet/IP	1408-EM3A-ENT	Production 2	Production 2 Meter	
Electricity	Shipping/Receiving/DC		Powermonitor 1000 on EtherNet/IP	1408-EM3A-ENT	Shipping/Receiving/DC	Shipping/Receiving/DC Meter	
Electricity	Data Center		OPC Server on Ethernet		Data Center	Data Center Meter	OPC
Natural Gas	Gas Main		Powermonitor 1000 on EtherNet/IP	1408-EM2A-ENT		Gas Main Meter	PM Status Input
Natural Gas	Boiler House Gas		ControlLogix on Ethernet	1769-L23E-QBFC1B		Boiler House Gas Meter	L2x Input
Fuel Oil	Fuel Oil		ControlLogix on Ethernet	1769-L23E-QBFC1B		Fuel Oil Meter	L2x Input
Propane	Propane		ControlLogix on Ethernet	1769-L23E-QBFC1B		Propane Meter	L2x Input
Steam	Steam Flow		ControlLogix on Ethernet	1769-L23E-QBFC1B		Steam Flow Meter	L2x Input
Air	Air Flow		Powermonitor 1000 on EtherNet/IP	1408-EM3A-ENT		Air Flow Meter	PM Status Input
Water	Water Main		Powermonitor 1000 on EtherNet/IP	1408-EM2A-ENT		Water Main Meter	PM Status Input

For the Efficient Industries Plant 1 example, the PowerMonitor 1000 device named MCC 2 collects two energy data points, the Gas Main and the Water Main. The CompactLogix device collecting one digital and three analog inputs is named L2x.

Energy	Energy Data Point						
Туре	Name	Group Name	Device Class	Device Cat. No.	Device Name	Meter Name	Meter Type
Electricity	Electric Main		Powermonitor 3000 on EtherNet/IP	1404-M605x-ENT	Electric Main	Electric Main Meter	
Electricity	Boiler House		Powermonitor 1000 on EtherNet/IP	1408-EM3A-ENT	Boiler House	Boiler House Meter	
Electricity	Power House		Powermonitor 1000 on EtherNet/IP	1408-EM3A-ENT	Power House	Power House Meter	
Electricity	Production 1		Powermonitor 1000 on EtherNet/IP	1408-EM3A-ENT	Production 1	Production 1 Meter	
Electricity	Production 2		Powermonitor 1000 on EtherNet/IP	1408-EM3A-ENT	Production 2	Production 2 Meter	
Electricity	Shipping/Receiving/DC		Powermonitor 1000 on EtherNet/IP	1408-EM3A-ENT	Shipping/Receiving/DC	Shipping/Receiving/DC Meter	
Electricity	Data Center		OPC Server on Ethernet		Dat <u>a Cen</u> ter	Data Center Meter	OPC
Natural Gas	Gas Main		Powermonitor 1000 on EtherNet/IP	1408-EM2A-ENT	Mcc 2	Gas Main Meter	PM Status Input
Natural Gas	Boiler House Gas		ControlLogix on Ethernet	1769-L23E-QBFC1B		Boiler House Gas Meter	L2x Input
Fuel Oil	Fuel Oil		ControlLogix on Ethernet	1769-L23E-QBFC1B	L2x	Fuel Oil Meter	L2x Input
Propane	Propane		ControlLogix on Ethernet	1769-L23E-QBFC1B	L2x	Propane Meter	L2x Input
Steam	Steam Flow		ControlLogix on Ethernet	1769-L23E-QBFC1B	L2x	Steam Flow Meter	L2x Input
Air	Air Flow		Powermonitor 1000 on EtherNet/IP	1408-EM3A-ENT	Production 2	Air Flow Meter	PM Status Input
Water	Water Main		Powermonitor 1000 on EtherNet/IP	1408-EM2A-ENT	MCC 2	Water Main Meter	PM Status Input

3. Review meter names.

The meter names are autopopulated in the worksheet based on energy data point names.

- 4. Choose Electric as the Meter Type for all the PowerMonitor devices.
- 5. Select or enter meter tag names for each data point based on the Energy Type and Meter Type shown in the table.

Energy Type	Meter Type	Meter Tag Names	
	Electric	Real Energy Net Reactive Energy Net Reactive Power Demand	
Electricity	PM Status Input		
	L2x Input	Real Energy Net ⁽¹⁾	
	OPC		
Natural Gas	PM Status Input		
	L2x Input	Natural Gas Usage ⁽¹⁾	
	OPC	_	
Fuel Oil	PM Status Input		
	L2x Input	Fuel Oil Usage ⁽¹⁾	
	OPC	_	
Propane	PM Status Input		
	L2x Input	Propane Usage ⁽¹⁾	
	OPC	_	
Steam	PM Status Input		
	L2x Input	Propane Usage ⁽¹⁾	
	OPC	_	
Air	PM Status Input		
	L2x Input	Air Usage ⁽¹⁾	
	OPC	_	
Water	PM Status Input		
	L2x Input	Water Usage ⁽¹⁾	
	OPC	7	

(1) If there is only one energy data point of a particular energy type then select the meter tag name listed in the table. If there is more than one energy data point with the same energy type then select a blank meter name and type [EnergyDataPointName] [EnergyType] Usage, for example, Boiler House Natural Gas Usage.

Energy	Energy Data Point							
Type	Name	Group Name	Device Class	Device Cat. No.	Device Name	Meter Name	Meter Type	Meter Tag Name
Electricity	Electric Main		Powermonitor 3000 on EtherNet/IP	1404-M605x-ENT	Electric Main	Electric Main Meter	Electric	Real Energy Net Reactive Energy Net Reactive Power
Electricity	Boiler House		Powermonitor 1000 on EtherNet/IP	1408-EM3A-ENT	Boiler House	Boiler House Meter	Electric	Real Energy Net Reactive Energy Net Reactive Power
Electricity	Power House		Powermonitor 1000 on EtherNet/IP	1408-EM3A-ENT	Power House	Power House Meter	Electric	Real Energy Net Reactive Energy Net Reactive Power
Electricity	Production 1		Powermonitor 1000 on EtherNet/IP	1408-EM3A-ENT	Production 1	Production 1 Meter	Electric	Real Energy Net Reactive Energy Net Reactive Power
Electricity	Production 2		Powermonitor 1000 on EtherNet/IP	1408-EM3A-ENT	Production 2	Production 2 Meter	Electric	Real Energy Net Reactive Energy Net Reactive Power
Electricity	Shipping/Receiving/DC		Powermonitor 1000 on EtherNet/IP	1408-EM3A-ENT	Shipping/Receiving/D C	Shipping/Receiving/DC Meter	Electric	Real Energy Net Reactive Energy Net Reactive Power
Electricity	Data Center		OPC Server on Ethernet		Data Center	Data Center Meter	OPC	Real Energy Net
Natural Gas	Gas Main		Powermonitor 1000 on EtherNet/IP	1408-EM2A-ENT	MCC 2	Gas Main Meter	PM Status Input	Natural Gas Usage
Natural Gas	Boiler House Gas		ControlLogix on Ethernet	1769-L23E-QBFC1B	L2x	Boiler House Gas Meter	L2x Input	Boiler House Natural Gas Usage
Fuel Oil	Fuel Oil		ControlLogix on Ethernet	1769-L23E-QBFC1B	L2x	Fuel Oil Meter	L2x Input	Fuel Oil Usage
Propane	Propane		ControlLogix on Ethernet	1769-L23E-QBFC1B	L2x	Propane Meter	L2x Input	Propane Usage
Steam	Steam Flow		ControlLogix on Ethernet	1769-L23E-QBFC1B	L2x	Steam Flow Meter	L2x Input	Steam Usage
Air	Air Flow		Powermonitor 1000 on EtherNet/IP	1408-EM3A-ENT	Production 2	Air Flow Meter	PM Status Input	Air Usage
Water	Water Main		Powermonitor 1000 on EtherNet/IP	1408-EM2A-ENT	MCC 2	Water Main Meter	PM Status Input	Water Usage

For the Efficient Industries Plant 1 example, the meter type and meter tag name listing would look like this.

Assign CompactLogix Input Addresses

Follow these steps to assign CompactLogix hardware input addresses and corresponding PLC-5[®] mapped tags to the energy data points.

- 1. Click the CompactLogix tab on the Energy Data Worksheet.
- 2. Enter an L2x address for each energy data point that is connected to a CompactLogix controller.
 - a. Select a cell in the L2x column and click the pull-down list icon.
 - b. Choose the L2x digital hardware address to which the energy data point is wired.

Digital Input addresses are Local:1:I.Data.0 through Local:1:I.Data.15. Analog Input addresses are Local:3:I.CH0 through Local:3:I.CH3.

	CompactLogix Tag and AOI Naming						
Group Name	Device Name	Meter Name	Meter Type	Meter Tag Name	AOI Name	L2x Input Address	
							+
							+
						-	-
	L2x	Boiler House Gas	L2x Input	Boiler House Natural Gas Usage	Boiler House Gas	· · · · ·	
	L2x	Fuel Oil Meter	L2x Input	Fuel Oil Usage	Fuel_Oil	Local:1:I.Data.0	4
	L2x	Propane Meter	L2x Input	Propane Usage	Propane	Local:1:I.Data.1 Local:1:I.Data.2	
	L2x	Steam Flow Meter	L2x Input	Steam Usage	Steam_Flow	Local:1:1.Data.3	
						Local:1:I.Data.4 Local:1:I.Data.5	
						Local:1:I.Data.6 Local:1:I.Data.7	-

- 3. Select the corresponding PLC-5 mapped address for the energy data point.
 - a. Select a cell in the PLC-5 Address column and click the pull-down list icon.
 - b. Choose a PLC-5 File 10 address to which the energy data point will be mapped for communicating with FactoryTalk EnergyMetrix software.
 - **TIP** It is recommended that you assign consecutive PLC-5 addresses in a single file to simplify mapping. Refer to <u>page 86</u> for details on mapped PLC-5 addresses.

Device Name	Meter Name	Meter Type	Meter Tag Name	AOI Name	L2x Input Address	L2x EnergyTotals Address	PLC 5 Address
L2x	Boiler House Gas	L2x Input	Boiler House Natural Gas Usage	Boiler_House_Gas	Local:1:1.Data.0		
L2x	Fuel Oil Meter	L2x Input	Fuel Oil Usage	Fuel Oil	Local:3:1.Ch0Data		10:0
L2x	Propane Meter	L2x Input	Propane Usage	Propane	Local:3:1.Ch1Data		10:1 10:2
L2x	Steam Flow Meter	L2x Input	Steam Usage	Steam_Flow	Local:3:1.Ch2Data	F	10:3
							10:4 10:5
						F	10:6

For the Efficient Industries Plant 1 example, the Compactlogix and PLC-5 address assignments would look similar to this.

Device Name	Meter Name	Meter Type	Meter Tag Name	AOI Name	L2x Input Address	L2x EnergyTotals Address	PLC 5 Address
L2x	Boiler House Gas	L2x Input	Boiler House Natural Gas Usage	Boiler_House_Gas	Local:1:I.Data.0	L2x_EnergyTotals[0]	
L2x	Fuel Oil Meter	L2x Input	Fuel Oil Usage	Fuel_Oil	Local:3:1.Ch0Data	L2x_EnergyTotals[1]	
L2x	Propane Meter	L2x Input	Propane Usage	Propane	Local:3:1.Ch1Data	L2x_EnergyTotals[2]	F10:2
L2x	Steam Flow Meter	L2x Input	Steam Usage	Steam_Flow	Local:3:1.Ch2Data	L2x_EnergyTotals[3]	F10:3

Create Energy Panel Layout and Wiring Drawings

The toolkit provides energy data collector panel layout and wiring drawings in DWG, DXF, and PDF file formats to help you plan the layout of your energy system. The files are organized by device (CompactLogix, PM1000, PM3000, PMW250, PM500, and PM5000). The drawings include power and control wiring.

If you do not have CAD software, use the pdf files to build your system drawings.

Use CAD Drawings from Toolkit

Follow these steps to access the AutoCAD drawings for each device in your Energy Data Worksheet.

1. Browse to and open the System	🚔 C:\Documents and Settings\jwnovak\Desktop\Energy Managem	ent Accelerator Toolkit\Files
Layout and Wiring folder on the	<u>File E</u> dit <u>V</u> iew F <u>a</u> vorites <u>T</u> ools <u>H</u> elp	
Energy Management Accelerator	🚱 Back 🔻 🌍 🖌 🏂 🔎 Search 🎼 Folders 🔛 -	
Toolkit CD image.	Address 🛅 C:\Documents and Settings\jwnovak\Desktop\Energy Management A	Accelerator Toolkit\Files 🛛 🕑 Go
	File and Folder Tasks	Size Type Date Modified
	File and Folder Tasks File and Folder Tasks	File Folder 11/3/2009 10:25 AM File Folder 11/3/2009 10:25 AM
	Other Places Sample Rate Schedules	File Folder 11/3/2009 10:25 AM File Folder 11/5/2009 10:04 AM
2. Navigate to the desired files based		
on your device and file format	C:\Documents and Settings\jwnovak\Desktop\Energy M File Edit View Favorites Tools Help	anagement Accelerator Toolkit\F1
(DXF, DWG, or PDF).		140
	🕒 Back 🔹 🕥 👘 🌮 Search 🕞 Folders	
	Address C:\Documents and Settings\jwnovak\Desktop\Energy Man	agement Accelerator Toolkit\Files\System Layı 💌 ラ Go
	File and Folder Tasks	Size Type Date Modified
	File and Folder Tasks	File Folder 11/5/2009 10:04 AM File Folder 11/5/2009 10:04 AM
	Other Places S PM3000	File Folder 11/5/2009 10:04 AM
	Energy Data Worksheet	53 KB Microsoft Excel Wor 11/3/2009 7:55 AM
	DWG	
	DXF	
	Rec1_PM1000_Panel_Layout	2,102 KB DWG File 7/29/2009 7:45 AM
	ee 02_Layout_Footprints	823 KB DWG File 7/29/2009 7:44 AM
	려운03_Layout_Footprints_3D	823 KB DWG File 7/29/2009 7:44 AM
	≓®04_PM1000_Comm_Diagram	119 KB DWG File 7/29/2009 7:44 AM
	≉@05_PM1000_480V_3Wire_WYE_Direct ≉@06_PM1000_480V_4Wire_WYE_Direct	188 KB DWG File 7/29/2009 7:44 AM 189 KB DWG File 7/29/2009 7:44 AM
	* @ 07_PM1000_480V_OpenDelta_2PTs_3CTs	191 KB DWG File 7/29/2009 7:44 AM
	*@08_PM1000_4160V_OpenDelta_2CTs	188 KB DWG File 7/29/2009 7:44 AM
	ee09_PM1000_120_240V_1Ph_Direct	176 KB DWG File 7/29/2009 7:44 AM
	Retrofit_Wiring	112 KB DWG File 7/29/2009 7:44 AM

3. Add the required files to your project or copy them to your project folder.

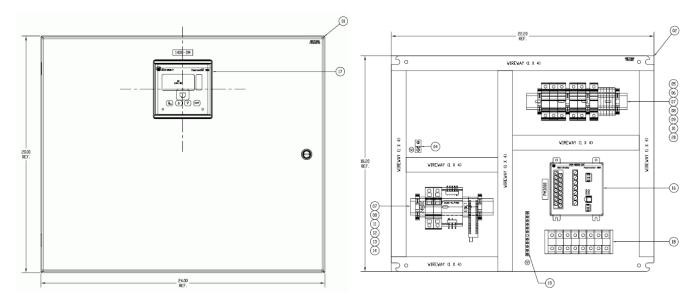
The drawings were created using AutoCAD Electrical. The project files are included in the DWG folder. The path references in the project file are the default AutoCAD Electrical installation path.

Panel Layout Drawings

The AutoCAD Electrical project includes several panel-layout drawings for the PowerMonitor 1000, PowerMonitor 3000, and CompactLogix data collector devices. Choose an appropriate drawing as a starting point. Add or remove components as needed.

This example shows an energy panel layout with a PowerMonitor 3000 device.

Sample PowerMonitor 3000 Layout



Sample Bill of Material

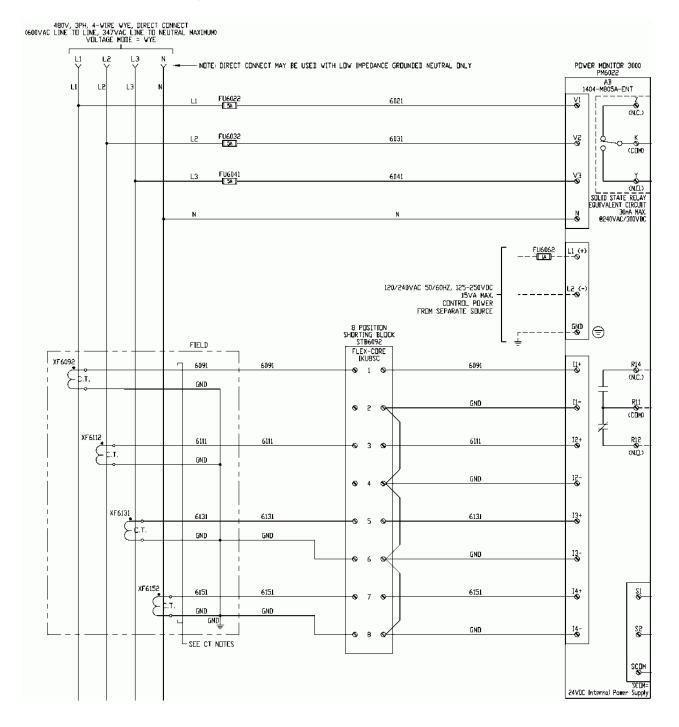
ITEM	QTY	DESCRIPTION	MFG	CATALDG
01	1	CONCEPT WALL-MOUNT ENCLOSURE	HDFFMAN	CSD20248
02	1	24" X 20" SUBPAN	HDFFMAN	CP2420
03	A/R	1X4 GRAY SLOT WIRE DUCT	PANDUIT	F1X4LG6
04	1	PANEL GROUND LUG #8AWG	ILSCO	TA-2
05	1	2 POLE FUSE BLOCK - CLASS CC	AB	1492-FB2C30-L
06	1	1 POLE FUSE BLOCK - CLASS CC	AB	1492-FB1C30-L
07	A/R	RAIL, DIN MTG, 25MM, 1M	AB	199-DR1
08	6	END ANCHOR	AB	1492-EAJ35
09	6	SCREW CONNECTION TERMINAL BLOCK; 1492-J	AB	1492-J4
10	1	END BARRIER; 1492-J	AB	1492-EBJ3
11	4	GROUP MARKER CARRIER	AB	1492-GM35
12	2	1AMP CIRCUIT BREAKER	AB	1492-SP1D010
13	1	PS, COMPACT, 30 ₩, 24-28∨	AB	1606-XLP30E
14	1	INDUSTRIAL, COPPER TO FIBER MEDIA CONVERTER 10-/100-MBPS	BLACKBOX	LIC022A
16	1	POWER MONITOR 3000, 120V/240VAC 50/60HZ OR 125-250VDC	AB	1404-M805A-ENT
17	1	POWERMONITOR 3000, DISPLAY MODULE, WITH 3 METER CABLE	AB	1404-DM
18	1	SHORTING BLOCK, 8 POSITION	FLEX-CORE	IKU8SC
19	1	GROUNDING BAR SYSTEM, 9 POS	SQUARE-D	PK9GTA
20	1	3 POLE FUSE BLOCK - CLASS CC	AB	1492-FB3C30-L

Wiring Drawings

The AutoCAD electrical project includes a variety of electrical power wiring configurations for PowerMonitor 1000 and PowerMonitor 3000 devices plus power and control wiring drawings for the CompactLogix L23E controller.

This drawing shows PowerMonitor 3000 device wiring for a 480V, 4-wire WYE direct system.

PowerMonitor 3000 Device Wiring

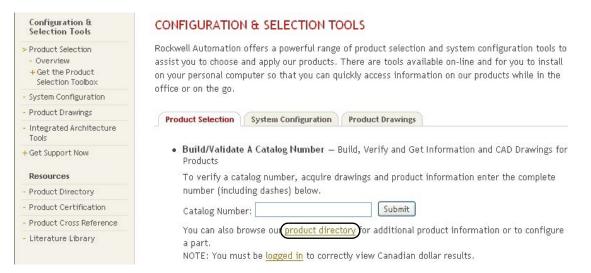


Access Other Allen-Bradley CAD Drawings

Follow these steps to download other Allen-Bradley[®] product CAD drawings.

1. Open your browser and go to <u>http://ab.com/e-tools</u>.

The Configuration and Selection Tools webpage opens.



- **TIP** If you know the complete catalog number of your Allen-Bradley product, you can enter it here and click Submit. However, you need a complete catalog number string to get the configuration results.
- 2. If you don't know the complete catalog number, click product directory to browse the configured Rockwell Automation products.
- **3.** Click Rockwell Automation and follow the prompts.

Select and Configure Products

Rockwell Automation/Allen-Bradley Product Catalog

- Rockwell Automation
- Services
- Encompass Partner Library

Select Monitoring Software

Use these tables to select the FactoryTalk EnergyMetrix software appropriate for your application requirements. Every FactoryTalk EnergyMetrix system must include a Manager license of 8, 64, or 1000 meters.

License Options

FactoryTalk EnergyMetrix software is a scalable, modular software application. Its components and capabilities are determined by the licenses purchased and installed by the user. Licenses are installed by means of FactoryTalk Activation.

The table below shows the component type and, if applicable, the number of meters supported. There is no limit on the number of users. It is the customer's responsibility to observe the requirements of software licenses.

The Manager license is required for use of the software, and includes 10 meters which can be any combination of RSLinx software and 3rd-party OPC meters. Additional meter licenses can be purchased in 10-, 50, 100- and 500- meter sets. The FTEMOPC 3rd-party OPC option enables 3rd-party OPC connectivity to all licensed meters.

If you are upgrading from an existing installation of FactoryTalk EnergyMetrix software, your existing licenses are supported, including existing meter counts.

IMPORTANT	FactoryTalk EnergyMetrix software only supports FactoryTalk Activation. If you plan to upgrade from an installation of
	FactoryTalk EnergyMetrix that uses EVRSI Master Disk activation, please contact Rockwell Automation customer service
	to convert to FT Activation.

Component Type	Maximum Meter Count
FTEM Manager, includes 10 RSLinx or OPC meters	10
FTEM10 10-meter option, RSLinx	10
FTEM50 50-meter option, RSLinx	50
FTEM100 100-meter option, RSLinx	100
FTEM500 500-meter option, RSLinx	500
FTEMOPC 3rd-party OPC client for all licensed meters	N/A
FTEMRT Real Time option	N/A
FTEMRPT ReportsPlus option	N/A
FTEMCHT ChartsPlus option	N/A
Microsoft SQL Server bundle - 1 client license option	N/A
Microsoft SQL Server bundle - processor license option	N/A

Contact your Rockwell Automation representative for information on the meter and option packages listed above.

Server Requirements

We recommend, but do not require, that you install FactoryTalk EnergyMetrix software on a dedicated server with a local installation of Microsoft SQL Server.

Server Software Requirements for Installing FactoryTalk EnergyMetrix Software

- Windows 2003 Server or Windows 2008 Server, Application Server role. For 64-bit operating systems, RSLinx Classic software version 2.57 CPR9 SR3 or later must be installed. Windows 2000 Server is not supported.
- Microsoft SQL Server 2005 or 2008, installed with mixed-mode authentication (Windows and SQL). TCP/IP access must be enabled. A system administrator SQL login must be used for the FactoryTalk EnergyMetrix installation.
- You must have machine administrator privileges to install FactoryTalk EnergyMetrix software.

Hardware Requirements

These are the hardware requirements that you need to use FactoryTalk EnergyMetrix software.

Definitions

The following rules of thumb are offered as a starting point for determining server sizing for FactoryTalk EnergyMetrix. Other factors will affect the required size of a server. A higher number of tags being logged, a faster log rate, a larger number of users, and a larger number of reports being run will require a more powerful server than the guidelines specify. These are the server guidelines:

- A low-end server has up to 8 meters and logs up to 40 meter tags at a minimum 15 minute log rate.
- A mid-range server has up to 64 meters and logs up to 320 meter tags at a minimum 15 minute log rate.
- A high-end server has more than 64 meters and logs more than 500 meter tags at a minimum 15 minute log rate.

Database Size Guidelines

FactoryTalk EnergyMetrix writes 16 bytes of data to the database for each meter tag logged. Over time, the database can grow to become quite large. Some examples include the following:

- A low-end server, logging 40 meter tags at 15 minute intervals, will grow the database at a rate of 2.56 KB per hour or 22 MB per year.
- A mid-level server, logging 320 meter tags at 15 minute intervals, will grow the database at a rate of 20.5 KB per hour, or 180 MB per year.
- A high-end server, logging 1000 meter tags at 15 minute intervals, will grow the database at a rate of 240 KB per hour, or 2.1 GB per year.

Consider these guidelines when determining hard disk requirements for a server as well as database maintenance schedules.

Recommendations

These are general guidelines. FactoryTalk EnergyMetrix software is capable of running on a variety of hardware platforms. The main scalability issue is related to processing of logged data (for example, report generation, trending). CPU speed, number of CPUs, RAM, and RAID 5 for the database files are the main scalability factors (in that order). All hardware platforms require the following:

- Processor, RAM and hard drive as noted below
- DVD drive
- One or more Ethernet network ports
- Internet access
- Monitor, keyboard, pointing device (mouse)
- Low-end Server
 - Single 2 GHz Pentium 4
 - 1...2 GB RAM
 - 80 GB hard disk
- Mid-range Server
 - 2 or 4 CPU 2 GHz Pentium 4 or better
 - 2...4 GB RAM
 - 160 GB hard disk (with separate disks for operating system and log files and RAID 5 for main database files preferred)
- High-end Server
 - High-end server requirements are very dependent upon the user's application requirements. Please contact Rockwell Automation for assistance in specifying hardware for a high-end server.

Client Requirements

The following are the client requirements for compatibility with FactoryTalk EnergyMetrix software:

- Microsoft Windows XP Professional, Vista Professional, Windows 7 (Windows 2000 is not supported) operating system.
- Internet Explorer 7, 8, or 9 web browser.
- Adobe Acrobat Reader 7.0 software or later is required to view reports.
- Microsoft .NET Framework 3.5 SP1 is required to use RT and Charts Plus options. .NET Framework 3.5 SP1 is included on the installation DVD or can be downloaded at no charge from Microsoft.

Your client workstation must also be permitted Intranet, Internet or dial-in access to the FactoryTalk EnergyMetrix server. Contact your IT support personnel for assistance.

TIP Your browser should be set to check for newer versions of stored pages automatically, not every visit to the page.

Energy Data Collector Configuration

Introduction

In this chapter, you configure data collector devices for your energy management application. This can include PowerMonitor W250, 500, 1000, 3000, or 5000 devices and CompactLogix controllers.

PowerMonitor devices typically gather electrical energy data through connections to electrical distribution systems. In addition, PowerMonitor devices can connect to digital pulse outputs from gas, water, and other types of energy meters.

The CompactLogix controller collects energy data from digital or analog outputs of meters and transmitters for a variety of energy sources such as water, air, gas, steam, electric, and fuel. The controller also provides an interface to HMI devices providing energy data and device status to the plant floor.

Before You Begin

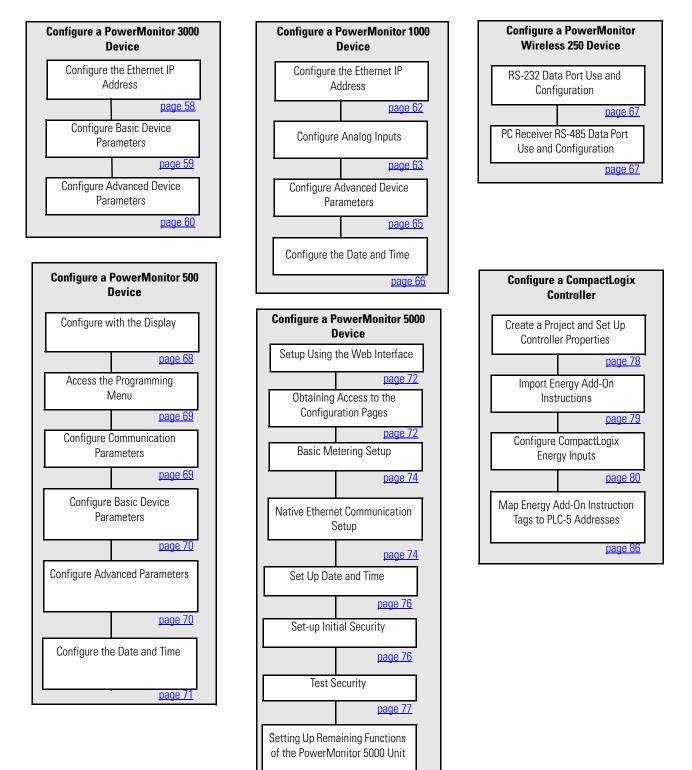
- Determine business goals, complete energy assessment, and determine monitoring methods (<u>Chapter 1</u>).
- Select hardware and wire devices (<u>Chapter 2</u>).

What You Need

- Supporting hardware identified in the Energy Data Worksheet for your system, which includes:
 - PowerMonitor 1000 device
 - PowerMonitor 3000 master module and display module
 - PowerMonitor W250 device
 - PowerMonitor 500 device
 - PowerMonitor 5000 device
 - CompactLogix controller
- RSLogix 5000 software, version 17 or later or Studio 5000 Logix Designer application, version 21.00 or later
- Energy Management Accelerator Toolkit, publication IASIMP-SP014 or visit the Integrated Architecture Tools and Resources website at http://www.ab.com/go/iatools
- Product manuals:
 - Bulletin 1404 PowerMonitor 3000 Unit User Manual, publication 1404-UM001
 - PowerMonitor 3000 Installation Instructions, publication <u>1404-IN007</u>
 - PowerMonitor 1000 Unit User Manual, publication <u>1408-UM001</u>
 - PowerMonitor 1000 Unit Installation Instructions, publication <u>1408-IN001</u>
 - PowerMonitor W250 Unit User Manual, publication <u>1425-UM001</u>
 - PowerMonitor 500 Unit User Manual, publication <u>1420-UM001</u>
 - PowerMonitor 5000 Unit User Manual, publication <u>1426-UM001</u>
 - Logix Common Procedures Programming Manual, publication 1756-PM001

Follow These Steps

Follow these paths to configure the PowerMonitor devices and Compactlogix controllers in your energy system.



page 77

Configure a PowerMonitor 3000 Device

This section shows you how to configure PowerMonitor 3000 device settings by using the PowerMonitor 3000 display module. Certain settings are needed for the power monitor to meter accurately, communicate correctly, and work with FactoryTalk EnergyMetrix software properly. These settings include network configuration, wiring, PT and CT ratios, nominal system voltage, demand settings, and the date/time. Your application may require additional configuration.

TIP Network configuration is provided for the PowerMonitor 3000 on Ethernet device. For other communication options, refer to the PowerMonitor 3000 Unit User Manual, publication 1408-UM001

The PowerMonitor 3000 display module has four keys on its front bezel that are used to navigate menus and select parameters within the module. The phase indicators, L1, L2, L3, N, show which phase, or phases, are being displayed. The phase indicators also indicate Program mode by flashing.

Vavigation	to Menu Items	POWERMONITOR 30		
Mode	Escape Key	Up Arrow Key	Down Arrow Key	Enter Key
	Poturna to parant manu	Steps back to the previous	Steps forward to the next	Steps into a submenu or sets as
Display	Returns to parent menu.	parameter/menu in the list.	parameter/menu in the list.	default screen.
Display Program	Returns to parent menu.			

Configure the Ethernet IP Address

Follow these steps to configure the Ethernet IP address of the PowerMonitor 3000 module.

The default IP address is 192.168.254.xxx, where xxx is the unit's id.

- **TIP** Before starting the procedure, make sure the PowerMonitor 3000 display module is connected to the PowerMonitor 3000 device and control power is on.
- 1. Press the Down Arrow key to select PROG mode.
- 2. Press the Enter key to access Edit mode.

You should see PASS.? and four flashing zeroes, 0000, on the display.

3. Press the Up and Down arrow keys to select the four-digit password and press the Enter key.

The default password is 0000.

- **TIP** You can press and hold the Up Arrow or Down Arrow key for a few seconds to increase the rate the value increments or decrements.
- 4. Press the Down arrow key to select CONFIGURATION, then press the Enter key.
- 5. Press the Down Arrow key until you see OPTIONAL COMM, then press the Enter key.

You should see IP ADDR. BYTE 1 on the display.

The syntax of the IP address is four bytes connected by decimal points: aaa.bbb.ccc.ddd. Each byte has a value in the range 0...255.

- 6. Press the Enter key to access the parameter value for editing.
 - **TIP** When editing a parameter, the phase indicators at the right of the display module are solid and the parameter flashes. After pressing the Enter key to store the new value, the phase indicators flash and the parameter turns solid.
- 7. Press the Up Arrow or Down Arrow key to select the desired value.
- 8. Press the Enter key to write the new value to the PowerMonitor 3000 master module.
- 9. Press the Down Arrow key to select the next IP address byte.
- 10. Repeat steps 6...9 to edit the remaining IP address byte values.
- 11. Repeat steps 6...10 to configure the Subnet Mask and Gateway IP addresses as required.
- 12. Press the Escape key twice to return to the Configuration menu.

Configure Basic Device Parameters

Follow these steps to configure wiring, PT and CT ratios, and nominal system voltage for the PowerMonitor 3000 device. The <u>Basic Device Configuration Parameters</u> table on <u>page 59</u> provides a list of basic device configuration parameters and example settings.

1. Press the Enter key from the PROG.>CONFIGURATION menu.

The BASIC configuration menu is displayed.

- 2. Press the Enter key to select the WIRING CONFIG. menu.
- 3. Press the Enter key to access Edit mode.
- 4. Press the Down Arrow key to select the desired wiring mode parameter.
- 5. Press the Enter key to write the new value to the PowerMonitor 3000 master module and return to the WIRING CONFIG menu.
- **6.** Repeat steps 4 and 5 to set the PT Secondary, CT Primary, CT Secondary, and Nominal System Voltage (M6 and M8 models only) parameters.

The I4 Primary and I4 Secondary parameters are used for neutral metering only.

7. Press the Escape key to return to the Configuration menu.

Basic Device Configuration Parameters

Parameter	Range		Default	Example Settings
Wiring	$\begin{array}{l} 0 = \text{Delta 3 CT} \\ 1 = \text{Delta 2 CT} \\ 2 = \text{Direct Delta 3 CT} \\ 3 = \text{Direct Delta 3 CT} \\ 4 = \text{Open Delta 3 CT} \end{array}$	5 = Open Delta 2 CT 6 = Wye 7 = Single Phase 8 = Demo	6 = Wye	Wye
PT Primary	110,000,000		480	480 (Volts)
PT Secondary	1600		480	480 (Volts)
CT Primary	110,000,000		5	600 (Amps)
CT Secondary	15		5	5 (Amps)
14 Primary	110,000,000		5	
14 Secondary	15		5	
Nominal System Voltage (M6 and M8 only)	110,000,000		480	277 (Volts) ⁽¹⁾

(1) This value is typically line-to-neutral voltage for Wye systems and line-to-line voltage for Delta systems.

Configure Advanced Device Parameters

The <u>Advanced Device Configuration Parameters</u> table on <u>page 61</u> provides a list of advanced parameters and values you can set for the PowerMonitor 3000 device. Most applications use the default values for demand period length, number of demand periods, and forced demand delay.

Follow these basic steps to configure demand parameters and the date/time.

1. Press the Enter key from the PROG.>CONFIGURATION menu.

The BASIC configuration menu is displayed.

- 2. Press the Down Arrow key to select the ADVANCED menu, then press the Enter key.
- 3. Press the Down Arrow key to select the desired advanced parameter.
- 4. Press the Enter key to access Edit mode.
- 5. Press the Up and Down Arrow keys to change the value.
- 6. Press the Enter key to write the new value to the PowerMonitor 3000 master module and set the display module back to Program mode.
- 7. Repeat steps 3...6 to set other advanced parameters.
- 8. Press the Escape key to return to desired menus.

Parameter	Range	Default	Example Settings
New Password	-19999	0000	0000
Demand Period Length	-9999 min	15	15
Number of Demand Periods	115	1	1
Forced Demand Delay	0900 s	10	10
Predicted Demand Type	Instantaneous 1st Order 2nd Order	Instantaneous	
KYZ Control Source	0 = None5 = Vah1 = Wh Forward6 = Ah2 = Wh Reverse7 = Setpoint3 = VARh Forward8 = Comms4 = VARh Reverse	7 = Setpoint	
KYZ Pulse Output Scale	130000	10	
KYZ Pulse Output Width	0, 402000	0	
Relay Control Source	Same as KYZ	7 = Setpoint	
Relay Pulse Output Scale	130000	10	
Relay Pulse Output Width	0, 402000	100	
RMS Resolution	Nominal / High	High ⁽²⁾	
RMS Averaging	On / Off	On	
Frequency Averaging	On / Off	On	
Date Format	MM/DD/YYYY DD/MM/YYYY	MM/DD/YYYY	
Date: Year	19982097	1998	
Date: Month	112	1	
Date: Day	131	1	
Time: Hour	023	0	
Time: Minutes	059	0	
Time: Seconds	059	0	
Default relay state on comms loss	0 = Last state/resume 2 = De-energize/resume	0	
Default KYZ state on comms loss	1 = Last state/freeze 3 = De-energize/freeze	0	
Wdog action	0 = Halt 1 = Continue	0 = Halt	
Display Module Scroll Speed	Fast / Slow	Fast	
Energy counter rollover point	415 digits	15	
Metering Result Set (M8 only ⁽¹⁾)	0 = All results 1 = Transducer mode 2 = Energy meter mode	0 = All results	

(1) Metering result set parameter may only be configured by using communication.

(2) Factory default for RMS Resolution is Nominal for the M4 and High for the M5, M6, and M8.

Configure a PowerMonitor 1000 Device

This section shows you how to configure parameters of a PowerMonitor 1000 device by using its internal Display and Configuration web page. Certain settings are needed for the PowerMonitor to meter accurately, communicate correctly, and work with FactoryTalk EnergyMetrix software properly. You will set the network configuration, voltage mode, PT and CT ratios, demand values, and the date and time. Your application may require additional configuration.

TIP Network configuration is provided for the PowerMonitor 1000 on Ethernet device. For other communication options, refer to the PowerMonitor 1000 Unit Installation Instructions, publication <u>1408-IN001</u>

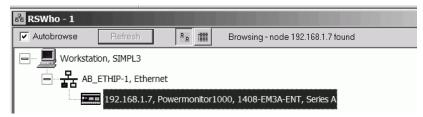
Follow these steps to configure PowerMonitor 1000 device parameters.

- 1. Launch the Internet browser on your computer.
- 2. In the Address field, type the IP address of your PowerMonitor 1000 device. The default IP address is 192.168.254.xxx, where xxx is the unit's id. The default address simplifies the task of making the initial connection to the unit from a personal computer.



TIP

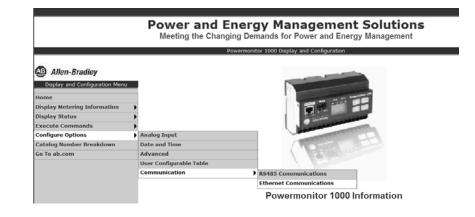
You can check the IP address of the PowerMonitor 1000 device from its display or by using RSLinx Classic software and configuring an EtherNet/IP driver.



Configure the Ethernet IP Address

Follow these steps to configure the Ethernet IP address of a PowerMonitor 1000 device.

1. Choose Configure Options> Communication>Ethernet Communications to access the Ethernet Configuration page.



- **2.** Enter the default password of 0 or another valid password to access Edit mode.
 - **TIP** The password appears as asterisks (*). If you don't know the password, call Rockwell Automation technical support for assistance.
- 3. Enter appropriate values in the IP Address Byte fields. For the <u>Efficient Industries Plant 1</u> example, the IP address is 10.10.10.1 for the first PowerMonitor 1000 device.
- **4.** Enter the Subnet Mask and Gateway IP addresses as required.
- 5. Click Submit to send the parameter changes to the PowerMonitor 1000 device.

	Ethernet Configuration					
Element	Element Item Name Value					
0	Password Range 0 to 9999	•				
1	IP Address Byte a (aaa.xxx.xxx.xxx) Range 0 to 255	10				
2	IP Address Byte b (xxx.bbb.xxx.xxx) Range 0 to 255	10				
3	IP Address Byte c (xxx.xxx.ccc.xxx) Range 0 to 255	10				
4	IP Address Byte d (xxx.xxx.xx.ddd) Range 0 to 255	1				
5	Subnet Mask Byte a Range 0 to 255	255				
6	Subnet Mask Byte b Range 0 to 255	255				
7	Subnet Mask Byte c Range 0 to 255	255				

- **TIP** You will lose communication to the PowerMonitor device. You must enter the new IP address in the Address field of your web browser to re-establish communication with the device.
- 6. Browse to the new IP address from your web browser.

The IP address is shown on the default LCD display screen.

Configure Analog Inputs

Follow these steps to configure the voltage mode, PT ratios, and CT ratios for the PowerMonitor 1000 device. The <u>Analog</u> <u>Input Setup Parameters</u> table on <u>page 64</u> shows the analog input parameters and example settings.

1. Choose Configure Options>Analog Input to display the Analog Input Configuration page.

				rgy Management S	
Allen-Bradley		meeting the C		Jemands for Power and Energy i	vanagement
Display and Configuration Men	u			Analog Input Configura	ation
ome					
isplay Metering Information	-		Element	Item Name	Value
xecute Commands				Password	
onfigure Options	- 1	Analog Input		Range 0 to 9999	••
atalog Number Breakdown io To ab.com		Date and Time Advanced		oltage Mode	
		User Configurable Table Communication		= Open Delta = Wye	
			1	3 = Single Phase 4 = Demo	
				5 = 1PT1CT-LL 6 = 1PT1CT-LN	2
			2	PT Primary Range 1 to 50000	480
			3	PT Secondary Range 1 to 600	480
			4	CT Primary Range 5 to 50000	600
			5	System PF Setting 0 = Leading -97 to +89	

- **2.** Enter the default password of 0 or another valid password to access Edit mode.
 - **TIP** The password appears as asterisks (*). If you don't know the password, call Rockwell Automation technical support for assistance.
- 3. Enter the value of the Voltage Mode you are using.
- **4.** Set elements 2, 3, and 4 to configure the PT and CT parameters.
- 5. Click Submit to send the parameter changes to the PowerMonitor 1000 device.

Analog Input Configuration				
nt Item Name				
Password Range 0 to 9999	•			
Voltage Mode 0 = Direct Delta 1 = Open Delta 2 = Wye 3 = Single Phase 4 = Demo 5 = 1PT1CT-LL 6 = 1PT1CT-LN	2			
PT Primary Range 1 to 50000	480			
PT Secondary Range 1 to 600	480			
CT Primary Range 5 to 50000	600			
	Item Name Password Range 0 to 9999 Voltage Mode 0 = Direct Delta 1 = Open Delta 2 = Wye 3 = Single Phase 4 = Demo 5 = 1PT1CT-LL 6 = 1PT1CT-LN PT Primary Range 1 to 50000 PT Secondary Range 1 to 600 CT Primary			

Analog Input Setup Parameters

Parameter	Range	Default	Example Settings
Password	09999	0	0
Voltage Mode	06 0 = Direct Delta 1 = Open Delta 2 = Wye 3 = Single Phase 4 = Demo, simulated results 5 = 1PT1CT-LL 6 = 1PT1CT-LN	2	2
PT Primary	1.0 50,000	480	480
PT Secondary	5.00 50,000	480	480
CT Primary	5.00 50,000	5	600
System PF Setting	0 = Lead (-9789) 1 = High (-8598) 2 = Low (-5295)	2 = Low	2

Configure Advanced Device Parameters

Follow these steps to configure advanced demand parameters for the PowerMonitor 1000 device. These settings include demand source, demand period length, and the number of demand periods to average for the demand calculation. The <u>Advanced Device Configuration Parameters</u> table on <u>page 65</u> shows the demand parameters and example settings.

1. Choose Configure Options>Advanced to access the Advanced Configuration page.

	Power and Energy Management Solutions Meeting the Changing Demands for Power and Energy Management	
	Powermonitor 1000 Display and Configuration	1
-Bradley		

Display and Configuration Menu			Ethernet Configuration			
Home			Element	Item N	ama	Value
Display Metering Information	•		Element	item is	ame	value
Display Status	•			Password		
Execute Commands	•		0	Range 0 t		••
Configure Options	•	Analog Input			<u> </u>	
Catalog Number Breakdown		Date and Tim	e		Byte	
Go To ab.com		Advanced			1	
		User Configu	rable Table		xx.xxx)	
		Communicat	ion		255	192

2. Enter the default password of 0 or another valid password to access Edit mode.

TIP The password appears as asterisks (*). If you don't know the password, call Rockwell Automation technical support for assistance.

AB Allen

-	17 200	
14	Demand Source 0 = Internal Timer 1 = Status Input 2 2 = Controller Command 3 = Ethernet Broadcast	0
15	Demand Period Length (minutes) Range 0 to 99	15
16	Number of Demand Periods Range 1 to 15	1

3. Set appropriate values for the demand parameters (elements 14, 15, and 16).

For this example, accept the default parameters as shown.

4. Click Submit to send the parameter changes to the PowerMonitor 1000 device.

Advanced Device Configuration Parameters

Parameter	Range	Default	Example Settings
Password	09999	0	0
Demand Source	03 0 = Internal Timer 1 = Status Input 2 2 = Controller Command 3 = Ethernet Demand Broadcast	0	0
Demand Period Length	099 min	15 min	15
Number of Demand Periods	115	1	1
Forced Demand Sync Delay	0 90 s	10	
Demand Broadcast Master Select	01	0	
Broadcast Port Number (Ethernet Setup)	300 400	300	

Configure the Date and Time

Follow these steps to configure the date and time for the PowerMonitor 1000 device. The <u>Date and Time Setup Parameters</u> table on <u>page 66</u> shows the date and time parameters, and example settings

1. Choose Configure Options>Date and Time to access the Date and Time Configuration page.

Power and Energy Management Solutions Meeting the Changing Demands for Power and Energy Management

Powermonitor 1000 Display and Configuration

Allen-Bradley				
		Element	Item Name	Value
Display and Configuration Menu Home		0	Password Range 0 to 9999	••
Display Metering Information Display Status	4 •	1	New Password	
Execute Commands Configure Options	Analog Input	<u> </u>	Range 0 to 9999	
Catalog Number Breakdown	Date and Time		etering Result Averaging	
Go To ab.com	Advanced User Configurable Table		DFF = 0 DN = 1	1
	Communication	3	Log Status Input Changes NO = 0 YES = 1	0

- **2.** Enter the default password of 0 or another valid password to access Edit mode.
 - **TIP** The password appears as asterisks (*). If you don't know the password, call Rockwell Automation technical support for assistance.
- 3. Configure the date and time parameters accordingly.
- **4.** Click Submit to send the parameter changes to the PowerMonitor 1000 device.

Date and Time Setup Parameters

Date and Time Configuration				
Element	Item Name Value			
0	Password Range 0 to 9999	•		
1	Date: Year Range 2001 to 2100	2009		
2	Date: Month Range 1 to 12	8		
3	Date: Day Range 1 to 31	31		
4	Time: Hour Range 0 to 23	7		
5	Time: Minute Range 0 to 59	44		
6	Time: Seconds Range 0 to 59	39		
7	Time: Hundredths Range 0 to 99	46		

Submit Refresh

Parameter	Range	Default	Example Settings
Password	09999	0	0
Date: Year	20012100	2005	
Date:Month	112	1	
Date:Day	131	0	
Time:Hour	023	0	
Time:Minute	059	0	
Time:Seconds	059	0	
Time:Hundreths	059	0	

Configure a PowerMonitor Wireless 250 Device

The PowerMonitor Wireless 250 monitors are factory configured. Each PowerMonitor Wireless 250 device is assigned a Group ID and Device ID in the factory. These should not be modified except under exceptional circumstances. One such circumstance would be operating two or more independent PowerMonitor W250 networks in such close proximity that RF interference with each other occurs. Please contact Rockwell Automation support services for more information or if assistance is required.

The PC Receiver can be configured for RS-232 or RS-485 data port use.

PC Receiver Connection

This section describes the RS-232 and RS-485 connections.

RS-232 Data Port Use and Configuration

DB-9 style connector: RS-232 Data Port connector with standard DCE connections for transmit data, receive data, RTS input, and CTS output.

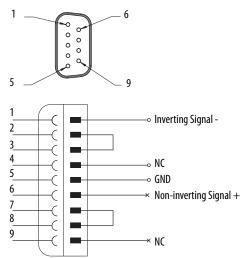
The PC Receiver is factory configured with the following parameters:

- Communication Rate 115,200
- Data Bits 8
- Parity None
- Stop Bits 1

PC Receiver RS-485 Data Port Use and Configuration

The RS-485 mode of the PC Receiver requires special wiring for the DB9 connection. In order to activate the RS-485 mode, please connect the data port as follows.

PC Receiver RS-485 Wiring Diagram



As soon as power is applied to the PC Receiver unit, the PC Receiver unit chooses the serial mode, RS-232 or RS-485, according to the DB9 wiring. This mode remains until the PC Receiver is power cycled (just removing the DB9 connector does not change the serial mode).

RS-485 mode is available on the PC Receiver unit with the date code 10267 or later with firmware revision (or later) 1.5.15 (100 and 200 node) or 1.7.5.15 (10 node). Upgrade of an older PC Receiver (before date code 10267) is not possible, as it is a different hardware revision.

RS-485 mode sets the device Modbus address to 247. The address cannot be changed. Only point-to-point communication is supported.

Refer to the PowerMonitor Wireless 250 Monitor User Manual, publication <u>1425-UM001</u>, for more information on installing and commissioning your wireless network.

Configure a PowerMonitor 500 Device

This section shows you how to configure parameters of a PowerMonitor 500 device by using its front panel display. Certain settings are needed for the power monitor to meter accurately, communicate correctly, and work with FactoryTalk EnergyMetrix software properly. You set the communication parameters, system type, PT and CT ratios, demand values, and the date and time. Your application may require additional configuration.

Configure with the Display

The PowerMonitor 500 unit provides menu-based configuration (programming) using its front panel display. The programming menus let you select parameters to edit, select digits within parameters, and increase or decrease the value of each digit.

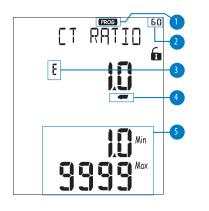
During the Programming mode, the instrument provides this information.

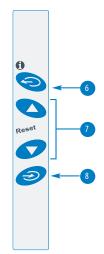
- 1. Indicates Programming mode.
- 2. Identifies the programming menu number.

Refer to the programming flow chart.

- 3. Indicates parameter currently being edited.
- 4. Cursor identifies the digit currently being edited.
- 5. Allowable range of selected parameter.

Use the Up and Down arrow (7) to increase and decrease the digit indicated by the cursor (4). To set another digit, move the cursor to the desired digit by using Escape (6). Each button press shifts the cursor (4) one digit to the left.

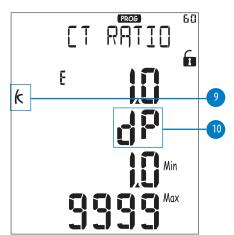




When the cursor is beneath the last digit on the left, a further press of Escape (6) lets you change the decimal point and the multiplier (9) (k or M). The blinking 'dP' (decimal point) text (10) indicates this capability.

To modify the decimal point position and the multiplier, use the Up and Down arrow button (7) to select the desired value.

To store the new programmed value, press Enter (7). To cancel the change in programming and restore the previous values of the parameter, press Escape (6) for at least 2 seconds.



Follow these steps to configure PowerMonitor 500 device parameters.

Access the Programming Menu

- 1. Press and hold Enter 🥏 for at least 2 seconds to access the programming menu.
- 2. Enter the default password of 0 (or another valid password).
- 3. Press Enter to access programming mode.

Configure Communication Parameters

- 1. Press the Up Arrow until you reach the RS232-485 or Ethernet menu.
- 2. Press Enter to select the menu item.
- 3. Press the Up and Down arrows to scroll through the communication parameters.

The Serial communication parameters are listed in this table.

Parameter	Range	Default
Address	1247	1
Communication Rate	9600, 19200, 38400, 115200	9600
Parity	None/odd/even	none

Parameter	Range	Default
IP Address	WWW.XXX.yyy.ZZZ	N/A
Subnet	WWW.XXX.yyy.ZZZ	N/A
Gateway	WWW.XXX.yyy.ZZZ	N/A
TCP IP Port	19999	502
ACD	Yes or No	No

The Ethernet communication parameters are listed in this table.

- 4. To change a parameter:
 - a. Press Enter to select a menu item.
 - b. Press the Up and Down arrows to change the value.
 - c. When the desired value is displayed, press Enter to confirm your selection.
- 5. Press Esc $\stackrel{\frown}{>}$ to return to the main menu.

Configure Basic Device Parameters

1. From the main programming menu, use the Up and Down Arrows to scroll through the programming menu and view the configuration for the basic device parameters.

Parameter	Range	Default
System	1P, 2P, 3P, 3P.n, 3P.1, 3P.2	3P.n
CT Ratio	1.09999	1.0
PT Ratio	1.09999	1.0

- 2. To change a parameter:
 - a. Press Enter to select a menu item.
 - b. Press the Up and Down arrows to change the value.
 - c. When the desired value is displayed, press Enter to confirm your selection.
- 3. Press Esc to return to the main menu.

Configure Advanced Parameters

Follow these steps to configure the advanced parameters for the PowerMonitor 500 device. These settings include the demand calculation mode, interval time, and synchronization mode.

- 1. From the main programming menu, use the Up and Down Arrows to scroll through the programming menu.
- 2. Select a menu item by pressing Enter.

Parameter ⁽¹⁾	Range	Default
Туре	FIXED AVG/DMD SLIDE	FIXED
Time	01, 05, 10, 15, 20, 30	15
Sync	OFF/CLOCK	OFF

These are the Demand configuration parameters.

 Additional advanced parameters, such as alarms, outputs, and digital filtering are also available for configuration. Refer to the PowerMonitor 500 Unit User Manual, publication <u>1420-UM001</u>, for detailed information.

- 3. To change a parameter:
 - a. Press Enter to select a menu item.
 - b. Press the Up and Down arrows to change the value.
 - c. When the desired value is displayed, press Enter to confirm your selection.
- 4. Press Esc to return to the main menu.

Configure the Date and Time

Follow these steps to configure the date and time for the PowerMonitor 500 device.

- 1. From the main programming menu, use the Up and Down Arrows to scroll through the programming menu.
- 2. Select the Clock menu item by pressing Enter.

These are the Clock configuration parameters.

Parameter	Range	Default
FORMAT	EU/USA	EU
YEAR	20092099	2009
MONTH	112	1
DAY	131	1
HOUR	023	0
MINUTE	059	0
SECOND	059	0

- **3.** To change a parameter:
 - a. Press Enter to select a menu item.
 - b. Press the Up and Down arrows to change the value.
 - c. When the desired value is displayed, press Enter to confirm your selection.
 - d. Press Esc to return to the main menu.

Configure a PowerMonitor 5000 Device

This section shows you how to configure parameters of a PowerMonitor 5000 device by using the Web interface. Certain settings are needed for the power monitor to meter accurately, communicate correctly, and work with FactoryTalk EnergyMetrix software properly. You will set the basic metering, native Ethernet communication, date and time, and initial security configuration. Your application may require additional configuration.

Setup Using the Web Interface

For initial setup, connect a personal computer to the PowerMonitor 5000 unit by using a USB cable. Initial setup is usually performed by using the USB Web interface, and initial security setup can only be performed by using the USB Web interface.

Refer to the PowerMonitor 5000 USB Driver Installation and Configuration instructions, publication <u>1426-IN001</u> for more information on installing the USB communication drivers.

Open Internet Explorer and browse to http://192.168.169.3. The PowerMonitor 5000 home page will display in your browser as shown below. The home page displays general information about the PowerMonitor 5000 unit. You can navigate by clicking folders and pages from the tree on the left.

🗿 🕢 🔹 👔 http://192.168.16	nttp://192.168.169.3/		able	P
Ele Edt yes fguorites Ioo	s geb			
Favorites 88 • Brone	PowerManitar 5000	× 🔄 🕯 · 🖾 · 🖙	in · Expe · Safe	ty = Tgols = 📦 =
Allen-Bradley Pov	verMonitor [™] 5000	Logged in as: Admin usbadmin	Log.out	Rockwel
Expand Minimize	Home			
MateringResults	Device_Name	PH5000		
PowerQuality	Device_Location	LaValle		
Status	IP_Address	192.168.0.101		
Statistics Calibration	Ethernet_Address	00:A0:91:00:92:32		
Calibration	Hardware_Revision	Revision 1.05		
Command	Firmware_Revision	Revision 1.06		
System_Repisters	Catalog_Number			
LoggingResults	Series_Letter	0		
Security	Copyright © 2011 Rackwell Automation,	Inc. All Rights Reserved.		
		Local	ntravet (6 · • 100% ·

Initial setup by using the USB Web interface should include at least the following configuration steps:

- Basic Metering this aligns the power monitor metering functionality with the properties of the circuit to which it connects
- Native Ethernet Network Communication this permits access to the unit for data monitoring and setup through an Ethernet network
- Date and Time this sets the unit's internal clock so that time stamps in logged data are correct
- Security (if desired) enabling and configuring security will guard against unauthorized changes to the power monitor configuration

Once initial setup has been completed, including configuration of the Ethernet IP address, you can also access the Web interface from a computer connected through a network to the PowerMonitor 5000 unit's native Ethernet port. Open Internet Explorer and browse to the IP address of the unit.

Obtaining Access to the Configuration Pages

The PowerMonitor 5000 unit initially has security disabled by default. If your power monitor's security is disabled, you can continue setting up the unit without logging in.

If Security is Enabled

If security is enabled, the web page header displays 'Logged in as:' and a Log in link.

Allen-Bradley PowerMonitor™ 5000 Logged in as: Rockwell Automation

If security is enabled, you will need to log in as an administrator to configure setup parameters. If not logged in as an administrator, you will be able to view, but not change, configuration parameters. If you need to log in, click the Log in link.

The USB connection has a special administrator account. Follow these steps to log in with this account.

- 1. Type in the user name usbadmin.
- 2. Type in the password usbadmin.
- 3. Click Log In.

A dialog box reports the result.

To log in from the network Web interface, select a previously configured administrator account user name and password. The PowerMonitor 5000 unit does not permit logging in with the USB administrator login from the network.

You will remain logged in until you log out or until 30 minutes have passed since configuration changes have been applied.

Allen-Bradley	owerMonitor™ 50	OO Logged in as:	Log in	Rockwell Automation
Expand Minimize	Security			
Home MeteringResults	Login			
PowerQuality	UserName	usbadmin		
Statistics	Password	******		
Calibration		Log In Log Out		
Command	User Name	User Type		
LoggingResults Security	usbadmin	Admin		
La Security		Edit Remove AddNew		
	Current User	User Type		
	NoU Message from webp	page 🔯 ser		
	Admin user I	ogin successful.		
	Sec 🌜	able Security		
	ОК	ply		
	Reset Security	Reset		
	· · · · · · · · · · · · · · · · · · ·			
		IMPORTANT NOTICE: Reset will remove all created accounts and return default status.		

How to Set Up the PowerMonitor 5000 Unit

From any power monitor web page, click the Configuration folder. A list of available configuration pages is displayed in the tree. The steps for entering, editing and applying configuration parameters are similar for each configuration page.

The configuration pages contain text boxes for entering parameter values, pull-down menus for selecting enumerated parameter values, and an Apply Changes button for committing changes to the power monitor. The power monitor checks that parameter values are within their valid range before applying them. A dialog box appears to report the success or reason for failure of an attempt to apply new parameters.

Message from webpage	Message from webpage
Configuration saved successfully.	Invalid number was found!
OK	ОК

Basic Metering Setup

We will begin with configuring the basic metering parameters. Click the Metering_Basic page under the open Configuration folder. The page opens. You can select other configuration pages by clicking the desired page in the tree, or by clicking the corresponding tab in the page.

This page displays the existing basic metering configuration of the power monitor, including the metering mode, PT (VT) and CT ratios, nominal voltage and frequency, and demand. To change the basic metering setup, enter the desired values into the text boxes, scroll down, and click Apply Changes. A dialog box appears to report the result of the setup change.

EXAMPLE This Metering_Basic page illustrates the setup for a 480V, 3-phase system with 1000:5 current transformer (CT) ratios on all phases and the neutral.

Minimize	DateTime 🔨 Logging 🔨 SystemGer	neral Communicati	ionsNative NetworkText Setpoi	nts_1_
lts	Metering_Basic			
	Metering_Mode	Wye	Y	
	V1_V2_V3_PT_Primary	480		
	V1_V2_V3_PT_Secondary	480		
	I1_I2_I3_CT_Primary	1000		
	I1_I2_I3_CT_Secondary	5	6	6
ative	VG_PT_Primary	480	Message from webpage	>
	VG_PT_Secondary	480	Configuration saved succ	ssfully
	I4_CT_Primary	1000		
	I4_CT_Secondary	5		
	Nominal_System_LL_Voltage	480		
	Nominal_System_Frequency	60		
A CONTRACTOR OF CONTRACTOR OFO	Realtime_Update_Rate	Single cycle aver	raged over 8 cycles 💌	
	Demand_Source	Internal Timer	~	
	Demand_Period_Length_Minutes	15		
	Number_Demand_Periods	1		
	Forced_Demand_Sync_Delay	10		
		Apply Change	'S	

Native Ethernet Communication Setup

Click the Configuration folder and select the CommunicationsNative page. The PowerMonitor 5000 unit is set up by default to obtain an IP address automatically from a DHCP (Dynamic Host Configuration Protocol) server. If your power monitor is on a network served by a DHCP server, and the power monitor is connected to the network, it has probably already been assigned an IP address.

We recommend that each power monitor be assigned a static, or fixed, IP address, since DHCP addresses can change from time to time, resulting in loss of communication with client applications. Obtain a fixed IP address, subnet mask, default gateway, and other network setup parameters from your network administrator. Another option can be to set up the power monitor as a reserved client in the DHCP server.

EXAMPLE This example explains how to change from a DHCP-assigned to a static IP address.

The initial network configuration is shown below. The IP address assigned is 192.168.200.8. The network administrator has provided a range of static IP addresses in the same subnet, beginning with 192.168.200.100. In this case, the default gateway and DNS servers remain the same for static or DHCP-obtained addresses (verify if this is true in your case with your network administrator).

Allen-Bradley Po	werMonitor™ 50	
Expand Minimize	DateTime Logging Sys	temGeneral CommunicationsNative NetworkText Setpoints_1_5 Setp
MeteringResults	CommunicationsNative	
PowerQuality Status	IP_Address_Obtain	DHCP 💌
Statistics	IP_Address_A	192
Calibration Configuration	IP_Address_B	168
DateTime Logging	IP_Address_C	200
SystemGeneral	IP_Address_D	8
CommunicationsNative NetworkText	Subnet_Mask_A	255
Setpoints_1_5 Setpoints_6_10	Subnet_Mask_B	255
Setpoint_Outputs Data_Log	Subnet_Mask_C	255
Metering_Basic	Subnet_Mask_D	0
Command LoggingResults	Gateway_Address_A	192
Security	Gateway_Address_B	168
	Gateway_Address_C	200
	Gateway_Address_D	1
	DNS Enable	Disable V

To change to the new address, from the IP_Address_Obtain pull-down menu choose Static, type in the new IP address, and click Apply Changes.

Minimize	DateTime Logging Syst	temGeneral CommunicationsNative NetworkText Setpoints_1_5
gResults	CommunicationsNative	
uality	IP_Address_Obtain	Static 💌
E.	IP_Address_A	192
n ition	IP_Address_B	168
e	IP_Address_C	200
eneral	IP_Address_D	101
ationsNative <t< td=""><td>Subnet_Mask_A</td><td>255</td></t<>	Subnet_Mask_A	255
	Subnet_Mask_B	255
puts	Subnet_Mask_C	255
asic	Subnet_Mask_D	0
	Gateway_Address_A	192
	Gateway_Address_B	168
	Gateway_Address_C	200
	Gateway_Address_D	1

IMPORTANT You can change the network configuration from the USB or network web pages. If you change the IP address from the network Web interface, you will then need to browse to the new IP address to re-establish communication.

Set Up Date and Time

Click the Configuration folder and select the DateTime page. Enter the year, month, day, hour, and minute into the corresponding input fields and click Apply Changes. If your power monitor has been set up for time synchronization with either a SNTP or IEEE 1588 PTP server, the time may already be set.

Set-up Initial Security

If you choose to enable security on the power monitor, you must perform the initial security setup by using the USB Web interface.

- In the USB web page, select the Security folder and then the Security page.
- 2. From the Security Defaults pulldown menu, choose Enable Security.
- 3. Accept the prompt regarding enabling security and accept the prompt to reload the web pages.
- **4.** Log in with user name usbadmin and password usbadmin.
- 5. Accept the prompt that the login was successful.
- **6.** To add a network administrator, click AddNew.
- 7. Enter a username and password for a network administrator.

The username and password can be any string up to 32 characters in length. This example sets a username of admin with a password of admin. Make a note of the new network administrator login for future use and keep it in a secure location.

8. While still connected to the USB "port, log out from the usbadmin account.

Allen-Bradley	PowerMonitor™ 5	000	Rockwell Automation
Expand Minimize	Security		
Home MeteringResults	User Name	User Type	1
PowerQuality	usbadmin	Admin	
Status Statistics		Edit Remove AddNew	
Calibration			
Configuration	Current User	User Type	
Command	NoUser	INVALID	
LoggingResults			
Security	Security Defaults		
		Disable Security 🕶	
		Disable Security	1
	Reset Security	**************************************	
		Reset	
		IMPORTANT NOTICE: Reset will remove all created accounts and return default status.	



Admin
admin
Admin 💌
•••••
••••
Apply

Only one admin type account is permitted to be active at a time.

Now that the network administrator user has been created, you can continue setting up the PowerMonitor 5000 unit by connecting through the native EtherNet/IP port and using the network Web interface. This includes the ability to configure additional users, administrators, and application security accounts.

Test Security

To test the network administrator login, follow these steps.

- 1. Browse to the network address of the PowerMonitor 5000 unit.
- 2. Click Log in from the page header and enter the user name and password just created and click Log In.

Note that only the USB Web interface can be used to enable, disable, or reset security. If security accounts are lost or forgotten, you will need to connect to the USB Web interface and log in with the usbadmin account to create new network security accounts.



Setting Up Remaining Functions of the PowerMonitor 5000 Unit

The remaining functions are set up in the same way as the examples discussed in this section. For additional details on configuring the PowerMonitor 5000 unit refer to the PowerMonitor 5000 Unit user manual, publication <u>1426-UM 001</u>.

Optionally, the PowerMonitor 5000 device can be configured using the FactoryTalk EnergyMetrix software. Refer to the FactoryTalk EnergyMetrix software user manual, publication <u>FTEM-UM002</u>, for details.

Configure a CompactLogix Controller

In this section, you set up a CompactLogix[™] controller as a FactoryTalk EnergyMetrix data collector, and interface to local HMI faceplates. You configure controller properties, digital and analog energy inputs, and energy Add-On Instructions for each controller in your system.

Refer to the CompactLogix tab in the Energy Data Worksheet created in <u>Chapter 2</u> for CompactLogix and PLC-5[®] address assignments.

Create a Project and Set Up Controller Properties

- 1. Open RSLogix 5000 software to create a new project.
- 2. Choose your first controller and choose revision 17, or later.

For this example, a CompactLogix 1769-L23E-QBFC1 is selected as a cost-effective solution supporting digital and analog energy inputs, and Ethernet communication.

3. Enter the name of the controller from your Energy Data Worksheet.

For this example, L2x is entered.

- 4. Click OK.
- 5. Right-click the Ethernet Port and choose Properties.

For this example, choose the LocalENB port.

6. Enter a unique IP address for your controller and click OK.

For this example, 10.10.10.7 is entered.

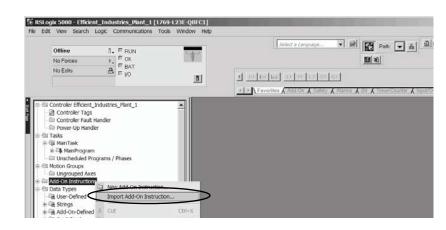
Vendor:	Allen-Bradley	
<u>T</u> ype:	1769-L23E-QBFC1 CompactLogix5323E-QBFC1 Controller 💌	OK
Re <u>v</u> ision:	17 💌	Cancel
		Help
Na <u>m</u> e:	L2x	
Descri <u>p</u> tion:		
<u>C</u> hassis Type:	<none></none>	
Sl <u>o</u> t:	0 📑 Safety Partner Slot:	
Cr <u>e</u> ate In:	C:\RSLogix 5000\Projects	Browse

RSLogix 5000 - L2x [1769-L23E-QBFC1]*	
e Edit View Search Logic Communications Tools Window	Help
) 😂 🔲 😹 🖻 💼 🗠 😒 Drive: O	- # 4 7. The VP QQ
Image:	
Controller L2x Tasks Controller L2x Tasks Motion Groups Add-On Instructions Data Types Trends ConjectualityS22E-QBFC1 System ConjectualityS22E-QBFC1 System ConjectualityS22E-QBFC1 Ethemest Port LocalENB Compacting Local Compacting Compacting Local Compa	Module Properties: Controller:1 (1769:L23E-QBFC1 Ethernet Port 17.2) General [®] Connection RSNetWorx Module Info Port Configuration Port Diagnostics Type: 1769:L23E-QBFC1 Ethernet Port 10/100 Mbps Ethernet Port on CompactLogic5323E-QBFC1 Vendor: Allen-Bradley Paient: Controller Name: LocalENB Descrigtion: Sigt: 1 Major Revision: 17 Cancel Apply Help

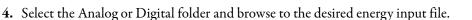
Import Energy Add-On Instructions

You will now import preconfigured Energy Add-On Instructions to support the digital and analog energy inputs listed on the CompactLogix tab of your Energy Data Worksheet. These Add-On Instructions provide energy data calculations and HMI interface logic for the energy inputs. Refer to <u>Appendix C</u> and <u>Appendix D</u> for detailed logic information.

- 1. Navigate to and right-click the Add-On Instructions folder.
- 2. Choose Import Add-On Instruction.



3. Browse to the Energy Input Logic folder on your Energy Management Accelerator Toolkit CD image.

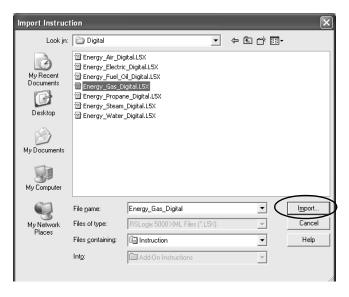


Choose a digital input file for meters with a pulse output representing consumption. Select an analog input file for meters with an analog output representing flow rate.

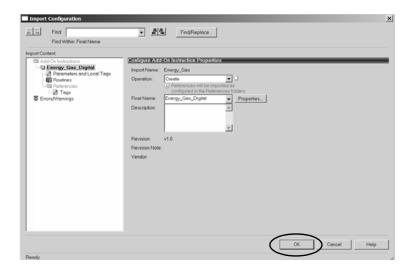
The example shows a gas meter digital input selected.

5. Click Import.





6. Click OK from the Import Configuration dialog box to continue the Add-On Instruction import.



- 7. Verify the imported file appears under Add-On Instructions.
- 8. Repeat steps 1...7 to import other required Add-On Instruction files for your project.

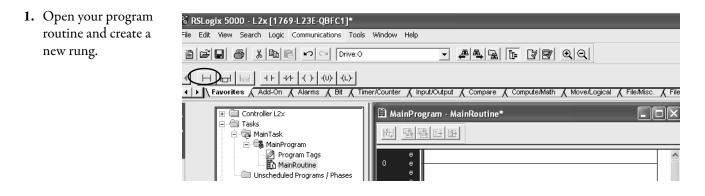
For the <u>Efficient Industries Plant 1</u> example, the Add-On Instructions list would look similar to this.

d
· · · · · · · · · · · · · · · · · · ·
Add-On Instructions

- Energy_Fuel_Oil_Analog
- ⊡ Image: Energy_Gas_Digital
- Energy_Propane_Analog
- 🗄 🕼 Energy_Steam_Analog

Configure CompactLogix Energy Inputs

You are now ready to program each digital and analog energy input listed on the CompactLogix tab of your Energy Data Worksheet and assign energy tags and factors.



?? ?? ?? ??

Alt+Ins Ctrl+D

- 2. Click the Add-On tab in the instruction toolbar.
- **3.** Click an Energy Add-On Instruction icon to add the instruction to your rung.

For this example, the Energy_Gas_Digital Add-On Instruction is selected.

4. Click in the energy tag name field and enter a tag name.

For this example, Boiler_House_Gas is entered.

5. Right-click the energy tag name just entered and choose the New "*Tag_Name*" from the list.

•	🕷 RSLog	ix 5000 ·	L2x [1769-L23E-	QBFC1]*	- [Ma	inProgran	n - Mair	nRoutin	e]	
1	ji File E	Edit View	Search	Logic Comr	nunications	Tool	s Window	Help			
	86		XE		Drivi	e:O			- #	a as Gas	Ē
On	I	⊢ ⊨	Ener		Ener Ener av G av G	Ener av G	Ener Ener av P av S	Ener P av 11	M_ PM_ 000 3000	,	
		Favorite	λ Add	-On Alarms			<u>/Counter</u>	<u>Input/O</u> v1.0	utput 🔏	Compare	10
	▶ Start Page		Contro Power sks MainTo	oller Tags oller Fault Hand -Up Handler ask ainProgram Program Tags MainRoutine eduled Program	s / Phase:	In Si Si Si Vi	Ene o_Pulse st_Meter_Pu st_Calc_Inte st_Calc_Inte st_High_Flov st_Critical_F al_Total_Gas_Per_	Ise_Facto rval v low	or	? ? ?? ?? ?? ?? ?? ?? ?? ?? ?? ?? ??	
0	e e e	>	•	New "Boiler_Ho			nergy_Gas_ Diaita		1		
	e e e		×	Cu <u>t</u> Instruction			Ctrl+X Ctrl+C		?? ? ?? ?		
	e e		ß	Paste			Ctrl+V		?? ?		
	е			Delete Instruct	tion		Del		??		

6. Click OK to accept the default setup for the new Add-On Instruction tag.

New Tag			\mathbf{X}
<u>N</u> ame:	Boiler_House_Gas	\subset	ОК
Description:	<u>`</u>		Cancel
			Help
	~		
<u>U</u> sage:	<normal></normal>		
Тур <u>е</u> :	Base <u>Connection</u>		
Alias <u>F</u> or:			
Data <u>T</u> ype:	Energy_Gas_Digital		
<u>S</u> cope:	🖸 L2x 🗨		
St <u>v</u> le:			
🔲 Open Con	figuration		

Add Ladder Element...

Edit Main Operand Description
___________Save Instruction Defaults

e e e e e e e 7. Double-click the input parameter field, then click the pull-down menu icon to display the input controller tags.

Refer to the CompactLogix tab of the Energy Data Worksheet for the local I/O digital or analog input address.

8. Navigate to the desired digital or analog input tag.

This example shows Local:1:I.Data.

- 9. For digital input tags:
 - a. Click the tag pull-down menu icon to display a table of data bits.
 - b. Click the bit associated with the hardware terminal wired to your digital input.

For analog input tags:

- a. Click the tag pull-down menu icon to display the channel tags.
- b. Double-click the channel data tag associated with the hardware terminal wired to your analog energy input.

The analog input channels must also be enabled.

) Ma	inPro	gram -	MainRoutine*			. DX
問	雪月	3 E	*			
0	e e e			Energy_Gas Energy_Gas_ <u>Dicital Pr</u> Inp_Pulse	ilar House Gas	
	e e e	1			Data Type AB:Embedded_IQ16F:C:	
	e e e	8	Local:1:I Local:1:I.Fault Local:1:I.Data		AB:Embedded_IQ16F:I:0 DINT MT	
	e e e	Ĩ	H 1 2 3 4 5	<u> </u>	AB:Embedded_OB16:C:I	• •
	e e e	, 	Program			
	е	J	ow. Show All			_>>

Ш м	ainPro	ograr	m - MainRoutine*	
围	B	3 <u>.</u>		
1	e e e		Energy_Cas_Analog Energy_Cas_Analog Boiler House Gas_2 Inp_Meter_Analog_Value Locat:31.Ch0Da	^
	e e		Name Data Type	^
	e e			
	e e e		Local:3:I.Ch3Data INT Local:3:I.InputRangeFlag INT	*
	e		Controller Program	
2	e e e	-	Show: Show All	>>

c. Double-click Analog I/O under IO Configuration to launch the module properties and enable the channels that will be used.

E-Controller L2x	Module Properties: Local:3 (Embedded IF4XOF2 1.1)	. ox
Tasks Add-On Instructions Add-On Instructions Data Types Trends Trends To Configuration Tof9-123E-QBFC1 System Tof9-123E-QBFC1 Ethernet Port LocalENB Tomestbus Local Tomestbus Tomestbus Local Tomestbus Tomestbus Local Tomestb	General Connection Input Configuration Output Configuration Fault/Program Action	
	Status: Offline OK Cancel Apply	Help

10. Assign energy input calculation and scaling factor tag values based on the Energy Add-On Instruction Factor table definitions on page 84.

One table provides factor definitions for electric inputs and one for all other energy inputs.

This example shows values that need to be set for the Energy_Gas_Digital Add-On Instruction.

	Energy_Gas_Digital				
	Energy_Gas_Digital Boiler_House_Gas Inp_Pulse Local:1:1.Data.0 0				
→	Set_Meter_Pulse_Factor	1.5			
	Set_Calc_Interval	1			
	Set_High_Flow	500			
	Set_Critical_Flow	750			
	Val_Total_Gas Val_Gas_Per_Calc_Interval	0.0 0.0			

TIP For additional information on how these energy factors affect calculations, refer to <u>Appendix C</u>, <u>Energy Electric Add-</u> <u>On Instructions</u> and <u>Appendix D</u>, <u>Digital and Analog Energy Add-On Instructions</u>.

Energy Factor Tag	Description			
Set_Meter_Pulse_Factor	The kWh value used to scale the input pulses. The value 1.5 represents 1.5 kWh per pulse.			
Set_Demand_Interval	The value, in minutes, used to calculate the End of Demand Interval (EOI). This value is used only if the Val_End_of Demand_Type is 2.			
Set_Demand_Delay	he time value used to reset the end of interval after the Set_Demand_Interval value has been exceeded without a tility contact or master end of demand contact closure. The value must be in the range of 090 seconds.			
Set_End_of_Demand_Interval_ Type	The value that defines how the End of Demand Interval (EOI) is triggered. 1 = A local digital input connected to an electric utility meter EOI contact (Inp_End_of_Demand_Utility_Contact). 2 = An internal PLC timer (Demand_Interval _PLC Timer) that is typically used when an electric utility meter EOI contact is not available. 3 = A master command input (CMD_Master_End_Of_Demand_Interval) typically from a central controller that is used to synchronize multiple electric meter EOIs.			
Set_High_Demand	When the demand (kW) value exceeds the Set_High_Demand, the High Demand Fault is set.			
Set_Critical_Demand	When the demand (kW) value exceeds the Set_Critical_Demand, the High Critical Fault is set.			

Energy Add-On Instruction Factors for Electric Inputs

Energy Add-On Instruction Factors for Gas, Propane, Fuel Oil, Steam, Air and Water Inputs

Energy Factor Tag	nergy Factor Tag Definitions				
Set_Meter_Pulse_Factor ⁽¹⁾	The consumption value of each input pulse.				
	Energy Add-On Instruction	Default Consumption Unit			
	Air	cf (cubic feet)			
	Fuel Oil, Propane, Water	gallons			
	Gas	therms			
	Steam	lbs (pounds)			
	For example, a value of 1.5 for	the Energy_Gas_Digital Add-	On Instruction, represents 1.5 therms per pulse.		
Set_Calc_Interval	The time interval, in minutes, u	sed to calculate the average	energy flow.		
	For example, an interval value	of 5 will calculate the average	e energy flow every 5 minutes.		
Set_High_Flow	When the flow rate value exce	eds the Set_High_Flow value	e, the High Flow Fault is set.		
	Energy Add-On Instruction	Default Flow Rate Unit			
	Air	cfm (cubic feet per min)			
	Fuel Oil, Propane, Water	gpm (gallons per min)			
	Gas	therms/hr			
	Steam	lbs/hr			
	Example 1: A value of 500 will rate exceeds 500 therms/hr.	set the High Flow Fault in the	Energy_Gas_Digital Add-On Instruction when the gas flow		
		set the High Flow Fault in the	Energy_Air_Analog Add-On Instruction when the air flow		
		and the Oat Original Flavour	Los des Original Flags Facilities et		
Set_Critical_Flow	when the flow rate value exce	eds the Set_Critical_Flow val	lue, the Critical Flow Fault is set.		
	Energy Add-On Instruction	Default Flow Rate Unit			
	Air	cfm (cubic feet per min)			
	Fuel Oil, Propane, Water	gpm (gallons per min)			
	Gas	therms/hr			
	Steam	lbs/hr			
	flow rate exceeds 750 therms/	hr.	the Energy_Gas_Digital Add-On Instruction when the gas ne Energy_Air_Analog Add-On Instruction when the air flow		

(1) The Set_Meter_Pulse_Factor applies only to Energy_xxx_Digital Add-On Instructions. Analog inputs must be scaled to represent flow by using the engineering units in the table.

- -Energy Gas Digital-Energy_Gas_Digital Boiler_House_Gas Inp_Pulse Local:1:I.Data.0 0 Set_Meter_Pulse_Factor 1.5 Set_Calc_Interval 1 Set_High_Flow 500 Set Critical Flow 750 Val Total Gas 0.0 Val_Gas_Per_Calc_Interval 0.0 -Energy_Fuel_Oil_Analog-Fuel_Oil ... Energy_Fuel_Oil_Analog Inp_Meter_Analog_Value Local:3:I.Ch0Data 0 Set_Calc_Interval 1 Set_High_Flow 2 Set_Critical_Flow 4 Val Total Fuel Oil 0.0 Val_Fuel_Oil_Per_Calc_Interval 0.0 Energy_Propane_Analog-Energy_Propane_Analog Propane ... Inp_Meter_Analog_Value Local:3:I.Ch1Data 0 Set_Calc_Interval 1 Set_High_Flow 3 Set Critical Flow 5 Val_Total_Propane 0.0 Val Propane Per Calc Interval 0.0 -Energy_Steam_Analog-Steam_Flow ... Energy_Steam_Analog Inp_Meter_Analog_Value Local:3:I.Ch2Data 0 0.1 Set Calc Interval 220 Set_High_Flow Set_Critical_Flow 245 Val Total Steam 0.0 Val_Steam_Per_Calc_Interval 0.0
- 11. Repeat steps 1...10 to program other digital and analog energy inputs in your project.

For the Efficient Industries Plant 1 example, the completed energy input logic would look similar to this.

Map Energy Add-On Instruction Tags to PLC-5 Addresses

After programming the CompactLogix energy Add-On Instructions, you must map the total energy tags (*AOIName*.Val_Total_xxx) to PLC-5 type addresses (Fxx:x) that FactoryTalk EnergyMetrix software can read. You will create a MOV instruction for each Compactlogix energy Add-On Instruction to move its total to a tag within an array named *ControllerName*_EnergyTotals. You will then map that array to the PLC-5 file F10.

TIP Tag mapping must be done in Offline mode.

Refer to the CompactLogix tab of the Energy Data Worksheet for the CompactLogix EnergyTotal and PLC-5 tags that must be mapped.

The worksheet below shows the tags to be mapped for the Efficient Industries Plant 1 example.

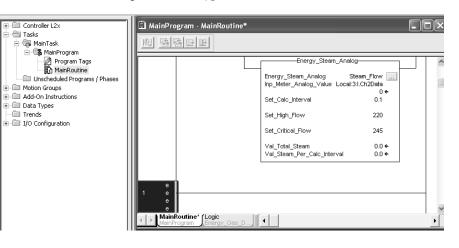
Device Name	Meter Name	Meter Type	Meter Tag Name	AOI Name	L2x Input Address	L2x EnergyTotals Address	PLC 5 Address
		10.1.	D 1 D 1 D 1 D 1			10 E T. 1 (0)	540.0
L2x	Boiler House Gas	L2x Input	Boiler House Natural Gas Usage	Boiler_House_Gas	Local:1:I.Data.0	L2x_EnergyTotals[0]	F10:0
L2x	Fuel Oil Meter	L2x Input	Fuel Oil Usage	Fuel_Oil	Local:3:1.Ch0Data	L2x_EnergyTotals[1]	F10:1
L2x	Propane Meter	L2x Input	Propane Usage	Propane	Local:3:1.Ch1Data	L2x_EnergyTotals[2]	F10:2
L2x	Steam Flow Meter	L2x Input	Steam Usage	Steam_Flow	Local:3:1.Ch2Data	L2x_EnergyTotals[3]	F10:3
qyMetrix), Compactl	ogix / List Data /			4			

CompactLogix Tag and AOI Naming

Follow these steps to map the total energy Add-On Instruction tags to PLC-5 type addresses.

1. Open your program routine and create a new rung.

For this example, a new rung is added after the Energy Add-On Instruction rung.



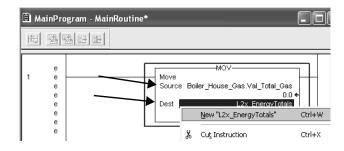
- 2. Add the MOV instruction to your rung by clicking the Move/ Logical tab in the Instruction toolbar, then clicking the MOV instruction icon.
- , 🗈 📄 ඟ 🖘 Drive:O # 4 7 E 1 8 QQ \mathbf{T} MVM AND OR XOR SWPB NOT CLR BTD dd-On 🔏 Alarms K Bit K Timer/Counter 🔏 Input/Output 🔏 Compare 🔏 Compute/Math 🖇 Move/Logical 🗎 MainProgram - MainRoutine* 醫醫醫醫 陆 Move e е Source е ?? е Dest ?? е MainRoutine* (
- **3.** Choose the source tag, Val_Total_*xxx*, from your energy Add-On Instruction.

For this example, Boiler_House_Gas.Val_Total_Gas is selected.

4. Enter a name for the new controller-scoped destination tag in the format: *ControllerName*_EnergyTotals.

For this example, enter L2x_EnergyTotals.

- 5. Right-click the destination tag just entered and choose New '*TagName*' to create the controller tag.
- 6. Configure the new tag.
 - a. Choose Real for the Data Type with an array size at least equal to the number of controller total energy tags to be mapped.
 - b. Choose Float for the Style.
 - c. Click OK to save the configuration.



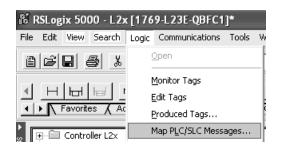
New Tag		×	
<u>N</u> ame:	L2x_EnergyTotals	ОК	
<u>D</u> escription:		Cancel Heip	
<u>U</u> sage:	<normal></normal>	~	
Тур <u>е</u> :	Base Conne	ction	
Alias <u>F</u> or:		v	
Data <u>T</u> ype: (REAL[4]		
<u>S</u> cope:	🔁 L2x	Select Data Type Data Types:	×
Style:	Float	REAL[4]	ОК
🔲 Open Conf	iguration	PM_1000 PM_3000	Cancel
		POSITION_PROP PROP_INT PULSE_MULTIPLIER RAMF_SOAK RATE_UMITER BEAL DECLINICANT INDUIT Array Dimensions Dim 1 Dim 2 Dim 1 Dim 2 Dim 2	Hep

 Double-click the Dest tag assignment in the MOV instruction and reassign the Dest tag to a unique *ControllerName*_EnergyTotals array element in the CompactLogix tab of the Energy Data worksheet.

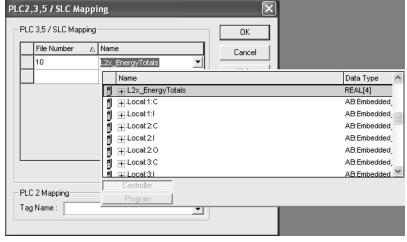
This example shows the instruction used to move Boiler_House_Gas.Val_Total_Gas to the L2x_EnergyTotals file element [0].

🗎 MainProgram - MainRoutine*		×
HBBEE		
	MOV Boiler_House_Gas.Val_Total_Gas 0.0.4 2x_EnergyTotals[0]	
Name	Data Type	
L2x_EnergyTotals[0]	REAL	
L2x_EnergyTotals[1]	REAL	
—L2x_EnergyTotals[2]	REAL	
L2x_EnergyTotals[3]	REAL	
Local:1:C	AB:Embedded_IQ1	
<u>C</u> ontroller		
Program		
Show: Show All	>>	

- 8. Repeat steps 2, 3, and 7 to program MOV instructions for the remaining Add-On Instruction total energy tags (*AOIName*.Val_Total_xxx.)
- 9. Choose Map PLC/SLC Messages from the Logic menu.

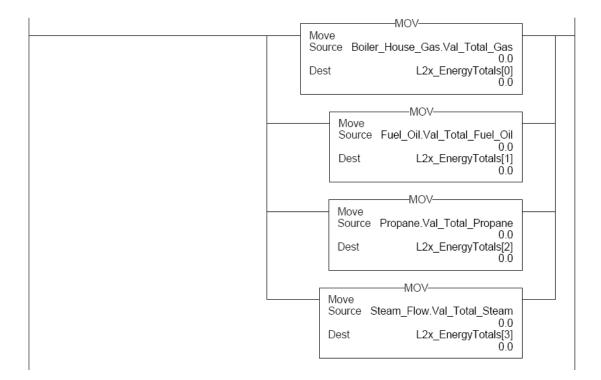


- **10.** In the PLC/SLC Mapping dialog box:
 - a. Enter a PLC/SLC file number. For this example, the PLC-5 file number 10 is entered.
 - b. Choose the *ControllerName*_EnergyTotals tag from the Name list. For this example, L2x_EnergyTotals is selected.
 - c. Click OK. This example shows the L2x_EnergyTotals 4-element, tag array mapped to the F10 PLC/SLC file.



TIP

FactoryTalk EnergyMetrix software meter tags reference these mapped tags by their PLC-5 equivalent addresses F10:0 through F10:3



For the <u>Efficient Industries Plant 1</u> example, the completed energy Add-On Instruction tag-mapping logic would look similar to this.

Notes:

FactoryTalk EnergyMetrix Software Installation

Introduction

In this chapter, you will install server software and FactoryTalk EnergyMetrix software on your computer, and launch FactoryTalk EnergyMetrix software from your web browser.

Before You Begin

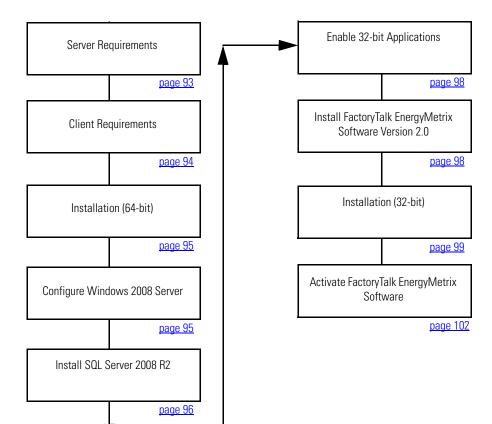
- Determine business goals, complete energy assessment, and determine monitoring methods (<u>Chapter 1</u>).
- Select hardware and wire devices (<u>Chapter 2</u>).
- Configure data collection devices (<u>Chapter 3</u>).

What You Need

- Personal computer with internet access for launching and using FactoryTalk EnergyMetrix software.
- FactoryTalk EnergyMetrix CD, catalog number 9307-FTEMMENE.
- FactoryTalk EnergyMetrix online help and user manual, publication <u>FTEM-UM002</u>.
- Energy Management Accelerator Toolkit CD, publication IASIMP-SP014, or visit the Integrated Architecture Tools and Resources website at http://www.ab.com/go/iatools to download toolkit files.

Follow These Steps

Follow these steps to install server software, prerequisite software, and FactoryTalk EnergyMetrix software on your computer. You will also modify settings to use FactoryTalk EnergyMetrix RT and Chart options and launch FactoryTalk EnergyMetrix software.



Contents of Installation DVD

The installation DVD contains the following required components:

- Factory Talk Energy Metrix software version 2.00.00
- FactoryTalk Activation Manager version 3.50
- RSLinx Classic Lite 2.57 CPR 9 SR 3
- Microsoft .NET Framework 3.5 SP1

And the following optional components:

• Adobe Acrobat Reader 9.1

The CD also includes the following applications, which are not accessible from the auto-run menu but can be browsed:

- FactoryTalk EnergyMetrix Software User Manual
- Internet Explorer WebControls 1.0

Server Requirements

We recommend, but do not require, that you install FactoryTalk EnergyMetrix software on a dedicated server with a local installation of Microsoft SQL Server.

Server Software Requirements for Installing FactoryTalk EnergyMetrix

- Windows 2003 Server or Windows 2008 Server, Application Server role. For 64-bit operating systems, RSLinx Classic version 2.57 CPR9 SR3 or later must be installed. Windows 2000 Server is not supported.
- Microsoft SQL Server 2005 or 2008, installed with mixed-mode authentication (Windows and SQL). TCP/IP access must be enabled. A system administrator SQL login must be used for the FactoryTalk EnergyMetrix installation.
- You must have machine administrator privileges to install FactoryTalk EnergyMetrix.

Hardware Requirements

These are the hardware requirements that you need to use FactoryTalk EnergyMetrix software.

Definitions

The following rules of thumb are offered as a starting point for determining server sizing for FactoryTalk EnergyMetrix. Other factors will affect the required size of a server. A higher number of tags being logged, a faster log rate, a larger number of users and a larger number of reports being run will require a more powerful server than the guidelines specify.

- A low-end server has up to 8 meters and logs up to 40 meter tags at a minimum 15 minute log rate
- A mid-range server has up to 64 meters and logs up to 320 meter tags at a minimum 15 minute log rate
- A high-end server has more than 64 meters and logs more than 500 meter tags at a minimum 15 minute log rate

Database Size Guidelines

FactoryTalk EnergyMetrix writes 16 bytes of data to the database for each meter tag logged. Over time, the database can grow to become quite large. Some examples include the following:

- A low-end server, logging 40 meter tags at 15 minute intervals, will grow the database at a rate of 2.56 KB per hour or 22 MB per year.
- A mid-level server, logging 320 meter tags at 15 minute intervals, will grow the database at a rate of 20.5 KB per hour, or 180 MB per year.
- A high-end server, logging 1000 meter tags at 15 minute intervals, will grow the database at a rate of 240 KB per hour, or 2.1 GB per year.

Consider these guidelines when determining hard disk requirements for a server as well as database maintenance schedules.

Recommendations

These are general guidelines. FactoryTalk EnergyMetrix software is capable of running on a variety of hardware platforms. The main scalability issue is related to processing of logged data (for example, report generation, trending). CPU speed, number of CPUs, RAM, and RAID 5 for the database files are the main scalability factors (in that order). All hardware platforms require the following:

- Processor, RAM and hard drive as noted below
- DVD drive
- One or more Ethernet network ports
- Internet access
- Monitor, keyboard, pointing device (mouse)
- Low-end Server
 - Single 2 GHz Pentium 4
 - 1...2 GB RAM
 - 80 GB hard disk
- Mid-range Server
 - 2 or 4 CPU 2 GHz Pentium 4 or better
 - 2...4 GB RAM
 - 160 GB hard disk (with separate disks for operating system and log files and RAID 5 for main database files preferred)
- High-end Server
 - High-end server requirements are very dependent upon the user's application requirements. Please contact Rockwell Automation for assistance in specifying hardware for a high-end server.

Client Requirements

The following are the client requirements for compatibility with FactoryTalk EnergyMetrix software:

- Microsoft Windows XP Professional, Vista Professional, Windows 7 (Windows 2000 is not supported) operating system.
- Internet Explorer 7, 8, or 9 web browser.

- Adobe Acrobat Reader 7.0 software or later is required to view reports.
- Microsoft .NET Framework 3.5 SP1 is required to use RT and Charts Plus options. .NET Framework 3.5 SP1 is included on the installation DVD or can be downloaded at no charge from Microsoft.

Your client workstation must also be permitted Intranet, Internet or dial-in access to the FactoryTalk EnergyMetrix server. Contact your IT support personnel for assistance.

TIP Your browser should be set to check for newer versions of stored pages automatically, not every visit to the page.

Installation (64-bit)

Perform the following steps while logged in as a Machine Administrator.

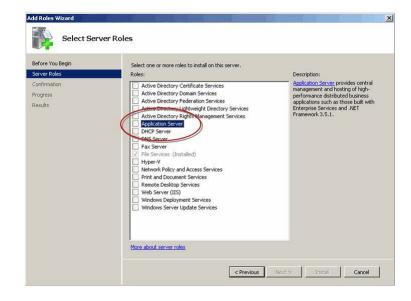
Configure Windows 2008 Server

IMPORTANT Start with a clean Windows Server 2008 R2 SP1.

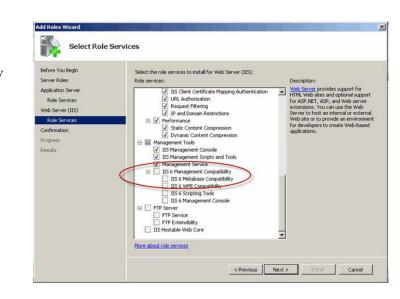
1. If it hasn't launched automatically, launch Server Manager.

