Integrate Endress+Hauser Instruments in a PlantPAx Distributed Control System

System Release 5.0

PlantPAx
Distributed Control System

Endress+Hauser
People for Process Automation

Rockwell Automation

Selection Guide

Original Instructions

What's Inside

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Preferred Integration

Manufacturers often prefer to select components from different suppliers so they can achieve the best control system with the best measurement components. This approach can pose risks because integration of components from different sources is often problematic. There are hundreds of different components in a typical plant: controllers, remote I/O, electrical drives, safety equipment, and sensors. Each component must be integrated, configured, and optimized during startup and operation.

Rockwell Automation and Endress+Hauser have strengthened their strategic alliance to provide complete process automation solutions that include instrumentation, software, and control systems. Rockwell Automation and Endress+Hauser continuously develop pre-engineered, pre-tested, supported, and maintained integrated solutions for plant-wide diagnostics and lifecycle management for seamless operation between products from both companies. This preferred integration provides you with the following:

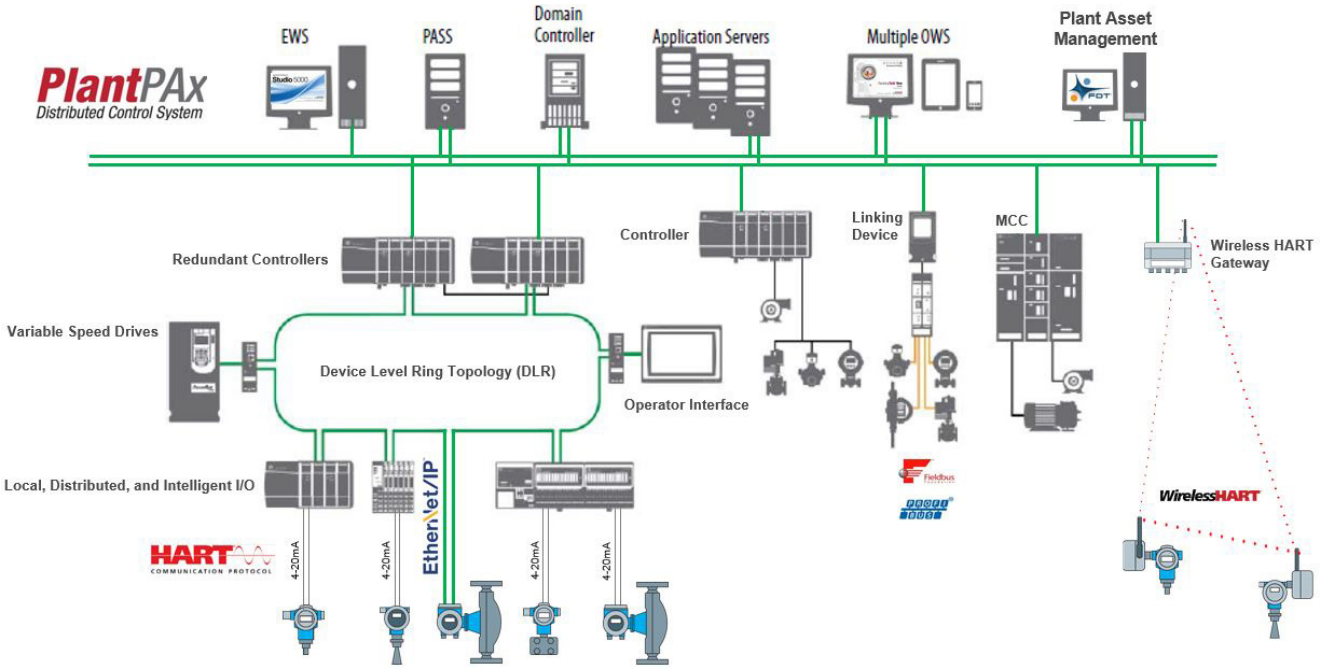
- Reduced integration costs throughout engineering, commissioning, and start-up
- Optimized plant availability and output
- Increased product quality and consistency
- Optimized traceability to meet regulatory demands
- Predictive maintenance through intelligent instruments

Integration tools from both companies include Add-on Profiles (AOPs) and process objects, that include Add-On Instructions and faceplates. This document helps you select the Endress+Hauser instruments to integrate with a Rockwell Automation control system.

Application Overview

The standard integration process involves the following steps:

1. Install the control system hardware and instrumentation.
   See Hardware Options and Software Options
2. Install Add-on Profiles and any other accessory files (such as EDS files).
   See Integration Components
   These files are necessary to configure the control hardware and instrumentation in the controller program.
3. Use the Add-On Instructions in the Process Object Library to develop the application.
   See Integration Components
4. Use the faceplates and graphical files to create an operator interface to monitor the application.
   See Integration Components
5. Use FDT/DTM technology to get access to the process device configuration. See Integration Components and Software Options



Hardware Options

Select communication modules that support the protocol that connects the Endress+Hauser instruments.

Protocol	See Page
HART	9
EtherNet/IP	25

Software Options

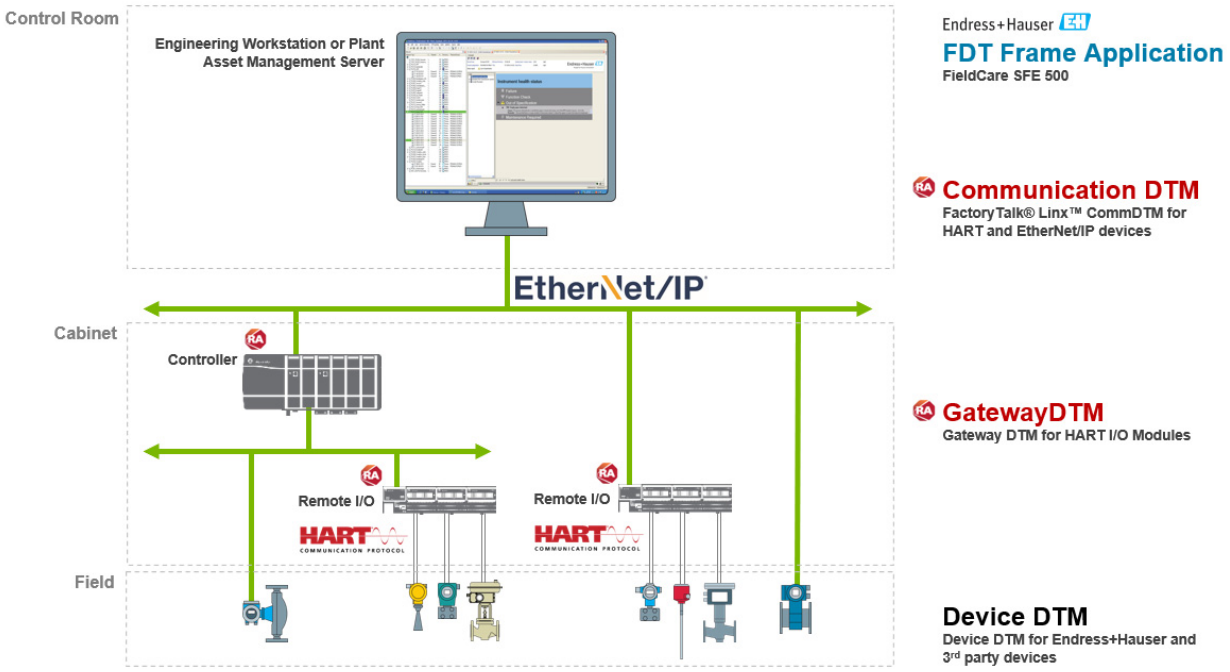
Software	Description
PlantPAx® Distributed Control System	The PlantPAx system is a distributed control system (DCS) that meets scalability and availability requirements for process control systems. The system shares common technology (the Integrated Architecture® system) with all other automation disciplines in the plant. This approach creates a seamless information flow across the plant for optimization opportunities and enables a connected enterprise. For more information, see the PlantPAx Distributed Control System Selection Guide, publication PROCES-SG001
Studio 5000® Integrated Design Environment	The design environment for the configuration of an Integrated Architecture system, including the PlantPAx system. For more information, see: Automation System Design Software
Endress+Hauser Device Configuration Management	FieldCare is the Endress+Hauser configuration tool for field devices. The software provides a range of functionality that includes device parameterization, replacement, and condition monitoring. The software uses DTM or EDD files to integrate devices. For more information see: Endress + Hauser Device Configuration Managerment
Endress+Hauser Netilion Industrial Internet of Things (IIoT) Services	Endress+Hauser solution for the Industrial Internet of Things. Improve and optimize plant productivity. For more information see: Endress+Hauser Netilion Services

