

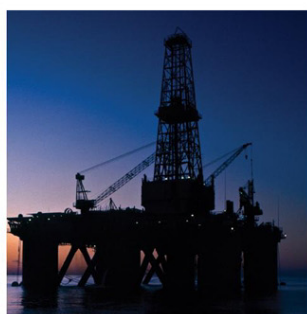
Reference Manual

Original Instructions

PlantPAX
Distributed Control System

Rockwell Automation Library of Electrical Protection Devices

Version 5.0



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.

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



WARNING: Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.



ATTENTION: Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence.

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.



SHOCK HAZARD: Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.



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).

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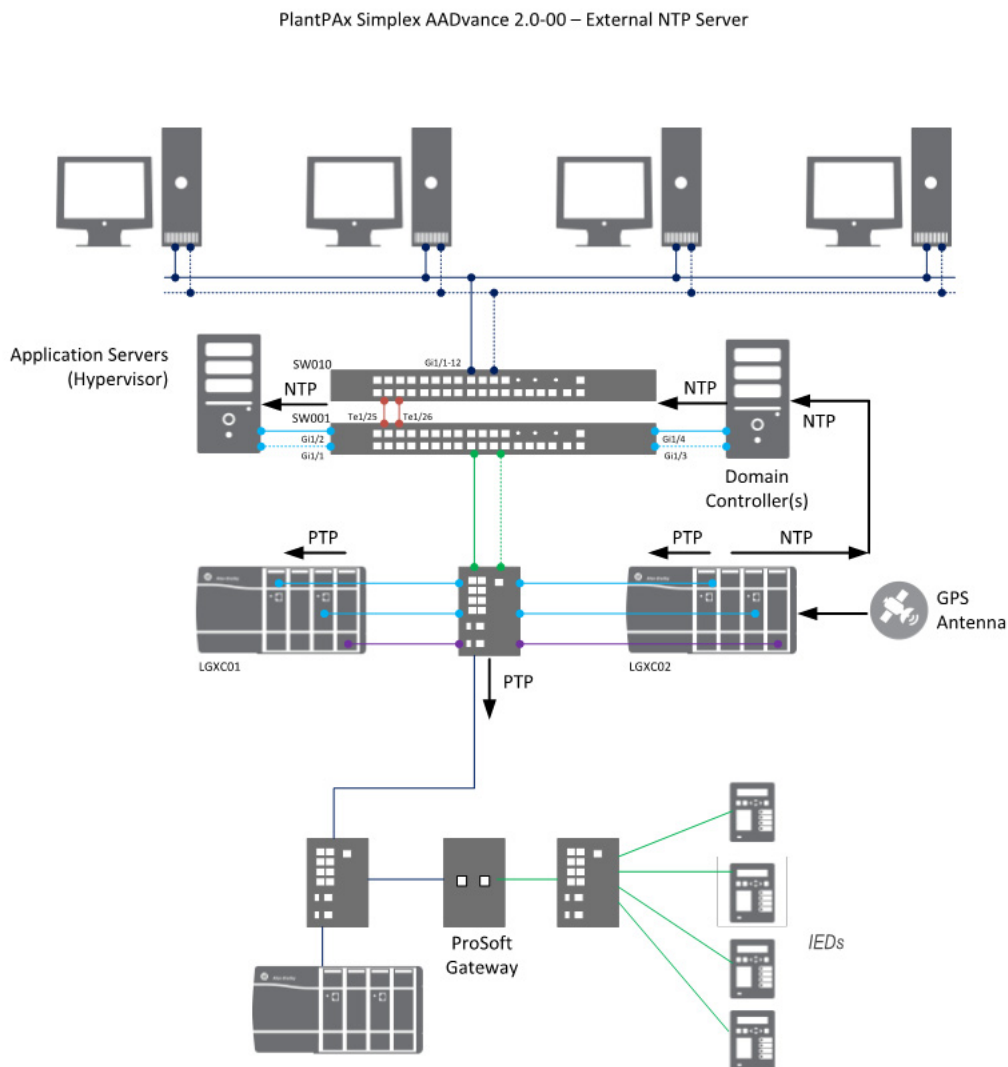
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Notes:

This manual describes how to configure the Add-On Instructions and visualization objects to integrate electrical protection devices by using IEC 61850 or EtherNet/IP™ connectivity within the PlantPAx® System.

The files that are required to configure the electrical protection devices can be downloaded from the Product Compatibility and Download Center (PCDC) at <http://compatibility.rockwellautomation.com/Pages/home.aspx>.

Figure 1 - PlantPAx System.



See [Chapter 1](#) for more information on the IEC61850 standard.

New and Updated Information

This manual contains new and updated information as indicated in the following table.

Topic	Page
Added SEL 351 Object	page 65
Added SEL 411L Object	page 79
Added SEL 421 Object	page 93
Added SEL 451 Object	page 105
Added SEL 487B Object	page 119
Added SEL 735 Object	page 165
Added SEL 751 Object	page 177

Additional Resources

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

Resource	Description
PlantPAx Distributed Control System Selection Guide, publication PROCES-SG001	Provides information to assist with equipment procurement for your PlantPAx system.
PlantPAx Distributed Control System Reference Manual, publication PROCES-RM001	Provides characterized recommendations for implementing your PlantPAx system.
Rockwell Automation Library of Process Objects, publication PROCES-RM002	Provides general considerations for the PlantPAx system library of process objects.
PlantPAx Distributed Control System Infrastructure Configuration User Manual, publication PROCES-UM001	Describes procedures for how to configure system components that comprise a PlantPAx modern DCS.
PlantPAx Distributed Control System Application Configuration User Manual, publication PROCES-UM003	Describes the steps necessary to start development of PlantPAx DCS.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, http://www.rockwellautomation.com/global/certification/overview.page	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at <http://www.rockwellautomation.com/global/literature-library/overview.page>. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

Introduction

PlantPAx DCS and IEC 61850

The PlantPAx® distributed control system architecture provides for the integration of electrical protection devices via the IEC 61850 standard and the EtherNet/IP™ network. The IEC 61850 standard defines a communication interface that monitors and controls electrical distribution systems with one common platform regardless of manufacturer. Substation equipment has evolved from electromechanical to microprocessor-based relays that allow for communication to industrial control systems.

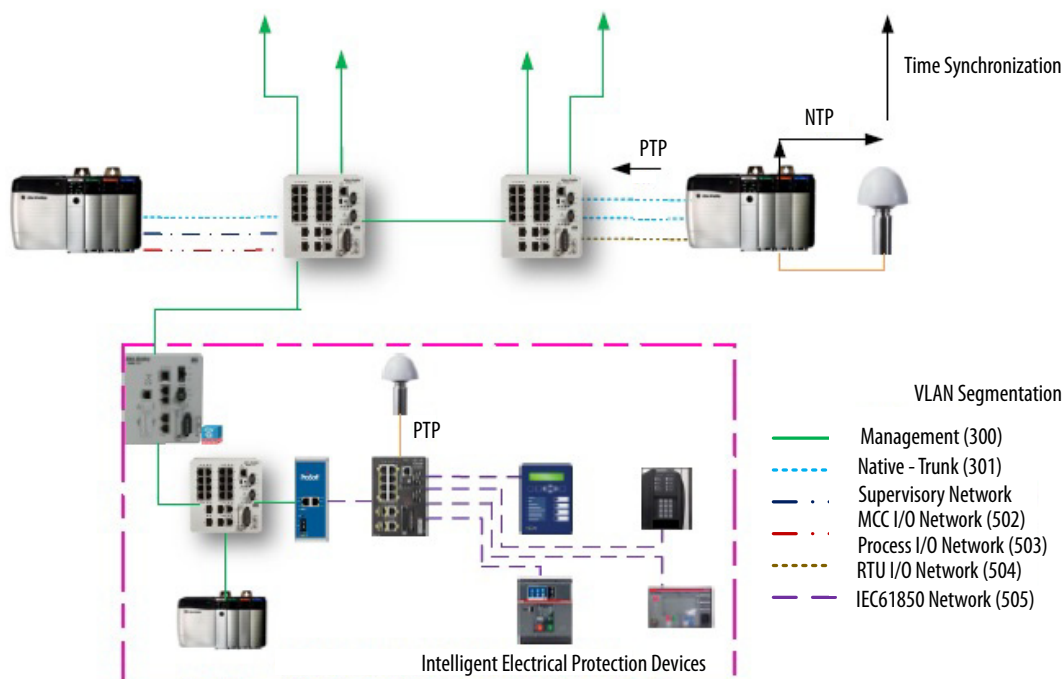
This manual describes how to integrate power infrastructure Add-On Instructions and visualization that are described in this manual. The instructions maximize process control with intelligent devices on The Connected Enterprise.

The IEC 61850 standard includes the following benefits:

- Support of comprehensive substation functions
- Ease of design, specification, setup, and maintenance
- Strong functional support for substation communication and flexibility to support system evolution

Figure 2 - IEC 61850 Standard-integrated Into PlantPAx DCS

Upstream to PlantPAx System as shown in [Figure 1 on page 11](#).



The devices that are shown in [Figure 1](#) include products from Rockwell Automation and Encompass™ partners, such as Schweitzer Engineering Labs (SEL) and ProSoft Technology. Faceplates in this manual are also representative of ABB products.

As the dashed lines show in [Figure 2](#), each physical device shares data across the network. Communication and mapping portions of the IEC 61850 standard define the data flow.

Devices within the electrical distribution system communicate using various standards and protocols. For purposes of the Library of Electrical Devices, the devices represented communicate via IEC 61850 or EtherNet/IP.

The gateway organizes the IEC 61850 data from the devices, and communicates with a controller on an EtherNet/IP network. The ProSoft gateway configuration software creates Add-On Instructions that decode the field device power data within the controller.

The controller then coordinates with upstream PlantPAx System infrastructure (shown by the green arrows in [Figure 2](#)). TripSource Add-On Instructions that monitor the devices for alarm conditions are also provided.

Graphic files in this manual link the devices to an HMI interface and the Add-On Instructions. Faceplates for each device present information, including diagnostics, to operators, engineers, or maintenance personnel.

Required Files

The controller and visualization files are required to create instruction sets for programming logic. This logic is as a supplement to the instruction set provided natively in the ControlLogix® firmware.

Controller Files

The module Add-On Instruction files are included in the following table

Table 1 - Module Add-On Instruction Files

Module Type	Device Name	Process Library Add-On Instruction	Configuration File	Description	Firmware
Power Relays	SEL 751A	SEL751ATripSource.I5x	(RA-LIB) SEL751A.CID	Feeder protection relay with arc flash detection	R418 and above
	SEL 710/710d5	SEL710TripSource.I5x	(RA-LIB) SEL710.CID	Motor protection relay	710-5 standard and above
	SEL 700G	SEL700GTripSource.I5x	(RA-LIB) SEL700G.CID	Generator protection relay	R107 and above
	SEL 787	SEL787TripSource.I5x	(RA-LIB) SEL787.CID	Transformer protection relay	R209 and above
	AB857	AB857TripSource.I5x	(RA-LIB) AB857.CID	Feeder protection relay	Revisions 12.001 and later
	AB865	AB865TripSource.I5x	(RA-LIB) AB865.CID	Generator protection relay	Revisions 12.001 and later
Circuit Breakers	ABB EMAX2 E/IP	EMAXEIPTripSource.I5x	Ekip2_07_12+key.eds	Power circuit breaker with communication via EtherNet/IP	2.08 and above
	ABB EMAX2 IEC 61850	EMAX61850TripSource.I5x	(RA-LIB) ABB EMAX2.CID	Power circuit breaker with communication via IEC 61850	2.10 and above

Visualization Files

The display files (.gfx file type) in [Table 2](#) are the displays that you see at runtime.

Table 2 - Display Files

FactoryTalk View SE Software	FactoryTalk View ME Software	Description
(RA-SEL) SEL_751A-faceplate	(RA-SEL-ME) SEL_751A-faceplate	Faceplate for the feeder protection relay with arc flash detection
(RA-SEL) SEL_710d5-faceplate	(RA-SEL-ME) SEL_710d5-faceplate	Faceplate for the motor protection relay
(RA-SEL) SEL_700G-faceplate	(RA-SEL-ME) SEL_700G-faceplate	Faceplate for the transformer protection relay
(RA-SEL) SEL_787-faceplate	(RA-SEL-ME) SEL_787-faceplate	Faceplate for the generator protection relay
(RA-AB) AB 857 61850-faceplate	(RA-AB-ME) AB 857 61850-faceplate	Faceplate for the feeder protection relay
(RA-AB) AB 865 61850-faceplate	(RA-AB-ME) AB 865 61850-faceplate	Faceplate for the generator protection relay
(RA-ABB) ABB EMAX2 E/IP-faceplate	(RA-SEL-ABB) ABB EMAX2 E/IP-faceplate	Faceplate for the power circuit breaker with communication via EtherNet/IP
(RA-ABB) ABB EMAX2 IEC 61850-faceplate	(RA-SEL-ABB) ABB EMAX2 IEC 61850-faceplate	Faceplate for the power circuit breaker with communication via IEC 61850

HMI Tags are created in a FactoryTalk® View ME application to support tab switching on Process Library faceplates. The HMI tags can be imported via the comma-separated values file (.csv file type) in the following table.

Table 3 - HMI Tags

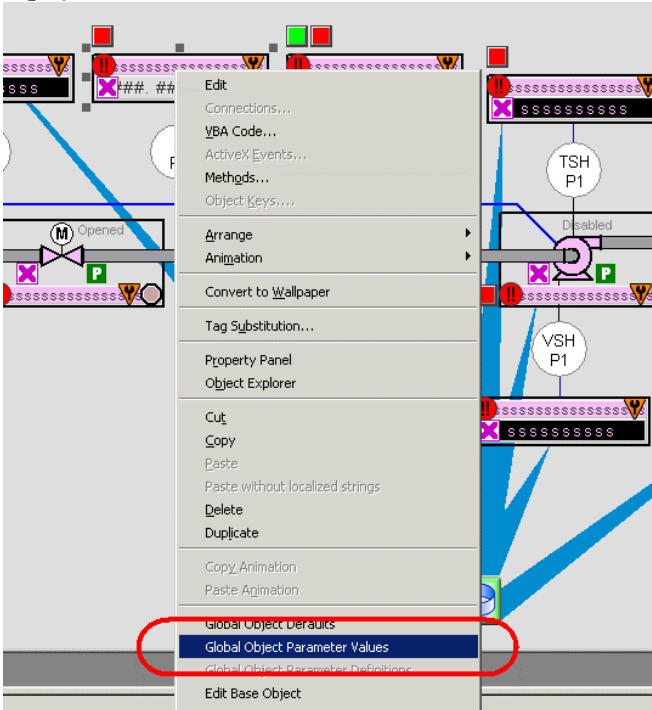
FactoryTalk View SE Software	FactoryTalk View ME Software	Description
—	FTVME_IEC61850Lib_Tags_3_5_05.CSV where xx = the service release number.	These tags must be imported into the FactoryTalk View ME project to support switching tabs on any Process Object faceplate.

Using a Display Element

Global objects are typically found in the global object file per instruction. For example: (RA-BAS) P_AIn Graphics Library.ggfx. The process is the same for each object.

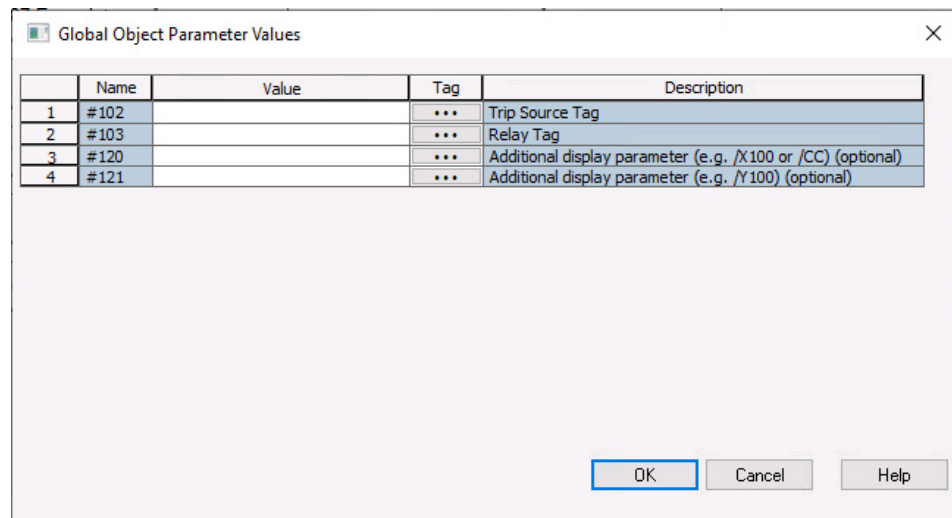
Follow these steps to use a global object.

- 1. Copy the global object from the global object file and paste it in the display file.



- 2. In the display, right-click the global object and choose Global ObjectParameter Values.

The Global Object Parameter Values dialog box appears.



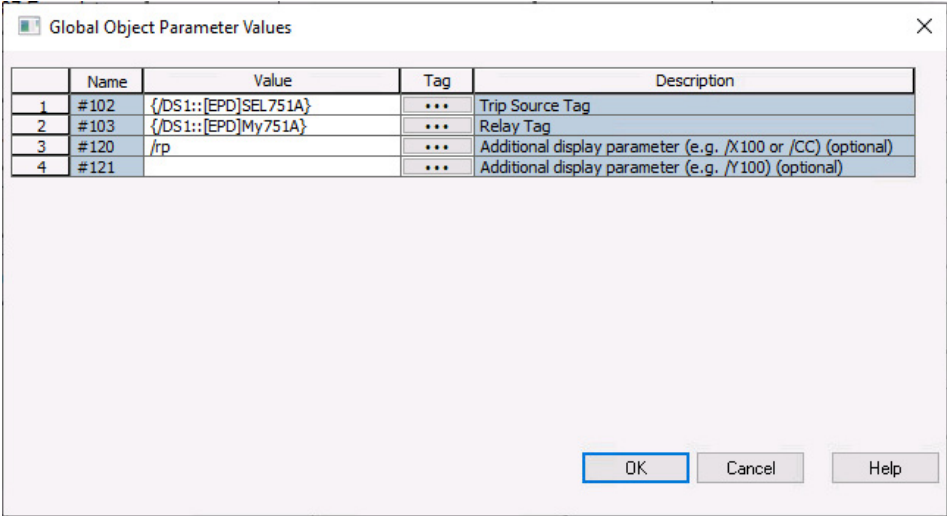
The global object parameters are as follows.

Parameter	Required	Description
#102	Y	Object tag to point to the name of the associated object Add-On Instruction in the controller.
#103	Y	Path that is used for display navigation features to other objects. Include program scope if tag is a program scope tag.
#120	N	Additional parameter to pass to the display command to open the faceplate. Typically used to define position for the faceplate.
#121	N	Additional parameter to pass to the display command to open the faceplate. To define X and Y coordinates, separate parameters so that #120 defines X and #121 defines Y. This separation lets these same parameters be used in subsequent display commands that originate from the faceplate.
#122	Y	The following are the options for the global object display: 0 = Always show faceplate 1 = Show Quick Display for users without Maintenance access (Code C) 2 = Always show Quick Display

- In the Value column, type the tag or value as specified in the Description column.

TIP Click the ellipsis (...) to browse and select a tag.
Values for items that are not required can be left blank.

Figure 3 - Example Parameter Values Dialog Box



4. Click OK.

HMI Security

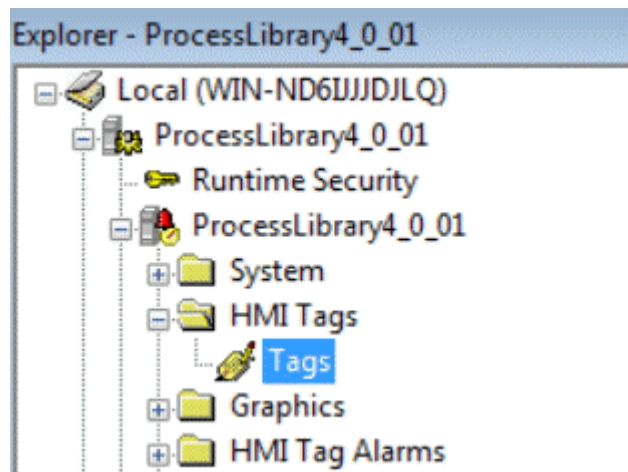
See publication [PROCES-RM002, Rockwell Automation Library of Process Objects: Configuration and Usage](#), section ‘Configure HMI Security’ for more information.

Help Files

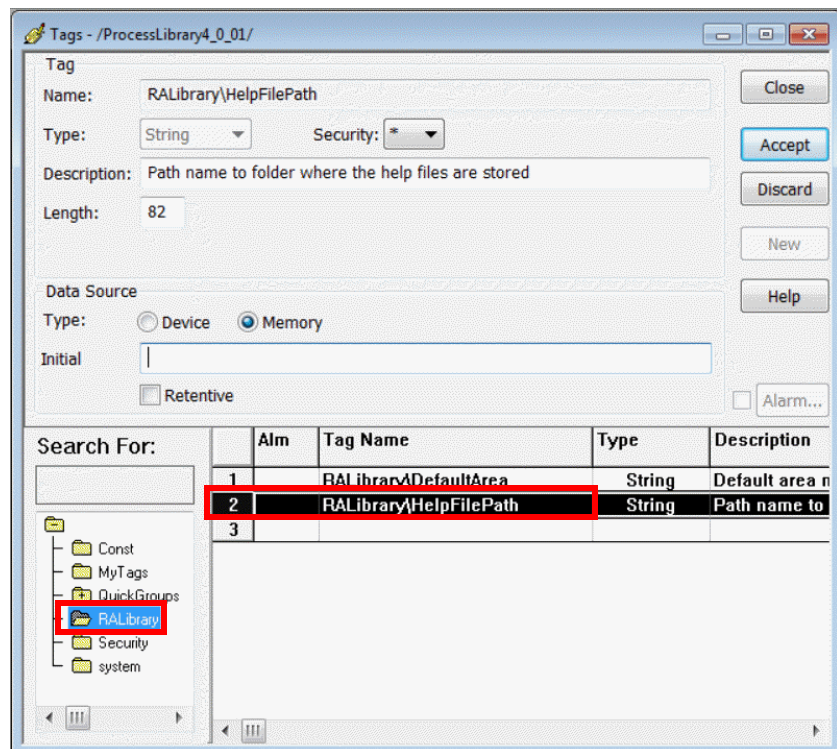
The help displays for the Library of Process Objects have been converted to PDF documents. The PDF documents can be displayed from the FactoryTalk View displays by clicking the Help button. The help files are downloaded as part of the Library of Process Objects and are contained in the Documents folder.

- 1. Copy the Help files to a folder accessible by the FactoryTalk View clients.
In this example we have copied the files to
C:\Users\Rockwell\Desktop\HMI Help Files.
- 2. Open your project in FactoryTalk View Studio.

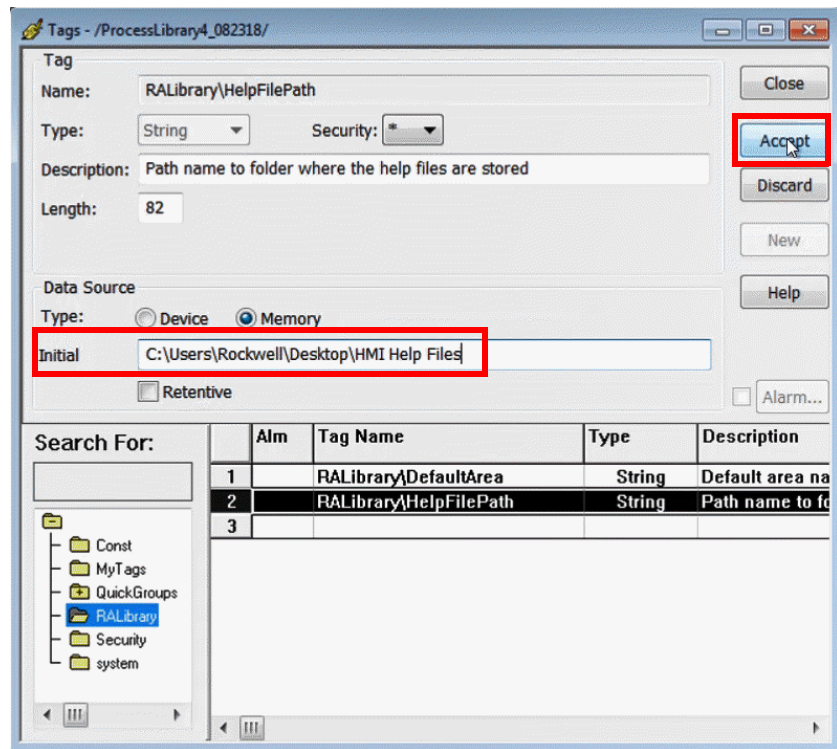
- Open the Tags setting in the Folder Tree.



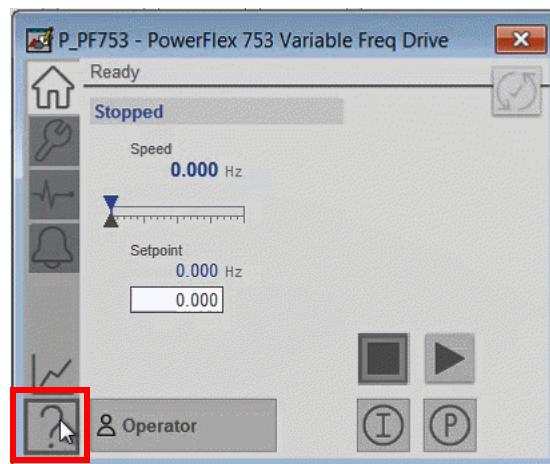
- Click the RALibrary Folder and then Click RALibrary\HelpFilePath to access the settings for the Help Files.



5. Type the path to the Help Files into the Initial Data Source Field and click Accept.



6. Close the settings display.
7. Restart FactoryTalk View Studio for the settings to take effect.
8. The Help Files can now be accessed using the Help button on the HMI Display.



Configure the Gateway Module

This section describes how to configure the ProSoft Technology EtherNet/IP™ to the IEC 61850 communication gateway module. This section also describes how to export Add-On-Instructions for use in the Studio 5000 Logix Designer® application to support devices that communicate through IEC 61850 protocol. This third-party Add-On Instruction creates the communication path from the ports on the gateway module to the power relays.

IMPORTANT This manual assumes that you are using the IEC 61850 CID files that are provided on the PCDC. If your application requires additional parameters, use the configuration software from the manufacturer to modify the PCDC CID files for parameters. Do not delete any content from pre-established reports that are labeled measurands, alarms, or PB and target status indicators. Deletion of these reports has an adverse effect on the faceplates.

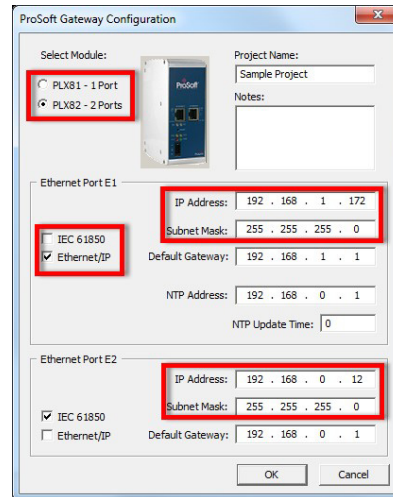
IMPORTANT Use ProSoft firmware revision 2.01 or later when you integrate the PlantPAx® objects for electrical protection.

Set Up the Communication

The following steps configure a gateway module within the ProSoft PLX8x-EIP-61850 Configuration Manager. If you do not already have this software, you can download it from the ProSoft Technology website (www.prosoft-technology.com).

1. Select if the module you are using is a single- or dual-port module (PLX81 or PLX82).

2. Assign the IP address to the ProSoft Module for the IEC 61850 Network and EtherNet/IP network.

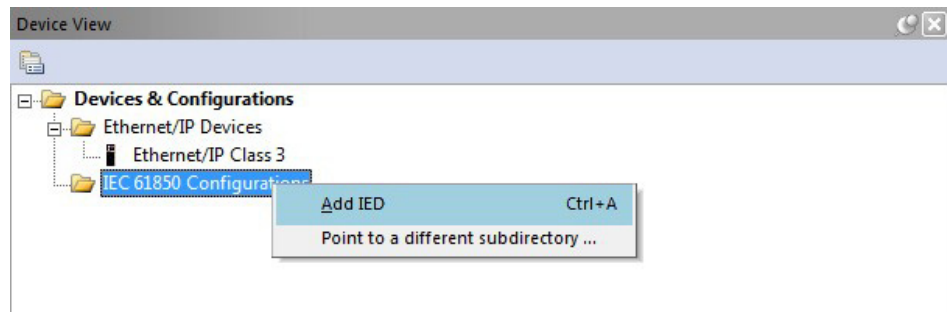


Verify the correct subnet mask and default gateway for each network. If the 2-port module is being used, the IEC 61850 and EtherNet/IP ports must be assigned on separate subnets. Also, verify that you select the correct port for the EtherNet/IP and IEC 61850 services.

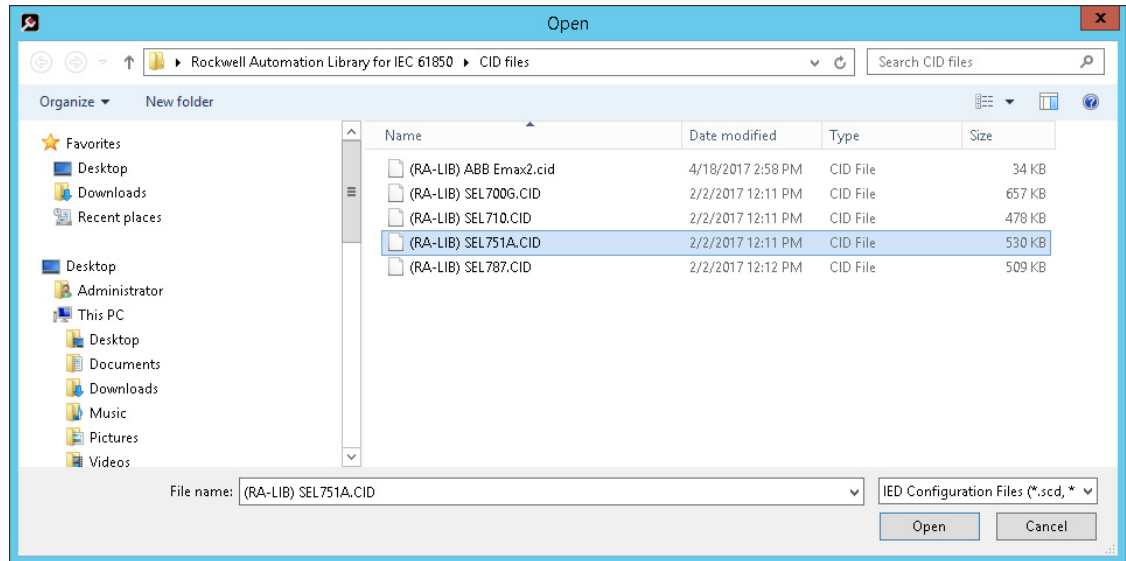
3. Click OK.

The software returns to the main canvas.

4. From the Device View on the left side, right-click IEC 61850 Configurations and select Add IED (Intelligent Electronic Device).

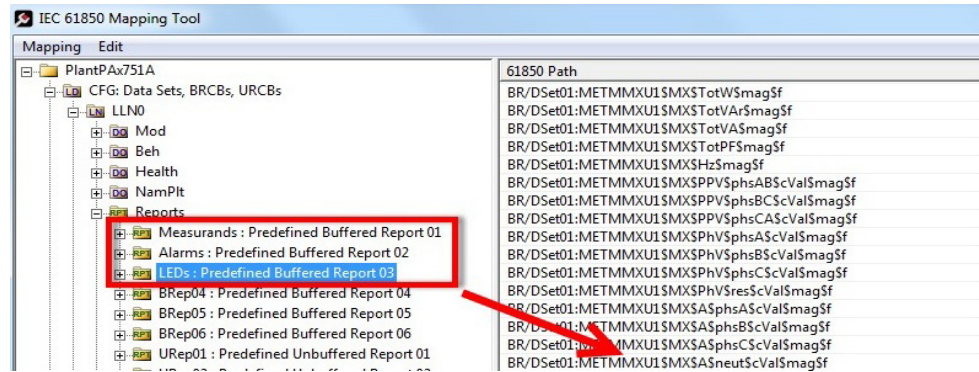


5. Select the CID file with the IED Configuration.
6. Click Open.

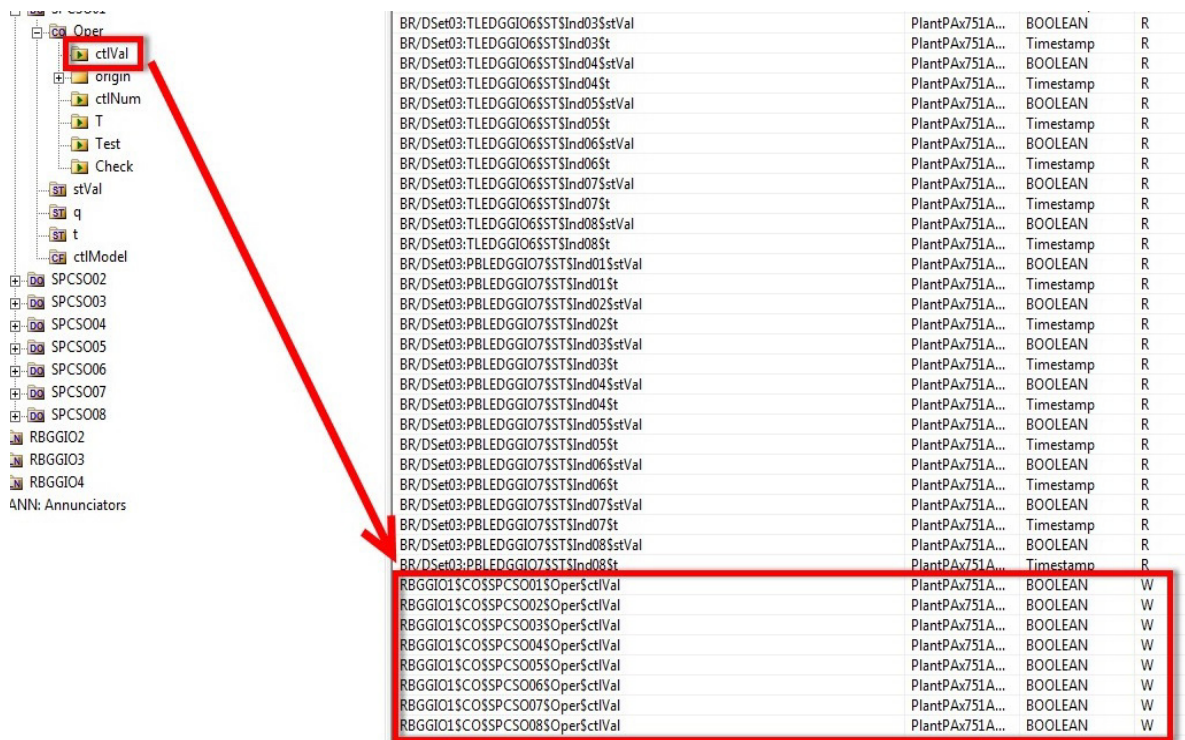


9. Expand the LLN0 folder, and then expand the Reports folder.
10. Drag Measurands (Buffered Report 1), Alarms (Buffered Report 2), and status indicators (Buffered Report 3) to the canvas on the right.

IMPORTANT For each additional report, drag reports into the canvas to move the data to a controller.

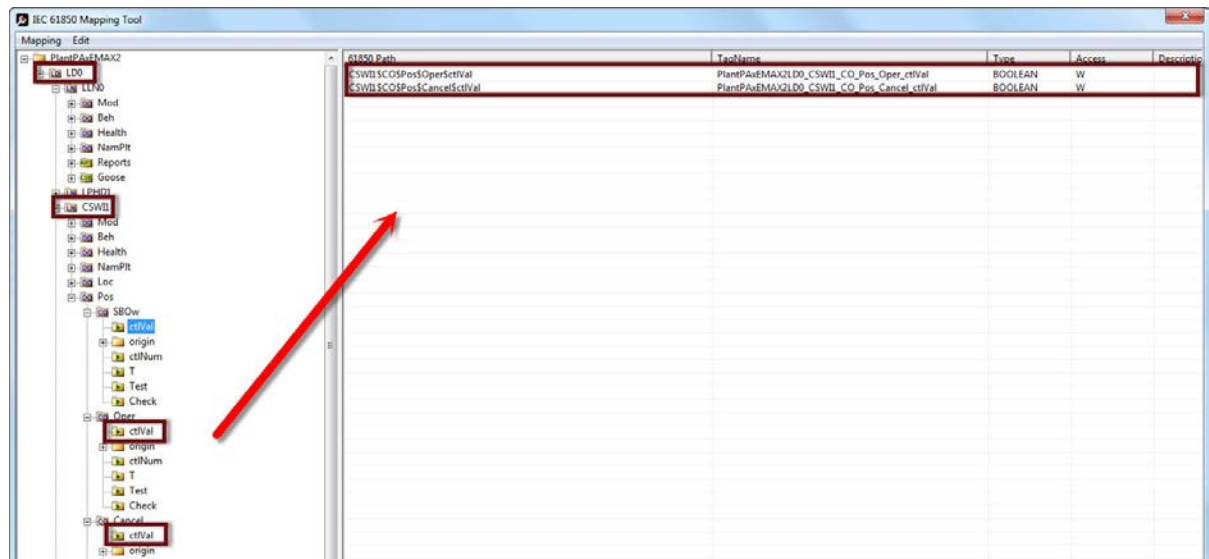


11. For SEL devices, expand the Control folder and RBGGIO1 folder.
12. Expand SPCSO1 through SPCSO8.
13. Expand Oper and select ctlVal. Drag these values to the canvas along with any other commands required for your application.

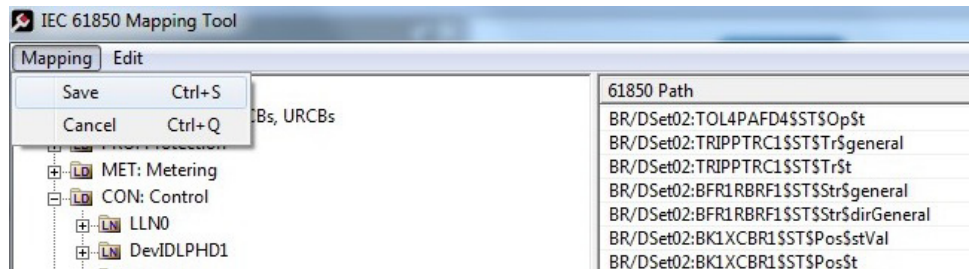


14. For ABB Devices, expand LD0, CS2I1, and Pos folders.

15. Expand Oper and Cancel folders. Drag these values to the canvas along with any other commands required for your application.



16. Select Mapping from the toolbar and select Save.



17. Repeat steps 3...9 for every gateway module being added to the system.

IMPORTANT The faceplates and three pre-defined buffered reports for the devices use the data in [Table 4](#).

Table 4 - Input and Output Data for IEC 61850 Devices

Device	Input Data Bytes	Output Data Bytes	Input Connections Used	Output Connections Used
SEL-700G	1497	8	3	0.02
SEL-710	971	8	1.95	0.02
SEL-751A	908	8	1.82	0.02
SEL-787	920	8	1.84	0.02
AB-857	1352	8	2.68	0.02
AB-865	1037	8	1.84	0.02
EMAX2	654	2	1.31	0.01

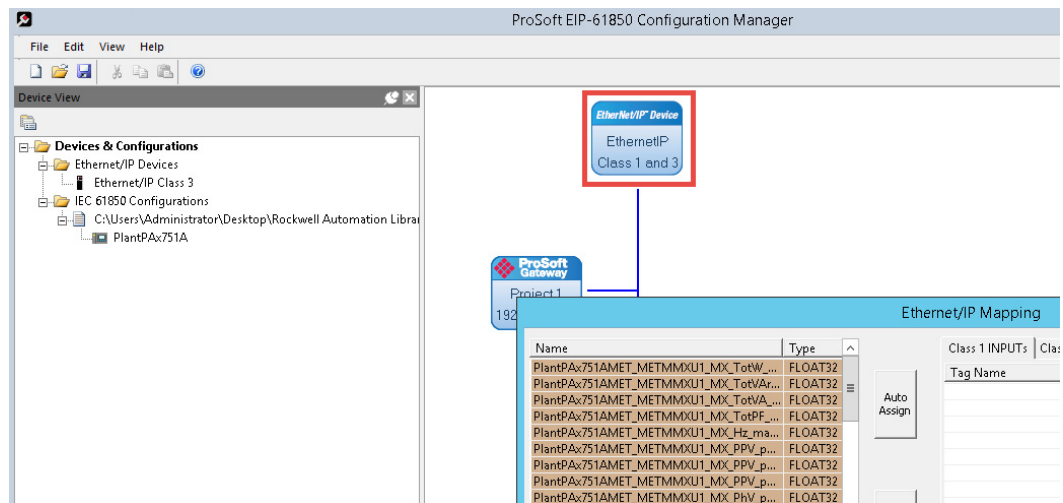
IMPORTANT These conditions apply only when you use the CID files from PCDC and the files are not modified.

Mapping the Gateway

If you are using a ProSoft technology PLX81-EIP-61850 module, a maximum of 10 I/O connections are available. If you are using the PlantPAx faceplates and pre-defined buffered reports, up to 5 relay devices could be supported on one module.

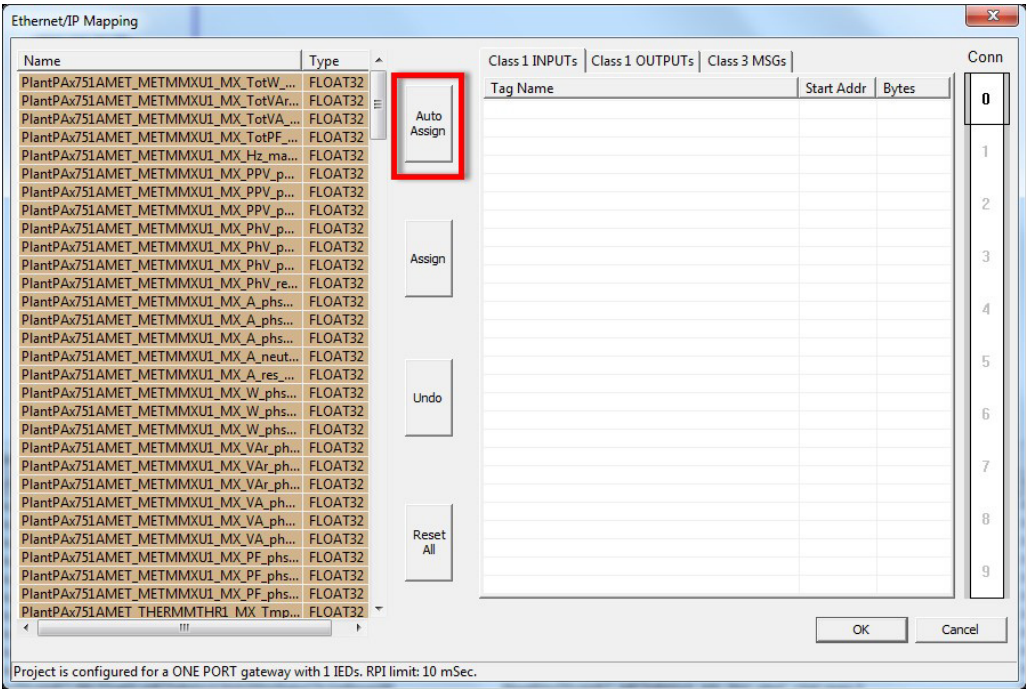
If you are using a PLX82-EIP-61850 module (dual Ethernet port), a maximum of 20 I/O connections are available. Up to 10 relay devices could be used in that project by using PlantPAx faceplates and the pre-defined buffered reports.

1. Once you have added all devices within the system, double-click the EtherNet/IP block in the configuration manager canvas. This action opens the EtherNet/IP Mapping Window.



2. Select the Auto Assign button.

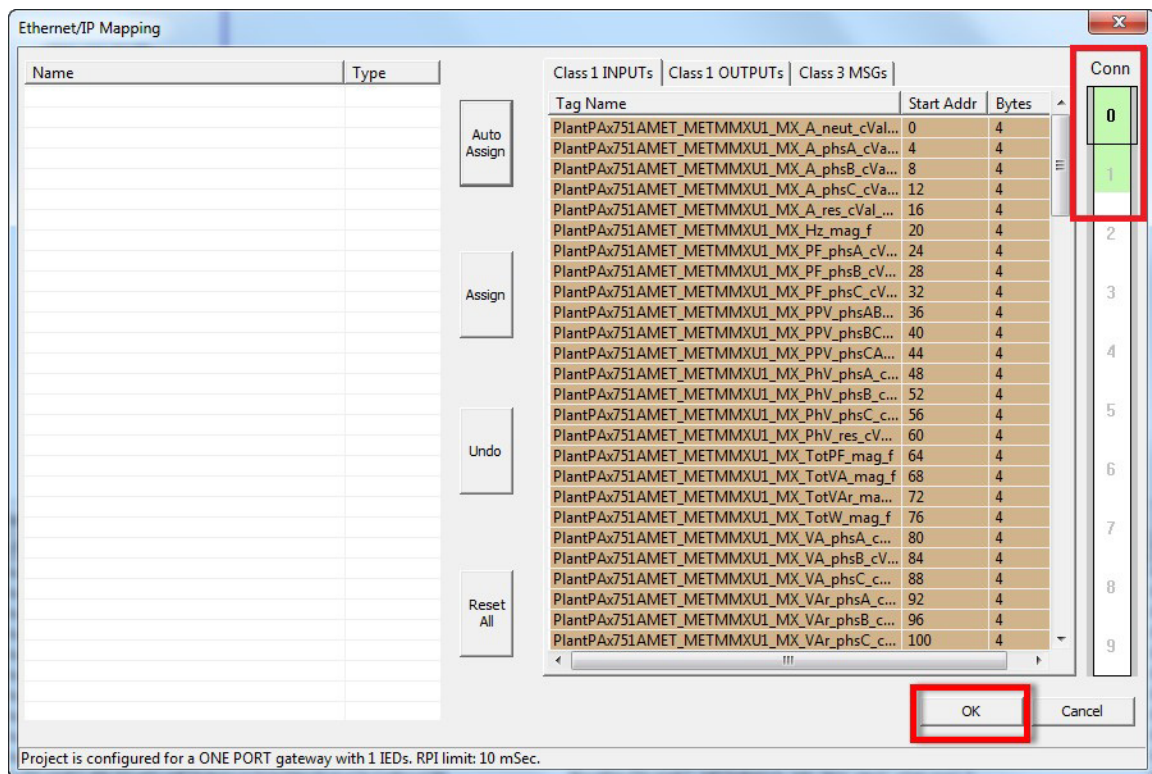
This function automatically assigns the gateway information that is used by the Rockwell Automation® controller on the EtherNet/IP network.



3. Record the number of connections that are used in your project.

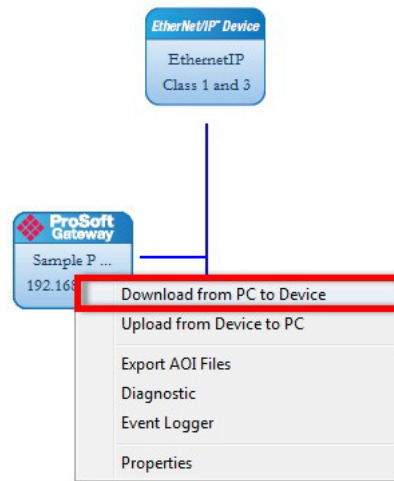
The number of connections is needed for configuring the Studio 5000® project and for defining your EtherNet/IP connections to the ProSoft PLX8x-EIP-61850 module.

4. To accept the mapping, click OK.

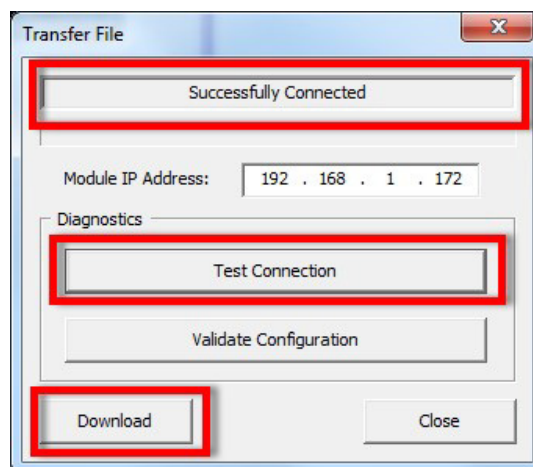


5. Save your work.

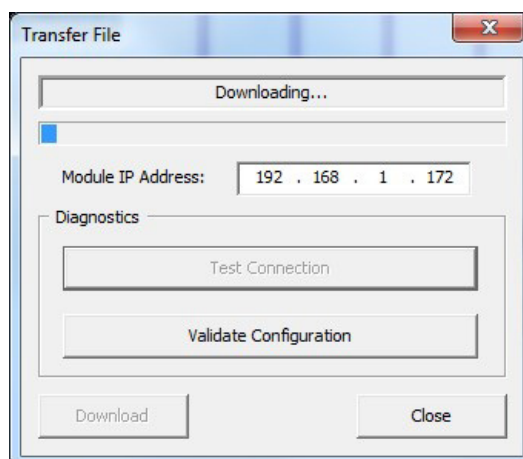
- Right-click the ProSoft module in the canvas and select Download From PC to Device.



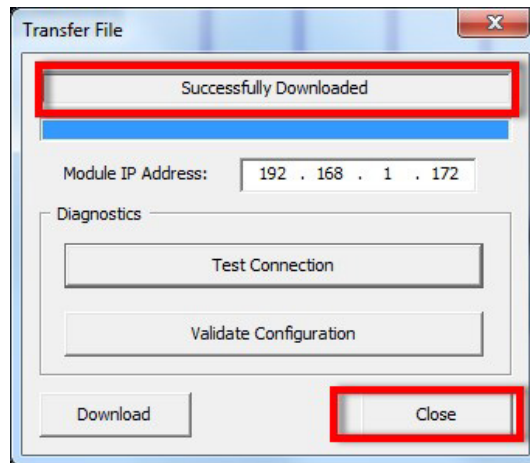
- Choose Test Connection to verify that your computer can communicate with the ProSoft module.
- Click download when you have connected to the module.



- The module automatically reboots during a download.

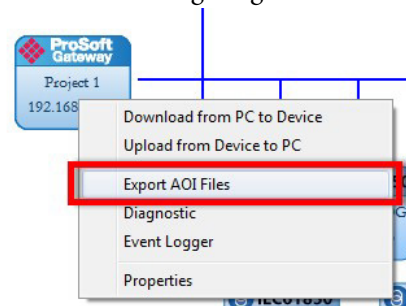


10. Once the download is complete, click Close.

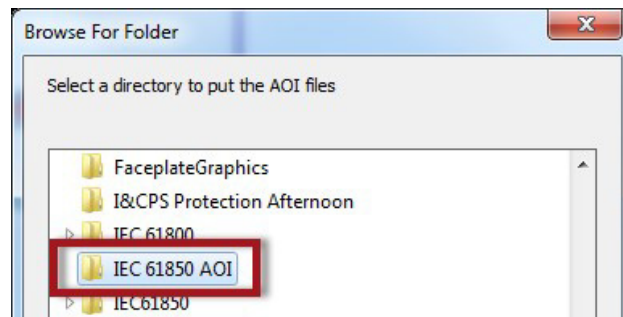


11. Right-click the ProSoft Module Block and select Export AOI Files.

These files are used for configuring the controller.



12. Select the destination folder for the Add-On Instruction.
13. Click OK.



14. Click OK on the Add-On Instruction Successfully Exported Dialog box.

There is one Add-On Instruction that is created for each independent device that is configured within the ProSoft canvas.

TIP For a full list of the device tags that are included, see IEC61850_IED_Tags.xlsx under the tools folder of the download.

Notes:

Integrate IEC 61850 into a Studio 5000 Project

This section describes how to connect the ProSoft gateway module to the Rockwell Automation® Studio 5000® environment. This module provides the communication link between the PlantPAx® system and the IEC 61850 devices.

Topic	Page
Gateway Integration	33
Import the Add-On Instructions	36
Create Your Routine	38

Gateway Integration

If you have a project with a controller already configured, make sure that the project path is set to the correct controller. For the purposes of this document, we refer to this path as the target application.

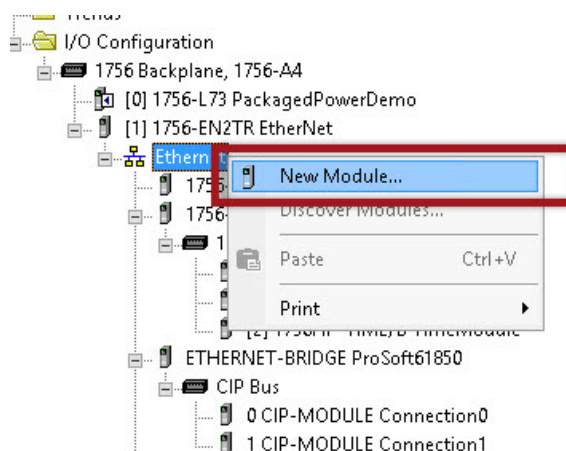
The ProSoft gateway that is created in [Chapter 2](#) must be added into the project I/O configuration.

IMPORTANT The following procedure uses the gateway that you configured in [Chapter 2](#).

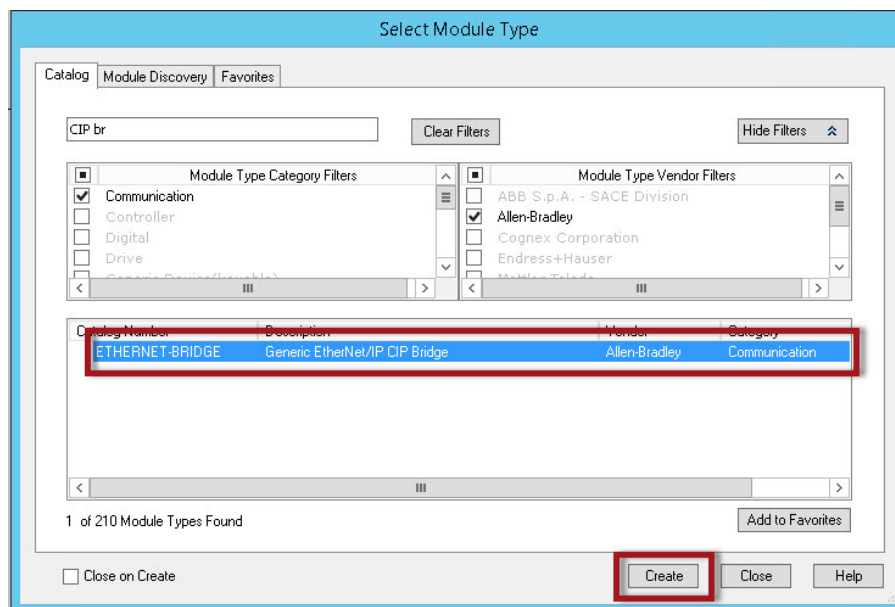
1. Open the Studio 5000 Project file.
2. Verify that the project path is set to the correct controller.

Make sure that the Slot positions of the controller and the Ethernet module are correct.

3. Right-click Ethernet and choose New Module.



4. Select the Ethernet Bridge, then click Create.

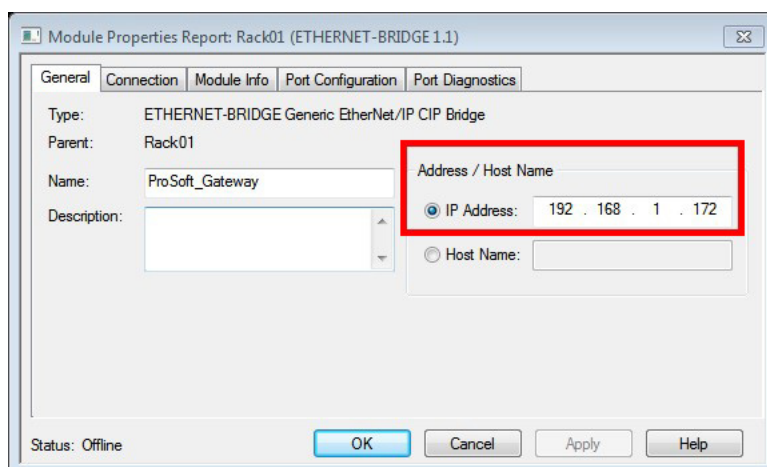


5. Name the module in the Module Properties dialog box.

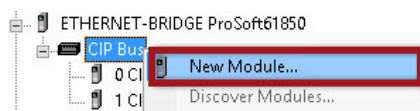
The gateway can be given any name. This example shows Prosoft_Gateway.

6. Assign the IP address for the gateway module.

IMPORTANT Verify that the gateway IP address is an exact match with the IP address that you assigned to the module ports in [step 2 of Chapter 2](#).



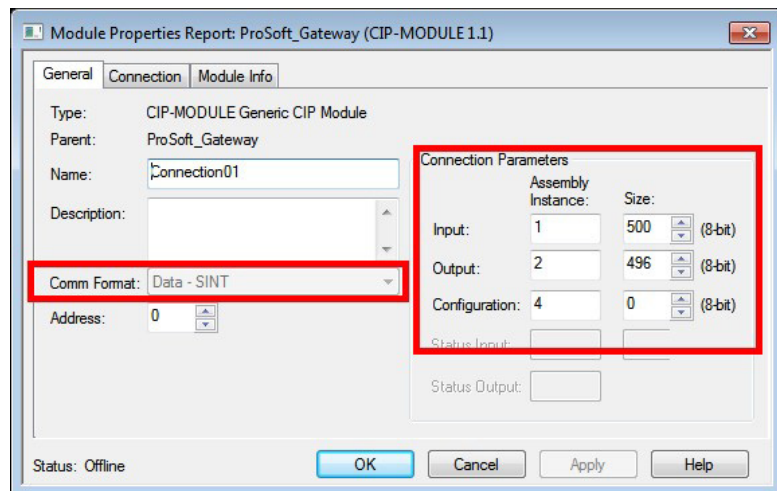
7. Click OK.
8. Right-click CIP Bus and choose New Module.



The Module Properties Report dialog box appears.

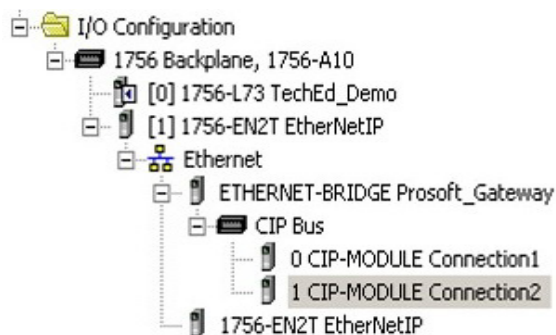
IMPORTANT In [Chapter 2](#), you recorded the number of connections for your project. On this dialog box, you must configure the data tables for CIP connections between the gateway and Studio 5000 environment. The connection parameter values provide the interface from the controller to the devices.

9. Click the Comm Format pull-down arrow and select the Comm Format (Data-SINT).
10. In the Connection Parameters box, type the values exactly as shown in the following Module Properties Report dialog box.



11. Click OK.

Your CIP connection for the bridge is now in the I/O Configuration tree.

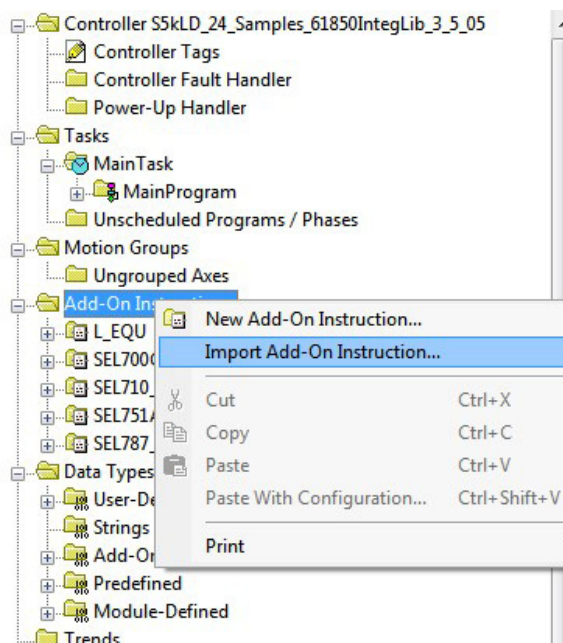


12. Repeat steps 8...11 for each module that you are configuring with CIP connections.

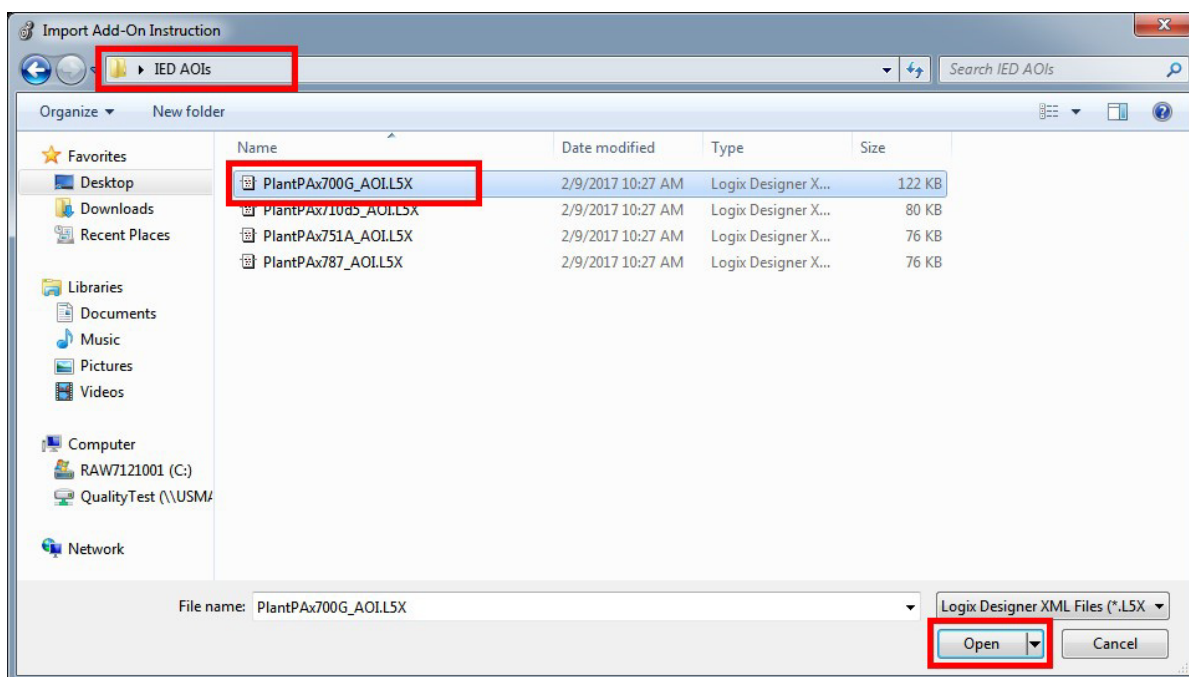
Import the Add-On Instructions

You have successfully configured the ProSoft gateway within your Studio 5000 project. The following steps define how to import the IEC 61850 data via the Add-On Instruction that was exported in [Chapter 2](#).

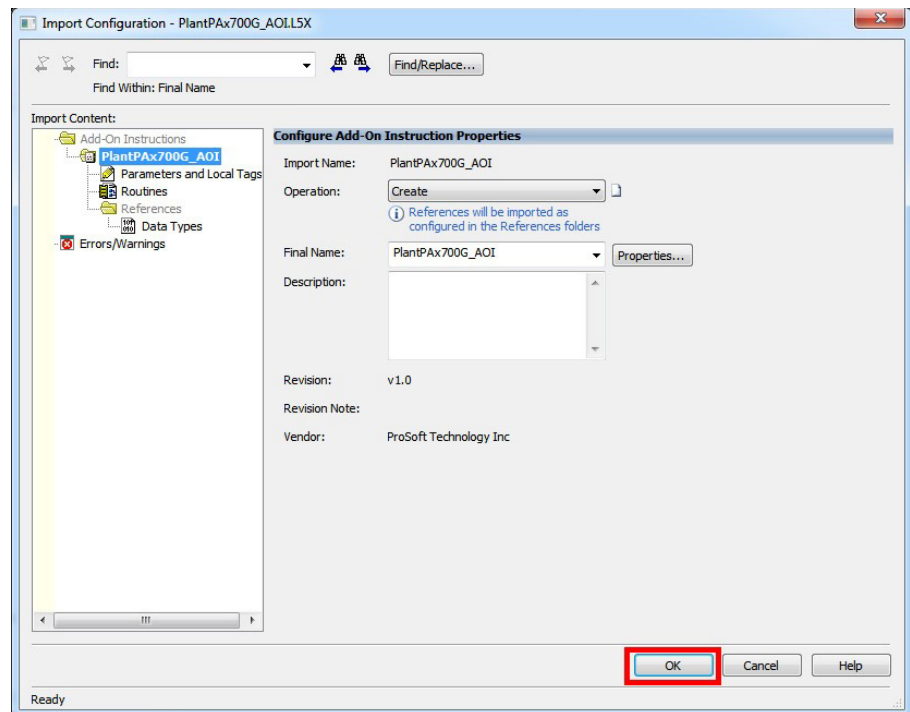
1. In the I/O Configuration tree, right-click Add-On Instruction and choose Import Add-On Instruction.



2. Navigate to the folder that contains the exported device Add-On Instructions from the ProSoft gateway that is configured in [Chapter 2](#).
3. Select the Add-On Instruction and click Open.

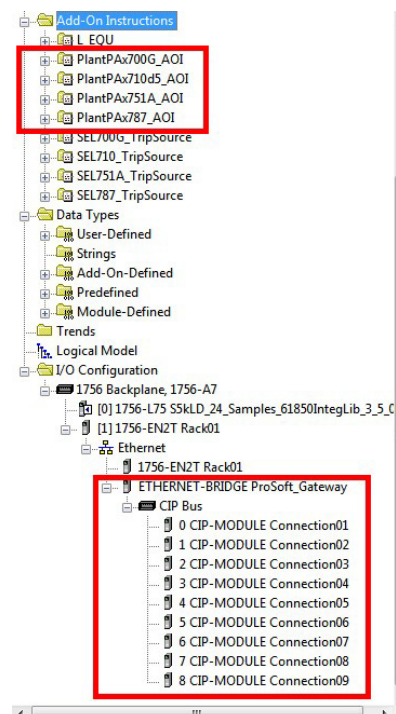


The Import Configuration window appears.



4. Click OK.
5. Repeat steps 1...4 for each device Add-On Instruction created by the ProSoft gateway.

For this example, we have four devices that require the use of four Add-On Instructions and nine CIP connections.

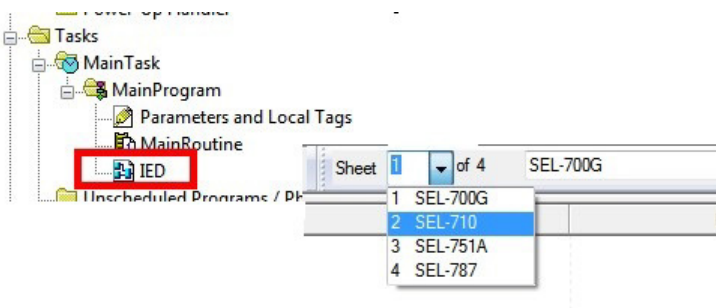


Create Your Routine

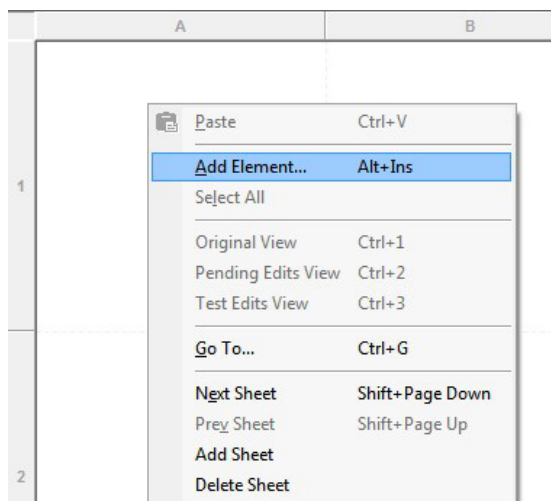
The following steps define how to use the ProSoft gateway Add-On Instructions to create a Studio 5000 project that can be downloaded to a controller.

1. Create a Function Block Diagram (FBD) routine in the Programmable Automation Controller.

This routine is used to instantiate the Add-On Instructions that you imported in the preceding section.