Wait until Server Manager has finished collecting data.

- 2. Right-click Roles and select Add Roles.
- 3. Click Next on Before You Begin page.
- 4. Select Application Server.
- 5. Click Add Required Features.
- 6. Click Next.
- 7. Click Next.
- 8. Click Web Services (IIS) Support.
- 9. Click Add Required Role Services.



- 10. Click Next.
- 11. Click Next.
- 12. Scroll down in the Role Services window and then select IIS 6 Management Compatibility.
- 13. Click Next.
- 14. Click Install.
- 15. Wait while installation proceeds.
- 16. Click Close when done.



TIP We recommend that you disable Internet Explorer Enhanced Security Configuration.

- 17. To do this, locate the Configure IE ESC link in the Security section In the Server Manager.
- 18. Click the link, turn off IE ESC for Administrators, and then click OK.

Install SQL Server 2008 R2

Microsoft SQL Server 2008 R2 must be installed on the local server even if the FactoryTalk EnergyMetrix database is to be hosted on another machine.

- 1. Insert disk into CD/DVD drive.
- 2. If necessary, run SETUP.EXE and click Yes to allow SQL Server 2008 R2 to install on the computer.
- 3. Review the documentation in the SQL Server Installation Center window.
- 4. Install the upgrade advisor if desired.
- 5. Click the Installation link in the menu.
- 6. Click the New installation or add features to an existing installation link.
- 7. Enter the product key and then click Next.
- 8. Accept the license terms and click Next
- 9. On the Setup Support Files page, click Install.
- 10. Wait while installation proceeds.
- 11. Make note of any issues or warnings listed in the Setup Support Rules page and take action as needed.
- 12. Click Next.
- 13. Select SQL Server Feature Installation.

- 14. Select the features shown as selected in the screen capture.
- 15. Click Next.
- 16. Click Next.
- 17. Leave the Default instance selected, click Next.
- 18. On the Disk Space Requirements page, click Next.
- **19.** On the Service Account dialog, Click Use the same account for all SQL Server services.
- **20.** Select NT AUTHORITY\SYSTEM in the dialog and then click OK.
- 21. Click Next.
- **22.** On the Database Engine Configuration page, select Mixed Mode.
- 23. Enter a password.

Record the password in a safe location. You will need to enter it when you install FactoryTalk EnergyMetrix.

24. Click Add Current User.

Add additional users as administrators as desired.

- 25. Click Next.
- 26. Click Next.
- 27. Click Install.
- 28. Wait until installation completes.
- 29. Click Close.
- **30.** Close the SQL Server Installation Center window.
- 31. Remove the SQL Server 2008 R2 installation DVD.

IMPORTANT In SQL Server 2008 R2, TCP/IP network access is enabled by default.

SQL Server 2008 R2 Setup		
Feature Selection Select the Standard features to	nstali.	
Setup Support Rules Setup Role Feature Selection Installation Rules	Features: Dotabase Engine Services Question Features Question Features Pail-Text Search	Description: Server features are instance- avere and have their own registly hines. They support multiple instances on a computer.
Initiano Configuration Diok Spose Regulamenta Server Configuration Catabase Engine Configuration Enric Reporting Initialisation Configuration Rules Ready to Initial Initialistion Progress Complete	Arwhysis Servors Reporting Services Sward Features Burnes Inteligence Development Studio Clemit Tools Connectivity Clemit Tools SRA Clemit Tools SRA	
	Select All Unselect All Shared feature directory: C: Program Files/W Shared feature directory (x86): C: Program Files (x1	
	1	< Back Next > Cancel Help

Enable 32-bit Applications

- Using Internet Information Services (IIS) Manager > Application Pools > DefautlAppPool > Advanced Settings, set Enable 32-Bit Applications to True.
- 2. Click OK.

Install FactoryTalk EnergyMetrix Software Version 2.0



- 1. Insert the FactoryTalk EnergyMetrix installation DVD into the CD/DVD drive.
 - **TIP** If needed, browse the DVD and launch Autorun.exe to access the installation menu. Perform the following steps from the installation menu.
- 2. If needed, install Adobe Acrobat Reader (required for viewing reports on the server).
 - a. Click the Adobe Acrobat Reader link under Install Optional Software.
 - b. Select all defaults for a typical installation.
- 3. Install FactoryTalk Activation Manager.
 - a. Click the FactoryTalk Activation Manager link under Install Required Software.
 - b. Click Continue on the InstallShield Wizard screen.
 - c. When prompted, select No to installing the HASP USB dongle drivers.
 - d. Wait while prerequisite packages are installed.
 - e. On the FactoryTalk Activation Manager InstallShield Wizard, click Next.
 - f. Accept the terms of the license agreement, click Next.
 - g. Click Install.
 - h. When prompted, reboot the server.
- 4. Install RSLinx Classic Lite software version 2.57.
 - a. From the FactoryTalk EnergyMetrix installation menu, click RSLinx Lite 2.57.00.
 - b. Complete the steps to install RSLinx Classic Lite software.
 - c. After installation, RSLinx Classic starts as an application.

Refer to the RSLinx application notes section below for tips on using RSLinx Classic software on Windows 2008 Server R2.

IMPORTANT Do not install Microsoft .NET Framework 3.5 SP1 on Windows Server 2008 R2 SP1. It is already installed with the operating system.

IMPORTANT FactoryTalk EnergyMetrix software does not require the installation of Internet Explorer WebControls 1.0.

- 5. Install FactoryTalk EnergyMetrix.
 - a. From the FactoryTalk EnergyMetrix installation menu, click FactoryTalk EnergyMetrix 2.00.00.
 - b. Locate the InstallShield Wizard.
 - It may be behind other windows on the desktop, click Next.
 - c. Click Yes to accept the EULA.
 - d. Enter the customer information, click Next.
 - e. Click Next.
 - f. Click Next.
 - g. Presuming a local installation of the SQL database, enter the server SQL login username and password that you entered in step 2.v previously.

If the SQL server is hosted on a remote machine, enter the database server name and SQL authentication credentials. Click Next.

- h. Click Next.
- i. Wait while FactoryTalk EnergyMetrix software is installed.
- j. When complete, click Finish to reboot the server.
- 6. Install activations by using the FactoryTalk Activation Manager.
- 7. Add local machine user IIS_IUSRS with read and modify rights to the C:\Program Files (x86)\Rockwell Software\FTEnergyMetrix\ChartFXNet folder.
- 8. Open Internet Explorer.
 - a. Browse to http://localhost/ftenergymetrix.
 - b. Log in with username admin and password admin.
 - **TIP** The RT and ChartsPlus options do not require specific security configuration in FactoryTalk EnergyMetrix software. They run as Microsoft ClickOnce applications by default. You will need to grant permission for the options to run, but only one time on each computer.
 - **TIP** When you set up Devices such as power monitors and PLCs in FactoryTalk EnergyMetrix software, you will need to access RSLinx Classic software running on the server to configure drivers and network addresses of devices. You access the RSLinx Classic user interface to perform tasks such as configure drivers, monitor devices in RSWho, and set up OPC topics.

Installation (32-bit)

IMPORTANT See <u>Installation (64-bit) on page 95</u> for instructions to install FactoryTalk EnergyMetrix software on a 64-bit operating system.

Pre-installation Checks

1. Check out the server for required customer-provided software:

- Windows 2003 R2 Server, set up in the Application Server role. ASPNET must be installed. Active Server Pages must be enabled in Internet Information Services. Network COM+ Access must be enabled. The server can not be set up as a Domain Server. FactoryTalk EnergyMetrix software installation on Windows 2000 Server is no longer supported.
- SQL 2005 or 2008 Server, installed and set up for mixed mode authentication (SQL Server and Windows). TCP/IP access must be enabled.
- If the SQL database server is hosted on a remote server, you must download from Microsoft (if necessary) and install Microsoft SQL Server 2005 or 2008 Express Edition on the FactoryTalk EnergyMetrix server. This installs the osql.exe application FactoryTalk EnergyMetrix software uses to connect to the remote database.
- IIS 6, 7, or 7.5 installed and enabled to run.
- 2. You must use a machine administrator login in Windows and have full administrator rights for SQL.
- 3. Ping all Ethernet devices (meters and/or controllers) the customer wishes to connect to.
 - Correct communication to any meters that don't respond.
 - Verify communication with Allen-Bradley Ethernet power monitors via their built-in web page.

Installation

1. Verify the Application Server role configuration in the host Windows Server operating system.

These are the minimum required components:

- ASPNET
- COM+ Services
- Internet Information Services (IIS), all options

Make any necessary changes before proceeding with the installation.

2. If not already installed, install Microsoft SQL Server 2005 or 2008 (NOT included in FactoryTalk EnergyMetrix base software but 2008 is available as a bundled option).

IMPORTANT SQL Server must be set up with mixed-mode authentication (Windows and SQL Server). You can make this selection during initial installation or by using Enterprise Manager and editing the server properties, security tab after installation. We recommend that you do not use the default system administrator login (username = 'sa', password = "") due to known security issues. Record the system administrator login credentials as you will be prompted to enter them when you install FactoryTalk EnergyMetrix software. The same SQL database login will be required when the software is upgraded to a new version eventually.

IMPORTANT If the SQL Server is to be hosted on another computer, download (if needed) and install SQL Server 2005 or 2008 Express Edition on the FactoryTalk EnergyMetrix server at this time.

3. Using Internet Information Services manager, verify that ASP.NET version 2.0 is selected in the default web page properties.

If it is not, select ASP.NET version 2.0 and run IISRESET before installing the software.

4. Insert the FactoryTalk EnergyMetrix software installation DVD into the server's DVD drive.

If auto-run is enabled, the installation menu will launch. If not enabled, browse to and launch autorun.exe in the root folder of the DVD.

- **TIP** The installation menu provides a link to the FactoryTalk EnergyMetrix online Help.
- 5. From the installation menu, install the Factory Talk Activation Manager.
 - **TIP** This step is recommended but not required when upgrading an existing installation.
- 6. Install RSLinx Classic Lite software version 2.57 CPR 9 SR 3.
 - **TIP** This step is recommended but not required when upgrading an existing installation on a 32-bit Windows Server 2003 operating system.
- 7. Install Microsoft .NET Framework version 3.5 SP1.
- 8. If not already installed, install Adobe Acrobat Reader.
- 9. Install FactoryTalk EnergyMetrix software:
 - a. Accept the license agreement and enter the serial number of the Manager software when prompted.
 - b. When prompted, enter the computer name or IP address of the SQL Server (the default is (local) for a SQL server hosted on the FactoryTalk EnergyMetrix server).

Then, enter the SQL system administrator account login credentials.

c. Accept the remaining prompts. The installation will proceed.

During the installation, the FactoryTalk EnergyMetrix SQL database is created, populated with stock values and updated to the current version.

- d. When prompted, reboot the server to complete the installation.
- 10. After the server restarts, log in as an administrator, and then open the Windows Control Panel > Administrative Tools > Computer Management > Local Users and Groups.
 - a. Select Users and right-click the ASPNET user name option.
 - b. Select Properties and select the Member Of tab.
 - c. If Administrators does not appear in the list, then click Add, and then click Advanced.
 - d. Click Find Now.
 - e. Select Administrators and click OK.
 - f. When finished, reset IIS (Start > Run > 'iisreset' > OK).
- 11. Install activations for Manager and all purchased options by using the Factory talk Activation Manager.
- 12. Launch Internet Explorer on the server.
- 13. Enter the server url (universal resource locator) into the Internet Explorer address field:

http://localhost/ftenergymetrix

TIP To use FactoryTalk EnergyMetrix software from a client workstation, substitute the FactoryTalk EnergyMetrix server name or IP address for 'localhost' in the url. 14. When the login screen appears, log in by using the default login credentials.

IMPORTANT If any errors are displayed when you try to log in or once you have logged in, please refer to the Troubleshooting section in the FactoryTalk EnergyMetrix Software user manual, publication <u>FTEM-UM002</u>.

Activate FactoryTalk EnergyMetrix Software

FactoryTalk EnergyMetrix software is one software product. The Manager and Options are enabled by installing activations. For example, one activation enables Manager, another enables the Real Time (RT) option, and one enables the ChartsPlus option.

IMPORTANT It is the customer's responsibility to observe the requirements of all software licenses.

FactoryTalk EnergyMetrix software may be optionally purchased bundled with Microsoft SQL Server 2008 R2 Standard Edition Runtime Database licenses. SQL Server bundles are offered with a processor license (unlimited clients) or a singleclient server license (1 client).

Any number of users may access the FactoryTalk EnergyMetrix server through its web interface.

IMPORTANT FactoryTalk EnergyMetrix software requires at minimum the activation for Manager for operation. Without a Manager activation, the software will not permit users to log in.

The basic Manager software includes a license for 10 meters. You can increase the meter limit on your server at any time by purchasing and installing additional meter licenses in 10, 50, 100, and 500-meter increments.

You can also add options such as RT, FTEMOPC, ChartsPlus, and ReportsPlus in the same manner. Check with your local Rockwell Automation representative for option pricing and availability.

FactoryTalk EnergyMetrix software uses FactoryTalk Activation. If you are a new user, you will need to activate your software by using FactoryTalk Activation because FactoryTalk EnergyMetrix software no longer ships with physical 'master disks' for activating the base software and options.

If you are upgrading from FactoryTalk EnergyMetrix software activated with EvRSI activation, please contact your local Rockwell Automation Sales office or Technical Support for information to migrate your activations to FactoryTalk activations.

For Rockwell Automation Technical Support in the U.S., call 1 (440) 646-3434. Outside the U.S., see <u>http://</u><u>www.rockwellautomation.com/locations/</u>.

When you log in to the FactoryTalk EnergyMetrix web page, the software checks for the activation file. If the system fails to detect the activation file, an error is displayed and logged to FactoryTalk Diagnostics. For more information, refer to the online help included with the FactoryTalk Manager software.

How to Activate Your Software

To activate FactoryTalk EnergyMetrix software, perform the following steps.

- 1. Install the FactoryTalk Manager software available from the Optional Steps screen of the Install program.
- 2. Once FactoryTalk Manager is installed, click Start > Programs > Rockwell Software > FactoryTalk Activation > FactoryTalk Manager to launch the FactoryTalk Manager.
- 3. Click Get Activations.
- 4. Follow the instructions to select an activation method, enter activation information, validate the activation and download the activation to your computer.
- 5. Refer to the Activation Manager Help topics for additional information.

FactoryTalk EnergyMetrix software does not provide a grace period. The software will not permit users to log in if a valid activation is not available.

A Host ID is an internal code that uniquely identifies a hardware device. FactoryTalk Activation uses the Host ID to 'lock' each software activation file to a specific hardware device.

To prevent activations from failing unexpectedly at runtime, do not lock activations to virtual network adapters, such as those used for virtual private networks (VPN) or virtual machines. Instead, lock activations to the Host IDs of fixed devices such as hardware network adapters or hard disk serial numbers. If you need help determining which network adapters are virtual adapters, contact your Information Technology department.

For help at any point, click the Help link on FactoryTalk Manager software, or click the Help link on the Rockwell Software Activation website:

https://activate.rockwellautomation.com/.

For Rockwell Automation Technical Support in the U.S., call 1 (440) 646-3434. Outside the U.S., see http:// www.rockwellautomation.com/locations/.

Notes:

FactoryTalk EnergyMetrix Groups and Security Setup

Introduction

In this chapter, you will set up domains and groups for an FactoryTalk EnergyMetrix project, and also assign user roles and privileges for accessing domains.

Examples are based on the Efficient Industries Plant 1 example on page 108.

Before You Begin

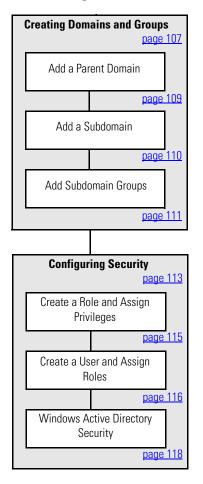
- Determine business goals, complete energy assessment, and determine monitoring methods (<u>Chapter 1</u>).
- Select hardware and wire devices (<u>Chapter 2</u>).
- Configure data collection devices (<u>Chapter 3</u>).
- Install FactoryTalk EnergyMetrix software (<u>Chapter 4</u>).

What You Need

- FactoryTalk EnergyMetrix CD, catalog number 9307-FTEMMENE
- FactoryTalk EnergyMetrix online help and user manual, publication <u>FTEM-UM002</u>.
- Energy Management Accelerator Toolkit CD, publication IASIMP-SP014, or visit the Integrated Architecture Tools and Resources website at http://www.ab.com/go/iatools to download toolkit files.

Follow These Steps

Follow these steps to create domains and groups, configure security, and configure devices and meters.



Creating Domains and Groups

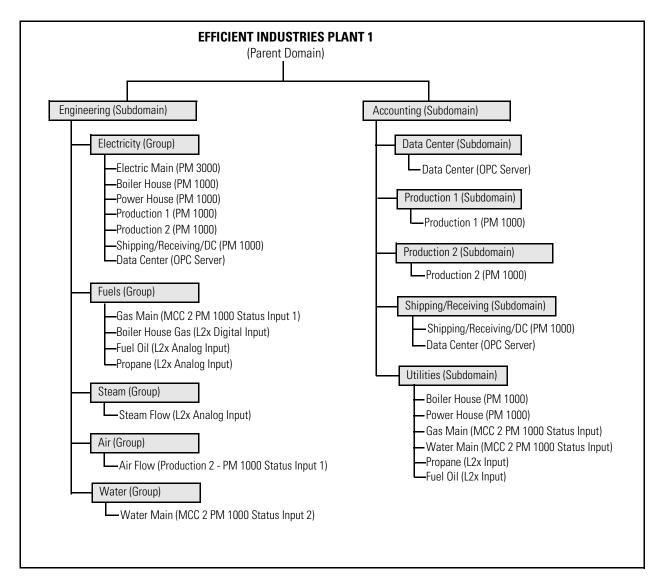
The first step in configuring an FactoryTalk EnergyMetrix software project is to set up domains and groups based on your plant's departments, production areas, or energy types.

- **Group** A named collection of devices and meters that represent a subdivision of your enterprise such as a department or process.
- **Domain** A group that is assigned roles and users. Users assigned to a domain may only access objects assigned to that domain. This allows an administrator to restrict user access to specific parts of the system.

A typical setup is to organize meters into domain groups by energy type, substation, boiler room, or other function. A second domain is then set up to organize meters into energy accounting groups.

This quick start uses the <u>Efficient Industries Plant 1</u> example on page <u>108</u> to set up groups and domains in the FactoryTalk EnergyMetrix software. It organizes the plant's energy data from the Energy Data Worksheet into two functional subdomains and groups.

- **Engineering** includes all of the energy data points and is subdivided into energy types for load profiling, consumption reporting, and power quality monitoring needs.
- Accounting organized into production, and shipping/receiving departments for cost allocation analysis. This group also includes a utilities subgroup for nonproduction cost allocation analysis and utility shadow billing.



Efficient Industries Plant 1

Add a Parent Domain

You will now set up a parent domain for your project. Typically, this is the name you want to use for your system or plant configuration.

- 1. Click the System tab.
- 2. Select the Groups folder.
- **3.** Click Add.



4. Enter the parent domain name.

For this example, enter Efficient Industries Plant 1.

Make sure to check This group is a domain.

The domain name can also be used for report titles.

5. Click Save.

The new plant domain appears in the Groups folder.

Add Group	_
Save Cancel	
Parent group None	
Image: Market Ma Narket Market M Narket Market Ma Market Market Mark	
Name Efficient Industries Plant 1	
Notes	
Default log rate 15	
Reports title line 1 Efficient Industries Plant 1	
Reports title line 2	
Meters Not Assigned to Group Meters Assigned to Group (Contribution factor %)	Contribution factor (%)

Add a Subdomain

Follow these steps to set up a new subdomain.

1. Select the parent domain under Groups.

In this example, the parent domain is Efficient Industries Plant 1.

2. Click Add to add a subdomain.

System Meters Reports Custom	Group Setup
Layout: <u>Save Restore</u> <u>Collapse</u>	Edit Add Delete
🚚 System Status	
🛱 🔄 Groups	Parent group None
E Efficient Industries Plant 1	This group is a domain
Devices	Name Efficient Industries Plant 1
- Roles and Users	
🗄 🛄 Rate Schedules	A
🖶 🛄 Multi-Purpose Report Scripts	
	Notes
📲 Unit Setup	
- 🔑 Configuration	v
-] System Configuration Report	Default log
🐻 My User Settings	rate
1 About	Reports title Efficient Industries Plant 1
	Reports title line 2
	Meters Assigned to Group (Contribution factor %)
e'l Done	Trusted sites

- 3. Create the subdomain.
 - a. Choose the parent domain from the Parent group pull-down menu.
 - b. Check This group is a domain.
 - c. Enter a subdomain name.

In this example, the subdomain name is Engineering.

- d. Enter the report titles as shown.
- 4. Click Save.

Add Group	-
Save Cancel	
Parent group Efficient Industries Plant 1 💌	
Name Engineering	
Notes	
Default log rate 15	
Reports title line Efficient Industries Plant 1	
Reports title line Engineering	
Meters Not Assigned to Group Meters Assigned to Group (Contribution factor %)	_

You should see the new subdomain under the parent domain.

System Meters		Reports	Custom					
Layout: <u>Save Restore</u> <u>Collapse</u>								
	Statu	s						
🖃 📾 Groups								
🗄 - 🗄 Efficient Industries Plant 1								
Engineering								
🗄 🛄 Devices	Devices							
🗄 💷 Roles and Users								
🗄 🛅 Rate Schedules								
-Ω I Alarm Setup								

Add Subdomain Groups

Follow these steps to set up groups under a subdomain.

1. Select the subdomain under the parent domain.

In this example, the subdomain is Engineering.

2. Click Add to add a group to the subdomain.

System Meters Reports Custom	Group Setup
Layout: <u>Save Restore</u> <u>Collapse</u>	Edit Add Delete
🖨 🗁 Groups	Parent group Efficient Industries Plant 1 👻
🗄 🗄 Efficient Industries Plant 1	This group is a domain
Engineering	
🖅 🛄 Devices	Name Engineering
E Roles and Users	
Rate Schedules	
	Notes
- 🛱 Unit Setup	
- P Configuration	
System Configuration Report	Default log
- 🛃 My User Settings	Tale -
O About	Reports title Engineering
	Reports title

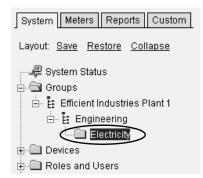
- 3. Create the subdomain group.
 - a. Select the subdomain from the Parent group list.
 - b. Clear the This group is a domain checkbox.
 In this example, the groups under the Engineering subdomain do not require security. This is why the checkbox is cleared.
 - c. Enter a name for the group.

For this example, the group name is Electricity.

- d. Enter the report titles as shown.
- 4. Click Save.

You should see the new group under the subdomain.

System Meters Reports Custom	Add Group
Layout: <u>Save</u> <u>Restore</u> <u>Collapse</u>	Save
🖓 🕮 System Status	
🖻 🚔 Groups	Parent group -Engineering
⊟ Efficient Industries Plant 1	This group is a domain
Engineering	Name
Bevices Roles and Users	
Rate Schedules	
	Notes
- P Configuration	
	Default log rate 15
About	Reports title line Efficient Industries Plant 1
O About	
	Reports title line 2 Engineering - Electricity



5. Repeat steps 1...4 to add other groups to the subdomain.

For the Efficient Industries Plant 1 example, enter the groups:

- Air
- Fuels
- Steam
- Water

The Engineering group structure should look like this.

You are now ready to set up the Accounting subdomain under Efficient Industries Plant 1.

Follow the steps in <u>Add a Subdomain</u> on page <u>110</u> and <u>Add Subdomain Groups</u> on page <u>111</u> to complete the Accounting structure. When you are done, the domain and group structure should look like this.

System Meter	s	Reports	Custom
Layout: <u>Save</u> <u>I</u>	Re	<u>store</u> <u>Col</u>	lapse
- 🖉 System St	atu	s	
🖻 📾 Groups			
🖃 🗄 Efficier	nt Ir	ndustries F	'lant 1
🖻 🗄 Acc	ou	nting	
Ē	Da	ita Center	
Ē	Pr	oduction 1	
Ē	Pr	oduction 2	
Ē	Sh	ipping/Red	eiving
Ē			
🖻 🗄 Eng	gin	eering	
	Air		
	Ele	ectricity	
	Fu	els	
	Ste	eam	
· · · · · · · · · · · · · · · · · · ·	Wa	ater	

IMPORTANT The only difference in setting up the Accounting subdomain is that the groups require security. Security is assigned only at the domain level. Make sure this setting is checked. **Image This group is a domain**

System Meters Reports Custom						
Layout: <u>Save Restore</u> <u>Collapse</u>						
🖉 System Status						
🖻 📹 Groups						
🗄 🗄 Efficient Industries Plant 1						
🗄 📴 Engineering						
🛅 Air						
Electricity						
🛄 Fuels						
- 🖾 Steam						
Water						
🕂 🗇 Devices						
🗄 🕮 Roles and Users						

🗄 🛅 Rate Schedules

Configuring Security

Security is used to restrict various levels of user access to a project on a need-to-know basis. For example, corporate users typically require only viewing access to plant summary data, where plant maintenance may require editing and viewing access to the engineering domain.

FactoryTalk EnergyMetrix software provides default roles and users to control access to parts of a project. You can optionally set up special roles and users.

- **Role** A named collection of privileges assigned to a user to manage security. Roles may be global, where they apply to the entire FactoryTalk EnergyMetrix software system, or domain specific.
- User A named set of security credentials, user name and password, that permit a user to access privileges of an assigned role. You can assign more than one role to a user.

Default Roles	Default User Name	Default Password
Admin	admin	admin
User	user	user
Guest	guest	guest

TIP It is recommended that you change the default password for the Admin user to prevent inadvertent changes to the database.

In addition to the FactoryTalk EnergyMetrix software default roles, the Efficient Industries Plant 1 example has three roles:

- **Engineering Manager** This role has Admin privileges that are limited to the Engineering subdomain. Admin privileges allow a user to perform editing and viewing operations.
- Accounting Manager This role has a subset of the Admin privileges that are limited to the Accounting subdomain.
- **Production 1 Manager** This role has User privileges that are limited to the Production 1 subdomain. User privileges allow a user to perform read-only or viewing operations.

The <u>Roles and Privileges</u> table on page <u>114</u> provides a list of the roles and privileges assigned to each role.

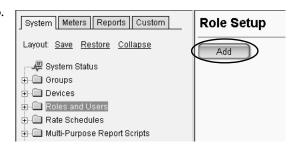
Roles and Privileges

Privilege Name	Description	J J		Accounting	Production 1		
r nvnege ivallie	Description	Admin	User	Guest	Manager	Manager	Manager
View Groups	View the structure of the project	•	•	•	•	٠	•
Edit Groups	Add, delete, and modify groups and domains	•			•		
View Users	View the list and properties of defined users	•	•		•	•	•
Edit Users	Add, delete, and modify users and their properties	•			•	•	
Overwrite Passwords	Change the password of other users	•			•	•	
View Roles	View the list and properties of defined roles	•	•		•	•	•
Edit Roles	Add, delete, and modify roles and their properties	•			•	•	
View Devices	View devices and their properties	•	•	•	•	•	•
Edit Devices	Add, delete, and modify devices and their properties	•			•		
View Meters	View meters and their properties	•	•	•	•	•	•
Edit Meters	Add, delete, and modify meters and their properties	•			•		
View Meter Tags	View meter tags and their properties	•	•	•	•	٠	•
Edit Meter Tags	Add, delete, and modify meter tags and their properties	•			•		
View Alarm Subscript.	View alarm subscriptions	•			•		
Edit Alarm Subscript.	Add, delete, and modify alarm subscriptions	•			•		
Purge Alarms	Purge alarms	•			•		
Edit Units	Add, delete, and modify units, base units, and value types	•			•		
View Meter Data View meter data in Summary, Trend, and Calendar Trend mode		•	•	•	•	•	•
Edit Meter Data Edit logged meter data in database		•			•		
View Man. Meter Data	View meter data in Summary, Trend, and Calendar Trend mode	•	•	•	•	•	•
Edit Man. Meter Data	Input and modify manual meter data	•			•	•	
Purge Device Errors		•			•		
View Rate Schedules	View rate schedules	•	•		•	•	•
Edit Rate Schedules	Add, delete, and modify rate schedules/properties	•			•	•	
View Reports	View reports including edit start and end dates	•	•	•	•	•	•
Edit Reports	Add, delete, and modify reports and their properties	•			•	•	
View Custom Pages	View custom pages	•	•		•	•	•
Edit Custom Pages	Add, delete, and modify custom pages	•			•	•	
View Report Jobs	View the setup information for autorun report jobs	•	•		•	•	•
Edit Report Jobs	Create and edit autorun report jobs	•			•	•	
Purge Logged Data	Purge meter data from the database	•			•	•	
View Multi-purpose Report Scripts	View multipurpose report scrips	•	•		•	•	•
Edit Multi-purpose Report Scripts	Add, delete, and modify multipurpose report scripts	•			•	•	
Edit System Config		•			•	•	
View Alarms		•	•	•	•	•	•
Edit Alarms		•			•	•	
View Logged In Users		•			•	•	•
View Fiscal Calendars	View Fiscal Calendars and select fiscal periods for functions	•	•	•	•	•	•
Edit Fiscal Calendars	Add, delete, and modify fiscal calendars	•		1	•	•	

Create a Role and Assign Privileges

Follow these steps to create a role and assign privileges.

- 1. Click Roles and Users on the System tab.
- 2. Click Add.



3. Choose a domain from the Parent group pull-down menu.

For this example, choose Engineering.

4. Enter a role name.

For this example, enter Engineering Manager.

5. Assign all Admin privileges to the Engineering Manager by moving all privileges from the right pane to the left pane. Clicking the left double-arrow icon will move all privileges in one operation.

You can also move or assign individual privileges by using the single arrow icons. To select noncontiguous privileges, hold down the Ctrl key while making selections.

The Engineering Manager has Admin privileges, but only for the Engineering subdomain. Refer to page <u>114</u> for a list of Admin privileges.

6. Click Save.

You should see the Engineering Manager role under the Engineering subdomain.



Save Cancel	
Parent group -Engineering	
Role name Engineering Manag	jer 🛛
Role notes	*
Privileges Assigned to Selected View Groups Edit Groups View Users Edit Users Overwrite Passwords View Roles Edit Roles View Devices Edit Devices Edit Devices Edit Devices View Meters Edit Meter Tags Edit Meter Tags Edit Meter Tags Edit Meter Tags Edit Meter Tags Edit Meter Tags Edit Alarm Subscriptions Edit Alarm Subscriptions Purge Alarms	I Role Privileges Not Assigned to Selected Role



- 7. Repeat steps 1...6 to add the Accounting Manager and Production 1 Manager roles.
 - The Accounting Manager will have a subset of the Admin privileges, but only for the Accounting subdomain.
 - The Production 1 Manager will only have User or viewing privileges for the Production 1 subdomain.

Refer to the <u>Roles and Privileges</u> table on page <u>114</u>.

When done, you should see three roles defined.

Roles and Users Global Roles Global Roles Global Roles Global Roles Accounting Manager E Data Center Data Center Production 1 Production 1 Manager E Production 2 E Shipping/Receiving E Utilities C E Engineering Manager

Create a User and Assign Roles

Follow these steps to create a user and assign a role to that user.

1. Select a role.

		em Meters	Reports Custom	Role Set	up			
	In this example, click the Accounting Manager role just created.	ut: <u>Save</u> <u>Re</u>) System Stati) Groups	estore <u>Collapse</u> us	Edit	Add Delete		A	dd User
2.	Click the <u>Add User</u> link on the right.) Devices Roles and U Global R E Efficient I E Accou	oles Industries Plant 1	Parent group Role name Role notes	-Accounting Accounting Manager	A		
3.	Enter a user name and pass for the new user.	word	User Setup					
	In this example, the user na Account 1.	me is	Save Cancel User Information User name Account	unt 1			er Roles	
4.	Assign a role to the user by checking the appropriate ro under User Roles.		First name				- 🖓 Admin - 🗆 🧐 User - 🗆 🧐 Guest E Efficient Industries Plant 1 - E <u>Accounting</u>	
	In this example, the Account Manager role is assigned to Account 1 user.	÷ 1	Password Password Password Office phone				Control Control Mana E Data Center Data Center E Production 1 E Production 2 E Shipping/Receiving E Utilities	
	Enter other user informatic necessary.	on as	Home phone Fax Fax				È- È: Engineering └── □ 功 Engineering Mar	nager
5.	Click Save.		Language None	-06:00) Central Time				

TIP You can assign more than one role to a user. For example, a user may have viewing (read-only) access to meters and published reports, but admin (read and write) access to a personal scratch-pad domain.

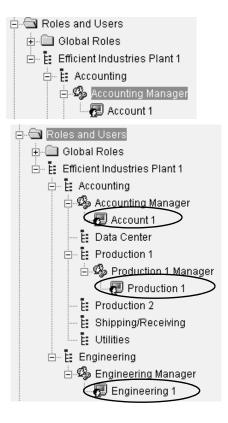
You should see the Account 1 user under the Accounting Manager role.

6. Repeat steps 1...5 to add additional users.

For this example, add two more users.

- Production 1
- Engineering 1

When done, Roles and Users should look like this.



Windows Active Directory Security

FactoryTalk EnergyMetrix software supports Windows Active Directory security. No configuration is required to use Active Directory / LDAP (Lightweight Directory Access Protocol). Simply create a user name in the format DomainName\UserName for logging into Windows.

The password fields and password button are displayed for Active Directory users, however, the password entered into the user setup will only be used if the user cannot be authenticated with the Active Directory server. When the user IS is authenticated against the Active Directory server, FactoryTalk EnergyMetrix software updates the password stored in the database to keep the passwords synchronized.

FactoryTalk EnergyMetrix Software Device Setup

Introduction

In this chapter, you will create and configure FactoryTalk EnergyMetrix software devices for your project.

Refer to the FactoryTalk EnergyMetrix tab in your Energy Data Worksheet for device class and device names in your project.

Examples are based on the Efficient Industries Plant 1 example on page 108.

Before You Begin

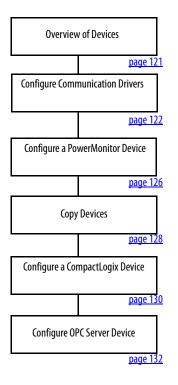
- Determine business goals, complete energy assessment, and determine monitoring methods (<u>Chapter 1</u>).
- Select hardware and wire devices (<u>Chapter 2</u>).
- Configure data collection devices (<u>Chapter 3</u>).
- Install FactoryTalk EnergyMetrix software (<u>Chapter 4</u>).
- Configure groups and security in (<u>Chapter 5</u>).

What You Need

- FactoryTalk EnergyMetrix software CD, catalog number 9307-FTEMMENE
- RSLinx Classic software, version 2.5 or later
- FactoryTalk EnergyMetrix online help and user manual, publication <u>FTEM-UM002</u>.
- Energy Management Accelerator Toolkit CD, publication IASIMP-SP014, or visit the Integrated Architecture Tools and Resources website at <u>http://www.ab.com/go/iatools</u> to download toolkit files.

Follow These Steps

Follow these steps to configure FactoryTalk EnergyMetrix devices including the power monitor, controller, and OPC Server device.



Overview of Devices

Devices are physical entities that FactoryTalk EnergyMetrix software communicates with over a network. Setting up a device in FactoryTalk EnergyMetrix software establishes communication and creates database definitions for the device.

Devices may be directly connected to the server over a network if the FactoryTalk EnergyMetrix server is also on the network through an appropriate network interface and you have configured the appropriate RSLinx Classic device drivers. Devices routed through a ControlLogix gateway or RSLinx Classic gateway are also considered directly connected devices.

Device Classes

FactoryTalk EnergyMetrix software uses device classes to determine how to interact with a particular device. The device class includes the device family, communication type, and specifies whether the device has a clock that can be synchronized. The device classes covered in this quick start include:

- PowerMonitor 1000 device
- PowerMonitor 3000 device
- PowerMonitor W250 device
- PowerMonitor 500 device
- PowerMonitor 5000 device
- ControlLogix controller
- OPC Server on Ethernet

For a complete list of device classes, refer to:

- FactoryTalk EnergyMetrix Software User Manual, publication <u>FTEM-UM002</u>
- FactoryTalk EnergyMetrix Online Help provided with FactoryTalk EnergyMetrix software

Configure Communication Drivers

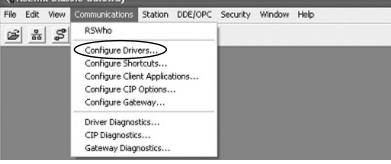
Before setting up devices, you need to configure the drivers required for communication. This example uses the RSLinx Classic Ethernet driver for the PowerMonitor and ControlLogix devices, and the Kepware OPC driver for the Data Center device.

Configure RSLinx Ethernet Driver

Follow these steps to configure the RSLinx Classic Ethernet driver.

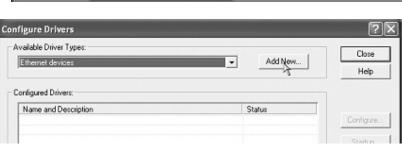
- 1. Open RSLinx Classic by clicking its icon in the Windows System Tray (SysTray).
- 2. Choose Configure Drivers from the Communications menu.





2:37 PM

- **3.** Choose Ethernet Devices from the pull-down menu.
- 4. Click Add New.



5. Click OK to accept the default driver AB_ETH-1.

dd New RSLinx Classic Driver	_
Choose a name for the new driver. 15 characters maximum)	OK
AB_ETH-1	Cancel

6. Enter the IP address of your first device (Station).

C

7. Click Add New to enter the IP address for each additional device you want to add, then click OK.

In this example, you will enter eight IP addresses for:

- (1) PowerMonitor 3000 device.
- (6) PowerMonitor 1000 devices.
- (1) CompactLogix controller.
- 8. Click OK when done entering IP addresses.
- **9.** Click Close to exit the Configure Drivers dialog box.

Station	Host Name		Add New
0	10.10.10.0	\sim	
1	10.10.10.1		<u>D</u> elete
2	10.10.10.2		
3	10.10.10.3		
4	10.10.10.4		
5	10.10.10.5		
6	10.10.10.6		
7	10.10.10.7		
8			
63	Driver		

Configure OPC Server

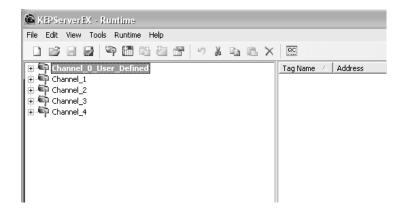
Before setting up devices and meters based on OPC servers, you need to configure an OPC server. This example uses the Kepware OPC driver for the Data Center device. For our example, the facility data center has an uninterruptible power supply (UPS) with a Modbus interface providing energy and real power demand data.

You may download KepServerEx V5 OPC server software and the Modbus communication driver suite from http://www.kepware.com. The Kepware server operates in full-featured demo mode for two hours. You may install and run KepServerEx V4 and V5 side-by-side on a single computer. Production use of Kepware server software requires that you purchase the applicable software and driver licenses.

Install the KepServerEx V5 software. Be sure to select the Simulation Suite during the installation.

Follow these steps to configure the OPC server after software is installed.

- 1. Open the Kepware KepServerEx V5 configuration.
- 2. Use the File menu to open the file simdemo.opf found in the default Projects folder.



3. Expand the Channel_0_User_Defined channel, then select the Ramp device.

Note the list of simulated data tags in the right pane.

🍘 KEPServerEX - Runtime						
File Edit View Tools Runtime Help						
16889106289×	QC					
- Channel_0_User_Defined	Tag Name 🔺	Address	Data Type	Scan Rate	Scaling	Description
Ramp	Ramp_Float	RAMP (100	Float	100	None	Ramps from 1
Random	Ramp1	RAMP (10,	Long	100	None	Value Ramps f
Sine	Ramp2	RAMP (100	Long	100	None	Value Ramps f
User	CRamp3	RAMP (100	Long	100	None	Value Ramps f
Deannel_1	Ramp4	RAMP (250	Long	100	None	Value Ramps f
	RampXL1	RAMP (50,	Long	100	None	Value Ramps f
E Channel_3	RampXL2	RAMP (50,	Long	100	None	Value Ramps f
	RampXL3	RAMP (50,	Long	100	None	Value Ramps f

Later in this document, you will set up a device, meter, and meter tag by using data from the tag Channel_0_User_Defined.Ramp.Ramp4.

4. To view this data now, launch the OPC Quick Client by clicking Quick Client in the toolbar.

KEPServerEX - Runtime	
File Edit View Tools Runtime Help	\frown
Channel_0_User_Defined	TaQuick Client Andress
Ramp	Ramp_Float RAMP (100
Random	Ramp1 RAMP (10,
Sine	Ramp2 RAMP (100

5. When the Quick Client opens, drill into the channel, device and tags as shown.

Note the changing values of the data.

SC OPC Quick Client - Untitled *				- DX
File Edit View Tools Help				
D ☞ 🖬 🛫 📽 🐇 🛍 🖹 🗙				
E Kepware.KEPServerEX.V5	Item ID 🛆	Data Type	Value	Timestamp
	Channel_0_User_Defined.Ramp.Ramp	Float	63.5	10:38:01.447
Channel_0_User_DefinedSystem	Channel_0_User_Defined.Ramp.Ramp1	Long	2867	10:38:01.447
Channel_0_User_Defined.Ramp	Channel_0_User_Defined.Ramp.Ramp2	Long	3051	10:38:01.447
	Channel_0_User_Defined.Ramp.Ramp3	Long	3001	10:38:01.447
Channel O User Defined.Random. Syster	Channel_0_User_Refined.Ramp.Ramp4	Long	8790	10:38:01.447
Channel_0_User_Defined.Sine	Channel_0_User_Defined.Ramp.RampXL1	Long	4	10:38:01.447
Channel 0 User Defined.Sine. System	Channel_0_User_Defined.Ramp.RampXL2	Long	98	10:38:01.447
Channel 0 User Defined.User	Channel_0_User_Defined.Ramp.RampXL3	Long	5076	10:38:01.447
Channel_0_User_Defined.UserSystem				
Channel_1System				
Channel_1.Device_1				
Channel 1.Device 1. System				

6. Exit from the Quick Client and the KepServerEx 5 configuration window.

You don't need to save changes.

Configure a PowerMonitor Device

Follow these steps to configure a PowerMonitor device.

C

- 1. Select the Devices folder on the System tab.
- 2. Navigate to and select the appropriate group or domain.

In this example, select the Electricity group under the Engineering subdomain.

- 3. Click the <u>Add a device</u> link.
- 4. Choose a subdomain or group from the Parent group list.

For this example, choose Electricity.

5. Check the boxes as shown.

The checkboxes vary by device type.

If the device will not be connected during configuration, clear the Enable device checkbox to avoid timeout errors.

6. Choose a device from the Device class list.

For this example, choose PowerMonitor 1000 (EM3) on EtherNet/IP.

7. Enter a name for the device.

For this example, enter Boiler House.

8. Enter the Time zone and Time sync interval.

Devices with internal clocks may be time-s

9. Enter the communication path to the device.

For this example the communication path to the first PowerMonitor 1000 EM3 device is AB_ETH-1\10.10.10.1.

10. Modify other communication settings as needed.

For details, refer to the FactoryTalk EnergyMetrix software help.

Comm. retries 2	
Max. messages 1	
П Е	nable comm. loss alarm
ynched, such as power m	onitors and controllers.
· · · · ·	
Device Communications	
Communications path AB_	ETH-1\10.10.10.1
Communications path AB_ Comm. timeout (seconds) 5	ETH-1\10.10.10.1
	ETH-1\10.10.10.1
Comm. timeout (seconds) 5	ETH-1\10.10.10.1
Comm. timeout (seconds) 5 Comm. retries 2 Max. messages 1	ETH-1\10.10.10.1

System Meters Reports Custom	Device Status
.ayout: <u>Save Restore</u> <u>Collapse</u>	Add a device Refresh Show all child devices
- 🗇 Groups	Legend: Online Online, not fully Online, tag scanned error(s) Offli
- 🔄 Devices	scanned enor(s)
🗄 🗄 Efficient Industries Plant 1	Domain: Electricity
🗄 🗄 Accounting	Electric Main
🖃 🗄 Engineering	
🛄 Air	
Electricity	
Electric Main	
- 🛄 Fuels	
- 🛅 Steam	
Water	

Add Device		
Save Can	cel	
Device Information		
	🗹 Enable device	
	🗷 Enable real-time logging	1
	🗹 Enable auto data repopu	Ilation
Parent group	Electricity	•
Device class	Powermonitor 1000 (EM3)	on EtherNet/IP
Name	Boiler House	
Notes		
Time zone	(GMT-06:00) Central Time ((US & Canada) 📃
Time sync.	Daily 💌	
Device password		 Device password applies only to the power monitors. The default of zero matches the default power monitor
Device Communicati	ions	password
Communicatio	ns path AB_ETH-1\10.10.10	J.1
Comm. timeout (se	econds) 5	
Comm.	retries 2	
Max. me	ssages 1	

11. Click Save. Add Device Save Cancel You should see the Boiler House device under 🗄 🖾 Devices Electricity. 🗄 🗄 Efficient Industries Plant 1 🗄 🗄 Accounting Engineering 🗀 Air Electricity 🔤 Boiler House 🧱 Electric Main 12. If the device is connected to the network, click Test Test Connection Connection to verify communication with the device. **Connection successful**

If you see connection failed, try again. If the test times

out, check that you entered the correct communication path in step <u>2</u> and that the device is on line. Try to access the PowerMonitor's web page or try to ping it from the FactoryTalk EnergyMetrix server.

Copy Devices

Follow these steps to create additional devices by using the copy function. For the Efficient Industries Plant 1 example, you will use the copy function to create five remaining PowerMonitor 1000 devices (Power House, Production 1, Production 2, Shipping/Receiving/DC, MCC2).

System Meters Reports Custom

Layout: Save Restore Collapse

🗄 🗄 Efficient Industries Plant 1

E Data Center

Production 1

F Production 2

- 🗄 Utilities

🗄 🗄 Engineering

💼 Air

Shipping/Receiving

🗄 🗄 Accounting

→ 🐙 System Status 🕀 🧰 Groups

🚊 🖾 Devices

Device Setup

Edit Add

Conv

🗹 Enable real-time logging

Device class Powermonitor 1000 (EM3) on EtherNet/I

🕅 Enable auto data repopulation

Device Configuration

🗹 Enable device

Device Viewer

Parent group --Electricity

Name Boiler House

Delete

-

-

1. Select an existing device, then click Copy.

For this example, select the Boiler House device.

2. Change the name of the copied device.

For this example, replace 'Copy of Boiler House' with Power House.

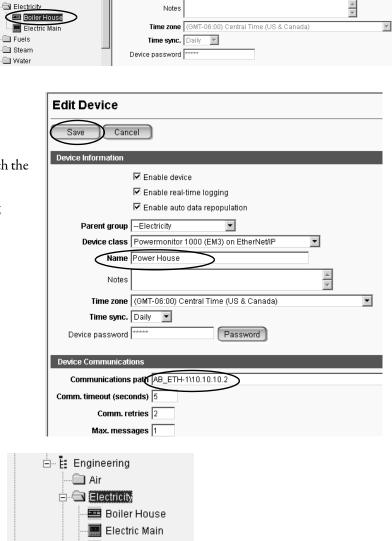
3. Change the Communication path to match the device for this example.

If the device will not be connected during configuration, clear the Enable device checkbox to avoid timeout errors.

4. Click Save.

You should see the Power House device under Electricity.

5. For this example, repeat steps 1...4 to copy the remaining PowerMonitor 1000 devices.

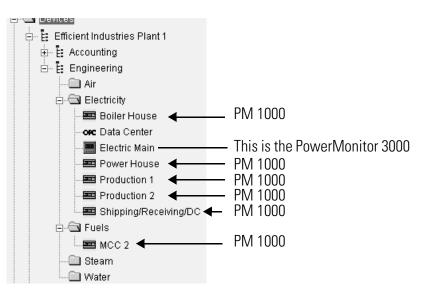


🔤 Power House

Change the name and communication path to each device as shown in the table. Note that all devices fall under the Electricity parent group except for the MCC 2 device that is under Fuels. For reference, see the Efficient Industries Plant 1 example on page 108.

Parent Group	Name	Communication Path
Electricity	Production 1	AB_ETH-1\10.10.10.3
Electricity	Production 2	AB_ETH-1\10.10.10.4
Electricity	Shipping/Receiving/DC	AB_ETH-1\10.10.10.5
Fuels	MCC 2	AB_ETH-1\10.10.10.6

You should see six PowerMonitor 1000 devices and one PowerMonitor 3000 device under the appropriate groups.



Configure a CompactLogix Device

Follow these steps to configure a CompactLogix device.

System Meters Reports Custom 1. Select the Devices folder on the **Device Status** Layout: Save Restore Collapse System tab. Show all child devices Refresh Add a device I System Status Online, not fully scanned Online, tag error(s) Offline Not Dis: 2. Navigate to and select the 🗄 🛄 Groups Legend: Online 🗄 🔄 Devices appropriate group or domain. 🗄 🗄 Efficient Industries Plant 1 Domain MCC 2 In this example, select the Fuels - Air Electricity group under the Engineering 🔳 Boiler House 📰 Electric Main subdomain. 🔤 Power House Production 1 3. Click the <u>Add a device</u> link. Production 2 📰 Shipping/Receiving 🔄 Fuels E MI 4. Choose a subdomain or group from the Add Device Parent group list. Save Cancel For this example, choose Fuels. 5. Check the boxes as shown. Device Information Enable device The checkboxes vary by device type. 🗹 Enable real-time logging If the device will not be connected during 🗹 Enable auto data repopulation configuration, clear the Enable device Parent group --Fuels Ŧ checkbox to avoid timeout errors. Device class ControlLogix on Ethernet Ŧ 6. Choose a device from the Device class list. Name L2x * Notes For this example, choose ControlLogix on Ethernet. You would make this Time zone (GMT-06:00) Central Time (US & Canada) selection for CompactLogix or Time sync. Daily 🔹 ControlLogix. Device Communications 7. Enter a device name. Communications path AB_ETH-1\10.10.10.7 For this example, L2x is entered. Comm. timeout (seconds) 5 Comm. retries 2 8. Enter the Time zone and Time sync Max. messages 1 interval. ADR interface file

Devices with internal clocks may be timesynched, such as power monitors and controllers. **9.** Enter the communication path to the device.

For this example, the communication path to the CompactLogix device is AB_ETH-1\10.10.10.7.

Device Communication	s
Communications pa	ath AB_ETH-1110.10.10.7
Comm. timeout (second	Is) 5
Comm. retri	es 2

For a ControlLogix device, the path would also include a backplane address, for example, AB_ETH-1\10.10.7\Backplane\0, where the CPU is slot 0.

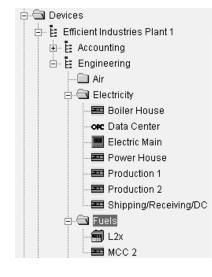
10. Modify other communication settings as needed.

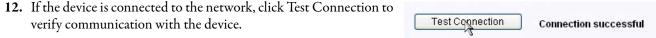
For details, refer to the FactoryTalk EnergyMetrix software online help.

11. Click Save.

Add Device		
Cancel		

You should see the L2x device under Fuels. Notice that the icon is a controller.





If you see connection failed, try again. If the test times out, check

that you entered the correct communication path in step <u>9</u> and that the device is on line. Try to ping it from the FactoryTalk EnergyMetrix server.

Configure OPC Server Device

Follow these steps to configure an OPC Server device.

- 1. Select the Devices folder.
- 2. Navigate to and select he desired group or domain.

For this example, select the Electricity group under the Engineering subdomain.

- 3. Click the <u>Add a device</u> link.
- System Meters Reports Custom **Device Status** Layout: <u>Save Restore</u> <u>Collapse</u> Refresh Show all child devices Add a device 🚚 System Status Online, not fully Online, tag 🗄 🛄 Groups Legend: Online Offline error(s 🗄 🖾 Devices 🗄 🗄 Efficient Industries Plant 1 Domain: Electricity 🗄 🗄 Accounting Production 1 Production 2 <u>Boiler House</u> Electric Main Power House Engineering 🗀 Air 📼 Boiler House 📟 Electric Main Power House Production 1 Production 2
- 4. Choose a subdomain or group from the Parent group list.

For this example, choose Electricity.

- 5. Check the boxes as shown.
- 6. Choose a device from the Device class list.

For this example, choose OPC Server on Ethernet.

7. Enter a device name.

For this example, enter Data Center.

8. Enter the OPC server name.

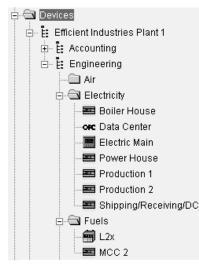
For this example, the name is Kepware.KepServerEx.v5.

9. Click Save.

You should see Data Center under Electricity. The icon shows that the device is an OPC server.

All devices are now configured.

Add Devie	ce	
Save	Cancel	
Device Inform	ation	
	🔽 Enable device	
	Enable real-time logging	
Parent group	Electricity	_
Device class	OPC Server on Ethernet]
Name	Data Center	
Notes		4
Time zone	(GMT-06:00) Central Time (US & Canada)	▼
Device Comm	unications	
OPC se	erver Kepware.KepServerEx.V5	



FactoryTalk EnergyMetrix Software Meter and Tag Setup

Introduction

In this chapter, you will create meters and assign meter tags for your FactoryTalk EnergyMetrix software project.

- A meter is a logical source of data to FactoryTalk EnergyMetrix software. It is the unit used for licensing FactoryTalk EnergyMetrix Manager software. Meters are associated with device data sources.
- A meter tag is the basic unit of data collection. Tags assigned to device meters are logged automatically at a selected log rate.

Refer to the FactoryTalk EnergyMetrix tab in your Energy Data Worksheet for meter information in your project including meter name, meter type, and meter tag names.

Meter configuration groups are based on the Efficient Industries Plant 1 example on page 108.

Before You Begin

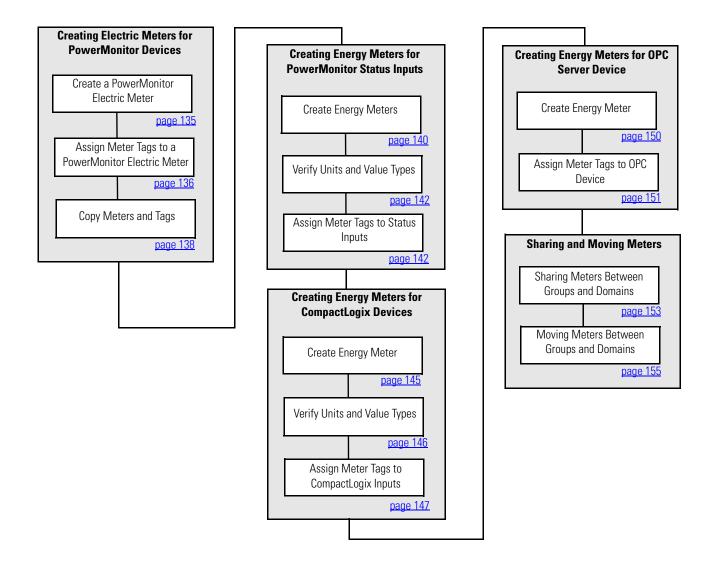
- Determine business goals, complete energy assessment, and determine monitoring methods (<u>Chapter 1</u>).
- Select hardware and wire devices (<u>Chapter 2</u>).
- Configure data collection devices (<u>Chapter 3</u>).
- Install FactoryTalk EnergyMetrix software (<u>Chapter 4</u>).
- Configure groups and security in (<u>Chapter 5</u>).
- Configure FactoryTalk EnergyMetrix devices in (<u>Chapter 6</u>).

What You Need

- FactoryTalk EnergyMetrix software CD, catalog number 9307-FTEMMENE
- FactoryTalk EnergyMetrix online help and user manual, publication <u>FTEM-UM002</u>.
- Energy Management Accelerator Toolkit CD, publication IASIMP-SP014, or visit the Integrated Architecture Tools and Resources website at http://www.ab.com/go/iatools to download toolkit files.

Follow These Steps

Follow these steps to create meters and meter tags.



Creating Electric Meters for PowerMonitor Devices

You will now create a meter for a PowerMonitor device and assign tags to the meter. Examples are based on the <u>Efficient Industries Plant 1</u> groupings on page <u>108</u>.

Electricity (Group)

—Electric Main (PM 3000) —Boiler House (PM 1000) —Power House (PM 1000) —Production 1 (PM 1000) —Production 2 (PM 1000) —Shipping/Receiving DC (PM 1000) —Data Center (OPC Server)

Create a PowerMonitor Electric Meter

Follow these steps to create a PowerMonitor electric meter.

- 1. Click the Meters tab.
- 2. Navigate to and select a group to assign the meter.

For this example, select Electricity under the Engineering subdomain.

- 3. Click the Meters tab on the right.
- 4. Click the <u>Add a new meter</u> link.
- Select the Parent group.
 For this example, select Electricity.
- 6. Choose the meter type. For this example, choose Electric.
- 7. Choose the device associated with the meter.

For this example, choose Boiler House.

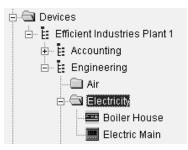
8. Enter a meter name.

For this example, enter Boiler House Meter.

- 9. Click Save.
- **10.** Confirm the meter was created in the correct group.

System Meters Reports Custom	Domain/Meter: Engineering/Electricity
Layout: <u>Save Restore</u> <u>Collapse</u>	Meter Data Meters Trend Calendar Trend
	Meters Domain: Electricity Add a new meter

Add a Mete	r		
Save	Cancel		
Meter Informatio	n		
Parent group	Electricity	•	
Туре	Electric	•	Assigned to Grou
Device	Boiler House	•	Electricity (100)
Name	Boiler House Meter		
Notes		4	<u> </u>
Time zone	(GMT-06:00) Central Time (US & Canada)	•	



Assign Meter Tags to a PowerMonitor Electric Meter

You will now assign tags to a PowerMonitor electric meter. For this example, Real Energy Net, Reactive Energy Net, and Real Power Demand are assigned to the Boiler House Meter.

Domain/Meter: Engineering/Electricity/Boiler House Meter

1. Select the meter to assign tags.

For this example, select Boiler House Meter.

- **2.** Click the Meter Setup tab.
- 3. Click the <u>Add a new meter tag</u> link.

System Meters Reports Custom
Layout: <u>Save</u> <u>Restore</u> <u>Collapse</u>
⊕-Ē:_Efficient Industries Plant 1 ⊖-Ē: Efficient Industries Plant 1 ⊕-Ē: Accounting
È-Ei Engineering ⊕-⊡ Air
Electricity Boiler House Meter

Meter type: Electric Device class: Powermonitor 1000 (EM3)				
Meter Data Trend Calendar Trend Meter Setup				
Meter Setup				
Edit Add Copy Delete				
Meter Information				
Type Electric	¥	Assigned to Groups	(Contribution factor %)	
Device Boiler House	¥	Electricity (100)		
Name Boiler House Meter				
Notes				
Time zone (GMT-06:00) Central Time (US & Canada)	~			
Meter Tags	Read device ta	<u>oqs</u>	Add a new meter	r tag
ID Type Name	Units	Loa Rate	Address	_

- 4. Verify the Meter tag type is Device.
- Choose Real Energy Net from the device tag list.
 For a PowerMonitor device, the rest of the settings

For a PowerMonitor device, the rest of the settings are autofilled.

Do not change the autofill values. Changing the values may prevent logging of the tag or cause incorrect data to be logged.

The log rate is set to the default log rate of meter's assigned group. It is typically the utility demand interval rate.

Refer to the FactoryTalk EnergyMetrix software help before changing the log rate or maximum consumption per hour.

6. Click Save.

Add a Meter Tag

Save Cancel)
Meter tag type	Device 💌
	Real Energy Net 💌
Meter tag name	Real Energy Net
Value type	Real Energy Net 💌
Log rate	15
Number of demand periods	1
Address	16:8
Tag format	Powermonitor 1000 Double Float 💌
Unit	kWh 💌
Number of decimals to display	1
Scale	1
Offset	0
Log delta reading	
Rollover value	100000000
Trend log parameter	9
Max consumption per hour	

7. Click Add when the screen refreshes. Return to meter screens Meter Tag Setup Delete Edit hhA **8.** Repeat steps 4...7 to add the remaining tags: Reactive Energy Net • Real Power Demand These are typical tags for electric meters. 9. When done, click the <u>Return to meter screens</u> Return to meter screens link or the meter tag. Add a Meter Tag Save Cancel The tags just entered should Domain/Meter: Engineering/Electricity/Boiler House Meter appear on the Meter Setup Meter type: Electric Device class 1000 (EM3) Meter Data Trend Calendar Tren tab. Meter Setup Edit Add Delete Conv Type Electri Ŧ Electricity (10 Device Boiler Ho Boiler House Meter Name Note: 7 For this example, you should Ŧ Time zone 3MT-06:00) Central Time (US & Canada) see these tags. er Tag ead d ID <u>Type</u> Units Log Rate Address Real Energy Net Device k₩h 15 minutes 16:8 View Device Reactive Energy Net kvaRh 15 minutes 16:14 <u>View</u> Device Real Power Demand ΚŴ 15 minutes 17:0 View 10. Click the Meter Data tab to verify that the Domain/Meter: Engineering/Electricity/Boiler House _Meter meter data is being logged. Meter type: Electric Meter Data Trend Calendar Trend Meter Setup The data will not appear until the next Time zone (GMT-05:00) Eastern Time (US & Canada) logging interval has occurred. 8/26/2009 2:53 PM Get Data Current Date/Time Date/Time Another way to check the data is to return < Page > Enter Data to the Meter Setup tab and click the Read 15-Min Auto Data device tags link just above the list of meter Real Energy Reactive **Real Power** tags. Energy Net Net Demand Date/Time (kVARh) (kWh) (kW) You can click Current Date/Time to refresh 8/26/2009 2:45:00 PM 295999.9 987213.4 516.5 the data. 8/26/2009 2:30:00 PM 295963.4 987084.3 526.9 8/26/2009 2:15:00 PM 295923.4 986952.6 537.7 8/26/2009 2:00:00 PM 295885.5 986818.1 544.6

8/26/2009 1:45:00 PM

8/26/2009 1:30:00 PM

8/26/2009 1:15:00 PM

295847.8

295809

295769.6

986682

986552.1

986424.9

519.7

508.8

550.4

Copy Meters and Tags

Meters with the same device class and tags can be copied. It's a real time saver to create the first meter and its tags, then use the copy function to create the rest of the meters.

System Meters Reports Custom

🔊 Boiler House Mete

🗉 🗄 _Efficient Industries Plant 1

Efficient Industries Plant 1
 E Accounting
 E Engineering
 Air
 E Engineering
 E Engineering

For the <u>Efficient Industries Plant 1</u> example, the PowerMonitor 1000 electric meters all use the Real Energy Net, Reactive Energy Net, and Real Power Demand tags. You will copy the Boiler House meter and tags to create the Power House, Production 1, Production 2, and Shipping/ Receiving/DC electric meters. The tags are copied with the meter.

Electricity (Group)

-Electric Main (PM 3000) -Boiler House (PM 1000) -Power House (PM 1000) -Production 1 (PM 1000) -Production 2 (PM 1000) -Shipping/Receiving/DC (PM 1000) -Data Center (OPC Server)

1. Select the meter to copy.

For this example, select Boiler House under the Electricity group.

- **2.** Click the Meter Setup tab.
- 3. Click Copy.

A copy of the meter is created under the selected group with the name 'Copy of Boiler House Meter'.

Domain/Meter: Engineering/Electricity/Boiler House _Meter	
Meter type: Electric	
Meter Data Trend Calendar Trend Meter Setup	
Meter Setup	
Edit Add Copy Delete	
Meter Information	
Type Electric	Assigned to Groups (Contribution factor %)
Device None	Electricity (100)
Name Boiler House Meter	

.

V

Log Rate

15 minutes

15 minutes

15 minutes

Address

View

View

Units

K/Vh

КW

KVARI

4.	Change t	he d	levice	to	Power	House.
----	----------	------	--------	----	-------	--------

- 5. Change the meter name to Power House Meter.
- 6. Click Save.

The copied meter and its tags are created under the Electricity group with the new name.

7. Repeat steps 1...6, copy the rest of the PowerMonitor 1000 electric meters.

Domain/Meter: Engineering/Electricity/Copy of Boiler House Meter				
Meter type: Electric Device class: Powermonitor 1000 (EM3)				
Meter Data Trend Calendar Trend Meter Setup				

Edit Meter

Note

er Tags

Type

Derived

Derived

Time zone (GMT-05:00) Eastern Time (US & Canada)

Real Energy Net

Real Power Demand

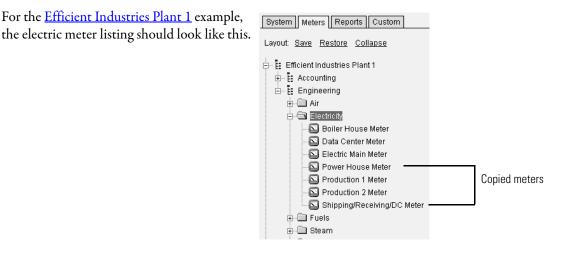
Reactive Energy Net

Name

Save	Cancel		
Meter Information	1		
Туре	Electric	•	Assigned to Groups (Contr
Device	Power House	▼	Electricity (100)
Name	Power House Meter		
			<u> </u>
Notes			
	I (GMT-06:00) Central Time (US & Canada)		
LIME ZODE	LIGMT-UNIUN CENTRAL LIME (US & Canada)	T	

The Real Energy Net, Reactive Energy Net, and Real Power Demand tags are automatically copied with each device. Change the device name and meter name as shown in the table.

Meter	Parent Group	Device	Name
Production 1	Electricity	Production 1	Production 1 Meter
Production 2	Electricity	Production 2	Production 2 Meter
Shipping/Receiving/DC	Electricity	Shipping/Receiving/DC	Shipping/Receiving/DC Meter

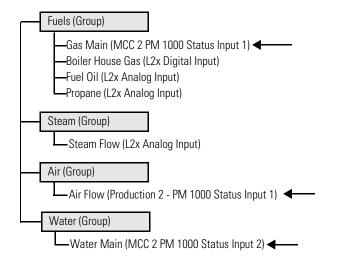


TIP Remember that the device class must be the same in the source and copied meters, otherwise the meter tag addressing will be incorrect in the copied meter.

Creating Energy Meters for PowerMonitor Status Inputs

You will now create energy meters for PowerMonitor status inputs and assign tags to the meters.

For the <u>Efficient Industries Plant 1</u> example, you will create a gas main, air flow, and water main meter, then assign tags to each meter.



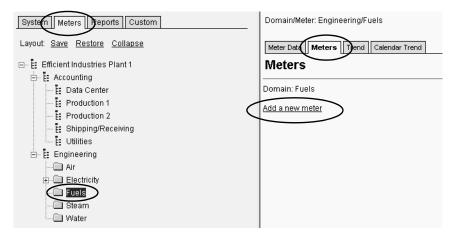
Create Energy Meters

Follow these steps to create a fuel meter for a PowerMonitor 1000 status input.

- 1. Click the Meters tab.
- 2. Navigate to and select a group to assign the meter.

For this example, select Fuels under the Engineering subdomain.

- 3. Click the Meters tab on right.
- 4. Click the <u>Add a new meter</u> link.



5. Choose the Parent group.

For this example, choose Fuels.

6. Choose the meter type.

For this example, choose Gas.

If the meter type you want to use is not in the standard list of meter types, you can create custom meters. Refer to <u>Appendix A</u>.

7. Choose the device associated with the meter.

For this example, choose MCC 2.

8. Enter a meter name.

For this example, enter Gas Main Meter.

9. Click Save.

Add a Mete	r		
Save	Cancel		
Meter Information	n		
Parent group	Fuels	•	
Туре	Gas	•	Assigned to Gra
Device	MCC 2	•	Fuels (100)
Name	Gas Main Meter		
Notes		▲	
Time zone	(GMT-06:00) Central Time (US & Canada)	•	

- **10.** Confirm the meter was created in the correct group.
- System Meters Reports Custom
 Layout: Save Restore Collapse
 Layout: Industries Plant 1
 Layout: Efficient Industries Plant 1
 Layout: Engineering
 Layout: Air
 Layout: Electricity
 Construction
 Gas Main Meter
 Construction
 Constructi
- 11. Repeat steps 1...10 to create the rest of the energy meters that are assigned to PowerMonitor status inputs.

For this example, enter the data in the table for the Air Flow and Water Main meters. Make sure to create each meter under the correct parent group.

Meter	Parent Group	Meter Type	Device	Name
Air Flow	Air	Air	Production 2	Air Flow Meter
Water Main	Water	Water	MCC 2	Water Main Meter

For the <u>Efficient Industries Plant 1</u> example, the meter listing should look like this.

System Meters Reports Custom
Layout: <u>Save Restore</u> <u>Collapse</u>
⊕È:Efficient Industries Plant 1 ⊡È:Efficient Industries Plant 1
E Accounting
i⊐ Ē≕ Engineering i⊡⊡ Air
Air Flow Meter
i⊞⊷i⊒ Electricity ⊟⊶ि⊒ Fuels
Gas Main Meter
Steam
⊡⁄⊂⊐ Water S Water Main Meter

Verify Units and Value Types

To create tags for meters, the appropriate base units and value types that will be used by the tags must be available. FactoryTalk EnergyMetrix software provides the most common value types and units.

Refer to <u>Appendix B</u> for details on how to check if the value types and base units you need are in the FactoryTalk EnergyMetrix software default list, and how to create them if necessary.

For the <u>Efficient Industries Plant 1</u> example, the gas main, air flow, and water main meters require custom units and value types not in the FactoryTalk EnergyMetrix software default list. The table shows the base units, units, and value types required.

Meter Type	Value Type	Base Unit	Unit
Gas Main Meter	Natural Gas Usage	thm	thm
Water Main Meter	Water Usage	Gal	Gal
Air Flow Meter	Air Usage	cf	Cf

Assign Meter Tags to Status Inputs

You will now assign meter tags to energy meters from a PowerMonitor status input.

For the Efficient Industries Plant 1 example, you will assign tags to the Gas Main, Water Main, and Air Flow meters.

1. Select the meter.

For this example, select Gas Main Meter.

- 2. Click the Meter Setup tab.
- 3. Click the <u>Add a new meter tag</u> link.

System Meters Reports Custom	Domain/Meter: Engineering/Fuels/Gas Main Meter Meter type: Gas Device class: <u>Powermeniter 1000 (EM3)</u> Meter Data Trend Calendar Trend Meter Setup
E: Efficient Industries Plant 1 E: Accounting E: Engineering Air E: Electricity Fuels	Meter Setup Edit Add Copy Delete Meter Information
Boiler House Gas Meter Euel Oil Meter Gas Main Meter Gas Main Meter Propane Meter Steam Water	Type Gas Assigned to Groups (Contribution factor %) Device MCC 2 Fuels (100) Name Gas Main Meter Fuels (100) Notes Fuels (100) Fuels (100) Time (GMT-06:00) Central Time (US & Canada) Fuels (100) Meter Tags Add a new meter tage

Status Input 1 Counter

Tag format Powermonitor 1000 Double Float 💌

•

•

Add a Meter Tag

Cancel

Meter tag type Device 💌

Log rate 15

Address 16:0

Scale 1

Offset 0

Rollover value 100000000

Log delta reading 🛛 🗌

Trend log parameter 5

Max consumption per hour

Unit thm

Number of demand periods 1

Number of decimals to display 2

Meter tag name Natural Gas Usage

Value type Natural Gas Usage

Save

- 4. Verify the meter tag type is Device.
- 5. Choose a status input counter from the device tag list.

For this example, Status Input 1 Counter is chosen because the Gas Main Meter is connected to the MCC 2 PowerMonitor 1000 status input 1.

6. Change the Meter tag name.

For this example, enter Natural Gas Usage (status input 1).

7. Choose the Value type.

For this example, choose Natural Gas Usage.

8. Accept the default Scale, Offset, and Rollover values.

When using a PowerMonitor 1000 device, it is good practice to set the pulse counter scaling factor in the power monitor advanced setup menu. The meter tag setup then uses the default scale and rollover value.

9. Accept the other default settings.

For a power monitor device, the remaining settings are autofilled.

Do not change the autofill values. Changing the values may prevent logging of the tag or cause incorrect data to be logged.

The log rate is set to the default log rate of meter's assigned group. It is typically the utility demand interval rate. Refer to the FactoryTalk EnergyMetrix software help before changing the log rate or maximum consumption per hour.

- 10. Click Save.
- 11. When done, click the <u>Return to meter screens</u> link.

Add a Meter Tag	
Save Cancel	

The tag just entered should appear on the Meter Setup tab.	Domain/Meter: Engineering/Fuels/Gas Main Meter Meter type: Gas Device class: <u>Powermonitor 1000 (EM3)</u> [Meter Data] Trend Calendar Trend Meter Setup Meter Setup					
	Edit Meter Informatio	Add Copy Delete				
	Туре	Gas	~	Assigned to Groups (Com	tribution factor %)	
	Device	MCC 2	~	Fuels (100)		
	Name	Gas Main Meter				
	Notes		< ×	<u> </u>		
	Time zone	(GMT-06:00) Central Time (US & Canada)	×			
For this example, you should	Meter Tags ID <u>Type</u>	Name	<u>Read device tag</u> Units	Log Rate	Address	new meter tag
see this tag.	20 Device	Natural Gas Usage	thm	15 minutes	16:0	View

Domain/Motor: Engineering/Eucle/Gas Main Motor

12. Click the Meter Data tab to verify that the meter data is being logged.

The data will not appear until the next logging interval has occurred.

Another way to check the data is to return to the Meter Setup tab and click the <u>Read device</u> <u>tags</u> link just above the list of meter tags.

You can click Current Date/Time to refresh the data.

Domainweter. Engineering/i deis/das wani _weter					
Me <u>ter type:</u> Gas					
Meter Data Trend Calendar Trend Meter Setup					
(GMT-06:00) Central Time (US & Canada)					
8/28/2009 11:29 AM Get Data Current Date/Time	\supset				
Enter Data	-				
15-Min Auto Data					
Hatural Gas Usage (thm)					
147.5					
139.06					
130.36					
121.55					
113.05					
104.38					
95.84					
87.62					
	Calendar Trend Meter Setup (GMT-06:00) Central Time (US & Canada) 8/28/2009 11:29 AM Get Data Enter Data Ilatural Gas Usage (thm) 147.5 139.06 130.36 121.55 113.05 104.38 95.84				

13. Repeat steps 1...12 to assign other energy meter tags to PowerMonitor status inputs.

Refer to the Energy Data Worksheet for the appropriate meter tag names.

For the <u>Efficient Industries Plant 1</u> example, you will assign meter tags to the Air Flow and Water Main meters by using the information in the table.

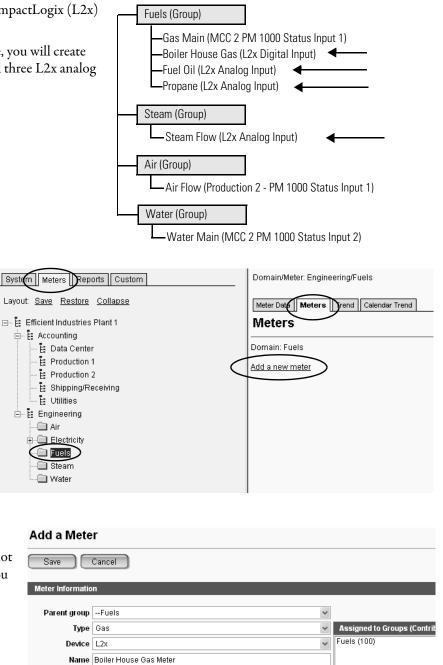
Meter Name	Meter Tag	Meter Tag Name	Value Type
Air Flow Meter	Status Input 1 Counter	Air Usage	Air Usage
Water Main Meter	Status Input 2 Counter	Water Usage	Water Usage

TIP If you use a PowerMonitor 3000 device as a pulse meter input, the setup is different. The PowerMonitor provides a raw pulse count that rolls over at 30,000. In the meter tag setup, set the Scale factor to the value in engineering units of each 0-to-1 transition of the meter pulse. Set the rollover value equal to the product of scale factor x 30,000.

Creating Energy Meters for CompactLogix Devices

You will now create energy meters for a CompactLogix (L2x) controller analog or digital inputs.

For the <u>Efficient Industries Plant 1</u> example, you will create energy meters for one L2x digital input and three L2x analog inputs.



Create Energy Meters

Follow these steps to create an energy meter for an L2x digital or analog input.

- 1. Click the Meters tab.
- 2. Navigate to and select a group to assign the meter.

For this example, select Fuels under Engineering.

- 3. Click the Meters tab.
- 4. Click Add a new meter.
- 5. Choose the Parent group.

For this example, choose Fuels. If the meter type you want to use is not in the standard list of meter types, you can create custom meters. Refer to <u>Appendix A</u>.

6. Choose the meter type.

For this example, choose Gas.

7. Choose the device associated with the meter.

For this example, choose L2x.

8. Enter a meter name.

For this example, enter Boiler House Gas Meter.

9. Click Save.

Notes

Time zone (GMT-06:00) Central Time (US & Canada)

¥

- **10.** Confirm the meter was created in the correct group.
- **11.** Repeat steps 1...10 to create other energy meters for the L2x analog or digital inputs.

If the meter type you want to use is not in the standard list of meter types, you can create custom meters. For this example, you will have to create custom meter types for the Fuel Oil and Propane meters. Refer to <u>Appendix A</u> for details.

System Meters Reports Custom Layout: Save Restore Collapse Efficient Industries Plant 1 Effic

For the <u>Efficient Industries Plant 1</u> example, create the Fuel Oil, Propane, and Steam Flow Meters. Enter the data shown in the table for each meter. Make sure to create the meter under the correct parent group.

Meter	Parent Group	Туре	Device	Name
Fuel Oil Meter	Fuels	Fuel Oil	L2x	Fuel Oil Meter
Propane Meter	Fuels	Propane	L2x	Propane Meter
Steam Flow Meter	Steam	Steam	L2x	Steam Flow Meter

Verify Units and Value Types

To create tags for meters, the appropriate base units and value types that will be used by the tags must be available. FactoryTalk EnergyMetrix software provides the most common value types and units.

Refer to <u>Appendix B</u> for details on how to check if the value types and base units you need are in the FactoryTalk EnergyMetrix software default list, and how to create them if necessary.

For the <u>Efficient Industries Plant 1</u> example, the natural gas, fuel oil, propane, and steam meters require units and value types not in the FactoryTalk EnergyMetrix software default list. The table shows the base units, units, and value types required.

Meter	Meter Type	Value Type	Base Unit	Unit
Boiler House Gas Meter	Natural Gas	Natural Gas Usage ⁽¹⁾	cf ⁽¹⁾	cf ⁽¹⁾
Fuel Oil Meter	Fuel Oil	Fuel Oil Usage	Gal	Gal
Propane Meter	Propane	Propane Usage	Gal	Gal
Steam Flow Meter	Steam Flow	Steam Usage	lb	lbs

(1) Natural Gas units and value type was created earlier when the Gas Main meter was configured.

Assign Meter Tags to CompactLogix Inputs

You will now assign meter tags to energy meters from CompactLogix digital and analog inputs.

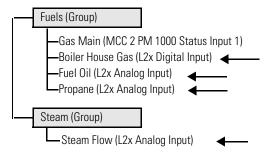
For the <u>Efficient Industries Plant 1</u> example, you will assign tags to the Boiler House Gas, Fuel Oil, Propane, and Steam meters.

Follow these steps to assign a tag to an energy meter from an L2x digital or analog input.

1. Select the meter.

For this example, select Boiler House Gas Meter.

- 2. Click the Meter Setup tab.
- 3. Click the <u>Add a new meter tag</u> link.



System Meters Reports Custom	Domain/Meter: Engineering/Fuels/Boiler House Gas Meter Meter type: Gas Device class: ControlLogix Meter Data Trend Calendar Trend Meter Setup	
	Meter Setup Edit Add Copy Delete Meter Information	
Seam Water	Type Gas	Assigned to Groups (Contribution factor %) Fuels (100) Add a new meter tag

- 4. Verify the Meter tag type is Device.
- 5. Change the Meter tag name.

For this example, enter Boiler House Natural Gas Usage.

6. Choose a Value type.

For this example, choose Natural Gas Usage.

7. Verify the log rate.

The log rate is set to the default log rate of meter's assigned group. It is typically the utility demand interval rate. Refer to the FactoryTalk EnergyMetrix software help for details.

8. Enter an L2x controller address.

Refer to the Energy Data Worksheet for the L2x PLC-5 type address.

FactoryTalk EnergyMetrix software communicates with PLC-5 or SLC 500 mapped tags in ControlLogix controllers so the address format is Fx:x.

In this example, the Boiler House Gas meter tag, Boiler House Natural Gas Usage, is assigned to the PLC-5 tag F10:0.

This F10:0 tag is then mapped to the L2x_EnergyTotals [0] tag in the ControlLogix controller as configured on page <u>86</u>.

9. Choose a tag format.

For this example, choose 32-bit Floating Point for this analog tag.

10. Fill in the appropriate scale and offset values.

For this example, the scale is 1 and the offset is 0 because the energy Add-On Instruction has already scaled the tag units.

- 11. Enter appropriate rollover value, which is 10 million when using the energy Add-On Instructions.
- 12. Click Save.
- 13. When done, click the <u>Return to meter screens</u> link or the meter tag.

Return to meter screens Add a Meter Tag	
Save Cancel	

Add a Meter Tag				
Save Cancel				
Meter tag type	Device 🗸			
Meter tag name	Boiler House Natural Gas Usage			
Value type	Natural Gas Usage 🛛 👻			
Log rate	15			
Number of demand periods	1			
Address	F10:0			
Tag format	32-bit Floating Point 🗸			
Unit	thm 🗸			
Number of decimals to display	2			
Scale	1			
Offset	0			
Log delta reading	\checkmark			
Rollover value				
Trend log parameter				
Max consumption per hour				

The tag just entered should appear on the Meter Setup tab.	Domain/Meter: Engineering/Fuels/Boiler House Gas Meter Meter type: Gas Device class: ControlLodix Meter Data Trend Calendar Trent Meter Setup Meter Setup Edit Add Copy Delete							
	M	eter Informatio	1					
		Туре	Gas	¥	Assign	ed to Groups (Contri	ibution factor %)	
		Device	L2x	~	Fuels (1	00)		
		Name	Boiler House Gas Meter]			
		Notes		~]
		Time zone	(GMT-06:00) Central Time (US & Canada)	~				
For this example, you should		eter Tags		Read device ta	#0		ê de la c	new meter tag
see these tags.	ID	Type	Name	Read device la	units	Log Rate	Address	new meter tag
0	56	Device	Boiler House Natural Gas Usage		thm	15 minutes	F10:0	View

14. Click the Meter Data tab to verify that the meter data is being logged.

The data will not appear until the next logging interval has occurred.

Another way to check the data is to return to the Meter Setup tab and click the <u>Read device tags</u> link just above the list of meter tags.

You can click Current Date/Time to refresh the data.

Domain/Meter: Engineering/Fuels/Boiler House Gas _Meter Meter type: Gas

Meter Data Drend	Calendar Trend	Meter Setup			
Time zone	(GMT-06:00) C	entral Time (l	JS & Canad	a)	~
Date/Time	8/28/2009 11:2	9 AM G	et Data	Current Date/Time	\supset
< Page >	Enter Data)			
15-Min Auto Data					
Date/Time	Natural G Usage (thm)	as			
8/28/2009 11:15:00 AM	. ,				
8/28/2009 11:00:00 AM	110.68				
8/28/2009 10:45:00 AM	104				
8/28/2009 10:30:00 AM	97.19				
8/28/2009 10:15:00 AM	90.72				
8/28/2009 10:00:00 AM	84.06				
8/28/2009 9:45:00 AM	77.55				
8/28/2009 9:30:00 AM	71.37				
8/28/2009 9:15:00 AM	64.34				
8/28/2009 9:00:00 AM	58.1				
0/00/000 0.45.00 AM	EA E				

15. Repeat steps 1...14 to assign other energy meter tags to L2x analog or digital inputs.

Refer to the Energy Data Worksheet for the appropriate meter tag names.

For this <u>Efficient Industries Plant 1</u> example, you will assign meter tags to the Fuel Oil, Propane, and Steam Flow meters by using the information in the table.

Meter Name	Meter Tag Name	Value Type	Address	Tag Format	Roller value
Fuel Oil Meter	Fuel Oil Usage	Fuel Oil Usage	F10:1	32-bit Floating Point	10,000,000
Propane Meter	Propane Usage	Propane Usage	F10:2	32-bit Floating Point	10,000,000
Steam Flow Meter	Steam Usage	Steam Usage	F10:3	32-bit Floating Point	10,000,000

Creating Energy Meters for OPC Server Device

You are now ready to create an energy meter for the OPC Server device and assign tags to the meter.

For the Efficient Industries Plant 1 example, you will create a Data Center meter for the OPC Server.

Electricity (Group)

 Electric Main (PM 3000) -Boiler House (PM 1000) -Power House (PM 1000) -Production 1 (PM 1000) -Production 2 (PM 1000) -Shipping/Receiving/DC (PM 1000) Data Center (OPC Server)

Create Energy Meter

- 1. Click the Meters tab.
- 2. Navigate to and select a group to assign the meter.

For this example, select Electricity under the Engineering subdomain.

- 3. Click the Meters tab on the right.
- 4. Click Add a new meter.
- 5. Choose the Parent group.

For this example, choose Electricity.

- 6. Choose the meter type. For this example, choose Electric.
- 7. Choose the device associated with the meter.

For this example, choose Data Center.

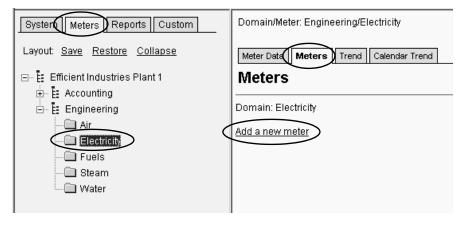
8. Enter a meter name.

For this example, enter Data Center Meter.

9. Enter the access path of the OPC Server.

For this example, Channel 0_User_Defined was entered, which is the same as the Kepware channel name.

10. Click Save.



dd a	Meter	
Save	Cancel	
vleter Inf	ormation	
Parent group	Electricity	
Туре	Electric	Assigned to Groups (Contribution factor
Device	Data Center	Electricity (100)
Name	Data Center Meter	
Notes	×	I
Time zone	(GMT-06:00) Central Time (US & Canada)	
Access path	Channel_0_User_Defined	

Add a M	leter		
Save	Cancel		
Meter Inform	nation		
Parent group	Electricity	•	
Type El	lectric	•	Assigned to Groups (Cor

11. Confirm the meter was created in the correct group.

For the <u>Efficient Industries Plant 1</u> example, the electric meter listing should look like this.

System Meters Reports Custom	
Layout: <u>Save Restore</u> <u>Collapse</u>	
📮 🗄 Efficient Industries Plant 1	
🕀 🗄 Accounting	
🖻 🗄 Engineering	
🛓 💼 Air	
Electricity	
🖾 Boiler House Meter	
🔤 Data Center Meter 🚽	
Electric Main Meter	
- S Power House Meter	
Production 1 Meter	
Production 2 Meter	
Shipping/Receiving/DC Meter	
🕂 🗂 Fuels	
⊕ 🛄 Steam	

Assign Meter Tags to OPC Device

You will now assign meter tags to an OPC server.

For the <u>Efficient Industries Plant 1</u> example, you will assign only the Real Energy Net meter tag to the Data Center (OPC Server) for logging consumption.

1. Select the meter.

For this example, select Data Center (OPC Server).

- 2. Click the Meter Setup tab.
- 3. Click the <u>Add a new meter tag link</u>.

System Meters Reports Custom	Domain/Meter: Engineering/Electricity/Data Center Meter Meter type: Electric Device class: OPC Server Meter Data Trend Calendar Trend Meter Data Trend Meter Setup		
E: Efficient Industries Plant 1 E: Accounting E: Engineering E: Air Air G Electricity E: Electricity	Meter Setup Edit Add Copy Delete Meter Information)	
Pada Center Meter Solata Center Meter Sol	Type Electric Device Data Center Name Data Center Meter Notes		Assigned to Groups (Contribution factor %) Data Center (100) Electricity (100)
	Meter Tags <u>Read</u> ID <u>Type Name</u> Unit	<u>l device tags</u> ts <u>Log Rate</u>	Address

4.	Verify the Meter tag type is Device.	Meter Tag Setup									
5.	Enter Real Energy Net as the name.	Edit	Add	Delete							
6.	Choose Real Energy Net as the value		Meter tag type Device								
7.	Set the Log rate to 1 minute.				Meter tag name Real Energy Net						
8.	Enter the OPC server data address.				Value type Real Energy Net Log rate 1 I Log on change-of-state						
	For this example, enter ramp.ramp.4				logging						
9.	Set the Tag format to 32-bit Floating	-	numper	of demand periods Address	ramp.ramp.4						
10.	Check the Log delta reading checkbo example of a tag whose value represer consumption during the logging inte Leave the Rollover value blank.	Number of d		1	nt						
11.	Click Save.				Log delta reading Rollover value rend log parameter sumption per hour						
12.	When done, click the <u>Return to mete</u> link or the meter tag.	<u>er scre</u>	Return to r	meter scree							
	The tag just entered appears on the Meter Setup tab.	Meter Edit	Electric Device clas Trend Calendar Trend Setup Add formation	×	Delete						
	For this example, you should see this tag.	Acce Meter Ta ID <u>Ty</u>	ess path Channel_0_Us ags pe Name	entral Time (US	<u>R</u> Unite	ead device tags	nter (100)	<u>is</u>	dd a new meter tag		
13.	Click the Meter Data tab to verify that the meter data is being logged.	19 De	evice Real Er		kwh Domain/Meter: Engir Meter type: Electric Meter Data Trend	1 minute neering/Electricity/Dat	a Center _Meter		<u>View</u>		
	The data will not appear until the new occurred. Another way to check the data is to r				Time zone Date/Time < Page > 15-Min Auto Data	(GMT-06:00) Centra 8/28/2009 12:01 PM Enter Data	al Time (US & C	-	Date/Time		
	Setup tab and click the <u>Read device ta</u>			the	Date/Time	Reactive Energy Net (kVARh)	Real Energy Net (kWh)	Real Power Demand (kW)			
	list of meter tags. You can click Current Date/Time to	refres	h the data.		8/28/2009 11:45:00 AM 8/28/2009 11:30:00 AM 8/28/2009 11:15:00 AM 8/28/2009 11:00:00 AM 8/28/2009 10:45:00 AM 8/28/2009 10:30:00 AM 8/28/2009 10:15:00 AM	494.6 469.8 444.2 444.1 417.1 394.1 371.5	2462.8 2336.3 2212.6 2090.3 1967.8 1840.7 1716.6	505.8 494.8 489.5 490 508.2 496.5 499.9			

Sharing and Moving Meters

You can assign a meter to multiple groups, move a meter from one group to another, or apportion a meter among different groups or domains.

Sharing Meters Between Groups and Domains

You will now learn how to assign a meter to multiple groups, so it is shared, or apportion a meter among different groups or domains for running billing and cost allocation reports.

For the <u>Efficient Industries Plant 1</u> example, meters in the Engineering subdomain will be shared by the Accounting subdomain.

1. On the System tab, navigate to a group or domain that will share the meter.

In this example, navigate to and select Data Center in the Accounting subdomain.

2. In Group Setup, click Edit.

System Meters Reports Custom	Group Setup
Layout: Save Restore Collapse	Edit Add Delete
🖕 🔄 Groups	Parent group -Accounting
😑 🗄 Efficient Industries Plant 1	This group is a domain
🖻 🗄 Accounting	
📴 Data Center	Name Data Center
Production 1	*
Production 2	
- E Shipping/Receiving	Notes
L E Utilities	
i in Est Engineering	×
⊕ Devices ⊕ Roles and Users	Default log rate 15
Roles and Osers	Reports title line 1 Efficient Industries Plant 1
Multi-Purpose Report Scripts	Reports title line 2 Accounting - Data Center
Allarm Setup	
The Unit Setup	Meters Assigned to Group (Contribution factor %)
Configuration	
System Configuration Report	

3. Select the meters to share.

In this example, select the Data Cen meter in the Meters Not Assigned to and click the right arrow to assign it

Edit Group

tor		
nter	Save Car	icel
o Group		
t. –	Parent group	-Accounting
	i dioin gi oup	✓ This group is a domain
	N	
	Name	Data Center
		<u>*</u>
	Notes	
	NULES	
		*
	Default log rate	15
		Efficient Industries Plant 1
		Accounting - Data Center
	Meters Not Assigne	d to Group Meters Assigned to Group (Contribution factor %)
	Air Flow Meter Boiler House Gas Me	ter ter
	Boiler House Meter	
	Data Center Meter Electric Main Meter	
	Fuel Oil Meter	
	Gas Main Meter	
Edit Grou	р	
Save	Cancel	
\smile		
Parent g	roup -Accounting	×
	I This group is a do	main
1	Name Data Center	
		<u> </u>
1	Notes	
		Y
Default log		
	line 1 Efficient Industries P	
	line 2 Accounting - Data Ce	
	ssigned to Group	Meters Assigned to Croup (Contribution factor %)
Air Flow Meter Boiler House G	as Meter	Data Center Meter (100)
Boiler House M Electric Main M	leter	100
Fuel Oil Meter		Save Factor
Gas Main Meter Power House N		
Production 1 M Production 2 M	eter	

4. With the meter selected in the Meters Assigned to Group, enter a Contribution Factor between 0...100%.

For this example, accept 100% as the default contribution factor.

You can share portions of the total meter data with multiple groups. For example, an electric meter feeding two production lines may apportion 60% of the total power to production line 1 and 40% to production line 2. You would set the Contribution Factor to 60% and 40%, respectively.

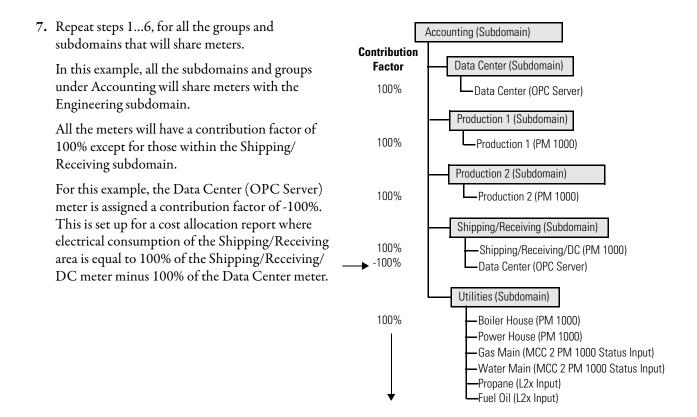
5. Click Save Factor if you modify the Contribution Factor.

TIP

Use caution before assigning fixed percentages of meters to groups for cost allocation. If and when actual conditions differ from the assigned percentages, reports will provide incorrect data.

6. Click Save at the top of the Edit Group.

You should see the meter in the Meters Assigned to Group with the contribution factor.



Moving Meters Between Groups and Domains

You will now learn how to move a meter and its data from one group to another. This is useful if you need to reassign one or more meters after initial configuration. The procedure is to assign the meter to the new target group, then unassign the meter from its initial group.

TIP When moving a meter, do not use the copy and delete meter functions. The copy function will not copy meter data. The delete function will delete the meter from all groups to which it is assigned and permanently remove all existing meter data.

Follow these steps to move a meter from one group to another.

- 1. Click the System tab.
- 2. Open the Group folder and select the target group or domain where you want to move the meter.

For this example, the New Meter Group is selected.

3. Click Edit.

] System [] weters [] Reports [] Custom	Group Serup
Layout: <u>Save</u> <u>Restore</u> <u>Collapse</u>	Edit Add Delete
🚚 System Status	
🖶 🔄 Groups	Parent group None 🗸
🕀 🗄 Efficient Industries Plant 1	✓ This group is a domain
- E Initial Meter Group	
🗈 🗄 New Meter Group	Name New Meter Group
🗄 💼 Devices	
🗄 🛅 Roles and Users	
🗄 🛅 Rate Schedules	Notes
🛓 🔲 Multi-Purpose Report Scripts	
Ω I Alarm Setup	×
📲 Unit Setup	Default log 15
- 🥬 Configuration	rate 1
	Reports title
📲 My User Settings	
About	Reports title
-	Meters Assigned to Group (Contribution factor %)
	meters assigned to droup (contribution factor %)

Edit Group

4. Select a meter from the Meters Not Assigned to Group that you want to move to the target group or domain, then click the right arrow.

You should see the meter in the Meters

6. Select the initial group to which the meter

For this example, Initial Meter Group is

Assigned to Group.

5. Click Save.

was assigned.

selected. 7. Click Edit.