Integration Components

Component	Description	Download
Add-on Profile (AOP)	An AOP file is the device description that integrates modules and devices into the Rockwell Automation Studio 5000 environment. An AOP file integrates configuration parameters and tag data into the controller program. This premier integration eliminates the need for you to map data or create tag aliases.	Rockwell Automation I/O modules: Find downloads In the search field, type AOP and select Add-on Profiles. Endress+Hauser Ethernet instruments: Downloads Select Media Type = Software and Software Type = Device Driver. In the search field, type AOP
Add-On Instruction (AOI)	Add-On Instructions are reusable code objects that contain encapsulated logic. The objects let you create your own instruction set for programming logic to supplement the instruction set that is native to the controller. An Add-On Instruction is defined once in each controller project, and can be instantiated multiple times in your application code.	The Rockwell Automation Library of Process Objects is a predefined library of controller code (Add-On Instructions), display elements (global objects), and faceplates. Find downloads In the search field, type process library and select the version. For more information, see: • Rockwell Automation Library of Process Objects, publication PROCES-RM200 • Rockwell Automation Library of Process Objects: HART Modules for PlantPAx DCS Reference Manual, publication PROCES-RM010
Faceplate	A faceplate is a graphical representation on an operator workstation of a specific function. Plant operators and engineers use the faceplates to monitor device performance, identify faults, and take corrective action. The faceplates create a flow of information between key components of the manufacturing process — from the Endress+Hauser instrumentation to an enterprise business system.	
Electronic data sheet (EDS)	An EDS file is the device description that integrates EtherNet/IP modules and instrumentation into the Rockwell Automation Studio 5000 environment.	Rockwell Automation devices: Find downloads In the search field, type EDS file. Endress+Hauser instruments: Downloads Select Media Type = Software and Software Type = Device Driver. In the search field, type EDS
Communication DTM (FactoryTalk® Linx CommDTM)	A Communication DTM is the first DTM to be activation upon communication setup in an FDT/FRAME system. This DTM standardizes the communication channel to the corresponding communication operations of the mapped network protocol. This DTM acts as the standardized device driver for one or multiple protocols.	Rockwell Automation devices: Find downloads In the search field, type FactoryTalk Linx CommDTM and select the version.
Gateway DTMs	Gateway DTMs let communication transition between the communications paths of different protocols in the FDT architecture. Gateway DTMs act as a link between the CommDTM and the device.	Rockwell Automation devices: Find downloads In the search field, type DTM and select the version
Device DTMs	A Device Type Manager™ (FDT/DTM™) is a software component for an intelligent device or communication component within a digital network. It contains all of the parameters, functions, user interfaces, and other items that represent the devices features. The user interface to the DTM is supplied by the manufacturer.	Endress+Hauser Device DTMs: Downloads Select Media = Device Driver Type = Device Type Manager (DTM) Type in the name for the desired device Download any other 3rd party Device DTMs direct on the FDT Group website (https://www.fdtgroup.org) or from the appropriate device vendor homepage

Process Device Configuration

Use FDT® Technology to configure, maintain, and monitor your smart field devices. Everything you need is in an FDT/DTM compatible frame application with the appropriate Communication, Gateway and device DTMs. Together an FDT Frame and a DTM, or a collection of DTMs, create an FDT-enabled application, which can be scaled from a single device to tens of thousands of devices controlled by a single FRAME throughout the automation system.



Process Device Integration

Most PlantPAx device integrations require that you instantiate one Add-On module Profile (AOP) and two Add-On Instructions (AOI) per field device:

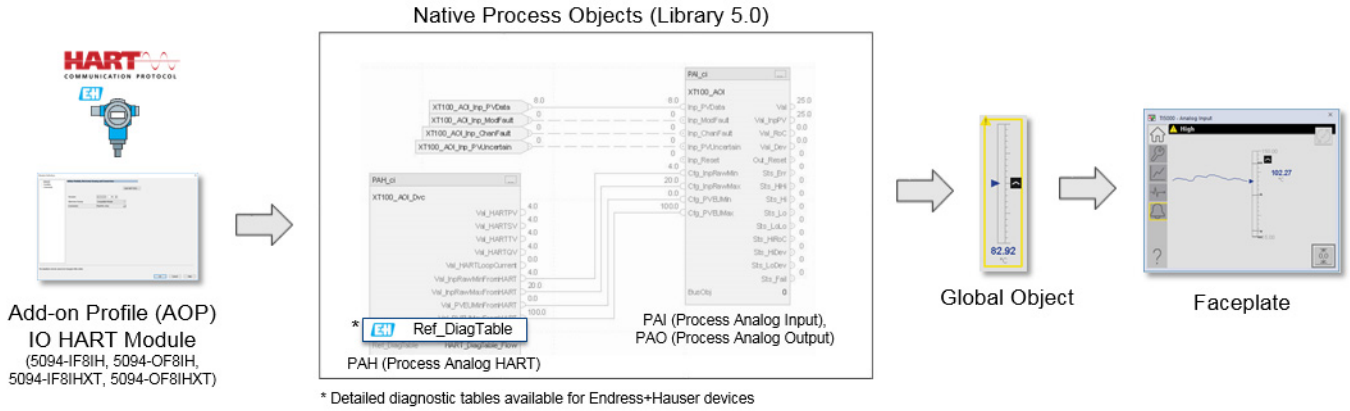
- Module or Device-specific Add-On module Profile for Studio 5000 software to create the item in the I/O Configuration list, required for device tags
- Device-specific Add-On Instruction that gathers the required device tags and prepares the data for use
- Generic object that uses the device data, along with custom-made device diagnostic and unit tables, to enable visibility with the PlantPAx Distributed Control System

Devices on Rockwell Automation HART I/O Modules

Highly-integrated HART provides a PlantPAx data type in the process controller for use with FLEX 5000 modules:

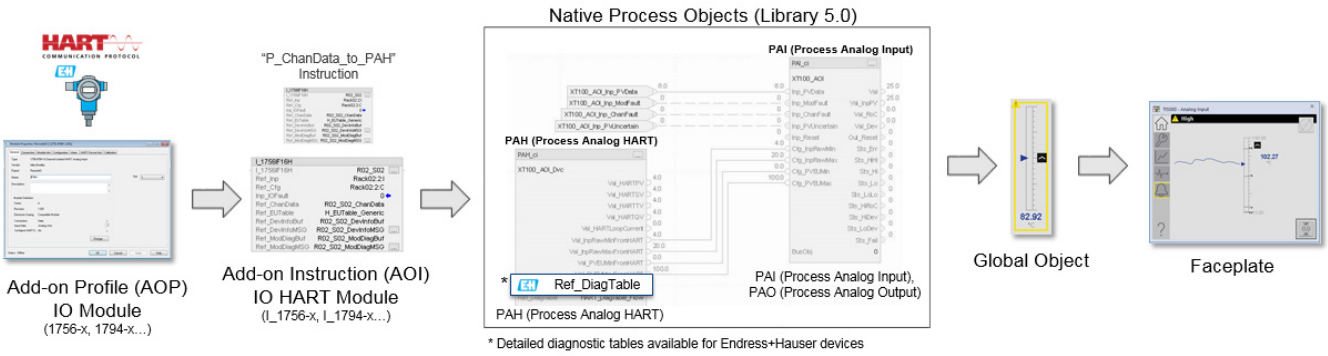
- Configuration of devices within the I/O Configuration tree (no Add-On Instruction needed)
- Device diagnostics automatically propagate to the controller project

Figure 1 - PlantPAx System Release 5.0 and FLEX 5000™ Highly Integrated HART I/O Modules