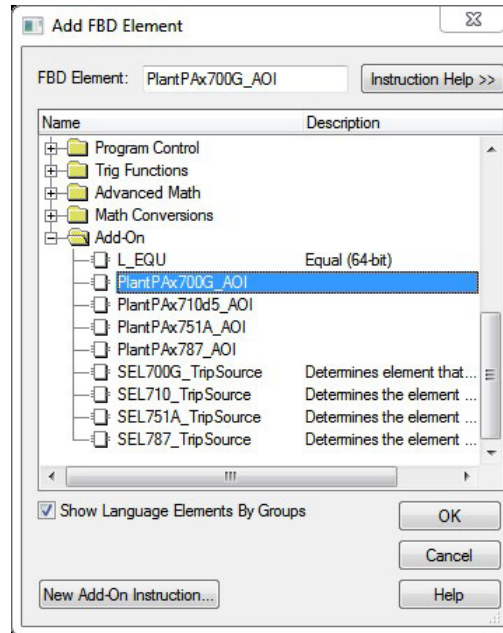


2. Right-click in the workspace and choose Add Element.



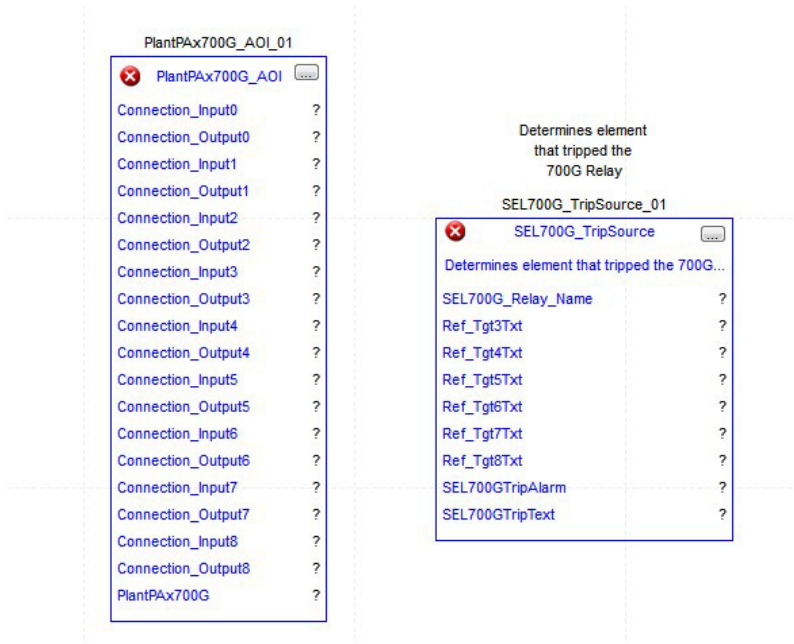
3. The Add FBD Element dialog box appears.

- Under the Add-On folder, select the appropriate device Add-On Instruction and click OK.

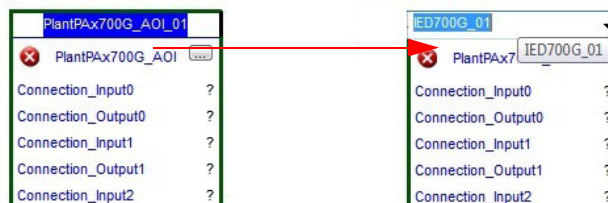


- Repeat steps 2...3 for the number of TripSource Add-On Instructions.

For each device in your system, you instantiate one device Add-On Instruction and one TripSource Add-On Instruction.

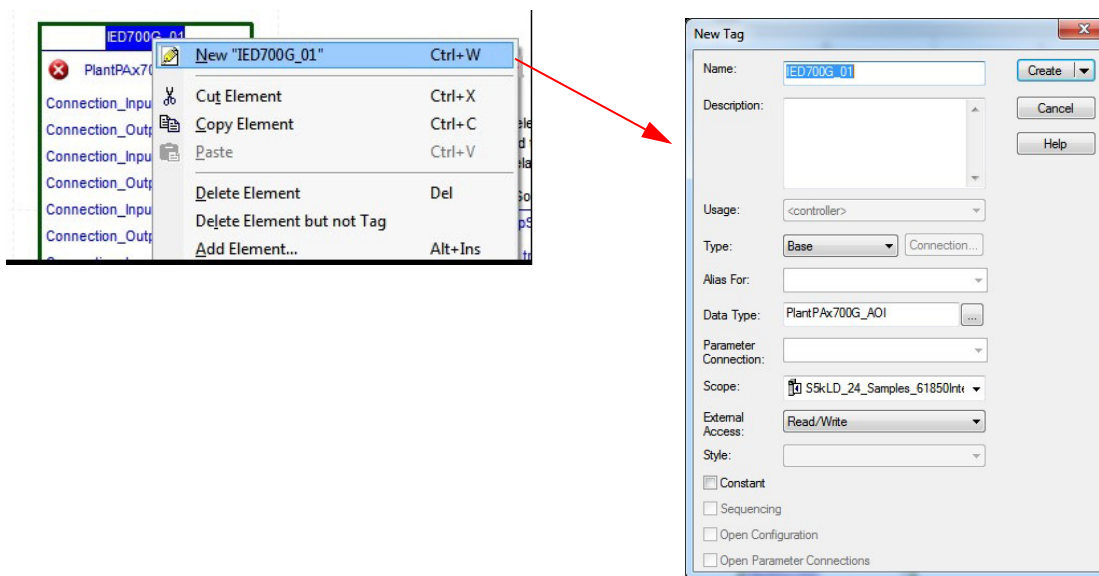


6. Inside the top of the function block, double-click the tag name and type a new name.
7. Click Enter.



8. Right-click the new tag name and choose New <new tag name> (New IED700G_01 in this example).

The New Tag dialog box appears.



By default the New Tag dialog box includes the tag name, data type, and external access (Read/Write)

9. Type an optional description and select a scope from the pull-down menu. Controller scope is selected in our example.
10. Click Create.
11. Repeat steps 5...9 for each function block required.

You have successfully configured the ProSoft gateway module in your Studio 5000 project.

The following chapters discuss each faceplate and its corresponding functionalities.

Two Add-On instructions back each faceplate. The ProSoft module generates one instruction, and the corresponding TripSource instruction is downloaded from the PCDC.

Bulletin 857 Motor/Feeder Protection Object



The Bulletin 857 Relay is a combined motor and feeder protection relay that is used for various tasks. These tasks include highly selective protection of rotating machines, line feeders, cable feeders, capacitor banks, reactors, transformers, and busbars.

The relay is used in power distribution substations, power plants, and industrial power systems, marine, and offshore installations. The 857 relay offers extensive customizable control, advanced protection, circuit breaker control and monitoring, power and energy measurements, primary circuit monitoring and communication functionality. The 857 relay also offers a comprehensive range of standard motor and feeder protection functions,.

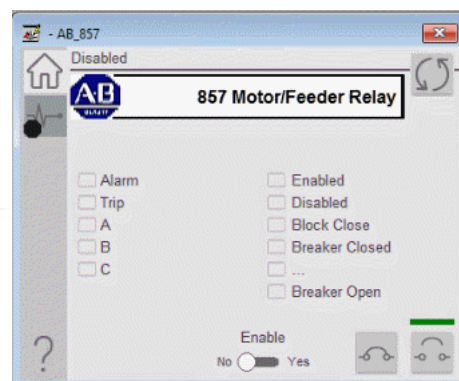
Topic	Page
Controller Code	42
Mapping InOut Tags to Add-On Instructions	44
Using Visualization Files	47
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This instruction monitors one 857 relay. Alarms are provided when the physical device experiences a protection-related trip. The instruction also provides capabilities for locking, and to open and close the breaker.

Add-On Instruction



Faceplate



Controller Code

Two Add-On Instructions represent each physical device. You must configure the InOut parameters of each Add-On Instruction per physical device.

The first Add-On Instruction is the ProSoft software-generated Add-On Instruction (see [Chapter 2](#)). The second Add-On Instruction is the TripSource Add-On Instruction, which is available for download from the Rockwell Automation® Library of Electrical Protection Devices from the PCDC.

InOut Structure for ProSoft Add-On Instruction

InOut parameters in [Table 5](#) are used to link the Add-On Instruction to external tags that contain necessary data for the instruction to operate. These external tags must be of the data type shown

Table 5 - Bulletin 857_TripSource

Name	Data Type	Description
[DeviceName]_Relay_Name	<Defined by device AOI>	Device Data from the Add-On Instruction. This data type changes to match each device tag in the ProSoft Gateway.
Ref_Tgt3Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt4Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt5Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt6Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt7Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt8Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
[DeviceName]TripAlarm	ALARM_DIGITAL	Digital Alarm tag
[DeviceName]TripText	STRING	Alarm text to be displayed when active.

InOut Structure for Rockwell Automation Library Download

[Table 6](#) shows the InOut parameters that are available from the Rockwell Automation Library of Electrical Protection Devices Folder in the PCDC. These external tags must be of the data type shown. These tags are representative of the tags that are required for each 857 relay.

Table 6 - Bulletin 857 Device

Name	Data Type	Description
[DeviceName]_AOI	[DeviceName]857_AOI	Add-On Instruction tag. Matches naming from ProSoft Configuration Manager.
Connection_Input0	SINT[500]	CIP Connection Input data. The number of these parameters vary depending on system sizing.
Connection_Output0	SINT[496]	CIP Connection Output data. The number of these parameters vary depending on system sizing.
Connection_Input1	SINT[500]	CIP Connection Input data. The number of these parameters vary depending on system sizing.
Connection_Output1	SINT[496]	CIP Connection Output data. The number of these parameters vary depending on system sizing.
[DeviceName]857	[DeviceName]857	Device data that is collected from the CIP connections and organized into understandable tags. This data type changes to match each device tag in the ProSoft Gateway.

Output Structure for Bulletin 857 Relay

These parameters are used to link the Add-On Instruction to the HMI. These tags are representative of the tags that are required for each 857 relay. These parameters are a subset of the full variable list available from the device.

The CID files that are provided with the download provide you with these measurement values from the physical device that is already selected. These measurement values are ready to load into the ProSoft gateway. This selection verifies that all variables that are needed for correct HMI operation are present.

For a full list of the relay variables included, see List_Of_Variables.xls under the tools folder of the download.

Remote Bit Control Value Structure

Remote Bit Control Value parameters are used to link the Add-On Instruction to configurable input points in the device. Each bit is configurable through the device vendor software. [Table 7](#) has the recommended uses for each bit.

Table 7 - Remote Bit Control - Bulletin 857

Name	Description
VI1GGI0137_CO_SPCSO_ctlVal	Enable/Disable

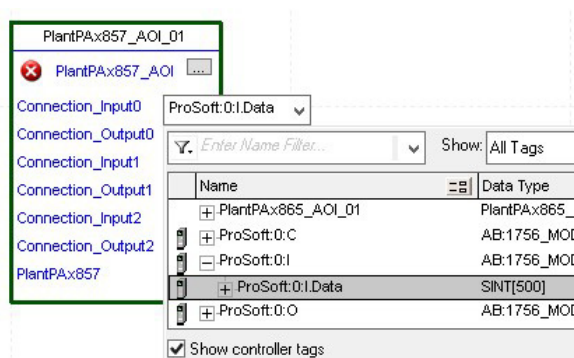
Table 7 - Remote Bit Control - Bulletin 857

Name	Description
VI1GGI0138_CO_SPCSO_ctlVal	Target Reset
VI1GGI0139_CO_SPCSO_ctlVal	Breaker Close
VI1GGI0140_CO_SPCSO_ctlVal	Breaker Open

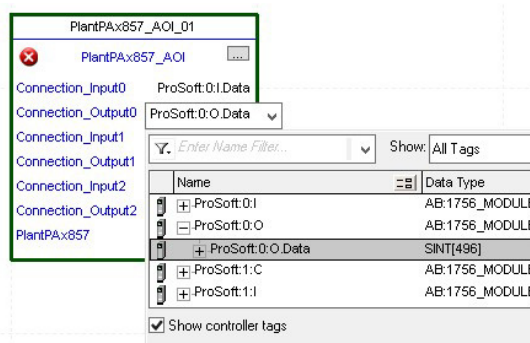
Mapping InOut Tags to Add-On Instructions

Each 857 relay requires two Add-On Instructions to monitor and visualize the relay. The ProSoft Software instruction is created in [Chapter 2](#). The Add-On Instruction is downloaded from the Rockwell Automation Library of Electronic Protection Devices from the PCDC.

1. Double-click the question mark next to Connection_Input0 of the device Add-On Instruction.
2. Click the down arrow on the drop box and expand the ProSoft_Gateway:0:I. Select the ProSoft_Gateway:0:I.Data and double-click to choose it.



3. Double-click the question mark next to Connection_Output0 of the device Add-On Instruction.
4. Click the down arrow on the drop box and expand the ProSoft_Gateway:0:O. Select the ProSoft_Gateway:0:O.Data and double-click to choose it.



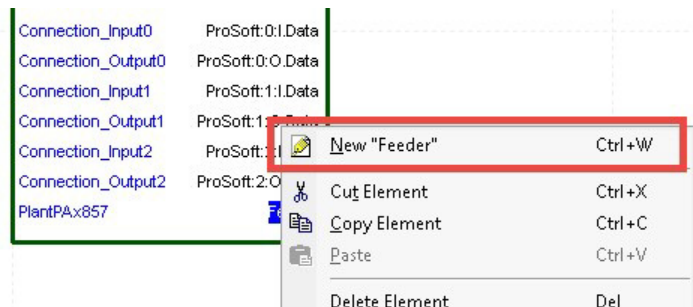
5. Repeat this process for Connection Input and Output that are included with your Add-On Instructions.
6. Click the question mark next to the final tag.

This tag has the same name as the Add-On Instruction and the device as configured in the ProSoft Gateway.

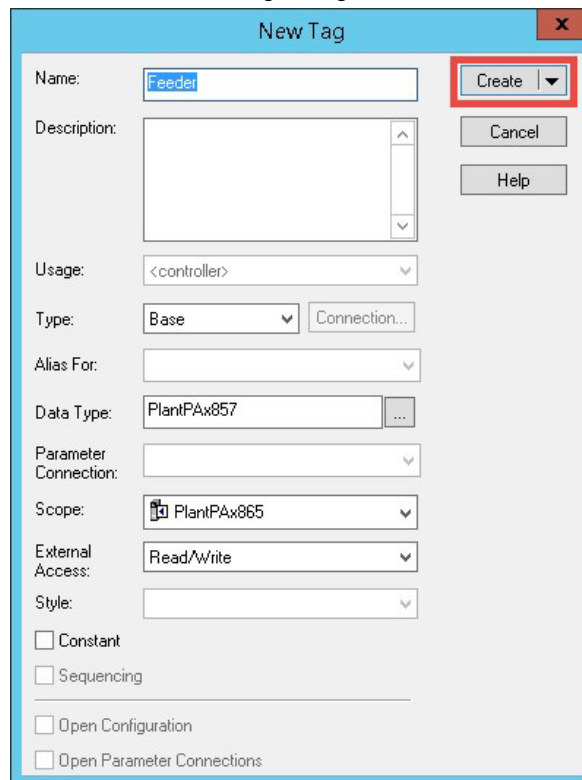
7. Type in a name for this tag. In this example, the name is “Feeder”.



8. Right-click on the new tag name and select New <tag name>.

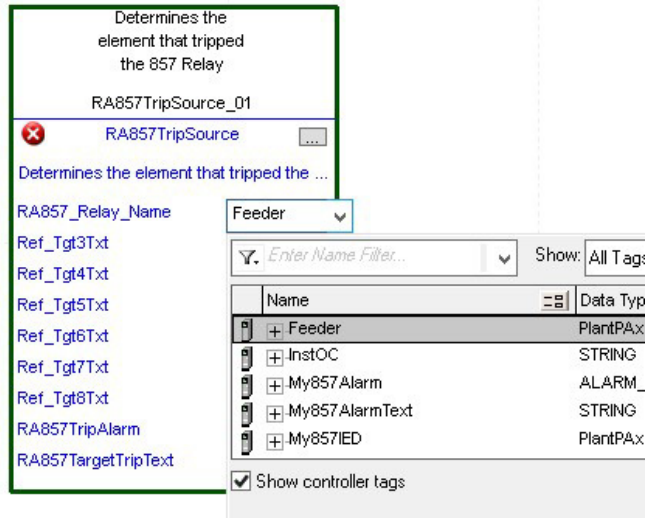


9. Click Create on the New Tag dialog box.

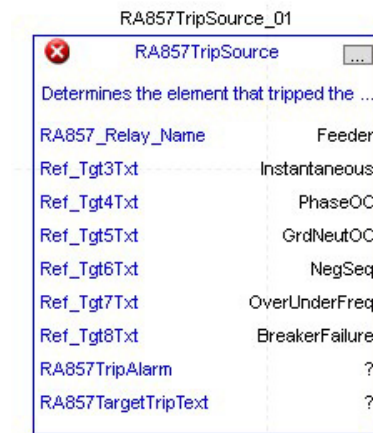


Now configure the Bulletin 857_TripSource Add-On Instruction.

10. Click the question mark next to Bulletin 857_Relay_Name and select the tag that was created in [step 9](#).



11. Click the question mark next to each Ref_Tgt#Txt and enter a string tag. These tags are intended to match the status indicators on the front panel of the device.
12. Once you type the tag name, if the tag is not already configured in the controller, you have to right-click and create a tag.



13. Click the question mark next to Bulletin 857TripAlarm and select or create the digital alarm tag to be used.

This tag is used for alarming through the HMI FactoryTalk® Alarms and Events Server.

14. Click the question mark next to Bulletin 857TripText and select or create the tag to be used.

This tag is used for alarm message through the HMI FactoryTalk Alarms and Events Server.

Fully Configured Add-On Instruction



Using Visualization Files

See [Using a Display Element on page 16](#) for detailed information.

Faceplates

The Operator tab is displayed when the faceplate is initially opened. Click the appropriate icon on the left of the faceplate to access a specific tab.

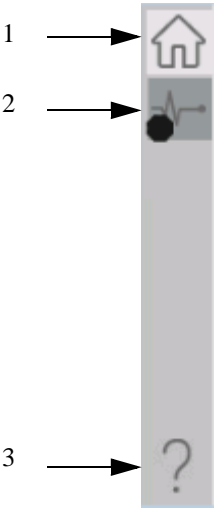


Table 8 - Tab Descriptions

Item	Description
1	Operator tab
2	Diagnostics tab
3	Help

The faceplate provides the means for operators, maintenance workers, engineers, and others to interact with the instruction instance. This interaction provides a view of the status and values of the instruction instance and an ability to manipulate it through its commands and settings.

Operator Tab

The Faceplate initially opens to the Operator tab, sometimes called the Home tab. From here, an operator can monitor the device status and manually operate the device.

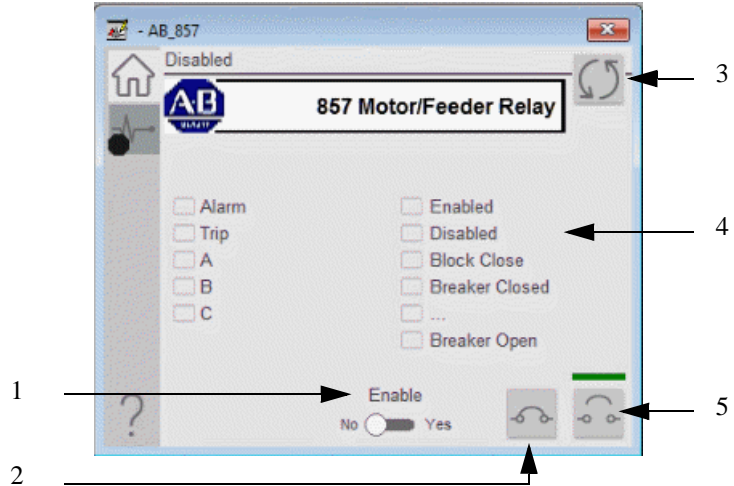


Table 9 - Operator Tab Description

Item	Description
1	Click to enable/disable the device. To issue the commands to the device, enable the device. If the device is disabled, you can only monitor data from the device.
2	Click to close the circuit breaker.
3	Click to reset the device. The status of the device is indicated on the faceplate.
4	Status Indicators
5	Click to open the circuit breaker.

Diagnostics Tab

The diagnostics tab allows the operator to see the measurement values from the physical device.

Diagnostics Tab

Readout of the measurement values from the 857 relay.



Advanced Properties


Click the advanced properties icon  on the diagnostics page to display the advanced properties. The following screen capture shows the tabs that are available in the advanced properties display



Table 10 - Advanced Properties Tab Descriptions

Item	Description
1	HMI Configuration
2	Faults
3	Help

HMI Configuration Tab

The HMI configuration tab provides access to displayed text, and faceplate-to-faceplate navigation settings. Configure the description, label, tag, and security area for the device.

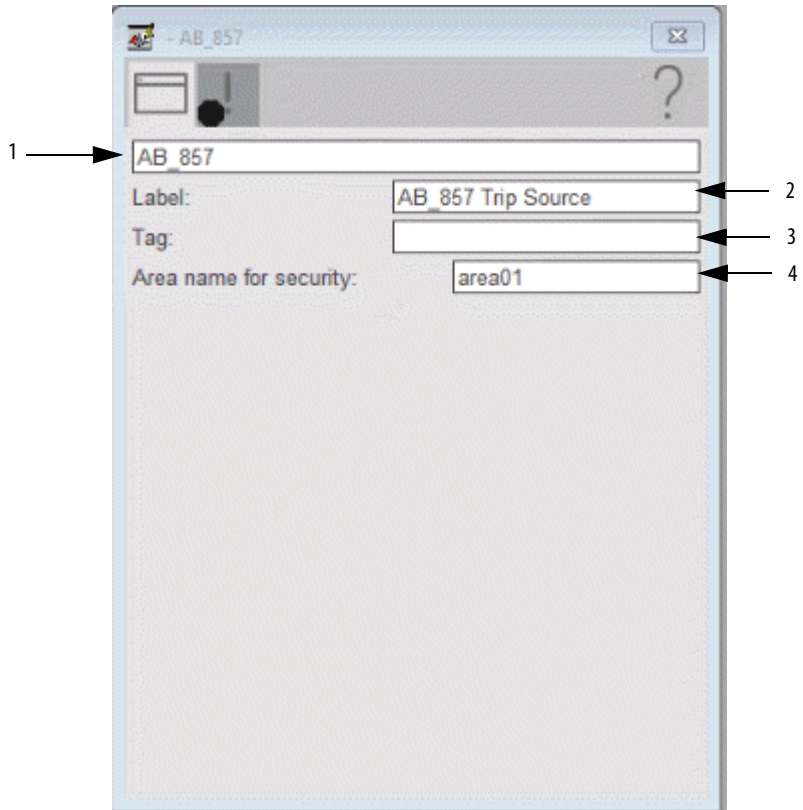
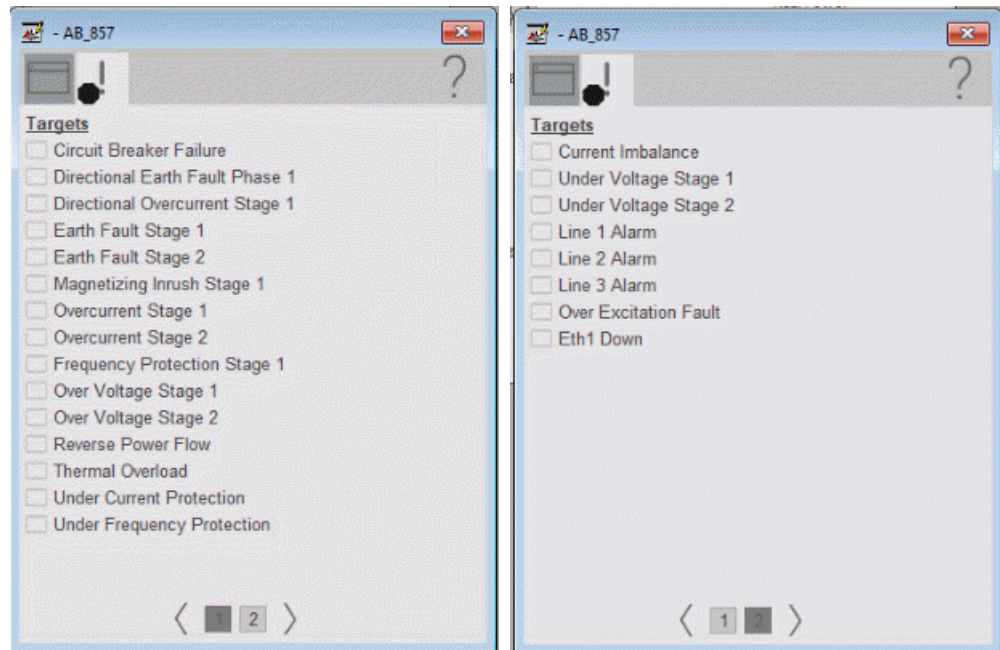


Table 11 - HMI Configuration Tab Description

Item	Action
1	Type the device description to show on the faceplate title bar.
2	Type the label to show on the graphic symbol.
3	Type the tag name to show on the faceplate and Tooltip. IMPORTANT: Pause the mouse over this field to display a tool tip with the configured Logix tag/path.
4	Type the Area name for security.

Faults Tab

The faults tab shows which alarms are active from the physical device.



Help Button

Press the help button on the faceplates to access help specific to that faceplate. The help file is in .pdf format and opens in a separate window.

Bulletin 865 Transformer Object



The Allen-Bradley® 865 is a differential protection relay that is used for various tasks. These tasks include selective differential protection of substation transmission lines, medium-voltage overhead and cable feeders, rotating machines, transformer feeders, capacitor banks, generators, reactors, and busbars. The relay is used in power system distribution substations, power plants, industrial power systems, and marine and offshore installations.

The 865 relay offers extensive customizable control, power and energy measurements, circuit breaker control and monitoring, primary circuit monitoring, and communication functionality, and a comprehensive range of standard protection functions.

Topic	Page
Controller Code	54
Mapping InOut Tags to Add-On Instructions	56
Using Visualization Files	59
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This instruction monitors one 865 relay. Alarms are provided when the physical device experiences a protection-related trip. The instruction also provides capabilities for opening and closing the breaker. It is also possible to switch between the two available breakers.

Add-On Instruction

AB865TripSource_01

AB865TripSource

Determines the element that tripped the ...

AB865_Relay_Name	AB865_Relay
Ref_Tgt3T:t	GrdNeutOC
Ref_Tgt4T:t	BreakerFailure
Ref_Tgt5T:t	Instantaneous
Ref_Tgt6T:t	Over_Current
Ref_Tgt7T:t	OverUnderFreq
Ref_Tgt8T:t	OverUnderVoltage
AB865TargetTripText	Alarm5Text
AB865TripAlarm	Alarm5

Faceplate

The faceplate shows the relay status as 'Enabled'. It includes checkboxes for Alarm, Trip, A, B, and C. On the right, there are checkboxes for Breaker 1 and Breaker 2, each with sub-options for 'Closed' and 'Open'. At the bottom, there is an 'Enable' toggle switch set to 'Yes' and two circular icons for breaker control.

Controller Code

Two Add-On Instructions represent each physical device. You must configure the InOut parameters of each Add-On Instruction per physical device.

The first Add-On Instruction is the ProSoft software-generated Add-On Instruction (see [Chapter 2](#)). The second Add-On Instruction is the TripSource Add-On Instruction, which is available for download from the Rockwell Automation® Library of Electrical Protection Devices from the PCDC.

InOut Structure for ProSoft Add-On Instruction

InOut parameters in [Table 12](#) are used to link the Add-On Instruction to external tags that contain necessary data for the instruction to operate. These external tags must be of the data type shown

Table 12 - Bulletin 865_TripSource

Name	Data Type	Description
[DeviceName]_Relay_Name	<Defined by device AOI>	Device data from the Add-On Instruction. This data type changes to match each device tag in the ProSoft Gateway.
Ref_Tgt3Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt4Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt5Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt6Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt7Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt8Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
[DeviceName]TripAlarm	ALARM_DIGITAL	Digital Alarm tag
[DeviceName]TripText	STRING	Alarm text to be displayed when active.

InOut Structure for Rockwell Automation Library Download

[Table 13](#) shows the InOut parameters that are available from the Rockwell Automation Library of Electrical Protection Devices Folder in the PCDC. These external tags must be of the data type shown. These tags are representative of the tags that are required for each 865 relay.

Table 13 - Bulletin 865 Device

Name	Data Type	Description
[DeviceName]_AOI	[DeviceName]_AOI	Add-On Instruction tag. Matches naming from ProSoft Configuration Manager.
Connection_Input0	SINT[500]	CIP Connection Input data. The number of these parameters vary depending on system sizing.
Connection_Output0	SINT[496]	CIP Connection Output data. The number of these parameters vary depending on system sizing.
Connection_Input1	SINT[500]	CIP Connection Input data. The number of these parameters vary depending on system sizing.
Connection_Output1	SINT[496]	CIP Connection Output data. The number of these parameters vary depending on system sizing.
[DeviceName]865	[DeviceName]865	Device Data that is collected from the CIP connections and organized into understandable tags. This data type changes to match each device tag in the ProSoft Gateway.

Output Structure for Bulletin 865 Relay

These parameters are used to link the Add-On Instruction to the HMI. These tags are representative of the tags that are required for each 865 relay. These parameters are a subset of the full variable list available from the device.

The CID files that are provided with the download provide you with these measurement values from the physical device that is already selected. These measurement values are ready to load into the ProSoft gateway. This selection verifies that all variables that are needed for correct HMI operation are present.

For a full list of the relay variables included, see List_Of_Variables.xls under the tools folder of the download

Remote Bit Control Value Structure

Remote Bit Control Value parameters are used to link the Add-On Instruction to configurable input points in the device. Each bit is configurable through the device vendor software. [Table 14](#) has the recommended uses for each bit.

Table 14 - Remote Bit Control - Bulletin 865 Device

Name	Description
VI1GGI0137_CO_SPCSO_ctlVal	Breaker Select

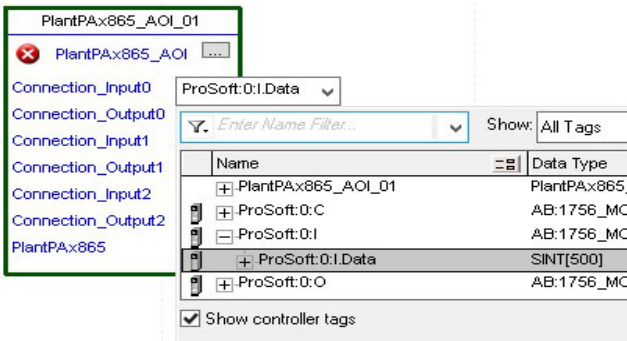
Table 14 - Remote Bit Control - Bulletin 865 Device

Name	Description
VI1GGI0138_CO_SPCSO_ctlVal	Target Reset
VI1GGI0139_CO_SPCSO_ctlVal	Breaker Close
VI1GGI0140_CO_SPCSO_ctlVal	Breaker Open

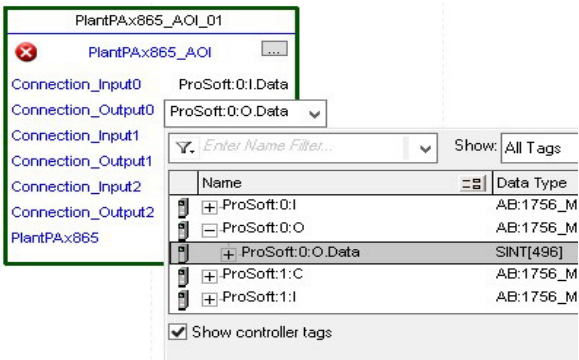
Mapping InOut Tags to Add-On Instructions

Each 865 relay requires two Add-On Instructions to monitor and visualize the relay. The ProSoft Software instruction is created in [Chapter 2](#). The Add-On Instruction is downloaded from the Rockwell Automation Library of Electronic Protection Devices from the PCDC.

1. Double-click the question mark next to Connection_Input0 of the device Add-On Instruction.
2. Click the down arrow on the drop box and expand the ProSoft_Gateway:0:I. Select the ProSoft_Gateway:0:I.Data and double-click to choose it.

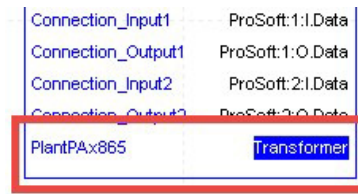


3. Double-click the question mark next to Connection_Output0 of the device Add-On Instruction. Click the down arrow on the drop box and expand the ProSoft_Gateway:0:O. Select the ProSoft_Gateway:0:O.Data and double-click to choose it.

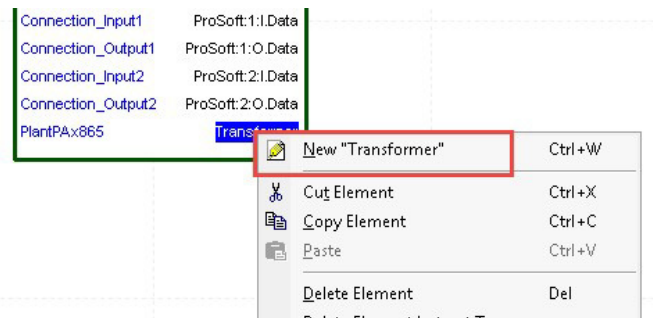


4. Repeat this process for Connection Input and Output that are included with your Add-On Instructions.

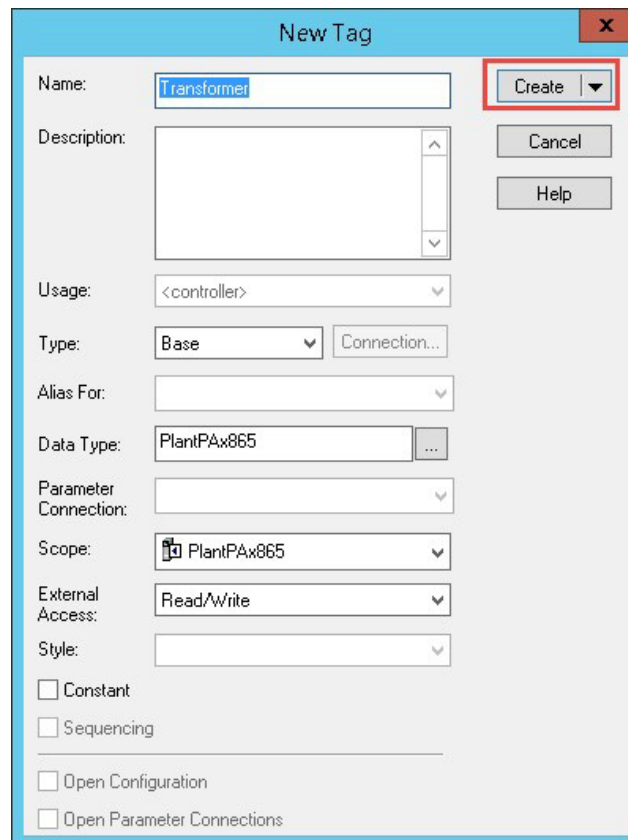
5. Click the question mark next to the final tag. This tag has the same name as the Add-On Instruction and the device as configured in the ProSoft Gateway.
6. Type in a name for this tag. In this example, the name is “Transformer”.



7. Right-click on the new tag name and select New <tag name>.

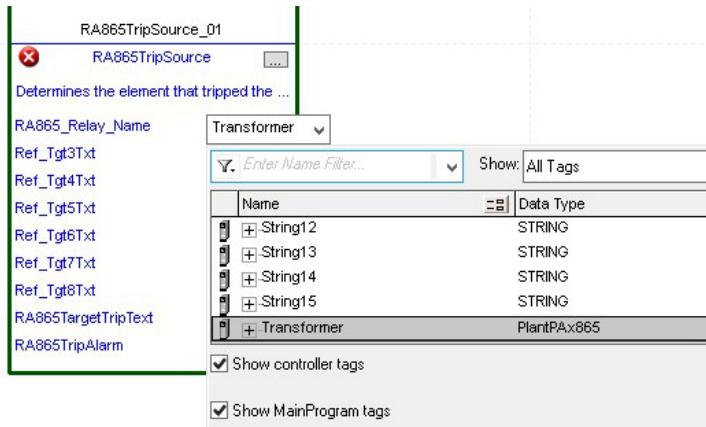


8. Click Create on the New Tag dialog box.

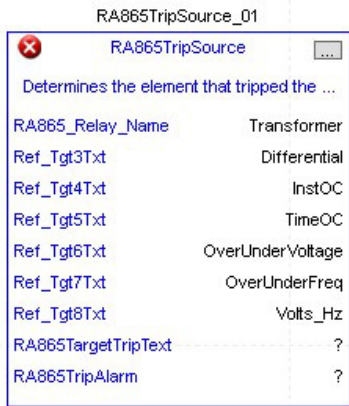


Now configure the Bulletin 865_TripSource Add-On Instruction.

9. Click the question mark next to Bulletin 865_Relay_Name and select the tag that was created in [step 8](#).



10. Click the question mark next to each Ref_Tgt#Txt and enter a string tag. These tags are intended to match the status indicators on the front panel of the device.
11. Once you type the tag name, if the tag is not already configured in the controller, you have to right-click and create a tag.



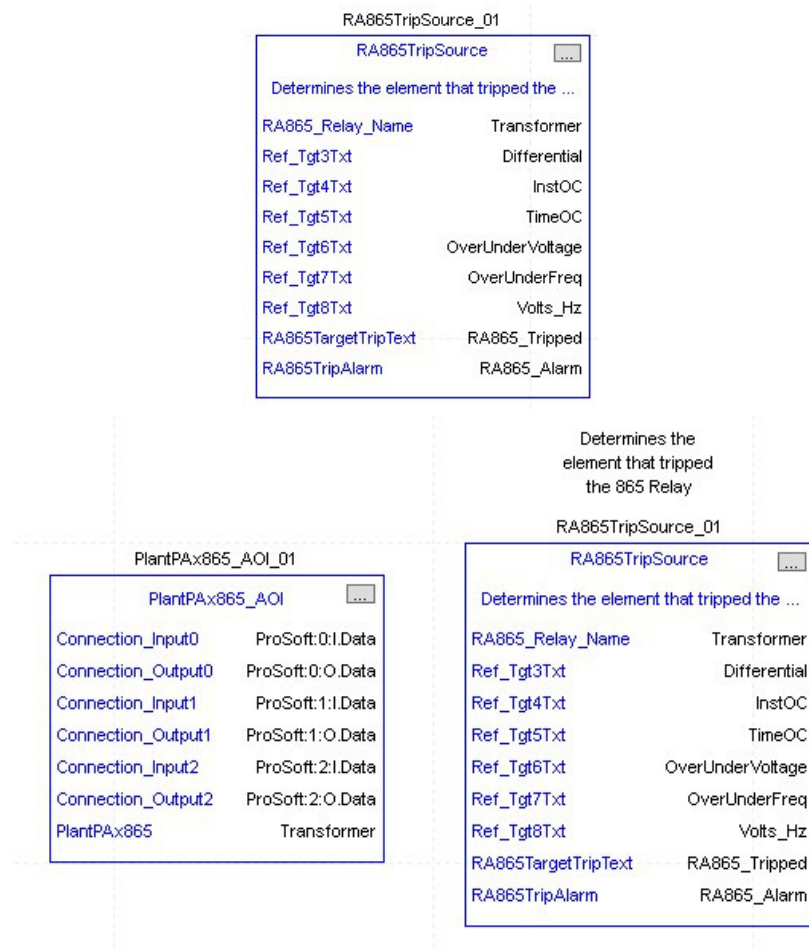
12. Click the question mark next to Bulletin 865TripAlarm and select or create the digital alarm tag to be used.

This tag is used for alarming through the HMI FactoryTalk® Alarms and Events Server.

13. Click the question mark next to Bulletin 865TripText and select or create the tag to be used.

This tag is used for alarm message through the HMI FactoryTalk Alarms and Events Server.

Fully Configured Add-On Instruction



Using Visualization Files

See [Using a Display Element on page 16](#) for detailed information.

Faceplates

The Operator tab is displayed when the faceplate is initially opened. Click the appropriate icon on the left of the faceplate to access a specific tab.

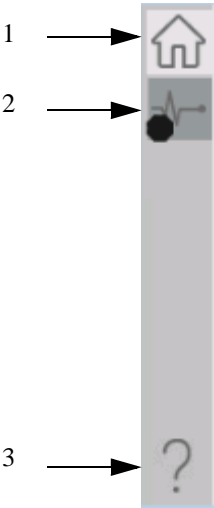


Table 15 - Tab Descriptions

Item	Description
1	Operator tab
2	Diagnostics tab
3	Help

The faceplate provides the means for operators, maintenance workers, engineers, and others to interact with the instruction instance. This interaction provides a view of the status and values of the instruction instance and an ability to manipulate it through its commands and settings.

Operator Tab

The Faceplate initially opens to the Operator tab, sometimes called the Home tab. From here, an operator can monitor the device status and manually operate the device.

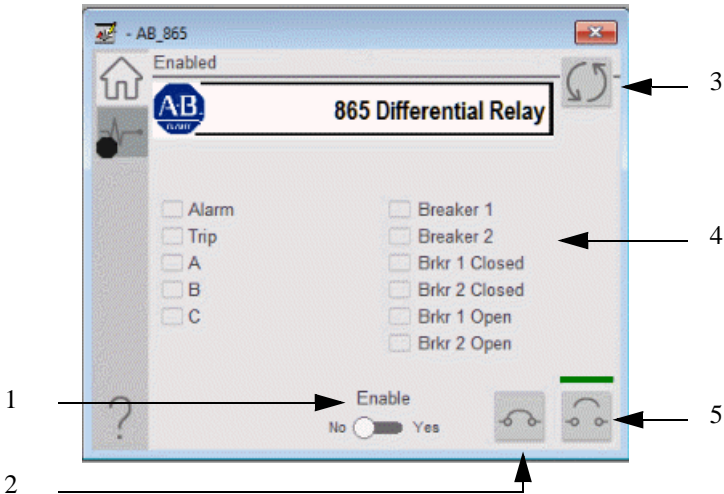


Table 16 - Operator Tab Description

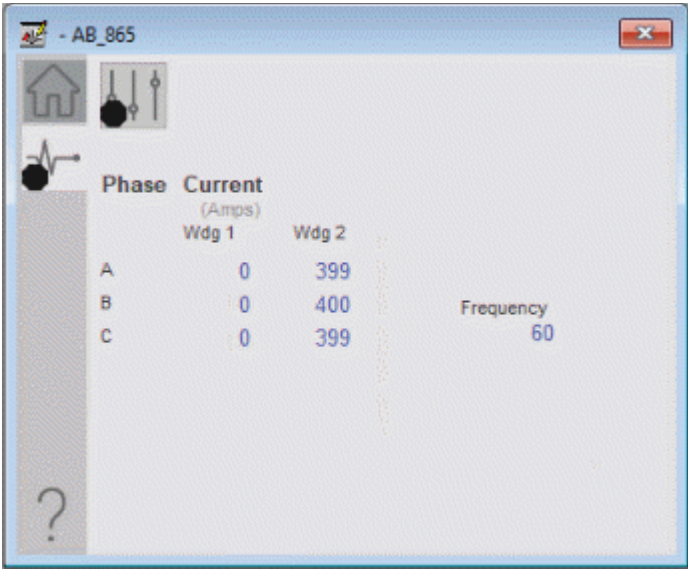
Item	Description
1	Click to enable/disable the device. To issue the commands to the device, enable the device. If the device is disabled, you can only monitor data from the device.
2	Click to close the circuit breaker.
3	Click to reset the device. The status of the device is indicated on the faceplate.
4	Status Indicators
5	Click to open the circuit breaker.

Diagnostics Tab

The diagnostics tab allows the operator to see the measurement values from the physical device.

Diagnostics Tab

Readout of the measurement values from the 865 relay.



Advanced Properties


Click the advanced properties icon  on the diagnostics page to display the advanced properties. The following screen capture shows the tabs that are available in the advanced properties display



Table 17 - Advanced Properties Tab Descriptions

Item	Description
1	HMI Configuration
2	Faults
3	Help

HMI Configuration Tab

The HMI configuration tab provides access to displayed text, and faceplate-to-faceplate navigation settings. Configure the description, label, tag, and security area for the device.

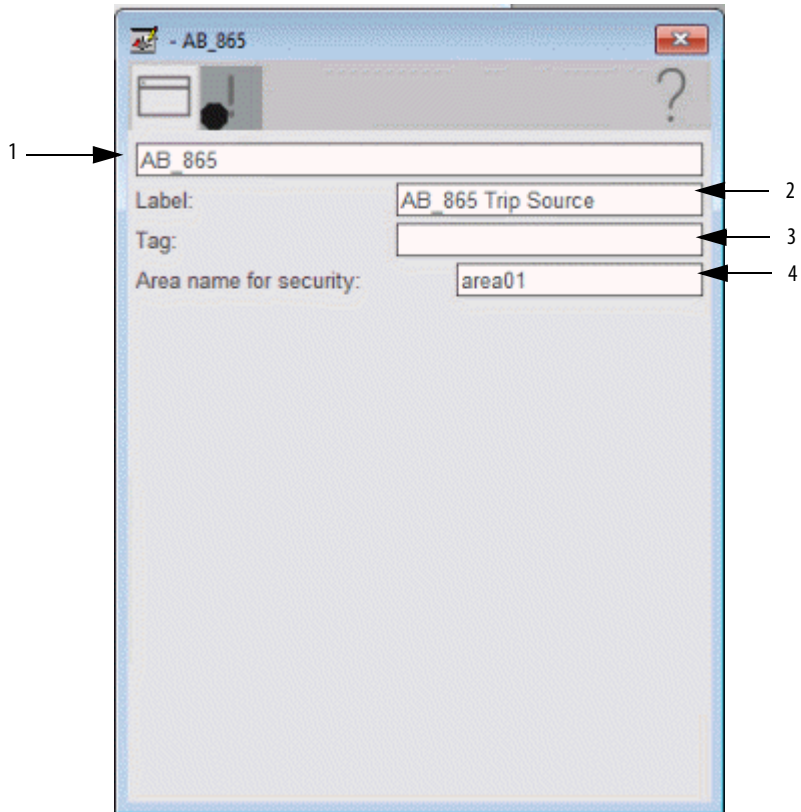
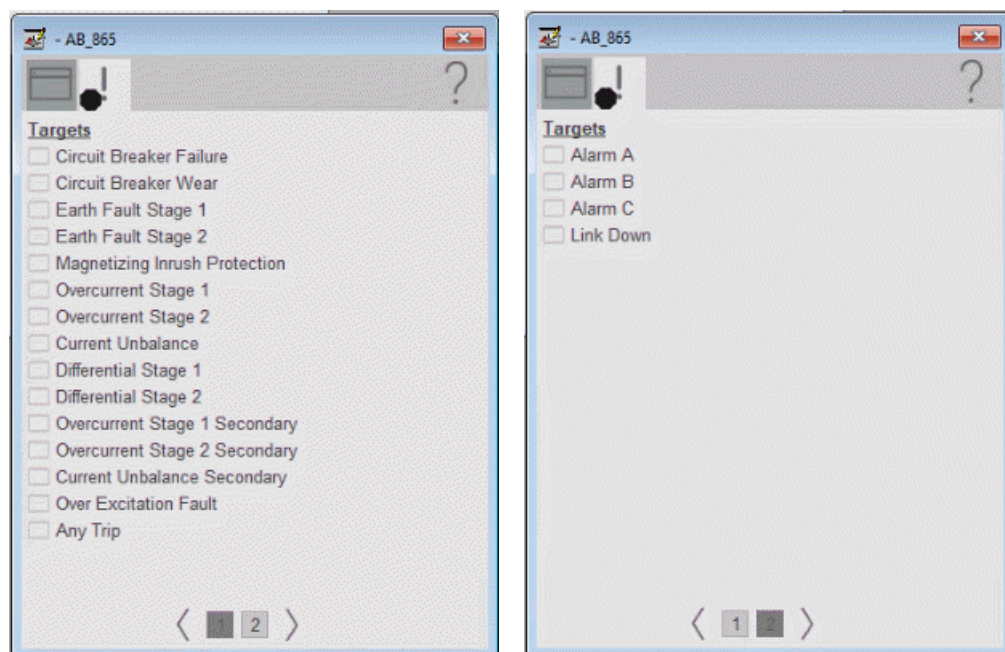


Table 18 - HMI Configuration Tab Description

Item	Action
1	Type the device description to show on the faceplate title bar.
2	Type the label to show on the graphic symbol.
3	Type the tag name to show on the faceplate and Tooltip. IMPORTANT: Pause the mouse over this field to display a tool tip with the configured Logix tag/path.
4	Type the Area name for security.

Faults Tab

The faults tab shows which alarms are active from the physical device.



Help Button

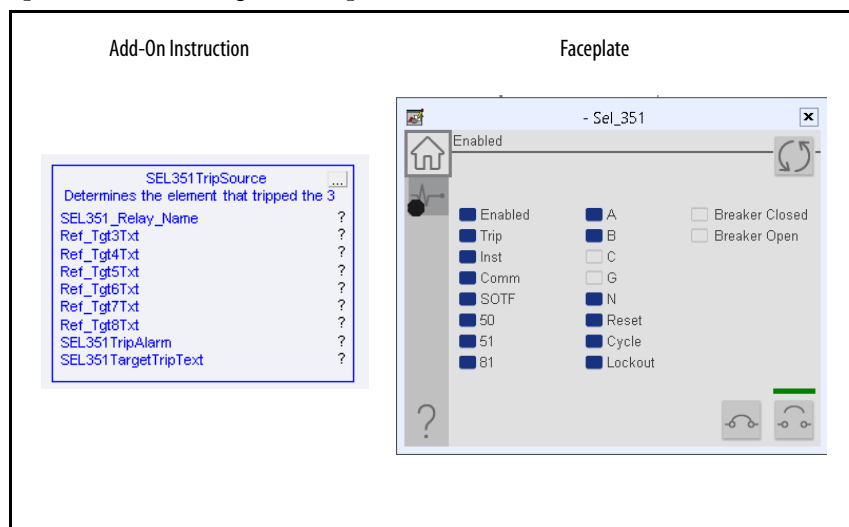
Press the help button on the faceplates to access help specific to that faceplate. The help file is in .pdf format and opens in a separate window.

SEL 351 Object

The Schweitzer Engineering Labs 351 is a feeder protection relay with synchrophasor capability. This device is used to help protect an electrical bus from conditions of over current, over voltage, under voltage, and so on. The device also provides multiple fundamental metering data including, voltage, current, frequency, and power.

Topic	Page
Controller Code	66
Mapping InOut Tags to Add-On Instructions	68
Using Visualization Files	72
Faceplates	73

This instruction monitors one SEL351 relay. Alarms are provided when the device experiences a protection-related trip. The instruction also provides capabilities for locking, and to open and close the breaker.



Controller Code

Two Add-On Instructions represent each physical device. You must configure the InOut parameters of each Add-On Instruction per physical device.

The first Add-On Instruction is the ProSoft software-generated Add-On Instruction (see [Chapter 2](#)), which maps data to the controller. The second Add-On Instruction is the TripSource Add-On Instruction, available for download from the library resources from the PCDC, which is for faceplate management

InOut Structure for ProSoft Add-On Instruction

InOut parameters in [Table 19](#) are used to link the Add-On Instruction to external tags that contain necessary data for the instruction to operate. These external tags must be of the data type shown. These tags are representative of the tags that are required for each SEL-351 relay, which is configured in your system.

Table 19 - SEL351Relay

Name	Data Type	Description
[DeviceName]_AOI	[DeviceName]_AOI	Add-On Instruction tag. Matches naming from ProSoft Configuration Manager.
Connection_Input0	SINT[500]	CIP Connection Input data. The number of these parameters vary depending on system sizing.
Connection_Output0	SINT[496]	CIP Connection Output data. The number of these parameters vary depending on system sizing.
Connection_Input1	SINT[500]	CIP Connection Input data. The number of these parameters vary depending on system sizing.
Connection_Output1	SINT[496]	CIP Connection Output data. The number of these parameters vary depending on system sizing.
[DeviceName]	[DeviceName]	Device data that is collected from the CIP connections and organized into understandable tags. This data type changes to match each device tag in the ProSoft Gateway.

InOut Structure for Rockwell Automation Library Download

[Table 20](#) shows the InOut parameters that are available from the Rockwell Automation Library of Electrical Protection Devices Folder in the PCDC. These external tags must be of the data type shown.

Table 20 - SEL351_TripSource

Name	Data Type	Description
[DeviceName]_Relay_Name	<Defined by device AOI>	Device data from the Add-On Instruction. This data type changes to match each device tag in the ProSoft Gateway.
Ref_Tgt3Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt4Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt5Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt6Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt7Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt8Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
[DeviceName]TripAlarm	ALARM_DIGITAL	Digital Alarm tag
[DeviceName]TripText	STRING	Alarm text to be displayed when active.

Remote Bit Control Value Structure

Remote Bit Control Value parameters are used to link the Add-On Instruction to configurable input points in the physical device. Each bit is configurable via the vendor software of each device. [Table 21](#) has recommended uses for each bit.

Table 21 - Remote Bit Control - SEL351 Relay

Name	Description
CON_RBGGIO1_CO_SPCS001_Oper_ctlVal	Lock/Unlock
CON_RBGGIO1_CO_SPCS002_Oper_ctlVal	Target Reset
CON_RBGGIO1_CO_SPCS003_Oper_ctlVal	Breaker Close
CON_RBGGIO1_CO_SPCS004_Oper_ctlVal	Breaker Open
CON_RBGGIO1_CO_SPCS005_Oper_ctlVal	User Programmable
CON_RBGGIO1_CO_SPCS006_Oper_ctlVal	User Programmable
CON_RBGGIO1_CO_SPCS007_Oper_ctlVal	User Programmable
CON_RBGGIO1_CO_SPCS008_Oper_ctlVal	User Programmable

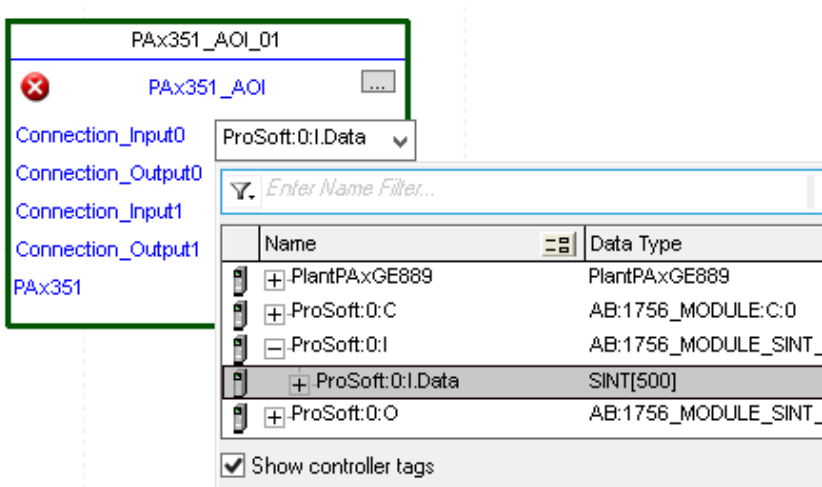
Mapping InOut Tags to Add-On Instructions

Each SEL351 relay requires two Add-On Instructions to monitor and visualize the relay. The ProSoft Software instruction is created in [Chapter 2](#). The Add-On Instruction is downloaded from the Rockwell Automation Library of Electronic Protection Devices from the PCDC.

Associate Controller Tags to ProSoft Add-On Instruction

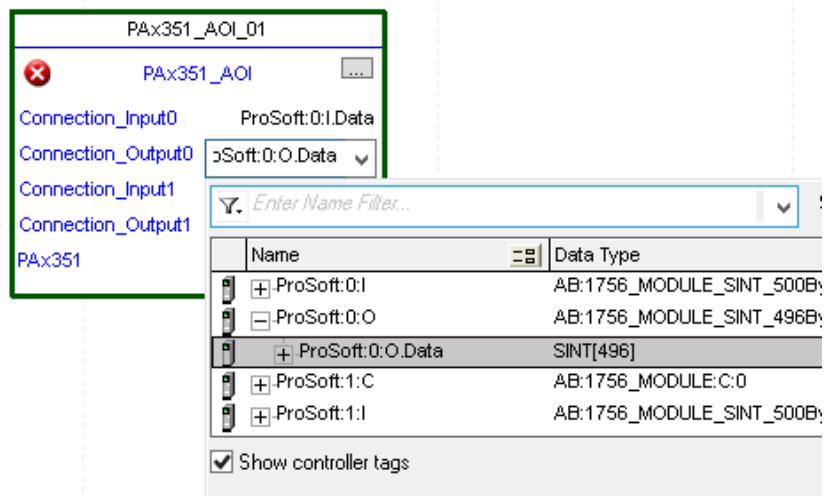
Complete these steps to map the ProSoft instruction to Studio 5000® tags.

1. Double-click the question mark next to Connection_Input0 of the device Add-On Instruction.
2. Click the down arrow on the drop box and expand the ProSoft_Gateway:0:I. Select the ProSoft_Gateway:0:I.Data and double-click to choose it.

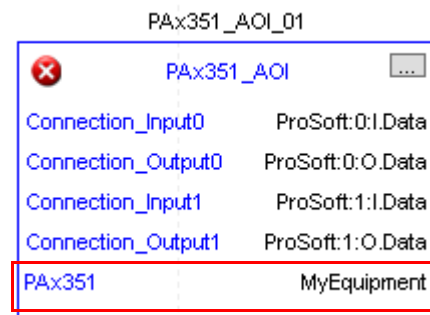


3. Double-click the question mark next to Connection_Output0 of the device Add-On Instruction.

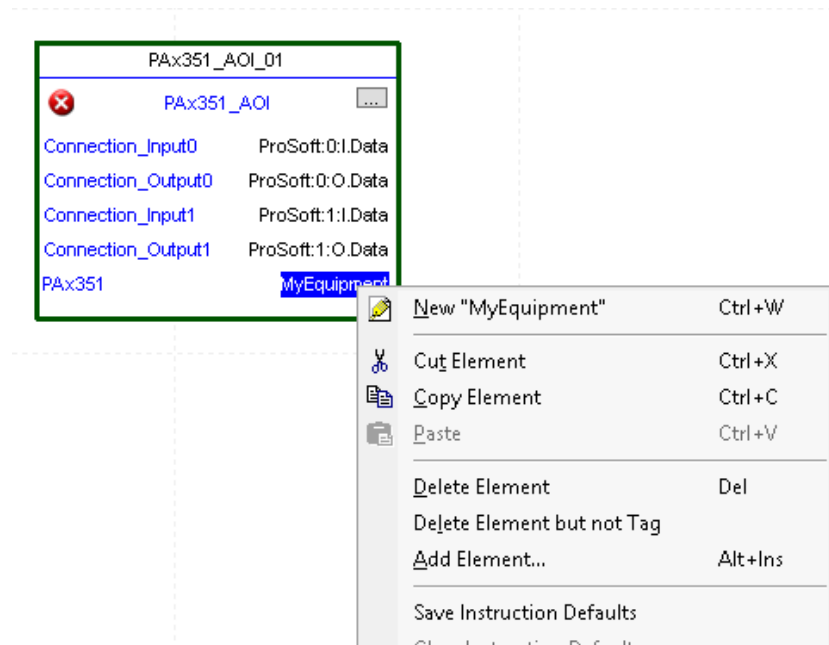
4. Click the down arrow on the drop box and expand the ProSoft_Gateway:0:O. Select the ProSoft_Gateway:0:O.Data and double-click to choose it.



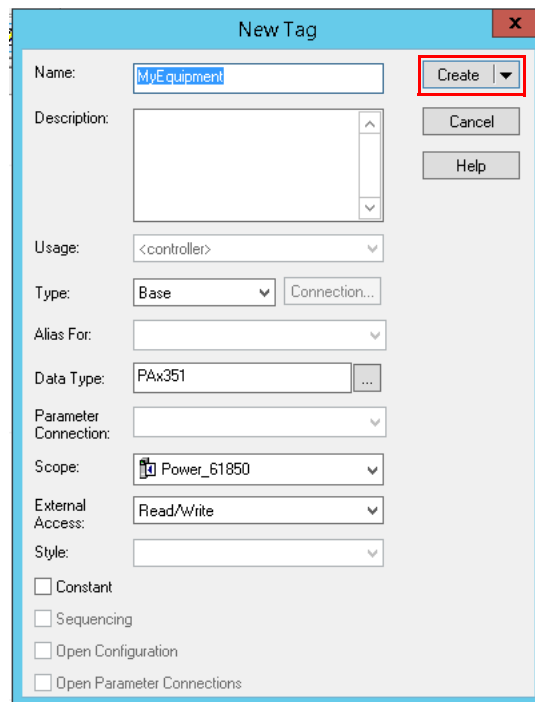
5. Repeat this process for each Connection Input and Output that are included with your Add-On Instructions.
6. Click the question mark next to the final tag. Type a tag name that represents your physical device within your Studio 5000 project. In this example, the name is "MyEquipment".



7. Right-click the new tag name and select New "<tag name>".



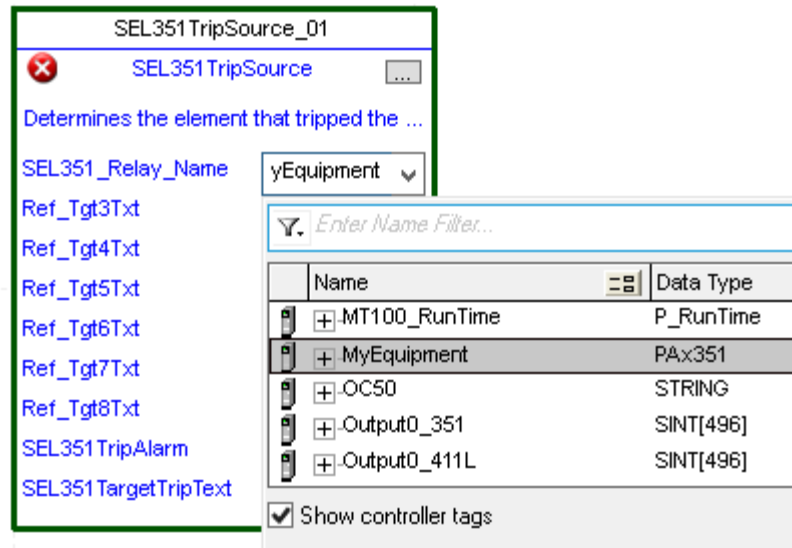
8. Click Create on the New Tag dialog box.



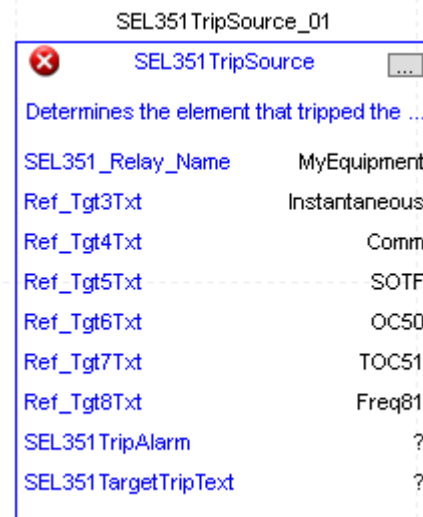
Configure Trip Source Add-On Instruction

Now that the SEL351 Add-On Instruction has been configured, you must configure the SEL351 trip source Add-On Instruction for alarming.

1. Click the question mark next to SEL351_Relay_Name and select the tag that was created in [step 8](#).



2. Next click the question mark next to each Ref_Tgt#Txt and enter a string tag. These tags are intended to match the status indicators on the front panel of the device.
3. Once you type the tag name, if the tag is not already configured in the controller, you have to right-click and create a tag.



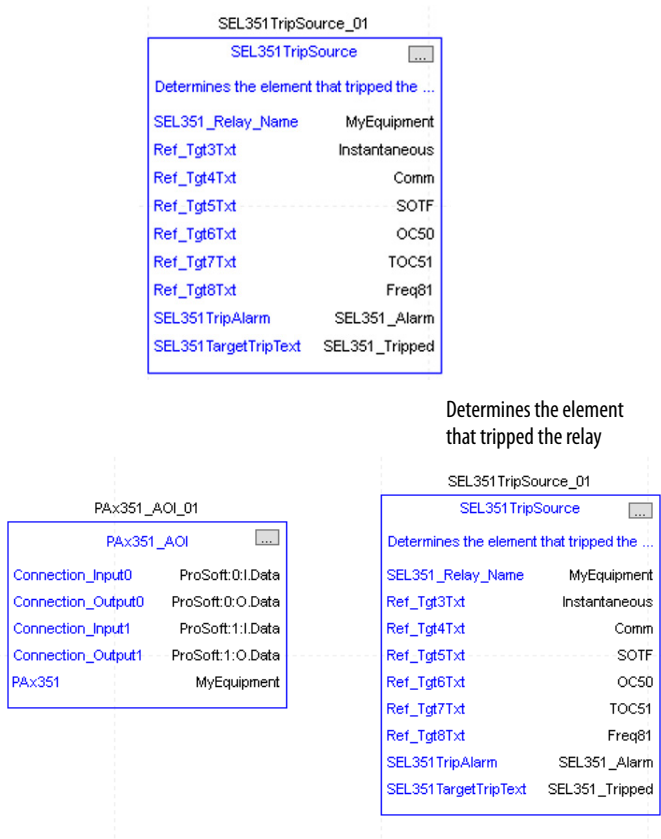
4. Click the question mark next to SEL351TripAlarm and select or create the digital alarm tag to be used.

This tag is used for alarming through the HMI FactoryTalk® Alarms and Events Server.

5. Click the question mark next to SEL351 Target TripText and select or create the tag to be used.

This tag is used for alarm message through the HMI FactoryTalk Alarms and Events Server.

Fully Configured Add-On Instruction



6. Save and download your project to the controller.

Using Visualization Files

See [Using a Display Element on page 16](#) for detailed information.

Faceplates

The Operator tab is displayed when the faceplate is initially opened. Click the appropriate icon on the left of the faceplate to access a specific tab.



Table 22 - Tab Descriptions

Item	Description
1	Operator tab
2	Diagnostics tab
3	Help

The faceplate provides the means for operators, maintenance workers, engineers, and others to interact with the instruction instance. This interaction provides a view of the status and values of the instruction instance and an ability to manipulate it through its commands and settings.

Operator Tab

The Faceplate initially opens to the Operator tab, sometimes called the Home tab. From here, an operator can monitor the device status and manually operate the device.

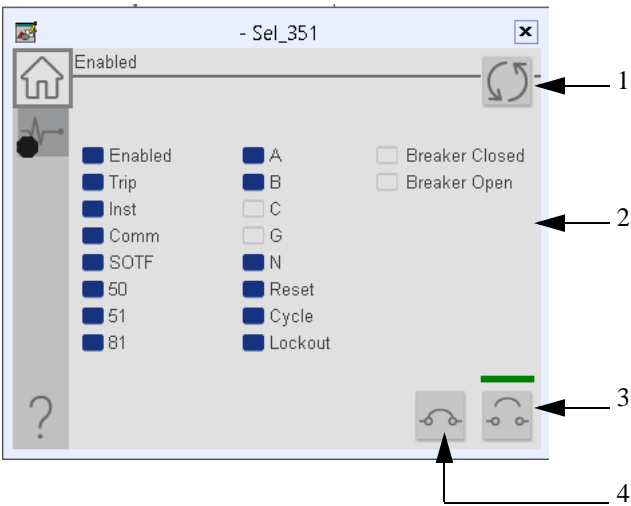


Table 23 - Operator Tab Description

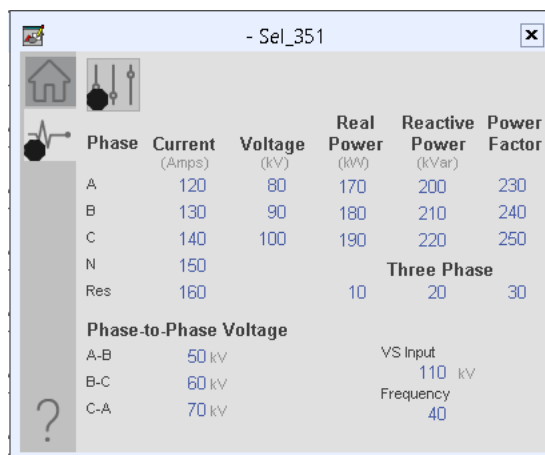
Item	Description
1	Click to reset the device. The status of the device is indicated on the faceplate.
2	Status Indicators
2	Click to open the circuit breaker.
4	Click to close the circuit breaker.

Diagnostics Tab

The diagnostics tab allows the operator to see the measurement values from the physical device.

Diagnostics Tab

Readout of the measurement values from the SEL-351.

**Advanced Properties**


Click the advanced properties icon  on the diagnostics page to display the advanced properties. The following screen capture shows the tabs that are available in the advanced properties display



Table 24 - Advanced Properties Tab Descriptions

Item	Description
1	HMI Configuration
2	Faults
3	Help

HMI Configuration Tab

The HMI configuration tab provides access to displayed text, and faceplate-to-faceplate navigation settings. Configure the description, label, tag, and security area for the device.