\sim					
Parent group	None	*			
I	🗹 This group is a don	nain			
Name	New Meter Group				
Notes			~		
Default log rate	15				
Reports title line					
1					
Reports title line 2					
Meters Not Assi	gned to Group	Meters Assig	ned to Group (Co	ntribution factor %)	
Fuel Oil Meter Gas Main _Meter Gas Main Meter Power House _Met Power House Met Production 1 _Met	er 🚽 🕞	\supset			Save Factor Cancel
Boiler House Gas Boiler House Gas I Boiler House Meter Data CenterMeter Data Center Meter Electric Main _Mete	Meter				Save Factor
System Meters	Reports Custom	Gro	oup Setup		
			\leq		
<u>u </u>	tore Collapse				_
Layout: <u>Save</u> <u>Res</u>			idit A	dd Delete	•
Layout: <u>Save</u> <u>Res</u>					
Layout: <u>Save</u> <u>Res</u>	8		arent group No	ne	~
Layout: <u>Save</u> Res System Statu: Groups E: Efficient In	s idustries Plant 1 er Group		arent group No	ne This group is a dor	~
Layout: <u>Save</u> Res System Statu: Groups E: Efficient In E: Initial Mate	s idustries Plant 1 er Group		arent group No	ne	~
Layout: <u>Save</u> Res System Statu: Groups E: Efficient In	s idustries Plant 1 er Group r Group		arent group No	ne This group is a dor	~
Layout: <u>Save</u> Res System Statu: Groups E Fit: Efficient In E Initial Mate E New Mete Coles and Us Roles and Us Roles and Us	s Idustries Plant 1 er Group r Group eers es		arent group No	ne This group is a dor	~
Layout: <u>Save</u> Res System Statu: Groups E Efficient In E Initial Mate Devices Roles and Us Rate Schedul Mutti-Purpose	s Idustries Plant 1 er Group r Group eers es		arent group Nor	ne This group is a dor	~
Layout: <u>Save</u> Res Coups Cou	s Idustries Plant 1 er Group r Group eers es	Pa	rrent group No	ne This group is a dor	~
Layout: <u>Save</u> Res System Statu: Groups E Efficient In E Initial Mate Devices Roles and Us Rate Schedul Mutti-Purpose	S ar Group r Group r Group es es Report Scripts	Pa	Name Init	ne This group is a dor	~
Layout: Save Res System Statu: Groups E Efficient In E Initial Mate E New Mete Convices Roles and Us Rate Schedul Multi-Purpose Alarm Setup Configuration System Confi	s dustries Plant 1 ar Group r Group es es e Report Scripts guration Report	Pa	rrent group No	ne This group is a dor	~
Layout: <u>Save</u> Res System Statu: Groups E Efficient In E Initial Mate E New Mete Cevices Rate Schedul Multi-Purpose Al Alarm Setup - Configuration	s dustries Plant 1 ar Group r Group es es e Report Scripts guration Report	Pz Defa Repc	Name Init	ne This group is a dor	~

Electric Meter Example (100)

тір

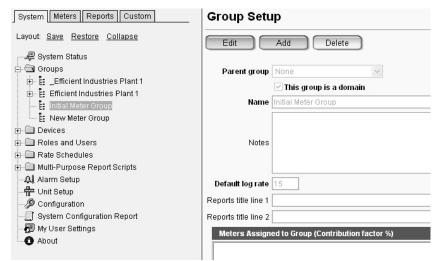
You cannot unassign a meter from a group if it is the only group to which the meter is assigned.

- 8. Unassign the meter by clicking the left arrow to move the meter to the Meters Not Assigned to Group.
- 9. Click Save.

Edit Group

Save	Cancel	
Parent group	None	
	🗹 This group is a domain	
Name	Initial Meter Group	
Notes	~	
Default log rate	15	
Reports title line		
1 Reports title line 2		
Meters Not Ass	gned to Group Meters Assigned to Group (Contribution factor %)	
Air Flow _Meter Air Flow Meter Boiler House _M Boiler House Ga Boiler House Ga Boiler House Ma Data Center _Met Data Center Met Electric Main _M	s Meter S Meter ter Ter	Contribution factor (%) 100 Save Fact Cancel

Now that the meter is unassigned to the initial meter group, you can optionally delete the group if it's not needed.





You cannot unassign a meter from a group if it is the only group to which the meter is assigned.

Notes:

FactoryTalk EnergyMetrix Software Alarm Setup

Introduction

In this chapter, you will learn how to configure, edit and view FactoryTalk EnergyMetrix software alarms.

Before You Begin

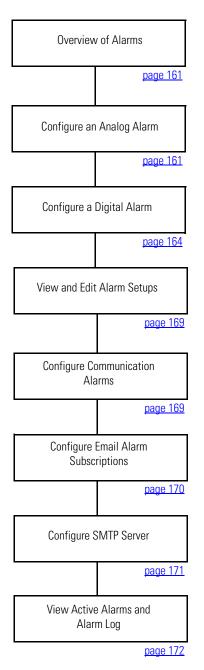
- Determine business goals, complete energy assessment, and determine monitoring methods (<u>Chapter 1</u>).
- Select hardware and wire devices (<u>Chapter 2</u>).
- Configure data collection devices (<u>Chapter 3</u>).
- Install FactoryTalk EnergyMetrix software (<u>Chapter 4</u>).
- Configure groups and security in (<u>Chapter 5</u>).
- Configure FactoryTalk EnergyMetrix software devices in (<u>Chapter 6</u>).
- Configure meters and tags in (<u>Chapter 7</u>).

What You Need

- FactoryTalk EnergyMetrix software CD, catalog number 9307-FTEMMENE
- FactoryTalk EnergyMetrix online help and user manual, publication <u>FTEM-UM002</u>.
- Energy Management Accelerator Toolkit CD, publication IASIMP-SP014, or visit the Integrated Architecture Tools and Resources website at http://www.ab.com/go/iatools to download toolkit files.

Follow These Steps

Follow these steps to configure, view, and edit alarms.



Overview of Alarms

FactoryTalk EnergyMetrix alarms operate on events or conditions. You can define one or more alarms per meter tag. When alarms occur, they are displayed in an alarm summary page and entered into an alarm log. You can send emails or run reports when alarms are triggered.

When configuring an alarm, you can specify an analog or digital trigger.

- Analog triggers have a high and low threshold value that can activate an alarm inside or outside the threshold value range.
- Digital triggers are either equal or not equal. Digital alarms may also be triggered by any change in a meter tag value.

Configure an Analog Alarm

Follow these steps to configure an analog alarm.

1. Click the Meters tab and navigate to the meter you want to assign an alarm.

For this example, assign the alarm to the Electric Main Meter under the Electricity group.

- 2. Click the Meter Setup tab.
- 3. Click the <u>Add a new alarm</u> link.

System Meters Reports Custom Layout <u>Save Restore Collapse</u>	Me	ter type: Electri	gineering/Electricity/Electric M Device class: <u>Powermen</u> Calendar Trend Meter Set	tor 3000 (M6)				
Efficient Industries Plant 1 E Accounting E Engineering Ar	M	eter Setu	Add Copy	Delete				
Air Electricity Soller House Meter Data Center Meter	M	leter Informati						
Electric Main Meter		Type 🗄			*	Assigned to Groups	: (Contribution factor	r %)
S Power House Meter		Device	lectric Main		*	Electricity (100)		
Production 1 Meter		Name 🗉	ectric Main Meter					
Production 2 Meter Shipping/Receiving Meter Fuels		Notes			*			
🗉 🧰 Steam 🖭 🎦 Water		Time zone 🤇	3MT-06:00) Central Time (US	& Canada)	v			
	M	leter Tags			Read device tags		Add a	a new meter tag
	ID	<u>Type</u>	<u>Name</u>		Units	Log Rate	Address	
	1	Device	Real Energy Net		K/Vh	15 minutes	20:12	View
	2	Device Device	Reactive Energy Net Reactive Power Demand		kvaRh kvaR	15 minutes 15 minutes	22:12 17:2	<u>View</u> View
	3	Device	Reactive Fower Demand		KVAR	15 minutes	17.2	<u></u>
	A	arms					A	ld a new alarm
		Enabled	Severity	Name	Meter tag	Trigge	r 🔪	Engali

- Enter an Alarm Name.
 For this example, enter High Demand.
- Choose a Meter Tag.
 For this example, choose Real Power Demand.
- 6. Choose the Alarm Severity.

For this example, choose Critical Alarm.

- 7. Enter a message for the alarm.
- 8. Check the email checkboxes if you want to send emails when the alarm is triggered or cleared.

Refer to page <u>170</u> for details on how to <u>Configure</u> <u>Email Alarm Subscriptions</u>.

9. Select the trigger type.

For this example, select Analog.

10. Enter the high and low thresholds for the alarm trigger value.

For this example, enter 300 and 0.

- **11.** Select the trigger range for the alarm.
 - Alarm on outside triggers the alarm when the meter tag value is outside of the high and low threshold range. For this example, the alarm will trigger if the tag value is >300 or <0.

Add a Alarm

• Alarm on inside - triggers the alarm when the meter tag value is between the high and low threshold value. For this example, the alarm will trigger if the tag value is < 300 or >0.

12. Click Save.

Save	Cancel			
Alarm Info	ormation			
	🗹 Enabled			
Alarm Nai	me High Demand			
Meter T	ag Real Power D	emand 💌		
Alarm Sever	rity Critical Alarm			
Messa	i ge Electric Dema	nd approaching high level.	4	
	🗹 Send emai	l on trigger		
	🔽 Send emai	l on clear		
Trigger Se	ettings			
Analog	High threshold	300	Range:	Alarm on outside
	Low threshold	0		C Alarm on inside
C Digital	🖲 On			
	C Off			
	C Changes to Or	1		
	C Changes to Of	f		
	C Anu Change			

Configured alarms appear on the Meter Setup tab for the meter. The Meter Setup tab would look like this for the alarm just configured.

⊡ 🗄 Efficient Industries Plant 1	Mete	er Setu	р						
E: Accounting E: Engineering → E: engineering	E	lit	Add	Сору	Delete				
Air Electricity Data Center Meter Source Meter Power House Meter Production 1 Meter Shipping/Receiving Meter Fuels	Ty Dev Na No		c c Main c Main Me			y y A	Assigned to Grou Electricity (100)	ips (Contribution f	actor %)
⊕-		ne [(GMT-	06:00) Ce	entral Time (US & C	anada)	7			
	Meter	Tags			Read de	wice tags		<u>Add a ne</u>	ew meter tag
	ID T	<u>vpe</u>	Name			Units	Log Rate	Address	
		evice		iergy Net		kWh	15 minutes	20:12	View
		evice		e Energy Net		kvaRh	15 minutes	22:12	View
		evice		wer Demand		КW	15 minutes	17:1	View
	20 D	evice	Voltage	Sag Alarm - Flag 3			1 minute	3:2/2	View
	Alarm	IS						Add a	a new alarm
	Enabl	ed <u>Severi</u>	ty	<u>Name</u>	Meter tag	Trigg	jer		Email
	R	Critica	IAlarm	High Demand	Real Power Demand	d High	er than 300 or lower	than O	View

Configure a Digital Alarm

Configuring a digital alarm requires that you perform three actions.

- Set the appropriate alarm flag in the PowerMonitor device.
- Assign a meter tag to a PowerMonitor device for use with the digital alarm.
- Create the digital alarm.

Set Alarm Flag in PowerMonitor Device

To use a digital alarm with a PowerMonitor device, you must set the appropriate alarm flag within the device. For this example, Flag 3 is assigned to a voltage sag setpoint in the PowerMonitor 3000 device.

Follow these steps to configure alarm Flag 3 in the PowerMonitor 3000 module by using the PowerMonitor 3000 display module. Refer to the <u>Setpoint Configuration</u> table on <u>page 165</u> for a list of setpoint parameters and user settings to use for this example.

- **TIP** Refer to <u>Configure a PowerMonitor 3000 Device</u> on <u>page 57</u> for an overview of the PowerMonitor 3000 display module navigation menus.
- 1. Press the Escape key until DISP appears.
- 2. Press the Down Arrow Key to select PROG mode.
- 3. Press the Enter key to access Edit mode.

The display shows PASS.? with four flashing zeroes, 0000.

- Press the Up and Down arrow keys to select the four-digit password and press Enter. The default password is 0000.
- 5. Press the Down Arrow key to select CONFIGURATION, then press the Enter key.
- 6. Press the Down Arrow key until you see SETPOINT, then press the Enter key.
- 7. Press the Down Arrow key to select the setpoint number to configure, then press Enter key.
- 8. Press the Down Arrow key to select a setpoint parameter.

The initial setpoint parameter is TYPE.

9. Press Enter to access Edit mode.

10. Press the Down Arrow key to select a value for the setpoint parameter.

For this example, VOLTAGE SAG is selected for the setpoint TYPE parameter.

- **TIP** For parameters that require numeric values, you can press and hold the Up Arrow or Down Arrow key for a few seconds to increase the rate the value increments or decrements.
- 11. Press the Enter key to write the new value to the master module.

- 12. Repeat steps 7...10 to edit the remaining setpoint parameters in the <u>Setpoint Configuration</u> table.
- 13. Press the Escape key to return to PROG. or DISP. menus.

Repeat this procedure to configure other setpoints.

TIP Refer to Bulletin 1404 PowerMonitor 3000 User Manual, publication <u>1404-UM001</u> for details on how to use data messaging as an alternative for configuring PowerMonitor 3000 setpoints.

Setpoint Configuration

Parameter Name	Parameter Description	Range	Units	Default	Example Settings
Setpoint Number	The number of the setpoint being configured.	110 (M4, M5) 120 (M6, M8)	-	N/A	1
Setpoint Type	The parameter value to be evaluated by the setpoint.	052 ⁽¹⁾	-	0	VOLTAGE SAG
Setpoint Evaluation Condition	The operator used to evaluate the parameter value.	$\begin{array}{l} 0 = \text{Over forward (+)} \\ 1 = \text{Over reverse (-)} \\ 2 = \text{Under forward (+)} \\ 3 = \text{Under reverse (-)} \\ 4 = \text{Equal (=)} \\ 5 = \text{Not equal (<>)} \end{array}$	-	0	U. FWD.
Setpoint High Limit	The value being used as a reference to activate the setpoint for over comparisons, or to deactivate the setpoint for under comparisons. Note: This parameter is non-numeric when viewed via the display module, and the Setpoint Type is Phase Rotation or Status input.	010,000,000	Depends on type	0	249
Setpoint Low Limit	The value being used as a reference to deactivate the setpoint for over comparisons, or to activate the setpoint for under comparisons.	010,000,000	Depends on type	0	249 ⁽²⁾
Setpoint Action Delay	The minimum time in seconds that the	03600	Sec (M4, M5)	0	0
(Pickup Delay)	setpoint limit must be exceeded continuously before the setpoint will trigger.	030,000	0.1 Sec (M6, M8)		
Setpoint Release Delay	The minimum time in seconds that the	03600	Sec (M4, M5)	0	90
(Dropout Delay)	setpoint limit must not be exceeded continuously before the setpoint releases.	030,000	0.1 Sec (M6, M8)		
Setpoint Action Type	The action that occurs when the setpoint is triggered.	032 ⁽¹⁾		0	OUTPUT FLAG 3
Clear Accumulated Time	Clear the time accumulator for this setpoint	Yes No		N/A	N/A

(1) Refer to Bulletin 1404 PowerMonitor 3000 User Manual, publication <u>1404-UM001</u> or details on these settings.

(2) This value is typically (line-to-neutral voltage -10%) for WYE systems and (line-to-line voltage -10%) for Delta systems.

Assign Meter Tag for a PowerMonitor Digital Alarm

You will now assign a meter tag to a PowerMonitor device for use with a digital alarm.

For the <u>Efficient Industries Plant 1</u> example, an alarm flag (Flag 3) is assigned to a voltage sag setpoint in the PowerMonitor 3000 device. You must assign a meter tag to the Flag 3 device tag.

Follow these steps to assign a meter tag for a digital alarm.

1. Select the meter.

For this example, select Electric Main Meter.

- 2. Click the Meter Setup tab then click Add a new meter tag.
- 3. Set the Meter tag type to Device.
- 4. Choose a Flag X tag from the device tag list.

For this example, choose Flag 3.

5. Enter a Meter tag name.

For this example, enter Voltage Sag Alarm - Flag 3.

- 6. Set the Value Type to None.
- 7. Set the Log rate to a value that is less than the Setpoint release delay in the PowerMonitor.
- 8. Accept the default address. Changing the address may cause logging of the incorrect flag or data.
- 9. Choose Boolean as the Tag format.
- **10.** Change the Unit to None.
- 11. Accept the defaults for other settings.
- 12. Click Save.

You should see the new meter tag listed on the Meter Setup tab.

	Add a Meter Tag	
vice tag	Save Cancel)
	Meter tag type	Device 💌
bag	Meter tag name	Flag 3 🔹 💌
	Value type	None
less 1 the	Log rate Number of demand periods	
nging the	Address Tag format	
at.	Unit Number of decimals to display	None 💌
	Scale	1
tings.	Offset Log delta reading	
l on the	Rollover value Trend log parameter	3
	Max consumption per hour	

Create a Digital Alarm

Follow these steps to create a digital alarm.

1. Click the Meters tab and navigate to the meter you want to assign an alarm.

For this example, assign the alarm to the Electric Main Meter under the Electricity group.

- 2. Click the Meter Setup tab.
- 3. Click the <u>Add a new alarm</u> link.

System Meters Poorts Custom Layout Save Restore Collapse Efficient Industries Plant 1 E Accounting E Engineering E Air	Met Met	ter type: Elec	and Calendar Tren Meter Set	tor 3000 (M6)				
Electricity	M	eter Informa	ition					
Boiler House Meter Data Center Meter Sectorc Main Meter Power House Meter		Type Electric Device Electric Main				Assigned to Groups (Contribution factor %) Electricity (100)		
- S Production 1 Meter		Name	Electric Main Meter					
Production 2 Meter Shipping/Receiving Meter Fuels Government Water		Notes Time zone	(GMT-06:00) Central Time (US	& Canada)	×	1		
in in white	M	eter Tags			Read device tags		Add	a new meter tag
	ID	Type	<u>Name</u>		Units	Log Rate	Address	
	1	Device	Real Energy Net		ki/Vh	15 minutes	20:12	View
	2	Device Device	Reactive Energy Net Reactive Power Demand		kvaRh kvaR	15 minutes 15 minutes	22:12 17:2	<u>View</u> <u>View</u>
	Al	arms					A	dd a new alarm
		Enable	I <u>Severity</u>	<u>Name</u>	Meter tag	Trigge	r 🗸	Email

4. Enter an Alarm Name.

For this example, enter Voltage Sag Alarm -Electric Main.

5. Choose a Meter Tag.

For this example, choose Voltage Sag Alarm - Flag 3.

6. Choose the Alarm Severity.

For this example, choose Alarm.

- 7. Enter a message for the alarm.
- 8. Check the email checkboxes if you want to send emails when the alarm is triggered or cleared.

Refer to page <u>170</u> for details on how to <u>Configure Email Alarm Subscriptions</u>.

- **9.** Select Digital for the trigger type.
- **10.** Select the trigger condition.

For this example, select Change to On. This condition will trigger the alarm when the

meter tag value associated with the alarm changes from 0 to 1.

11. Click Save.

You should see the configured alarm on the Meter Setup tab for the meter.

Alarms <u>Add a ne</u>							
Enabled	Severity	Name	<u>Meter tag</u>	Trigger	Email		
\checkmark	CriticalAlarm	High Demand	Real Power Demand	Higher than 300 or lower than 0	<u>⊠ View</u>		
	Alarm	Voltage Sag Alarm - Electric Main	Voltage Sag Alarm - Flag 3	ChangesToOn	View		

Alarm Report . Ir

Add a Alarm

TIP You can use a similar procedure as that outlined in this example to set up any PLC or OPC digital tag as a digital alarm.

Alarm Inf	ormation		
	🗹 Enabled		
Alarm Na	me Voltage Sag Alarm - Electric Main		
Meter	Tag 🛛 Voltage Sag Alarm - Flag 3 💌		
arm Seve	rity Alarm		
Mess	age Voltage Sag detected at Electric Main. 🗾		
	,		
	. Send email on trigger		
	E Send email on clear		
Trigger S	E Send email on clear		
Trigger S DAnalog	I Send email on clear ettings	ange:	C Alarm on outside
0	I Send email on clear ettings	ange:	 Alarm on outside Alarm on inside
0	✓ Send email on clear ettings High threshold	ange:	
Analog	✓ Send email on clear ettings High threshold Low threshold	ange:	
Analog	✓ Send email on clear ettings High threshold Low threshold C On	ange:	

View and Edit Alarm Setups

You can view and edit alarm configurations by selecting Alarm Setup on the System tab. The Alarm Setup view provides a summary list of all the alarms configured in the system. The list may be sorted by severity, name, meter tag name, or meter name by clicking the underlined links. The <u>View</u> link directs you to the alarm setup page where you can view, edit or delete the alarm.

You must have privileges to view and edit alarm setups.

System Meters Reports Custom	Alarm	Setups						
Layout: Save Restore Collapse	Alarm S	Setups						
P System Status	Enabled	Severity	<u>Name</u>	Meter Tag Name	Meter	Trigger	Emai	
⊕- 🛄 Groups ⊕- 🛄 Devices	V	CriticalAlarm	High Demand	Real Power Demand	Electric Main Meter	Higher than 300 or lower than 0	$\overline{ } \forall$	<u>View</u>
eren Coles and Users eren Coles Rate Schedules	V	Alarm	Voltage Sag Alarm - Electric Main	Voltage Sag Alarm - Flag 3	Electric Main Meter	ChangesToOn	$ \!$	<u>View</u>
已一〕 Multi-Purpose Report Scripts - 슈에 Alarm Setup - ਜੂਜ Unit Setup								

Configure Communication Alarms

A communication alarm is triggered when a device fails to respond to four consecutive polls. An error is logged to the alarm log for each communication alarm that occurs.

Follow these steps to enable communication alarms.

- 1. Select the Devices folder on the System tab.
- 2. Navigate to and select the appropriate group or domain.

For this example, Electricity is selected.

- 3. Click Edit.
- **4.** Check Enable comm. loss alarm.
- 5. Click Save.

Edit Device	
Save Cancel)
Device Information	
	Enable device
	🔽 Enable real-time logging
	🔽 Enable auto data repopulation
	Enable PQ events logging
Parent group	Electricity
Device class	Powermonitor 3000 (M6) on EtherNet/IP
Name	Electric Main
Notes	A V
Time zone	(GMT-06:00) Central Time (US & Canada)
Time sync.	Daily
Device password	***** Password
Device Communications	
Communic	ations path AB_ETH-1\10.10.10.0
Comm. timeout	(seconds) 5
	nm. retries 2
	messages 1
mus.	
	🔽 Enable comm. loss alarm

Configure Email Alarm Subscriptions

You can configure one or more email subscriptions for an alarm. A subscription supports three email addresses and a schedule that determines when each email address is active. Alarm subscriptions are assigned to a specific domain or all domains.

Follow these steps to set up an email subscription for an alarm.

- 1. Select My User Settings on the System tab, then click the Edit.
- **2.** Check Enable alarm notifications, then click Save.
- 3. Click the <u>Add a new alarm subscription</u> link.
- Select the group or domain to which you want to subscribe. To subscribe to all domains, select the default of All.

User name	admin		📮 🚭 Global Roles
First name	e Administrator		- F 🧐 summ - F 🕼 User
Last name	•		Guest
Email addres:	5		🚊 🗄 Efficient Industries Plant 1
Note	3		
Password	1		Production 1
Passwor			E Production 2
confirmation Office phone			- E Shipping/Receiving
			🖨 🗄 Engineering
Home phone			📙 🔚 🛱 Engineering Manage
Fa	x		
Page	r		
Time zon	e (GMT-12:00) International Date Lin	e West	
Language	English (U.S.)		
(Enable alarm notifications		

- 5. Enter up to three email addresses.
- 6. Click the <u>Add new notification</u> <u>period</u> link to set up each alarm notification period.
 - Select a day or day range from the pull-down list.
 - Enter start and end times for each period.

To set up a notification period of all day, leave all times at zero.

For this example, a weekday notification was set for email address #1, and a weekend notification was set for email address #2.

7. Click Save.

IMPORTANT	For emails to be sent on alarm, you must also:
	 Check Send email on trigger or Send email on clear from the Add Alarm page when configuring alarm. Configure an SMTP server by selecting Configuration on the System tab. Refer to page <u>171</u>.

Edit Alarm Subscription

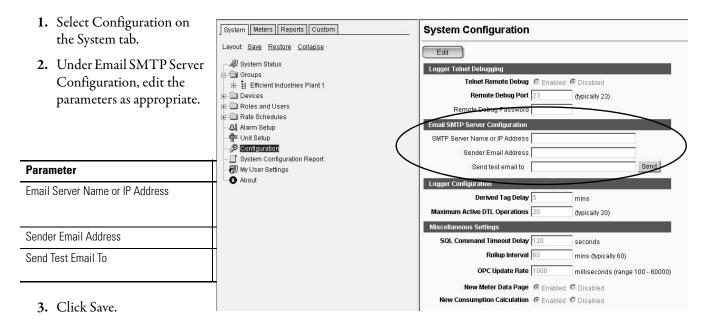
Save	ancel							
		Group A	II*					
	Emai	l address #1 rar	norgan@ra.ro	ockwell.com				
	Emai	l address #2 sc:	schmelzer@r	a.rockwell.com				
	Emai	l address #3	245					
Notification Perio	ds						Add new notifica	tion period
Day	Start Hour	Start Minute	End Hour	End Minute	Send to Email #1	Send to Email #2	Send to Email #3	
Weekdays 💌	0	0	0	0	V	E		<u>Delete</u>
Weekends 💌	0	0	0	0				<u>Delete</u>

Configure SMTP Server

You may need to make changes to the system configuration, for example, to set up an email SMTP server for alarm and report emailing. You must have the Edit System Config privilege, an Admin privilege, to edit the system configuration.

For details on other system configuration parameters, refer to the FactoryTalk EnergyMetrix software online help.

Follow these steps to configure the SMTP server for emailing alarms or reports.



View Active Alarms and Alarm Log

You can view active alarms and the alarm log by selecting System Status on the System tab, then selecting either the Active Alarms tab or the Alarm Log tab.

On activation, an alarm displays on the Active Alarms and Alarm Log tab. When the alarm clears, it is removed from Active Alarms but remains in the Alarm Log until purged.

					_
me zone (UTC-06:00) Central Time (US & Canada)					
List alarms since my last log in					
List alarms in last seven days					
List alarms in previous month					
List alarms in current month					
List all alarms					
Purge All					
ctive Alarms		Value	Triggered		
				Message	
atus <u>Severity Name</u> Info test	Meter PM3000 (M8) on Ethernet/IP 10		06/08/2012 12:30 F		

The Alarm Log tab lists the alarm history. You can view or purge individual alarms by clicking the appropriate link. You can view Device communication errors by selecting the Device Comm. Errors tab.

Active	Alarms	Alarm Log						
Alarn	n Log							
<u>Status</u>	<u>Severity</u>	<u>Name</u>	<u>Meter</u>	Value	<u>Triggered</u>	<u>Cleared</u>	Message	
On	Into	High current alarm	Richs M8	69.2029113769531	10/17/2005 04:09 PM		Richs M8: Average current greater C	Purge
Off	Into	High current alarm	Richs M8	68.6537475585938	10/17/2005 08:39 AM		Richs M8: Average current greater than 50 amps	
Off	Into	High current alarm	Richs M8	68.6537475585938	10/17/2005 08:39 AM	10/17/2005 08:45 AM	Richs M8: Average current greater than 50 amps	Purge <u>Vie</u>
Off	Intra	High Avg V IEEE THD	Richs M8	1	10/17/2005 08:37 AM	10/17/2005 08:55 AM	Avg V IEEE THD > 5%	Purge Viev
Off	IFILL	High current alarm	Richs M8	68.5393295288086	10/17/2005 08:30 AM		Richs M8: Average current greater than 50 amps	Purge Viev
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FactoryTalk EnergyMetrix Software Reports and Charts

Introduction

In this chapter, you will learn how to configure and run standard reports and charts for your FactoryTalk EnergyMetrix software project.

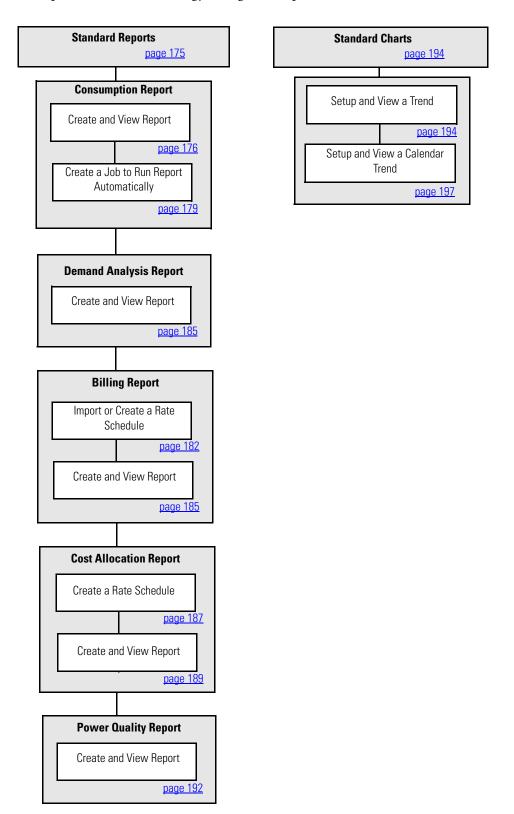
- Determine business goals, complete energy assessment, and determine monitoring methods (<u>Chapter 1</u>).
- Select hardware and wire devices (<u>Chapter 2</u>).
- Configure data collection devices (<u>Chapter 3</u>).
- Install FactoryTalk EnergyMetrix software (<u>Chapter 4</u>).
- Configure groups and security in (<u>Chapter 5</u>).
- Configure FactoryTalk EnergyMetrix software devices in (<u>Chapter 6</u>).
- Configure meters and tags in (<u>Chapter 7</u>).
- Configure, edit, and view alarms in (<u>Chapter 8</u>).

What You Need

- FactoryTalk EnergyMetrix software CD, catalog number 9307-FTEMMENE
- FactoryTalk EnergyMetrix software online help and user manual, publication <u>FTEM-UM002</u>.
- Energy Management Accelerator Toolkit CD, publication IASIMP-SP014, or visit the Integrated Architecture Tools and Resources website at http://www.ab.com/go/iatools to download toolkit files.

Follow These Steps

Complete these steps to create and view energy management reports and charts.



Standard Reports

FactoryTalk EnergyMetrix software standard reporting converts logged energy and production data into information you can use to manage your business, improve efficiency, and reduce costs. You can run reports on demand, automatically on a configured schedule, or event-driven in response to an alarm condition.

Standard Report Type	Description
Consumption	Reports all consumption values (for example, kWh, kVARh) for selected meters for a specified time interval. The report groups meters as they are organized in the FactoryTalk EnergyMetrix software navigation tree, with subtotals calculated for each group. The report includes all meters that have Consumption enabled for the value type.
Demand Analysis	Reports real power (for example kW) demand values for selected meters or groups for a specified time interval, and itemizes each meter or group's contribution to the total. It also reports the worst case peak demand that would have occurred had each meter or group's peak demand occurred in the same demand interval. The report includes all meters that have Demand enabled for the value type.
Billing	Generates a replication of a monthly bill (shadow bill) from your energy provider for comparative billing analysis and potential energy cost recovery. The report is based on data from your energy meters and utility rate schedules. The report is a list of line items and a total charge amount. Each line item consists of a description, quantity, rate and charge.
Cost Allocation	Runs a report that lists each meter's contribution to the total energy cost, based on a rate schedule that you configure. Cost allocation reports are generated in Microsoft Excel output format.
Power Quality	Runs a report that combines a graph and a grid display of power quality, sag and swell events. This report is used only for the PowerMonitor 3000 M6 and M8 models that have configured sag and swell setpoints. Enable PQ events logging must be checked on the Device setup page. FactoryTalk EnergyMetrix software will periodically read the PowerMonitor event log, and store sag and swell events in the database. Each sag and swell record lists the time, duration, and maximum deviation of the sag or swell.

TIP In addition to standard reports, the ReportsPlus option extends reporting capabilities by including custom scriptdriven multipurpose, efficiency, load factor, power factor, and electrical summary reports.

Consumption Report

A consumption report shows all consumption values, in specified units kWh, kVARh, of selected meters for a specified time interval. The report includes group meters as organized in the project and subtotals for each group.

A consumption report is typically used to monitor daily energy use and assists with the early detection of production/ equipment problems. You can configure the report to automatically run at a specific time every day and emailed to specific users. The procedure for creating this type of report, or any other report, is to:

- set up, view, and print the report.
- configure a job option to automatically run the report on a set schedule.

For the <u>Efficient Industries Plant 1</u> example, you will run and email a daily consumption report for the energy main meters: air, electric, gas, fuel oil, propane, steam, and water.

Create and View Report

Follow these steps to set up a consumption report.

- 1. Click the Reports tab.
- 2. Navigate to and select a domain to create the report for.

For this example, select Engineering.

Only users with access to the domain will be able to view the report.

- 3. Click Add.
- **4.** Enter a Report name.

For this example, enter Consumption Report.

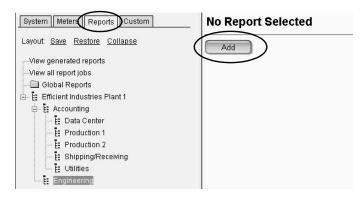
- 5. Choose the Consumption Report template.
- 6. Accept the default Report file for correct operation.
- 7. Verify the Report parent group.

For this example, Engineering was selected in step 2.

8. Select meters to include in report.

For this example, select the meters as checked.

9. Click Save.



Add a new report

Save Can	cel	
Report Information		Select By: Meters <u>Groups</u>
Report name	Consumption Report	Select All Clear All
Report template	Consumption	Efficient Industries Plant 1
Report file	Consumption.rpx	⊟- E Engineering
Report parent group	-Engineering	

The report appears under the Engineering domain.	Efficient Industries Plant 1 E Accounting E Engineering Consumption Report	
10. Verify the report is selected.	Reports	
11. Choose the Export type.	Reports	

By default, the report is exported in a PDF format.

- 12. Select report parameters.
 - a. Select time zone.
 - The default is the logged-in user time zone.
 - b. Select a predefined or custom time span.
 - c. Check Suppress meter details to list only group totals in report.

This is useful when percentages of meters are allocated to groups.

	22400000000 I	-		
Repor	rt name	Consumption Report		
Report te	emplate	Consumption		4
Rej	port file	Consumption.rpx		~
Report parent group		Engineering		*
Exp	oort type [PDF 🗸		
Report Paran	neters			
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Fime zone Predefined	(GMT-0) Yesterd Start dat	ay 👻		~
Time zone	(GMT-0) Yesterd Start dat	ay v 8/30/2009 12:00 AM		~
Time zone	(GMT-0) Yesterd Start dat Start time End dat	ay	Pick	Y

13. Click View.

A new browser window opens while the report is being generated and then closes automatically.

The report opens in a new window.

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	L	Г.

If the new browser window does not open, make sure the browser pop-up blocker is not active.

Back - 🕥 - 💌 🗷 🏠 🔎	Search 👷 Favorites 🚱	0.30	3		•
ress A http://usmkegakhan/rsenergymetrix/R	eportsOutput/Consumption Repo	rt f04879dd 1.pdf			· · · ·
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		6 31%			
Factory Talk ' Ener	gyMetrix			Efficient Industri	es Plant 1
Consumption Report		8/31/200	9 12:00 AM	to 9/1/2009 12:0	00 AM
Air (ID 22)					_
Air (ID 22)					
A1	Air Usage (cf)				
Air Flow _Meter	Air Usage (cf) 1,441				
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Air Flow_Meter Total(s):	1,441	Reactive Energy Net (WADb)			
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14. To print or save the report to the specified output file, use the menu commands in the browser.

 To edit an existing report, navigate to and select the report. Click Edit to modify the report parameters. When you are done, click the Save.

 To copy a report, click copy on the Reports page. The report is copied with the name: Copy of <existing report name>.

TIP

Create a Job to Run Report Automatically

You can set up a report to run automatically by defining a report job. Reports that run automatically are saved in the database and sent to one or more email addresses provided the STMP mail server is configured.

Follow these steps to create a job option to run a daily consumption report at 12:00 am for the previous day, and email the report to several engineering managers.

1. Navigate to and select a report on the Reports tab.

For this example, select Consumption Report under the Engineering subdomain.

2.	Click the <u>Add a New</u>	Auto-run repo	ort jobs		A	dd a new report	job
	<u>Report Job</u> link.	<u>Name</u>	Notes	S	chedule	40	
	Make sure the report job is enabled. Enter a name for the report job.		Add Repor	t Job			
	For this example, enter Daily Consum Report.	iption	Report name: Co Report Job Infor Name Notes		eport		
5.	Select the time zone to run the report.		Time zone	(GMT-06:00) Central	Time (US & Canada)		~
6.	Enter email addresses, one per line, for you want receive the scheduled report You must configure the email SMTP s system configuration. Refer to page 17	:. server path in	Email addresses (one per line) Job start date	ramorgan@ra.rockwe scschmelzer@ra.rock			< >
7.	Enter optional start and end dates to r report job.		Job end date Export type		(optional)		
8.	Select a schedule to run the report job For this example, select daily to run th		Report Job Sch	edule kly OMonthly OOn	Alarm		
	every day at 12:00 am.	le lepoit	Every 1 day	(s) at 12:00 AM			
9.	Select a predefined or custom report of For this example, select Predefined and run report for previous day.	U U	Report Date Ran Predefined Custom	nge Yesterday 🗸			
10.	Click Save.			0 Months			

You should see the report job at the bottom of the Reports page under Auto-run report jobs.

You can view the output of automatically run reports by clicking the <u>Generated Reports</u> link in the Reports tab.

Demand Analysis Report

A demand analysis report analyzes the electrical demand of plant areas so that you can make energy saving production scheduling, and/or demand control decisions.

For the <u>Efficient Industries Plant 1</u> example, you will create a report to list real power demand values for the plant's electrical submeters including all PowerMonitor 1000 meters: Boiler House, Power House, Production 1, Production 2, Shipping/Receiving/DC.

Create and View Report

Follow these steps to set up and view a demand analysis report.

- 1. Click the Reports tab.
- 2. Navigate to and select a domain to create the report for.

For this example, select the Engineering subdomain.

Only users with access to the domain will be able to view the report.

- 3. Click Add.
- 4. Enter a Report name.

For this example, enter Electrical Demand Analysis Report.

- 5. Choose the Demand Analysis Report template.
- 6. Accept the default Report file.
- 7. Verify the Report parent group.

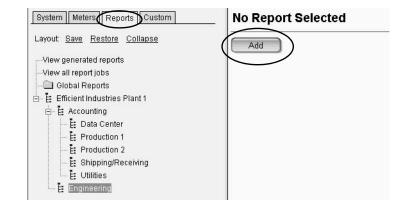
For this example, Engineering was selected in step 2.

8. Select the meters or groups to include in the report.

For this example, select the meters as checked.

9. Click Save.

The report appears under the Engineering domain.



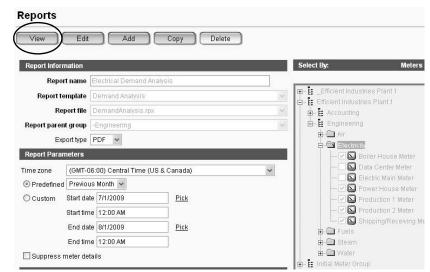
Add a new re					
Save Car	icel	_			
Report Information			Select By:	Meters	<u>Group</u>
Report name	Electrical Demand Analysis		elect All <u>Clear All</u>		
Report template	Demand Analysis	· 1	Efficient Indu		
Report file	DemandAnalysis.rpx	~	⊕-E Accountir ⊡-E Engineer		
Report parent group	-Engineering	~) Boiler House N) Data Center Mi) Electric Main M) Power House I) Production 1 M) Production 2 M) Shipping/Rece	eter eter vleter eter eter
domain.	 ➡ Efficient Industries Plant 1 ➡ E Accounting ➡ E Engineering ➡ Consumption Report ➡ Electrical Demand Anality 	alvsi	q		

- **10.** Verify the report is selected.
- 11. Accept PDF as the Export type.
- 12. Select the report parameters.
 - a. Select the time zone.
 - b. Select a predefined or custom time span. For this example, select Previous Month.
 - c. Check Suppress meter details to list only group totals in the report.

This is useful when percentages of meters are allocated to groups.

13. Click View.

The report is generated and opened in a new browser window.



Ical Demand Analysis 7/1 Ical Demand Summary 7/1 House _Meter 655.5 kW r House _Meter 352.0 kW r House _Meter 1,787.9 kW r top 2_Meter 1,224.6 kW	Efficient Industries PI /1/2009 12:00 AM to 8/1/2009 12:0 9.2% 7/22/2009 1:30:00 P 4.9% 7/22/2009 1:30:00 P	1	cient Industries Plant
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ction 1 _Meter 1,787.9 kW ction 2 _Meter 1,224.6 kW			
ction 2_Meter 1,224.6 kW	24.7% 7/22/2009 1:30:00 P		7/22/2009 1:30:00 PM
-	112212003 1.30.001		7/22/2009 1:30:00 PM
ing/Receiving_Meter 3,222.4 kW	16.9% 7/22/2009 1:30:00 P		7/22/2009 1:30:00 PM
	44.4% 7/22/2009 1:30:00 P		7/22/2009 1:30:00 PM
Total 7,252.3 kW 1	100.0%		
Case Peak Demand Analysis			
House Meter 732.0 kW	9.8% 7/29/2009 10:15:00		7/29/2009 10:15:00 AM
	5.2% 7/15/2009 10:30:00		7/15/2009 10:30:00 AM
			7/1/2009 3:45:00 PM
			7/8/2009 11:45:00 AM
			7/7/2009 4:00:00 PM
Case Peak Demand Analysis House _Meter 732.0 kW r House _Meter 388.2 kW ction 1 _Meter 1,851.8 kW ction 2 _Meter 1,250.4 kW	100.0% 9.8% 7/29/2009 10:15:0 5.2% 7/15/2009 10:30:0 24.8% 7/1/2009 3:45:00 16.8% 7/8/2009 11:45:00		7/29/2009 10:15:0 7/15/2009 10:30:0 7/1/2009 3:45:00 7/8/2009 11:45:00

TIP

If the new browser window does not open, make sure the browser pop-up blocker is not active.

- 14. To print or save the report to the output file, use the menu commands in the browser.
- 15. Refer to <u>Create a Job to Run Report Automatically</u> on <u>page 179</u> for details on how to configure a report job to automatically run the report.

Billing Report

A billing report generates a replication of a monthly bill (shadow bill) from your energy provider, for comparative billing analysis and potential energy cost recovery. The report is based on data from your energy meters and utility rate schedules. Creating a billing report requires you to:

- add or import a rate schedule.
- set up, view, and print the report using the selected rate schedule.

For the Efficient Industries Plant 1 example, you will create a billing report for the electric utility.

Import or Create a Rate Schedule

A rate schedule defines a set of rules that FactoryTalk EnergyMetrix software uses to convert energy usage data into usable billing or cost allocation information. For details on how to configure rate schedules, refer to the FactoryTalk EnergyMetrix software online help.

For your convenience, the Energy Management Accelerator Toolkit CD provides sample rate schedules that you can import and modify for your needs.

Rate Schedule	Description
AEP Indiana Michigan Power Company Tariff IP	Includes demand charges based on kVA, power factor penalty if < 0.85, secondary metering correction factor of 1.01, time of use on and off peak, and no seasons or holidays.
Alliant Cg-2 TOD	Includes summer and winter seasons with different rates, time of use on and off peak, and no holidays.
Alliant Cp-1 - 12 hr 10-10	Includes holidays, summer and winter seasons with different rates, time of use on and off peak, global variables, and hidden line items for preliminary calculations.
Alliant IP	Incudes seasons based on Daylight Savings Time (DST) start and end dates in 2007. For accuracy, seasons should be adjusted for DST each year. The value type EAC is needed for manual meter to store monthly energy adjustment rates. Rate schedule is based on Alliant IP&L tariff sheet 26 issued on June 26, 2006.
Black Hills Power General Service 20	Includes global variables, hidden line items for preliminary calculations, stepped (banded) energy and demand charges, and a power factor penalty < 0.85. Rate schedule does not include seasons, holidays, or times of use.
Dominion VA Power Non-Residential Sched 130	Includes summer and winter seasons with different rates, time of use with different season schedules, global variables, hidden line items for preliminary calculations, and several fixed facility charges.
Progress Energy LGS-9	Includes seasons for ratchet demand calculation, stepped (banded) demand charges, global variables, global proration factor for partial month reporting.
Virginia Electric and Power Company GS-4	Includes summer and winter seasons, time of use with different season schedules, global variables, and many riders.
WE General Primary Service TOU Cp1	Includes holidays, global variables, sales tax, and blended rate per kWh calculation.

Sample Rate Schedules

Follow these steps to import a rate schedule.

- 1. Click the System tab.
- 2. Open the Rate Schedules folder.
- 3. Navigate to and select the group or domain to create the report for.

For this example, select the Utilities group under the Accounting subdomain.

4. Click Import.

- 5. Navigate to the Sample Rate Schedules folder on the Energy Management Toolkit CD image.
- 6. Select the WE General Primary Service TOU Cp1 rate schedule and click Open.

This rate schedule will be used by the billing report for the electrical utility.

7. Click Upload File.

Rate Schedules

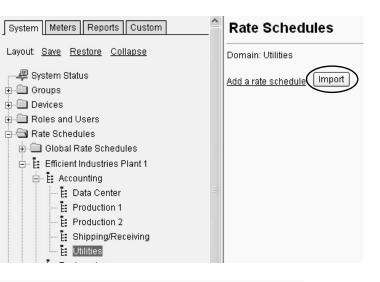


You should see the imported rate schedule on the Rate Schedules page and under the Utilities group.

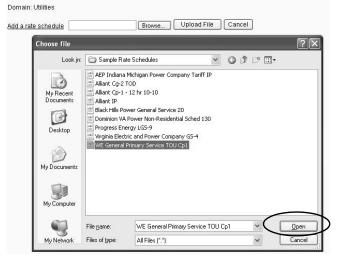
8. Click the <u>View</u> link to open the Rate Schedule.

Rate Schedules

Domain: Utilities	
Add a rate schedule Import	
ID Name	Notes
3 WE General Primary Service TOU Cp	1 <u>ViewDelete</u>



Rate Schedules



9. Click a tab containing the information you want to change, then click Edit.

For details on rate schedules, refer to the online help.

- **10.** Click Save when done to save your rate schedule changes.
- **11.** Repeat steps 1...9 to import rate schedules for other billing reports.

Rate Schedule Setup

Infor	mation Seasons	Non-Working Days Holiday	rs Times Of Use Line Items Global Variables
Lin	e Items		
Line	Group	Description	
1	Fixed Charges	Facilities Charge	View
2	Demand Charges	Peak Power Factor calculation	View
3	Demand Charges	Demand, On-peak	View
4	Demand Charges	Demand, Customer Maximum	View
5	Energy Charges	Energy, On-peak	View
6	Energy Charges	Energy, Off-peak	View
7	Other Charges	Minimum Charge Adder	View
8	Taxes and Fees	Sales Tax	View
9	Blended rate	Blended energy rate per kWh	View

Create and View Report

Follow these steps to set up and view a billing report that uses a selected rate schedule.

For the <u>Efficient Industries Plant 1</u> example, you will create two billing reports; one for the electric utility and one for gas utility.

- 1. Click the Reports tab.
- 2. Navigate to and select a domain for the report.

For this example, select Utilities under the Accounting subdomain.

Only users with access to the domain will be able to view the report.

- 3. Click Add.
- 4. Enter a Report name.

For this example, enter Electric Billing Report.

- 5. Choose the Billing report template.
- **6.** Accept the default Report file for correct operation.
- 7. Verify the Report parent group.

For this example, Utilities was selected in step 2.

8. Choose a Rate schedule.

For this example, choose WE General Primary Service TOU Cp1.

9. Select meters to include in report.

For this example, check the Electric Main Meter.

10. Click Save.

The report appears under Utilities group of the Accounting domain.

System Meters Reports Custom	No Report Selected
Layout: <u>Save</u> <u>Restore</u> <u>Collapse</u>	Add
View all report jobs	
🗀 Global Reports	
📄 🗄 Efficient Industries Plant 1	
🛓 🗄 Accounting	
🗕 🧮 Data Center	
- E Production 1	
Production 2	
- E Shipping/Receiving	
- E Utilities	
🛓 Engineering	
Consumption Report	
Electrical Demand Analysis	

Add a new report

Report Information			Select By:	Meters	Groups
Report name	Electric Billing Report		Select All Clear All		
Report template	Billing	~	E Efficient Indust	ries Plant 1	
Report file	Billing.rpx	~	E Accounting	1	
Report parent group	Utilities	*	🗄 💼 Air		
Rate schedule	WE General Primary Service TOU Cp1	>		Boiler House Me Data Center Met Electric Main Me Power House M Production 1 Me Production 2 Me Shipping/Receiv	ter ter eter ter ter



- **11.** Verify the report is selected.
- **12.** Edit the report parameters as needed.
- 13. Click View.

View	Edit	Add	Copy Delete)		
Report Inform	nation			5	Select By:	Meters
Report	t name 🛛	Electric Billing Rep	ort			
Report te	mplate	Billing				s Plant 1
Rep	oort file	Billing.rpx		~	E Accounting Engineering	
Report parent	t group	Utilities		~	i interning int	
Rate sc	hedule	WE General Prima	ry Service TOU Cp1	~		
Ехр	ort type	PDF 🗸				ler House Meter ta Center Meter
Report Param	neters					ctric Main Meter
Time zone	(GMT-08	6:00) Central Time	(US & Canada)	*		wer House Meter
Predefined	Previous	s Month 😽				iduction 1 Meter
O Custom	Start date	8/1/2009	Pick		L 🗌 🖾 shi	pping/Receiving Met
	Start time	e 12:00 AM			🖶 - 🧰 Fuels	
	End date	9/1/2009	Pick		t∎ 🛄 Steam t∓ 🛄 Water	
	122 13535	12:00 AM				

The report is generated and opened in a new browser window.

Factory Talk Energy Metrix

Efficient Industries Plant 1

Electric Billing Report		8/1/2009	12:00 AM to 9/1/2	009 12:00 AM
Time Zone: (GMT-06:00) Cen	tral Time (US & Canada)			
Rate Schedule: WE General Prim	ary Service TOU Cp1			
Total Charge: \$175,405.72				
Fixed Charges		_	X.1	
Description	Quantity		Rate	Charge
Facilities Charge	1.0		525	\$525.00
			Subtotal:	\$525.00
Demand Charges				
Description	Quantity		Rate	Charge
Demand, On-peak	7,400.7	kW	8.72	\$64,533.81
Demand, Customer Maximum	7,815.1	kW	0.76	\$5,939.46
			Subtotal:	\$70,473.27
Energy Charges				
Description	Quantity	-	Rate	Charge
Energy, On-peak	1,585,749.1	kWh	0.03459	\$54,851.06
Energy, Off-peak	1,877,882.2	kWh	0.02152	\$40,412.02
		1	Subtotal:	\$95,263.08
Taxes and Fees				
Description	Quantity		Rate	Charge
Sales Tax	166,261.4	1.44	0.055	\$9,144.37
			Subtotal:	\$9,144.37

TIP

If the report does not open in the browser window, make sure the browser pop-up blocker is not active.

- 14. To print or save the report to the output file, use the menu commands in the browser.
- **15.** Refer to <u>Create a Job to Run Report Automatically</u> on <u>page 179</u> for details on how to configure a report job to automatically run the report.

Cost Allocation Report

A cost allocation report lists each meter's contribution to the total energy cost, based on a rate schedule. Cost allocation reports are generated in a Microsoft Excel output format.

For the <u>Efficient Industries Plant 1</u> example, you will create a cost allocation report for all of the electric submeters including Boiler House, Power House, Production 1, Production 2, Shipping/Receiving/DC, and the Data Center.

Create a Rate Schedule

A rate schedule for a cost allocation report typically includes only energy consumption (kWh) calculations. More complex reports can be created by using the ReportsPlus option.

For the <u>Efficient Industries Plant 1</u> example, you will create a simple rate schedule that calculates energy charges from the Real Energy Net (kWh) tag values of the electric submeters by using a single rate per unit value.

Follow these steps to create a rate schedule.

- 1. Click the System tab.
- 2. Open the Rate Schedule folder.
- **3.** Navigate to and select a domain for the rate schedule.

For this example, select the Accounting subdomain.

4. Click the <u>Add a rate schedule</u> link.

System Meters Reports Custom	Rate Schedules
Layout: <u>Save Restore</u> <u>Collapse</u>	Domain: Accounting
	Add a rate schedule Import
🗄 🛅 Groups	
🗄 🛅 Devices	
🗄 🛅 Roles and Users	
🗄 📾 Rate Schedules	
🗄 🛅 Global Rate Schedules	
🚊 🗄 Efficient Industries Plant 1	
Accounting	
🗄 Data Center	
Production 1	
Production 2	
- E Shipping/Receiving	
🗄 🗄 🗄 Utilities	
📙 📙 Engineering	

- 5. On the Information tab:
 - a. Verify the selected domain.
 - b. Enter a rate schedule name.

For this example, enter Electric Cost Allocation.

- c. Verify the time zone.
- d. Enter optional information.

Add Rate Schedule

Save Rate schedule i	Cance name:					
Information [Seasons	Non-Working Days	Holidays	Times Of Use	Line Items	Global Variables
General Infor	mation					
Domain	-Accounti	ng 🗸				
Name	Electric C	ost Allocation				
Time zone	(GMT-06:	00) Central Time (US	& Canada)	8	~	
Start date				End date		
Contact name						
Contact phone					S ²	
Contact email						
Notes					<	

6. Click the Line Items tab, then click the <u>Add a line item</u> link.

7. Enter a description of the rate schedule.

For this example, enter Real Energy Charge (kWh).

- Enter the Rate per unit (kWh).
 For this example, enter 0.03459.
- 9. Enter a cost allocation script.

For this example, enter the scripts shown.

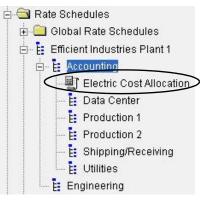
10. Click Validate to check the script syntax.

	ate Schedule	
Save	Cancel	
Rate schee	dule name:	
Informatio	on Seasons Non-Working Days Holidays Times Of U	Jse Line Items Global Variables
Line Iter		
Line Grou	up Description	
Add Rate S	Schedule	
Save	Cancel	
Rate schedule nai	me:	
Information Sea	asons Non-Working Days Holidays Times Of Use Line It	ems Global Variables
		ems Global Variables
Line Items	Add a line item	ems Global Variables
	Add a line item	ems Global Variables
Line Items Line Group Desc	Add a line item	ems Global Variables
Line Items Line Group Desc 1 Edit Line Item	Add a line item	
Line Items Line Group Desc 1 Edit Line Item	Add a line item cription Insert Copy Delete Edit View Real Energy Charge (KWh) Save Ite	
Line Items Line Group Desc 1 Edit Line Item Description	Add a line item cription Insert Copy Delete Edit View Real Energy Charge (KWh) Save Ite	
Line Items Line Group Desc 1 Edit Line Item Description Group Start date Script	Add = line item Cription Insert Copy Delete Edit View Real Energy Charge (kWh) End date End date Quantity = Total(ValueType RealEnergyNet)	erm Cancel Item
Line Items Line Group Desc 1 Edit Line Item Description Group Start date	Add a line item cription Insert Copy Delete Edit View Real Energy Charge (kWh) End date	erm Cancel Item
Line Items Line Group Desc 1 Edit Line Item Description Group Start date Script	Add a line item cription Insert Copy Delete Edit View Real Energy Charge (KWh) End date Guantity = Total(ValueType.RealEnergyNet)	erm Cancel Item
Line Items Line Group Desc 1 Edit Line Item Description Group Start date Script	Add a line item cription Insert Copy Delete Edit View Real Energy Charge (KWh) End date Guantity = Total(ValueType.RealEnergyNet)	erm Cancel Item
Line Items Line Group Desc 1 Edit Line Item Description Group Start date Script	Add a line item cription Insert Copy Delete Edit View Real Energy Charge (KWh) Save Ite Guantity = Total(ValueType.RealEnergyNet) Unit < GetUnit (ValueType.RealEnergyNet) Charge = Quantity * RatePerUnit	erm Cancel Item

Script	Description
Quantity = Total(ValueType.RealEnergyNet)	Specifies the energy value for the report.
Unit = GetUnit(ValueType.RealEnergyNet)	Specifies the unit for the quantity value on the report.
Charge = Quantity*RatePerUnit	Specifies the energy calculation charge for the report.

Refer to the FactoryTalk EnergyMetrix software help for more details on scripts.

- 11. Click Save.
- **12.** Verify the new rate schedule appears under the specified domain.



Create and View Report

Follow these steps to create a cost allocation report that uses a defined rate schedule.

For the <u>Efficient Industries Plant 1</u> example, you will create a cost allocation report that uses the Electric Cost Allocation rate schedule.

- 1. Click the Reports tab.
- 2. Navigate to and select a domain for the report.

For this example, select the Accounting subdomain.

Only users with access to the domain will be able to view the report.

- 3. Click Add.
- 4. Enter a Report name.

For this example, enter Electric Cost Allocation Report.

- **5.** Choose the Cost Allocation report template.
- **6.** Verify the Report parent group.

For this example, Accounting was selected in step 2.

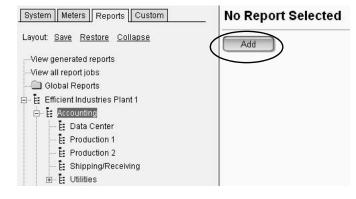
7. Choose a Rate schedule.

For this example, choose Electric Cost Allocation.

8. Click the <u>Meters</u> or <u>Groups</u> link to determine the report selection criteria.

The <u>Groups</u> link is typically chosen to report energy costs by production areas (groups) that are derived from multiple meter allocations.

For this example, groups were selected so a single cost allocation could be reported for the Shipping/Receiving area based on the Shipping/Receiving/DC meter (100%) minus the Data Center meter (-100%). Refer to <u>page 153</u> for details on how to assign contribution factors.



Add a new report

Report Information	Report Information						
Report name	Electric Cost Allocation Report	Select All Clear All					
Report template	Cost Allocation	Efficient Industries Plant					
Report parent group	-Accounting	El Accounting El Data Center					
Rate schedule	Electric Cost Allocation	Production 1					
		tine time Production 2					
		⊡ Ē Shipping/Receivin ⊡ Ē Utilities					
		Engineering					

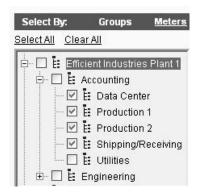
9. Select the meters or groups to include in report.

For this example, cost allocation for the Data Center, Production 1, Production 2, and the Shipping/Receiving groups will be reported.

10. Click Save.

The report appears under the Accounting domain.

11. Verify the report is selected.



- 12. Edit the report parameters as needed.
- 13. Click View.

System Meters Reports Custom	Reports				
Layout: <u>Save Restore Collapse</u> (View Edit	Add	Copy Delete		
View generated reports View all report jobs Disclobal Reports	Report Information				Select By: Groups
Efficient Industries Plant 1	Report name	Electric Cost Allocation	Report		
E Accounting	Report template	Cost Allocation		~	End Contraction Contraction Contraction End Contraction Contraction End Contraction Contraction End Contraction Contraction
Electric Cost Allocation Report	Report parent group	-Accounting		4	
Production 1	Rate schedule	Electric Cost Allocation		\sim	🗹 😫 Data Center
Froduction 2 Shipping/Receiving	Report Parameters				Production 1
	Time zone (GMT-	06:00) Central Time (US	& Canada)	~	- 🗹 🗄 Shipping/Receiving
🗄 🗄 Engineering	Predefined Previo	us Month 🐱			Utilities
- E Initial Meter Group	OCustom Start da	te 8/1/2009	Pick		🖮 🗔 🗄 Engineering
E New Meter Group	Start tin	ne 12:00 AM			
	End da	te 9/1/2009	Pick		
	End tin	ne 12:00 AM			
	Auto-run report jobs		Add a nev	v report job	
	<u>Name</u>	Notes	Schedule		

The report is generated in a .csv Microsoft Excel format. A File Download dialog box prompts you to open or save the report to a file.

14. Click Open to view the report.

The report opens in a browser window. You may need to adjust column widths to view the data.

🗐 h	ttp://usmkegakhan/r	senergymetrix/ReportsOutput/Electric_C	lost_	Allocation_Re	eport	- 0 ×
Fil	e Edit View Insert	Format Tools Data Go To Favorites H	Help			
(3 Back - 🕥 - 🚺	🖸 🔝 🏠 🔎 Search 🤺 Favorites 🗟	Ø		» 🔁 -	Links *
Add	lress 🙆 http://usmkegak	han/rsenergymetrix/ReportsOutput/Electric_Cost_A	llocat	ion_Report_ed68	8f26_1.csv	∕ 🗦 Go
	A1 👻	& Report name:				
	A	B	С	D	E	F 🔒
1	Report name:	Electric Cost Allocation Report				
2	Starting date/time:	8/1/2009 0:00				
3	Ending date/time:	9/1/2009 0:00				
4	Time zone:	(GMT-06:00) Central Time (US & Canada)				
5	Rate schedule:	Electric Cost Allocation				
6	Total charge:	\$89,204.20				
7	-					
8		Real Energy Charge (kWh)		Subtotals		
9	Data Center	\$11,947.60		\$11,947.60		
10	Production 1	\$26,717.20		\$26,717.20		
11	Production 2	\$17,784.00		\$17,784.00		
12	Shipping/Receiving	\$32,755.40		\$32,755.40		
13						
14	Subtotals	\$89,204.20		\$89,204.20		
15			1			
16						
17						
18						<u> </u>
H 4	► ► \ Electric_Cost	_Allocation_Report / I				
e				Unk	nown Zone	

TIP If the report does not open in the browser window, make sure the browser pop-up blocker is not active.

- 15. To print or save the report, use the File menu in the browser.
- **16.** Refer to <u>Create a Job to Run Report Automatically</u> on <u>page 179</u> for details on how to configure a report job to automatically run the report.

Power Quality Report

A power quality report combines a graph and grid display of power quality (sag and swell) events. FactoryTalk EnergyMetrix software periodically reads the power monitor event log from the PowerMonitor 3000, and stores sag and swell events in the database. The power quality report displays events logged during the selected report interval on a ITI/ CBEMA chart and in a grid (tabular) listing.

TIP The power quality report is supported only for PowerMonitor 3000 M6/M8 models with configured sag and swell setpoints. Enable PQ events logging must be checked when configuring the device.

For the <u>Efficient Industries Plant 1</u> example, you will create a power quality report for the PowerMonitor 3000 Electric Main meter.

Create and View Report

Follow these steps to set up and view a power quality report.

- 1. Click the Reports tab.
- 2. Navigate to and select a domain for the report.

For this example, select Engineering.

Only users with access to the domain will be able to view the report.

- 3. Click Add.
- 4. Enter a Report name.

For this example, enter Electric Main Power Quality Report.

- 5. Choose the Power Quality template.
- 6. Accept the default Report file.
- 7. Verify the Report parent group.

For this example, Engineering was selected in step 2.

8. Select the meters or groups to include in the report.

For this example, check the Electric Main meter.

9. Click Save.

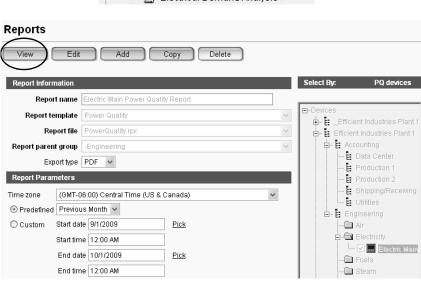
System Meters Reports Custom	No Report Selected
Layout: <u>Save Restore</u> <u>Collapse</u>	Add
-View generated reports	
View all report jobs	
🛄 Global Reports	
🗄 🗄 _Efficient Industries Plant 1	
🗄 🗄 Efficient Industries Plant 1	
🛓 🗄 Accounting	
🖻 🗄 Engineering	
Consumption Report	
Electrical Demand Analysis	

Add a new report

Save Car	icel			
Report Information			Select By:	PQ devices
Report name	Electric Main Power Quality Report		<u>Select All</u> <u>Clear A</u>	<u>ui</u>
Report template	Power Quality	*	⊡-Devices	nt Industries Plant 1
Report file	PowerQuality.rpx	*		
Report parent group	-Engineering	~		gineering
				Air Electricity
				Electric Main
				Fuels
				Steam Water

The report appears under the Engineering domain.

- 10. Verify the report is selected.
- **11.** Accept PDF as the Export type.
- 12. Edit the report parameters as needed.
- 13. Click View.



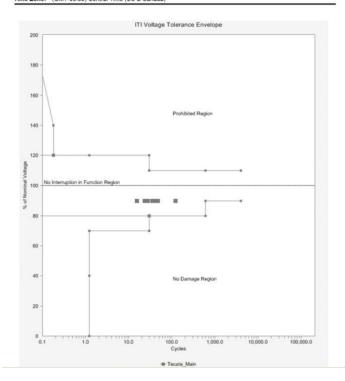
The report opens in a new browser window.

- 14. To print or save the report to the output file, use the menu commands in the browser.
- 15. Refer to <u>Create a Job to Run Report</u> <u>Automatically</u> on <u>page 179</u> for details on how to configure a report job to automatically run the report.
 - TIP

If the new window does not appear, make sure the browser pop-up blocker is not active. Factory Talk Energy Metrix

Efficient Industries Plant 1

Electric Main Power Quality Report Time Zone: (GMT-06:00) Central Time (US & Canada) 9/1/2009 12:00 AM to 10/1/2009 12:00 AM



Standard Charts

Two standard charting tools are available to view and analyze energy usage and demand.

Chart Type	Description
Trend	Displays a trend of one or more logged parameters from one or more meters over a specified time interval. You can select up to five parameters on the same chart.
Calendar	Displays a trend line of one logged parameter in a calendar format. This chart is typically used to display real or reactive power demand over time to pinpoint peaks that vary by day, week or month. You can zoom in on a day's chart by clicking on the day in the calendar view. Selecting multiple days overlays one trend line on top of another, allowing you to compare, for instance, all Mondays in a month.

TIP In addition to the standard charts, the optional ChartsPlus package extends custom charting capabilities. This client application downloads and runs on the client computer.

Setup and View a Trend

- 1. Click the Meters tab.
- 2. Navigate to and select the group and meter for the trend.

For this example, select the Electric Main Meter under the Electricity group in the Engineering subdomain.

3. Click the Trend tab.

A blank chart appears and is labeled No meter tags selected.

4. Select a time zone for the chart.

The default is the logged-in user time zone.

5. Choose a meter tag to display from the list.

M	leter	Data	1	Trer	nd		Calen	ndar T	Trend	1	Po	wer Qu	ality Events	Meter Se	etup		
				~	_												
Time	zone	(U	TC-0	6:00)	Cen	tral 1	Time	(US	& Ca	inada	a)			▼ IV SI	how grid lir	nes	Export Data
	Ê																
											No	meter	tags select	ed.			
Apr		May	2012	2	بال	un	May		June	201	2	Jul	Select a me	ter tag to dis	splay on gra	nh v	Show grid
-	Mon		Wed				_					Fri Sat	Select a me	ter tag to dis			El onow grid
29	30	1	2	3	_	_	27		29	30	31	1 2	Reactive En Reactive Po		d		
<u>6</u> 13	<u>Z</u> 14	<u>8</u> 15	<u>9</u> 16		11 1 18 1		<u>3</u> 10	4 11	<u>5</u> 12	<u>6</u> 13	<u>7</u> 14	<u>8</u> <u>9</u> <u>15</u> <u>16</u>	Real Energy Voltage Sag		13		
20	21	22	23		25 2				19	20		22 23	[voltage bag	Autor Trag	3.5		
27	28	29	30	<u>31</u>					26	27		29 30					
3	4	5	6	Z		9	1	2	3	4	G	6 Z					
-				Go													

For this example, RealEnergyNet is selected. Data is trended for the tag displayed under the chart, in the specified unit.

e zone	UTC-0	6:00)	Centra	l Time	e (US	& Car	nada)					N	Sho	w grid line	es 📃	Export	Data	
11,000,000	-	_	_			_		_	_	-			_	1			11	-
10,500,000				+								******			****			
10,000,000					- interest		1110/02/02			-							مستسر	
9,500,000						en e		1.0020			wanten a						un Perina	
9,000,000	-							i), main					~		here in the			
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7,500,000				بسمد			1-01-0100			-								
7,000,000	-	_				in all in an a												
6,500,000									17252.1	1								
5,000,000	L	1		1	1	1. 1		1.1	1		1.1		1	1.1	1.1	11	1	-
8/1	/2009			8,	/8/200	9			3/15	2009	(8/22/	2009		8/2	9/2009	_).
l <u>ul</u> Aug	just 20	09	Sep	<u>Jul</u>	1	Augus	t 200	9	<u>Sep</u>	Selec	t a met	er tag to	disp	lay on gra	ph: 🗾			
Sun Mon Tu								'hu Fri						Units Do				
<u>26 27 28</u> 2 <u>3</u> <u>4</u>	<u>29</u> <u>5</u>		31 <u>1</u> 7 8	<u>26</u> <u>2</u>	3	<u>28</u> <u>4</u>		<u>6 7</u>	<u>1</u> 8	Bar	Hide	Rem	ove			g/Electric Energy I		ic main
<u>9 10 11</u>		3750 1	<u>14 15</u>	9				<u>13 14</u>	10570									
<u>16 17 18</u>			21 22	<u>16</u>				20 21										
<u>23 24 25</u>	<u>26</u>	27	28 29	<u>23</u>	<u>24</u>	<u>25</u>	26	27 28	29									
30 31 1	2	3	4 5	<u>30</u>	<u>31</u>	1	2	3 4	5									
N. 202 - 55																		

6. Select a start and end date for the trend by using the calendars.

Or, enter the start and end dates into the data entry fields then click Go.

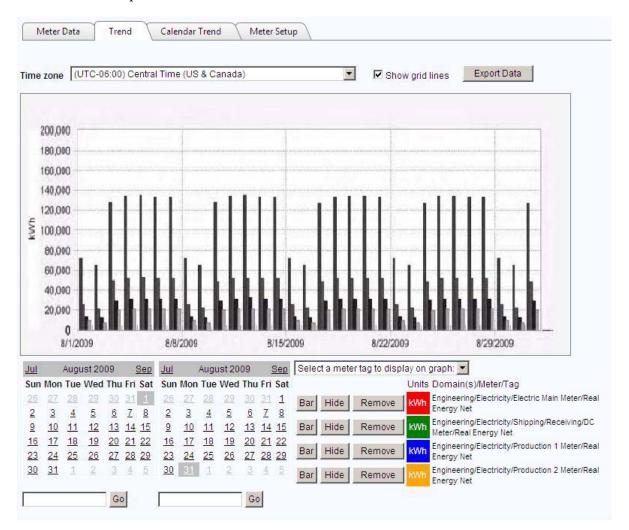
For this example, August 1, 2009 through August 31, 2009 is selected.

7. Optionally, choose another meter tag from the list.

You can view up to five tags in a standard trend chart. Trend selections are active until you log out or remove from the chart.

TIP To add a tag from another meter, navigate to and select the other meter on the meters tab, then choose a tag from its list.

For this example, electric consumption from three other production areas is selected and viewed relative to the Electric Main consumption data.



8. Choose other charting options to view, remove, and export trend data.

Click This Button	То
Hide	Temporarily hide the view of a tag on the trend chart. The tag is still selected but not visible. To view the tag again, click Show.
Bar	Display a bar chart for the selected tag. The button toggles between Bar and Line so you can choose the desired chart type for each tag.
Remove	Permanently remove a tag from the chart.
Export Data	Save the data series displayed in the chart to a .csv file.

TIP Move the mouse cursor over the trend chart until a menu bar appears. From this menu bar, you may save, print, or email the chart image.

Setup and View a Calendar Trend

The calendar trend is most commonly used to display demand-type values.

Follow these steps to view a calendar trend of meter or group data.

1. Navigate to and select a meter or group on the Meters tab.

For this example, select the Electric Main Meter under Electricity in the Engineering subdomain.

- 2. Click the Calendar trend tab.
- 3. Choose the meter tag you want to trend from the list. For this example, choose Real Power Demand.
- 4. Choose a month and year from the pull-down menus.

	Power Demand			August 🚽	Year 2009	Export D	
Augu	st 2009						
Sun	Mon	Tue	Wed	Thu	Fri	Sat	
						1	
2	3	ہمسے 4	5	6	× 17	4 8	~
	(m)	ſ		VE	11		
		V	Y	Y	Y	Im	
9	10	11	12	13	1 14	15	
	$\int $		21	$\sum \int$	1	1	
	- And and a second	yr	Y	Y	Y	Jum	m
16	17	18	19	20~~~	2 21	22	
		45	11	11	31	1	
23	24	25 Jum	. 20 Juni	27	1 28 _nur	1 29	en l
23	24	20 Junit	20 mm	27 pure	28	1 29	
	1 ·	X	11	N	NI	Y	

- 5. Zoom-in by clicking on a day in the calendar.
- 6. Optionally, select up to five days by clicking on each day, one at a time.

This allows you to view multiple days on one chart.



7. Click Export Data to save the calendar trend data series as a .csv file.

FactoryTalk EnergyMetrix Software and PowerMonitor Device Maintenance

Introduction

This chapter describes ways to maintain your power monitoring system to achieve a high level of performance on an ongoing basis.

Before You Begin

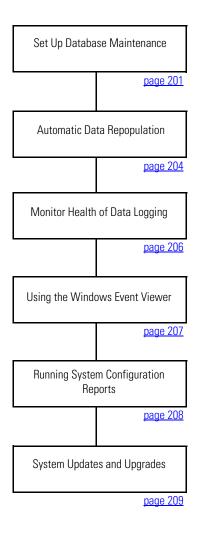
- Determine business goals, complete energy assessment, and determine monitoring methods (<u>Chapter 1</u>).
- Select hardware and wire devices (<u>Chapter 2</u>).
- Configure data collection devices (<u>Chapter 3</u>).
- Install FactoryTalk EnergyMetrix software (<u>Chapter 4</u>).
- Complete FactoryTalk EnergyMetrix software chapters (<u>Chapter 5</u> through (<u>Chapter 9</u>).

What You Need

- For FactoryTalk EnergyMetrix software updates:
 - Updated FactoryTalk EnergyMetrix software CD, catalog number 9307-FTEMMENE
 - Downloaded software updates from the Rockwell Automation website at http://www.rockwellautomation.com/support.
- For FactoryTalk EnergyMetrix software upgrades:
 - Product option license
 - Activation master disks or FactoryTalk activation data
- For PowerMonitor firmware updates:
 - RS-232-to-RS-485 converter such as B&B Electronics USOPTL4
 - Downloaded firmware update from the Rockwell Automation Knowledgebase at http://www.rockwellautomation.com/knowledgebase.

Follow These Steps

Follow this path for details on how to perform common maintenance tasks. Not all tasks will be required at all times.



Set Up Database Maintenance

FactoryTalk EnergyMetrix software connects to the Microsoft SQL database named EMMA to store configuration parameters and logged data. It is a system requirement to back up and shrink the EMMA database on a regular schedule. Backups create a record of the database so it may be restored in case of database corruption or a system crash. Regularly scheduled database backup and shrink operations control the growth of the SQL transaction log.

Many FactoryTalk EnergyMetrix software users maintain established backup and archiving procedures for business databases. FactoryTalk EnergyMetrix software does not have any unusual database maintenance requirements, so established IT database procedures will generally meet the backup needs. Rockwell Automation recommends a daily scheduled backup and shrink of the EMMA database.

If your site does not have established database administration routines, the following steps are suggested to provide a basic level of database management. Also, refer to Microsoft SQL Server documentation for database backup, shrink, and restore procedures.

Follow these steps to set up a database maintenance plan in Microsoft SQL Server 2005.

- 1. Access the FactoryTalk EnergyMetrix server and log in as an administrator.
- 2. Open Microsoft SQL Server Management Studio.
- **3.** Connect to the local server by using Windows authentication.

- 4. Open the Management folder in the tree, and select Maintenance Plans.
- 5. Right-click the Maintenance Plans folder and choose New Maintenance Plan.
- 6. Type in a name for the plan and click OK.

🖟 Connect to Serv	er		×
SQL Serv	ver.2005	Window	vs Server System
Server type:	Database Engine		~
Server name:	USMKERAMORGAN3		~
Authentication:	Windows Authenticati	on	~
User name:	NA\RAMorgan		~
Password:			
	Remember pass	word	
Conne Object Explorer		Help	Options >>
Object Explorer	- # ×	Summ	ary
Object Explorer Connect • USMKERAMC	← 부 ×	Summ	ary 2 T IIII
Object Explorer Connect • 22 =	+ + ×	Summ	ary ≇ γ IIII Mainte
Object Explorer Connect •	RGAN3 (SQL Server 9.0.1 as bjects	Summ	
Object Explorer Connect •	RGAN3 (SQL Server 9.0.1 as bjects	Summ	ary ≇ γ IIII Mainte
Object Explorer Connect USMKERAMC USMKER	RGAN3 (SQL Server 9.0.1 as bjects on nent tenance P Server Lo Server Lo Maintenance base Mail View History	Summ	ary ary Mainte USMKERAMOR
Object Explorer Connect • USMKERAMC USMKERAMC USMKERAMC Connect • USMKERAMC Connect • Connect Connect • Connect • Connect Connect • Connect •	RGAN3 (SQL Server 9.0.1 ss bjects on nent tenance P Server Loy Maintenance	Summ	ary The mainte USMKERAMOR
Object Explorer Connect USMKERAMC Database Connect Security Connect Connect	RGAN3 (SQL Server 9.0.1 as bjects on hent tenance P Server Loi Mañxenance View History buted Tre- rext Searc Refresh	Summ	ary The mainte USMKERAMOR

- SQL Server Logs
 Activity Monitor
 Database Mail
 Distributed Tran 7. In the design view, drag and drop the following from the Toolbox into the blank Back Up Database Task Bistributed Tran Full-Text Search Legacy Notification Services SQL Server Agent Backup Database on Databases: <Select one ... Type: Full Append existing Databashes: Did plan page: a Shrink Database Task Back Up Database Task ٠ Shrink Database on Destination: Disl Databases: <Select on... Limit: 50 ME Shrink Database Task **•** 0 Free space: 10 % Maintenance Plan Tasks Pointer Maintenance Cleanup Task Back Up Database Task Maintenance Cleanup Task Maintenance Cleanup on Cleanup Database Backup files Age: Older than 4 Weeks 📝 Check Database Integrity Task **.** Execute SQL Server Agent Job Task Execute T-SQL Statement Task 💃 History Cleanup Task 🐑 Maintenance Cleanup Task 🐣 Notify Operator Tasl 8. Select the Back Up Database Task box, then select the tip of the green arrow and drag it Back Up Database Task to the Shrink Database Task Box. Backup Database on Databases: <Select one ... ۵ Type: Full **9.** In the same way, connect the Shrink Shrink Database Task Append existing Database Task to the Maintenance Cleanup Shrink Database on Destination: Disk 0 Databases: <Select on... Task. Limit: 50 MB Free space: 10 % 10. Select the Back Up Database Task. 🚈 Back Up Database Task $\left[\times\right]$ a. Right-click and choose Edit. Local server connection New. Connection: b. Choose the EMMA database. Specific databas • Databases: c. Accept the remaining defaults and click OK. Backup type: Full Backup component Database O Files and filegroups Destination Disk 🔿 Tape Back up to: ○ Back up databases across one or more files: If backup files exist: Create a backup file for every database Create a sub-directory for each database C:\Program Files\Microsoft SOL Server\MSSOL.3\MSSOL\Backup Folder: ... Backup file extension: bak Verify backup integrity Cancel View T-SQL Help OK I
- 11. In the same way, choose the EMMA database in the Shrink Database Task.

Local server connection

🗟 Maintenance Cleanup Task

Connection:

- 12. Edit the Maintenance Cleanup Task.
 - a. Select the backup folder used for the backups as the search target, and enter the BAK file extension.
 - b. Select to delete files older than 1 week.
- Delete files of the following type: Backup files O Maintenance Plan text reports File location: O Delete specific file File name: Search folder and delete files based on an extension C:\Program Files\Microsoft SQL Server\MSSQL.3\MS: Folder: BAK File extension: File age: 🔽 Delete files based on the age of the file at task run time Delete files older than the following: Week(s) 1 Cancel View T-SQL Help Nok Schedule (On Demand) Not scheduled] 😱 💌 Connections. Logging. Job Schedule Properties - EMMA-Schedule - **-** × EMMA-Schedule Name: Schedule type: Recurring Enabled 📰 Job Schedule Properties - EMMA-Schedule Name: EMMA-Schedule Schedule type: 🔽 🔽 Enabled Recurring 10/26/2009 💌 Time: Frequency Occurs: Daily Recurs every: 1 🔛 day(s) Daily frequency Occurs once at: 🛿:00:00 AM 🛛 😜 O Occurs every: Starting at: Ending at: Duration 10/26/2009 O End date: Start date: No end date Summary Description: Occurs every day at 2:00:00 AM. Schedule will be used starting on 10/26/2009. Cancel QK
- Click the browse icon next to the Schedule field.
- **14.** Set up a recurring schedule to occur daily at a convenient time, then Click OK.

15. Click the Save icon to save the maintenance plan.

If notified that the SQL Agent is not

running, follow the prompts to autostart the SQL Agent.

16. When done, close SQL Management Studio.

 \mathbf{X}

New..

Emergency Transaction Log Backup and Shrink Procedure

If routine database maintenance is not performed or fails, the transaction log can become very large and in the extreme can fill the hard drive. Executing this query will back up and shrink the transaction log to correct the situation.

```
Use EMMA
DBCC SHRINKFILE (EMMA_Log, 0)
BACKUP LOG EMMA WITH TRUNCATE_ONLY
DBCC SHRINKFILE (EMMA_Log, 0)
GO
```

Run this query from Microsoft SQL Management Studio.

Automatic Data Repopulation

ADR, a standard Manager function, gathers selected data from device data logs to repopulate database gaps caused by network or server outages. ADR will not repopulate gaps in the database that are caused by loss of power to or failure of the metering devices.

ADR periodically reads data logs from the device and, inserts records in the database where no corresponding data exists. It will not overwrite existing database records.

IMPORTANT ADR is designed to help assure the integrity of data for billing, cost allocation, demand analysis and consumption reporting, such as real energy, reactive energy and demand real power. Data not contained in the device snapshot, energy or trend logs is not available for data repopulation.

Devices that Support ADR

The following devices support Automatic Data Repopulation.

Allen-Bradley PowerMonitor 5000 Unit

The PowerMonitor energy and data logs provide the source for ADR. The energy log collects a fixed collection of energy and demand parameters at a user-settable logging rate. The data log content and logging rate are user-configurable.

Allen-Bradley PowerMonitor 1000 Unit

The PowerMonitor 1000 energy log contains a predefined collection of energy, status input and demand parameters (depending on the model) logged at a user-configurable interval.

Allen-Bradley PowerMonitor 3000 Unit

All communication networks are supported. The trend log is user configurable and holds a variable number of records depending on the user configuration. The PowerMonitor 3000 unit trend log should be configured to align with parameters and logging rate of parameters being logged as meter tags.

TIP PowerMonitor 3000 unit trend log energy data is expressed with 7 digit precision while real-time energy data is expressed with 15 digit precision. For accurate reporting results when using ADR, configure the PowerMonitor 3000 energy counters to roll-over at 7 or 8 digits depending on your accuracy requirements. This option is available with master module firmware version 1.12 or higher. The rollover value in consumption meter tags must be adjusted to match the actual energy rollover value.

Allen-Bradley PowerMonitor II Unit

Remote I/O, Ethernet and serial communication are supported. The PowerMonitor II must be at firmware version 3.00 or later and set up to use either the 16 parameter or 3 and 7 parameter snapshot log.

TIP Snapshot log energy data is expressed with 7 digit precision while real-time energy data is expressed with 15 digit precision. ADR used with the PowerMonitor II may result in inaccuracies in energy consumption and billing reports, especially if the repopulated data occurs at the beginning or end of the reporting period.

Allen-Bradley PowerMonitor Unit

The power monitor's snapshot log holds up to 50 records. Remote I/O communication is supported.

Allen-Bradley MicroLogix EEM (1803-EEM) Module

The MicroLogix EEM trend log contains an accumulated energy counter and a demand value for each configured meter.

Allen-Bradley Programmable Controllers

ControlLogix, CompactLogix, MicroLogix, SLC 500, and PLC-5 controllers support ADR when programmed with specific logic. The ADR Wizard for RSLogix software is used to develop the specific logic that supports ADR.

Refer to the FactoryTalk EnergyMetrix user manual, publication <u>FTEM-UM002</u>, for details on setting up ADR.

Monitor Health of Data Logging

It is important to monitor the health of the FactoryTalk EnergyMetrix software data logging periodically. Any system may lose functionality over time due to issues with devices or communication. FactoryTalk EnergyMetrix software has status pages that provide information on the health of the system at a glance.

Device Status Page

The Device Status page provides a color-coded view of the communication status of each device in the system. To view the Device Status page, launch and log into the FactoryTalk EnergyMetrix software web page. In the System tab, click the Devices folder.

Device Status	Device Status											
Add a device Refresh												
Legend: Online	Legend: 🔜 Online 🔝 Online, not fully scanned 🔛 Online, tag error(s) 🛑 Offline 🔛 Not scanned 🔝 Disabled											
<u>1P-SW</u>	<u>2-A7</u>	<u>2D26-1</u>	<u>2D26-2</u>	<u>2F15-1</u>								
<u>2F15-2</u>	<u>2F15-3</u>	<u>2F15-4</u>	<u>2F15-5</u>	<u>3820-1</u>								
<u>3B20-2</u>	<u>3B20-3</u>	<u>3B26-1</u>	<u>3B26-2</u>	<u>3826-3</u>								
<u>3N24-E</u>	<u>3N24-W</u>	<u>3P SOUTH</u>	<u>4G28-1</u>	<u>4G28-2</u>								

Each device name is a hyperlink to a web page that provides more detail as to issues encountered by the data logger, including RSLinx error codes.

System Status Page

The System Status page provides a list of device communication errors. To view the System Status page, launch and log into the FactoryTalk EnergyMetrix software web page. Click System Status in the System tab.

A device communication error occurs when four consecutive logging intervals occur with no response from the device.

Click the device name for a new page with additional detail. Occasional communication errors occur normally and have little impact on data integrity. Sustained or frequent communication errors indicate a need to troubleshoot the network and/or device.

System S	tatus								
Active Alarm	s Alarm Log Device Comm. Err	ors Appli	cation Statistics	Logged In	Users				
Time zone (U	TC-06:00) Central Time (US & Canada)								
Eist alarms	since my last log in								
C List alarms	in last seven days								
C List alarms	in previous month								
C List alarms	in current month								
C List all alarn	15								
- di sa angina ang									
Purge All									
1.0									
Active Alarm									
Status Severit		Meter			Value	Triggered		Message	
On Info		PM3000 (M6)	on Ethernet/IP 10_			08/08/2012			Purge View
On Alarm	Test -SS	PM1000-Valid			606124888	5 06/08/2012	12:30 PM	To test Alarm Setup	Purge View
On Info	Build 17 Apparent Power Demand Alarm	PM5000 (M5)	on Ethernet/IP 10_	90_172_151	4.5	06/08/2012	12:22 PM	Test	Purge View

Daily Consumption Report

A popular method for monitoring the health of the data logger and the integrity of the facility utility systems is the daily consumption report. This is an automatically generated report that lists the consumption of each meter over the previous day. A plant engineer may receive this report in the morning email. Meters that indicate zero consumption may indicate an offline metering point (or it may indicate actual conditions in the facility). Consumption line items that are significantly higher than expected my indicate a leak or a failure of a facility subsystem, causing a waste of energy or raw material.

See <u>Chapter 9</u>, <u>FactoryTalk EnergyMetrix Software Reports and Charts</u> for procedures on setting up a daily consumption report and generating the report automatically.

Using the Windows Event Viewer

The Windows Event Viewer can be helpful in diagnosing software issues that cause performance issues in the FactoryTalk EnergyMetrix software system. Issues such as slow response, missed report output, and server errors may be attributed to the interactions between FactoryTalk EnergyMetrix software and other programs it needs, such as SQL Server, IIS, RSLinx Classic, and ASPNET.

To open the Event Viewer, follow these steps.

1. From the Windows Start menu, choose Control Panel and then launch Administrative Tools.

Your start menu setup may be different.

2. Launch the Event Viewer.

The Application and System logs can provide clues to help diagnose performance issues.

· · · · · · · · · · · · · · · · · · ·					
> ⇒ È 💽 🗳 🖧	Ê				
Event Viewer (Local)	Application 1,9	65 event(s)			
😥 Application	Туре	Date	Time	Source	Ca
Security	Information	10/26/2009	7:29:03 AM	RSLinx	No
System	Information	10/26/2009	7:28:55 AM	SQLBrowser	No
ChartsPlusLog	A Warning	10/26/2009	7:28:55 AM	SQLBrowser	No
Microsoft Office Diagnostics	Information	10/26/2009	7:28:53 AM	SQLBrowser	No
Microsoft Office Sessions	Information	10/26/2009	7:28:51 AM	SPCSUtilityService	No
	Information	10/26/2009	7:28:29 AM	RSLinx Enterprise	No
	Information	10/26/2009	7:28:28 AM	RSLinx	No
	Information	10/26/2009	7:28:24 AM	RoxSniffer	No
	Information	10/26/2009	7:28:24 AM	AlbumCore	No
	Information	10/26/2009	7:28:23 AM	RoxLiveShare	No
	Information	10/26/2009	7:28:23 AM	RoxLiveShare	No
	Information	10/26/2009	7:28:02 AM	MSSQLSERVER	(2)
	Information	10/26/2009	7:28:02 AM	MSSQLSERVER	(2)
	Information	10/26/2009	7:28:01 AM	MSSQLSERVER	(2)
	Information	10/26/2009	7:27:58 AM	MSSQLSERVER	(2)
	Information	10/26/2009	7:27:58 AM	MSSQLSERVER	(2)
	Information	10/26/2009	7:27:57 AM	MSSQLSERVER	(2)

3. To check or edit settings of a specific event log, rightclick the log name and choose Properties.

For this example, the System log was selected.

For best results, the application and system logs should be set to at least 512 MB in size, and to overwrite as needed.

System Pro	perties ?×
General Fi	ter
Display nar	ne: System
Log name:	C:\WINDOWS\system32\config\SysEvent.Evt
Size:	512.0 KB (524,288 bytes)
Created:	Wednesday, July 24, 2002 9:39:05 AM
Modified:	Friday, October 23, 2009 5:03:44 PM
Accessed:	Monday, October 26, 2009 1:45:49 PM
- Log size-	
Maximu	m log size: 512 🤮 KB
When n	naximum log size is reached:
⊙ Ove	rwrite events as needed
Ove	rwrite events older than 30 🔅 days
	not overwrite events ar log manually) Restore Defaults
🗌 Using a	low-speed connection Clear Log
	OK Cancel Apply

At times it may be helpful to restart the FactoryTalk EnergyMetrix software logger service. To restart the service, open the Windows Service Control panel, in the Administrative Tools, find the FactoryTalk EnergyMetrix Logger Service in the listing of services, and restart the service.

Running System Configuration Reports

The system configuration report documents the configuration of any or all of the FactoryTalk EnergyMetrix software objects listed in the Report Setup page. In addition, you may select all groups or an individual group/domain and its subgroups. Groups are limited to those accessible to your login role.

System configuration reports are useful in documenting the installed and configured system, and identifying details of devices, meters, and meter tags such as Device ID and Meter ID.

Efficient Industries Plant 1 / Engineering / Electricity Enabled Time Deviceld Name Device Class ADR PQ Logs Time zone Device RT sync 1 Electric Main Powermonitor 3000 (GMT-06:00) Central Time Daily \checkmark ~ ✓ (M6) on EtherNet/IP (US & Canada) Comm Comm Timout Comm Max RIO RIO Parent Device Communications Path Group (secs) Retries Msgs Alarm Rack AB ETH-1\10.10.10.0 5 2 1 Enabled Time Device Class Deviceld Name Device RT ADR PQ Logs Time zone sync (GMT-06:00) Central Time 2 Boiler House Powermonitor 1000 Daily \square (EM3) on (US & Canada) EtherNet/IP

This is an example of the Devices report run on the Efficient Industries Plant 1 project.

System Updates and Upgrades

Part of any maintenance program is keeping your software and device firmware up to date. Rockwell Automation regularly updates software and firmware to include features requested by customers, adapt to a changing software environment, and resolve issues. As your system grows and your use of it becomes more in depth, you may also need to add meter licenses or other options.

Upgrade FactoryTalk EnergyMetrix Software by Adding Meters or Product Options

Product upgrades may be purchased from your local Rockwell Automation representative. Note that FactoryTalk EnergyMetrix software is one software product with different licensing options that are enabled by installing activations. The current version of FactoryTalk EnergyMetrix software, Version 2.0, uses the EVRSI floppy-disk activation system.

Follow these steps to upgrade your system by adding options.

- 1. Purchase the desired product option from your local Rockwell Automation representative.
- 2. Locate the activation master disk in the product packaging.
- **3.** Access the FactoryTalk EnergyMetrix server. Locate the floppy disk drive, or connect to a shared floppy disk drive on another computer.
- 4. Using the Windows Services control panel, shut down all activated Rockwell Software applications.
- 5. Insert the master disk into the floppy drive.
- 6. From the Windows Start menu, drill down through All Programs>Rockwell Software>Utilities and launch Move Activation -32 bit.
- 7. Use the program to move the new activation to the hard drive of the FactoryTalk EnergyMetrix software server.
- 8. Restart the services that you stopped in an earlier step.

Update FactoryTalk EnergyMetrix Software Version

A benefit of purchasing a TechConnect support agreement on your FactoryTalk EnergyMetrix software is the ability to upgrade your software at no charge. You may download the latest major release, for example, Version 1.7, from the Rockwell Automation Software Updates web page. You will need the serial number of the registered software along with the name of the person to whom the software is registered.

TIP You need to only download one FactoryTalk EnergyMetrix software installer regardless of how many options you have installed.

Under certain circumstances you may need a service pack, for example, version 1.7 SP1, for your particular needs. Please contact Rockwell Automation technical support for access to the download site for FactoryTalk EnergyMetrix software service packs.

Follow these steps to install an update.

- 1. Write down the serial number of your FactoryTalk EnergyMetrix software. You may find this on the System Tab>About link.
- 2. Locate and write down the system administrator login for the Microsoft SQL Server. This is typically a username of 'sa' with a password. You must have this login to complete installing the update.
- **3.** Download the update installation files. Unzip the downloaded installer to a folder on the FactoryTalk EnergyMetrix software server.
- 4. Browse to the FactoryTalk EnergyMetrix subfolder and locate the file setup.exe.
- 5. Double-click setup.exe to run the program. Accept the prompt to uninstall the existing software.
- 6. After the existing version has been uninstalled, run setup.exe once again.
- 7. When prompted, accept the license agreement
- 8. When prompted, enter the serial number you wrote down in step 1.
- 9. When prompted, select the SQL server host computer (default = local) and enter the system administrator login username and password.
- 10. When installation completes, reboot the server.

Upgrade PowerMonitor Firmware

You may find the latest PowerMonitor firmware in the Rockwell Automation Knowledgebase at <u>http://</u><u>www.rockwellautomation.com/knowledgebase.</u>

You may be required to have a TechConnect agreement for access to the Knowledgebase. Please contact your local Rockwell Automation for information on available TechConnect support programs.

Search for PowerMonitor 1404 or 1408 in the Knowledgebase. Instructions and firmware upgrade files are included.

Notes:

FactoryTalk View ME Energy Faceplates

Introduction

The Energy Management toolkit provides a variety of HMI faceplates for displaying real-time energy data and device status/diagnostic information on plant floor HMI devices, such as PanelView Plus terminals and industrial computers.

	Ene	ergy View	1		
	P٥	wermo	nitor	1000	X
F	VIF	PWR	E	РН	0
ENERG	(
kWh Net	É -	1	664.9	9	
kVARh I	Net:		316.8	7	
kVAh N	et:		741.8	4	
Status 1	Count:		11		
Status 2	Count:	11			
DEMAN	D	LAS	τ	PRO	JECTED
kW Dem	and:	398.2	26	39	38.52
KVAR D	emand:	198.4	16	19	98.47
kVA Der	nand:	444.9	97	44	45.12

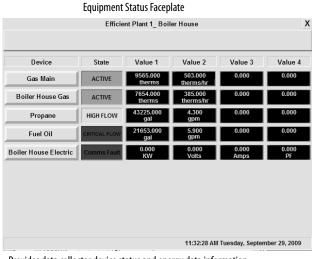
Provides real, reactive, and apparent energy, status count and demand data.

PowerMonitor 1000 Faceplate

Voltage, Current, Frequency View

×	VIF PWR		E PH		(
VOLTA	<u>GE</u>		CURRE	NT (AM	PS)
L1-L2:	502.95		L1:	532.66	
L2-L3:	501.83		L2:	533.22	
L3-L1:	503.17		L3:	532.71	
AVG:	502.65		AVG: 5		33.27
% UNBA	1:	0.5	% UNB.	AL:	0.1

Provides three phase voltage, current, and frequency information.



Provides data collector device status and energy data information.

Alarm History Faceplate



Provides date and time-stamped alarm and fault information for energy data collector devices.

Before You Begin

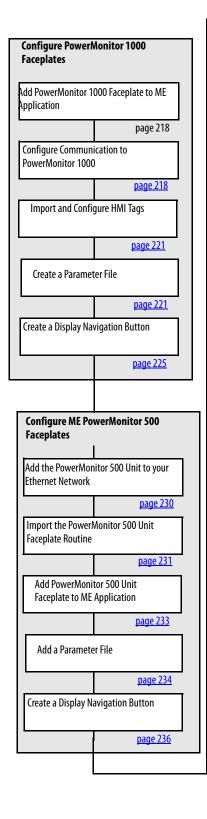
- Determine business goals, complete energy assessment, and determine monitoring methods (<u>Chapter 1</u>).
- Select hardware and wire devices (<u>Chapter 2</u>).
- Configure data collection devices (<u>Chapter 3</u>).
- Complete FactoryTalk EnergyMetrix software chapters (<u>Chapter 5</u> through (<u>Chapter 9</u>).
- FactoryTalk View Machine Edition software loaded on your personal computer.

