



# Profibus PA and FOUNDATION Fieldbus Linking Devices in a PlantPAx Distributed Control System



***Allen-Bradley***

by ROCKWELL AUTOMATION

Reference Manual

Original Instructions

# Important User Information

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

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

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

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

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

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

Reproduction of the contents of this manual, in whole or in part, without written permission of Rockwell Automation, Inc., is prohibited.

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.

These 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).

The following icon may appear in the text of this document.



Identifies information that is useful and can help to make a process easier to do or easier to understand.

## Allen-Bradley 1788-EN2FFR

## Aparian A-FFL/B

<b>Preface</b>	<b>7</b>
About This Publication	7
Download Firmware, Add-on Profiles, EDS, and Other Files	7
Additional Resources	7
Controller Code for raP_Dvc_EN2FFR	9
Input Structure	9
Output Structure	9
InOut Structure	9
Operations	9
Execution	9
Graphic Symbols	10
FactoryTalk View SE Faceplates	10
Operator Tab	10
Engineering Tab	11
HMI Configuration Tab	11
Studio 5000 View Designer Faceplates	12
Programming Example	12
Install AOP	12
Add Device to I/O Configuration Tree	12
Configuration	14
Import Device Add-On Instruction	14
Add Process Analog Input (PAI) Instruction to Routine	15
Add Device Instruction to Routine	16
Connect the PAI Instance to the raP_Dvc_EN2FFR Instance	19
Update the Extended Tag Properties of the raP_Dvc_EN2FFR Instance	20
Add HMI Graphic Symbol to Studio 5000 View Designer and Link to Object	24
Controller Code for raP_Dvc_AP_FFLINK	25
Input Structure	25
Output Structure	25
InOut Structure	25
Operations	25
Execution	25
Graphic Symbols	26
FactoryTalk View SE Faceplates	26
Operator Tab	26
Diagnostics Tab	27
HMI Configuration Tab	27
Studio 5000 View Designer Faceplates	28
Operator Tab	28
Diagnostics Tab	28
Programming Example	29
Install EDS	29
Add Device to I/O Configuration Tree	29
Configuration	30
Import Device Add-On Instruction	30
Add Process Analog Input (PAI) Instruction to Routine	31

**Allen-Bradley 1788-EN2PAR**

Add Device Instruction to Routine .....	33
Connect the PAI Instance to the raP_Dvc_AP_FFLink Instance .....	36
Update the Extended Tag Properties of the raP_Dvc_AP_FFLink Instance .....	36
Add HMI Graphic Symbol to Studio 5000 View Designer and Link to Object .....	40
Controller Code for raP_Dvc_EN2PAR .....	43
Input Structure .....	43
Output Structure .....	43
InOut Structure .....	43
Operations .....	43
Execution .....	43
Graphic Symbols .....	44
FactoryTalk View SE Faceplates .....	44
Operator Tab .....	44
Diagnostics Tab .....	45
Engineering Tab .....	45
HMI Configuration Tab .....	46
Studio 5000 View Designer Faceplates .....	47
Diagnostics Tab .....	47
Programming Example .....	47
Install AOP .....	47
Add Device to I/O Configuration Tree .....	47
Configuration .....	49
Import Device Add-On Instruction .....	49
Add Process Analog Input (PAI) Instruction to Routine .....	50
Add Device Instruction to Routine .....	51
Connect the PAI Instance to the raP_Dvc_EN2PAR Instance .....	54
Update the Extended Tag Properties of the raP_Dvc_EN2PAR Instance .....	55
Add HMI Graphic Symbol to Studio 5000 View Designer and Link to Object .....	59

**Aparian A-PAL/B**

Controller Code for raP_Dvc_AP_PALink .....	61
Input Structure .....	61
Output Structure .....	61
InOut Structure .....	61
Operations .....	61
Execution .....	61
Graphic Symbols .....	62
FactoryTalk View SE Faceplates .....	62
Operator Tab .....	62
Diagnostics Tab .....	63
HMI Configuration Tab .....	63
Studio 5000 View Designer Faceplates .....	64
Diagnostics Tab .....	64
Programming Example .....	64
Install EDS .....	64
Add Device to I/O Configuration Tree .....	65
Configuration .....	66
Import Device Add-On Instruction .....	66
Add Process Analog Input (PAI) Instruction to Routine .....	67
Add Device Instruction to Routine .....	68
Connect the PAI Instance to the raP_Dvc_AP_FFLink Instance .....	72
Update the Extended Tag Properties of the raP_Dvc_AP_PALink Instance .....	72



Add HMI Graphic Symbol to Studio 5000 View Designer and Link to Object . . . . .	76
--	----

**Notes:**

## About This Publication

This reference manual provides information on the EtherNet/IP™ to PROFIBUS PA linking devices and EtherNet/IP to FOUNDATION Fieldbus linking devices used in the PlantPax® Distributed Control System.

## Download Firmware, Add-on Profiles, EDS, and Other Files

Download firmware, associated files, and access product release notes from the Product Compatibility and Download Center at [rok.auto/pcdc](http://rok.auto/pcdc).

## Additional Resources

These documents contain additional information concerning related products from Rockwell Automation. You can view or download publications at [rok.auto/literature](http://rok.auto/literature).

Resource	Description
EtherNet/IP and ControlNet to FOUNDATION Fieldbus Linking Devices, publication <a href="#">1788-UM057</a>	This user manual describes the installation and operation of the 1788-EN2FFR and 1788-CN2FFR linking devices.
PlantPax Process Control Instructions, publication <a href="#">PROCES-RM215</a>	This manual provides a programmer with details about the available Process instruction set for a Logix-based Process controller.
EtherNet/IP and ControlNet to PROFIBUS PA Linking Devices, publication <a href="#">1788-UM058</a>	This user manual describes the installation and operation of the 1788-EN2PAR and 1788-CN2PAR linking devices.
Rockwell Automation Library of Process Objects, publication <a href="#">PROCES-RM200</a>	Provides information about the Add-On Instructions that are used in the PlantPax Library.
PlantPax Faceplates for Process Controller Instructions, publication <a href="#">PROCES-RM203</a>	Describes the PlantPax Process instructions, and associated faceplates that are available to develop applications.
FOUNDATION Fieldbus and PROFIBUS PA Instrumentation Process Object Parameters parameters Spreadsheet, publication, <a href="#">PROCES-RD213</a>	Describes the FOUNDATION Fieldbus and PROFIBUS PA Instrumentation parameters.
PlantPax Visualization Files, publication, <a href="#">PROCES-RD201</a>	Describes the visualization files that are required for the Library of Process Objects.
Logix 5000 Controllers Add On Instructions, publication <a href="#">1756-PM010</a>	Provides detailed information on Logix 5000® Controller instructions.
EtherNet/IP Network Devices User Manual, publication <a href="#">ENET-UM006</a>	Describes how to configure and use EtherNet/IP devices to communicate on the EtherNet/IP network.
Ethernet Reference Manual, publication <a href="#">ENET-RM002</a>	Describes basic Ethernet concepts, infrastructure components, and infrastructure features.
System Security Design Guidelines Reference Manual, publication <a href="#">SECURE-RM001</a>	Provides guidance on how to conduct security assessments, implement Rockwell Automation products in a secure system, harden the control system, manage user access, and dispose of equipment.
UL Standards Listing for Industrial Control Products, publication <a href="#">CMPNTS-SR002</a>	Assists original equipment manufacturers (OEMs) with construction of panels, to help ensure that they conform to the requirements of Underwriters Laboratories.
American Standards, Configurations, and Ratings: Introduction to Motor Circuit Design, publication <a href="#">IC-AT001</a>	Provides an overview of American motor circuit design based on methods that are outlined in the NEC.
Industrial Components Preventive Maintenance, Enclosures, and Contact Ratings Specifications, publication <a href="#">IC-TD002</a>	Provides a quick reference tool for Allen-Bradley® industrial automation controls and assemblies.
Safety Guidelines for the Application, Installation, and Maintenance of Solid-state Control, publication <a href="#">SGI-1.1</a>	Designed to harmonize with NEMA Standards Publication No. ICS 1.1-1987 and provides general guidelines for the application, installation, and maintenance of solid-state control in the form of individual devices or packaged assemblies incorporating solid-state components.
Industrial Automation Wiring and Grounding Guidelines, publication <a href="#">1770-4.1</a>	Provides general guidelines for installing a Rockwell Automation industrial system.
ProposalWorks™ configuration software, <a href="http://rok.auto/systemtools">rok.auto/systemtools</a>	Helps configure complete, valid catalog numbers and build complete quotes based on detailed product information.
Rockwell Automation Global SCCR tool, <a href="http://rok.auto/sccr">rok.auto/sccr</a>	Provides coordinated high-fault branch circuit solutions for motor starters, soft starters, and component drives.
Product Certifications website, <a href="http://rok.auto/certifications">rok.auto/certifications</a>	Provides declarations of conformity, certificates, and other certification details.

---

**Notes:**



## Allen-Bradley 1788-EN2FFR

The 1788-EN2FFR FOUNDATION Fieldbus Analog PV to PAI (raP\_Dvc\_EN2FFR) Add-On Instruction transfers data from one FOUNDATION Fieldbus analog PV, mapping the REAL PV directly and mapping the PV status to a set of status bits suitable for use with the PAI instruction.

This instruction has no prescan, EnableInFalse, or postscan logic. It is intended to be executed always true in logic every scan. The instruction can be used in Ladder Diagram, Function Block Diagram, or Structured Text logic.

For more information on the PAI instruction, see Rockwell Automation Library of Process Objects, publication [PROCES-RM203](#).

### Controller Code for raP\_Dvc\_EN2FFR

See EtherNet/IP™ Instrumentation Process Object Parameters, publication [PROCES-RD213](#) for parameter names and descriptions.

### Input Structure

Input parameters include the following:

- Configuration data elements (Cfg\_) are used to set configurable capabilities and features of the instruction.

### Output Structure

Output parameters include the following:

- Value data elements (Val\_) are numeric outputs of the instruction for use by the HMI. Values can also be used by other application logic or software packages.
- Status data elements (Sts\_) are bit and enumerated outputs of the instruction for use by the HMI. Status bits can also be used by other application logic.

### InOut Structure

InOut parameters include the following:

- Reference data elements (Ref\_) are used to link the instruction to external tags. Specifically, they are used to collect the device image from the device input assembly.

### Operations

### Execution

For more information, see the Logix 5000 Controllers Add-On Instructions Programming Manual, publication [1756-PM010](#).

# Graphic Symbols

A graphic symbol (global object or add-on graphic) is created once and can be referenced multiple times on multiple displays in an application. When changes are made to the original (base) object, the instantiated copies (reference objects) are automatically updated. Use of global objects and add-on graphics, with tag structures in the ControlLogix® system, aid consistency and save engineering time.

**IMPORTANT**

The raP\_Dvc\_EN2FFR instruction is linked to the downstream PAI instruction, which provides alarming and other standard analog input processing functions. In FactoryTalk® View SE software, the PAI instruction is linked for navigation to its upstream raP\_Dvc\_EN2FFR instruction faceplate for device diagnostics and other variables.

The following indicators are provided by the downstream PAI instruction that is connected to raP\_Dvc\_EN2FFR:

- Status/Quality indicators
- Threshold indicators
- Alarm indicators
- Maintenance bypass indicators

**IMPORTANT**

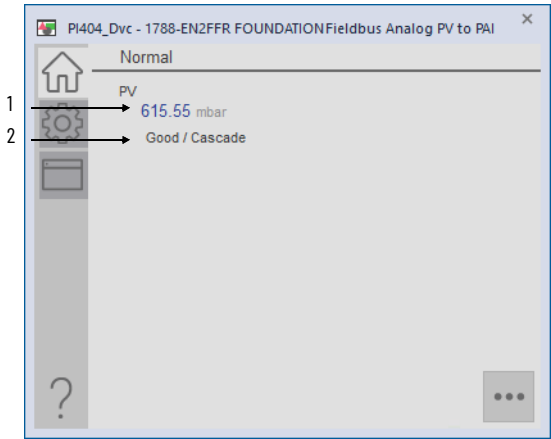
SMART device objects in the Studio 5000 View Designer® application are accessible only if an object is placed on the user screen and linked to the raP\_Dvc\_EN2FFR object. Faceplate to Faceplate navigation is not possible in the Studio 5000 View Designer application.

For more information about these indicators on the PAI instruction, see Rockwell Automation Library of Process Objects, publication [PROCES-RM200](#).

Graphic Symbol Name	FactoryTalk View SE Graphic Symbol	Studio 5000 View Designer Graphic Symbol	Description
GO_nav_SmartDevice (FactoryTalk View SE)			Standard Graphic Symbol.
GO_EN2FFR_PV_to_PAI (Studio 5000 View Designer)			

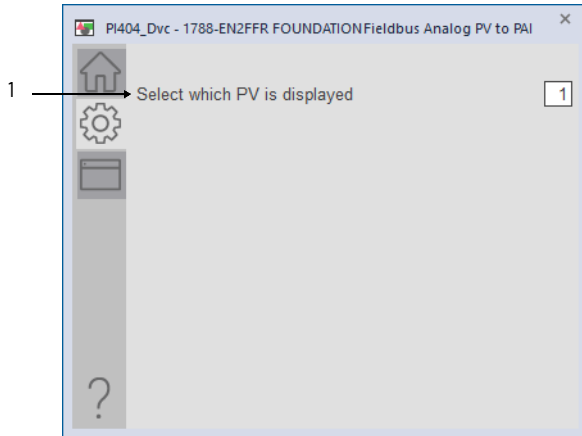
## FactoryTalk View SE Faceplates

## Operator Tab



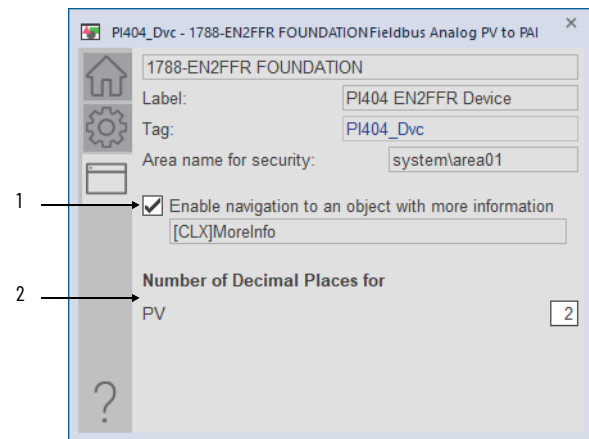
Item	Description
1	Process variable value with engineering units.
2	Process variable status (Bad, Uncertain, Good, Good / Cascade).

## Engineering Tab



Item	Description
1	Each Field Device image provides 8 REAL process variables. Select which of the 8 PVs is to be monitored.

## HMI Configuration Tab



Item	Description
1	Select to enable navigation to an object with more information (Cfg_HasMoreObj is set to true.) This can be configured to navigate to an object backing tag or a UDT tag that has Instruction and Library defined.
2	Enter the number of decimal places for the Process Variable.

## Studio 5000 View Designer Faceplates

Any feature that is contained in the Studio 5000 View Designer faceplates has the same functionality as used in the FactoryTalk® View SE faceplates. See [FactoryTalk View SE Faceplates on page 10](#).

### Operator Tab



## Programming Example

### Install AOP

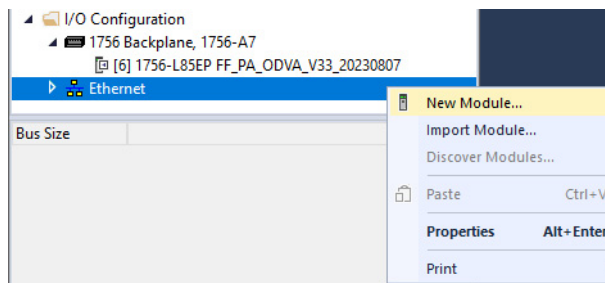
You must install the Add-On Profile (AOP) for the 1788-EN2FFR to configure and manage the linking device.

For the latest compatible software information and to download the AOP, see the Product Compatibility and Download Center at [rok.auto/pcdc](http://rok.auto/pcdc).

### Add Device to I/O Configuration Tree

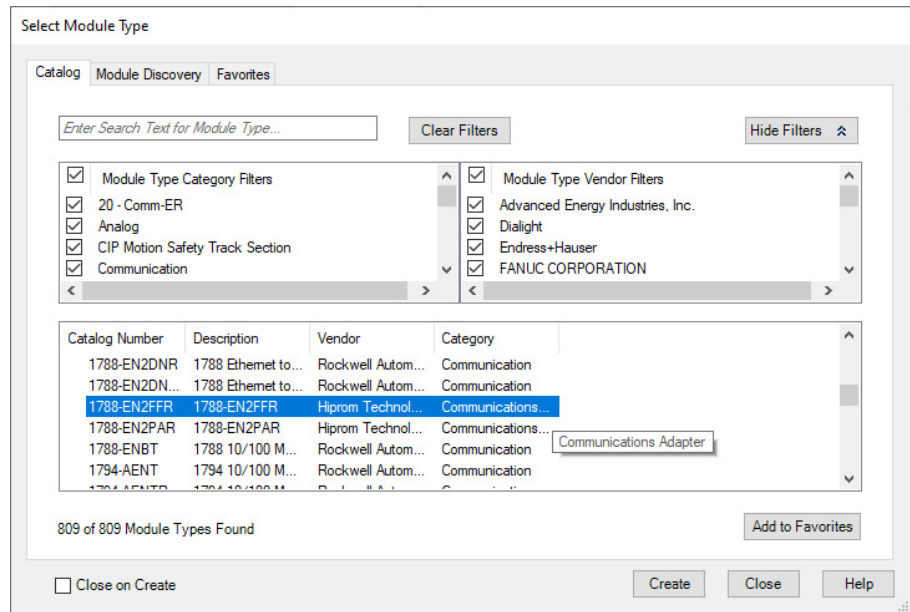
The 1788-EN2FFR must be added into the project I/O configuration. This step is performed for every device in the I/O configuration tree. This example uses the 1788-EN2FFR linking device.