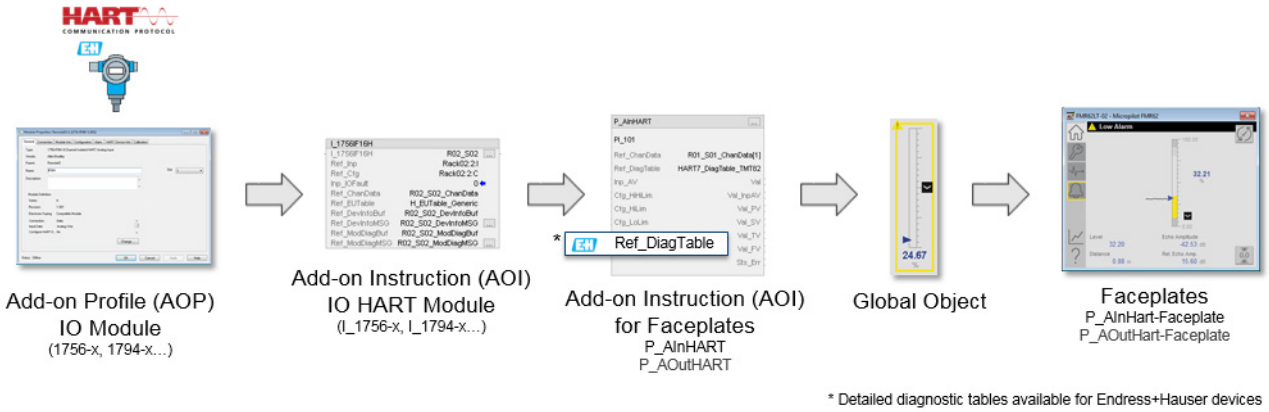
1. HART device in Studio 5000 I/O Configuration for device connection.
2. Add-on Profile for Module creation in (IOC) list, provides connection and device tags.
3. Process Controller PlantPAx Instructions for application logic/process strategies/alarms.
4. PlantPAx HMI Global Object to support Faceplates.
5. PlantPAx Faceplates.

Figure 2 - PlantPAx System Release 5.0 and 1756, 1794, 1718, 1719, 1734, 1769 or 1715 HART I/O Modules



1. HART device is not entered in Controllers I/O Configuration list.
2. Add-on Profile for Modules creation in (IOC) list, provides connection and device tags.
3. AOI to access device tags.
4. Add-on Instruction to interface device with PlantPAx Instructions.
5. Process Controller PlantPAx Instructions for application logic/process strategies/alarms.
6. PlantPAx HMI Global Object to support Faceplates.
7. PlantPAx Faceplates.

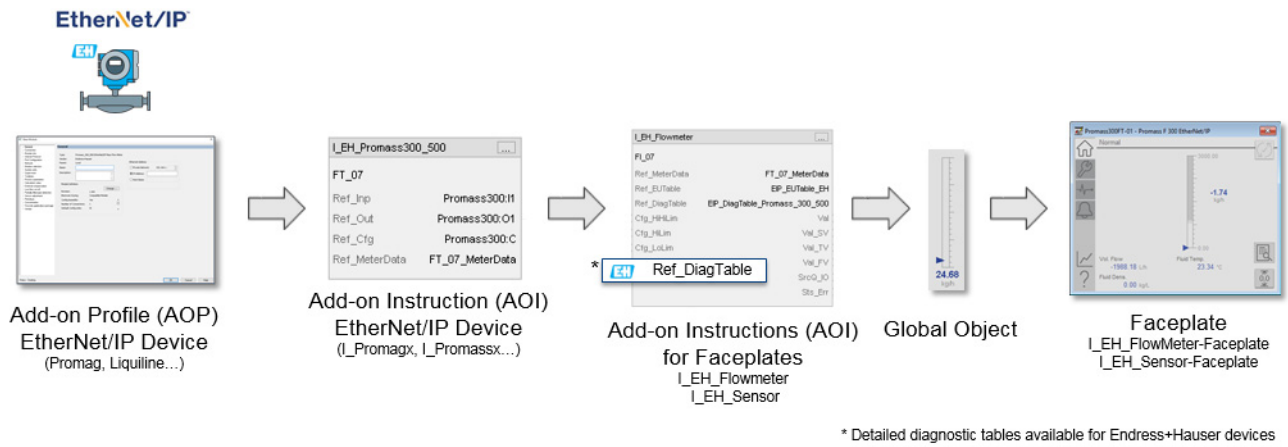
Figure 3 - PlantPAx System Release 4.6 and 1756, 1794, 1718, 1719, 1734, 1769 or 1715 HART I/O Modules



1. HART device is not entered in Controllers I/O Configuration list.
2. Add-on Profile for Modules creation in (IOC) list, provides connection and device tags.
3. Add-on Instruction to access device tags for use with application logic / process strategies.
4. Add-on Instruction for diagnostics and control to the HMI Global Object.
5. PlantPAx HMI Global Object to support Faceplates.
6. PlantPAx Faceplates, such as P_AInHART-Faceplate and P_AOutHART-Faceplate.

Devices on EtherNet/IP (Custom Add-On Profile)

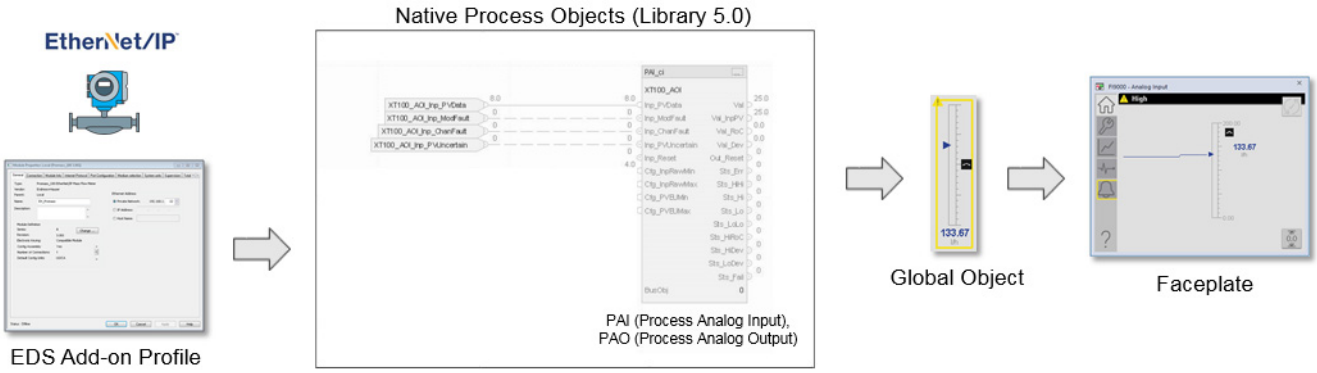
Figure 4 - PlantPAx System Release 4.6 and 5.0 and EtherNet/IP device with Custom AOP (for example, Endress+Hauser)



1. Endress+Hauser device in Studio 5000 I/O Configuration for device connection.
2. Add-on Profile for device creation and configuration, such as Promag, Liquiline.
3. Add-on Instruction to device tags, such as I_Promagx, I_Promassx... for use with application logic / process strategies.
4. Add-on Instruction for diagnostics and control to the HMI Global Object.
5. PlantPAx HMI Global Object to support Faceplates.
6. PlantPAx Faceplates, such as I_EH_FlowMeter-Faceplate and I_EH_Sensor-Faceplate.