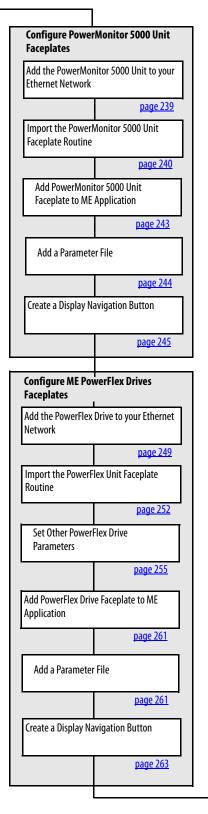
What You Need

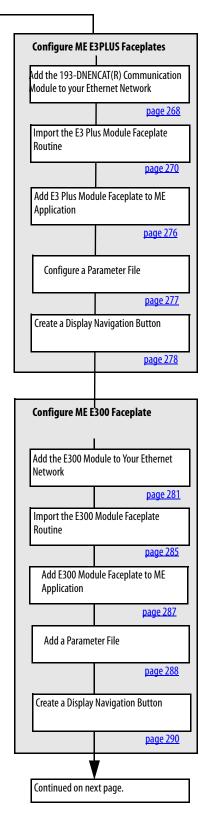
- RSLogix 5000 software, version 17 or later or Studio 5000 Logix Designer application, version 21.00 or later
- FactoryTalk View Machine Edition software, version 5.0 or later
- Energy Management Accelerator Toolkit, publication IASIMP-SP014 or visit the Integrated Architecture Tools and Resources website at <u>http://www.ab.com/go/iatools</u>
- Hardware installation and wiring complete with power applied
- FactoryTalk View ME runtime application file downloaded to the PanelView Plus terminal

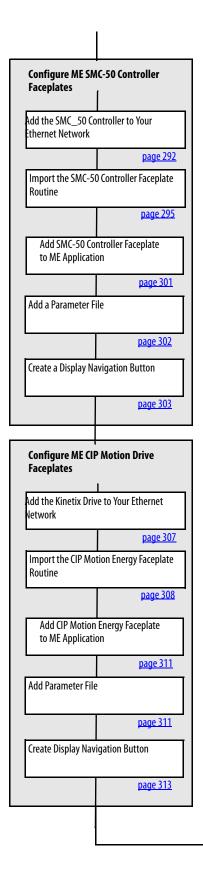
Follow These Steps

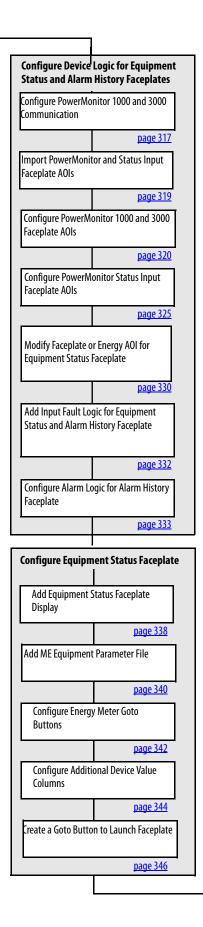
Follow these paths to run the preconfigured logic and faceplates to gain an understanding of how to use these tools in your application.

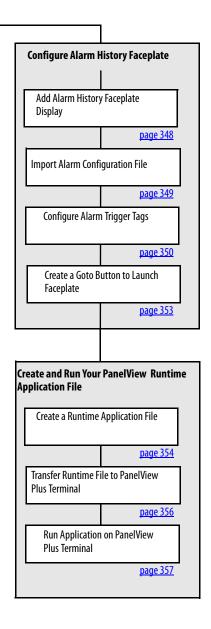








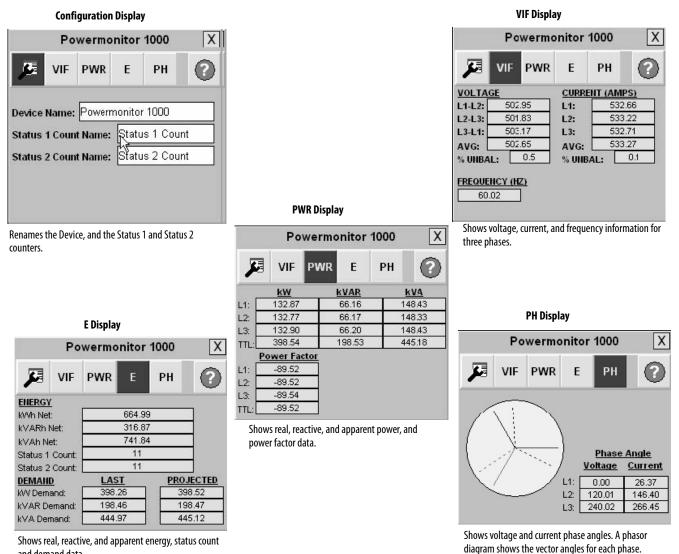




Configure PowerMonitor 1000 Faceplates

The PowerMonitor 1000 faceplate is a graphic display that you can add to your FactoryTalk View ME application. The display provides real-time data such as voltage, current, power, and energy from a PowerMonitor 1000 meter. Data is polled from a PowerMonitor 1000 meter via RSLinx Enterprise so a controller is not required. Because parameter passing has been implemented, you only have to maintain a single display for all PowerMonitor 1000 meters on a plant floor.

The PowerMonitor 1000 faceplate is compatible only with the PowerMonitor 1000 EM3 model over an Ethernet connection.

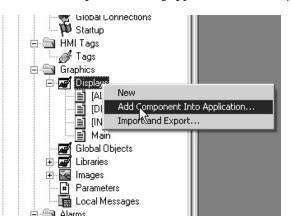


and demand data.

Add PowerMonitor 1000 Faceplate to ME Application

Follow these steps to add the PowerMonitor 1000 faceplate to a FactoryTalk View ME application.

- 1. Launch FactoryTalk View Studio for Machine Edition.
- 2. Create a new or open an existing application to which you want to add the faceplate.



3.Right-click Displays and choose Add Component Into Application.

Add Componer	t Into Project			?×
Look jn:	🗁 ME Powermonitor 1000 Fa	iceplate Files 💽	⇔ ≞ 🕆 💷•	
My Recent Documents Desktop	DMIK_FP.gfx			
My Documents				
My Computer				
My Network Places	File name: PM1K_FP Files of type: Graphic Di	splays (*.gfx; *.ggfx)	•	<u>O</u> pen Cancel

4.Browse to the ME PowerMonitor 1000 Faceplate Files folder on the Energy Management Toolkit CD image and choose PM1K_FP.gfx.

5.Select the file and click Open.

The faceplate display is added to application.

Configure Communication to PowerMonitor 1000

Follow these steps to configure RSLinx Enterprise software to communicate with the PowerMonitor 1000 meter.

1.Launch RSLinx Enterprise software.

 2. Double-click Communication Setup under RSLinx Enterprise in the Explorer window.
 Cogic and Control
 Macros
 Data Log
 Data Log Models
 RecipePlus
 RecipePlus Setup
 RecipePlus Editor
 RSLinx Enterprise

🔲 System

+

🕞 🖡 Communication Setup

×

You will see this dialog box if a communication setup does not exist.

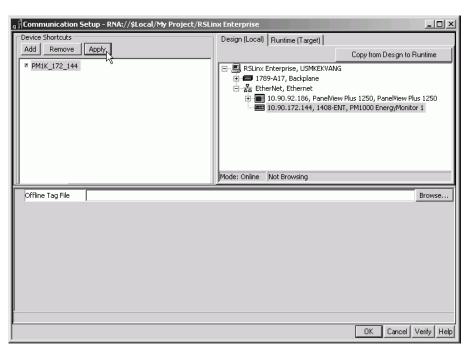
- 3. Select Create a new configuration and click Finish.
- 4. Click Add under Device Shortcuts to create a new shortcut, then rename the shortcut PM1K_172_144.

then rename the 144.	 Create a new configuration.
1 1 1.	 Copy an existing configuration from a
n Communication Setup - RNA://\$L	
Device Shortcuts Add Remove Apply PM1K_172_144	Design (Local) Runtime (Target) Copy from Design to Runtime 또 RSLinx Enterprise, USMKEKVANG 또 RSLinx Enterprise, USMKEKVANG 또 문동 EtherNet, Ethernet
	Mode: Online Not Browsing
Offline Tag File	Browse
	OK Cancel Verify Help

RSLinx Enterprise Configuration Wizard

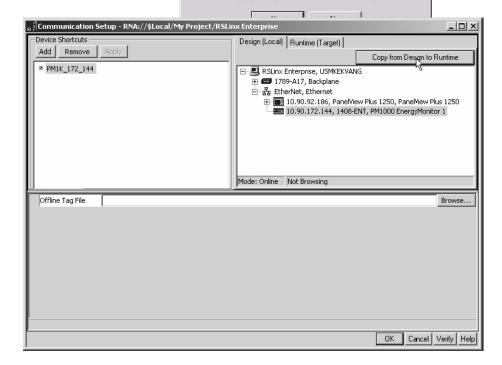
A configuration file contains information about devices, drivers, and networks. Select the source for this offline configuration file:

- 5. Write down the shortcut name, PM1K_172_44, for later use.
- 6. Click the Design Local tab.
- 7. Expand the Ethernet network and select the PowerMonitor 1000 meter.



- 8. Verify that the shortcut name is highlighted, then click Apply.
- 9. Click Yes to apply the changes when prompted.
- Click Copy from Design to Runtime to copy changes to the runtime communication setup.

You've made the following changes to the sl	hortcut 'PM1K_172_144
Design (Local) path edited - Old:	
- New: Ethernet.PM1000 EnergyMonitor 1	



The Runtime (Target) configuration and shortcut definitions will be replaced with a copy of the Design (Local) configuration and shortcut definitions.

 \times

- 11. Click Yes when prompted to continue with the copy operation.
- 12. Click OK at the bottom of the RSLinx Enterprise dialog box to save the communication setup changes.

Import and Configure HMI Tags

Do you want to continue?

RSLinx Enterprise

Because a controller is not used with the faceplate, HMI tags are required to control visibility animation and edit custom properties. You will now import the tags needed to interface with the PowerMonitor 1000 faceplate in FactoryTalk View Studio for Machine Edition.

1. From the Tools menu, choose Tag Import and Export wizard.

2. Choose Import FactoryTalk View tag CSV files from the pull-down menu, then click Next.

3. Click the ellipse icon to browse for the FactoryTalk View ME project (.med) you want to import tags into.

FactoryTalk View Studio - Machine Edition
File View Application Tools Window Help
🛒 🖳 🎒 🗋 😝 Diagnostics Setup
Explorer - My Project Diagnostics Viewer
Cocal (USMKEK) A Transfer <u>U</u> tility
ag Import and Export Wizard
Application Manager
🖻 🔄 Syste 🛛 Eirmware Upgrade Wizard
F Languages
- 🚫 E Options
Global Connections
Tag Import and Export Wizard
Select the operation you would like to perform.
Operation
Export FactoryTalk View tag database to CSV files
Export FactoryTalk View tag database to CSV files
Import FactoryTalk View tag CSV files
Merge FactoryTalk View tag database K Import A.I. Series or Logic 5 database files
Merge FactoryTalk View tag database
Merge FactoryTalk View tag database K Import A.I. Series or Logic 5 database files
Merge FactoryTalk View tag database K Import A.I. Series or Logic 5 database files
Merge FactoryTalk View tag database Import A.I. Series or Logic 5 database files Import RSLogix 5/500 Address & Symbol ASCII files
Merge FactoryTalk View tag database Import A.I. Series or Logic 5 database files Import RSLogix 5/500 Address & Symbol ASCII files
Merge FactoryTalk View tag database \backslash Import A.I. Series or Logic 5 database files Import RSLogix 5/500 Address & Symbol ASCII files Help Cancel Cancel Import and Export Wizard
Merge FactoryTalk View tag database k² Import A.I. Series or Logic 5 database files Import RSLogix 5/500 Address & Symbol ASCII files Help Cancel Year Emish
Merge FactoryTalk View tag database kš Import A.I. Series or Logic 5 database files Import RSLogix 5/500 Address & Symbol ASCII files Help Cancel Back Next> Frag Import and Export Wizard Import into. Choose the FactoryTalk View project you want to import into. Destination project
Merge FactoryTalk View tag database Import A.I. Series or Logic 5 database files Import RSLogix 5/500 Address & Symbol ASCII files Help Cancel Import and Export Wizard Choose the FactoryTalk View project you want to import into.
Merge FactoryTalk View tag database Import A.I. Series or Logic 5 database files Import RSLogix 5/500 Address & Symbol ASCII files Help Cancel Import and Export Wizard Choose the FactoryTalk View project you want to import into. Destination project
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Merge FactoryTalk View tag database Import Al. Series or Logic 5 database files Import RSLogix 5/500 Address & Symbol ASCII files Help Cancel Import and Export Wizard Choose the FactoryTalk View project you want to import into. Destination project Project type:
Merge FactoryTalk View tag database Import Al. Series or Logic 5 database files Import RSLogix 5/500 Address & Symbol ASCII files Help Cancel Import and Export Wizard Choose the FactoryTalk View project you want to import into. Destination project Project type:
Merge FactoryTalk View tag database k\$ Import A.I. Series or Logic 5 database files Import RSLogix 5/500 Address & Symbol ASCII files Help Cancel ✓ Tag Import and Export Wizard ✓ Choose the FactoryTalk View project you want to import into. ✓ Destination project Project type:

4. Select your FactoryTalk View ME project file (.med), then click Open.

Select Destination Project

Look in: 🗁 My Project

Accounts 🚞 Startup 1 ActivityLog 🗎 TAG 🔤 My Project.med 🚞 cache DLG 🗋 Gf 🗙 🛅 Global Objects 🚞 GlobalConn 🗋 Images 🚞 Information Local My Document M_Alarms Macros 🚞 PAR ProjectSettings 🚞 RecipePlus Open My Project.med • File name: • Cancel Files of type: Machine Edition Projects (*.med) Tag Import and Export Wizard × Choose the FactoryTalk View project you want to import into. Destination project Project type: Machine Edition • C:\Documents and Settings\All Users\Documents\RSView Enterprise\ME\HMI projects\My Project\My Project.med Project:) Help <u>C</u>ancel <<u>B</u>ack Next Tag Import and Export Wizard × Choose the FactoryTalk View CSV files you want to import. Import files R 🔽 Tags

Cancel

? ×

⇔ 🗈 💣 📰•

<u>N</u>ext>

<<u>B</u>ack

Finish

•

5. Click Next.

6. Click the ellipse icon to browse for PM1K_FP_HMI_tags_default.csv.

The file is in the

ME_PowerMonitor1000_Faceplates_Files folder on the Energy Management Toolkit CD.

<u>H</u>elp

7. Select PM1K_FP_HMI_tags_default.csv and Select FactoryTalk View Export File ? X click open. Look in: 🗁 Powermonitor1000 - 🖛 🗗 - 🗖 MIK_FP_HMI_tags_default.csv 2 ly Rece R PM1K_FP_HMI_tags_default.csv • NOpen File name: • FactoryTalk View Export Files (*.csv) Čancel Files of type 8. Click Next. Tag Import and Export Wizard X Choose the FactoryTalk View CSV files you want to import. Import files ✓ Tags C:\Documents and Settings\kvang\My Documents\RA\Commercial Engineering\08 -Projects\Faceplates\Powermonitor 1000 Einish <u>H</u>elp Cancel <<u>B</u>ack Next> 9. Select Skip existing, then click Next. Tag Import and Export Wizard × Choose the import options you want Import options Tags C Update existing (slower) (<u>H</u>elp) <<u>B</u>ack Einish Cancel Next> 10. Click Finish. Tag Import and Export Wiza × Click the Finish button to import the database. Source C:Vocuments and Settings\kvang\My Documents\RA\Commercial Engineering\08 - Projects\Faceplates\Powermonitor 1000\Powermonitor1000\PM1K_FP_HMI_tags_default.csv The tag folder PM1K_FP_DEFAULT should Destination: C:\Documents and Settings\All Users\Documents\RSView Enterprise\ME\HMI projects\My Project\My Project.med appear in the HMI Tags database. This folder contains the correct tags Number of lines in import files: Tags: 5 lines Alarms: 0 lines but must be renamed to the Help Cancel <<u>B</u>ack Next Einish N shortcut name PM1K_172_144 created on page 219. You cannot

rename an existing tag folder but you can create a duplicate folder and rename it.

name PM1K_172_144, then click OK.

🖙 nuntime pecunty 11. Double-click Tags to open the HMI 🖏 Diagnostics List Setup Tag database. Global Connections 🗄 📾 İMI Tags 🖉 Tagʻ 🗄 🔄 Graphics 🕅 🕂 📝 Displays 🗐 (ALARM) [DIAGNOSTICS] Ē INFORMATION 12. Select the PM1K_FP_DEFAULT tag 🞻 Lags - /My Project/ <u>_ | | ×</u> folder. Tag Close Name: Type: • Description: Ne<u>x</u>t New Data Source <u>H</u>elp Type: • Device C Memory Address: [PLC]Current_Settings.Melt_Time ... Tag Name Туре Description Search For: 1 Ē - PM1K_FP_DEFAULT ŀ • 13. Click the Duplicate Tag Folder icon in the Tag Database menu. Θ ×雷 14. Rename the folder to the shortcut Duplicate Folder ×

From: PM1K_FP_DEFAULT\

PM1K_172_144

To:

0K

Cancel

Help

- 15. Verify that the tag folder was duplicated.
- 16. Click Close to close the HMI Tag database.

Create a Parameter File

You will now create a parameter file to use when calling the faceplate display. A parameter is used to replace the shortcut name in the tags referenced on the display. This allows the use of one display for multiple PowerMonitor 1000 meters.

Follow these steps to create a parameter file.

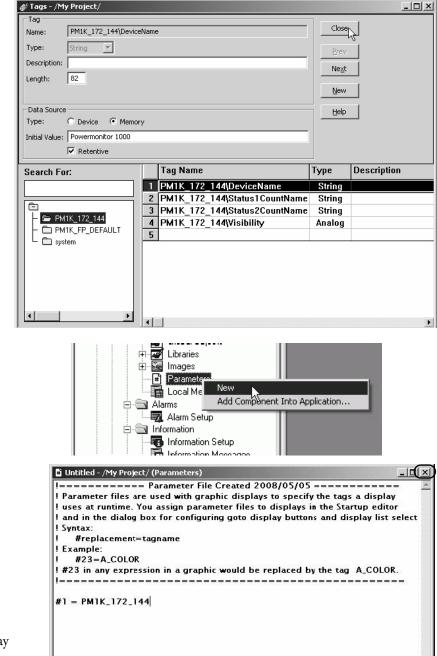
1. Right-click Parameters in the Explorer window and choose New.

- Set the parameter #1 = <device shortcut> to the shortcut name PM1K-172-144.
- 3. Click X to save and close the Parameter file.
- 4. Rename the file PM1K-172-144.

Create a Display Navigation Button

Follow these steps to create a Goto Display navigation button to launch the faceplate display.

1. Create a new or open an existing display from which you want to launch the PowerMonitor 1000 faceplate.



2. Choose Goto from the Objects>Display Navigation menu.

- 3. Draw the Goto Display push button on the display.
- 4. Double-click the Goto Display push button to configure its properties.
- 5. Click the ellipse icon under Display.

(⊠)F4	actor	yTalk '	iew Stu	dio - Mac	hine Edi	ition					
Filo	Edit	View	Objects	Arrango	Animati	ion A	pplication	Tools	Windov	v Holp	
		3	✓ Seler Rota								
		X B					山山	D 6	ર્ ્	컴마	1
Ĩ	5	A 🎖	D <u>r</u> av Push	ving n Button			104	9	क्त स) 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	
Expl		- My Pi		eric and S	tring	•		-			
	🖉 Lo	ocal (US	Displ	lay Na <u>v</u> igal	tion	•	<u>G</u> oto				
		§ My Pr I- 🅵 М		ator ge and Gra	nh		<u>R</u> eturr <u>C</u> lose	n To 🌱			
			Iren			•		/ List Se	lector		
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		÷		ort			1				
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ral Label	Con	nmon									
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Inset		-	4			_	order uses b ack color	back co	lor		
Back style	э:		1 –	attern style	:	В	order color				
Solid		•	1 1	lone	•	=	attern color ighlight colo	or			
Shape:	-	_	ī				ink				
Rectang	e	•	J								
Display set	tings –										
Display:			(
Param	eter fil	e: []			
C Param	eter lis	st [
			Top port	tion:		Loft n=	cition:				
Display		un	i ob bosi	tion: J∪		Leit po	sition: ∣∪				
Touch marg											
Horizont	al ma	irgin:	\ 0	/ertical ma	rgin:						
,			I0								
Other Audio											
			ОК	Car	ncel		Apply		Help		
		L									

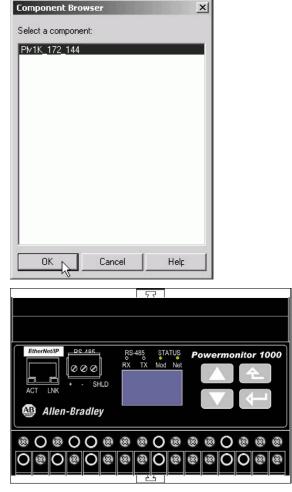
6. Select the PowerMonitor 1000 faceplate, PM1K_FP, then click OK.



7. Click the ellipse icon below Parameter file.

Goto Display Button Pr	operties			×
General Label Comm	non			
Appearance				
Border style:	Bo	order width:		
Inset	▼ 4		🔽 Border uses b	ack color
Back style:	Pε	attern style:	Back color Border color	
Solid		one 🔻	1 🗖 -	
Shape:	,		Highlight colo	r
Rectangle	-		🔲 Blink	
Display settings		\rightarrow		
Display: PM1K	FP.			
Parameter file:				
C Parameter list:				
Display position	Top posit	ion: 0	Left position:	
- Touch margins				
Horizontal marg	in: V O	'ertical margin:		
Other				
V Audio				
	ОК	Cancel	Apply	Help

8. Select the parameter file you created on page <u>225</u> and dick OK.



A bitmap image of the PowerMonitor 1000 device has been included with the PowerMonitor 1000 faceplate files. You can add this image to your project and use it as the button image if you want.

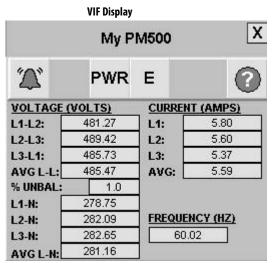
- 9. Click OK to close the Goto Display push button Properties dialog box.
- 10. Save your display and run the application to verify that the PowerMonitor faceplate works properly.
 - **TIP** If the Test Application function is used to verify faceplate operation, press the x key to escape test.

To integrate the faceplate with additional PowerMonitor 1000 meters on the plant floor, repeat all procedures under sections <u>Configure PowerMonitor 1000 Faceplates</u> starting on page <u>page 217</u> You do not have to add the faceplate display again or import the HMI tags. You just need to duplicate the default Faceplate tag folder and rename according to the shortcut name.

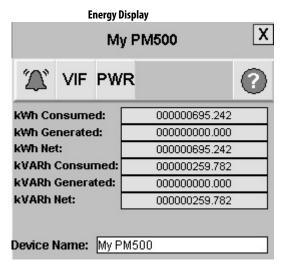
Configure ME PowerMonitor 500 Faceplates

The ME PowerMonitor 500 Faceplate files let you quickly load, configure, and use a preconfigured status display or 'faceplate' for the PowerMonitor 500 unit by using FactoryTalk View Machine Edition software.

These instructions are for the PowerMonitor 500 unit communicating over an EtherNet/IP network only.



Shows voltage, current, and frequency status.



Shows real, reactive, and apparent energy odometers. Also lets the operator configure the device name for display at the top of the faceplate.

		PWR Display	
	r	My PM500	X
Ŕ	VIF	E	0
	<u>kW</u>	kVAR	<u>kVA</u>
L1:	1.50	0.55	1.61
L2:	1.46	0.54	1.57
L3:	1.41	0.52	1.52
TTL:	4.36	1.61	4.69
Po	ower Factor	<u>r</u>	
L1:	-93.03]	
L2:	-92.93		
L3:	-93.00		
TTL:	-92.98	1	
	2	hows the power status.	



The PowerMonitor 500 unit provides two user configurable alarms (Virtual Alarm 1 and 2). The alarm display indicates when either of these alarms is active or if there is a communication fault.

Configure RSLogix5000 for the PowerMonitor 500 Unit Faceplate

Follow these procedures to configure the faceplate.

Add the PowerMonitor 500 Unit to your Ethernet Network

- 1. Create a new or open an existing RSLogix5000 software (or Studio 5000 Logix Designer application) file.
- 2. Under I/O Configuration, right-click the network communication module to be used for the intended unit.

IMPORTANT This step assumes you have already added and configured an Ethernet module to your I/O tree.

- 3. Select 'New Module'.
- 4. From the Communication pull-down menu, choose ETHERNETMODULE Generic Ethernet Module.
- 5. Enter a distinct module name and the IP Address of your power monitor.

(For example, we use 'MyPM500' for the module name throughout this document.)

6. Enter the Connection Parameters as listed in this dialog box.

Type: Vendor:	ETHERNET-MODULE Generic Et Allen-Bradley	hernet Module		
Parent: Name:	Ethernet	Connection Para	ameters	
Description:		-	Assembly Instance:	Size:
		Input	101	12 <u>+</u> (32-bit
		Output:	98	
	L Input Data - REAL	Configuration:	3	0 <u>•</u> (8-bit)
- Address / H		Status Input:		
C Host N	ame:	Status Output:		

7. Click OK.

Import the PowerMonitor 500 Unit Faceplate Routine

1. From the Controller Organizer, right-click on the program where you would like to add the power monitor faceplate routine, and choose Import Routine.

Controller Organizer	→ ‡ ×	Scope: 1 SM0
🕞 📇 Controller SMC50		
Controller Tags		Name
Controller Fault Handle	r	+ Motor_1:I
Power-Up Handler		Hotor_1:0
🖻 🔂 Tasks		<i>"</i>
😑 🔁 MainTask 😑 🚭 MainProgram	New Routine	
Program	Import Routine	
MainRout	Cut	Ctrl+X
😑 🚖 Motion Groups 🔰 🗎	Сору	Ctrl+C
Ungrouped Axes 💼	Paste	Ctrl+V
Add-On Instructions	Delete	Del

2. Navigate to the ME PowerMonitor 500 Faceplate Files folder, select the RXX_PowerMonitor500_Faceplate routine, and click Import.

Import Configuration						×
Eind Find Find Name	- <u>A</u>	Find/Replace				
Import Content:						
- 🧔 MainTask	Configure Routine	e Properties	_			
MainProgram	Import Name:	RXX_DeviceName_Faceplate				
	Operation:	Create	•	Ì		
☐ Tags Data Types		 References will be imported as configured in the References 	s folders			
Other Components Other Components Other Components	Final Name:	RXX_DeviceName_Faceplate	•	Collision Details		
	Description:	PowerMonitor 500 Faceplate v1	×			
	Type:	Ladder Diagram				
	In Program:	S MainProgram				
	Number of Rungs:	5				
				ОК	Cancel	Help
Ready						//

The Import Configuration dialog box opens.

3. Enter the name for your routine in the Final Name field.

Find: Find Final Name	-	Find/Replace
nport Content:	Configure Routine	e Properties
MainProgram	Import Name:	RXX_DeviceName_Faceplate
References	Operation:	Create
Other Components Section 2 Other Components Section 2 Other Components	Final Name:	R01_MyPM500_Faceplate
	Description:	PowelMonitor 500 Faceplate
	Туре:	I Ladder Diagram
	In Program:	🕞 MainProgram
	Number of Rungs:	5

4. In the Import Content organizer, select tags.

The Configure Tag References dialog box opens.

5. Replace _DeviceName in the Final Name with the name of your device.

Import Configuration Import Configuration Import Configuration Find: Find Within: Final Name	¥	A A Find/I	Replace					
nport Content:	onfia	ure Tag Reference	25	1				
MainProgram		Import Name	Operation		Final Name	۵ 😭	Alias F	Data Typ
R01_MyPM500_Facep	IJ	_DeviceName	Create	J	_DeviceName_FP			EEO_FP
	IJ	_DeviceName	Create	1	_DeviceName_FP_AlarmMSG			MESSAG
🔤 🛗 Data Types	ß	_DeviceName	Create		_DeviceName_FP_MSG1			MESSAG
🔄 🔄 🖸 Other Components	9	_DeviceName	Create	1	_DeviceName_FP_MSG2			MESSAG
- 🔯 Errors/Warnings	9	_DeviceName	Create		_DeviceName_FP_MSG3			MESSAG
	1	⊞_DeviceName	Create		_DeviceName_Inst101			REAL[12]
	9	E_DeviceName	Create	1	_DeviceName_Inst102			REAL[18]
	9	E DeviceName	Create	1	DeviceName Inst107		/	REAL[18]

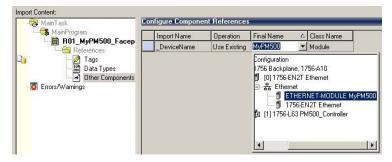
For the 'MyPM500' example, the Final Names are renamed to the following:

de main doit	Config	ure Tag Reference	es	1				
		Import Name	Operation	1D	Final Name	۲ ۵	Alias F	Data Type
R01_MyPM500_Facep	1	DeviceName	Create	1	MyPM500_FP			EEO_FP
	9	_DeviceName	Create		MyPM500_FP_AlarmMSG			MESSAGE
Data Types	1	_DeviceName	Create	1	MyPM500_FP_MSG1			MESSAGE
🚩 🔄 🔤 🖓 🕹 🛃 👻	1	_DeviceName	Create	1	MyPM500_FP_MSG2			MESSAGE
Errors/Warnings	9	_DeviceName	Create		MyPM500_FP_MSG3			MESSAGE
	9		Create	1	MyPM500_Inst101			REAL[12]
	1	E_DeviceName	Create	1	MyPM500_Inst102			REAL[18]
	1	□	Create	V	MyPM500_Inst107		/	REAL[18]

6. In the Import Content organizer, select Other Components.

The communication path can be set for all messages by selecting the device from the I/O configuration drop-down in the Component References.

7. Click OK.



The new Routine appears in the Controller Organizer in the selected program.



8. Add a JSR to your main routine, or other desired location, to execute the new routine.



Configure FactoryTalk View ME for the PowerMonitor 500 Unit Faceplate

Follow these procedures to configure the faceplate.

Add PowerMonitor 500 Unit Faceplate to ME Application

- 1. Launch FactoryTalk View Studio software and create or open an existing application file.
- 2. In the Graphics folder, right-click on Displays and choose 'Add Component Into Application'.

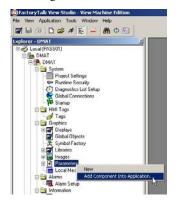


3. Navigate to the ME PowerMonitor 500 Faceplate Files folder, select the PowerMonitor500_Faceplate, and click Open.

ganize 👻 New folder				浦 • 🗆 🛛
Favorbes	Name -	Date modified	Туре	
Cesktop	PowerHonitor500_Faceplate.gfx	4/16/2014 10:19 PM	GFX File	
bownloads				
Recent Places				
Libraries				
Documents				
Nusic				
Notures 1				
Wideos				No preview available
PA5501				
Local Disk (C-)				
Local Dek (D-)				
RAJELES (F:)				
Network				
SAS-PC				
	-	1	21	

Add a Parameter File

1. Right-click on Parameters, and choose 'Add Component Into Application'.

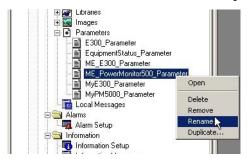


 Navigate to the ME PowerMonitor 500 Faceplate Files folder, select the ME_PowerMonitor500_Parameter.par file, and click Open.



Configure a Parameter File

1. From the explorer window in FactoryTalk View Studio, in the Parameters folder, right-click the ME_PowerMonitor500_Parameter.par file, and choose Rename.



2. Rename the parameter file with the name of the corresponding device in your RSLogix500 application.

For example, MyPM500_Parameter.

Renam	ie	
From:	ME_PowerMonitor500_Parameter	ОК
To:	MyPM500_Parameter	Cancel

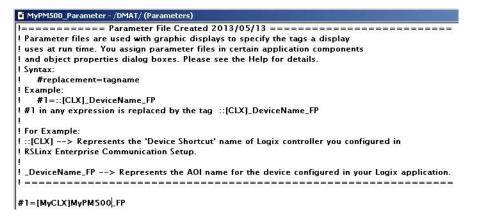
3. Double-click the parameter file to open it.

Parameter #1 represents the tag name for the specific Faceplate tag in your RSLogix 5000 project. Each tag contains a controller shortcut name in brackets. This matches the shortcut name created in your RSLinx Enterprise communication setup.



 For parameter #1, change the shortcut name [CLX] to match your communication setup and DeviceName to match the tag configured in your RSLogix5000 project.

For the MyPM500 example, the configuration looks like the following:

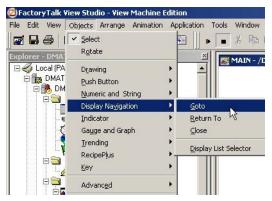


- 5. Save your parameter file.
- 6. To add parameter files for additional power monitors:
 - a. Right-click on the parameter file that you just created and choose Duplicate.
 - b. Rename the file with the new device name.
 - c. Open the parameter file and configure the tag to match the associated device.

Create a Display Navigation Button

A display navigation button must be created to launch the PowerMonitor Faceplate at runtime. This can be drawn over an existing graphic object that represents the device you intend to monitor/control or it can be configured to use a bitmap image as the display.

1. From the display where you want to launch the faceplate (can be a new or an existing display), choose Objects > Display Navigation > Goto.



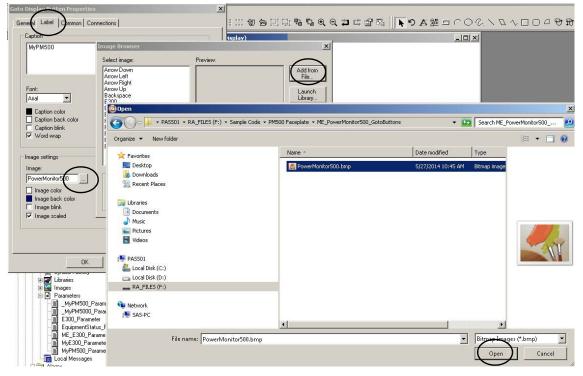
- 2. Draw the Goto button rectangle.
- 3. Double-click the new Goto rectangle to configure the button properties.
 - a. Modify the appearance as desired for your application (for example, choose Transparent as the Back style if you are drawing the Goto button over an existing object on your display).
 - b. Click the ellipse next to the Display field and assign the PowerMonitor500_Faceplate display.
 - c. Click the ellipse next to the Parameter file field and assign the PowerMonitor parameter file you created earlier for this intended device.

Border style:	Border width:	
Raised	- 4	Border uses back colo
Back style:	Pattern style:	Back color
Solid	None	Border color
Shape:		Highlight color
Rectangle	-	🔲 Blink
Display position		Left position: 0
 Display position Use Variable Disp 	· · · ·	
	· · · ·	

- 4. Follow these steps to use a bitmap image with the button.
 - a. Click the Label Tab and click the ellipse next to the Image field.
 - b. Click Add from File and select the PowerMonitor500 Bitmap Image located in the ME PowerMonitor 500 Faceplates Files folder.

IMPORTANT You only need to add the image from File the first time you use the image. Once added, the image can be selected from the image list.

- c. Click Open to add the image then OK to close the Image Browser window.
- d. Add text in the Caption field if desired.



e. Click OK to close the Goto button properties window.

This is an example of a final goto button on your display.

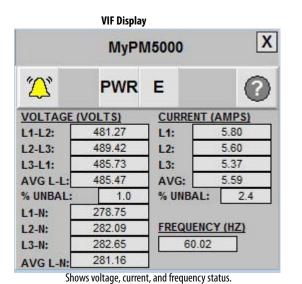


5. To support additional PowerMonitor 500 devices, create a new Goto display navigation button, assign the PowerMonitor500 faceplate display, and assign a unique parameter file associated with the additional device.

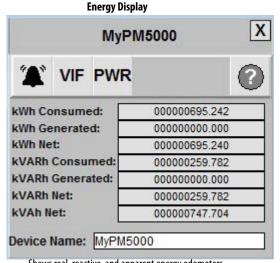
Configure PowerMonitor 5000 Unit Faceplates

The ME PowerMonitor 5000 Faceplate files lets you quickly load, configure, and use a preconfigured status display or 'faceplate' for the PowerMonitor 5000 using FactoryTalk View Machine Edition.

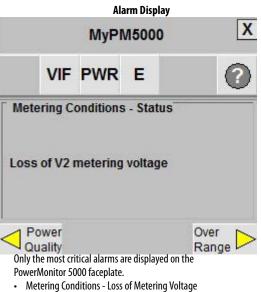
These instructions are for PowerMonitor 5000 units communicating over the EtherNet/IP network only.



PWR Display Х MyPM5000 N VIF ? E kW **kVAR kVA** 1.50 0.55 1.61 L1: 1.46 0.54 1.57 L2: L3: 1.41 0.52 1.52 4.36 1.61 4.69 TTL Power Factor Phase Rotation -93.03 ABC L1: -92.93 L2: -93.00 L3: -92.98 TTL Shows the power status.



Shows real, reactive, and apparent energy odometers. Also lets the operator configure the device name for display at the top of the faceplate.



- Over Range Voltage/Ampere Over Range Power Quality - Sag/Swell Detected

Configure RSLogix5000 for the PowerMonitor 5000 Unit Faceplate

Follow these procedures to configure the faceplate.

Add the PowerMonitor 5000 Unit to your Ethernet Network

- 1. Create a new or open an existing RSLogix5000 file.
- 2. Under I/O Configuration, right-click the network communication module to be used for the intended drive.

IMPORTANT This step assumes you have already added and configured an Ethernet module to your I/O tree.

- 3. Select 'New Module'.
- 4. Select the PowerMonitor 5000 unit and click OK.

er Search Text for Module Ty	Clear Filters		Show Filters ¥
talog Number	Description	Vendor	Category
1336T-FORCEDriveCNA	AC Drive, ControlNet Adapter via 1203-EN1	Allen-Bradley	Drive
1336T-FORCEDrivePLC	AC Drive, PLC Comm Adapter via 1203-EN1	Allen-Bradley	Drive
1336T-FORCEDriveStd-E	AC Drive, Standard Adapter via 1203-EN1	Allen-Bradley	Drive
1397DigitalDCDrive-EN1	DC Drive via 1203-EN1	Allen-Bradley	Drive
1426-M5E-A	PowerMonitor 5000	Allen-Bradley	PowerMonitor 500
150 SMC Flex-E	Smart Motor Controller via 20-COMM-E	Allen-Bradley	Drive
150-SMCDialogPlus-EN1	Smart Motor Controller via 1203-EN1	Allen-Bradley	Drive
1557	1557 Medium Voltage AC Drive	Allen-Bradley	SCANport Drives
1715-AENTR	1715 Ethemet Adapter, Twisted Pair Media	Allen-Bradley	Communication
1732E-12X4M12QCDR	12 Point Input/4 Point Output 24V DC Quick Connect	Allen-Bradley	Digital
1732E-16CFGM12	EtherNet/IP 16 Point Self-configuring 24VDC	Allen-Bradley	Digital
1732E-16CFGM12QCR	16 Point 24V DC Self-Configuring Quick Connect, 2-Port	Allen-Bradley	Digital
1732E-16CFGM12QCWR	16 Point 24V DC Self-Configuring Quick Connect Weld	Allen-Bradley	Digital
1700E 100EGM10D	16 Daint 241/ DC Solf Canfin vine 2 Dat	Allon Dendlar	Diał-I
	talog Number 1336T-FORCEDrivePLC 1336T-FORCEDrivePLC 1336T-FORCEDriveStd-E 1337DigitalDCDrive-EN1 1426:MBE/A 150 SMC Rex-E 150 SMC DialogPlus-EN1 1557 1715-AENTR 1732E-18CFGM120CR 1732E-18CFGM120CR	talog Number Description 1336T-FORCEDriveCIA AC Drive, ControlNet Adapter via 1203-EN1 1336T-FORCEDriveFLC AC Drive, PLC Comm Adapter via 1203-EN1 1336T-FORCEDriveStd-E AC Drive, Standard Adapter via 1203-EN1 1337DigtalDCDrive-EN1 DC Drive via 1203-EN1 1337DigtalDCDrive-EN1 DC Drive via 1203-EN1 1357DigtalDCDrive-EN1 Smart Motor Controller via 200-COMM-E 150-SMCDialogPlus-EN1 Smart Motor Controller via 200-COMM-E 1557 1557 Medium Volsage AC Drive 1735-ENTR 1715 Ethemet Adapter, Twisted Pair Media 1732E-152KM12QCDR 12 Point Input/4 Point Output 24V DC Quick Connect 1732E-16CFGM12QC 16 Point 24V DC Self-Configuing Quick Connect 1732E-16CFGM12QCRR 16 Point 24V DC Self-Configuing Quick Connect 1732E-16CFGM12QCUR 16 Point 24V DC Self-Configuing Quick Connect 1732E-16CFGM12QCUR 16 Point 24V DC Self-Configuing Quick Connect	Lalog Number Description Vendor 1336T+FORCEDriveCIA AC Drive, ControlNet Adapter via 1203-EN1 Allen-Bradley 1336T+FORCEDriveCIA AC Drive, ControlNet Adapter via 1203-EN1 Allen-Bradley 1336T+FORCEDrivePLC AC Drive, Standard Adapter via 1203-EN1 Allen-Bradley 1336T+FORCEDrivePLC AC Drive, Standard Adapter via 1203-EN1 Allen-Bradley 1337DigtalDCDrive-EN1 DC Drive via 1203-EN1 Allen-Bradley 1325M5F6A RowerMonitor 5000 Allen-Bradley 150 SMC Plex-E Smart Motor Controller via 1203-EN1 Allen-Bradley 155.7 15557 Smart Motor Controller via 1203-EN1 Allen-Bradley 1715-AENTR 1715 Ethernet Adapter, Twisted Pair Media Allen-Bradley 1732E-162KM12QCDR 12 Point Input/4 Point Output 24V DC Guick Connect Allen-Bradley 1732E-162KM12QCWR 16 Point 24V DC Self-Configuring Quick Connect Allen-Bradley 1732E-162KM12QCWR 16 Point 24V DC Self-Configuring Quick Connect Allen-Bradley 1732E-162KM12QCWR 16 Point 24V DC Self-Configuring Quick Connect Allen-Bradley 1732E-162KM12QCWR 16 Point 24V D

5. Enter a distinct module name and the IP Address of your power monitor.

(For example, we use 'MyPM5000' for the module name throughout this document.)

General*	Connection	Module Info	Configuration	Parameters	Internet Protocol	Port Configuration	n
Type: Vendor: Parent:		-M5E-A Poweri Bradley	Monitor 5000				
Name: Descripti		M5000			* © I	met Address Private Network: P Address: Host Name:	192.168.1.
Revisi Electro		2.30 Compatible N PM5000 Exc	lodule Ilusive Owner C	Connection Chang	Je		

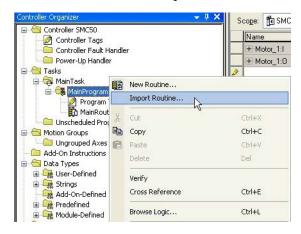
- 6. Click Change to launch the Module Definition window.
- 7. Select the firmware of the device you are using.

sion:	2 - 30 -
ronic Keying:	Compatible Module
ections:	
lame	
M5000 Exclusive	e Owner Connection

- 8. Click OK to accept the changes.
- 9. Click OK again to close the dialog.

Import the PowerMonitor 5000 Unit Faceplate Routine

1. From the Controller Organizer, right-click on the program where you would like to add the power monitor faceplate routine, and choose Import Routine.



2. Navigate to the ME PowerMonitor 5000 Faceplate Files folder, select the RXX_PowerMonitor5000_Faceplate routine, and click Import.

The Import Configuration dialog box opens.

Import Configuration			_	
문 및 Find: Find Within: Final Name	- #A	Find,Replace		
Import Content:				
RainTask	Configure Routine	e Properties		
MainProgram	Import Name:	RXX_DeviceName_Faceplate		
Réferènces	Operation:	Use Existing	*	
Tags Data Types		References will be imported as configured in the References I	folders	
Other Components Errors/Warnings	Final Name:	RXX_DeviceName_Faceplate	✓ Collsion Details)	
	Description:	PowerMonitor 5000 Faceplate v01		
			-	
	Type:	📔 Ladder Diagram		
	In Program:	AainProgram		
	Number of Rungs:	5		
• [
				OK Cancel Help
Ready				

3. Enter the name for your routine in the Final Name field.

Import Content:			
MainTask	Configure Routine	Properties	
MainProgram	Import Name:	RXX_DeviceName_Faceplate	
References	Operation:	Create	- D
Tags		i References will be imported as configured in the <u>Refer</u> ences folde	rs
Other Components	Final Name:	R01_MyPM5000_Faceplate	Properties
	Description:	PowerMonitor 5000 Faceplate v01	*
			-
	Type:	🗎 Ladder Diagram	
	In Program:	S MainProgram	
	Number of Rungs:	5	

4. In the Import Content organizer, select tags.

The Configure Tag References dialog box opens.

5. Replace _DeviceName in the Final Name with the name of your device.

Find: Find Within: Final Name		Find/Replace				
Content:						
MainTask	Configu	re Tag References		(
MainProgram	П	Import Name	Operation .	Final Name	۲ 🗠	Data Type
References	9	_DeviceName_FP	Use Existing	_DeviceName_FP	•••	EEO_FP
	1	_DeviceName_FP_AlarmMSG	Use Existing	_DeviceName_FP_AlarmMSG		MESSAGE
<mark>@ Tags</mark> 	1	DeviceName_FP_EEO	Use Existing	_DeviceName_FP_EEO		EEO
Other Components	1	_DeviceName_FP_MSG1	Use Existing	_DeviceName_FP_MSG1		MESSAGE
Errors/Warnings	1	_DeviceName_FP_MSG2	Use Existing	_DeviceName_FP_MSG2		MESSAGE
	1	_DeviceName_FP_MSG3	Use Existing	_DeviceName_FP_MSG3		MESSAGE
				1		

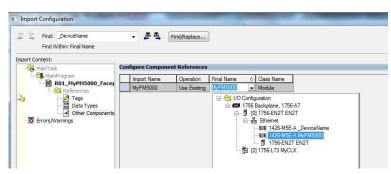
For the 'MyPM5000' example, the Final Names are renamed to the following:

Find: _DeviceName	*	Find/Replace		_		`	
ort Content:			(
MainTask	Configu	re Tag References					
R01_MyPM5000_Facer	-	Import Name DeviceName FP	Operation Create		Final Name MyPM5000 FP		Data Type EEO FP
References	9	_DeviceName_FP_AlarmMSG	Create	1	MyPM5000_FP_AlamMSG		MESSAGE
Tags	Ű	DeviceName_FP_EEO	Create	Ē	MyPM5000 FP EEO		EEO
Other Components	Ĩ	_DeviceName_FP_MSG1	Create		MyPM5000_FP_MSG1		MESSAGE
- 🐼 Errors/Warnings	9	_DeviceName_FP_MSG2	Create		MyPM5000_FP_MSG2		MESSAGE
	-	DeviceName_FP_MSG3	Create		MyPM5000_FP_MSG3		MESSAGE

6. In the Import Content organizer, select Other Components.

The communication path can be set for all messages by selecting the device from the I/O configuration drop-down in the Component References.

7. Click OK.



The new Routine appears in the Controller Organizer within the selected program.



8. Add a JSR to your main routine, or other desired location, to execute the new routine.

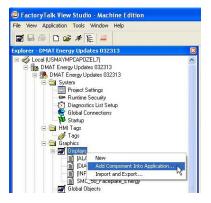


Configure FactoryTalk View ME for the PowerMonitor 5000 Unit Faceplate

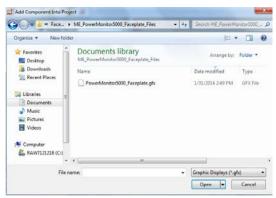
Follow these procedures to configure the faceplate.

Add PowerMonitor 5000 Unit Faceplate to ME Application

- 1. Launch FactoryTalk View Studio software and create or open an existing application file.
- 2. In the Graphics folder, right-click on Displays and choose 'Add Component Into Application'.

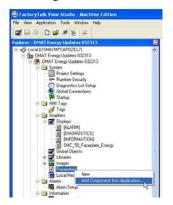


3. Navigate to the ME PowerMonitor 5000 Faceplate Files folder, select the PowerMonitor5000_Faceplate, and click Open.



Add a Parameter File

1. Right-click on Parameters, and choose 'Add Component Into Application'.



2. Navigate to the ME PowerMonitor 5000 Faceplate Files folder, select the ME_PowerMonitor5000_Parameter.par file, and click Open.

Configure a Parameter File

- 1. From the explorer window in FactoryTalk View Studio, in the Parameters folder, right-click the ME_PowerMonitor5000_Parameter.par file, and choose Rename.
- 2. Rename the parameter file with the name of the corresponding device in your RSLogix5000 application.
- 3. For example, MyPM5000_Parameter.
- 4. Double-click the parameter file to open it.

Parameter #1 represents the tag name for the specific Faceplate tag in your RSLogix 5000 project. Each tag contains a controller shortcut name in brackets. This matches the shortcut name created in your RSLinx Enterprise communication setup.



5. For parameter #1, change the shortcut name [CLX] to match your communication setup and DeviceName to match the tag configured in your RSLogix5000 project.

For the MyPM5000 example, the configuration would look like the following:

```
      I====== Parameter File Created 2013/05/13 ======

      I Parameter files are used with graphic displays to specify the tags a display

      I uses at run time. You assign parameter files in certain application components

      I and object properties dialog boxes. Please see the Help for details.

      I Syntax:

      # replacement=tagname

      ! Example:

      I #1=::[CLX]DeviceName_FP

      ! #1 in any expression is replaced by the tag :::[CLX]DeviceName_FP

      !

      ! :::[CLX] --> Represents the 'Device Shortcut' name of Logix controller you configured in

      ! RSLinx Enterprise Communication Setup.

      !

      !

      ! DeviceName_FP --> Represents the AOI name for the device configured in your Logix application.

      !

      !

      !

      !

      !

      !

      !

      !

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      !

      !

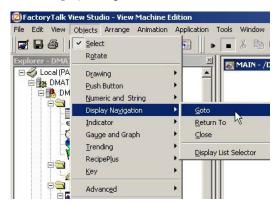
      !
```

- 6. Save your parameter file.
- 7. To add parameter files for additional power monitors:
 - a. Right-click on the parameter file that you just created and choose Duplicate.
 - b. Rename the file with the new device name.
 - c. Open the parameter file and configure the tag to match the associated device.

Create a Display Navigation Button

A display navigation button must be created to launch the PowerMonitor Faceplate at runtime. This can be drawn over an existing graphic object that represents the device you intend to monitor/control or it can be configured to use a bitmap image as the display.

1. From the display where you want to launch the faceplate (can be a new or an existing display), choose Objects > Display Navigation > Goto.



2. Draw the Goto button rectangle.

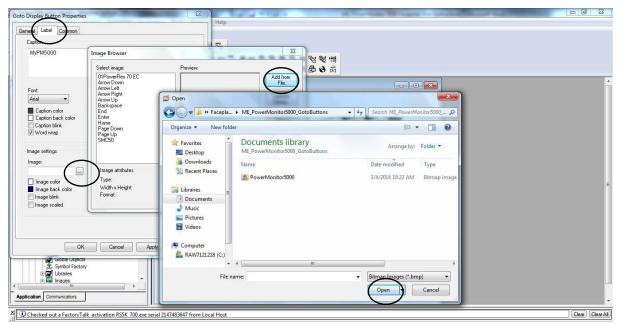
- 3. Double-click the new Goto rectangle to configure the button properties.
 - a. Modify the appearance as desired for your application (for example, choose Transparent as the Back style if you are drawing the Goto button over an existing object on your display).
 - b. Click the ellipse next to the Display field and assign the PowerMonitor5000_Faceplate display.
 - c. Click the ellipse next to the Parameter file field and assign the PowerMonitor parameter file you created earlier for this intended device.

	non	
Appearance		
Border style:	Border width:	
Raised	▼ 4	📝 Border uses back color
Back style:	Pattern style:	Back color
Solid		Border color Pattern color
Shape:		Highlight color
	_	🕅 Blink
Rectangle	_	
Parameter file:	Ionitor5000_F	
 Parameter file: Parameter list: Display position 		Left position:
O Parameter list:	MyPM5000	
 Parameter list: Display position Touch margins 	MyPM5000 Top position:	
Parameter list:	MyPM5000 Top position:	
 Parameter list: Display position Touch margins Horizontal marging 	MyPM5000 Top position: Uertical margin:	
 Parameter list: Display position Touch margins Horizontal margin 0 	MyPM5000 Top position: Uertical margin:	

- 4. Folow these steps to use a bitmap image with the button.
 - a. Click the Label Tab and click the ellipse button next to the Image field.
 - b. Click Add from File and select the PowerMonitor5000 Bitmap Image located in the ME PowerMonitor 5000 Faceplates Files folder.

IMPORTANT You only need to add the image from File the first time you use the image. Once added, the image can be selected from the image list.

- c. Click Open to add the image then OK to close the Image Browser window.
- d. Add text in the Caption field if desired.



e. Click OK to close the Goto button properties window. This is an example of a final goto button on your display.



To support additional PowerMonitor 5000 devices, create a new Goto display navigation button, assign the PowerMonitor5000 faceplate display, and assign a unique parameter file associated with the additional device.

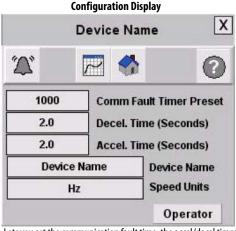
Configure ME PowerFlex Drives Faceplates

The ME PowerFlex[®] Faceplates files let you quickly load, configure, and use preconfigured status, control, and diagnostic displays or 'faceplates' for the PowerFlex family of drives using RSView Machine Edition software.

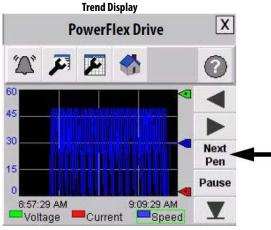
These instructions are for PowerFlex drives communicating over the EtherNet/IP network only.



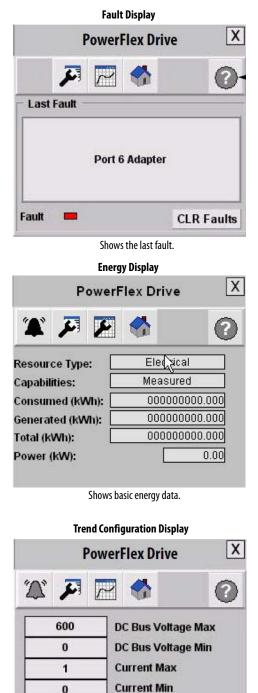
Shows status and provides operator control of the drive.



Lets you set the communication fault time, the accel/decel times, and rename the device for display at the top of the faceplate.



Press Next Pen to shift between the voltage, current, and speed trends.



Lets you set the minimum and maximum values of the trend scale.

Speed Max

Speed Min

60

0

Configure RSLogix5000 for the PowerFlex Drive Faceplate

Follow these procedures to configure the faceplate.

Add the PowerFlex Drive to your Ethernet Network

- 1. Create a new or open an existing RSLogix5000 file.
- 2. Under I/O Configuration, right-click the network communication module to be used for the intended drive.

IMPORTANT This step assumes you have already added and configured an Ethernet module to your I/O tree.

- 3. Select 'New Module'.
- 4. Expand the Drives folder and select the appropriate PowerFlex drive module and click OK.

odule	Description	Vendor	
PowerFlex 40P-E	AC Drive via 22-COMM-E	Allen-Bradley	1
PowerFlex 70 EC-E	AC Drive via 20-COMM-E	Allen-Bradley	
PowerFlex 70-E	AC Drive via 20-COMM-E	Allen-Bradley	
PowerFlex 400-E	AC Drive via 22-COMM-E	Allen-Bradley	
PowerFlex 400P-E	AC Drive via 22-COMM-E	Allen-Bradley	
PowerFlex 700 AC	E Active Converter via 20-COMM-E	Allen-Bradley	
- PowerFlex 700 Vec	tor 208/240V AC Drive via 20-COMM-E	Allen-Bradley	
- PowerFlex 700 Vec	tor 400/480V AC Drive via 20-COMM-E	Allen-Bradley	
- PowerFlex 700 Vec	tor 600V AC Drive via 20-COMM-E	Allen-Bradley	
PowerFlex 700-20	V-E 208/240V AC Drive via 20-COMM-E	Allen-Bradley	
PowerFlex 700-40	0V-E 400/480V AC Drive via 20-COMM-E	Allen-Bradley	
PowerFlex 700-60	V-E 600V AC Drive via 20-COMM-E	Allen-Bradley	
PowerFlex 700AFE	-E Active Front End Converter via 20-COMM-E	Allen-Bradley	
PowerFlex 700H-E	AC Drive via 20-COMM-E	Allen-Bradley	
PowerFlex 700PC-	E 400/480V AC Drive via 20-COMM-E	Allen-Bradley	
imi			>
		_	Find Add Favorite
By Category By 1	/endor Favorites		

5. Enter a distinct module name and the IP Address of your drive.

(For example, we use 'Motor_1' for the module name throughout this document.)

IMPORTANT The IP address must match with that of your 20-COMM-E module. This step assumes you already assigned an IP address to your 20-COMM-E module. Refer to the PowerFlex 20-COMM-E EtherNet/IP Adapter User Manual, publication 20COMM-UM010, for information on how to assign it an IP address.

General* Con	nection M	todule Info	Port Configuration	Drive	
Type: Vendor: Parent:	PowerFl Allen-Bra Ethernet	adley	AC Drive via 20-COI	MM-E	Ethernet Address
Na <u>m</u> e:	Motor_1				⊙ P <u>r</u> ivate Network: 192.168.1. 101
Descri <u>p</u> tion:			× ×		O IP Address:
Module Defi	inition				
Series: Revision:		5.1	Change		
Electronic K			atible Module		
Connection: Data Format		Paran Paran	neters via Datalinks neters		

- 6. Click Change to launch the Module Definition window.
- 7. Select the firmware of the device you are using.

IMPORTANT If the firmware revision of your drive is not listed, refer to the lower left corner of the Module Definition window for instructions on how to create a database.

Revision:	5 💙 1	🐱 Datalini	Input Data		Output Data	
			DriveStatus		DriveLogicRst	
Electronic <u>K</u> eying:	Compatible Module	×	OutputFreq		CommandedFreq	
DI DV					Use Network Ref	erence
Drive Rating:	208V 2.5A		AccelTime1 - 140	~	AccelTime1 - 140	~
			DecelTime1 - 142	~	DecelTime1 - 142	~
		▼ B	Fault1Code - 243	~	Undefined_B1	~
			DCBusVoltage - 12		Undefined_B2	×
			OutputCurrent - 3	~	Undefined_C1	×
			OutputCurrent - 3		Undefined_C2	~
		D				
Data Format:	Parameters	~	Sort Input/Output	selectio	n lists by Parameter Na	ame
 click Web Update the web if drive is of 	r drive is not listed: nase button below if drive is o to download the database fr offline. nd upload the configuration of a	om	Sort Input/Dutput DANGER: Unexpected, H when improperly using sol Parameter names selecte member names in the driv necessary Datalink paran data transfer between col parameters. You must download confi controller, drive and comm	iazardoi itware to d for the e Modu neters in ntroller a guration	us motion of machinery o configure a drive. Input and Output Dat Ie-Defined Data Types the RSLogix 5000 pro and drive is determined to the drive to ensure	rmay occ a appear and defi ject. Actu I by Datal that the

8. Enter the DataLink Module Definitions exactly as shown for your specific PowerFlex drive.

IMPORTANT The datalinks listed must be configured exactly as shown for successful faceplate AOI import and operation. If additional datalinks are required for your application, modifications to the corresponding AOIs are required. See <u>Set Other PowerFlex Drive Parameters</u> for more information.

PowerFlex 70, 70EC, 700, & 700H Datalinks

Datalink	Input Data		Output Data DriveLogicRstt CommandedFreq		
3	DriveStatus				
	OutputFreq				
A	AccelTime1 - 140	×	AccelTime1 - 140	~	
-	DecelTime1 - 142	~	DecelTime1 - 142	~	
PB	Fault1Code - 243	×	Undefined_B1	×	
_	DCBusVoltage - 12	×	Undefined_B2	×	
VC	OutputCurrent - 3	~	Undefined_C1	Y	
_	OutputCurrent - 3		Undefined_C2	Y	
D					

PowerFlex 753 Datalinks

Datalink	Input Data		Output Data		
	DriveStatus	LogicCommand	Command		
	Feedback		Reference		
A	AccelTime1		AccelTime1		
_	DecelTime1		DecelTime1		
₽ B	LastFaultCode		Undefined_B1		
_	DCBusVolts		Undefined_B2		
СC	OutputCurrent		Undefined_C1		
	Undefined_C2		Undefined_C2		
D					

PowerFlex 700S & 700S 2P Datalinks

Datalink	Input Data	Output Data LogicCommand SpeedReference		
	LogicStatus			
	SpeedFeedback			
A	AccelTime - 32	~	AccelTime - 32	×
	DecelTime - 33	×	DecelTime - 33	V
ØΒ	DCBusVoltage - 306	V	Undefined_B1	V
	OutputCurrent - 308	×	Undefined_B2	V
□c				

PowerFlex 755 Datalinks

Input Data	Output Data	Ĩ.
DriveStatus	LogicCommand	
Feedback	Reference Vise Network Reference	
AccelTime1	 AccelTime1	•••
DecelTime1	 DecelTime1	
LastFaultCode		
DCBusVolts		
OutputCurrent		
OutputPower		

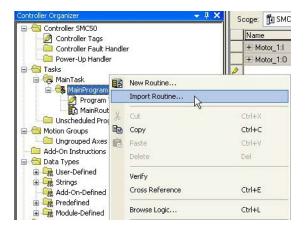
For the PowerFlex 750 drives, in addition to configuring datalinks, verify that Use Network Reference is checked.

IMPORTANT If you create multiple PowerFlex Module Definitions for the same type of drive (PF 70) with unique datalink definitions, you also have to create unique AOIs with unique names for those modules.

- 9. Click OK to accept the changes.
- 10. Click OK again to close the dialog box.

Import the PowerFlex Unit Faceplate Routine

1. From the Controller Organizer, right-click on the program where you would like to add the PowerFlex unit faceplate routine, and choose Import Routine.



2. Navigate to the ME PowerFlex Faceplate Files folder, select the routine for the drive you are using, and click Import.

Look in	ME PowerFlex Faceplate Files	💽 🔇 💋 📂 🖽 -	
<i>i</i> 100	Name 🔺 🚽	Date modified 🚽 Type	✓ Size ✓
1	PowerFlex_Control_Rungs.L5X	11/19/2013 8:51 L5X File	68 KB
cent Places	RXX_PowerFlex70EC_Faceplate_Energy	11/15/2013 2:53 L5X File	108 KB
	RXX_PowerFlex7005_2P_Faceplate_ener	11/15/2013 2:53 L5X File	98 KB
	RXX_PowerFlex700VC_Faceplate_Energ	11/15/2013 2:53 L5X File	107 KB
Desktop	RXX_PowerFlex753_Faceplate_Energy.L5X	11/15/2013 2:52 L5X File	114 KB
	RXX_PowerFlex755_Faceplate_Energy.L5X	11/15/2013 2:52 L5X File	118 KB

The Import Configuration dialog box opens.

End Within: Final Name	▲ 4 4	End/Replace		
on Content				
MainTask	Configure Routine	CONTRACTOR OF THE CONTRACTOR		
ROCK_DriveName_Face	Import Name:	RVC_DriveName_Faceplate		
References	Operation:	Create	2	
Tags		(1) References will be imported as configured in the References folders		
Data Type: Other Components	Final Name:	RIOL_DiveName_Faceplate	Properties	
To Eners/Warrings	Description	PowerFilex 755 Faceplate and Alarm A History AOI with Energy Monitoring v01		
	Турк	E Ladder Diagram		
	In Program	🕞 MainProgram		
	Number of Rungs:	15		

3. Enter the name for your routine in the Final Name field.

😽 MainTask	Configure Routine	e Properties	
MainProgram	Import Name:	RXX_DriveName_Faceplate	
	Operation:	Create	 □
j 🧖 Tags ⊡ Add-On Instruction:		(i) References will be imported as configured in the References folder	rs
Data Types Other Components	Einal <u>N</u> ame:	R01_Motor_1_Faceplate	Properties
- 🔯 Errors/Warnings	Description:	PowerFlex 755 Faceplate and Alarm History AOI with Energy Monitoring v01	
	Туре:	📋 Ladder Diagram	
	In Program:	🕞 MainProgram	
	Number of Rungs:	15	

4. In the Import Content organizer, select tags.

The Configure Tag References dialog box opens.

5. Replace _DeviceName in the Final Name with the name of your device.

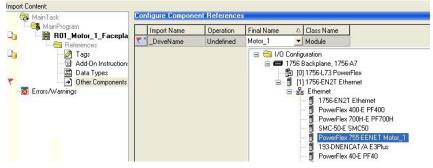
impo	ort Content:	Con	figu	re Tag References					
	MainProgram			Import Name	Operation	D	Final Name	۲ 🗠	Data Type
	RXX_DriveName_Facer	٣	Ð	_DriveName:I	Undefined	4	_DriveName:I		
٣	Tags	٣	IJ	_DriveName:O	Undefined	4	_DriveName:O		
	Add-On Instruction		g	_DriveName_AlarmName	Create	1	_DriveName_AlarmName		STRING
	Data Types		9	_DriveName_BEO	Create	1	_DriveName_BEO	•••	UDT_BEO
5	Other Components			_DriveName_BEO_AlarmHistory	Create		_DriveName_BEO_AlarmHistory		AlarmHistory_AOI
	· 🔞 Errors/Warnings		IJ	_DriveName_BEOmsgGetAtr1	Create		_DriveName_BEOmsgGetAtr1	•••	MESSAGE
			IJ	_DriveName_BEOmsgGetAtr2	Create	1	_DriveName_BEOmsgGetAtr2		MESSAGE
			1	_DriveName_BEOmsgGetAtr3	Create		_DriveName_BEOmsgGetAtr3		MESSAGE
			IJ	_DriveName_BEOmsgGetAtr7	Create	1	_DriveName_BEOmsgGetAtr7		MESSAGE
			IJ	_DriveName_BEOmsgGetAtr8	Create		_DriveName_BEOmsgGetAtr8		MESSAGE
			g	_DriveName_BEOmsgGetAtr9	Create	1	_DriveName_BEOmsgGetAtr9		MESSAGE
				_DriveName_DriveAlarmHistory	Create		_DriveName_DriveAlarmHistory		AlarmHistory_AOI
			IJ	_DriveName_FP	Create	N	_DriveName_FP		PFlex_755_AOI
			1	Module Alam Handshake	Use Existing		Module Alam Handshake		BOOL

For the 'Motor_1' example, the Final Names are renamed to the following:

Configur	e Tag References					
	Import Name	Operation	120	Final Name	😭 ۵	Data Type
IJ	_DriveName:I	Use Existing	1	Motor_1:1		AB:PowerFlex755_E_0838FE
9	_DriveName:O	Use Existing	10	Motor_1:0		AB:PowerFlex755_EB34DFD
9	_DriveName_AlarmName	Create	1	Motor_1_AlarmName		STRING
1	_DriveName_BEO	Create	1	Motor_1_BEO		UDT_BEO
	_DriveName_BEO_AlarmHistory	Create	1	Motor_1_BEO_AlarmHistory	•••	AlarmHistory_AOI
9	_DriveName_BEOmsgGetAtr1	Create	1	Motor_1_BEOmsgGetAtr1		MESSAGE
1	_DriveName_BEOmsgGetAtr2	Create	1	Motor_1_BEOmsgGetAtr2	•••	MESSAGE
9	_DriveName_BEOmsgGetAtr3	Create	1	Motor_1_BEOmsgGetAtr3		MESSAGE
1	_DriveName_BEOmsgGetAtr7	Create	1	Motor_1_BEOmsgGetAtr7	•••	MESSAGE
1	_DriveName_BEOmsgGetAtr8	Create	1	Motor_1_BEOmsgGetAtr8		MESSAGE
-	DriveName BEOmsgGetAtr9	Create	N	Motor 1 BEOmsgGetAtr9	/	MESSAGE
		J _DriveName;0 J _DriveName_AlarmName J _DriveName_BEO _DriveName_BEO _DriveName_BEO_AlarmHistory J _DriveName_BEOmsgGetAtr1 J _DriveName_BEOmsgGetAtr2 J _DriveName_BEOmsgGetAtr3 J _DriveName_BEOmsgGetAtr3 J _DriveName_BEOmsgGetAtr3 J _DriveName_BEOmsgGetAtr3 J _DriveName_BEOmsgGetAtr3	Import Name Operation DriveName:1 Use Existing DriveName:0 Use Existing DriveName.AlarmName Create DriveName_BEO Create DriveName_BEO_AlarmHistory Create DriveName_BEOMsgGetAtr1 Create DriveName_BEOmsgGetAtr2 Create DriveName_BEOmsgGetAtr3 Create	Import Name Operation Import Name: Use Existing Import Name_Name Create Import Name_BEO Create Import Name_BEO Create Import Name_BEO Create Import Name_BEOmsgGetAtr1 Create Import Name_BEOmsgGetAtr2 Create Import Name_BEOmsgGetAtr3 Create	Import Name Operation Import Name Import Name Use Existing Motor_1:1 Import Name.O Use Existing Motor_1.1 Import Name.AlamName Create Motor_1_AlamName Import Name_BEO Create Motor_1_BEO Import Name_BEO_AlamHistory Create Motor_1_BEO_AlamHistory Import Name_BEOmsgGetAtr1 Create Motor_1_BEOmsgGetAtr1 Import Name_BEOmsgGetAtr2 Create Motor_1_BEOmsgGetAtr2 Import Name_BEOmsgGetAtr3 Create Motor_1_BEOmsgGetAtr2 Import Name_BEOmsgGetAtr3 Create Motor_1_BEOmsgGetAtr3 Import Name_BEOmsgGetAtr3 Create Motor_1_BEOmsgGetAtr3	Import Name Operation Final Name Import Name Import Name Use Existing Motor_1:1 Import Name:1 Import Name:1

6. In the Import Content organizer, select Other Components.

The communication path can be set for all messages by selecting the device from the I/O configuration drop-down in the Component References.



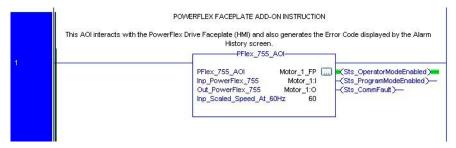
7. Click OK.

The new Routine appears in the Controller Organizer within the selected program.

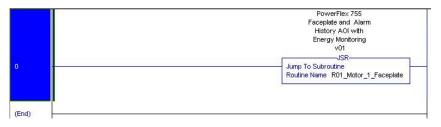


8. Open the routine and enter the value for the Inp_Scaled_Speed_At_xxxx input on the AOI on rung 1.

The AOI scales the drive input and output speed values based on the value entered.



9. Add a JSR to your main routine, or other desired location, to execute the new routine.



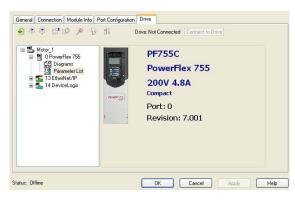
Set Other PowerFlex Drive Parameters

PowerFlex drive parameter settings are very specific to your application and need to be reviewed carefully before running your drive application. If you modify the datalink configuration for any PowerFlex drive, follow these steps to re-configure tag data types in the PowerFlex AOI.

- 1. In your RSLogix5000 Controller Organizer, expand the Add-On Instructions folder.
- 2. Select the AOI for your PowerFlex drive and double click on 'Parameters and Local Tags'.
- 3. Select the Edit Tags tab and locate the 'Inp_PowerFlex_*' AOI tag.
- 4. Change the Data Type to match the PowerFlex Module Input Data Type that applies to your application.

🗉 🛅 PFlex_70_AOI	- Inc			In the	-
E PFlex_753_20COMM_AOI	Name	== 4 D		Description	
E G PFlex_755_AOI			DUNTER		-
Parameters and Local Tags	CommFaultTimer	201	MER		
Logic	CommStatusValue	B	EAL		
Gamma SMC_50_AOI Data Types	Controller_Trigger	BO	DOL		
Trends	EnableIn	BC	COL	Enable Input - System Define	dP
I/O Configuration	EnableOut	BO	DOL	Enable Output - System Defin	ied
1756 Backplane, 1756-A7	+Inp NumRowsVis	DI	INT		
- 🔄 [0] 1756-L73 PowerFlex	+ Inp PowerFlex 755	A	3:PowerFlex755 E 951A3E82:1:0		
😑 🖞 [1] 1756-EN2T Ethernet	Inp_Scaled_Speed_At_60Hz		EAL		
금 윪 Ethernet	OperONS		Select Data Type		
1756-EN2T Ethernet	+ Out PowerFlex 755	A			
PowerFlex 400-E PF400	Set AccelOper	BI	Data Types.		
SMC-50-E SMC50	Set AccelProg	BI			
PowerFlex 755-EENET Motor 1		DI	10 AD D	F4A2:1:0 🔥 Cane	- 01
193-DNENCAT/A E3Plus	Set_CommFaultTimerPresetOper		AB:PowerElev753 4633		
PowerFlex 40-E PF40	Set_CommFaultTimerPresetProg	DI	- AB:PowerFlex/55_E85		n
PowerFlex 40P-E PF40P	⊞-Set_CurrentMaxOper	DI	MD.1 OWEIT IEAR JJ	1A3E82:1:0	
PowerFlex 4-E PF4	E Set_CurrentMinOper	DI			
PowerFlex 700S-200V-E PF700S		DI			
PowerFlex 700-200V-E PF700		DI	N AB:SMC_BDEBFA87:0:0		
PowerFlex 70-E PF70	Set_DecelOper	B	EA AB:SMC_C36D62ED:I:0	~	
PowerFlex 70 EC-E PF/0EC	Set_DecelProg	RI	EA Array Dimensions		
PowerFlex 753-NET-E PF753	+ Set DeviceNameOper	ST	IF Dim 2 Dim 1	Dim 0	
PowerElex 7005 2P-200V-E PE70052E	Set EquipFaceplateAnimation	IN			
PowerFlex 755-EENET Motor_11		ST		0	
¢	F Set FaceplateAnimation Anitor Tags λ Edit Tags /	IN	I Show Data Types by Groups		

- 5. Repeat the previous steps for the 'Out_PowerFlex_*' AOI tag by using the Module Output Data Type.
- **IMPORTANT** Any time you modify your PowerFlex module definitions after you have created your PowerFlex AOI, it is necessary for you to reassign your PowerFlex AOI Input and Output Tag Data Types. If multiple changes to your PowerFlex module definitions were made and saved, there are multiple Data Types listed for a particular DataLink configuration. Be careful to match the Data Type you select within the AOI to the Data Type of the intended PowerFlex module definition.
 - 6. Select the 'Drive' tab of the PowerFlex Module Properties.



7. Open the Parameter List and modify as your application requires.

In addition to application required parameters, the following parameter settings must be applied for general Ethernet/IP network communication for the PowerFlex drive faceplates to operate correctly.

a. For the PowerFlex 70, 70EC, 700, 700VC, and 700H drives, set parameter 90 to DPI Port 5 (22).

1	Parame	ter List - Power	Flex 70					
Para	ameter Gi	oup: [🏦 All Parame	ters 💌					
Γ	ID A	Name	Value	*	Units	Inter +	Min	Ma 🔨
	87	Skip Freq Band		0.0	Hz	0	0.0	
*	90	Speed Ref A Sel	DPI Port 5	-		22	Analog In 1	Re
	91	Speed Ref A Hi	1.00	60.0	Hz	600	-400.0	15

b. For the PowerFlex 700S drives, set parameter 16 to Spd Ref DPI (6) and parameter 691 to Int DPI Comm (5).

	ID A	Name	Value	+	Units	Inter +	Min	Ma
	15	Speed Ref 5		0.0000	RPM	0.000000	-14000.0000	14
	16	Speed Ref Sel	Spd Ref DPI	-		6	Zero Speed	Spc
	17	Jog Speed 1		0.0000	RPM	0.000000	-14000.0000	141
P	arame	ter List - Power	Flex 700S					
	meter Gr	oup: [🕄 All Parame	ters _]				
			a navana na navana na	Ī				
	meter Gr	oup: All Parame	a navana na navana na		Units mSec	Inter •	Min 1	Ma 4
	meter Gr ID △ 673	oup: [🕄 All Parame	ters _				Min Local HIM	Ma In

c. For the PowerFlex 700S 2P drives, set parameter 27 to DPI Port 5 (16).

ar	amete	er Gr	oup: All Paramet	ers	•				
1	ID	Δ	Name	Value	+	Units	Inter +	Min	Ma
			SpdTrim2 Filt BW		200.0000	R/S	200.000	0.0000	10
		26	Spairim2 Filt BW						
*			Speed Ref A Sel	DPI Port 5	-		16	Zero Speed	DP1

d. For the PowerFlex 753 drives, verify that parameter 545 Spd Ref A Sel is set to Port 0: Port 6 Reference and the value is set to 876.

ame	ter Gr	oup: [eters 🔽						
Lie		Name	Value	+	Units	Internal Value 🔸	Min	Max	1
						miller mar value	191011	THUN	
1"		S Curve Decel		0.000	%	0.000000	0.000	100.000	
ľ	541		Port 0: Port 6 Ref		%	0.000000		100.000 159999	

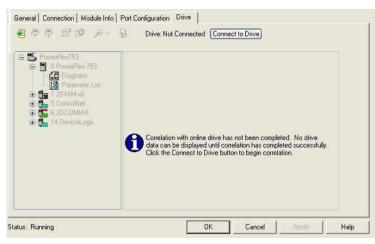
- 8. Close the Parameter List window.
- 9. Download your parameters to the PowerFlex drive by choosing the download icon from the toolbar.

Follow prompts to complete the download process.

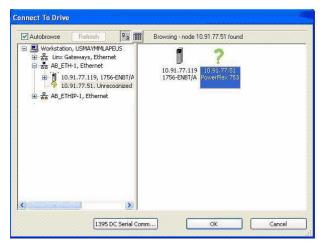


Correlate the Online Drive

1. On the Drive tab, click Connect to Drive.



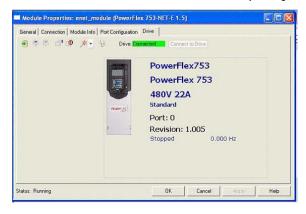
2. Select which drive to connect to and click OK.



3. In the Differences Found dialog box, click Download.



4. When the drive download successfully completes, the drive status indicates 'Connected', highlighted in green.



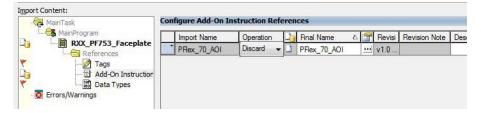
Import Program Control Rungs

Example logic is provided for configuring program commands. To import this configuration, follow these steps.

- 1. Choose a routine for importing the new rungs.
- 2. On a new rung, right click and select 'Import Rungs'
- 3. From the Basic PowerFlex Control folder, select 'PowerFlex_Control_Rungs.L5X' and click Import.
- 4. Click Tags in the Import Content organizer.
- 5. Replace '_DriveName' in the Final Name field with the name of your PowerFlex module and click OK.

ainTask 🗧	Configu	ire Tag References					
MainProgram		Import Name	Operation	-	Final Name	😭 ۵	Data Type
RXX_PF753_Faceplate	9	_DriveName_FP	Create	1	_DriveName_FP		PFlex_70_AOI
	9	Initiate_Conveyor	Create	1	Initiate_Conveyor		BOOL
Add-On Instruction	9	Slow_Speed	Create	1	Slow_Speed		BOOL
Data Types	9	System_Fault	Create	1	System_Fault		BOOL

- 6. Select Add-On Instructions in the Import Content organizer.
- 7. Discard the import of the PFlex_70_AOI (this AOI was used to create the rung import file, but is needed, because the existing AOI for your PowerFlex drive is used).



Important Program and Operator Control Transfer Considerations

The first three rungs of each AOI handle the transfer of control from the Logix program (Program Control) to the faceplate (Operator Control). The two Operator Control rungs are shown below. It is important to understand how these rungs operate so your desired program to operator and operator to program control transfers are achieved.

	RSViewME/SE (OperOperRe MainRoutine with specific input or application could be added The Cmd_Pro PLEASE NOTE: If the Cmd_Prog direction, speed, or active status or "Set_SpeedOper" tag, creating a	q). For example, to enable onditions driving an output with a value tag name of ogToOperPermissive allow foOperPermissive tag is so of the PowerFlex Drive. In "bumpless" transfer when	le Operator control for a drive a instruction with the tag name " "#1.Cmd_OperOperReq" with t "s the Logix Program to control let to 1, the AOI is programmed' a addition, the next rung transfe n a fransfer from Program Contr	quests (Cmd) can be initiated from eiti ssociated with "Motor_1" AOI instand Motor_1.Cmd_ProgOperReq". Likewi he #1 parameter for that faceplate di whether a Program to Operator Cont to allow a transfer from Program Cor rs the current Program Speed value ' rol to Operator Control is executed. I t be issued before the Cmd_ProgToC	e, a rung could be added to se, a pushbutton within an F splay associated with "Moto rol transfer is allowed. throl to Operator Control rega Set_SpeedProg" to the Oper herefore, the status of the F	the Logix RSView ME/SE _1" tag. rdless of the rator Speed tag, lowerFlex Drive
	Cmd ProgToOperPermissive	Cmd ProgOperReg	Cmd ProgProgReg	Sts OperatorModeEnable	d OperONS Sts Progra	mModeEnabled
1				(L)	(L)	<u>س</u>
	57.4724	Cmd_OperOperReq	Cmd_OperProgReq			
				Į	Cmd_ProgOperReq Cmd_ (U)	← ← ← ← OperOperReq (U)
	the Operator Mode Speed "Set_S will continue to run at the most rec	in the previous rung, the ' SpeedOper''. Therefore, it ent Program Speed allow	"OperONS" tag is set to 1. This f the PowerFlex Drive was runn ring a "Bumpless" Speed transfe	MPLESS SPEED TRANSFER RUNG allows a transfer of the most recent sing at the time of a Program to Operator and the appropriate Program comm ive is allowed.	tor Control transition, the Por Control transition is desired	werFlex Drive then the status
	OperONS		7 7 8		MOV	OperONS
2					Move	(V)
					Source Set_SpeedProg 0	
				12	Dest Set_SpeedOper	
					0 ←	

For example, these rungs enable the Operator Control of the intended PowerFlex drive. Command requests (Cmd) can be initiated from either the Logix Programs (ProgOperReq) or RSViewME/SE PowerFlex Faceplate (OperOperReq).

The following is a specific drive example:

EXAMPLETo enable Operator Control for a drive associated with 'Motor_1' AOI instance, a rung can be added to the Logix MainRoutine with
specific input conditions driving an output instruction with the tag name 'Motor_1.Cmd_ProgOperReq'. Also, a pushbutton in an
RSView ME/SE faceplate can be added with a value tag name of '#1.Cmd_OperOperReq' with the #1 parameter for that faceplate
display associated with 'Motor_1' tag.
A 'Motor_1.Cmd_ProgToOperPermissive' must also be included in the Logix Program to control whether Program to Operator
Control transfer requests are allowed or acted upon. A tag value of 1 permits the associated control transfer requests. A value of 0

prevents the associated control transfer requests.



ATTENTION: If an Xxxx.Cmd_ProgToOperPermissive tag is set to 1, the associated AOI is programmed to allow a transfer from Program Control to Operator Control regardless of the current direction, speed, or active status of the PowerFlex drive. In addition, the AOI is programmed to transfer the current Program Speed value 'Xxxx.Set_SpeedProg' to the associated Operator Speed tag, 'Xxxx.Set_SpeedOper', creating a 'bumpless' transfer when a transfer from Program Control to Operator Control is executed. Therefore, if the PowerFlex drive is running at the time of a Program to Operator Control transition, the PowerFlex drive continues to run at the most recent commanded Program Speed. If a different Program to Operator Control transition is desired, then the status of the PowerFlex drive and the Operator command requests must be monitored and the appropriate Program commands must be issued before the Xxxx.Cmd_ProgToOperPermissive is allowed. Therefore, it is very important that the status of the PowerFlex drive is set, to insure a safe Program to Operator Control transfer.



ATTENTION: If an Xxxx.Cmd_OperToProgramPermissive tag is set to 1, the associated AOI is programmed to allow a transfer from Operator Control to Program Control regardless of the current direction, speed, or active status of the PowerFlex Drive. In addition, there is no logic within the AOI that sets the 'Set_SpeedProg' upon transfer to Program mode, so the PowerFlex drive assumes the last commanded 'Set_SpeedProg' speed value unless logic is programmed outside of the AOI to set it to a different value. Therefore, it is very important that the status of the PowerFlex Drive is monitored and appropriate Program commands, for the specific application, are issued before the Xxxx.Cmd_OperToProgramPermissive tag is set, to insure a safe Operator to Program Control transfer.



ATTENTION: If The PowerFlex drive is started in Operator Mode and the RSView ME PowerFlex faceplate is closed while the PowerFlex drive is running, the PowerFlex drive continues running at the current Set_SpeedOper tag value. Therefore, it is very important to understand how this operation affects the specific application and appropriate actions and safeguards are implemented.



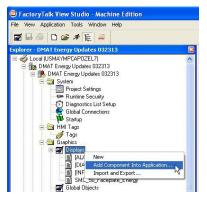
ATTENTION: There is no logic in the AOI that controls the minimum or maximum PowerFlex Commanded Speed values sent to the specific drive. Therefore, it is very important to understand the limitations of the motor connected to the specific drive and set the appropriate PowerFlex drive parameters and add additional Program logic if necessary.

Configure FactoryTalk View ME for the PowerFlex Drive Unit Faceplate

Follow these procedures to configure the faceplate.

Add PowerFlex Drive Faceplate to ME Application

- 1. Launch FactoryTalk View Studio software and create or open an existing application file.
- 2. In the Graphics folder, right-click on Displays and choose 'Add Component Into Application'.

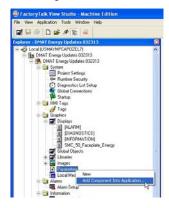


3. Navigate to the ME PowerFlex Faceplate Files folder, select the applicable PowerFlex faceplate, and click Open.

rganize 🔻 New folder)== -
🔛 Recent Places	▲ Name *		Date modified	Туре	Size
🔚 Libraries	Power	Flex_70_700_Faceplate_Energy.gfx	4/29/2013 9:37 AM	GFX File	149 K
Documents	Power	Flex_7005_70052_Faceplate_Energy	. 4/29/2013 9:39 AM	GFX File	82 K
Music	Power	Flex_753_Faceplate_Energy.gfx	4/29/2013 9:41 AM	GFX File	178 K
Pictures	Power	Flex_755_Faceplate_Energy.gfx	4/29/2013 9:43 AM	GFX File	180 K
🔣 Videos	100				
VASS01					
🏭 Local Disk (C:)					
👝 Local Disk (D:)					
RA_FILES (F:)					
📭 Network	-				

Add a Parameter File

1. Right-click on Parameters, and choose 'Add Component Into Application'.



2. Navigate to the ME PowerFlex Faceplate Files folder, select the ME_PowerFlex_Parameter.par file, and click Open.

Configure a Parameter File

- 1. From the explorer window in FactoryTalk View Studio, in the Parameters folder, right-click the ME_PowerFlex_Parameter.par file, and choose Rename.
- 2. Rename the parameter file with the name of the corresponding device in your RSLogix5000 application.

For example, Motor_1.

3. Double-click the parameter file to open it.

The parameter file contains configuration for two parameters. Parameter #1 represents the tag name for the specific Faceplate AOI in your RSLogix 5000 project. Parameter #2 represents the tag name for the Base Energy Object tag (UDT_BEO) in your RSLogix5000 project. This second parameter only applies when the energy monitoring option is being used. Each tag contains a controller shortcut name in brackets. This must match the shortcut name created in your RSLinx Enterprise communication setup.

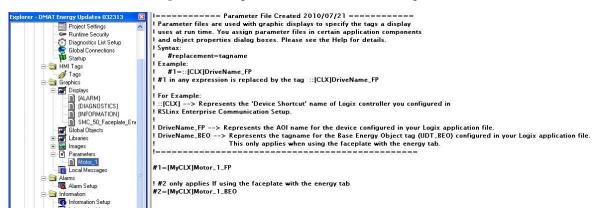
```
! Parameter files are used with graphic displays to specify the tags a display
! uses at run time. You assign parameter files in certain application components
and object properties dialog boxes. Please see the Help for details.
! Syntax:
   #replacement=tagname
Example:
   #1=::[CLX]DriveName_FP
! #1 in any expression is replaced by the tag ::[CLX]DriveName_FP
! For Example:
! :: [CLX] --> Represents the 'Device Shortcut' name of Logix controller you configured in
! RSLinx Enterprise Communication Setup.
PriveName_FP --> Represents the AOI name for the device configured in your Logix application file.
! DriveName_BEO --> Represents the tagname for the Base Energy Object tag (UDT_BEO) configured in your Logix application file.
                    This only applies when using the faceplate with the energy tab.
!-----
```

#1=[CLX]DriveName_FP

! #2 only applies If using the faceplate with the energy tab #2=[CLX]DriveName_BEO

4. Replace the shortcut name (CLX) and DriveName in parameters 1 and 2(if applicable) to match the tags configured in your RSLogix5000 project.

For the Motor_1 example, the configuration looks like the following:



- 5. Save your parameter file.
- 6. To add parameter files for additional drives:
 - a. Right-click on the parameter file that you just created and choose Duplicate.
 - b. Rename the file with the new device name.
 - c. Open the parameter file and configure the tag to match the associated device.

Create a Display Navigation Button

A display navigation button must be created to launch the PowerFlex faceplate at runtime. This can be drawn over an existing graphic object that represents the device you intend to monitor/control or it can be configured to use a bitmap image as the display.

1. From the display where you want to launch the faceplate (can be a new or an existing display), choose Objects > Display Navigation > Goto.



- 2. Draw the Goto button rectangle.
- 3. Double-click the new Goto rectangle to configure the button properties.
 - a. Modify the appearance as desired for your application (for example, choose Transparent as the Back style if you are drawing the Goto button over an existing object on your display).
 - b. Click the ellipse next to the Display field and assign the PowerFlex Faceplate display.
 - c. Click the ellipse next to the Parameter file field and assign the PowerFlex parameter file you created earlier for this intended device.

Appearance				
Border style:		Border width:		
Raised	-	4	V	
Back style:		Pattern style:		Back color Border color
Solid	-		- 0	Pattern color
Shape:	0.00	1	- 🧧	Highlight color
Rectangle	•			Blink
Display settings - Display: Pow Parameter fi	le: Motor	-		
Display: Pow	le: Motor	-	Left	position:
Display: Power Parameter fi	le: Motor	_1	Left	
Display: Pow Parameter fi Parameter li Display positi	le: Motor st: on Top	_1	Left	
Display: Pow Parameter fi Parameter li Display positi Touch margins – Horizontal mar	le: Motor st: on Top	_1 position: 0 Vertical margin:	Left	
Display: Pow Parameter fi Display positi Touch margins Horizontal margins	le: Motor st: on Top	_1 position: 0 Vertical margin:	Left	

- 4. Folow these steps to use a bitmap image with the button.
 - a. Click the Label Tab and click the ellipse button next to the Image field.
 - b. Click Add from File and select the PowerFlex Bitmap Image located in the ME_PowerFlex_GotoButtons folder.

IMPORTANT You only need to add the image from File the first time you use the image. Once added, the image can be selected from the image list.

- c. Click Open to add the image then OK to close the Image Browser window.
- d. Add text in the Caption field if desired.

Goto Display Button Properties	
Geneeli Label Common Caption Font Font Arrow Jown Arrow Jight Arrow Wight Arrow Up Backspace End Erder Caption blink Word wrap Image settings Image settings Image color Image back color Caption blink Width x Height Toppe: Image back color Image back color	Preview: Add E Red Set 14 Open Cok in: ME_PowerFlex_GatoButtons C Red Set 14 Wy Recent Documents OIPowerFlex 40.hmp OIPowerFlex 755.hmp CIPowerFlex 40.hmp OiPowerFlex 40.hmp OIPowerFlex 70 EC.hmp OIPowerFlex 70 EC.hmp OIPowerFlex 70 C.hmp OIPowerFlex 700 AC.hmp OIPowerFlex 700 AC.hmp OIPowerFlex 700 AC.hmp OIPowerFlex 700 AC.hmp OIPowerFlex 700 AC.hmp OIPowerFlex 700 AC.hmp OIPowerFlex 700 AC.hmp OIPowerFlex 700 AC.hmp OIPowerFlex 700 AC.hmp OIPowerFlex 700 AC.hmp OIPowerFlex 700 AC.hmp OIPowerFlex 700 AC.hmp OIPowerFlex 700 AC.hmp OIPowerFlex 700 AC.hmp OIPowerFlex 700 AC.hmp OIPowerFlex 700 AC.hmp OIPowerFlex 700 AC.hmp OIPowerFlex 700 AC.hmp OIPowerFlex 700 AC.hmp OIPowerFlex 700 AC.hmp OIPowerFlex 700 AC.hmp OIPowerFlex 700 AC.hmp OIPowerFlex 700 AC.hmp OIPowerFlex 700 AC.hmp OIPowerFlex 700 AC.hmp OIPowerFlex 700 AC.hmp OIPowerFlex 700 AC.hmp OIPowerFlex 700 AC.hmp OIPowerFlex 700 AC.hmp OIPowerFlex 700 AC.hmp OIPowerFlex 700 AC.hmp OIPowerFlex 700 AC.hmp OIPowerFlex 700 AC.hmp OIPowerFl
Image blink Coc Image scaled Coc	My Computer 01PowerFlex 753.bmp 01PowerFlex 755.bmp My Network File name:
OK Cancel	Places Files of type: Bitmap Images (".bmp) Cancel

e. Click OK to close the Goto button properties window.

This is an example of a final goto button on your display.

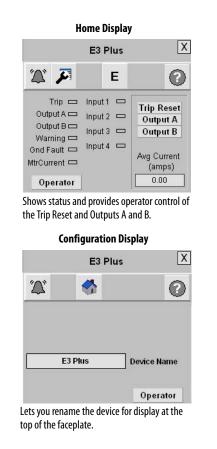


To support additional PowerFlex devices, create a new Goto display navigation button, assign the PowerFlex faceplate display, and assign a unique parameter file associated with the additional device.

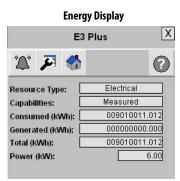
Configure ME E3PLUS Faceplates

The ME E3PLUS Faceplate files provide a pre-configured display and associated logic for the E3 Plus Solid State Overload Relay using FactoryTalk View Machine Edition and RSLogix 5000. The faceplate includes status, control, diagnostic, and energy views controlled by its own toolbar buttons.

The E3 Plus faceplate is compatible only with the E3 Plus Overload Relays communicating with the 193-DNENCAT.







Shows basic energy data.

DeviceNet to EtherNet/IP Network Setup

In order for the faceplate add-on instruction to function properly in your RSlogix5000 application, you need to configure the following parameters for your E3 Plus module:

- Param 59, Output Assembly = 105
- Param 60, Input Assembly = 100
- Param 61, Assy Word 0 Param = 21 (supplies status of Inputs and Outputs)
- Param 62, Assy Word 1 Param = 4 (supplies Avg current)
- Param 63, Assy Word 2 Param = 14 (supplies Trip Status)
- Param 64, Assy Word 3 Param = 15 (supplies Warning Status)

The Communication Auxiliary module can be configured by using an internal web page.

1. Type the IP Address of your 193-DNENCAT module into the URL window in an internet browser.

G 🛇 • 🕑 1/152,168,1,234		*	🔸 🗙 🗷 Inig
File Edit Veril Fauntes Tools	104		
Favorites 👍 🗵 Supported Stat	• 💸 Renote Access Logon		
Rodovel Automation			💁 • 🔯 - 🖾 👼 • Page - Safety • Tools • 1
Allen-Bradley 193	-DNENCATR Comms Au	ix	Rock
Expand Minimize	- Marrie		
D Home	Device Itame	193-DIERCATE Comma Aux	
Data Links	Device Rame Device Description	193-CRENCATE CENTRE AUE	
Diagnostics	Device Description		Resources
Administrative Settings	Ethernet Address (MAC)	00-00(80)00(84)80	Visit AB.com for additional information
EDS File	DP Address	192 168 1 234	
	Product Revisions	2.001 Build 4	Contacta
	Firmware Version Date	Feb 8 2012, 11:39-36	
	Serial Number	A0186A08	
	Status	Run	
	Uptime	0 days, 4hi37miks	

- 2. Select Scan List Configuration to configure the scan list to allow for E3 Plus communication.
- 3. When prompted, use 'Administrator' as the User name, leave the password blank, and click OK.