1. Right-click the Ethernet network and choose New Module.

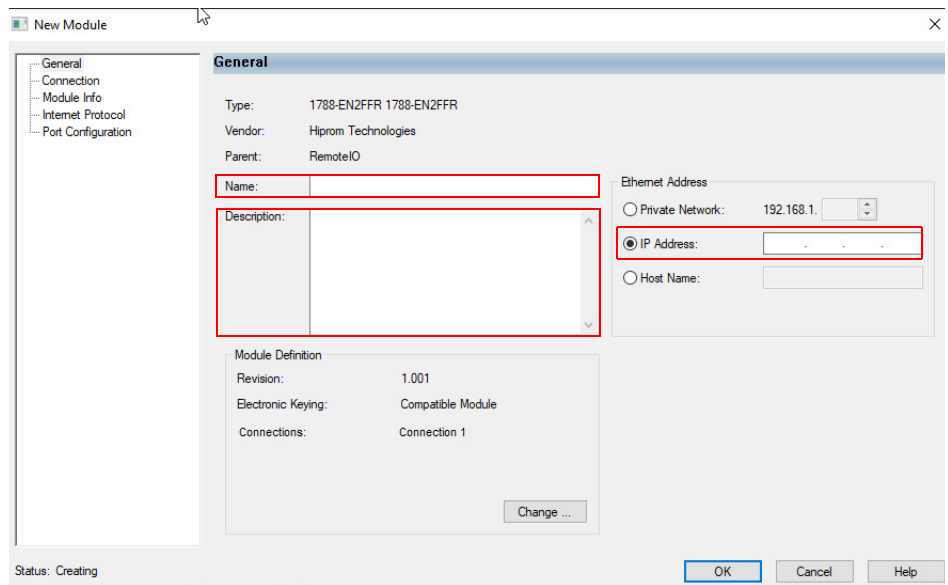




2. Select the linking device that you want to add to the network.

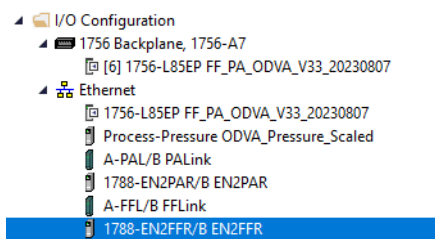


3. Click the General tab and set the name, description, and IP address.



Depending on the number of Fieldbus devices connected to this linking device, you may need to change the number of connections in the Module Definition section. See EtherNet/IP and ControlNet to FOUNDATION Fieldbus Linking Devices, publication [1788-UM057](#) for more information.

4. Select OK to add the linking device to the I/O tree.



## Configuration

For 1788-EN2FFR configuration options, see EtherNet/IP and ControlNet to FOUNDATION Fieldbus Linking Devices, publication [1788-UM057](#).

The 1788-EN2FFR should be configured to provide one or more analog (REAL) PV values with status.

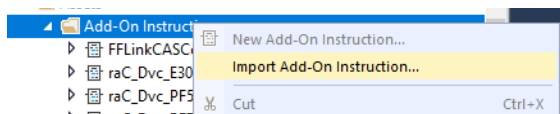
## Import Device Add-On Instruction

The raP\_Dvc\_EN2FFR Add-On Instruction definition file must be imported into the controller project to be able to be used in the controller configuration.

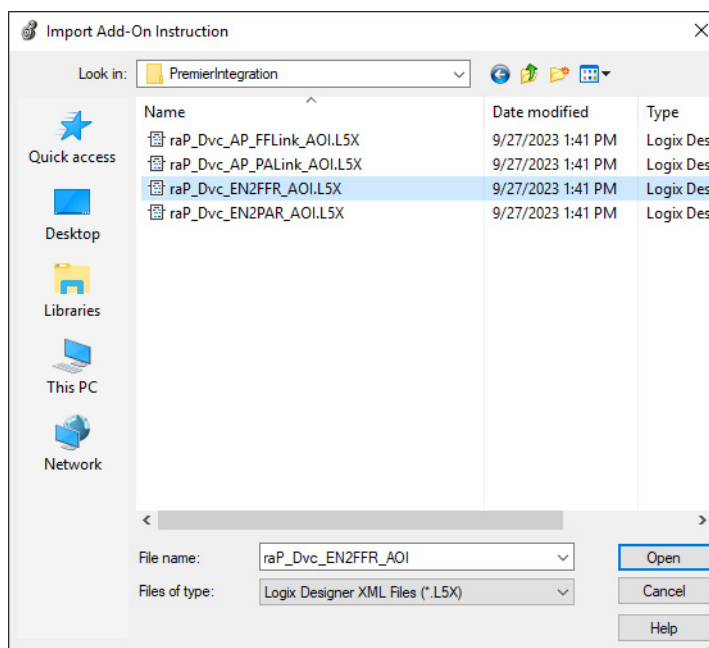
This instruction transfers data from one FOUNDATION Fieldbus analog PV, mapping the REAL PV directly, and mapping the PV status to a set of status bits suitable for use with the PAI instruction.

This instruction is for use with the PAI instruction in a process controller (1756-L8xEP) version 35 or later.

1. Import the appropriate device Add-On Instruction. (This procedure uses raP\_Dvc\_EN2FFR.L5X as an example.)
2. In the target Controller Organizer, right-click Add-On Instructions and choose Import Add-On Instruction.

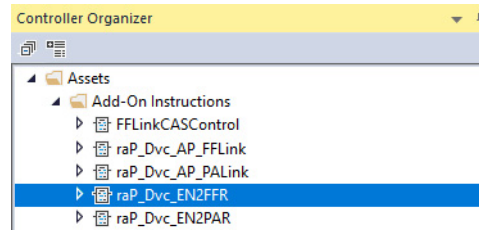


3. Navigate to the folder that contains the device Add-On Instructions and select raP\_Dvc\_EN2FFR.L5X, and then click Open.



4. Click OK in the Import Configuration window.

The Add-On Instruction is then added to the Controller Organizer.

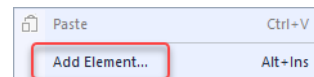


## Add Process Analog Input (PAI) Instruction to Routine

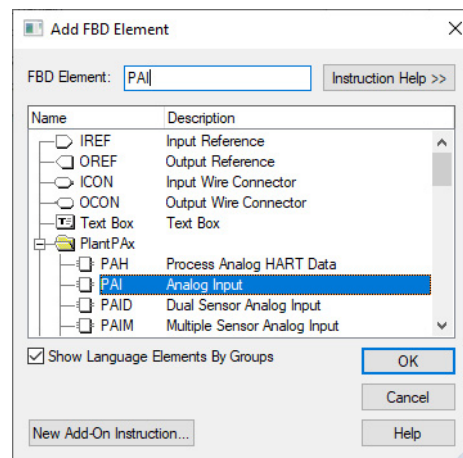


This instruction shows how to add instructions to a Function Block Diagram routine. The instructions can be used in Ladder Diagram and Structured Text routines as well.

1. Right-click the sheet within the routine and choose Add Element to add the PAI instruction to the routine.

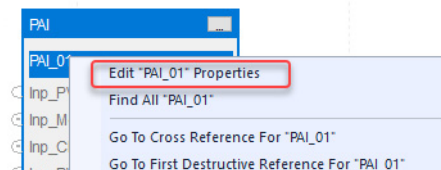


2. Type PAI into the FBD Element text box and select OK.

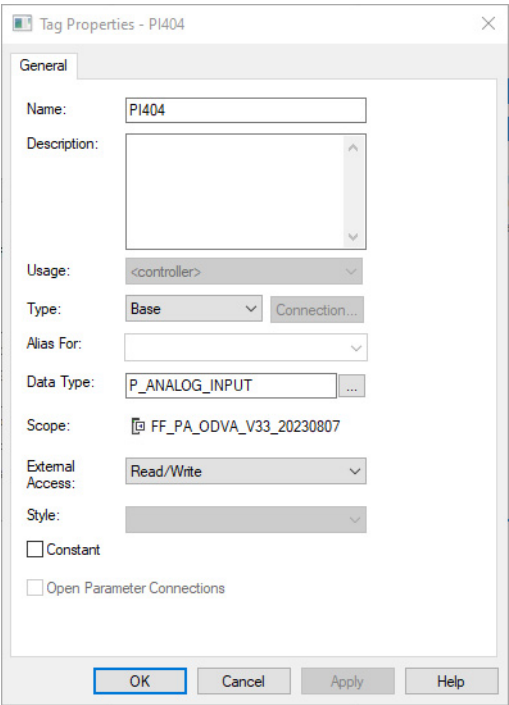



**IMPORTANT** At least one instance of the Process Analog Input (PAI) instruction is used for each channel (device) on the input module.

3. Right-click the name of the new instance of PAI and choose Edit...Properties.



4. Change the name according to the project convention. To save the changes, click OK.

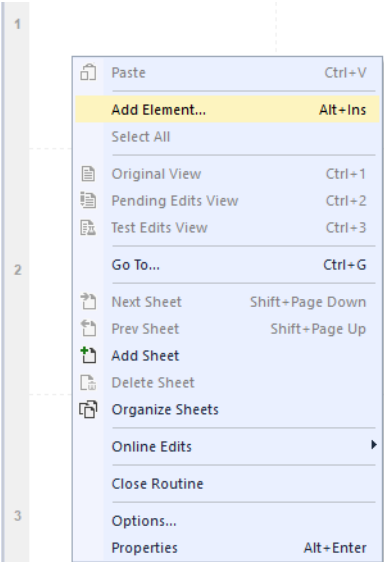


5. To save the project, click .

Add Device Instruction to Routine

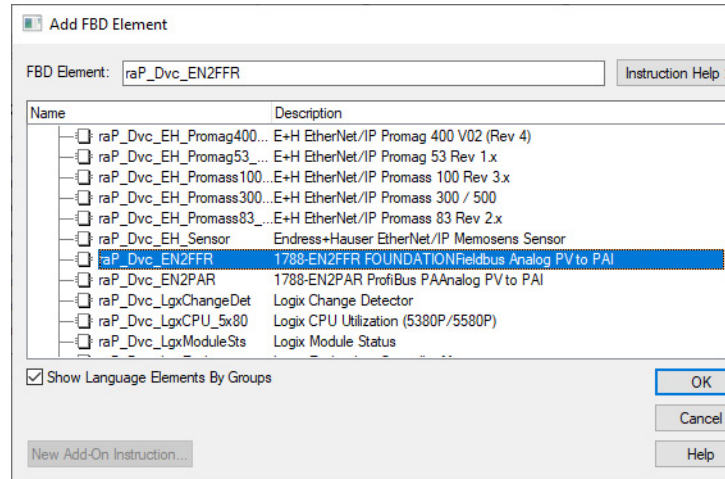
This procedure adds the device logic to the routine. Perform this procedure once for every device.

- 1. Open the routine where the device logic is used.
- 2. Within the routine, right-click the sheet and click Add Element.

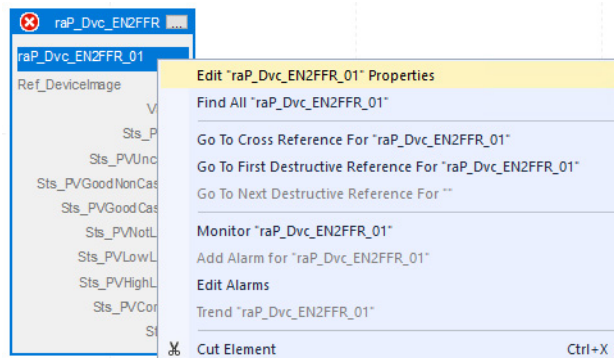




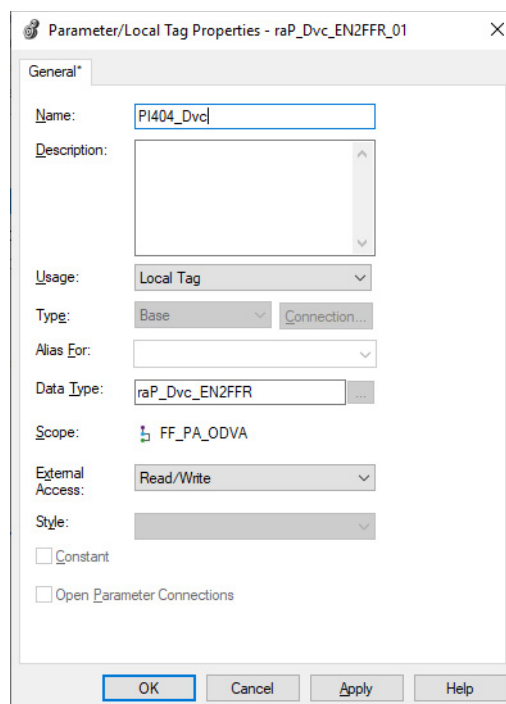
3. Type the device Add-On Instruction name in the FBD Element box; for this example, `raP_Dvc_EN2FFR`, and then click OK.



4. Right-click the name of the backing tag for the new Add-On Instruction instance and choose **Edit...Properties**.



5. Change the name to correspond with the project convention. To save the changes, click OK.




---

**IMPORTANT** The tag name for the raP\_Dvc\_EN2FFR instance must correspond to the instance of the PAI that it is connected to. The tag name for the raP\_Dvc\_EN2FFR must be the name of the PAI object appended with “\_Dvc”. For example, if the corresponding PAI instruction is PI404, the raP\_Dvc\_EN2FFR tag must be PI404\_Dvc. This allows for automatic navigation via the SMART Device button on the HMI faceplate of the PAI.

---

6. Set the value for Ref\_DeviceImage. The reference must be a member of the type "HT:1788HP\_EN2FFR\_DeviceImage:I:0".



The 1788-EN2FFR can provide up to 16 device images, so be sure to choose the correct one for the device being linked.

raP\_Dvc\_EN2FFR

P404\_Dvc

Ref\_DeviceImage ? 0.0

Val\_PV 0

Sts\_PVBad 0

Sts\_PVUncertain 0

Sts\_PVGoodNonCascade 0

Sts\_PVGoodCascade 0

Sts\_PVNotLimited 0

Sts\_PVLowLimited 0

Sts\_PVHighLimited 0

Sts\_PVConstant 0

Sts\_Err 0

Scope: EN2FFR\_PA\_ODVA\_2 Show: All Tags

Name	Alias For	Base Tag	Data Type
EN2FFR:IA			HT:1788HP_EN2FFR_0_3:IA:0
EN2FFR:IA.CommStatusA			DINT
EN2FFR:IA.Master			HT:1788HP_EN2FFR_MasterImage:I:0
EN2FFR:IA.FieldDevice00			HT:1788HP_EN2FFR_DeviceImage:I:0
EN2FFR:IA.FieldDevice01			HT:1788HP_EN2FFR_DeviceImage:I:0
EN2FFR:IA.FieldDevice02			HT:1788HP_EN2FFR_DeviceImage:I:0
EN2FFR:IA.FieldDevice03			HT:1788HP_EN2FFR_DeviceImage:I:0
EN2FFR:IB			HT:1788HP_EN2FFR_4_7:IB:0

raP\_Dvc\_EN2FFR

P404\_Dvc

Ref\_DeviceImage EN2FFR:IA.FieldDevice02 0

Val\_PV 0

Sts\_PVBad 0

Sts\_PVUncertain 0

Sts\_PVGoodNonCascade 0

Sts\_PVGoodCascade 0

Sts\_PVNotLimited 0

Sts\_PVLowLimited 0

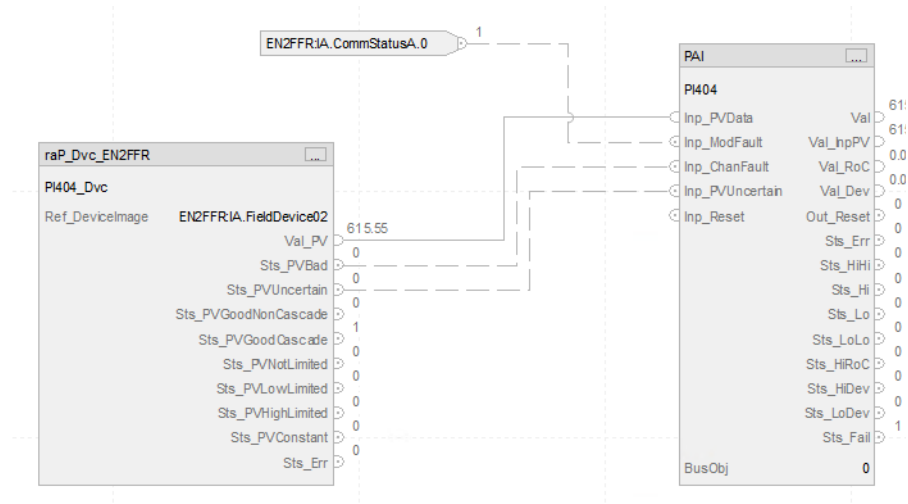
Sts\_PVHighLimited 0

Sts\_PVConstant 0

Sts\_Err 0

### Connect the PAI Instance to the raP\_Dvc\_EN2FFR Instance

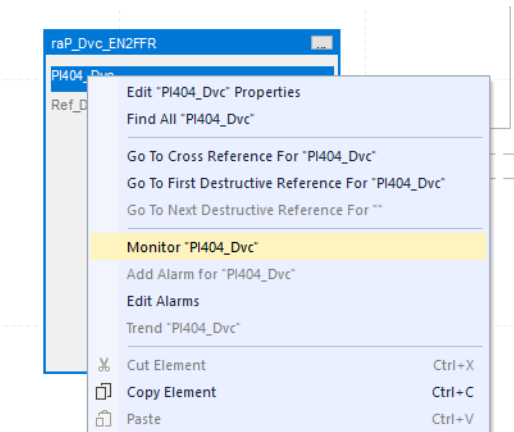
1. Connect the instruction instances as shown in the following diagram.