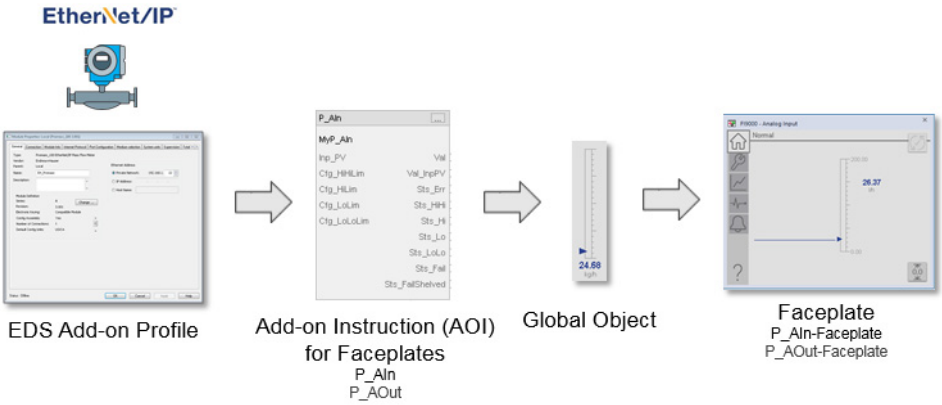
Devices on EtherNet/IP (Electronic Data Sheet Add-On Profile)

Figure 5 - PlantPAx System Release 5.0 and EtherNet/IP device with EDS AOP



1. Device in Studio 5000 I/O Configuration for device connection.
2. Add-on Profile created via Electronic Data Sheet (EDS) file, is used for device creation and configuration.
3. EDS files are text files that contain details about the readable and configurable parameters of the device.
4. Process Controller PlantPAx Instructions for application logic / process strategies /alarms.
5. PlantPAx HMI Global Object to support Faceplates.
6. PlantPAx Faceplates.

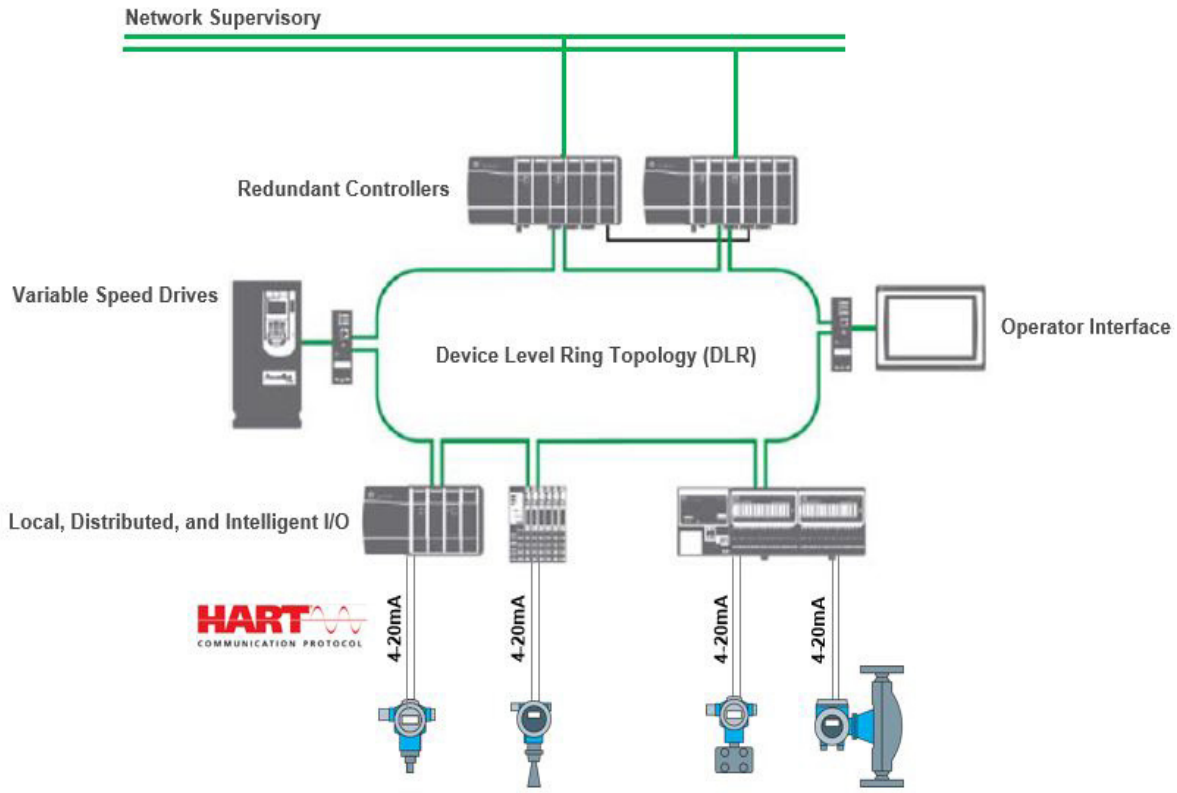
Figure 6 - PlantPAx System Release 4.6 and EtherNet/IP device with EDS AOP



1. Device in Studio 5000 I/O Configuration for device connection.
2. Add-on Profile created via EDS file, is used for device creation and configuration.
3. Add-on Profile for HMI Faceplates, such as P_AIn and P_AOut.
4. PlantPAx HMI Global Object to support Faceplates.
5. PlantPAx Faceplates, such as P_AIn and P_AOut.

The Highway Addressable Remote Transducer (HART) protocol supports industrial process measurement and control applications. The HART protocol combines analog and digital communication in both wired and wireless architectures. The analog signal uses a range of 4.0...20.0 mA DC, and the digital communication signal is superimposed on the analog signal. Additional information can be found in Publication PROCES-RM010, Rockwell Automation® Library of Process Objects: HART Modules for PlantPAx® DCS.

Example Topology



HART System Requirements

Supported I/O Modules

Family	Module	Description
1715 Redundant I/O Modules Redundant I/O System User Manual, publication 1715-UM001	1715-IF16	Allen-Bradley® redundant I/O 16-channel analog input module with HART
	1715-OF8I	Allen-Bradley redundant I/O 8-channel isolated analog input module with HART
1719 EX I/O Modules 1719 EX I/O Modules User Manual, publication 1719-UM001	1719-CF4H	Allen-Bradley 4-channel configurable HART analog I/O module
	1719-IF4HB	Allen-Bradley 4-channel HART analog input module
1756 ControlLogix I/O Modules ControlLogix HART Analog I/O Modules User Manual, publication 1756-UM533	1756-IF8H	Allen-Bradley ControlLogix® 8-channel HART analog input module
	1756-IF8IH	Allen-Bradley ControlLogix 8-channel isolated HART analog input module
	1756-IF16H	Allen-Bradley ControlLogix 16-channel HART analog input module
	1756-IF16IH	Allen-Bradley ControlLogix 16-channel isolated HART analog input module
	1756-OF8H	Allen-Bradley ControlLogix 8-channel HART analog output module
	1756-OF8IH	Allen-Bradley ControlLogix 8-channel isolated HART analog output module
1794 FLEX I/O Modules FLEX I/O Isolated Input/Output HART Analog Modules User Manual, publication 1794-UM065	1794-IF8IH	Allen-Bradley FLEX™ I/O 8-channel isolated HART analog input module
	1794-IF8IHNFXT	Allen-Bradley FLEX I/O-XT™ extended temperature 8-channel isolated HART analog input module
	1794-OF8IH	Allen-Bradley FLEX I/O 8-channel isolated HART analog output module
1734 POINT I/O Modules http://www.spectrumcontrols.com	1734sc-IE2CH	Spectrum Controls POINT I/O™ 2-channel HART analog input module
	1734sc-IE4CH	Spectrum Controls POINT I/O 4-channel HART analog input module
	1734sc-OE2CIH	Spectrum Controls POINT I/O 2-channel isolated HART analog output module
1769 Compact I/O Modules http://www.spectrumcontrols.com	1769sc-IF4IH	Spectrum Controls Compact I/O™ 4-channel isolated HART analog input module
	1769sc-OF4IH	Spectrum Controls Compact I/O 4-channel isolated HART analog output module
FLEX 5000 I/O Modules publication 5094-UM007	5094-IF8IH	Allen-Bradley Flex 5000™ Analog 8-channel analog isolated HART
	5094-OF8IH	Allen-Bradley Flex 5000 Analog 8-channel output isolated HART
	5094-IF8IHXT	Allen-Bradley Flex 5000 Analog 8-channel input isolated HART (Extreme environment)
	5094-OF8IHXT	Allen-Bradley Flex 5000 Analog 8-channel output isolated HART (Extreme environment)
WirelessHART Fieldgate Gateway WirelessHART Fieldgate Technical Information	SWG70	Endress+ Hauser WirelessHART gateway with Ethernet interface
WirelessHART Adapter WirelessHART Adapter Technical Information	SWA70	Endress+ Hauser WirelessHART interface with power supply for field devices
Memograph Memograph Technical Information	RSG45	Endress+ Hauser data manager