4. Select the E3 Plus for your application and click Save.

Expand Minimize	Scan List Node Commissioning Advanced	
ome :an List	Network Who	Scan List
Configuration Scan List Node Commissioning Scan List Scan Link S E3 E5 (1-5A) ata Linka lagnostics dministrative Settings DS File	[0] 193-DNENCATR Comms Aux (Me)	[5] E3 EC5 (1-5A) ≪
	Scanner DeviceNet Network Address: 0	Config S

5. Select E3 Plus > Parameters > DNET Setup and edit these parameters:

IMPORTANT You must set these parameters or the AOI does not function properly in your RSlogix5000 application.

- Param 59, Output Assembly = 105
- Param 60, Input Assembly = 100
- Param 61, Assy Word 0 Param = 21 (supplies status of Inputs and Outputs)
- Param 62, Assy Word 1 Param = 4 (supplies Avg current)
- Param 63, Assy Word 2 Param = 14 (supplies Trip Status)
- Param 64, Assy Word 3 Param = 15 (supplies Warning Status)

When your edit is complete, be sure to Save the changes.

Expand Minimize	A Identity Par	ameters			
an List	DNet Setu	р			
Configuration	Parameter	Name	Data Type	Value	Unit
Node Commissioning	55*	AutoBaudEnable	BOOL	Enabled	
Advanced	56*	NonVol Baud Rate	USINT	125K Baud	
[5] E3 EC5 (1-5A)	58*	COS Mask	WORD		
Parameters	59*	Output Assembly	USINT	105	
Monitor Params	60*	Input Assembly	USINT	100	
Reset/Lock	61*	Assy Word0 Param	UINT	21	
DNet Setup	62*	Assy Word1 Param	UINT	4	
Output Setup	63*	Assy Word2 Param	UINT	14	
TripWarn History	64*	Assy Word3 Param	UINT	15	
Trip Snapshot	* Parameter ed	litable			
Voltage Monitor Voltage Setup Power Monitor	Edit Can	cel			

6. Configure additional parameters for the E3 Plus.

Refer to the E3 and E3 Plus Solid-State Overload Relay User Manual, publication <u>193-um002</u>. Determine which trips, warnings, and corresponding parameter limits are to be enabled. The E3 Plus Overload Relay faceplate is configured to support all the Trip and Warning Status as defined in the user manual.

Trip Status	Warning Status
Overload Phase Loss	Overload
Ground Fault	Ground Fault
Stall Jam	Jam
Underload	Underload
PTC	PTC
Current Imbal	Current Imbal
Comm Fault	Comm Fault
Comm Idle	Comm Idle
Remote Trip (only in major revision	3 of E3 Plus)

In this example, the Overload, Phase Loss, and Comm Fault trips are enabled.



Configure RSLogix5000 for the E3 Plus Faceplate

Follow these procedures to configure the faceplate.

Add the 193-DNENCAT(R) Communication Module to your Ethernet Network

- 1. Create a new or open an existing RSLogix 5000 file.
- 2. Under I/O Configuration, right-click the network communication module to be used for the intended E3 Plus module.

IMPORTANT This step assumes you have already added and configured an Ethernet module to your I/O tree.

3. Select 'New Module'.

4. Expand the Communications folder and select the '193-DNENCAT' (or 193-DNENCATR) module and click OK.

IMPORTANT If this module is not available in the list, you can update the Add-on Profile for your device. Refer to Appendix E for more information on updating the Add-on Profiles.

Module	Description	Vendor	
Communications			
-193-DNENCA	Ethernet to DeviceNet Communications Auxiliary	Allen-Bradley	
193-DNENCA	R Ethernet to DeviceNet Communications Auxiliary, 2-Port	Allen-Bradley	
- 1715-AENTR	1715 Ethernet Adapter, Twisted Pair Media	Allen-Bradley	
- 1734-AENT	1734 Ethernet Adapter, Twisted-Pair Media	Allen-Bradley	
- 1734-AENTR	1734 Ethernet Adapter, 2-Port, Twisted Pair Media	Allen-Bradley	
- 1738-AENT	1738 Ethernet Adapter, Twisted-Pair Media	Allen-Bradley	
- 1738-AENTR	1738 Ethernet Adapter, 2-Port, Twisted Pair Media	Allen-Bradley	
- 1756-EN2F	1756 10/100 Mbps Ethernet Bridge, Fiber Media	Allen-Bradley	
- 1756-EN2T	1756 10/100 Mbps Ethernet Bridge, Twisted-Pair Media	Allen-Bradley	
- 1756-EN2TR	1756 10/100 Mbps Ethernet Bridge, 2-Port, Twisted-Pair .	Allen-Bradley	
- 1756-EN3TR	1756 10/100 Mbps Ethernet Bridge, 2-Port, Twisted-Pair .	Allen-Bradley	
1756-ENBT	1756 10/100 Mbps Ethernet Bridge, Twisted-Pair Media	Allen-Bradley	
			>
		Find	Add Favorite
By Category	By Vendor Favorites		

5. Enter a distinct module name and the IP Address of your DNENCAT module.

(For example, we use 'Motor_1' for the module name throughout this document.)

Type: Vendor:	193-DNENCATR Ethemet to DeviceNet C Allen-Bradley	ommunications Auxiliary, 2-Port Ethernet Address
Parent: Name:	EN2T Motor_1	Private Network: 192.168.1. 234
— Description:		O JP Address:
Revision: Electronic K Connection: Data Mappir	Data	

The default setting for Data Mapping is Generic.

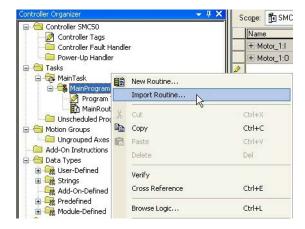
6. If Data Mapping is not set to Generic, click 'Change' under the Module Definition and set Data Mapping to Generic.

Langardering	ection Module Info Internet	Protocol Port Configuration	Network
Туре:	193-DNENCATR Ethernet to	DeviceNet Communications	Auxiliary, 2-Port
Vendor:	Allen-Bradley		
Parent:	EN2T	Et	hernet Address
Name:	Motor_1		Private Network: 192.168.1. 234 🤤
Description:) IP Address:
		~ 0	Host Name:
Module Def	inition	\frown	
Series:	A (Change)	
Revision:	2.1		
Electronic K	eying: Compatible Mo	dule	
Connection:	Data	Module Definition	
connocion.	ng: Generic	Module Deminion	
Data Mappir		and the second se	
		Series:	A X
		Series: Revision: Electronic Keying:	2 V 1 V Compatible Module

- **IMPORTANT** The E3 Plus faceplate A0I has been configured to work with the Generic data mapping. If you change the data mapping to a specific type of E3 the A0I does not function properly.
 - 7. Click OK to close the Module Properties window.

Import the E3 Plus Module Faceplate Routine

1. From the Controller Organizer, right-click on the program where you would like to add the E3 Plus module faceplate routine, and choose Import Routine.



2. Navigate to the ME E3 PLUS Faceplate Files folder, select the RXX_E3Plus_Faceplate_Energy.L5X file, and click Import.

Look in:	🎉 ME E3 Plus Faceplate Files	- 🕝 ৈ 📂 🖽-	
Cm	Name 🔺	▼ Date modified ▼ Type	- Size -
	E3Plus_Control_Rungs.L5X	11/14/2013 10:0 L5X File	48 KB

The Import Configuration dialog box opens.

Find Within: Final Name		Find/Replace	
Import Content:	Configure Routine	e Properties	
MainProgram	Import Name:	RXX_DeviceName_Faceplate	
	Operation:	Create	• •
Tags Tags Add-On Instruction: Min Data Types Other Components	Final Name:	References will be imported as configured in the References fold RX_DeviceName_Faceplate	ers Properties
-🔯 Errors/Warnings	Description:	E3 Plus with Comms Aux Faceplate and Alarm History A01 with Energy Monitoring v01	
			<u> </u>
	Туре:	🗎 Ladder Diagram	
	In Program:	🕞 MainProgram	
	Number of Rungs:	14	

3. Enter the name for your routine in the Final Name field.

Find: Find: Final Name		Find/Replace	
mport Content:		Describes	
MainTask MainProgram MainProgram	Configure Routine Import Name:	RXX_DeviceName_Faceplate	
	Operation:	Create	•
Tags → Add-On Instructio	n:	() References will be imported as configured in the <u>Ref</u> erences folder	ers
ja Data Types → Other Component	Final Name:	R1_Motor_1_Faceplate	Properties.
- I Errors/Warnings	Description:	E3 Plus with Comms Aux Faceplate and Alarm History AOI with Energy Monitoring v01	<u> </u>
			-
	Туре:	🗎 Ladder Diagram	
	In Program:	🕞 MainProgram	
	Number of Rungs:	14	

4. In the Import Content organizer, select tags.

The Configure Tag References dialog box opens.

5. Replace _DeviceName in the Final Name with the name of your device.

Find: Final Name		-	Find/F	eplace					
nport Content:									
😽 MainTask	Con	figu	re Tag Reference	s	\langle				_
MainProgram			Import Name	Operation		Final Name	4	Alias For	Data Type
R01_Motor_1_Facepla References Add-On Instruction: M Data Types Other Components Errors/Warnings	*	IJ	_DeviceName:I	Undefined	1	_DeviceName:I	-		
	*	IJ	_DeviceName:0	Undefined	1	_DeviceName:0	Г		
		9	_DeviceName	Create	1	_DeviceName_AlarmName			STRING
		9	_DeviceName	Create	1	_DeviceName_BEO			UDT_BEO
			_DeviceName	Create	1	_DeviceName_BEO_AlarmHistory			AlarmHisto
	12 50	IJ	⊞_DeviceName	Create	1	_DeviceName_BEOMSG_Read_Data			INT[20]
		IJ	_DeviceName	Create		_DeviceName_BEOMSG_Read_Request			INT[20]
		IJ	_DeviceName	Create	1	_DeviceName_BEOmsgGetSts	Г		MESSAGE
	1000		_DeviceName	Create	1	_DeviceName_DeviceAlarmHistory			AlarmHistor
		IJ	_DeviceName	Create	1	_DeviceName_FP	Г		E3Plus_Co
		IJ	DeviceName	Create	NI	DeviceName_MSG	· ·		MESSAGE

For the 'Motor_1' example, the Final Names are renamed to the following:

🖓 MainTask				-	-			-		-	-
B1_Motor_1_Faceplate	12.10	Import Name	Operation	A	-0	Final Name	4	<u></u>	Alias For	Data Type	
References	1	_DeviceName:I	Use Existin	6		Motor_1:I				AB:E3Plus	
- 🖉 Tags	1	_DeviceName:0	Use Existin	g	0	Motor_1:0		•••		AB:E3Plus	
	1	_DeviceName	Create		1	Motor_1_AlarmName				STRING	
Data Types	1	_DeviceName	Create			Motor_1_BEO		•••		UDT_BEO	
Other Components		_DeviceName	Create		1	Motor_1_BEO_AlarmHistory		•••		AlarmHistor	Ne In
rors/Warnings	1	⊞_DeviceName	Create			Motor_1_BEOMSG_Read_Data		•••		INT[20]	
	1	_DeviceName	Create		1	Motor_1_BEOMSG_Read_Request		•••		INT[20]	
	1	_DeviceName	Create		1	Motor_1_BEOmsgGetSts	- 20	•••		MESSAGE	
		_DeviceName	Create			Motor_1_DeviceAlarmHistory	T	•••		AlarmHistor	
	1	_DeviceName	Create	\square	1	Motor_1_FP		•••		E3Plus_Co	
	1	_DeviceName	Create		1	Motor_1_MSG				MESSAGE	1

6. In the Import Content organizer, select Other Components.

The communication path can be set for all messages by selecting the device from the I/O configuration drop-down in the Component References.

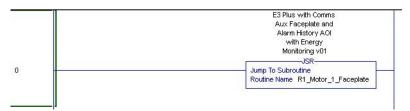
🙀 MainTask	Configure Compone	ent Reference	s			_
MainProgram	Import Name	Operation	Final Name	Δ	Class Name	
i References	CeviceName	Undefined	Motor_1	-	Module	
Construction: Constru			÷	Backp	juration blane, 1789-A17/A Vir] EtherNet/IP Ethernet 5 Ethernet 193-DNENCAT	et hernet

7. Click OK.

The new Routine appears in the Controller Organizer within the selected program.



8. Add a JSR to your main routine, or other desired location, to execute the new routine.



9. Open the new routine that you just created.

The communication path for the message instruction in rung 1 needs to be configured with the port number for the DeviceNet scanner and the node address for the E3 Plus.

- a. Click on the ellipse in the E3Plus_CommsAux_Rev6_AOI instruction next to the Ref_MSG1 input.
- b. Click the Communication tab.
- c. Add the 193-DNENCAT port number and your E3 Plus node address to your path configuration in the following format: _DeviceName, 3, #.
- TIP DeviceName the name of the EtherNet/IP Communications Auxiliary Module
 - 3 the port number of the DeviceNet Scanner of the EtherNet/IP Communications Auxiliary.
 - 5 the node address of the E3 Plus Overload Relay.

Message Configuration - Motor_1_MSG	[NOP]-
Configuration Communication* Tag	
Motor_1, 3, 5	ATE ADD-ON INSTRUCTION (HMI) and also generates the Error Code displayed by the h History screen.
Communication Method C CIP D H+ C CIP D H+ C CIP Destination Link: O CIP Source Link: D Estination Node: D CIP C CIP Source Link: D Estination Node: D CIP C CIP Connected C Connected Cache Connections	E3Plus_CommsAux_rev6 Motor_1_FP Inp_E3Input Motor_1:IDevice[0] Out E3Output Motor_1:OPevice[0] Ref_MSG1 Motor_1_MSG
🔾 Error Code: 🛛 🗖 Timed Out 🕤	ARM HISTORY all are ONLY used with the Alarm History screen.
OK Cancel Apply Help	

The communication path for the message instruction in rung 6 also needs to be configured with the port number for the DeviceNet scanner and the node address for the E3 Plus.

d. Click on the ellipse in the MSG instruction in rung 6.

- e. Click the Communication tab.
- f. Add the 193-DNENCAT port number and your E3 Plus node address to your path configuration in the following format: Motor1, 3, #.

TIP Motor_1 - the name of the EtherNet/IP Communications Auxiliary

- 3 the port number of the DeviceNet Scanner of the EtherNet/IP Communications Auxiliary.
- 5 the node address of the E3 Plus Overload Relay.

Message Configuration - Motor_1_BEOmsgGet5ts Configuration Communication* Tag	MISG
Path: Motor_1,3,5 Browse Motor_1, 3, 5	Message Control Motor_1_BEOmsgGetSts (ER)
C Broadcast Communication Method C CIP C DH+ Channel: 14' Destination Link:	Base Energy Object
CIP With Source Link: 0 💼 Destination Node: 0	

Import Program Control Rungs

Example logic is provided for configuring program commands. Follow these steps to import this configuration.

- 1. Choose a routine for importing the new rungs.
- 2. On a new rung, right click and select 'Import Rungs...'
- 3. From the ME E3 Plus Faceplate Files folder, select "E3Plus_Control_Rungs.L5X." Click Import.
- 4. Click Tags within the Import Content organizer.
- 5. Replace "_DeviceName" in the Final Name field with the name of your E3 Plus device. Click OK.

Import Content:	Config	ure Tag Reference	:5	_		_		
MainProgram		Import Name	Operation	1	Final Name	Δ		Ali Data Type
R1_Motor_1_Faceplate References	× 9	_DeviceName	Create		Motor_1	-		E3Plus_CommsAux_rev6_A01
	1	forward_cmd	Create	1	forward_cmd			BOOL
Add-On Instruction		gnd_fault_indic	Create	1	gnd_fault_indication		-	BOOL
- 💽 Errors/Warnings	1	reverse_cmd	Create	1	reverse_cmd			BOOL

Important Program and Operator Control Transfer Considerations

The first two rungs of the E3Plus_CommsAux AOI handle the transfer of control from the Logix program (Program Control) to the faceplate (Operator Control). These are the two Operator Control rungs. It is important to understand how these rungs operate so your desired program to operator and operator to program control transfers are achieved.

	This rung enables Logix Program Control of the E3 Plus Overload Relay. Command request: example, to enable Program control for a motor associated with "Motor_1" AOI instance, a r	E3Plus Overload Relay AOI GRAM CONTROL ENABLE RUNG (Cmd) can be initiated from either the Logix Programs (ProgProgReq) or RSViewME/SE (OperProgReq) application. For ang could be added to the Logix MainRoutine with specific input conditions driving an output instruction with the tag name
		ion could be added with a value tag name of "#1.Cmd_OperProgReq" with the #1 parameter for that faceplate display issociated with "Motor_1" tag. Program to control whether an Operator to Program Control transfer is allowed.
	PLEASE NOTE: If the Cmd_OperToProgramPermissive tag is set to 1, the AOI is programmed	regram to control memore an operation of regram control managers is an over a to allow a transfer from Operator Control to Program Control regardless of status of the E3Overload Relay. Therefore, sed to set Cmd_OperToProgram Permissive tag outside of the AOI to insure a safe transfer.
0	Crnd_OperToProgPermissive Crnd_ProgProgReq Crnd_ProgOperReq	Sts_ProgramModeEnabled Sts_OperatorModeEnabled Cmd_ProgProgReq Cmd_OperProgReq
	Cmd_OperProgReq Cmd_OperOperReq	
1	Cmd_ProgToOperPermissive Cmd_ProgOperReq Cmd_ProgProgReq	Sts_OperatorModeEnabled OperONS Sts_ProgramModeEnabled Cmd_ProgOperReq Cmd_OperOperReq
	Cmd_OperOperReq Cmd_OperProgReq	

For example, these rungs enable the Program or Operator Control of the intended E3 Plus Overload Relay. Command requests (Cmd) can be initiated from either the Logix Programs (ProgOperReq) or the FactoryTalk View ME E3 Plus Faceplate (OperOperReq).

EXAMPLE To enable Operator Control for a device associated with 'Motor_1' AOI instance, a rung is added to the Logix MainRoutine with specific input conditions driving an output instruction with the tag name 'Motor_1.Cmd_ProgOperReq'. Likewise, a pushbutton in an RSView ME/SE Faceplate is added with a value tag name of '#1.Cmd_OperOperReq' with the #1 parameter for that faceplate display associated with 'Motor_1' tag.

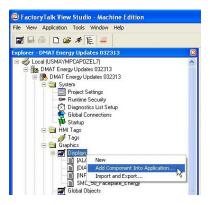
A 'Motor_1.Cmd_ProgToOperPermissive' must also be included in the Logix Program to control whether Program to Operator Control transfer requests are allowed or acted upon. A tag value of 1 permits the associated control transfer requests. A value of 0 prevents the associated control transfer requests.

Configure FactoryTalk View ME for the E3 Plus Module Faceplate

Follow these procedures to configure the faceplate.

Add E3 Plus Module Faceplate to ME Application

- 1. Launch FactoryTalk View Studio software and create or open an existing application file.
- 2. In the Graphics folder, right-click on Displays and choose 'Add Component Into Application'.

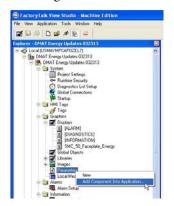


3. Navigate to the ME E3 Plus Faceplate Files folder, select the E3Plus_Faceplate_Energy.gfx file, and click Open.



Add a Parameter File

1. Right-click on Parameters, and choose 'Add Component Into Application'.



2. Navigate to the ME E3PLUS Faceplate Files folder, select the E3Plus_Parameter.par file, and click Open.

Configure a Parameter File

- 1. From the explorer window in FactoryTalk View Studio, in the Parameters folder, right-click the E3Plus_Parameter file, and choose Rename.
- 2. Rename the parameter file with the name of the corresponding device in your RSLogix5000 application.

For example, Motor_1.

3. Double-click the parameter file to open it.

The parameter file contains configuration for two parameters. Parameter #1 represents the tag name for the specific Faceplate AOI in your RSLogix 5000 project. Parameter #2 represents the tag name for the Base Energy Object tag (UDT_BEO) in your RSLogix5000 project. This second parameter only applies when the energy monitoring option is being used. Each tag contains a controller shortcut name in brackets. This must match the shortcut name created in your RSLinx Enterprise communication setup.

```
===== Parameter File Created 2013/05/13 ======
! Parameter files are used with graphic displays to specify the tags a display
uses at run time. You assign parameter files in certain application components
and object properties dialog boxes. Please see the Help for details.
Syntax:
   #replacement=tagname
! Example:
   #1=::[CLX]DeviceName_FP
#1 in any expression is replaced by the tag ::[CLX]DeviceName_FP
For Example
 ::[CLX] --> Represents the 'Device Shortcut' name of Logix controller you configured in
 RSLinx Enterprise Communication Setup
 DeviceName_FP --> Represents the AOI name for the device configured in your Logix application.
 DeviceName_BEO --> Represents the tagname for the Base Energy Object tag (UDT_BEO)
                      configured in your Logix application file.
                      This only applies when using the faceplate with the energy tab.
   _____
                                   _____
```

```
#1=[CLX]DeviceName_FP
```

! #2 only applies If using the faceplate with the energy tab #2=[CLX]DeviceName_BEO

4. Replace the shortcut name (CLX) and DriveName in parameters 1 and 2(if applicable) to match the tags configured in your RSLogix5000 project.

For the Motor_1 example, the configuration looks like the following:

```
==== Parameter File Created 2013/05/13 ===
Parameter files are used with graphic displays to specify the tags a display
uses at run time. You assign parameter files in certain application components
and object properties dialog boxes. Please see the Help for details.
Syntax
   #replacement=tagname
! Example:
   #1=::[CLX]DeviceName_FP
! #1 in any expression is replaced by the tag ::[CLX]DeviceName_FP
| For Example:
::[CLX] --> Represents the 'Device Shortcut' name of Logix controller you configured in
RSLinx Enterprise Communication Setup.
DeviceName_FP --> Represents the AOI name for the device configured in your Logix application.
DeviceName_BEO --> Represents the tagname for the Base Energy Object tag (UDT_BEO)
                      configured in your Logix application file.
                      This only applies when using the faceplate with the energy tab.
_____
#1=[CLX]Motor_1_FP
#2 only applies If using the faceplate with the energy tab
```

#2=[CLX]Motor_1_BEO

5. Save your parameter file.

- 6. To add parameter files for additional E3 Plus modules:
 - a. Right-click on the parameter file that you just created and choose Duplicate.
 - b. Rename the file with the new device name.
 - c. Open the parameter file and configure the tag to match the associated device.

Create a Display Navigation Button

A display navigation button must be created to launch the E3 Plus faceplate at runtime. This can be drawn over an existing graphic object that represents the device you intend to monitor/control or it can be configured to use a bitmap image as the display.

 From the display where you want to launch the faceplate (can be a new or an existing display), choose Objects > Display Navigation > Goto.

File Edit View	Objects	Arrange	Animation	Appli	ation	Tools	Window
🖬 🖬 🎒 Ixplorer - DMA El 🎻 Local (PA		te		•			X P
DMAT	Eusi	Button eric and Sti	ring))			
	Displ	ay Na <u>v</u> igati	ion	Þ	Goto	4	<
(0.00	je and Grap	bh	+	<u>R</u> eturi <u>C</u> lose	n To	13
	<u>T</u> ren Recip	ding pePļus		•	Displa	y List S	elector

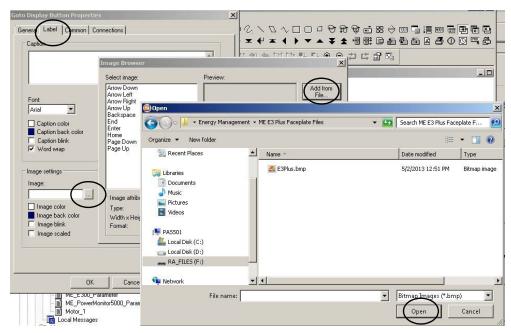
- 2. Draw the Goto button rectangle.
- 3. Double-click the new Goto rectangle to configure the button properties.
 - a. Modify the appearance as desired for your application (for example, choose Transparent as the Back style if you are drawing the Goto button over an existing object on your display).
 - b. Click the ellipse next to the Display field and assign the E3PLUS_Faceplate_Energy display.
 - c. Click the ellipse next to the Parameter file field and assign the E3PLUS parameter file you created earlier for this intended device.

Appearance	
Border style:	Border width:
Raised	3 Border uses back cole
Back style:	Back color Pattern style: Border color
Solid	▼ None ▼ Pattern color
Shape:	Highlight color
Rectangle	
C Parameter list:	Top position: 130 Left position: 300
Display position	
Touch margins Horizontal margin:	Vertical margin:
Touch margins	Vertical margin: 0

- 4. Folow these steps to use a bitmap image with the button.
 - a. Click the Label Tab and click the ellipse button next to the Image field.
 - b. Click Add from File and select the E3 Plus Bitmap Image located in the ME E3 Plus Files folder.

IMPORTANT You only need to add the image from File the first time you use the image. Once added, the image can be selected from the image list.

- c. Click Open to add the image then OK to close the Image Browser window.
- d. Add text in the Caption field if desired.



e. Click OK to close the Goto button properties window.

This is an example of a final goto button on your display.

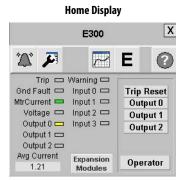


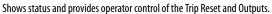
To support additional E3 Plus modules, create a new Goto display navigation button, assign the E3 Plus faceplate display, and assign a unique parameter file associated with the additional device.

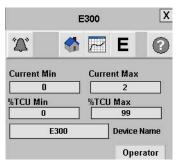
Configure ME E300 Faceplate

The ME E300 Faceplate files provide a preconfigured display and associated logic for the E300 Electronic Overload Relay using FactoryTalk View Machine Edition and RSLogix5000 software. The faceplate includes status, control, diagnostic, and energy views controlled by its own toolbar buttons.

The E300 module faceplate is compatible only with E300 Relay modules communicating over the EtherNet/IP network.

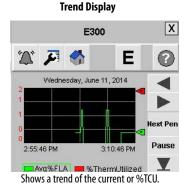






Configuration Display

Lets you configure the min and max EU values to be displayed on the trend display and rename the device for display at the top of the faceplate





Energy Display



The energy data displayed is dependent on the module definition configured in the controller. If you do not have a voltage-sensing module configured, only the current is displayed on the energy tab.

Configure RSLogix5000 for the E300 Module Faceplate

Follow these procedures to configure the faceplate.

Add the E300 Module to Your Ethernet Network

- 1. Create a new or open an existing RSLogix 5000 file.
- 2. Under I/O Configuration, right-click the network communication module to be used for the intended E300 module.

IMPORTANT This step assumes you have already added and configured an Ethernet module to your I/O tree.

- 3. Select 'New Module'.
- 4. Select the E300 Electronic Overload Relay Communication module (193-ECM-ETR) and click OK.

IMPORTANT If this module is not available in the list, you can update the Add-on Profile for your device. Refer to Appendix E for more information on updating the Add-on Profiles.

nter Search Text for Module	Clear Filters		Show Filters
Catalog Number	Description	Vendor	Category
1794-AENT	1794 10/100 Mbps Ethernet Adapter, Twisted-Pair Me	Allen-Bradley	Communication
1794-AENTR	1794 10/100 Mbps Ethernet Adapter, 2-Port, Twisted	Allen-Bradley	Communication
1799ER-IQ10X0Q10	10 Point Input/10 Point Output, 24V DC Base, Source	Allen-Bradley	Digital
193-ECM-ETR	E300 Electronic Overload Relay, 2-Port	Allen-Bradley	MotorOverload
2094-EN02D-M01-S0	Kinetix 6500 Single Axis Ethernet Safe Torque Off Drive	Allen-Bradley	Drive,Motion
2094-EN02D-M01-S1	Kinetix 6500 Single Axis Ethernet Safe Speed Monitori	Allen-Bradley	Safety, Drive, Motic
2094-SEPM-B24-S	2094-SEPM-B24-S	Allen-Bradley	Rockwell Automat
2097-V31PR0	Kinetix 300, 2A, 120/240V, No Filter	Allen-Bradley	Drive
2097-V31PR0-LM	Kinetix 350, 2A, 120/240V, No Filter Ethernet Drive	Allen-Bradley	Drive,Motion
2097-V31PR2	Kinetix 300, 4A, 120/240V, No Filter	Allen-Bradley	Drive
2097-V31PR2-LM	Kinetix 350, 4A, 120/240V, No Filter Ethernet Drive	Allen-Bradley	Drive,Motion
2097-V32PR0	Kinetix 300, 2A, 240V, Integrated Filter	Allen-Bradley	Drive
2097-V32PR0-LM	Kinetix 350, 2A, 240V, Integral Filter Ethernet Drive	Allen-Bradley	Drive,Motion
2097-V32PR2	Kinetix 300, 4A, 240V, Integrated Filter	Allen-Bradley	Drive
2097-V32PB2-LM	Kinetix 350, 4A, 240V, Integral Filter Ethernet Drive	Allen-Bradley	Drive.Motion
2097-V31PR2 2097-V31PR2-LM 2097-V32PR0 2097-V32PR0-LM 2097-V32PR0-LM 2097-V32PR2	Kinetix 300, 4A, 120/240V, No Filter Kinetix 350, 4A, 120/240V, No Filter Ethernet Drive Kinetix 300, 2A, 240V, Integrated Filter Kinetix 350, 2A, 240V, Integrated Filter Kinetix 300, 4A, 240V, Integrated Filter	Allen-Bradley Allen-Bradley Allen-Bradley Allen-Bradley Allen-Bradley	Drive Drive,Moti Drive Drive,Moti Drive

5. Enter a distinct module name and the IP Address of your E300 module.

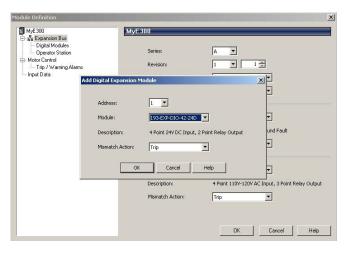
(For example, we use 'MyE300' for the module name throughout this document.)

Connection Module Info	Type: 193-E	CM-ETR E300 Electronic Ov	verload Belay, 2-Port		
Protection Internet Protocol		Bradley			
Port Configuration	Parent: Etherr	net	Eth	nernet Address	
Network	Name: MyE3	300	•	Private Network: 192.168.1.	3 ÷
Description	Description:			IP Address:	
				Host Name:	
	Module Definition				
	Series:	А		Change	
	Revision:	1.1			
	Electronic Keying:	Compatible Module	Digital Module 1:	Undefined	
	Connection:	Data	Digital Module 2:	Undefined	
	Sensing Module:	XXX-ESM-IG-30A	Digital Module 3:	Undefined	
	Control Module:	193-EIO-43-120	Digital Module 4:	Undefined	
	Control Strategy:	Overload	Operator Station:	Undefined	
	Sensing Module: Control Module: Control Strategy:	XXX-ESM-IG-30A 193-EIO-43-120 Overload	Digital Module 3: Digital Module 4:	ef	Undefined Undefined Undefined

- 6. Click Change to launch the Module Definition window.
- 7. Select the specific E300 Electronic Overload Relay Sensing and Control Modules and their respective Option Match actions.

이 MyE300 한 중 Expansion Bus	MyE300	<u></u>
E sig Expansion Sus — Digital Modules — Operator Station — Motor Control — Trip / Warning Alarms — Input Data	Series: Revision: Electronic Keying: Connection: Sensing Module Module:	A V 1 V 1 Compatible Module V Data V X004-ESM-IG-30A V
	Description: Mismatch Action: Control Module	0.5A-30A, Current & Ground Fault Trip
	Module: Description: Mismatch Action:	193-ETO-43-120 4 Point 110V-120V AC Input, 3 Point Relay Output Trip

- 8. Right click on the Expansion Bus to add the specific Expansion Bus accessories for the E300 Electronic Overload Relay system and select their specific Option Match action.
- 9. When finished, click OK.



10. Configure the Operating Mode and associated relay output assignments for the E300 Electronic Overload Relay.

odule Definition*	2
MyE300 白 器 Expansion Bus	Motor Control
Digital Modules [] [1] 193-EXP-DI0-42-24D* Operator Station Motor Control	Control Strategy: Overload
— Input Data	Control Module
	Relay 0 💌
	()
	The diagram elements are for reference puposes only and may not represent
	actual field wiring.
	OK Cancel Help

The E300 module lets you configure up to 8 Datalinks.

11. Select the parameters for the additional data to be included with the input tags.

12. Click OK to complete the module definition.

oansion Bus gital Modules				
[] [1] 193 EXP DIO 42-24D*	Datalink	Parameter		Tagname
erator Station Control	0	P002: Overload Time to Trip	•	MyE300:1.UserDefinedData[0]
p / Warning Alarms	1	P003: Overload Time to Reset	•	MyE300:1.UserDefinedData[1]
) ata	2	P028: Operating Hours	•	MyE300:1.UserDefinedData[2]
	3	P029: Auto Restart Tries Count	•	MyE300:1.UserDefinedData[3]
	4	P030: Auto Restart Tries Available	•	MyE300:1.UserDefinedData[4]
	5	P031: Auto Restart Time till Try	-	MyE300:1.UserDefinedData[5]
	6	P038: Invalid Configuration Parameter	-	MyE300:1.UserDefinedData[6]
	7	P039: Invalid Configuration Cause	-	MyE300:I.UserDefinedData[7]
		: by Parameter Number		

13. Select Protection and set the overload configuration parameters for your specific application and click OK.

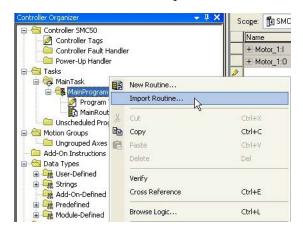
General Connection	Protection - Overload			
Module Info	Motor Type:	Single Phase 💌		
Internet Protocol Port Configuration	Overload			
- Network	Trip Class:	10 🛨	Activate FLA2:	Disable
	Full Load Current (FLA1):	0.50 🕂 Am	ps Alternate Full Load Current (FLA2):	0.50 - Amps
	Current Transformer Ratio:			
	Primary:	5 🕂 Am	ps	
	Secondary:	5 🕂 Am	ps	
	Overload Trip / Warning			
	🔽 Enable Trip		🔲 Enable Warning	
	Reset Mode:	Manual	Warning Limit:	85 📑 % TCU
	Reset Level:	75 🕂 %	TCU	
atus: Offine			ок са	ancel Apply Help

- 14. To configure the other protection configuration parameters, follow these steps.
 - a. In Controller Tags, browse to the configuration tags of the newly added E300 module.
 - b. Modify the configuration tags directly to enable and adjust the other current-based and control-based protection functions of the E300 module.

Name	<u></u>	Value	+	Ford
HyE300:C.GroundFaultType			1	
HyE300:C.GroundFaultInhibitTime			10	
Hyperbolic GroundFaultTripDelay			5	
⊞-MyE300:C.GroundFaultWarnDelay			0	
HyE300:C.GroundFaultTripLimit			250	
Hyperbound Hyperbou			200	
HyE 300: C. PhaseLossInhibit Time			0	
HyE 300: C. PhaseLoss TripDelay			10	
∃-MyE300:C.StallEnabledTime			10	
HyE300:C.StallTripLimit			600	
			10	
E MyE300:C.JamTripDelay			50	
🗄 MyE300: C. Jam TripLimit		0	250	
			150	
. HyE 300: C. Underload Inhibit Time			10	
E MyE 300: C. Underload TripDelay			50	
HyE 300: C. Underload TripLimit			50	
⊞-MyE300:C.UnderloadWarnLimit			70	
			10	
∰-MyE300:C.CurrentImbalanceTripDelay			50	
HyE300:C.CurrentImbalanceTripLimit		1	35	
			20	

Import the E300 Module Faceplate Routine

1. From the Controller Organizer, right-click on the program where you would like to add the E300 module faceplate routine, and choose Import Routine.



2. Navigate to the ME E300 Faceplate Files folder and select the ME_E300_Faceplate with Energy.L5X file, and click Import.

Look ir	🛙 🍶 ME E 300 Faceplate Files	🗾 🕝 💋 📴 •	
1	Name 🔺	- Date modified - Type	-
1	ME_E300_Faceplate with Energy.L5X	6/16/2014 9:33 PM L5X File	

The Import Configuration dialog box opens.

Find Within: Final Name			
Import Content:	Configure Routine	Proportion	
MainTask MainProgram	Import Name:	RXX_DeviceName_Faceplate	
	Operation:	Create	I D
Tags Image: Second s		References will be imported as configured in the References folder	ers
Cata Types ♥ Other Components	Final Name:	RXX_DeviceName_Faceplate	Properties
- 🔯 Errors/Warnings	Description:	E300 Overload Relay ME Faceplate v01 with Energy	
			¥
	Туре:	🗎 Ladder Diagram	
	In Program:	🕞 MainProgram	
	Number of Rungs:	15	

3. Enter the name for your routine in the Final Name field.

Import Content:			
🔁 MainTask	Configure Routine	e Properties	
MainProgram	Import Name:	RXX_DeviceName_Faceplate	
I	Operation:	Create	
Tags		i) References will be imported as configured in the References folders	
Components	Final Name:	R01_MyE300_Faceplate	Properties
- 💽 Errors/Warnings	Description:	E300 Overload Helay ME Faceplate	
		2	1
	Туре:	🗎 Ladder Diagram	
	In Program:	🕞 MainProgram	
	Number of Rungs:	15	

4. In the Import Content organizer, select tags.

The Configure Tag References dialog box opens.

5. Replace _DeviceName in the Final Name with the name of your device.

port Content:	Con	fiqu	re Tag Reference	\$5	_		_		
			Import Name	Operation		Final Name	4	A	i Data Type
R1_MyE300_Faceplate	٣	IJ	_DeviceName:I	Undefined	1	_DeviceName:I			
	٣	IJ	_DeviceName:0	Undefined	1	_DeviceName:0	1		
Add-On Instruction			_DeviceName	Create	1	_DeviceName_AlarmHistory	1		AlarmHistory_AOI
Data Types		Đ	_DeviceName	Create	D	_DeviceName_AlarmName			STRING
Other Components		ŋ	_DeviceName	Create	1	_DeviceName_EEO		•	UDT_EE0
- 🔯 Errors/Warnings	0.9	IJ	_DeviceName	Create	1	_DeviceName_EEO_MSG		•	MESSAGE
			_DeviceName	Create		_DeviceName_Energy_AlarmHistory		•	AlarmHistory_A0I
		IJ	_DeviceName	Create	L	_DeviceName_FP			E300_rev0_A01
		ŋ	E300AlarmHan	Create		E300AlarmHandshake			BOOL
		IJ	E300AlarmInPr	Create		E300AlarmInProcess		•	BOOL
		IJ	E 300AlarmName	Create	1	E300AlarmName	1		STRING
		Ð	E 300AlarmTrig	Create	L	E300AlarmTrigger			DINT
		IJ	ModuleAlarmH	Use Existing	V	ModuleAlarmHandshake			BOOL
	2 12	IJ	ModuleAlarmIn	Use Existing		ModuleAlarmInProcess			BOOL
		IJ	ModuleAlarmN	Use Existing	*	ModuleAlarmName		•	STRING
		0	MALE ALC: TO	11 E 2 C		MALE AL TO		et	DUIT

For the 'MyE300' example, the Final Names are renamed to the following:

the main date	Configu	re Tag Reference	s					
MainProgram		Import Name	Operation	15	Final Name		😭 Al	i Data Type
References	9	_DeviceName:I	Use Existing	0	MyE300:1			AB:E300:1:0
	9	_DeviceName:0	Use Existing	Ē	MyE300:0			AB:E300:0:0
Control Contr		_DeviceName	Create		MyE300_AlarmHistory			AlarmHistory_A0
	1	_DeviceName	Create		MyE300_AlarmName			STRING
	1	_DeviceName	Create		MyE300_EEO			UDT_EE0
	9	_DeviceName	Create		MyE300_EEO_MSG			MESSAGE
		_DeviceName	Create		MyE300_Energy_AlarmHistory			AlarmHistory_A0
	ß	_DeviceName	Create		MyE300_FP			E300_rev0_A0I
	9	E300AlarmHan	Create		E300AlarmHandshake			BOOL
	9	E300AlarmInPr	Create		E300AlarmInProcess	ノ		BOOL
	IJ	E300AlarmName	Create	1	E300AlarmName			STRING

6. In the Import Content organizer, select Other Components.

The communication path can be set for all messages by selecting the device from the I/O configuration drop-down in the Component References.

Import Content:	Configure	Compone	nt Reference	0			
AinTask	Import		Operation	Final Name	Δ	Class Name	
R1_Motor_1_Faceplate	C _Devic	eName	Undefined	Motor_1	-	Module	
Components Components				ė 🖞	ackp	lane, 1789-A17/A EtherNet/IP Ethe Ethernet EtherNet/IP	ernet

7. Click OK.

The new Routine appears in the Controller Organizer within the selected program.



8. Add a JSR to your main routine, or other desired location, to execute the new routine.

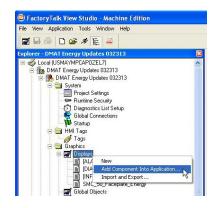


Configure FactoryTalk View ME for the E3 Plus Module Faceplate

Follow these procedures to configure the faceplate.

Add E300 Module Faceplate to ME Application

- 1. Launch FactoryTalk View Studio software and create or open an existing application file.
- 2. In the Graphics folder, right-click on Displays and choose 'Add Component Into Application'.

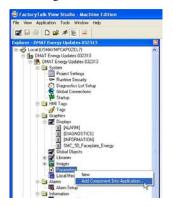


3. Navigate to the ME E300 Faceplate Files folder, select the ME_E300_Faceplate_Energy.gfx, and click Open.

rganize 👻 New folde	er		855	- 🔳 🤇
归 Recent Places	<u> </u>	Name *	Date modified	Туре
Libraries Libraries Documents Music Fictures Videos PASS01 Local Disk (C;) Cal Local Disk (D;) RA_FILES (F;)		ME_E300_Faceplate_Energy.gfx	4/25/2014 1:00 PM	GFX File
📬 Network	-	•		

Add a Parameter File

1. Right-click on Parameters, and choose 'Add Component Into Application'.



2. Browse to the ME E300 Faceplate Files folder, select the ME_E300_Parameter.par file, and click Open.

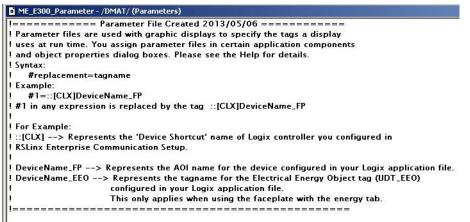
Configure a Parameter File

- 1. From the explorer window in FactoryTalk View Studio, in the Parameters folder, right-click the ME_E300_Parameter.par file, and choose Rename.
- 2. Rename the parameter file with the name of the corresponding device in your RSLogix5000 application.

For example, MyE300.

3. Double-click the parameter file to open it.

Parameter #1 represents the tag name for the specific faceplate tag within your RSLogix 5000 project. Each tag contains a controller shortcut name in brackets. This should match the shortcut name created in your RSLinx Enterprise communication setup.



#1=[CLX]DeviceName_FP

4. Replace the shortcut name (CLX) and DriveName in parameters 1 to match the tags configured in your RSLogix5000 project.

For the MyE300 example, the configuration looks like the following:

#1=[MyCLX]MyE300_FP

! #2 only applies If using the faceplate with the energy tab #2=[MyCLX]MyE300_EE0

5. For parameter #2, change the shortcut name [CLX] to match your communication setup and DeviceName to match the tag configured in your RSLogix5000 project.

For the MyE300 example, the configuration would look like the following:

 ! DeviceName_FP --> Represents the AOI name for the device configured in your Logix application file.

 ! DeviceName_EEO --> Represents the tagname for the Electrical Energy Object tag (UDT_EEO)

 ! configured in your Logix application file.

 ! This only applies when using the faceplate with the energy tab.

#1=[MyCLX]MyE300_FP

! #2 only applies If using the faceplate with the energy tab #2=[MyCLX]MyE300_EE0

6. Save your parameter file.

- 7. To add parameter files for additional E300 modules:
 - a. Right-click on the parameter file that you just created and choose Duplicate.
 - b. Rename the file with the new device name.
 - c. Open the parameter file and configure the tag to match the associated device.

Create a Display Navigation Button

A display navigation button must be created to launch the E300 faceplate at runtime. This can be drawn over an existing graphic object that represents the device you intend to monitor/control or it can be configured to use a bitmap image as the display.

 From the display where you want to launch the faceplate (can be a new or an existing display), choose Objects > Display Navigation > Goto.

🖉 Factory Talk '	View Stud	lio - View I	Machine E	dition	Č.	
File Edit View	Objects	Arrange	Animation	Applie	ation -	Fools Window
Explorer - DMA	✓ Selec Rotat			•	• [] ×	■ ※ Pa
E 🞸 Local (PA	Push	ing Button ric and Str	ing	+ + +		
	Displa	ay Na <u>v</u> igatio	n	•	<u>G</u> oto	N
-0	Indica Ga <u>u</u> g	ator e and Grapi	ו	+	<u>R</u> eturn <u>⊂</u> lose	to hè
	<u>T</u> reno Recip			• •	Display	List Selector

- 2. Draw the Goto button rectangle.
- 3. Double-click the new Goto rectangle to configure the button properties.
 - a. Modify the appearance as desired for your application (for example, choose Transparent as the Back style if you are drawing the Goto button over an existing object on your display).
 - b. Click the ellipse next to the Display field and assign the ME_E300_Faceplate display.
 - c. Click the ellipse next to the Parameter file field and assign the E300 parameter file you created earlier for this intended device.

Reised 4 Border uses back color Back style: Pattern style: Back color Solid None Pattern color Shape: Pattern color Pattern color Rectangle Pattern color Bink Display settings Use variable Display Parameter file: MyE300 Parameter file: Use variable Display Display position Top position: 0 Use Variable Display Position Left position: 0	Border style:	Border width:	
Back style: Solid Altern style: Solid Altern style: Back color Back color Back color Back color Pattern color Pattern color Pattern color Bink Display settings Display: ME_E300_Faceplate MyE300 Parameter file: Display position: Display posit			Rorder uses back colo
Solid Image: Color Shape: Pattern color Rectangle Pattern color Display settings Blink Display: ME_E300_Faceplate; Or Parameter file: MyE300 Or Parameter file: Image: Color Display position Top position:	1 second se		
Shape: Pattern color Rectangle Highlight color Display settings Blink Display: ME_E300_Faceplate Parameter file: MyE300 Parameter list: Display position: 0 Left position: 0	-		
Rectangle Implage color Display settings Blink Display. ME_E300_Faceplate Implage color Implage color Implage color Implage color Display. ME_E300_Faceplate Implage color Implage color Implage color Implage colo	1	INONE	
Display settings Display: ME_E300_Faceplate Use variable Display Parameter file: MyE300 Parameter list: Display position: 1 Left position: 1			
Display: ME_E300_Faceplate Use variable Display Parameter file: MyE300 Parameter list Display position: Top position: 0 Left position: 0	Treetangie		
			Left position: 0
	Touch margins		
Horizontal margin: Vertical margin:	Horizontal marg		

- 4. Folow these steps to use a bitmap image with the button.
 - a. Click the Label Tab and click the ellipse button next to the Image field.
 - b. Click Add from File and select the E300 Bitmap Image located in the ME E300 Faceplate Files folder.

IMPORTANT You only need to add the image from File the first time you use the image. Once added, the image can be selected from the image list.

- c. Click Open to add the image then OK to close the Image Browser window.
- d. Add text in the Caption field if desired.

Caption	(mage Browser		<u> </u>
	Select image: Arrow Down Arrow Left		dd from File
Font:		anagement 🝷 ME E300 Faceplate Files	Search ME E300 Faceplate Files
Caption color	E → Corganize → New folder F F E Recent Places	Name *	8⊞ ▼ 🛄 🤅 Date modified Type
Caption blink Word wrap	Libraries	🛃 E300.bmp	6/11/2014 10:13 AM Bitmap ima
mage settings	Music Pictures Videos		
Image color	PASS01		
Image blink Image scaled	Local Disk (D:)	_	

e. Click OK to close the Goto button properties window.

This is an example of a final goto button on your display.



To support additional E300 modules, create a new Goto display navigation button, assign the E300 faceplate display, and assign a unique parameter file associated with the additional device.

Configure ME SMC-50 Controller Faceplates

The ME SMC-50 controller faceplate files provide a pre-configured display and associated logic for the SMC-50 Solid State Soft Starter using FactoryTalk View Machine Edition and RSLogix 5000 software. The faceplate includes status, control, diagnostic and energy views controlled by its own toolbar buttons.

These instructions are for the SMC_50 communicating over the EtherNet/IP network only.

Home Display X SMC 50 <u>í i ja</u> N Ε ? Alarm □ Fault □ At Speed Start Stop Stop/Manuvr %MTU 0 Slow Speed Current 0.0 Voltage 0 Program Shows status and provides operator control of the soft starter **Configuration Display** X SMC 50 "A" \sim -(?)10000 Comm Fault Timer Preset

Slow Speed %

Lets you set the communication fault timer and the

slow speed percentage and rename the device for

Device Name

Program

SMC 50 X SMC 50 X SMC 50 Cast Fault F5 Shorted SCR B Fault CLR Faults

Fault Display

Shows the last fault.

Energy Display

	SMC 50			
X 🔎	\sim		0	
Resource Typ	e:	Elect	rical	
Capabilities:		Meas	ured	
Consumed (k	Wh):	0001	23456.000	
Generated (k)	Nh):	0000	000000.000	
Total (kWh):		0001	23456.000	
Power (kW):			2.00	

Shows basic energy data.

Configure RSLogix5000 for the SMC-50 Controller Faceplate

Follow these procedures to configure the faceplate.

Add the SMC_50 Controller to Your Ethernet Network

10

SMC 50

display at the top of the faceplate.

- 1. Create a new or open an existing RSLogix5000 file.
- 2. Under I/O Configuration, right-click the network communication module to be used for the intended SMC-50 controller.

IMPORTANT This step assumes you have already added and configured an Ethernet module to your I/O tree.

- 3. Select 'New Module'.
- 4. Expand the Drives folder and select the appropriate SMC-50-E controller and click OK.

Module	Description	Vendor
PowerFlex 755-N.	AC Drive via 20-COMM-E	Allen-Bradley
PowerFlex 7000 2	MV Drive, Fourth Gen Control via 20-COMM-E	Allen-Bradley
PowerFlex 7000-B	MV Drive via 20-COMM-E	Allen-Bradley
PowerFlex DC-20	208/240V DC Drive via 20-COMM-E	Allen-Bradley
PowerFlex DC-40	400/480V DC Drive via 20-COMM-E	Allen-Bradley
PowerFlex DC-60	600V DC Drive via 20-COMM-E	Allen-Bradley
SMC-50-E	Fully Solid-State Smart Motor Controller via 20-COMM-E	Allen-Bradley
SMC-50-E ⊕- HMI ⊕- Motion	Fully Solid-State Smart Motor Controller via 20-COMM-E	Allen-Bradley
. ⊕ HMI	Fully Solid-State Smart Motor Controller via 20-COMM-E	Allen-Bradley
HMI Motion	Fully Solid-State Smart Motor Controller via 20-COMM-E	Allen-Bradley
HMI Motion Other	Fully Solid-State Smart Motor Controller via 20-COMM-E	Allen-Bradley
HMI Motion Other Safety	Fully Solid-State Smart Motor Controller via 20-COMM-E	Allen-Bradley
 HMI Motion Other Safety Specialty 	Fully Solid-State Smart Motor Controller via 20-COMM-E	

5. Enter a distinct module name and the IP Address of your module.

(For example, we use 'Motor_1' for the module name throughout this document.)

IMPORTANT The IP address must match with that of your 20-COMM-E module. This step assumes you already assigned an IP address to your 20-COMM-E module. Refer to the PowerFlex 20-COMM-E EtherNet/IP Adapter User Manual, publication <u>20COMM-UM010</u>, for information on how to assign it an IP address.

General* Conr	nection Module Info	Drive	
Type: Vendor: Parent:	SMC-50-E Fully Solid-State Sma Allen-Bradley Ethemet	t Motor Controller via 20-COMM-E Ethernet Address	
Na <u>m</u> e: Description:	Motor_1	Private Network: IP Address: Host <u>N</u> ame:	192.168.1. 8
Module Defi Series: Revision:	2.1	Change	
Electronic K Connection: Data Format	Parameters via D		

6. Click Change to launch the Module Definition window.

7. Select the firmware of the device you are using.

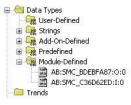
IMPORTANT If the firmware revision of your drive is not listed, refer to the lower left corner of the Module Definition window for instructions on how to create a database.

	Compatible Module Standard	.	Phi	gicStatus aseACurrent ThermUsage - 18		LogicCommand NotUsed Use Network Refe	vence
							vence
Drive Rating:	Standard		A Mtr	Thormulacare 19		Use Network Refe	rence
unve naung.	standard		A Mtr	Thorm loogo 19			sience
				merniosage - ro	~	SlowSpeed - 72	~
			1.	ult1 - 138		Undefined_A2	~
			247	tsPhaseA_B - 2		Undefined_B1	~
				pMode - 65	~	Undefined_B2	~
			° _				
Connection:	Parameters via Datalinks	_				<u></u>	
Data Format:	Parameters	~					
 click Web Update to the web if drive is offlin 	e button below if drive is onlir to download the database from		Ner Parar memi nece data parar You r contr	improperly using soft neter names in the drive ssary Datalink parame transfer between con neters. nust download config	ware to for the Modu eters in troller a uration unicatio	us motion of machinery o configure a drive. Input and Output Data le-Defined Data Types the RSLogix 5000 proj and drive is determined to the drive to ensure on module configuration	a appea and del ject. Aci by Data that the

- 8. Enter the DataLink Module Definitions exactly as shown.
- **IMPORTANT** The datalinks listed must be configured exactly as shown for successful faceplate AOI import and operation. If additional datalinks are required for your application, modifications to the corresponding AOIs may be required. Refer to step 4 of the Set Other SMC-50 Parameters section, for more information on how to modify the AOI.

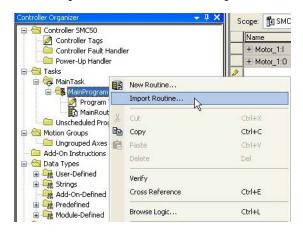
Datalink	Input Data		Output Data		
	LogicStatus	LogicCommand			
	PhaseACurrent		NotUsed		
A	MtrThermUsage - 18	~	SlowSpeed - 72	~	
	Fault1 - 138	~	Undefined_A2	~	
₽ B	VoltsPhaseA_B - 2	~	Undefined_B1	~	
172	StopMode - 65	~	Undefined_B2	~	
□c	-				
D					

- 9. Click OK to accept the changes.
- 10. Click OK again to close the dialog box.
- 11. In the Data Types folder, verify these module-defined data types have been created.



Import the SMC-50 Controller Faceplate Routine

1. From the Controller Organizer, right-click on the program where you would like to add the SMC-50 controller faceplate routine, and choose Import Routine.



2. Browse to the ME SMC 50 Faceplate Files folder, select the SMC50_Faceplate_Energy.L5X file, and click Import.

Look in	: 🔋 📕 ME SMC 50 Faceplate Files	- 😳 💋 🔄
<i>i</i> 1 m	Name 🔺	- → Date modified - Type
2	SMC_50_Control_Rungs.L5X	4/18/2013 11:08 L5X File
tecent Places	SMC50_Faceplate_Energy.L5X	11/7/2013 1:32 PM L5X File

The Import Configuration dialog box opens.

문 또 Find: Find Within: Final Name	• 🏭 🛱	Find/Replace	
Import Content:	Configure Routine	Proportion	
MainTask MainProgram	Import Name:	RXX_DeviceName_Faceplate	
References	Operation:	Create	- 0
Tags Tags Add-On Instruction Data Types Other Components Errors/Warnings		(i) References will be imported as configured in the References fol	ders
	Final Name:	RXX_DeviceName_Faceplate	✓ Properties
	Description:	SMC-50 Faceplate Routine with Energy Monitoring v01	*
	Type:	📋 Ladder Diagram	×
	In Program: Number of Rungs:	MainProgram	

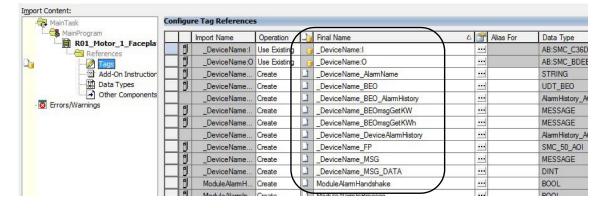
3. Enter the name for your routine in the Final Name field.

Import Content:			
MainTask MainProgram MainProgram MainProgram References Tags	Configure Routine Import Name: Operation:	Properties RXX_DeviceName_Faceplate Create]ם
Add-On Instruction Add-On Instruction Data Types Other Components Errors/Warnings	Final Name:	Configured in the References folders R01_Motor_1_Faceplate SMC-50 Faceplate Routine with Energy Monitoring v01	Collision
	Type:	T Ladder Diagram	Collision
	In Program:	A MainProgram	
	Number of Rungs:	15	

4. In the Import Content organizer, select tags.

The Configure Tag References dialog box opens.

5. Replace _DeviceName in the Final Name with the name of your device.



For the 'Motor_1' example, the Final Names are renamed to the following:

🚑 MainTask	Configu	ure Tag Reference	5				
MainProgram		Import Name	Operation		Final Name	Δ	
R01_Motor_1_Facepla R01_Motor_1_Facepla References Add-On Instruction M Data Types Other Components C Errors/Warnings		_DeviceName:I	Use Existing	1	Motor_1:1		
	1	_DeviceName:O	Use Existing	G	Motor_1:0		
	- 9	_DeviceName	Create	1	Motor_1_AlarmName		
	9	_DeviceName	Create	1	Motor_1_BEO		
	5	_DeviceName	Create	1	Motor_1_BEO_AlarmHistory		
	9	_DeviceName	Create	1	Motor_1_BEOmsgGetKW		
	1	_DeviceName	Create		Motor_1_BEOmsgGetKWh		
		_DeviceName	Create	1	Motor_1_DeviceAlarmHistory		
	9	_DeviceName	Create	1	Motor_1_FP		
	1	_DeviceName	Create	1	Motor_1_MSG	7	
	1	_DeviceName	Create	1	Motor_1_MSG_DATA	/	
	l nl		1.429 1.0	1000			

6. In the Import Content organizer, select Other Components.

The communication path can be set for all messages by selecting the device from the I/O configuration drop-down in the Component References.

Import Content:	Config	gure Compone	nt References				
MainProgram		mport Name DeviceName	Operation Use Existing	Final Name Motor 1	Δ	Class Name Module]
References Tags - Tags - Data Types Data Types Other Components Frrors/Warnings				1/0 	Config 1756 일 [0 금 물	uration Backplane, 175 J 1756-EN2T Eti 5 Ethemet J SMC-50-E J 1756-EN2 SMC-50-E J SMC-50-E	hemet E SMC_1 2T Ethemet

7. Click OK.

The new Routine appears in the Controller Organizer within the selected program.



8. Add a JSR to your main routine, or other desired location, to execute the new routine.



Set Other SMC-50 Controller Parameters

SMC-50 controller parameter settings are very specific to your application and need to be reviewed carefully before running your application.

- 1. Double click on the 'SMC-50 Motor_1' in the I/O Configuration tree.
- 2. On the General tab, click Change to configure any additional datalink parameters, other than those configured in <u>step 8</u> on <u>page 294</u>, that are required for your application.

In this example, input parameter 17 and output parameter 189 were added.

Revision:	2 🗸 1	~	Datalink	Input Data	i i	Output Data	
-				LogicStatus	-	LogicCommand	
Electronic Keying:	Compatible Module	~		PhaseACurrent		NotUsed	ence
Drive Rating:	Standard	~	A	MtrThermUsage - 18	~	SlowSpeed - 72	~
				Fault1 - 138	~	StallPosition - 189	~
			₽ B	VoltsPhaseA_B - 2	~	Undefined_B1	~
				StopMode - 65	V	Undefined_B2	~
			C	PowerFactor - 17	~	Undefined_C1	~
				Undefined_C2	×	Undefined_C2	~
				2000 C			

3. Click OK and Apply to accept any changes.

- 4. If you modify the datalink configuration, you must also re-configure tag data types in the SMC 50 AOI.
 - a. In your RSLogix5000 Controller Organizer, expand the Add-On Instructions folder.
 - b. Select the SMC_50 AOI and double-click on 'Parameters and Local Tags'.
 - c. Click the Edit Tags tab and find the 'Inp_SMC_50' AOI tag
 - d. Change the Data Type to match the SMC_50 Module Input Data Type that applies to your application.

🗟 Controller SMC50	Scope: Scope:	Show: All T		
- 🧭 Controller Tags	Data Context: DSMC_50_A01 (definition)	- ● ● -		
Controller Fault Handler	Name		Alias For Data Type	Description
B G Tasks	EnableIn	Input	BOOL	Enable Input - System
😑 🙀 MainTask	EnableOut	Output	BOOL	Enable Output - Syste
🗄 🕞 MainProgram	+ Inp NumRowsVis	Input	DINT	
- 🗀 Unscheduled Programs / Phases	+ Inp SMC 50	InDut	AB:SMC_C36D62ED:10	
🗄 🔠 Motion Groups	H MSG1 Timer	Local		
Ungrouped Axes	+ Out SMC 50	InOut	Select Data Type	
a 😂 Add-On Instructions 😟 🕼 AlarmHistory AOI	+ Bef MSG1	InDut	Data Types:	
SMC 50 AOI			AB:SMC 6109746E:I:0	OK
Parameters and Local Tags	+ Set_CommFaultTimerPresetOper	Input	AD.3MC_0103740E.1.0	
Logic	Set_CommFaultTimerPresetProg	Input	🗄 🙀 Strings	Cancel
🗉 🔠 Data Types		Input	Add-On-Defined	
🗉 🚂 User-Defined	E-Set_CurrentMinOper	Input	🕀 🙀 Predefined	Help
😟 🖼 Strings	E-Set_DeviceNameOper	Local	😑 🕞 Module-Defined	
🗉 🚂 Add-On-Defined		Input	— 🛄 AB:SMC_6109746E:I:0	
🕀 🏣 Predefined	EquipmentDisplayName	Local		
😑 🦏 Module-Defined	+ Set. FaceplateAnimation	Input		
	+ Set_MTUMaxOper	Input	- 60 ABISMU_U36062EDII:0	~
	+-Set MTUMinOper	Input	Array Dimensions	
AB:SMC C36D62ED:I:0	+ Set Option1Name	Local	Dim 2 Dim 1 Dim 0	
Trends	+ Set Option2Name	Local	0 0 0 0	\$
🛛 😁 I/O Configuration	+ Set SMC Direction Oper	Input		Y
🖃 🖅 1756 Backplane, 1756-A7	+ Set SMC Direction Prog	Input	Show Data Types by Groups	
- [1] [0] 1756-L73 SMC50 - 1] [1] 1756-EN2T Ethernet	E Set TrendNextPenOper	Input	PINT PINT	

- e. Repeat the previous steps for the "Out_SMC_50" AOI tag, using the Module Output Data Type.
- **IMPORTANT** Any time you modify your SMC_50 Module definitions after you have created your SMC_50 AOI, you have to reassign your SMC_50 AOI Input and Output Tag Data Types. If multiple changes to your SMC_50 Module definitions were made and saved, there are multiple Data Types listed for a particular DataLink configuration. Be careful to match the Data Type you select within the AOI to the Data Type of the intended SMC_50 Module definition.
 - 5. Select the 'Drive' tab of the SMC_50 Module Properties.

Module Properties: Ethernet (SMC-50-E 2.	.1)
Status: Offline	OK Cancel Apply Help

6. Open the Parameter List and modify as your application requires.

7. This faceplate requires bit 4 of parameter 148 to be set to 1 to enable start and maneuver commands via the internal comm module.

ama							
ame	eter Gi	roup: [🕄 All Parame	eters 🔽				
ID	۵ (Name	Value	♥ Units	Internal Value 🔸	Min	Max
	148	Logic Mask	00000000)0010000	16	000000000000000000000000000000000000000	01111111111111
-		Logic Mask Logic Mask Act	00000000		16	000000000000000000000000000000000000000	
-	149			0000000	16 0 32767		11111111111111

- 8. Close the Parameter List window.
- 9. Download your parameters to the SMC-50 controller by choosing the download icon from the toolbar.

Follow prompts to complete the download process.



Import Program Control Rungs

Example logic is provided for configuring program commands. To import this configuration, follow these steps.

- 1. Choose a routine for importing the new rungs.
- 2. On a new rung, right click and select 'Import Rungs'
- 3. From the ME SMC 50 Faceplate Files folder, select 'SMC_50_Control_Rungs.L5X' and click Import.
- 4. Click Tags in the Import Content organizer.

- Harrison	onfig	ure Tag References					
MainProgram		Import Name	Operation	20	Final Name	۲ 😭	Data Type
MainRoutine (Rungs)	9	Cmd_SMCName_OperCntrl	Use Existing		Cmd_SMCName_OperCntrl		BOOL
	10	Cmd_SMCName_Reset	Use Existing		Cmd_SMCName_Reset		BOOL
Add-On Instruction:	19	Cmd_SMCName_Start	Use Existing		Cmd_SMCName_Start		BOOL
🔞 Errors/Warnings	1	Cmd_SMCName_Stop	Use Existing		Cmd_SMCName_Stop		BOOL
	D	SMCName FP	Use Existing	1	SMCName FP		SMC_50_A0I

5. Replace SMCName in the Final Name field with the name of your SMC50 device and click OK.

de main dat	Configu	ure Tag References					
MainProgram		Import Name	Operation	1	Final Name	۵ 😭	Data Type
References	* 1	Cmd_SMCName_OperCntrl	Create		Cmd_Motor_1_OperCntrl		BOOL
	* 1	Cmd_SMCName_Reset	Create		Cmd_Motor_1_Reset		BOOL
Add-On Instruction:	* 1	Cmd_SMCName_Start	Create		Cmd_Motor_1_Start		BOOL
👿 Errors/Warnings	* 9	Cmd_SMCName_Stop	Create		Cmd_Motor_1_Stop		BOOL
	* 1	SMCName FP	Use Existing		Motor_1_FP	· ·	SMC 50 AO

Important Program and Operator Control Transfer Considerations

The first rung of the SMC_50_AOI handles the transfer of control from the Logix program (Program Control) to the faceplate (Operator Control). The Operator Control rung is shown below. It is important to understand how this rung operates so your desired program to operator and operator to program control transfers are achieved.

	OPERA	FOR CONTROL ENABLE RUNG	
This rung enables RSViewME/SE	Operator Control of the SM	IC_Flex Soft Start. Command re-	quests (Cmd) can be initiated from either the Logix
Programs (ProgOperReg) or RSVi	ewME/SE (OperOperReg). For example, to enable Operat	or control for a drive associated with "Motor_1" AOI
instance, a rung could be add	ed to the Logix MainRouti	ne with specific input conditions (driving an output instruction with the tag name
			ation could be added with a value tag name of
		rameter for that faceplate display	
			gram to Operator Control transfer is allowed.
			allow a transfer from Program Control to Operator
FLEASE NOTE. IT the Child_Floght			
	Control regardless of	the active status of the SMC_Fle	X SUIL STAR.
Cmd_ProgToOperPermissive	Cmd_ProgOperReq	Cmd_ProgProgReq	Sts_OperatorModeEnabled
			L}L}L
2 h	and the second	Sale and	
	Cmd OperOperReg	Cmd OperProgReg	
	JL		
		1 1 1 1 1 1	1 1 1 1 1 1 1 1 1 1 1
		Sts_ProgramModeEnabl	ed Cmd_ProgOperReq Cmd_OperOperReq

For example, these rungs enable the Operator Control of the intended SMC-50 controller. Command requests (Cmd) can be initiated from either the Logix Programs (ProgOperReq) or RSViewME/SE SMC_50 Faceplate (OperOperReq).

The following is a specific drive example:

To enable Operator Control for an SMC associated with 'Motor_1' AOI instance, a rung can be added to the Logix MainRoutine with EXAMPLE specific input conditions driving an output instruction with the tag name 'Motor_1.Cmd_ProgOperReg'. Also, a pushbutton in an RSView ME/SE faceplate can be added with a value tag name of '#1.Cmd_OperOperReq' with the #1 parameter for that faceplate display associated with 'Motor_1' tag. A 'Motor_1.Cmd_ProgToOperPermissive' must also be included in the Logix Program to control whether Program to Operator

Control transfer requests are allowed or acted upon. A tag value of 1 permits the associated control transfer requests. A value of 0 prevents the associated control transfer requests.



ATTENTION: If an Xxxx.Cmd_ProgToOperPermissive tag is set to 1, the associated AOI is programmed to allow a transfer from Program Control to Operator Control regardless of the current direction, speed, or active status of the SMC_50. Therefore, if the SMC_50 is running at the time of a Program to Operator Control transition, the SMC_50 continues to run. If a different Program to Operator Control transition is desired, then the status of the SMC_50 and the Operator command requests must be monitored and the appropriate Program commands must be issued before the Xxxx.Cmd_ProgToOperPermissive is allowed. Therefore, it is very important that the status of the SMC_50 is monitored and appropriate Program commands, for the specific application, are issued before the Xxxx.Cmd_ProgToOperPermissive tag is set, to insure a safe Program to Operator Control transfer.



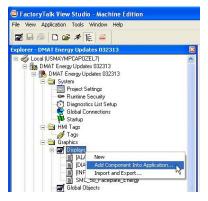
ATTENTION: If the SMC_50 is started in Operator Mode and the RSView ME SMC_50 Faceplate is closed while the SMC_50 is running, the SMC_50 continues running. Therefore, it is very important to understand how this operation affects the specific application and appropriate actions and safeguards are implemented.

Configure FactoryTalk View ME for the SMC-50 Controller Faceplate

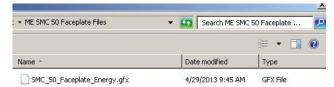
Follow these procedures to configure the faceplate.

Add SMC-50 Controller Faceplate to ME Application

- 1. Launch FactoryTalk View Studio software and create or open an existing application file.
- 2. In the Graphics folder, right-click on Displays and choose 'Add Component Into Application'.



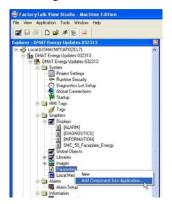
3. Navigate to the ME SMC 50 Faceplate Files folder, select the SMC_50_Faceplate_Energy.gfx file, and click Open.





Add a Parameter File

1. Right-click on Parameters, and choose 'Add Component Into Application'.



2. Navigate to the ME SMC 50 Faceplate Files folder, select the SMC50_Parameter.par file, and click Open.

Configure a Parameter File

- 1. From the explorer window in FactoryTalk View Studio, in the Parameters folder, right-click the SMC50_Parameter file, and choose Rename.
- 2. Rename the parameter file with the name of the corresponding device in your RSLogix5000 application.

For example, Motor_1.

3. Double-click the parameter file to open it.

The parameter file contains configuration for two parameters. Parameter #1 represents the tag name for the specific Faceplate AOI in your RSLogix 5000 project. Parameter #2 represents the tag name for the Base Energy Object tag (UDT_BEO) in your RSLogix5000 project. Each tag contains a controller shortcut name in brackets. This matches the shortcut name created in your RSLinx Enterprise communication setup.

```
Parameter files are used with graphic displays to specify the tags a display
uses at run time. You assign parameter files in certain application components
! and object properties dialog boxes. Please see the Help for details.
! Syntax:
   #replacement=tagname
Example:
   #1=::[CLX]DeviceName_FP
! #1 in any expression is replaced by the tag ::[CLX]DeviceName_FP
| For Example:
! ::[CLX] --> Represents the 'Device Shortcut' name of Logix controller you configured in
! RSLinx Enterprise Communication Setup.
! DeviceName_FP --> Represents the AOI name for the device configured in your Logix application.
! DeviceName_BEO --> Represents the tagname for the Base Energy Object tag (UDT_BEO)
                    configured in your Logix application file.
                    This only applies when using the faceplate with the energy tab.
                                 ______
#1=[CLX]DeviceName_FP
```

! #2 only applies If using the faceplate with the energy tab #2=[CLX]DeviceName_BEO Replace the shortcut name (CLX) and DriveName in parameters 1 and 2(if applicable) to match the tags configured in your RSLogix5000 project.

For the Motor_1 example, the configuration looks like the following:

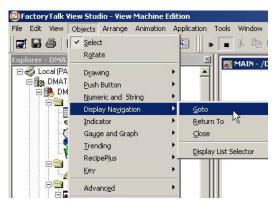
```
! Parameter files are used with graphic displays to specify the tags a display
 uses at run time. You assign parameter files in certain application components
! and object properties dialog boxes. Please see the Help for details.
Syntax:
   #replacement=tagname
Example:
   #1=::[CLX]DeviceName_FP
! #1 in any expression is replaced by the tag ::[CLX]DeviceName_FP
| For Example:
! :: [CLX] --> Represents the 'Device Shortcut' name of Logix controller you configured in
! RSLinx Enterprise Communication Setup.
! DeviceName_FP --> Represents the AOI name for the device configured in your Logix application.
 DeviceName_BEO --> Represents the tagname for the Base Energy Object tag (UDT_BEO)
                     configured in your Logix application file.
                     This only applies when using the faceplate with the energy tab.
#1=[CLX]Motor 1 FP
#2 only applies If using the faceplate with the energy tab
#2=[CLX]Motor_1_BEO
```

- 5. Save your parameter file.
- 6. To add parameter files for additional SMC-50 controllers:
 - a. Right-click on the parameter file that you just created and choose Duplicate.
 - b. Rename the file with the new device name.
 - c. Open the parameter file and configure the tag to match the associated device.

Create a Display Navigation Button

A display navigation button must be created to launch the SMC_50 faceplate at runtime. This can be drawn over an existing graphic object that represents the device you intend to monitor/control or it can be configured to use a bitmap image as the display.

1. From the display where you want to launch the faceplate (can be a new or an existing display), choose Objects > Display Navigation > Goto.



2. Draw the Goto button rectangle.

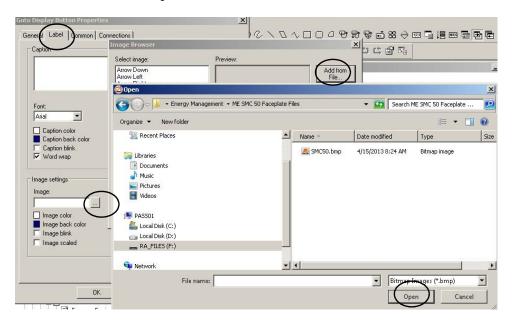
- 3. Double-click the new Goto rectangle to configure the button properties.
 - a. Modify the appearance as desired for your application (for example, choose Transparent as the Back style if you are drawing the Goto button over an existing object on your display).
 - b. Click the ellipse next to the Display field and assign the SMC_50_Faceplate_Energy display.
 - c. Click the ellipse next to the Parameter file field and assign the SMC_50 parameter file you created earlier for this intended device.

Border style:	Border width:
Raised	4 Border uses back colo
Back style:	Back color Pattern style: Border color
Solid	None Pattern color
Shape:	Highlight color
Rectangle	▼ UNIK
Display settings Display: SMC_5 Parameter file: Parameter list:	i0_Faceplate
Display: SMC_5	Motor_1
Display: SMC_5 Parameter file: Parameter list:	Motor_1
Display: SMC_E Parameter file: Parameter list: Display position Touch margins Horizontal margin	Motor_1
Display: SMC_E Parameter file: Parameter list: Display position Touch margins	Motor_1 Top position: Left position:

- 4. Folow these steps to use a bitmap image with the button.
 - a. Click the Label Tab and click the ellipse button next to the Image field.
 - b. Click Add from File and select the SMC50 Bitmap Image located in the ME SMC 50 folder.

IMPORTANT You only need to add the image from File the first time you use the image. Once added, the image can be selected from the image list.

- c. Click Open to add the image then OK to close the Image Browser window.
- d. Add text in the Caption field if desired.



e. Click OK to close the Goto button properties window. This is an example of a final goto button on your display.



To support additional SMC-50 controllers, create a new Goto display navigation button, assign the SMC-50 faceplate display, and assign a unique parameter file associated with the additional device.

Configure ME CIP Motion Drive Faceplates

The 'ME CIP Motion Energy Faceplate' files let you quickly load, configure, and use a preconfigured status display or 'faceplate' for the CIP Motion Servo Drives by using FactoryTalk View Machine Edition software.

IMPORTANT This faceplate covers Kinetix[®] K6500, K5500, and K350 drives. The instructions show the Kinetix K5500 drive as an example. These instructions are similar for the other drives.

MyPM	5500
F	6
Resource Type:	Electrical
Capabilities:	Derived
Consumed (kWh): [00000023.37
Generated (kWh):	000000000000
Total (kWh):	00000023.37
Power (kW):	0.3

System Compatibility

The faceplate and routine import files are compatible with the following software:

- Studio 5000 Logix Designer application, version 21.00 or later
- FactoryTalk View Machine Edition software, version 7.0 or later

The faceplate files are also compatible with the following faceplates:

- Equipment Status Faceplate Rev 1.0
- Alarm History Faceplate Rev 1.0

IMPORTANT These instructions are for CIP Motion Servo Drives (Kinetix 350, 5500, and 6500) communicating over an EtherNet/IP network.

General Setup

After downloading your faceplate zip file, the following folders are created:

- ME_CIPMotion_Energy_Faceplate_Files contains the CIP Motion Energy faceplate, parameter file, and controller logic
- ME_CIPMotion_Goto Buttons contains the image used in creating a Goto button for your HMI display

Configure Studio 5000 Logix Designer Application for the Kinetix Drive Faceplate

Follow these procedures to configure the faceplate.

Add the Kinetix Drive to Your Ethernet Network

- 1. Create a new or open an existing Logix Designer application file.
- 2. Under I/O Configuration, right click the network communication module to be used for the intended drive.

IMPORTANT This step assumes you have already added and configured an Ethernet module to your I/O tree.

- 3. Select 'New Module'.
- 4. Select the applicable Kinetix drive and click Create.

			Clear Filters			Hide Filter	5 🛠
	Module 1	ype Category Filters	× 🔽	м	odule Type Vendor	Filters	-
	Digital DPI to EtherNet/IP Drive DSI to EtherNet/IP		<u>।</u> যত্র ত	Allen-Bradley Cognex Corpora Endress+Hause FANUC Corpora	r		
	General Pumper Disor	1/0		EANILIC Debatio			<u>.</u>
-	Catalog Number	Description			Vendor	Category	
20	097-V34PR6-LM	Kinetix 350, 6A, 480V, No	Filter Ethemet	Drive	Allen-Bradley	Drive, Motion	
			I HON LETTONITON	Dire			
	198-H003-ERS	Kinetix 5500, 1A, 195-528			Allen-Bradley	Drive,Motion	
2	198-H003-ERS 198-H008-ERS	Kinetix 5500, 1A, 195-528 Kinetix 5500, 2.5A, 195-52	Volt, Safe To	que Off Drive	Allen-Bradley Allen-Bradley	Drive,Motion Drive,Motion	
2	and the second		Volt, Safe To 28 Volt, Safe T	que Off Drive orque Off Drive		and the second	
22	198-H008-ERS	Kinetix 5500, 2.5A, 195-52	Volt, Safe To 28 Volt, Safe T 3 Volt, Safe To	que Off Drive orque Off Drive rque Off Drive	Allen-Bradley	Drive,Motion	
2222	198-H008-ERS 198-H015-ERS	Kinetix 5500, 2.5A, 195-52 Kinetix 5500, 5A, 195-528	Volt, Safe To 28 Volt, Safe T 3 Volt, Safe To Volt, Safe To	que Off Drive orque Off Drive rque Off Drive que Off Drive	Allen-Bradley Allen-Bradley	Drive,Motion Drive,Motion	
22222	198-H008-ERS 198-H015-ERS 198-H025-ERS	Kinetix 5500, 2.5A. 195-52 Kinetix 5500, 5A, 195-528 Kinetix 5500, 8A, 195-528	Volt, Safe To 28 Volt, Safe To 8 Volt, Safe To Volt, Safe To 8 Volt, Safe To	que Off Drive forque Off Drive rque Off Drive rque Off Drive orque Off Drive	Allen-Bradley Allen-Bradley Allen-Bradley	Drive,Motion Drive,Motion Drive,Motion	

5. Enter a distinct module name and the IP Address of your drive.

(For example, we use My5500 for the module name throughout this document.)

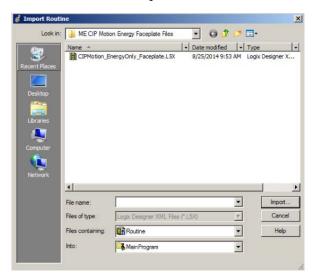
Joneral Con	rection Tim	ie sync wodule ini	o internet Protocol	Fort Configuration	Network	Associated Axes Power M.
Туре:			1A, 195-528 Volt, Safe	e Torque Off Drive		
Vendor:	Allen-Brad	ley		Ethernet Address		
Parent:	Local					
Name:	My5500			Private Network	ork:	192.168.1. 23
Description:			A	C IP Address:		8 8 E
			*	C Host Name:		
Module Defi	oition				1	
modulo Den			Change			
Revision:		2.1				
Electronic K		Compatible Mod	ule			
Connection:		Motion				
Power Struc	ture:	2198-H003-ERS				

Import the CIP Motion Energy Faceplate Routine

1. From the Controller Organizer, right-click on the program where you want to add the CIP Motion Energy faceplate routine, and choose Import Routine.



2. Navigate to the ME CIP Motion Energy Faceplate Files folder and select the CIPMotion_EnergyOnly_Faceplate routine and click Import.



The Import Configuration dialog box opens.

t Content:	Configure Routine	Properties	-	_	_	_
MainProgram	Import Name:	RXX_CIPMotion_Energy				
- References	Operation:	Create	•	2		
- Mags - Mata Types		(i) References will be imported as configured in the References f	olders			
Other Components Errors/Warnings	Final Name:	RXX_CIPMotion_Energy	-	Properties		
	Description:	CIP Motion Servo Drive Energy Faceplate Routine v.01	*			
	Type:	🗎 Ladder Diagram	2			
	In Program: Number of Rungs:	L MainProgram				

3. Enter the name for your routine in the Final Name field.

rt Content: AmainTask	Configure Routine	Properties		_
MainProgram	Import Name:	RXX_CIPMotion_Energy		
Tags Data Types Other Component	Operation:	Create () References will be imported as configured in the References		
Other Component	Final Name:	R01_My5500_Energy	· Properties	
	Description:	CIP Motion Servio Drive Energy Faceplate Routine v.01		
	Type:	Ladder Diagram	<u></u>	
	In Program:	C& MainProgram		
	Number of Rungs:	10		

4. Click Tags in the Import Content organizer.

The Configure Tag References dialog box opens.

5. Replace _DriveName in the Final Name with the name of your device.

	Confi	jure Tag References	_		-	~		
MainProgram		Import Name	Operation		Final Name 🛆		Alias For	Data Ty
R01_My5500_Energy		DriveName_BEO	Use Existing		_DriveName_BEO			UDT_BE
		DriveName_BEOmsg	Use Existing		_DriveName_BEOmsg_Get			MESSAC
Data Types		Module_FaultCode	Create		Module_FaultCode	•••		DINT
Other Components		Module_FaultTrigger	Create		Module_Fault Trigger	-		BOOL
Errors/Warnings				1		/	/	

For the My5500 example, the Final Names would be renamed to the following:

day rightrask	Configu	re Tag References		~		\		
MainProgram		Import Name	Operation		Final Name 🛛 🖉		Alias For	Data Ty
R01_My5500_Energy	9	_DriveName_BEO	Create		My5500_BEO			UDT_BE
	9	_DriveName_BEOmsg	Create	1	My5500_BEOmsg_Get			MESSAG
Data Types		Module_FaultCode	Create		Module_FaultCode			DINT
Other Components		Module_FaultTrigger	Create		Module_Fault Trigger			BOOL

6. Click Other Components in the Import Content organizer and choose your drive from the I/O configuration dropdown in the Final Name column.

This configures the communication path to your device in the message instructions.

MainProgram	Import Name	Operation	Final Name	4	Class Name	
Ro1_My5500_Energy	_DriveName	Use Existing	My5500	-	Module	
Other Components				Ethem	1769-L36ERM C	Notion IniveNarr

7. Click OK.

The new Routine appears in the Controller Organizer in the selected program.



8. Add a JSR to your main routine, or other desired location, to execute the new routine.

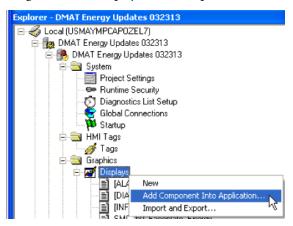


Configure FactoryTalk View ME for the CIP Motion Energy Faceplate

Follow these procedures to configure the faceplate.

Add CIP Motion Energy Faceplate to ME Application

- 1. Launch FactoryTalk View Studio (Machine Edition) and create or open an existing application file.
- 2. Right-click on Displays in the Graphics folder and select 'Add Component Into Application.



3. Navigate to the ME CIP Motion Energy Faceplate Files folder, select the CIPMotion_Faceplate_EnergyOnly.gfx file, and click Open.

anize 🔻 New folder				1993 🔹	
🍌 Sample Code	1	Name ^	Date modified	Туре	Siz
LIPMotion		CIPMotion_Faceplate_EnergyOnly.gfx	8/22/2014 12:52 PM	GFX File	
E300 Faceplate		CIPHODOIT_I aceptate_citergyOnly.gix	6/22/2014 12:32 PM	GIATIE	
🕌 Faceplates					
ME CIP Motion Energy Faceplate Files					
MMS_049188					
MMS_054613					
MMS_055017					
JMMS_055053					
MMS_055195					
MMS_055196					
MMS_055455					
MMS_055677					
MMS_057184	-	4			

Add Parameter File

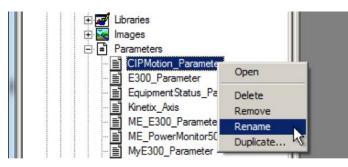
1. Right-click on Parameters, and choose 'Add Component Into Application'.



2. Browse to the ME CIP Motion Energy Faceplate Files folder, select the CIPMotion_Parameter.par file, and click Open.

Configure Parameter File

1. In the FactoryTalk View Explorer window, in the Parameters folder, right-click the CIPMotiion_Parameter file and choose Rename.



2. Rename the parameter file with the name of the corresponding device in your Logix Designer application.

For example, My5500_Parameter.

3. Double-click the parameter file to open it.

Parameter #1 represents the tag name of the faceplate tag in your Studio 5000 project. Parameter #2 represents the base energy object tag in your Studio 5000 project. Each tag contains a controller shortcut name in brackets. This matches the shortcut name created in your RSLinx Enterprise communication setup.



4. For parameter #1 and #2, change the shortcut name [CLX] to match your communication setup and _DriveName to match the tag configured in your Studio 5000 project.