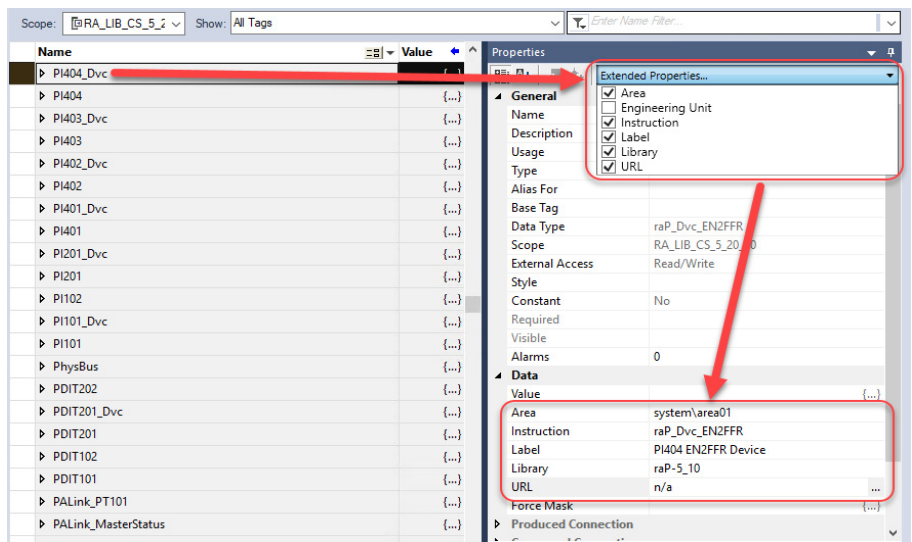
2. To save the project, click

## Update the Extended Tag Properties of the raP\_Dvc\_EN2FFR Instance


1. Right-click the name of the raP\_Dvc\_EN2FFR Add-On Instruction and choose Monitor... The tags list opens with the flowmeter tag selected.



2. In the right-hand panel, the properties for that tag are shown. Confirm that the following extended tag properties are enabled and the correct information is entered.



Extended Tag Property	Typical Value	Action
Area	Area01	Update per project conventions
Instruction	raP_Dvc_EN2FFR	Leave as is
Label	Device name	Update per project conventions
Library	raP-5_10	Leave as is
URL	n/a	Update per project conventions

3. To save the project, click 

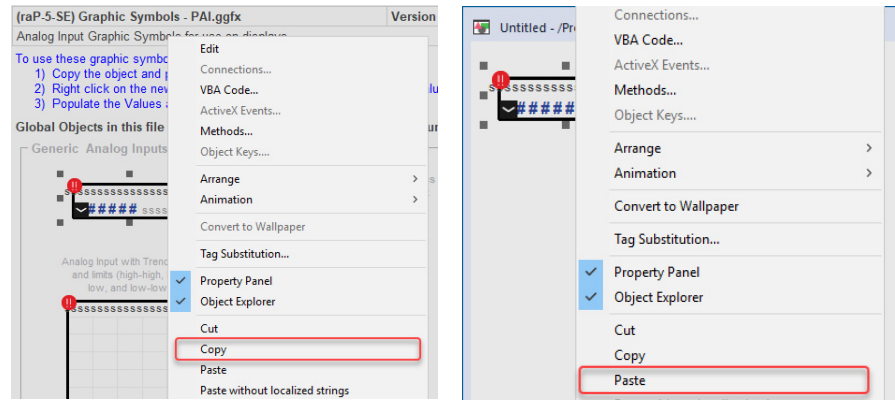


## Add HMI Graphic Symbol to FactoryTalk View SE Application and Link to PAI Tag

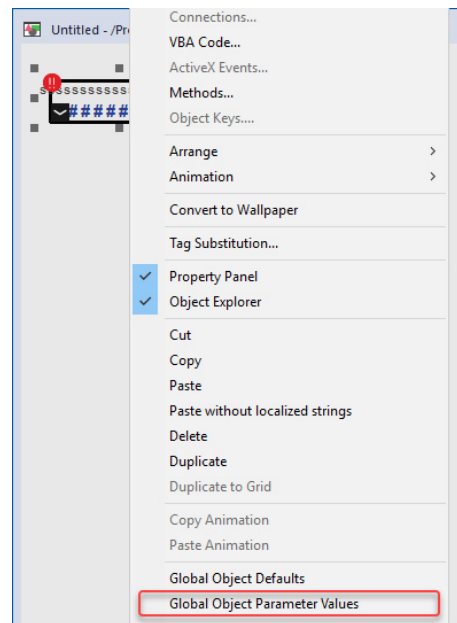
Global objects are typically found in the global objects file per instruction. For example: (raP-5-SE) Graphic Symbols - PAI. The EN2FFR faceplate is accessed from the associated PAI faceplate.

Follow these steps to use a global object.

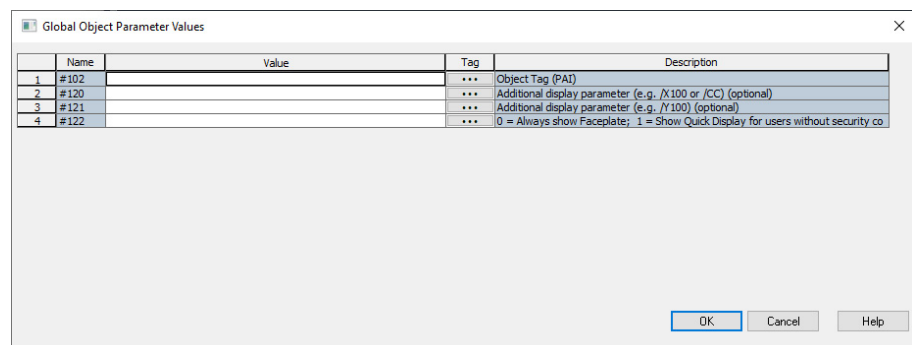
1. Copy the global object from the global object file and paste it in the display file.



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 in the controller.
#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

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



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

Global Object Parameter Values

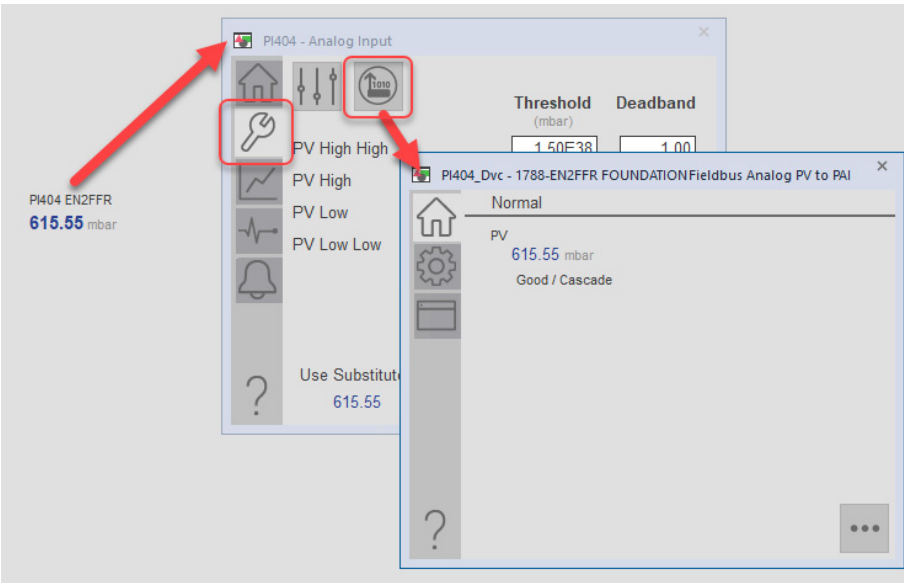
	Name	Value	Tag	Description
1	#102	{PPAx_S_10_01/DATA::[App_with_Ethernet]F1101}	...	Object Tag (PAI)
2	#120	/CC	...	Additional display parameter (e.g. /X100 or /CC) (optional)
3	#121		...	Additional display parameter (e.g. /Y100) (optional)
4	#122	0	...	0 = Always show Faceplate; 1 = Show Quick Display for users without security co

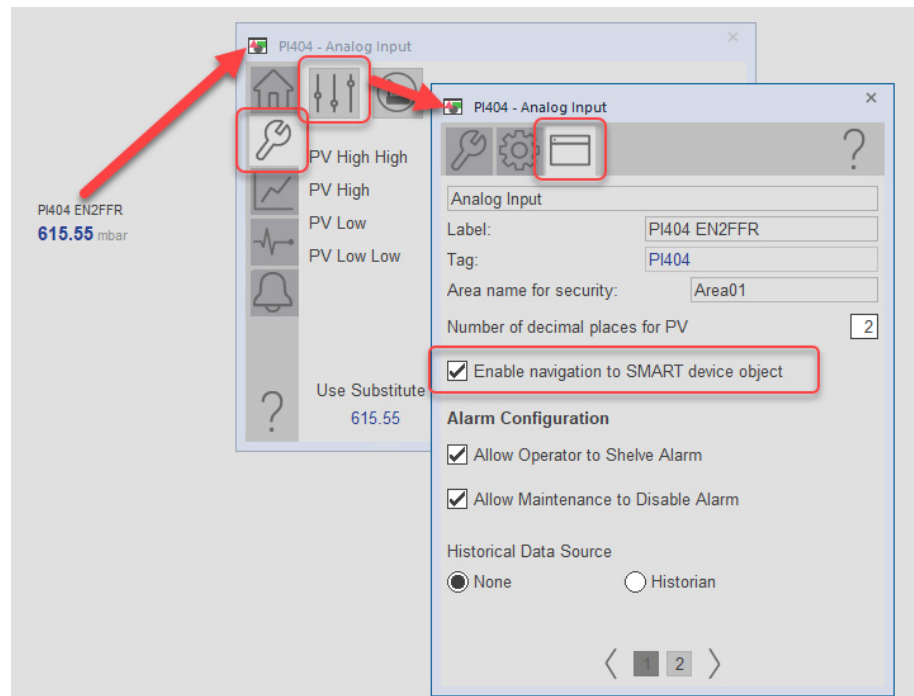
OK

Cancel

Help

4. Click OK.
5. From the runtime client, you can now navigate to the new PAI object faceplate. Open the faceplate and navigate to the Maintenance tab. Click the SMART device button to access the EN2FFR faceplate.





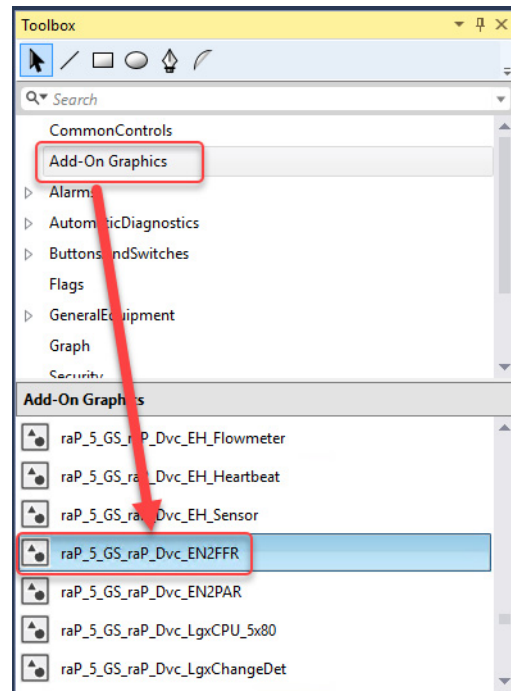
If the SMART device button is not visible on the PAI faceplate, verify that Cfg\_HasSmartDvc is enabled.

## Add HMI Graphic Symbol to Studio 5000 View Designer and Link to Object

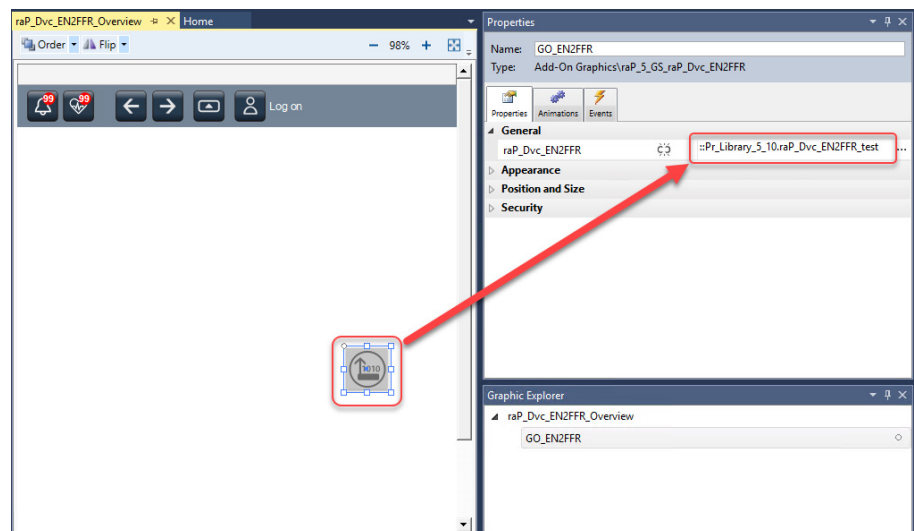
Graphic symbols are created from Add-on Graphic objects. The EN2FFR faceplate is accessed from the Add-on Graphic object.

Follow these steps to use the Add-on Graphics.

1. Open the user screen that the EN2FFR faceplate will be accessed from. From the Toolbox in the Studio 5000 View Designer application, select Add-On Graphics and select the add-on graphic "raP\_5\_GS\_raP\_Dvc\_EN2FFR". Drag the object into the user screen.



2. Select the new object and enter the binding property for the device tag.



The EN2FFR faceplate is now accessible from the display.

## Aparian A-FFL/B

The Aparian FFLink/B FOUNDATION Fieldbus Analog PV to PAI (raP\_Dvc\_AP\_FFLink) Add-On Instruction is used to transfer data from one FOUNDATION Fieldbus analog PV, mapping the REAL PV directly and mapping the PV status to a set of status bits suitable for use with the PAI instruction.

This instruction has no prescan, EnableInFalse, or postscan logic. It is intended to be executed always true in logic every scan. The instruction can be used in Ladder Diagram, Function Block Diagram, or Structured Text logic.

For more information on the PAI instruction, see Rockwell Automation Library of Process Objects, publication [PROCES-RM203](#).

### Controller Code for raP\_Dvc\_AP\_FFLINK

See EtherNet/IP™ Instrumentation Process Object Parameters, publication [PROCES-RD213](#) for parameter names and descriptions.

### Input Structure

Input parameters include the following:

- Configuration data elements (Cfg\_) are used to set configurable capabilities and features of the instruction.

### Output Structure

Output parameters include the following:

- Value data elements (Val\_) are numeric outputs of the instruction for use by the HMI. Values can also be used by other application logic or software packages.
- Status data elements (Sts\_) are bit and enumerated outputs of the instruction for use by the HMI. Status bits can also be used by other application logic.

### InOut Structure

InOut parameters include the following:

- Reference data elements (Ref\_) are used to link the instruction to external tags. Specifically, they are used to collect the analog input PV value and status from the linking device input assembly.

## Operations

### Execution

For more information, see the Logix 5000 Controllers Add-On Instructions Programming Manual, publication [1756-PM010](#).

# Graphic Symbols

A graphic symbol (global object or add-on graphic) is created once and can be referenced multiple times on multiple displays in an application. When changes are made to the original (base) object, the instantiated copies (reference objects) are automatically updated. Use of global objects and add-on graphic, with tag structures in the ControlLogix® system, aid consistency and save engineering time.

**IMPORTANT**

The raP\_Dvc\_AP\_FFLink instruction is linked to the downstream PAI instruction, which provides alarming and other standard analog input processing functions. In FactoryTalk® View SE, the PAI instruction is linked for navigation to its upstream raP\_Dvc\_AP\_FFLink instruction faceplate for device diagnostics and other variables.



The following indicators are provided by the downstream PAI instruction connected to raP\_Dvc\_AP\_FFLink:

- Status/Quality indicators
- Threshold indicators
- Alarm indicators
- Maintenance bypass indicators

**IMPORTANT**

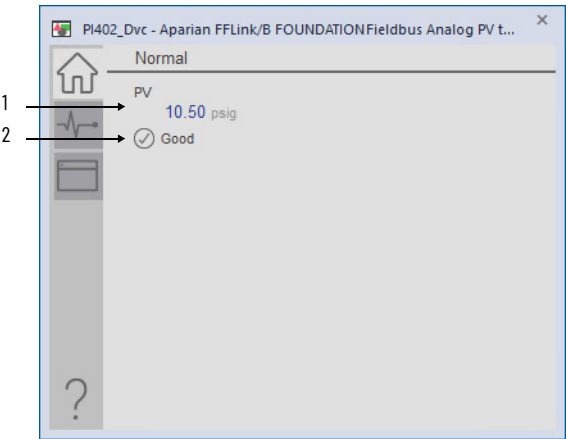
SMART device objects in the Studio 5000 View Designer® application are accessible only if an object is placed on the user screen and linked to the raP\_Dvc\_AP\_FFLink object. Faceplate to Faceplate navigation is not possible in the Studio 5000 View Designer application.

For more information about these indicators on the PAI instruction, see Rockwell Automation Library of Process Objects, publication [PROCES-RM200](#)

Graphic Symbol Name	FactoryTalk View SE Graphic Symbol	Studio 5000 View Designer Graphic Symbol	Description
GO_nav_SmartDevice (FactoryTalkView SE) GO_AP_FFLink (Studio 5000 View Designer)			Standard Graphic Symbol.

## FactoryTalk View SE Faceplates

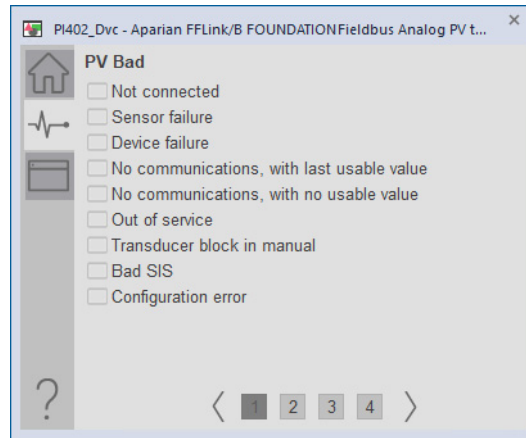
## Operator Tab



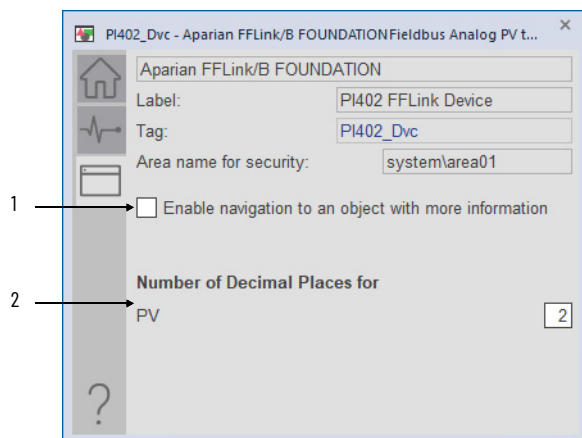
Item	Description
1	Process variable value with engineering units.
2	Process variable status (Bad, Uncertain, Good, Good / Cascade).