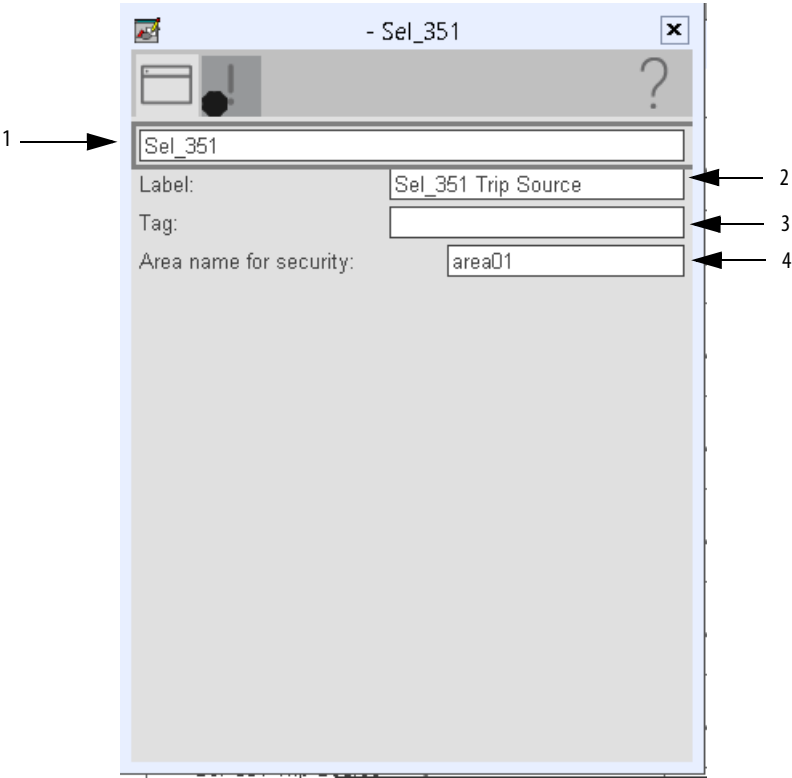
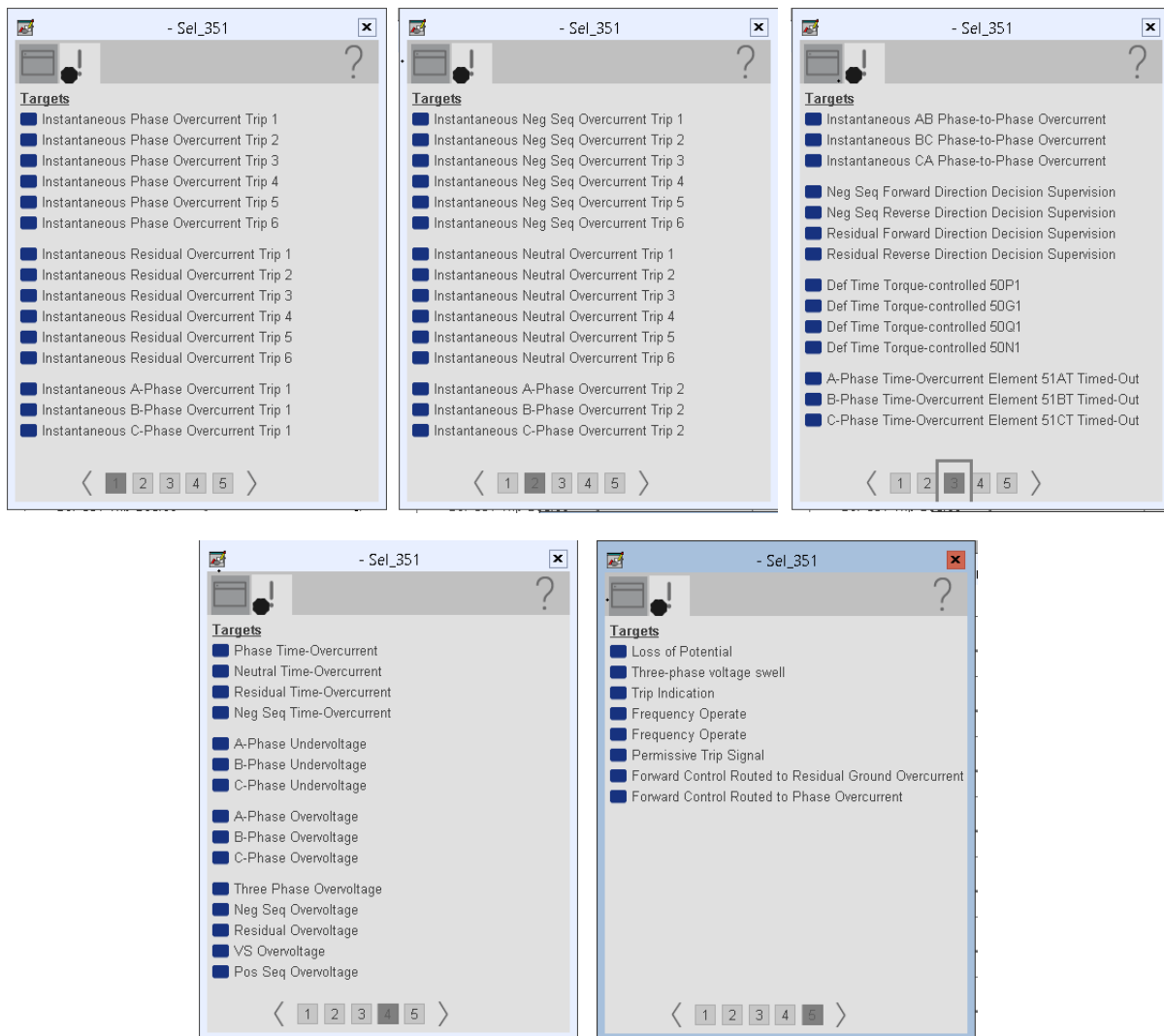


Table 25 - HMI Configuration Tab Description

Item	Action
1	Type the device description to show on the faceplate title bar.
2	Type the label to show on the graphic symbol.
3	Type the tag name to show on the faceplate and Tooltip. IMPORTANT: Pause the mouse over this field to display a tool tip with the configured Logix tag/path.
4	Type the Area name for security.

Faults Tab

The Faults tab shows which alarms are active from the physical device.



Help Button

Press the help button on the faceplates to access help specific to that faceplate. The help file is in .pdf format and opens in a separate window.

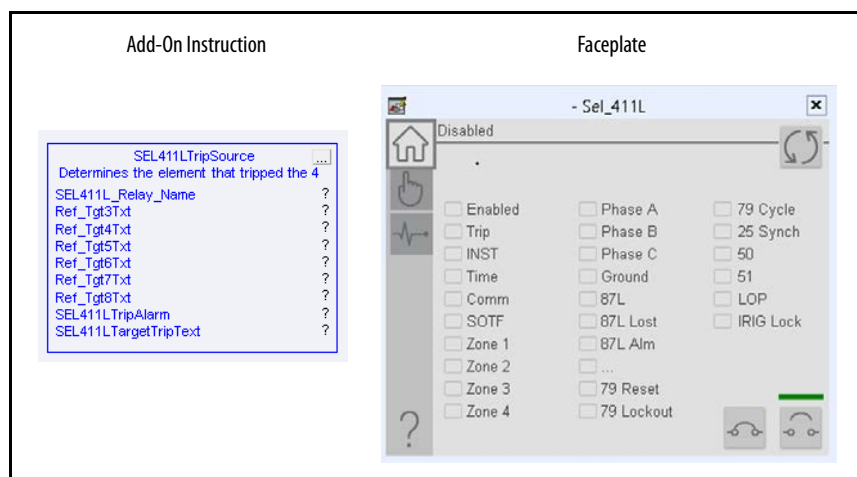
Notes:

SEL 411L Object

The SEL-411L provides protection and control of transmission lines. The SEL-411L provides differential protection with both phase- and sequence-based operating elements for sensitivity and high-speed operation.

Topic	Page
Controller Code	80
Mapping InOut Tags to Add-On Instructions	85
Using Visualization Files	86
Faceplates	87

This instruction monitors one SEL411L relay. Alarms are provided when the device experiences a protection-related trip. The instruction also provides capabilities for locking, and to open and close the breaker.



Controller Code

Two Add-On Instructions represent each physical device. You must configure the InOut parameters of each Add-On Instruction per physical device.

The first Add-On Instruction is the ProSoft software-generated Add-On Instruction (see [Chapter 2](#)), which maps data to the controller. The second Add-On Instruction is the TripSource Add-On Instruction, available for download from the library resources from the PCDC, which is for faceplate management

InOut Structure for ProSoft Add-On Instruction

InOut parameters in [Table 26](#) are used to link the Add-On Instruction to external tags that contain necessary data for the instruction to operate. These external tags must be of the data type shown. These tags are representative of the tags that are required for each SEL-411L relay, which is configured in your system.

Table 26 - SEL411L Relay

Name	Data Type	Description
[DeviceName]_AOI	[DeviceName]_AOI	Add-On Instruction tag. Matches naming from ProSoft Configuration Manager.
Connection_Input0	SINT[500]	CIP Connection Input data. The number of these parameters vary depending on system sizing.
Connection_Output0	SINT[496]	CIP Connection Output data. The number of these parameters vary depending on system sizing.
Connection_Input1	SINT[500]	CIP Connection Input data. The number of these parameters vary depending on system sizing.
Connection_Output1	SINT[496]	CIP Connection Output data. The number of these parameters vary depending on system sizing.
[DeviceName]	[DeviceName]	Device data that is collected from the CIP connections and organized into understandable tags. This data type changes to match each device tag in the ProSoft Gateway.

InOut Structure for Rockwell Automation Library Download

[Table 27](#) shows the InOut parameters that are available from the Rockwell Automation® Library of Electrical Protection Devices Folder in the PCDC. These external tags must be of the data type shown.

Table 27 - SEL411L TripSource

Name	Data Type	Description
[DeviceName]_Relay_Name	<Defined by device AOI>	Device data from the Add-On Instruction. This data type changes to match each device tag in the ProSoft Gateway.
Ref_Tgt3Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt4Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt5Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt6Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt7Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt8Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
[DeviceName]TripAlarm	ALARM_DIGITAL	Digital Alarm tag
[DeviceName]TripText	STRING	Alarm text to be displayed when active.

Remote Bit Control Value Structure

Remote Bit Control Value parameters are used to link the Add-On Instruction to configurable input points in the physical device. Each bit is configurable via the vendor software of each device. The following table has recommended uses for each bit.

Name	Description
CON_RBGGIO1_CO_SPCS001_Oper_ctlVal	Lock/Unlock
CON_RBGGIO1_CO_SPCS002_Oper_ctlVal	Target Reset
CON_RBGGIO1_CO_SPCS003_Oper_ctlVal	Breaker Close
CON_RBGGIO1_CO_SPCS004_Oper_ctlVal	Breaker Open
CON_RBGGIO1_CO_SPCS005_Oper_ctlVal	User Programmable
CON_RBGGIO1_CO_SPCS006_Oper_ctlVal	User Programmable
CON_RBGGIO1_CO_SPCS007_Oper_ctlVal	User Programmable
CON_RBGGIO1_CO_SPCS008_Oper_ctlVal	User Programmable

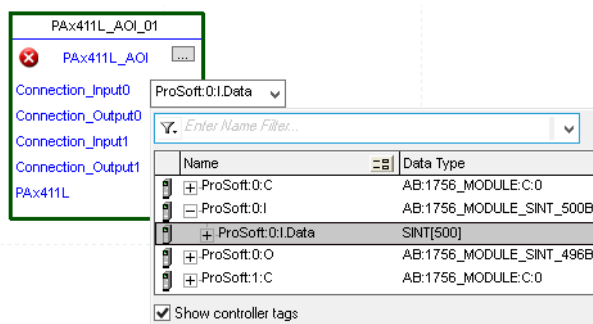
Mapping InOut Tags to Add-On Instructions

Each SEL411L relay requires two Add-On Instructions to monitor and visualize the relay. The ProSoft Software instruction is created in [Chapter 2](#). The Add-On Instruction is downloaded from the Rockwell Automation Library of Electronic Protection Devices from the PCDC.

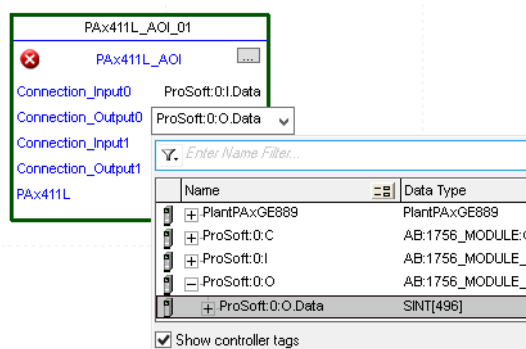
Associate Controller Tags to ProSoft Add-On Instruction

Complete these steps to map the ProSoft instruction to Studio 5000® tags.

1. Double-click the question mark next to Connection_Input0 of the device Add-On Instruction.
2. Click the down arrow on the drop box and expand the ProSoft_Gateway:0:I. Select the ProSoft_Gateway:0:I.Data and double-click to choose it.

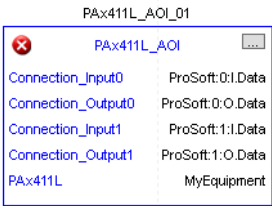


3. Double-click the question mark next to Connection_Output0 of the device Add-On Instruction.
4. Click the down arrow on the drop box and expand the ProSoft_Gateway:0:O. Select the ProSoft_Gateway:0:O.Data and double-click to choose it.

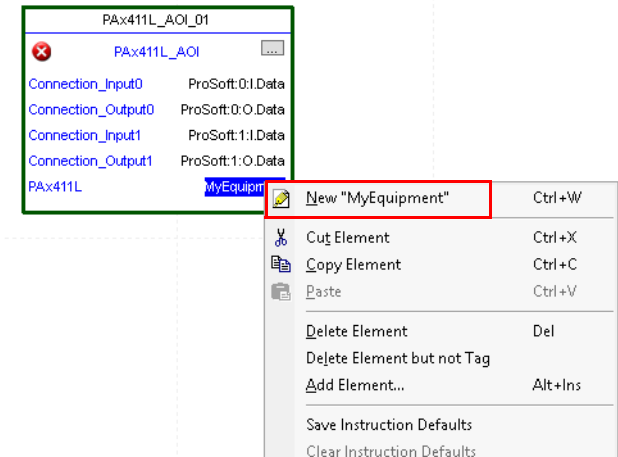


5. Repeat this process for each Connection Input and Output that are included with your Add-On Instructions.

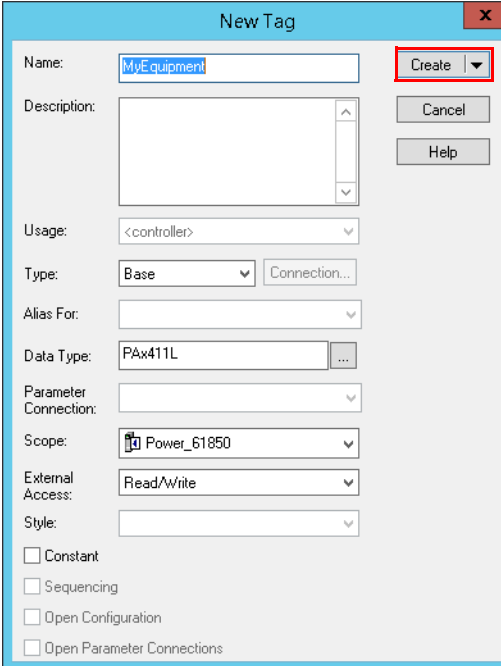
6. Click the question mark next to the final tag. Enter a clear engineering name to this tag that represents your device within your Studio 5000 project. In this example “MyEquipment”.



7. Right-click the new tag name and select New “<tag name>”.



8. Click Create on the New Tag dialog box.

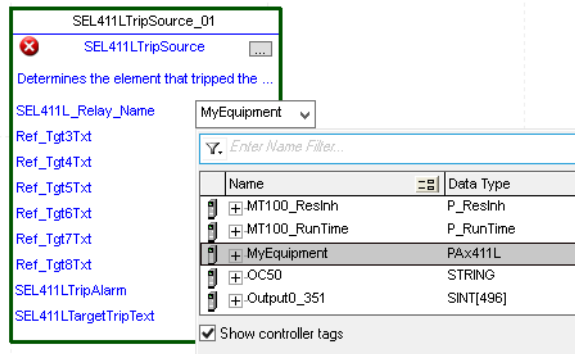


The image shows a 'New Tag' dialog box with a light blue title bar and a red 'X' close button. The dialog contains several fields and buttons. The 'Name' field is highlighted with a red box and contains the text 'MyEquipment'. The 'Create' button is also highlighted with a red box. Other fields include 'Description' (a text area), 'Usage' (a dropdown menu set to '<controller>'), 'Type' (a dropdown menu set to 'Base' with a 'Connection...' button next to it), 'Alias For' (a dropdown menu), 'Data Type' (a dropdown menu set to 'PAX411L' with an ellipsis button), 'Parameter Connection' (a dropdown menu), 'Scope' (a dropdown menu set to 'Power_61850' with a folder icon), 'External Access' (a dropdown menu set to 'Read/Write'), and 'Style' (a dropdown menu). At the bottom, there are four unchecked checkboxes: 'Constant', 'Sequencing', 'Open Configuration', and 'Open Parameter Connections'. On the right side of the dialog, there are three buttons: 'Create', 'Cancel', and 'Help'.

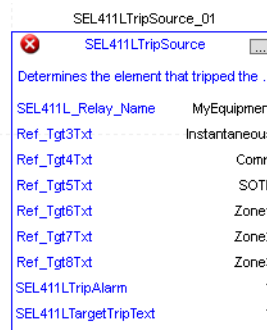
Configure Trip Source Add-On Instruction

Now that the SEL411L Add-On Instruction has been configured, you must configure the SEL411L trip source Add-On Instruction for alarming.

1. Click the question mark next to SEL411L_Relay_Name and select the tag that was created in [step 8](#).



2. Next click the question mark next to each Ref_Tgt#Txt and enter a string tag. These tags are intended to match the status indicators on the front panel of the device. Once you type the tag name, if the tag is not already configured in the controller, you have to right-click and create a tag.



3. Click the question mark next to SEL411L TripAlarm and select or create the digital alarm tag to be used. This tag is used for alarming through the HMI FactoryTalk® Alarms and Events Server.

4. Click the question mark next to SEL411LTripText and select or create the tag to be used.

This tag is used for alarm message through the HMI FactoryTalk Alarms and Events Server.

Fully Configured Add-On Instruction



5. Save and download your project to the controller.

Using Visualization Files

See [Using a Display Element on page 16](#) for detailed information.

Faceplates

The Operator tab is displayed when the faceplate is initially opened. Click the appropriate icon on the left of the faceplate to access a specific tab.

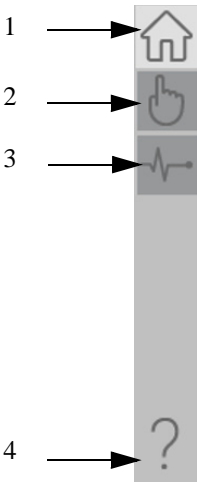


Table 28 - Tab Descriptions

Item	Description
1	Operator tab
2	Manual Control Tab
3	Diagnostics tab
4	Help

The faceplate provides the means for operators, maintenance workers, engineers, and others to interact with the instruction instance. This interaction provides a view of the status and values of the instruction instance and an ability to manipulate it through its commands and settings.

Operator Tab

The Faceplate initially opens to the Operator tab, sometimes called the Home tab. From here, an operator can monitor the device status and manually operate the device.

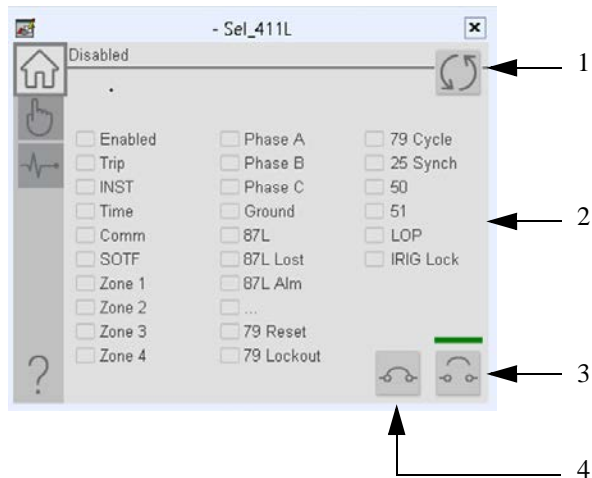


Table 29 - Operator Tab Description

Item	Description
1	Click to reset the device. The status of the device is indicated on the faceplate.
2	Status Indicators
3	Click to open the circuit breaker.
4	Click to close the circuit breaker.

Diagnostics Tab

The diagnostics tab allows the operator to see the measurement values from the device.

Diagnostics Tab

Readout of the measurement values from the SEL-411L.



Advanced Properties


Click the advanced properties icon  on the diagnostics page to display the advanced properties. The following screen capture shows the tabs that are available in the advanced properties display



Table 30 - Advanced Properties Tab Descriptions

Item	Description
1	HMI Configuration
2	Faults
3	Help

HMI Configuration Tab

The HMI configuration tab provides access to displayed text, and faceplate-to-faceplate navigation settings. Configure the description, label, tag, and security area for the device.

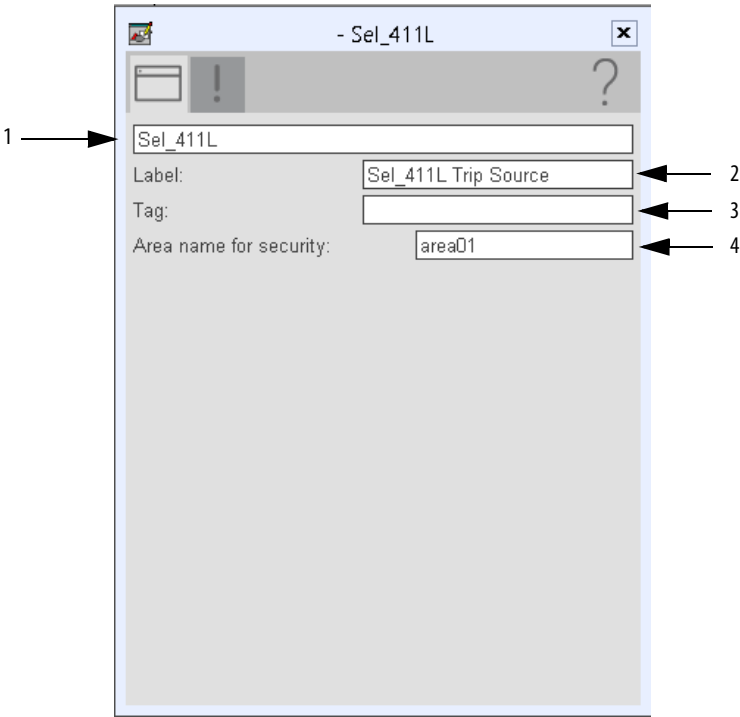
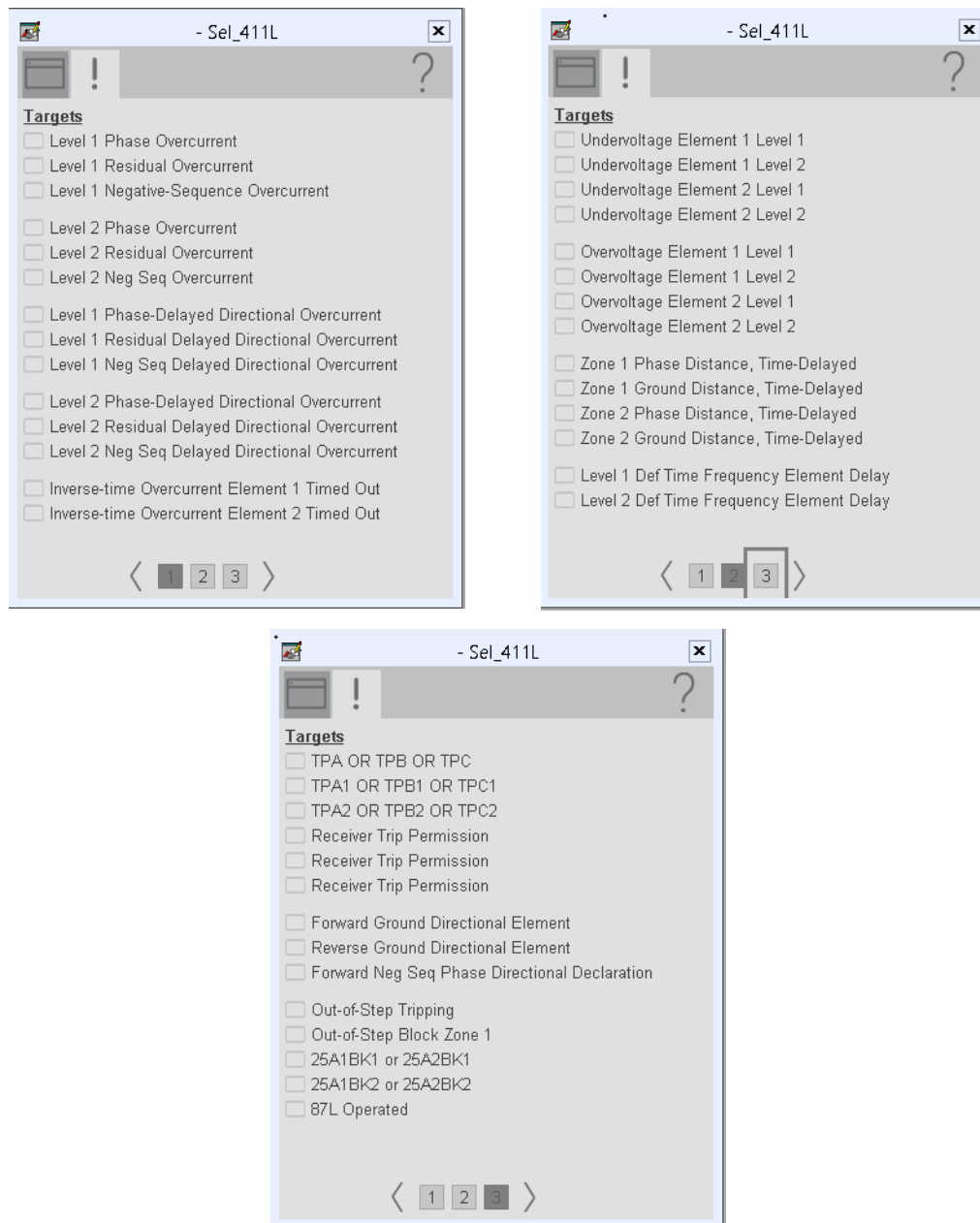


Table 31 - HMI Configuration Tab Description

Item	Action
1	Type the device description to show on the faceplate title bar.
2	Type the label to show on the graphic symbol.
3	Type the tag name to show on the faceplate and Tooltip. IMPORTANT: Pause the mouse over this field to display a tool tip with the configured Logix tag/path.
4	Type the Area name for security.

Faults Tab

The faults tab shows which alarms are active from the device.



Help Button

Press the help button on the faceplates to access help specific to that faceplate. The help file is in .pdf format and opens in a separate window.

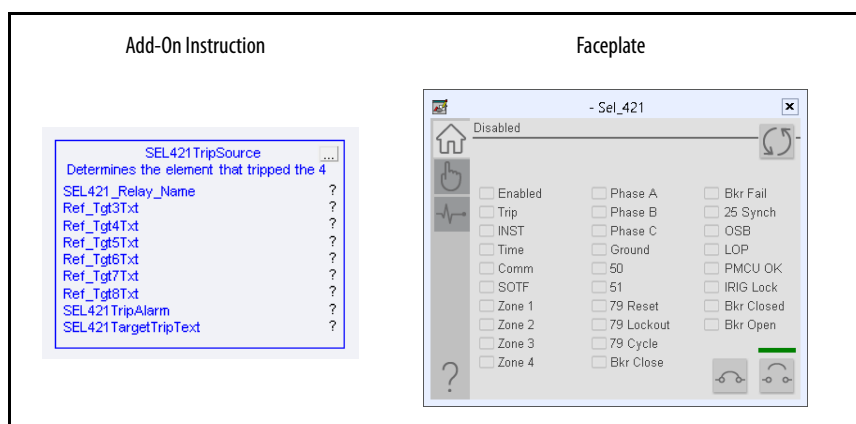
Notes:

SEL 421 Object

The SEL-421 is a high-speed distance and directional protection relay that can provide complete control of a two-breaker bay. It is used to help protect any transmission line using a combination of five zones of phase- and ground-distance and directional overcurrent elements.

Topic	Page
Controller Code	94
Mapping InOut Tags to Add-On Instructions	98
Using Visualization Files	99
Faceplates	100

This instruction monitors one SEL421 relay. Alarms are provided when the device experiences a protection-related trip. The instruction also provides capabilities for locking and to open and close the breaker.



Controller Code

Two Add-On Instructions represent each physical device. You must configure the InOut parameters of each Add-On Instruction per physical device.

The first Add-On Instruction is the ProSoft software-generated Add-On Instruction (see [Chapter 2](#)), which maps data to the controller. The second Add-On Instruction is the TripSource Add-On Instruction, available for download from the library resources from the PCDC, which is for faceplate management

InOut Structure for ProSoft Add-On Instruction

InOut parameters in [Table 32](#) are used to link the Add-On Instruction to external tags that contain necessary data for the instruction to operate. These external tags must be of the data type shown. These tags are representative of the tags that are required for each SEL-421 relay, which is configured in your system.

Table 32 - SEL421 Relay

Name	Data Type	Description
[DeviceName]_AOI	[DeviceName]_AOI	Add-On Instruction tag. Matches naming from ProSoft Configuration Manager.
Connection_Input0	SINT[500]	CIP Connection Input data. The number of these parameters vary depending on system sizing.
Connection_Output0	SINT[496]	CIP Connection Output data. The number of these parameters vary depending on system sizing.
Connection_Input1	SINT[500]	CIP Connection Input data. The number of these parameters vary depending on system sizing.
Connection_Output1	SINT[496]	CIP Connection Output data. The number of these parameters vary depending on system sizing.
[DeviceName]	[DeviceName]	Device data that is collected from the CIP connections and organized into understandable tags. This data type changes to match each device tag in the ProSoft Gateway.

InOut Structure for Rockwell Automation Library Download

[Table 33](#) shows the InOut parameters that are available from the Rockwell Automation® Library of Electrical Protection Devices Folder in the PCDC. These external tags must be of the data type shown.

Table 33 - SEL421TripSource

Name	Data Type	Description
[DeviceName]_Relay_Name	<Defined by device AOI>	Device data from the Add-On Instruction. This data type changes to match each device tag in the ProSoft Gateway.
Ref_Tgt3Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt4Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt5Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt6Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt7Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt8Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
[DeviceName]TripAlarm	ALARM_DIGITAL	Digital Alarm tag
[DeviceName]TripText	STRING	Alarm text to be displayed when active.

Remote Bit Control Value Structure

Remote Bit Control Value parameters are used to link the Add-On Instruction to configurable input points in the physical device. Each bit is configurable via the vendor software of each device. The following table has recommended uses for each bit.

Name	Description
CON_RBGGIO1_CO_SPCS001_Oper_ctlVal	Lock/Unlock
CON_RBGGIO1_CO_SPCS002_Oper_ctlVal	Target Reset
CON_RBGGIO1_CO_SPCS003_Oper_ctlVal	Breaker Close
CON_RBGGIO1_CO_SPCS004_Oper_ctlVal	Breaker Open
CON_RBGGIO1_CO_SPCS005_Oper_ctlVal	User Programmable
CON_RBGGIO1_CO_SPCS006_Oper_ctlVal	User Programmable
CON_RBGGIO1_CO_SPCS007_Oper_ctlVal	User Programmable
CON_RBGGIO1_CO_SPCS008_Oper_ctlVal	User Programmable

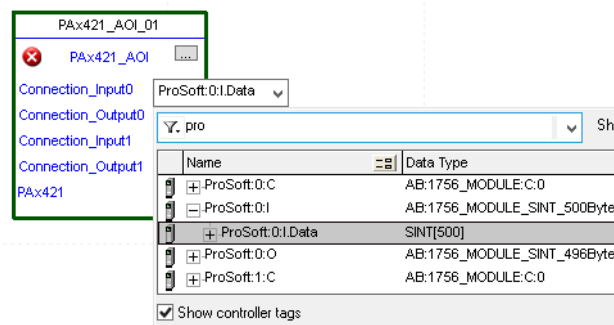
Mapping InOut Tags to Add-On Instructions

Each SEL421 relay requires two Add-On Instructions to monitor and visualize the relay. The ProSoft Software instruction is created in [Chapter 2](#). The Add-On Instruction is downloaded from the Rockwell Automation Library of Electronic Protection Devices from the PCDC.

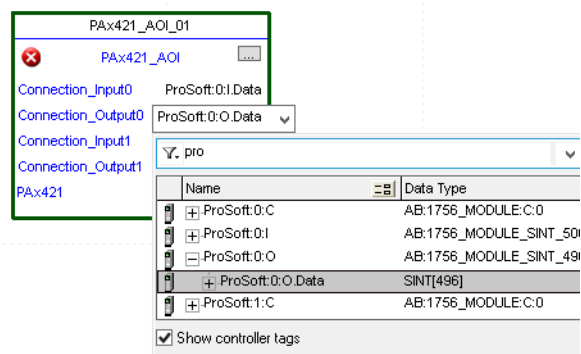
Associate Controller Tags to ProSoft Add-On Instruction

Complete these steps to map the ProSoft instruction to Studio 5000® tags.

1. Double-click the question mark next to Connection_Input0 of the device Add-On Instruction.
2. Click the down arrow on the drop box and expand the ProSoft_Gateway:0:I. Select the ProSoft_Gateway:0:I.Data and double-click to choose it.

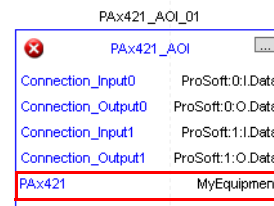


3. Double-click the question mark next to Connection_Output0 of the device Add-On Instruction.
4. Click the down arrow on the drop box and expand the ProSoft_Gateway:0:O. Select the ProSoft_Gateway:0:O.Data and double-click to choose it.

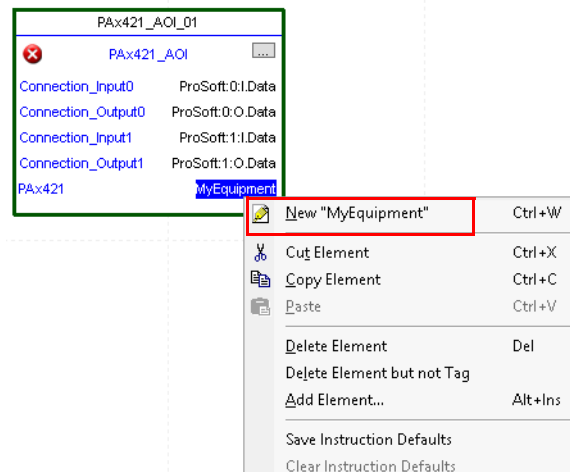


5. Repeat this process for each Connection Input and Output that are included with your Add-On Instructions.

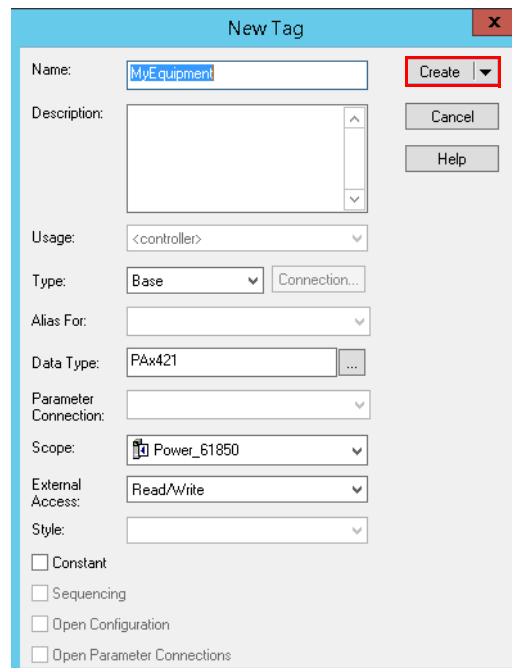
- Click the question mark next to the final tag. Enter a clear engineering name to this tag that represents your device within your Studio 5000 project. In this example “MyEquipment”.



- Right-click the new tag name and select New “<tag name>”.



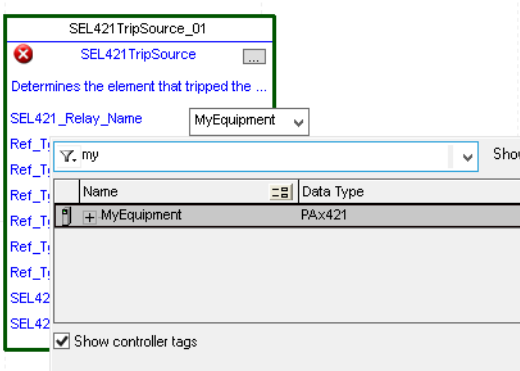
- Click Create on the New Tag dialog box.



Configure Trip Source Add-On Instruction

Now that the SEL421 Add-On Instruction has been configured, you must configure the SEL421 trip source Add-On Instruction for alarming.

1. Click the question mark next to SEL421_Relay_Name and select the tag that was created in [step 8](#).



2. Next click the question mark next to each Ref_Tgt#Txt and enter a string tag. These tags are intended to match the status indicators on the front panel of the device. Once you type the tag name, if the tag is not already configured in the controller, you have to right-click and create a tag.

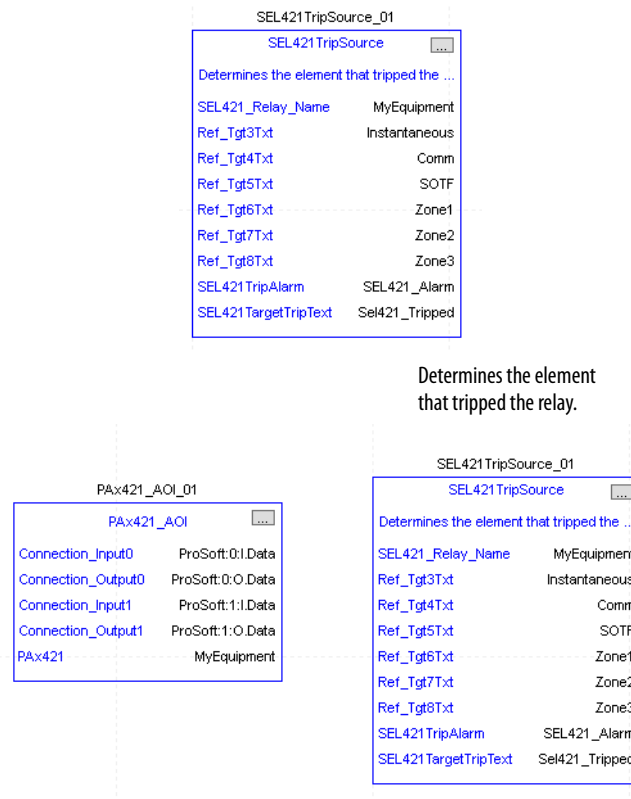


3. Click the question mark next to SEL421TripAlarm and select or create the digital alarm tag to be used. This tag is used for alarming through the HMI FactoryTalk® Alarms and Events Server.

- Click the question mark next to SEL421TripText and select or create the tag to be used.

This tag is used for alarm message through the HMI FactoryTalk Alarms and Events Server.

Fully Configured Add-On Instruction



- Save and download your project to the controller.

Using Visualization Files

See [Using a Display Element on page 16](#) for detailed information.

Faceplates

The Operator tab is displayed when the faceplate is initially opened. Click the appropriate icon on the left of the faceplate to access a specific tab.

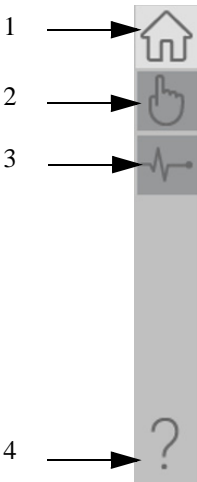


Table 34 - Tab Descriptions

Item	Description
1	Operator tab
2	Manual Control Tab
3	Diagnostics tab
4	Help

The faceplate provides the means for operators, maintenance workers, engineers, and others to interact with the instruction instance. This interaction provides a view of the status and values of the instruction instance and an ability to manipulate it through its commands and settings.

Operator Tab

The Faceplate initially opens to the Operator tab, sometimes called the Home tab. From here, an operator can monitor the device status and manually operate the device.

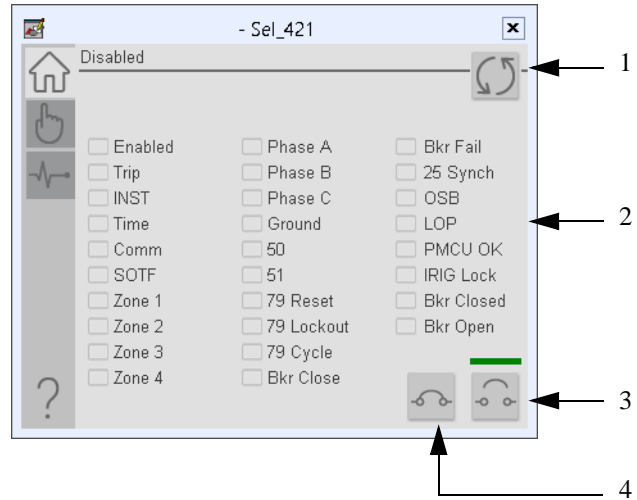


Table 35 - Operator Tab Description

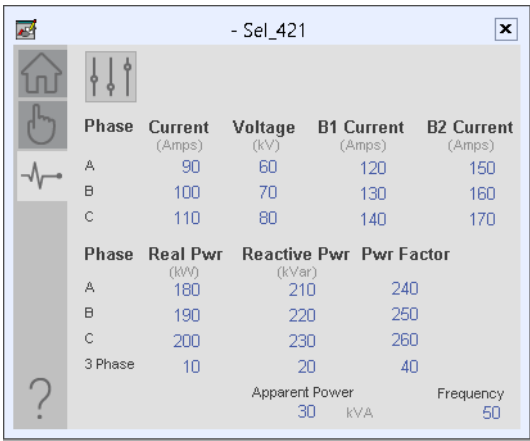
Item	Description
1	Click to reset the device. The status of the device is indicated on the faceplate.
2	Status Indicators
3	Click to open the circuit breaker.
4	Click to close the circuit breaker.

Diagnostics Tab

The diagnostics tab allows the operator to see the measurement values from the device.

Diagnostics Tab

Readout of the measurement values from the SEL-421.



Advanced Properties


Click the advanced properties icon  on the diagnostics page to display the advanced properties. The following screen capture shows the tabs that are available in the advanced properties display



Table 36 - Advanced Properties Tab Descriptions

Item	Description
1	HMI Configuration
2	Faults
3	Help

HMI Configuration Tab

The HMI configuration tab provides access to displayed text, and faceplate-to-faceplate navigation settings. Configure the description, label, tag, and security area for the device.

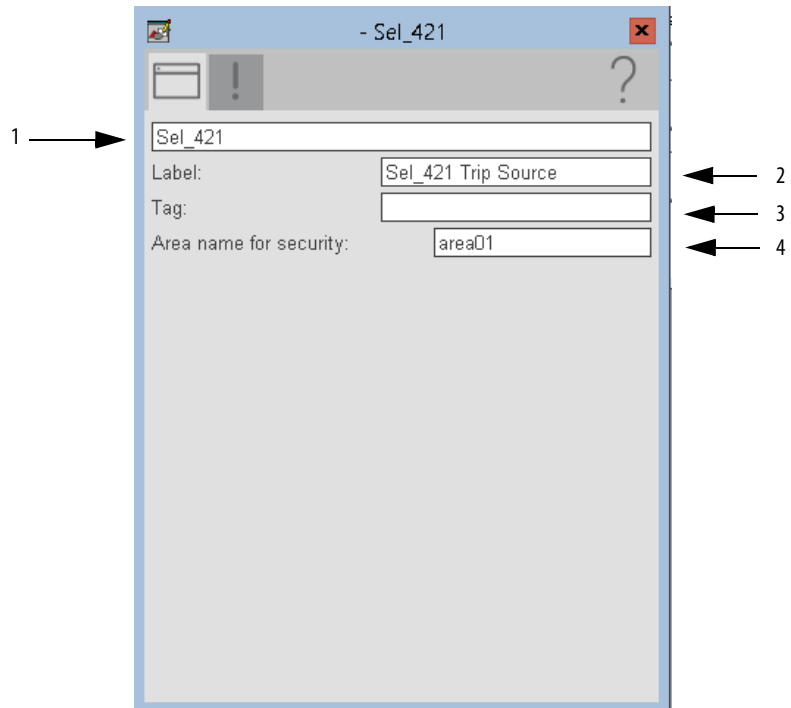
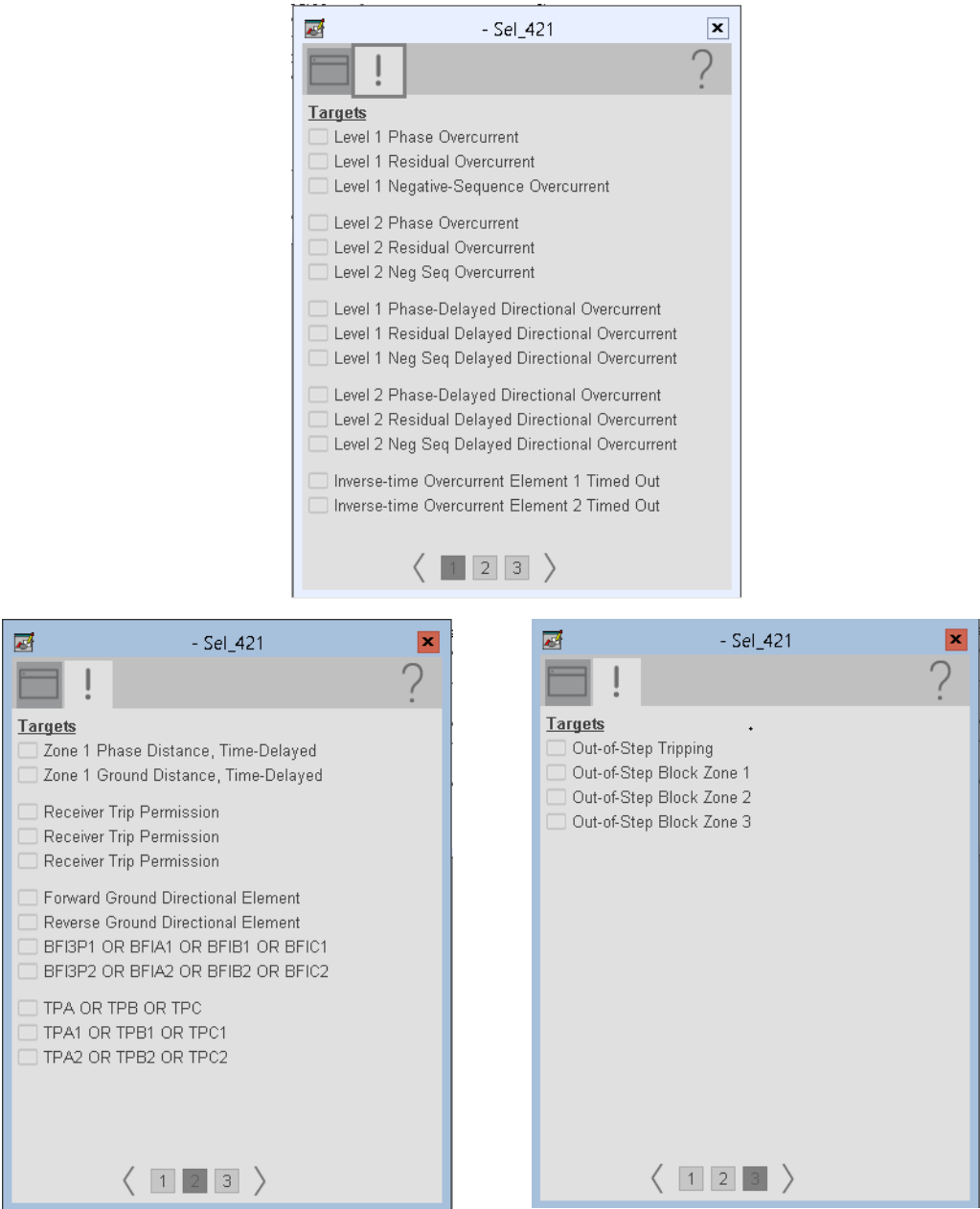


Table 37 - HMI Configuration Tab Description

Item	Action
1	Type the device description to show on the faceplate title bar.
2	Type the label to show on the graphic symbol.
3	Type the tag name to show on the faceplate and Tooltip. IMPORTANT: Pause the mouse over this field to display a tool tip with the configured Logix tag/path.
4	Type the Area name for security.

Faults Tab

The faults tab shows which alarms are active from the device.



Help Button

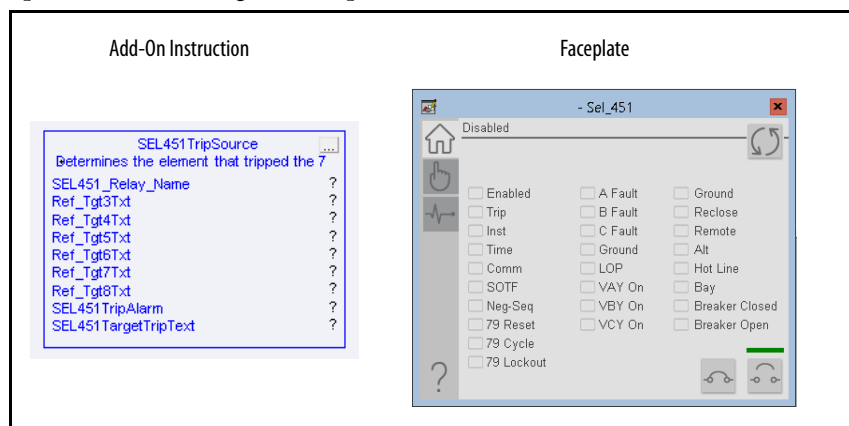
Press the help button on the faceplates to access help specific to that faceplate. The help file is in .pdf format and opens in a separate window.

SEL 451 Object

The Schweitzer Engineering Labs 451 is a feeder protection relay. This device is used to help protect an electrical bus from conditions of over current, over voltage, under voltage, and so on. The device also provides multiple fundamental metering data including, voltage, current, frequency, and power. The SEL-451 provides complete bay control functionality.

Topic	Page
Controller Code	106
Mapping InOut Tags to Add-On Instructions	108
Using Visualization Files	112
Faceplates	112

This instruction monitors one SEL451 relay. Alarms are provided when the device experiences a protection-related trip. The instruction also provides capabilities for locking, and to open and close the breaker.



Controller Code

Two Add-On Instructions represent each physical device. You must configure the InOut parameters of each Add-On Instruction per physical device.

The first Add-On Instruction is the ProSoft software-generated Add-On Instruction (see [Chapter 2](#)), which maps data to the controller. The second Add-On Instruction is the TripSource Add-On Instruction, available for download from the library resources from the PCDC, which is for faceplate management

InOut Structure for ProSoft Add-On Instruction

InOut parameters in [Table 38](#) are used to link the Add-On Instruction to external tags that contain necessary data for the instruction to operate. These external tags must be of the data type shown. These tags are representative of the tags that are required for each SEL-451 relay, which is configured in your system.

Table 38 - SEL451 Relay

Name	Data Type	Description
[DeviceName]_AOI	[DeviceName]_AOI	Add-On Instruction tag. Matches naming from ProSoft Configuration Manager.
Connection_Input0	SINT[500]	CIP Connection Input data. The number of these parameters vary depending on system sizing.
Connection_Output0	SINT[496]	CIP Connection Output data. The number of these parameters vary depending on system sizing.
Connection_Input1	SINT[500]	CIP Connection Input data. The number of these parameters vary depending on system sizing.
Connection_Output1	SINT[496]	CIP Connection Output data. The number of these parameters vary depending on system sizing.
[DeviceName]	[DeviceName]	Device data that is collected from the CIP connections and organized into understandable tags. This data type changes to match each device tag in the ProSoft Gateway.

InOut Structure for Rockwell Automation Library Download

[Table 39](#) shows the InOut parameters that are available from the Rockwell Automation Library of Electrical Protection Devices Folder in the PCDC. These external tags must be of the data type shown.

Table 39 - SEL451_TripSource

Name	Data Type	Description
[DeviceName]_Relay_Name	<Defined by device AOI>	Device data from the Add-On Instruction. This data type changes to match each device tag in the ProSoft Gateway.
Ref_Tgt3Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt4Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt5Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt6Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt7Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt8Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
[DeviceName]TripAlarm	ALARM_DIGITAL	Digital Alarm tag
[DeviceName]TripText	STRING	Alarm text to be displayed when active.

Remote Bit Control Value Structure

Remote Bit Control Value parameters are used to link the Add-On Instruction to configurable input points in the physical device. Each bit is configurable via the vendor software of each device. [Table 40](#) has recommended uses for each bit.

Table 40 - Remote Bit Control - SEL451 Relay

Name	Description
CON_RBGGIO1_CO_SPCS001_Oper_ctlVal	Lock/Unlock
CON_RBGGIO1_CO_SPCS002_Oper_ctlVal	Target Reset
CON_RBGGIO1_CO_SPCS003_Oper_ctlVal	Breaker Close
CON_RBGGIO1_CO_SPCS004_Oper_ctlVal	Breaker Open
CON_RBGGIO1_CO_SPCS005_Oper_ctlVal	Ground Enable
CON_RBGGIO1_CO_SPCS006_Oper_ctlVal	Reclose Enable
CON_RBGGIO1_CO_SPCS007_Oper_ctlVal	Remote Enable

Table 40 - Remote Bit Control - SEL451 Relay

Name	Description
CON_RBGGI01_CO_SPCS008_Oper_ctlVal	Alt Settings
CON_RBGGI01_CO_SPCS009_Oper_ctlVal	Hot Line Tag
CON_RBGGI01_CO_SPCS010_Oper_ctlVal	Bay Display

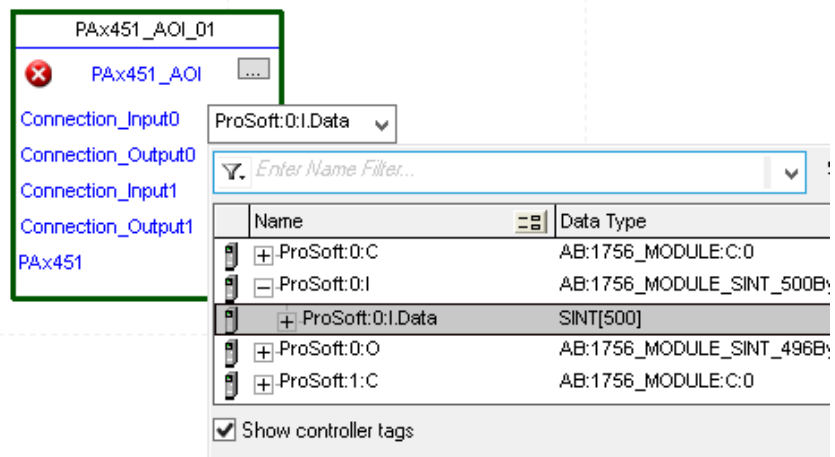
Mapping InOut Tags to Add-On Instructions

Each SEL451 relay requires two Add-On Instructions to monitor and visualize the relay. The ProSoft Software instruction is created in [Chapter 2](#). The Add-On Instruction is downloaded from the Rockwell Automation Library of Electronic Protection Devices from the PCDC.

Associate Controller Tags to ProSoft Add-On Instruction

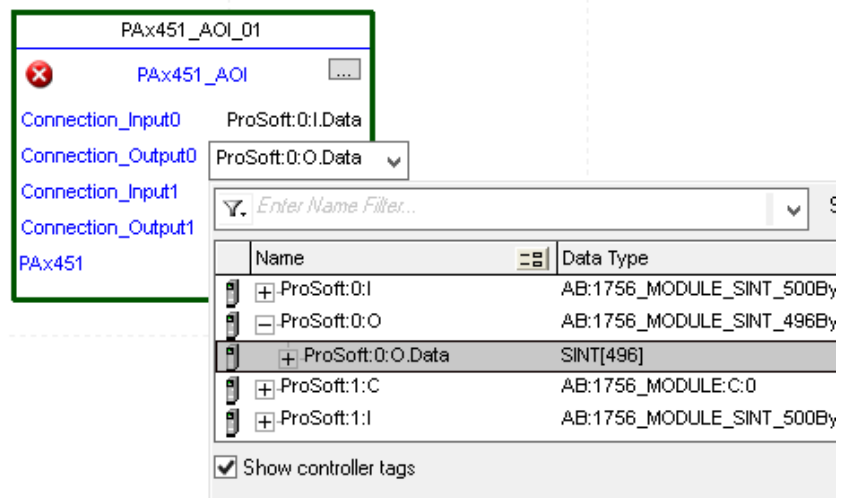
Complete these steps to map the ProSoft instruction to Studio 5000® tags.

1. Double-click the question mark next to Connection_Input0 of the device Add-On Instruction.
2. Click the down arrow on the drop box and expand the ProSoft_Gateway:0:I. Select the ProSoft_Gateway:0:I.Data and double-click to choose it.

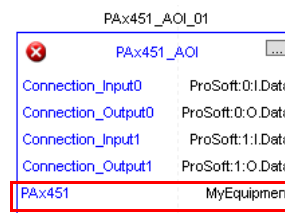


3. Double-click the question mark next to Connection_Output0 of the device Add-On Instruction.

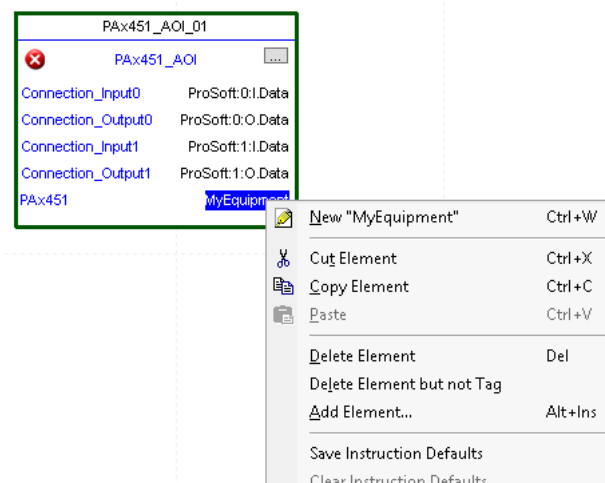
- Click the down arrow on the drop box and expand the ProSoft_Gateway:0:O. Select the ProSoft_Gateway:0:O.Data and double-click to choose it.



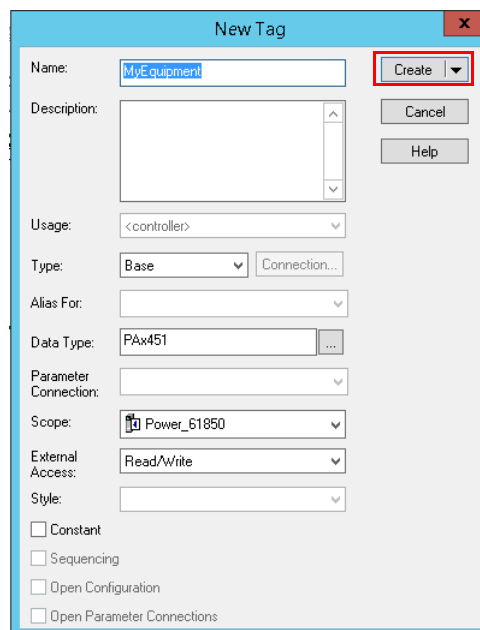
- Repeat this process for each Connection Input and Output that are included with your Add-On Instructions.
- Click the question mark next to the final tag. Type a tag name that represents your physical device within your Studio 5000 project. In this example, the name is "MyEquipment".



- Right-click the new tag name and select New "<tag name>".



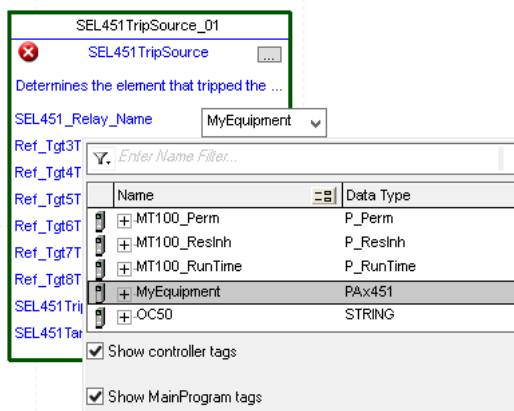
- Click Create on the New Tag dialog box.



Configure Trip Source Add-On Instruction

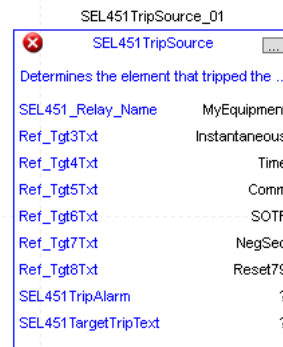
Now that the SEL451 Add-On Instruction has been configured, you must configure the SEL451 trip source Add-On Instruction for alarming.

- Click the question mark next to SEL451_Relay_Name and select the tag that was created in [step 8](#).



- Next click the question mark next to each Ref_Tgt#Txt and enter a string tag. These tags are intended to match the status indicators on the front panel of the device.

- Once you type the tag name, if the tag is not already configured in the controller, you have to right-click and create a tag.



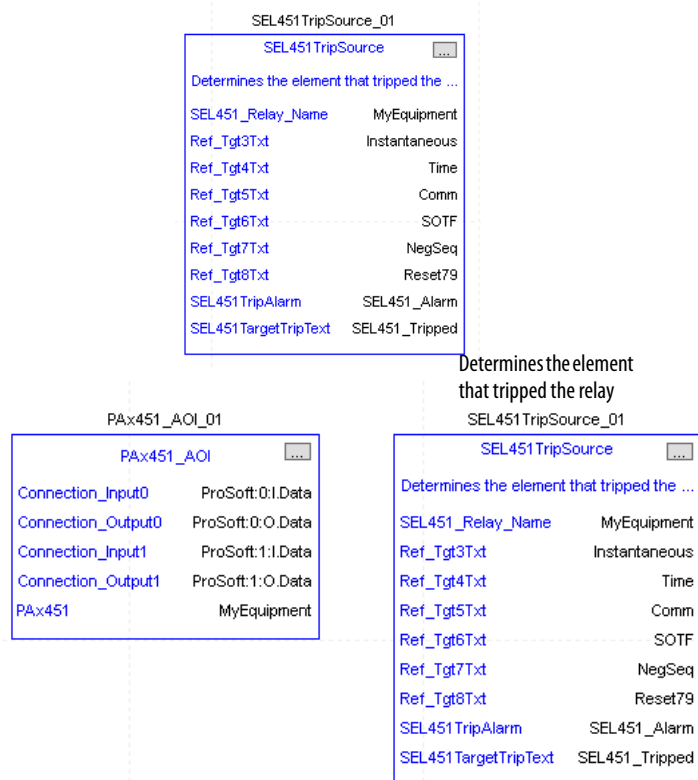
- Click the question mark next to SEL451TripAlarm and select or create the digital alarm tag to be used.

This tag is used for alarming through the HMI FactoryTalk® Alarms and Events Server.

- Click the question mark next to SEL451TripText and select or create the tag to be used.

This tag is used for alarm message through the HMI FactoryTalk Alarms and Events Server.

Fully Configured Add-On Instruction



- Save and download your project to the controller.

Using Visualization Files

See [Using a Display Element on page 16](#) for detailed information.

Faceplates

The Operator tab is displayed when the faceplate is initially opened. Click the appropriate icon on the left of the faceplate to access a specific tab.

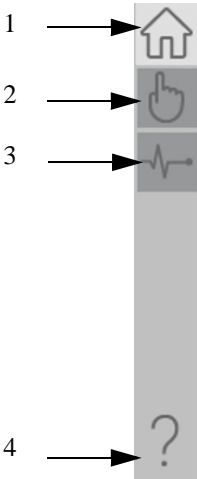


Table 41 - Tab Descriptions

Item	Description
1	Operator tab
2	Manual Control Tab
3	Diagnostics tab
4	Help

The faceplate provides the means for operators, maintenance workers, engineers, and others to interact with the instruction instance. This interaction provides a view of the status and values of the instruction instance and an ability to manipulate it through its commands and settings.

Operator Tab

The Faceplate initially opens to the Operator tab, sometimes called the Home tab. From here, an operator can monitor the device status and manually operate the device.

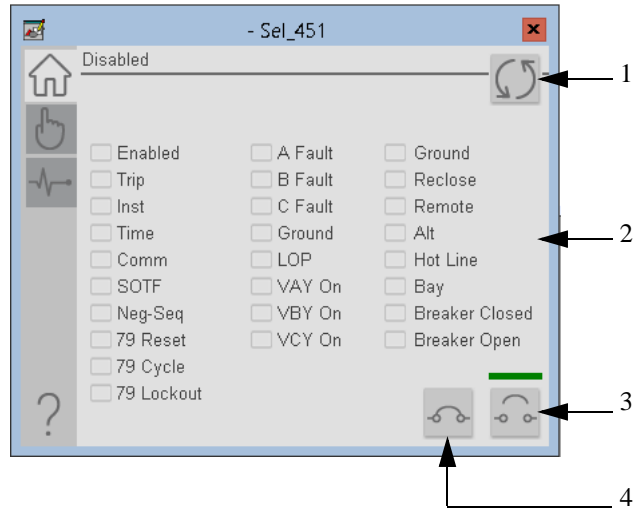
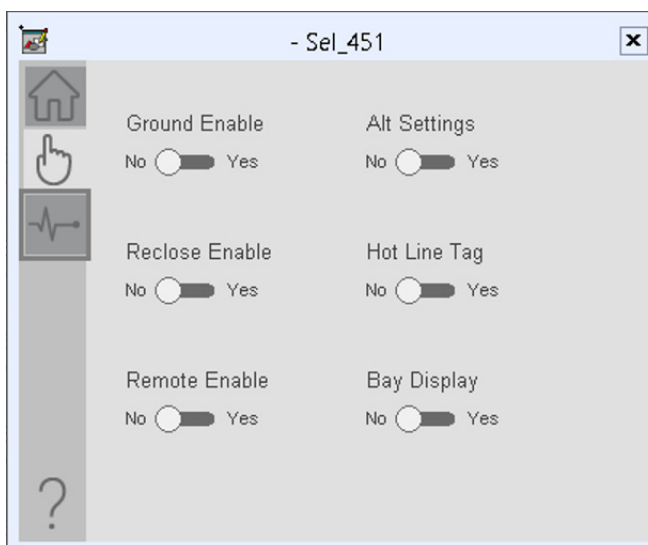


Table 42 - Operator Tab Description

Item	Description
1	Click to reset the device. The status of the device is indicated on the faceplate.
2	Status Indicators
3	Click to open the circuit breaker.
4	Click to close the circuit breaker.

Manual Control Tab



Diagnostics Tab

The diagnostics tab allows the operator to see the measurement values from the physical device.

Diagnostics Tab

Readout of the measurement values from the SEL-451.

Phase	Current (Amps)	Voltage (kV)	B1 Current (Amps)	B2 Current (Amps)
A	90	60	120	150
B	100	70	130	160
C	110	80	140	170

Phase	Real Pwr (kW)	Reactive Pwr (kVar)	Pwr Factor
A	180	210	240
B	190	220	250
C	200	230	260
3 Phase	10	20	40

Apparent Power	30 kVA	Frequency	50
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Advanced Properties


Click the advanced properties icon  on the diagnostics page to display the advanced properties. The following screen capture shows the tabs that are available in the advanced properties display



Table 43 - Advanced Properties Tab Descriptions

Item	Description
1	HMI Configuration
2	Faults
3	Help

HMI Configuration Tab

The HMI configuration tab provides access to displayed text, and faceplate-to-faceplate navigation settings. Configure the description, label, tag, and security area for the device.