Download add-on profile and accessory files from the Product and Compatibility Download Center at:
https://compatibility.rockwellautomation.com/Pages/home.aspx

Integrated HART Devices

HART Analytical Devices

Family	Device	Documentation
Liquiline Multichannel transmitter for monitoring processes   	CM44P: multichannel; combines process photometers and Memosens sensors	Liquiline CM44P Operating Instructions
	CM442: 1 or 2 channel CM444: 4 channel CM448: 8 channel	Liquiline CM442/CM444/CM448 Operating Instructions
	CM442R: DIN rail or cabinet; 1 or 2 channel CM444R: DIN rail or cabinet; 4 channel CM448R: DIN rail or cabinet; 8 channel	Liquiline CM442R/CM444R/CM448R Operating Instructions
Liquiline M Transmitter for pH/ORP, conductivity, or oxygen measurement 	CM42: Two-wire transmitter for Ex and non-Ex areas	Technical Information Liquiline M CM42
Liquistation Stationary sampler for water and wastewater treatment  	CSF34: North America version	Liquistation CSF34 Operating Instructions
	CSF48: integrated controller	Liquistation CSF48 Operating Instructions

HART Analytical Devices

Family	Device	Documentation
Liquisys M Continuous plausibility, process, and sensor checks for liquid analysis  	CLM223: panel device; conductivity transmitter CLM253: field device; conductivity transmitter	Liquisys M CLM223/253 Operating Instructions
	COM223: panel device; dissolved oxygen transmitter COM253: field device; dissolved oxygen transmitter	Liquisys M COM223/253 Operating Instructions
	CPM223: panel device; pH/ORP transmitter CPM253: field device; pH/ORP transmitter	Liquisys M CPM223/253 Operating Instructions
Smartec S Toroidal conductivity measurement system  	CLD132: hygienic applications	Field Communication with SmarTec S CLD 132 Operating Instructions
	CLD134: hygienic and sterile applications	Smartec CLD134 Operating Instructions

HART Flow Devices

Family	Devices	Documentation
CNGmass DCI Coriolis flowmeter for refueling applications 	8DF	CNGmass DCI HART Operating Instructions
Cubemass DCI Ultra-compact Coriolos flowmeter for small quantities 	8CN	Cubemass DCI HART Operating Instructions
Proline t-mass Thermal mass flowmeter that is designed for the direct mass flow measurement of industrial gases, and compressed air  	65F: inline 65I: integrated gas engine	Proline t-mass 65 Operating Instruction

HART Flow Devices

Family	Devices	Documentation
Proline t-mass 150 Thermal mass flowmeter that is designed for the direct mass flow measurement of industrial gases, and compressed air 	A 150 utility gases; inline	Proline t-mass A 150 HART Operating Instructions
	B 150: utility gases; insertion	Proline t-mass B 150 HART Operating Instructions
	T 150: water; insertion	Proline t-mass T 150 HART Operating Instructions
Proline t-mass 300 Flowmeter with long-term stability and a sense for utility gases 	F 300: utility and process gases, inline, easy cleaning	Proline t-mass F/I 300/500 Operating Instructions
	I 300: utility and process gases, insertion, flexible mounting location	Proline t-mass F/I 300/500 Operating Instructions
Proline t-mass 500 Versatile instrument for pure gases and gas mixtures 	F 500: utility and process gases, inline, remote, easy cleaning	Proline t-mass F/I 300/500 Operating Instructions
	I 500: utility and process gases, insertion, remote, flexible mounting	Proline t-mass F/I 300/500 Operating Instructions
Promag 10 Electromagnetic flowmeter 	10D: wafer version 10E: basic chemical applications 10H: food and beverage and life science industries 10L: water and wastewater industries with a lap-joint flange 10P: chemical and process applications with corrosive liquids and high medium temperatures 10W: IP68 protection (Type 6P enclosure)	Proline Promag 10 HART Operating Instructions
Proline Promag 100 Electromagnetic flowmeter 	E 100: chemical applications	Proline Promag E 100 HART Operating Instructions
	H 100: hygienic applications	Proline Promag H 100 HART Operating Instructions
	P 100: chemical and process applications with corrosive liquids and high medium temperatures	Proline Promag P 100 HART Operating Instructions

HART Flow Devices

Family	Devices	Documentation
Proline Promag 200 Electromagnetic flowmeter 	H 200: hygienic applications	Proline Promag H 200 HART Operating Instructions
	P 200: chemical and process applications with corrosive liquids and high medium temperatures	Proline Promag P 200 HART Operating Instructions
Proline Promag 300 Electromagnetic flowmeter 	H 300: hygienic applications	Proline Promag H 300 HART Operating Instructions
	P 300: chemical and process applications with corrosive liquids and high medium temperatures	Proline Promag P 300 HART Operating Instructions
	W 300: corrosive protection for water and wastewater applications	Proline Promag W 300 HART Operating Instructions
Proline Promag 400 Electromagnetic flowmeter 	D 400: wafer flowmeter for water applications	Proline Promag D 400 HART Operating Instructions
	W 400: corrosive protection for water and wastewater applications	Proline Promag W 400 HART Operating Instructions
Proline Promag 500 Electromagnetic flowmeter 	H 500: hygienic applications	Proline Promag H 500 HART Operating Instructions
	P 500:chemical and process applications with corrosive liquids and high medium temperatures	Proline Promag P 500 HART Operating Instructions
	W 500: corrosive protection for water and wastewater applications	Proline Promag W 500 HART Operating Instructions

HART Flow Devices

Family	Devices	Documentation
Proline Promass 100 Coriolis flowmeter 	A 100: small quantities of liquids and gases for high pressure and low pressure	Proline Promass A 100 HART Operating Instructions
	E 100: smallest footprint	Proline Promass E 100 HART Operating Instructions
	F 100: multiple process applications	Proline Promass F 100 HART Operating Instructions
	G 100: liquids and gases in high pressure applications up to 350 bar (5080 psi)	Proline Promass G 100 HART Operating Instructions
	H 100: corrosion resistant	Proline Promass H 100 HART Operating Instructions
	I 100: in-line viscosity and flow measurement	Proline Promass I 100 HART Operating Instructions
	O 100: liquids and gases at the highest process pressures in the oil and gas industry	Proline Promass O 100 HART Operating Instructions
	P 100: life science applications	Proline Promass P 100 HART Operating Instructions
Proline Promass 200 Coriolis flowmeter 	E 200: loop power; hazardous area	Proline Promass E 200 HART Operating Instructions
	F 200: loop power	Proline Promass F 200 HART Operating Instructions

HART Flow Devices

Family	Devices	Documentation
Proline Promass 300 Coriolis flowmeter 	A 300: small quantities of liquids and gases for high pressure and low pressure	Proline Promass A 300 HART Operating Instructions
	E 300: smallest footprint	Proline Promass E 300 HART Operating Instructions
	F 300: multiple process applications	Proline Promass F 300 HART Operating Instructions
	H 300: corrosion resistant	Proline Promass H 300 HART Operating Instructions
	I 300: in-line viscosity and flow measurement	Proline Promass I 300 HART Operating Instructions
	O 300: liquids and gases at the highest process pressures in the oil and gas industry	Proline Promass O 300 HART Operating Instructions
	P 300: life science applications	Proline Promass P 300 HART Operating Instructions
	Q 300: liquids and gases at the highest process pressures in the oil and gas industry	Proline Promass Q 300 HART Operating Instructions
	S 300: self-drainable single-tube system for food and beverage applications	Proline Promass S 300 HART Operating Instructions
	X 300: on- and offshore applications in the oil and gas industry	Proline Promass X 300 HART Operating Instructions