## Diagnostics Tab

The Diagnostic tab provides additional information about the process variable's status. Breadcrumb indicators guide you to the appropriate page if additional diagnostic information is available.



## HMI Configuration Tab



Item	Description
1	Select to enable navigation to an object with more information (Cfg_HasMoreObj is set to true.) This can be configured to navigate to an object backing tag or a UDT tag that has Instruction and Library defined.
2	Enter the number of decimal places for the Process Variable.

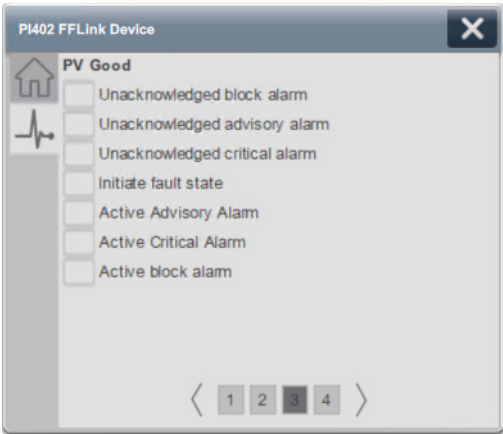
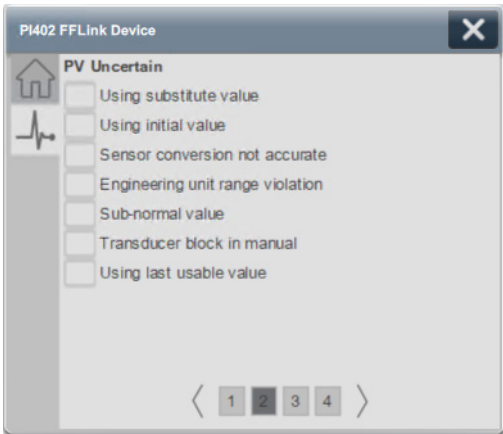
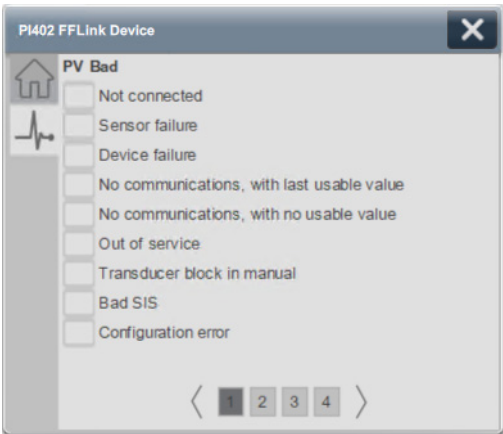
# Studio 5000 View Designer Faceplates

Any feature that is contained in the Studio 5000 View Designer faceplates has the same functionality as used in the FactoryTalk View SE faceplates. See [FactoryTalk View SE Faceplates on page 26](#).

## Operator Tab



## Diagnostics Tab







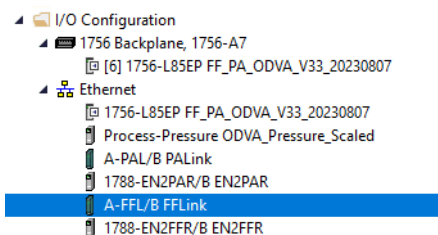
- Click the General tab and set the name, description, and IP address.

The 'New Module' dialog box is shown with the 'General' tab selected. The 'Name' field is empty and highlighted with a red box. The 'Description' field is also empty and highlighted with a red box. The 'Ethernet Address' section has the 'IP Address' radio button selected and highlighted with a red box. The 'Module Definition' section shows 'Revision: 2.001', 'Electronic Keying: Compatible Module', and 'Connections: I/O Connection'. The status bar at the bottom indicates 'Status: Creating'.



Depending on the number of Fieldbus devices connected to this linking device, you may need to change the number of connections in the Module Definition section. See [EtherNet/IP and ControlNet to FOUNDATION Fieldbus Linking Devices](#), publication [1788-UM057](#) for more information.

- Select OK to add the linking device to the I/O tree.



## Configuration

For the Aparian A-FFL/B linking device configuration options, download the user manual from [Aparian.com](#). It can be found under Products > Foundation Fieldbus Link.

The Aparian A-FFL/B user manual explains how to configure the linking device using their software (Slate). After the configuration is complete, the Slate software will generate the required User-Defined tags (UDTs) and routines for your program based on the Internal Mapping configured. The generated L5X (routine) file must be imported into your target program before completing the remaining steps in this manual (See section "Logix Mapping" in the Aparian user manual).

## Import Device Add-On Instruction

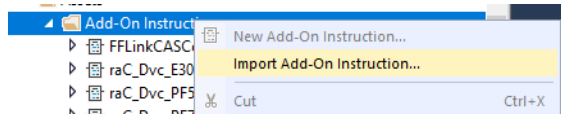
The `raP_Dvc_AP_FFLink` Add-On Instruction definition file must be imported into the controller project to be able to be used in the controller configuration.

This instruction transfers data from one Foundation Fieldbus analog PV, mapping the REAL PV directly, and mapping the PV status to a set of status bits suitable for use with the PAI instruction.

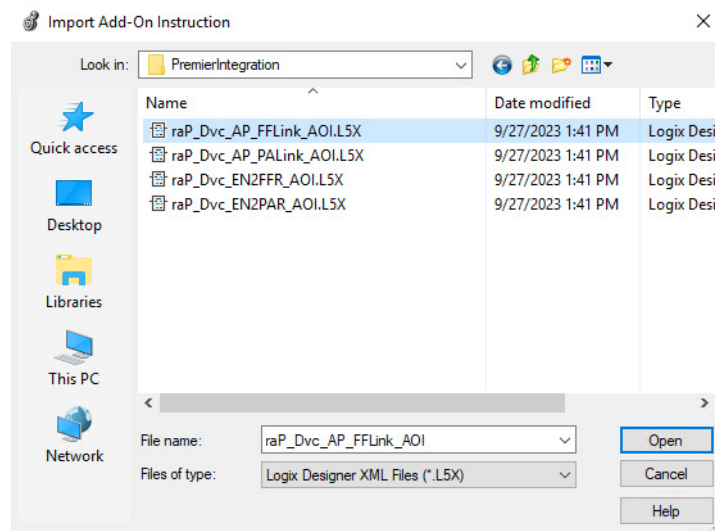
This instruction is for use with the PAI instruction in process controller (1756-L8xEP) version 35 or later.

- Import the appropriate device Add-On Instruction. (This procedure uses `raP_Dvc_AP_FFLink.AOI.L5X` as an example.)

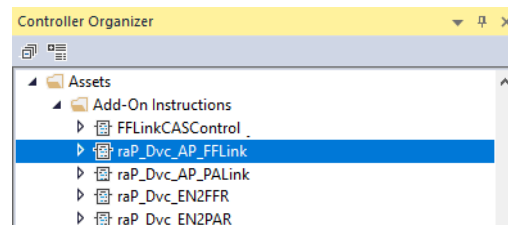
2. In the target Controller Organizer, right-click Add-On Instructions and choose Import Add-On Instruction.



3. Navigate to the folder that contains the device Add-On Instructions and select raP\_Dvc\_AP\_FFLink.AOI.L5X, and then click Open.



4. Click OK in the Import Configuration window.
5. The Add-On Instruction is then added to the Controller Organizer.

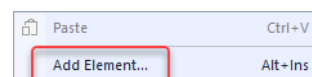


## Add Process Analog Input (PAI) Instruction to Routine

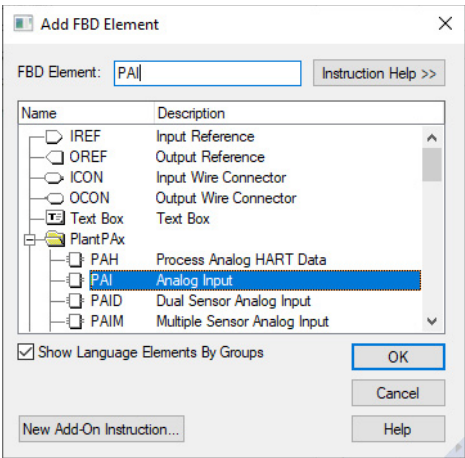


This instruction shows how to add instructions to a Function Block Diagram routine. The instructions can be used in Ladder Diagram and Structured Text routines as well.

1. Right-click the sheet within the routine and choose Add Element to add the PAI instruction to the routine.

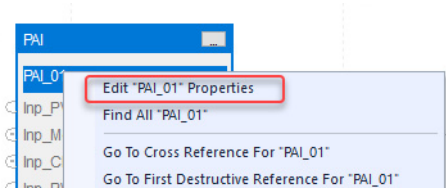


2. Type PAI into the FBD Element text box and select OK.

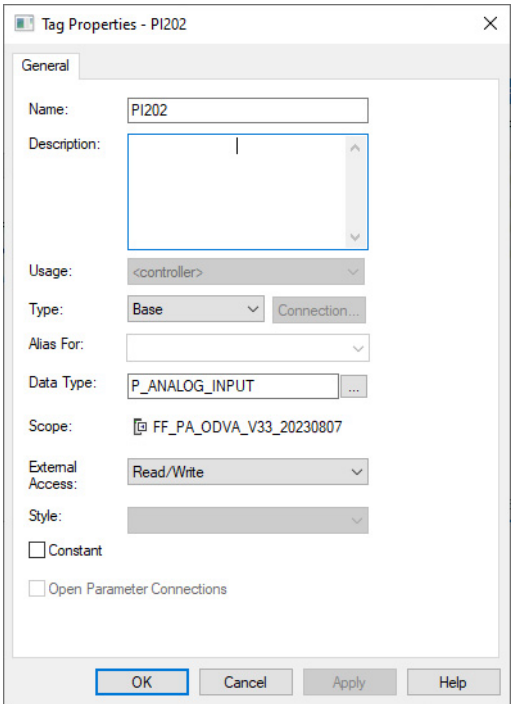



**IMPORTANT** At least one instance of the Process Analog Input (PAI) instruction is used for each channel (device) on the input module.

3. Right-click the name of the new instance of PAI and choose Edit...Properties.



4. Change the name according to the project convention. To save the changes, click OK.

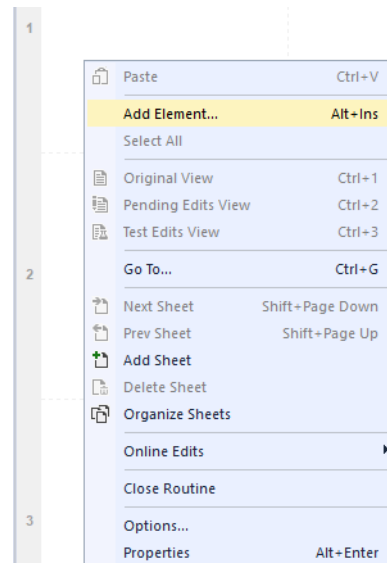


5. To save the project, click 

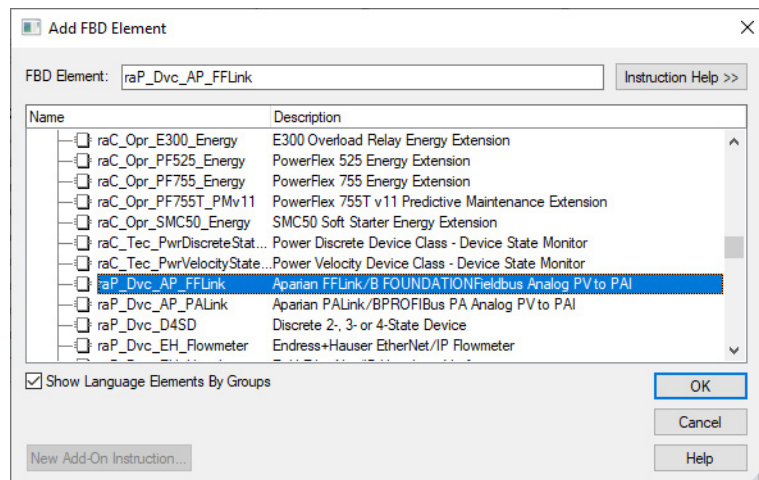
## Add Device Instruction to Routine

This procedure adds the device logic to the routine. Perform this procedure once for every device.

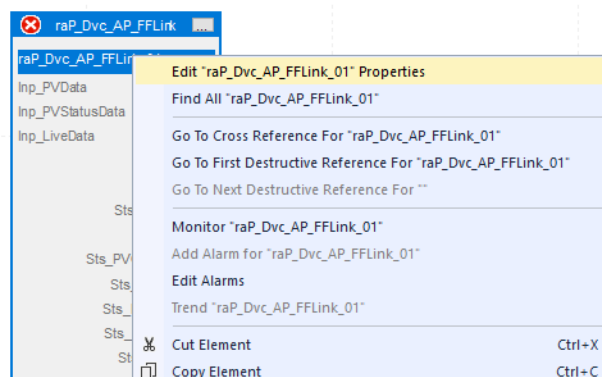
1. Open the routine where the device logic is used.
2. Within the routine, right-click the sheet and click Add Element.



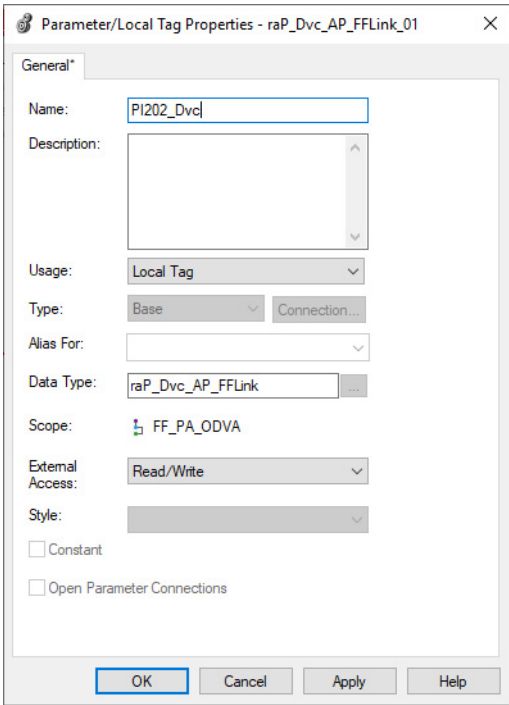
3. Type the device Add-On Instruction name in the FBD Element box; for this example, `raP_Dvc_AP_FFLink`, and then click OK.



4. Right-click the name of the backing tag for the new Add-On Instruction instance and choose Edit...Properties.

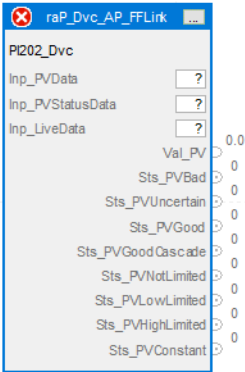


5. Change the name to correspond with the project convention. To save the changes, click OK.



**IMPORTANT** The tag name for the raP\_Dvc\_AP\_FFLink instance must correspond to the instance of the PAI that it is connected to. The tag name for the raP\_Dvc\_AP\_FFLink must be the name of the PAI object appended with “\_Dvc”. For example, if the corresponding PAI instruction is PI202, the raP\_Dvc\_AP\_FFLink tag must be PI202\_Dvc. This allows for automatic navigation via the SMART Device button on the HMI faceplate of the PAI.

6. Set the Inp\_ Values.



Inp\_LiveData and Inp\_PVStatusData come from the following table:

Name	Value	Force	Style	Data Type	Description
FFLinkIn	{...}	{...}		FFLinkInput	
FFLinkOut	{...}	{...}		FFLinkOutput	
FFLinkPT202In	{...}	{...}		FFLink452B481007IX3F52	
FFLinkPT202In.Status	{...}	{...}		FFLinkDeviceStatus	
FFLinkPT202In.Status.Online	0		Decimal	BOOL	Device Online (0=Offline, 1=Online)
FFLinkPT202In.Status.DataExchangeActive	0		Decimal	BOOL	Data Exchange Active (0=Inactive, 1=...
FFLinkPT202In.Status.IdentityMismatch	0		Decimal	BOOL	Device Identity Mismatch (0=Ok, 1=...
FFLinkPT202In.Status.DeviceError	0		Decimal	BOOL	FF Device Error (0=Ok, 1=Error)
FFLinkPT202In.Status.SysUpdateBusy	0		Decimal	BOOL	FFLink Busy Updating System Infor...
FFLinkPT202In.Status.APUpdateBusy	0		Decimal	BOOL	FFLink Busy Updating Application Pr...
FFLinkPT202In.Status.MapChecksumMismatch	1		Decimal	BOOL	Device Mapping Checksum Mismatch
FFLinkPT202In.Status.Station	18		Decimal	INT	Station Address
FFLinkPT202In.PV1	{...}	{...}		FFLinkInputPVReal	
FFLinkPT202In.PV1.Status	{...}	{...}		FFLinkInputPVStatus	
FFLinkPT202In.PV1.Status.Value	16#00		Hex	SINT	Raw Status Value
FFLinkPT202In.PV1.Status.Bad	1		Decimal	BOOL	

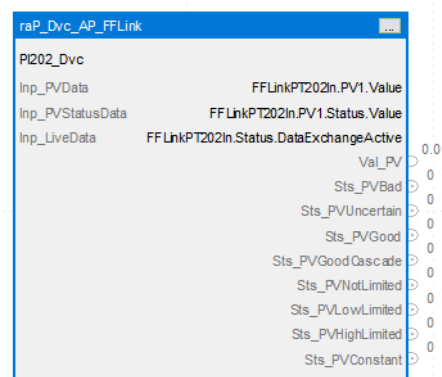
### IMPORTANT

These tags are imported with the L5X mapping routine that is generated by the Aparian configuration software Slate.