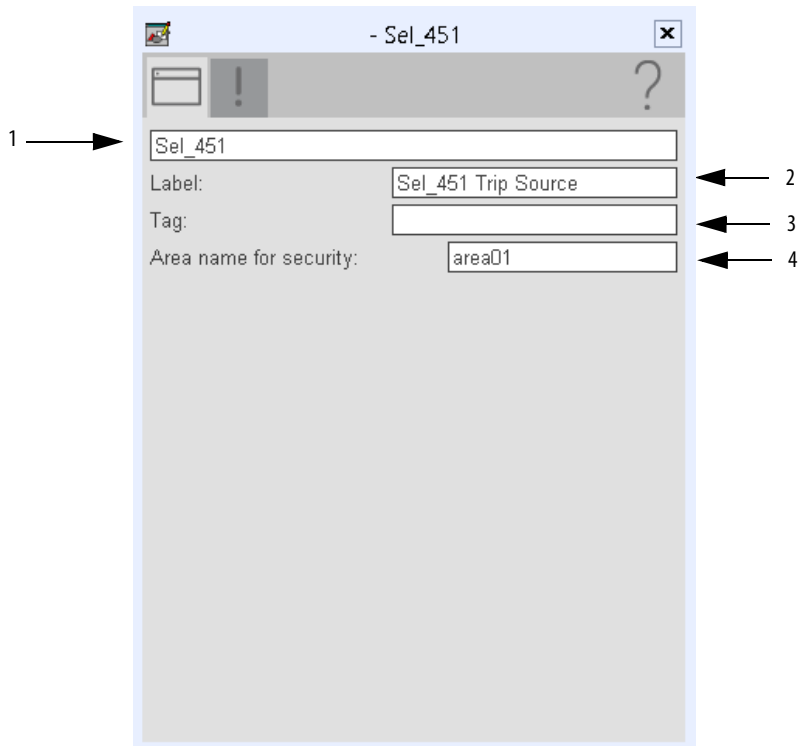
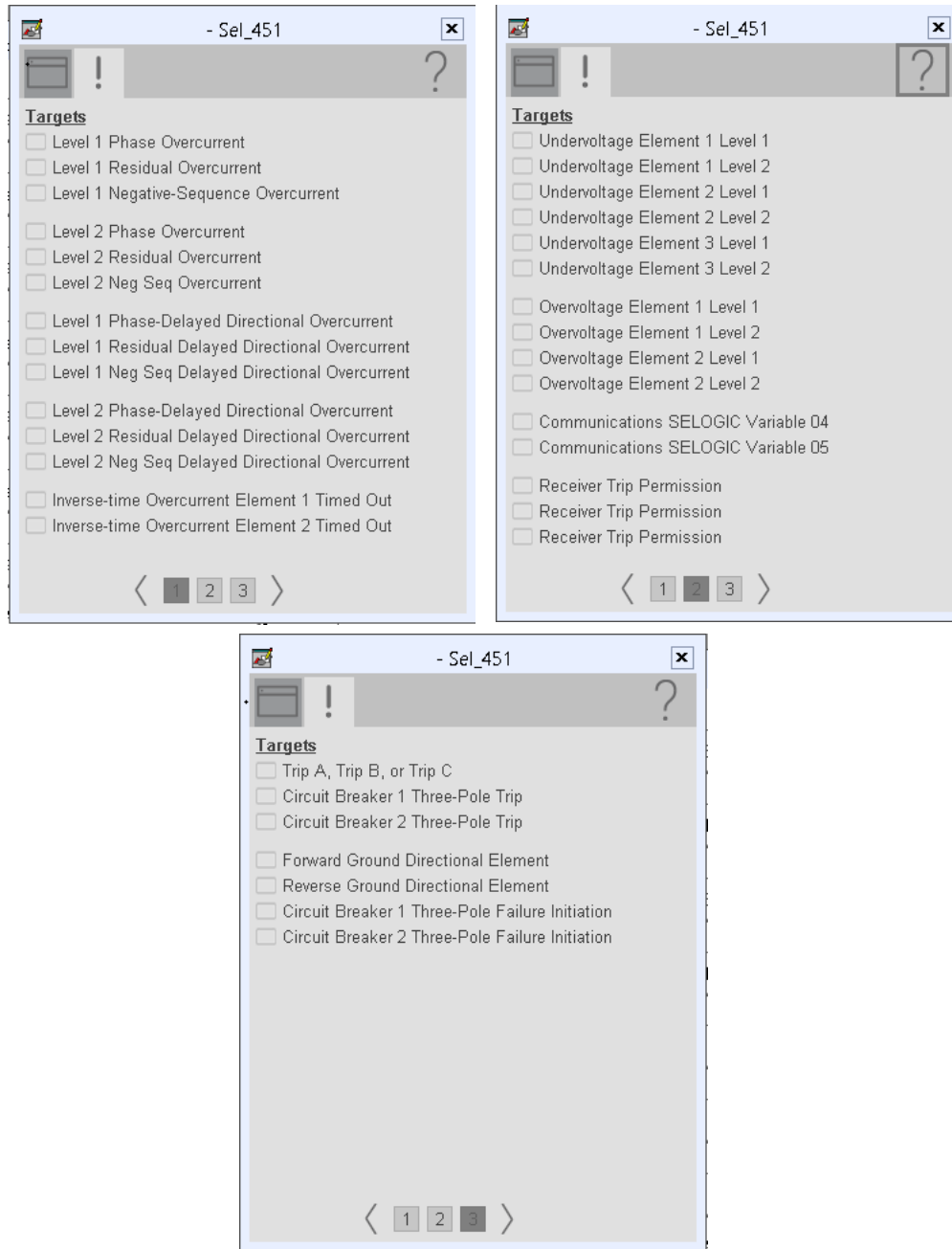


Table 44 - HMI Configuration Tab Description

Item	Action
1	Type the device description to show on the faceplate title bar.
2	Type the label to show on the graphic symbol.
3	Type the tag name to show on the faceplate and Tooltip. IMPORTANT: Pause the mouse over this field to display a tool tip with the configured Logix tag/path.
4	Type the Area name for security.

Faults Tab

The Faults tab shows which alarms are active from the physical device.



Help Button

Press the help button on the faceplates to access help specific to that faceplate. The help file is in .pdf format and opens in a separate window.

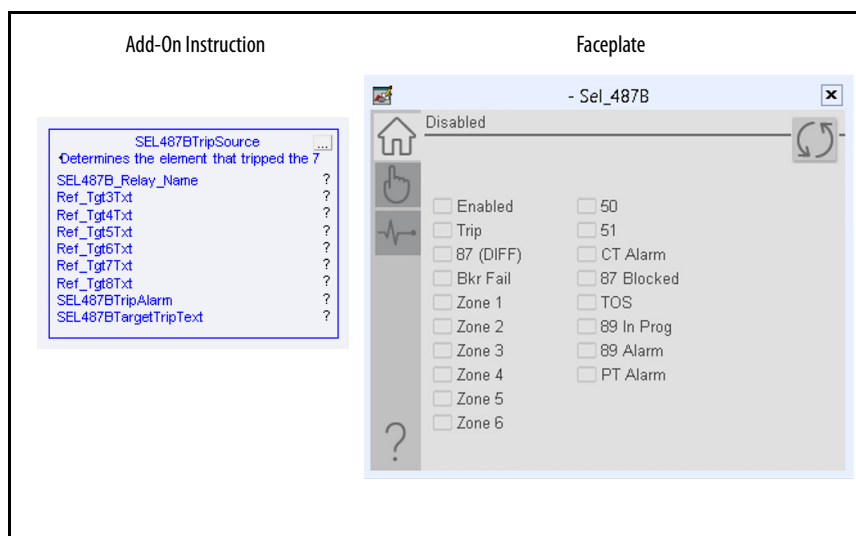
Notes:

SEL 487B Object

The SEL-487B is a bus differential and breaker failure relay. The SEL-487B provides optimized, low-impedance bus differential fault detection by using high-speed, subcycle protection.

Topic	Page
Controller Code	120
Mapping InOut Tags to Add-On Instructions	125
Using Visualization Files	126
Faceplates	127

This instruction monitors one SEL487B relay. Alarms are provided when the device experiences a protection-related trip. The instruction also provides capabilities for locking, and to open and close the breaker.



Controller Code

Two Add-On Instructions represent each physical device. You must configure the InOut parameters of each Add-On Instruction per physical device.

The first Add-On Instruction is the ProSoft software-generated Add-On Instruction (see [Chapter 2](#)), which maps data to the controller. The second Add-On Instruction is the TripSource Add-On Instruction, available for download from the library resources from the PCDC, which is for faceplate management

InOut Structure for ProSoft Add-On Instruction

InOut parameters in [Table 45](#) are used to link the Add-On Instruction to external tags that contain necessary data for the instruction to operate. These external tags must be of the data type shown. These tags are representative of the tags that are required for each SEL-487B relay, which is configured in your system.

Table 45 - SEL487B Relay

Name	Data Type	Description
[DeviceName]_AOI	[DeviceName]_AOI	Add-On Instruction tag. Matches naming from ProSoft Configuration Manager.
Connection_Input0	SINT[500]	CIP Connection Input data. The number of these parameters vary depending on system sizing.
Connection_Output0	SINT[496]	CIP Connection Output data. The number of these parameters vary depending on system sizing.
Connection_Input1	SINT[500]	CIP Connection Input data. The number of these parameters vary depending on system sizing.
Connection_Output1	SINT[496]	CIP Connection Output data. The number of these parameters vary depending on system sizing.
[DeviceName]	[DeviceName]	Device data that is collected from the CIP connections and organized into understandable tags. This data type changes to match each device tag in the ProSoft Gateway.

InOut Structure for Rockwell Automation Library Download

[Table 46](#) shows the InOut parameters that are available from the Rockwell Automation® Library of Electrical Protection Devices Folder in the PCDC. These external tags must be of the data type shown.

Table 46 - SEL487B TripSource

Name	Data Type	Description
[DeviceName]_Relay_Name	<Defined by device AOI>	Device data from the Add-On Instruction. This data type changes to match each device tag in the ProSoft Gateway.
Ref_Tgt3Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt4Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt5Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt6Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt7Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt8Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
[DeviceName]TripAlarm	ALARM_DIGITAL	Digital Alarm tag
[DeviceName]TripText	STRING	Alarm text to be displayed when active.

Remote Bit Control Value Structure

Remote Bit Control Value parameters are used to link the Add-On Instruction to configurable input points in the physical device. Each bit is configurable via the vendor software of each device. The following table has recommended uses for each bit.

Name	Description
CON_RBGGI01_CO_SPCS001_Oper_ctlVal	Lock/Unlock
CON_RBGGI01_CO_SPCS002_Oper_ctlVal	Target Reset
CON_RBGGI01_CO_SPCS003_Oper_ctlVal	Breaker Close
CON_RBGGI01_CO_SPCS004_Oper_ctlVal	Breaker Open
CON_RBGGI01_CO_SPCS005_Oper_ctlVal	87 Diff Enable
CON_RBGGI01_CO_SPCS006_Oper_ctlVal	BKR Fail Enable
CON_RBGGI01_CO_SPCS007_Oper_ctlVal	Relay Test Mode Enabled
CON_RBGGI01_CO_SPCS008_Oper_ctlVal	User Programmable
CON_RBGGI01_CO_SPCS009_Oper_ctlVal	User Programmable

Name	Description
CON_RBGGI01_CO_SPCS010_Oper_ctlVal	User Programmable
CON_RBGGI01_CO_SPCS011_Oper_ctlVal	User Programmable
CON_RBGGI01_CO_SPCS012_Oper_ctlVal	User Programmable

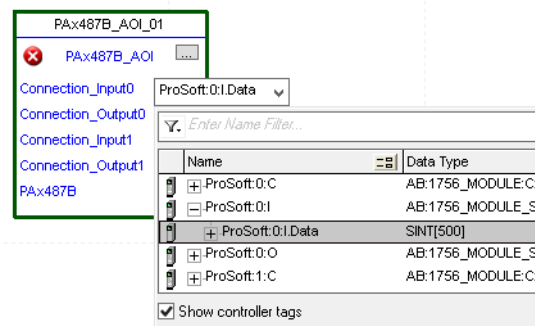
Mapping InOut Tags to Add-On Instructions

Each SEL487B relay requires two Add-On Instructions to monitor and visualize the relay. The ProSoft Software instruction is created in [Chapter 2](#). The Add-On Instruction is downloaded from the Rockwell Automation Library of Electronic Protection Devices from the PCDC.

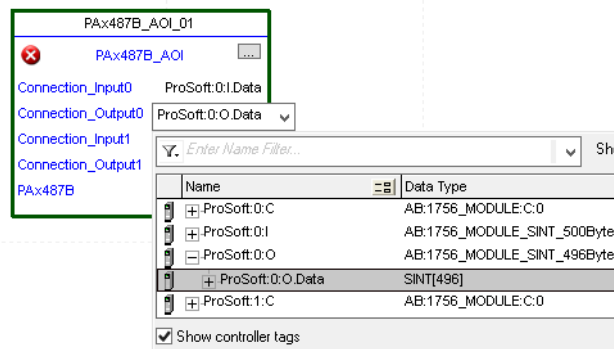
Associate Controller Tags to ProSoft Add-On Instruction

Complete these steps to map the ProSoft instruction to Studio 5000® tags.

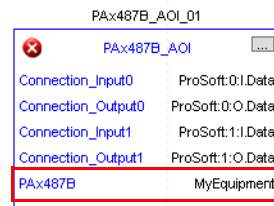
1. Double-click the question mark next to Connection_Input0 of the device Add-On Instruction.
2. Click the down arrow on the drop box and expand the ProSoft_Gateway:0:I. Select the ProSoft_Gateway:0:I.Data and double-click to choose it.



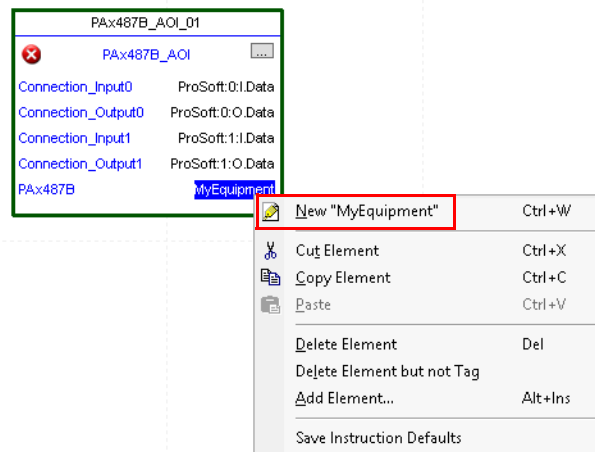
3. Double-click the question mark next to Connection_Output0 of the device Add-On Instruction.
4. Click the down arrow on the drop box and expand the ProSoft_Gateway:0:O. Select the ProSoft_Gateway:0:O.Data and double-click to choose it.



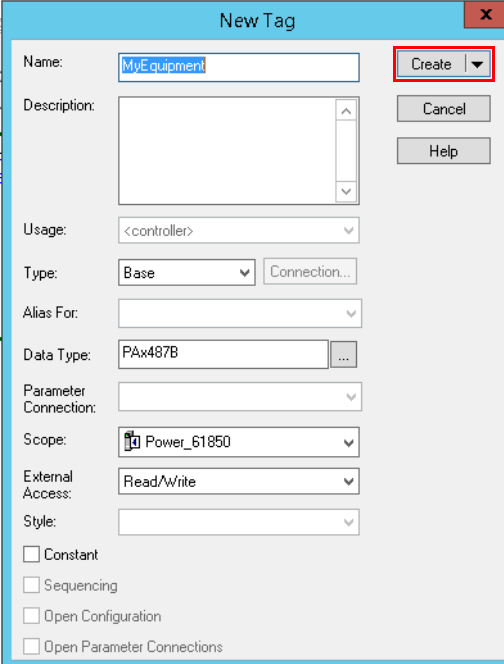
5. Repeat this process for each Connection Input and Output that are included with your Add-On Instructions.
6. Click the question mark next to the final tag. Enter a clear engineering name to this tag that represents your device within your Studio 5000 project. In this example “MyEquipment”.



7. Right-click the new tag name and select New “<tag name>”.



8. Click Create on the New Tag dialog box.



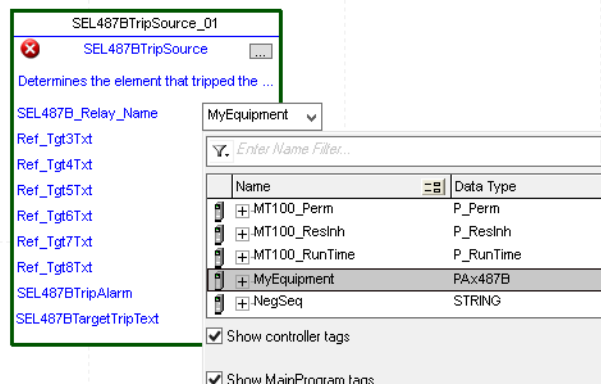
The image shows a 'New Tag' dialog box with a light blue title bar and a red 'X' close button. The dialog contains several fields and options:

- Name:** A text box containing 'MyEquipment'.
- Description:** A large text area.
- Usage:** A dropdown menu showing '<controller>'.
- Type:** A dropdown menu showing 'Base' and a 'Connection...' button.
- Alias For:** A dropdown menu.
- Data Type:** A dropdown menu showing 'PAx487B' and an ellipsis button.
- Parameter Connection:** A dropdown menu.
- Scope:** A dropdown menu showing 'Power_61850'.
- External Access:** A dropdown menu showing 'Read/Write'.
- Style:** A dropdown menu.
- Buttons:** 'Create', 'Cancel', and 'Help' buttons are on the right. The 'Create' button is highlighted with a red rectangle.
- Checkboxes:** At the bottom, there are four unchecked checkboxes: 'Constant', 'Sequencing', 'Open Configuration', and 'Open Parameter Connections'.

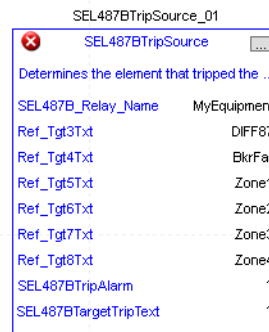
Configure Trip Source Add-On Instruction

Now that the SEL487B Add-On Instruction has been configured, you must configure the SEL487B trip source Add-On Instruction for alarming.

1. Click the question mark next to SEL487B_Relay_Name and select the tag that was created in [step 8](#).



2. Next click the question mark next to each Ref_Tgt#Txt and enter a string tag. These tags are intended to match the status indicators on the front panel of the device. Once you type the tag name, if the tag is not already configured in the controller, you have to right-click and create a tag.

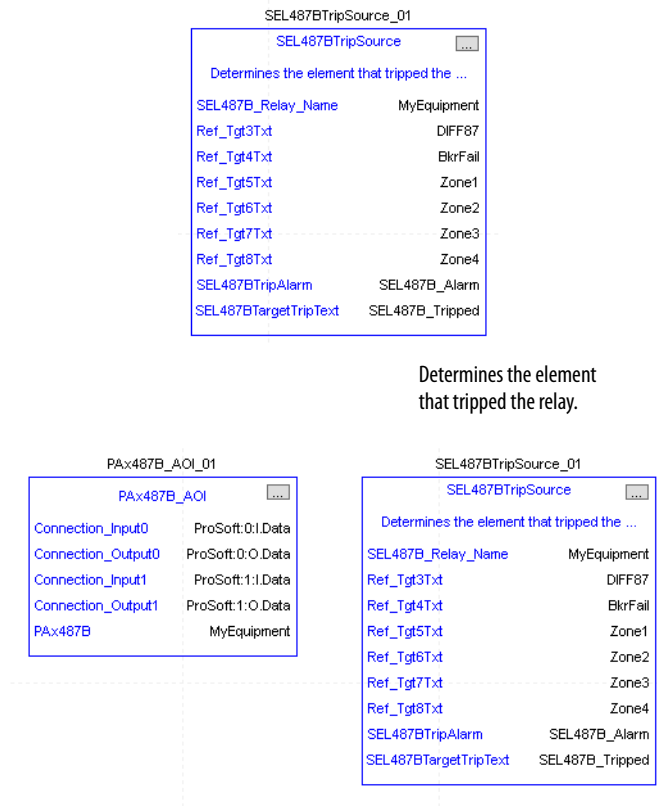


3. Click the question mark next to SEL487B TripAlarm and select or create the digital alarm tag to be used. This tag is used for alarming through the HMI FactoryTalk® Alarms and Events Server.

4. Click the question mark next to SEL487BTripText and select or create the tag to be used.

This tag is used for alarm message through the HMI FactoryTalk Alarms and Events Server.

Fully Configured Add-On Instruction



5. Save and download your project to the controller.

Using Visualization Files

See [Using a Display Element on page 16](#) for detailed information.

Faceplates

The Operator tab is displayed when the faceplate is initially opened. Click the appropriate icon on the left of the faceplate to access a specific tab.

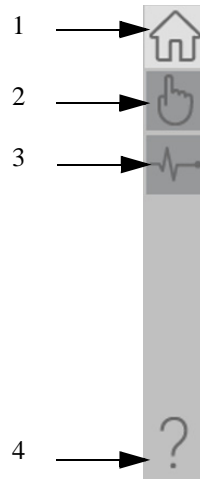


Table 47 - Tab Descriptions

Item	Description
1	Operator tab
2	Manual Control Tab
3	Diagnostics tab
4	Help

The faceplate provides the means for operators, maintenance workers, engineers, and others to interact with the instruction instance. This interaction provides a view of the status and values of the instruction instance and an ability to manipulate it through its commands and settings.

Operator Tab

The Faceplate initially opens to the Operator tab, sometimes called the Home tab. From here, an operator can monitor the device status and manually operate the device.

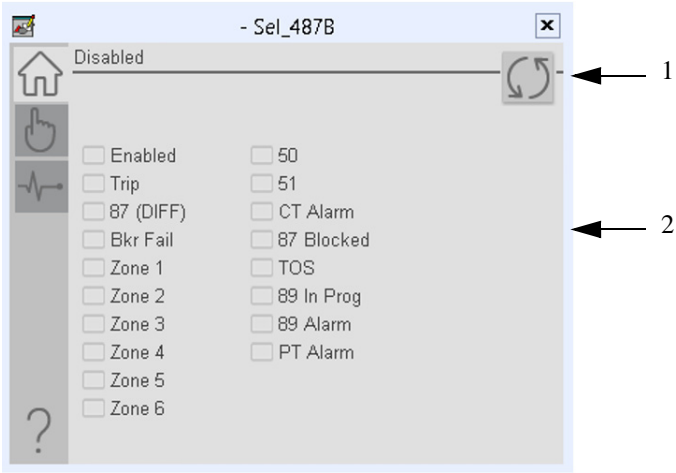
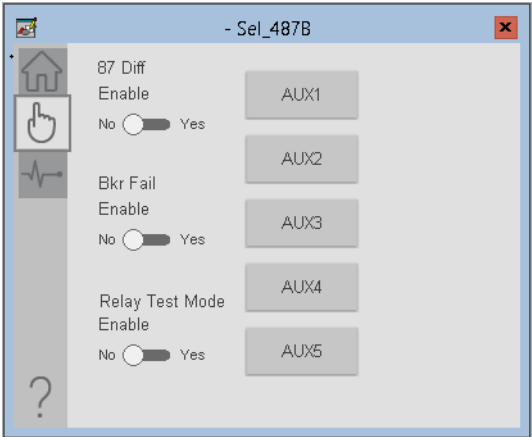


Table 48 - Operator Tab Description

Item	Description
1	Click to reset the device. The status of the device is indicated on the faceplate.
2	Status Indicators

Manual Control Tab



Diagnostics Tab

The diagnostics tab allows the operator to see the measurement values from the device.

Diagnostics Tab

Readout of the measurement values from the SEL-487B.



Advanced Properties


Click the advanced properties icon  on the diagnostics page to display the advanced properties. The following screen capture shows the tabs that are available in the advanced properties display



Table 49 - Advanced Properties Tab Descriptions

Item	Description
1	HMI Configuration
2	Faults
3	Help

HMI Configuration Tab

The HMI configuration tab provides access to displayed text, and faceplate-to-faceplate navigation settings. Configure the description, label, tag, and security area for the device.

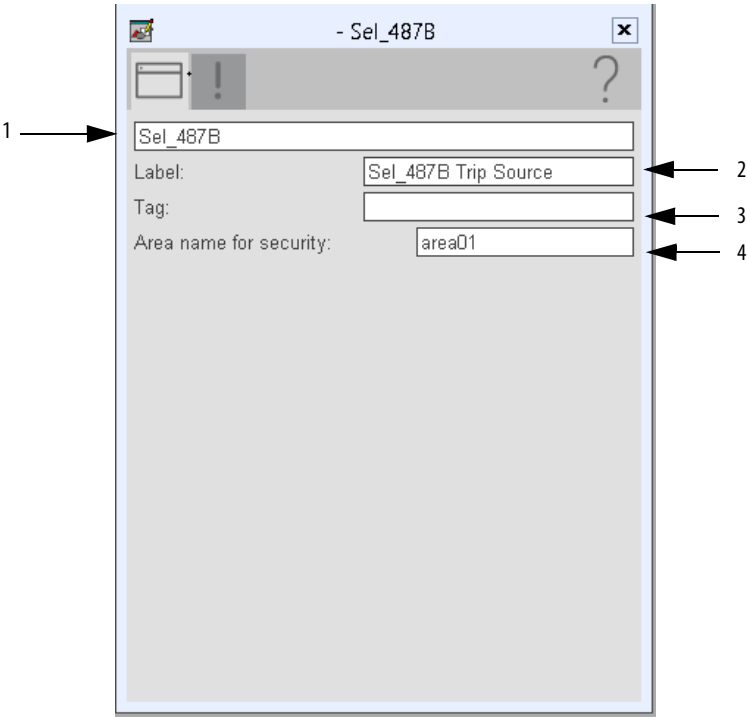
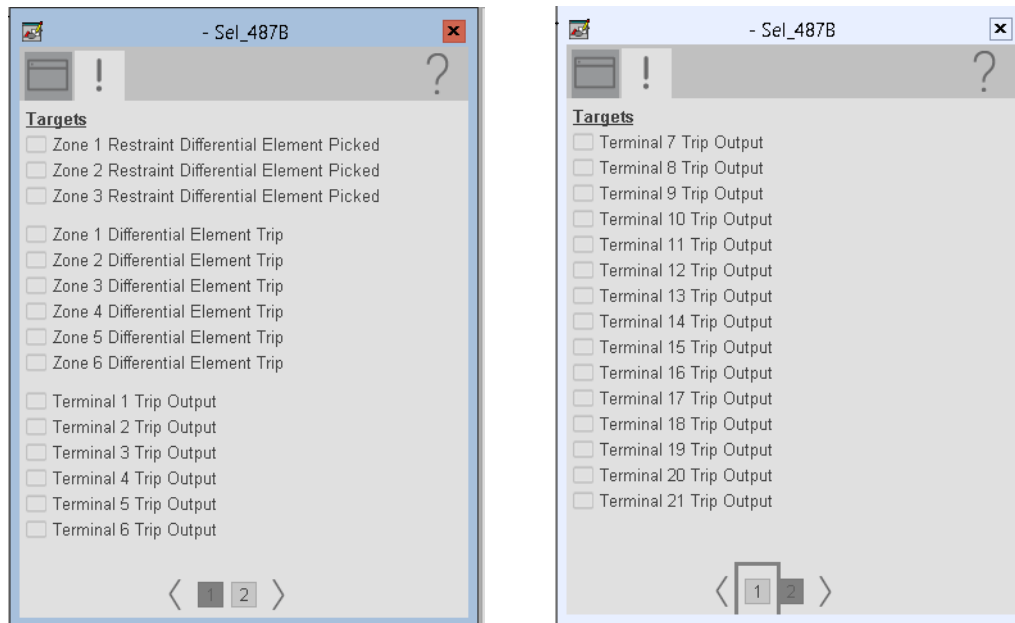


Table 50 - HMI Configuration Tab Description

Item	Action
1	Type the device description to show on the faceplate title bar.
2	Type the label to show on the graphic symbol.
3	Type the tag name to show on the faceplate and Tooltip. IMPORTANT: Pause the mouse over this field to display a tool tip with the configured Logix tag/path.
4	Type the Area name for security.

Faults Tab

The faults tab shows which alarms are active from the device.



Help Button

Press the help button on the faceplates to access help specific to that faceplate. The help file is in .pdf format and opens in a separate window.

Notes:

SEL 700G Object



The Schweitzer Engineering Labs (SEL) 700G is a generator protection relay. This device helps protect primary and backup generation. The device can also auto-synchronize when bringing the generator online with the system. The device also provides multiple fundamental metering data including, voltage, current, frequency, power, and so on.

Topic	Page
Controller Code	134
Mapping InOut Tags to Add-On Instructions	136
Using Visualization Files	140
Faceplates	141

The following instruction monitors one SEL700G relay. Alarms are provided when the device experiences a protection-related trip. The instruction also provides capabilities for locking, and to open and close the breaker. Synchronization control of the device is also permitted through the instruction.

Add-On Instruction

SEL700G_TripSource

Determines element that tripped the 700G...

SEL700G_Relay_Name	?
Ref_Tgt3Txt	?
Ref_Tgt4Txt	?
Ref_Tgt5Txt	?
Ref_Tgt6Txt	?
Ref_Tgt7Txt	?
Ref_Tgt8Txt	?
SEL700GTripAlarm	?
SEL700GTripText	?

Faceplate

Sel_700G

Disabled

SEL

SCHWEITZER
ENGINEERING
LABORATORIES

SEL-700G
GENERATOR PROTECTION RELAY

☐ Enabled

☐ Trip

☐ Differential

☐ Overcurrent

☐ Over/Under Freq

☐ Volts/Hertz

☐ Loss of Field

☐ Stator/Field Grd

☐ Enabled

☐ Disabled

☐ ...

☐ Gen Brkr Clsd

☐ Block Close

☐ Gen Brkr Open

☐ ...

Enable

No ☐ Yes ☐

AUX

☐

☐

Controller Code

Two Add-On Instructions represent each physical device. You must configure the InOut parameters of each Add-On Instruction per physical device.

The first Add-On Instruction is the ProSoft software-generated Add-On Instruction (see [Chapter 2](#)), which maps data to the controller. The second Add-On Instruction is the TripSource Add-On Instruction, available for download from the library resources from the PCDC, which is for faceplate management

InOut Structure for ProSoft Add-On Instruction

InOut parameters in [Table 51](#) are used to link the Add-On Instruction to external tags that contain necessary data for the instruction to operate. These external tags must be of the data type shown. These tags are representative of the tags that are required for each SEL-700G relay, which is configured in your system.

Table 51 - SEL700G_Relay

Name	Data Type	Description
[DeviceName]_AOI	[DeviceName]_AOI	Add-On Instruction tag. Matches naming from ProSoft Configuration Manager.
Connection_Input0	SINT[500]	CIP Connection Input data. The number of these parameters vary depending on system sizing.
Connection_Output0	SINT[496]	CIP Connection Output data. The number of these parameters vary depending on system sizing.
Connection_Input1	SINT[500]	CIP Connection Input data. The number of these parameters vary depending on system sizing.
Connection_Output1	SINT[496]	CIP Connection Output data. The number of these parameters vary depending on system sizing.
[DeviceName]	[DeviceName]	Device Data that is collected from the CIP connections and organized into understandable tags. This data type changes to match each device tag in the ProSoft Gateway.

InOut Structure for Rockwell Automation Library Download

InOut parameters in [Table 52](#) are used to link the Add-On Instruction to external tags that contain necessary data for the instruction to operate. These external tags must be of the data type shown. These tags are representative of the tags that are required for each SEL-700G relay, which is configured in your system in [Chapter 2](#).

Table 52 - SEL700G_TripSource

Name	Data Type	Description
[DeviceName]_Relay_Name	<Defined by device AOI>	Device data from the Add-On Instruction. This data type changes to match each device tag in the ProSoft Gateway.
Ref_Tgt3Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt4Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt5Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt6Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt7Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt8Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
[DeviceName]TripAlarm	ALARM_DIGITAL	Digital Alarm tag
[DeviceName]TripText	STRING	Alarm text to be displayed when active.

Remote Bit Control Value Structure

Remote Bit Control Value parameters are used to link the Add-On Instruction to configurable input points in the physical device. Each bit is configurable via the vendor software of each device. [Table 53](#) has recommended uses for each bit.

Table 53 - Remote Bit Control - SEL700G Relay

Name	Description
CON_RBGGIO1_CO_SPCS001_Oper_ctlVal	Lock/Unlock
CON_RBGGIO1_CO_SPCS002_Oper_ctlVal	Target Reset
CON_RBGGIO1_CO_SPCS003_Oper_ctlVal	Breaker Close
CON_RBGGIO1_CO_SPCS004_Oper_ctlVal	Breaker Open
CON_RBGGIO1_CO_SPCS005_Oper_ctlVal	AUX
CON_RBGGIO1_CO_SPCS006_Oper_ctlVal	Enable SYNC
CON_RBGGIO1_CO_SPCS007_Oper_ctlVal	Frequency SYNC
CON_RBGGIO1_CO_SPCS008_Oper_ctlVal	Voltage SYNC

IMPORTANT The bits shown in [Table 53](#) are dependent on the use of the IEC 61850 CID files and your gateway is configured as described in [Chapter 2](#). The IEC 61850 CID files are provided on the PCDC. If your application requires additional parameters, use the configuration software of the manufacturer to modify the PCDC CID files.

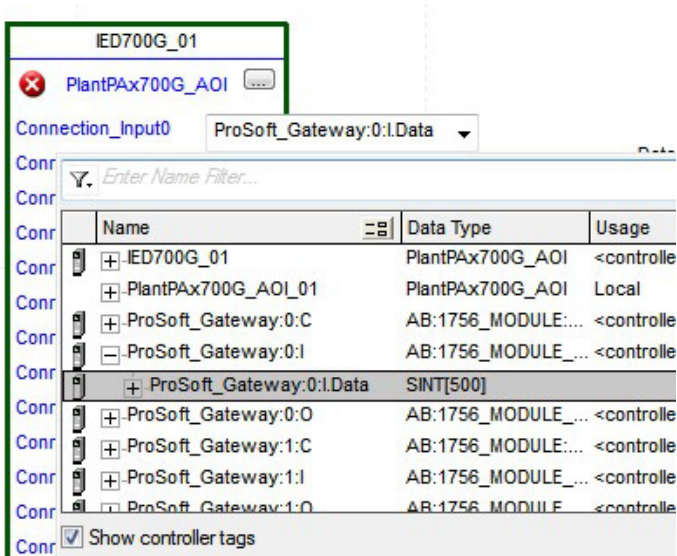
Mapping InOut Tags to Add-On Instructions

Each SEL700G relay requires two Add-On Instructions to monitor and visualize the relay. The ProSoft Software instruction is created in [Chapter 2](#). The Add-On Instruction is downloaded from the Rockwell Automation® Library of Electronic Protection Devices from the PCDC.

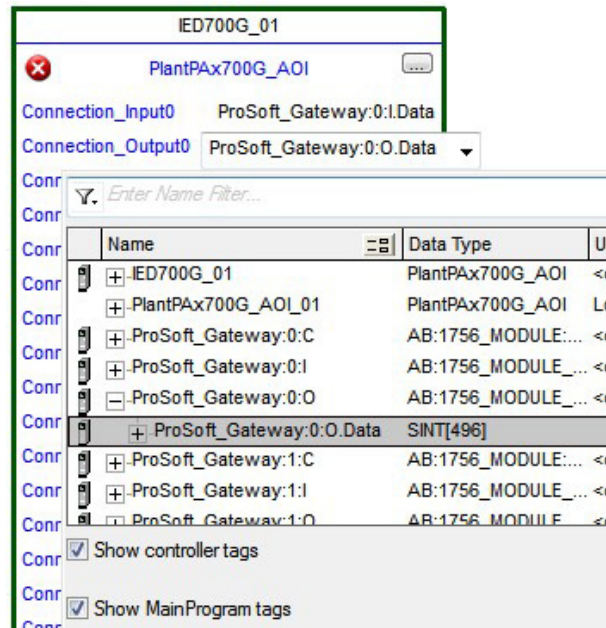
Associate Controller Tags to ProSoft Add-On Instruction

Complete these steps to map the ProSoft instruction to Studio 5000® tags.

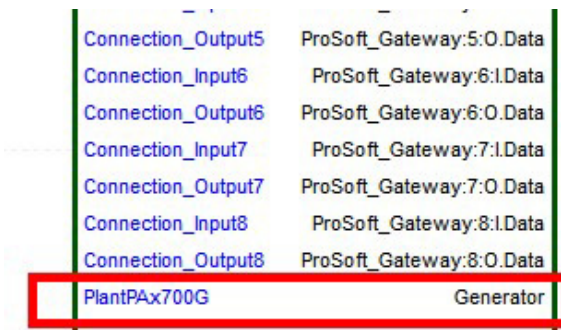
1. Double-click the question mark next to Connection_Input0 of the device Add-On Instruction.
2. Click the down arrow on the drop box and expand the ProSoft_Gateway:0:I. Select the ProSoft_Gateway:0:I.Data and double-click.



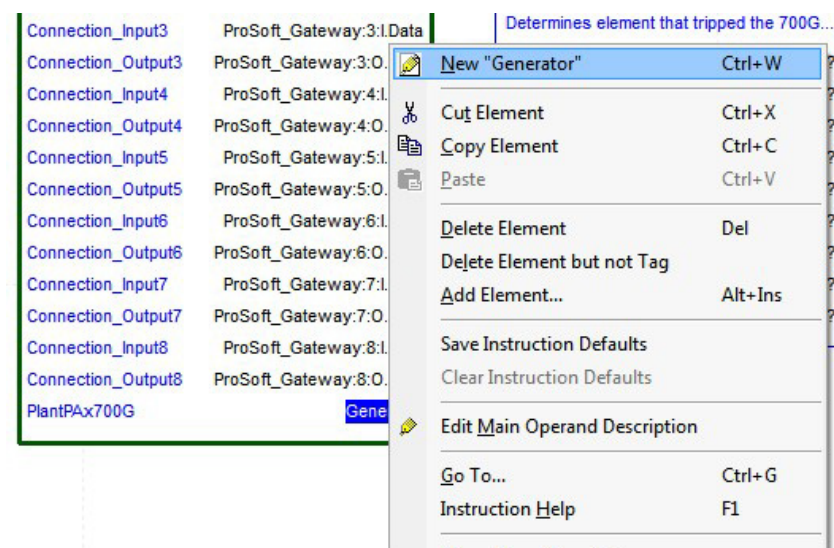
3. Double-click the question mark next to Connection_Output0 of the device Add-On Instruction.
4. Click the down arrow on the drop box and expand the ProSoft_Gateway:0:O. Select the ProSoft_Gateway:0:O.Data and double-click.



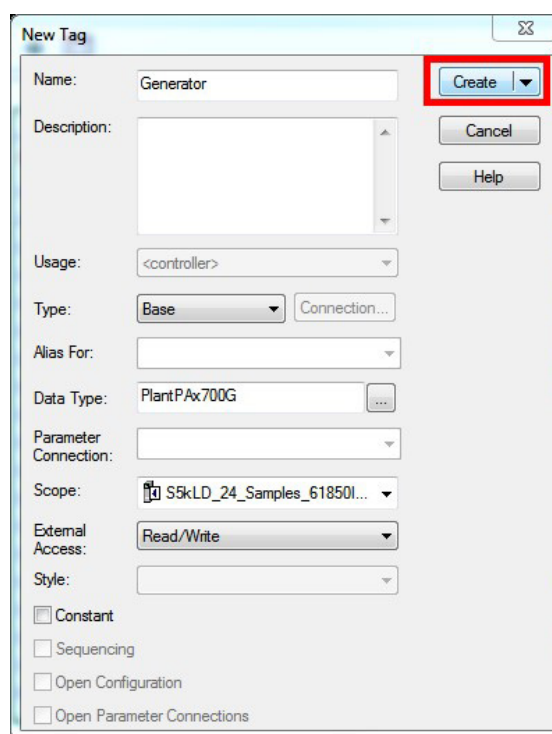
5. Repeat this process for each connection input and output that are included with your Add-On Instructions.
6. Click the question mark next to the final tag. Enter a clear engineering name to this tag that represents your device within your Studio 5000 project. In this example, the name is "Generator".



7. Right-click on the new tag name and select New "<tag name>".



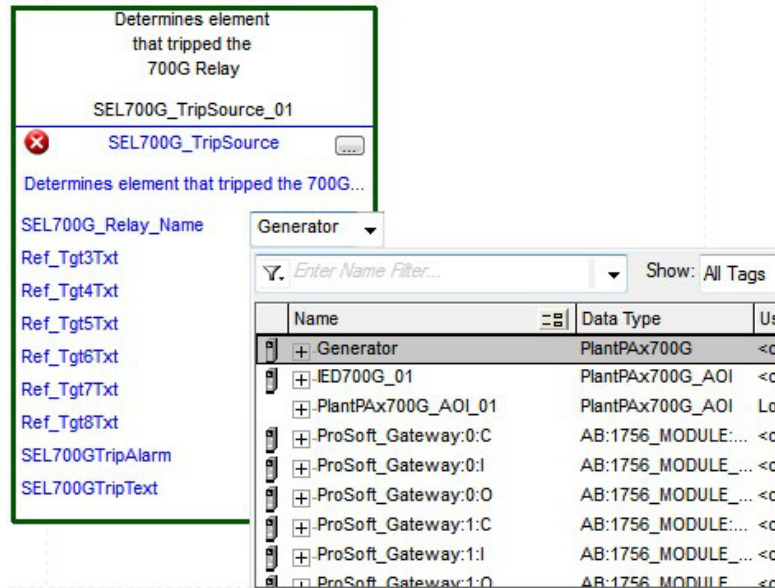
8. Click create on New Tag dialog box.



Configure Trip Source Add-On Instruction

Now that the SEL700G Add-On Instruction has been configured, you must configure the SEL700G trip source Add-On Instruction for alarming.

1. Click the question mark next to SEL00G_Relay_Name and select the tag that was created in [step 8](#).



2. Click the question mark next to each Ref_Tgt#Txt and enter a string tag. These tags are intended to match the status indicators on the front panel of the device.
3. Once you type the tag name, if needed, right-click and create a tag if that the tag is not already configured in the controller.



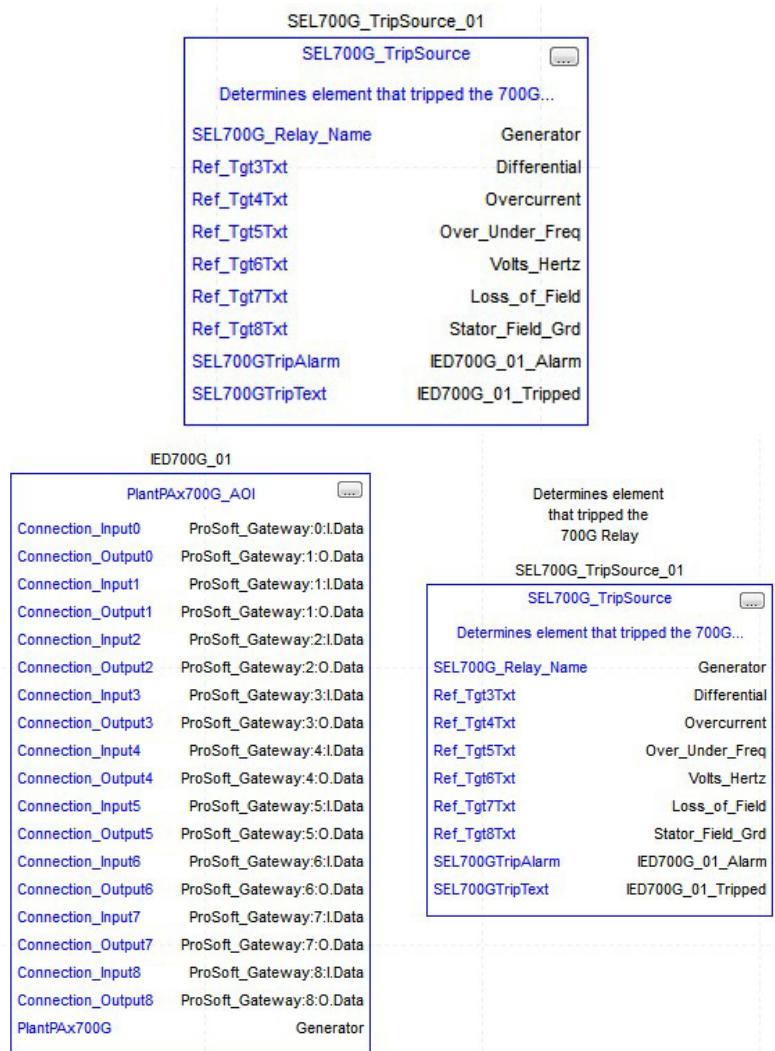
4. Click the question mark next to SEL700GTripAlarm and select or create the digital alarm tag to be used.

This tag is used for alarming through the HMI FactoryTalk® Alarms and Events Server.

- Click the question mark next to SEL700GTripText and select or create the tag to be used.

This tag is used for the alarm message through the HMI FactoryTalk Alarms and Events Server.

Fully Configured Add-On Instruction



- Save and download your project to the controller.

Using Visualization Files

See [Using a Display Element on page 16](#) for detailed information.

Faceplates

The faceplates for each physical device are contained in the Accessory File that is part of the Rockwell Automation Library of Process Objects. The SEL700G faceplate consists of three tabs and each tab consists of one or more pages.

The Operator tab is displayed when the faceplate is initially opened. Click the appropriate icon on the left of the faceplate to access a specific tab.

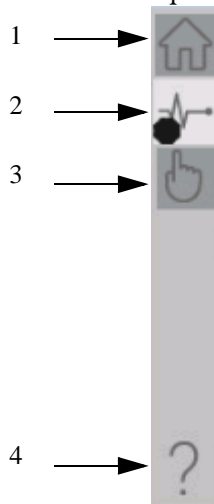


Table 54 - Tab Descriptions

Item	Description
1	Operator tab
2	Diagnostics tab
3	Auto-Sync tab
4	Help

The faceplate provides the means for operators, maintenance workers, engineers, and others to interact with the instruction instance. Here, they can view the status and values of the instruction instance and manipulate it through its commands and settings.

Operator Tab

The Faceplate initially opens to the Operator tab, sometimes called the Home tab. From here, an operator can monitor the device status and manually operate the device.

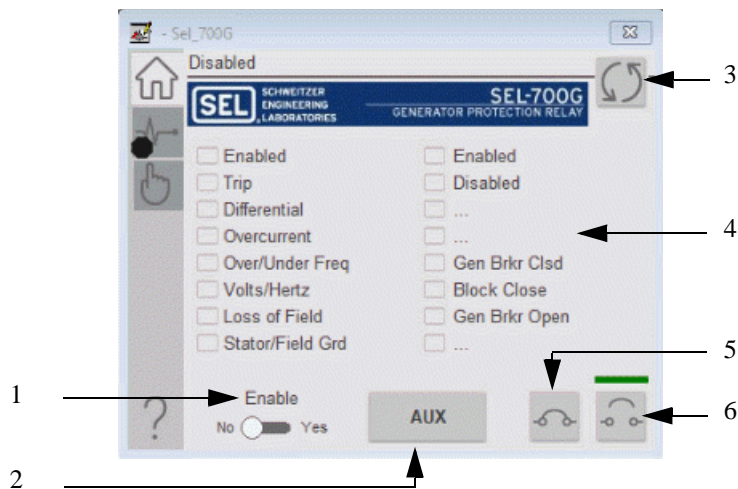


Table 55 - Operator Tab Description

Item	Description
1	Click to enable/disable the device. To issue the commands to the device, enable the device. If the device is disabled, you can only monitor data from the device.
2	Click to toggle the AUX input to the device. This input is configurable in the device vendor software. This button provides a configurable interface to provide a user chosen command.
3	Click to reset the device. The status of the device is indicated on the faceplate.
4	Status Indicators
5	Click to close the circuit breaker.
6	Click to open the circuit breaker.

Automatic-Synchronization Tab

The Automatic-synchronization tab allows the operator to initiate and monitor the status of the device synchronization. You can select the type of synchronization, voltage, or frequency and initiate the process by clicking the Start button.

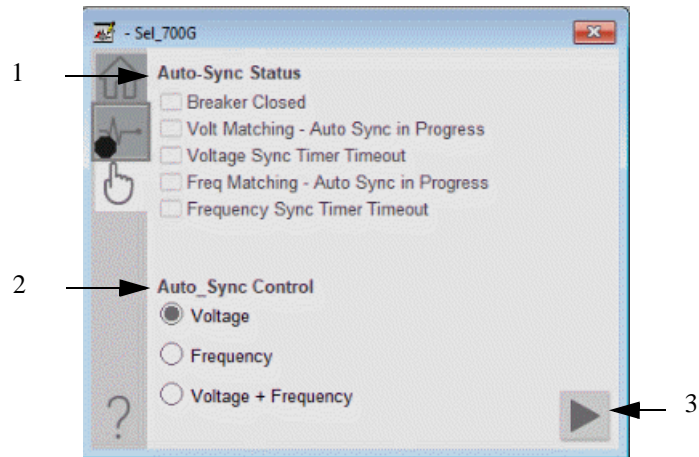


Table 56 - Auto-Sync Tab Description

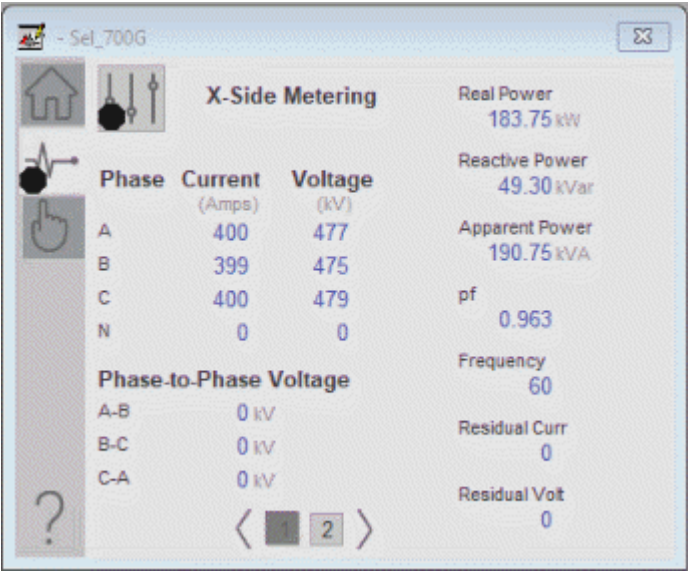
Item	Description
1	Auto-Sync Status
2	Auto-Sync control options
3	Click to initiate Auto-Sync.

Diagnostics Tab

The diagnostics tab allows the operator to see the measurement values from the physical device.

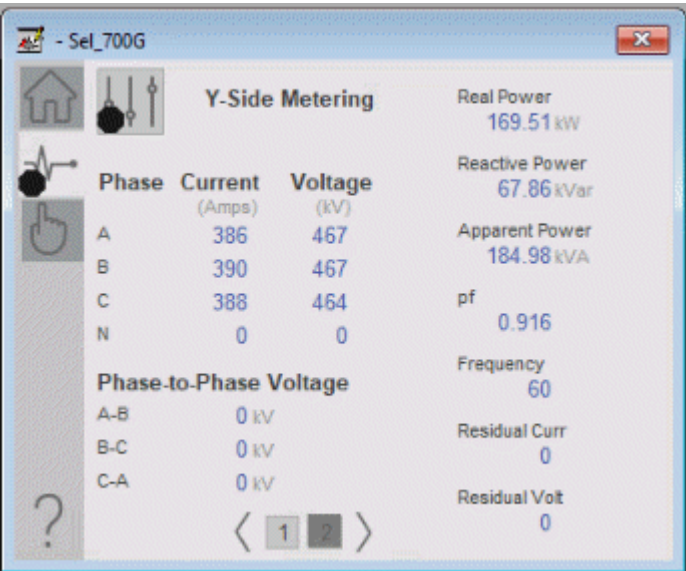
Diagnostics Page 1

Readout of the X-side measurement values from the SEL-700G. This readout displays fundamental metering data that is associated with the X-side of the generator.




Diagnostics Page 2

Readout of the Y-side measurement values from the SEL-700G. This readout displays fundamental metering data that is associated with the Y-side of the generator.



Advanced Properties

Click the advanced properties icon  on the diagnostics page to display the advanced properties. The following screen capture shows the tabs that are available in the advanced properties display.

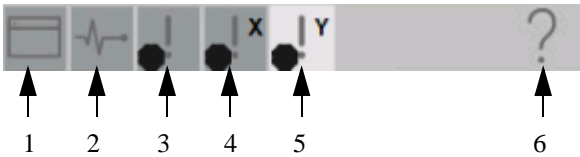


Table 57 - Advanced Properties Tab Descriptions

Item	Description
1	HMI Configuration
2	Diagnostics
3	Faults
4	X-Side Faults
5	Y-Side Faults
6	Help

HMI Configuration Tab

The HMI configuration tab provides access to displayed text, and faceplate-to-faceplate navigation settings. Configure the description, label, tag, and security area for the device.

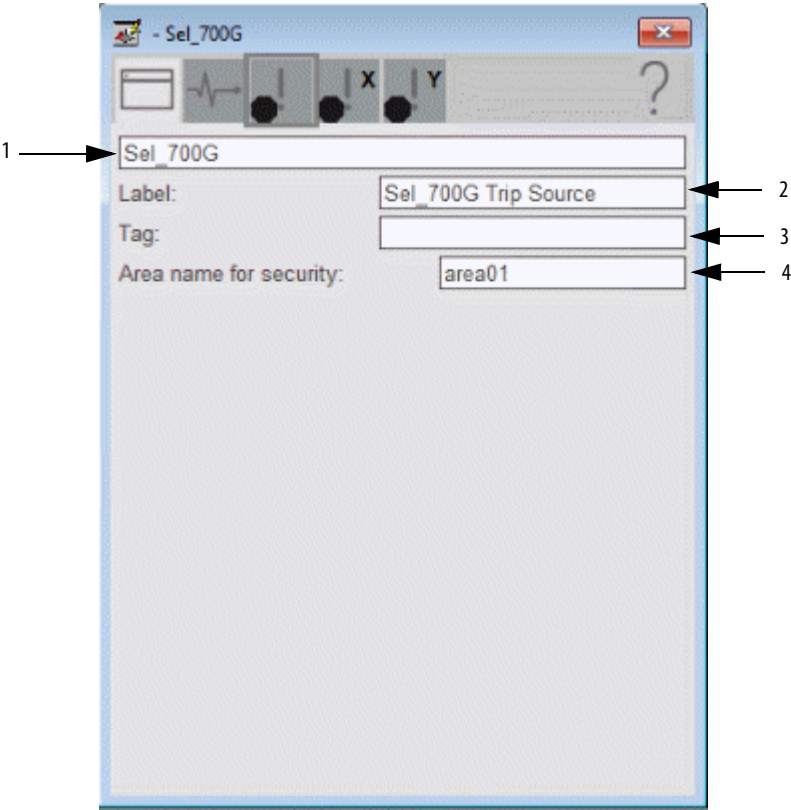
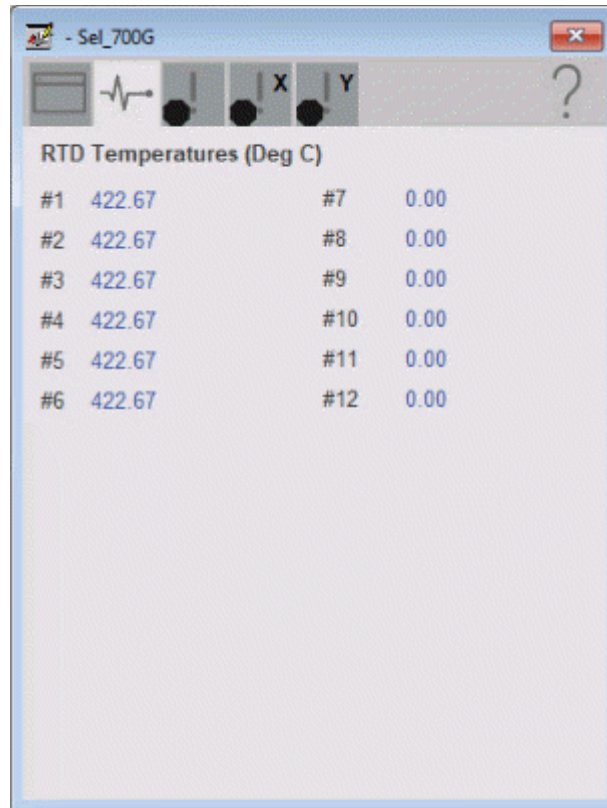


Table 58 - HMI Configuration Tab Description

Item	Action
1	Type the device description to show on the faceplate title bar.
2	Type the label to show on the graphic symbol.
3	Type the tag name to show on the faceplate and Tooltip. IMPORTANT: Pause the mouse over this field to display a tool tip with the configured Logix tag/path.
4	Type the Area name for security.

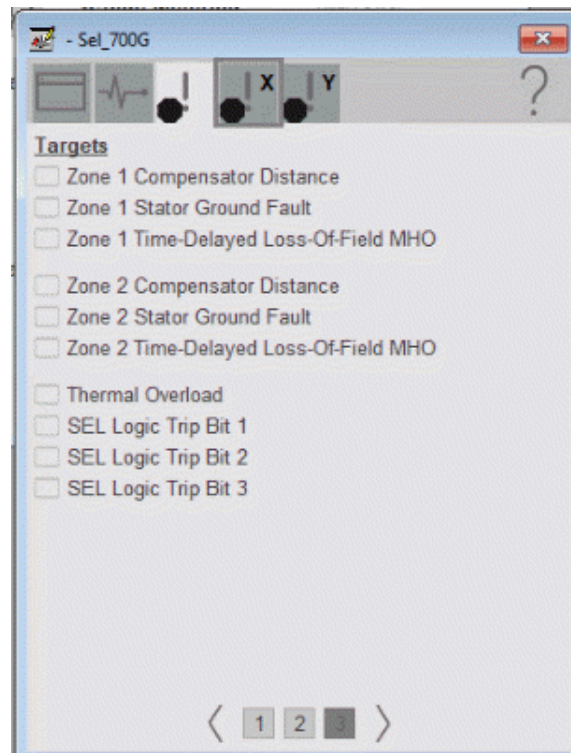
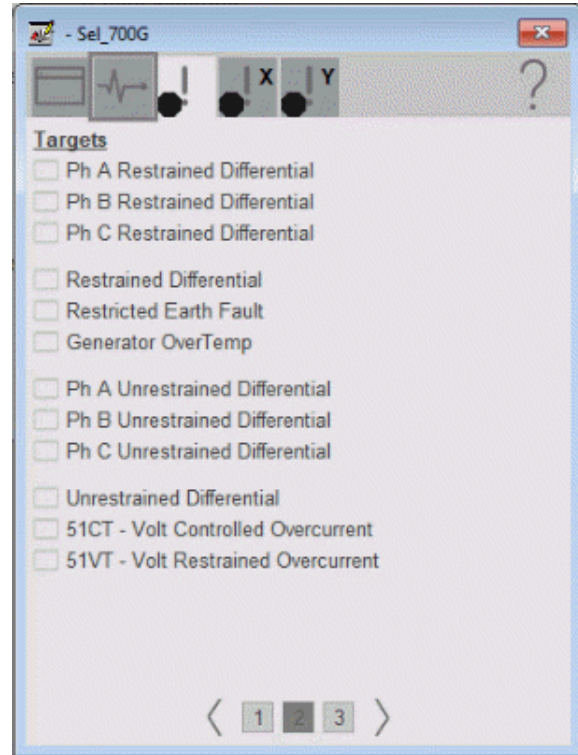
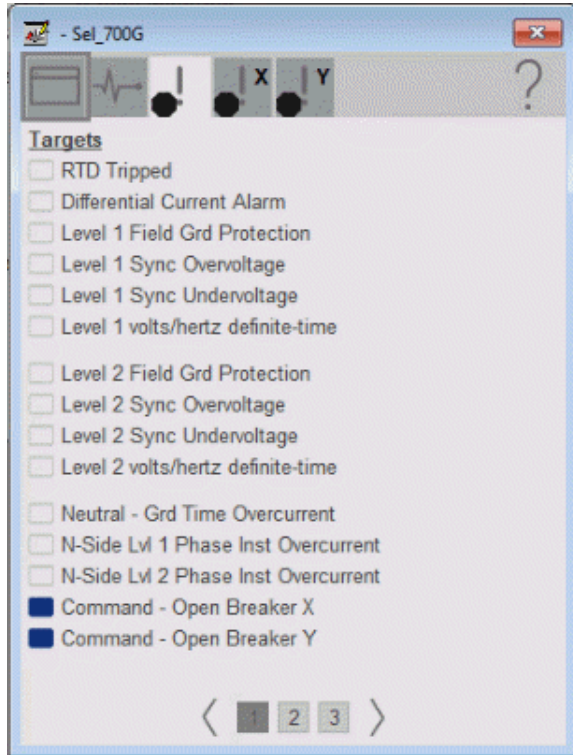
Advanced Diagnostics Tab

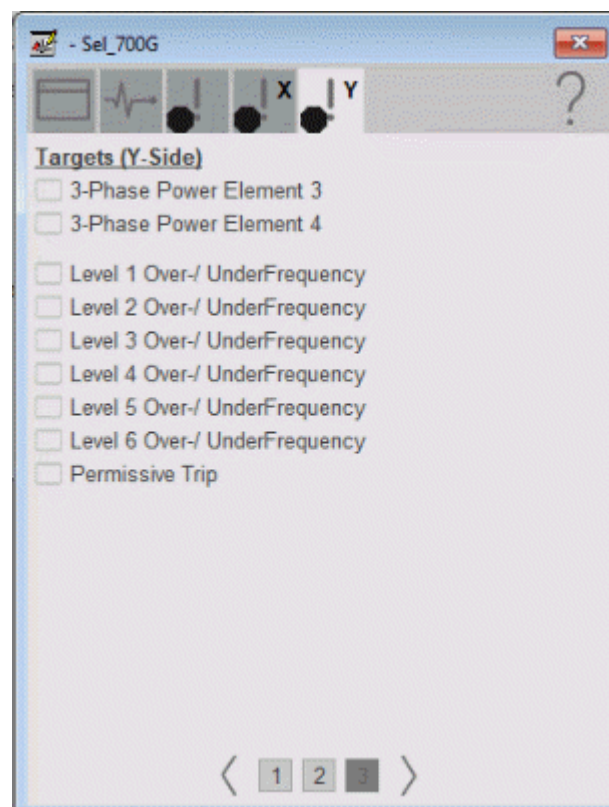
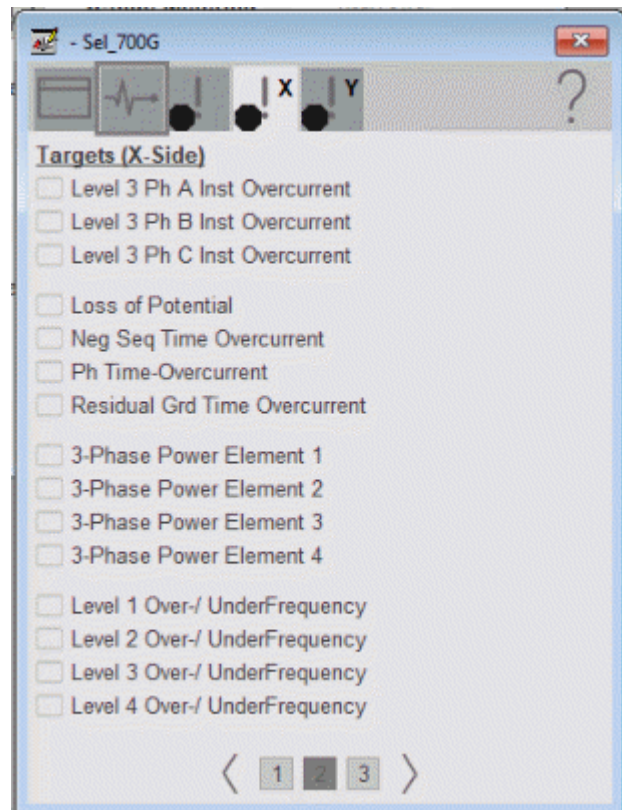
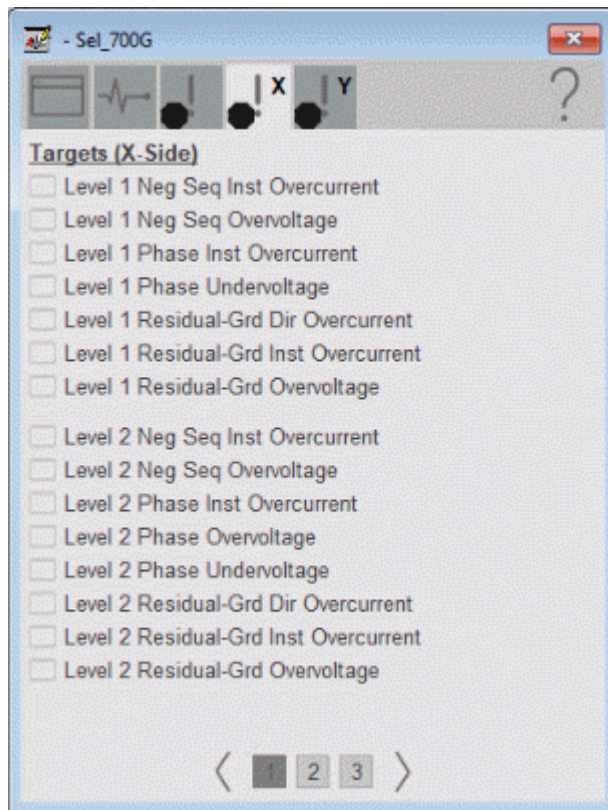
This tab provides a readout of the temperatures from the 12 RTD inputs that are available in the SEL-700G.

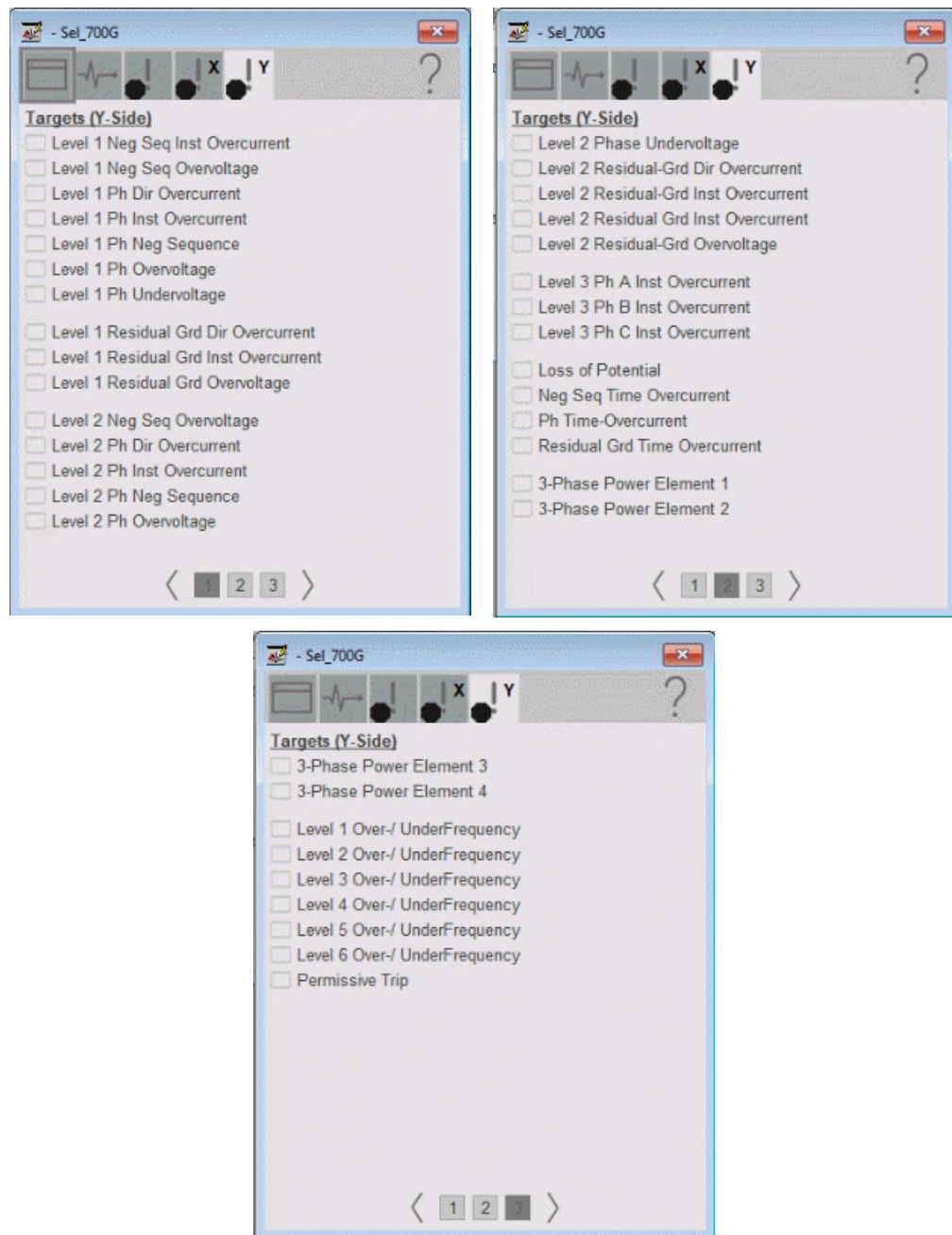


Faults Tab

The faults tab shows which alarms are active from the physical device. The first tab shows general faults for the entire generator. There are separate tabs for the X-Side and Y-Side conditions.



X-Side Faults Tab

Y-Side Diagnostic Tab**Help Button**

Press the help button on the faceplates to access help specific to that faceplate. The help file is in .pdf format and opens in a separate window.

SEL 710 Object



The Schweitzer Engineering Labs 710 / 710d5 is a motor protection relay. This device helps protect rotating load assets within the system. It is equipped with a thermal model and metering data that allows a configurable starting sequence of the motor. The device also provides multiple fundamental metering data including, voltage, current, frequency, power, and so on. The SEL 710d5 model version is equipped with synchronous machine protection capabilities.

Topic	Page
Controller Code	152
Mapping InOut Tags to Add-On Instructions	154
Using Visualization Files	158
Faceplates	159

The following instruction monitors one SEL710 relay. Alarms are provided when the device experiences a protection-related trip. The instruction also provides capabilities for starting and stopping the motor and two auxiliary inputs.

Add-On Instruction

SEL710TripSource_02

SEL710TripSource

Determines the element that tripped the ...