HART Flow Devices

Family	Devices	Documentation
Proline Promass 500 Coriolis flowmeter 	A 500: small quantities of liquids and gases for high pressure and low pressure	Proline Promass A 500 HART Operating Instructions
	E 500: smallest footprint	Proline Promass E 500 HART Operating Instructions
	F 500: multiple process applications	Proline Promass F 500 HART Operating Instructions
	H 500: corrosion resistant	Proline Promass H 500 HART Operating Instructions
	I 500: in-line viscosity and flow measurement	Proline Promass I 500 HART Operating Instructions
	O 500: liquids and gases at the highest process pressures in the oil and gas industry	Proline Promass O 500 HART Operating Instructions
	P 500: life science applications	Proline Promass P 500 HART Operating Instructions
	Q 500: liquids and gases at the highest process pressures in the oil and gas industry	Proline Promass Q 500 HART Operating Instructions
	S 500: self-drainable single-tube system for food and beverage applications	Proline Promass S 500 HART Operating Instructions
	X 500: onshore and offshore applications in the oil and gas industry	Proline Promass X 500 HART Operating Instructions
Proline Prosonic Flow Ultrasonic flowmeter 	91W: clamp-on sensor	Prosonic Flow 91 Operating Instructions
	92F: loop powered	Prosonic Flow 92F PROFIBUS PA Operating Instructions
	93C: inline for large pipes up to DN 2000	Prosonic Flow 93 HART Operating Instructions
	93P: clamp-on sensor for hazardous locations	Prosonic Flow 93 HART Operating Instructions
	B 200: biogas	Proline Prosonic Flow B 200 HART Operating Instructions
	G 300: inline measurement of natural and process gas in chemical, oil, and gas industries	Proline Prosonic Flow G 300 HART Operating Instructions
	G 500: inline measurement of natural and process gas in chemical, oil, and gas industries	Proline Prosonic Flow G 500 HART Operating Instructions

HART Flow Devices

Family	Devices	Documentation
Prowirl Vortex flowmeter for steam quality measurement 	C 200: carbon-steel sensor	Proline Prowirl C 200 HART Operating Instructions
	D 200: disc/wafer model	Proline Prowirl D 200 HART Operating Instructions
	F 200: heavy duty applications	Proline Prowirl F 200 HART Operating Instructions
	O 200: high-pressure applications	Proline Prowirl O 200 HART Operating Instructions
	R 200: integrated reduction of the line size by 1 or 2 diameters	Proline Prowirl R 200 HART Operating Instructions

HART Level Devices

Family	Device	Documentation
Gammapilot M Compact transmitter for point level detection, continuous level, interface, and density measurement 	FMG60	Gammapilot M FMG60 HART Operating Instructions

HART Level Devices

Family	Device	Documentation
Levelflex Guided-radar, continuous-level, and interface measurement 	FMP50: basic level applications in liquids	Levelflex FMP50 HART Operating Instructions
	FMP51: standard sensor for liquids (level and interface measurement) FMP52: coated probe for use in aggressive liquids (level and interface measurement) FMP54: high-temperature and high-pressure applications in the oil and gas, chemical, and power industries (level and interface measurement)	Levelflex FMP51, FMP52, FMP54 HART Operating Instructions
	FMP53: hygiene requirements in the food and life sciences industries	Levelflex FMP53 HART Operating Instructions
	FMP55: multiparameter device (level and interface measurement)	Levelflex FMP55 HART Operating Instructions
	FMP56: basic model for all level applications in bulk solids FMP57: standard sensor for level measurement in bulk solids	Levelflex FMP56, FMP57 HART Operating Instructions
Liquicap M Continuous level and interface measurement in liquids 	FMI51: fully insulated rod probe FMI52: fully insulated rope probe	Operating Instructions Liquicap M FMI51, FMI52 FEI50H HART

HART Level Devices

Family	Device	Documentation
Micropilot Level measurement in liquids or solids	FMR20: water and wastewater and utilities	Micropilot FMR20 HART Operating Instructions
	FMR50: basic model for level liquid applications	Micropilot FMR50 HART Operating Instructions
	FMR51: standard sensor for level liquid applications FMR52: aggressive liquids or applications with hygiene requirements	Micropilot FMR51, FMR52 HART Operating Instructions
	FMR53: simple liquid measurement FMR54: strong steam or ammonia applications	Micropilot FMR53, FMR54 HART Operating Instructions
	FMR56: basic model for level measurement in solids FMR57: standard sensor for bulk solids level measurement	Micropilot FMR56, FMR57 HART Operating Instructions
	FMR60: standard sensor for liquid level measurement with 80 GHz technology	Micropilot FMR60 HART Operating Instructions
	FMR62: 80 GHz level measurement in aggressive liquids or applications with hygiene requirements	Micropilot FMR62 HART Operating Instructions
	FMR67: standard sensor for bulk solids level measurement with 80 GHz technology	Micropilot FMR67 HART Operating Instructions
Prosonic M Non-contact level measurement in fluids, pastes, and coarse bulk materials; flow measurement in open channels or at weirs	FMU40: level measurement in liquids and bulk solids for up to 5 m (16.04 ft) FMU41: measurement in liquids and bulk solids for up to 8 m (26.25 ft) FMU42: measurement in liquids and bulk solids for up to 10 m (32.81 ft) FMU43: measurement in liquids and bulk solids for up to 15 m (49.21 ft) FMU44: measurement in liquids and bulk solids for up to 20 m (65.62 ft)	Prosonic M FMU40/41/42/43/44 Operating Instructions

HART Level Devices

Family	Device	Documentation
Prosonic S Continuous, non-contact level measurement of fluids, pastes, sludge, and powdery to coarse bulk solids 	FMU90: level/flow measurement and pump control FDU90, FDU91, FDU91F, FDU92, FDU93. FDU95: transmitter in housing for field or top hat rail mounting for up to 2 sensors	Prosonic S FMU90
Waterpilot Hydrostatic level measurement 	FMX21: level probe with ceramic cell	Waterpilot FMX21 Operating Instructions

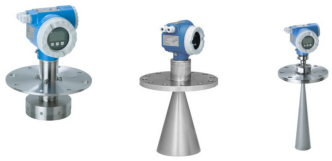
HART Pressure Devices

Family	Device	Documentation
Cerabar M Digital pressure transmitter with sensor for measurement in gases or liquids 	PMC51: oil-free ceramic sensor PMP51: fully-welded metal sensor PMP55: fully-welded metal diaphragm seal	Cerabar M, Deltabar M, Deltapilot M HART (V 01.00.zz)
Cerabar S Digital pressure transmitter with sensor for measurement in gases or liquids 	PMC71: oil-free ceramic sensor PMP71: fully-welded metal sensor PMP75: fully-welded, metal diaphragm seal	Cerabar S PMC71, PMP71, PMP75 HART V02.30.zz Operating Instructions
Deltabar Differential pressure system that is used to measure the pressure or level, volume, or mass of liquids in pressurized tanks or distillation columns/ evaporators 	FMD71: oil-free ceramic sensors FMD72: fully-welded sensors	Deltabar FMD71, FMD72 Operating Instructions

HART Pressure Devices

Family	Device	Documentation
Deltabar M Differential pressure transmitter for measurement of pressure differences 	PMD55: metal sensor	Cerabar M, Deltabar M, Deltapilot M HART (V 01.00.zz)
Deltabar S Differential pressure transmitter for level measurement 	FMD77: one diaphragm seal (fixed) FMD78: one diaphragm seal (capillary) PMD75: metal sensor	Deltabar S FMD77, FMD78, PMD75 HART V02.30.zz Operating Instructions
Deltapilot M Pressure sensor with the condensation-tight, Contite cell for hydrostatic level measurement 	FMB50: fully condensate-resistant metal pressure (CONTITEM) sensor FMB51: rod version in fixed process connection FMB52: cable version in fixed process connection FMB53: cable version with mounting clamp	Cerabar M, Deltabar M, Deltapilot M HART (V 01.00.zz)
Deltapilot S High-performance pressure sensor with the condensation-tight, Contite cell for hydrostatic level measurement 	FMB70: fully condensate-resistant metal pressure (CONTITEM) sensor	Deltapilot S FMB70 HART V02.30.zz Operating Instructions