Inp\_PVData comes from the following table:

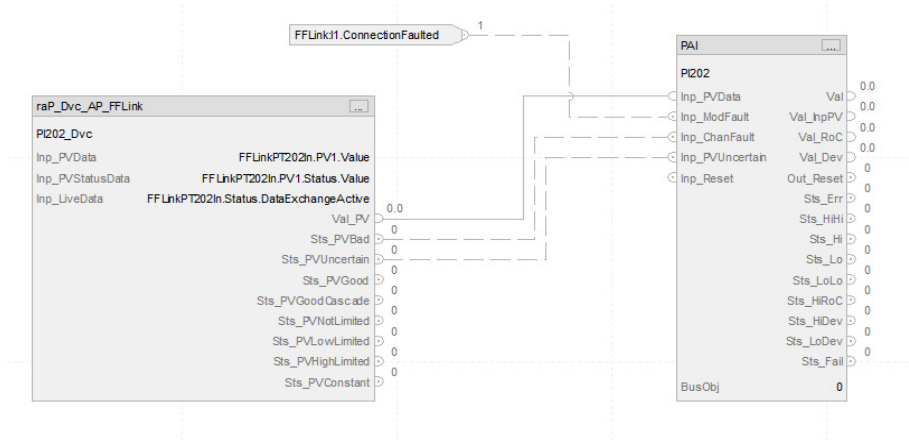
Name	Value	Force	Style	Data Type	Description
FFLinkPT202In.PV1.Status.Uncertain_LastValue	0		Decimal	BOOL	
FFLinkPT202In.PV1.Status.Uncertain_Substitute	0		Decimal	BOOL	
FFLinkPT202In.PV1.Status.Uncertain_InitValue	0		Decimal	BOOL	
FFLinkPT202In.PV1.Status.Uncertain_SensNotAccura...	0		Decimal	BOOL	
FFLinkPT202In.PV1.Status.Uncertain_EngRangeErr	0		Decimal	BOOL	
FFLinkPT202In.PV1.Status.Uncertain_SubNormal	0		Decimal	BOOL	
FFLinkPT202In.PV1.Status.Uncertain_TransducerMan...	0		Decimal	BOOL	
FFLinkPT202In.PV1.Status.Good_ActBlockAlarm	0		Decimal	BOOL	
FFLinkPT202In.PV1.Status.Good_ActAdvisoryAlarm	0		Decimal	BOOL	
FFLinkPT202In.PV1.Status.Good_ActCriticalAlarm	0		Decimal	BOOL	
FFLinkPT202In.PV1.Status.Good_UnackBlockAlarm	0		Decimal	BOOL	
FFLinkPT202In.PV1.Status.Good_UnackAdvisoryAlarm	0		Decimal	BOOL	
FFLinkPT202In.PV1.Status.Good_UnackCriticalAlarm	0		Decimal	BOOL	
FFLinkPT202In.PV1.Status.Good_InitialFaultState	0		Decimal	BOOL	
FFLinkPT202In.PV1.Status.GoodCas_InitAck	0		Decimal	BOOL	
FFLinkPT202In.PV1.Status.GoodCas_InitReq	0		Decimal	BOOL	
FFLinkPT202In.PV1.Status.GoodCas_NotInvited	0		Decimal	BOOL	
FFLinkPT202In.PV1.Status.GoodCas_NotSelected	0		Decimal	BOOL	
FFLinkPT202In.PV1.Status.GoodCas_LocalOverride	0		Decimal	BOOL	
FFLinkPT202In.PV1.Status.GoodCas_FaultStateActive	0		Decimal	BOOL	
FFLinkPT202In.PV1.Status.GoodCas_InitFaultState	0		Decimal	BOOL	
FFLinkPT202In.PV1.Value	0.0		Float	REAL	PV Value
FFLinkPT202Out	{...}	{...}		FFLink452B481007OX3F52	


Final configuration.



## Connect the PAI Instance to the raP\_Dvc\_AP\_FFLink Instance

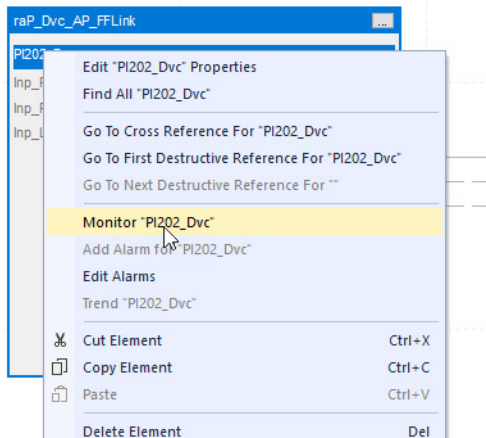
1. Connect the instruction instances as shown in the following diagram.



2. To save the project, click 

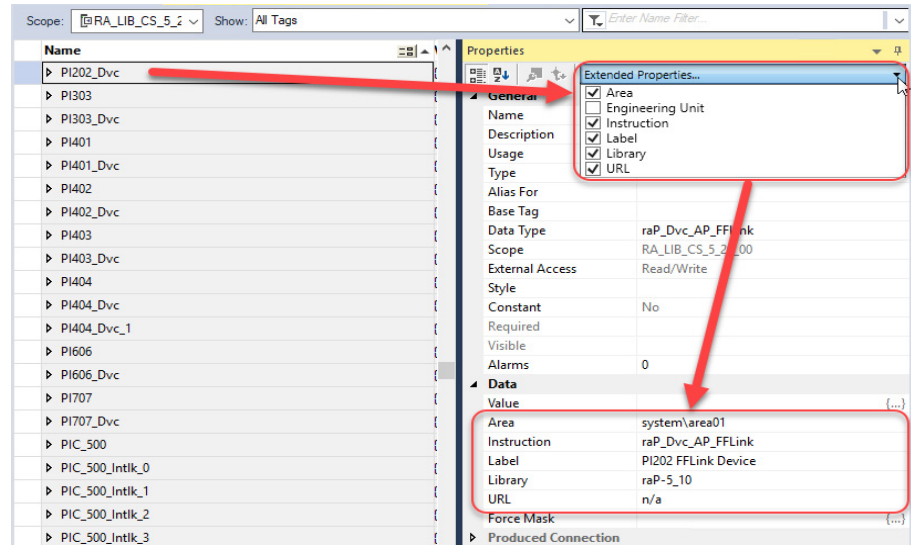
## Update the Extended Tag Properties of the raP\_Dvc\_AP\_FFLink Instance

1. Right-click the name of the raP\_Dvc\_AP\_FFLink Add-On Instruction and choose Monitor... The tags list opens with the flowmeter tag selected.






- In the right-hand panel, the properties for that tag will be shown. Verify that the following extended tag properties are enabled and the correct information is entered.



Extended Tag Property	Typical Value	Action
Area	Area01	Update per project conventions
Instruction	raP_Dvc_AP_FFLink	Leave as is
Label	Device name	Update per project conventions
Library	raP-5.10	Leave as is
URL	n/a	Update per project conventions

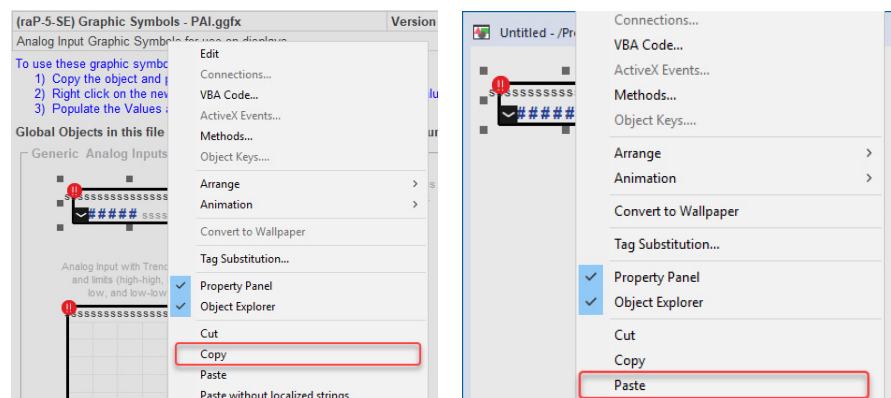
- To save the project, click 

## Add HMI Graphic Symbol to FactoryTalk View SE Application and Link to PAI Tag

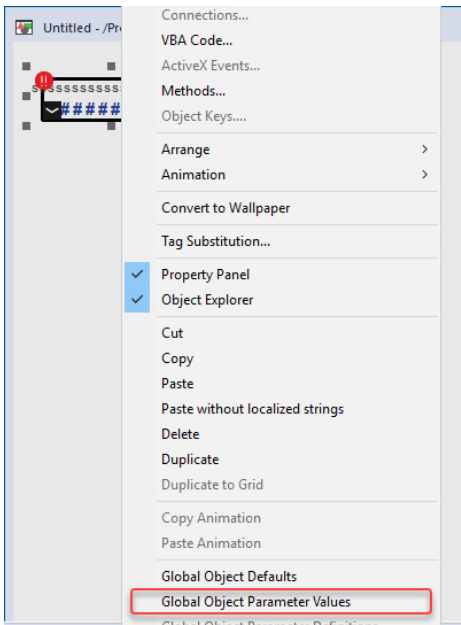
Global objects are typically found in the global objects file per instruction. For example: (raP-5-SE) Graphic Symbols - PAI. The FFLink faceplate is accessed from the associated PAI faceplate.

Follow these steps to use a global object.

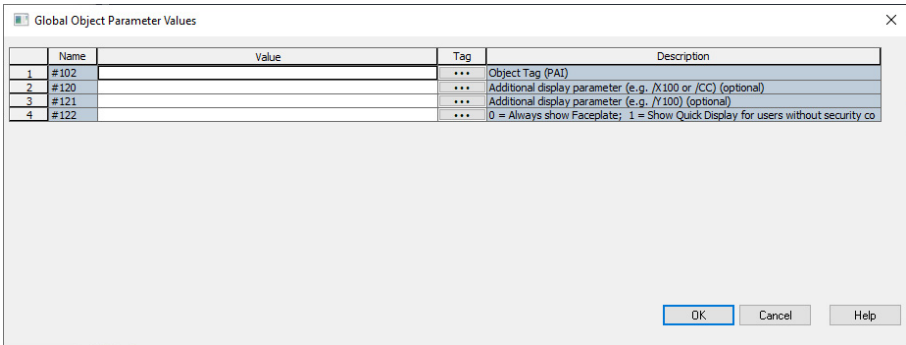
- Copy the global object from the global object file and paste it in the display file.



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



The Global Object Parameter Values dialog box appears.



he global object parameters are as follows.

Parameter	Required	Description
#102	Y	Object tag to point to the name of the associated object in the controller.
#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

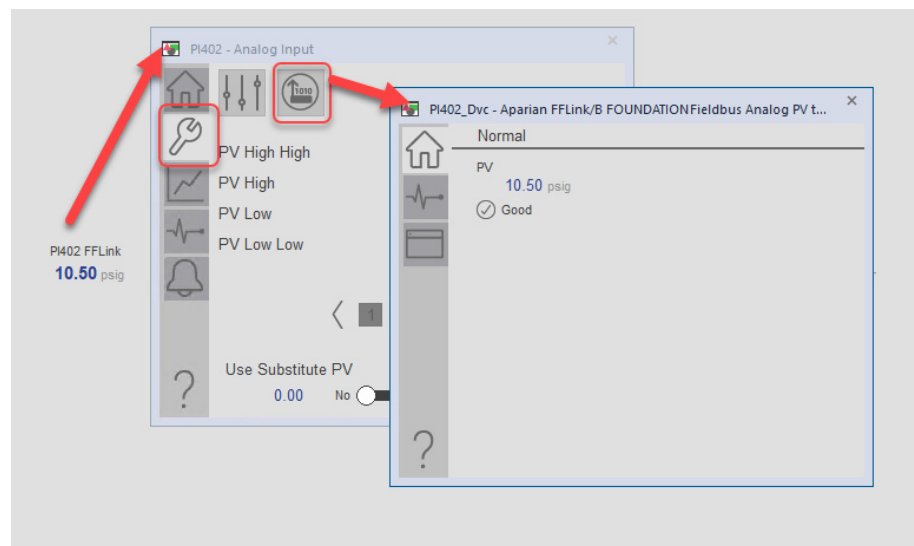
3. In the Value column, type the tag or value as specified in the Description column.



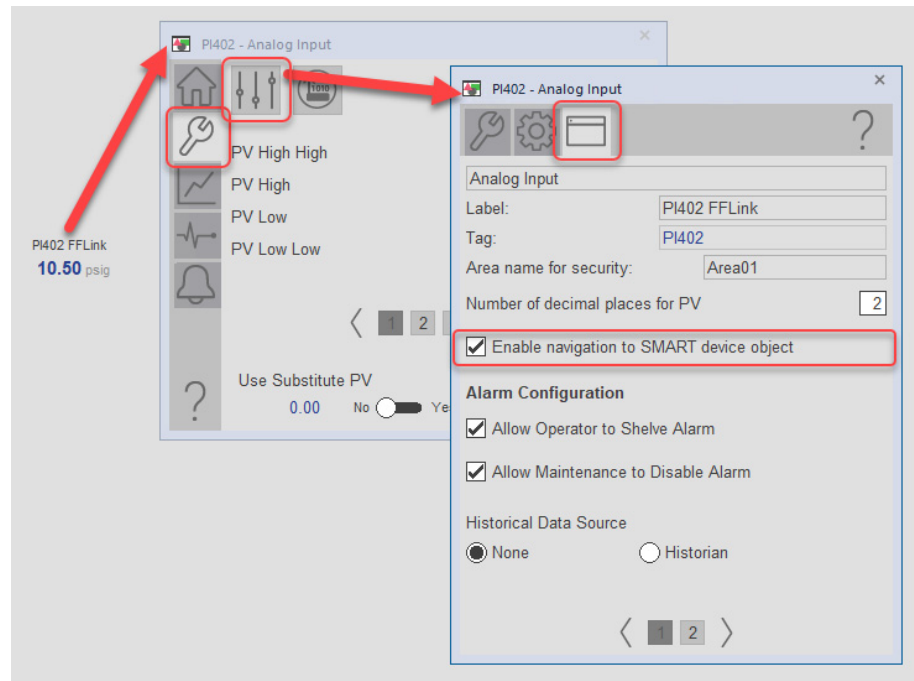
Click the ellipsis (...) to browse and select a tag.  
Values for items that are not required can be left blank.

Global Object Parameter Values				
	Name	Value	Tag	Description
1	#102	{PPAx_5_10_01/DATA::[App_with_Ethernet]FI101}	...	Object Tag (PAI)
2	#120	/CC	...	Additional display parameter (e.g. /X100 or /CC) (optional)
3	#121		...	Additional display parameter (e.g. /Y100) (optional)
4	#122	0	...	0 = Always show Faceplate; 1 = Show Quick Display for users without security co...

4. Click OK.
5. From the runtime client, you can now navigate to the new PAI object faceplate. Open the faceplate and navigate to the Maintenance tab. Click the SMART device button to access the FFLink.



If the SMART device button is not visible on the PAI faceplate, verify that Cfg\_HasSmartDvc is enabled.

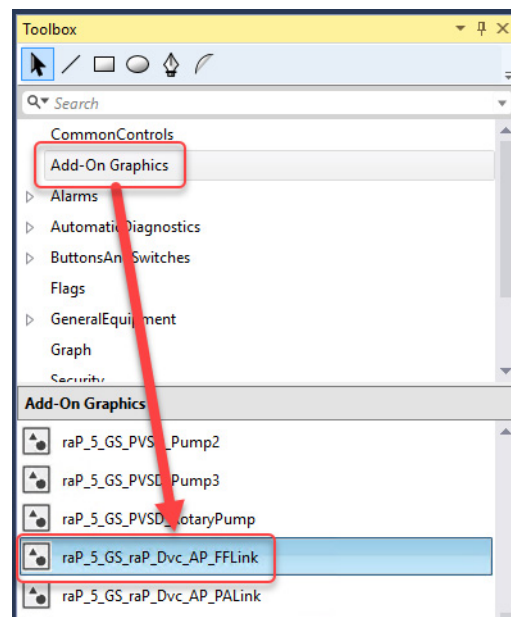


## Add HMI Graphic Symbol to Studio 5000 View Designer and Link to Object

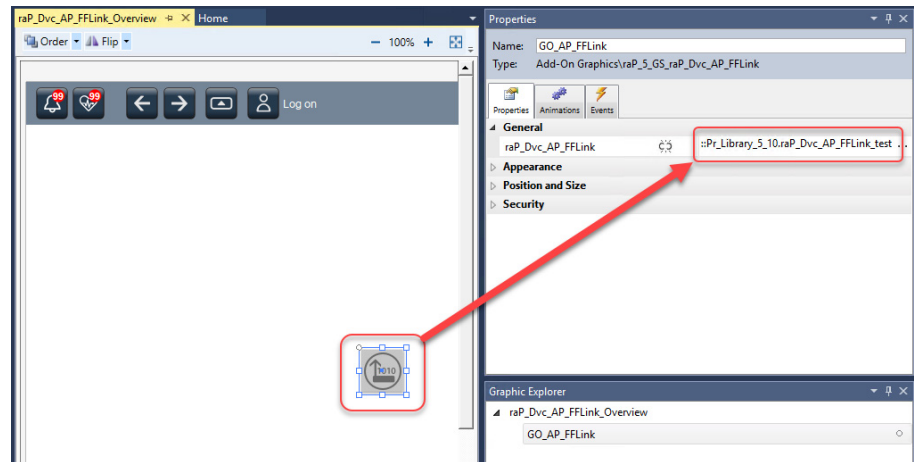
Graphic symbols are created from Add-on Graphic objects. The FFLink faceplate is accessed from the Add-on Graphic object.

Follow these steps to use the Add-on Graphics.

1. Open the user screen that the FFLink faceplate will be accessed from. From the Toolbox in View Designer, select Add-On Graphics and select the Add-on Graphic "raP\_5\_GS\_raP\_Dvc\_FFLink". Drag the object into the user screen.



2. Select the new object and enter the binding property for the device tag.



The FFLink faceplate is now accessible from the display.

**Notes:**

## Allen-Bradley 1788-EN2PAR

The 1788-EN2PAR provides a fast, fully integrated, and easy-to-use solution for adding PROFIBUS PA to the PlantPAx® Distributed Control System (DCS). The modules provide a direct link from EtherNet/IP™ to the PROFIBUS PA device level protocol without a PROFIBUS DP layer. The module's Add-On Profile (AOP) which provides an intuitive environment for the configuration the field device network and all field devices. The AOP captures all Process Variables (PVs) in Engineering Units and provides PV status data and extended device diagnostics.