For the My5500 example, the configuration looks like the following:

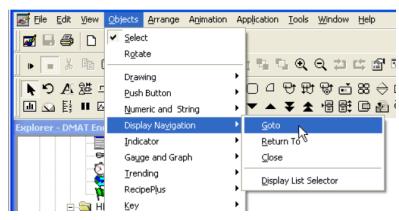
```
# Instance of the second ```

- 5. Save your parameter file.
- 6. To add parameter files for additional CIP Motion Servo Drives:
  - a. Right-click on the parameter file that you just created and choose Duplicate.
  - b. Rename the file with the new device name.
  - c. Open the parameter file and configure the tags to match the associated device.

#### Create Display Navigation Button

A display navigation button must be created to launch the CIP Motion Energy Faceplate at runtime. This can be drawn over an existing graphic object that represents the device you intend to monitor/control or it can be configured to use a bitmap image as the display.

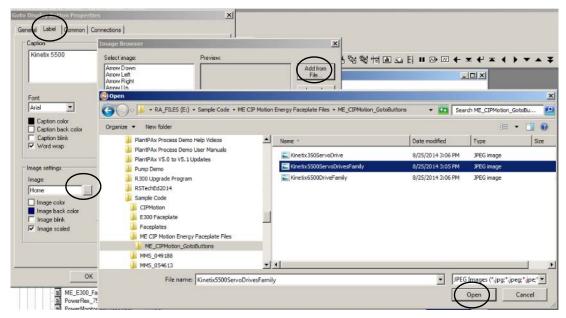
1. From the display where you want to launch the faceplate (can be a new or an existing display), choose Objects > Display Navigation > Goto.



- 2. Draw the Goto button rectangle.
- 3. Double-click the Goto button to configure its properties
  - a. Modify the appearance as desired for your application (choose Transparent as the Back style if you are drawing the goto button over an existing object on your display).
  - b. Click the ellipse next to the Display field and assign the CIPMotion\_Faceplate\_EnergyOnly display.
  - c. Click the ellipse next to the Parameter file field and assign the CIPMotion parameter file you created earlier for this intended device.

| Goto Display Button Properties                                                                                                                           | × |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| General Label Common Connections                                                                                                                         |   |
| Appearance<br>Border style: Border width:<br>Raised ¥ 4 ¥ Border uses back color<br>Back style: Pattern style: Back color<br>Solid ¥ None ¥ Border color |   |
| Shape: Pattern color<br>Rectangle I Blink                                                                                                                |   |
| Display settings Display: CIPMotion_Faceplate Use variable Display   Parameter file: My5500_Parameter Parameter list.                                    |   |
| Display position Top position:     Left position:     Use Variable Display Position                                                                      |   |
| Touch margins       Horizontal margin:       0       0         0         Other         ✓ Audio                                                           |   |
| OK Cancel Apply Help                                                                                                                                     |   |

- 4. Follow these steps to use a bitmap image with the button.
  - a. Click the Label Tab and click the ellipse next to the Image field. Images are available for the Kinetix Servo drives in the ME\_CIPMotion\_GotoButtons folder.
  - b. Click Add from File, navigate to the gotobuttons folder, and select the desired image.
  - c. Click Open to add the image then OK to close the Image Browser window.
  - d. Add text in the Caption field if desired.



e. Click OK to close the Goto button properties window.

This is an example of a final goto button on your display.



5. To support additional Kinetix Servo Drives, create a new Goto display navigation button, assign the CIPMotion\_Faceplate\_EnergyOnly display, and assign a unique parameter file associated with the additional device.

### **CIP Motion Energy Faceplate Overview**



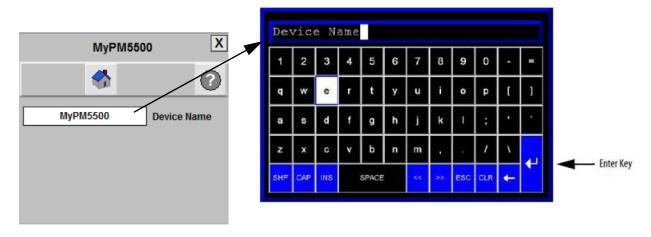
#### Table 1 - Faceplate Status/Control Buttons

| Button                    | Icons                                                                                                                                                                                                                                                                                    | Description                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Configuration             | <b>3</b>                                                                                                                                                                                                                                                                                 | The Configuration button lets you edit the faceplate/device name to be displayed at the top of the faceplate.                                                                                                                                                                                                                                                    |
| Help                      | 0                                                                                                                                                                                                                                                                                        | The Help button provides information for the current view.                                                                                                                                                                                                                                                                                                       |
| Base Energy Object Values | MyPN5500         X           Resource Type:         Electrical           Capabilities:         Derived           Consumed (kWh):         000000023.371           Generated (kWh):         000000023.371           Total (MWh):         000000023.371           Power (kW):         0.384 | <ul> <li>Resource Type – Indicates the type of energy resource being monitored</li> <li>Capabilities - Indicates how the energy values are generated</li> <li>Measured indicates the values are directly measured by the device</li> <li>Derived indicates the values are derived from fixed nominal power values or some other combination of values</li> </ul> |

### **Configuration View**

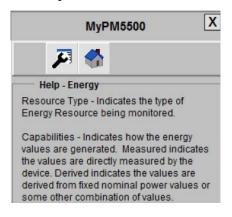
- 1. Click Configuration 🔀 on the toolbar to launch the Configuration view.
- 2. Click the string entry box to launch the QWERTY keyboard popup.
- 3. Type the desired text and press Enter.

The text you enter is displayed at the top of the faceplate.



### Help View

Click Help 🙆 on the toolbar to access the online help information.



# **Configure Device Logic for Equipment Status and Alarm History Faceplates**

Some logic is required in the CompactLogix controller for PowerMonitor 1000 and 3000 devices to support the Equipment Status and Alarm History Faceplates.

- **TIP** The faceplate logic required for the CompactLogix energy inputs is included in the Energy Add-On Instructions that were configured in <u>Configure CompactLogix Energy Inputs</u> on <u>page 86</u>.
- **TIP** The equipment status faceplate logic required for the PowerMonitor 500, PowerMonitor 5000, PowerFlex Drives, E3 Plus, E300, SMC-50, and CIP Motion Drives is included in the faceplate routines that were configured in the previous sections.

#### Configure PowerMonitor 1000 and 3000 Communication

Follow these steps to add the PowerMonitor 1000 and 3000 devices to your Ethernet network in the CompactLogix I/O Configuration.

- 1. Browse to the CompactLogix Ethernet network in the I/O Configuration.
- 2. Right-click Ethernet and choose New Module.
- 3. Choose Communication.
- 4. Scroll through the modules and choose the ETHERNET-MODULE (Generic Ethernet Module).
- 5. Click OK.

|                                                                                | iguration                                                                                                    |                                                 |
|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
| 🖻 🖅 Comp                                                                       | actLogix5323E-QBFC1 System                                                                                   |                                                 |
| - fb 17                                                                        | 69-L23E-QBFC1 Efficient_Industri                                                                             | es Plant 1                                      |
|                                                                                |                                                                                                              |                                                 |
| 🖻 🛷 17                                                                         | 69-L23E-QBFC1 Ethernet Port Lo                                                                               | calENB                                          |
| ÷                                                                              | Ethernet                                                                                                     |                                                 |
|                                                                                | in an                                                                    |                                                 |
| 🖻 🏛 Co                                                                         | mpactBus Local                                                                                               |                                                 |
| ÷@                                                                             | Embedded I/O                                                                                                 |                                                 |
|                                                                                |                                                                                                              |                                                 |
|                                                                                | [1] Embedded IQ16F Discrete                                                                                  | _Inputs                                         |
|                                                                                | A                                                                                                            |                                                 |
| Select Module                                                                  |                                                                                                              | ×                                               |
|                                                                                | P                                                                                                            |                                                 |
| Module                                                                         | Description                                                                                                  | Vendor                                          |
|                                                                                | . 10/100 Mbps Ethernet Port on CompactLogix5323E-QB1<br>10/100 Mbps Ethernet Port on CompactLogix5323E-QBFC1 | Allen-Bradley                                   |
|                                                                                | . 10/100 Mbps Ethernet Port on CompactLogix5332E                                                             | Allen-Bradley                                   |
|                                                                                | . 10/100 Mbps Ethernet Port on CompactLogix5335E                                                             | Allen-Bradley                                   |
| 1788-EN2DN/A                                                                   | 1788 Ethernet to DeviceNet Linking Device                                                                    | Allen-Bradley                                   |
| 1788-ENBT/A                                                                    | 1788 10/100 Mbps Ethernet Bridge, Twisted-Pair Media                                                         | Allen-Bradley                                   |
| 1788-EWEB/A                                                                    | 1788 10/100 Mbps Ethernet Bridge w/Enhanced Web Servic.                                                      |                                                 |
| 1794-AENT/A                                                                    | 1794 10/100 Mbps Ethernet Adapter, Twisted-Pair Media                                                        | Allen-Bradley                                   |
| 1794-AENT/B                                                                    | 1794 10/100 Mbps Ethernet Adapter, Twisted-Pair Media                                                        | Allen-Bradley                                   |
|                                                                                |                                                                                                              |                                                 |
|                                                                                | . 10/100 Mbps Ethernet Port on DriveLogix5730                                                                | Allen-Bradley                                   |
|                                                                                | . 10/100 Mbps Ethernet Port on DriveLogix5730<br>Generic EtherNet/IP CIP Bridge                              | Allen-Bradley<br>Allen-Bradley                  |
| Drivelogix5730 Ethern<br>ETHERNET-BRIDGE<br>ETHERNET-MODULE                    | Generic EtherNet/IP CIP Bridge<br>Generic Ethernet Module                                                    | Allen-Bradley<br>Allen-Bradley                  |
| Drivelogix5730 Ethern<br>ETHERNET-BRIDGE                                       | Generic EtherNet/IP CIP Bridge                                                                               | Allen-Bradley                                   |
| Drivelogix5730 Ethern.     ETHERNET-BRIDGE     ETHERNET-MODULE                 | Generic EtherNet/IP CIP Bridge<br>Generic Ethernet Module                                                    | Allen-Bradley<br>Allen-Bradley                  |
| Drivelogix5730 Ethern.     ETHERNET-BRIDGE     ETHERNET-MODULE                 | Generic EtherNet/IP CIP Bridge<br>Generic Ethernet Module                                                    | Allen-Bradley<br>Allen-Bradley                  |
| Drivelogix5730 Ethem     ETHERNET-BAIDGE     ETHERNET-MODULE     EtherNet/IP   | Generic EtherNet/IP CIP Bridge<br>Generic Ethernet Module<br>SoftLoax5800 EtherNet/IP                        | Alien-Bradley<br>Alien-Bradley<br>Alien-Bradley |
| Drivelogix5730 Ethern.     ETHERNET-BRIDGE     ETHERNET-MODULE                 | Generic EtherNet/IP CIP Bridge<br>Generic Ethernet Module<br>SoftLoax5800 EtherNet/IP                        | Allen-Bradley<br>Allen-Bradley<br>Allen-Bradley |
| Drivelogix 5730 Ethern     ETHERNET-RRIDGE     ETHERNET-MODULE     EtherNet/IP | Generic EtherNet/IP CIP Bridge<br>Generic Ethernet Module<br>SoftLoax5800 EtherNet/IP                        | Allen-Bradley<br>Allen-Bradley<br>Allen-Bradley |

6. Enter a module name for the first PowerMonitor device.

For this example, you will configure the first PowerMonitor device named Electric\_Main\_PM3000.

- 7. Choose Input Data-REAL from the Comm Format list.
- 8. Enter Connection Parameters.

| Туре:               | ETHERNET-MODULE Generic Ether | net Module            |           |       |             |
|---------------------|-------------------------------|-----------------------|-----------|-------|-------------|
| Vendor:             | Allen-Bradley                 |                       |           |       |             |
| Parent:             | LocalENB                      | - Connection Pa       |           |       |             |
| Na <u>m</u> e:      | Electric_Main_PM3000          | Connection r a        | Assembly  |       |             |
| Description:        |                               |                       | Instance: | Size: |             |
|                     |                               | <u>I</u> nput:        | 1         | 16    | .▲ (32-bit) |
|                     |                               | O <u>u</u> tput:      | 2         |       | -           |
| Comm <u>F</u> ormat | Input Data - REAL 🔹           | Configuration         | 3         | 0     |             |
| Address / H         | ost Name                      | 2                     |           | -     | -           |
| IP <u>A</u> ddre    | ess: 10 . 10 . 10 . 0         | <u>S</u> tatus Input: |           |       |             |
| ⊂ <u>H</u> ost Na   | me:                           | S <u>t</u> atus Outpu | t:        |       |             |

Table 2 - PowerMonitor 1000/3000 Connection Parameters

|               | Assembly Instance | Size |
|---------------|-------------------|------|
| Input         | 1                 | 16   |
| Output        | 2                 |      |
| Configuration | 3                 | 0    |

9. Enter the IP address of the PowerMonitor device.

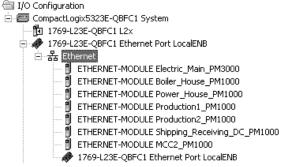
For this example, the Electric\_Main\_PM3000 IP address is 10.10.10.0.

- 10. Click OK.
- 11. Repeat steps 1...9 to configure each PowerMonitor 1000 and 3000 device in your project.

For the <u>Efficient Industries Plant 1</u>, enter the names and IP addresses of the PowerMonitor devices in the table. The rest of the parameters in the New Module dialog box are the same.

When done, the I/O configuration should look like this.

| PowerMonitor Device Name     | IP Address | 🗄 🔚 I/O Configurati |
|------------------------------|------------|---------------------|
| Electric_Main_PM3000         | 10.10.10.0 | - CompactLo         |
| Boiler_House_PM1000          | 10.10.10.1 | 1769-Li<br>总 器 型    |
| Power_House_PM1000           | 10.10.10.2 |                     |
| Production1_PM1000           | 10.10.10.3 | - 1                 |
| Production2_PM1000           | 10.10.10.4 |                     |
| Shipping_Receiving_DC_PM1000 | 10.10.10.5 |                     |
| MCC2_PM1000                  | 10.10.10.6 | -                   |



### Import PowerMonitor and Status Input Faceplate AOIs

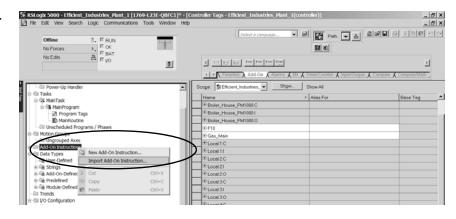
You will now learn how to import faceplate Add-On Instructions for PowerMonitor devices and PowerMonitor status inputs. These Add-On Instructions support the Equipment Status and Alarm History faceplates for FactoryTalk View Machine Edition or Site Edition applications.

Faceplate Add-on Instruction types required for the <u>Efficient Industries Plant 1</u> example are listed in the table.

| Energy Meter          | Meter Type                | Add-on Instruction Required |
|-----------------------|---------------------------|-----------------------------|
| Electric Main         | PowerMonitor 3000         | PM_3000                     |
| Boiler House          | PowerMonitor 1000         | PM_1000                     |
| Power House           |                           |                             |
| Production 1          |                           |                             |
| Production 2          |                           |                             |
| Shipping/Receiving/DC |                           |                             |
| Gas Main              | PowerMonitor Status Input | Energy_Gas_PM_Status        |
| Air Flow              |                           | Energy_Air_PM_Status        |
| Water Main            |                           | Energy_Water_PM_Status      |

Follow these steps to import the required Add-on Instructions.

- 1. Open your RSLogix 5000 project.
- 2. Right-click the Add-On Instructions folder and choose Import Add\_On Instruction.



3. Browse to the Faceplate Files folder on your Energy Management Accelerator Toolkit CD image and select the PowerMonitor Faceplate Logic Files folder.

| Import Instruct        | ion                                                                                                                                                                                    |   |          | × |
|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|----------|---|
| Look jn:               | 🗁 Faceplate Files                                                                                                                                                                      | • | ← 🗈 💣 💷• |   |
| My Recent<br>Documents | ME Alarm History Faceplate Files<br>ME Equipment Status Faceplate Files<br>ME Powermonitor 1000 Faceplate Files<br>Powermonitor Faceplate Logic<br>SE Equipment Status Faceplate Files |   |          |   |

4. Select the required Add-On Instruction file then click Import.

For this example, PM\_3000.L5X is imported for the Electric Main meter connected to the PowerMonitor 3000 device.

5. Click OK on the Import Configuration dialog box to continue the import.

6. Verify the imported instruction is listed under the Add-On Instructions folder.

For this example, you should see the PM\_3000 Add-On Instruction.

 Repeat steps 1...7 to import each PowerMonitor and PowerMonitor Status Input Add-On Instruction required for your project.

#### Configure PowerMonitor 1000 and 3000 Faceplate AOIs

You will now configure the faceplate Add-On Instructions for each PowerMonitor 1000 or 3000 device in your system.

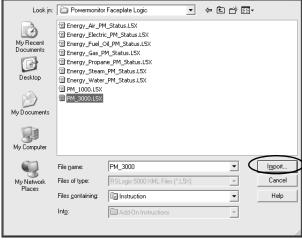
- 1. Open your program routine and create a new rung.
- 2. Click the Add-On tab, then click the desired PowerMonitor Add-On Instruction to add to the rung.

For this example, the PM\_3000 Add-On Instruction was added.

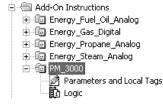
3. Click in the PowerMonitor tag name field and enter a tag name.

For this example, Electric\_Main is entered.

4. Right-click the PowerMonitor tag name and choose the New *'tag\_name'* just entered.



Import Instruction





| <br>PM_3000-                                                   |         |                                                     |                  |
|----------------------------------------------------------------|---------|-----------------------------------------------------|------------------|
| PM_3000 Electr<br>Ref_Total_Real_Power<br>Val Total Real Power | ic Ma   | in Comms fault )                                    | Ctrl+W           |
| Ref_Avg_L_L_Volts<br>Val_Avg_L_L_Volts                         | Х<br>®⊡ | Cu <u>t</u> Instruction<br><u>C</u> opy Instruction | Ctrl+X<br>Ctrl+C |
| Ref_Avg_Current<br>Val_Avg_Current                             | ß       | Paste<br><br>Delete Instruction                     | Ctrl+V<br>Del    |

5. Click OK to accept the default setup for the new PowerMonitor tag.

The PowerMonitor Add-On Instructions use explicit messaging to retrieve data from PowerMonitor devices. You must configure an explicit message for each PowerMonitor data address. Four messages will be configured to display PowerMonitor device values on the Equipment Status and Alarm History faceplates. The table lists the data and corresponding Add-On Instruction parameters, tags, and addresses to be configured for each device.

#### Table 3 - PowerMonitor Add-On Instruction Tag References

| New Tag            |                   |          |                 | $\mathbf{X}$ |
|--------------------|-------------------|----------|-----------------|--------------|
| <u>N</u> ame:      | Electric_Main     |          | $\triangleleft$ | ОК           |
| Description:       |                   | ~        |                 | Cancel       |
|                    |                   |          |                 | Help         |
|                    |                   | ~        |                 |              |
| <u>U</u> sage:     | <normal></normal> | <b>T</b> |                 |              |
| Тур <u>е</u> :     | Base 💽 Cor        | nection  |                 |              |
| Alias <u>F</u> or: |                   | -        |                 |              |
| Data <u>T</u> ype: | PM_3000           |          |                 |              |
| <u>S</u> cope:     | L2x               | •        |                 |              |
| Style:             |                   | ~        |                 |              |
| 🗖 🖸 pen Cor        | figuration        |          |                 |              |

| PowerMonitor Data | Add-On Instruction                             | Message Tag                                          | PLC5 Address         |                      | Message Destination Tag                                 |
|-------------------|------------------------------------------------|------------------------------------------------------|----------------------|----------------------|---------------------------------------------------------|
|                   | Parameter Tags                                 |                                                      | PowerMonitor<br>1000 | PowerMonitor<br>3000 |                                                         |
| Real Power        | Ref_Total_Real_Power<br>Val_Total_Real_Power   | xxx <sup>(1)</sup> _MsgTotalRealPower                | F22:7                | F17:3                | <pre>xxx<footnote>(1)_TotalRealPowe r</footnote></pre>  |
| Average L-L Volts | Ref_Avg_L_L_Volts<br>Val_Avg_L_L_Volts         | <pre>xxx<footnote>(1)_MsgAvgLLVolts</footnote></pre> | F21:11               | F15:11               | <pre>xxx<footnote>(1)_AvgLLVolts</footnote></pre>       |
| Average Current   | Ref_Avg_Current<br>Val_Avg_Current             | <pre>xxx<footnote>(1)_MsgAvgCurrent</footnote></pre> | F21:3                | F15:3                | <i>xxx</i> <footnote>(1)_AvgCurrent</footnote>          |
| True Power Factor | Ref_True_Power_Factor<br>Val_True_Power_Factor | xxx <footnote>(1)_MsgTruePowerFa<br/>ctor</footnote> | F22:3                | F19:3                | <pre>xxx<footnote>(1)_TruePowerFact or</footnote></pre> |

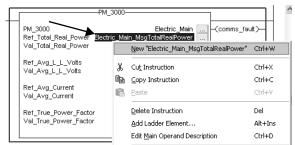
(1) xxx is the PowerMonitor device name. For example, the prefix Electric\_Main in Electric\_Main\_MsgTotalRealPower is the message tag for the PM 3000 Electric\_Main device.

6. Select the message tag name field next to the Ref\_Total\_Real\_Power parameter and type a tag name in the format xxx\_MsgTotalRealPower.

For this example Electric\_Main\_MsgTotalRealPower is entered.

7. Right-click the message tag name just entered and choose New *xxx\_MsgTotalRealPower*'.

For this example, New 'Electric\_Main\_MsgTotalRealPower' is selected.



9. Click the Browse icon next to the

Configuration dialog box.

as the Source Element.

Power PLC5 address.

Destination Element.

tag.

12. Set the Number of Elements to 1.

xxx MsgTotalRealPower tag to open the Message

11. Enter the associated PM1000 or PM3000 PLC5 address

Refer to PowerMonitor Add-On Instruction Tag

<u>References</u> table on <u>page 321</u> for the PLC5 address.

13. Click New Tag to create a controller-scoped tag for the

a. Enter a name for the associated controller-scoped

For this example, F17:3 is entered for the PM 3000 Real

10. Choose PLC5 Typed Read for Message Type.

- 8. Click OK to accept the default setup for the new message tag.
- New Tag Name: ΟK Electric Main MsgTotalBealPov Description Cancel Help <u>U</u>sage  $\overline{\nabla}$ Base <u>C</u>onnection. Тур<u>е</u>: Alias For Ŧ MESSAGE Data <u>T</u>ype 他 L2x • Scope Style: Den MESSAGE Configuration -PM 3000-PM 3000 Electric Main Ref Total Real Power Electric Main MsgTotalRealPowe Val\_Total\_Real\_Power Ref\_Avg\_L\_L\_Volts Message Configuration - Electric\_Main\_MsgTotalRealPower  $\mathbf{x}$ Configuration\* Communication Tag PLC5 Typed Read • Message Type: Source Element: F17:3 Number Of <u>E</u>lements: • Destination Element: Ne<u>w</u> Tag. New Tag Name: ΟK Electric\_Main\_TotalRealPower 🔘 Enable Description: Error C Error Path Help Error Text <u>U</u>sage: <normal> Ŧ <u>C</u>onnection. Base Type: Alias Eor: -REAL Data <u>T</u>ype 🗓 L2x <u>S</u>cope • Style: Float -Copen Configuration

Use the Message Destination Tag, *xxx*\_TotalRealPower, defined in the <u>PowerMonitor Add-On Instruction Tag</u>. <u>References</u> table on <u>page 321</u>.

For this example, enter Electric\_Main\_TotalRealPower.

- b. Choose REAL as the Data Type.
- c. Choose a controller from the Scope list. For this example, L2x is selected.
- d. Choose Float for Style.
- e. Click OK.

14. Click the Communication tab on on - Mse Total I the Message Configuration Config Communicatio Tan dialog. Path ssage Path Bro M a. Click the Browse icon. Communication Method Destination Link: • CIP C DH+ Cha Path: Electric Main PM3000 b. Select the path to the Electric Main PM3000 C CIP With Source ID \_\_\_\_\_ 0 1769-L23E-QBFC1 L2x PowerMonitor device. Connected Cache Connections 1769-L23E-QBFC1 Ethernet Port LocalENB 몲 Ethernet ETHERNET-MODULE Electric\_Main\_PM3000 ETHERNET-MODULE Boiler\_House\_PM1000 ETHERNET-MODULE Power\_House\_PM100 Enable Enable Waiting Start O Done Done Leng ETHERNET-MODULE Production1\_PM1000 C Error Co Extended Error Code Timed 0 ETHERNET-MODULE Production2 PM1000 Error Path: ETHERNET-MODULE Shipping\_Receiving\_DC\_PM1000 ETHERNET-MODULE MCC2\_PM1000 Error Text v OK 1769-L23E-OBFC1 Ethernet Port LocalENB Cancel Apply OK Cancel Help

For this example, select ETHERNET-MODULE Electric\_Main\_PM3000.

- c. Click OK.
- d. Verify the path is okay.
- e. Verify CIP is the Communication Method.
- f. Click OK to close the Message Configuration dialog box.
- 15. Assign the Val\_Total\_Real\_Power parameter to the associated controller-scoped tag.
  - a. Double-click the tag name field next to Val\_Total\_Real\_Power.
  - b. Click the pull-down menu icon then double-click the associated controller-scoped tag to select it.

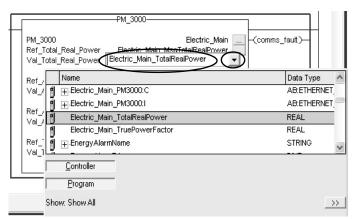
For this example, the tag is Electric\_Main\_TotalRealPower.

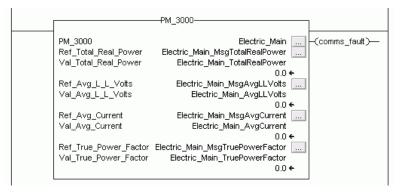
 Repeat steps 6...15 to configure the remaining three PowerMonitor data messages and tags.

> Refer to the <u>PowerMonitor Add-On</u> <u>Instruction Tag References</u> table on <u>page 321</u> for associated parameters, tags, and addresses.

> For this example, the completed PM\_3000 Add-On Instruction instance for the Electric\_Main meter looks like this.

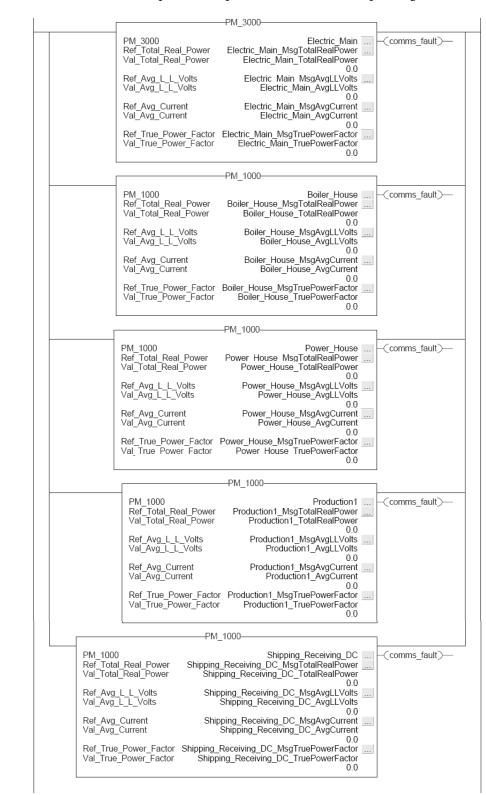
 Repeat steps 1...16 for each PowerMonitor 1000 or 3000 device in your system.





2

For the Efficient Industries Plant 1 example, the completed PowerMonitor faceplate logic would look similar to this.



#### Configure PowerMonitor Status Input Faceplate AOIs

Logic is required to display energy meter data on Equipment Status and Alarm History faceplates from PowerMonitor status inputs.

- 1. Open your program routine and create a new rung.
- 2. Click the Add-On tab, then click RSLogix 5000 - L2x [1769-L23E-QBFC1]\* ile Edit View Search Logic Communications Tools Window Help the required PowerMonitor status input Add-On Instruction to add - 444 6 28 99 🗎 🗃 🔚 🎒 👗 🖻 💼 🖍 👓 👓 Drive:O to the rung. €. Favorites Add-On Alarms (Bit (Timer/Counter (Input/Output (Compare (Compute/Math ) e/Logica For this example, the nergy\_Gas\_PM\_Status v1.0 Energy\_Gas\_PM\_Status a Controller L2x 🗎 MainProgram - Main -Energy Gas PM Status Controller Tags instruction is selected to support Energy\_Gas\_PM\_Status Controller Fault Handler ? ... ? Ref Status Input Dower-Up Handler the Gas Main meter connected to Val\_Status\_Input ? ا Tasks ?? the MCC 2 PowerMonitor status 🗄 👼 MainTask Set\_Calc\_Interval 2 🗄 🖳 MainProgram ?? ? input. Program Tags Set\_Critical\_Flow ?? Unscheduled Programs / Phase Set\_High\_Flow 2 ?? 🗄 📖 Motion Groups 4 Val\_Total\_Gas ?? 🗄 🛅 Add-On Instructions Val\_Gas\_Per\_Calc\_Interval ?? 🗄 📹 Data Types 🙀 User-Defined 3. Click in the PowerMonitor status Energy\_Gas\_PM\_Status input tag name field and enter a tag name. Energy\_Gas\_PM\_Status Gas Main Ref\_Status\_Input New "Gas Main" Ctrl+W For this example, Gas\_Main is entered. Val\_Status\_Input X Cut Instruction Ctrl+X Set\_Calc\_Interva 4. Right-click the tag name just entered and choose New ⊆opy Instruction Ð Ctrl+C 'tag\_name' from the list. Set\_Critical\_Flow E. Chrl+V Paste 5. Click OK to accept the default setup for the new New Tag PowerMonitor status input tag. <u>N</u>ame Gas\_Main OK The PowerMonitor status input Add-on Instructions Description: Cancel also use explicit messaging to retrieve data from the Help PowerMonitor devices. You must configure an explicit message for each PowerMonitor status input. The table lists the data and corresponding Add-On Instruction <u>U</u>sage: parameters, tags, and addresses to be configured for each Base <u>C</u>onnection.. Type: status input. Alias For:  $\overline{\mathbf{v}}$

Energy\_Gas\_PM\_Status

•

10 L2×

Data <u>Type</u>

Copen Configuration

<u>S</u>cope Style:

| PowerMonitor          | Add-On                               | Message Tag                                       | PLC5 Address         |                      |                      | Message Destination                            |
|-----------------------|--------------------------------------|---------------------------------------------------|----------------------|----------------------|----------------------|------------------------------------------------|
| Data                  | Instruction<br>Parameter Tags        |                                                   | PowerMonitor<br>1000 | PowerMonitor<br>3000 | PowerMonitor<br>5000 | — Tag                                          |
| Status 1<br>Count x 1 | Ref_Status_Input<br>Val_Status_Input | xxx <sup>(1)</sup> _MsgStatusInput1               | F11:12               | N9:4                 | F55:1                | xxx <footnote>(1)_Sta<br/>tus1Count</footnote> |
| Status 2<br>Count x 1 | Ref_Status_Input<br>Val_Status_Input | xxx <footnote>(1)_MsgStat<br/>usInput2</footnote> | F11:13               | N9:5                 | F55:3                | xxx <footnote>(1)_Stat<br/>us2Count</footnote> |
| Status 3<br>Count x 1 | Ref_Status_Input<br>Val_Status_Input | xxx <footnote>(1)_MsgStat<br/>usInput3</footnote> |                      |                      | F55:5                | xxx <footnote>(1)_Stat<br/>us3Count</footnote> |
| Status 4<br>Count x 1 | Ref_Status_Input<br>Val_Status_Input | xxx <footnote>(1)_MsgStat<br/>usInput4</footnote> |                      |                      | F55:7                | xxx <footnote>(1)_Stat<br/>us4Count</footnote> |

Table 4 - PowerMonitor Status Input Add-on Instruction Tag References

(1) xxx is the PowerMonitor device name associated with the Add-on Instruction message tag and message destination tag. For example, the prefix MCC2 in MCC2\_MsgStatusInput1 and MCC2\_Status1Count are the message tags for the MCC2 PM1000 Gas\_Main device.

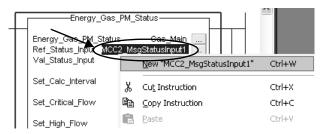
6. Select the message tag name field next to the Ref\_Status\_Input parameter and type a tag name in the format xxx\_MsgStatusInput1.

For this example, MCC\_2\_MsgStatusInput1 is entered for the Gas Main meter.

 Right-click the message tag name just entered and choose New 'xxx\_MsgStatusInput1'.

In this example, 'MCC\_2\_MsgStatusInput1' is selected.

8. Click OK to accept the default setup for the new message tag.



| New Tag            |                      | ×      |
|--------------------|----------------------|--------|
| <u>N</u> ame:      | MCC2_MsgStatusInput1 | OK     |
| Description:       |                      | Cancel |
|                    |                      | Help   |
|                    | ~                    |        |
| <u>U</u> sage:     | <normal></normal>    |        |
| Тур <u>е</u> :     | Base  Connection     |        |
| Alias <u>F</u> or: | <b></b>              |        |
| Data <u>T</u> ype: | MESSAGE              |        |
| <u>S</u> cope:     | 🔁 L2x 💌              |        |
| Style:             |                      |        |
| Den MES            | SSAGE Configuration  |        |

- Click the Browse icon next to the xxx\_MsgStatusInput1 tag to open the Message Configuration dialog box.
- 10. Choose PLC5 Typed Read for Message Type.
- 11. Enter the associated PM1000, PM3000, or PM5000 PLC5 address as the Source Element.

Refer to <u>PowerMonitor Status Input Add-on</u> <u>Instruction Tag References</u> table on <u>page 326</u> for the correct PLC5 address.

For this example, F11:12 is entered as the Status 1 Count x 1 PLC5 address for the PM 1000 MCC 2.

- 12. Set the Number of Elements to 1.
- 13. Click New Tag to create a controller-scoped tag for the Destination Element.
  - a. Enter a name for the associated controller-scoped tag.

| Ref_                  | gy_Gas_PM_                             | _Gas_PM_Status<br>_Status Gas_Main<br>_MCC2_MsgStatusInput1<br>?<br>?? | )               |
|-----------------------|----------------------------------------|------------------------------------------------------------------------|-----------------|
| essage (              | Configuration                          | - MCC2_MsgStatusInput1                                                 | $\times$        |
| Configura             | tion* Communica                        | tion   Tag                                                             |                 |
| Message               | e <u>T</u> ype: PL                     | C5 Typed Read 💌                                                        |                 |
| <u>S</u> ource B      | ,                                      | 1:12                                                                   |                 |
|                       | Of <u>E</u> lements: 1<br>ion Element: | <u>.</u>                                                               | New Tag         |
| Destinat              |                                        |                                                                        | Ne <u>w</u> rag |
|                       |                                        |                                                                        |                 |
|                       |                                        |                                                                        |                 |
| ) Enable              | 🔍 Enable Wa                            | aiting 🔾 Start 🔾 Done Do                                               | one Length: 0   |
| Error C<br>Error Path | New Tag                                |                                                                        | ×               |
| Error Text            | <u>N</u> ame:                          | MCC2_Status1Count                                                      | ОК              |
|                       | Description:                           | A                                                                      | Cancel          |
|                       |                                        |                                                                        | Help            |
|                       |                                        |                                                                        |                 |
|                       |                                        |                                                                        | -               |
|                       | <u>U</u> sage:                         | <normal></normal>                                                      |                 |
|                       | Тур <u>е</u> :                         | Base Connection                                                        |                 |
|                       | Alias <u>F</u> or:                     |                                                                        | I               |
|                       | Data <u>T</u> ype:                     | REAL                                                                   |                 |
|                       | <u>S</u> cope:                         | 🔁 L2x 💌                                                                |                 |
|                       | Style:                                 | Float                                                                  | [               |
|                       |                                        |                                                                        |                 |

Use the Message Destination Tag defined in the <u>PowerMonitor Status Input Add-on Instruction Tag References</u> table on <u>page 326</u>.

For this example, MCC\_2\_Status1Count is entered.

- b. Choose REAL as the Data Type for PowerMonitor 1000 messages; choose INT for PowerMonitor 3000 messages.
- c. Choose a controller from the Scope list. For this example, L2x is chosen.
- d. Choose Float as the style for PowerMonitor 1000 and PowerMonitor 5000 messages. Choose Decimal for PowerMonitor 3000 messages.
- e. Click OK.

14. Click the Communication tab on Message Configuration - MCC2\_MsgStatusInput1 the Message Configuration dialog Configuration Communication Tag box. <u>B</u>rowse <u>P</u>ath: a. Click the Browse icon. Message Path Browse Communication Method b. Select the path to the ▼ Destir Path: MCC2\_PM1000 PowerMonitor device. CIP <u>W</u>ith Γ - A -MCC2\_PM1000 Source ID Ethernet CHERNET-MODULE Electric\_Main\_PM30 ETHERNET-MODULE Boiler\_House\_PM10 ETHERNET-MODULE Power\_House\_PM10 ETHERNET-MODULE Production1\_PM100( ETHERNET-MODULE Production2\_PM100( ETHERNET-MODULE Shipping Receiving 는 꿂 Ethernel Cache Connections Connected Enable Enable Waiting Start Done C Error Co Extended Error Code ETHERNET-MODULE MCC2\_PM1000 Error Path: 1769-L23E-0BFC1 Ethernet Port LocalENB ComnactBus Local Error Text: > < OK Canc ΟK Cancel Help

For this example, select ETHERNET-MODULE MCC2\_PM1000.

- c. Click OK, then verify the path is correct.
- d. Verify CIP is the Communication Method.
- e. Click OK to close the Message Configuration dialog box.
- 15. Assign the Val\_Status\_Input parameter to the associated controller-scoped tag.
  - a. Double-click the tag name field next to Val\_Status\_Input parameter.
  - b. Click the pull-down menu icon then double-click the associated controller-scoped tag to select it.

For this example, the tag is MCC\_2\_Status1Count.

|                                       |           | Energy_Gas_PM_Status<br>Energy_Gas_PM_Status Gas_Main<br>Ref_Status_Input MCC2_MsuStatusTimut4<br>Val_Status_Input MCC2_Status1Count |             |    |
|---------------------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------|-------------|----|
| Name                                  |           |                                                                                                                                      | Data Type   | ^  |
| ¶ ⊞-MCC                               | 2_MsgStat | tusInput1                                                                                                                            | MESSAGE     |    |
| III ⊞-MCC                             | 2_MsgStat | tusInput2                                                                                                                            | MESSAGE     | _  |
| III ⊞-MCC                             | 2_PM1000  | :C                                                                                                                                   | AB:ETHERNET |    |
| I I I I I I I I I I I I I I I I I I I | 2_PM1000  | :1                                                                                                                                   | AB:ETHERNET | 1  |
| 🗍 МСС                                 | 2_Status1 | Count                                                                                                                                | REAL        | ~  |
| <u>C</u> ontro<br>Prog                |           |                                                                                                                                      |             |    |
| Show: Shov                            | v All     |                                                                                                                                      |             | >> |

16. Assign energy input calculation and alarm setpoints based on the Energy Add-On Instruction Factor table definitions on page 329.

One table provides factor definitions for electric inputs and one for all other energy inputs.

This example shows values that need to be set for the Energy\_Gas\_PM\_Status Add-On Instruction.

| Energy_Gas_PM_State                                                                                    | a              |  |
|--------------------------------------------------------------------------------------------------------|----------------|--|
| Energy_Gas_PM_Status<br>Ref_Status_Input_MCC2_MsgSta<br>Val_Status_InputMCC2_Stat<br>Set_Calc_Interval | · · · · ·      |  |
| Set_Critical_Flow                                                                                      | 1500           |  |
| Set_High_Flow                                                                                          | 1000           |  |
| Val_Total_Gas<br>Val_Gas_Per_Calc_Interval                                                             | 0.0 ←<br>0.0 ← |  |

| Energy Factor Tag               | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Set_Demand_Interval             | The value, in minutes, used to calculate the End of Demand Interval (EOI). This value is used only if the Val_End_of Demand_Type is 2.                                                                                                                                                                                                                                                                                                                                                                          |
| Set_Demand_Delay                | The time value used to reset the end of interval after the Set_Demand_Interval value has been exceeded without a utility contact or master end of demand contact closure. The value must be between 090 seconds.                                                                                                                                                                                                                                                                                                |
| Set_End_of_Demand_Interval_Type | The value that defines how the End of Demand Interval (EOI) is triggered.<br>1 = A local digital input connected to an electric utility meter EOI contact (Inp_End_of_Demand_Utility_Contact).<br>2 = An internal PLC timer (Demand_Interval _PLC Timer) that is typically used when an electric utility meter EOI contact is not available.<br>3 = A master command input (CMD_Master_End_Of_Demand_Interval) typically from a central controller that is used to synchronize<br>multiple electric meter EOIs. |
| Set_High_Demand                 | When the demand (kW) value exceeds the Set_High_Demand, the High Demand Fault is set.                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Set_Critical_Demand             | When the demand (kW) value exceeds the Set_Critical_Demand, the High Critical Fault is set.                                                                                                                                                                                                                                                                                                                                                                                                                     |

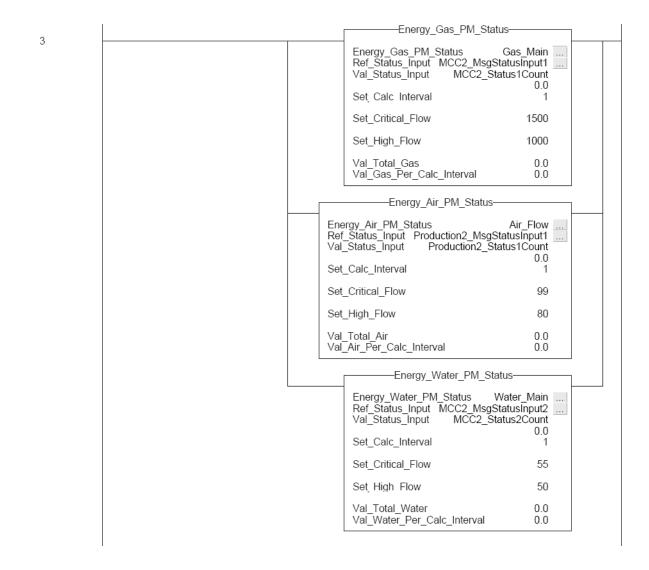
#### Table 6 - Energy Add-On Instruction Factors for Gas, Propane, Fuel Oil, Steam, Air and Water Inputs

| Energy Factor Tag | Definitions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                     |                                                     |
|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| Set_Calc_Interval | The time interval, in minutes, used to calculate the average energy flow.<br>For example, an interval value of 5 will calculate the average energy flow every 5 minutes.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                     |                                                     |
| Set_High_Flow     | When the flow rate value exceeds th                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | e Set_High_Flow value, the High Fl                                                                                                  | low Fault is set.                                   |
|                   | Energy Add-On Instruction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Default Flow Rate Unit                                                                                                              | —                                                   |
|                   | Air                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | cfm (cubic feet per minute)                                                                                                         |                                                     |
|                   | Fuel Oil, Propane, Water                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | gpm (gallons per minute)                                                                                                            |                                                     |
|                   | <u> </u>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | therms/hr                                                                                                                           |                                                     |
|                   | Gas                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                     |                                                     |
|                   | Steam                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | lbs/hr                                                                                                                              | PM_Status Add-On Instruction when the gas flow rate |
| Set_Critical_Flow | Steam<br><u>Example</u> : A value of 1000 will set the<br>exceeds 1000 therms/hr.<br>When the flow rate value exceeds th                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Bigh Flow Fault in the Energy_Gase Set_Critical_Flow value, the Critical_                                                           |                                                     |
| Set_Critical_Flow | Steam<br><u>Example</u> : A value of 1000 will set the<br>exceeds 1000 therms/hr.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | High Flow Fault in the Energy_Gas                                                                                                   |                                                     |
| Set_Critical_Flow | Steam         Example: A value of 1000 will set the exceeds 1000 therms/hr.         When the flow rate value exceeds the exceeds the flow rate value exceeds the ex | bs/hr<br>High Flow Fault in the Energy_Gas<br>e Set_Critical_Flow value, the Critic<br>Default Flow Rate Unit                       |                                                     |
| Set_Critical_Flow | Steam         Example: A value of 1000 will set the exceeds 1000 therms/hr.         When the flow rate value exceeds the flow rate value exceed | High Flow Fault in the Energy_Gas<br>e Set_Critical_Flow value, the Critic<br>Default Flow Rate Unit<br>cfm (cubic feet per minute) |                                                     |

- **TIP** The meter pulse factor, consumption value of each input pulse, is set within the PowerMonitor configuration. Refer to <u>Configure</u> <u>CompactLogix Energy Inputs</u>, on page 80.
- TIP
   For additional information on how these energy factors affect calculations, refer to Appendix C, Energy Electric Add-On

   Instructions
   and Appendix D, Digital and Analog Energy Add-On Instructions
- 17. Repeat steps 1...16 for each PowerMonitor 1000 or 3000 status input in your system.

For the <u>Efficient Industries Plant 1</u> example, the completed PowerMonitor status input Add-On Instruction logic would look similar to this.



Modify Faceplate or Energy AOI for Equipment Status Faceplate

**TIP** The procedure in this section is optional and necessary only if you intend to use the Equipment Status Faceplate.

The Equipment Status Faceplate displays a status summary of energy meter data on PanelView Plus terminals. The Equipment Status Faceplate works in conjunction with energy and faceplate Add-On Instructions.

You can display up to nine energy meters on a single Equipment Status Faceplate. In addition, you can configure the Equipment Status Faceplate to launch your faceplates by using preconfigured Goto Display buttons.

| Efficient Plant 1_ Boiler House |               |                    |                      | 1             |             |
|---------------------------------|---------------|--------------------|----------------------|---------------|-------------|
| Device                          | State         | Value 1            | Value 2              | Value 3       | Value 4     |
| Gas Main                        | ACTIVE        | 9565.000<br>therms | 503.000<br>therms/hr | 0.000         | 0.000       |
| Boiler House Gas                | ACTIVE        | 7654.000<br>therms | 385.000<br>therms/hr | 0.000         | 0.000       |
| Propane                         | HIGH FLOW     | 43225.000<br>gal   | 4.300<br>gpm         | 0.000         | 0.000       |
| Fuel Oil                        | CRITICAL FLOW | 21653.000<br>gal   | 5.900<br>gpm         | 0.000         | 0.000       |
| Boiler House Electric           | Comms Fault   | 0.000<br>KW        | 0.000<br>Volts       | 0.000<br>Amps | 0.000<br>PF |
|                                 |               |                    |                      |               |             |

This example shows the Boiler House energy meters for the Efficient Industries Plant 1. The faceplate is configured for five rows or five energy meters and provides overall status with up to four additional status values for each meter.

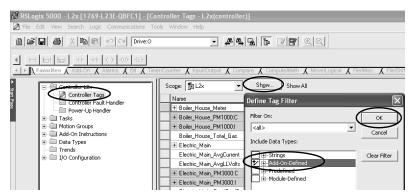
Follow these steps to modify the faceplate or energy Add-On Instruction to set the number of rows for the Equipment Status Faceplate.

1. Determine how many of the nine available rows you will use on the Equipment Status Faceplate and which energy meter you will assign to each row.

For the Efficient Industries Plant 1 example, you will use five rows to display data from five meters.

| Row Number | Energy Meter            | Faceplate or Energy Add-On Instruction |
|------------|-------------------------|----------------------------------------|
| 1          | Gas Main                | Gas_Main                               |
| 2          | Boiler House Gas        | Boiler_House_Gas                       |
| 3          | Propane                 | Propane                                |
| 4          | Fuel Oil                | Fuel_Oil                               |
| 5          | Boiler House (Electric) | Boiler_House                           |

- 2. In your RSLogix 5000 project, set the Inp\_NumRowsVis tag of the energy meter Add-On Instruction that is assigned to row 1.
  - a. Select Controller Tags under the Controller folder for your project then click Show to open the Define Tag Filter dialog box.
  - b. Check the Add-On-Defined filter and click OK.



c. Choose the Faceplate or Energy Add-On Instruction associated with the energy meter you want to assign to row 1.

For this example, Gas\_Main is selected.

- d. Click the Monitor Tags tab.
- e. Click in the xxx.Inp\_NumRowsVis Value field and type the number of rows to display on the Equipment Status Faceplate. For this example, 5 is entered.

| ope: 🚺 L2x 💌 Show.                | STRING, Energy_Air_PM_ | Status, E | nergy_Electric_ | PM_Status, Energy_Fuel_Oil_Ana |
|-----------------------------------|------------------------|-----------|-----------------|--------------------------------|
| Name 🛆                            | Value 🔶                | Force +   | Style           | Data Type                      |
| Fuel_Oil_Total                    | 0.0                    |           | Float           | REAL                           |
| — Gas_Main                        | {}                     | {}        |                 | Energy_Gas_PM_Status           |
| -Gas_Main.EnableIn                | 1                      |           | Decimal         | BOOL                           |
| -Gas_Main.EnableOut               | 0                      |           | Decimal         | BOOL                           |
| -Gas_Main.alarm_reset             | 0                      |           | Decimal         | BOOL                           |
| Gas_Main.Inp_NumRowsVis           | - 5                    | >         | Decimal         | DINT                           |
| -Gas_Main.Val_Status_Input        | 0.0                    |           | Float           | REAL                           |
| -Gas_Main.Set_Calc_Rate           | 0.0                    |           | Float           | REAL                           |
| -Gas_Main.Set_Critical_Flow       | 0.0                    |           | Float           | REAL                           |
| 🛨 Gas_Main.Set_EquipFaceplateAni  | 0                      |           | Decimal         | INT                            |
| + Gas_Main.Set_FaceplateAnimation | 0                      |           | Decimal         | DINT                           |

#### Add Input Fault Logic for Equipment Status and Alarm History Faceplate

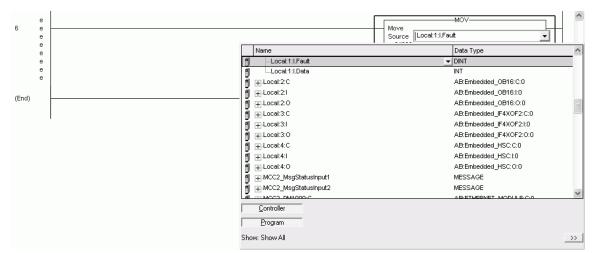
**TIP** The procedure in this section is optional and necessary only if you intend to use the Equipment Status or Alarm History Faceplate.

The energy Add-On Instructions include logic to update the Equipment Status Faceplate Status field and the Alarm History Faceplate alarm triggers with the analog or digital input faults.

An additional rung is required to transfer the local I/O fault data to the energy *MeterName*.Sts\_xxx\_Input\_Fault tag.

Follow these steps to add the fault logic to your RSLogix 5000 project.

- 1. Open your RSLogix 5000 project and add a new rung.
- Add a MOV instruction and assign the local fault tag of your analog or digital energy input to the Source field. For this example, the Local:1:I.Fault tag is selected for the Boiler\_House\_Gas digital input.



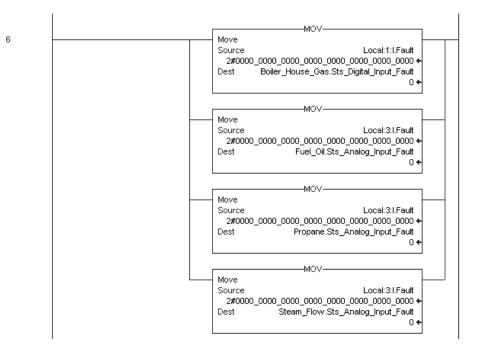
 Choose the corresponding energy tag, *MeterName*.Sts\_xxx\_Input\_Fault, for the Dest tag.

For this example, Boiler\_House\_Gas.Sts\_Digital\_Input\_Fault tag is chosen.

 Repeat steps 2 and 3 for each of your CompactLogix energy digital and analog inputs that were configured on page 80.

For the Efficient Industries Plant 1 example, the fault logic would look similar to this.

|             |                                        | Dest Boiler_House_Gas.Sts_Digital_Input_Fault |
|-------------|----------------------------------------|-----------------------------------------------|
| 1.          | Name                                   | Data Type                                     |
| ₽ -         | Boiler_House_Gas                       | Energy_Gas_Digital                            |
| 1           | _Boiler_House_Gas.EnableIn             | BOOL                                          |
| 1           | _Boiler_House_Gas.EnableOut            | BOOL                                          |
| 8           | _Boiler_House_Gas.Inp_Pulse            | BOOL                                          |
| 1           | _Boiler_House_Gas.Set_Meter_Pulse_Fac  | ctor REAL                                     |
| Ē.          | _Boiler_House_Gas.Set_Calc_Interval    | REAL                                          |
| 9<br>9<br>9 | _Boiler_House_Gas.Sts_Value1           | REAL                                          |
| ð           | _Boiler_House_Gas.Sts_Value2           | REAL                                          |
| Ĵ           | Boiler_House_Gas.Sts_Digital_Input_Fau | it _ DINT                                     |
| 1           | _Boiler_House_Gas.Set_High_Flow        | REAL                                          |
| ē.          | Boiler House Gas.Set Critical Flow     | REAL                                          |
|             | Controller                             |                                               |



#### Configure Alarm Logic for Alarm History Faceplate

**TIP** The procedure in this section is optional and necessary only if you intend to use the Alarm History Faceplate.

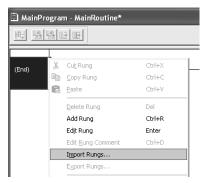
The Alarm History Faceplate can display date and time-stamped alarm, and fault information for each energy meter on a PanelView Plus terminal. The Alarm History Faceplate works in conjunction with energy and faceplate Add-On Instructions.

In this example, the Alarm History Faceplate shows alarms from three energy meters.

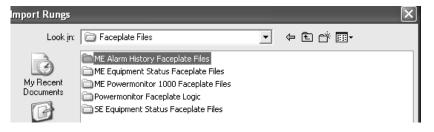
|                                      |                   | Alarm Histo | ory                     |                             |                 |       |  |
|--------------------------------------|-------------------|-------------|-------------------------|-----------------------------|-----------------|-------|--|
| Alarm time                           | Acknowledg        |             | Message                 |                             | _               | _     |  |
| 9/15/2009 4:21:0                     |                   |             | Gas Main                |                             |                 |       |  |
| 9/15/2009 4:21:0<br>9/15/2009 4:21:0 |                   |             | Propane M<br>Fuel Oil M | leter Critic<br>eter Critic | al Flow         |       |  |
| 5/15/2005 4.21.0                     |                   |             |                         | eter Giltic                 |                 |       |  |
|                                      |                   |             |                         |                             |                 |       |  |
|                                      |                   |             |                         |                             |                 |       |  |
|                                      |                   |             |                         |                             |                 |       |  |
|                                      |                   |             |                         |                             |                 |       |  |
|                                      |                   |             |                         |                             |                 |       |  |
|                                      |                   |             |                         |                             |                 |       |  |
|                                      |                   |             |                         |                             |                 |       |  |
|                                      |                   |             |                         |                             |                 |       |  |
|                                      |                   |             |                         |                             |                 |       |  |
|                                      |                   |             |                         |                             |                 |       |  |
|                                      |                   |             |                         |                             |                 |       |  |
|                                      |                   |             |                         |                             |                 |       |  |
|                                      | (                 |             |                         |                             |                 |       |  |
| Ack<br>Alarm                         | Silence<br>Alarms |             |                         | <b>D</b> • •                | Alarm<br>Status |       |  |
| Alarm                                |                   |             | _                       | Print<br>History            | Sort            | Close |  |
| All                                  |                   | <b>T</b>    |                         | motory                      | Alarms          |       |  |

Follow these steps to add required logic for each energy meter you want to include in the Alarm History Faceplate.

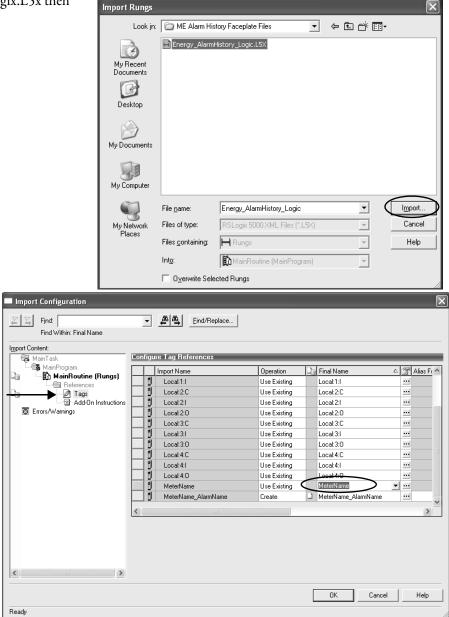
- 1. Open your RSLogix 5000 program routine and select the end rung or an existing rung that you want the alarm logic to follow.
- 2. Right-click the rung and choose Import Rungs.



3. Browse to the Faceplate Files folder on your Energy Management Toolkit CD image and select the ME Alarm History Faceplate Files folder.



4. Select Energy\_AlarmHistory\_Logix.L5x then click Import.



- 5. Select Tags under Import Content to display the Tag References view.
- 6. Scroll to and select the MeterName tag in the Final Name column.
- Click the pull-down menu icon and double-click the energy, PowerMonitor, or PowerMonitor status input Add-On Instruction tag that you want to include in the Alarm History Faceplate.

| Find Within: Final Name                     |             |                                   | _                  |            |                            |           |                         |         |                                       |                 | 1 |
|---------------------------------------------|-------------|-----------------------------------|--------------------|------------|----------------------------|-----------|-------------------------|---------|---------------------------------------|-----------------|---|
| ort Content:<br>@ MainTask                  | Config      | ure Tag References                |                    |            |                            |           |                         | -       | ise 🔏 Program Control 🔏               | <u>}</u>        |   |
| - 🕞 MainProgram                             |             | Import Name                       | Operation          | Dial Final | Vame                       | ∧ 🕾 ∆lias | For Data Type           | ^       | ise X Program control X               |                 |   |
| 🚯 MainRoutine (Rungs)                       | 1           | Local:1:1                         | Use Existing       | Loca       |                            |           | AB:Embedded IQ16F:I:0   |         |                                       |                 | × |
| References                                  | Ĩ           | Local:2:C                         | Use Existing       | Loca       |                            |           | AB:Embedded_0B16:C:0    |         |                                       |                 |   |
| Add-On Instructions                         | Ĩ           | Local:2:1                         | Use Existing       | Loca       |                            |           | AB:Embedded 0B16:I:0    |         |                                       |                 |   |
| Errors/Warnings                             | Ĩ           | Local:2:0                         | Use Existing       | Loca       | 2:0                        |           | AB:Embedded_0B16:0:0    |         |                                       |                 | ^ |
|                                             | Ē           | Local:3:C                         | Use Existing       | Loca       | 3.0                        |           | AB:Embedded IF4X0F2:C:0 | -       | us Water_Main                         |                 | - |
|                                             | 1           | Local:3:1                         | Use Existing       | Loca       | 3:1                        |           | AB:Embedded_IF4X0F2:1:0 |         | 2_MsgStatusInput2<br>CC2_Status2Count |                 |   |
|                                             | 1           | Local:3:0                         | Use Existing       | Loca       | 3:0                        |           | AB:Embedded_IF4X0F2:0:0 |         | 0.0 +                                 |                 |   |
|                                             | 1           | Local:4:C                         | Use Existing       | Low        | 4:C                        |           | AB:Embedded_HSC:C:0     | 1       | 1                                     |                 |   |
|                                             | 1           | Local:4:1                         | Use Existing       | Loca       | 4:1                        |           | AB:Embedded_HSC:I:0     |         | 55                                    |                 |   |
|                                             | 1           | Local:4:0                         | Use Existing       | Loca       | 4:0                        |           | AB:Embedded_HSC:0:0     |         |                                       |                 |   |
|                                             | ۳* ۵        | MeterName                         | Use Existing       | 🗦 Gas      | 4ain                       |           | Energy_Gas_PM_Status    |         | 50                                    |                 |   |
|                                             | 1           | MeterName_AlarmName               | Create             |            | Namo                       | $\sim$    | Data Ty                 | pe      |                                       | ~               |   |
|                                             |             |                                   |                    | - CT       | + Gas_Main                 | >         | Energy                  | _Gas_F  | PM_Status                             |                 |   |
|                                             | <u> </u>    |                                   |                    |            | + L2x_EnergyTote           | nis       | REAL[4                  |         |                                       |                 |   |
|                                             |             |                                   |                    |            | + Local:1:C                |           |                         |         | _IQ16F:C:0                            |                 |   |
|                                             |             |                                   |                    |            | + Local:1:I                |           |                         |         | _IQ16F:I:0                            |                 |   |
|                                             |             |                                   |                    |            | + Local:2:C                |           |                         |         | _0816:C:0                             |                 |   |
|                                             |             |                                   |                    |            | + Local:2:1                |           |                         |         | _0816:1:0                             |                 |   |
|                                             |             |                                   |                    |            | ∓-Local:2:0<br>∓-Local:3:C |           |                         |         | _OB16:0:0<br>  IF4X0F2:C:0            |                 |   |
|                                             |             |                                   |                    |            | ∔-Local:3:0                |           |                         |         | _F4X0F2:10                            |                 |   |
|                                             |             |                                   |                    |            | + Local 3:0                |           |                         |         | _F4X0F2:0:0                           |                 |   |
|                                             |             |                                   |                    |            | + Local:4:C                |           |                         |         | HSC.C.0                               |                 |   |
| 'Gas_Main' already exists in project and ha | as a differ | ent data type. Values for existin | g tags may be lost |            | Local:4:I                  |           |                         |         | HSC:I:0                               |                 | - |
| ⊕ ⊕ Energy_Steam_Digital                    | 1           |                                   |                    |            | + Local:4:0                |           | AB:Emb                  | edded   | HSC:0:0                               |                 |   |
| <                                           | >           |                                   |                    | ä          | Moon Meester               | unionu #1 | MECCA                   | <u></u> |                                       | ~               |   |
|                                             |             | -110                              |                    |            | Controller                 |           |                         |         |                                       |                 |   |
|                                             |             |                                   |                    |            | Program                    |           |                         |         |                                       |                 | ~ |
|                                             |             | MainRoutine'                      |                    | Sho        | : Show All                 |           |                         |         |                                       |                 |   |
| <                                           | 3           | MainProgram                       |                    |            | , anow All                 |           |                         |         |                                       | <u>&gt;&gt;</u> |   |

For this example, the Gas\_Main PowerMonitor status input tag is selected.

8. Replace *MeterName* in *MeterName\_*AlarmName with the corresponding Add-On Instruction tag name selected in the previous step.

For this example, Gas\_Main is entered.

9. Click OK to complete the alarm logic import.

Two alarm logic rungs should appear without errors.

| Find Within: Final Name |            |                     |              |    |                    |         |           |                         |   |
|-------------------------|------------|---------------------|--------------|----|--------------------|---------|-----------|-------------------------|---|
| A MainTask              | Configu    | re Tag References   |              | -  |                    | _       | _         |                         | - |
|                         |            | Import Name         | Operation    | D. | Final Name         | 6       | Alias For | Data Type               | 1 |
| MainRoutine (Rungs)     | 1          | Local:1:1           | Use Existing | _  | Local:1:1          |         | radoror   | AB:Embedded IQ16F:I:0   | _ |
| References              | Ŭ          | Local 2:C           | Use Existing |    | Local 2 C          |         |           | AB:Embedded OB16:C:0    |   |
| ⊡ Add-On Instructions   | Ŭ          | Local 21            | Use Existing |    | Local 21           |         |           | AB:Embedded OB16:1:0    |   |
| Errors/Warnings         | Ŭ          | Local 2:0           | Use Existing |    | Local 2:0          |         |           | AB:Embedded OB16:0:0    |   |
|                         | Ŭ          | Local 3:C           | Use Existing |    | Local 3 C          |         |           | AB:Embedded IF4X0F2:C:0 |   |
|                         | Ű          | Local 3:1           | Use Existing |    | Local 3.1          |         |           | AB:Embedded_IF4X0F2:I:0 |   |
|                         | Ð          | Local:3:0           | Use Existing |    | Local 3:0          |         |           | AB:Embedded_IF4X0F2:0:0 |   |
|                         | Ð          | Local:4:C           | Use Existing |    | Local:4:C          | -       |           | AB:Embedded HSC:C:0     |   |
|                         | Ð          | Local:4:1           | Use Existing |    | Local: 4:1         |         |           | AB:Embedded HSC:I:0     |   |
|                         | Ð          | Local:4:0           | Use Existing |    | Local 4:0          |         |           | AB:Embedded HSC:0:0     |   |
|                         | ** U       | MeterName           | Use Existing |    | Geo Main           |         |           | Energy_Gas_PM_Status    |   |
|                         | * <u>9</u> | MeterName AlarmName | Create       | 6  | Gas Main AlarmName | • · · · |           | STRING                  |   |
|                         | <          |                     |              |    | <u> </u>           |         |           |                         | > |
|                         |            |                     |              |    |                    |         |           |                         |   |

For this example, two alarm logic rungs will move the alarm trigger values and names for the Gas\_Main meter to the Alarm History Faceplate tags.

| Gas_Main.Sts_Controller_Trigger | MOV<br>Source Gas_Main.Sts_EnergyAlarmTrigger<br>0 ←<br>Dest EnergyAlarmTrigger<br>0 ←<br>Copy File<br>Source Gas_Main_AlarmName<br>Dest EnergyAlarmName<br>Length 1 |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cmd_Application_Alarm_Reset     | MOV<br>Source 0<br>Dest EnergyAlarmTrigger<br>0 €<br>Gas_Main.Cmd_AlarmReset                                                                                         |

- 10. Enter the string value for the *MeterName\_*AlarmName tag just imported.
  - a. Navigate to and double-click Controller Tags in the Controller folder.
  - b. Click the Monitor Tags tab.
  - c. Browse to the *MeterName\_*AlarmName tag and select the Value Column field. For this example, Gas\_Main\_AlarmName is selected.
  - d. Click the ... ellipse icon in the Value field.
  - e. In the String Browser dialog box, enter the meter name that you want to display in the Alarm History Faceplate for the corresponding alarm.

For this example, Gas Main is entered.

f. Click OK.

| ► Sta   | Controller L2x                    |      | Controller Tags - L2x(cont | troller) |                |                |           |                |              |        |
|---------|-----------------------------------|------|----------------------------|----------|----------------|----------------|-----------|----------------|--------------|--------|
| nt Page | Controller Tags                   |      | Scope: 🚺 L2x 💌             | Show     | STRING, E      | nergy_Air_Anal | log, ALAF | M, ALARM_ANALO | )G, ALARM_DI | GITAL, |
|         |                                   |      | Name                       | Δ        | Value          | +              | Force 🗲   | Style          | Data Type    |        |
|         | 🖻 🛱 MainTask                      |      | + EnergyAlarmTrigger       |          |                | 0              |           | Decimal        | DINT         |        |
|         | 🛓 🕞 🖓 MainProgram                 |      | Fuel_Oil_Total             |          |                | 0.0            |           | Float          | REAL         |        |
|         | Program Tags                      |      | ±-Gas_Main_AlarmName       | (        |                | 1.1            | {}        |                | STRING       |        |
|         | MainRoutine                       |      | +-L2x_EnergyTotals         |          | of station De  |                | Main      | AlarmName*     |              |        |
|         | Unscheduled Programs / Phases<br> |      | ±-Local:1:C                |          | is string bro  | Jwser - Gas    | _main_    | atarminame"    |              |        |
|         | Add-On Instructions               |      |                            |          | Gas Main       |                |           |                | ~            | \$\$   |
|         | 🖅 🛅 Data Types                    |      | +-Local:2:C                |          |                |                |           |                |              | \$1    |
|         | Trends                            |      | +-Local:2:I                |          |                |                |           |                |              | \$L    |
|         |                                   |      | +-Local:2:0                |          |                |                |           |                |              | \$N    |
|         |                                   |      | +-Local:3:C                |          |                |                |           |                |              |        |
|         |                                   |      | + Local:3:1                |          |                |                |           |                |              | \$P    |
|         |                                   | 1    | Monitor Tags Edit Tag      | s/       |                |                |           |                |              | \$R    |
|         |                                   | 5    |                            |          |                |                |           |                | $\sim$       | \$T    |
|         |                                   | ll Č |                            |          | Position: 8 Co | ount: 8 of 82  |           | <u> &lt;</u> < | Errors       |        |
|         |                                   |      |                            |          |                | ~              |           |                |              |        |
|         |                                   |      |                            |          |                | DCance         |           | Apply          | Help         |        |
|         |                                   |      |                            |          |                |                |           |                |              | 10     |

The completed string entry appears in the Value field.

g. Close the Controller Tags dialog box.

| icope: 🗗 L2x 💌         | Sh <u>o</u> w S | TRING, Energy_Air_Anal | log, ALAR   | IM, ALARM_AN | IALOG, ALARM_DIGITA |
|------------------------|-----------------|------------------------|-------------|--------------|---------------------|
| Name                   | ∆ Value         | +                      | Force 🕈     | Style        | Data Type 🔺         |
| ∃ EnergyAlarmTrigger   |                 | 0                      |             | Decimal      | DINT                |
| Fuel_Oil_Total         |                 | 0.0                    |             | Float        | REAL                |
| ∃ ⊞-Gas_Main_AlarmName |                 | 'Gas Main'             | <b>b</b> {} |              | STRING              |
| +-L2x_EnergyTotals     |                 | {}                     | {}          | Float        | REAL[4]             |
| +-Local:1:C            |                 | {}                     | {}          |              | AB:Embeddec 🚽       |

11. Repeat steps 1...10 for each energy meter that you want to include in the Alarm History faceplate.

### **Configure Equipment Status Faceplate**

The Equipment Status Faceplate is a display that provides device status and meter data from data collector devices in your energy management application. The faceplate works in conjunction with energy and faceplate Add-On Instructions.

You can display up to nine energy meters on a single Equipment Status Faceplate. In addition, you can configure the Equipment Status Faceplate to launch your faceplates by using preconfigured Goto Display buttons.

This example shows the Boiler House energy meters for the Efficient Industries Plant 1. The faceplate is configured for five rows or five energy meters and provides overall status with up to four additional status values for each meter.

|                       | Efficie       | nt Plant 1_ Boil   | er House             |               | Х           |
|-----------------------|---------------|--------------------|----------------------|---------------|-------------|
| Device                | State         | Value 1            | Value 2              | Value 3       | Value 4     |
| Gas Main              | ACTIVE        | 9565.000<br>therms | 503.000<br>therms/hr | 0.000         | 0.000       |
| Boiler House Gas      | ACTIVE        | 7654.000<br>therms | 385.000<br>therms/hr | 0.000         | 0.000       |
| Propane               | HIGH FLOW     | 43225.000<br>gal   | 4.300<br>gpm         | 0.000         | 0.000       |
| Fuel Oil              | CRITICAL FLOW | 21653.000<br>gal   | 5.900<br>gpm         | 0.000         | 0.000       |
| Boiler House Electric | Comms Fault   | 0.000<br>KW        | 0.000<br>Volts       | 0.000<br>Amps | 0.000<br>PF |

#### Add Equipment Status Faceplate Display

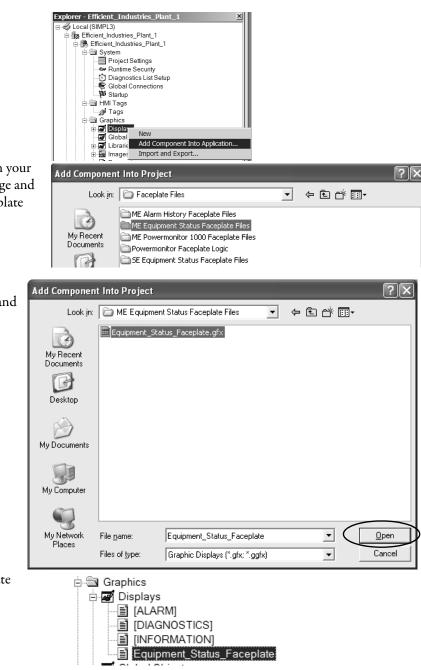
Follow these steps to add the Equipment Status Faceplate display to your FactoryTalk View ME application. The procedure uses the <u>Efficient Industries Plant 1</u> example to demonstrate the configuration steps.

- 1. Open the FactoryTalk View ME application to which you want to add the Equipment Status Faceplate display.
  - **TIP** The default display size for the Equipment Status Faceplate is 640 x 480 and is compatible with PanelView Plus 700 or larger terminals.

2. Right-click Displays and choose Add Component into Application.

- 3. Browse to the Faceplate Files folder on your Energy Management Toolkit CD image and select the ME Equipment Status Faceplate Files folder.
- 4. Select the Equipment\_Status\_Faceplate.gfx file and click Open.

5. Verify the Equipment\_Status\_Faceplate display appears under Displays.



#### ME Equipment Status Summary Faceplate

The CIP Motion energy faceplate routine is compatible with an equipment status faceplate, which is available on the Rockwell Automation sample code library. Search for 'ME Equipment Status' from the Sample Code Home search page.

http://search.rockwellautomation.com/search?site=sample\_code&client=samplecode&output=xml\_no\_dtd&proxystylesheet=samplecode

Follow the user instructions provided with the equipment status faceplate.

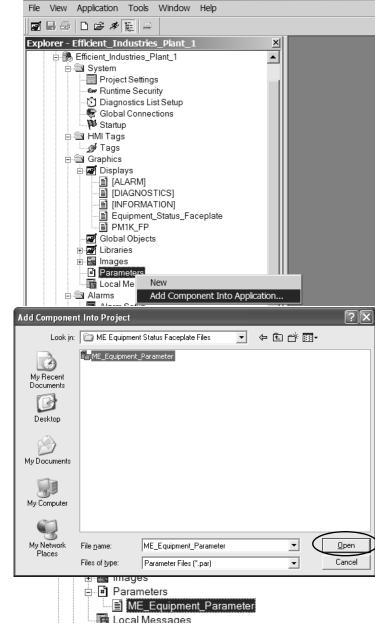
#### Add ME Equipment Parameter File

Follow these steps to add and configure the ME\_Equipment\_Parameter file.

1. Right-click Parameters and choose Add Component into application.

- 2. Browse to the ME Equipment Status Faceplate Files folder on your Energy Management Toolkit CD image and select the ME\_Equipment\_Parameter file.
- 3. Click Open.

4. Verify the ME\_Equipment\_Parameter file appears under Parameters.



5. Open the ME\_Equipment\_Parameter file.

The file has nine parameters, #1...#9, that correspond to each of the nine rows on the Equipment Status Faceplate.

For the Efficient Industries Plant 1 example, the first five default parameters will be replaced with these Add-On Instruction tag assignments: #1=::[L2X]Gas\_Main #2=::[L2X]Boiler\_House\_Gas #3=::[L2X]Propane #4=::[L2X]Fuel\_Oil #5=::[L2X]Boiler\_House

| General Parameter Syntax:                                  |                                                                                                                                                                                |
|------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| #replacement=tagname                                       |                                                                                                                                                                                |
| Example:                                                   |                                                                                                                                                                                |
| #1=::[CLX-L63]Device_1                                     | (This will represent the device monitored in row 1 of the Equipment Faceplate)                                                                                                 |
| #2=::[CLX-L63]Device_2_EEO                                 | (This will represent the device monitored in row 2 of the Equipment Faceplate)                                                                                                 |
| #3=::[CLX-L63]Device_3_BE0                                 | (This will represent the device monitored in row 3 of the Equipment Faceplate)                                                                                                 |
| #4=::[CLX-L63]Device_4                                     | (This will represent the device monitored in row 4 of the Equipment Faceplate)                                                                                                 |
| #5=::[CLX-L63]Device_4                                     | (This will represent the device monitored in row 5 of the Equipment Faceplate)                                                                                                 |
| #9=::[CLX-L63]Device_4                                     | (This will represent the device monitored in row 9 of the Equipment Faceplate)                                                                                                 |
|                                                            | L 9 Parameter numbers representing each of the 9 rows, respectively                                                                                                            |
| for the Equipment Status F                                 | aceplate. If you are not planning on using 9 devices for the Equipment Status                                                                                                  |
|                                                            | ning parameters with the last device used, ie. In the example above, only                                                                                                      |
| 4 devices are configured for<br>same as the last device in | or the Equipement Faceplate, therefore the remaining rows 5–9 are configured the<br>row 4.                                                                                     |
| **NOTE: Configure parameter #1                             | with the name of the AOI that has the "Inp_NumRowsVis" configured                                                                                                              |
| in the AOI to represent the actu                           | al number of rows to appear on the Equipment Status Faceplate.                                                                                                                 |
|                                                            |                                                                                                                                                                                |
| Assign the energy tagname of the o                         | device you intend to monitor.                                                                                                                                                  |
| The tagname includes the "Device !                         | Shortcut" of your system's Logix Controller. This is the name of the Logix controller                                                                                          |
| you configured in RSLinx Enterprise                        | Communication Setup that is connected to the intended device you want to monitor.                                                                                              |
| Ex. [CLX-63]                                               |                                                                                                                                                                                |
| The tagname also includes the ene                          | rgy tag of the device that was configured in your Logix application file.                                                                                                      |
| For PowerMonitor 500, 5000, and                            | PowerMonitor Status Inputs, energy tagnames are of the format "DeviceName". Ex. My_PM100<br>E300 devices, energy tagnames are of the format "DeviceName_EEO". Ex. My_PM500_EEO |
| For PowerFlex, SMC 50, and E3 Plu                          | is devices, energy tags are of the format "DeviceName_BEO". Ex. My_SMC50_BEO                                                                                                   |
| (EEO/BEO in the tagnames represe                           | nts the CIP standard Electrical Energy Object/Base Energy Object.)                                                                                                             |
|                                                            |                                                                                                                                                                                |
|                                                            |                                                                                                                                                                                |
| #1=::[CLX-L63]Motor_1                                      |                                                                                                                                                                                |
| #2=::[CLX-L63]Motor_2                                      |                                                                                                                                                                                |
| #3-::[CLX-L63]Motor_3                                      |                                                                                                                                                                                |
| #4=::[CLX-L63]Motor_4                                      |                                                                                                                                                                                |
| #5=::[CLX-L63]Motor_5                                      |                                                                                                                                                                                |
| #6=::[CLX-L63]Motor_6                                      |                                                                                                                                                                                |
| #7=::[CLX-L63]Motor 7                                      |                                                                                                                                                                                |

- **TIP** Unused parameters can be replaced with any of the previous valid tag assignments. Unused parameters must be assigned to a valid Add-On Instruction for the Equipment Status Faceplate to operate without errors.
- 6. Assign an energy or faceplate Add-On Instruction tag name to each of the nine parameters.
  - a. Enter the device shortcut name of the controller associated with the tag assignment.

For this example, [L2x] is the shortcut name of the controller associated with the Gas\_Main Add-On Instruction.

Shortcut names are defined in the RSLinx Enterprise Communication Setup.

b. Enter the energy or faceplate Add-On Instruction name to display in the corresponding row of the faceplate.

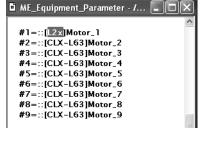
For this example, Gas\_Main is entered to display data from the Gas\_Main Add-On Instruction on the first row of the faceplate.

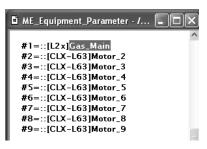
 TIP
 The first parameter, #1, must be assigned to a preconfigured energy or faceplate Add-On Instruction that includes the Inp\_NumRowsVis assignment configured on page 330.

TIP For PowerMonitor 1000/3000 and PM Status Inputs, energy tags are of the format 'DeviceName', for example, My\_PM1000

For PowerMonitor 500, 5000, and E300 devices, energy tags are of the format 'DeviceName\_EEO', for example, My\_PM500\_EEO.

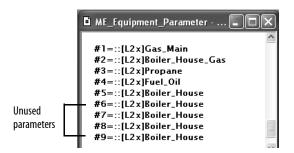
For PowerFlex, SMC 50, and E3 Plus devices, energy tags are of the format 'DeviceName\_BEO', for example, My\_SMC50\_BEO.





When done, the parameter file will look similar to this.

**TIP** To add devices that do not have preconfigured Add-On Instructions or faceplates, refer to the ME Equipment Status Summary Faceplate at http://samplecode.rockwellautomation.com.



7. Close and save the file.

#### Configure Energy Meter Goto Buttons

The Goto Display buttons within the Equipment Status Faceplate are used to identify the energy meters displayed in each row and can also be used to launch the PowerMonitor faceplates.

For the Efficient Industries Plant 1 example, the first four Goto Display buttons are configured for meter identification only. The Boiler House Electric Goto Display button is configured to identify the meter and also launch the corresponding PowerMonitor 1000 faceplate.

|                                               |                       | Efficie       | nt Plant 1_ Boil   | er House             |               | X           |
|-----------------------------------------------|-----------------------|---------------|--------------------|----------------------|---------------|-------------|
|                                               | During                | Ctata         | Value 1            | Value 2              | Malua 2       | Value 4     |
|                                               | Device                | State         | value 1            | Value 2              | Value 3       | Value 4     |
|                                               | Gas Main              | ACTIVE        | 9565.000<br>therms | 503.000<br>therms/hr | 0.000         | 0.000       |
| Goto Display buttons<br>identify meters only. | Boiler House Gas      | ACTIVE        | 7654.000<br>therms | 385.000<br>therms/hr | 0.000         | 0.000       |
|                                               | Propane               | HIGH FLOW     | 43225.000<br>gal   | 4.300<br>gpm         | 0.000         | 0.000       |
| Goto Display button                           | Fuel Oil              | CRITICAL FLOW | 21653.000<br>gal   | 5.900<br>gpm         | 0.000         | 0.000       |
| identifies meter and launches faceplate       | Boiler House Electric | Comms Fault   | 0.000<br>KW        | 0.000<br>Volts       | 0.000<br>Amps | 0.000<br>PF |

Follow these steps to configure the energy meter Goto Display buttons for each row of the Equipment Status Faceplate.

1. Double-click the Equipment Status Faceplate display in the Graphics folder.

The display opens.

| 🔏 RSView Studio - Machine Edition       |   |
|-----------------------------------------|---|
| File View Application Tools Window Help |   |
| <b>2</b> - 3 - 1 <b>2 * k</b>           |   |
| Explorer - Efficient_Industries_Plant_1 | × |
| 🖃 🎻 Local (USMKEJWNOVAK3)               | ~ |
| 🗐 📴 Efficient_Industries_Plant_1        |   |
| 🚊 🥵 Efficient_Industries_Plant_1        |   |
| 😟 🧰 System                              |   |
| 🕀 🧰 HMI Tags                            |   |
| 🖻 🔄 Graphics                            |   |
| 🖻 🌌 Displays                            |   |
| [ALARM]                                 |   |
| DIAGNOSTICS]                            |   |
| INFORMATION]                            |   |
| Equipment_Status_Faceplate              |   |
| PM1K_FP                                 |   |
| Global Objects                          |   |

2. Right-click in the display and choose Object Explorer.

|                                         | \$\$\$       | ******                  | *****                   |                                        |
|-----------------------------------------|--------------|-------------------------|-------------------------|----------------------------------------|
|                                         | <b>0</b> 1.1 |                         |                         | Edit<br>Connections<br>Key Assignments |
| Device                                  | State        | Value 1                 | Value 2                 | Arrange                                |
| \$\$\$\$\$\$\$\$\$\$\$\$\$\$\$          | NOT READY    | NNNNNN.NNN<br>SSSSSSSSS | NNNNNN.NNN<br>SSSSSSSSS | Animation                              |
| \$\$\$\$\$\$\$\$\$\$\$\$\$\$            | NOT READY    | NNNNNN.NNN<br>SSSSSSSSS | NNNNNN.NNN<br>SSSSSSSSS | Convert to <u>W</u> allpaper           |
|                                         |              | NNNNNN.NNN              | NNNNNN.NNN              | Tag Substitution                       |
| \$\$\$\$\$\$\$\$\$\$\$\$\$\$            | NOT READY    | SSSSSSSS                | SSSSSSSS                | Property Panel                         |
| \$\$\$\$\$\$\$\$\$\$\$\$\$\$\$          | NOT READY    | NNNNNN.NNN<br>SSSSSSSSS | NNNNNN.NNN<br>SSSSSSSSS | O <u>b</u> ject Explorer               |
| \$\$\$\$\$\$\$\$\$\$\$\$\$\$\$          | NOT READY    | NNNNNN.NNN              | NNNNNN.NNN              | Cu <u>t</u>                            |
|                                         | HOT ILADT    | SSSSSSSS                | SSSSSSSS                | ⊆ору                                   |
| \$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$        | NOT READY    | NNNNNN.NNN<br>SSSSSSSSS | NNNNNN.NNN<br>SSSSSSSSS | <u>P</u> aste                          |
|                                         |              | NNNNNNNNN               | NNNNNN.NNN              | <u>D</u> elete<br>Duplicate            |
| \$\$\$\$\$\$\$\$\$\$\$\$\$\$            | NOT READY    | SSSSSSSS                | SSSSSSSS                |                                        |
| \$\$\$\$\$\$\$\$\$\$\$\$\$\$\$\$        |              | NNNNNN.NNN              | NNNNNN.NNN              | Copy Animation                         |
| 555555555555555555555555555555555555555 | NOTREADY     | ect Explorer            |                         | Paste Animation                        |

3. Browse to Row\_Group\_*x* and double-click the GotoDisplayButton\_*x* that you want to configure.

For this example, GotoDisplayButton\_5 is selected to configure the Boiler\_House meter button in row 5 of the faceplate.

| ADY NNNNNNNN NNNNNNNNN       |
|------------------------------|
| Object Explorer              |
| ⊡-Equipment_Status_Faceplate |
| ⊡ Row_Group_9                |
| i≣- Row_Group_8              |
| ia Row_Group_7               |
| Row_Group_6                  |
| Bow_Group_5                  |
| ⊞ Value4_Grp_5               |
| ⊕ Value3_Grp_5               |
|                              |
| ⊕ Value1_Grp_5               |
| - DeviceName_String_5        |
| GotoDisplayButton_5          |
|                              |

4. Click the Label tab and type the text you want to display on the corresponding Goto Display button.

For this example, Boiler House Electric is entered.

| Goto Display Button Propert         | ies           |                     | × |
|-------------------------------------|---------------|---------------------|---|
| General Label Common                |               |                     |   |
| Caption                             |               |                     |   |
| Boiler House Electric               |               |                     |   |
|                                     |               |                     |   |
|                                     |               | Insert Variable     |   |
| Font:                               | Size:         |                     |   |
| Arial                               | 10 💌          | B Z U               |   |
| Caption color<br>Caption back color | Alignment     | Caption back style: |   |
| Caption blink                       | CEC           | Transparent 💌       |   |
| Vord wrap                           | ccc           |                     |   |
| Image settings                      |               |                     |   |
| Image:                              | Image back st | yle:                |   |
|                                     | Transparent   | •                   |   |
| Image color Image back color        | Alignment     |                     |   |
| Image blink                         | 0.00          |                     |   |
| Image scaled                        | 000           |                     |   |
|                                     |               |                     |   |
|                                     |               |                     |   |
| ОК                                  | Cancel        | Apply Help          |   |

TIP

Complete steps 5 and 6 only if you are configuring the button to also launch a faceplate. Otherwise, skip to step 7.

5. Click the General tab, then choose the faceplate display to be launched when the GotoDisplay button is pressed, then click OK.

For this example, the PM1K\_FP is selected.

- General Label Common Appearance Border style Border width 5 ✓ Border uses back colo Raised • Back color Back style: Pattern style Border color Border color
  Pattern color Transparent -None -Shape: **Component Browse** Rectangle • Select a component Equipment\_Status\_Faceplate PM1K\_FP Display se Display: [ALARM] [DIAGNOSTICS] [INFORMATION] PM1K\_FF Top position Touch margins Horizontal margin Other 🔽 Audio ПК Cancel Help ΟK oto Display Button Propertie × General Label Common Appearance Border style Border width: Raised • 5 Border uses back color Back color Back style Pattern style: Border color Pattern color Transparent • None -High Shape **Component Browser** Blin Rectangle • Select a component: М Display settings ME\_Equipment\_Paramet PM1K-172-144 Parameter file: Display: PM1K\_FF PM1K-172-144 Top position Displa Touch margins Horizontal margin Vertical margin: 0 0 Other 🔽 Audio ΠК Cancel Help ΟK Cancel
- 6. Select the Parameter file that corresponds to the faceplate previously configured in the Configure Faceplate sections above, then click OK.

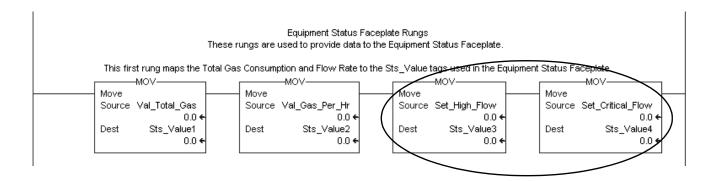
For this example, PM1K-172-144 is selected.

- 7. Click OK to complete the configuration.
- 8. Repeat steps 3...7 to configure a GotoDisplay button for each faceplate row.

#### Configure Additional Device Value Columns

Not all device faceplates used with the Equipment Status Faceplate are configured to display four value fields. If additional value fields are needed, then you must add logic to the existing faceplate routine or Add-On Instruction to move the additional tag values to the corresponding Sts\_Valuexx tags.

In this example, preconfigured logic in the Energy\_Gas\_AOI writes values to Sts\_Value1 and Sts\_Value2. Two additional MOV instructions were added to this rung to display high flow and critical flow values on the Equipment Status Faceplate.



You can do the same for units displayed with additional value fields. Write logic to move a string value to the SetValue*x*Units tag in the Add-On Instruction, or set the default string for this tag by:

- opening the Controller Tags browser,
- changing the scope to your Add-On Instruction,
- editing the Set\_ValuexUnits default field.

In this example, High Flow and Critical Flow are added to Set\_Value3Unit and Set\_Value4Unit tags.

| ø                                                                                          | Add-On Instruction Parameters a                                         | nd Local Taş | gs - Energy_Gas_Digital |                         |         |         |  |  |
|--------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|--------------|-------------------------|-------------------------|---------|---------|--|--|
| Scoge: 🕼 Energy_Gas_Digital 💌 Show STRING, Energy_Air_Analog, Energy_Air_Digital, Energy_A |                                                                         |              |                         |                         |         |         |  |  |
| D                                                                                          | Data Context: 🗑 Energy_Gas_Digital <definit td="" 🏂<="" 🚽=""></definit> |              |                         |                         |         |         |  |  |
|                                                                                            | Name 🛆                                                                  | Usage        | Default 🔶               | Force +                 | Style   | <b></b> |  |  |
|                                                                                            | Set_Meter_Pulse_Factor                                                  | Input        | 1.0                     |                         | Float   |         |  |  |
|                                                                                            |                                                                         | Local        | 'Therms'                | {}                      |         |         |  |  |
|                                                                                            |                                                                         | Local        | 'Therms/Hr'             | {}                      |         |         |  |  |
|                                                                                            |                                                                         | Local 🖌      | 'High Flow'             | $\langle \dots \rangle$ |         |         |  |  |
|                                                                                            |                                                                         | Local        | 'Critical Flow'         | J}                      |         |         |  |  |
|                                                                                            | Storage1                                                                | Local        |                         | 1                       | Decimal | -       |  |  |
| 4                                                                                          | Monitor Tags / Edit Tags /                                              |              | •                       |                         |         | • //    |  |  |

#### Create a Goto Button to Launch Faceplate

Follow these steps to add a Goto Display button to launch the Equipment Status Faceplate from a display in your FactoryTalk View ME application.

🗷 Main - /Efficient\_Industries\_Plant\_1// (Display)

Efficient Industries Plant 1 Energy Status

- 1. Add a Goto Display button to one of your existing ME application displays.
- 2. Double-click the button to open its Properties.

× Goto Display Button Properti General Label Common Appearance Border style Border width: Inset -4 🔽 Border uses back color Back color Back style: Pattern style Border color • Pattern color Highlight color Solid None -Shape: 🔲 Blink Rectangle -Display setting Display: Equipment\_Status\_Fac .... Parameter file: ME\_Equipment\_Parameter Para Top position: Left position: Display position Touch margins Horizontal margin: Vertical margin: 0 0 Other 🔽 Audio ОК Cancel Help

- D×

3. Under Display Settings, set the Display to Equipment\_Status\_Faceplate and the Parameter file to ME\_Equipment\_Parameter. 4. Click the Label tab and type the text you want displayed on the button.

For this example, Boiler House is entered.

- 5. Click OK.
- 6. Save and test your application by creating a runtime application.

| Goto Display Button Properti                                                               | ies                                                          |                                                       | $\mathbf{X}$ |
|--------------------------------------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------|--------------|
| General Label Common                                                                       |                                                              | 4                                                     |              |
| Font:<br>Arial                                                                             | Size:<br>10<br>Alignment<br>C C C<br>C C C                   | Insert Variable B Z U Caption back style: Transparent |              |
| Image settings<br>Image:<br>Image color<br>Image back color<br>Image blink<br>Image scaled | Image back sty<br>Transparent<br>Alignment<br>C C C<br>C C C | lle:<br>▼                                             |              |
| OK                                                                                         | Cancel                                                       | Apply Help                                            | )            |

### **Configure Alarm History Faceplate**

The Alarm History Faceplate leverages the alarm functionality in FactoryTalk View Machine Edition and provides time and date-stamped alarm, and fault information for energy data collector devices. This faceplate works in conjunction with energy and faceplate Add-On Instructions.

In this example, the Alarm History Faceplate shows alarms from three energy meters.

|         | Alarm History                                     |                                   |           |                      |         |                                           |                                   |       |  |
|---------|---------------------------------------------------|-----------------------------------|-----------|----------------------|---------|-------------------------------------------|-----------------------------------|-------|--|
| 9/15/20 | time<br>109 4:21:03<br>109 4:21:03<br>109 4:21:03 | 3 PM<br>3 PM                      | knowledge | time                 | Propane | n Comms F<br>Meter Critic<br>Meter Critic | al Flow                           |       |  |
|         | Ack<br>Alarm<br>Ack<br>All                        | Silence<br>Alarms<br>Clear<br>All | ⊼<br>⊻    | <b>★</b><br><b>▼</b> | ▲<br>▼  | Print<br>History                          | Alarm<br>Status<br>Sort<br>Alarms | Close |  |

#### Add Alarm History Faceplate Display

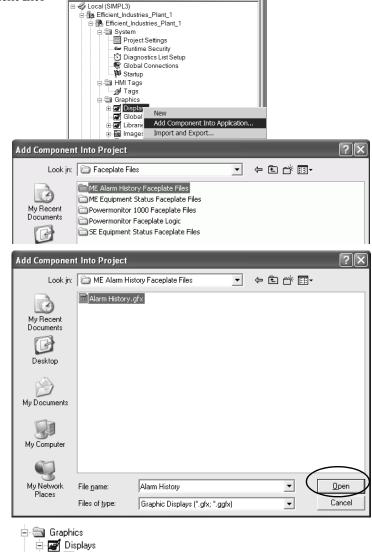
Follow these steps to add the Alarm History Faceplate display to your FactoryTalk View ME application. The procedure uses the <u>Efficient Industries Plant 1</u> example to demonstrate the configuration steps.

- 1. Open the FactoryTalk View ME application to which you want to add the Alarm History Faceplate.
  - **TIP** The default display size for the Alarm History Faceplate is 640 x 480 and is compatible with PanelView Plus 700 or larger terminals.

Explorer - Efficient\_Industries\_Plant\_1

2. Right-click Displays and choose Add Component Into Application.

- 3. Browse to the Faceplate Files folder on your Energy Management Toolkit CD image and select the ME Alarm History Faceplate Files folder.
- 4. Select the Alarm History.gfx file and click Open.



5. Verify Alarm History appears under Displays.

[ALARM]

[DIAGNOSTICS]

[INFORMATION]

Equipment\_Status\_Faceplate

<u>Ala</u>rm History

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1.1 -

#### Import Alarm Configuration File

Follow these steps to import the alarm configuration file with energy alarm trigger tags and alarm messages into your FactoryTalk View application.

1. Right-click Alarm Setup in the Alarms folder and choose Import and Export.

2. Select Import alarm configuration into application then click Next.

| nd choose                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Explorer - Efficient_Industries_Plant_1 |  |  |  |  |  |  |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|--|--|--|--|--|--|--|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 🖃 🎻 Local (USMKEJWNOVAK3)               |  |  |  |  |  |  |  |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 🖹 🤀 Efficient_Industries_Plant_1        |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | i System                                |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | i⊞ • 🛄 HMI Tags                         |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                         |  |  |  |  |  |  |  |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                         |  |  |  |  |  |  |  |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                         |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 🕀 🧰 RecipePlus                          |  |  |  |  |  |  |  |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                         |  |  |  |  |  |  |  |
| Alarm Import Exp                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | oort Wizard - Select Operation 🛛 🗙      |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                         |  |  |  |  |  |  |  |
| Select the operation                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | n to perform.                           |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                         |  |  |  |  |  |  |  |
| C Export alarm of Export al | configuration from application          |  |  |  |  |  |  |  |
| Import alarm c                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | configuration into application          |  |  |  |  |  |  |  |
| import alarm c                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | ornigulation into application           |  |  |  |  |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                         |  |  |  |  |  |  |  |
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|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                         |  |  |  |  |  |  |  |

**IMPORTANT** When importing the alarm configuration, your existing alarm configuration is lost. When prompted to back up the existing alarm configuration, you can choose to save it as a .xml file.

• Yes • <u>N</u>o

Alarm Import Export Wizard - Create Backup

Do you want to backup your existing alarm configuration?

- 3. Choose Yes or No when prompted to back up application, then click Next.
- 4. Browse to the ME Alarm History Faceplate Files folder on your Energy Management Toolkit CD image, then select Alarms.xml and click Open.

|   |                        | < <u>B</u> ac  | ck <u>N</u> ext>        | Cancel | Help  |          |
|---|------------------------|----------------|-------------------------|--------|-------|----------|
|   | Choose alarm o         | onfiguration   | file to import          |        |       | ?×       |
|   | Look in:               | 📄 ME Alarm H   | History Faceplate File: | s 💌    | ⇔ € ₫ |          |
|   | My Recent<br>Documents | Alarms         |                         |        |       |          |
|   | My Documents           |                |                         |        |       |          |
|   | My Computer            |                |                         |        |       |          |
|   |                        |                |                         |        |       | $\frown$ |
|   | My Network<br>Places   | File name:     | Alarms                  |        | •     | Open     |
| l |                        | Files of type: | Alarm Files (*.xm       | 1)     | •     | Cancel   |

5. Choose Finish to complete the import.

6. Double-click Alarm Setup in the Alarms folder to open the new configuration.

You will see the EnergyAlarmTrigger tag and other Rockwell Automation device triggers.

| Explorer - Efficient_Industries_Plant_1  Cocal (USMKEJWNOVAK3)  Efficient_Industries_Plant_1  System  System  Graphics  Alarms  Final Alarm Setup  Final Information | Triggers Messages Advanced<br>Select trigger:<br>PowerFlexAlarmTrigger<br>KinetixAlarmTrigger<br>E3AlarmTrigger<br>SMCAlarmTrigger<br>Kinetix2AlarmTrigger<br>ArmorStartAlarmTrigger | Trigger settings<br>Irigger type:<br>Value<br>Use ack all value:<br>Optional trigger <u>c</u> onnections | Trigger la <u>b</u> el:<br>Label8 | -          |       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|-----------------------------------|------------|-------|
| ⊕ - 🧰 Logic and Control<br>⊕ - 🛄 Data Log                                                                                                                            | EnergyAlarmTrigger                                                                                                                                                                   | Name<br>Handshake                                                                                        | Tag or expression                 | Tag<br>••• | Exprn |
|                                                                                                                                                                      | ,<br><u>A</u> dd                                                                                                                                                                     | Ack<br>Remote Ack                                                                                        |                                   | •••        | •••   |
|                                                                                                                                                                      | <u>E</u> dit                                                                                                                                                                         | Remote Ack Handshake<br>Message<br>Message Notification                                                  |                                   | •••        |       |
|                                                                                                                                                                      | Remove                                                                                                                                                                               | Message Handshake                                                                                        |                                   | •••        |       |
| Application Communications                                                                                                                                           |                                                                                                                                                                                      |                                                                                                          | OK Cancel                         |            | Help  |

You can remove device triggers not needed by selecting the triggers and clicking Remove. Corresponding messages not needed can be deleted from the Messages tab.

#### Configure Alarm Trigger Tags

Although the alarm triggers were imported, you must configure the alarm trigger tags.

Follow these steps to configure the alarm trigger tags.

1. Access the Machine Edition HMI tag database by double-clicking Tags under the HMI Tags folder.

| Explorer - Efficient_Industries_Plant_1 |                                         |               |
|-----------------------------------------|-----------------------------------------|---------------|
|                                         | F Tags - /Efficient_Industries_Plant_1/ |               |
| System     HHL Tags                     | Tag<br>Name:                            | Close         |
| Tags<br>Graphics<br>Alarms              | Type:  Description:                     | Accept        |
|                                         |                                         | Discard       |
| Logic and Control      Data Log         |                                         | New           |
| RecipePlus     RSLinx Enterprise        | Data Source<br>Type:  C Memory          | Help          |
| 🗄 🛅 System                              | Address:                                |               |
|                                         | Search For: Tag Name Typ                | e Description |
|                                         |                                         | Description   |
|                                         |                                         |               |
|                                         | System                                  |               |
|                                         |                                         | >             |

- 2. Create two FactoryTalk View device tags used by the preconfigured alarm triggers.
  - EnergyAlarmTrigger Analog tag set to a maximum of 200
  - EnergyAlarmName- String tag
- 3. Assign the data source of each tag to the EnergyAlarmTrigger and EnergyAlarmName controller tags that you configured in RSLogix 5000 software.

| <pre> # Tags - /Efficient_Industries_Plant_1/ </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| Tag<br>Name: EnergyAlarmTrigger                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Close        |
| Type: Analog V                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Accept       |
| Description:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Discard      |
| Minimum: 0 Scale: 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |              |
| Maximum: 200 ffset: 0 Data Type: (Default)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | New          |
| Data Source                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <u>H</u> elp |
| Address: [L2x]EnergyAlarmTrigger                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |              |
| leaning). and it is a second s |              |
| <pre># Tags - /Efficient_Industries_Plant_1/</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | _            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 1            |
| Name: EnergyAlarmName                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Close        |
| Type: String                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Accept       |
| Description:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Discard      |
| Length: 82                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | New          |
| Data Source                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |              |
| Type:      Device      Memory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Help         |
| Address: [L2x]EnergyAlarmTrigger                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |              |

#### Alarm History Faceplate/AOI

If you choose to display the kW High Limit alarm and Communication alarm, you need to create two FactoryTalk View device tags and customize two alarm messages:

- 'ModuleAlarmTrigger' Analog tag (Set max to 200 for each)
- 'ModuleAlarmName'- String tag
- 1. Assign each tag to the associated controller tag that was created when you imported the CIP Motion Energy faceplate routine.

|              |         | _          |                   |        |                |   |            |  |  |  |
|--------------|---------|------------|-------------------|--------|----------------|---|------------|--|--|--|
| 🎻 Tags - /DN | 1AT/    |            |                   |        |                |   |            |  |  |  |
| Tag          |         |            |                   |        |                | _ |            |  |  |  |
| Name:        | ModuleA | AlarmT     | rigger            |        |                |   | Close      |  |  |  |
| Type:        | Analog  | ~          |                   |        |                |   | Prev       |  |  |  |
| Description: |         |            |                   |        |                | _ | New A      |  |  |  |
| Minimum:     | 0       | 0 Scale: 1 |                   |        |                |   |            |  |  |  |
| Maximum:     | 200     |            | Offset: 0         | Data T | /pe: (Default) | • | New        |  |  |  |
| Data Source  |         |            |                   |        |                |   | Help       |  |  |  |
| Type:        | Devic   | e 🤇        | Memory            |        |                |   |            |  |  |  |
| Address:     | [CLX]Mo | duleA      | larmTrigger       |        |                |   |            |  |  |  |
|              |         |            |                   |        |                |   |            |  |  |  |