HART Tank Gauge Devices

Family	Device	Documentation
Micropilot S Custody transfer and inventory control applications 	FMR530: custody transfer and inventory control applications with NMi- and PTB-approvals	Micropilot S FMR530 HART Operating Instructions
	FMR532: non-contact level measurement in stilling well applications in custody transfer	Micropilot S FMR532 HART Operating Instructions
	FMR540: horn antenna and parabolic antenna for custody transfer	Micropilot S FMR540 HART Operating Instructions
Proservo Servo measurement for liquid level, interface, and density 	NMS80: rude oil, gasoline, diesel, petrochemical, and chemical applications	Proservo NMS80 Operating Instructions
	NMS81: crude oil, gasoline, diesel, petrochemical, and chemical applications	Proservo NMS81 Operating Instructions
	NMS83: hygienic applications	Proservo NMS83 Operating Instructions
Prothermo Average temperature measurement 	NMT532: intrinsically safe multi-signal converter with precision average temperature sensor for inventory control	Prothermo NMT532 - Operating Instructions
	NMT539: intrinsically safe multi-signal converter with precision average temperature and water bottom sensor for inventory control and custody transfer	Prothermo NMT539 - Operating Instructions and Description of Device Function
Tank Side Monitor Field gateway for tank sensor operation and monitoring, and for integration into inventory control system 	NRF81: standalone	Tankside Monitor NRF81 Operating Instructions
	NRF590: integrates with Micropilot radar or Proservo level gauges	Tankside Monitor NRF590 Operating Instructions

HART Temperature Devices

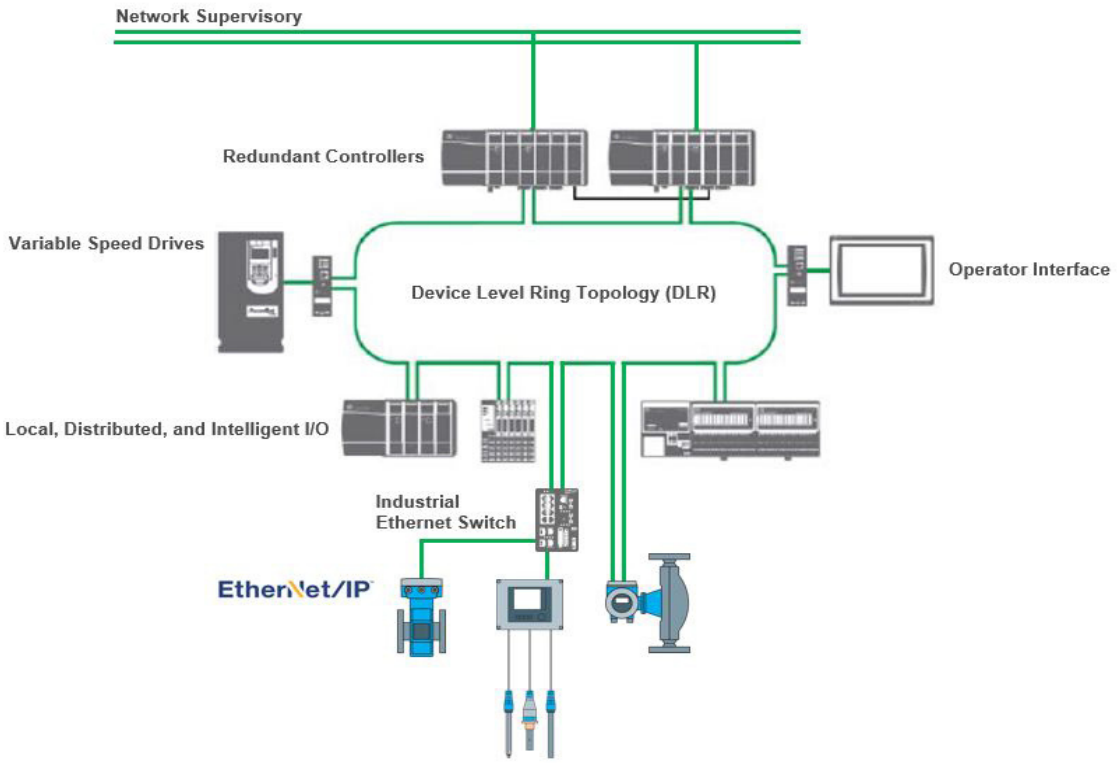
Family	Device	Documentation
iTEMP 	TMT142	iTEMP HART TMT142 Temperature Field Transmitter
	TMT162	Temperature field transmitter iTEMP TMT162, HART 7 specification
	TMT82	iTEMP TMT82 Operating Instructions
	TMT72	iTEMP TMT72 Operating Instructions
iTERM TrustSens 	TM371/372	iTHERM TrustSens TM371, TM372 Operating Instructions

HART Display Devices

Family	Device	Documentation
Process Indicator 	RIA15	RIA15 Operating Instructions

The PlantPAx system is built on open industry standards, leveraging the EtherNet/IP™ network as its backbone. The EtherNet/IP network helps support seamless integration of the system components, as well as to provide connectivity to higher-level business systems. In a PlantPAx system, the EtherNet/IP network provides the communication backbone for the supervisory network for the workstations, servers, and the controllers. The EtherNet/IP network also supports connections to remote I/O and field device interfaces. Additional information can be found in Publication PROCES-RM012, Rockwell Automation® Library of Process Objects: EtherNet/IP Instrumentation for PlantPAx DCS.

Example Topology



EtherNet/IP System Requirements

Supported EtherNet/IP Communication Modules

Family	Module	Description
1756 ControlLogix EtherNet/IP Communication Modules EtherNet/IP Modules Installation Instructions, publication ENET-IN002	1756-EN2T 1756-EN2TP 1756-EN2TR 1756-EN3TR 1756-EN2F	EtherNet/IP bridge
1769 CompactLogix™ Controllers with embedded EtherNet/IP interface CompactLogix 5370 Controllers User Manual, publication 1769-UM021	1769-L33ER 1769-L36ERM 1769-L19ER-BB1 1769-L24ER-QBFC1B	CompactLogix 5370 controllers with embedded EtherNet/IP interface
1769 Compact I/O™ EtherNet/IP interface EtherNet/IP Modules Installation Instructions, publication ENET-IN002	1769-AENTR	Compact I/O EtherNet/IP communication adapter
1734 POINT EtherNet/IP interface POINT I/O EtherNet/IP Adapter Module User Manual, publication 1734-UM011 POINT I/O and ArmorPOINT® I/O 2 Port EtherNet/IP Adapters User Manual, publication 1734-UM014	1734-AENT 1734-AENTR	POINT I/O EtherNet/IP communication adapter
Compact 5000 EtherNet/IP Adapters, publication 5069-UM007	5069-AENTR 5069-AEN2TR	5069 EtherNet/IP Adapters
FLEX 5000 EtherNet/IP Adapter, publication 5094-UM005	5094-AENTR 5094-AENTRXT 5094-AEN2TR 5094-AEN2TRXT 5094-AENSFPR 5094-AENSFPRXT 5094-AEN2SFPR 5094-AEN2SFPRXT	5094 EtherNet/IP Adapters
1738 ArmorPoint EtherNet/IP interface 1738 ArmorPOINT I/O EtherNet/IP Adapters User Manual, publication 1738-UM005 POINT I/O and ArmorPOINT I/O 2 Port EtherNet/IP Adapters User Manual, publication 1734-UM014	1738-AENT 1738-AENTR	ArmorPOINT I/O EtherNet/IP communication adapter
1794 FLEX EtherNet/IP interface FLEX™ I/O EtherNet/IP Adapters Installation Instructions, publication 1794-IN082 FLEX I/O Dual Port EtherNet/IP Adapter Modules Installation Instructions, publication 1794-IN131	1794-AENT 1794-AENTR 1794-AENTRXT	FLEX I/O EtherNet/IP communication adapter

Download add-on profile files from the Product and Compatibility Download Center at:
https://compatibility.rockwellautomation.com/Pages/home.aspx