This instruction has no prescan, EnableInFalse, or postscan logic. It is intended to be executed always true in logic every scan. The instruction can be used in Ladder Diagram, Function Block Diagram, or Structured Text logic.

For more information on the PAI instruction, see Rockwell Automation Library of Process Objects, publication [PROCES-RM203](#).

### Controller Code for raP\_Dvc\_EN2PAR

See EtherNet/IP Instrumentation Process Object Parameters, publication [PROCES-RD213](#) for parameter names and descriptions.

### Input Structure

Input parameters include the following:

- Configuration data elements (Cfg\_) are used to set configurable capabilities and features of the instruction.

### Output Structure

Output parameters include the following:

- Value data elements (Val\_) are numeric outputs of the instruction for use by the HMI. Values can also be used by other application logic or software packages.
- Status data elements (Sts\_) are bit and enumerated outputs of the instruction for use by the HMI. Status bits can also be used by other application logic.

### InOut Structure

InOut parameters include the following:

- Reference data elements (Ref\_) are used to link the instruction to external tags. Specifically, they are used to collect the device image from the device input assembly.

## Operations

### Execution

For more information, see the Logix 5000 Controllers Add-On Instructions Programming Manual, publication [1756-PM010](#).

Graphic Symbols

A graphic symbol (global object or add-on graphic) is created once and can be referenced multiple times on multiple displays in an application. When changes are made to the original (base) object, the instantiated copies (reference objects) are automatically updated. Use of global objects and add-on graphics, with tag structures in the ControlLogix® system, aid consistency and save engineering time.



**IMPORTANT** The raP\_Dvc\_EN2PAR instruction is linked to the downstream PAI instruction, which provides alarming and other standard analog input processing functions. In FactoryTalk® View SE the PAI instruction is linked for navigation to its upstream raP\_Dvc\_EN2PAR instruction faceplate for device diagnostics and other variables.

The following indicators are provided by the downstream PAI instruction connected to raP\_Dvc\_EN2PAR:

- Status/Quality indicators
- Threshold indicators
- Alarm indicators
- Maintenance bypass indicators

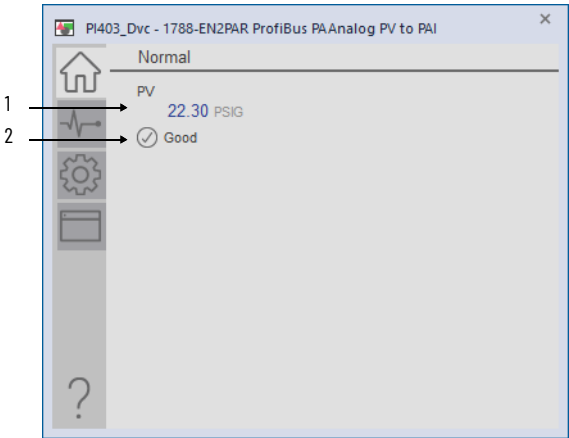
**IMPORTANT** SMART device objects in the Studio 5000 View Designer application are accessible only if an object is placed on the user screen and linked to the raP\_Dvc\_EN2PAR object. Faceplate to Faceplate navigation is not possible in the Studio 5000 View Designer application.

For more information about these indicators on the PAI instruction, see Rockwell Automation Library of Process Objects, publication [PROCES-RM200](#).

Graphic Symbol Name	FactoryTalk View SE Graphic Symbol	Studio 5000 View Designer Graphic Symbol	Description
GO_nav_SmartDevice (FactoryTalkView SE) GO_EN2PAR (Studio 5000 View Designer)			Standard Graphic Symbol.

FactoryTalk View SE Faceplates

Operator Tab

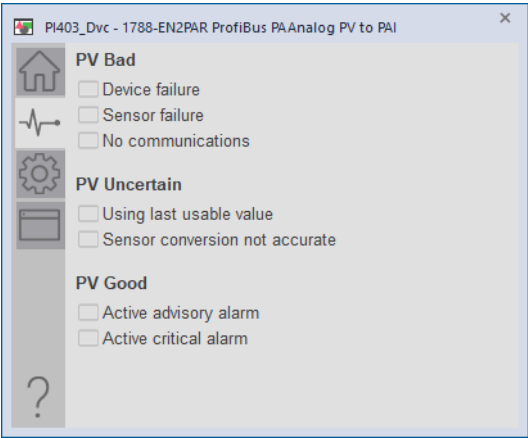


Item	Description
1	Process variable value with engineering units.
2	Process variable status (Bad, Uncertain, Good, Good / Cascade).

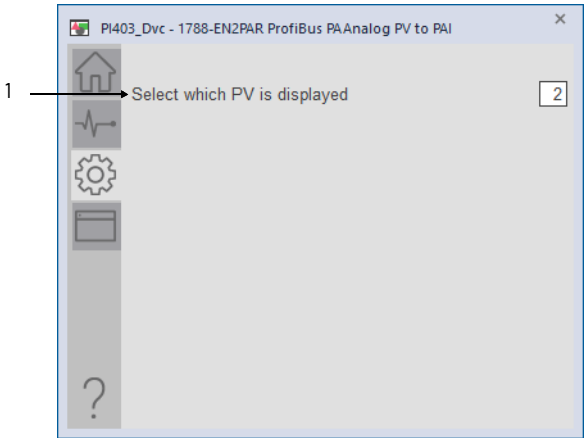


## Diagnostics Tab

The Diagnostic tab provides additional information about the process variable's status. Breadcrumb indicators guide you to the appropriate page if additional diagnostic information is available.

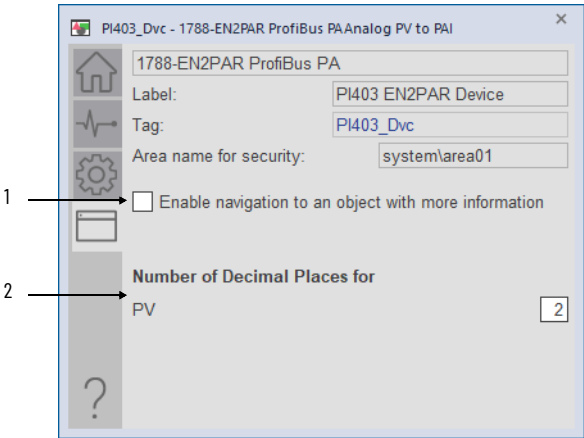


## Engineering Tab



Item	Description
1	Each Field Device image provides 8 REAL process variables. Select which of the 8 PVs is to be monitored..

# HMI Configuration Tab

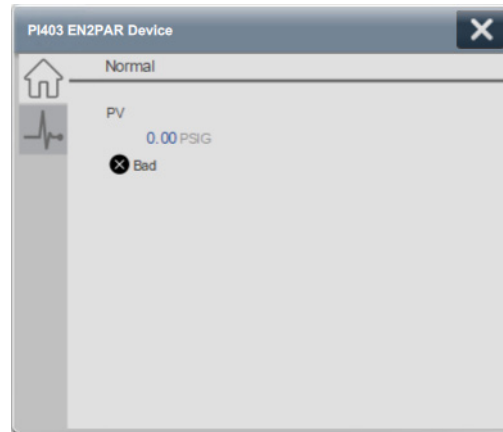


Item	Description
1	Select to enable navigation to an object with more information (Cfg_HasMoreObj is set to true.) This can be configured to navigate to an object backing tag or a UDT tag that has Instruction and Library defined.
2	Enter the number of decimal places for the Process Variable.

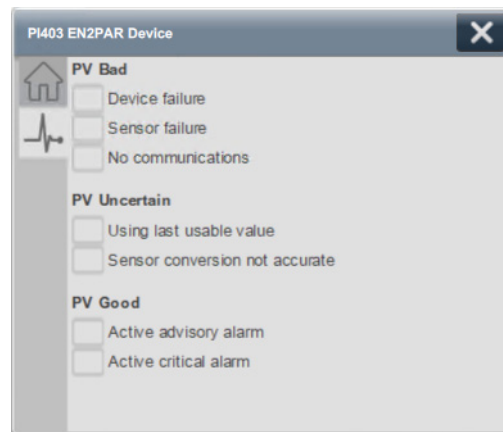
## Studio 5000 View Designer Faceplates

Any feature that is contained in the Studio 5000 View Designer faceplates has the same functionality as used in the FactoryTalk View SE faceplates. See [FactoryTalk View SE Faceplates on page 44](#)

### Operator Tab



### Diagnostics Tab



## Programming Example

### Install AOP

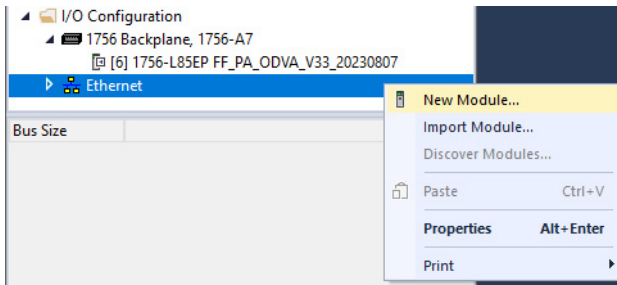
You must install the Add-On Profile (AOP) for the 1788-EN2PAR to configure and manage the linking device.

For the latest compatible software information and to download the AOP, see the Product Compatibility and Download Center at [rok.auto/pcdc](http://rok.auto/pcdc).

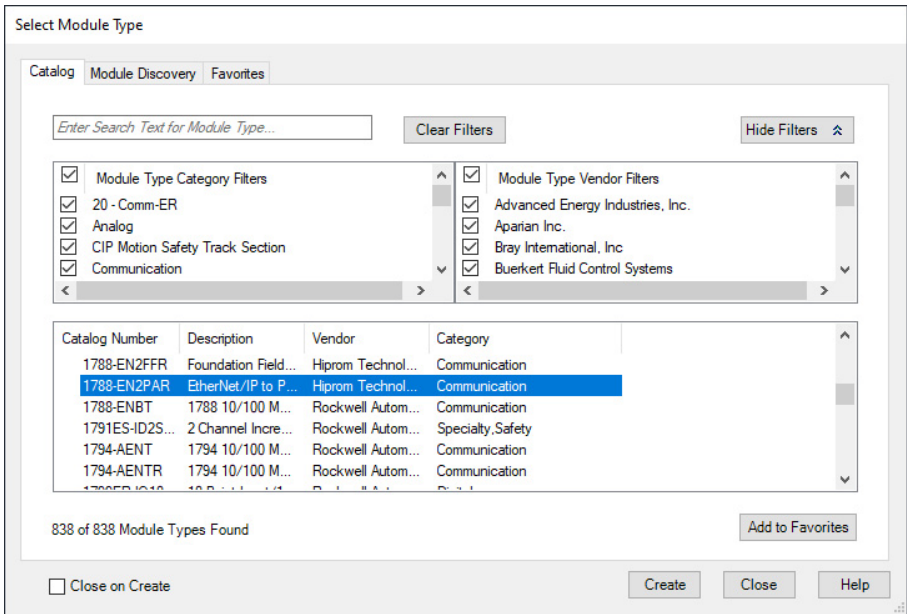
### Add Device to I/O Configuration Tree

The 1788-EN2PAR must be added into the project I/O configuration. This step is performed for every device in the I/O configuration tree. This example uses the 1788-EN2PAR linking device.

1. Right-click the Ethernet network and choose New Module.



2. Select the linking device that you want to add to the Ethernet network.



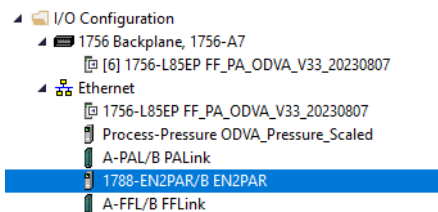
- Click the General tab and set the name, description, and IP address.

The screenshot shows the 'New Module' dialog box with the 'General' tab selected. The 'Name' and 'Description' fields are highlighted with red boxes. The 'IP Address' radio button is selected and highlighted with a red box. The 'Ethernet Address' section shows 'Private Network' selected with IP 192.168.1.1. The 'Module Definition' section shows Series C, Revision 3.001, and Connection Output.



Depending on the number of Fieldbus devices connected to this linking device, you may need to change the number of connections in the Module Definition section. See EtherNet/IP and ControlNet to FOUNDATION Fieldbus Linking Devices, publication [1788-UM057](#) for more information.

- Select OK to add the linking device to the I/O tree.



## Configuration

For 1788-EN2PAR configuration options, see EtherNet/IP and ControlNet to PROFIBUS PA Linking Devices, publication [1788-UM058](#).

The 1788-EN2PAR should be configured to provide one or more analog (REAL) PV values with status.

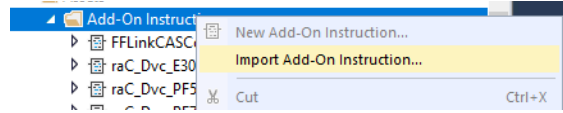
## Import Device Add-On Instruction

The raP\_Dvc\_EN2PAR Add-On Instruction definition file must be imported into the controller project to be able to be used in the controller configuration.

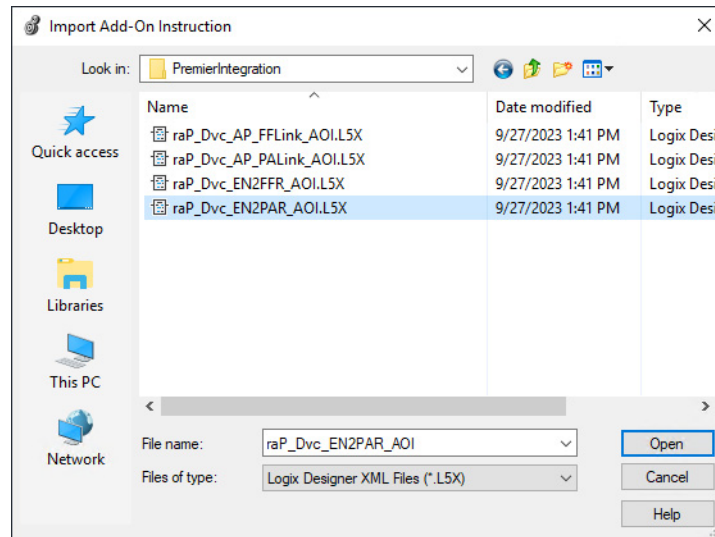
This instruction transfers data from one PROFIBUS PA analog PV, mapping the REAL PV directly, and mapping the PV status to a set of status bits suitable for use with the PAI instruction.

This instruction is for use with the PAI instruction in process controller (1756-L8xEP) version 35 or later.

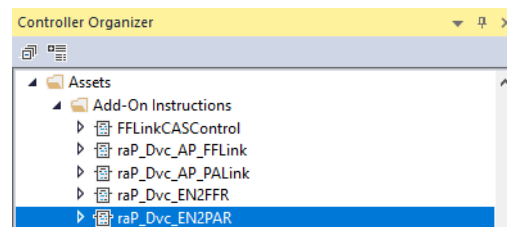
1. Import the appropriate device Add-On Instruction. (This procedure uses raP\_Dvc\_EN2PAR.AOI.L5X as an example.)
2. In the target Controller Organizer, right-click Add-On Instructions and choose Import Add-On Instruction.



3. Navigate to the folder that contains the device Add-On Instructions and select raP\_Dvc\_EN2PAR.AOI.L5X, and then click Open



4. Click OK in the Import Configuration window.
5. The Add-On Instruction is then added to the Controller Organizer.

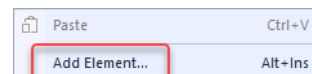


## Add Process Analog Input (PAI) Instruction to Routine

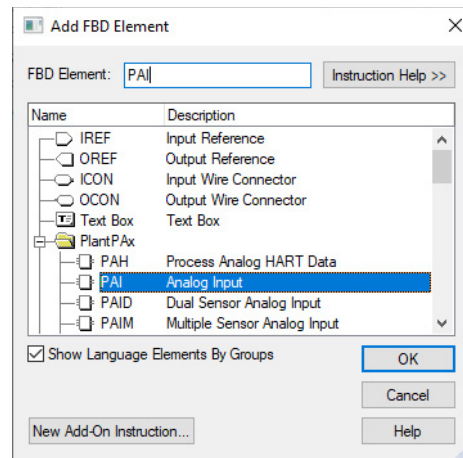


This instruction shows how to add instructions to a Function Block Diagram routine. The instructions can be used in Ladder Diagram and Structured Text routines as well.

1. Right-click the sheet within the routine and choose Add Element to add the PAI instruction to the routine.

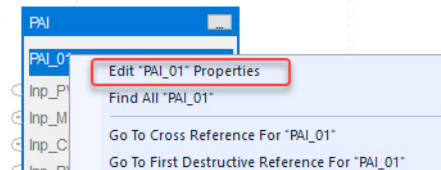


2. Type PAI into the FBD Element text box and select OK.

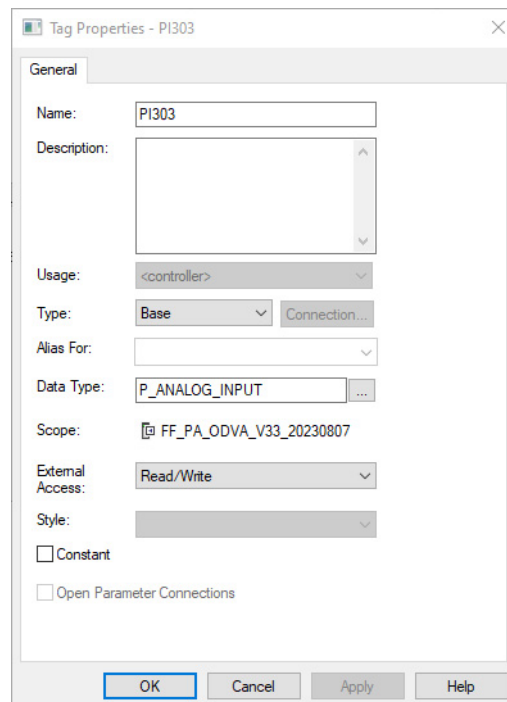



**IMPORTANT** At least one instance of the Process Analog Input (PAI) instruction is used for each channel (device) on the input module.