| Search Fo    | r:      |            | Tag Name          |        | Туре           |   | Descriptio |  |  |  |
|              |         | 1          | E300AlarmName     |        | String         |   |            |  |  |  |
|              |         | 2          | E300AlarmTrigger  |        | Analog         |   |            |  |  |  |
|              |         | 3          | ModuleAlarmName   |        | String         |   |            |  |  |  |
| 📙 🗅 🗀 sys    | tem     | 4          | ModuleAlarmTrigge | r      | Analog         |   |            |  |  |  |
|              |         |            | 00                |        |                |   |            |  |  |  |

2. Customize two alarm messages.

- a. Expand Alarms and double-click on Alarm Setup.
- b. Go to the Messages tab.
- c. Filter on ModuleAlarmTrigger.
- d. Replace 'User Alarm' in alarm message 18 with 'Communication Fault'.
- e. Replace 'User Alarm' in alarm message 19 with 'kW High Limit'.

| Explorer - DMAT            | 🔄 🗖 | Alarm Se  | tup - /DMAT/              |               |                             |                     |          |       |
|----------------------------|-----|-----------|---------------------------|---------------|-----------------------------|---------------------|----------|-------|
| 🖃 🎻 Local (PASS01)         |     |           |                           |               |                             |                     |          |       |
| 🗄 📷 DMAT                   |     |           |                           |               |                             |                     |          |       |
| 🕀 🥵 DMAT                   |     | Triggers  | Messages Advanced         |               |                             |                     |          |       |
| 🖃 🔄 System                 |     |           |                           |               |                             |                     |          |       |
| Project Settings           |     | Trigge    | er filter: ModuleAlarmTri | gger          | <ul> <li>Sort by</li> </ul> | : <none></none>     |          |       |
| - Security                 |     | Alarm me  |                           |               |                             |                     |          |       |
| - 🐼 Diagnostics List Setup |     | Alarining |                           |               |                             |                     |          |       |
| Global Connections         |     |           | Trigger                   | Trigger value | M                           | essage              | Display  | Audio |
| Startup                    |     | 1         | ModuleAlarmTrigger        | 1             | /*S:0 ModuleAlarmName*/     | Drive Fault         | V        |       |
|                            |     |           | ModuleAlarmTrigger        | 2             | /*S:0 ModuleAlarmName*/     | Not Ready           | <b>v</b> |       |
| 🖻 🔄 HMI Tags               |     | 3         | ModuleAlarmTrigger        | 3             | /*S:0 ModuleAlarmName*/     | Failed to Clear     | <b>v</b> |       |
| - 🍠 Tags                   |     | 4         | ModuleAlarmTrigger        | 4             | /*S:0 ModuleAlarmName*/     | Failed to Reset     | <b>V</b> |       |
| 🖃 🔄 Graphics               |     | 5         | ModuleAlarmTrigger        | 5             | /*5:0 ModuleAlarmName*/     | ' Failed to Start   | <b>N</b> |       |
| 🕀 🌌 Displays               |     | 6         | ModuleAlarmTrigger        | 6             | /*S:0 ModuleAlarmName*/     | Failed to Stop      | V        |       |
| Global Objects             |     | 7         | ModuleAlarmTrigger        | 7             | /*5:0 ModuleAlarmName*/     | Safety Fault        | ব        |       |
| Symbol Factory             |     | 8         | ModuleAlarmTrigger        | 8             | /*S:0 ModuleAlarmName*/     | User Alarm          |          |       |
|                            |     | 9         | ModuleAlarmTrigger        | 9             | /*5:0 ModuleAlarmName*/     | User Alarm          | <b>v</b> |       |
| 🕀 🌌 Libraries              |     |           | ModuleAlarmTrigger        | 10            | /*S:0 ModuleAlarmName*/     | User Alarm          | <b>v</b> |       |
| 🕀 🚾 Images                 |     | 11        | ModuleAlarmTrigger        | 11            | /*5:0 ModuleAlarmName*/     | User Alarm          | V        |       |
| 🛨 🛋 Parameters             |     | 12        | ModuleAlarmTrigger        | 12            | /*S:0 ModuleAlarmName*/     | User Alarm          | <b>v</b> |       |
| - The Local Messages       |     | 13        | ModuleAlarmTrigger        | 13            | /*S:0 ModuleAlarmName*/     | User Alarm          | <b>V</b> |       |
| 🖃 🔄 Alarms                 |     |           | ModuleAlarmTrigger        | 14            | /*S:0 ModuleAlarmName*/     |                     | 2        |       |
| - Alarm Setup              |     | 15        | ModuleAlarmTrigger        | 15            | /*5:0 ModuleAlarmName*/     | 'User Alarm         | <b>v</b> |       |
|                            |     | 16        | ModuleAlarmTrigger        | 16            | /*5:0 ModuleAlarmName*/     | User Alarm          | V        |       |
|                            |     |           | ModuleAlarmTrigger        | 17            | /*S:0 ModuleAlarmName*/     | User Alarm          | <b>v</b> |       |
| - The Information Setup    |     | 18        | ModuleAlarmTrigger        | 18            | /*S:0 ModuleAlarmName*/     | Communication Fault | V V      |       |
| Information Messages       |     |           | ModuleAlarmTrigger        | 19            | /*S:0 ModuleAlarmName*/     | ' kW High Limit     | 2        |       |
| 🖻 🚍 Logic and Control      |     |           | ModuleAlarmTrigger        | 20            | /*S:0 ModuleAlarmName*/     |                     | <b>N</b> |       |
| Macros                     |     | 21        | ModuleAlarmTrigger        |               |                             |                     | •        |       |
| 🖃 🔄 Data Log               |     |           |                           |               |                             |                     |          |       |
| Data Log Models            |     |           |                           |               |                             |                     |          |       |
|                            |     |           |                           |               |                             |                     |          |       |
| 🖻 🔁 RecipePlus             |     |           |                           |               |                             |                     |          |       |

3. Configure the kW High Limit alarm threshold in the controller by modifying the value for the tag, \_\_\_\_\_\_DriveName\_BEO.Set\_High\_Limit; where '\_\_\_\_DriveName' is the device name particular to your application.

| DriveName_BEO                          | {}         |
|----------------------------------------|------------|
| DriveName_BEO.Control1                 | {}         |
|                                        | 0          |
| DriveName_BEO.Set_DeviceNameOper       | 'MyPM5500' |
|                                        | 2          |
| DriveName_BEO.Set_EquipmentDisplayName |            |
| DriveName_BEO.Set_High_Limit           | 10000000.0 |
| DriveNameBEO.Set_kWhMaxRate            | 0.0        |
| - DriveName BEO Set kWhSamplingBate    | 0.05       |

#### Create a Goto Button to Launch Faceplate

Follow these steps to add a Goto Display button to launch the Alarm History Faceplate from a display in your FactoryTalk View ME application.

- 1. Add a Goto Display button to one of your existing ME application displays.
- 2. Double-click the button to open its Properties.

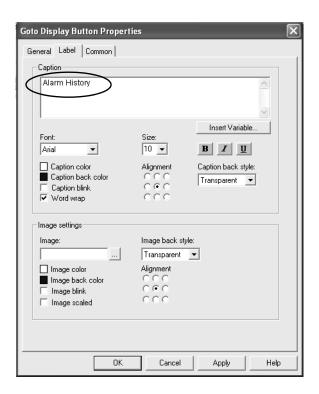
3. Under Display Settings, set the Display to Alarm History.

| 🖾 Main - /Efficient_Industries_P                                                                                               | lant_1// (Display)                                                                                                    |   |  |  |
|--------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|---|--|--|
| S Main - /Ffficient_Industries_Plant_1// (Display)  Efficient Industries Plant 1 Energy Status  Boller House  Doller House     |                                                                                                                       |   |  |  |
| General Label Common<br>Appearance<br>Border style:<br>Raised<br>Back style:<br>Solid<br>Shape:<br>Rectangle                   | Pattern style:<br>None ▼ Horder uses back color<br>Pattern style:<br>None ▼ Pattern color<br>Highlight color<br>Blink | X |  |  |
| Display settings<br>Display:<br>Alarm History<br>Top position:<br>Touch margins<br>Horizontal margin:<br>0<br>Other<br>✓ Audio | Left position:<br>Vertical margin:                                                                                    |   |  |  |
| OK                                                                                                                             | Cancel Apply Help                                                                                                     |   |  |  |

4. Click the Label tab and type the text you want displayed on the button.

For this example, Alarm History is entered.

- 5. Click OK.
- 6. Save and test your application by creating a runtime application.



### **Create a Runtime Application File**

Before you can download your application to a PanelView Plus terminal, you must first create a runtime version of your FactoryTalk View application.

1. Choose Create Runtime Application from the Application menu.

| 😰 FactoryTalk View Studio - Machine Edition | [Demo Mode]                   |                  |
|---------------------------------------------|-------------------------------|------------------|
| File Edit View Objects Arrange Animation    | Application Tools Window Help |                  |
| ◙◼◓।▷▻▰◣=                                   | ☆ <u>T</u> est Application    | 티머리타우오ク수감물       |
| Explorer - doc_test                         | Create Runtime Application    | test// (Display) |
| doc_test<br>⊟-System                        | Application Properties        |                  |
| Project Settings                            |                               |                  |

2. Specify the target directory and file name for the runtime application.

You can accept the default application name.

- 3. In the Save as type box, select the terminal firmware version on which the .mer application will run.
- 4. Click Save and wait for the progress bar to complete.

|                                   |                                                                                                                    | ?      |
|-----------------------------------|--------------------------------------------------------------------------------------------------------------------|--------|
| Save in:                          | 🔁 Runtime 💌 🗧 🖆 🖽 🔻                                                                                                |        |
| My Recent<br>Documents<br>Desktop | 회Analog_faceplates Set2<br>회doc_test<br>회equip_faceplate<br>회GuardPLC Messaging<br>회Motion<br>회Translation_Test_SP |        |
| A3 setgsp[<br>erspsper '1         |                                                                                                                    |        |
|                                   | File name: PM1K_FP                                                                                                 | Save   |
| Mv Network                        | Save as type: Runtime 5.10 Application (*.mer)                                                                     | Cancel |
| [                                 | Conversion to development application                                                                              | Help   |
|                                   | Always allow conversion                                                                                            |        |
|                                   |                                                                                                                    |        |
|                                   | Never allow conversion     Conversion                                                                              |        |
|                                   | Never allow conversion     Conversion protected by password     Password:                                          |        |

**TIP** Older versions of Factory Talk View ME Station cannot run newer versions of ME runtime applications. Check the version of ME Station on your PanelView Plus by selecting System Information under Terminal Settings.

A Validation message appears when the runtime application has been created. Any errors or warnings are displayed.

| 🗊 doc_testValidationResults - Notepad                                                                                                               | _ 🗆 🗙              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|
| File Edit Format View Help                                                                                                                          |                    |
| *** Start RSLinx Enterprise Conversion Messages ***                                                                                                 | A                  |
| WARNING: Unconfigured shortcut detected. Shortcut name = "PM1K_172_44". Descript                                                                    | ion: The system ha |
| *** End RSLinx Enterprise Conversion Messages ***                                                                                                   |                    |
| Validation completed with warnings. The runtime application has been created.<br>CAUTION: Running this application might produce errors at runtime. |                    |

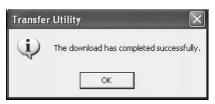
### **Transfer Runtime File to PanelView Plus Terminal**

Follows these steps to download the runtime file just created to the PanelView Plus terminal.

- 1. Choose Transfer Utility from the Tools Dence FactoryTalk View Studio - Machine Edition [Demo Mode] File Edit View Objects Arrange Animation Application Tools Window Help menu. Q Q 2 ⊈ 2 ⊑ ▶ ■ <u>D</u>iagnostics Setup... Diagnostics Viewer. Transfer <u>U</u>tility.. 🗄 🦺 doc\_test System Project Settings Tag Import and Export Wizard.. Application Manager. Runtime Security
   Diagnostics List Setup
   Global Connections
   W Startup Firmware Upgrade Wizard... Languages.. 🗄 🗐 HMI Tags Options ☐ ∰ Tags ⊡ ∰ Graphics Displays [ALARM] [ILAGNOSTICS] [INFORMATION] Main Displays 2. Click the Download \_ 🗆 × 🗐 Transfer Utility tab. Download Upload Compare Download Exit 3. Click the ... icon to Source file C:\Documents and Settings\All Users\Documents\RSView Enterprise\ME\Runtime\PM1K\_FP.met Help locate the source Download as runtime file. estination storage type WARNING: Internal Storage -⚠ 4. Choose Internal Run application at start-up Include a goto configure mode button in your application if you need to access the configuration mode screens. Storage box, from the Replace communica Include a shutdown button in your application if you want to be able to shut it down. Destination storage 🔲 Delete Log Files type list. Select destination terminal 5. Optionally, check RSLinx Enterprise, SIMPL3 Run application at 🗉 💷 1789-A17, Backplane 🗄 윪 EtherNet, Ethernet start-up to start the 🗄 🔳 192.168.1.77, PanelView Plus 1000, PanelView-Plus application when the
- 6. Browse through the RSlinx Enterprise communication tree to select the destination PanelView Plus terminal for the download.
- 7. Click Download.

download finishes.

- 8. Click OK when the download completes successfully.
- 9. Click Exit to close the File Transfer Utility.
- 10. Choose Exit from the File menu to close the FactoryTalk View Studio software.



# **Run Application on PanelView Plus Terminal**

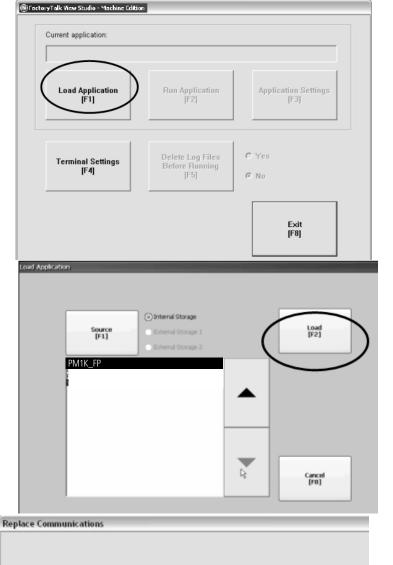
The (.mer) runtime file is now stored in the PanelView Plus terminal so you are ready to run the application on the terminal.

1. Apply power to the PanelView Plus terminal.

The FactoryTalk View ME Station window opens.

2. Press F1, Load Application.

You can skip this step if you checked Run application at start-up when creating the runtime application.

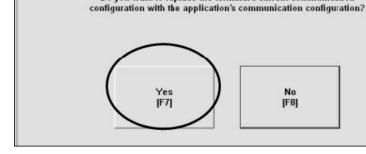


The Load Application window opens.

- 3. Press the up and down arrows to scroll through the list and select the application you want to load and run.
- 4. Press Load [F2] to load the application.

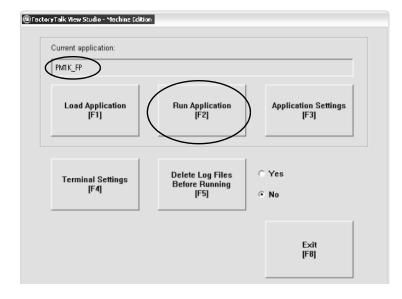
5. Press Yes [F7].

If you press No, the communication settings from the previously run project will be used.



Do you want to replace the terminal's current communication

- 6. Wait for the application to load and verify the application name appears under Current application.
- 7. Press Run [F2] to run the application.
- 8. Verify the functionality of the application.



# **Demand Control**

# Introduction

ControlLogix and CompactLogix controllers, with preconfigured demand logic, can be used as demand controllers to control a maximum of 16 loads, with the objective of maintaining total plant electrical real power demand below a threshold, defined by the user, during peak demand periods. The power monitor calculates the predicted end-of-interval demand according to its demand configuration. It also provides real time clock, end of demand interval, and demand period time remaining data to the controller. The controller converts predicted demand in excess of the setpoint into kWh to shed based on the time remaining in the demand interval, and then sheds loads based on their priority and availability until the predicted demand is under the setpoint. Loads are restored when the predicted demand is less than the demand setpoint by a hysteresis value.

Alarms are raised if the total sheddable kWh is less than the kWh to shed to satisfy the setpoint, when there is only one sheddable load remaining, or when a shed command fails to shed the load based on its status input. Alarms are also used to prompt an operator to remove load override status.

# **Before You Begin**

- Complete an energy assessment and review monitoring methods in <u>Chapter 1</u>.
- Complete other Energy Monitoring and Analysis chapters as applicable, Chapter 2 through 9.

### What You Need

- Energy Management Accelerator Toolkit, publication IASIMP-SP014 or visit the Integrated Architecture Tools and Resources website at <a href="http://www.ab.com/go/iatools">http://www.ab.com/go/iatools</a>
- RSLogix 5000 software, version 18.0 or later or Studio 5000 Logix Designer application, version 21.00 or later
- FactoryTalk View Machine Edition Software, version 5.1 or later
- Logix controller and supporting hardware
- PowerMonitor 1000 or 5000 unit

# **Follow These Steps**

The following steps are based on a CompactLogix 1769-L23E-QBFC1 packaged controller, but the general steps may be applied to other Logix controller configurations and are similar. Follow these steps to implement your Demand Control application.

- Control Hardware Selection and Wiring
- Logic Integration
- HMI Integration
- System Commissioning

### **Control Hardware Selection and Wiring**

Follow these steps to determine the hardware required for your application.

### **List Load Outputs and Inputs**

- 1. Determine which loads in your application will be controlled by the Demand controller (maximum of 16 loads).
- 2. Number each load from 1...16.
- 3. List the outputs and inputs associated with each load.

As a minimum each load must accept a command to stop from the Demand Controller. The Demand Controller also accepts a load status input that is used for indication and alarming, however this is not required.

In the Efficient Industries Plant 1 example, the monitoring and analysis revealed some significant energy savings if Demand control was used to control the loads identified below.

| Load | Description         | Output I/O Location | Input I/O Location |
|------|---------------------|---------------------|--------------------|
| 1    | Air Compressor 1    | Local:2:0.Data.0    | Local:1:I.Data.0   |
| 2    | Air Compressor 2    | Local:2:0.Data.1    | Local:1:I.Data.1   |
| 3    | AHU 1 Production    | Local:2:0.Data.2    | Local:1:I.Data.2   |
| 4    | AHU 2 Production    | Local:2:0.Data.3    | Local:1:I.Data.3   |
| 5    | AHU 3 Shipping      | Local:2:0.Data.4    | Local:1:I.Data.4   |
| 6    | AHU 4 Office        | Local:2:0.Data.5    | Local:1:I.Data.5   |
| 7    | Exhaust Fan 1       | Local:2:0.Data.6    | N/A                |
| 8    | Exhaust Fan 2       | Local:2:0.Data.7    | N/A                |
| 9    | Exhaust Fan 3       | Local:2:0.Data.8    | N/A                |
| 10   | Exhaust Fan 4       | Local:2:0.Data.9    | N/A                |
| 11   | Lighting Production | Local:2:0.Data.10   | Local:1:I.Data.6   |
| 12   | Lighting Production | Local:2:0.Data.11   | Local:1:I.Data.7   |
| 13   | Lighting Shipping   | Local:2:0.Data.12   | Local:1:1.Data.8   |
| 14   | Lighting Office     | Local:2:0.Data.13   | Local:1:1.Data.9   |

# **Create Control Panel Layout and Wiring**

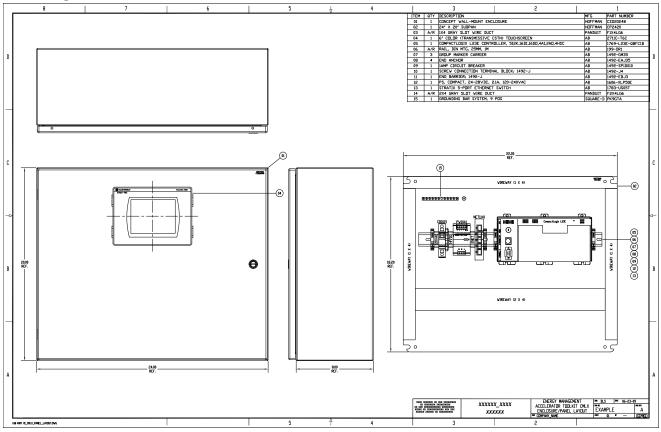
The toolkit provides panel layout and wiring drawings in DWG, DXF, and PDF file formats to help you plan the layout of your system. If you do not have CAD software, use the pdf files to build your system drawings.

### Use CAD Drawings from Toolkit

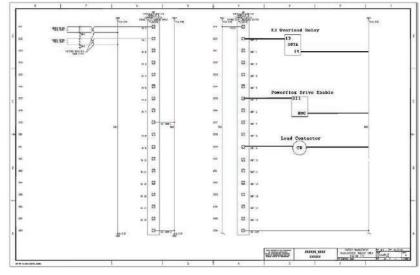
- 1. Browse to the System Layout and Wiring folder on the Energy Management Accelerator Toolkit CD image.
- 2. Double Click the CompactLogix folder.
- 3. Navigate to the desired files based on your file format (DXF, DWG, or PDF).
- 4. Add the required files to your project or copy them to your project folder.

#### Panel Layout Drawings

The AutoCAD Electrical project includes a panel-layout drawing for the CompactLogix controller, shown below. Add or remove components as needed.



#### Power and Control Wiring Drawings



The AutoCAD electrical project also includes power and control wiring drawings for the CompactLogix L23E controller. Several digital output examples are shown below.

#### Access Other RA CAD Drawings

Follow these steps to download other Allen-Bradley product CAD drawings.

- 1. Open your browser and go to <u>http://www.rockwellautomation.com/en/e-tools/.</u>
- 2. The Configuration and Selection Tools webpage opens.
- 3. If you don't know the complete catalog number, click product directory to browse the configured Rockwell Automation products.
- 4. Click Rockwell Automation and follow the prompts.

# **Logic Integration**

You will need to configure the controller, import the Demand program, configure the load inputs and outputs, and configure messages.

## Configure Controller, Network, and I/O

These next sections will show you how to configure the controller, network, and I/O.

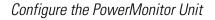
#### Create or Open a Project in RSLogix 5000 Software

Follow these steps to create or open a project in RSLogix 5000 software.

1. Open RSLogix 5000 software by clicking Start> Programs> Rockwell Software> RSLogix 5000 Enterprise Series> RSLogix 5000.

The Quick Start window displays in the RSLogix workspace.

- 2. Click Open Project to open an existing project, or click New Project.
- 3. If you are creating a new project, configure the controller.
  - a. Choose your controller and revision number.
  - b. Enter a unique controller name.
  - c. Click OK.



Follow these steps to configure a PowerMonitor unit.

- 1. Right-click the Ethernet Port and choose New Module.
- **2.** Select ETHERNET-MODULE (Generic Ethernet Module) as the module type and click OK.
- **3.** Configure the PowerMonitor's IP address and Connection Parameters and then click OK.

#### **PowerMonitor 1000/3000 Connection Parameters**

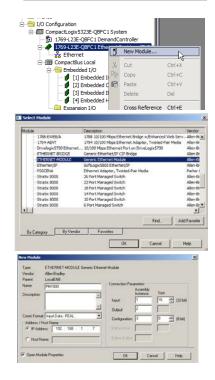
|               | Assembly Instance | Size |
|---------------|-------------------|------|
| Input         | 1                 | 16   |
| Output        | 2                 |      |
| Configuration | 3                 | 0    |

#### **PowerMonitor 5000 Connection Parameters**

|               | Assembly Instance | Size |
|---------------|-------------------|------|
| Input         | 100               | 60   |
| Output        | 101               | 1    |
| Configuration | 102               | 160  |



| per.      | 1769L23E-QBFC1 CompactLogis5323E-QBFC1 Controller + | OK     |
|-----------|-----------------------------------------------------|--------|
|           |                                                     |        |
| vision:   | 10 -                                                | Cancel |
|           | F Redundancy Englished                              | Help   |
| ne:       | DemandController                                    |        |
| scription | 1                                                   |        |
|           | 1                                                   |        |
|           | (zone) v                                            |        |
|           | 5 Salary Factore Sid. second                        |        |
| nate In:  | C-VHSLogx 5000/Projects                             | Based  |



#### Configure the I/O

Configure the I/O specific to your application, as identified in the control Hardware Selection and Wiring section above.

The 1769-L23E packaged controller included embedded I/O for 16 DC inputs, 16 DC outputs, 4 differential or single-ended analog inputs, 2 single-ended analog outputs, 6 HSC inputs, and 4 HSC outputs.

1. To configure the properties for any of the embedded I/O modules, right-click on the module and select Properties.

If required, up to two 1769 CompactLogix modules may be added to the 1769-L23E-QBFC1B packaged controller.

**2.** To add an expansion module to the I/O configuration tree, right-click the Expansion I/O folder and select New Module.

For detailed information about configuring your embedded I/O, see Chapter 3 of the 1769 CompactLogix Packaged Controllers Quick Start and User Manual, publication <u>IASIMP-QS010</u>, Embedded I/O (page 191).

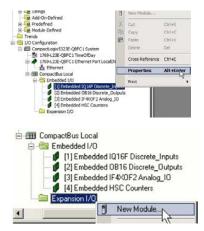
#### Save the Project File

Click to save your RSLogix 5000 application file.

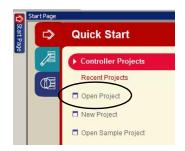
## Import and Configure Demand Control Program

Follow these steps to import and configure your Demand Control program.

1. If not already opened, open your RSLogix 5000 software project.







Controller Tags Controller Fault Handler er-Up Handle

Copy

R Ethernet

New Program.

New Equipment Ph Import Program.. Import Equipment Ph

Cross Reference Print Properties

Ctrl+C

Ctrl+V Del Ctrl+E

Alt+Enter

- 2. Expand the Tasks folder in your Controller Organizer, right click the Main Task folder, and select Import Program.
- 3. Browse to and open the Demand Control Logic folder on the Energy Management Accelerator Toolkit CD image.

C:\Program Files\RA\_Simplification\EMAT\File\Demand Control Logic.

4. Select the DemandControl.L5x file and click Import.

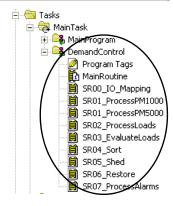
The Import Configuration dialog will appear.

5. Leave the program properties at the default; click OK to create the Demand Control program.

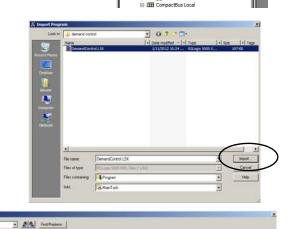
6. The new DemandControl program should appear in the Controller Organizer within the Main Task folder.

I I Find





OK Cancel Help



-Properties

## **Configure Load Inputs and Outputs**

Follow these steps to load inputs and outputs.

- 1. Expand the DemandControl program and double-click the SR00\_IO\_Mapping Routine.
- 2. Rungs 1 through 32 have been configured for I/O mapping.

The I/O mapping routine will not be executed unless the Enable\_IO bit is set. Refer to page 379, step 10.

|   | Map discrete inputs to each load's i<br>Map each load's output command (Load[ind |                                                 |
|---|----------------------------------------------------------------------------------|-------------------------------------------------|
| 0 |                                                                                  | [NOP]                                           |
|   | 1=Shed Load<br>Load[1].Out_Shed                                                  |                                                 |
|   |                                                                                  | [NOP]                                           |
|   |                                                                                  | Status of load from<br>discrete input<br>0=Off  |
|   | 1=Shed Load                                                                      | 1=On                                            |
|   | Load[1].Out_Shed                                                                 | Load[1].Inp_Status                              |
|   | 3/E                                                                              | 0                                               |
|   | 1=Shed Load                                                                      |                                                 |
|   | Load[2].Out_Shed                                                                 |                                                 |
|   |                                                                                  | [NOP]                                           |
|   |                                                                                  | Status of load from<br>discrete input<br>0=0 ff |
|   | 1=Shed Load                                                                      | 1=On                                            |
|   | Load[2].Out_Shed                                                                 | Load[2].Inp_Status                              |
|   | 3/E                                                                              | ()()()()()()                                    |
|   | 1=Shed Load                                                                      |                                                 |
|   | Load[3].Out_Shed                                                                 |                                                 |
|   | 7/5                                                                              | EvonT                                           |

For each load, there are two rungs to configure. The first is for mapping the command output.

3. Double-click the NOP instruction on rung 1 and type OTE.



- 4. Click Enter.
- 5. Double click on the question mark above the OTE and type the name of the tag that should be mapped to the output command for Load Number 1.

Use an XIC/XIO or an OTE/OTU instruction as required to fit your application.

In the Efficient Industries example, the output for Load 1 is hard-wired to Local:2:O.Data.0.

| 1=Shed Load      |                  |
|------------------|------------------|
| Load[1].Out_Shed | Local:2:0.Data.0 |
|                  |                  |

6. Click Enter.

In rung 2, the input status has been configured to follow the commanded state. If the input status is not available for the load, this rung can be left alone. In the Efficient Industries example, the input status for Load number 1 is available and is hard-wired to Local:1:I.Data.0.

7. Double click the tag above the XIC instruction and enter the tag for the input status.

Use an XIO or an XIC instruction as required to fit your application.

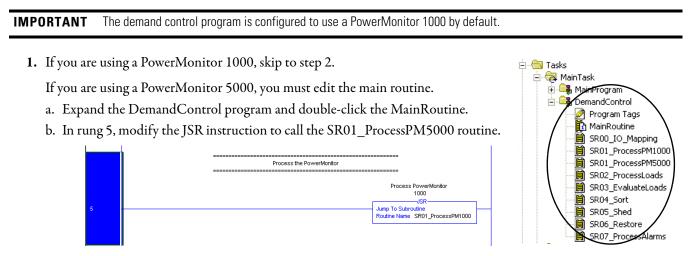
|                    | Status of load from |
|--------------------|---------------------|
|                    | discrete input      |
|                    | 0=Off               |
|                    | 1=On                |
| Local:1:I.Data.0 💌 | Load[1].lnp_Status  |
|                    | ()                  |

- 8. Click Enter.
- 9. Use the same procedure to configure the I/O mapping for the remaining loads in rungs 3...32.

If you are not utilizing all 16 loads in your application, you can delete the unused I/O mapping rungs, or leave them as is.

### **Configure PowerMonitor Messages**

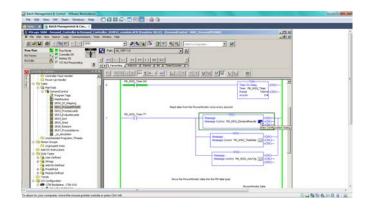
Follow these steps to configure PowerMonitor unit messages.



2. Expand the DemandControl program and double-click the SR01\_ProcessPM1000 or SR01\_ProcessPM5000 routine as required per your application.

Rung 1 includes several message instructions.

3. For each message, click the View Configuration Dialog button to launch the configuration window.



**4.** Select the Communication tab and set the path to your PowerMonitor unit.

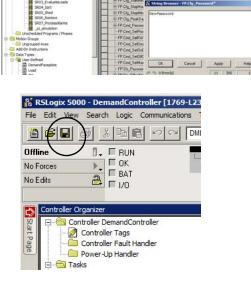
| • Path: PM1000          |                 |                    | Browse        |
|-------------------------|-----------------|--------------------|---------------|
| PM1000                  |                 |                    |               |
| C Broadcast             | <b>*</b>        |                    |               |
| Communication Metho     |                 |                    |               |
| CIP C DH+               | Channel: A'     | Destination Link:  | 0 🚎           |
| C CIP With<br>Source ID | Source Link: 0  | 🔆 Destination Node | e: 0 📻 (Oct   |
| Connected               | 🔽 Cache         | e Connections 🛛 🔶  |               |
| Enable O Enable         |                 |                    |               |
|                         | Waiting O Start | O Done Do          | one Length: 9 |

# **Configure Password**

A password is required for configuring the demand control from the faceplate. To set the password, locate the controller tag, FP.Cfg\_Password in the controller. Configure the string value to your desired password.

# **Save the Project File**

Click save to save your RSLogix 5000 application file.



# **HMI Integration**

These next sections show you how to integrate the HMI into your system.

# Add Demand Faceplate to FactoryTalk View ME Application

- 1. Launch FactoryTalk View Studio for Machine Edition.
- 2. Create a new or open an existing application to which you want to add the Demand Control faceplate.
- **3.** Expand the graphics folder in the explorer window, right-click on the displays folder and choose Add Component into Application.
- 4. Browse to and open the ME Demand Control Faceplate Files folder on the Energy Management Accelerator Toolkit CD image.

 $C:\Program Files\RA\_Simplification\EMAT\Files\Faceplate Files\ME Demand Control Faceplate Files$ 

5. Choose the ME\_Demand\_Faceplate.gfx file and click Open.





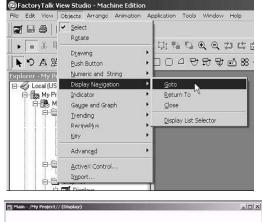
# **Create a Display Navigation Button**

Follow these steps to create a Goto Display navigation button to launch the faceplate display.

1. Create a new or open an existing display from which you want to launch the Demand Control faceplate.

If you do not have any additional displays in your application, use the default MAIN display.

- 2. Choose Goto from the Objects > Display Navigation menu.
- 3. Draw the Goto Display push button on the display.
- **4.** Double-click the Goto Display push button to configure its properties.





- 5. Click the ellipse icon next to Display:, select the ME\_Demand\_Faceplate, and then click OK.
- 6. Click on the Label tab and enter a caption, such as 'Demand Controller'.
- 7. Click OK to close the Goto Display push button Properties dialog box.

If you do not already have a Shutdown or Goto Configure Mode button configured in your application, you should add one to the main page as well.

This will provide a means of shutting down your application.

- From the Objects > Advanced menu select Goto Configure Mode or Shutdown.
- 9. Draw the button on your display and configure its properties.
- **10.** Save your display.

## **Configure Alarms**

- 1. Expand the Alarms folder in the system tree.
- 2. Right-click Alarm Setup and choose Import and Export.
- 3. Select Import alarm configuration into application.
- 4. Click Next.

| Appearance       |                                       |
|------------------|---------------------------------------|
| Border style:    | Border width:                         |
| Inset 💌          | 4 Sorder uses back color              |
| Back style:      | Pattern style: Border color           |
| Solid 💌          |                                       |
| Shape            | Highlight color                       |
| Rectangle +      |                                       |
|                  | 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 |
| C Parameter list | Top position 0 Let position 0         |
| Display position | Top position                          |
| 1                | Top position 0 Let position 0         |
| Display position | Vertical margin                       |

| Corocal Ubjects      Corocal Ubjects      Corocal Ubjects      Corocal Messages      Cocal Messages      Cocal Messages                                                                                                                         |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alam Setup<br>Alam Setup<br>Information<br>Information<br>Information Messages<br>Control<br>Information Messages                                                                                                                               |
| Alarm Import Export Wizard - Select Operation         Image: Comparison of the select the operation to perform.           C         Export alarm configuration from application           C         Import alarm configuration into application |
| cock Next > Concel Help                                                                                                                                                                                                                         |

- 5. Choose Yes or No when prompted to backup your existing alarm configuration, and then click Next.
- **IMPORTANT** When importing the alarm configuration, the existing alarm configuration is lost. When prompted to backup the existing alarm configuration, you can choose to save it as an XML file.
  - 6. Browse to and open the ME Demand Control Faceplate Files folder on the Energy Management Accelerator Toolkit CD image to import the Alarms.xml file to your project.

Do you want to backup your existing alarm configuration?

| C No |  |  |  |
|------|--|--|--|
|      |  |  |  |
|      |  |  |  |
|      |  |  |  |
|      |  |  |  |
|      |  |  |  |
|      |  |  |  |
|      |  |  |  |
|      |  |  |  |

C:\Program Files\RA\_Simplification\EMAT\Files\Faceplate Files\ME Demand Control Faceplate Files

7. Click Open.

8. Click Finish.

| choose alam  | Configuration     | me to import                                         |                    |                                   |                |
|--------------|-------------------|------------------------------------------------------|--------------------|-----------------------------------|----------------|
| Look in:     | ME Deman          | d Control Faceplate Files                            | - 🗢 🔁              |                                   |                |
| <b>(</b>     | Name Alarms.xml   |                                                      | <b>•</b>           | Date modified<br>5/3/2011 1:26 PM | Type     XML E |
| ecent Places | Alarms.xml        |                                                      |                    | 5/3/2011 1:26 PM                  | XML L          |
|              |                   |                                                      |                    |                                   |                |
| Desktop      |                   |                                                      |                    |                                   |                |
|              |                   |                                                      |                    |                                   |                |
| labuser      |                   |                                                      |                    |                                   |                |
| . 🔍          |                   |                                                      |                    |                                   |                |
| Computer     |                   |                                                      |                    |                                   |                |
| Network      |                   |                                                      |                    |                                   |                |
| Network      | •                 |                                                      |                    |                                   | •              |
|              | File name:        | Alarms xml                                           |                    | •                                 | pen )          |
|              | Files of type:    | Alarm Files (* xml)                                  |                    | -                                 | Incel          |
|              |                   |                                                      |                    |                                   |                |
| Alarm Imp    | ort Export Wiz    | ard - Select File                                    |                    | ×                                 | 1              |
|              |                   |                                                      |                    |                                   |                |
| Select the   | alarm configurat  | ion file to import.                                  |                    |                                   |                |
| C:\Users     | Vabuser\Desktop   | )<br>Energy System Project File<br>Piles (Alarms xml | s\Faceplate Files\ | ME                                |                |
| Demand       | Control Faceplate | Files valams xmi                                     |                    |                                   |                |
|              |                   |                                                      |                    |                                   |                |
|              |                   |                                                      |                    |                                   |                |
|              |                   |                                                      |                    |                                   |                |
|              |                   |                                                      |                    |                                   |                |
|              |                   |                                                      |                    |                                   |                |
|              |                   |                                                      |                    |                                   |                |
|              |                   |                                                      |                    |                                   |                |
|              |                   |                                                      |                    |                                   |                |
|              |                   | < Back Finish                                        | Cancel             | Help                              |                |
|              |                   |                                                      |                    |                                   |                |

# **Configure Communication**

Follow these steps to configure communication.

1. Double-click Communication Setup under RSLinx Enterprise in the Explorer window.

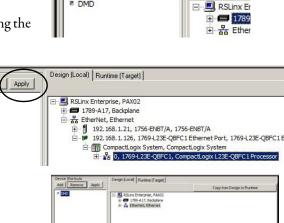
You will see this dialog box if a communication setup does not exist.

2. Select Create a new configuration and click Finish.



| guration file contains information about devices, drivers, and<br>s. Select the source for this offline configuration file: |
|-----------------------------------------------------------------------------------------------------------------------------|
| Create a new configuration.                                                                                                 |
| <ul> <li>Copy an existing configuration from a<br/>previously created project.</li> </ul>                                   |
| C Copy the configuration that is currently<br>running on this workstation.                                                  |
|                                                                                                                             |
| < Back Finish Can                                                                                                           |

- 3. Click Add under Device Shortcuts to create a new shortcut, then rename the shortcut DMD.
- 4. Click the Design Local tab.
- 5. Expand the Ethernet network and select the controller containing the DMD program.
- 6. Verify that the shortcut name is highlighted, then click Apply.
- 7. Click Yes to apply the changes when prompted.
- **8.** Click Copy from Design to Runtime to copy changes to the runtime communication setup.
- 9. Click Yes when prompted to continue with the copy operation.



OK Cancel Venity He

Ø DMD

Device Shortcut

Add Remo

DMD

**10.** Click OK at the bottom of the RSLinx Enterprise dialog box to save the communication setup changes.

# Image: Scale Particle [Engli] Cogy has Design to Running Image: Scale Extra Strangene, FAX2; Cogy has Design to Running Image: Scale Image: Scale Cogy has Design to Running Image: Scale Image: Scale Cogy has Design to Running Image: Scale Image: Scale Cogy has Design to Running Image: Scale /t

# System Commissioning

To commission the system, you need to install the system hardware and download the projects.

# **Install System Hardware**

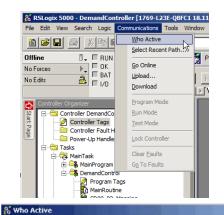
Refer to the documentation listed below for information on installing the CompactLogix and PanelView Plus Hardware.

| Document Name                                                 | Publication Number | Document Contents                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------------------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CompactLogix Packaged Controller Installation<br>Instructions | <u>1769-IN082</u>  | <ul> <li>Installation Checklist</li> <li>Controller Dimensions</li> <li>How to Install the Battery</li> <li>How to Connect Expansion Modules</li> <li>Minimum Spacing Requirements</li> <li>How to Panel Mount</li> <li>How to DIN Rail Mount</li> <li>Grounding Considerations</li> <li>Wiring Power to the System</li> <li>Wire the I/O Removable Terminal Blocks</li> <li>Expansion Module Wiring</li> <li>Selecting Operating Mode</li> <li>Status Indicators</li> </ul> |
| PanelView Plus Installation Manual                            | 2711P-IN002        | <ul> <li>Environmental Information</li> <li>Mounting Clearances</li> <li>Cutout Dimensions</li> <li>Panel Mounting Instructions</li> <li>Product Dimensions</li> <li>Removing and Installing the Power Terminal<br/>Block</li> <li>DC Power Connections</li> <li>AC Power Connections</li> <li>Troubleshooting</li> <li>Battery Removal</li> <li>System Specifications</li> <li>Certifications</li> </ul>                                                                    |

# **Download RSLogix5000 Project**

Follow these steps to download your RSLogix 5000 project file to the Logix controller.

- 1. Open your RSLogix 5000 project file.
- 2. From the Communications menu, choose Who Active. The Who Active dialog box opens.



- 3. Browse to and select your Logix controller.
- 4. Verify the key switch on your controller module is in the REM (remote) position.



- 0 ×

- 0 ×

Go Online

Upload.

Download

Close

Help

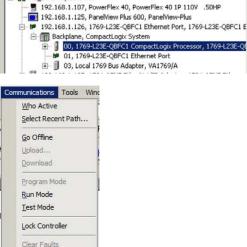
Update Firmware

r, 1769-L23E-Q

5. Click Download.

The Download dialog box opens. Click Download.

6. From the Communications menu, choose Run mode to switch the controller to Run mode.



**Who Active** 

Autobrowse

Workstation, USMAYPTGRIESM09

윪 Linx Gateways, Ethernet

AB\_DF1-1, DF1

# **Configure and Download FactoryTalk Project to PanelView Plus Terminal**

Before you can download your application to a PanelView Plus terminal, you must first create a runtime version of your FactoryTalk View application.

- 1. Start FactoryTalk View Studio for Machine Edition and open your application which contains the Demand Control faceplate.
- 2. Choose Create Runtime Application from the Application menu.
- **3.** Specify the target directory and the file name for the runtime application.
- **4.** In the Save as type box, select the terminal firmware version on which the .mer application will run.

5. Click Save and wait for the progress bar to complete.



Tag Import and Export Wzard...

Application Manager...

Languages...

Options..

Firmware Upgrade Wizard...

Application Tools

-

Efficient Industries

Efficient Indu

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5

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A Test Application

Create Runtime

**Application Properties** 

Window

Help

Download the PanelView Plus terminal Runtime File

Follow these steps to download the runtime file just created to the PanelView Plus terminal.

- 1. Choose Transfer Utility from the Tools menu.
- 2. Click the Download tab.
- 3. Click the ... icon to locate the source runtime file.
- 4. Choose Internal Storage box, from the Destination storage type list.

Optionally, check Run application at start-up to start the application when the download finishes.

5. Browse through the RSlinx Enterprise communication tree to select the destination PanelView Plus terminal for the download.

- 6. Click Download.
- 7. Click OK when the download completes successfully.
- 8. Click Exit to close the File Transfer Utility.

#### Run Application on PanelView Plus Terminal

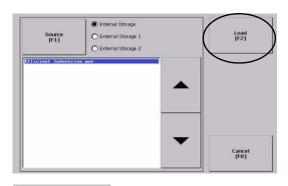
The (.mer) runtime file is now stored in the PanelView Plus terminal so you are ready to run the application on the terminal.

1. Press F1, Load Application.

You can skip this step if you checked Run application at start-up when creating the runtime application.

The Load Application window opens.

- 2. Press the up and down arrows to scroll through the list and select the application you want to load and run.
- 3. Press Load [F2] to load the application.



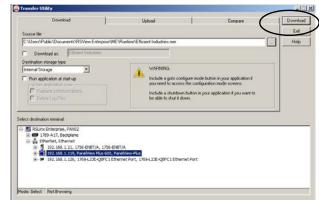
4. Press Yes [F7].

If you press No, the communication settings from the previously run project will be used.

**5.** After the application loads, press Run [F2] to run the application.



Load Application [F1]



# **Demand Control Configuration**

| Load | Description         | Rated KW | Priority | On Delay (s) | Off Delay (s) | Max Off Time (s) |
|------|---------------------|----------|----------|--------------|---------------|------------------|
| 1    | Air Compressor 1    | 21       | 1        | 60           | 60            | 900              |
| 2    | Air Compressor 2    | 21       | 1        | 60           | 60            | 900              |
| 3    | AHU 1 Production    | 15       | 4        | 120          | 120           | 1800             |
| 4    | AHU 2 Production    | 15       | 4        | 120          | 120           | 1800             |
| 5    | AHU 3 Shipping      | 12       | 5        | 120          | 120           | 1800             |
| 6    | AHU 4 Office        | 10       | 7        | 120          | 120           | 1800             |
| 7    | Exhaust Fan 1       | 2        | 2        | 30           | 30            | 2700             |
| 8    | Exhaust Fan 2       | 2        | 2        | 30           | 30            | 2700             |
| 9    | Exhaust Fan 3       | 2        | 10       | 30           | 30            | 2700             |
| 10   | Exhaust Fan 4       | 2        | 10       | 30           | 30            | 2700             |
| 11   | Lighting Production | 6        | 3        | 15           | 15            | 1200             |
| 12   | Lighting Production | 6        | 6        | 15           | 15            | 1200             |
| 13   | Lighting Shipping   | 6        | 8        | 15           | 15            | 3600             |
| 14   | Lighting Office     | 6        | 9        | 15           | 15            | 3600             |

Prior to configuring the loads in the controller, you must assign priority levels and interlock times to the loads in your application. The configuration for the Efficient Industries Plant 1 Example is shown below:

#### Priority Levels

- There are up to 16 priority levels available.
- Loads with the largest priority number are shed first (priority level 1 is shed last).
- More than one load may be assigned to a given priority level. If loads share the same priority level, they will be shed based on the time since the load was last shed. (In other words, when a shed is required, the running load with the largest priority level number and the longest minutes since shed will be the next load to shed.)

#### Interlocks

- On Delay interlock is the minimum time the load must be off, in seconds, before it can be restarted.
- Off Delay interlock is the minimum time the load must be on, in seconds, before it can be shed.
- Max Off Time interlock is the maximum amount of time, in seconds, that the load is allowed to be shed per hour.

Configure the individual loads and the demand control schedule.

1. Click the configuration button on the toolbar.

|        | R   | mand        | Contr        | ol Status X       |
|--------|-----|-------------|--------------|-------------------|
| Ŕ      | Æ   | Load<br>1-8 | Load<br>9-16 | 0                 |
| Load S | nte | Load        | State        | Predicted Demand  |
| 1      |     | 9           |              | KW Demand Control |
| 2      |     | 10          |              | 200 OFF           |
| 3      |     | 11          |              | Present Billing   |
| 4      |     | 12          |              | KW Demand         |
| 5      |     | 13          |              | 0                 |
| 6      |     | 14          |              | Demand            |
| 7      |     | 15          |              | KW Setpoint       |
| 8      |     | 16          |              | 250 1/11/2012     |

2. Enter your configured password.

**3.** Configure the demand control schedule, kW setpoint, and billing end date.

For the Efficient Industries example, the demand control is on from 8:00 to 18:00, Monday through Friday.

**4.** Click on the load config button to configure the individual loads.

For the efficient industries example, loads are configured as follows:

| PA                                                                                                                                                                                                                                                                                                                                                             | SSW | ORD |   |       |   |    |    |     |     |    |    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----|---|-------|---|----|----|-----|-----|----|----|
| 1                                                                                                                                                                                                                                                                                                                                                              | 2   | 3   | 4 | 5     | 6 | 7  | 8  | 9   | 0   | -  | =  |
| q                                                                                                                                                                                                                                                                                                                                                              | w   | е   | r | t     | у | u  | i. | o   | р   | ſ  | 1  |
| а                                                                                                                                                                                                                                                                                                                                                              | s   | d   | f | g     | h | j  | k  | Т   | ;   | •  | •  |
| z                                                                                                                                                                                                                                                                                                                                                              | ×   | с   | v | b     | n | m  |    | ÷   | 1   | ١. | 41 |
| SHF                                                                                                                                                                                                                                                                                                                                                            | CAP | INS |   | SPACE |   | ** | >> | ESC | CLR | +  |    |
| StartTime     StopTime       8     0       18     9-16       Control     Predicted       Bund     StopTime       StartTime     StopTime       StopTime     Present Billing       COFF     OH       OH     OFF       ZOO     10 |     |     |   |       |   |    |    |     |     |    |    |
| 233     1/11/2012       Image: Control     Image: Control       StarTime     StopTime       8     0       18     0       Predicted     Billing       KW Demand     End Date       200     10       Sun     Non       OFF     OH       OH     OFF       OH     OFF       Ub     OFF       17:30:56       250     11/12012                                       |     |     |   |       |   |    |    |     |     |    |    |

| Load | Description         | Priority | Rated KW | On Delay SEC | Off Delay SEC | Max Off Time<br>SEC |
|------|---------------------|----------|----------|--------------|---------------|---------------------|
| 1    | Air Compressor 1    | 1        | 21       | 60           | 60            | 900                 |
| 2    | Air Compressor 2    | 1        | 21       | 60           | 60            | 900                 |
| 3    | AHU 1 Production    | 4        | 15       | 120          | 120           | 1800                |
| 4    | AHU 2 Production    | 4        | 15       | 120          | 120           | 1800                |
| 5    | AHU 3 Shipping      | 5        | 12       | 120          | 120           | 1800                |
| 6    | AHU 4 Office        | 7        | 10       | 120          | 120           | 1800                |
| 7    | Exhaust Fan 1       | 2        | 2        | 30           | 30            | 2700                |
| 8    | Exhaust Fan 2       | 2        | 2        | 30           | 30            | 2700                |
| 9    | Exhaust Fan 3       | 10       | 2        | 30           | 30            | 2700                |
| 10   | Exhaust Fan 4       | 10       | 2        | 30           | 30            | 2700                |
| 11   | Lighting Production | 3        | 6        | 15           | 15            | 1200                |
| 12   | Lighting Production | 6        | 6        | 15           | 15            | 1200                |
| 13   | Lighting Shipping   | 8        | 6        | 15           | 15            | 3600                |
| 14   | Lighting Office     | 9        | 6        | 15           | 15            | 3600                |

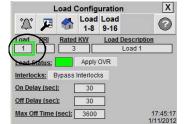
5. Click on the load number to launch the numeric keypad.

- **6.** Enter the load number you wish to configure, and then click Return.
- 7. Configure the load priority, rated kW, description, on delay, off delay, and max off times for the load.

Place the load in Normal Demand Control mode (Remove OVR if OVR is applied).

- 8. To change the mode, click on the mode indicator to toggle between modes.
- 9. Repeat the above step for each load in your application.
- **10.** Once the demand controller has been configured, enable the IO mapping routine.

Go online with your RSLogix project and monitor the Enable\_IO tag. Set the tag value to '1' if it is not already set.





| Load                | Config      | uration      |            | X                  |
|---------------------|-------------|--------------|------------|--------------------|
| 🏠 🔁 🐔               | Load        | Load<br>9-16 |            | 0                  |
| Load PRI Rate       | ed KW       | Load D       | escription |                    |
| 1 1                 | 7           | Air Co       | mpressor   | 1                  |
| Load Status:        | Apply       | OVR          |            |                    |
| Interlocks: Bypas   | s Interloci | s            |            |                    |
| On Delay (sec):     | 60          |              |            |                    |
| Off Delay (sec):    | 60          |              |            |                    |
| Max Off Time (sec): | 900         |              |            | 7:54:28<br>11/2012 |

 Scope:
 Bow All Tags

 Name
 Image: Scope:

 Alm\_InsufficientLoad
 1

 Alm\_OneLoadVail
 0

 CalcPresentBillingDemand
 1

 Demand\_Hysteres:
 Fct

 Scope:
 Scope:

 Enable\_IO
 1

 H: E0I\_Delay\_Imer
 {...}

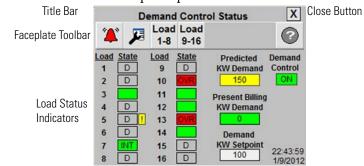
 I: EVUID to Scope
 1

# **System Application Guide**

This section guides you through the pre-configured FactoryTalk View Machine Edition faceplate providing you with an understanding of the status, control, and diagnostic operation of the faceplate display.

# **Faceplate Operation Overview**

The Demand Control Faceplate opens with the Demand Control Status displayed.

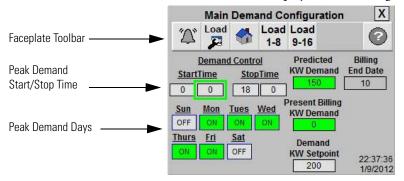


| Button                 | lcons                  | Description                                                                                                                                                                                                                                                                                                                                                       |
|------------------------|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alarm                  | j<br>L'                | The alarm button indicates an alarm condition and activates alarm diagnostic views. A grey bell indicates normal status, with no alarms. A red flashing bell indicates an alarm condition.                                                                                                                                                                        |
| Configuration          | ¥                      | The Configuration button displays the main demand control configuration screen (upon entering the correct password).                                                                                                                                                                                                                                              |
| Load 18                | Load<br>1-8            | The Load 1-8 button lets you view the load status and descriptive name for loads 18                                                                                                                                                                                                                                                                               |
| Load 916               | Load<br>9-16           | The Load 9-16 button lets you view the load status and descriptive name for loads 916                                                                                                                                                                                                                                                                             |
| Help                   | 0                      | The Help button provides information for the existing view.                                                                                                                                                                                                                                                                                                       |
| Close                  | X                      | Click the Close button to close the faceplate.                                                                                                                                                                                                                                                                                                                    |
| Status Indicators      |                        | Grey = Off/Normal Control<br>Green = On/Normal Control<br>D-Grey = Off/Demand Control<br>OVR-Grey = Off/Override Set<br>OVR-Green = On/Override Set<br>OVR-Red = On/Override Set/Operator Action Required<br>Red Flashing = Load is not in OVR, controller telling to turn off, but load is still on.<br>INT-Green = Interlocked On<br>INT-Grey = Interlocked Off |
| Interlocks Bypassed    | !                      | Indicates that the interlocks have been bypassed for the load.                                                                                                                                                                                                                                                                                                    |
| Predicted KW<br>Demand | Predicted<br>KW Demand | <ul> <li>The predicted KW demand is read from the PowerMonitor with the following color code</li> <li>Red = Operator Action Required to stay within Demand kW Setpoint</li> <li>Yellow = Shedding Loads to stay within Demand kW Setpoint</li> <li>Green = Predicted Demand within Demand kW Setpoint - Shedding not required</li> </ul>                          |

| Button                       | lcons                        | Description                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Present billing KW<br>Demand | Present Billing<br>KW Demand | <ul> <li>The present kW Billing Demand is the max of interval demands during the on-peak time-of-use periods in the current month.</li> <li>Red= Present Billing Demand is greater than or equal to the Demand kW SP</li> <li>Yellow=Present Billing Demand is within 10% of the Demand kW SP</li> <li>Green=Present Billing Demand is 10% Below the Demand kW SP</li> </ul> |
| Demand KW<br>Setpoint        | Demand<br>KW Setpoint<br>200 | The demand kW setpoint is entered by the user from the main demand configuration screen                                                                                                                                                                                                                                                                                      |
| Demand Control<br>Status     | Demand<br>Control            | Indicates whether demand control is currently on or off (on-peak or off-peak).                                                                                                                                                                                                                                                                                               |

#### Main Demand Configuration View

Click on the wrench button from the toolbar to display the load configuration view.



| Button                       | lcons                                                         | Description                                                                                                                                                                                                                      |
|------------------------------|---------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alarm                        | N.                                                            | The alarm button indicates an alarm condition and activates alarm diagnostic views. A grey bell indicates normal status, with no alarms. A red flashing bell indicates an alarm condition.                                       |
| Load Configuration           | Load                                                          | The Load Configuration button displays the load configuration screen. (The load configuration screen can also be displayed by clicking a load number from any of the status screens and entering the correct password.)          |
| Home                         |                                                               | The Home button lets you view the status of all 16 loads.                                                                                                                                                                        |
| Help                         | 0                                                             | The Help button provides information for the existing view.                                                                                                                                                                      |
| Close                        | X                                                             | Click the Close button to close the faceplate.                                                                                                                                                                                   |
| Days of the Week             | Sun Mon Tues Wed<br>orr On On On<br>Thurs Ed Sat<br>ON ON OFF | Click on a day of the week to toggle demand control on/off for that day.                                                                                                                                                         |
| Demand Control<br>Schedule   | StartTime StopTime                                            | Click on the Start Time or Stop Time Hour or Minute to launch the keypad input object and enter a time.                                                                                                                          |
| Predicted KW<br>Demand       | Predicted<br>KW Demand                                        | The predicted kW demand is read from the PowerMonitor device and displayed here for status only. (The color indication is the same as described for the demand control status screen.)                                           |
| Present Billing KW<br>Demand | Present Billing<br>KW Demand                                  | The present billing kW demand is equal to the max of interval demands during the on-peak time-of-use periods in the current billing month. (The color indication is the same as described for the demand control status screen.) |
| Demand KW<br>Setpoint        | Demand<br>KW Setpoint<br>200                                  | Click on the demand setpoint to launch the numeric keypad and enter the demand kW setpoint.                                                                                                                                      |
| Billing End Date             | Billing<br>End Date                                           | Click on the billing end date to launch the numeric keypad and enter the monthly billing end date. (This date is used to calculate the present billing kW demand for the current billing month.)                                 |
| Time and Date                | 13:47:22<br>2/22/2011                                         | The current time and date are displayed in the lower right corner of the faceplate.                                                                                                                                              |

## Load Configuration View

Click on the wrench button from the toolbar to display the load configuration view.

|                          | Load Configuration  |                                       |            |                 |              |                         |         |
|--------------------------|---------------------|---------------------------------------|------------|-----------------|--------------|-------------------------|---------|
| Faceplate Toolbar        | 1                   | F                                     |            | Load<br>1-8     | Load<br>9-16 |                         |         |
| Load Number to Configure | Load<br>7           | PRI<br>10                             | Rated      | <u>kw</u>       | Load         | Description<br>Load 7   |         |
| Load Status              | Load S              | tatus:                                | INT        | Apply           | OVR          |                         |         |
| Interlocks               | Interioo<br>On Dela | Concernation of the local division of |            | interlock<br>30 | S            | erlock Time<br>maining: | :       |
|                          | Off Dela            | ay (sec)                              | <u>E</u> [ | 30              |              |                         |         |
|                          | Max Of              | f Time (                              | sec):      | 10              |              |                         | 2:40:27 |

| Button                 | Icons                                                                                                       | Description                                                                                                                                                                                                                                                                                                                                 |
|------------------------|-------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alarm                  | Ц.                                                                                                          | The alarm button indicates an alarm condition and activates alarm diagnostic views. A grey bell indicates normal status, with no alarms. A red flashing bell indicates an alarm condition.                                                                                                                                                  |
| Configuration          | <b>7</b>                                                                                                    | The Configuration button displays the main demand control configuration screen.                                                                                                                                                                                                                                                             |
| Home                   | *                                                                                                           | The Home button lets you view the status of all 16 loads.                                                                                                                                                                                                                                                                                   |
| Help                   | 0                                                                                                           | The Help button provides information for the existing view.                                                                                                                                                                                                                                                                                 |
| Close                  | X                                                                                                           | Click the Close button to close the faceplate.                                                                                                                                                                                                                                                                                              |
| Load Number            | Load<br>1                                                                                                   | The load currently being displayed/configured. To select a new load for configuration, click on the load number to launch the numeric keypad input object. Enter a load number from 116, and then click Enter.                                                                                                                              |
| Load Priority          | <b>PRI</b> 1                                                                                                | The priority number for the load currently being displayed/configured. To change the priority, click on the priority number to launch the numeric keypad input object. Valid priority numbers are from 116. The loads with the highest priority numbers are shed first. Loads can share the same PRI values.                                |
| Load Rated KW          | Rated KW<br>5                                                                                               | The rated kW for the load currently being displayed/configured. To change the rated kW, click on the number to launch the numeric keypad input object.                                                                                                                                                                                      |
| Load Description       | Load Description<br>Load 1                                                                                  | Click on the load description to launch the keypad input object and enter a description for the load.                                                                                                                                                                                                                                       |
| Demand Control<br>Mode | Apply OVR<br>Remove OVR                                                                                     | Click on the Apply Override button to place the load in override mode. In override mode, the demand controller will not attempt to shed the load. When the load is in override mode, the button text will change to Remove OVR with a yellow background. Click on the Remove Override button to place the load back in demand control mode. |
| Interlock Bypass       | Bypass Interlocks<br>Remove Intlk Bypass                                                                    | Click on the Bypass Interlocks button to ignore the interlocks for the load. When the interlocks are bypassed, the button text will change to 'Remove Intlk Bypass' with a yellow background. Click the Remove Intlk Bypass button to re-activate the interlocks.                                                                           |
| Interlocks             | On Delay (sec):         30           Off Delay (sec):         30           Max Off Time (sec):         1000 | On Delay $(03600 \text{ s})$ = minimum time off before restarting<br>Off Delay $(03600 \text{ s})$ = minimum time on before shedding<br>Max Off Time $(03600 \text{ s})$ = Max time per hour shed If an interlock is active, the interlock time<br>remaining will appear to the right of the associated interlock.                          |
| Time and Date          | 13:47:22<br>2/22/2011                                                                                       | The current time and date are displayed in the lower right corner of the faceplate.                                                                                                                                                                                                                                                         |

#### Load Status View

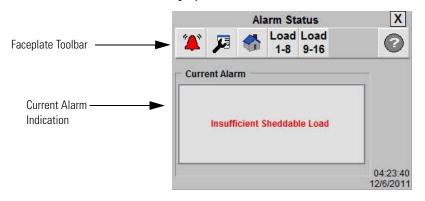
Click the Loads 1-8 or Loads 9-16 button on the toolbar to display the Load Status view. The Load 1-8 and Load 9-16 Status views display the load status, just like the Home View, as well as the load's rated kW, priority and description.

|                       | Load Status |       |         |              |                  |   |
|-----------------------|-------------|-------|---------|--------------|------------------|---|
| Faceplate Toolbar 🗕 🕨 | *           | y     |         | Load<br>9-16 |                  | 0 |
|                       | Load        | State | Rated K | W PRI        | Load Description |   |
|                       | 1           | D     | 10      | 1            | Load 1           |   |
| Load Status           | 2           | D     | 5       | 1            | Load 2           |   |
|                       | 3           | OVR   | 5       | 1            | Load 3           |   |
|                       | 4           | OVR   | 5       | 13           | Load 4           |   |
|                       | 5           | D     | 5       | 12           | Load 5           |   |
|                       | 6           | D     | 5       | 11           | Load 6           |   |
|                       | 7           | D     | 5       | 10           | Load 7           |   |
|                       | 8           | OVR   | 5       | 9            | Load 8           |   |

| Button                 | lcons                      | Description                                                                                                                                                                                                                                                                                                                                                  |  |  |  |
|------------------------|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
| Alarm                  | N.                         | The alarm button indicates an alarm condition and activates alarm diagnostic views. A grey bell indicates norma status, with no alarms. A red flashing bell indicates an alarm condition.                                                                                                                                                                    |  |  |  |
| Home                   |                            | The Home button lets you view the status of all 16 loads.                                                                                                                                                                                                                                                                                                    |  |  |  |
| Configuration          | <b>F</b>                   | The Configuration button displays the main demand control configuration screen (upon entering the correct password).                                                                                                                                                                                                                                         |  |  |  |
| Help                   | 0                          | The Help button provides information for the existing view.                                                                                                                                                                                                                                                                                                  |  |  |  |
| Close                  | X                          | Click the Close button to close the faceplate.                                                                                                                                                                                                                                                                                                               |  |  |  |
| Status Indicators      | D<br>OVR<br>OVR<br>TOVR    | Grey - Off/Normal Control<br>Green - On/Normal Control<br>D-Grey - Off/Demand Control<br>OVR-Grey - Override Set<br>OVR-Green - On/Override Set<br>OVR-Red - On/Override Set/Operator Action Required<br>Red Flashing - Load is not in OVR, controller telling to turn off, but load is still on<br>INT-Green - Interlocked On<br>INT-Grey - Interlocked Off |  |  |  |
| Interlocks<br>Bypassed | !                          | Indicates that the interlocks have been bypassed for the load.                                                                                                                                                                                                                                                                                               |  |  |  |
| Load Number            | Load<br>1<br>2             | The load number. To change the configuration for a load, click on the load number to launch the load configuration screen.                                                                                                                                                                                                                                   |  |  |  |
| Load Priority          | PRI<br>1                   | The priority currently assigned to the load.                                                                                                                                                                                                                                                                                                                 |  |  |  |
| Load Rated KW          | Rated KW                   | The rated kW currently assigned to the load.                                                                                                                                                                                                                                                                                                                 |  |  |  |
| Load Description       | Load Description<br>Load 1 | The description currently assigned to the load.                                                                                                                                                                                                                                                                                                              |  |  |  |

#### Alarm View

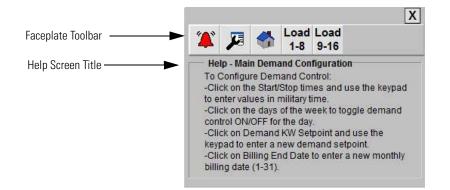
Click on the alarm bell button to display the Alarm Status view.



| Button Icons  |              | Description                                                                                                                                                                              |  |  |  |
|---------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
| Alarm         | j)<br>L      | The alarm button indicates an alarm condition and activates alarm diagnostic views. A grey bell indicates norm status, with no alarms. A red flashing bell indicates an alarm condition. |  |  |  |
| Configuration | 7            | The Configuration button displays the main demand control configuration screen (upon entering the correct password).                                                                     |  |  |  |
| Home          |              | The Home button lets you view the status of all 16 loads.                                                                                                                                |  |  |  |
| Load 18       | Load<br>1-8  | The Load 1-8 button lets you view the load status, rated kW, priority and descriptive name for loads 18.                                                                                 |  |  |  |
| Load 916      | Load<br>9-16 | The Load 9-16 button lets you view the load status, rated kW, priority and descriptive name for loads 916.                                                                               |  |  |  |
| Help          | 0            | Press the Help button to access a more detailed alarm description and recommended actions.                                                                                               |  |  |  |
| Close         | X            | Click the Close button to close the faceplate.                                                                                                                                           |  |  |  |
| Current Alarm |              | Indicates the highest priority active alarm in the demand controller.                                                                                                                    |  |  |  |

#### Help View

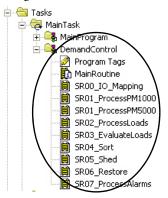
Press the Help button on any view to access the online help information.



| Button Icons Description |          |                                                                                                                                                                                            |  |
|--------------------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Alarm                    | Ŕ        | The alarm button indicates an alarm condition and activates alarm diagnostic views. A grey bell indicates normal status, with no alarms. A red flashing bell indicates an alarm condition. |  |
| Configuration            | <b>F</b> | The Configuration button displays the main demand control configuration screen (upon entering the correct password).                                                                       |  |
| Home                     |          | The Home button lets you view the status of all 16 loads.                                                                                                                                  |  |
| Next Page                |          | The next button will appear if there is more than one help screen for the help topic. Click the next button to scroll through the screens.                                                 |  |

## Program Overview

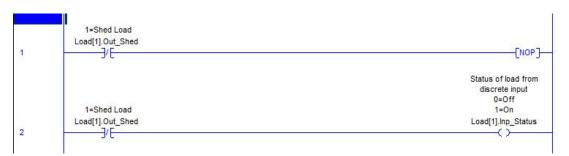
The Demand Control program is organized into eight routines, as shown below.



| Routine Name       | Description                                                                                                                                                                                                                                                                |  |  |  |
|--------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
| MainRoutine        | Performs the demand control calculations and processes the commands from the faceplate. It also dispatches all of the subroutines.                                                                                                                                         |  |  |  |
| SR00_I0_Mapping    | Used to map the demand control inputs (Load[#].Inp_Status) and outputs (Load[#].Out_Shed) to the corresponding hardwired I/O point or device level control tag for each load. This routine will need to be customized for each application, as described on the next page. |  |  |  |
| SR01_ProcessPM1000 | Reads the PowerMonitor 1000 device data and writes the data to the PM tag (UDT).                                                                                                                                                                                           |  |  |  |
| SR01_ProcessPM5000 | Reads the PowerMonitor 5000 device data and writes the data to the PM tag (UDT).                                                                                                                                                                                           |  |  |  |
| SR02_ProcessLoads  | Calculates the KWH_Sheddable, processes the timers, determines the inlerlock state, output state, and load status for the load.                                                                                                                                            |  |  |  |
| SR03_EvaluateLoads | Determines which loads are sheddable and copies the data for the sheddable loads into an array for sorting. This routine is executed after each shed or restore event and periodically every 10 seconds.                                                                   |  |  |  |
| SR04_Sort          | Sorts the sheddable loads first by priority and then by minutes since shed ascending and stores them in the Sheddable_Load LIFO array. This array presents the next load to shed as the last element in the array.                                                         |  |  |  |
| SR05_Shed          | Sets the shed status equal to 'Shed' for the next load to shed. Adds the load to the Shed_Load FIFO array. This array presents the next load to restore as the first element in the array.                                                                                 |  |  |  |
| SR06_Restore       | Sets the shed status equal to 'Normal' for the next load to restore (the first element in the Shed_Load array).                                                                                                                                                            |  |  |  |
| SR07_ProcessAlarms | Sets the alarm status bit for the following alarms:<br>Power monitor communication loss<br>Invalid Power monitor Demand Configuration<br>Insufficient Sheddable Load<br>[Load Name] Load Shed Failed alarm<br>Only 1 Sheddable Load Available                              |  |  |  |

#### I/O Mapping

The only modifications to the controller code that will be required for your application will be to map the demand controller inputs and outputs to the loads in your application. The shed command from the demand controller, Load[##].Out\_Shed, will need to be mapped to the stop command or enable bit for the load. This could be a hardwired output or a tag in your controller that ties into your device level control. The load status (on/off) will need to be mapped to the Demand Controller tag, Load[##].Inp\_Status (if it is available). The SR00\_IO\_Mapping routine has been provided to easily configure your I/O mapping. This routine contains 2 rungs for each of the 16 loads available in the demand controller:



To map the shed output, replace the NOP instruction with an OTE or OTU instruction as required per your application. In the example below, the shed output for Load number 1 is mapped to the first output on the local I/O card in slot 2.



The input status has been configured to follow the shed command by default. If the load's actual input status is not available, this rung can be left as is. If the load's input status is available, map the input status to the appropriate status bit. In the example below, the input status for Load number 1 is mapped to the first input on the local I/O card in slot 1.



# **Demand Controller Tags**

When the DemandControl program is imported, three User Defined Data Types will be added to the controller; DemandFaceplate, Load, and PM.

The DemandFaceplate UDT is used for the HMI interface.

| Name                   | Data Type                                                                               | Description                                                                                                                                                                                               |  |
|------------------------|-----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Set_FaceplateAnimation | INT                                                                                     | Controls the visibility on the faceplate                                                                                                                                                                  |  |
| Set_LoadNum            | DINT                                                                                    | Load number currently being configured                                                                                                                                                                    |  |
| Set_Password           | STRING                                                                                  | Password entered from the HMI                                                                                                                                                                             |  |
| Cfg_Load               | Load                                                                                    | Configured Load Buffer                                                                                                                                                                                    |  |
| Cfg_Password           | STRING                                                                                  | Configured Password                                                                                                                                                                                       |  |
| Cfg_StartHour          | DINT                                                                                    | Configured Demand Control Start Hour                                                                                                                                                                      |  |
| Cfg_StartMin           | DINT                                                                                    | Configured Demand Control Start Minute                                                                                                                                                                    |  |
| Cfg_StopHour           | DINT                                                                                    | Configured Demand Control Stop Hour                                                                                                                                                                       |  |
| Cfg_StopMin            | DINT                                                                                    | Configured Demand Control Stop Minute                                                                                                                                                                     |  |
| Cfg_PeakDays           | B00L[32]                                                                                | Configured Peak Days of the week                                                                                                                                                                          |  |
| Cmd_PasswordEntered    | DINT                                                                                    | Set when a password is entered from the faceplate (Bit 0 is set when a password is entered for demand control configuration, bits 116 are set when a password is entered for configuring a specific load) |  |
| Cmd_SetPriority        | BOOL                                                                                    | Set when a new priority is entered from the load configuration screen                                                                                                                                     |  |
| Cmd_SetKWRated         | BOOL                                                                                    | Set when a new KW rating is entered from the load configuration screen                                                                                                                                    |  |
| Cmd_SetDesc            | BOOL                                                                                    | Set when a new load description is entered from the load configuration screen                                                                                                                             |  |
| Cmd_SetOnDelay         | BOOL                                                                                    | Set when a new on delay time is entered from the load configuration screen                                                                                                                                |  |
| Cmd_SetOffDelay        | BOOL                                                                                    | Set when a new off delay time is entered from the load configuration screen                                                                                                                               |  |
| Cmd_SetMaxOffTime      | BOOL                                                                                    | Set when a new maximum off time is entered from the load configuration screen                                                                                                                             |  |
| Sts_PasswordAccepted   | BOOL                                                                                    | Set when the correct password is entered from<br>the faceplate, allowing visibility of the<br>configuration screen                                                                                        |  |
| Sts_BillingKW          | DINT                                                                                    | Used for color animation of the present billing kW                                                                                                                                                        |  |
| Sts_PredKW             | DINT                                                                                    | Used for color animation of the predicted kW demand                                                                                                                                                       |  |
| Val_ActiveAlarm        | DINT                                                                                    | Used for displaying the highest priority alarm on the faceplate                                                                                                                                           |  |
| Val_AlmLabel           | AlmLabel STRING Used for displaying the load nan faceplate when the load shed fa active |                                                                                                                                                                                                           |  |

| Name                 | Data Type | Description                                                                  |  |
|----------------------|-----------|------------------------------------------------------------------------------|--|
| Name                 | STRING    | Load Description                                                             |  |
| Number               | DINT      | Load Number                                                                  |  |
| Priority             | DINT      | Load Priority 116 (Priority 16 loads are shed first)                         |  |
| kW_Rated             | DINT      | User Input (065535)                                                          |  |
| kWh_Sheddable        | DINT      | kW_Rated * PM.Period_Remaining_Sec/3600                                      |  |
| Inp_Status           | BOOL      | Status of load from discrete input 0=Off 1=On                                |  |
| Avail                | BOOL      | 0=Override, 1=Normal                                                         |  |
| Shed_State           | BOOL      | Shed (on) Normal (off)                                                       |  |
| Out_Shed             | BOOL      | 1=Shed Load                                                                  |  |
| Intlk_State          | BOOL      | 1=Interlocked (Load not available to shed)                                   |  |
| Intlk_Bypass         | BOOL      | User command to bypass all interlocks                                        |  |
| Alm_FailToShed       | BOOL      | Load Shed Failed Alarm                                                       |  |
| Val_Status           | DINT      | Status Value used to drive status indicators on the faceplate                |  |
| Off_Delay_Sec        | DINT      | Min time on before shedding User Input (03600 s)                             |  |
| On_Delay_Sec         | DINT      | Min time off before restarting User Input (03600 s)                          |  |
| Max_Off_Time_Sec     | DINT      | Max time per hour shed User input (03600 s                                   |  |
| Alm_DelayTimer       | TIMER     | Failed to Shed Alarm Delay Timer                                             |  |
| Off_Delay_Timer      | TIMER     | Min time on before shedding timer                                            |  |
| On_Delay_Timer       | TIMER     | Min time off before restarting timer                                         |  |
| OneHourTimer         | TIMER     | Rolling One Hour Timer to limit the amount of time per hour the load is shed |  |
| Max_Off_Timer        | TIMER     | Maximum Off (Shed) timer                                                     |  |
| Min_Since_Shed_Timer | TIMER     | One minute timer used to count the minutes since shed                        |  |
| Minutes_Since_Shed   | COUNTER   | Incremented each time the minutes since shed timer is done                   |  |
| storagebits          | B00L[32]  | Miscellaneous storage bits used for<br>programming                           |  |

| Name                      | Data Type | Description                                                                                                  |  |
|---------------------------|-----------|--------------------------------------------------------------------------------------------------------------|--|
| MeteringIteration         | REAL      | Read from PowerMonitor Demand Results element                                                                |  |
| Predicted_Demand_KW       | REAL      | Read from PowerMonitor Demand Results element                                                                |  |
| Present_Billing_Demand_KW | REAL      | Set to the max of interval demands during the<br>on-peak time-of-use periods in the current billing<br>month |  |
| Real_Power_Demand         | REAL      | Read from PowerMonitor Demand Results element                                                                |  |
| Period_Remaining_Sec REAL |           | Seconds remaining in the current interval                                                                    |  |
| Interval_Elapsed_Time     | REAL      | Read from PowerMonitor Demand Results element                                                                |  |
| Real_Time_Clock           | DINT[7]   | Read from PowerMonitor Date and Time<br>Configuration element                                                |  |
| Demand_Period_Min         | DINT      | Read from PowerMonitor Advanced<br>Configuration element                                                     |  |
| Number_of_Demand_Periods  | DINT      | Read from PowerMonitor Advanced<br>Configuration element                                                     |  |
| Billing_End_Date          | DINT      | Monthly billing date                                                                                         |  |
| End_Of_Interval           | BOOL      | Set for one scan at the end of each 15-minute interval                                                       |  |
| Alm_Comm                  | BOOL      | Loss of Communication Alarm                                                                                  |  |
| Alm_Cfg                   | BOOL      | Invalid Demand Configuration Alarm                                                                           |  |
| Interval_Timer            | TIMER     | 15 minute interval timer, synchronized with the interval elapsed time in the PM once per interval            |  |
| Billing_Start_Init        | TIMER     | Present Billing Demand Initialize Timer                                                                      |  |
| Comm_Timer                | TIMER     | Communication Alarm Timer                                                                                    |  |

The PM UDT is used to store the main load attributes for each load.

Most of the demand controller tags will be added as program scope tags. However, there are a few tags that will be added as controller scope, shown in the figure below. The power monitor message tags are required by the Message instruction to be controller scope. The FP\_DMD tag has been configured as controller scope to minimize the length of the tagnames used in the HMI.

| Name IB            | Data Type       |  |
|--------------------|-----------------|--|
|                    | DemandFaceplate |  |
|                    | REAL[2]         |  |
|                    | REAL[9]         |  |
|                    | MESSAGE         |  |
|                    | MESSAGE         |  |
|                    | MESSAGE         |  |
| ⊕-PM_RealTimeClock | DINT[7]         |  |

# Notes:

# **Time of Day Control**

# Introduction

ControlLogix and CompactLogix controllers, with preconfigured Time of Day logic, can be used as Time of Day controllers to control up to sixteen loads. Six configurable on/off settings are provided for each day of the week for each load. A calendar allows for configuring in holidays. Each load can be configured to follow a holiday schedule or ignore the holiday calendar and follow the normal daily schedule.

In this chapter you will configure hardware, import preconfigured logic and edit it specifically for your application. The toolkit provides preconfigured logic and an operator interface faceplate that can run on a PC or a PanelView Plus terminal.

# **Before You Begin**

- Complete an energy assessment and review monitoring methods in <u>Chapter 1</u>.
- Complete other Energy Monitoring and Analysis chapters as applicable, Chapter 2 through 9.

# What You Need

- Energy Management Accelerator Toolkit, publication IASIMP-SP014 or visit the Integrated Architecture Tools and Resources website at <a href="http://www.ab.com/go/iatools">http://www.ab.com/go/iatools</a>
- RSLogix 5000 software, version 18.0 or later or Studio 5000 Logix Designer application, version 21.00 or later
- FactoryTalk View Machine Edition Software, version 5.1 or later
- Logix controller and supporting hardware

# **Follow These Steps**

The following steps are based on a CompactLogix 1769-L23E-QBFC1 packaged controller, but the general steps may be applied to other Logix controller configurations and are similar. Follow these steps to implement your Time of Day Control application:

- Control Hardware Selection and Wiring
- Logic Integration
- HMI Integration
- System Commissioning

# **Control Hardware Selection and Wiring**

You need to determine what your system will contain.

### **List Load Outputs and Inputs**

- 1. Determine which loads in your application will be controlled by the Time of Day controller (maximum of 16 loads).
- 2. Number each load from 1...16.
- 3. List the outputs and inputs associated with each load.

As a minimum each load must accept a command to run from the Time of Day Controller. The Time of Day Controller will also accept a load status input that can be used for indication and alarming, however this is not required.

In the Efficient Industries Plant 1 example, the monitoring and analysis revealed some significant energy savings if TOD control was used to control the loads identified below:

| Load Number | Loads                           | Output Description | Output I/O Location | Input Description | Input I/O Location |
|-------------|---------------------------------|--------------------|---------------------|-------------------|--------------------|
| 1           | Boiler 1                        | Command On         | Local:2:0.Data.0    | Status Feedback   | Local:1:1.Data.0   |
| 2           | Boiler 2                        | Command On         | Local:2:0.Data.1    | Status Feedback   | Local:1:1.Data.1   |
| 3           | Air Compressor 1                | Command On         | Local:2:0.Data.2    | Status Feedback   | Local:1:1.Data.2   |
| 4           | Air Compressor 2                | Command On         | Local:2:0.Data.3    | Status Feedback   | Local:1:1.Data.3   |
| 5           | Air Compressor 3                | Command On         | Local:2:0.Data.4    | Status Feedback   | Local:1:1.Data.4   |
| 6           | Lighting Production<br>Area 1   | Command On         | Local:2:0.Data.5    | Status Feedback   | Local:1:1.Data.5   |
| 7           | Lighting Production<br>Area 2   | Command On         | Local:2:0.Data.6    | Status Feedback   | Local:1:1.Data.6   |
| 8           | Lighting Shipping/<br>Receiving | Command On         | Local:2:0.Data.7    | Status Feedback   | Local:1:I.Data.7   |
| 9           | Lighting Office                 | Command On         | Local:2:0.Data.8    | N/A               | N/A                |

## **Create Control Panel Layout and Wiring**

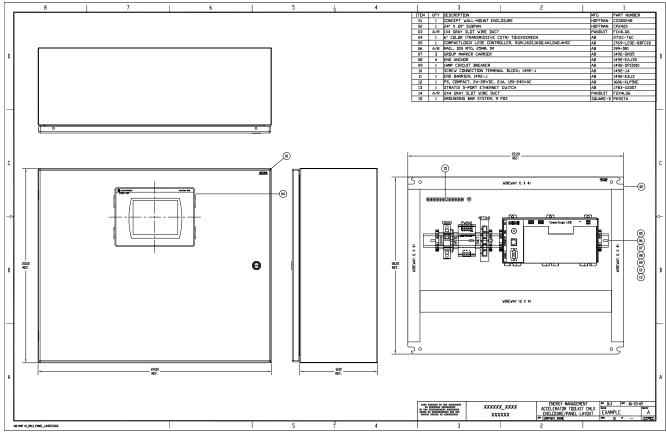
The toolkit provides panel layout and wiring drawings in DWG, DXF, and PDF file formats to help you plan the layout of your system. If you do not have CAD software, use the pdf files to build your system drawings.

#### Use CAD Drawings from Toolkit

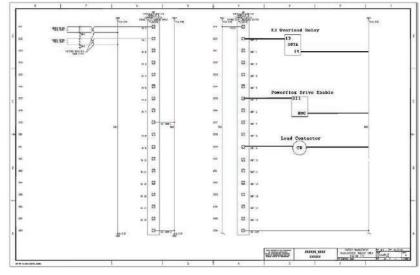
- 1. Browse to the System Layout and Wiring folder on the Energy Management Accelerator Toolkit CD image.
- 2. Double Click the CompactLogix folder.
- 3. Navigate to the desired files based on your file format (DXF, DWG, or PDF).
- 4. Add the required files to your project or copy them to your project folder.

#### Panel Layout Drawings

The AutoCAD Electrical project includes a panel-layout drawing for the CompactLogix controller, shown below. Add or remove components as needed.



#### Power and Control Wiring Drawings



The AutoCAD electrical project also includes power and control wiring drawings for the CompactLogix L23E controller. Several digital output examples are shown below.

#### Access Other RA CAD Drawings

Follow these steps to download other Allen-Bradley product CAD drawings.

- 1. Open your browser and go to <u>http://www.rockwellautomation.com/en/e-tools/.</u>
- 2. The Configuration and Selection Tools webpage opens.
- 3. If you don't know the complete catalog number, click product directory to browse the configured Rockwell Automation products.
- 4. Click Rockwell Automation and follow the prompts.

# **Logic Integration**

You will need to configure the controller, import the Time of Day program, configure the load inputs and outputs, and configure alarms.

## Configure Controller, Network, and I/O

These next sections will show you how to configure the controller, network, and I/O.

#### Create or Open a Project in RSLogix 5000 Software

Follow these steps to create or open a project in RSLogix 5000 software.

 Open RSLogix 5000 software by clicking Start> Programs> Rockwell Software> RSLogix 5000 Enterprise Series> RSLogix 5000.

The Quick Start window displays in the RSLogix workspace.

- 2. Click Open Project to open an existing project, or click New Project.
- 3. If you are creating a new project, configure the controller.
  - a. Choose your controller and revision number.
  - b. Enter a unique controller name.
  - c. Click OK.

#### Configure the Network

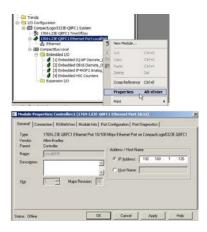
Follow these steps to configure the network.

- 1. Right-click the Ethernet Port and choose Properties.
- 2. Enter the controller's IP address and click OK.

For detailed information about assigning an IP address to your controller, see Chapter 2 of the 1769 CompactLogix Packaged Controllers Quick Start and User Manual; Assign an IP Address to the Packaged Controller, (page 42).



| ipe:        | 17694.23E-QBFC1 Compact.ogi/5323E-QBFC1 Controler • | OK.    |
|-------------|-----------------------------------------------------|--------|
| evision     | 18 -                                                | Cancel |
|             | F Redundance English                                | Help   |
| ame:        | TimeOID ay                                          |        |
| escription  | 1                                                   |        |
|             | 1                                                   |        |
| heres Type: | choneo 👻                                            |        |
|             | 0 🚽 Salety Kanner Slot, unover                      |        |
| eate In:    | C-VRSLogix 5000/Projects                            | Browne |



#### Configure the I/O

Configure the I/O specific to your application, as identified in the <u>Control Hardware</u> <u>Selection and Wiring</u> section.

The 1769-L23E packaged controller included embedded I/O for 16 DC inputs, 16 DC outputs, 4 differential or single-ended analog inputs, 2 single-ended analog outputs, 6 HSC inputs, and 4 HSC outputs.

1. To configure the properties for any of the embedded I/O modules, right-click on the module and select Properties.

If required, up to two 1769 CompactLogix modules may be added to the 1769-L23E-QBFC1B packaged controller.

**2.** To add an expansion module to the I/O configuration tree, right-click the Expansion I/O folder and select New Module.

For detailed information about configuring your embedded I/O, see Chapter 3 of the 1769 CompactLogix Packaged Controllers Quick Start and User Manual, publication <u>IASIMP-QS010</u>, Embedded I/O (page 191).

#### Save the Project File

Click to save your RSLogix 5000 application file.

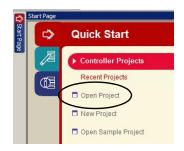
### Import and Configure Time of Day Program

Follow these steps to import and configure the Time-of-Day program.

1. If not already opened, open your RSLogix 5000 software project.

| Add-On-Defined                                                                       | 3       | New Module      |                 |
|--------------------------------------------------------------------------------------|---------|-----------------|-----------------|
| Fredefined                                                                           | X       | Cut             | Ctr1+X          |
| Module Defined                                                                       | 10p     | Copy            | Cb1+C           |
| - Trends                                                                             | IB.     | Paste           | Ctrl+V          |
| I/O Configuration CompactLogix5323E-QBEC1 System                                     |         | Delete          | Del             |
| <ul> <li>1769-L23E-QBFC1 TimeOfDay</li> <li>1769-L23E-QBFC1 Ethernet Port</li> </ul> | LocalEN | Cross Reference | Ctrl+E          |
| Ethernet                                                                             |         | Properties      | Alt+Enter       |
| Enbedded I/O                                                                         |         | Print           | , <sup>31</sup> |
| E-GE Embedded I/O                                                                    | d 1016F | Discrete In     | puts            |
|                                                                                      |         | 2010 C          | 100000          |
| - 🚺 [2] Embedde                                                                      |         |                 | 1.5 C. 1. C. 1. |
| — 🥬 [3] Embedde                                                                      | d IF4X0 | F2 Analog_I     | 0               |
| [4] Embedde                                                                          | d HSC C | Counters        |                 |
| Expansion 1/0                                                                        |         |                 |                 |
|                                                                                      |         |                 |                 |
| •                                                                                    | J Nev   | w Module        |                 |





**2.** Expand the Tasks folder in your Controller Organizer, right click the Main Task folder, and select Import Program.

3. Browse to and open the TOD Control Logic folder on the Energy Management Accelerator Toolkit CD image.

 $\label{eq:c:Program Files\RA\_Simplification\EMAT\Files\TOD\Control Logic$ 

4. Select the TOD\_Program.L5x file, and click Import.

The Import Configuration dialog appears.

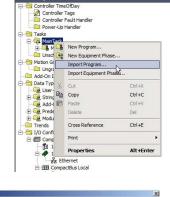
**5.** Leave the program properties at the default; click OK to create the TOD\_program.

**6.** The new TOD\_program should appear in the Controller Organizer within the Main Task folder.

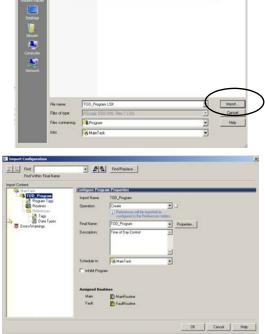
### **Configure Load Inputs and Outputs**

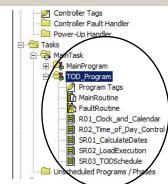
Follow these steps to configure the load inputs and outputs.

 Expand the TOD\_Program and double-click MainRoutine. Rungs 3 through 34 have been configured for I/O mapping.



. . ,





| ****************************** | ***************************************                                   |
|--------------------------------|---------------------------------------------------------------------------|
|                                | VO MAPPING                                                                |
| The WO meaning super 2         | through 34 will only be executed when the Enable IO bit is set            |
|                                |                                                                           |
| Enable_IO                      | L1                                                                        |
|                                | (9ML)                                                                     |
|                                |                                                                           |
|                                |                                                                           |
| Commanded State of             |                                                                           |
| Load (0=Off, 1=On)             |                                                                           |
| Loads[1].Out_Run               |                                                                           |
| ][]                            | [NOP]                                                                     |
|                                |                                                                           |
|                                | Actual status of                                                          |
| Commanded State of             | load from discrete                                                        |
| Load (0=Off, 1=On)             | input (0=Off, 1=On)                                                       |
| Loads[1].Out_Run               | Loads[1].lnp_Status                                                       |
| 36                             | ()()()()()()()()()()()()()()()()()()()()()()()()()()()()()()()()()()()_() |
|                                |                                                                           |
| Commanded State of             |                                                                           |
| Load (0=Off, 1=On)             |                                                                           |
| Loads[2].Out_Run               | 2334                                                                      |
| JL                             | (NOP]                                                                     |
|                                | Actual status of                                                          |
| Commanded State of             | load from discrete                                                        |

The I/O mapping rungs will not be executed unless the Enable\_IO bit in rung 2 is set.

For each load, there are two rungs to configure. The first is for mapping the command output.

2. Double-click the NOP instruction on rung 3 and type OTE.



- 3. Click Enter.
- 4. Double click on the question mark above the OTE and type the name of the tag that should be mapped to the output command for Load Number 1.

In the Efficient Industries example, the output for Load 1 is mapped to Local:2:O.Data.0.



5. Click Enter.

In rung 4, the input status has been configured to follow the commanded state. If the input status is not available for the load, this rung can be left alone. In the Efficient Industries example, the input status for Load number 1 is available and is wired to Local:1:I.Data.0.

6. Double click the tag above the XIC instruction and enter the I/O tag for the input status.



- 7. Click Enter.
- 8. Use the same procedure to configure the I/O mapping for the remaining loads in rungs 5...34.

If you are not utilizing all 16 loads in your application, you can delete the unused I/O mapping rungs, or leave them as is.

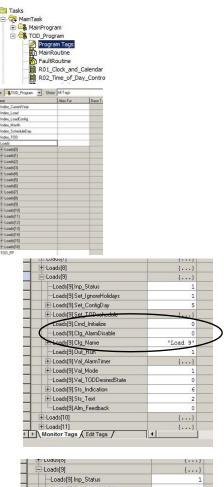
### **Configure Alarms**

Each load is configured to generate a feedback alarm if the load input status does not match the commanded state. If the load input status is not available, the feedback alarm can be disabled. Perform the following steps to disable the alarm.

- 1. Expand the TOD\_Program folder and double-click Program Tags.
- 2. Expand the Loads tag.
- 3. Select the Monitor Tags tab and expand the load instance (Loads[#] where # equals the load number) for the alarm that is being disabled.

In the Efficient Industries example, load number 9 does not have an input status, so we would want to disable the feedback alarm for that load.

- 4. Set the Loads[#].Cfg\_AlarmDisable tag to 1.
- 5. Repeat for any loads that do not have a feedback status.



|                              | []       |
|------------------------------|----------|
| -Loads[9]                    | {}       |
| Loads[9].Inp_Status          | 1        |
| Loads[9].Set_IgnoreHolidays  | 1        |
| ±-Loads[9].Set_ConfigDay     | 5        |
| E-Loads[9] Set_TODschedule   |          |
| Loads[9].Cmd_Initialize      | •        |
| Loads[9].Cfg_AlarmDisable    | 1        |
| + Loade(91Cfg_Name           | 'Load 9' |
| Loads[9].Out_Run             | 1        |
|                              | {}       |
| ± Loads[9].Val_Mode          | 1        |
| Loads[9].Val_TODDesiredState | 0        |
| Loads[9].Sts_Indication      | 6        |
| E Loads[9].Sts_Text          | 2        |
| Loads[9].Alm_Feedback        | 0        |
| +Loads[10]                   | {}       |
| +Loads[11]                   | {}       |
| Monitor Tags / Edit Tags /   | •        |

### **Save the Project File**

Click save to save your RSLogix 5000 application file.

| File Edit Vie |                            |            | Communicatio | Γ |
|---------------|----------------------------|------------|--------------|---|
| Offline       |                            | RUN        |              | 1 |
| No Forces     | ▶                          | ОК         |              |   |
| No Edits      | <mark>ا 4</mark>           | BAT<br>1/0 |              |   |
|               | Organizer<br>ontroller Tin |            |              |   |

## **HMI Integration**

These next sections show you how to integrate the HMI into your system.

### Add TOD Faceplate to FactoryTalk View ME Application

Follow these steps to add a Time of Day (TOD) faceplate to a FactoryTalk View ME application.

- 1. Launch FactoryTalk View Studio for Machine Edition.
- 2. Create a new or open an existing application to which you want to add the Time of Day Control faceplate.
- **3.** Expand the graphics folder in the explorer window, right-click on the displays folder, and choose Add Component into Application.
- 4. Browse to and open the ME TOD Control Faceplate Files folder on the Energy Management Accelerator Toolkit CD image.

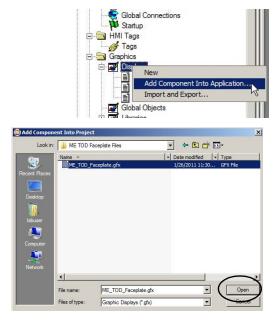
 $\label{eq:c:Program Files} C: Program Files \ RA\_Simplification \ EMAT \ Files \ Faceplate \ Files \ ME \ TOD \ Control \ Faceplate \ Files \ Faceplate  

5. Choose the ME\_TOD\_Faceplate.gfx file and click Open.

### **Configure Alarms**

Follow these steps to configure alarms.

- 1. Expand the Alarms folder in the system tree.
- 2. Right-click Alarm Setup and choose Import and Export.
- 3. Select Import alarm configuration into application.
- 4. Click Next.



|          | Gio<br>Biggina Constantino<br>Biggina Constantino<br>Bi | plays [ALARM] [DIAGNOSTICS] [INFORMATION] ME_TOD_Faceplat bal Objects arise ges ameters ation Secure tion Open Import Import mation Messages | e<br>and Export |  |
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Cancel

Next >

Help

- **5.** Choose Yes or No when prompted to backup your existing alarm configuration, and then click Next.
- **IMPORTANT** When importing the alarm configuration, the existing alarm configuration is lost. When prompted to backup the existing alarm configuration, you can choose to save it as an XML file.
  - 6. Browse to and open the ME TOD Control Faceplate Files folder on the Energy Management Accelerator Toolkit CD image to import the Alarms.xml file to your project.