SEL710_Relay_Name

Ref_Tgt3Txt

Ref_Tgt4Txt

Ref_Tgt5Txt

Ref_Tgt6Txt

Ref_Tgt7Txt

Ref_Tgt8Txt

SEL710TripAlarm

SEL710TargetTripText

Faceplate

Sel 710 - Description

Disabled

SEL

SCHWEITZER
ENGINEERING
LABORATORIES

SEL-710

MOTOR PROTECTION RELAY

☐ Enabled

☐ Trip

☐ Thermal Overload

☐ Overcurrent

☐ Unbalance

☐ Load Loss

☐ Over/Under Voltage

☐ Differential

☐ ...

☐ ...

☐ ...

☐ ...

☐ Motor Running

☐ ...

☐ Motor Stopped

AUX1

AUX2

Controller Code

Two Add-On Instructions represent each physical device. You must configure the InOut parameters of each Add-On Instruction per physical device.

The first Add-On Instruction is the ProSoft software-generated Add-On Instruction (see [Chapter 2](#)), which maps data to the controller. The second Add-On Instruction is the TripSource Add-On Instruction, available for download from the library resources from the PCDC, which is for faceplate management

InOut Structure for ProSoft Add-On Instruction

InOut parameters in [Table 59](#) are used to link the Add-On Instruction to external tags that contain necessary data for the instruction to operate. These external tags must be of the data type shown. These tags are representative of the tags that are required for each SEL-710 relay, which is configured in your system.

Table 59 - SEL710_Relay

Name	Data Type	Description
[DeviceName]_AOI	[DeviceName]710_AOI	Add-On Instruction tag. Matches naming from ProSoft Configuration Manager.
Connection_Input0	SINT[500]	CIP Connection Input data. The number of these parameters vary depending on system sizing.
Connection_Output0	SINT[496]	CIP Connection Output data. The number of these parameters vary depending on system sizing.
Connection_Input1	SINT[500]	CIP Connection Input data. The number of these parameters vary depending on system sizing.
Connection_Output1	SINT[496]	CIP Connection Output data. The number of these parameters vary depending on system sizing.
[DeviceName]	[DeviceName]	Device data that is collected from the CIP connections and organized into understandable tags. This data type changes to match each device tag in the ProSoft Gateway.

InOut Structure for Rockwell Automation Library Download

InOut parameters in [Table 60](#) are used to link the Add-On Instruction to external tags that contain necessary data for the instruction to operate. These external tags must be of the data type shown. These tags are representative of the tags that are required for each SEL-710 relay, which is configured in your system in [Chapter 2](#).

Table 60 - SEL710_TripSource

Name	Data Type	Description
[DeviceName]_Relay_Name	<Defined by device AOI>	Device data from the Add-On Instruction. This data type changes to match each device tag in the ProSoft Gateway.
Ref_Tgt3Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt4Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt5Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt6Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt7Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt8Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
[DeviceName]TripAlarm	ALARM_DIGITAL	Digital Alarm tag
[DeviceName]TripText	STRING	Alarm text to be displayed when active.

Remote Bit Control Value Structure

Remote Bit Control Value parameters are used to link the Add-On Instruction to configurable input points in the physical device. Each bit is configurable via the vendor software of each device. [Table 61](#) has recommended uses for each bit.

Table 61 - Remote Bit Control - SEL710 Relay

Name	Description
CON_RBGGIO1_CO_SPCS001_Oper_ctlVal	Lock/Unlock
CON_RBGGIO1_CO_SPCS002_Oper_ctlVal	Target Reset
CON_RBGGIO1_CO_SPCS003_Oper_ctlVal	Motor Start
CON_RBGGIO1_CO_SPCS004_Oper_ctlVal	Motor Stop
CON_RBGGIO1_CO_SPCS005_Oper_ctlVal	AUX1

Table 61 - Remote Bit Control - SEL710 Relay

Name	Description
CON_RBGGI01_CO_SPCS006_Oper_ctlVal	AUX2
CON_RBGGI01_CO_SPCS007_Oper_ctlVal	Not Used
CON_RBGGI01_CO_SPCS008_Oper_ctlVal	Not Used

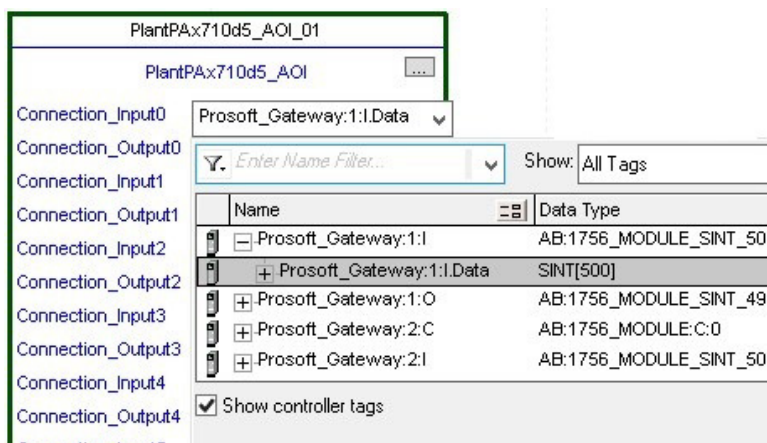
Mapping InOut Tags to Add-On Instructions

Each SEL710 relay requires two Add-On Instructions to monitor and visualize the relay. The ProSoft Software instruction is created in [Chapter 2](#). The Add-On Instruction is downloaded from the Rockwell Automation® Library of Electronic Protection Devices from the PCDC.

Associate Controller Tags to ProSoft Add-On Instruction

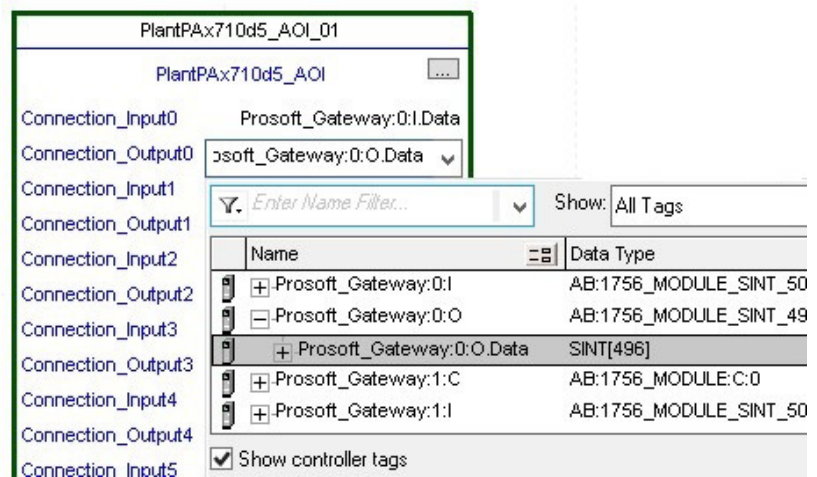
Complete these steps to map the ProSoft instruction to Studio 5000® tags.

1. Double-click the question mark next to Connection_Input0 of the device Add-On Instruction.
2. Click the down arrow on the drop box and expand the ProSoft_Gateway:0:I. Select the ProSoft_Gateway:0:I.Data and double-click to choose it.



3. Double-click the question mark next to Connection_Output0 of the device Add-On Instruction.

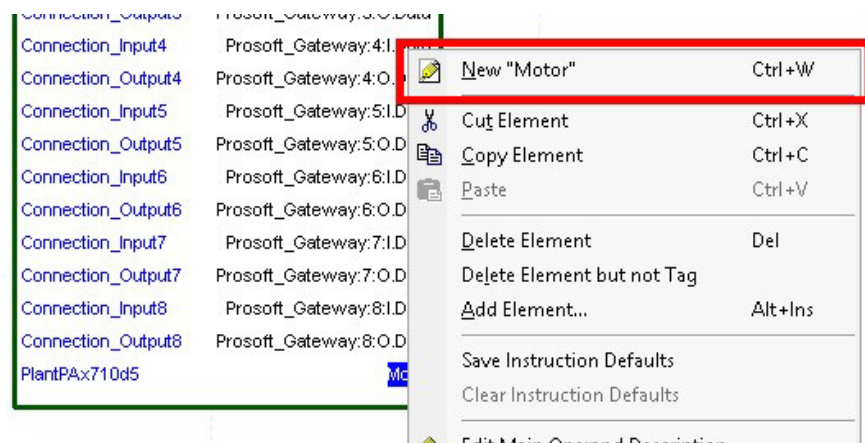
4. Click the down arrow on the drop box and expand the ProSoft_Gateway:0:O. Select the ProSoft_Gateway:0:O.Data and double-click to choose it.



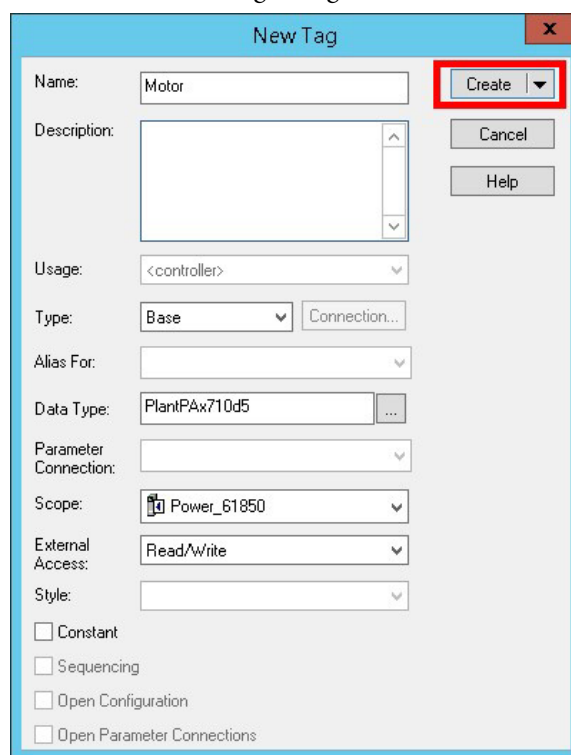
5. Repeat this process for each Connection Input and Output that are included with your Add-On Instructions.
6. Click the question mark next to the final tag. Enter a clear engineering name to this tag that represents your device within your Studio 5000 project. In our example "Motor".



7. Right-click on the new tag name and select New "<tag name>".



8. Click Create on the New Tag dialog box.



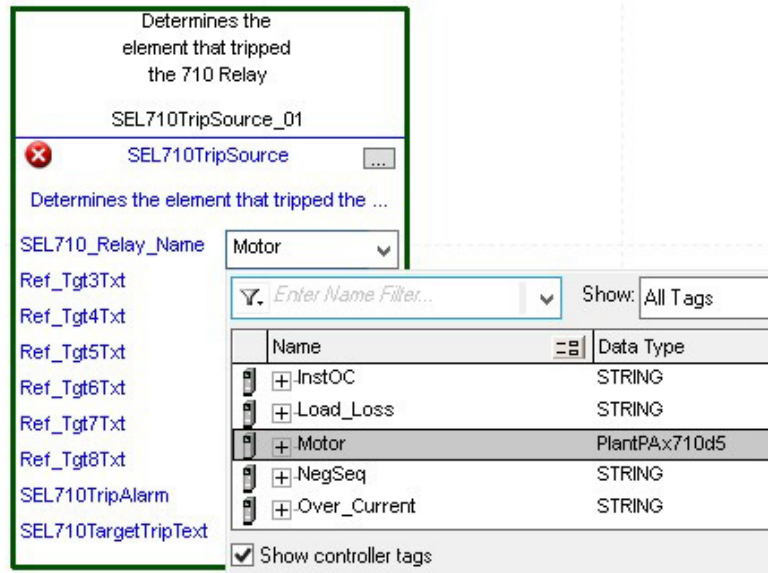
The image shows a 'New Tag' dialog box with a light blue border and a red 'X' close button in the top right corner. The dialog contains several fields and options:

- Name:** A text box containing 'Motor'.
- Description:** A large text area with up and down arrow buttons on the right.
- Usage:** A dropdown menu showing '<controller>'.
- Type:** A dropdown menu showing 'Base' and a 'Connection...' button.
- Alias For:** An empty dropdown menu.
- Data Type:** A dropdown menu showing 'PlantPAx710d5' and an ellipsis button.
- Parameter Connection:** An empty dropdown menu.
- Scope:** A dropdown menu showing 'Power_61850' with a small icon to its left.
- External Access:** A dropdown menu showing 'Read/Write'.
- Style:** An empty dropdown menu.
- Buttons:** 'Create' (highlighted with a red rectangle), 'Cancel', and 'Help' are located on the right side.
- Checkboxes:** At the bottom, there are four unchecked checkboxes: 'Constant', 'Sequencing', 'Open Configuration', and 'Open Parameter Connections'.

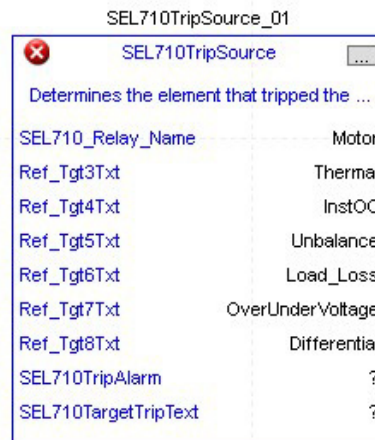
Configure Trip Source Add-On Instruction

Now that the SEL710 Add-On Instruction has been configured, you must configure the SEL710 trip source Add-On Instruction for alarming.

1. Click the question mark next to SEL00G_Relay_Name and select the tag that was created in [step 8](#).



2. Next click the question mark next to each Ref_Tgt#Txt and enter a string tag. These tags are intended to match the status indicators on the front panel of the device.
3. Once you type the tag name, if the tag is not already configured in the controller, you have to right-click and create a tag.



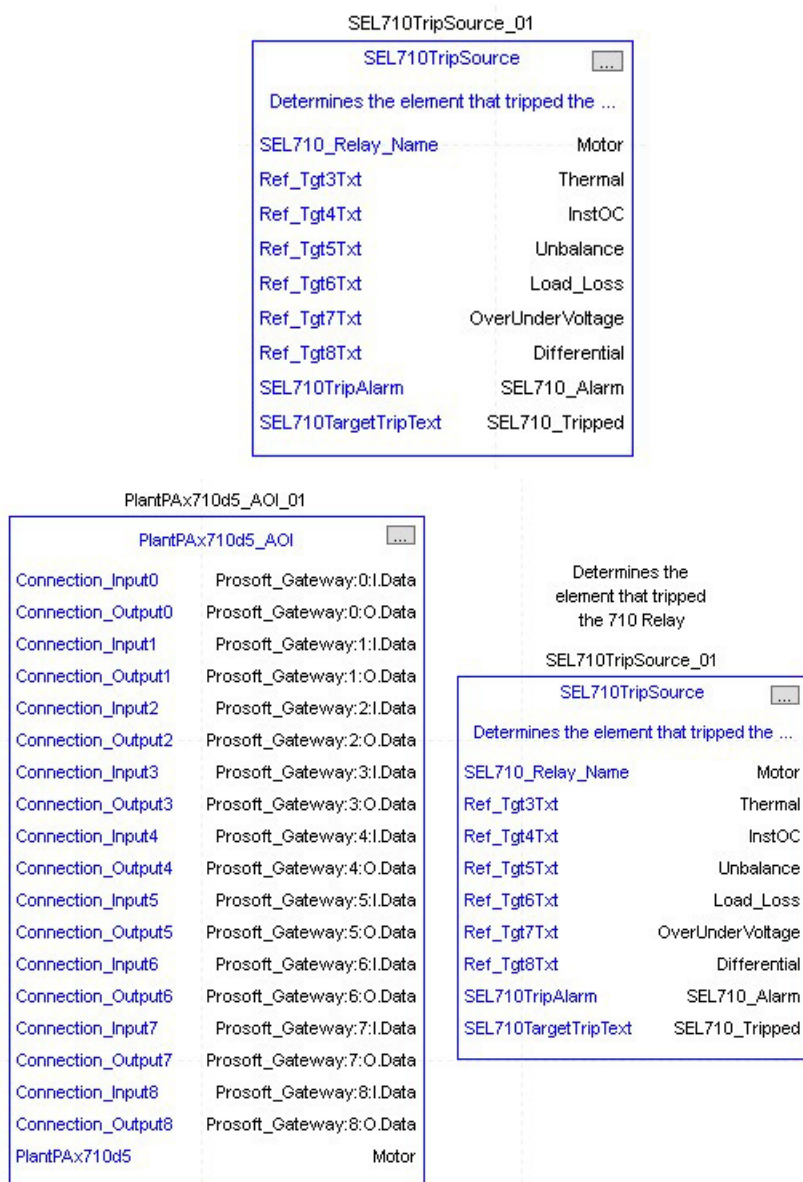
4. Click the question mark next to SEL710TripAlarm and select or create the digital alarm tag to be used.

This tag is used for alarming through the HMI FactoryTalk® Alarms and Events Server.

- Click the question mark next to SEL710TripText and select or create the tag to be used.

This tag is used for alarm message through the HMI FactoryTalk Alarms and Events Server.

Fully Configured Add-On Instruction



- Save and download your project to the controller.

Using Visualization Files

See [Using a Display Element on page 16](#) for detailed information.

Faceplates

The Operator tab is displayed when the faceplate is initially opened. Click the appropriate icon on the left of the faceplate to access a specific tab.



Table 62 - Tab Descriptions

Item	Description
1	Operator tab
2	Diagnostics tab
3	Help

The faceplate provides the means for operators, maintenance workers, engineers, and others to interact with the instruction instance. This interaction provides a view of the status and values of the instruction instance and an ability to manipulate it through its commands and settings.

Operator Tab

The Faceplate initially opens to the Operator tab, sometimes called the Home tab. From here, an operator can monitor the device status and manually operate the device.

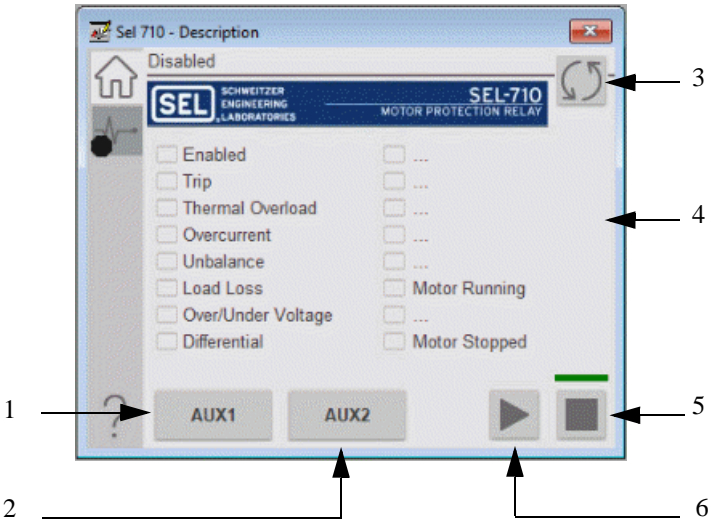


Table 63 - Operator Tab Description

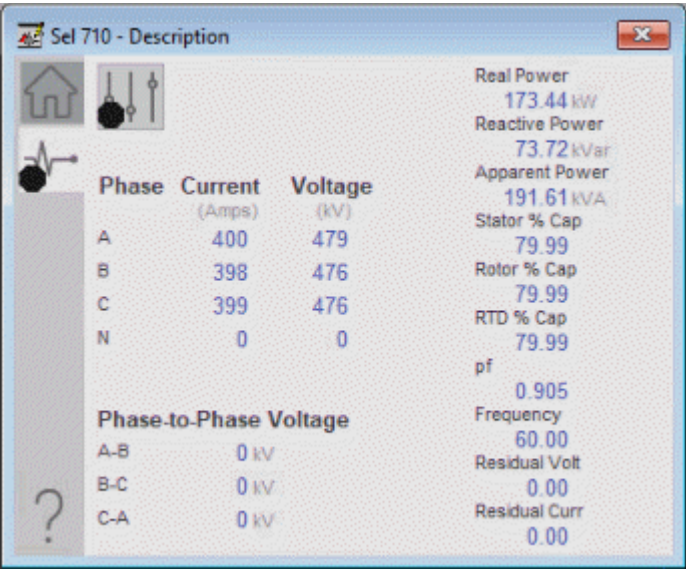
Item	Description
1	Click to toggle the AUX input to the device. This input is configurable in the device vendor software.
2	Click to toggle the AUX input to the device. This input is configurable in the device vendor software.
3	Click to reset the device. The status of the device is indicated on the faceplate.
4	Status Indicators
5	Click to stop the motor.
	Click to start the motor.

Diagnostics Tab

The diagnostics tab allows the operator to see the measurement values from the physical device.

Diagnostics Tab

Readout of measurement values from the SEL-710.



Advanced Properties


Click the advanced properties icon  on the diagnostics page to display the advanced properties. The following screen capture shows the tabs that are available in the advanced properties display



Table 64 - Advanced Properties Tab Descriptions

Item	Description
1	HMI Configuration
2	Diagnostics
3	Faults
4	Help

HMI Configuration Tab

The HMI configuration tab provides access to displayed text, and faceplate-to-faceplate navigation settings. Configure the description, label, tag, and security area for the device.

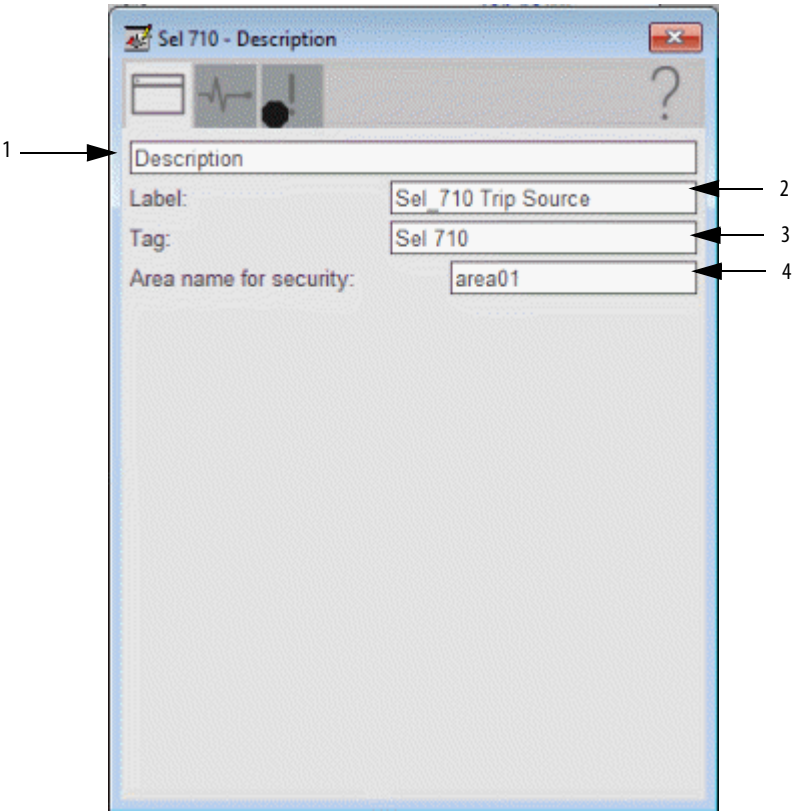
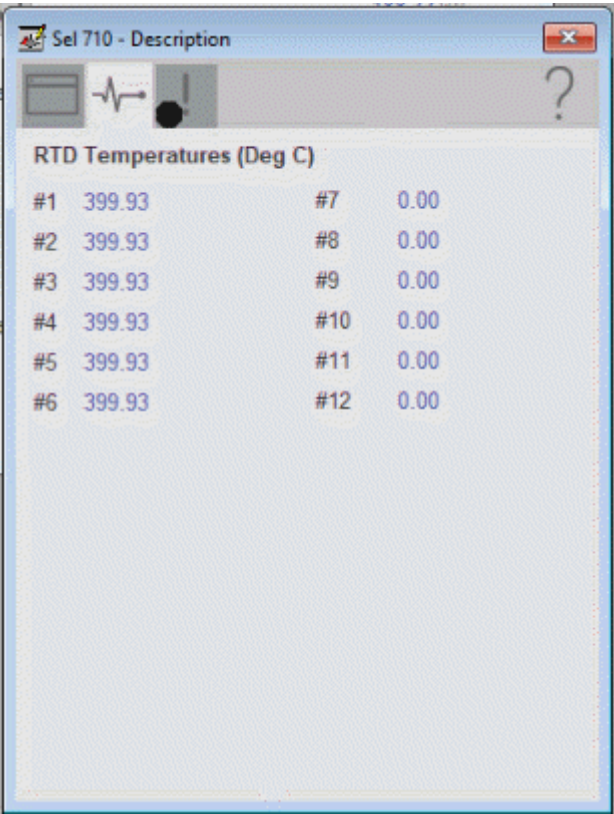


Table 65 - HMI Configuration Tab Description

Item	Action
1	Type the device description to show on the faceplate title bar.
2	Type the label to show on the graphic symbol.
3	Type the tag name to show on the faceplate and Tooltip. IMPORTANT: Pause the mouse over this field to display a tool tip with the configured Logix tag/path.
4	Type the Area name for security.

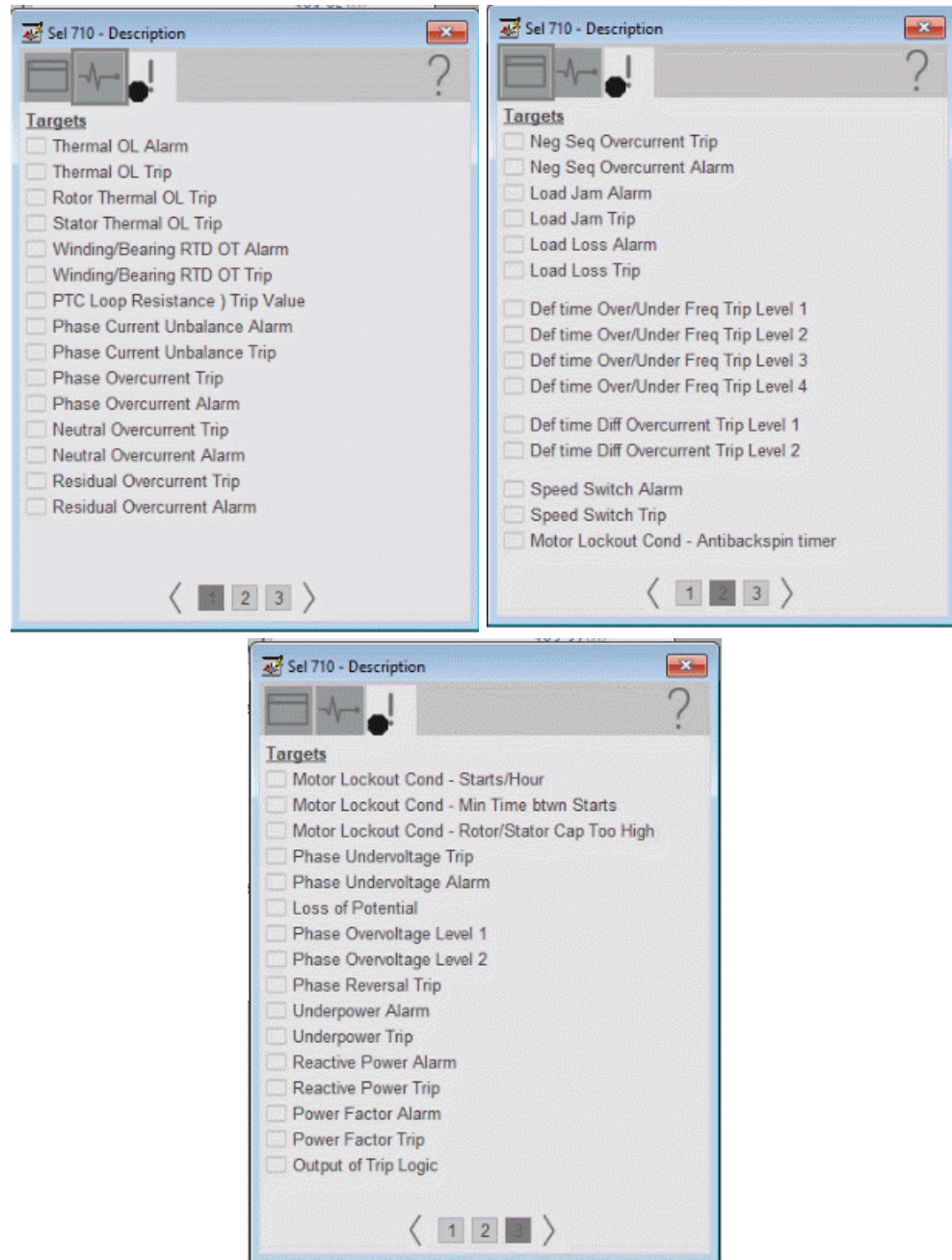
Diagnostics Tab

Readout of the temperatures from the 12 RTD inputs that are available in the SEL-710.



Faults Tab

The faults tab shows which alarms are active from the physical device.



Help Button

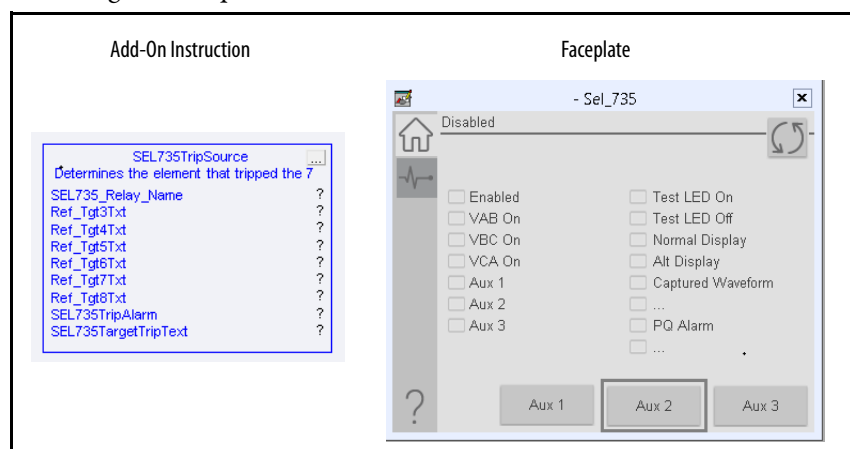
Press the help button on the faceplates to access help specific to that faceplate. The help file is in .pdf format and opens in a separate window.

SEL 735 Object

The SEL-735 Power Quality and Revenue Meter is fully Class A-compliant to the IEC 61000-4-30 power quality standard. The meter provides voltage, current, and power quality measures in an easy to utilize fashion.

Topic	Page
Controller Code	166
Mapping InOut Tags to Add-On Instructions	168
Using Visualization Files	171
Faceplates	172

This instruction monitors one SEL735. Alarms are provided when the device experiences a protection-related trip. The instruction also provides capabilities for locking, and to open and close the breaker.



Controller Code

Two Add-On Instructions represent each physical device. You must configure the InOut parameters of each Add-On Instruction per physical device.

The first Add-On Instruction is the ProSoft software-generated Add-On Instruction (see [Chapter 2](#)), which maps data to the controller. The second Add-On Instruction is the TripSource Add-On Instruction, available for download from the library resources from the PCDC, which is for faceplate management

InOut Structure for ProSoft Add-On Instruction

InOut parameters in [Table 66](#) are used to link the Add-On Instruction to external tags that contain necessary data for the instruction to operate. These external tags must be of the data type shown. These tags are representative of the tags that are required for each SEL-735, which is configured in your system.

Table 66 - SEL735

Name	Data Type	Description
[DeviceName]_AOI	[DeviceName]_AOI	Add-On Instruction tag. Matches naming from ProSoft Configuration Manager.
Connection_Input0	SINT[500]	CIP Connection Input data. The number of these parameters vary depending on system sizing.
Connection_Output0	SINT[496]	CIP Connection Output data. The number of these parameters vary depending on system sizing.
Connection_Input1	SINT[500]	CIP Connection Input data. The number of these parameters vary depending on system sizing.
Connection_Output1	SINT[496]	CIP Connection Output data. The number of these parameters vary depending on system sizing.
[DeviceName]	[DeviceName]	Device data that is collected from the CIP connections and organized into understandable tags. This data type changes to match each device tag in the ProSoft Gateway.

InOut Structure for Rockwell Automation Library Download

[Table 67](#) shows the InOut parameters that are available from the Rockwell Automation Library of Electrical Protection Devices Folder in the PCDC. These external tags must be of the data type shown.

Table 67 - SEL735_TripSource

Name	Data Type	Description
[DeviceName]_Relay_Name	<Defined by device AOI>	Device data from the Add-On Instruction. This data type changes to match each device tag in the ProSoft Gateway.
Ref_Tgt3Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt4Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt5Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt6Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt7Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt8Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
[DeviceName]TripAlarm	ALARM_DIGITAL	Digital Alarm tag
[DeviceName]TripText	STRING	Alarm text to be displayed when active.

Remote Bit Control Value Structure

Remote Bit Control Value parameters are used to link the Add-On Instruction to configurable input points in the physical device. Each bit is configurable via the vendor software of each device. [Table 68](#) has recommended uses for each bit.

Table 68 - Remote Bit Control - SEL735

Name	Description
CON_RBGGIO1_CO_SPCS001_Oper_ctlVal	User Programmable
CON_RBGGIO1_CO_SPCS002_Oper_ctlVal	User Programmable
CON_RBGGIO1_CO_SPCS003_Oper_ctlVal	User Programmable
CON_RBGGIO1_CO_SPCS004_Oper_ctlVal	User Programmable
CON_RBGGIO1_CO_SPCS005_Oper_ctlVal	User Programmable
CON_RBGGIO1_CO_SPCS006_Oper_ctlVal	User Programmable
CON_RBGGIO1_CO_SPCS007_Oper_ctlVal	User Programmable
CON_RBGGIO1_CO_SPCS008_Oper_ctlVal	User Programmable

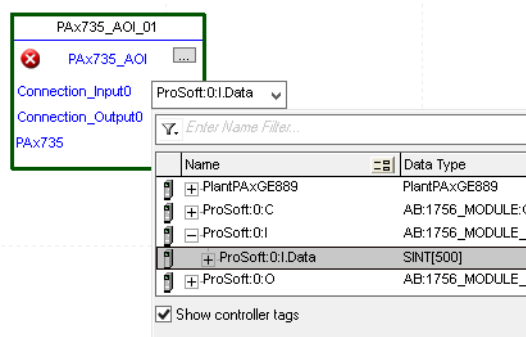
Mapping InOut Tags to Add-On Instructions

Each SEL735 requires two Add-On Instructions to monitor and visualize the relay. The ProSoft Software instruction is created in [Chapter 2](#). The Add-On Instruction is downloaded from the Rockwell Automation Library of Electronic Protection Devices from the PCDC.

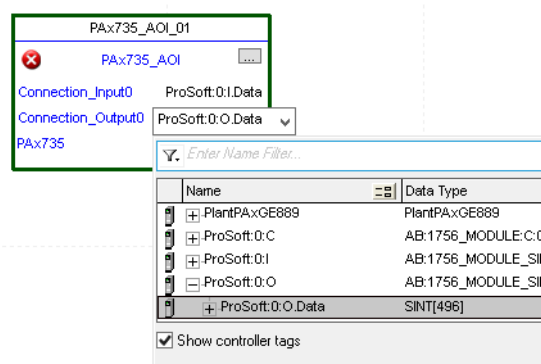
Associate Controller Tags to ProSoft Add-On Instruction

Complete these steps to map the ProSoft instruction to Studio 5000® tags.

1. Double-click the question mark next to Connection_Input0 of the device Add-On Instruction.
2. Click the down arrow on the drop box and expand the ProSoft_Gateway:0:I. Select the ProSoft_Gateway:0:I.Data and double-click to choose it.

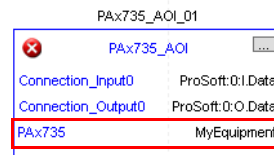


3. Double-click the question mark next to Connection_Output0 of the device Add-On Instruction.
4. Click the down arrow on the drop box and expand the ProSoft_Gateway:0:O. Select the ProSoft_Gateway:0:O.Data and double-click to choose it.

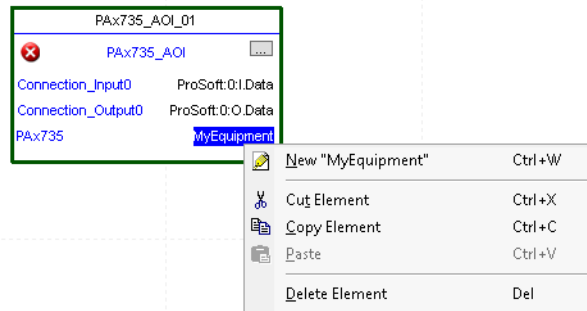


5. Repeat this process for each Connection Input and Output that are included with your Add-On Instructions.

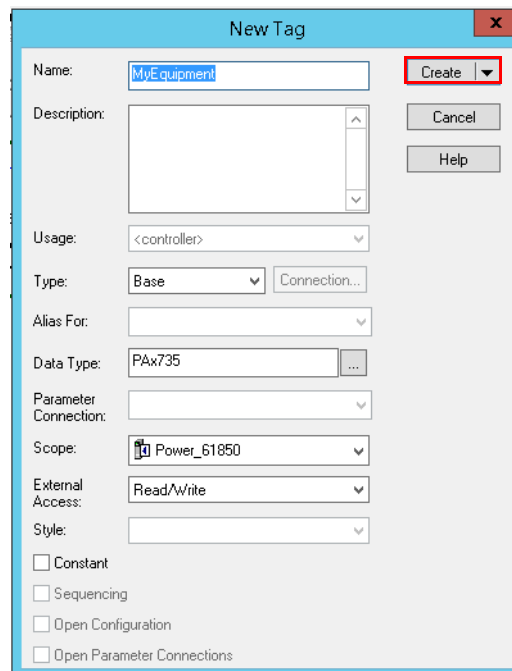
- Click the question mark next to the final tag. Type a tag name that represents your physical device within your Studio 5000 project. In this example, the name is “MyEquipment”.



- Right-click the new tag name and select New “<tag name>”.



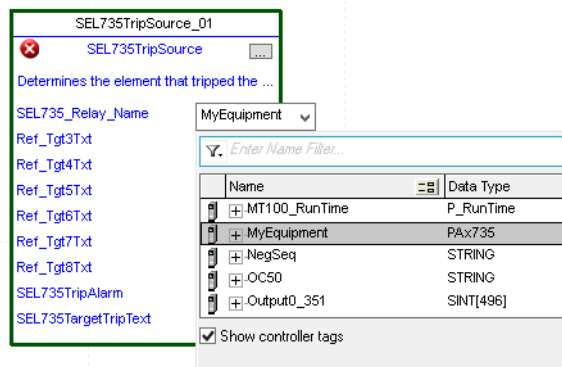
- Click Create on the New Tag dialog box.



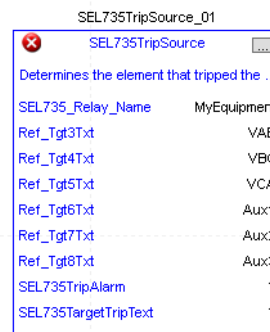
Configure Trip Source Add-On Instruction

Now that the SEL735 Add-On Instruction has been configured, you must configure the SEL735 trip source Add-On Instruction for alarming.

1. Click the question mark next to SEL735_Relay_Name and select the tag that was created in [step 8](#).



2. Next click the question mark next to each Ref_Tgt#Txt and enter a string tag. These tags are intended to match the status indicators on the front panel of the device.
3. Once you type the tag name, if the tag is not already configured in the controller, you have to right-click and create a tag.



4. Click the question mark next to SEL735TripAlarm and select or create the digital alarm tag to be used.

This tag is used for alarming through the HMI FactoryTalk® Alarms and Events Server.

5. Click the question mark next to SEL735TripText and select or create the tag to be used.

This tag is used for alarm message through the HMI FactoryTalk Alarms and Events Server.

Fully Configured Add-On Instruction



6. Save and download your project to the controller.

Using Visualization Files

See [Using a Display Element on page 16](#) for detailed information.

Faceplates

The Operator tab is displayed when the faceplate is initially opened. Click the appropriate icon on the left of the faceplate to access a specific tab.

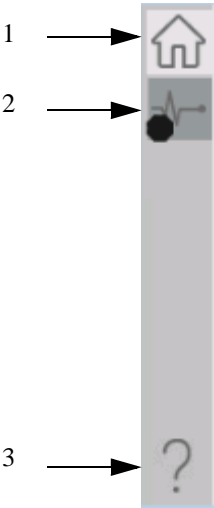


Table 69 - Tab Descriptions

Item	Description
1	Operator tab
2	Diagnostics tab
3	Help

The faceplate provides the means for operators, maintenance workers, engineers, and others to interact with the instruction instance. This interaction provides a view of the status and values of the instruction instance and an ability to manipulate it through its commands and settings.

Operator Tab

The Faceplate initially opens to the Operator tab, sometimes called the Home tab. From here, an operator can monitor the device status and manually operate the device.

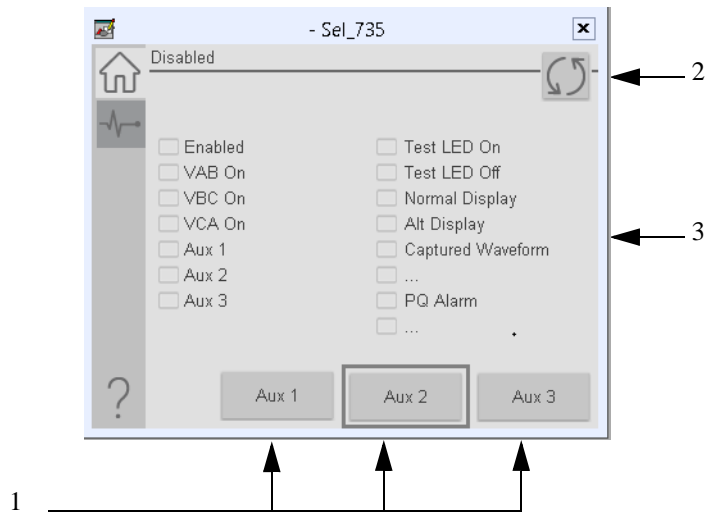


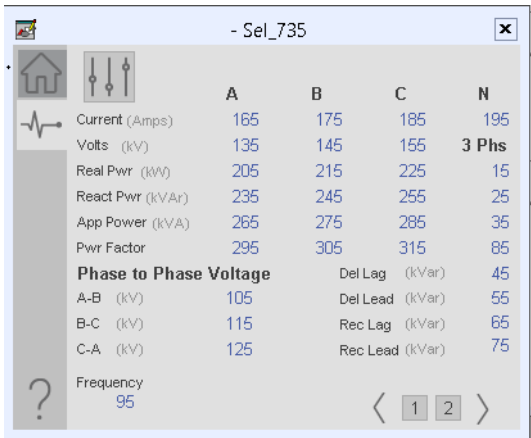
Table 70 - Operator Tab Description

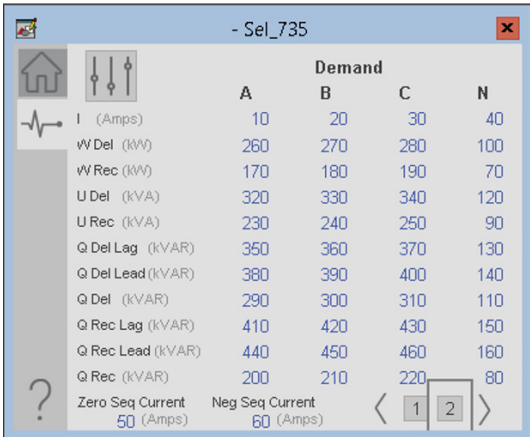
Item	Description
1	Click to toggle the AUX input to the device. This input is configurable in the device vendor software.
2	Click to reset the device. The status of the device is indicated on the faceplate.
3	Status Indicators

Diagnostics Tab

The diagnostics tabs allow the operator to see the measurement values from the physical device.

Readout of the measurement values from the SEL-735.





- Sel_735				
	A	B	C	N
I (Amps)	10	20	30	40
W Del (kW)	260	270	280	100
W Rec (kW)	170	180	190	70
U Del (kVA)	320	330	340	120
U Rec (kVA)	230	240	250	90
Q Del Lag (kVAR)	350	360	370	130
Q Del Lead (kVAR)	380	390	400	140
Q Del (kVAR)	290	300	310	110
Q Rec Lag (kVAR)	410	420	430	150
Q Rec Lead (kVAR)	440	450	460	160
Q Rec (kVAR)	200	210	220	80
Zero Seq Current 50 (Amps)	Neg Seq Current 60 (Amps)			

Advanced Properties


Click the advanced properties icon  on the diagnostics page to display the advanced properties. The following screen capture shows the tabs that are available in the advanced properties display



Table 71 - Advanced Properties Tab Descriptions

Item	Description
1	HMI Configuration
2	Help

HMI Configuration Tab

The HMI configuration tab provides access to displayed text, and faceplate-to-faceplate navigation settings. Configure the description, label, tag, and security area for the device.

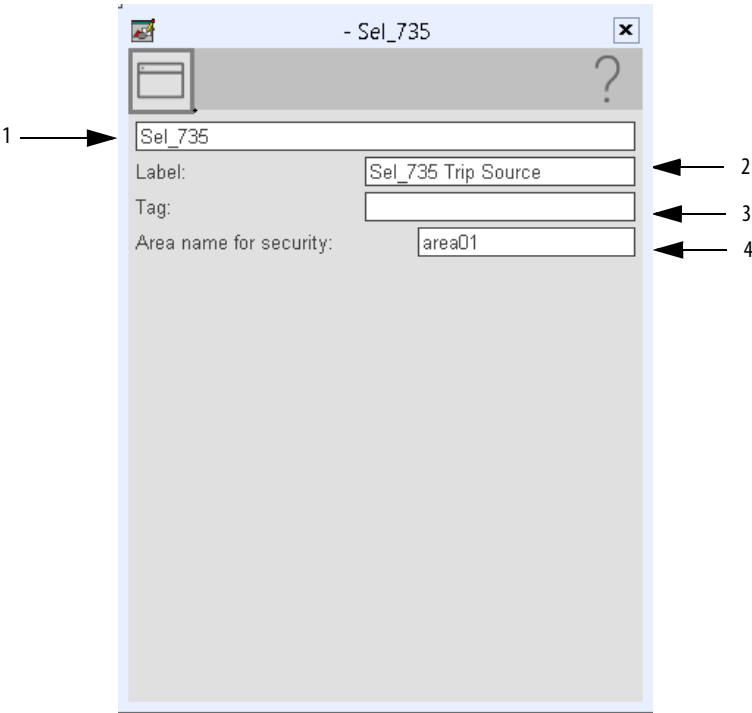


Table 72 - HMI Configuration Tab Description

Item	Action
1	Type the device description to show on the faceplate title bar.
2	Type the label to show on the graphic symbol.
3	Type the tag name to show on the faceplate and Tooltip. IMPORTANT: Pause the mouse over this field to display a tool tip with the configured Logix tag/path.
4	Type the Area name for security.

Help Button

Press the help button on the faceplates to access help specific to that faceplate. The help file is in .pdf format and opens in a separate window.

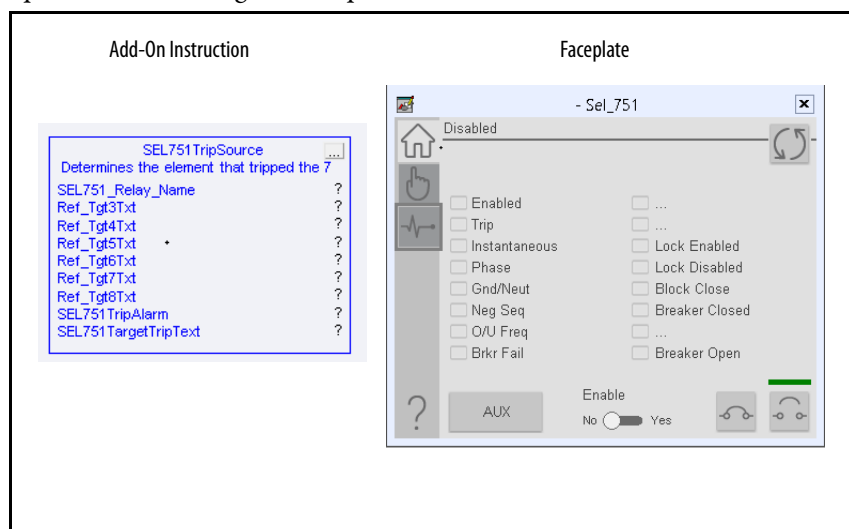
Notes:

SEL 751 Object

The Schweitzer Engineering Labs 751 is a feeder protection relay. This device is used to help protect an electrical bus from conditions of over current, over voltage, under voltage, and so on. The device also provides multiple fundamental metering data including, voltage, current, frequency, and power.

Topic	Page
Controller Code	178
Mapping InOut Tags to Add-On Instructions	180
Using Visualization Files	183
Faceplates	184

This instruction monitors one SEL751 relay. Alarms are provided when the device experiences a protection-related trip. The instruction also provides capabilities for locking and to open and close the breaker.



Controller Code

Two Add-On Instructions represent each physical device. You must configure the InOut parameters of each Add-On Instruction per physical device.

The first Add-On Instruction is the ProSoft software-generated Add-On Instruction (see [Chapter 2](#)), which maps data to the controller. The second Add-On Instruction is the TripSource Add-On Instruction, available for download from the library resources from the PCDC, which is for faceplate management

InOut Structure for ProSoft Add-On Instruction

InOut parameters in [Table 73](#) are used to link the Add-On Instruction to external tags that contain necessary data for the instruction to operate. These external tags must be of the data type shown. These tags are representative of the tags that are required for each SEL-751 relay, which is configured in your system.

Table 73 - SEL751 Relay

Name	Data Type	Description
[DeviceName]_AOI	[DeviceName]_AOI	Add-On Instruction tag. Matches naming from ProSoft Configuration Manager.
Connection_Input0	SINT[500]	CIP Connection Input data. The number of these parameters vary depending on system sizing.
Connection_Output0	SINT[496]	CIP Connection Output data. The number of these parameters vary depending on system sizing.
Connection_Input1	SINT[500]	CIP Connection Input data. The number of these parameters vary depending on system sizing.
Connection_Output1	SINT[496]	CIP Connection Output data. The number of these parameters vary depending on system sizing.
[DeviceName]	[DeviceName]	Device data that is collected from the CIP connections and organized into understandable tags. This data type changes to match each device tag in the ProSoft Gateway.

InOut Structure for Rockwell Automation Library Download

[Table 74](#) shows the InOut parameters that are available from the Rockwell Automation Library of Electrical Protection Devices Folder in the PCDC. These external tags must be of the data type shown.

Table 74 - SEL751

Name	Data Type	Description
[DeviceName]_Relay_Name	<Defined by device AOI>	Device data from the Add-On Instruction. This data type changes to match each device tag in the ProSoft Gateway.
Ref_Tgt3Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt4Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt5Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt6Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt7Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt8Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
[DeviceName]TripAlarm	ALARM_DIGITAL	Digital Alarm tag
[DeviceName]TripText	STRING	Alarm text to be displayed when active.

Remote Bit Control Value Structure

Remote Bit Control Value parameters are used to link the Add-On Instruction to configurable input points in the physical device. Each bit is configurable via the vendor software of each device. [Table 75](#) has recommended uses for each bit.

Table 75 - Remote Bit Control - SEL751 Relay

Name	Description
CON_RBGGIO1_CO_SPCS001_Oper_ctlVal	Lock/Unlock
CON_RBGGIO1_CO_SPCS002_Oper_ctlVal	Target Reset
CON_RBGGIO1_CO_SPCS003_Oper_ctlVal	Breaker Close
CON_RBGGIO1_CO_SPCS004_Oper_ctlVal	Breaker Open
CON_RBGGIO1_CO_SPCS005_Oper_ctlVal	AUX
CON_RBGGIO1_CO_SPCS006_Oper_ctlVal	User Programmable
CON_RBGGIO1_CO_SPCS007_Oper_ctlVal	User Programmable
CON_RBGGIO1_CO_SPCS008_Oper_ctlVal	User Programmable

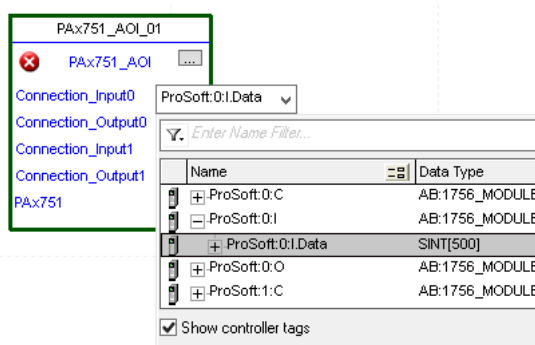
Mapping InOut Tags to Add-On Instructions

Each SEL751 relay requires two Add-On Instructions to monitor and visualize the relay. The ProSoft Software instruction is created in [Chapter 2](#). The Add-On Instruction is downloaded from the Rockwell Automation Library of Electronic Protection Devices from the PCDC.

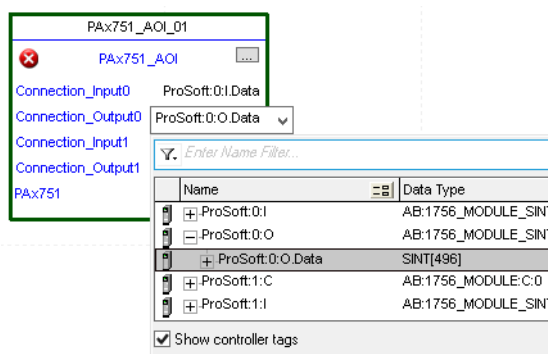
Associate Controller Tags to ProSoft Add-On Instruction

Complete these steps to map the ProSoft instruction to Studio 5000® tags.

1. Double-click the question mark next to Connection_Input0 of the device Add-On Instruction.
2. Click the down arrow on the drop box and expand the ProSoft_Gateway:0:I. Select the ProSoft_Gateway:0:I.Data and double-click to choose it.

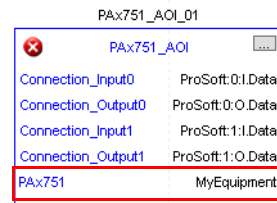


3. Double-click the question mark next to Connection_Output0 of the device Add-On Instruction.
4. Click the down arrow on the drop box and expand the ProSoft_Gateway:0:O. Select the ProSoft_Gateway:0:O.Data and double-click to choose it.

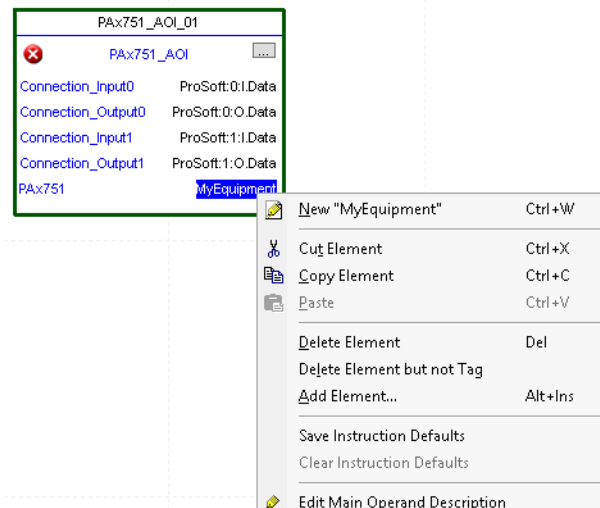


5. Repeat this process for each Connection Input and Output that are included with your Add-On Instructions.

- Click the question mark next to the final tag. Type a tag name that represents your physical device within your Studio 5000 project. In this example, the name is “My Equipment”.



- Right-click the new tag name and select New “<tag name>”.



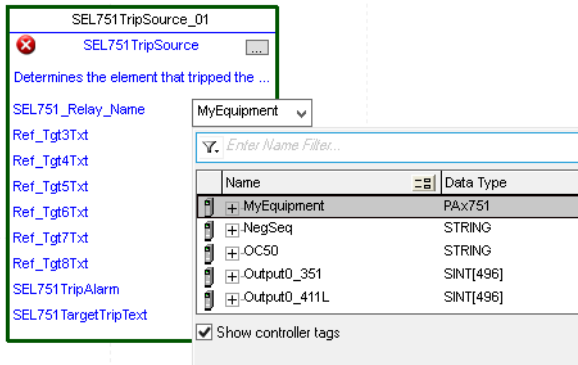
- Click Create on the New Tag dialog box.

The screenshot shows the 'New Tag' dialog box. The 'Name' field contains 'MyEquipment'. The 'Description' field is empty. The 'Usage' dropdown is set to '<controller>'. The 'Type' dropdown is set to 'Base'. The 'Alias For' field is empty. The 'Data Type' dropdown is set to 'PAx751'. The 'Parameter Connection' dropdown is empty. The 'Scope' dropdown is set to 'Power_61850'. The 'External Access' dropdown is set to 'Read/Write'. The 'Style' dropdown is empty. There are checkboxes for 'Constant', 'Sequencing', 'Open Configuration', and 'Open Parameter Connections', all of which are unchecked. The 'Create' button is highlighted with a red box.

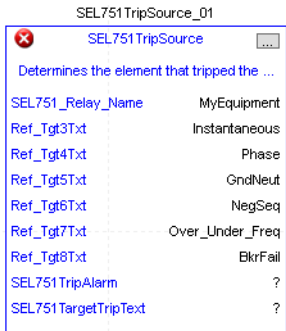
Configure Trip Source Add-On Instruction

Now that the SEL751 Add-On Instruction has been configured, you must configure the SEL751 trip source Add-On Instruction for alarming.

1. Click the question mark next to SEL751_Relay_Name and select the tag that was created in [step 8](#).



2. Next click the question mark next to each Ref_Tgt#Txt and enter a string tag. These tags are intended to match the status indicators on the front panel of the device.
3. Once you type the tag name, if the tag is not already configured in the controller, you have to right-click and create a tag.



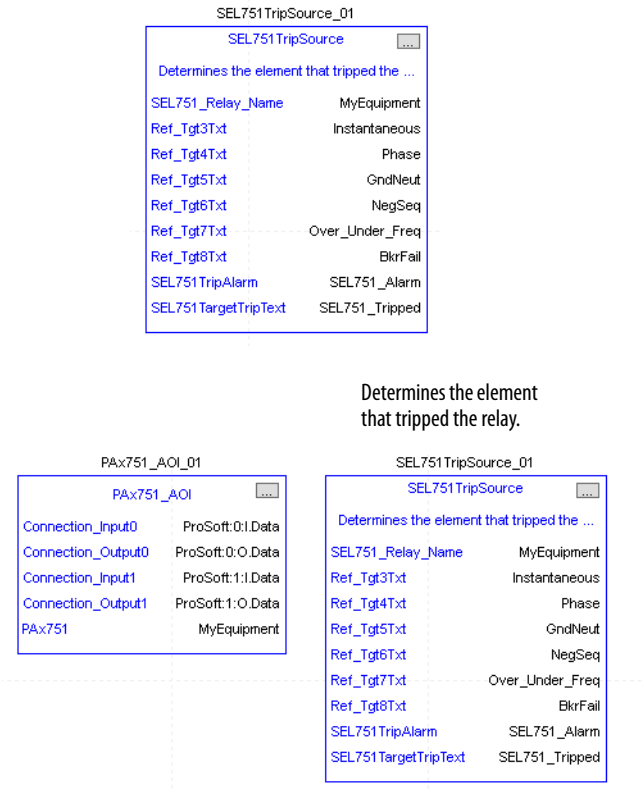
4. Click the question mark next to SEL751TripAlarm and select or create the digital alarm tag to be used.

This tag is used for alarming through the HMI FactoryTalk® Alarms and Events Server.

5. Click the question mark next to SEL751TripText and select or create the tag to be used.

This tag is used for alarm message through the HMI FactoryTalk Alarms and Events Server.

Fully Configured Add-On Instruction



6. Save and download your project to the controller.

Using Visualization Files

See [Using a Display Element on page 16](#) for detailed information.

Faceplates

The Operator tab is displayed when the faceplate is initially opened. Click the appropriate icon on the left of the faceplate to access a specific tab.

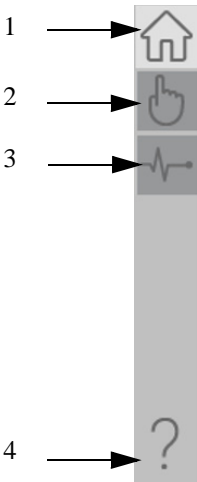


Table 76 - Tab Descriptions

Item	Description
1	Operator tab
2	Manual Control Tab
3	Diagnostics tab
4	Help

The faceplate provides the means for operators, maintenance workers, engineers, and others to interact with the instruction instance. This interaction provides a view of the status and values of the instruction instance and an ability to manipulate it through its commands and settings.

Operator Tab

The Faceplate initially opens to the Operator tab, sometimes called the Home tab. From here, an operator can monitor the device status and manually operate the device.

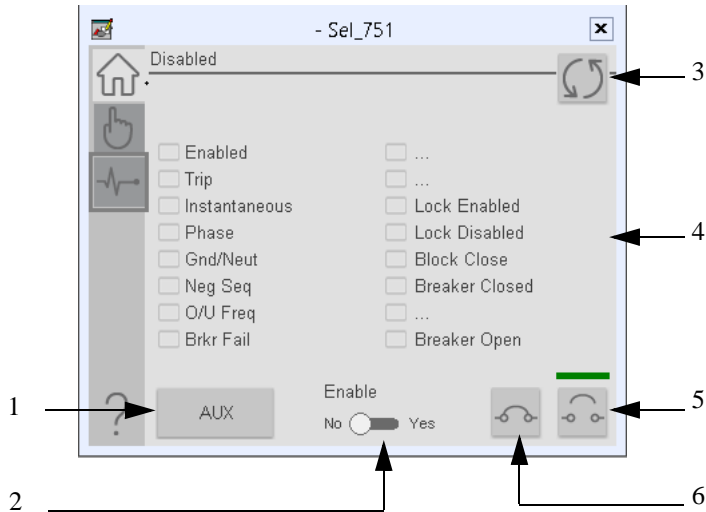
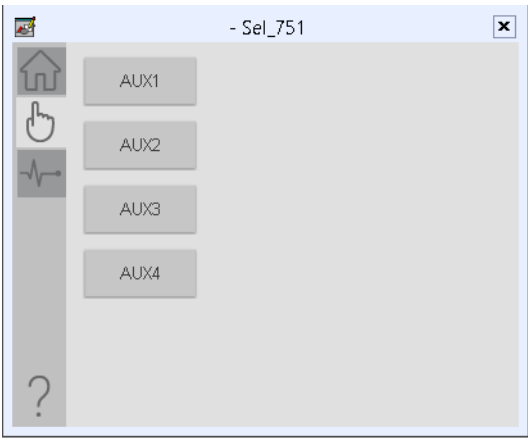


Table 77 - Operator Tab Description

Item	Description
1	Click to toggle the AUX input to the device. This input is configurable in the device vendor software.
2	Click to enable/disable the device. To issue the commands to the device, enable the device. If the device is disabled, you can only monitor data from the device.
3	Click to reset the device. The status of the device is indicated on the faceplate.
4	Status Indicators
5	Click to open the circuit breaker.
	Click to close the circuit breaker.

Manual Control Tab

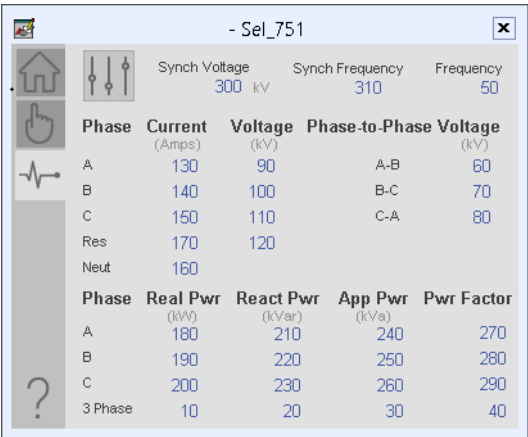


Diagnostics Tab

The diagnostics tab allows the operator to see the measurement values from the physical device.

Diagnostics Tab

Readout of the measurement values from the SEL-751.



Advanced Properties


Click the advanced properties icon  on the diagnostics page to display the advanced properties. The following screen capture shows the tabs that are available in the advanced properties display



Table 78 - Advanced Properties Tab Descriptions

Item	Description
1	HMI Configuration
2	Diagnostics
3	Faults
4	Help

HMI Configuration Tab

The HMI configuration tab provides access to displayed text, and faceplate-to-faceplate navigation settings. Configure the description, label, tag, and security area for the device.

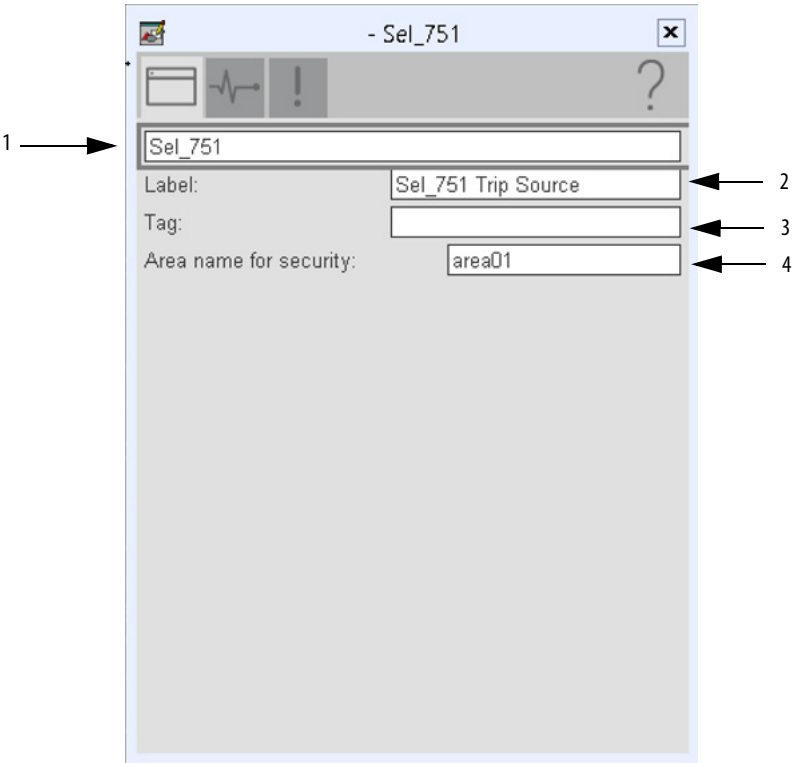
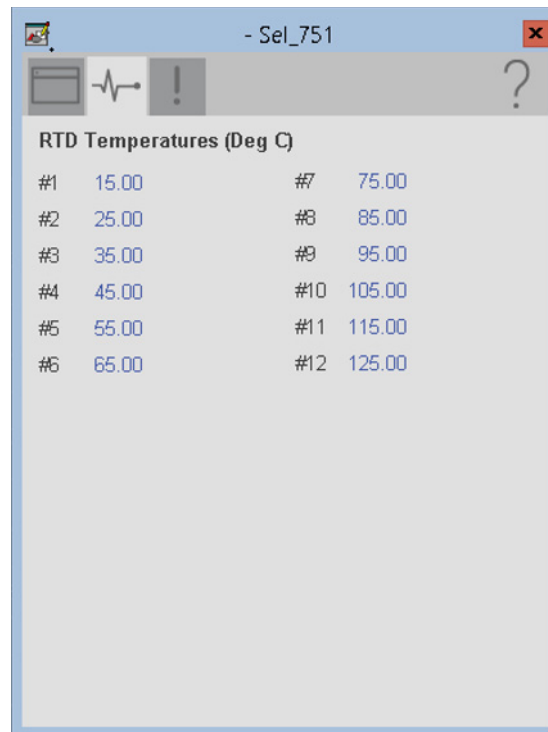


Table 79 - HMI Configuration Tab Description

Item	Action
1	Type the device description to show on the faceplate title bar.
2	Type the label to show on the graphic symbol.
3	Type the tag name to show on the faceplate and Tooltip. IMPORTANT: Pause the mouse over this field to display a tool tip with the configured Logix tag/path.
4	Type the Area name for security.