3. Right-click the name of the new instance of PAI and choose Edit...Properties.



4. Change the name according to the project convention. To save the changes, click OK.

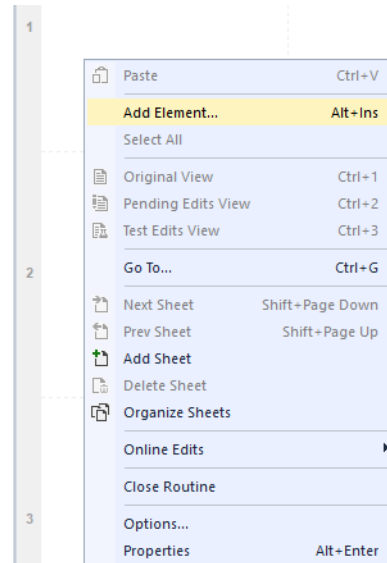


5. To save the project, click .

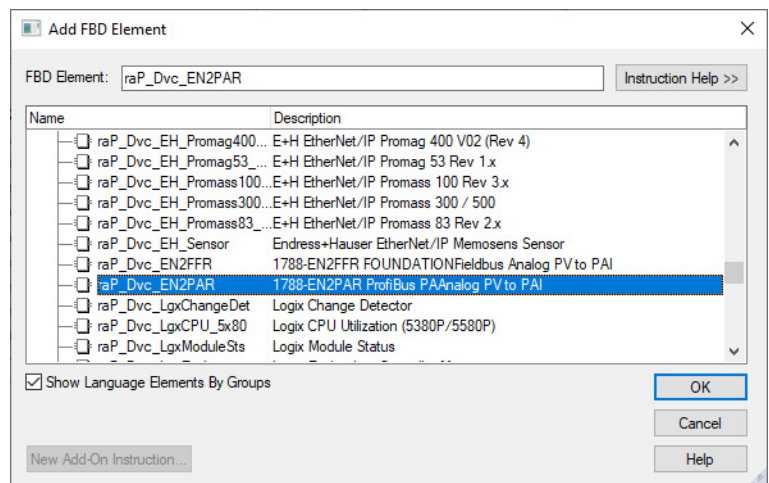
## Add Device Instruction to Routine

This procedure adds the device logic to the routine. Perform this procedure once for every device.

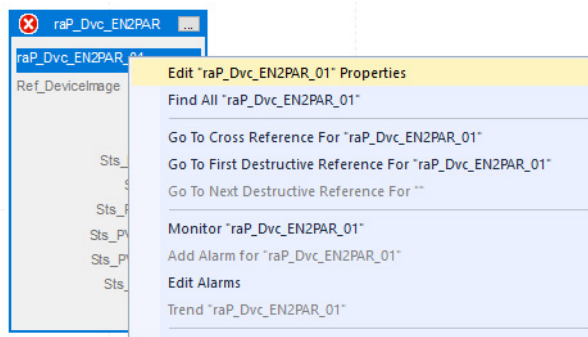
1. Open the routine where the device logic is used.
2. Within the routine, right-click the sheet and click Add Element.



3. Type the device Add-On Instruction name in the FBD Element box; for this example, raP\_Dvc\_EN2PAR, and then click OK.

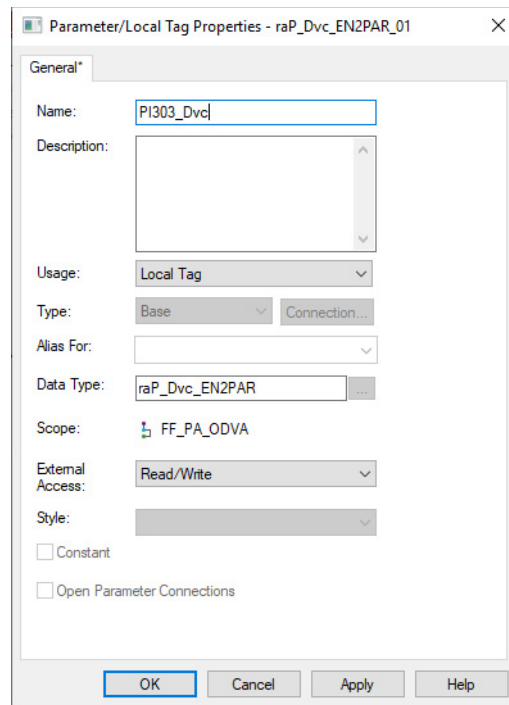


4. Right-click the name of the backing tag for the new Add-On Instruction instance and choose Edit...Properties.





5. Change the name to correspond with the project convention. To save the changes, click OK.



### IMPORTANT

The tag name for the raP\_Dvc\_EN2PAR instance must correspond to the instance of the PAI that it is connected to. The tag name for the raP\_Dvc\_EN2PAR must be the name of the PAI object appended with "\_Dvc". For example, if the corresponding PAI instruction is PI303, the raP\_Dvc\_EN2PAR tag must be PI303\_Dvc. This allows for automatic navigation via the SMART Device button on the HMI faceplate of the PAI.

6. Set the value for Ref\_DeviceImage. The reference must be a member of type "HT:1788\_EN2PARB\_DeviceImage:I:0".



The 1788-EN2PAR can provide up to 16 device images, so be sure to choose the correct one for the device being linked.

raP\_Dvc\_EN2PAR

PI303\_Dvc

Ref\_DeviceImage ?

Val\_PV 0.0

Sts\_PVBad 0

Sts\_PVUncertain 0

Sts\_PVGood 0

Sts\_PVNotLimited 0

Sts\_PVLowLimited 0

Sts\_PVHighLimited 0

Sts\_PVConstant 0

Sts\_Err 0

Scope: [FF\_PA\_ODVA\_v] Show: All Tags

Name	Style	Data Type
EN2PAR:IA		HT:1788_EN2PARB_0_5:IA:0
EN2PAR:IA.CommStatusA	Hex	DINT
EN2PAR:IA.Master		HT:1788_EN2PARB_MasterImage:I:0
EN2PAR:IA.FieldDevice00		HT:1788_EN2PARB_DeviceImage:I:0
EN2PAR:IA.FieldDevice01		HT:1788_EN2PARB_DeviceImage:I:0
EN2PAR:IA.FieldDevice02		HT:1788_EN2PARB_DeviceImage:I:0
EN2PAR:IA.FieldDevice03		HT:1788_EN2PARB_DeviceImage:I:0
EN2PAR:IA.FieldDevice04		HT:1788_EN2PARB_DeviceImage:I:0
EN2PAR:IA.FieldDevice05		HT:1788_EN2PARB_DeviceImage:I:0
EN2PAR:IB		HT:1788_EN2PARB_6_11:IB:0

raP\_Dvc\_EN2PAR

PI303\_Dvc

Ref\_DeviceImage EN2PAR:IA.FieldDevice00

Val\_PV 0.0

Sts\_PVBad 0

Sts\_PVUncertain 0

Sts\_PVGood 0

Sts\_PVNotLimited 0

Sts\_PVLowLimited 0

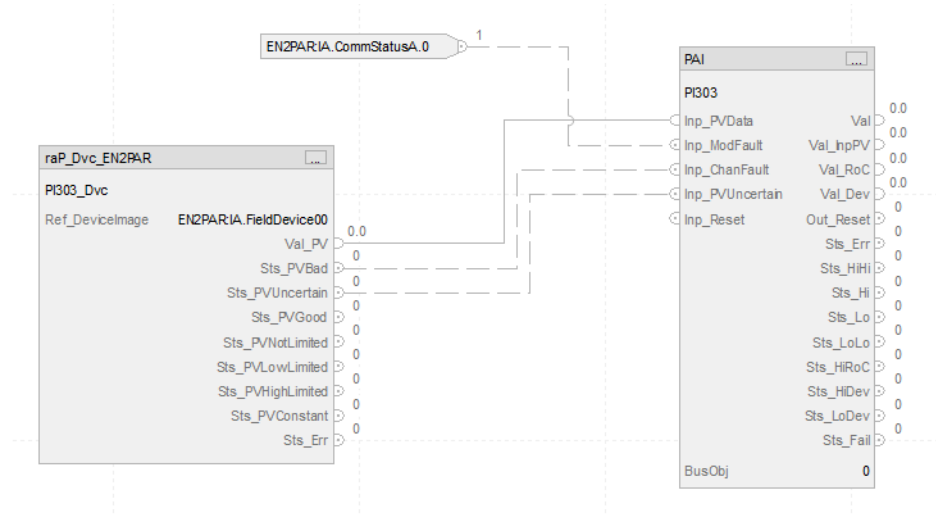
Sts\_PVHighLimited 0

Sts\_PVConstant 0

Sts\_Err 0

Connect the PAI Instance to the raP\_Dvc\_EN2PAR Instance

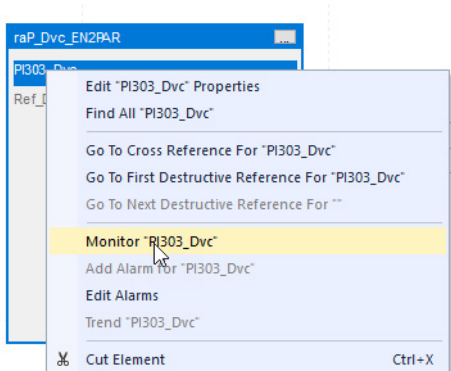
- 1. Connect the instruction instances as shown in the following diagram.



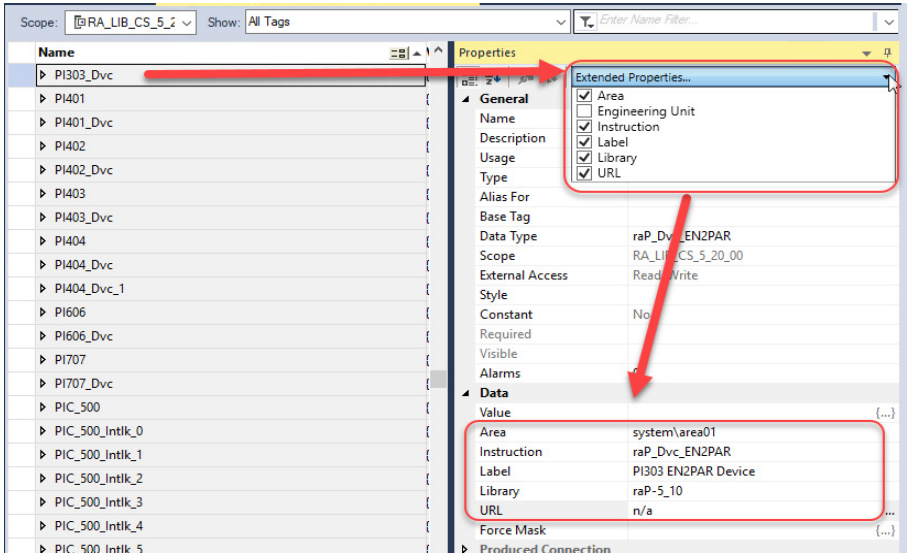
- 2. To save the project, click

### Update the Extended Tag Properties of the raP\_Dvc\_EN2PAR Instance


1. Right-click the name of the raP\_Dvc\_EN2PAR Add-On Instruction and choose Monitor... The tags list opens with the flowmeter tag selected.



2. In the right-hand panel, the properties for that tag will be shown. Confirm that the following extended tag properties are enabled and the correct information is entered.



Extended Tag Property	Typical Value	Action
Area	Area01	Update per project conventions
Instruction	raP_Dvc_EN2PAR	Leave as is
Label	Device name	Update per project conventions
Library	raP-5_10	Leave as is
URL	n/a	Update per project conventions

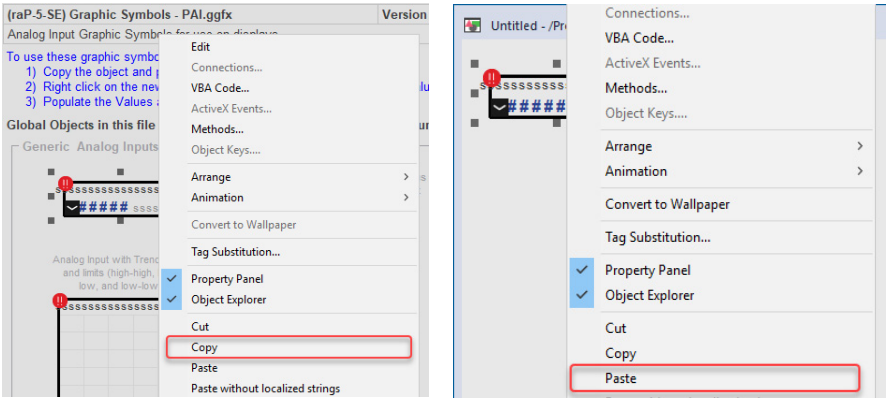
3. To save the project, click 

# Add HMI Graphic Symbol to FactoryTalk View SE Application and Link to PAI Tag

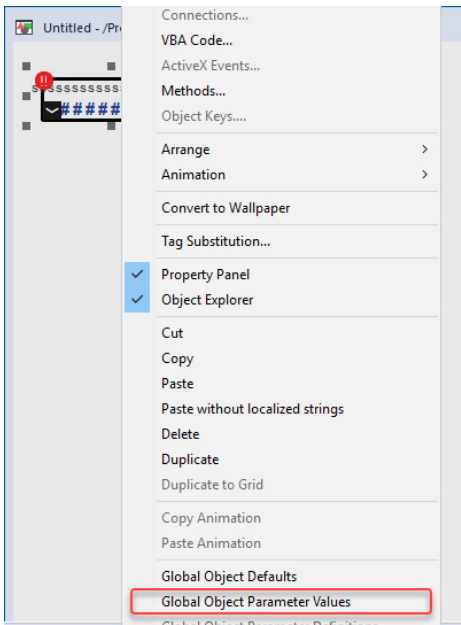
Global objects are typically found in the global objects file per instruction. For example: (raP-5-SE) Graphic Symbols - PAI. The EN2PAR faceplate is accessed from the associated PAI faceplate.

Follow these steps to use a global object.

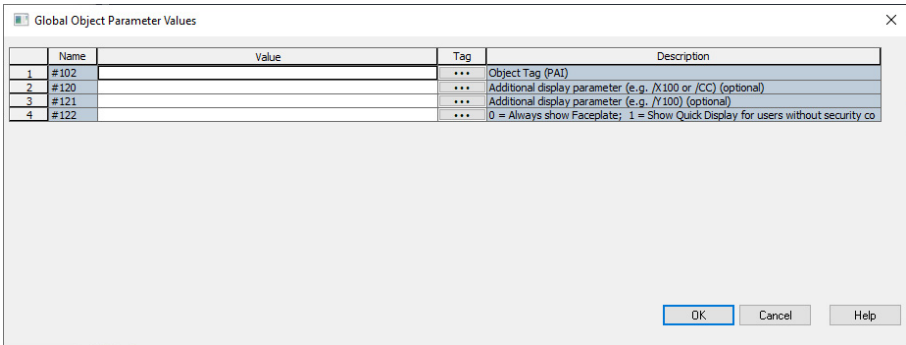
- 1. Copy the global object from the global object file and paste it in the display file.



- 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 in the controller.
#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.

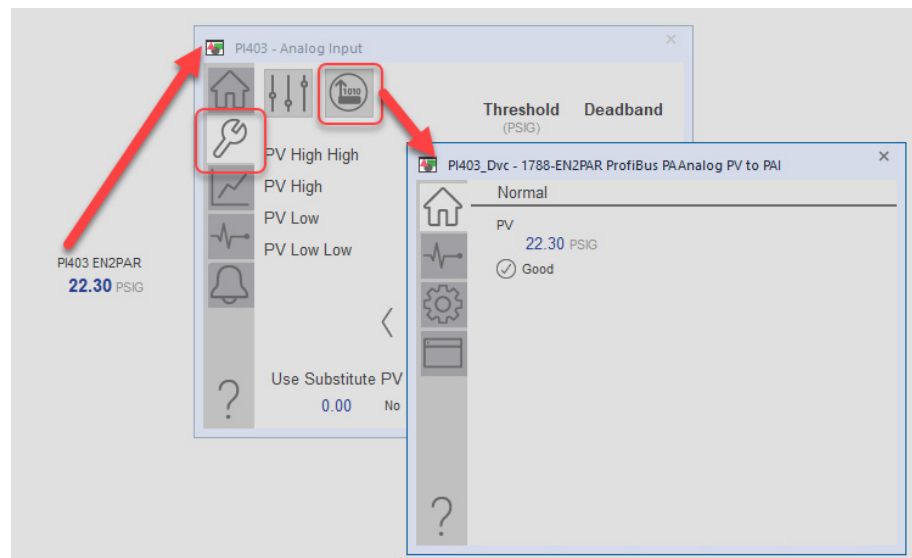


Click the ellipsis (...) to browse and select a tag.  
Values for items that are not required can be left blank.

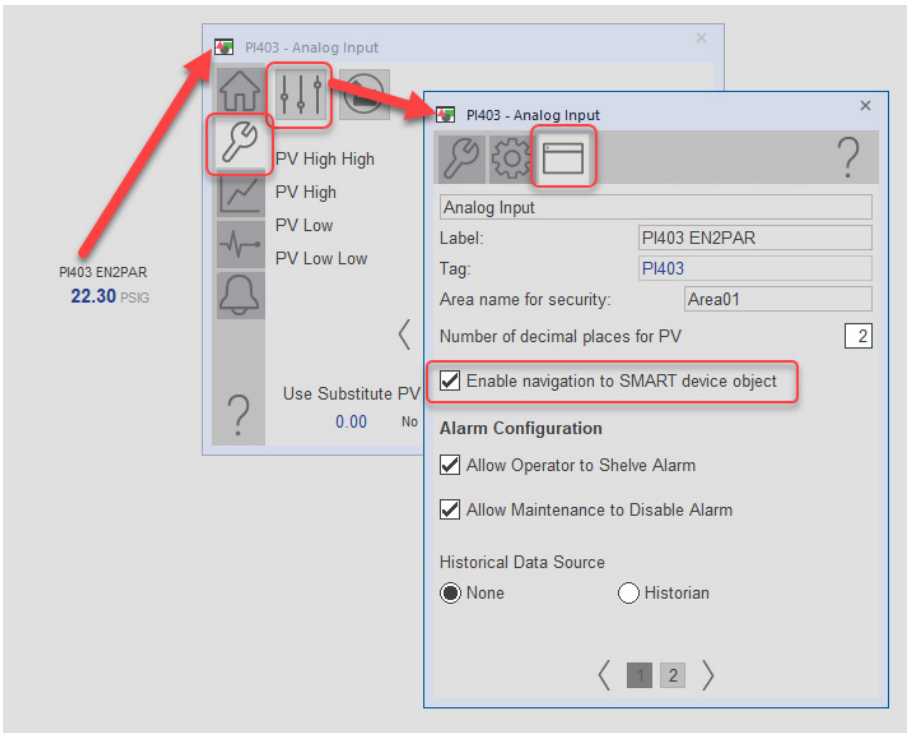
Name	Value	Tag	Description
1 #102	{PPAx_S_10_01/DATA::[App_with_Ethernet]F101}	...	Object Tag (PAI)
2 #120	/CC	...	Additional display parameter (e.g. /X100 or /CC) (optional)
3 #121	/CC	...	Additional display parameter (e.g. /Y100) (optional)
4 #122	0	...	0 = Always show Faceplate; 1 = Show Quick Display for users without security co

OK Cancel Help

- Click OK.
- From the runtime client, you can now navigate to the new PAI object faceplate. Open the faceplate and navigate to the Maintenance tab. Click the SMART device button to access the EN2PAR faceplate.