#### Do you want to backup your existing alarm configuration?

| C No |  |  |
|------|--|--|
|      |  |  |
|      |  |  |
|      |  |  |
|      |  |  |
|      |  |  |

C:\Program Files\RA\_Simplification\EMAT\Files\Faceplate Files\ME TOD Control Faceplate Files

7. Click Open.

8. Click Finish.

| Choose alarm                   | configuration fil                 | e to import              |                        | ×            |
|--------------------------------|-----------------------------------|--------------------------|------------------------|--------------|
| Look in:                       | ME TOD Fac                        | eplate Files             |                        |              |
| 0                              | Name A                            |                          | <br>↓ Date modified    | - Type       |
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| necenii riaces                 |                                   |                          |                        |              |
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|                                |                                   |                          |                        |              |
|                                | m configuration file              |                          |                        |              |
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|                                | < Bai                             | sk Finish                | Cancel Help            |              |
|                                | < Dd                              | rinsri                   | Cancer Help            |              |

## **Configure Communication**

Follow these steps to configure communication.

1. Double-click Communication Setup under RSLinx Enterprise in the Explorer window.

You will see this dialog box if a communication setup does not exist.

2. Select Create a new configuration and click Finish.



Finish

Cancel

x

configuration file contains information about devices, etworks. Select the source for this offline configuration

Create a new configuration

Copy an existing configuration previously created project.

Copy the configuration that is currently running on this workstation.

//\$Local/Effici

Design (Local)

RSLinx Er 1789 + La Ethe

- 3. Click Add under Device Shortcuts to create a new shortcut, then rename the shortcut TOD.
- 4. Click the Design Local tab.
- 5. Expand the Ethernet network and select the controller containing the TOD program.
- 6. Verify that the shortcut name is highlighted, then click Apply.
- 7. Click Yes to apply the changes when prompted.
- Device Shortcuts Design (Local) Runtime (Target) Add Rem Apply - 🔜 RSLinx Enterprise, PAX02 🗄 📟 1789-A17, Backplane 🖃 🚠 EtherNet, Ethernet B ■ 192.168.1.21, 1756-ENBT/A, 1756-ENBT/A □ ■ 192.168.1.126, 1769-L23E-QBFC1Ethernet Port, 1769-L23E-QBFC1E - CompactLogix System, CompactLogix System ompactLogix L23E-OBFC1
- 8. Click Copy from Design to Runtime to copy changes to the runtime communication setup.
- 9. Click Yes when prompted to continue with the copy operation.
- 10. Click OK at the bottom of the RSLinx Enterprise dialog box to save the communication setup changes.



TOD

## System Commissioning

To commission the system, you need to install the system hardware and download the projects.

### **Install System Hardware**

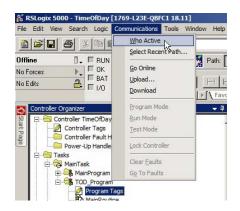
Refer to the documentation listed below for information on installing the CompactLogix and PanelView Plus Hardware.

| Document Name                                                 | Publication Number | Document Contents                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------------------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CompactLogix Packaged Controller Installation<br>Instructions | <u>1769-IN082</u>  | <ul> <li>Installation Checklist</li> <li>Controller Dimensions</li> <li>How to Install the Battery</li> <li>How to Connect Expansion Modules</li> <li>Minimum Spacing Requirements</li> <li>How to Panel Mount</li> <li>How to DIN Rail Mount</li> <li>Grounding Considerations</li> <li>Wiring Power to the System</li> <li>Wire the I/O Removable Terminal Blocks</li> <li>Expansion Module Wiring</li> <li>Selecting Operating Mode</li> <li>Status Indicators</li> </ul> |
| PanelView Plus Installation Manual                            | 2711P-IN002        | <ul> <li>Environmental Information</li> <li>Mounting Clearances</li> <li>Cutout Dimensions</li> <li>Panel Mounting Instructions</li> <li>Product Dimensions</li> <li>Removing and Installing the Power Terminal<br/>Block</li> <li>DC Power Connections</li> <li>AC Power Connections</li> <li>Troubleshooting</li> <li>Battery Removal</li> <li>System Specifications</li> <li>Certifications</li> </ul>                                                                    |

### Download RSLogix5000 Project File

Follow these steps to download your RSLogix 5000 project file to the Logix controller.

- 1. Open your RSLogix 5000 project file.
- 2. From the Communications menu, choose Who Active. The Who Active dialog box opens.

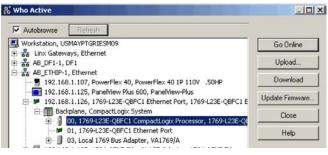


- 3. Browse to and select your Logix controller.
- 4. Verify the key switch on your controller module is in the REM (remote) position.
- 5. Click Download.

The Download dialog box opens. Click Download.

- OU, 1769-L23E-QBFC1 CompactLogix P OU, 1769-L23E-QBFC1 CompactLogix P OI, 1769-L23E-QBFC1 Ethernet Port 01, 1769-L23E-QBFC1 Ethernet Port 😟 🗍 03, Local 1769 Bus Adapter, VA1769/A ownload × Download offline project 'TimeOfDay' to the controller A Connected Controller: Name: TimeOfDay 1769-L23E-QB1 CompactLogiv5323E-QB1 Controlle Type: AB\_ETHIP-1\192.168.1126\Backplane\0 Path: Serial Number: 00632A21 Security: No Protection ⚠️ The controller is in Remote Run mode. The mode will be changed to Remote Program prior to download. 1 DANGER: Unexpected hazardous motion of machinery may occur. Some devices maintain independent configuration settings that are not loaded to the device during the download of the controller. Verify these devices (drives, network devices, 3rd party products) have been properly loaded before placing the controller into run mode Failure to load proper configuration could result in misaligned data and unexpected equipment operation Download Cancel Help
- **6.** From the Communications menu, choose Run mode to switch the controller to Run mode.





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### **Configure and Download FactoryTalk Project to PanelView Plus Terminal**

Before you can download your application to a PanelView Plus terminal, you must first create a runtime version of your FactoryTalk View application.

1. Start FactoryTalk View Studio for Machine Edition and open your application which contains the Time of Day control faceplate.

View

Cocal (F

Save in: 1 Runtime

Create Runtime Application

Efficient Industries

- 2. Choose Create Runtime Application from the Application menu.
- **3.** Specify the target directory and the file name for the runtime application.
- **4.** In the Save as type box, select the terminal firmware version on which the .mer application will run.

5. Click Save and wait for the progress bar to complete.

Deskto Deskto Isbure Comput Graphics ........... Home Cancel FactoryTalk View Studio View Application Window Help 🗹 🖬 🎒 🗋 🗃 🧖 Diagnostics Setup... Diagnostics Viewer. Explorer - Efficient In fer Utility. Local (PAX02) port and Export W Efficient Indu Efficient Application Manager... Syst are Upgrade Wizard. Languages 6 Options.

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Application Tools Window Help

Create Runtime Application.

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Application Properties.

📌 Test Application

Download the PanelView Plus terminal Runtime File

Follow these steps to download the runtime file just created to the PanelView Plus terminal.

- 1. Choose Transfer Utility from the Tools menu.
- **2.** Click the Download tab.
- 3. Click the ... icon to locate the source runtime file.
- 4. Choose Internal Storage box, from the Destination storage type list.

Optionally, check Run application at start-up to start the application when the download finishes.

5. Browse through the RSlinx Enterprise communication tree to select the destination PanelView Plus terminal for the download.

- 6. Click Download.
- 7. Click OK when the download completes successfully.
- 8. Click Exit to close the File Transfer Utility.

#### Run Application on PanelView Plus Terminal

The (.mer) runtime file is now stored in the PanelView Plus terminal so you are ready to run the application on the terminal.

1. Apply power to the PanelView Plus terminal.

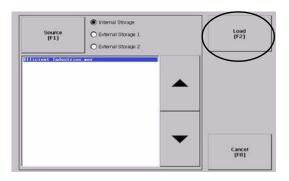
The FactoryTalk View ME Station window opens.

2. Press F1, Load Application.

You can skip this step if you checked Run application at start-up when creating the runtime application.

The Load Application window opens.

- 3. Press the up and down arrows to scroll through the list and select the application you want to load and run.
- 4. Press Load [F2] to load the application.



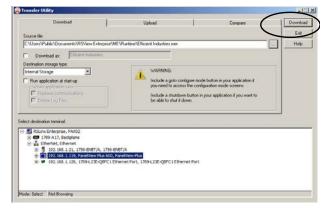
5. Press Yes [F7].

If you press No, the communication settings from the previously run project will be used.

**6.** After the application loads, press Run [F2] to run the application.



Load Application [F1]



## **System Startup and Test**

Configure the individual loads and the time of day schedule.

#### Setup

- 1. Verify the TOD controller is in Run mode.
- 2. Verify the HMI application is running on the PanelView Plus Terminal.
- 3. Verify the IO Mapping rungs in the controller are enabled.
  - a. Go online with your RSLogix project and monitor the Enable\_IO tag.
  - b. Set the tag value to '1' if it is not already set.

#### Configure Time and Date

- 1. From the TOD faceplate, click the configuration button on the toolbar.
- 2. Verify the current date and time.

If the current date and time are correct, no action is required. If the current date and time are not correct, click the time and date configuration button on the toolbar.

- 3. Enter the current time and date.
- 4. Choose an option for Daylight Savings Time.
- 5. Click on the box to toggle between Yes (apply) and No (do not apply).
- 6. Click Update PLC Clock.

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|---|----------------------|---------|-------|
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| 15       |                           | 1.02     | ad 15                               |                                      | Start  | time.          | Stop                               | Time             |
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| Thu      | Fri                       | Sat      | Hol                                 | Holiday                              | s Enal | bled           |                                    | 08:3             |
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#### Configure Holidays

- 1. Click on the Calendar Configuration button on the toolbar.
- 2. Configure holidays by clicking the date on the calendar.

Days configured as holidays are highlighted in purple. In this example, May 30, 2011 (Memorial Day) has been configured as a holiday.

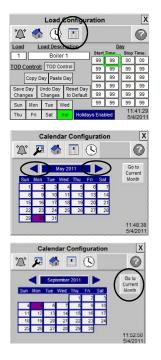
- **3.** Select the left and right arrows next to the name of the displayed month to scroll through the months and configure holidays.
- 4. To return to the current month, click Go to Current Month.

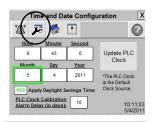
#### Override Mode Testing

1. Verify that all loads wired to your TOD controller are currently off.

Initially, all loads will be in Override Off mode by default. Prior to configuring the load schedules and running the Time of Day control, the loads should be tested using the override modes.

- 2. To set the override for each load, click the load configuration button on the toolbar.
- 3. Select a load by clicking on the load number to launch the numeric keypad.
- 4. Enter a load number, and then click Enter.









5. Click on the TOD Control mode indicator until the Override On mode is displayed.

Each click will toggle between TOD Control, Override On, and Override Off modes.

- 6. Click Save Day Changes to confirm the mode selection.
- 7. Verify that the load turns on and the input status (where applicable) is on.
- **8.** Click on the TOD Control mode indicator until the Override Off mode is displayed and click Save Day Changes to confirm the mode selection.
- 9. Verify that the load turns off and the input status (where applicable) is off.
- 10. Repeat the above steps for each load in your application.

#### TOD Control Mode Testing

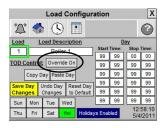
Once the loads have been override tested, configure the TOD schedules for each load and enable TOD control.

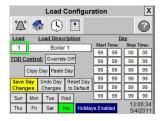
1. Click the load configuration button on the toolbar.

For the Efficient Industries example, the load schedule has been defined as shown in the table below.

| Load<br>Number | Loads                           | Sunday | Monday                                 | Tuesday                                | Wednesday                              | Thursday                               | Friday                                 | Saturday   | Holiday |
|----------------|---------------------------------|--------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|----------------------------------------|------------|---------|
| 1              | Boiler 1                        | Off    | 6:30 on                                | On all day                             | On all day                             | On all day                             | On all day                             | 11:30 off  | Off     |
| 2              | Boiler 2                        | Off    | 6:30-23:00                             | 6:30-23:00                             | 6:30-23:00                             | 6:30-23:00                             | 6:30-23:00                             | 6:30-11:30 | Off     |
| 3              | Air Compressor 1                | Off    | 7:00 on                                | On all day                             | On all day                             | On all day                             | On all day                             | 7:00-11:00 | Off     |
| 4              | Air Compressor 2                | Off    | 7:00-11:30<br>12:00-7:00<br>7:30-11:00 | 7:00-11:30<br>12:00-7:00<br>7:30-11:00 | 7:00-11:30<br>12:00-7:00<br>7:30-11:00 | 7:00-11:30<br>12:00-7:00<br>7:30-11:00 | 7:00-11:30<br>12:00-7:00<br>7:30-11:00 | 7:00-12:00 | Off     |
| 5              | Air Compressor 3                | Off    | 3:00-11:00                             | 3:00-11:00                             | 3:00-11:00                             | 3:00-11:00                             | 3:00-11:00                             | Off        | Off     |
| 6              | Lighting<br>Production Area 1   | Off    | 6:45-23:15                             | 6:45-23:15                             | 6:45-23:15                             | 6:45-23:15                             | 6:45-23:15                             | 6:45-11:15 | Off     |
| 7              | Lighting<br>Production Area 2   | Off    | 6:45-11:30<br>12:00-7:00<br>7:30-11:00 | 6:45-11:30<br>12:00-7:00<br>7:30-11:00 | 6:45-11:30<br>12:00-7:00<br>7:30-11:00 | 6:45-11:30<br>12:00-7:00<br>7:30-11:00 | 6:45-11:30<br>12:00-7:00<br>7:30-11:00 | 6:45-11:30 | Off     |
| 8              | Lighting Shipping/<br>Receiving | Off    | 7:00-23:00                             | 7:00-23:00                             | 7:00-23:00                             | 7:00-23:00                             | 7:00-23:00                             | 7:00-12:00 | Off     |
| 9              | Lighting Office                 | Off    | 8:00-17:00                             | 8:00-17:00                             | 8:00-17:00                             | 8:00-17:00                             | 8:00-17:00                             | Off        | Off     |

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| I ( 🔎 |            |             | 1                               |
|-------|------------|-------------|---------------------------------|
| Hour  | Minute     | Second      |                                 |
| 9     | 43         | 0           | Update PLC                      |
| Month | Day        | Year        | Clock                           |
| 5     | 4          | 2011        | "The PLC Cloc                   |
|       | Davlight S | avings Time | is the Default<br>Clock Source. |

2. Click on the load number to launch the numeric keypad.

3. Select a load to configure by entering the load number, then clicking Enter.

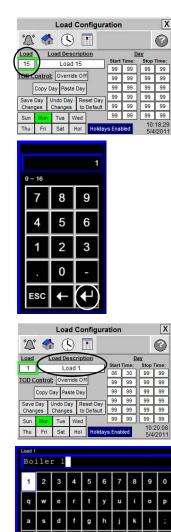
4. Click on the load description.

5. Enter a description for the load and then click Enter.

The Save Day Changes button will turn yellow indicating changes have been made that have not been saved.

- 6. Click the Save Day Changes button.
- 7. To configure the schedule for the load, click on each day of the week and enter the desired schedule.

Be sure to click the Save Day Changes button after entering the schedule for each day. If a new day is selected prior to saving the schedule for the displayed day, the changes will be lost.



|       |       | Lo         | ad (   | Col   | nfigura | ation   |       |      | X     |
|-------|-------|------------|--------|-------|---------|---------|-------|------|-------|
| 2     |       | <b>}</b> ( | 9      |       |         |         |       |      | 0     |
| Load  |       | Load D     | esc    | ripti | on      |         |       | ay   | _     |
| 1     |       | В          | oiler  | r 1   | 1       | Start   | Time: | Stop | Time: |
|       |       | -          |        |       | 06      | 30      | 99    | 99   |       |
| TOD C | ontro | ol: 0v     | erride | e Of  | f       | 99      | 99    | 99   | 99    |
| [     | Сору  | Day P      | aste   | Day   |         | 99      | 99    | 99   | 99    |
| Save  | Dav   | Undo       | Jav    | De.   | set Dav | 99      | 99    | 99   | 99    |
| Chan  |       | Chang      |        |       | Default | 99      | 99    | 99   | 99    |
| Sun   | Mor   | Tue        | W      | /ed   |         | 99      | 99    | 99   | 99    |
| Thu   | Fri   |            | -      | Hol   | Holiday | /s Enal | oled  |      | 21:22 |

•Sunday Load Configuration X X 🛠 🕓 🖪 Load Load Descript 1 Boiler 1 TOD Control: TOD Control Copy Day Paste Day Jndo Day Reset D to Defa

•Tuesday

|      |      | L        | oa   | dC    | Con     | figur  | ation |       |      | 2    |
|------|------|----------|------|-------|---------|--------|-------|-------|------|------|
| 2    | ' 📢  | 5        | C    | 9     |         |        |       |       |      | 0    |
| Load |      | Load     | 1 De | scr   | iptic   | n      |       | D     | ay   |      |
| 1    |      | Boiler 1 |      |       |         |        | Start | Time: | Stop | Time |
| -    |      |          |      |       |         |        | 00    | 00    | 99   | 99   |
| TODC | ontr | ol:      | TOD  | Cor   | trol    |        | 99    | 99    | 99   | 99   |
| [    | Сору | Day      | Pas  | ste [ | Day     |        | 99    | 99    | 99   | 99   |
| Save | Dav  | lind     | o De | w I   | Dee     | et Dav | 99    | 99    | 99   | 99   |
| Chan |      |          | ange |       |         | efault | 99    | 99    | 99   | 99   |
| Sun  | Mor  | Т        | ue   | W     | ed      |        | 99    | 99    | 99   | 99   |
| Thu  | Fri  |          |      |       | ys Enal | oled   |       | 31:2  |      |      |

•Thursday

|       | Load Configuration |         |         |         |      |       |    |         |  |  |
|-------|--------------------|---------|---------|---------|------|-------|----|---------|--|--|
| 2     |                    |         | 9 [     | •       |      |       |    | 0       |  |  |
| Load  | L                  | oad De  | script  | tion    |      | D     | ay |         |  |  |
| 1     |                    | Bo      | Start   | Time:   | Stop | Time: |    |         |  |  |
|       |                    |         | 00      | 00      | 99   | 99    |    |         |  |  |
| TOD C | ontrol             | TOD     | Contro  | al l    | 99   | 99    | 99 | 99      |  |  |
| [     | Copy D             | ay Pas  | ste Day | 7       | 99   | 99    | 99 | 99      |  |  |
| Save  | Day                | Indo Dr |         | set Day | 99   | 99    | 99 | 99      |  |  |
| Chan  |                    | Change  |         | Default | 99   | 99    | 99 | 99      |  |  |
| Sun   | Mon                | Tue     | Wed     | 1       | 99   | 99    | 99 | 99      |  |  |
| Thu   | Fri                | Sat     | Hol     | Holiday |      |       |    | 1:31:57 |  |  |

•Monday Load Configuration X In the second se 0 N. Load Descripti Boiler TOD Control: TO Copy Day Paste Day



|      |        | Loa    | d Co   | onfigura  | ation  |      |       | X     |
|------|--------|--------|--------|-----------|--------|------|-------|-------|
| 2    |        |        | 9      | •         |        |      |       | 0     |
| Load | L      | oad De | escrip | tion      |        |      | ay    |       |
| 1    |        | Bo     | iler 1 | Start     | Time:  | Stop | Time: |       |
|      |        | _      |        |           | 00     | 00   | 99    | 99    |
| OD C | ontrol | TOD    | Contr  | ol        | 99     | 99   | 99    | 99    |
| ſ    | Copy [ | ay Pa  | ste Da | у         | 99     | 99   | 99    | 99    |
| Save | David  | Undo D | ov I n | eset Dav  | 99     | 99   | 99    | 99    |
| Chan |        |        |        | o Default | 99     | 99   | 99    | 99    |
| Sun  | Mon    | Tue    | Wed    | 1         | 99     | 99   | 99    | 99    |
| Thu  | Fri    | Sat    | Hol    | Holiday   | s Enal | bled |       | 32:10 |

•Friday

•Saturday Load Configuration X X 🚯 🕓 🔳 Load Descriptio Boiler 1 TOD Control: TOD Contro opy Day Paste Day

- 8. If the load will not follow a holiday schedule, click the Holidays Enabled/ Disabled button so that Holidays Disabled is displayed.
- 9. If the load will follow a different schedule on holidays, click the Holidays Enabled/Disabled button so that Holidays Enabled is displayed.



V

In the Efficient Industries example, the configuration for Boiler 1 (Load 1) would look like the following:

- 10. Click the holiday button and enter the desired holiday schedule.
- 11. Place the load in TOD Control mode.

To change the mode, click on the mode indicator to toggle between TOD Control, Override On, and Override Off.

- 12. Click Save Day Changes to confirm your mode selection.
- 13. Verify that the load turns on and off per the configured schedule.
- 14. Repeat the above steps for each load in your application.

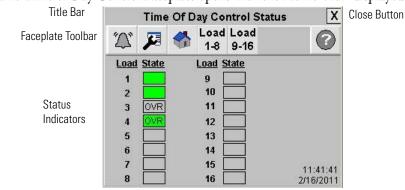
|       |       | L             | oa                       | d(   | Col   | nfigura | ation |       |      | X     |
|-------|-------|---------------|--------------------------|------|-------|---------|-------|-------|------|-------|
| 1     |       | 2             | C                        | 9    |       | •       |       |       |      | 0     |
| Load  |       | Load          | De                       | sc   | ript  | ion     |       |       | ay   |       |
| 1     |       | -             | Bo                       | iler | 1     | 1       | Start | Time: | Stop | Time: |
|       |       |               |                          |      |       |         |       | 99    | 00   | 00    |
| TOD C | ontro | <u>1 : Ic</u> | OD                       | Co   | ntrol |         | 99    | 99    | 99   | 99    |
|       | Copy  | Day           | Pas                      | ste  | Day   |         | 99    | 99    | 99   | 99    |
| Sava  | Dav   | Had           | o Dr                     |      | De    | set Day | 99    | 99    | 99   | 99    |
| Chan  |       |               |                          |      |       | Default | 99    | 99    | 99   | 99    |
| Sun   | Mor   | Т             | ue                       | W    | led   |         | 99    | 99    | 99   | 99    |
| Thu   | Fri   | S             | Sat Hol Holidays Enabled |      |       |         |       | 41:29 |      |       |

|      |       | Lo         | ad (   | Con    | figura  | ation   |       |      | X              |
|------|-------|------------|--------|--------|---------|---------|-------|------|----------------|
| ۲Ľ   |       | <b>}</b> ( | 3      |        |         |         |       |      | 0              |
| Load |       | Load I     | Desc   | riptio | on      |         | D     | ay   |                |
| 1    |       | F          | loiler | 1      |         | Start   | Time: | Stop | Time:          |
| ~    | -     |            | _      |        | 99      | 99      | 00    | 00   |                |
| TODC | ontro | DI: TO     | D Co   | ntrol  | D I     | 99      | 99    | 99   | 99             |
|      | Сору  | Day F      | aste   | Day    |         | 99      | 99    | 99   | 99             |
| Save | Dav   | lindo      | Dav    | Dee    | et Dav  | 99      | 99    | 99   | 99             |
| Chan |       | Chan       |        |        | Default | 99      | 99    | 99   | 99             |
| Sun  | Mon   | Tue        | W      | (ed    |         | 99      | 99    | 99   | 99             |
| Thu  | Fri   | Sat        |        |        | Holiday | /s Enal | oled  |      | 57:53<br>/2011 |

## **System Application Guide**

This section guides you through the pre-configured FactoryTalk View Machine Edition faceplate providing you with an understanding of the status, control, and diagnostic operation of the faceplate display.

### **Faceplate Operation Overview**



The Time of Day Control Faceplate opens with the Home View displayed.

| Button            | Icons        | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|-------------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alarm             | 1X           | The alarm button indicates an alarm condition and activates alarm diagnostic views. A grey bell indicates normal status, with no alarms. A red flashing bell indicates an alarm condition.                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Configuration     | <b>F</b>     | The Configuration button lets you edit the Time of Day control settings, such as load schedules, overrides, time and date configuration, and calendar configuration.                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Load 18           | Load<br>1-8  | The Load 1-8 button lets you view the load status and descriptive name for loads 18                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Load 916          | Load<br>9-16 | The Load 9-16 button lets you view the load status and descriptive name for loads 916                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Help              | 0            | The Help button provides information for the existing view.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Close             | X            | Click the Close button to close the faceplate.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Status Indicators |              | Grey = Off/Auto TOD Control         H Grey = Off/Auto TOD control - Holiday         Green = On/Auto TOD Control         H Green = On/Auto TOD Control - Holiday         OVR-Grey = Off/Override Set/Load is off.         OVR Grey/Red Flashing = Override Off is set, but load is still on.         OVR-Green = On/Override Set/Load is on         OVR Green/Red Flashing = Override On is set, but load is still off.         Red/Grey Flashing = Load is not in OVR, controller telling to turn off, but load is still on.         Red/Green Flashing = Load is not in OVR, controller telling to turn on, but load is still off. |

### Load Configuration View

Click on the wrench button from the toolbar to display the load configuration view.

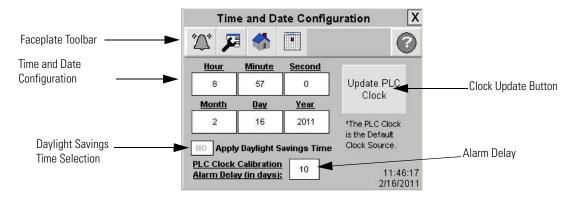
|                              | Load Configuratio             | on X                                       |        |
|------------------------------|-------------------------------|--------------------------------------------|--------|
| Faceplate Toolbar ————       | 公 🍫 🕓 🔳                       | 3                                          |        |
| Load Number to Configure     | Load Load Description         | Day                                        |        |
|                              | 1 Load 1 Production 07        | art Time: Stop Time:<br>7 00 23 00         |        |
| TOD Control Mode             | TOD Control: TOD Control 99   |                                            | ۵      |
| Commanda                     | Copy Day Paste Day 99         | 9 99 99 99                                 |        |
| Commands                     | Save Day Undo Day Reset Day   |                                            |        |
|                              | Changes Changes to Default 99 | 9 99 99 Holiday Enable/D                   | isable |
| Day of the Week to Configure | Sun Mon Tue Wed               |                                            |        |
|                              | Thu Fri Sat Hol Holidays Er   | habled 11:44:33<br>2/16/2011 Time and Date |        |

| Button                 | Icons                                 | Description                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alarm                  | Ц.                                    | The alarm button indicates an alarm condition and activates alarm diagnostic views. A grey bell indicates normal status, with no alarms. A red flashing bell indicates an alarm condition.                                                                                                                                                                                                |
| Home                   | -                                     | The Home button lets you view the status of all 16 loads.                                                                                                                                                                                                                                                                                                                                 |
| Clock                  | (\$)                                  | The Clock button displays the Time and Date Configuration View, which lets you update the PLC clock                                                                                                                                                                                                                                                                                       |
| Calendar               |                                       | The Calendar button displays the Calendar Configuration View, which lets you assign holidays.                                                                                                                                                                                                                                                                                             |
| Help                   | 0                                     | The Help button provides information for the existing view.                                                                                                                                                                                                                                                                                                                               |
| Close                  | X                                     | Click the Close button to close the faceplate.                                                                                                                                                                                                                                                                                                                                            |
| Load Number            | Load<br>1                             | The load currently being displayed/configured. To select a new load for configuration, click on the load number to launch the numeric keypad input object. Enter a load number from 116, then click Enter.                                                                                                                                                                                |
| Load Description       | Load Description<br>Load 1 Production | Click on the load description to launch the keypad input object and enter a description for the load. When a description change is made, the Save Day Changes button background will turn yellow, indicating that a change has been made, but has not been saved. The description change will not take effect until it is saved. Click on the Save Day Changes button to save the change. |
| TOD Control Mode       | TOD Control                           | Click on the Mode Selection button to toggle between TOD Control, Override On, and Override Off modes. When a mode change is made, the Save Day Changes button will turn yellow, indicating a save is required. The mode change will not take effect until saved.                                                                                                                         |
| Copy/Paste<br>Commands | Copy Day<br>Paste Day                 | To copy the schedule from the displayed day to another day, click Copy Day. Select a new day, and then click Paste Day. Click Save Day Changes to download the changes to the controller.                                                                                                                                                                                                 |
| Save Command           | Save Day<br>Changes                   | Click Save Day Changes anytime a change is made to the load configuration. You must save your changes prior to selecting a new day or a new load to configure. If you select a new day or new load prior to saving your changes, the changes will be lost.                                                                                                                                |
| Undo Command           | Undo Day<br>Changes                   | To revert to the previously saved schedule for the day, click Undo Day Changes. You can only undo changes if they have not been saved. Once saved, you cannot revert to the previous schedule.                                                                                                                                                                                            |

| Button                     | lcons                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Reset Command              | Reset Day<br>to Default                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | To reset all schedule entries for the day to the default, click Reset Day to Default. The default value is 99:99. When a value of 99:99 is entered, the setting is ignored by the TOD program.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Days of the Week           | Sun Mon Tue Wed<br>Thu Fri Sat Hol                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Click on a day of the week to configure the schedule for that day. The TOD schedule for the day highlighted in green is displayed in the configuration view.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Holiday Enable/<br>Disable | Holidays Enabled                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | When holidays are enabled, the load will follow its holiday schedule whenever a holiday is configured on the calendar. To modify the holiday schedule, click on the 'HOL' day of the week button. When holidays are disabled, the holiday schedule for the load is ignored. Click on the Holidays Enabled/Disabled button to toggle between holidays enabled or disabled.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Time of Day<br>Schedule    | Day           Start Time:         Stop Time:           99         99         99         99         99           99         99         99         99         99         99           99         99         99         99         99         99         99         99           99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99         99 | <ul> <li>By default, all schedule entries are set to 99:99. If a value of 99:99 is entered, the setting is ignored by the TOD program.</li> <li>Click on the Start Time or Stop Time Hour or Minute to launch the keypad input object and enter a time. Enter start and stop times in military time, 00:00 through 23:59.</li> <li>Once the desired schedule for the day is entered, Click Save Day Changes to download the schedule to the controller.</li> <li>Tip: To run the load overnight, configure a start time, but leave the stop time at 99:99. On the next day, configure a start time of 00:00. For example the load configured below would start at 20:00 on Monday and stop at 6:00 on Tuesday.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Load Configuration         X           Image: Changes         Image: Change         Image: Change         Image: Change         Image: Change         I |
| Time and Date              | 13:47:22<br>2/22/2011                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | The current time and date are displayed in the lower right corner of the faceplate.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

### Time and Date Configuration View

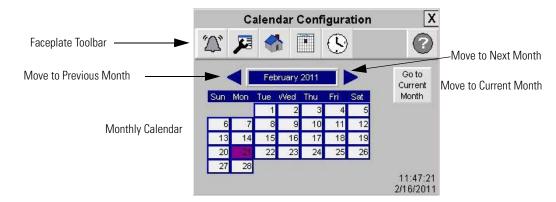
Click on the clock button from the toolbar to display the Time and Date configuration view.



| Button                             | Icons                                                                                                                                            | Description                                                                                                                                                                                                                                                                                        |
|------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alarm                              | I.                                                                                                                                               | The alarm button indicates an alarm condition and activates alarm diagnostic views. A grey bell indicates normal status, with no alarms. A red flashing bell indicates an alarm condition.                                                                                                         |
| Configuration                      | <b>F</b>                                                                                                                                         | The Configuration button lets you edit the Time of Day control settings, such as load schedules, overrides, time and date configuration, and calendar configuration.                                                                                                                               |
| Home                               | *                                                                                                                                                | The Home button lets you view the status of all 16 loads.                                                                                                                                                                                                                                          |
| Calendar                           |                                                                                                                                                  | The Calendar button displays the Calendar View, which lets you assign holidays.                                                                                                                                                                                                                    |
| Help                               | 0                                                                                                                                                | The Help button provides information for the existing view.                                                                                                                                                                                                                                        |
| Close                              | X                                                                                                                                                | Click the Close button to close the faceplate.                                                                                                                                                                                                                                                     |
| Time and Date<br>Configuration     | Hour         Minute         Second           8         57         0           Month         Day         Year           2         16         2011 | Click on each button to launch the numeric entry keypad input object and enter the current values for the time and date. Enter the hour in military time. When the desired date and time have been entered, click the Update PLC Clock button to download the new date and time to the controller. |
| Clock Update<br>Button             | Update PLC<br>Clock                                                                                                                              | Click the Update PLC Clock button to download the configured date and time to the controller.                                                                                                                                                                                                      |
| Daylight Savings<br>Time Selection | NO Apply Daylight Savings Time                                                                                                                   | Click the button to turn Daylight Savings Time on and off. When Daylight Savings time is applied, one hour is added to the current hour.                                                                                                                                                           |
| Alarm Delay                        | PLC Clock Calibration<br>Alarm Delay (in days): 10                                                                                               | The PLC clock will drift over time and will need to be recalibrated every so often, depending on the accuracy of your PLC clock. Enter an alarm delay here (in days) to notify the operator when the PLC clock should be checked for accuracy.                                                     |

### Calendar Configuration View

Click on the calendar button on the toolbar to display the Calendar Configuration view.



| Button                      | lcons                                                                                                                 | Description                                                                                                                                                                                                                                                      |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alarm                       | N.                                                                                                                    | The alarm button indicates an alarm condition and activates alarm diagnostic views. A grey bell indicates normal status, with no alarms. A red flashing bell indicates an alarm condition.                                                                       |
| Configuration               | <b>F</b>                                                                                                              | The Configuration button lets you edit the Time of Day control settings, such as load schedules, overrides, time and date configuration, and calendar configuration.                                                                                             |
| Home                        |                                                                                                                       | The Home button lets you view the status of all 16 loads.                                                                                                                                                                                                        |
| Clock                       | (9)                                                                                                                   | The Clock button displays the Time and Date Configuration View, which lets you update the PLC clock.                                                                                                                                                             |
| Help                        | Ø                                                                                                                     | The Help button provides information for the existing view.                                                                                                                                                                                                      |
| Close                       | X                                                                                                                     | Click the Close button to close the faceplate.                                                                                                                                                                                                                   |
| Display previous month      |                                                                                                                       | Click to move to the previous month.                                                                                                                                                                                                                             |
| Display next month          |                                                                                                                       | Click to move to the next month.                                                                                                                                                                                                                                 |
| Display current month       | Go to<br>Current<br>Month                                                                                             | Click to return to the current month.                                                                                                                                                                                                                            |
| Monthly Calendar<br>Display | Mon. Tue West Thu Fri Sat<br>11 2 2 2 2 2 2 2 2 2<br>12 10 2 10 11 12 2<br>13 10 2 12 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 | Click on a date to toggle between a holiday and a non-holiday. Days configured as holidays are highlighted in purple<br>If the current day is configured as a holiday, the load will follow the holiday schedule, unless holidays are disabled<br>for that load. |

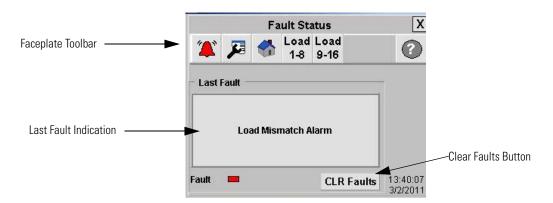
#### Load Status View

Click the Loads 1-8 or Loads 9-16 button on the toolbar to display the Load Status view. The Load 1-8 and Load 9-16 Status views display the load status, just like the Home View, as well as the load description.

|      |       | Load 1-8 Status            | X                    |   |  |  |               |       | Load   | 9-16     | Status       |                    |
|------|-------|----------------------------|----------------------|---|--|--|---------------|-------|--------|----------|--------------|--------------------|
| Т,   | F     | Load Load<br>1-8 9-16      | 0                    |   |  |  | $\mathcal{D}$ | F     |        |          | Load<br>9-16 | 0                  |
| Load | State | Load Description           |                      | 1 |  |  | Load          | State | Load I | Descrip  | tion         |                    |
| 1    | OVR   | Boiler 1                   |                      |   |  |  | 9             | OVR   | Lighti | ng Offic | e            |                    |
| 2    | OVR   | Boiler 2                   |                      |   |  |  | 10            | OVR   | Load   | 10       |              |                    |
| 3    | OVR   | Air compressor 1           |                      |   |  |  | 11            | OVR   | Load   | 11       |              |                    |
| 4    | OVR   | Air Compressor 2           |                      |   |  |  | 12            | OVR   | Load   | 12       |              |                    |
| 5    | OVR   | Air Compressor 3           |                      |   |  |  | 13            | OVR   | Load   | 13       |              |                    |
| 6    | OVR   | Lighting Production Area 1 |                      |   |  |  | 14            | OVR   | Load   | 14       |              |                    |
| 7    | OVR   | Lighting Production Area 2 | 100000000000         |   |  |  | 15            | OVR   | Load   | 15       |              |                    |
| 8    | OVR   | Lighting Ship/Receiving    | 13:43:54<br>5/4/2011 |   |  |  |               | OVR   | Load   | 16       |              | 13:44:1<br>5/4/201 |

### Fault View

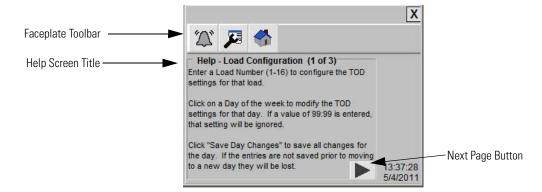
Click on the alarm bell button to display the Fault Status view.



| Button        | Icons        | Description                                                                                                                                                                                |
|---------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alarm         | N.           | The alarm button indicates an alarm condition and activates alarm diagnostic views. A grey bell indicates normal status, with no alarms. A red flashing bell indicates an alarm condition. |
| Configuration | F            | The Configuration button lets you edit the Time of Day control settings, such as load schedules, overrides, time and date configuration, and calendar configuration.                       |
| Home          |              | The Home button lets you view the status of all 16 loads.                                                                                                                                  |
| Load 18       | Load<br>1-8  | The Load 1-8 button lets you view the load status and descriptive name for loads 18                                                                                                        |
| Load 916      | Load<br>9-16 | The Load 9-16 button lets you view the load status and descriptive name for loads 916                                                                                                      |
| Help          | 0            | Press the Help button to access a more detailed alarm description and recommended actions.                                                                                                 |
| Close         | X            | Click the Close button to close the faceplate.                                                                                                                                             |
| Last Fault    |              | Indicates the error being reported by the TOD control program; a load mismatch, a PLC clock recalibration alert, or both.                                                                  |
| Clear Faults  |              | Click the clear faults button to clear the alert from the fault view. The alert will only clear if the condition causing the alert is no longer active.                                    |

### Help View

Press the Help button on any view to access the online help information.



| Button        | Icons  | Description                                                                                                                                                                                                                                             |
|---------------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Alarm         | j<br>L | The alarm button indicates an alarm condition and activates alarm diagnostic views. A grey bell indicates normal status, with no alarms. A red flashing bell indicates an alarm condition.                                                              |
| Configuration |        | The Configuration button lets you edit the Time of Day control settings, such as load schedules, overrides, time and date configuration, and calendar configuration.                                                                                    |
| Home          |        | The Home button lets you view the status of all 16 loads.                                                                                                                                                                                               |
| Next Page     |        | The next button will appear if there is more than one help screen for the help topic. Click the next button to scroll through the screens. The Help Screen Title will indicate the total number of help screens and the current screen being displayed. |

## Notes:

# **Custom Meter Types**

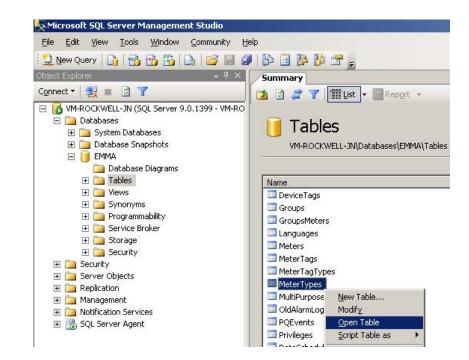
This appendix shows how to create custom meter types. The <u>Efficient Industries Plant 1</u> example has two custom meter types under the Fuels group: Fuel Oil and Propane.

Follow these steps to create custom meter types.

- 1. Launch SQL Server Manager Studio from the Start menu or Programs.
- 2. Enter your SQL Server name and click Connect.

| Server type:         | Database Engine              |   |
|----------------------|------------------------------|---|
| <u>S</u> erver name: | VM-ROCKWELL-JN               |   |
| Authentication:      | Windows Authentication       |   |
| User name:           | VM-ROCKWELL-JN\Administrator | 1 |
| Password:            |                              |   |

- 3. Navigate to Databases>EMMA and select Tables.
- **4.** Right-click MeterTypes and choose Open Table.



**5.** Select the last row and enter a MeterTypeId and Name.

For this example, Fuel Oil and Propane were added.

6. Click X to close dialog box, the close SQL Server Management Studio.

|     | ble - dbo.MeterT | I set the set of the |
|-----|------------------|----------------------|
|     | MeterTypeId      | Name                 |
|     | 1                | Manual               |
|     | 2                | Water                |
|     | 3                | Air                  |
|     | 4                | Gas                  |
|     | 5                | Electric             |
|     | 6                | Steam                |
|     | 7                | Environmenta         |
| -   | 8                | Fuel Oil             |
| + • | 9                | Propane              |
| *   | NULL             | NULL                 |

# **Custom Units and Value Types**

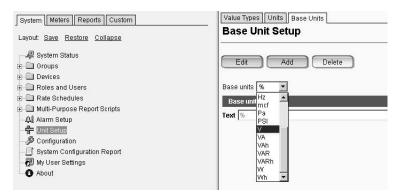
This appendix shows how to configure custom base units, units, and value types used by meter tags for logging energy data. The FactoryTalk EnergyMetrix software collection of base units are those most commonly used in energy management applications. A base unit consists of a unit and a scaling factor. For example, VA (voltampere) is a base unit, and kVA (kilovoltampere) is a unit, with a scaling factor of 0.001.

Value types are used by reporting and billing functions to aggregate values of a specific type in one or more meters or groups. The FactoryTalk EnergyMetrix software value types represent the most commonly used electrical energy management parameters. Value types are set up as consumption or demand. Consumption types are treated as accumulated values of energy or process output, for example, real energy net. Demand types are treated as rate values such as real power demand.

If FactoryTalk EnergyMetrix software does not contain the base units, units, and value types required, you'll need to create them.

## **Verify Base Units**

- 1. Select Unit Setup on the System tab.
- 2. Click the Base Units tab.
- **3.** Click the Base unit pull-down menu to show the available units.
- 4. Verify that all base units required are available in the list.

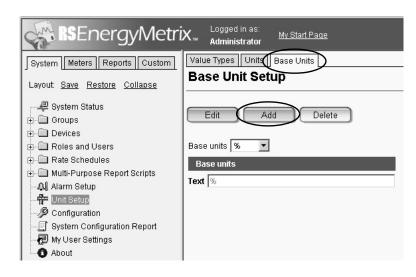


You'll need to create those base units that don't appear in the FactoryTalk EnergyMetrix list. For the <u>Efficient Industries</u> <u>Plant 1</u> example, create these base units:

- gallons (gal) for fuel oil, propane, and water
- therms (thm) for natural gas
- pounds (lbs) for steam
- cubic feet (cf) for air
- **TIP** For advanced users, an SQL query named Accel Tk Units Value Units.sql is available that will automatically populate the database with value types and units. This query is in the System Layout and Wiring folder of the Energy Management Accelerator Toolkit CD image.

## **Create Base Units**

1. Click Add on the Base Units tab.



**2.** Enter the base unit text.

(cf), and pounds (lbs).

For this example, enter Gal for fuel oil, propane, and water.

- 3. Click Save.
- 4. Repeat steps 1...3 to add therms (thm), cubic feet

Text Gal bic feet Value Types Units Base Units Base Unit Setup

Value Types Units Base Units Base Unit Setup

Cancel

Save

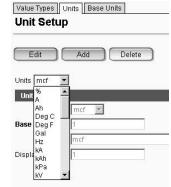
Base units

When done, you should see cf, thm, and lb in the Base unit list.

| Edit                               |     | Ac | ld | Delet | e |
|------------------------------------|-----|----|----|-------|---|
| Base units<br>Base unit<br>Text cf |     | •  |    | _     | _ |
|                                    | thm | •  |    |       |   |

## **Verify Units**

- 1. Click the Units tab.
- 2. Click the <u>Units</u> pull-down menu to show the available units.



**3.** Verify that all units required are available in the list.

You'll need to create those units that don't appear in the FactoryTalk EnergyMetrix list. For the <u>Efficient Industries Plant 1</u> example, you'll need to create these units:

- gallon (gal) for fuel oil, propane, and water
- therms (thm) for natural gas
- pounds (lbs) for steam
- cubic feet (cf) for air

## **Create Units**

1. Click the Add button on the Units tab.

| Layout: <u>Save Restore</u> <u>Collapse</u>                             | Unit Setup                          |
|-------------------------------------------------------------------------|-------------------------------------|
| - ₩ System Status<br>                                                   | Edit Add Delete                     |
| <ul> <li>□ Roles and Users</li> <li>□ Rate Schedules</li> </ul>         | Units % 💌<br>Unit details           |
| e - ☐ Multi-Purpose Report Scripts<br>- ↓ Alarm Setup<br>- ∰ Unit Setup | Base unit % 💌<br>Base units scale 1 |
| ✓ Configuration ☐ System Configuration Report 7 My User Settings        | Text % Display decimals 1           |

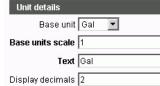
- 2. Choose the base unit just created from the pulldown menu.
- 3. Enter the Base units scale and text.

For this example, enter 1 and Gal to be used by the fuel oil, propane, and water meter tags.

4. Click Save.

| Save | Car | rel |  |
|------|-----|-----|--|

Value Types Units Base Units



5. Repeat steps 1...4 to create other units.

For this example, create:

- therms (thm) for natural gas
- pounds (lbs) for steam
- cubic feet (cf) for air

Enter the settings from the table for each unit.

**6.** Verify that each unit appears in the Units pull-down menu.

| Base Unit | Base Unit Scale | Text | Display Decimals |
|-----------|-----------------|------|------------------|
| thm       | 1               | thm  | 2                |
| cf        | 1               | cf   | 2                |
| lbs       | 1               | lbs  | 2                |

\_\_\_\_

| Value Types | Units | Base Units |
|-------------|-------|------------|
| Unit Setu   | au    |            |



## **Verify Value Types**

- 1. Click the Value Types tab.
- **2.** Click the Values types pull-down menu to show the available value types.

| Value Types | Units Base Units                              |
|-------------|-----------------------------------------------|
| Value T     | ype Setup                                     |
| Edit        | Add Delete                                    |
|             |                                               |
| Value types | Apparent Power Demand 💌                       |
|             | Apparent Power Demand                         |
| value type  | Reactive Energy Exported                      |
|             | Reactive Energy Imported                      |
|             | Reactive Energy Net<br>Reactive Power Demand  |
|             | Reactive Power Demand<br>Real Energy Exported |
| Consumptio  | Real Energy Imported                          |
| Doman       | Real Energy Net                               |
|             | Real Power Demand                             |

3. Verify that all value types required appear in the list.

You'll need to create the value types that don't appear in the FactoryTalk EnergyMetrix list. For the <u>Efficient</u> <u>Industries Plant 1</u> example, you'll need to create these value types:

- Fuel Oil Usage
- Propane Usage
- Water Usage
- Natural Gas Usage
- Steam Usage
- Air Usage

## **Create Value Types**

1. Click Add on the Value Types tab.

| Value T  | pes Units Base Units       |
|----------|----------------------------|
|          | Type Setup                 |
| value    | : Type Setup               |
|          | $\bigcirc$                 |
| Edit     | Add Delete                 |
|          |                            |
| Value Mr | es Apparent Power Demand 🔻 |
| -        |                            |
| Value 1  | lypes                      |
| N        | lame Apparent Power Demand |
|          | Unit KVA                   |
| Consum   | ntion <b>F</b>             |

2. Enter a name for the value type.

In this example, enter Fuel Oil Usage. This value type is used for the Fuel Oil Meter.

3. Choose a Unit.

For this example, select Gal.

4. Check Consumption and/or Demand.

For this example, only Consumption will be logged for the Fuel Oil, Propane, Water, Natural Gas, Steam, and Air meters. Demand is typically associated only with electric meters.

- 5. Click Save.
- 6. Repeat steps 1...4 to add value types for:
  - Propane Usage
  - Water Usage
  - Natural Gas Usage
  - Steam Usage
  - Air Usage

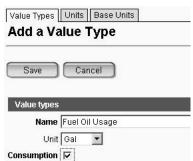
Enter the settings from the table for each value type.

When done, the new value types should appear in the list.

| Value Type Name   | Unit | Consumption | Demand  |
|-------------------|------|-------------|---------|
| Propane Usage     | Gal  | Check       | Uncheck |
| Water Usage       | Gal  | Check       | Uncheck |
| Natural Gas Usage | thm  | Check       | Uncheck |
| Steam Usage       | lbs  | Check       | Uncheck |
| Air Usage         | cf   | Check       | Uncheck |

| Value Types | Units | Base Units |  |
|-------------|-------|------------|--|
| Value Ty    | /pe S | etup       |  |

| Edit         | Add Dele                 | te |
|--------------|--------------------------|----|
| Value types  | Air Usage                | •  |
| ) falua trav | Air Usage                | -  |
| value type   | Apparent Power Demand    |    |
| Nam          | Fuel Oil Usage           | 1  |
|              | Natural Gas Usage        | 1  |
| Ur           | Propane Usage            |    |
| C            | Reactive Energy Exported |    |
| Consumptio   | Reactive Energy imponed  |    |
| Demar        | Reactive Energy Net      | _  |
|              | Reactive Power Demand    |    |
|              | Real Energy Exported     |    |
|              | Real Energy Imported     | -  |



Demand 🗖

# **Energy Electric Add-On Instructions**

This appendix describes the behavior of the Energy\_Electric\_Digital, Energy\_Electric\_Analog, and Energy\_Electric\_PM\_Status Add-On Instructions. It is provided to help you understand the output values and calculations methods. It also provides information you need to adjust consumption rollover values, and interval timer presets. Tag names for end of demand intervals from a utility meter or central controller are also included.

The Add-On Instructions perform four functions.

- Calculate the total electric consumption, kWh, for the metered input. This value is stored is the in Add-On Instruction output, Val\_Total\_kWh.
- Calculate the demand for the metered input over a user-defined interval.
- Provide the Equipment Status Faceplate, total Val\_Total\_kWh, Val\_Demand\_Electric, and Demand\_Interval\_PLC\_Timer.ACC values with the predefined device status information.
- Provide the Alarm History Faceplate information needed to display predefined alarm messages based on the device status.

## **CompactLogix Digital Input Logic**

The following logic is included in the Energy\_Electric\_Digital Add-On Instructions to calculate the total kWh electric consumption from a CompactLogix digital input.

The Inp\_Pulse tag initiates a total kWh computation. Every time a pulse is triggered, the logic adds the value of the Set\_Meter\_Pulse\_Factor tag to the Val\_Total\_kWh (total consumption) tag. The Inp\_Pulse tag is assigned to a CompactLogix digital input and the Set\_Meter\_Pulse\_Factor is entered when the Add-On Instruction is added to your program.

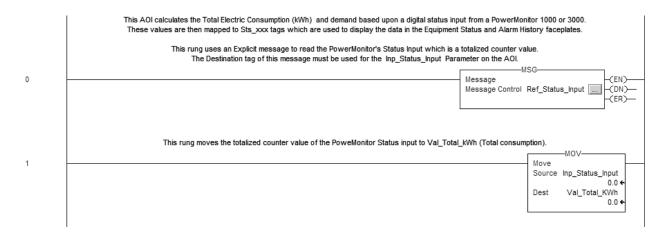
When the total kWh value reaches 10 million, the rollover rung resets the Val\_Total\_kWh value.

| 0 | Totalizer Rung This rung monitors for an input pulse and then adds the value of the Set_Meter_Pulse Factor to the Val_Total_KWh tag to keep a running total (h By default, 1 pulse = 1Kwh. Use the Set_Meter_Pulse_Factor as a scale to adjust the value of 1 pulse. Inp_Pulse Storage1 Add Source A Source F Dest | ADD<br>A Set_Meter_Pulse_Factor<br>1.0 |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|
| 1 | 0.0 ←<br>Source B 10000000                                                                                                                                                                                                                                                                                         |                                        |

## **PowerMonitor Digital Status Input Logic**

The following logic is included in the Energy\_Elecric\_PM\_Status Add-On Instruction to read the kWh value from a PowerMonitor status input.

An explicit message reads the status inputs from the PowerMonitor 1000, 3000, or 5000 device. A PLC-5 Typed Read message is configured to read one of the status inputs when adding the Add-On Instruction to your logic. Refer to <u>page 326</u> for details on configuring the message instruction. The destination tag of the message must be input back into the instruction through the Inp\_Status\_Input tag. The PowerMonitor status inputs are counters that total the number of incoming digital pulses. Additional logic is not required to calculate total consumption as the digital pulse is scaled in the advanced device parameters of the PowerMonitor. The Inp\_Status\_Input value is moved to the Val\_Total\_kWh tag.



### CompactLogix Analog Input Logic

The following logic is included in the Energy\_Electric\_Analog Add-On Instructions to calculate the total kWh electric consumption from a CompactLogix analog input.

The Inp\_Meter\_Analog\_Value tag is the instantaneous electric value from the CompactLogix analog input. To calculate total kWh, the instantaneous electric value is calculated every 250 ms and stored as Buffered\_Flow. This value is then included in the Val\_Total\_kWh, total consumption. For very small instantaneous values, a comparison between the new Val\_Total\_kWh and the previous Val\_Total\_kWh (Temp\_Buffer) is performed by using the NEQ instruction. If the two values are not equal the Buffer\_Flow is cleared.

When the total value equals 10 million, the rollover rung resets the Val\_Total\_kWh value.

|   | This AOI calculates the total electric consumption (kWh) and I<br>These values are then mapped to Sts_xxx tags which are used to display the o                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                    |
|---|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|   | Instantaneous Flow Calcul<br>These rungs calculate the additional totalized flow that ca                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                    |
| 0 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Timer On Delay<br>Timer Totalized_Flow_Interval_Timer<br>Preset 250 (DN)-<br>Accum 0 (                                                                                                                                             |
| 1 | Additional Totalized Flow Cal<br>Every 250ms, the analog input is divided by 60sec, added to the buffered flo<br>Totalized_Flow_Interval_Timer.DN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                    |
| 2 | Val_Total (total consumption) is moved to temp buffer before being overwritten wi<br>Totalized_Flow_Interval_Timer.DN<br>] [                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | th the addition of the additional totalizd flow(Buffered_Flow).<br>Move<br>Source Val_Total_kWh<br>0.0 ←<br>Dest Temp_Buffer<br>0.0 ←<br>Dest Val_Total_kWh<br>0.0 ←<br>Dest Val_Total_kWh<br>0.0 ←<br>Dest Val_Total_kWh<br>0.0 ← |
| 3 | This rung clears the buffer to accomodate very small flows without the state of th | totalizer getting stuck due to data resolution issues.<br>Move<br>Source 0<br>Dest Buffered_Flow<br>0.0                                                                                                                            |
| 4 | GRT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | SUB<br>Subtract<br>Source A Val_Total_kWh<br>0.0 ¢<br>Source B 10000000                                                                                                                                                            |
|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Dest Val_Total_kWh<br>0.0 ←                                                                                                                                                                                                        |

#### **Demand Calculation Logic**

The following logic is included in the Energy\_Electric\_Digital, Energy\_Electric\_Analog, and Energy\_Electric\_PM\_Status Add-On Instructions for calculating electric demand, Val\_Demand\_Electric.

The end-of-demand interval is based on the Set\_End\_of\_Demand\_Interval\_Type that is set when configuring the Add-On Instruction.

- The first rung sets and runs the internal PLC timer based on the Set\_Demand\_Interval tag minute setting.
- The second rung sets and runs the Demand\_Interval\_Exceeded timer in case the end-of-demand utility contact or master end-of-demand command is not seen by the controller.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                             | Multiply<br>Source A                                                                                        |                                                                                                                                                                                                                                                                              |                                                                                                                                    |                                                                                            |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                             |                                                                                                             | Set_Demand_Interval                                                                                                                                                                                                                                                          | Timer On Delay<br>Timer Demand_Inte                                                                                                | erval PLC Timer                                                                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                             |                                                                                                             | 0.0 +                                                                                                                                                                                                                                                                        | Preset                                                                                                                             | 0 + (DN                                                                                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                             | Source B                                                                                                    | 60000                                                                                                                                                                                                                                                                        | Accum                                                                                                                              | 0 ←                                                                                        |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                             | Dest Deman                                                                                                  | d_Interval_PLC_Timer.PRE<br>0 ←                                                                                                                                                                                                                                              |                                                                                                                                    |                                                                                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                             |                                                                                                             | e EOI interval time has exceeded<br>put from the user (0-90 sec)                                                                                                                                                                                                             |                                                                                                                                    |                                                                                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                             | CPT                                                                                                         |                                                                                                                                                                                                                                                                              | TON                                                                                                                                | I                                                                                          |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Compute                                                                                                                                                                                                     |                                                                                                             |                                                                                                                                                                                                                                                                              | Timer On Delay                                                                                                                     | -< EN                                                                                      |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Dest                                                                                                                                                                                                        | Demai                                                                                                       | nd_Interval_Exceeded.PRE                                                                                                                                                                                                                                                     | Timer Demand_Int                                                                                                                   |                                                                                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Expression (Set Demar                                                                                                                                                                                       | nd Interval+(Set i                                                                                          | 0 <del>&lt;</del><br>Demand_Delay/60))*60000                                                                                                                                                                                                                                 | Preset<br>Accum                                                                                                                    | 0 ← (DN<br>0 ←                                                                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | L                                                                                                                                                                                                           |                                                                                                             |                                                                                                                                                                                                                                                                              | L                                                                                                                                  |                                                                                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Set_End_of_Demand_Inter                                                                                                                                                                                     | rval_Type is the v                                                                                          | ow the End of Interval (EOI ) is t<br>value that defines how the EOI tr<br>ic utility meter EOI contact (Inp_E                                                                                                                                                               | riggered. It is selected b                                                                                                         |                                                                                            |
| 2= An intern                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | e Set_End_of_Demand_Inter<br>= A local digital input conne<br>al PLC timer (Demand_Interv<br>i input(Cmd_Master_End_01                                                                                      | rval_Type is the v<br>ected to an electri<br>val_PLC_Timer) th<br>f_Demand_Interva                          | value that defines how the EOI tr<br>ic utility meter EOI contact (Inp_E<br>tat is typically used when an ele<br>a) typically from a central contro                                                                                                                          | riggered. It is selected b<br>ind_of_Demand_Utility_(<br>ectric utility meter EOI con<br>iller that is sed to synch                | Contact).<br>ntact is not available.                                                       |
| 2= An intern<br>= A Master command                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | e Set_End_of_Demand_Inter<br>= A local digital input conne<br>al PLC timer (Demand_Interv                                                                                                                   | rval_Type is the v<br>ected to an electri<br>val_PLC_Timer) th<br>f_Demand_Interva                          | value that defines how the EOI tr<br>ic utility meter EOI contact (Inp_E<br>tat is typically used when an ele<br>a) typically from a central contro                                                                                                                          | riggered. It is selected b<br>ind_of_Demand_Utility_(<br>ectric utility meter EOI con<br>iller that is sed to synch                | Contact).<br>ntact is not available.<br>ronize multiple electric n<br>nd_End_of_Demand_Int |
| 2= An interna<br>= A Master command<br>Equal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | e Set_End_of_Demand_Inter<br>= A local digital input conne<br>al PLC timer (Demand_Interv<br>input(Cmd_Master_End_01<br>EQUEQU                                                                              | rval_Type is the v<br>ected to an electri<br>val_PLC_Timer) th<br>f_Demand_Interv:                          | value that defines how the EOI tr<br>ic utility meter EOI contact (Inp_E<br>nat is typically used when an ele                                                                                                                                                                | riggered. It is selected b<br>ind_of_Demand_Utility_(<br>ectric utility meter EOI con<br>iller that is sed to synch                | Contact).<br>ntact is not available.<br>ronize multiple electric n                         |
| 2= An interna<br>= A Master command<br>Equal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | e Set_End_of_Demand_Inter<br>= A local digital input conne<br>al PLC timer (Demand_Interv<br>i input(Cmd_Master_End_01                                                                                      | rval_Type is the v<br>ected to an electri<br>val_PLC_Timer) th<br>f_Demand_Interv:                          | value that defines how the EOI tr<br>ic utility meter EOI contact (Inp_E<br>tat is typically used when an ele<br>a) typically from a central contro                                                                                                                          | riggered. It is selected b<br>ind_of_Demand_Utility_(<br>cctric utility meter EOI co-<br>liller that is sed to synch<br>contact Cr | Contact).<br>ntact is not available.<br>ronize multiple electric n<br>nd_End_of_Demand_Int |
| 2= An interna<br>= A Master command<br>Equal<br>Source A S                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <pre>set_End_of_Demand_Inter<br/>= A local digital input conne<br/>al PLC timer (Demand_Interv<br/>input(Cmd_Master_End_Of<br/>EQU<br/>et_End_of_Demand_Interva</pre>                                       | rvaLType is the v<br>ccted to an electri<br>al_PLC_Timer) th<br>f_Demand_Interva<br>al_Type<br>0 €          | value that defines how the EOI tr<br>ic utility meter EOI contact (inp_<br>lat is typically used when an ele<br>a) typically from a central contro<br>inp_End_of_Demand_Utility_C<br>Demand_Interval_Exceeded.D<br>Demand_Interval_Exceeded.D                                | riggered. It is selected b<br>ind_of_Demand_Utility_(<br>cctric utility meter EOI co-<br>liller that is sed to synch<br>contact Cr | Contact).<br>ntact is not available.<br>ronize multiple electric n<br>nd_End_of_Demand_Int |
| 2= An interna<br>= A Master command<br>Equal<br>Source A S<br>Source B<br>Equal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <pre>set_End_of_Demand_Inter<br/>= A local digital input conne<br/>al PLC timer (Demand_Intervi<br/>input(Cmd_Master_End_O1<br/>EQUet_End_of_Demand_Intervie<br/>et_End_of_Demand_Intervie<br/>EQUEQU</pre> | rva_Type is the v<br>scted to an electri<br>f_Demand_Interv<br>al_Type<br>0 ←                               | value that defines how the EOI tr<br>ic utility meter EOI contact (inp_E<br>a) trypically used when an ele<br>a) trypically from a central contro<br>inp_End_of_Demand_Utility_C<br>                                                                                         | riggered. It is selected b<br>ind_of_Demand_Utility_(<br>cctric utility meter EOI co-<br>liller that is sed to synch<br>contact Cr | Contact).<br>ntact is not available.<br>ronize multiple electric n<br>nd_End_of_Demand_Int |
| 2= An interna<br>= A Master command<br>Equal<br>Source A S<br>Source B<br>Equal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <pre>set_End_of_Demand_Inter<br/>= A local digital input conne<br/>al PLC timer (Demand_Interv<br/>input(Cmd_Master_End_Of<br/>EQU<br/>et_End_of_Demand_Interva</pre>                                       | rva_Type is the v<br>scted to an electri<br>al_PLC_Timer) th<br>f_Demand_Interv<br>0 ←<br>1<br>0 ←          | value that defines how the EOI tr<br>ic utility meter EOI contact (inp_<br>lat is typically used when an ele<br>a) typically from a central contro<br>inp_End_of_Demand_Utility_C<br>Demand_Interval_Exceeded.D<br>Demand_Interval_Exceeded.D                                | riggered. It is selected b<br>ind_of_Demand_Utility_(<br>cctric utility meter EOI co-<br>liller that is sed to synch<br>contact Cr | Contact).<br>ntact is not available.<br>ronize multiple electric n<br>nd_End_of_Demand_Int |
| 2= An interna<br>= A Master command<br>Equal<br>Source A S<br>Source B<br>Equal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <pre>set_End_of_Demand_Inter<br/>= A local digital input conne<br/>al PLC timer (Demand_Intervi<br/>input(Cmd_Master_End_O1<br/>EQUet_End_of_Demand_Intervie<br/>et_End_of_Demand_Intervie<br/>EQUEQU</pre> | rva_Type is the v<br>scted to an electri<br>f_Demand_Interv<br>al_Type<br>0 ←                               | value that defines how the EOI tr<br>ic utility meter EOI contact (inp_<br>lat is typically used when an ele<br>a) typically from a central contro<br>inp_End_of_Demand_Utility_C<br>Demand_Interval_Exceeded.D<br>Demand_Interval_Exceeded.D                                | riggered. It is selected b<br>ind_of_Demand_Utility_(<br>cctric utility meter EOI co-<br>liller that is sed to synch<br>contact Cr | Contact).<br>ntact is not available.<br>ronize multiple electric n<br>nd_End_of_Demand_Int |
| 2= An intern<br>= A Master command<br>Equal<br>Source A S<br>Source B<br>Equal<br>Source A S                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | ≥ Set_End_of_Demand_Inter<br>= A local digital input conne<br>a PLC timer (Demand_Interv<br>input(Cmd_Master_End_O1<br>EQU<br>et_End_of_Demand_Interva<br>EQU<br>et_End_of_Demand_Interva                   | rvaLType is the v<br>scted to an electri<br>f_Demand_Intervi<br>aLType<br>0 ←<br>1<br>Demand_Intervi<br>0 ← | value that defines how the EOI tr<br>ic utility meter EOI contact (inp_<br>lat is typically used when an ele<br>a) typically from a central contro<br>inp_End_of_Demand_Utility_C<br>Demand_Interval_Exceeded.D<br>Demand_Interval_Exceeded.D<br>emand_Interval_PLC_Timer.DN | iggered. It is selected b Ind_of_Demand_Utility_( ctric utility meter EOI cou- uiller that is sed to synch contact Cr IN           | Contact).<br>ntact is not available.<br>ronize multiple electric n<br>nd_End_of_Demand_Int |
| 2= An intern<br>= A Master command<br>Source A S<br>Source B<br>Equal<br>Source A S<br>Source B<br>Equal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <pre>set_End_of_Demand_Inter<br/>= A local digital input conne<br/>al PLC timer (Demand_Intervi<br/>input(Cmd_Master_End_O1<br/>EQUet_End_of_Demand_Intervie<br/>et_End_of_Demand_Intervie<br/>EQUEQU</pre> | rva_Type is the v<br>scted to an electri<br>f_Demand_Intervi<br>a_Type<br>0 ← 1<br>a_Type<br>0 ← 2          | value that defines how the EOI tr<br>ic utility meter EOI contact (inp_<br>lat is typically used when an ele<br>a) typically from a central contro<br>inp_End_of_Demand_Utility_C<br>Demand_Interval_Exceeded.D<br>Demand_Interval_Exceeded.D                                | iggered. It is selected b Ind_of_Demand_Utility_( ctric utility meter EOI cou- uiller that is sed to synch contact Cr IN           | Contact).<br>ntact is not available.<br>ronize multiple electric n<br>nd_End_of_Demand_Int |
| 2= An international for the second se | e Set_End_of_Demand_Inter<br>= A local digital input conne<br>al PLC timer (Demand_Interv<br>input(Cmd_Master_End_01<br>EQUEQU                                                                              | rval_Type is the v<br>ected to an electri<br>val_PLC_Timer) th<br>f_Demand_Interva<br>al_Type<br>0 €        | value that defines how the EOI tr<br>ic utility meter EOI contact (inp_E<br>a) trypically used when an ele<br>a) trypically from a central contro<br>inp_End_of_Demand_Utility_C<br>                                                                                         | riggered. It is selected b<br>ind_of_Demand_Utility_(<br>cctric utility meter EOI co-<br>liller that is sed to synch<br>contact Cr | Contact).<br>ntact is not ava<br>ronize multiple<br>md_End_of_De                           |

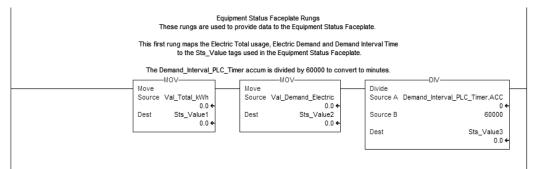
To calculate the electric demand, a MUL instruction converts the Set\_Demand\_Interval minutes to milliseconds for the preset used by the Demand\_Interval\_PLC\_Timer and Demand Interval\_Exceeded Timer. Once the Cmd\_End of\_Demand\_Interval is set, the Val\_Total\_kWh is compared to the previous interval's Val\_Total\_kWh, and the Val\_Demand\_Electric is calculated.

|                                                                                                 | End of Interval Rungs and Demand Ca<br>Set_Demand_Interval is an input from us<br>Val_Demand_Electric is Real Demar                                                                                             | er in Minutes                                                                                                                                                                                                                                                                                                                |
|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| If the value is greater than the prev<br>If the previous kWh value is greater than<br>The value | evious total, then the previous kWh is subtracted from t<br>Set_Demand_Interval to determine the                                                                                                                | unt and 10,000,000 is subtracted from the previous kWh total and<br>I<br>d_Interval to determine the Demand.                                                                                                                                                                                                                 |
|                                                                                                 | GRT<br>Greater Than (A>B)<br>Source A Val_Previous_KMh<br>0.0 €<br>Source B Val_Total_KWh<br>0.0 €<br>GEQ<br>Grtr Than or Ed( A>=B)<br>Source A Val_Previous_KWh<br>0.0 €<br>Source B Val_Previous_KWh<br>0.0 € | CPT<br>Val_Demand_Electric<br>0.0 ¢<br>((Val_Previous_KWh - 10000000)+Val_Total_KWh)*60/Set_Demand_Interval<br>CPT<br>Compute<br>Dest Val_Demand_Electric<br>0.0 ¢<br>Expression (Val_Total_KWh - Val_Previous_KWh)*60/Set_Demand_Interval<br>MOV<br>Move<br>Source Val_Total_KWh<br>0.0 ¢<br>Dest Val_Previous_KWh<br>0.0 ¢ |

#### **Equipment Status Faceplate Logic**

The following logic is included in the Energy\_Electric\_Digital, Energy\_Electric\_Analog, and Energy\_Electric\_PM\_Status Add-On Instructions to provide the Equipment Status Faceplate with electric consumption, demand, and device states.

This rung moves the Val\_Total\_*xxx* and Val\_Avg\_Flow\_*xxx* values to predefined tags in the Equipment Status Faceplate, Sts\_Value1 and Sts\_Value2.



The next four rungs monitor and send device status information to the Equipment Status Faceplate including Active, Fault, High Flow, and Critical Flow.

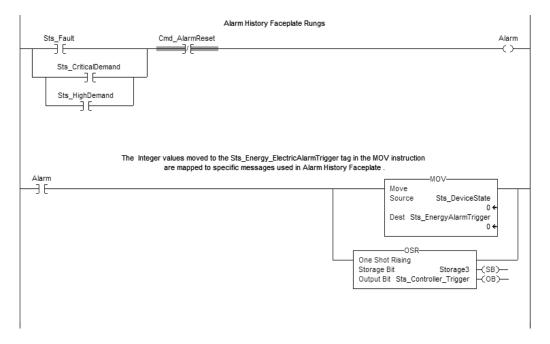
The Sts\_DeviceState tag is a predefined tag mapped to a multistate indicator in the Equipment Status Faceplate. Each device status state is triggered by a unique integer value preconfigured in the multistate indicator.

| The Integer values in the MOV instructions are mapped to specific states used in Equipment Status Faceplate's Multi State Indicat                     | or connected to the Sts_DeviceState tag.                           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|
| This rung move a 9, for an Active Status state, as long as there are no faults or High or Critical Dem<br>Sts_Fault Sts_CriticalDemand Sts_HighDemand | MOV-                                                               |
|                                                                                                                                                       | Move<br>Source 9                                                   |
|                                                                                                                                                       | Dest Sts_DeviceState<br>0 €                                        |
| This rung moves a 2, for a Fault state, if a fault occurs on the input module.                                                                        | MOV                                                                |
|                                                                                                                                                       | Move                                                               |
|                                                                                                                                                       | Source 2                                                           |
|                                                                                                                                                       | Dest Sts_DeviceState<br>0 ←                                        |
| This rung moves a 19, for a High Demand status state, if the High Demand value has been reached of Sts_Fault Sts_CriticalDemand Sts_HighDemand        | Move<br>Source 19                                                  |
|                                                                                                                                                       | Source 19                                                          |
|                                                                                                                                                       | Dest Sts_DeviceState<br>0 ←                                        |
| This rung moves a 20, for a Critical Demand status state, if the Critical Demand value has been reaches Sts_CriticalDemand Sts_Fault                  | d or exceeded.<br>Move<br>Source 20<br>Dest Sts_DeviceState<br>0 ← |

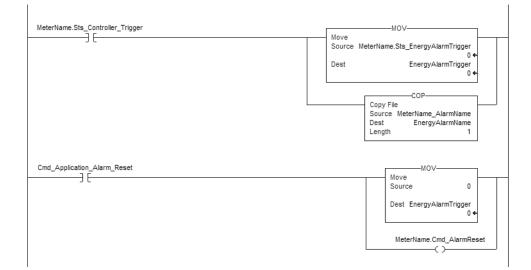
#### **Alarm History Faceplate Logic**

The following logic is included in the Energy\_Electric\_Digital, Energy\_Electric\_Analog, and Energy\_Electric\_PM\_Status Add-On Instructions to initiate an alarm trigger and send corresponding device state to the alarm trigger value.

The following two rungs monitor the Fault, High Flow, and Critical Flow bits, and send predefined integer values to the Sts\_Energy\_AlarmTrigger tags already configured in the Alarm History setup file. The Alarm History Faceplate uses these values to trigger the appropriate messages to show on the Alarm Display.



Additional rungs must be added to the main routine to reset the alarm trigger tags and the alarm messages. Refer to page 332 and page 333 for more details on the alarm history.



# **Digital and Analog Energy Add-On Instructions**

This appendix describes the behavior of all Digital and Analog Energy Add-On Instructions with the exception of the Energy\_Electric\_Analog or Energy\_Electric Digital Add-On Instructions, described in Appendix C.

The Digital and Analog Energy Add-On Instructions perform four functions.

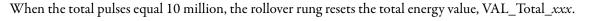
- A total consumption calculation for the metered input. This value is stored in the output, Val\_Total\_xxx.
- A consumption rate calculation for the metered input over a predefined interval set by the user. This value, also known as Average Flow rate, is stored in the output, Val\_xxx\_Per\_Calc\_Interval.
- Equipment Status Faceplate update of the energy total Val\_Total\_xxx, the flow rate (Val\_xxx\_Per\_Min or Val\_xxx\_Per\_Hr), and energy device status information.
- Alarm History Faceplate update of information needed to display predefined alarm messages based on the energy device status.

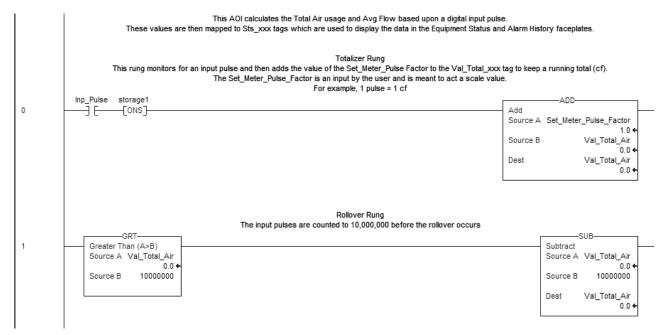
## **CompactLogix Digital Input Logic**

Logic is provided in all Energy\_*xxx*\_Digital Add-On Instructions to calculate energy consumption from CompactLogix digital inputs. The Inp\_Pulse tag initiates an energy computation, where 1 pulse = 1 (unit).

| Energy Add-On Instruction | Unit    |
|---------------------------|---------|
| Air_Flow                  | cf      |
| Fuel_Oil                  | gallons |
| Propane                   | gallons |
| Steam_Flow                | lbs     |
| Water_Flow                | gallons |

Every time a pulse is triggered, the logic adds the value of the Set\_Meter\_Pulse\_Factor tag to the Val\_Total\_*xxx* (total consumption) tag. The Set\_Meter\_Pulse\_Factor, is set by default to 1, but can be user-defined for scaling purposes.





#### PowerMonitor Digital Status Input Logic

The following logic is included in all Energy\_xxx\_PM\_Status Add-On Instructions to read the energy values from a PowerMonitor status input.

An explicit message reads the status inputs from the PowerMonitor 1000, 3000, or 5000 device. A PLC-5 Typed Read message is configured to read one of the status inputs when adding the Add-On Instruction to your logic. Refer to <u>page 326</u> for details on configuring the message instruction. The destination tag of the message must be input back into the instruction through the Inp\_Status\_Input tag. The PowerMonitor status inputs are counters that total the number of incoming digital pulses. No additional logic is required to calculate total consumption as the digital pulse is scaled in the advanced parameters of the PowerMonitor. The Inp\_Status\_Input value is simply moved to the Val\_Total\_xxx tag (Total Consumption).

|   | This AOI calculates the Total Air usage and Avg Flow based upon a digital status input from a PowerMonitor 10<br>These values are then mapped to Sts_xxx tags which are used to display the data in the Equipment Status and Alarm |                                                                 |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
|   | This rung uses an Explicit message to read the PowerMonitor's Status Input which is a totalized counter v<br>The Destination tag of this message must be used for the Inp_Status_Input Parameter on the AOI.                       | alue.                                                           |
| 0 | Message                                                                                                                                                                                                                            | Ref_Status_Input (EN)                                           |
|   |                                                                                                                                                                                                                                    |                                                                 |
| 1 | This rung moves the totalized counter value of the PoweMonitor Status input to Val_Total_Air (Total consump                                                                                                                        | Move                                                            |
|   |                                                                                                                                                                                                                                    | Source Inp_Status_Input<br>0.0 ←<br>Dest Val_Total_Air<br>0.0 ← |
|   |                                                                                                                                                                                                                                    |                                                                 |

### CompactLogix Analog Input Logic

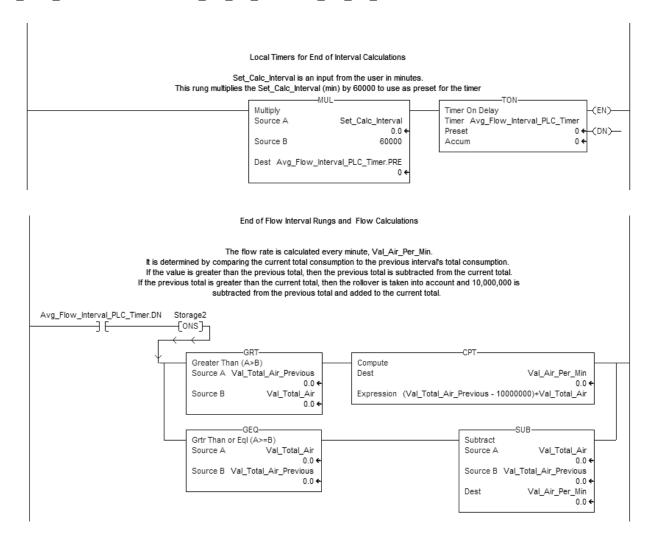
The following Logic is provided in all the Energy\_xxx\_Analog Add-On Instructions to calculate energy consumption from corresponding CompactLogix analog inputs. The Inp\_Meter\_Analog\_Value tag is the instantaneous energy flow value from the CompactLogix analog input.

To calculate total flow, an instantaneous flow value is calculated every 250 ms and is stored as Buffered\_Flow. This value is then included in the Val\_Total\_xxx, total consumption. For very small instantaneous flows, a comparison between the new Val\_Total\_xxx and the previous Val\_Total (Temp\_Buffer) is performed by using the NEQ instruction. If the two values are not equal the Buffer\_Flow is cleared.

When the total value equals 10 million, the rollover rung resets the total energy value, Val\_Total\_xxx.

|   | This AOI calculates the Total Flow and Avg Flow<br>These values are then mapped to Sts_xxx tags which are used to display the o |                                          | History faceplates.                       |
|---|---------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|-------------------------------------------|
|   | Instantaneous Flow Calcul                                                                                                       |                                          |                                           |
|   | These rungs calculate the additional totalized flow that ca                                                                     | n occur during a set 250ms interval.     |                                           |
| 0 |                                                                                                                                 | Timer On Dela                            |                                           |
|   |                                                                                                                                 |                                          | ed_Flow_Interval_Timer                    |
|   |                                                                                                                                 | Preset                                   | 250 + (DN)-                               |
|   |                                                                                                                                 | Accum                                    | 0 ←                                       |
|   |                                                                                                                                 |                                          |                                           |
|   |                                                                                                                                 |                                          |                                           |
|   | Additional Totalized Flow Cal                                                                                                   |                                          | inlind by 250mg                           |
|   | Every 250ms, the analog input is divided by 60sec, added to the buffered flo<br>Totalized_Flow_Interval_Timer.DN                | CPT-CPT-                                 | upiled by 250ms.                          |
| 1 |                                                                                                                                 | Compute                                  |                                           |
|   |                                                                                                                                 | Dest                                     | Buffered_Flow                             |
|   |                                                                                                                                 | Expression Buffered_Flow +((Inp_!        | 0.0 <del>&lt;</del>                       |
|   |                                                                                                                                 | Expression Burlered_now ((inp_           | inclui_Analog_valacion/.2007              |
|   |                                                                                                                                 |                                          |                                           |
|   |                                                                                                                                 |                                          |                                           |
|   | Val_Total (total consumption) is moved to temp buffer before being overwritten wi<br>Val Total Air is total consum              |                                          | flow(Buffered_Flow).                      |
|   | Totalized_Flow_Interval_Timer.DN                                                                                                | MOV-                                     | ADD-                                      |
| 2 | ][                                                                                                                              | Move                                     | Add                                       |
|   |                                                                                                                                 | Source Val_Total_Air                     | Source A Buffered_Flow                    |
|   |                                                                                                                                 | 0.0 ←<br>Dest Temp_Buffer                | 0.0 ←<br>Source B Val_Total_Air           |
|   |                                                                                                                                 | 0.0                                      | 0.0 +                                     |
|   |                                                                                                                                 |                                          | Dest Val_Total_Air                        |
|   |                                                                                                                                 |                                          | 0.0 ←                                     |
|   |                                                                                                                                 |                                          |                                           |
|   |                                                                                                                                 |                                          |                                           |
|   | This rung clears the buffer to accomodate very small flows without the                                                          | totalizer getting stuck due to data reso |                                           |
| 3 | Totalized_Flow_Interval_Timer.DNNEQNot Equal                                                                                    |                                          | Move                                      |
| 5 | Source A Val_Total_Air                                                                                                          |                                          | Source 0                                  |
|   | 0.0 ←                                                                                                                           |                                          |                                           |
|   | Source B Temp_Buffer<br>0.0                                                                                                     |                                          | Dest Buffered_Flow<br>0.0 <del>&lt;</del> |
|   | Rollover Rung                                                                                                                   |                                          | 0.04                                      |
|   | GRT                                                                                                                             |                                          | SUB                                       |
| 4 | Greater Than (A>B)                                                                                                              |                                          | Subtract                                  |
|   | Source A Val_Total_Air                                                                                                          |                                          | Source A Val_Total_Air                    |
|   | 0.0 🗲                                                                                                                           |                                          | 0.0 ←                                     |
|   | Source B 10000000                                                                                                               |                                          | Source B 1000000                          |
|   |                                                                                                                                 |                                          | Dest Val Total Air                        |
|   |                                                                                                                                 |                                          | 0.0 <del>C</del>                          |
|   |                                                                                                                                 |                                          |                                           |

To calculate the average flow rate, Val\_*xxx*\_Per\_Calc\_Interval, the logic uses the Set\_Calc\_Interval, in minutes, to configure the sample interval. A MUL instruction converts the sample interval in minutes to milliseconds for the Avg\_Flow\_Interval\_PLC\_Timer preset. At the end of interval, Val\_Total\_*xxx* is compared to the previous interval's Val\_Total\_*xxx* and the flow rate, Val\_*xxx*\_Per\_Min or Val\_*xxx*\_Per\_Hr, is calculated.



The average flow rate, Val\_xxx\_Per\_Calc\_Interval, is calculated by dividing the flow rate (in minutes) by the Set\_Calc\_Interval, which you previously entered.

| The avg flow rate, Val_Air_Per_Calc_Interval is calculated by<br>Val_Air_Per_Min / Set_Calc |                                                                                                             |
|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Avg_Flow_Interval_PLC_Timer.DN                                                              | CPT<br>Compute<br>Dest Val_Air_Per_Calc_Interval<br>0.0 ←<br>Expression Val_Air_Per_Min / Set_Calc_Interval |

### **Equipment Status Faceplate Logic**

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The following logic is included all digital and analog energy Add-On Instructions to provide the Equipment Status Faceplate with energy consumption, flow, and device states.

The following rung moves the Val\_Total\_*xxx* and Val\_*xxx*\_Per\_Min or Val\_*xxx*\_Per\_Hr values to the predefined tags in the Equipment Status Faceplate, Sts\_Value1 and Sts\_Value2.

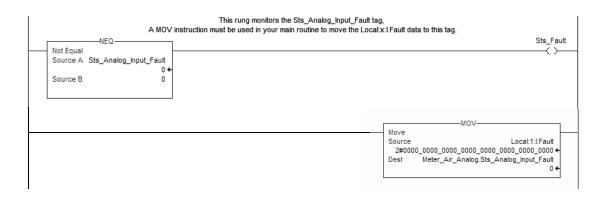
| Equipment Status Faceplate Rungs<br>These rungs are used to provide data to the Equipment Status Faceplate.<br>This first rung maps the Air Total (Consumption) and Flow Rate to the Sts_Value tags used in the Equipment Status Faceplate. |  |  |  |  |  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--|--|
|                                                                                                                                                                                                                                             |  |  |  |  |  |

The next four rungs monitor and send device status information to the Equipment Status Faceplate including Active, Fault, High Flow, and Critical Flow.

The Sts\_DeviceState tag is a predefined tag mapped to a multistate indicator in the Equipment Status Faceplate. Each device status state is triggered by a unique integer value preconfigured in the multistate indicator.

| The Integer values in the MOV instructions are mapped to specific states used in Equipment Status Faceplate's Multi State Indicator connect             | ted to the Sts_DeviceState tag.                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
| This rung move a 9, for an Active Status state, as long as there are no faults or High or Critical Flow states. Sts_Fault Sts_CriticalFlow Sts_HighFlow | MOV<br>Source 9<br>Dest Sts_DeviceState<br>0 ← |
| This rung moves a 2, for a Fault state, when a fault occurs on the input module.                                                                        | MOV                                            |
|                                                                                                                                                         | Move<br>Source 2<br>Dest Sts_DeviceState       |
| This rung moves a 21, for a High Flow status state, if the High Flow limit has been reached or exceeded.                                                | 0 €                                            |
| Sts_Fault_Sts_CriticalFlow Sts_HighFlow                                                                                                                 | Move<br>Source 21<br>Dest Sts DeviceState      |
|                                                                                                                                                         |                                                |
| This rung moves a 22, for a Critical Flow status state, if the Critical Flow limited has been reached or exceeder<br>Sts_CriticalFlow Sts_Fault         | Move                                           |
|                                                                                                                                                         | Source 22 Dest Sts_DeviceState                 |
|                                                                                                                                                         |                                                |

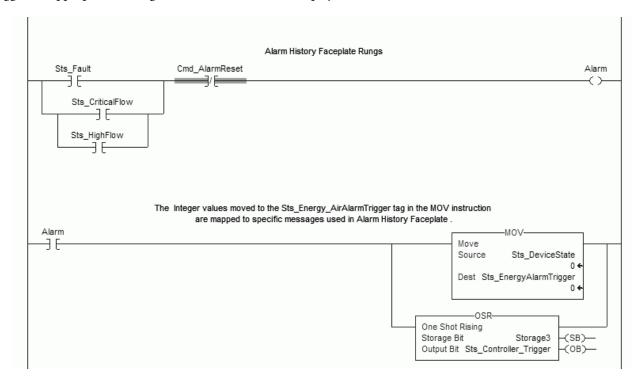
The additional input fault logic added on page 332 is used to move the Local:x:I.Fault data to the Sts\_xxx\_Input\_Fault tag of the Add-On Instruction.

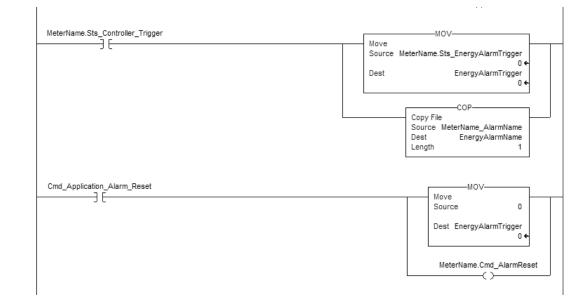


#### **Alarm History Faceplate Logic**

The following logic is included all digital and analog energy Add-On Instructions to initiate an alarm trigger and send the corresponding device state to the alarm trigger value.

The following two rungs monitor the Fault, High Flow, and Critical Flow bits and send predefined integer values to the Sts\_EnergyAlarmTrigger tags configured in the Alarm History setup file. The Alarm History Faceplate uses these values to trigger the appropriate messages to show on the Alarm Display.





Additional rungs must be added to the main routine to reset the alarm trigger tags and the alarm messages. Refer to page 332 and page 333 for more details on the alarm history.

## Notes:

# **Update Add-on Profiles**

#### Update the E3PLUS Add-On Profiles

The E3 Plus Add-On Profiles are independent of RSLogix 5000 software releases. Update your E3 Plus Add-On Profiles to make sure your application runs correctly. Add-On Profiles are available for download at the RSLogix 5000 Add-On Profiles website:

https://download.rockwellautomation.com/esd/download.aspx?downloadid=addonprofiles

- Select the AOP for RA E3 Plus 193-DNENCAT(R) profile.
- Click the Download Now button and follow instructions.

| 5XRF_IN MultiSight RFID Interface | 1.02.05 | 2012/08/20 | 1 | 6.48 MB  | 15.00.00 - Minimum RSLogix<br>5000 Software Revision                                                           |
|-----------------------------------|---------|------------|---|----------|----------------------------------------------------------------------------------------------------------------|
| 842E Ethernet/IP Encoders         | 2.01.26 | 2012/08/20 | 1 | 28.73 MB | 18.00.00 - Minimum RSLogix<br>5000 Software Revision                                                           |
| RA E1 Plus                        | 1.01.00 | 2012/08/20 | 1 | 27.86 MB | 15.00.00 - Minimum RSLogix<br>5000 Software Revision                                                           |
| RA E3 Plus via 2100-ENET          | 1.01.02 | 2012/08/20 | ۲ | 70.71 MB | 17.00.00 - Minimum RSLogix<br>5000 Software Revision                                                           |
| RA E3 Plus 193-DNETCAT(R)         | 1.01.04 | 2012/08/20 | 1 | 27.85 MB | 17.00.00 - Minimum RSLogix<br>5000 Software Revision                                                           |
| 1756-IB, LS, OB Apex I/O          | 2.03.12 | 2012/08/21 | Þ | 65.1 MB  | 20.00.00 - Minimum RSLogix<br>5000 Software Revision.<br>AOP for 1756-IB16IF, 1756-<br>LSC8XIB8I, 1756-OB16IEF |
| Drives - PowerFlex / SCANport     | 4.04.01 | 2012/09/05 | 1 | 247 MB   | 16.00.00 - Minimum RSLogix<br>5000 Software Revision                                                           |

### Update the SMC-50 Add-On Profiles

The SMC-50 Add-On Profiles are independent of RSLogix 5000 software releases. Update your SMC-50 Add-On Profiles to make sure your application runs correctly. Add-On Profiles are available for download at the RSLogix 5000 Add-On Profiles website:

https://download.rockwellautomation.com/esd/download.aspx?downloadid=addonprofiles

- Select the AOP for Drives-PowerFlex/SCANport profile which includes SMC profiles.
- Click the Download Now button and follow instructions.

|   | AOP for 280E,281E,284E ArmorStart<br>ENet   | 1.04.03 | 2012/08/20 | 1         | 78.69 MB | 17.00.00 - Minimum RSLogic<br>5000 Software Revision |
|---|---------------------------------------------|---------|------------|-----------|----------|------------------------------------------------------|
|   | AOP for 290E, 291E, 294E<br>ArmorStart LT   | 2.01.02 | 2012/08/20 | <b>11</b> | 82.11 MB | 17.00.00 - Minimum RSLogix<br>5000 Software Revision |
|   | AOP for 48MS MultiSight ENet Vision<br>Sens | 1.01.19 | 2012/08/20 | -         | 6.48 MB  | 15.00.00 - Minimum RSLogix<br>5000 Software Revision |
|   | AOP for SXRF_IN MultiSight RFID<br>Interfac | 1.02.05 | 2012/08/20 | 1         | 6.48 MB  | 15.00.00 - Minimum RSLogio<br>5000 Software Revision |
|   | AOP for 842 Ethernet/IP Encoders            | 2.01.26 | 2012/08/20 | 1         | 28.73 MB | 18.00.00 - Minimum RSLogix<br>5000 Software Revision |
|   | AOP for Drives-PowerFlex 755/CIP<br>Motion  | 8.01.00 | 2012/08/20 | -         | 62.92 MB | 19.00.00 - Minimum RSLogix<br>5000 Software Revision |
|   | AOP for RA E1 Plus                          | 1.01.00 | 2012/08/20 | -         | 27.86 MB | 15.00.00 - Minimum RSLogix<br>5000 Software Revision |
|   | AOP for RA E3 Plus via 2100-ENET            | 1.01.02 | 2012/08/20 | HE)       | 70.77 MB | 17.00.00 - Minimum RSLogix<br>5000 Software Revision |
|   | AOP for E3 Plus 193-DNETCAT(R)              | 1.01.04 | 2012/08/20 | -         | 27.85 MB | 17.00.00 - Minimum RSLogix<br>5000 Software Revision |
| • | AOP for Drives-PowerFlex/SCANport           | 4.04.01 | 2012/09/05 | -         | 247 MB   | 16.00.00 - Minimum RSLogix<br>5000 Software Revision |
|   | AOP for RA1769Analog                        | 8.04.00 | 2012/09/12 |           | 73.42 MB | 13.04.00 - Minimum RSLogix<br>5000 Software Revision |
|   | AOP for 1788-CN2FFR                         | 1,01.16 | 2012/10/25 | -         | 78.86 MB | 15.00.00 - Minimum RSLogix<br>5000 Software Revision |
|   | AOP for 1788-EN2FFR                         | 1.01.16 | 2012/10/25 | 12        | 78.81 MB | 15.00.00 - Minimum RSLogix<br>5000 Software Revision |
|   | AOP for 1788-CN2PAR                         | 2.01.01 | 2012/10/25 |           | 76.8 MB  | 16.00.00 - Minimum RSLogix<br>5000 Software Revision |
|   | AOP for 1788-EN2PAR                         | 2.01.01 | 2012/10/25 | -         | 76.8 MB  | 16.00.00 - Minimum RSLogb                            |

### Update the PowerFlex Add-On Profiles

The PowerFlex Add-On Profiles are independent of RSLogix 5000 software releases. Update your PowerFlex Add-On Profiles to make sure your application runs correctly. Add-On Profiles are available for download at the RSLogix 5000 Add-On Profiles website:

https://download.rockwellautomation.com/esd/download.aspx?downloadid=addonprofiles

- Select the AOP for Drives-PowerFlex / SCANport profile.
- Click the Download Now button and follow instructions.

|   | AOP for 280E,281E,284E ArmorStart<br>ENet   | 1.04.03 | 2012/08/20 | -         | 78.69 MB | 17.00.00 - Minimum RSLogix<br>5000 Software Revision |
|---|---------------------------------------------|---------|------------|-----------|----------|------------------------------------------------------|
|   | AOP for 290E, 291E, 294E<br>ArmorStart LT   | 2.01.02 | 2012/08/20 | <b>11</b> | 82.11 MB | 17.00.00 - Minimum RSLogix<br>5000 Software Revision |
|   | AOP for 48MS MultiSight ENet Vision<br>Sens | 1.01.19 | 2012/08/20 | -         | 6.48 MB  | 15.00.00 - Minimum RSLogix<br>5000 Software Revision |
|   | AOP for SXRF_IN MultiSight RFID<br>Interfac | 1.02.05 | 2012/08/20 | 1         | 6.48 MB  | 15.00.00 - Minimum RSLogix<br>5000 Software Revision |
|   | AOP for 842 Ethernet/IP Encoders            | 2.01.26 | 2012/08/20 | 1         | 28.73 MB | 18.00.00 - Minimum RSLogbo<br>5000 Software Revision |
|   | AOP for Drives-PowerFlex 755/CIP<br>Motion  | 8.01.00 | 2012/08/20 | -         | 62.92 MB | 19.00.00 - Minimum RSLogix<br>5000 Software Revision |
|   | AOP for RA E1 Plus                          | 1.01.00 | 2012/08/20 | -         | 27.86 MB | 15.00.00 - Minimum RSLogix<br>5000 Software Revision |
|   | AOP for RA E3 Plus via 2100-ENET            | 1.01.02 | 2012/08/20 | 111 I     | 70.77 MB | 17.00.00 - Minimum RSLogix<br>5000 Software Revision |
|   | AOP for E3 Plus 193-DNETCAT(R)              | 1.01.04 | 2012/08/20 | -         | 27.85 MB | 17.00.00 - Minimum RSLogio<br>5000 Software Revision |
| • | AOP for Drives-PowerFlex/SCANport           | 4.04.01 | 2012/09/05 | -         | 247 MB   | 16.00.00 - Minimum RSLogix<br>5000 Software Revision |
|   | AOP for RA1769Analog                        | 8.04.00 | 2012/09/12 | 1         | 73.42 MB | 13.04.00 - Minimum RSLogix<br>S000 Software Revision |
|   | AOP for 1788-CN2FFR                         | 1,01.16 | 2012/10/25 | -         | 78.86 MB | 15.00.00 - Minimum RSLogix<br>5000 Software Revision |
|   | AOP for 1788-EN2FFR                         | 1.01.16 | 2012/10/25 | 12        | 78.81 MB | 15.00.00 - Minimum RSLogix<br>5000 Software Revision |
|   | AOP for 1788-CN2PAR                         | 2.01.01 | 2012/10/25 |           | 76.8 MB  | 16.00.00 - Minimum RSLogix<br>5000 Software Revision |
|   | AOP for 1788-EN2PAR                         | 2.01.01 | 2012/10/25 |           | 76.8 MB  | 16.00.00 - Minimum RSLogb                            |

### Update the E300 Add-On Profiles

An Add-On Profile is available for the E300 Overload Relay EtherNet/IP Communication Module. The profile can be downloaded from:

https://download.rockwellautomation.com/esd/download.aspx?downloadid=addonprofiles.

- Select the AOP for 193-ECM-ETR E300 Ethernet Overload Relay profile.
- Click the Download Now button and follow instructions.

|   | 1440 DYN02-01RJ XM Module                   | 2 02 04 | 2012/02/01 | -          | 34 72 MB | 16.00.00 - Minimum RSLogiz                                                                         |
|---|---------------------------------------------|---------|------------|------------|----------|----------------------------------------------------------------------------------------------------|
|   | PSSCENA - Parker Isysnet™<br>Ethernet Adapt | 3.03.01 | 2014/07/18 | <b>B</b> ) | 33 MB    | 17.00.00 - Minimum RSLogix<br>5000 Software Revision                                               |
| • | 193-ECM-ETR E300 Ethernet<br>Overload Relay | 2.00.11 | 2014/07/17 | ٢          | 77.2 MB  | 17.00.00 Minimum RSLogix<br>5000 Software Revision.<br>Minimum Module/ Firmware<br>Revision is 1.0 |
|   | PowerFlex 525 & PowerFlex 523               | 1.04.00 | 2014/06/20 | 1          | 480 MB   | 17.00.00 - Minimum RSLogix<br>5000 Software Revision                                               |
|   | Stratix 5700/8000/8300 Switches<br>6.07.001 | 6.07.01 | 2014/06/12 | 9          | 79.85 MB | Added Power over Ethernet.<br>16.00.00 Minimum RSLogix<br>5000 Software Revision.                  |

#### **Rockwell Automation Support**

Rockwell Automation provides technical information on the Web to assist you in using its products. At <u>http://www.rockwellautomation.com/support</u> you can find technical and application notes, sample code, and links to software service packs. You can also visit our Support Center at <u>https://rockwellautomation.custhelp.com/</u> for software updates, support chats and forums, technical information, FAQs, and to sign up for product notification updates.

In addition, we offer multiple support programs for installation, configuration, and troubleshooting. For more information, contact your local distributor or Rockwell Automation representative, or visit <a href="http://www.rockwellautomation.com/services/online-phone">http://www.rockwellautomation.com/services/online-phone</a>.

#### Installation Assistance

If you experience a problem within the first 24 hours of installation, review the information that is contained in this manual. You can contact Customer Support for initial help in getting your product up and running.

| United States or Canada | 1.440.646.3434                                                                                                                                                                    |
|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                         | Use the <u>Worldwide Locator</u> at <u>http://www.rockwellautomation.com/rockwellautomation/support/overview.page</u> , or contact your local Rockwell Automation representative. |

#### **New Product Satisfaction Return**

Rockwell Automation tests all of its products to help ensure that they are fully operational when shipped from the manufacturing facility. However, if your product is not functioning and needs to be returned, follow these procedures.

| United States         | Contact your distributor. You must provide a Customer Support case number (call the phone number above to obtain one) to your distributor to complete the return process. |
|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Outside United States | Please contact your local Rockwell Automation representative for the return procedure.                                                                                    |

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