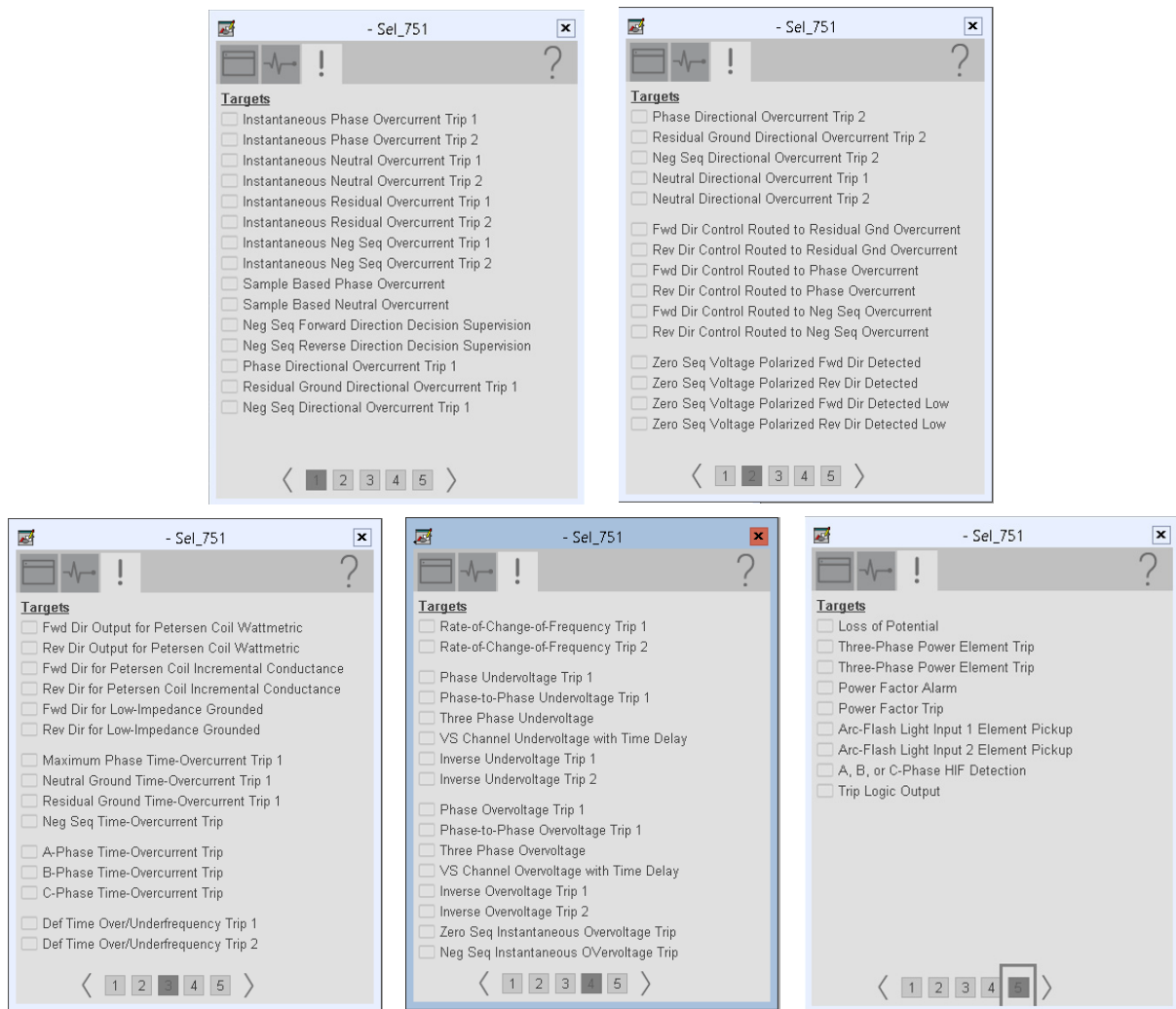
Advanced Diagnostics Tab

Readout of the temperatures from the 12 RTD inputs that are available in the SEL-751.



Faults Tab

The Faults tab shows which alarms are active from the physical device.



Help Button

Press the help button on the faceplates to access help specific to that faceplate. The help file is in .pdf format and opens in a separate window.

SEL 751A Object



The Schweitzer Engineering Labs 751A is a feeder protection relay with arc flash protection. This device is used to help protect an electrical bus from conditions of over current, over voltage, under voltage, and so on. The device also provides multiple fundamental metering data including, voltage, current, frequency, and power. When retrofitted with RTD capability, the SEL 751A can also provide various temperature measurements at locations on the electrical bus.

Topic	Page
Controller Code	192
Mapping InOut Tags to Add-On Instructions	194
Using Visualization Files	197
Faceplates	198

This instruction monitors one SEL751A relay. Alarms are provided when the device experiences a protection-related trip. The instruction also provides capabilities for locking, and to open and close the breaker.

Add-On Instruction

SEL751ATripSource1_01

SEL751ATripSource1

Determines the element that tripped the ...

SEL751A_Relay_Name ?

Ref_Tgt3Txt ?

Ref_Tgt4Txt ?

Ref_Tgt5Txt ?

Ref_Tgt6Txt ?

Ref_Tgt7Txt ?

Ref_Tgt8Txt ?

SEL751ATripAlarm ?

SEL751ATargetTripText ?

Faceplate

- Sel_751A

Disabled

SEL SCHWEITZER ENGINEERING LABORATORIES SEL-751A FEEDER PROTECTION RELAY

☐ Enabled ☐ ...

☐ Trip ☐ ...

☐ Instantaneous ☐ Enabled

☐ Phase Overcurrent ☐ Disabled

☐ Gnd/Neu Overcurrent ☐ Block Close

☐ Neg Seq Overcurrent ☐ Breaker Closed

☐ Over/Under Freq ☐ ...

☐ Breaker Failure ☐ Breaker Open

AUX Enable No Yes

Controller Code

Two Add-On Instructions represent each physical device. You must configure the InOut parameters of each Add-On Instruction per physical device.

The first Add-On Instruction is the ProSoft software-generated Add-On Instruction (see [Chapter 2](#)), which maps data to the controller. The second Add-On Instruction is the TripSource Add-On Instruction, available for download from the library resources from the PCDC, which is for faceplate management

InOut Structure for ProSoft Add-On Instruction

InOut parameters in [Table 80](#) are used to link the Add-On Instruction to external tags that contain necessary data for the instruction to operate. These external tags must be of the data type shown. These tags are representative of the tags that are required for each SEL-751A relay, which is configured in your system.

Table 80 - SEL751A Relay

Name	Data Type	Description
[DeviceName]_AOI	[DeviceName]_AOI	Add-On Instruction tag. Matches naming from ProSoft Configuration Manager.
Connection_Input0	SINT[500]	CIP Connection Input data. The number of these parameters vary depending on system sizing.
Connection_Output0	SINT[496]	CIP Connection Output data. The number of these parameters vary depending on system sizing.
Connection_Input1	SINT[500]	CIP Connection Input data. The number of these parameters vary depending on system sizing.
Connection_Output1	SINT[496]	CIP Connection Output data. The number of these parameters vary depending on system sizing.
[DeviceName]	[DeviceName]	Device data that is collected from the CIP connections and organized into understandable tags. This data type changes to match each device tag in the ProSoft Gateway.

InOut Structure for Rockwell Automation Library Download

[Table 81](#) shows the InOut parameters that are available from the Rockwell Automation Library of Electrical Protection Devices Folder in the PCDC. These external tags must be of the data type shown.

Table 81 - SEL751A_TripSource

Name	Data Type	Description
[DeviceName]_Relay_Name	<Defined by device AOI>	Device data from the Add-On Instruction. This data type changes to match each device tag in the ProSoft Gateway.
Ref_Tgt3Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt4Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt5Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt6Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt7Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt8Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
[DeviceName]TripAlarm	ALARM_DIGITAL	Digital Alarm tag
[DeviceName]TripText	STRING	Alarm text to be displayed when active.

Remote Bit Control Value Structure

Remote Bit Control Value parameters are used to link the Add-On Instruction to configurable input points in the physical device. Each bit is configurable via the vendor software of each device. [Table 82](#) has recommended uses for each bit.

Table 82 - Remote Bit Control - SEL751A Relay

Name	Description
CON_RBGGIO1_CO_SPCS001_Oper_ctlVal	Lock/Unlock
CON_RBGGIO1_CO_SPCS002_Oper_ctlVal	Target Reset
CON_RBGGIO1_CO_SPCS003_Oper_ctlVal	Breaker Close
CON_RBGGIO1_CO_SPCS004_Oper_ctlVal	Breaker Open
CON_RBGGIO1_CO_SPCS005_Oper_ctlVal	AUX
CON_RBGGIO1_CO_SPCS006_Oper_ctlVal	User Programmable
CON_RBGGIO1_CO_SPCS007_Oper_ctlVal	User Programmable
CON_RBGGIO1_CO_SPCS008_Oper_ctlVal	User Programmable

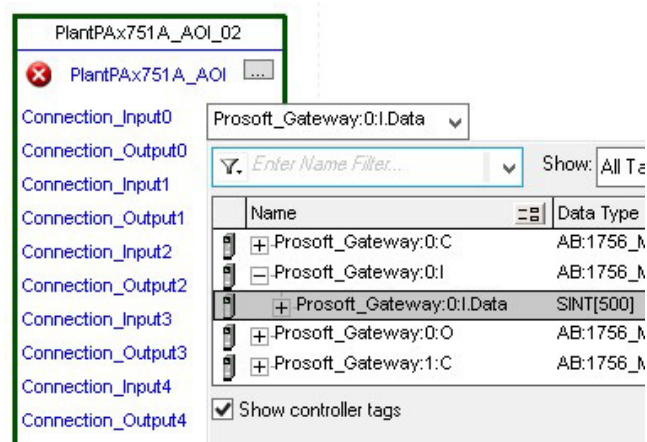
Mapping InOut Tags to Add-On Instructions

Each SEL751A relay requires two Add-On Instructions to monitor and visualize the relay. The ProSoft Software instruction is created in [Chapter 2](#). The Add-On Instruction is downloaded from the Rockwell Automation Library of Electronic Protection Devices from the PCDC.

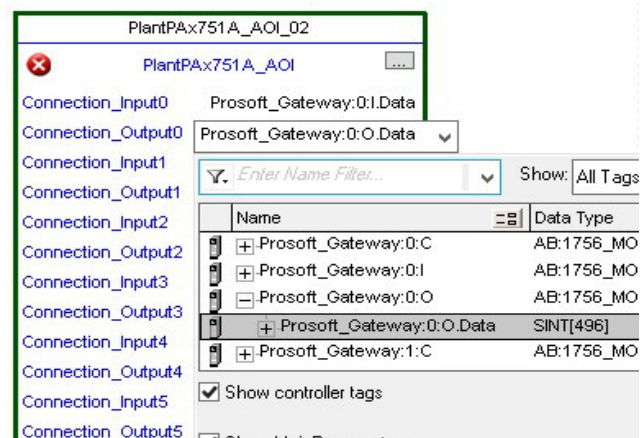
Associate Controller Tags to ProSoft Add-On Instruction

Complete these steps to map the ProSoft instruction to Studio 5000® tags.

1. Double-click the question mark next to Connection_Input0 of the device Add-On Instruction.
2. Click the down arrow on the drop box and expand the ProSoft_Gateway:0:I. Select the ProSoft_Gateway:0:I.Data and double-click to choose it.



3. Double-click the question mark next to Connection_Output0 of the device Add-On Instruction.
4. Click the down arrow on the drop box and expand the ProSoft_Gateway:0:O. Select the ProSoft_Gateway:0:O.Data and double-click to choose it.

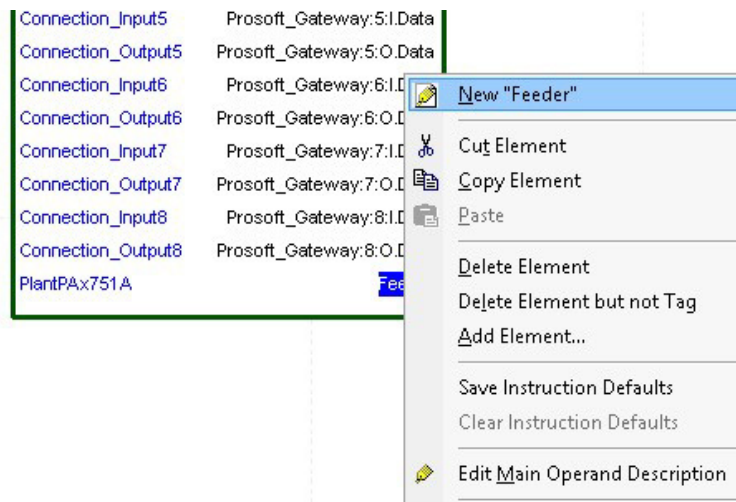


5. Repeat this process for each Connection Input and Output that are included with your Add-On Instructions.

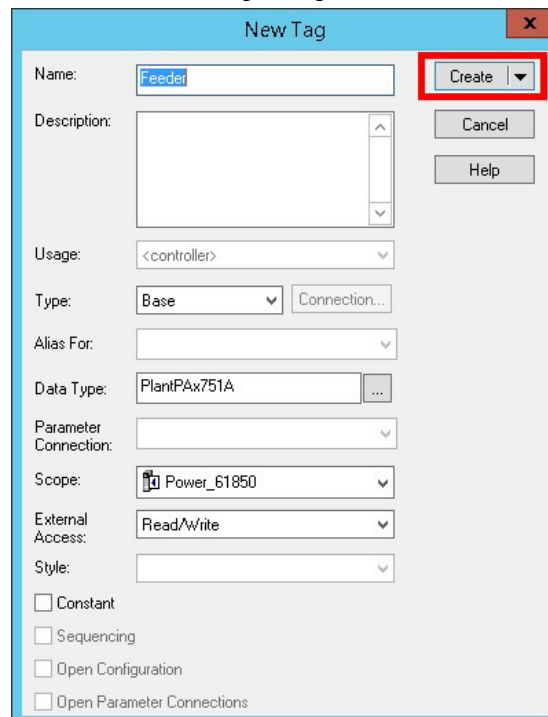
6. Click the question mark next to the final tag. Type a tag name that represents your physical device within your Studio 5000 project. In this example, the name is “Feeder”.



7. Right-click the new tag name and select New “<tag name>”.



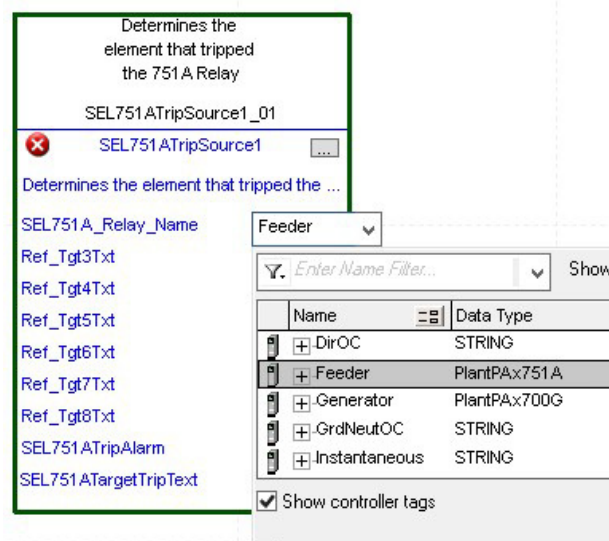
8. Click Create on the New Tag dialog box.



Configure Trip Source Add-On Instruction

Now that the SEL751A Add-On Instruction has been configured, you must configure the SEL751A trip source Add-On Instruction for alarming.

1. Click the question mark next to SEL751A_Relay_Name and select the tag that was created in [step 8](#).



2. Next click the question mark next to each Ref_Tgt#Txt and enter a string tag. These tags are intended to match the status indicators on the front panel of the device.
3. Once you type the tag name, if the tag is not already configured in the controller, you have to right-click and create a tag.



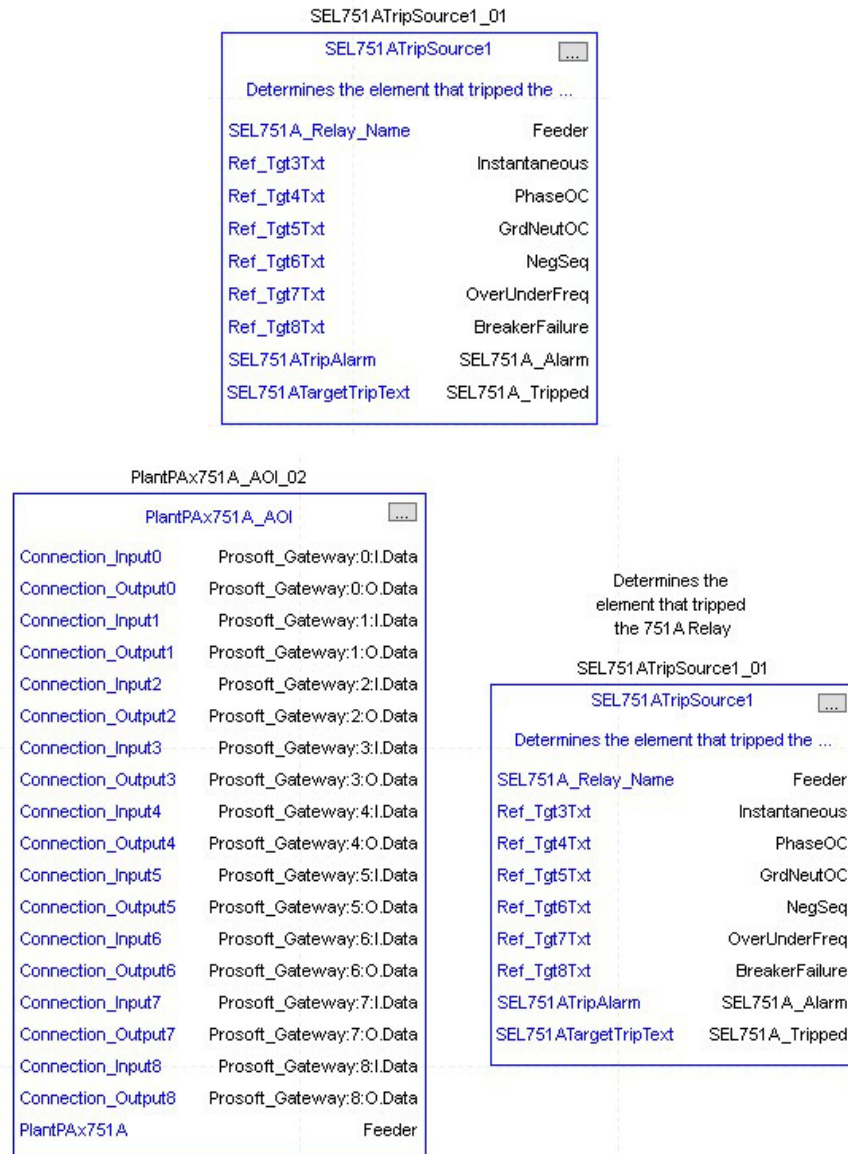
4. Click the question mark next to SEL751ATripAlarm and select or create the digital alarm tag to be used.

This tag is used for alarming through the HMI FactoryTalk® Alarms and Events Server.

- Click the question mark next to SEL751ATripText and select or create the tag to be used.

This tag is used for alarm message through the HMI FactoryTalk Alarms and Events Server.

Fully Configured Add-On Instruction



- Save and download your project to the controller.

Using Visualization Files

See [Using a Display Element on page 16](#) for detailed information.

Faceplates

The Operator tab is displayed when the faceplate is initially opened. Click the appropriate icon on the left of the faceplate to access a specific tab.

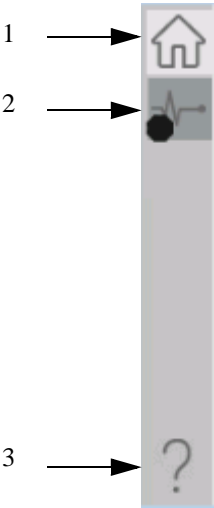


Table 83 - Tab Descriptions

Item	Description
1	Operator tab
2	Diagnostics tab
3	Help

The faceplate provides the means for operators, maintenance workers, engineers, and others to interact with the instruction instance. This interaction provides a view of the status and values of the instruction instance and an ability to manipulate it through its commands and settings.

Operator Tab

The Faceplate initially opens to the Operator tab, sometimes called the Home tab. From here, an operator can monitor the device status and manually operate the device.



Table 84 - Operator Tab Description

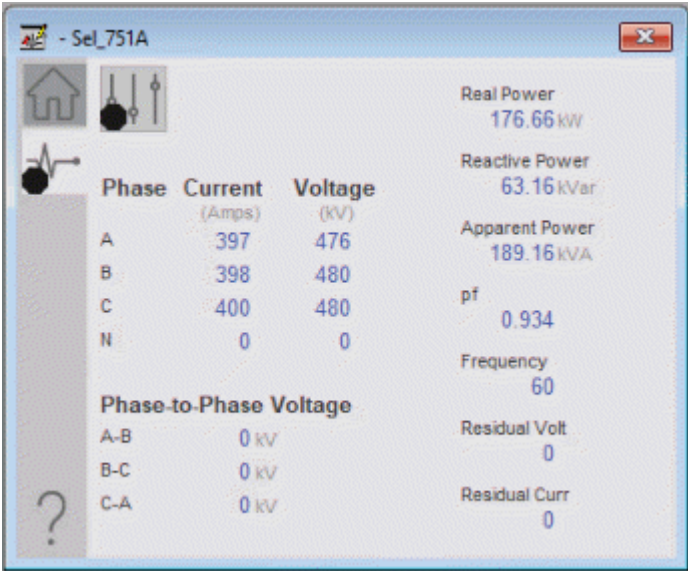
Item	Description
1	Click to toggle the AUX input to the device. This input is configurable in the device vendor software.
2	Click to enable/disable the device. To issue the commands to the device, enable the device. If the device is disabled, you can only monitor data from the device.
3	Click to reset the device. The status of the device is indicated on the faceplate.
4	Status Indicators
5	Click to open the circuit breaker.
6	Click to close the circuit breaker.

Diagnostics Tab

The diagnostics tab allows the operator to see the measurement values from the physical device.

Diagnostics Tab

Readout of the measurement values from the SEL-751A.



Advanced Properties


Click the advanced properties icon  on the diagnostics page to display the advanced properties. The following screen capture shows the tabs that are available in the advanced properties display



Table 85 - Advanced Properties Tab Descriptions

Item	Description
1	HMI Configuration
2	Diagnostics
3	Faults
4	Help

HMI Configuration Tab

The HMI configuration tab provides access to displayed text, and faceplate-to-faceplate navigation settings. Configure the description, label, tag, and security area for the device.

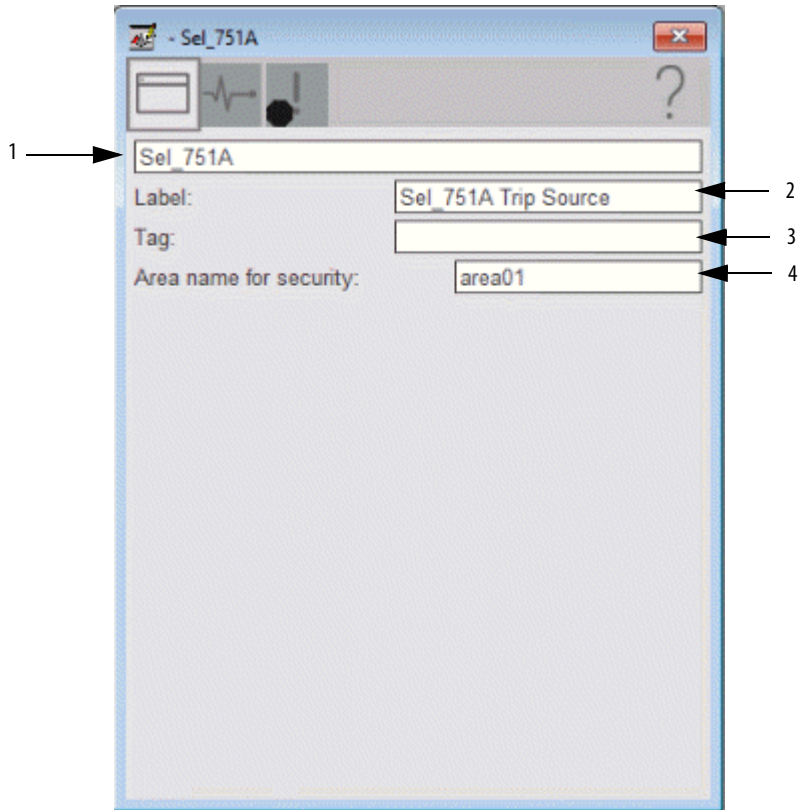
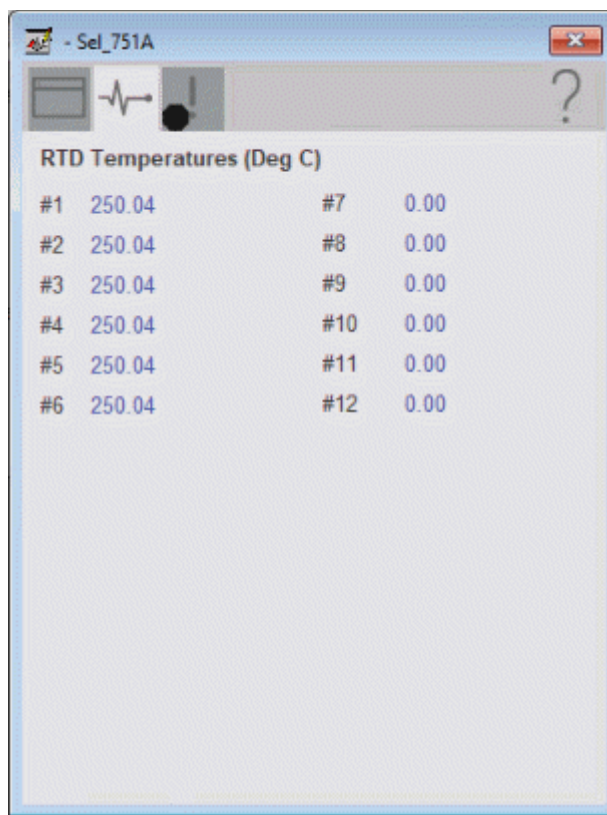


Table 86 - HMI Configuration Tab Description

Item	Action
1	Type the device description to show on the faceplate title bar.
2	Type the label to show on the graphic symbol.
3	Type the tag name to show on the faceplate and Tooltip. IMPORTANT: Pause the mouse over this field to display a tool tip with the configured Logix tag/path.
4	Type the Area name for security.

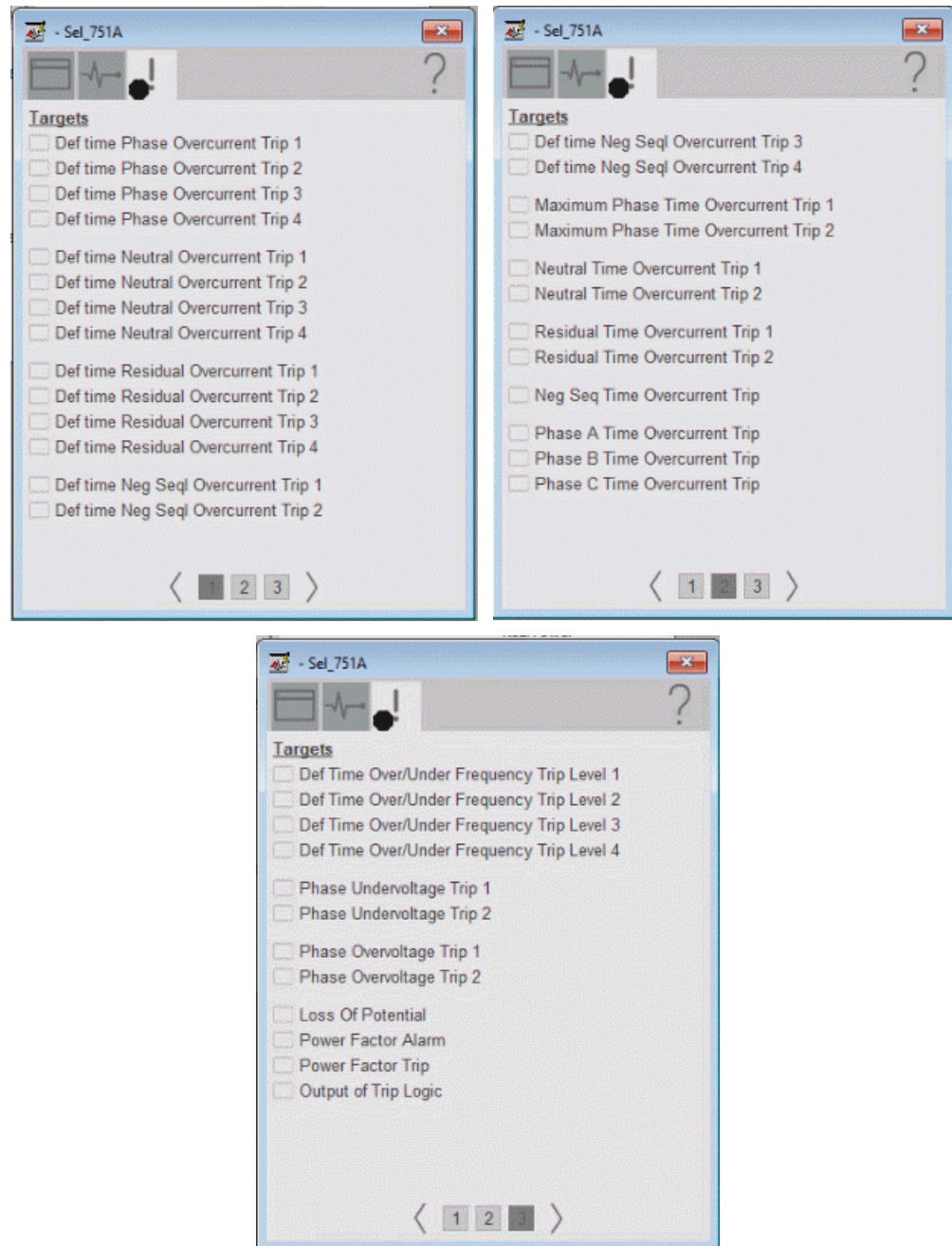
Diagnostics Tab

Readout of the temperatures from the 12 RTD inputs that are available in the SEL-751A.



Faults Tab

The Faults tab shows which alarms are active from the physical device.



Help Button

Press the help button on the faceplates to access help specific to that faceplate. The help file is in .pdf format and opens in a separate window.

Notes:

SEL 787 Object



The Schweitzer Engineering Labs 787 is a transformer protection relay. This device provides comprehensive transformer protection for a three winding transformer. This device is able to provide indications of differential faults, winding overcurrent, over/under frequency, and more. The device also provides multiple fundamental metering data including, voltage, current, frequency, power, and so on.

Topic	Page
Controller Code	206
Mapping InOut Tags to Add-On Instructions	211
Using Visualization Files	212
Faceplates	213

This instruction monitors one SEL787 relay. Alarms are provided when the device experiences a protection-related trip. The instruction also provides capabilities for locking, and to open and close the breaker. It is also possible to switch between the two available breakers.

Add-On Instruction

SEL787TripSource_02

SEL787TripSource

Determines the element that tripped the ...

SEL787_Relay_Name ?

Ref_Tgt3Txt ?

Ref_Tgt4Txt ?

Ref_Tgt5Txt ?

Ref_Tgt6Txt ?

Ref_Tgt7Txt ?

Ref_Tgt8Txt ?

SEL787TripAlarm ?

SEL787TargetTripText ?

Faceplate

- Sel_787

Disabled

SEL SCHWEITZER ENGINEERING LABORATORIES TRANSFORMER PROTECTION RELAY SEL-787

☐ Enabled

☐ Trip

☐ Differential

☐ Inst Overcurrent

☐ Time Overcurrent

☐ Over/Undervoltage

☐ Over/Under Freq

☐ Volts/Hertz

☐ Enabled

☐ Disabled

☐ Breaker 1

☐ Breaker 2

☐ Brkr 1 Closed

☐ Brkr 2 Closed

☐ Brkr 1 Open

☐ Brkr 2 Open

Enable

No ☐ Yes ☐

?

Controller Code

Two Add-On Instructions represent each physical device. You must configure the InOut parameters of each Add-On Instruction per physical device.

The first Add-On Instruction is the ProSoft software-generated Add-On Instruction (see [Chapter 2](#)), which maps data to the controller. The second Add-On Instruction is the TripSource Add-On Instruction, available for download from the library resources from the PCDC, which is for faceplate management

InOut Structure for ProSoft Add-On Instruction

InOut parameters in [Table 87](#) are used to link the Add-On Instruction to external tags that contain necessary data for the instruction to operate. These external tags must be of the data type shown. These tags are representative of the tags that are required for each SEL-787 relay, which is configured in your system.

Table 87 - SEL787 Relay

Name	Data Type	Description
[DeviceName]_AOI	[DeviceName]_AOI	Add-On Instruction tag. Matches naming from ProSoft Configuration Manager.
Connection_Input0	SINT[500]	CIP Connection Input data. The number of these parameters vary depending on system sizing.
Connection_Output0	SINT[496]	CIP Connection Output data. The number of these parameters vary depending on system sizing.
Connection_Input1	SINT[500]	CIP Connection Input data. The number of these parameters vary depending on system sizing.
Connection_Output1	SINT[496]	CIP Connection Output data. The number of these parameters vary depending on system sizing.
[DeviceName]	[DeviceName]	Device data that is collected from the CIP connections and organized into understandable tags. This data type changes to match each device tag in the ProSoft Gateway.

InOut Structure for Rockwell Automation Library Download

[Table 88](#) shows the InOut parameters that are available from the Rockwell Automation® Library of Electrical Protection Devices Folder in the PCDC. These external tags must be of the data type shown.

Table 88 - SEL787 TripSource

Name	Data Type	Description
[DeviceName]_Relay_Name	<Defined by device AOI>	Device data from the Add-On Instruction. This data type changes to match each device tag in the ProSoft Gateway.
Ref_Tgt3Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt4Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt5Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt6Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt7Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt8Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
[DeviceName]TripAlarm	ALARM_DIGITAL	Digital Alarm tag
[DeviceName]TripText	STRING	Alarm text to be displayed when active.

Remote Bit Control Value Structure

Remote Bit Control Value parameters are used to link the Add-On Instruction to configurable input points in the physical device. Each bit is configurable via the vendor software of each device. The following table has recommended uses for each bit.

Name	Description
CON_RBGGIO1_CO_SPCS001_Oper_ctlVal	Lock/Unlock
CON_RBGGIO1_CO_SPCS002_Oper_ctlVal	Target Reset
CON_RBGGIO1_CO_SPCS003_Oper_ctlVal	Breaker Close
CON_RBGGIO1_CO_SPCS004_Oper_ctlVal	Breaker Open
CON_RBGGIO1_CO_SPCS005_Oper_ctlVal	Breaker Select
CON_RBGGIO1_CO_SPCS006_Oper_ctlVal	User Programmable
CON_RBGGIO1_CO_SPCS007_Oper_ctlVal	User Programmable
CON_RBGGIO1_CO_SPCS008_Oper_ctlVal	User Programmable

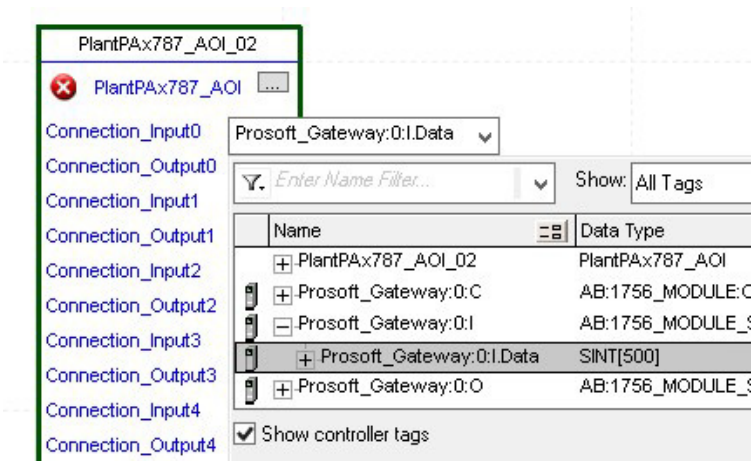
Mapping InOut Tags to Add-On Instructions

Each SEL787 relay requires two Add-On Instructions to monitor and visualize the relay. The ProSoft Software instruction is created in [Chapter 2](#). The Add-On Instruction is downloaded from the Rockwell Automation Library of Electronic Protection Devices from the PCDC.

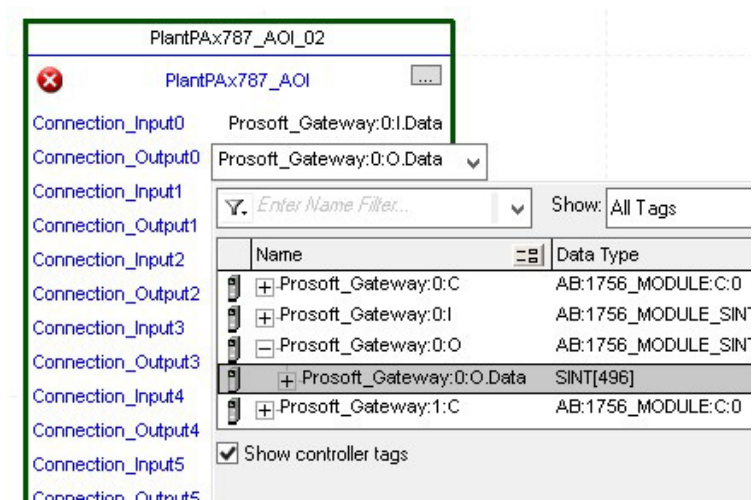
Associate Controller Tags to ProSoft Add-On Instruction

Complete these steps to map the ProSoft instruction to Studio 5000® tags.

1. Double-click the question mark next to Connection_Input0 of the device Add-On Instruction.
2. Click the down arrow on the drop box and expand the ProSoft_Gateway:0:I. Select the ProSoft_Gateway:0:I.Data and double-click to choose it.



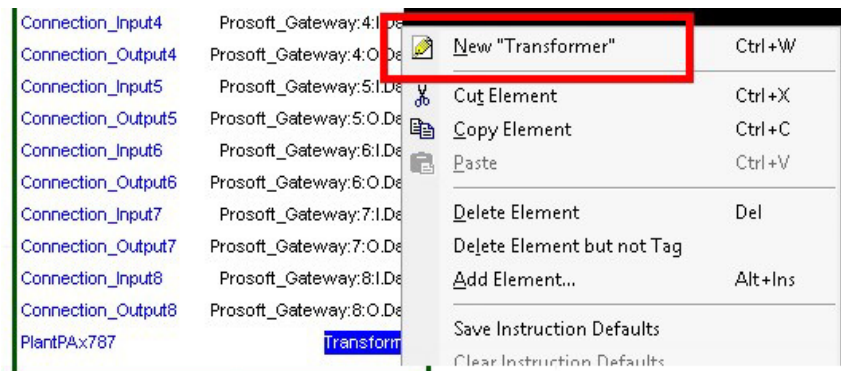
3. Double-click the question mark next to Connection_Output0 of the device Add-On Instruction.
4. Click the down arrow on the drop box and expand the ProSoft_Gateway:0:O. Select the ProSoft_Gateway:0:O.Data and double-click to choose it.



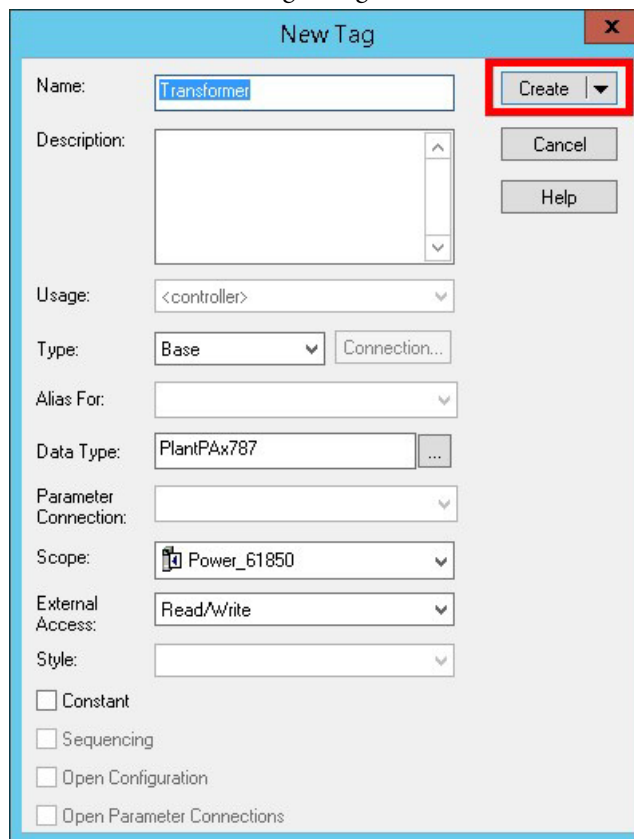
5. Repeat this process for each Connection Input and Output that are included with your Add-On Instructions.
6. Click the question mark next to the final tag. Enter a clear engineering name to this tag that represents your device within your Studio 5000 project. In this example “Transformer”.

Connection_Output3	Prosoft_Gateway:3:O.Data
Connection_Input6	Prosoft_Gateway:6:I.Data
Connection_Output6	Prosoft_Gateway:6:O.Data
Connection_Input7	Prosoft_Gateway:7:I.Data
Connection_Output7	Prosoft_Gateway:7:O.Data
Connection_Input8	Prosoft_Gateway:8:I.Data
Connection_Output8	Prosoft_Gateway:8:O.Data
PlantPAx787	Transformer

7. Right-click the new tag name and select New “<tag name>”.



8. Click Create on the New Tag dialog box.

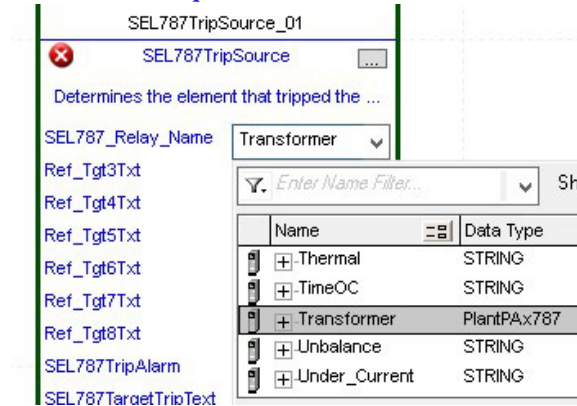


The image shows a 'New Tag' dialog box with a blue title bar and a red 'X' close button. The dialog contains several input fields and buttons. The 'Name' field is highlighted with a red box and contains the text 'Transformer'. The 'Create' button is also highlighted with a red box. Other fields include 'Description' (a text area), 'Usage' (a dropdown menu set to '<controller>'), 'Type' (a dropdown menu set to 'Base' with a 'Connection...' button next to it), 'Alias For' (a dropdown menu), 'Data Type' (a dropdown menu set to 'PlantPAx787' with an ellipsis button), 'Parameter Connection' (a dropdown menu), 'Scope' (a dropdown menu set to 'Power_61850' with a small icon to the left), 'External Access' (a dropdown menu set to 'Read/Write'), and 'Style' (a dropdown menu). At the bottom, there are four checkboxes: 'Constant', 'Sequencing', 'Open Configuration', and 'Open Parameter Connections', all of which are currently unchecked. On the right side of the dialog, there are three buttons: 'Create' (highlighted with a red box), 'Cancel', and 'Help'.

Configure Trip Source Add-On Instruction

Now that the SEL787 Add-On Instruction has been configured, you must configure the SEL787 trip source Add-On Instruction for alarming.

1. Click the question mark next to SEL787_Relay_Name and select the tag that was created in [step 8](#).



2. Next click the question mark next to each Ref_Tgt#Txt and enter a string tag. These tags are intended to match the status indicators on the front panel of the device. Once you type the tag name, if the tag is not already configured in the controller, you have to right-click and create a tag.

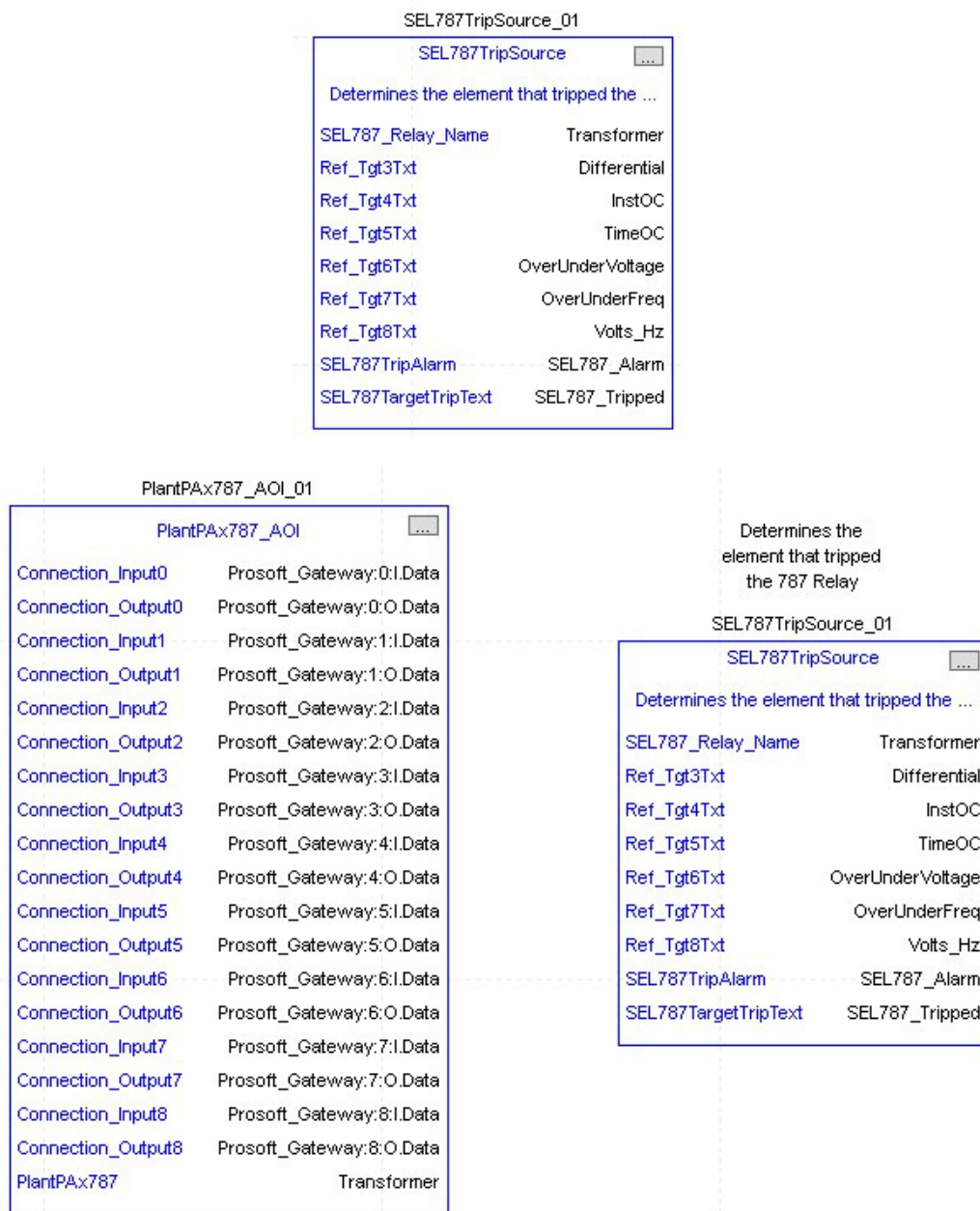


3. Click the question mark next to SEL787TripAlarm and select or create the digital alarm tag to be used. This tag is used for alarming through the HMI FactoryTalk® Alarms and Events Server.

- Click the question mark next to SEL787TripText and select or create the tag to be used.

This tag is used for alarm message through the HMI FactoryTalk Alarms and Events Server.

Fully Configured Add-On Instruction



- Save and download your project to the controller.

Using Visualization Files

See [Using a Display Element on page 16](#) for detailed information.

Faceplates

The Operator tab is displayed when the faceplate is initially opened. Click the appropriate icon on the left of the faceplate to access a specific tab.



Table 89 - Tab Descriptions

Item	Description
1	Operator tab
2	Diagnostics tab
3	Help

The faceplate provides the means for operators, maintenance workers, engineers, and others to interact with the instruction instance. This interaction provides a view of the status and values of the instruction instance and an ability to manipulate it through its commands and settings.

Operator Tab

The Faceplate initially opens to the Operator tab, sometimes called the Home tab. From here, an operator can monitor the device status and manually operate the device.

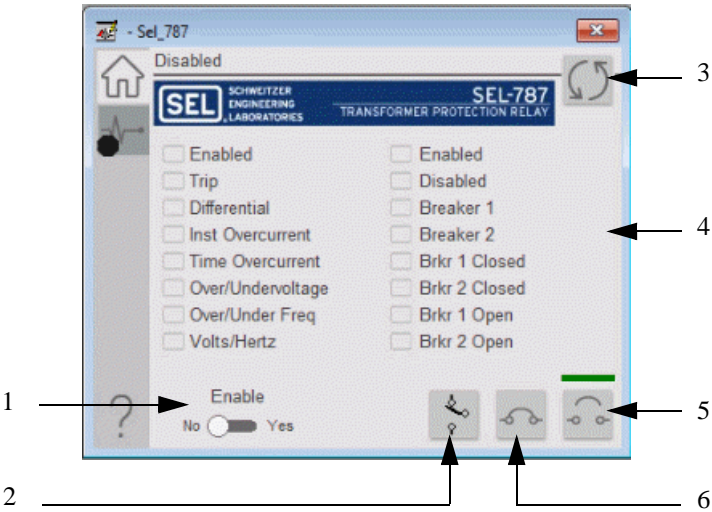


Table 90 - Operator Tab Description

Item	Description
1	Click to enable/disable the device. To issue the commands to the device, enable the device. If the device is disabled, you can only monitor data from the device.
2	Click to toggle control between breaker 1 and breaker 2.
3	Click to reset the device. The status of the device is indicated on the faceplate.
4	Status Indicators
5	Click to open the circuit breaker.
6	Click to close the circuit breaker.

Diagnostics Tab

The diagnostics tab allows the operator to see the measurement values from the device.

Diagnostics Tab

Readout of the measurement values from the SEL-787.



Advanced Properties


Click the advanced properties icon  on the diagnostics page to display the advanced properties. The following screen capture shows the tabs that are available in the advanced properties display



Table 91 - Advanced Properties Tab Descriptions

Item	Description
1	HMI Configuration
2	Diagnostics
3	Faults
4	Help

HMI Configuration Tab

The HMI configuration tab provides access to displayed text, and faceplate-to-faceplate navigation settings. Configure the description, label, tag, and security area for the device.

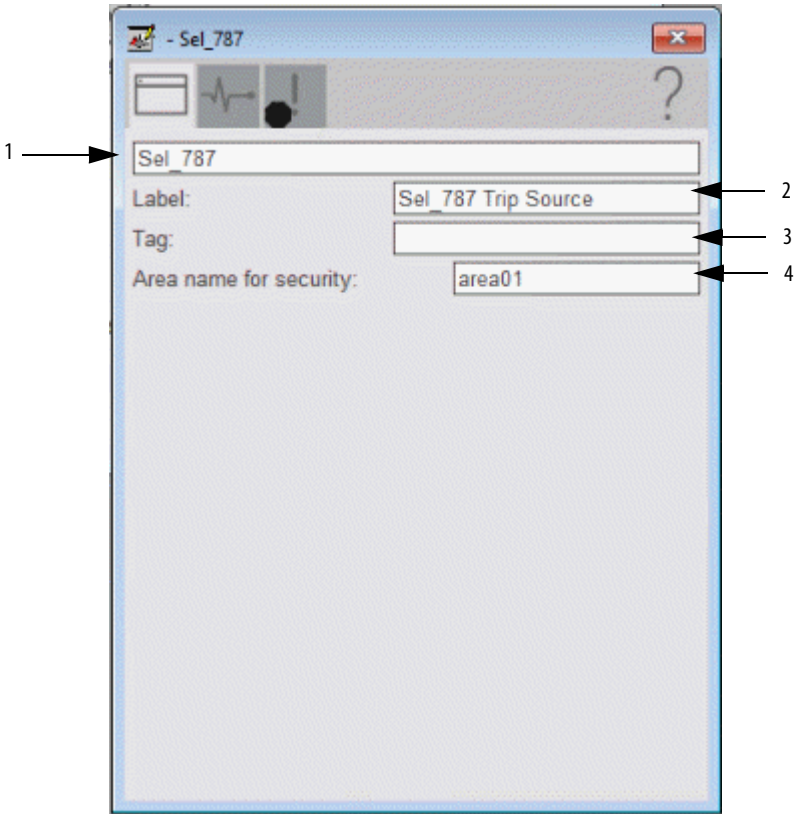
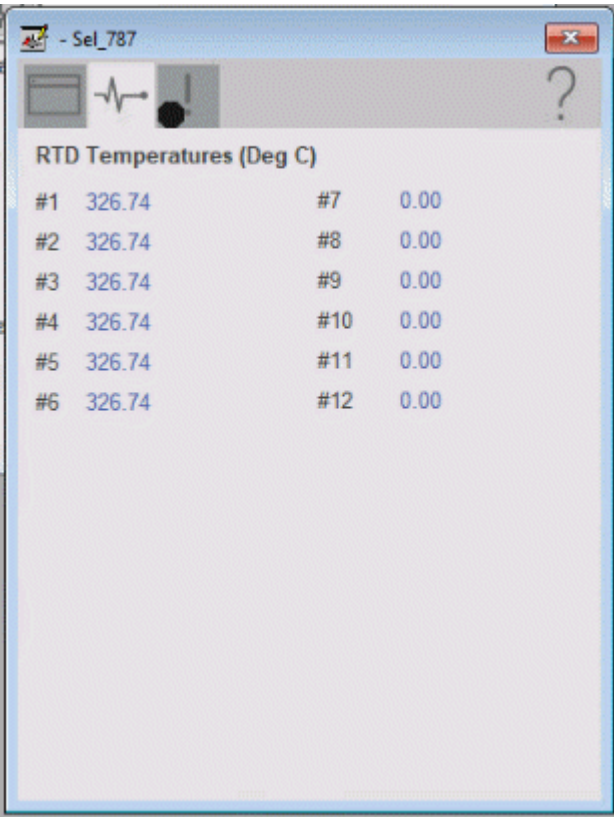


Table 92 - HMI Configuration Tab Description

Item	Action
1	Type the device description to show on the faceplate title bar.
2	Type the label to show on the graphic symbol.
3	Type the tag name to show on the faceplate and Tooltip. IMPORTANT: Pause the mouse over this field to display a tool tip with the configured Logix tag/path.
4	Type the Area name for security.

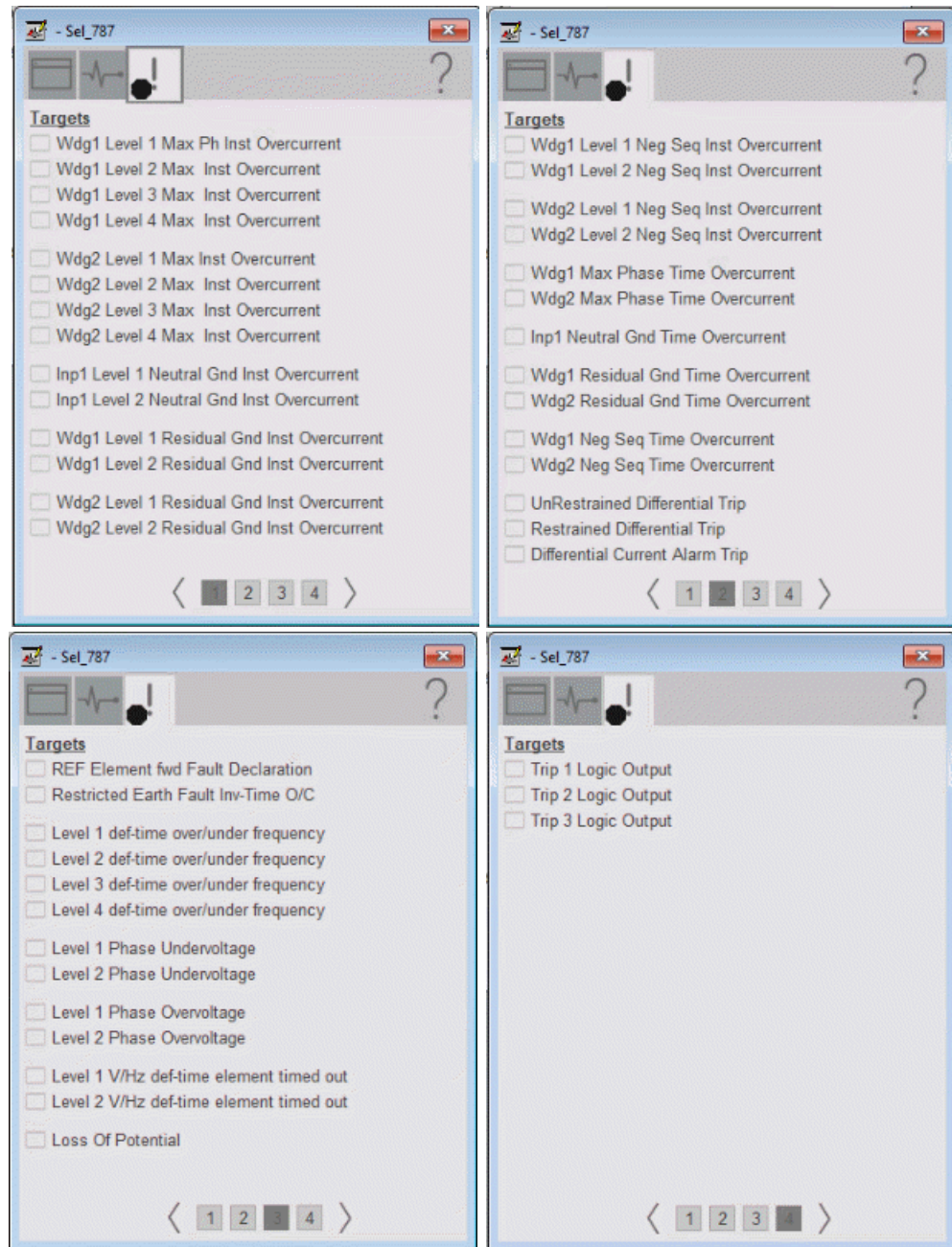
Diagnostics Tab

Readout of the 12 RTD inputs that are available in the SEL-787.



Faults Tab

The faults tab shows which alarms are active from the device.



Help Button

Press the help button on the faceplates to access help specific to that faceplate. The help file is in .pdf format and opens in a separate window.

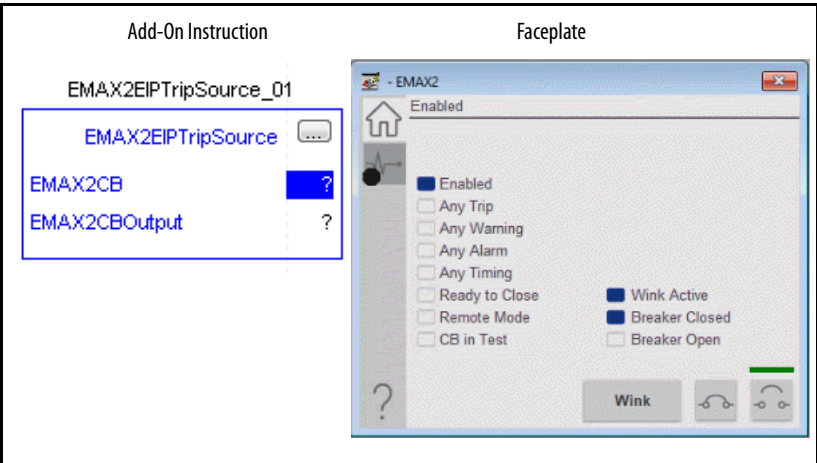
ABB EMAX2 Using EtherNet/IP Object



The ABB EMAX2 is a power/ air circuit breaker that has been configured with an electronic trip unit. This device can communicate on various industrial and electrical distribution networks including, EtherNet/IP™, and IEC 61850. The device can be controlled via remote command with proper credentials. Additionally, the device also provides multiple fundamental metering data including, voltage, current, frequency, power, and more.

Topic	Page
Controller Code	220
Mapping InOut Tags to Add-On Instructions	223
Using Visualization Files	224
Faceplates	225

This instruction monitors one ABB EMAX2 breaker communication via the EtherNet/IP ABB. Alarms are provided when the device experiences a protection-related trip. The instruction also provides the capability to open and close the breaker.



Controller Code

Two Add-On Instructions represent each physical device. You must configure the InOut parameters of each Add-On Instruction per physical device.

The first Add-On Instruction is the ProSoft software-generated Add-On Instruction (see [Chapter 2](#)), which maps data to the controller. The second Add-On Instruction is the TripSource Add-On Instruction, available for download from the library resources from the PCDC, which is for faceplate management

InOut Structure for ProSoft Add-On Instruction

InOut parameters in [Table 93](#) are used to link the Add-On Instruction to external tags that contain necessary data for the instruction to operate. These external tags must be of the data type shown. These tags are representative of the tags that are required for each ABB EMAX2 breaker, which is configured in your system.

Table 93 - EMAX2 Breaker

Name	Data Type	Description
CBWink	BOOL	Diagnostic to blink status indicator for CB location
CBClose	BOOL	Close Circuit Breaker
CBOpen	BOOL	Open Circuit Breaker

InOut Structure for Rockwell Automation Library Download

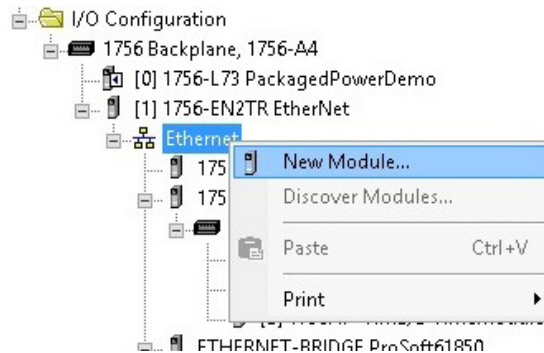
[Table 94](#) shows the InOut parameters that are available from the Rockwell Automation® Library of Electrical Protection Devices Folder in the PCDC. These external tags must be of the data type shown.

Table 94 - EMAX2 TripSource

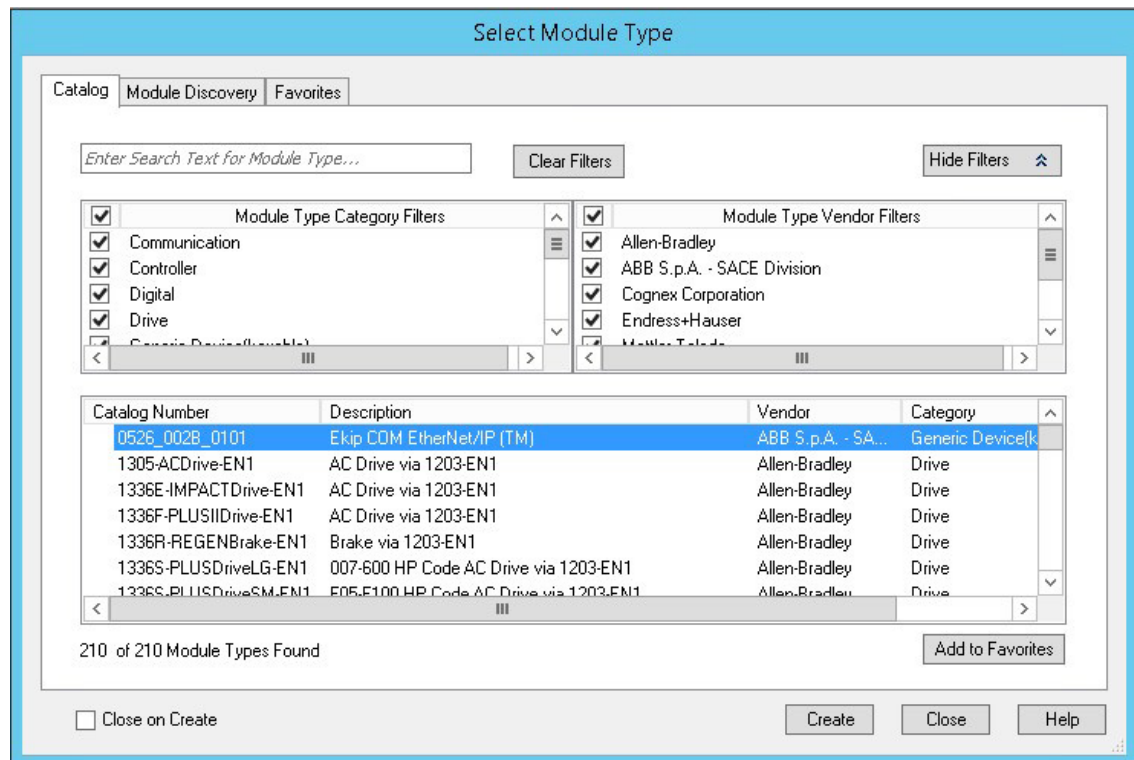
Name	Data Type	Description
EMAX2CB	_0526:002B_0101_82C511B0:I:0	Device Input Data Structure
EMAX2CB	_0526:002B_0101_82C511B0:O:0	Device Output Data Structure

Adding a Device

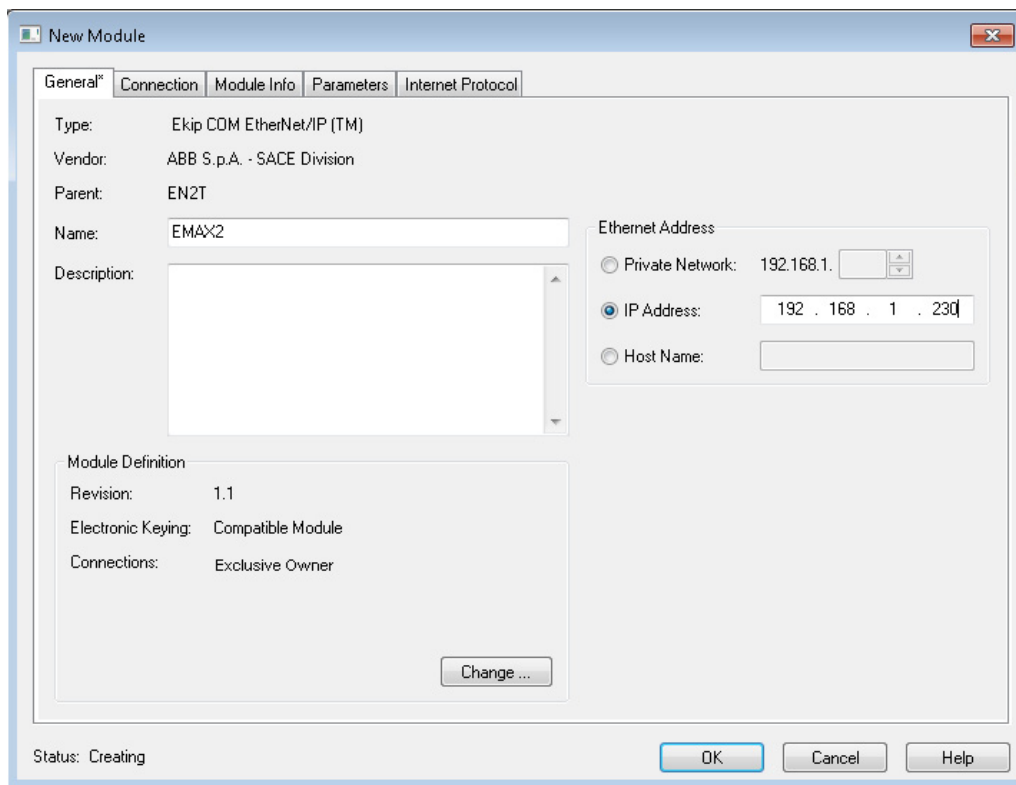
1. Open your Studio 5000® project.
2. Right-click on the Ethernet network and select New Module.



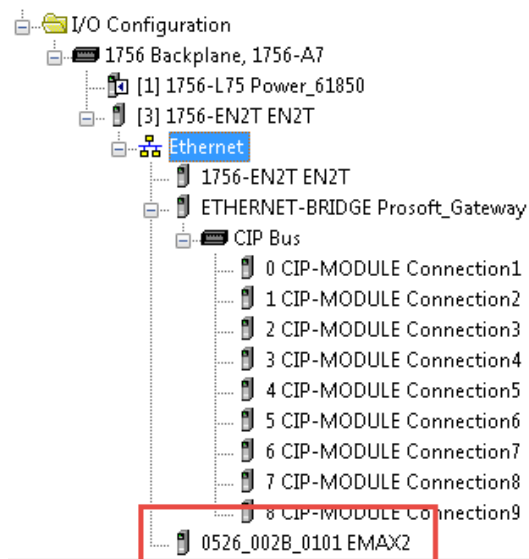
3. Select the ABB Ekip COM EtherNet/IP module from the module list and click Create.



4. Enter the name and IP address for the ABB EMAX2 circuit breaker.
Click OK.



5. Now you can see the circuit breaker in your project tree and tags in the controller tags.



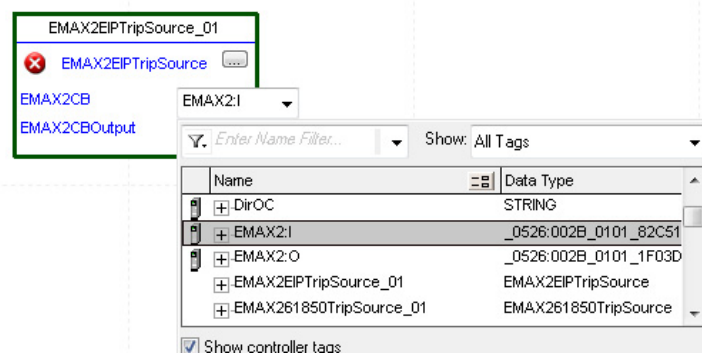
Mapping InOut Tags to Add-On Instructions

Each EMAX2 relay requires two Add-On Instructions to monitor and visualize the relay. The ProSoft Software instruction is created in [Chapter 2](#). The Add-On Instruction is downloaded from the Rockwell Automation® Library of Electronic Protection Devices from the PCDC.