Integrated EtherNet/IP Devices

EtherNet/IP Analytical Devices

Family	Device	Documentation
Liquiline System 	CA80AL: Aluminum	Liquiline System CA80AL Operating Instructions
	CA80HA: water hardness	Liquiline System CA80HA Operating Instructions
	CA80SI: Silica	Liquiline System CA80SI Operating Instructions
	CA80AM: ammonium	Liquiline System CA80AM Operating Instructions
	CA80COD: chemical oxygen demand	Liquiline System CA80COD Operating Instructions
	CA80CR: chromate	Liquiline System CA80CR Operating Instructions
	CA80FE: iron	Liquiline System CA80FE Operating Instructions
	CA80NO: nitrite	Liquiline System CA80NO Operating Instructions
	CA80PH: orthophosphate	Liquiline System CA80PH Operating Instructions
	CA80TP: total phosphorous	Liquiline System CA80TP Operating Instructions
Liquiline Multichannel transmitter for monitoring processes   	CM44P: multichannel; combines process photometers and Memosens sensors	Liquiline CM44P Operating Instructions
	CM442: 1 or 2 channel CM444: 4 channel CM448: 8 channel	Liquiline CM442/CM444/CM448 Operating Instructions
	CM442R: DIN rail or cabinet; 1 or 2 channel CM444R: DIN rail or cabinet; 4 channel CM448R: DIN rail or cabinet; 8 channel	Liquiline CM442R/CM444R/CM448R Operating Instructions
Liquistation Stationary sampler for water and wastewater treatment  	CSF34: North America version	Liquistation CSF34 Operating Instructions
	CSF48: integrated controller	Liquistation CSF48 Operating Instructions

EtherNet/IP Flow Devices - Promag

Family	Devices	Documentation
Proline Promag 100 Electromagnetic flowmeter 	E 100: basic chemical applications	Proline Promag E 100 EtherNet/IP Operating Instructions
	H 100: hygienic applications	Proline Promag H 100 EtherNet/IP Operating Instructions
	P 100: chemical and process applications with corrosive liquids and high medium temperatures	Proline Promag P 100 EtherNet/IP Operating Instructions
Proline Promag 300 Electromagnetic flowmeter 	H 300: hygienic applications	Proline Promag H 300 EtherNet/IP Operating Instructions
	P 300: chemical and process applications with corrosive liquids and high medium temperatures	Proline Promag P 300 EtherNet/IP Operating Instructions
	W 300: corrosive protection for water and wastewater applications	Proline Promag W 300 EtherNet/IP Operating Instructions
Proline Promag 400 Electromagnetic flowmeter 	D 400: basic water applications	Proline Promag D 400 EtherNet/IP Operating Instructions
	W 400: corrosion protection	Proline Promag W 400 EtherNet/IP Operating Instructions
Proline Promag 500 Electromagnetic flowmeter 	H 500: hygienic applications	Proline Promag H 500 EtherNet/IP Operating Instructions
	P 500:chemical and process applications with corrosive liquids and high medium temperatures	Proline Promag P 500 EtherNet/IP Operating Instructions
	W 500: corrosive protection for water and wastewater applications	Proline Promag W 500 EtherNet/IP Operating Instructions

EtherNet/IP Flow Devices - Promass

Proline Promass 100 Coriolis flowmeter 	A 100: measures small quantities of liquids and gases	Proline Promass A 100 EtherNet/IP Operating Instructions
	Cubemass C 100: direct mass and density measurement	Proline Promass C 100 EtherNet/IP Operating Instructions
	E 100: basic applications; smallest footprint	Proline Promass E 100 EtherNet/IP Operating Instructions
	F 100: basic process applications	Proline Promass F 100 EtherNet/IP Operating Instructions
	G 100: high pressure applications	Proline Promass G 100 EtherNet/IP Operating Instructions
	H 100: corrosion resistant	Proline Promass H 100 EtherNet/IP Operating Instructions
	I 100: combines flow measurement with in-line viscosity	Proline Promass I 100 EtherNet/IP Operating Instructions
	O 100: resistant to stress corrosion cracking	Proline Promass O 100 EtherNet/IP Operating Instructions
	P 100: life science applications	Proline Promass P 100 EtherNet/IP Operating Instructions
Proline Promass 300 Coriolis flowmeter 	A 300: small quantities of liquids and gases for high pressure and low pressure	Proline Promass A 300 EtherNet/IP Operating Instructions
	E 300: smallest footprint	Proline Promass E 300 EtherNet/IP Operating Instructions
	F 300: multiple process applications	Proline Promass F 300 EtherNet/IP Operating Instructions
	H 300: corrosion resistant	Proline Promass H 300 EtherNet/IP Operating Instructions
	I 300: in-line viscosity and flow measurement	Proline Promass I 300 EtherNet/IP Operating Instructions
	S 300: self-drainable single-tube system for food and beverage applications	Proline Promass S 300 EtherNet/IP Operating Instructions
	X 300: on- and offshore applications in the oil and gas industry	Proline Promass X 300 EtherNet/IP Operating Instructions
	O 300: on- and offshore applications in the oil and gas industry at the highest pressures	Proline Promass O 300 EtherNet/IP Operating Instructions
	P 300: specialist for sterile processes dedicated to biotech applications	Proline Promass P 300 EtherNet/IP Operating Instructions
	Q 300: custody transfer applications	Proline Promass Q 300 EtherNet/IP Operating Instructions

Proline Promass 500 Coriolis flowmeter 	A 500: small quantities of liquids and gases for high pressure and low pressure	Proline Promass A 500 EtherNet/IP Operating Instructions
	E 500: smallest footprint	Proline Promass E 500 EtherNet/IP Operating Instructions
	F 500: multiple process applications	Proline Promass F 500 EtherNet/IP Operating Instructions
	H 500: corrosion resistant	Proline Promass H 500 EtherNet/IP Operating Instructions
	I 500: in-line viscosity and flow measurement	Proline Promass I 500 EtherNet/IP Operating Instructions
	O 500: liquids and gases at the highest process pressures in the oil and gas industry	Proline Promass O 500 EtherNet/IP Operating Instructions
	P 500: life science applications	Proline Promass P 500 EtherNet/IP Operating Instructions
	Q 500: liquids and gases at the highest process pressures in the oil and gas industry	Proline Promass Q 500 EtherNet/IP Operating Instructions
	S 500: self-drainable single-tube system for food and beverage applications	Proline Promass S 500 EtherNet/IP Operating Instructions
	X 500: onshore and offshore applications in the oil and gas industry	Proline Promass X 500 EtherNet/IP Operating Instructions

EtherNet/IP Interface Devices

Family	Device	Documentation
WirelessHART gateway with Ethernet interface 	SWG70	WirelessHART Fieldgate SWG70 Operating Instructions
WirelessHART adapter For use with then WirelessHART gateway 	SWA70	WirelessHART Adapter SWA70 Operating Instructions

EtherNet/IP Recorder Devices

Family	Devices	Documentation
Memograph M Store, visualize, and analyze process values 	RSG45	Memograph M, RSG45 Operating Instructions Additional instructions Memograph M, RSG45 EtherNet/IP communication

Additional Resources

These websites provide additional information.

Resource	Description
https://www.rockwellautomation.com/global/capabilities/process-solutions	Information about Rockwell Automation process control.
http://literature.rockwellautomation.com	Available Rockwell Automation documentation.
https://rockwellautomation.custhelp.com	Rockwell Automation customer support center.
http://www.endress.com	Information about Endress+Hauser products, solutions, and services.
https://www.endress.com/en/downloads	Available Endress+Hauser documentation.
https://www.endress.com/en/solutions-lowering-costs/field-network-engineering	Information about assistance with the: • selection of technology, components, and devices • design of the network according to your requirements • integration of devices into a PlantPAx distributed control system • operation and maintenance of the network
https://www.endress.com/en/Endress-Hauser-group/life-cycle-management/Optimized-operations/access-device-information/device-viewer	The device viewer requires the serial number of the device. Or download the Operations App (available via App Store and Google Play) for up-to date device details by serial number, or scan the data matrix code on the device.

Rockwell Automation Support

Use these resources to access support information.

Technical Support Center	Find help with how-to videos, FAQs, chat, user forums, and product notification updates.	rok.auto/support
Knowledgebase	Access Knowledgebase articles.	rok.auto/knowledgebase
Local Technical Support Phone Numbers	Locate the telephone number for your country.	rok.auto/phonesupport
Literature Library	Find installation instructions, manuals, brochures, and technical data publications.	rok.auto/literature
Product Compatibility and Download Center (PCDC)	Get help determining how products interact, check features and capabilities, and find associated firmware.	rok.auto/pcdc

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