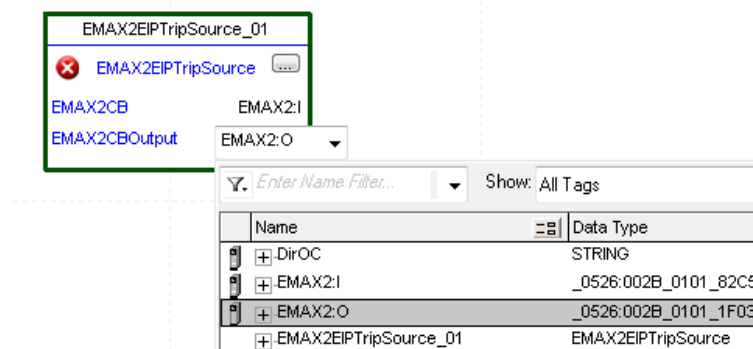
Associate Controller Tags to ProSoft Add-On Instruction

Complete these steps to map the ProSoft instruction to Studio 5000 tags.

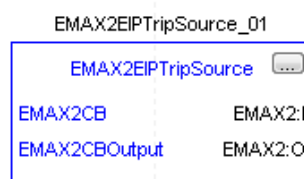
1. Double-click the question mark next to EMAX2CB of the Add-On Instruction.
2. Click the down arrow on the drop box and select the EtherNet/IP EMAX2 input tag and double-click to choose it.



3. Double-click the question mark next to EtherNet/IP EMAX2 of the Add-On Instruction.
4. Click the down arrow on the drop box and select the EMAX2 output tag and double-click to choose it.



Fully Configured Add-On Instruction



Using Visualization Files

See [Using a Display Element on page 16](#) for detailed information.

Faceplates

The Operator tab is displayed when the faceplate is initially opened. Click the appropriate icon on the left of the faceplate to access a specific tab.



Table 95 - Tab Descriptions

Item	Description
1	Operator tab
2	Diagnostics tab
3	Help

The faceplate provides the means for operators, maintenance workers, engineers, and others to interact with the instruction instance. This interaction provides a view of the status and values of the instruction instance and an ability to manipulate it through its commands and settings.

Operator Tab

The Faceplate initially opens to the Operator tab, sometimes called the Home tab. From here, an operator can monitor the device status and manually operate the device when it is in Operator mode.

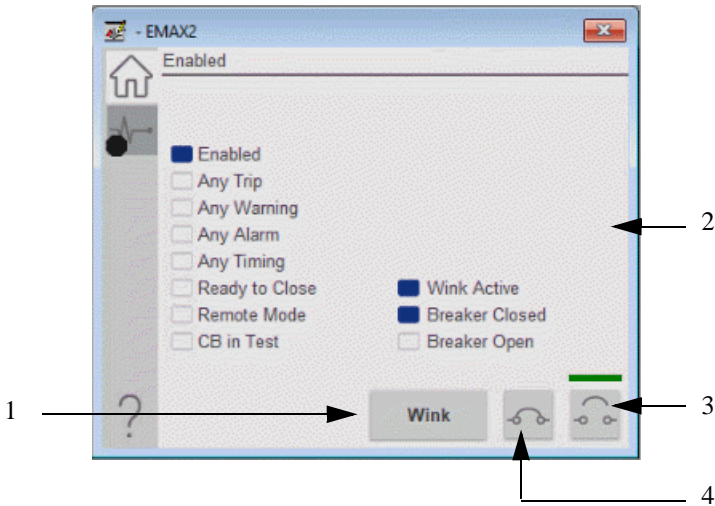


Table 96 - Operator Tab Description

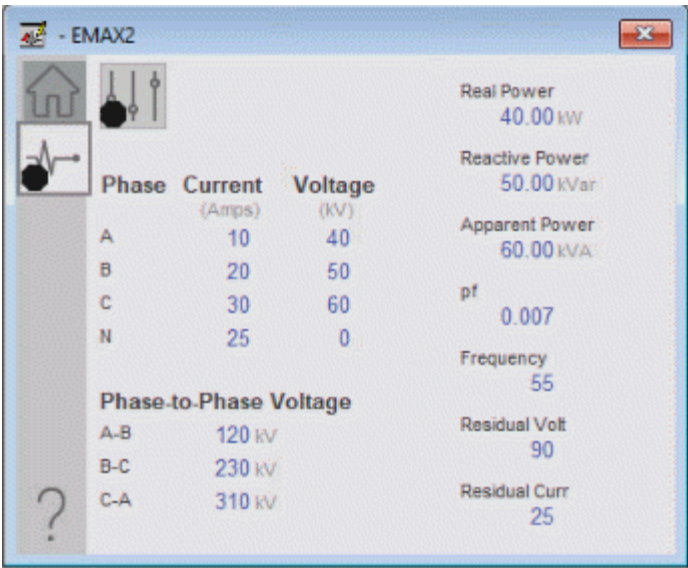
Item	Description
1	Click to activate the diagnostic wink function of the circuit breaker. Wink is an ABB diagnostic function that allows for blinking of status indicator to locate the device to which you're communicating. This activation allows for discovery of the breaker.
2	Status Indicators
3	Click to open the circuit breaker.
4	Click to close the circuit breaker.

Diagnostics Tab

The diagnostics tab allows the operator to see the measurement values from the physical device.

Diagnostics Tab

Readout of the measurement values from the EMAX2.



Advanced Properties


Click the advanced properties icon  on the diagnostics page to display the advanced properties. The following screen capture shows the tabs that are available in the advanced properties display



Table 97 - Advanced Properties Tab Descriptions

Item	Description
1	HMI Configuration
2	Diagnostics
3	Faults
4	Help

HMI Configuration Tab

The HMI configuration tab provides access to displayed text, and faceplate-to-faceplate navigation settings. Configure the description, label, tag, and security area for the device.

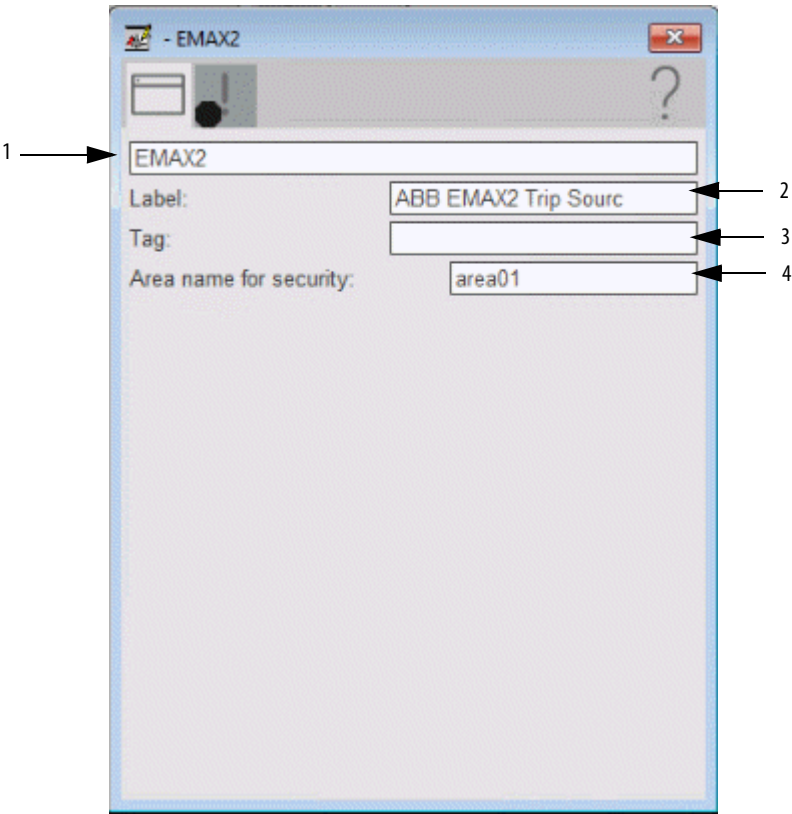
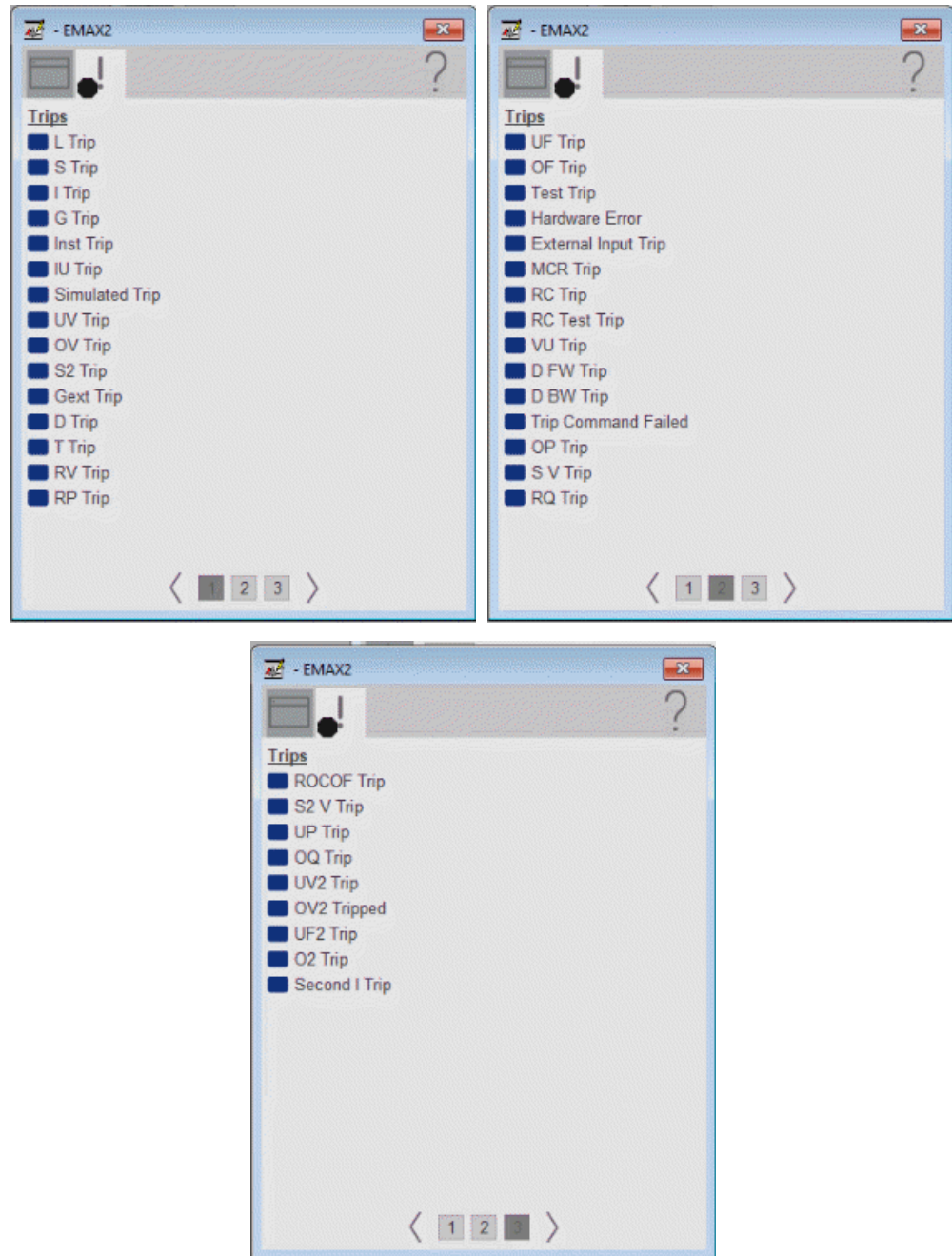


Table 98 - HMI Configuration Tab Description

Item	Action
1	Type the device description to show on the faceplate title bar.
2	Type the label to show on the graphic symbol.
3	Type the tag name to show on the faceplate and Tooltip. IMPORTANT: Pause the mouse over this field to display a tool tip with the configured Logix tag/path.
4	Type the Area name for security.

Faults Tab

The faults tab shows which alarms are active from the physical device.



Help Button

Press the help button on the faceplates to access help specific to that faceplate. The help file is in .pdf format and opens in a separate window.

Notes:

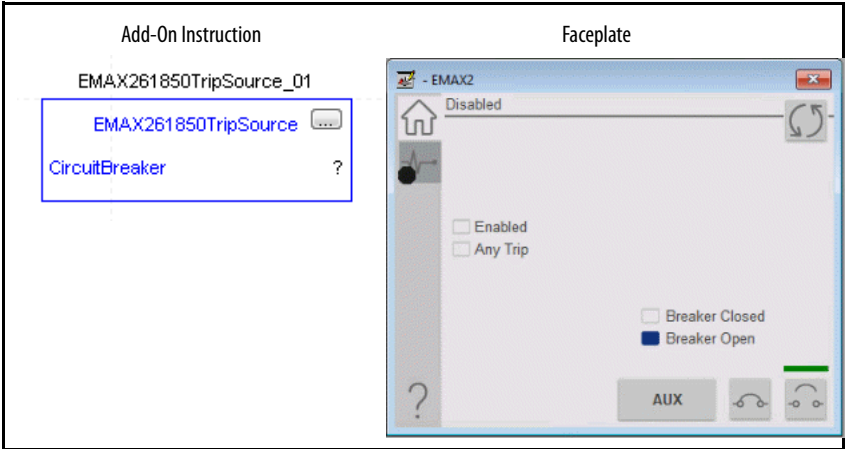
ABB EMAX2 Using IEC 61850 Object



The ABB EMAX2 power circuit breaker provides a user the benefits of a power circuit breaker that is combined with the intelligence of a device. The ABB EMAX2 contains an electronic trip unit that can communicate with upstream control systems via a number of protocols and standards. When equipping the ABB EMAX2 with IEC 61850 communications, you can configure various MMS and GOOSE communications that allow SCADA/monitoring communications. Those communications also allow high speed interlocking. This chapter discusses how to integrate the EMAX2 that communicates via IEC 61850 for SCADA purposes to the PlantPax® system.

Topic	Page
Controller Code	232
Mapping InOut Tags to Add-On Instructions	233
Using Visualization Files	236
Faceplates	237

This instruction monitors one ABB EMAX2 breaker communication via the EtherNet/IP™ ABB. Alarms are provided when the device experiences a protection-related trip. The instruction also provides capabilities for opening, and to close the breaker.



Controller Code

Two Add-On Instructions represent each physical device. You must configure the InOut parameters of each Add-On Instruction per physical device.

The first Add-On Instruction is the ProSoft software-generated Add-On Instruction (see [Chapter 2](#)), which maps data to the controller. The second Add-On Instruction is the TripSource Add-On Instruction, available for download from the library resources from the PCDC, which is for faceplate management

InOut Structure for ProSoft Add-On Instruction

InOut parameters are used to link the Add-On Instruction to external tags that contain necessary data for the instruction to operate. These external tags must be of the data type shown.

Name	Data Type	Description
CircuitBreaker	<Defined by device AOI>	Device data from the device Add-On Instruction. This data type changes to match each device tag in the ProSoft Gateway.

InOut Structure for Rockwell Automation Library Download

InOut parameters are used to link the Add-On Instruction to external tags that contain necessary data for the instruction to operate. These external tags must be of the data type shown. These tags are representative of the tags that are required for each IEC 61850ABB EMAX2 that is configured in your system.

Name	Data Type	Description
[DeviceName]_AOI	[DeviceName]_AOI	Add-On Instruction tag. Matches naming from ProSoft Configuration Manager.
Connection_Input0	SINT[500]	CIP Connection Input data. The number of these parameters vary depending on system sizing.
Connection_Output0	SINT[496]	CIP Connection Output data. The number of these parameters vary depending on system sizing.
Connection_Input1	SINT[500]	CIP Connection Input data. The number of these parameters vary depending on system sizing.
Connection_Output1	SINT[496]	CIP Connection Output data. The number of these parameters vary depending on system sizing.
[DeviceName]	[DeviceName]	Device data that is collected from the CIP connections and organized into understandable tags. This data type changes to match each device tag in the ProSoft Gateway.

Remote Command Structure

Remote Bit Control Value parameters are used to link the Add-On Instruction to configurable input points in the physical device. Each bit is configurable via the vendor software of each device. The following table has recommended uses for each bit.

Table 99 - Remote Command Structure for IEC 61850

Control Bit	Function
PlantPAxEMAX2LD0_CSW11_CO_Pos_Oper_ctlVal	Issue Open/ Command via Toggle
PlantPAxEMAX2LD0_CSW11_CO_Pos_Cancel_ctlVal	Issue Command Canceled

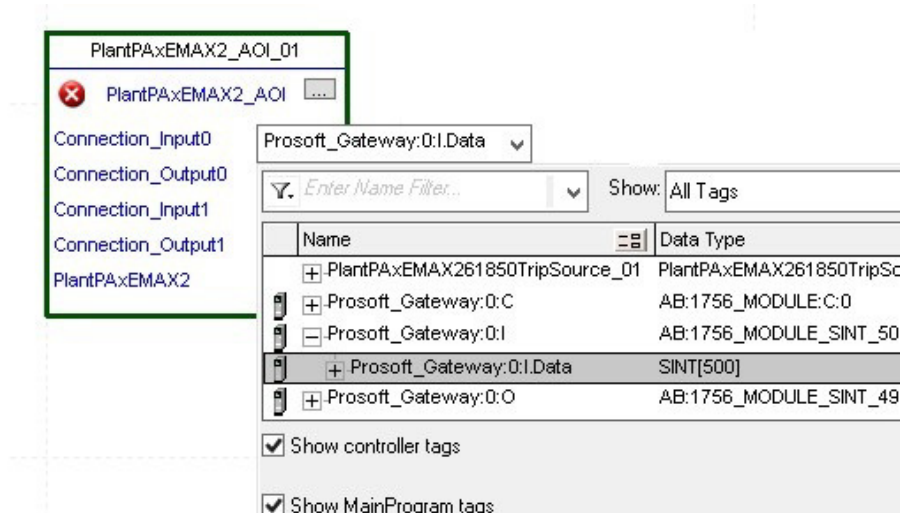
Mapping InOut Tags to Add-On Instructions

Each 61850 EMAX2 relay requires two Add-On Instructions to monitor and visualize the relay. The ProSoft Software instruction is created in [Chapter 2](#). The Add-On Instruction is downloaded from the Rockwell Automation Library of Electronic Protection Devices from the PCDC.

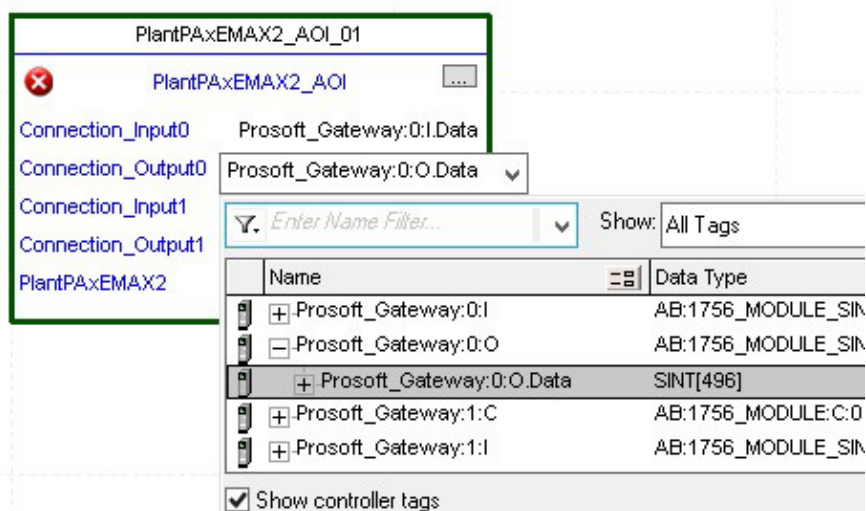
Associate Controller Tags to ProSoft Add-On Instruction

Complete these steps to map the ProSoft instruction to Studio 5000® tags.

1. Double-click the question mark next to Connection_Input0 of the device Add-On Instruction.
2. Click the down arrow on the drop box and expand the ProSoft_Gateway:0:I. Select the ProSoft_Gateway:0:I.Data and double-click to choose it.



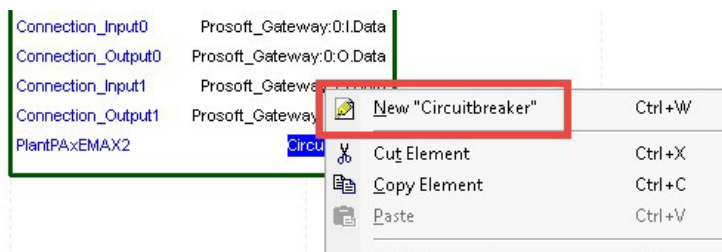
- Double-click the question mark next to Connection_Output0 of the device Add-On Instruction.
- Click the down arrow on the drop box and expand the ProSoft_Gateway:0:O. Select the ProSoft_Gateway:0:O.Data and double-click to choose it.



- Repeat this process for Connection Input and Output that are included with your Add-On Instructions.
- Click the question mark next to the final tag. This tag has the same name as the Add-On Instruction and the device as configured in the ProSoft Gateway. Type in a name for this tag. In this example, the name is Circuitbreaker.



- Right-click on the new tag name and select New "<tag name>".

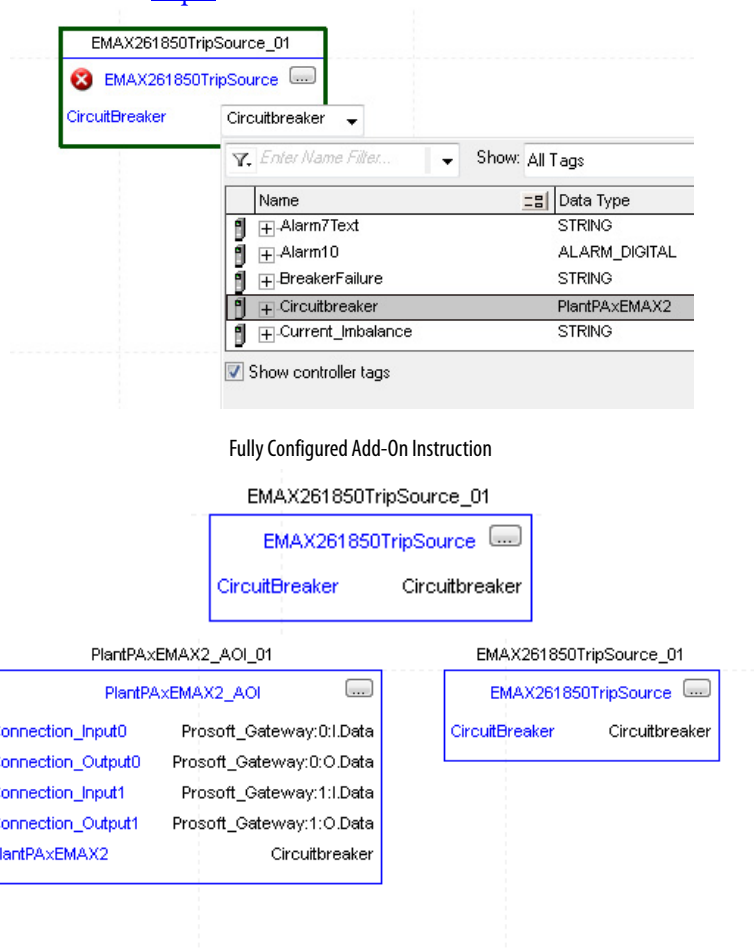


8. Click Create on the New Tag dialog box.

The 'New Tag' dialog box is shown with the following fields and options:

- Name:** Circuitbreaker
- Description:** (Empty text area)
- Usage:** <controller>
- Type:** Base (with a 'Connection...' button)
- Alias For:** (Empty dropdown)
- Data Type:** PlantPAxEMAX2 (with an ellipsis button)
- Parameter Connection:** (Empty dropdown)
- Scope:** Power_61850
- External Access:** Read/Write
- Style:** (Empty dropdown)
- Buttons:** Create (highlighted), Cancel, Help
- Checkboxes:** Constant, Sequencing, Open Configuration, Open Parameter Connections (all unchecked)

9. Now you can configure the ABB EMAX2_TripSource Add-On Instruction.
10. Click the question mark next to Circuitbreaker and select the tag that was created in [step 8](#).



Using Visualization Files

See [Using a Display Element on page 16](#) for detailed information.

Faceplates

The Operator tab is displayed when the faceplate is initially opened. Click the appropriate icon on the left of the faceplate to access a specific tab.



Table 100 - Tab Descriptions

Item	Description
1	Operator tab
2	Diagnostics tab
3	Help

The faceplate provides the means for operators, maintenance workers, engineers, and others to interact with the instruction instance. This interaction provides a view of the status and values of the instruction instance and an ability to manipulate it through its commands and settings.

Operator Tab

The Faceplate initially opens to the Operator tab, sometimes called the Home tab. From here, an operator can monitor the device status and manually operate the device when it is in Operator mode.

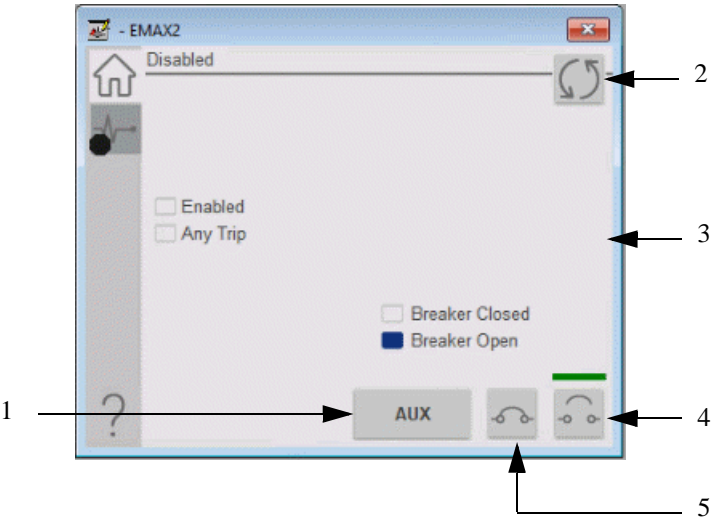


Table 101 - Operator Tab Description

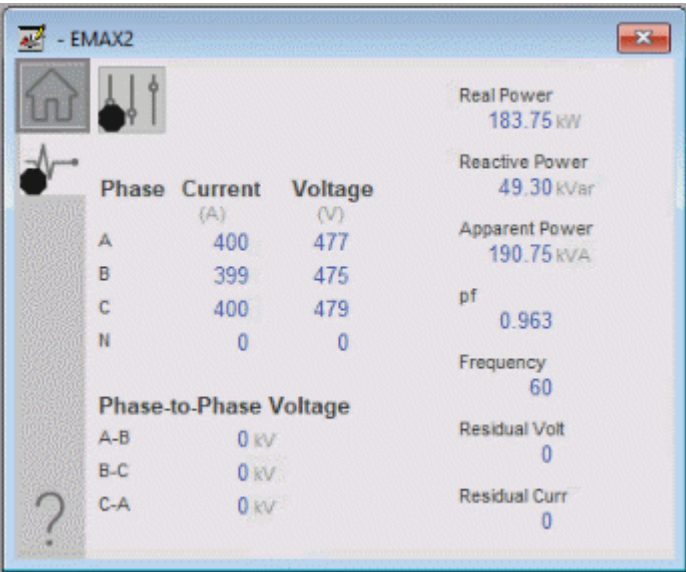
Item	Description
1	Click to control AUX input
2	Click to reset the device. The status of the device is indicated on the faceplate.
3	Status Indicators
4	Click to open the circuit breaker.
5	Click to close the circuit breaker.

Diagnostics Tab

The diagnostics tab allows the operator to see the measurement values from the physical device.

Diagnostics Tab

Readout of the measurement values from the ABB EMAX2.



Advanced Properties


Click the advanced properties icon  on the diagnostics page to display the advanced properties. The following screen capture shows the tabs that are available in the advanced properties display



Table 102 - Advanced Properties Tab Descriptions

Item	Description
1	HMI Configuration
2	Faults
3	Help

HMI Configuration Tab

The HMI configuration tab provides access to displayed text, and faceplate-to-faceplate navigation settings. Configure the description, label, tag, and security area for the device.

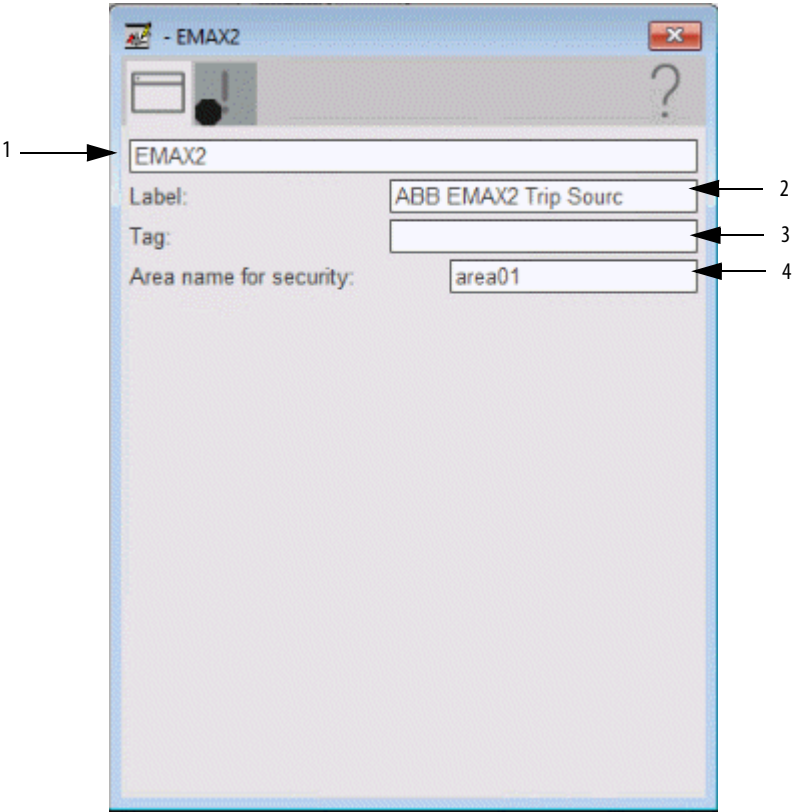
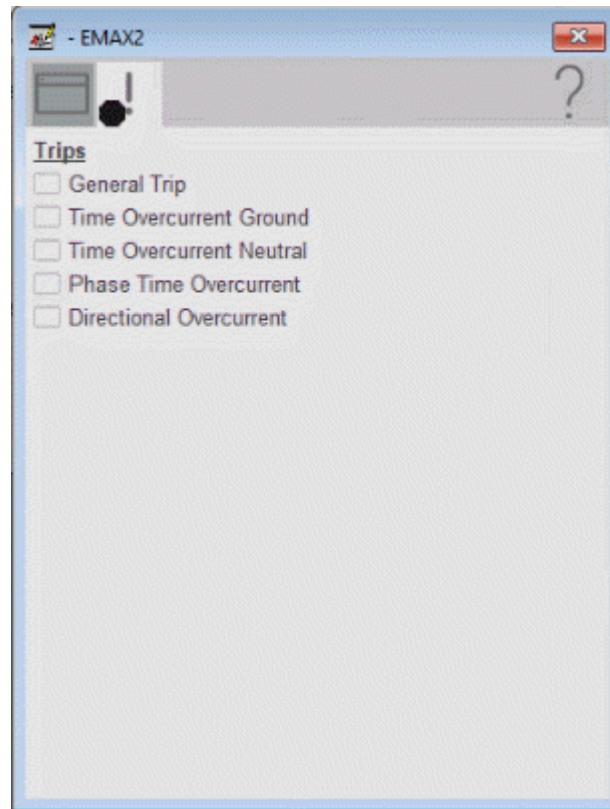


Table 103 - HMI Configuration Tab Description

Item	Action
1	Type the device description to show on the faceplate title bar.
2	Type the label to show on the graphic symbol.
3	Type the tag name to show on the faceplate and Tooltip. IMPORTANT: Pause the mouse over this field to display a tool tip with the configured Logix tag/path.
4	Type the Area name for security.

Faults Tab

The Faults tab shows which alarms are active from the physical device.



Help Button

Press the help button on the faceplates to access help specific to that faceplate. The help file is in .pdf format and opens in a separate window.

Notes:

GE Multilin 845 Object

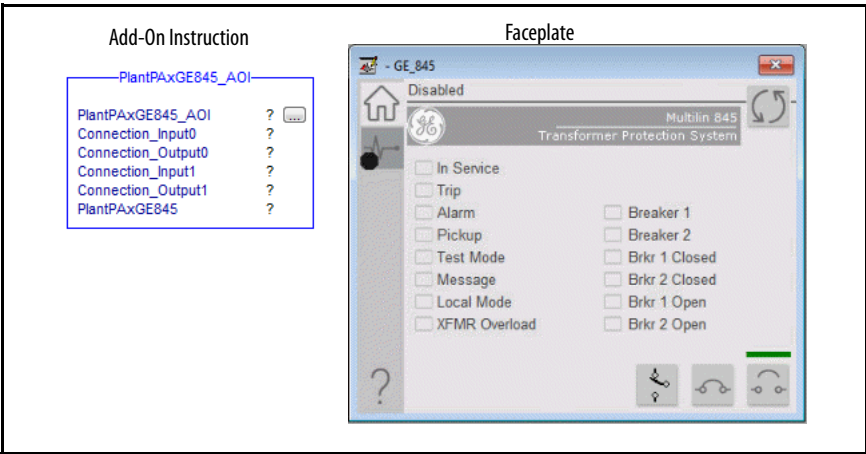


Images courtesy of General Electric. Multilin and the monogram are copyright of the General Electric Company © 2018.

The General Electric (GE) 845 is a transformer differential protection relay with arc flash protection. This device provides comprehensive protection for multi-winding transformers. The GE 845 relay can provide indications of differential faults, winding overcurrent, over frequency, underfrequency, overvoltage, and various other protection features. The device also provides fundamental metering data, including (but not limited to) voltage, current, frequency, and power. The GE 845 can also provide various environmental measurements at its respective physical install location.

Topic	Page
Controller Code	244
Mapping InOut Tags to Add-On Instructions	245
Using Visualization Files	250
Faceplates	251

This Add-On Instruction monitors one GE 845 transformer protection relay. Alarms are provided when the device experiences a protection-related trip. The instruction also provides capabilities for opening and closing the breaker feature of the relay. The GE 845 provides two available breakers to switch between.



Controller Code

Two Add-On Instructions represent each physical device. You must configure the InOut parameters of each Add-On Instruction per physical device.

The first Add-On Instruction is the ProSoft software-generated Add-On Instruction (see [Chapter 2](#)), which maps data to the controller. The second Add-On Instruction is the TripSource Add-On Instruction, available for download from the library resources from the PCDC, which is for faceplate management

InOut Structure for ProSoft Add-On Instruction

InOut parameters in [Table 104](#) are used to link the Add-On Instruction to external tags that contain necessary data for the instruction to operate. These external tags must be of the data type shown in the following table. These tags are representative of the tags that are required for each GE 845 relay, which is configured in your system.

Table 104 - GE 845 Add-On Instruction

Name	Data Type	Description
[DeviceName]_AOI	[DeviceName]_AOI	Add-On Instruction tag. Matches naming from ProSoft Configuration Manager.
Connection_Input0	SINT[500]	CIP Connection Input data. The number of these parameters varies depending on system sizing.
Connection_Output0	SINT[496]	CIP Connection Output data. The number of these parameters varies depending on system sizing.
Connection_Input1	SINT[500]	CIP Connection Input data. The number of these parameters varies depending on system sizing.
Connection_Output1	SINT[496]	CIP Connection Output data. The number of these parameters varies depending on system sizing.
[DeviceName]	[DeviceName]	Device data that is collected from the CIP connections and organized into understandable tags. This data type changes to match each device tag in the ProSoft Gateway.

InOut Structure for Rockwell Automation Library Download

[Table 105](#) shows the InOut parameters that are available from the Rockwell Automation® Library of Electrical Protection Devices Folder in the PCDC. These external tags must be of the data type shown.

Table 105 - GE 845_TripSource

Name	Data Type	Description
[DeviceName]_Relay_Name	<Defined by device AOI>	Device data from the Add-On Instruction. This data type changes to match each device tag in the ProSoft Gateway.
Ref_Tgt3Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt4Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.

Name	Data Type	Description
Ref_Tgt5Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt6Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt7Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt8Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt9Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt10Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt11Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt12Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt13Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt14Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
[DeviceName]TripAlarm	ALARM_DIGITAL	Digital Alarm tag
[DeviceName]TripText	STRING	Alarm text to be displayed when active.

Remote Bit Control Value Structure

Remote Bit Control Value parameters are used to link the Add-On Instruction to configurable input points in the physical device. Each bit is configurable via the vendor software of each device. [Table 106](#) has recommended uses for each bit.

Table 106 - Remote Bit Control - GE 845 Relay

Control Bit	Function
GGI03_CO_SPCS01_Oper_ctlVal	Enable Relay Configuration
GGI03_CO_SPCS02_Oper_ctlVal	Reset Relay
GGI03_CO_SPCS03_Oper_ctlVal	Breaker Close
GGI03_CO_SPCS04_Oper_ctlVal	Breaker Open
GGI03_CO_SPCS05_Oper_ctlVal	Breaker Select

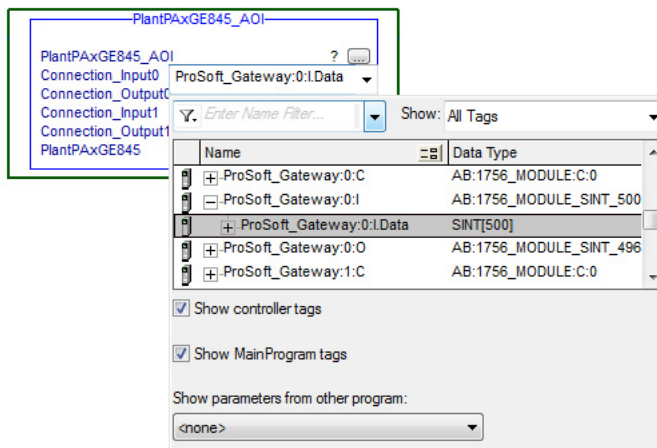
Mapping InOut Tags to Add-On Instructions

Each GE 845 relay requires two Add-On Instructions to monitor and visualize the relay. The ProSoft Software instruction is created in [Chapter 2](#). The Add-On Instruction is downloaded from the Rockwell Automation Library of Electrical Protection Devices from the PCDC.

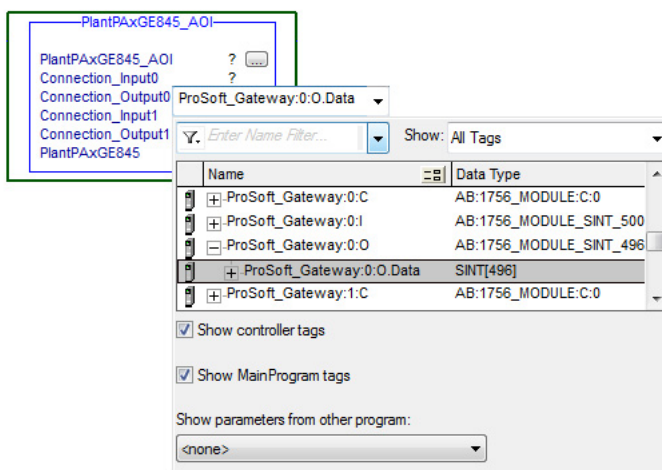
Associate Controller Tags to ProSoft Add-On Instruction

Complete these steps to map the ProSoft instruction to Studio 5000® tags.

1. Double-click the question mark next to Connection_Input0 of the device Add-On Instruction.
2. Click the down arrow on the drop box and expand the ProSoft_Gateway:0:I. Select the ProSoft_Gateway:0:I.Data and double-click to choose it.

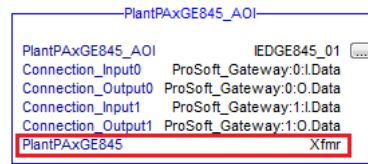


3. Double-click the question mark next to Connection_Output0 of the device Add-On Instruction.
4. Click the down arrow on the drop box and expand the ProSoft_Gateway:0:O. Select the ProSoft_Gateway:0:O.Data and double-click to choose it.

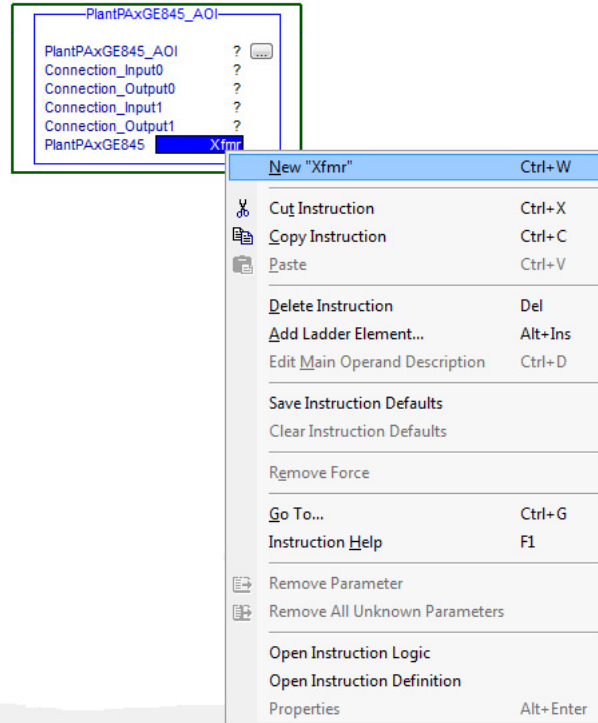


5. Repeat this process for each Connection Input and Output that is included with your Add-On Instructions.

6. Click the question mark next to the final tag. Type a tag name that represents your physical device within your Studio 5000 project. In this example, the name is “Xfmr”.

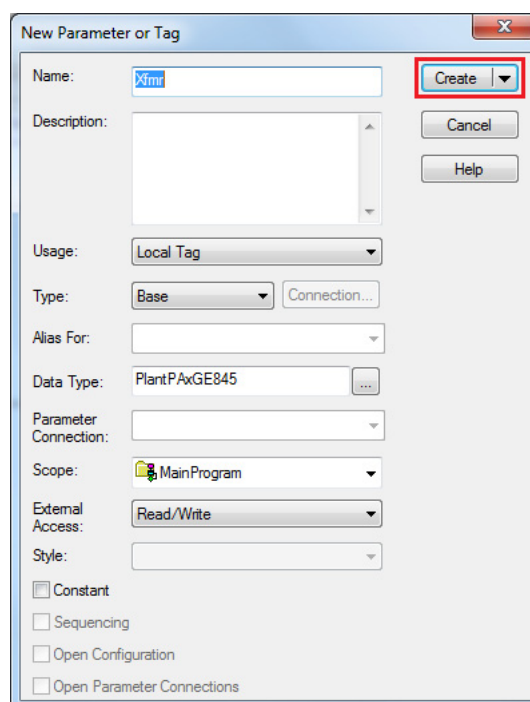


7. Right-click on the new tag name and select New “<tag name>”.



8. Click Create on the New Tag dialog box.

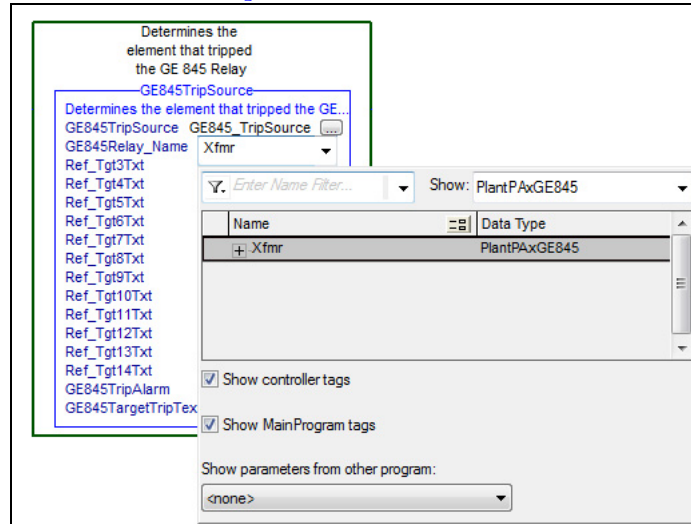
IMPORTANT Verify that Data Type matches intended device configuration.



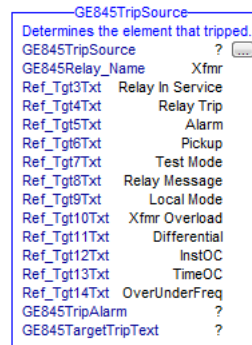
Configure Rockwell Automation Add-On Instruction

This section describes how to configure the Rockwell Automation Add-On Instruction. The functionality allows the ProSoft Add-On Instruction to work with the Rockwell Automation tags.

1. Click the question mark next to GE845Relay_Name and select the tag that was created in [step 8](#).

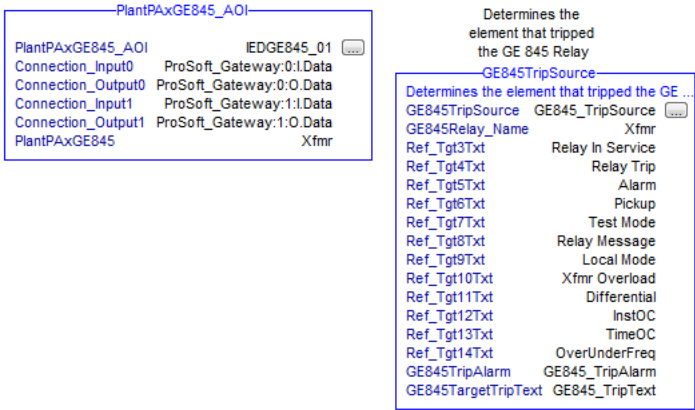


2. Click the question mark next to each Ref_Tgt#Txt and enter a string tag. These tags are intended to match the status indicators on the front panel of the device.
3. Once you type the tag name, if the tag is not already configured in the controller, you have to right-click and create a tag.



4. Click the question mark next to GE845TripAlarm and select or create the digital alarm tag to be used.
This tag is used for alarming through the Human Machine Interface (HMI) FactoryTalk® Alarms and Events Server.
5. Click the question mark next to GE845TargetTripText and select or create the tag to be used.
This tag is used for alarm message through the HMI FactoryTalk Alarms and Events Server.

Figure 4 - Fully Configured Add-On Instructions



- 6. Save and download your project to the controller.

Using Visualization Files

See [Using a Display Element on page 16](#) for detailed information.

Faceplates

The Operator tab is displayed when the faceplate is initially opened. Click the appropriate icon on the left of the faceplate to access a specific tab.



Table 107 - Tab Descriptions

Item	Description
1	Operator tab
2	Diagnostics tab
3	Help

The faceplate provides the means for operators, maintenance workers, engineers, and others to interact with the instruction instance. This interaction provides a view of the status and values of the instruction instance and an ability to manipulate it through its commands and settings.

Operator Tab

The Faceplate initially opens to the Operator tab, sometimes called the Home tab. From here, an operator can monitor the device status and manually operate the device.

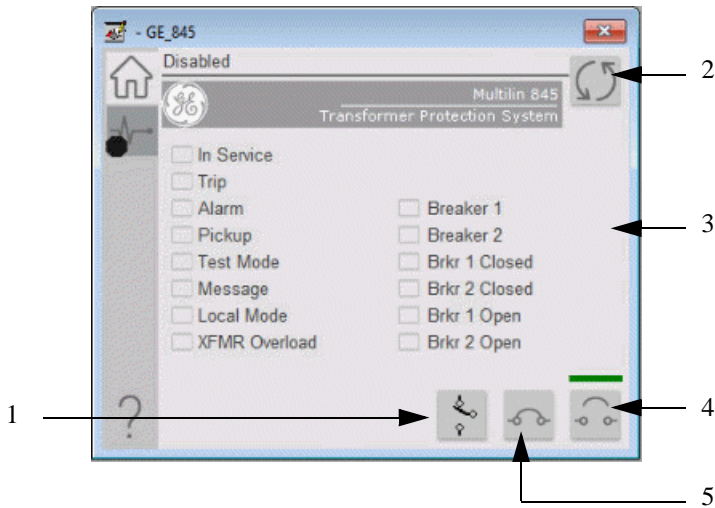


Table 108 - Operator Tab Description

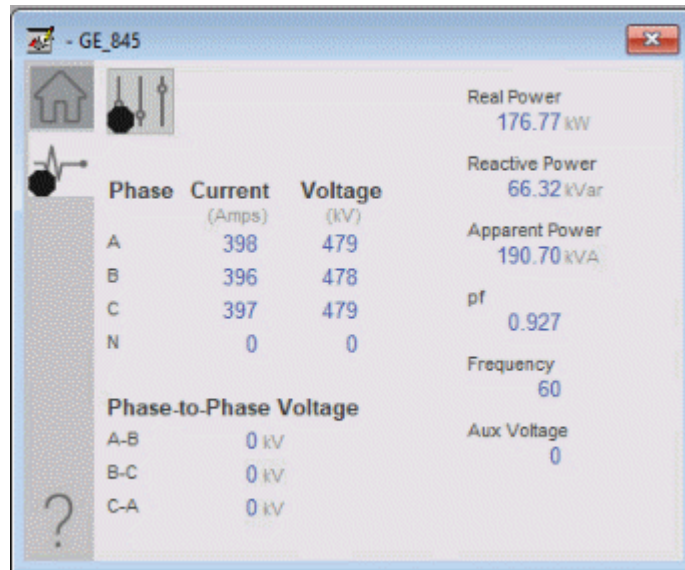
Item	Description
1	Click to toggle control between breaker 1 and breaker 2.
2	Click to reset the device. The status of the device is indicated on the faceplate.
3	Status Indicators
4	Click to open the circuit breaker.
5	Click to close the circuit breaker.

Diagnostics Tab

The Diagnostics tab allows the operator to see the measurement values from the physical device.

Diagnostics Tab

Readout of the measurement values from the GE 845.



Advanced Properties


Click the advanced properties icon  on the diagnostics page to display the advanced properties. The following screen capture shows the tabs that are available in the advanced properties display



Table 109 - Advanced Properties Tab Descriptions

Item	Description
1	HMI Configuration
2	Faults
3	Help

HMI Configuration Tab

The HMI configuration tab provides access to displayed text, and faceplate-to-faceplate navigation settings. Configure the description, label, tag, and security area for the device.

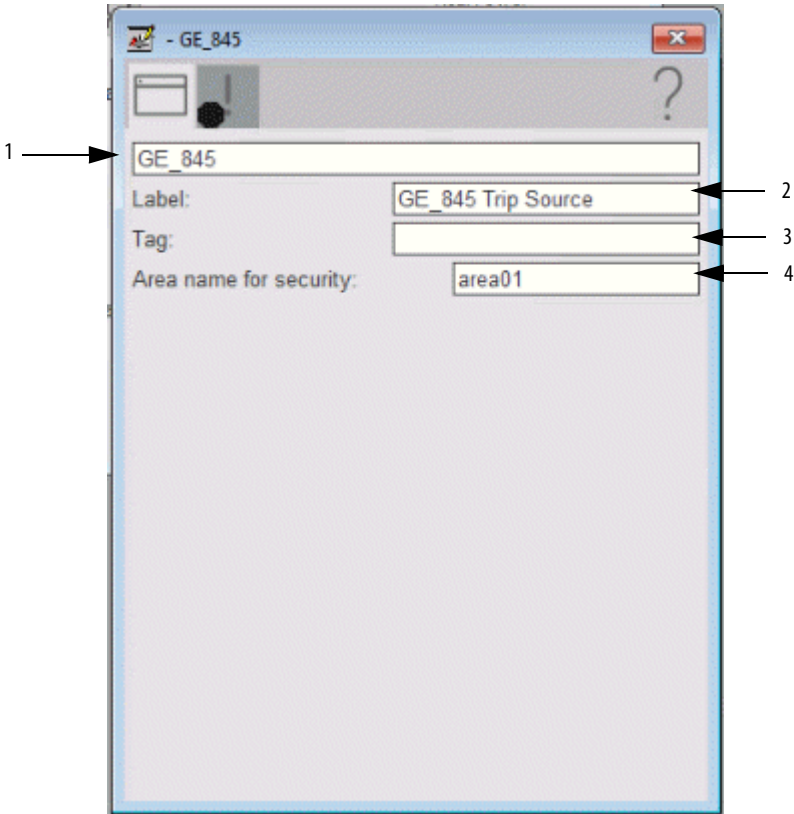
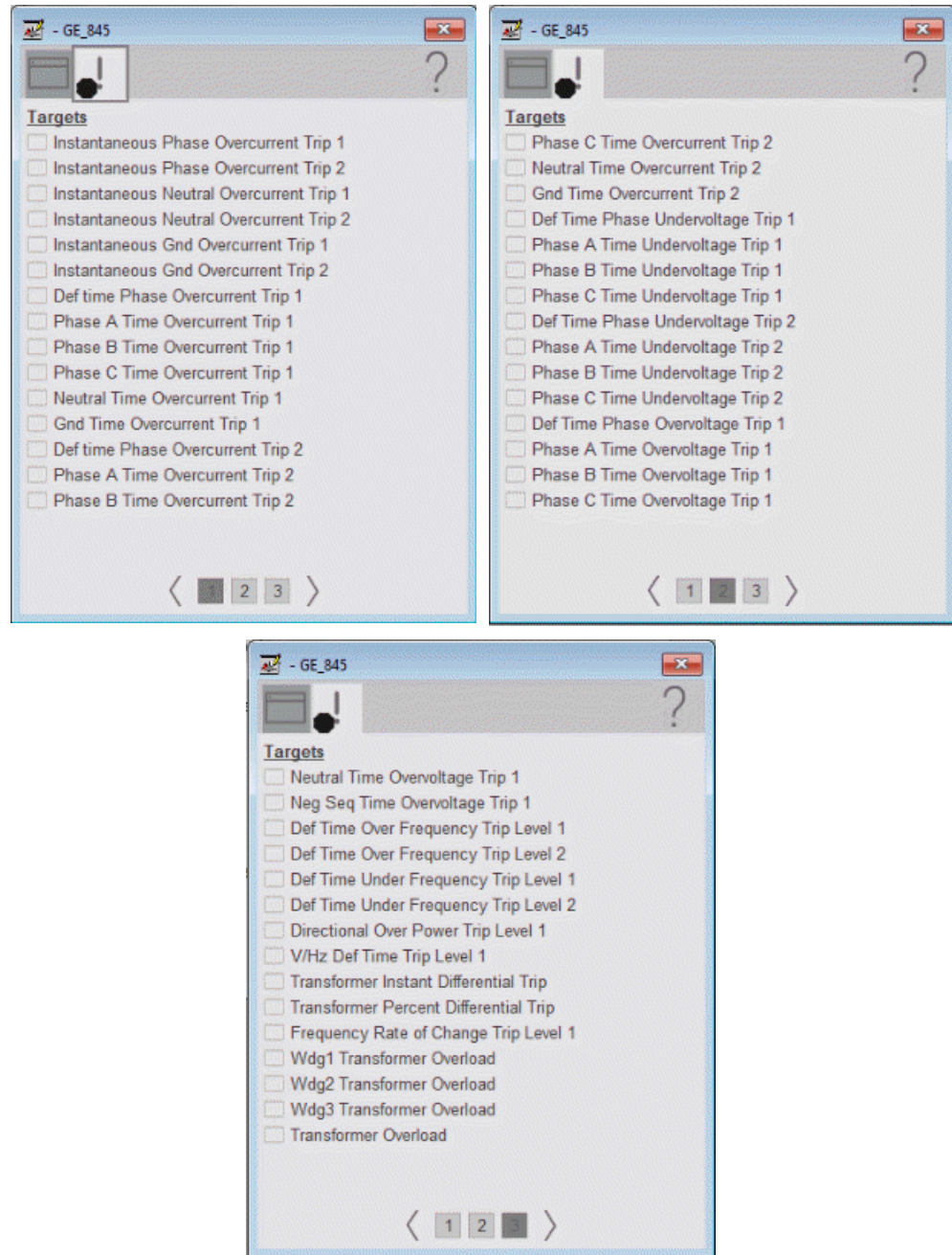


Table 110 - HMI Configuration Tab Description

Item	Action
1	Type the device description to show on the faceplate title bar.
2	Type the label to show on the graphic symbol.
3	Type the tag name to show on the faceplate and Tooltip. IMPORTANT: Pause the mouse over this field to display a tool tip with the configured Logix tag/path.
4	Type the Area name for security.

Faults Tab

The Faults tab shows which alarms are active from the physical device.



Help Button

Press the help button on the faceplates to access help specific to that faceplate. The help file is in .pdf format and opens in a separate window.

Notes:

GE Multilin 850 Object



Images courtesy of General Electric. Multilin and the monogram are copyright of the General Electric Company © 2018.

The General Electric (GE) 850 is a feeder protection relay with arc flash protection. This device is used to help protect an electrical bus from conditions of overcurrent, overvoltage, undervoltage, and other various protection features. The device also provides fundamental metering data, including (but not limited to) voltage, current, frequency, and power. The GE 850 can also provide various environmental measurements at its respective physical install location.

Topic	Page
Controller Code	258
Mapping InOut Tags to Add-On Instructions	259
Using Visualization Files	263
Faceplates	264

This Add-On Instruction monitors one GE 850 feeder protection relay. Alarms are provided when the device experiences a protection-related trip. The instruction also provides capabilities for opening and closing the breaker feature of the relay.

Add-On Instruction

PlantPAxGE850_AOI

PlantPAxGE850_AOI ?

Connection_Input0 ?

Connection_Output0 ?

Connection_Input1 ?

Connection_Output1 ?

PlantPAxGE850 ?

Faceplate

- GE_850

Disabled

Multilin 850

Feeder Protection System

☐ In Service

☐ Trip

☐ Alarm

☐ Pickup

☐ Test Mode

☐ Message

☐ Local Mode

☐ Block Close

☐ Breaker Closed

☐ Block Open

☐ Breaker Open

Controller Code

Two Add-On Instructions represent each physical device. You must configure the InOut parameters of each Add-On Instruction per physical device.

The first Add-On Instruction is the ProSoft software-generated Add-On Instruction (see [Chapter 2](#)), which maps data to the controller. The second Add-On Instruction is the TripSource Add-On Instruction, available for download from the library resources from the PCDC, which is for faceplate management

InOut Structure for ProSoft Add-On Instruction

InOut parameters are used to link the Add-On Instruction to external tags that contain necessary data for the instruction to operate. These external tags must be of the data type shown in the following table. These tags are representative of the tags that are required for each GE 850 relay, which is configured in your system.

Table 111 - GE 850 Add-On Instruction

Name	Data Type	Description
[DeviceName]_AOI	[DeviceName]_AOI	Add-On Instruction tag. Matches naming from ProSoft Configuration Manager.
Connection_Input0	SINT[500]	CIP Connection Input data. The number of these parameters varies depending on system sizing.
Connection_Output0	SINT[496]	CIP Connection Output data. The number of these parameters varies depending on system sizing.
Connection_Input1	SINT[500]	CIP Connection Input data. The number of these parameters varies depending on system sizing.
Connection_Output1	SINT[496]	CIP Connection Output data. The number of these parameters varies depending on system sizing.
[DeviceName]	[DeviceName]	Device data that is collected from the CIP connections and organized into understandable tags. This data type changes to match each device tag in the ProSoft Gateway.

InOut Structure for Rockwell Automation Library Download

[Table 112](#) shows the InOut parameters that are available for download from the Rockwell Automation Library of Electrical Protection Devices in the PCDC. These external tags must be of the data type shown.

Table 112 - GE 850_TripSource

Name	Data Type	Description
[DeviceName]_Relay_Name	<Defined by device AOI>	Device data from the Add-On Instruction. This data type changes to match each device tag in the ProSoft Gateway.
Ref_Tgt3Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt4Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.

Name	Data Type	Description
Ref_Tgt5Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt6Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt7Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt8Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt9Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
[DeviceName]TripAlarm	ALARM_DIGITAL	Digital Alarm tag
[DeviceName]TripText	STRING	Alarm text to be displayed when active.

Remote Bit Control Value Structure

Remote Bit Control Value parameters are used to link the Add-On Instruction to configurable input points in the physical device. Each bit is configurable via the vendor software of each device. The following table has recommended uses for each bit.

Table 113 - Remote Bit Control - GE 850 Relay

Control Bit	Function
GGIO3_CO_SPCS01_Oper_ctlVal	Enable Relay Configuration
GGIO3_CO_SPCS02_Oper_ctlVal	Reset Relay
GGIO3_CO_SPCS03_Oper_ctlVal	Breaker Close
GGIO3_CO_SPCS04_Oper_ctlVal	Breaker Open

Mapping InOut Tags to Add-On Instructions

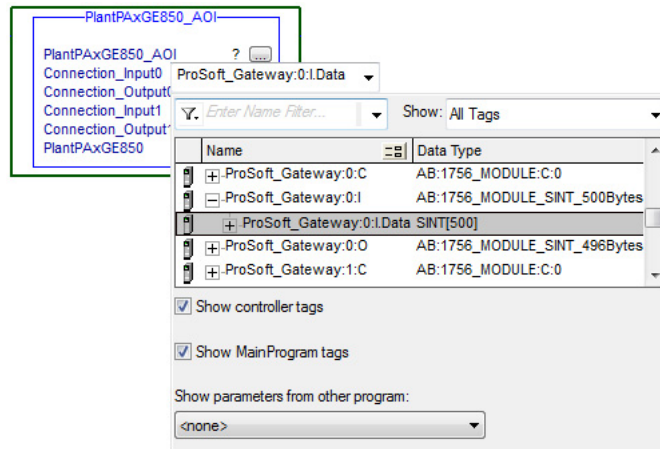
Each GE 850 relay requires two Add-On Instructions to monitor and visualize the relay. The ProSoft Software instruction is created in [Chapter 2](#). The Add-On Instruction is downloaded from the Rockwell Automation® Library of Electrical Protection Devices from the PCDC.

Associate Controller Tags to ProSoft Add-On Instruction

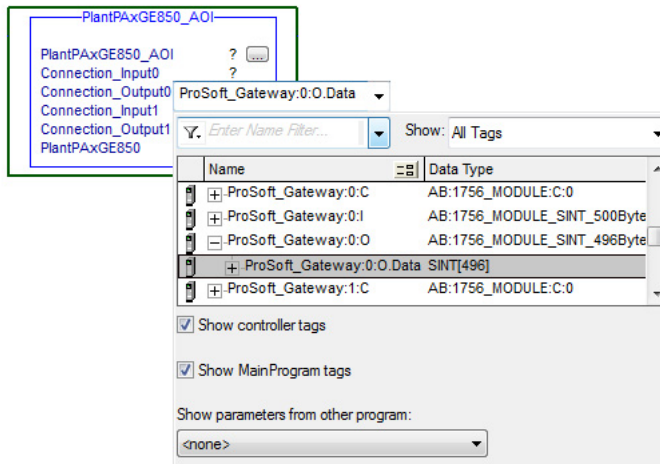
Complete these steps to map the ProSoft instruction to Studio 5000® tags.

1. Double-click the question mark next to Connection_Input0 of the device Add-On Instruction.

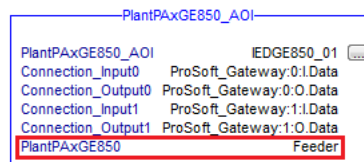
- Click the down arrow on the drop box and expand the ProSoft_Gateway:0:I. Select the ProSoft_Gateway:0:I.Data and double-click to choose it.



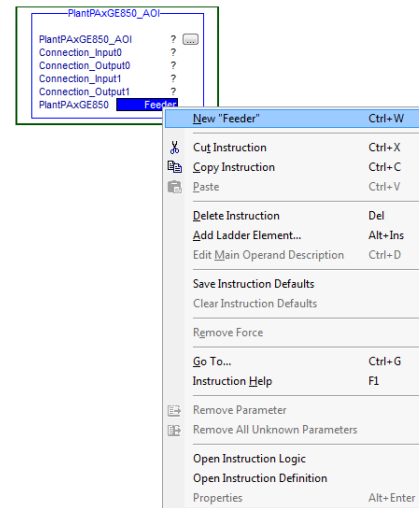
- Double-click the question mark next to Connection_Output0 of the device Add-On Instruction.
- Click the down arrow on the drop box and expand the ProSoft_Gateway:0:O. Select the ProSoft_Gateway:0:O.Data and double-click to choose it.



- Repeat this process for each Connection Input and Output that is included with your Add-On Instructions.
- Click the question mark next to the final tag. Type a tag name that represents your physical device within your Studio 5000 project. In this example, the name is "Feeder".

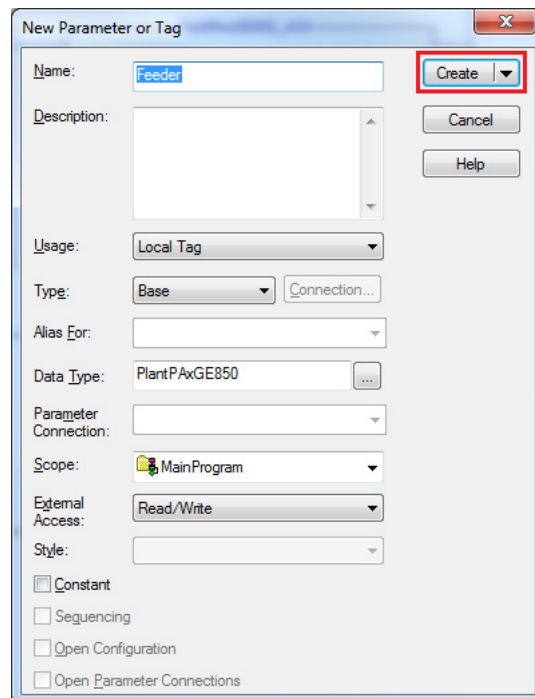


7. Right-click on the new tag name and select New "<tag name>".



8. Click Create on the New Tag dialog box.

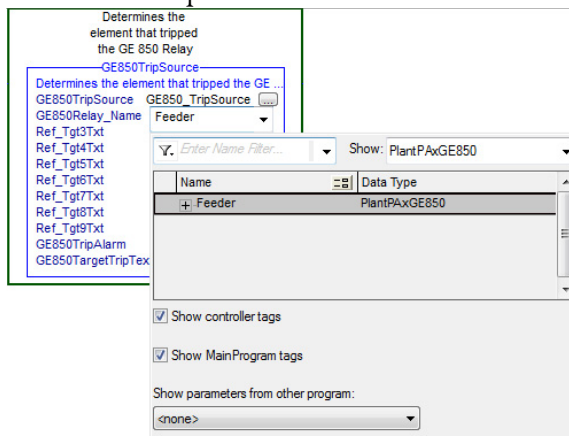
IMPORTANT Verify that Data Type matches intended device configuration.



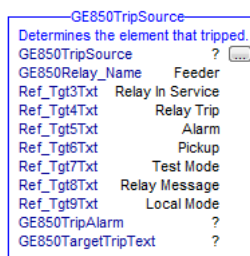
Configure Rockwell Automation Add-On Instruction

This section describes how to configure the Rockwell Automation Add-On Instruction. The functionality allows the ProSoft Add-On Instruction to work with the Rockwell Automation tags.

1. Click the question mark next to GE 850 Relay_Name and select the tag that was created in the previous section.



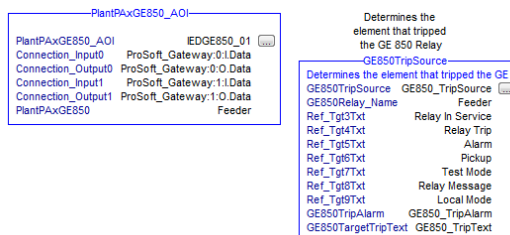
2. Click the question mark next to each Ref_Tgt#Ttxt and enter a string tag. These tags are intended to match the status indicators on the front panel of the device.
3. Once you type the tag name, if the tag is not already configured in the controller, you have to right-click and create a tag.



4. Click the question mark next to GE850TripAlarm and select or create the digital alarm tag to be used.
This tag is used for alarming through the Human Machine Interface (HMI) FactoryTalk® Alarms and Events Server.

5. Click the question mark next to GE850TargetTripText and select or create the tag to be used.
This tag is used to alarm through the HMI FactoryTalk Alarms and Events Server.

Figure 5 - Fully Configured Add-On Instructions



6. Save and download your project to the controller.

Using Visualization Files

See [Using a Display Element on page 16](#) for detailed information.

Faceplates

The Operator tab is displayed when the faceplate is initially opened. Click the appropriate icon on the left of the faceplate to access a specific tab.



Table 114 - Tab Descriptions

Item	Description
1	Operator tab
2	Diagnostics tab
3	Help

Operator Tab

The Faceplate initially opens to the Operator tab, sometimes called the Home tab. From here, an operator can monitor the device status.

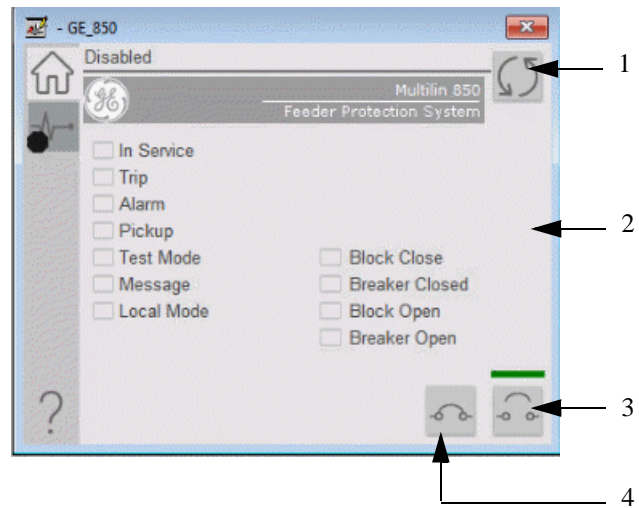


Table 115 - Operator Tab Description

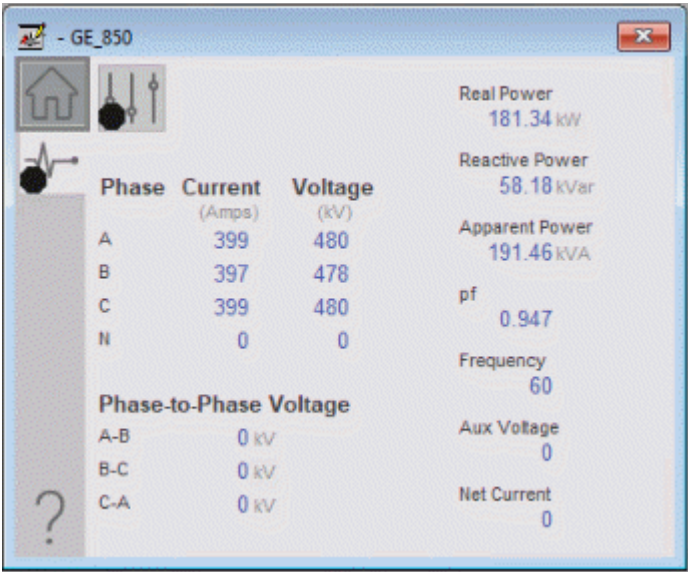
Item	Description
1	Click to reset the device. The status of the device is indicated on the faceplate.
2	Status Indicators
3	Click to open the circuit breaker.
4	Click to close the circuit breaker.

Diagnostics Tab

The diagnostics tab allows the operator to see the measurement values from the physical device.

Diagnostics Tab

Readout of the measurement values from the GE 850.



Advanced Properties


Click the advanced properties icon  on the diagnostics page to display the advanced properties. The following screen capture shows the tabs that are available in the advanced properties display



Table 116 - Advanced Properties Tab Descriptions

Item	Description
1	HMI Configuration
2	Faults
3	Help

HMI Configuration Tab

The HMI configuration tab provides access to displayed text, and faceplate-to-faceplate navigation settings. Configure the description, label, tag, and security area for the device.

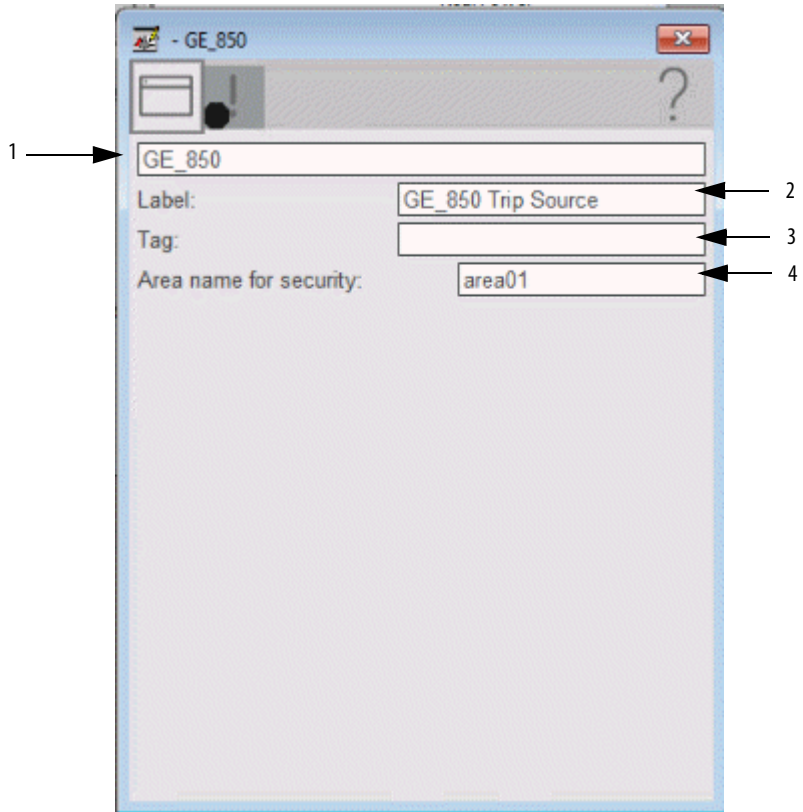
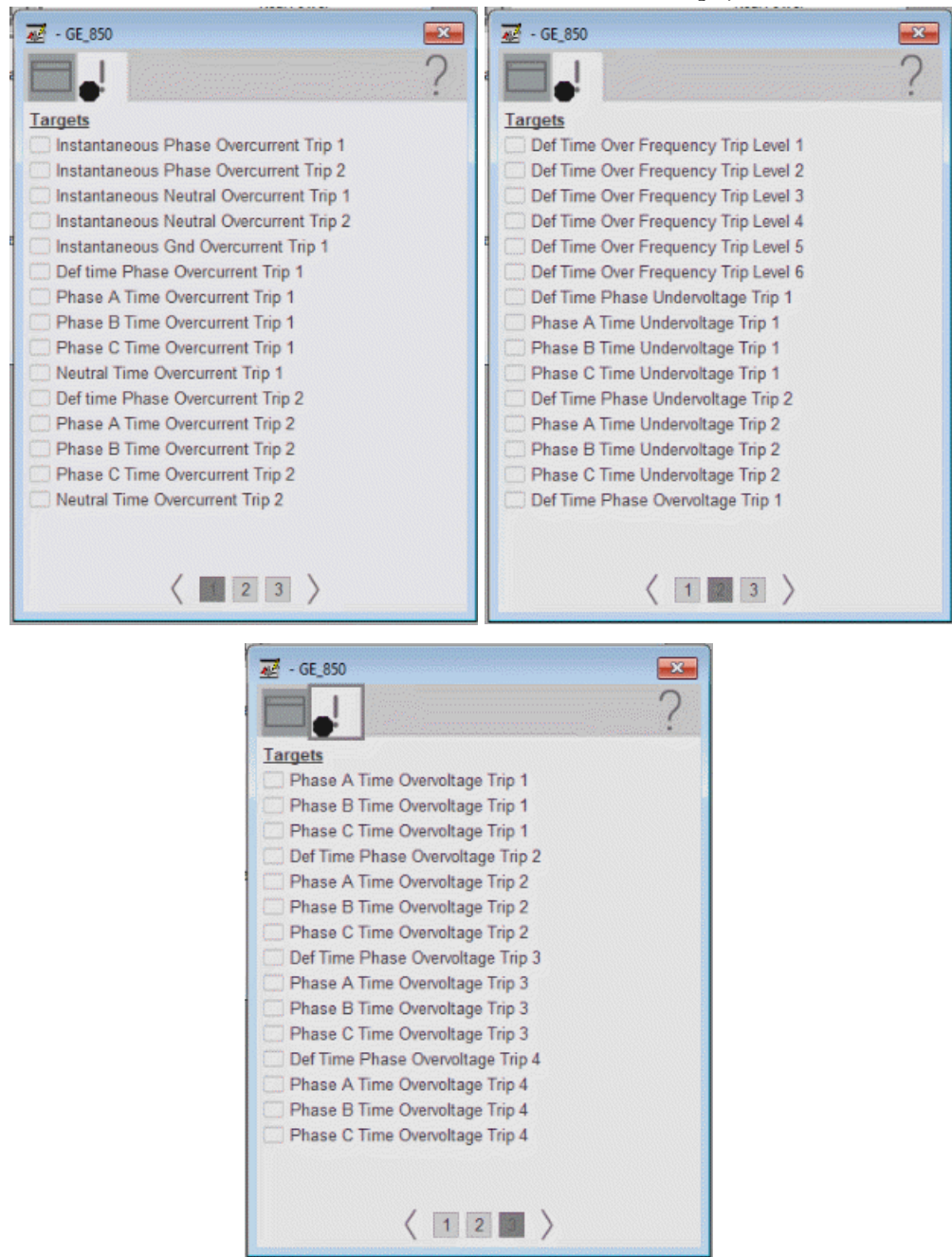


Table 117 - HMI Configuration Tab Description

Item	Action
1	Type the device description to show on the faceplate title bar.
2	Type the label to show on the graphic symbol.
3	Type the tag name to show on the faceplate and Tooltip. IMPORTANT: Pause the mouse over this field to display a tool tip with the configured Logix tag/path.
4	Type the Area name for security.

Faults Tab

The faults tab shows which alarms are active from the physical device.



Help Button

Press the help button on the faceplates to access help specific to that faceplate. The help file is in .pdf format and opens in a separate window.

GE Multilin 869 Object

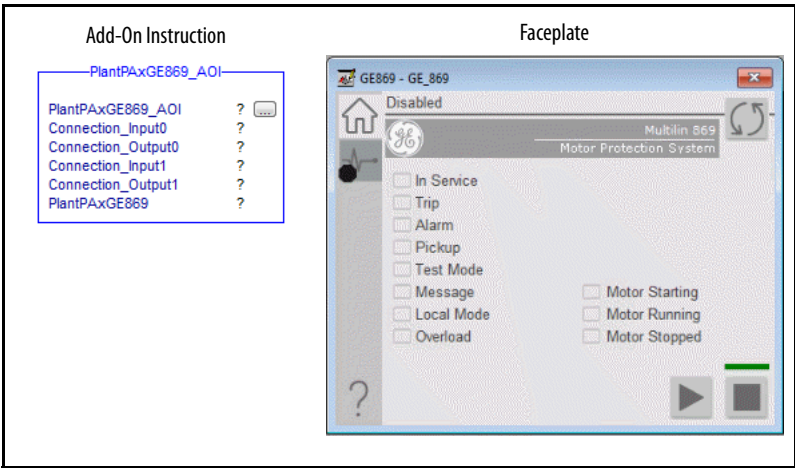


Images courtesy of General Electric. Multilin and the monogram are copyright of the General Electric Company © 2018.

The General Electric (GE) 869 is a motor protection relay with arc flash protection. This device is designed for the protection, control, and management of medium- and large-induction and synchronous motors. The GE 869 relay provides advanced condition-based monitoring and diagnostics with high-end fault and disturbance recording. The device also provides fundamental metering data, including (but not limited to) voltage, current, frequency, and power. The GE 869 can also provide various environmental measurements at its respective physical install location.

Topic	Page
Controller Code	270
Mapping InOut Tags to Add-On Instructions	272
Using Visualization Files	276
Faceplates	277

This Add-On Instruction monitors one GE 869 motor protection relay. Alarms are provided when the device experiences a protection-related trip. The instruction also provides capabilities for starting and stopping the motor feature of the relay.



Controller Code

Two Add-On Instructions represent each physical device. You must configure the InOut parameters of each Add-On Instruction per physical device.

The first Add-On Instruction is the ProSoft software-generated Add-On Instruction (see [Chapter 2](#)), which maps data to the controller. The second Add-On Instruction is the TripSource Add-On Instruction, available for download from the library resources from the PCDC, which is for faceplate management

InOut Structure for ProSoft Add-On Instruction

InOut parameters in [Table 118](#) are used to link the Add-On Instruction to external tags that contain necessary data for the instruction to operate. These external tags must be of the data type shown. These tags are representative of the tags that are required for each GE 869 relay, which is configured in your system.

Table 118 - GE 869 Add-On Instruction

Name	Data Type	Description
[DeviceName]_AOI	[DeviceName]_AOI	Add-On Instruction tag. Matches naming from ProSoft Configuration Manager.
Connection_Input0	SINT[500]	CIP Connection Input data. The number of these parameters varies depending on system sizing.
Connection_Output0	SINT[496]	CIP Connection Output data. The number of these parameters varies depending on system sizing.
Connection_Input1	SINT[500]	CIP Connection Input data. The number of these parameters varies depending on system sizing.
Connection_Output1	SINT[496]	CIP Connection Output data. The number of these parameters varies depending on system sizing.
[DeviceName]	[DeviceName]	Device data that is collected from the CIP connections and organized into understandable tags. This data type changes to match each device tag in the ProSoft Gateway.

InOut Structure for Rockwell Automation Library Download

[Table 119](#) shows the InOut parameters that are available from the Rockwell Automation

Library of Electrical Protection Devices Folder in the PCDC. These external tags must be of the data type shown.

Table 119 - GE 869_TripSource

Name	Data Type	Description
[DeviceName]_Relay_Name	<Defined by device AOI>	Device data from the Add-On Instruction. This data type changes to match each device tag in the ProSoft Gateway.
Ref_Tgt3Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt4Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt5Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt6Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt7Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt8Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt9Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt10Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt11Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
[DeviceName]TripAlarm	ALARM_DIGITAL	Digital Alarm tag
[DeviceName]TripText	STRING	Alarm text to be displayed when active.

Remote Bit Control Value Structure

Remote Bit Control Value parameters are used to link the Add-On Instruction to configurable input points in the physical device. Each bit is configurable via the vendor software of each device. [Table 120](#) has recommended uses for each bit.

Table 120 - Remote Bit Control - GE 869 Relay

Control Bit	Function
GGI03_CO_SPCS01_Oper_ctlVal	Reset Relay
GGI03_CO_SPCS02_Oper_ctlVal	Motor Start
GGI03_CO_SPCS03_Oper_ctlVal	Motor Stop

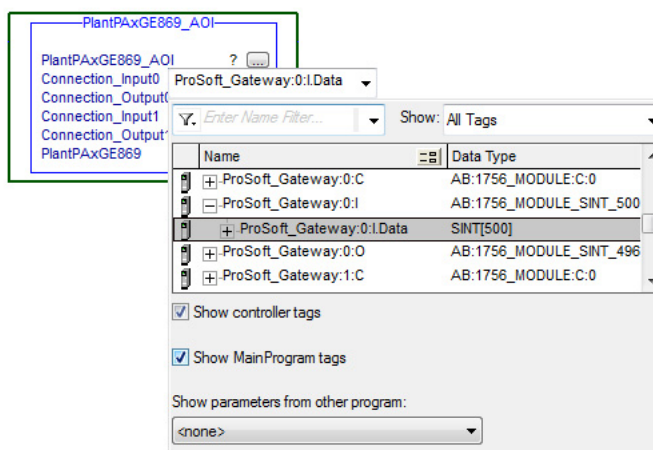
Mapping InOut Tags to Add-On Instructions

Each GE 869 relay requires two Add-On Instructions to monitor and visualize the relay. The ProSoft Software instruction is created in [Chapter 2](#). The Add-On Instruction is downloaded from the Rockwell Automation® Library of Electrical Protection Devices from the PCDC.

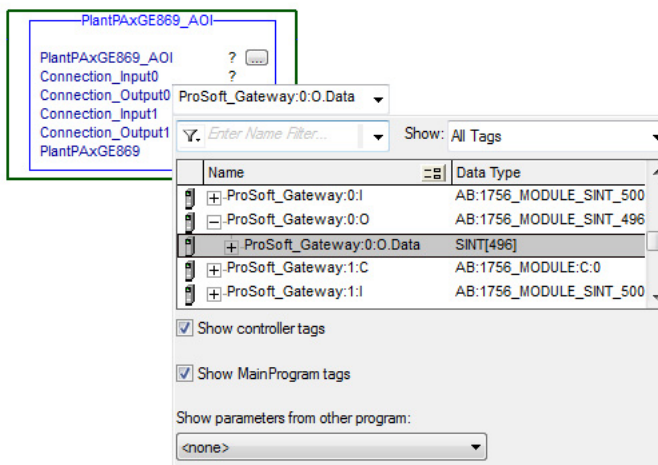
Associate Controller Tags to ProSoft Add-On Instruction

Complete these steps to map the ProSoft instruction to Studio 5000® tags.

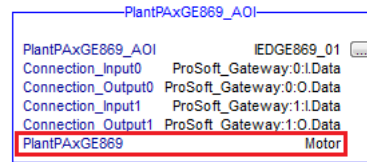
1. Double-click the question mark next to Connection_Input0 of the device Add-On Instruction.
2. Click the down arrow on the drop box and expand the ProSoft_Gateway:0:I. Select the ProSoft_Gateway:0:I.Data and double-click to choose it.



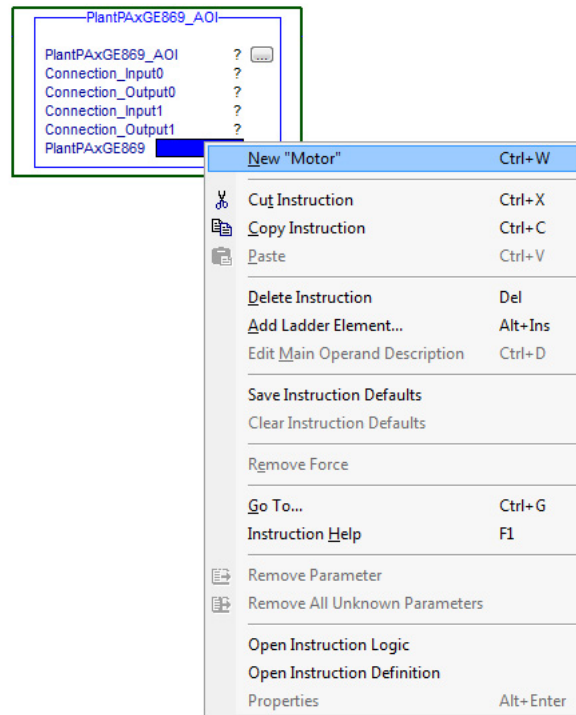
3. Double-click the question mark next to Connection_Output0 of the device Add-On Instruction.
4. Click the down arrow on the drop box and expand the ProSoft_Gateway:0:O. Select the ProSoft_Gateway:0:O.Data and double-click to choose it.



5. Repeat this process for each Connection Input and Output that is included with your Add-On Instructions.
6. Click the question mark next to the final tag. Type a tag name that represents your physical device within your Studio 5000 project. In this example, the name is “Motor”.

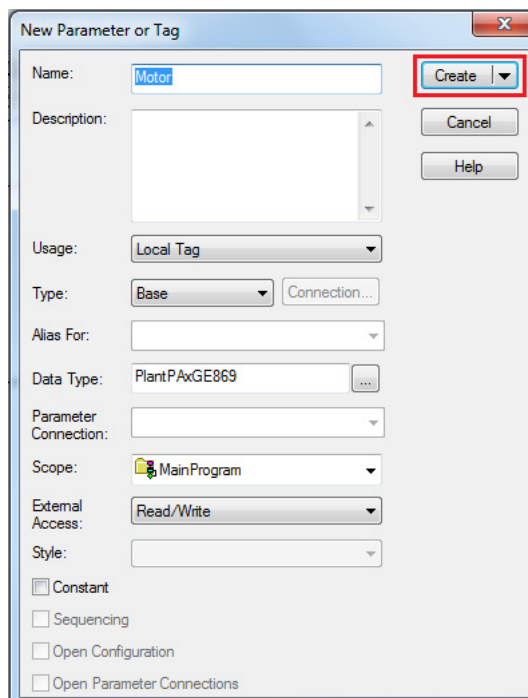


7. Right-click on the new tag name and select New “<tag name>”.



8. Click Create on the New Tag dialog box.

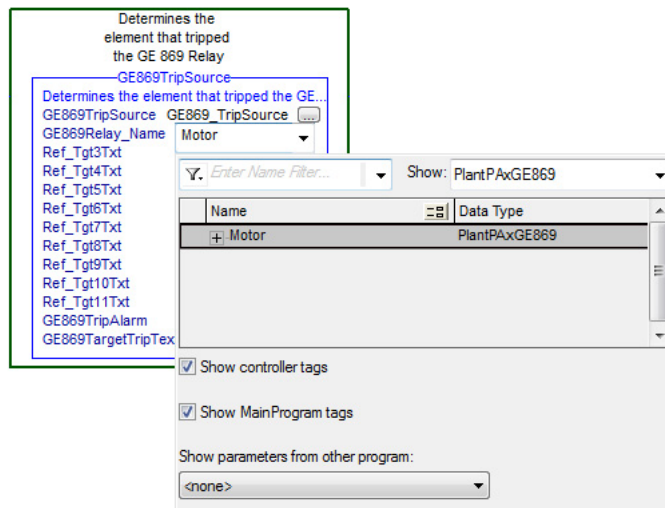
IMPORTANT Verify that Data Type matches intended device configuration.



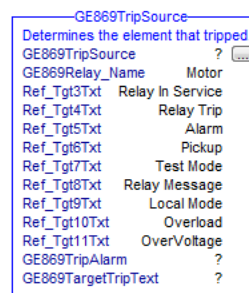
Configure Rockwell Automation Add-On Instruction

This section describes how to configure the Rockwell Automation Add-On Instruction. The functionality allows the ProSoft Add-On Instruction to work with the Rockwell Automation tags.

1. Click the question mark next to GE869Relay_Name and select the tag that was created in [step 8](#).



2. Click the question mark next to each Ref_Tgt#Txt and enter a string tag. These tags are intended to match the status indicators on the front panel of the device.
3. Once you type the tag name, if the tag is not already configured in the controller, you must right-click and create a tag.

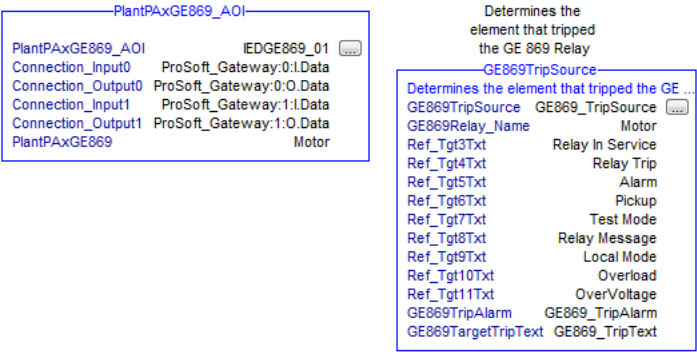


4. Click the question mark next to GE869TripAlarm and select or create the digital alarm tag to be used.

This tag is used for alarming through the Human Machine Interface (HMI) FactoryTalk® Alarms and Events Server.

5. Click the question mark next to GE869TargetTripText and select or create the tag to be used.
This tag is used for alarming through the HMI FactoryTalk Alarms and Events Server.

Figure 6 - Fully Configured Add-On Instructions



6. Save and download your project to the controller.

Using Visualization Files

See [Using a Display Element on page 16](#) for detailed information.

Faceplates

The Operator tab is displayed when the faceplate is initially opened. Click the appropriate icon on the left of the faceplate to access a specific tab.



Table 121 - Tab Descriptions

Item	Description
1	Operator tab
2	Diagnostics tab
3	Help

Operator Tab

The Faceplate initially opens to the Operator tab, sometimes called the Home tab. From here, an operator can monitor the device status and manually operate the device.

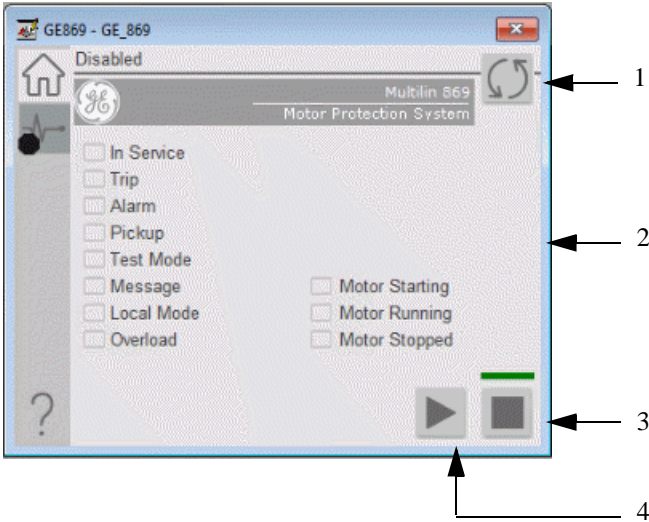


Table 122 - Operator Tab Description

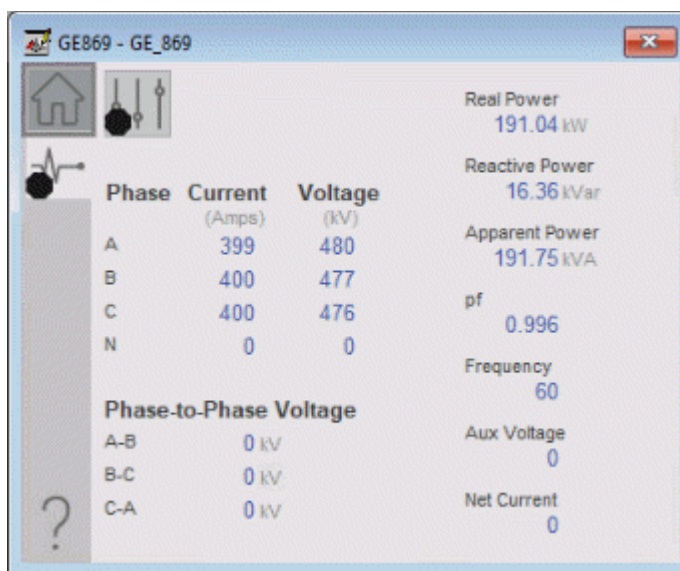
Item	Description
1	Click to reset the device. The status of the device is indicated on the faceplate.
2	Status Indicators
3	Click to stop the motor.
4	Click to start the motor.

Diagnostics Tab

The diagnostics tab allows the operator to see the measurement values from the physical device.

Diagnostics Tab

Readout of the measurement values from the GE 869.



Advanced Properties


Click the advanced properties icon  on the diagnostics page to display the advanced properties. The following screen capture shows the tabs that are available in the advanced properties display



Table 123 - Advanced Properties Tab Descriptions

Item	Description
1	HMI Configuration
2	Faults
3	Help

HMI Configuration Tab

The HMI configuration tab provides access to displayed text, and faceplate-to-faceplate navigation settings. Configure the description, label, tag, and security area for the device.

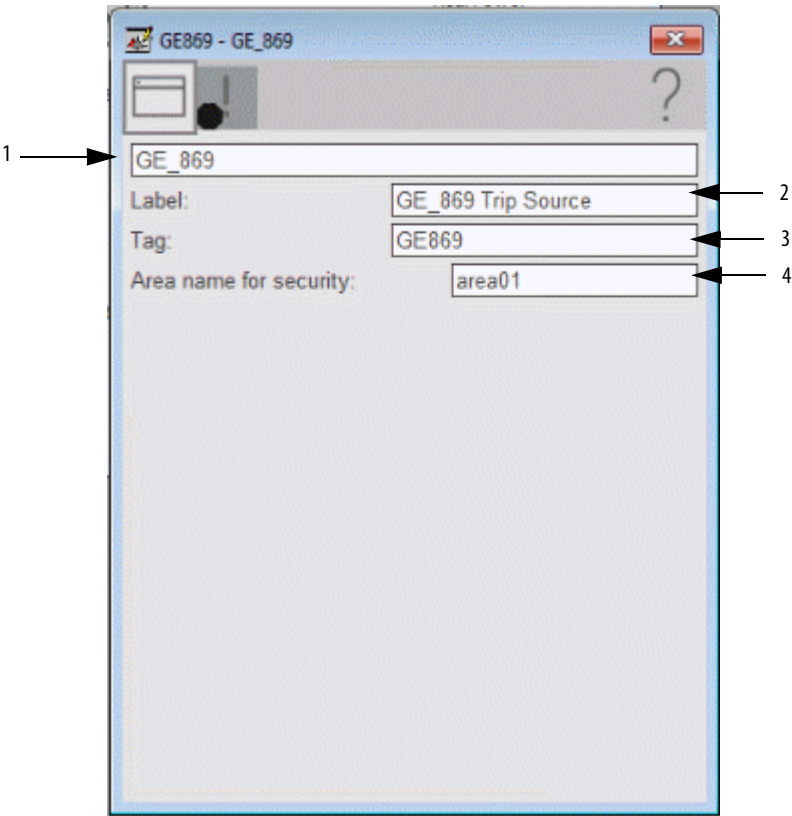
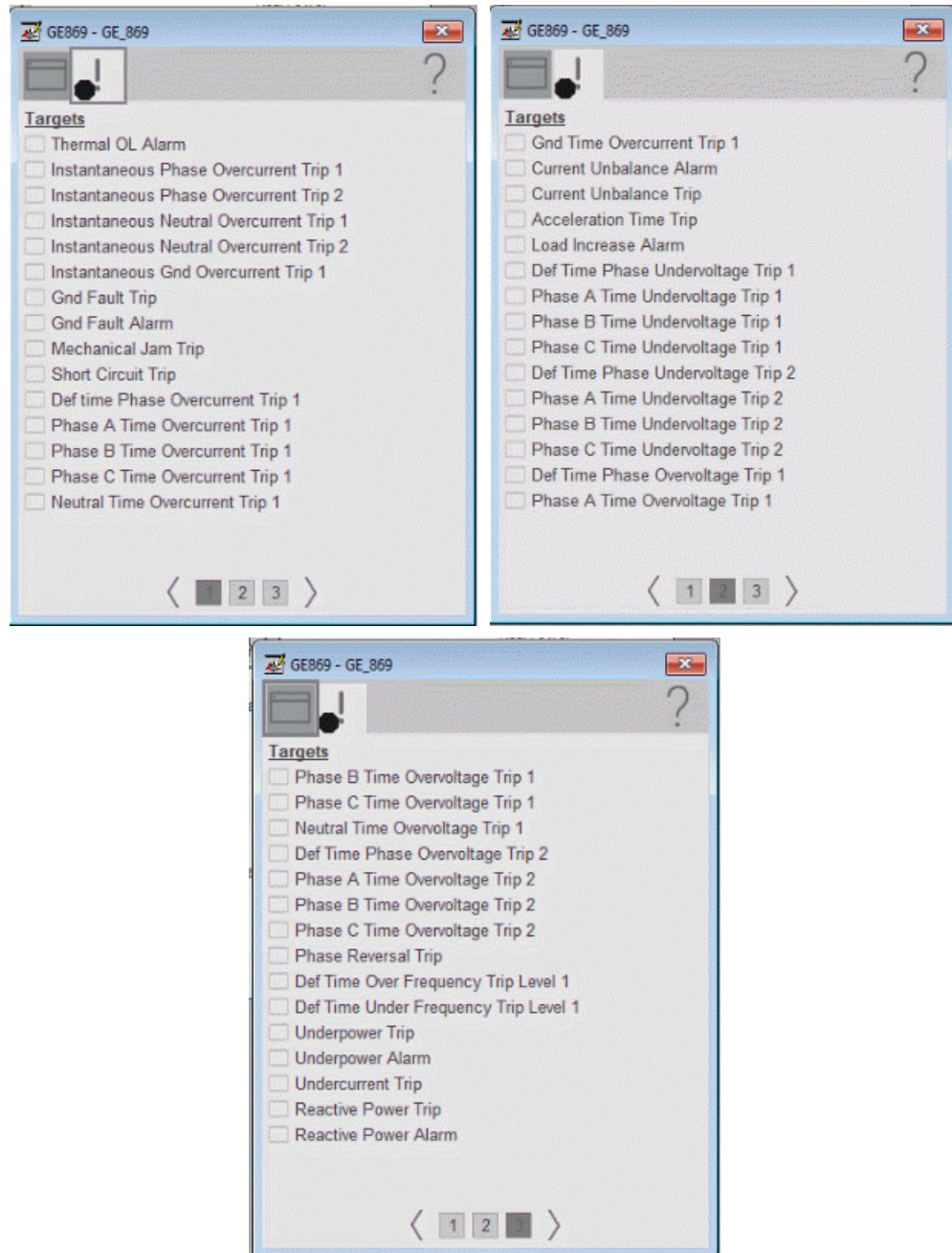


Table 124 - HMI Configuration Tab Description

Item	Action
1	Type the device description to show on the faceplate title bar.
2	Type the label to show on the graphic symbol.
3	Type the tag name to show on the faceplate and Tooltip. IMPORTANT: Pause the mouse over this field to display a tool tip with the configured Logix tag/path.
4	Type the Area name for security.

Faults Tab

The faults tab shows which alarms are active from the physical device.



Help Button

Press the help button on the faceplates to access help specific to that faceplate. The help file is in .pdf format and opens in a separate window.

Notes:

GE Multilin 889 Object



Images courtesy of General Electric. Multilin and the monogram are copyright of the General Electric Company © 2018.

The General Electric (GE) 889 is a generator protection relay with arc flash protection. This device is designed to provide subcycle differential protection, control, and monitoring of primary and back-up generation equipment. The device also provides fundamental metering data including (but not limited to) voltage, current, frequency, and power. The GE 889 can also provide various environmental measurements at its respective physical install location.

Topic	Page
Controller Code	284
Mapping InOut Tags to Add-On Instructions	285
Using Visualization Files	289
Faceplates	290

This Add-On Instruction monitors one GE 889 generator protection relay. Alarms are provided when the device experiences a protection-related trip. The instruction also provides capabilities for opening and closing the breaker feature of the relay.

Add-On Instruction

PlantPAxGE889_AOI

PlantPAxGE889_AOI ?

Connection_Input0 ?

Connection_Output0 ?

Connection_Input1 ?

Connection_Output1 ?

PlantPAxGE889 ?

Faceplate

- GE_889

Disabled

Multilin 889

Generator Protection System

☐ In Service

☐ Trip

☐ Alarm

☐ Pickup

☐ Test Mode

☐ Message

☐ Local Mode

☐ Overload

☐ Gen Brkr Closed

☐ Gen Brkr Open

Controller Code

Two Add-On Instructions represent each physical device. You must configure the InOut parameters of each Add-On Instruction per physical device.

The first Add-On Instruction is the ProSoft software-generated Add-On Instruction (see [Chapter 2](#)), which maps data to the controller. The second Add-On Instruction is the TripSource Add-On Instruction, available for download from the library resources from the PCDC, which is for faceplate management

InOut Structure for ProSoft Add-On Instruction

InOut parameters in [Table 125](#) are used to link the Add-On Instruction to external tags that contain necessary data for the instruction to operate. These external tags must be of the data type shown. These tags are representative of the tags that are required for each GE 889 relay, which is configured in your system.

Table 125 - GE 889 Add-On Instruction

Name	Data Type	Description
[DeviceName]_AOI	[DeviceName]_AOI	Add-On Instruction tag. Matches naming from ProSoft Configuration Manager.
Connection_Input0	SINT[500]	CIP Connection Input data. The number of these parameters varies depending on system sizing.
Connection_Output0	SINT[496]	CIP Connection Output data. The number of these parameters varies depending on system sizing.
Connection_Input1	SINT[500]	CIP Connection Input data. The number of these parameters varies depending on system sizing.
Connection_Output1	SINT[496]	CIP Connection Output data. The number of these parameters varies depending on system sizing.
[DeviceName]	[DeviceName]	Device data that is collected from the CIP connections and organized into understandable tags. This data type changes to match each device tag in the ProSoft Gateway.

InOut Structure for Rockwell Automation Library Download

[Table 126](#) shows the InOut parameters that are available from the Rockwell Automation® Library of Electrical Protection Devices Folder in the PCDC. These external tags must be of the data type shown.

Table 126 - GE 889_TripSource

Name	Data Type	Description
[DeviceName]_Relay_Name	<Defined by device AOI>	Device data from the Add-On Instruction. This data type changes to match each device tag in the ProSoft Gateway.
Ref_Tgt3Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt4Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.

Name	Data Type	Description
Ref_Tgt5Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt6Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt7Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt8Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt9Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
Ref_Tgt10Txt	STRING	Alarm description for device front-plate status indicators, which is configurable through device vendor software.
[DeviceName]TripAlarm	ALARM_DIGITAL	Digital Alarm tag
[DeviceName]TripText	STRING	Alarm text to be displayed when active.

Remote Bit Control Value Structure

Remote Bit Control Value parameters are used to link the Add-On Instruction to configurable input points in the physical device. Each bit is configurable via the vendor software of each device. [Table 127](#) has recommended uses for each bit.

Table 127 - Remote Bit Control - GE 889 Relay

Control Bit	Function
GGI03_CO_SPCS01_Oper_ctlVal	Enable Relay Configuration
GGI03_CO_SPCS02_Oper_ctlVal	Reset Relay
GGI03_CO_SPCS03_Oper_ctlVal	Breaker Close
GGI03_CO_SPCS03_Oper_ctlVal	Breaker Open

Mapping InOut Tags to Add-On Instructions

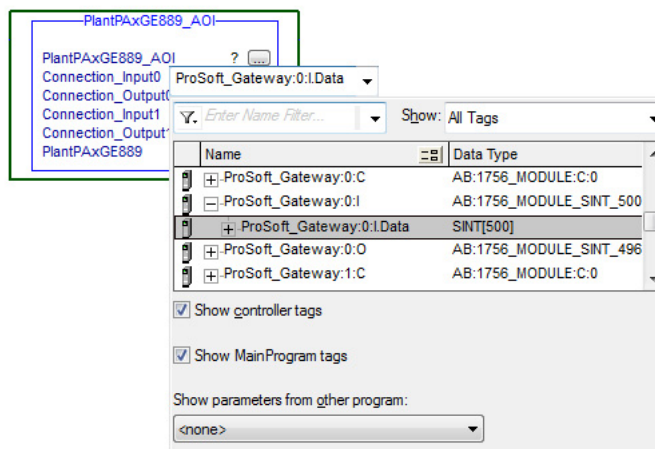
Each GE 889 relay requires two Add-On Instructions to monitor and visualize the relay. The ProSoft Software instruction is created in [Chapter 2](#). The Add-On Instruction is downloaded from the Rockwell Automation® Library of Electrical Protection Devices from the PCDC.

Associate Controller Tags to ProSoft Add-On Instruction

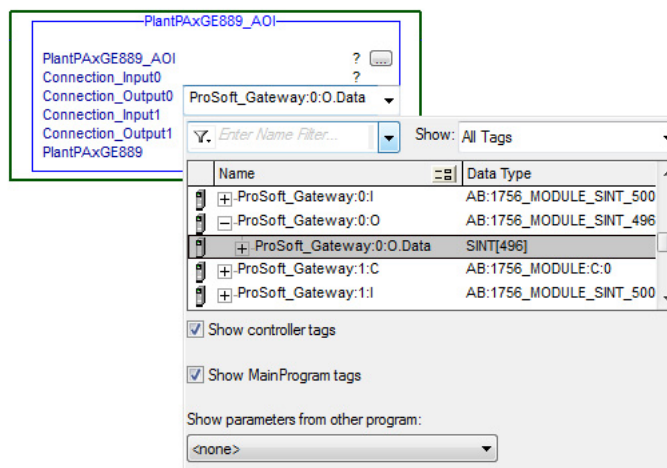
Complete these steps to map the ProSoft instruction to Studio 5000® tags.

1. Double-click the question mark next to Connection_Input0 of the device Add-On Instruction.

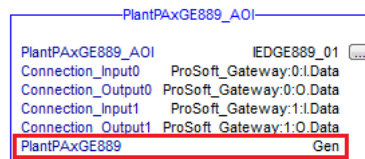
- Click the down arrow on the drop box and expand the ProSoft_Gateway:0:I. Select the ProSoft_Gateway:0:I.Data and double-click to choose it.



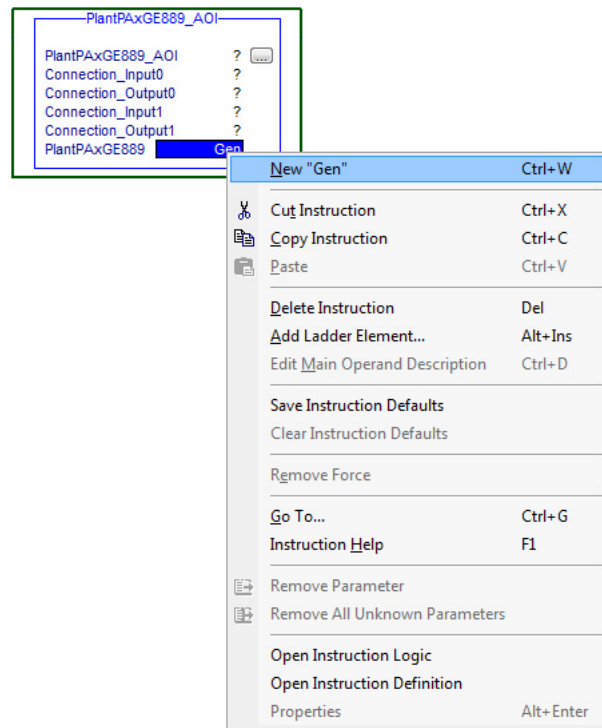
- Double-click the question mark next to Connection_Output0 of the device Add-On Instruction.
- Click the down arrow on the drop box and expand the ProSoft_Gateway:0:O. Select the ProSoft_Gateway:0:O.Data and double-click to choose it.



- Repeat this process for each Connection Input and Output that is included with your Add-On Instructions.
- Click the question mark next to the final tag. Type a tag name that represents your physical device within your Studio 5000 project. In this example, the name is "Gen".

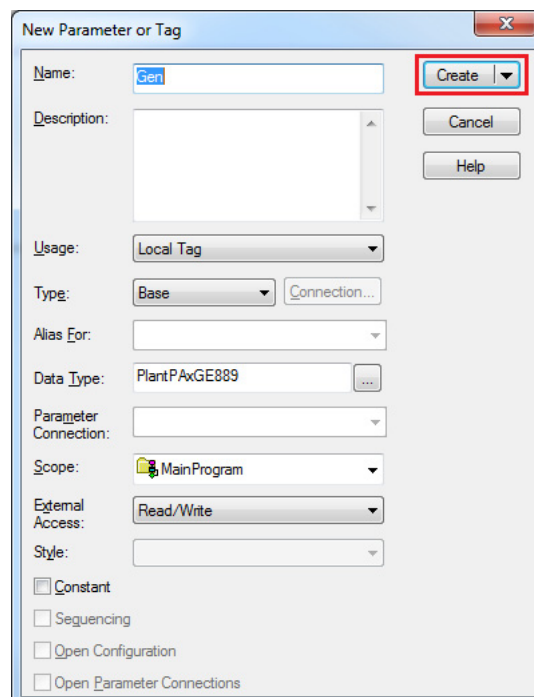


7. Right-click on the new tag name and select New "<tag name>".



8. Click Create on the New Tag dialog box.

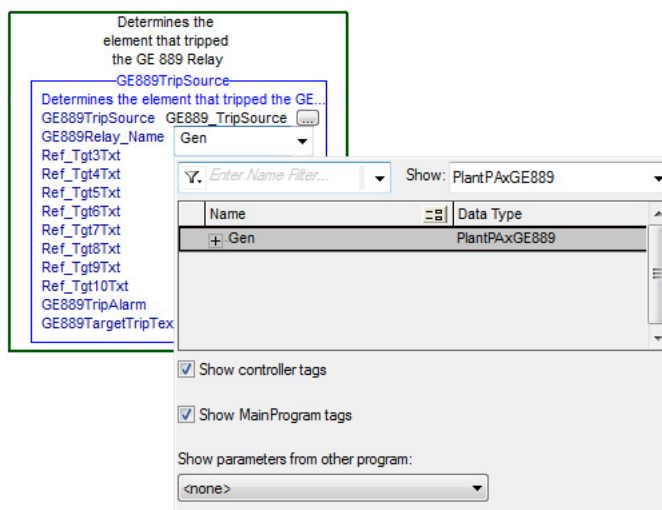
IMPORTANT Verify that Data Type matches intended device configuration.



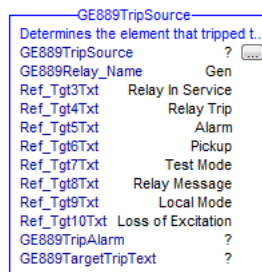
Configure Rockwell Automation Add-On Instruction

This section describes how to configure the Rockwell Automation Add-On Instruction. The functionality allows the ProSoft Add-On Instruction to work with the Rockwell Automation tags.

1. Click the question mark next to GE889Relay_Name and select the tag that was created in [step 8](#).



2. Click the question mark next to each Ref_Tgt#Txt and enter a string tag. These tags are intended to match the status indicators on the front panel of the device.
3. Once you type the tag name, if the tag is not already configured in the controller, you have to right-click and create a tag.

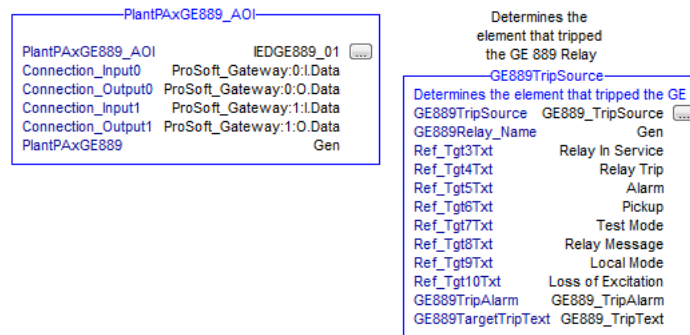


4. Click the question mark next to GE889TripAlarm and select or create the digital alarm tag to be used.
This tag is used for alarming through the Human Machine Interface (HMI) FactoryTalk® Alarms and Events Server.

- Click the question mark next to GE889TargetTripText and select or create the tag to be used.

This tag is used for alarm message through the HMI FactoryTalk Alarms and Events Server.

Figure 7 - Fully Configured Add-On Instructions



- Save and download your project to the controller.

Using Visualization Files

See [Using a Display Element on page 16](#) for detailed information.

Faceplates

The Operator tab is displayed when the faceplate is initially opened. Click the appropriate icon on the left of the faceplate to access a specific tab.



Table 128 - Tab Descriptions

Item	Description
1	Operator tab
2	Diagnostics tab
3	Help

Operator Tab

The Faceplate initially opens to the Operator tab, sometimes called the Home tab. From here, an operator can monitor the device status and manually operate the device.

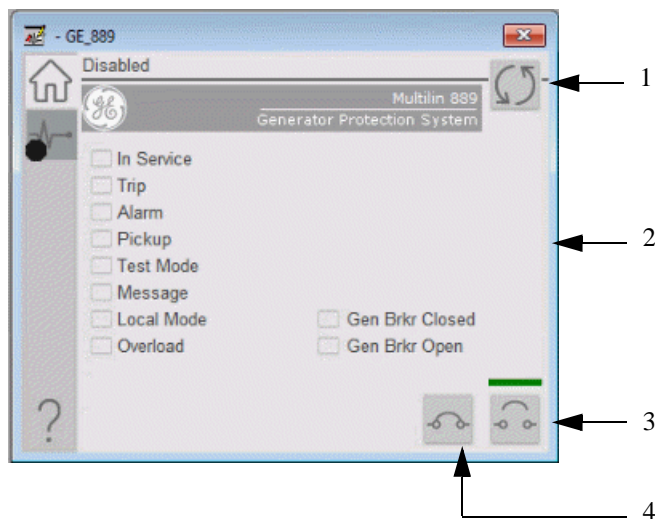


Table 129 - Operator Tab Description

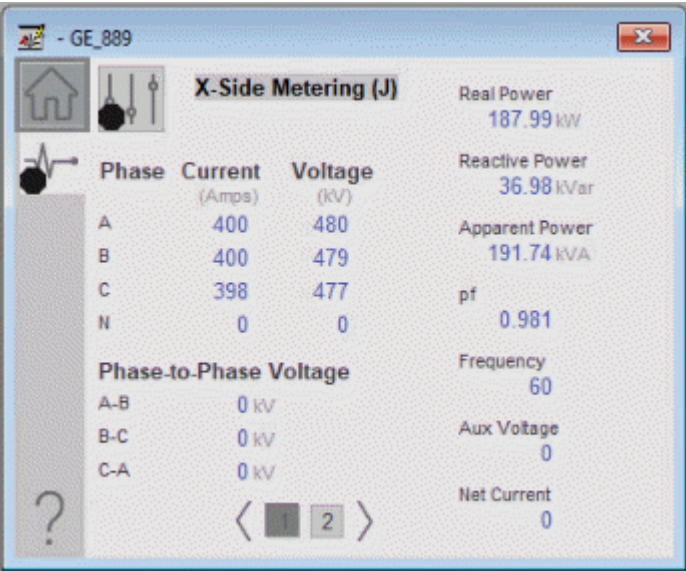
Item	Description
1	Click to reset the device. The status of the device is indicated on the faceplate.
2	Status Indicators
3	Click to open the circuit breaker.
4	Click to close the circuit breaker.

Diagnostics Tab

The diagnostics tab allows the operator to see the measurement values from the physical device.

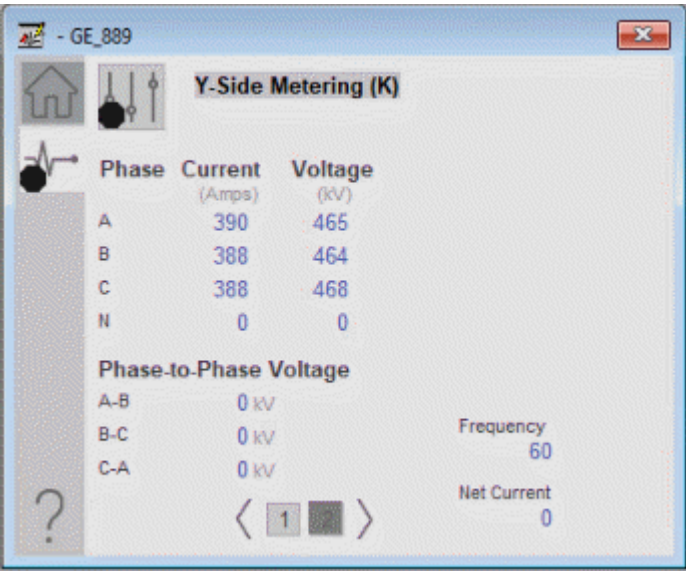
Diagnostics Tab Page 1

Readout of the X-side measurement values from the GE 889. This readout displays fundamental metering data that is associated with the X-side of the generator.



Diagnostics Tab Page 2

Readout of the Y-side measurement values from the GE 889. This readout displays fundamental metering data that is associated with the Y-side of the generator.



Advanced Properties


Click the advanced properties icon  on the diagnostics page to display the advanced properties. The following screen capture shows the tabs that are available in the advanced properties display

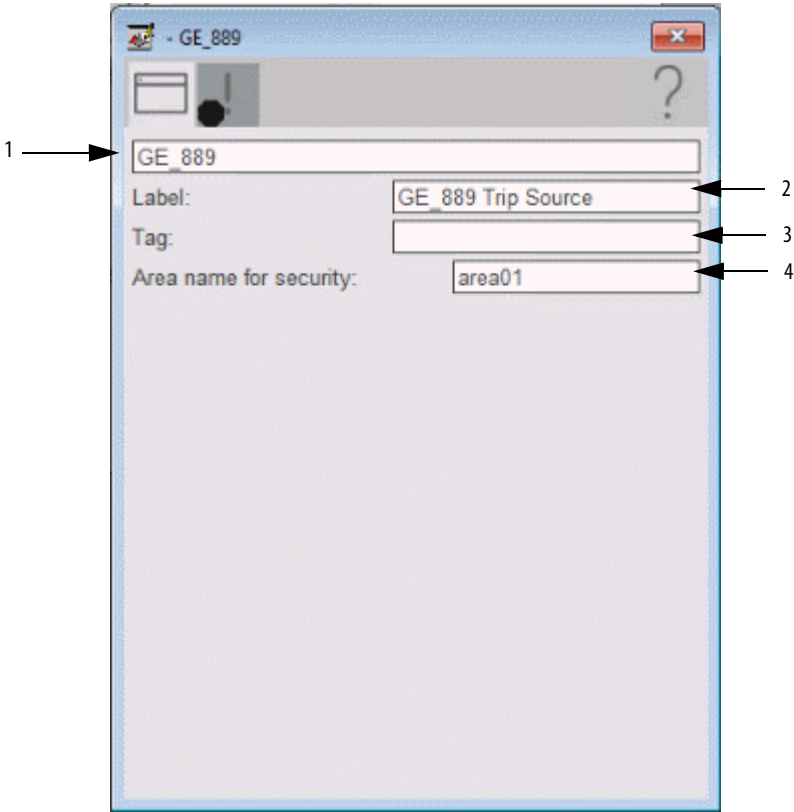


Table 130 - Advanced Properties Tab Descriptions

Item	Description
1	HMI Configuration
2	Faults
3	Help

HMI Configuration Tab

The HMI configuration tab provides access to displayed text, and faceplate-to-faceplate navigation settings. Configure the description, label, tag, and security area for the device.

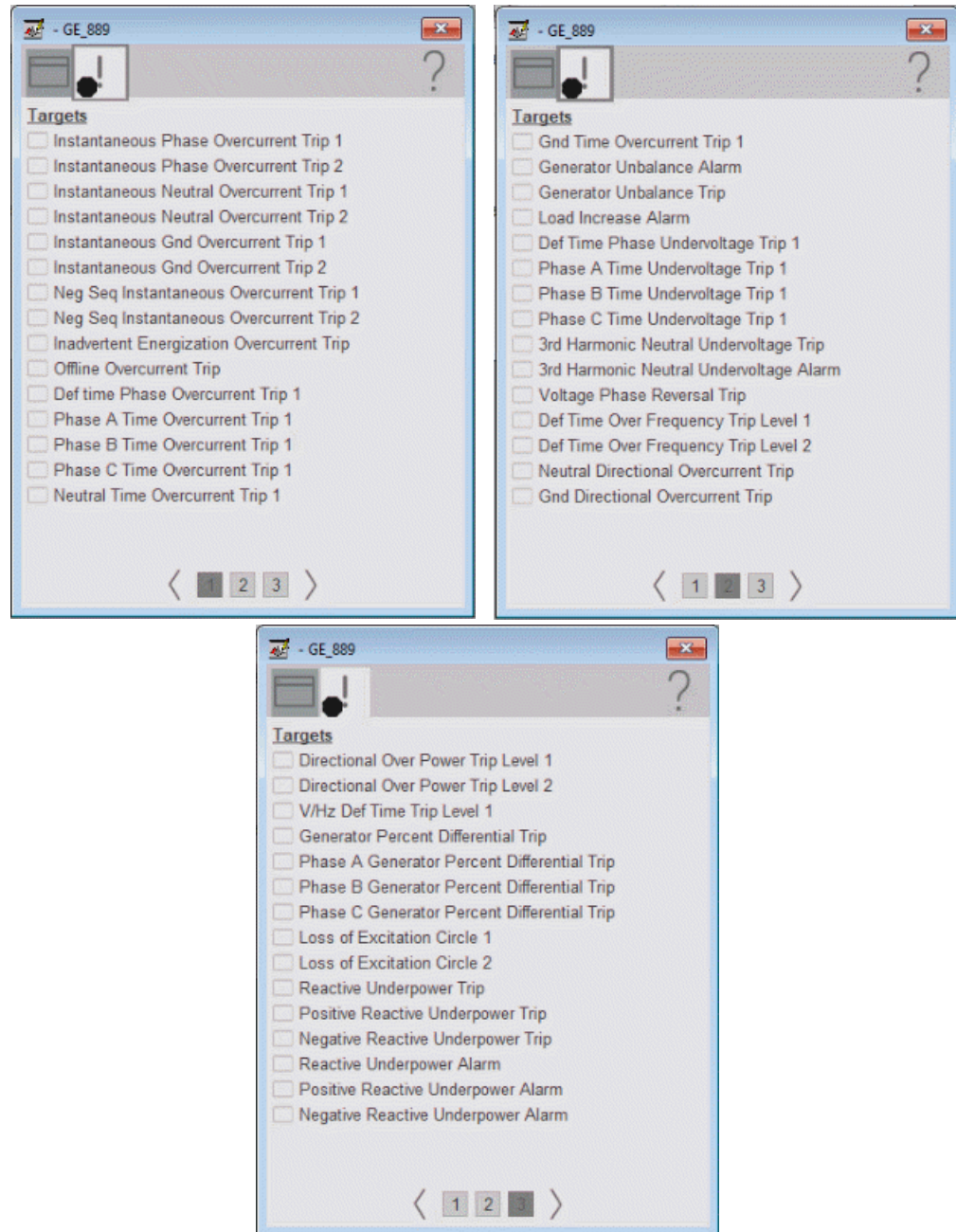


HMI Configuration Tab

Item	Action
1	Type the device description to show on the faceplate title bar.
2	Type the label to show on the graphic symbol.
3	Type the tag name to show on the faceplate and Tooltip. IMPORTANT: Pause the mouse over this field to display a tool tip with the configured Logix tag/path.
4	Type the Area name for security.

Faults Tab

The faults tab shows which alarms are active from the physical device.



Help Button

Press the help button on the faceplates to access help specific to that faceplate. The help file is in .pdf format and opens in a separate window.

Notes:

For definitions of terms not listed here, refer to the Allen-Bradley® Industrial Automation Glossary, publication [AG-7.1](#).

Add-On Instruction	Add-On Instructions are reusable code objects that contain encapsulated logic that can streamline the implementation of your system. The objects let you create your own instruction set for programming logic as a supplement to the instruction set provided natively in the ControlLogix® firmware. An Add-On Instruction is defined once in each controller project, and can be instantiated multiple times in your application code as needed.
address conflict detection (ACD)	Allows a device to detect if another device is using its IP address. This ACD is not to be confused with the .acd file extension, which is associated with the RSLogix 5000® software tool. The .acd file stores a programming project.
Address Resolution Protocol (ARP)	A broadcast message that asks who has this IP address; enables a network to learn and adapt to changes.
alarm	An audible or visible means of indicating to the operator an equipment malfunction, process deviation, or abnormal condition that requires a response.
alarm event	A push notification from the alarm object to the alarm subscriber that indicates a change in alarm state.
alarm management	The processes and practices to determine, document, design, operate, monitor, and maintain alarm systems.
alarm object	The alarm system element that owns the alarm; it is responsible to identify an alarm, manage its state, and generate an alarm event.
alarm priority	An attribute of In-Alarm event that informs you of the salience of the event.
alarm system	The collection of hardware and software that detects an alarm state, communicates the indication of that state to the operator, and records changes in the alarm state.
application objects	These objects define how device data is represented and accessed.
application server (AppServ)	The application server (AppServ) is also the Process Automation System Server (PASS) that is typically a FactoryTalk® Directory client of the PASS. Examples are AppServ-Batch for a FactoryTalk Batch application or AppServ-History for a Historian application.
architecture	An architecture is a representation of a control and software system, and the process and discipline for effectively implementing the designs for such a system. An architecture conveys the information content of the related elements that comprise a system, the relationships among those elements, and the rules that govern those relationships.

Automatic Device Configuration (ADC) A Studio 5000 environment feature that supports the automatic download of configuration data into a Logix controller. The download establishes an EtherNet/IP network connection to a device.

Automatic Device Replacement (ADR) A Studio 5000 environment feature that automatically commissions the original node address and downloads the original configured device parameters into the new device.

characterization A characterization is the operation and collection of performance data for a representative process system to determine scalability, stability, and usability of a specific system configuration. A characterization:

- Aims to define a complete system
- Is used to determine if the system is performing at specified level
- Is used to identify usability issues
- Is used to check and create rules, relationships, limits, and recommendations for system elements

CIP connection Transfers data from an application that runs on one end node (transmitter) to an application that runs on another end node (receiver); uses explicit or implicit message types; connected message types are used to transfer data; connected message type can use implicit or explicit messages; unconnected messages are used temporarily and only use explicit messages.

CIP Sync™ Time synchronization service for CIP. Synchronizes clocks across devices on the network; an individual time master with multiple slaves.

client A client is hardware (personal computer) and software that provides an interface with a link into a system server application. In the Rockwell Automation® architecture, a client is a computer that is loaded with runtime software.

Common Industrial Protocol (CIP) Open, message-based, application-layer protocol.

control strategy A control strategy is a system footprint to show the complexity of the following:

- Data servers
- Information storage
- Operator interface (graphics, faceplates)
- Control code (sequence, procedure, phases)
- I/O

Control strategies are used to determine a set of comprehensive process system footprints that establish a representative system loading. The representative system loading can be measured to identify a process system's boundaries and limitations (implementation rules).

Configured IED Description (CID) An XML file that defines all information that can be communicated from the Intelligent Electronic Device (IED).

Converged Plant-wide Ethernet (CPwE)	An architecture that provides standard network services to application devices and equipment in an Industrial Automation and Control System (IACS) application; integrates the devices and equipment into the wider enterprise.
critical system attribute (CSA)	<p>A critical system attribute (CSA) is a customer-facing characteristic that defines or identifies whether the system is performing as expected. CSAs are specific, visible indicators of overall system performance and usability.</p> <p>CSAs have specified parameters that must be maintained and that set the base operational requirements for the system. These parameters determine pass or fail (follow up) of a system test. For example, screen paint time < 2 seconds and screen refresh < 1 second.</p> <p>There are many other attributes that are associated with system elements such as controller loading, computer loading, and network settings that must be configured properly to maintain system CSAs.</p>
datastore	Represents a storage location for virtual machine files. A storage location can be a virtual machine file system volume, a local file system path, or a directory on Network Attached Storage.
development software	Development software is a program application that is used to configure various system components and not required at runtime. For example, Studio 5000 Logix Designer®, FactoryTalk View Studio software.
Device Level Ring (DLR)	An individual, fault-tolerant network for interconnection of automatic devices; Layer 2 protocol.
DHCP port-based allocation	Assigned automatically per physical switch port.
display object	A display object is a functional group of display elements with animations.
distributed control system (DCS)	A specially designed control system for complex and large applications in industrial processes wherein the control elements of the system are distributed geographically throughout the plant. In a DCS, a hierarchy of controllers is connected by communication networks for command and monitoring.
Domain Name System (DNS)	A name resolution protocol that enables identification of devices by name instead of IP address.
Dynamic Host Configuration Protocol (DHCP)	A server assigns IP addresses from a pool of addresses.
Electronic data sheet (EDS)	An ASCII text file that describes the features of an EtherNet/IP device and is used by software tools for device and network configuration.

engineering workstation (EWS)	The engineering workstation (EWS) provides system configuration, development, and maintenance functions of the PlantPAx® system. The EWS contains development software, including FactoryTalk View SE Studio and Studio 5000 Logix Designer.
ESXi hypervisor	Also called a 'bare metal' hypervisor, this virtual software is on top of the resources of a host server when the server does not have an operating system installed.
FactoryTalk Directory software	FactoryTalk Directory software defines where system data is stored for access. FactoryTalk Directory software provides a common address book of factory resources that are shared among FactoryTalk-enabled products.
FactoryTalk Services Platform	The FactoryTalk Services Platform (FTSP) is a service-oriented architecture (see SOA) that delivers value through FactoryTalk-enabled products. This platform reduces the customer learning curve and project engineering time through commonality and reuse. For example, activation, FactoryTalk Directory, security, diagnostics, audit, live data, and alarms and events.
flowchart	A formalized graphic representation of a logic sequence, work, or manufacturing process, organization chart, or similar formalized structure.
full-duplex mode	A data transmission mode that is deterministic, collision-free, and can transmit and receive simultaneously.
function block diagram	A graphical language for programmable logic controller design that describes the function between input variables and output variables.
gateway	Connects individual networks to a system of networks.
Generic Object-Oriented Substation Event (GOOSE)	A control strategy to collect and control devices remotely in a distributed system.
global object	An object that is created once and can be referenced multiple times on multiple displays in an application.
half-duplex mode	A data transmission that is non-deterministic, and transmits and receives at different times; collisions occur if a transmission and reception is attempted simultaneously.
historian	Historian is a data collection system with the following components: collection, storage, compression, retrieval, reports, and analysis. Historian functions include raw sampling, compression, storage, retrieval, reconstitute, analyze, summarize, and present (reports and displays).
hypervisor	A program that lets multiple operating systems share resources from an individual hardware host; also called a virtual machine manager. The hypervisor manages the host processor and resources, to allocate what is needed to each virtual machine to make sure they cannot negatively impact each other.

hypervisor client	A program that lets you remotely connect to a host server with a hypervisor from any workstation. From the hypervisor client, you can create, deploy, copy, and edit your virtual machines. When a hypervisor client connects to a vCenter server, additional features include management of your virtual machines.
IEEE-1588	Standard for Precision Clock Synchronization Protocol for Networked Measurement and Control Systems (Precision Time Protocol or PTP).
implicit connection	Time critical in nature. For example, I/O and produced/consumed tags.
Integrated Architecture (IA)	Integrated Architecture (IA) is the identifying name of Rockwell Automation group of products that use Rockwell Automation core-enabling technologies. The PlantPAx system is a defined set of IA products configured in a prescribed way to provide optimal performance as a distributed control system.
International Electrotechnical Commission (IEC)	A global standards body.
Internet Group Management Protocol (IGMP)	A protocol that manages the membership of IP multicast groups.
IP address	Identifies each node on the IP network or system of connected networks.
Knowledgebase	A Rockwell Automation online database of hardware and software solutions based on actual customer-support requests.
linear topology	End-user devices that are daisy-chained together; limited number of nodes are supported.
Manufacturing Message Specification (MMS)	A SCADA-like communication within the IEC 61850 standard.
Network Address Translation (NAT)	A service that translates one IP address to another IP address via a NAT-configured switch. NAT makes it possible for devices that share one IP address on a private subnet to be segmented into multiple identical private subnets while maintaining unique identities on the public subnet.
old computer name	The term 'old computer name' is used to refer to the computer name of the virtual machine before your changes. It could be the factory default computer name of the virtual machines or a computer name set by your organization. Once the computer name is changed, the previous computer name becomes the old computer name.
OPC	A set of industry-standard specifications that define interfaces for communicating with automation devices and services.
operator workstation (OWS)	The operator workstation (OWS) provides the graphical view and interface into the process. The workstation is a client of either a PASS or AppServ-HMI.

PlantPAx Distributed Control System The PlantPAx system has all core capabilities that are expected in a world-class distributed control system (DCS). The system is built on a standards-based architecture by using Integrated Architecture® components that enable multi-disciplined control and premier integration with the Rockwell Automation® intelligent motor control portfolio.

Process Automation System Server (PASS) The Process Automation System Server (PASS) is the core PlantPAx system server that allows central administration throughout the PlantPAx system. The PASS is a required component.

redundant star topology Dual connections.

server Software component that serves data to an application (for example, data server). Typically, server software components are installed on server-class computers.

SFC A programming language in which individual machine operations within a process are organized into steps and transitions.

star topology End-user devices are connected to each other via a switch.

static A device that is hard-coded with an IP address.

subnet mask Determines which of the 32 bits of the IP address are part of the network ID and which are part of the unique node identification.

Supervisory Control and Data Acquisition (SCADA) A control strategy to collect and control devices remotely in a distributed system.

system attribute A system attribute is an operational functionality that can be manipulated or measured and is used to establish the operational boundaries or system capability. For example workstation memory, number of parameters on a screen, and number of control loops. A system attribute can be independent or dependent.

system element A system element is a distinctive system entity that is made up of a combination of hardware and software products that support an identifiable system function or role. A system element can be manipulated to vary system operation or capability. For example, engineering workstation (EWS), operator workstation (OWS), process automation system server (PASS), and controller.

system infrastructure System infrastructure is the commercial hardware and software that is required to enable system elements to work together as a system. For example, network switches, computers.

system server A system server expands the scope of a system as it provides support for additional system capacity or optional system functions. For example, the Process Automation System Server (PASS) is a required component for all centralized and distributed process systems. The PASS provides central name resolution and system-wide, FactoryTalk services. The PASS provides the

capability to distribute information to the OWS and add to optional application servers to increase the scope of the process system.

TCP/IP Abbreviation for Transmission Control Protocol/Internet Protocol. A transport-layer protocol (TCP) and a network-layer protocol (IP) used by Rockwell Automation Ethernet modules to support explicit messaging.

User -defined Data Type (UDT) Tag types that you create once and reuse in multiple tag templates, multiple times.

virtual LAN (VLAN) A display object is a functional group of display elements with animations.

virtual machine A virtual machine is a software implementation of a computer or workstation that executes programs like a physical computer or workstation. A virtual machine is the collection of dedicated resources a computer needs (for example, RAM, HDD, CPU). These resources are allocated to a virtual machine with the help of a hypervisor.

virtualization A switched network segment on a functional or organizational basis rather than physical or geographical.

workstation A workstation is a computer that runs development, configuration, and optional maintenance software. A workstation is not a server.

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Rockwell Automation Support

Use the following resources to access support information.

Technical Support Center	Knowledgebase Articles, How-to Videos, FAQs, Chat, User Forums, and Product Notification Updates.	https://rockwellautomation.custhelp.com/
Local Technical Support Phone Numbers	Locate the phone number for your country.	http://www.rockwellautomation.com/global/support/get-support-now.page
Direct Dial Codes	Find the Direct Dial Code for your product. Use the code to route your call directly to a technical support engineer.	http://www.rockwellautomation.com/global/support/direct-dial.page
Literature Library	Installation Instructions, Manuals, Brochures, and Technical Data.	http://www.rockwellautomation.com/global/literature-library/overview.page
Product Compatibility and Download Center (PCDC)	Get help determining how products interact, check features and capabilities, and find associated firmware.	http://www.rockwellautomation.com/global/support/pcdc.page

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Publication PROCES-RM011D-EN-P - April 2020

Supersedes Publication PROCES-RM011B-EN-P - June 2019

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