If the SMART device button is not visible on the PAI faceplate, verify that Cfg\_HasSmartDvc is enabled.

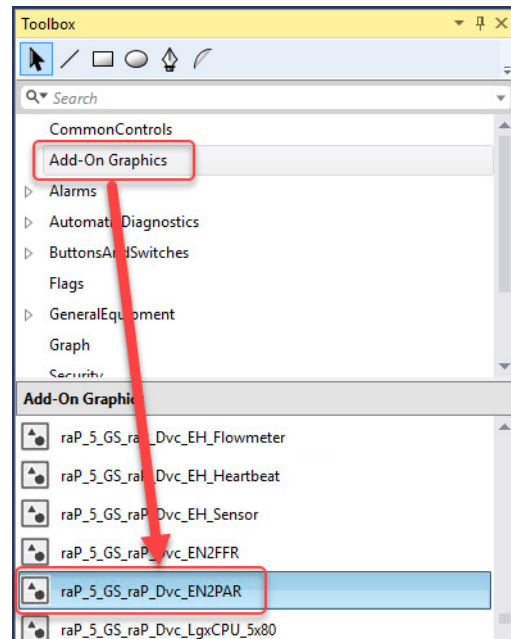


## Add HMI Graphic Symbol to Studio 5000 View Designer and Link to Object

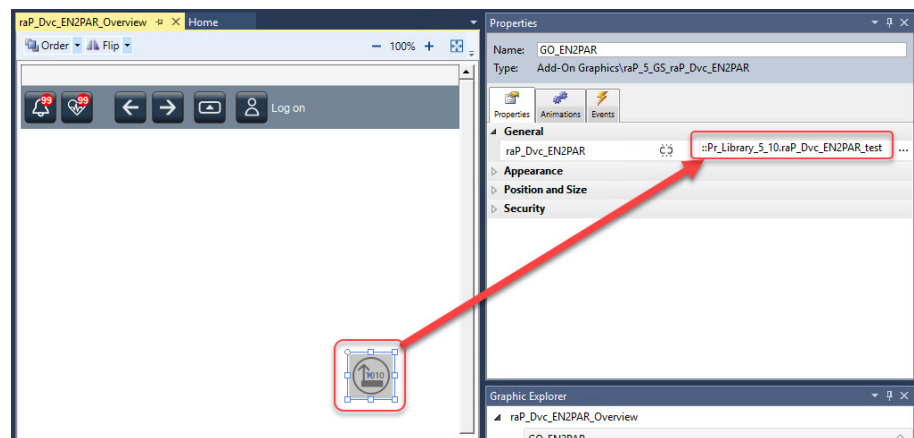
Graphic symbols are created from Add-on Graphic objects. The EN2PAR faceplate is accessed from the Add-on Graphic object.

Follow these steps to use the Add-on Graphic.

1. Open the user screen that the EN2PAR faceplate will be accessed from. From the Toolbox in View Designer, select Add-On Graphics and select the Add-on Graphic "raP\_5\_GS\_raP\_Dvc\_EN2PAR". Drag the object into the user screen.



2. Select the new object and enter the binding property for the device tag.



The EN2PAR faceplate is now accessible from the display.

**Notes:**



## Aparian A-PAL/B

The Aparian PALink/B PROFIBUS PA Analog PV to PAI (raP\_Dvc\_AP\_PALink) Add-On Instruction is used to transfer data from one PROFIBUS PA analog PV, mapping the REAL PV directly and mapping the PV status to a set of status bits suitable for use with the PAI instruction.

This instruction has no prescan, EnableInFalse, or postscan logic. It is intended to be executed always true in logic every scan. The instruction can be used in Ladder Diagram, Function Block Diagram, or Structured Text logic.

For more information on the PAI instruction, see Rockwell Automation Library of Process Objects, publication [PROCES-RM203](#).

### Controller Code for raP\_Dvc\_AP\_PALink

See EtherNet/IP™ Instrumentation Process Object Parameters, publication [PROCES-RD213](#) for parameter names and descriptions.

### Input Structure

Input parameters include the following:

- Configuration data elements (Cfg\_) are used to set configurable capabilities and features of the instruction.

### Output Structure

Output parameters include the following:

- Value data elements (Val\_) are numeric outputs of the instruction for use by the HMI. Values can also be used by other application logic or software packages.
- Status data elements (Sts\_) are bit and enumerated outputs of the instruction for use by the HMI. Status bits can also be used by other application logic.

### InOut Structure

InOut parameters include the following:

- Reference data elements (Ref\_) are used to link the instruction to external tags. Specifically, they are used to collect the device image from the device input assembly.

## Operations

### Execution

For more information, see the Logix 5000 Controllers Add-On Instructions Programming Manual, publication [1756-PM010](#).

# Graphic Symbols

A graphic symbol (global object or add-on graphic) is created once and can be referenced multiple times on multiple displays in an application. When changes are made to the original (base) object, the instantiated copies (reference objects) are automatically updated. Use of global objects and Add-on graphics, with tag structures in the ControlLogix® system, aid consistency and save engineering time.

**IMPORTANT**

The raP\_Dvc\_AP\_PALink instruction is linked to the downstream PAI instruction, which provides alarming and other standard analog input processing functions. In FactoryTalk® View SE, the PAI instruction is linked for navigation to its upstream raP\_Dvc\_AP\_PALink instruction faceplate for device diagnostics and other variables.



The following indicators will be provided by the downstream PAI instruction connected to raP\_Dvc\_AP\_PALink:

- Status/Quality indicators
- Threshold indicators
- Alarm indicators
- Maintenance bypass indicators

**IMPORTANT**

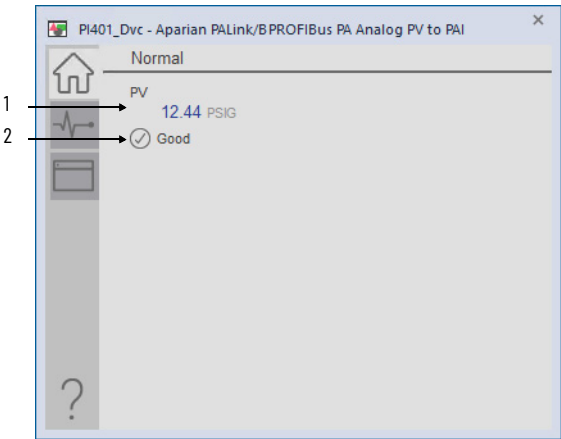
SMART device objects in the Studio 5000 View Designer® application are accessible only if an object is placed on the user screen and linked to the raP\_Dvc\_AP\_PALink object. Faceplate to Faceplate navigation is not possible in the Studio 5000 View Designer application.

For more information about these indicators on the PAI instruction, see Rockwell Automation Library of Process Objects, publication [PROCES-RM200](#)

Graphic Symbol Name	FactoryTalk View SE Graphic Symbol	Studio 5000 View Designer Graphic Symbol	Description
G0_nav_SmartDevice (FactoryTalk View SE)			Standard Graphic Symbol.
G0_AP_PALink (Studio 5000 View Designer)			

## FactoryTalk View SE Faceplates

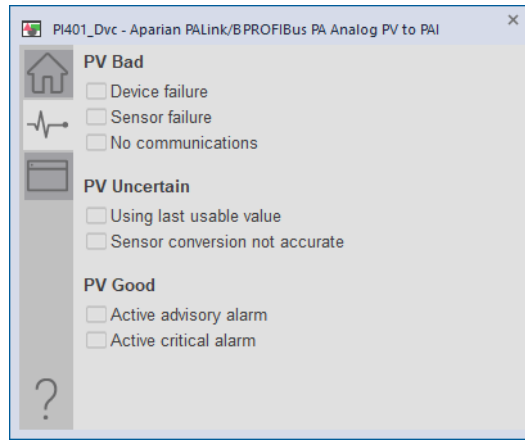
## Operator Tab



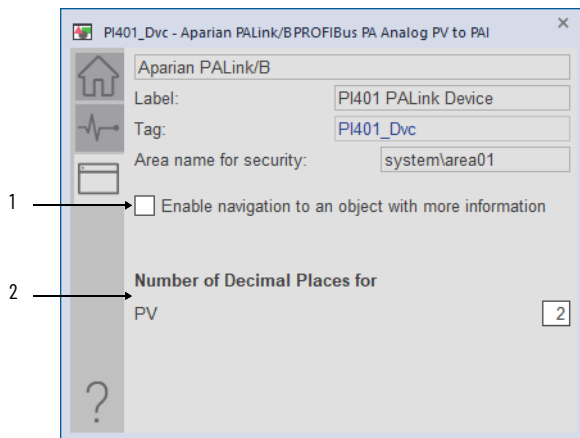
Item	Description
1	Process variable value with engineering units.
2	Process variable status (Bad, Uncertain, Good, Good / Cascade).

## Diagnostics Tab

The Diagnostic tab provides additional information about the process variable's status. Breadcrumb indicators guide you to the appropriate page if additional diagnostic information is available.



## HMI Configuration Tab



Item	Description
1	Select to enable navigation to an object with more information (Cfg_HasMoreObj is set to true.) This can be configured to navigate to an object backing tag or a UDT tag that has Instruction and Library defined.
2	Enter the number of decimal places for the Process Variable.

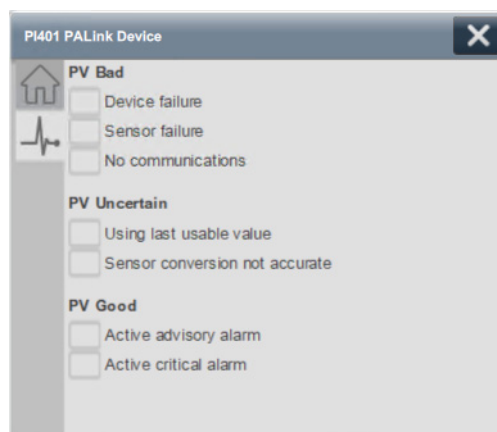
## Studio 5000 View Designer Faceplates

Any feature that is contained in the Studio 5000 View Designer faceplates has the same functionality as used in the FactoryTalk View SE faceplates. See [FactoryTalk View SE Faceplates on page 62](#)

### Operator Tab



### Diagnostics Tab



## Programming Example

### Install EDS

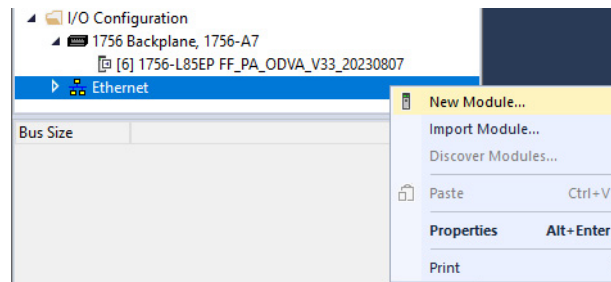
You need the EDS file from Aparian for the Studio 5000 Logix Designer® application to configure and manage the linking device.

For the latest compatible software information and to download the EDS, see [Aparian.com](http://Aparian.com). It can be found under Products > PROFIBUS PA Link. For more information on installing an EDS file, See Logix 5000 Controllers EDS AQP Guidelines for Logix Designer, publication [1756-PM002](#) for more information.

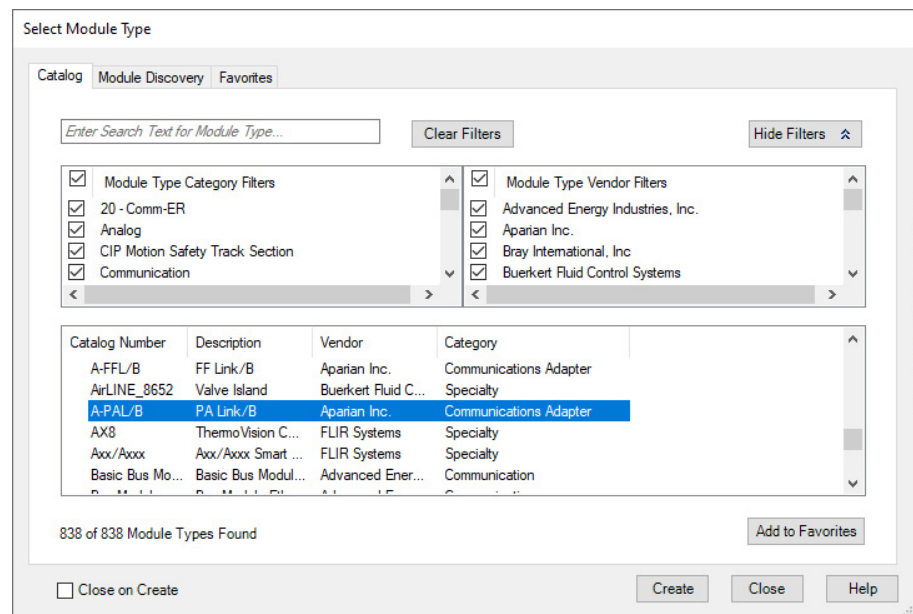
## Add Device to I/O Configuration Tree

The A-FFL/B linking device must be added into the project I/O configuration. This step is performed for every device in the I/O configuration tree. This example uses the A-FFL/B linking device.

1. Right-click the Ethernet network and choose New Module.



2. Select the linking device that you want to add to the Ethernet network.

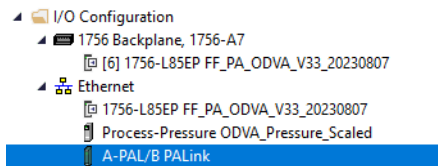


- Click the General tab and set the name, description, and IP address.



Depending on the number of Fieldbus devices connected to this linking device, you may need to change the number of connections in the Module Definition section. See [EtherNet/IP and ControlNet to FOUNDATION Fieldbus Linking Devices](#), publication [1788-UM057](#) for more information.

- Select OK to add the linking device to the I/O tree.



## Configuration

For the Aparian A-PAL/B linking device configuration options, download the user manual from [Aparian.com](http://Aparian.com). It can be found under Products > PROFIBUS PA Link.

The Aparian A-PAL/B user manual explains how to configure the linking device using their software (Slate). After the configuration is complete, the Slate software will generate the required User-Defined tags (UDTs) and routines for your program based on the Internal Mapping configured. The generated L5X (routine) file needs to be imported into your target program before completing the remaining steps in this manual (See section “Logix Mapping” in the Aparian user manual).

## Import Device Add-On Instruction

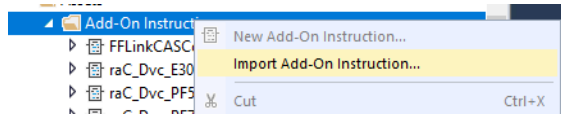
The `raP_Dvc_AP_PALink` Add-On Instruction definition file must be imported into the controller project to be able to be used in the controller configuration.

This instruction transfers data from one PROFIBUS PA analog PV, mapping the REAL PV directly, and mapping the PV status to a set of status bits suitable for use with the PAI instruction.

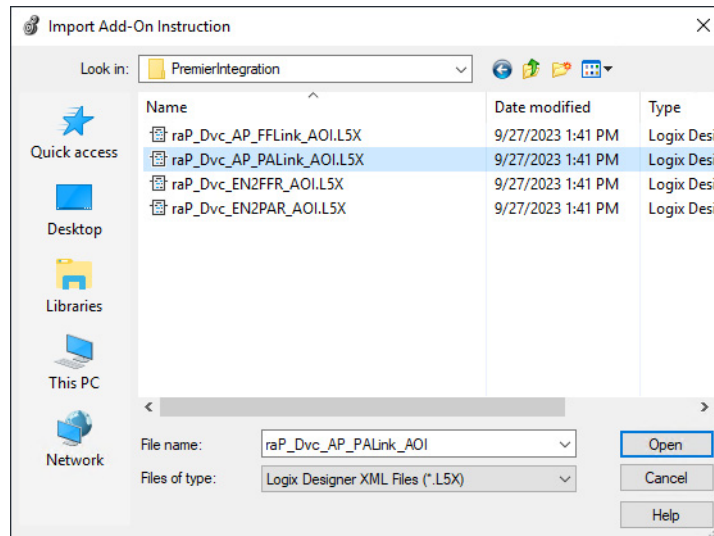
This instruction is for use with the PAI instruction in process controller (1756-L8xEP) version 35 or later.

- Import the appropriate device Add-On Instruction. (This procedure uses `raP_Dvc_AP_PALink.AOI.L5X` as an example.)

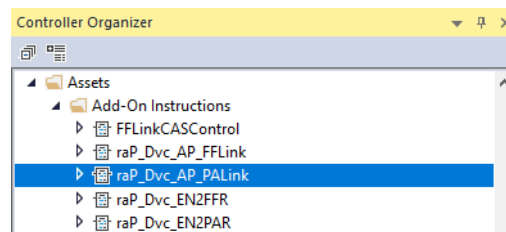
2. In the target Controller Organizer, right-click Add-On Instructions and choose Import Add-On Instruction.



3. Navigate to the folder that contains the device Add-On Instructions and select raP\_Dvc\_AP\_PALink.AOI.L5X, and then click Open.



4. Click OK in the Import Configuration window.
5. The Add-On Instruction is then added to the Controller Organizer.

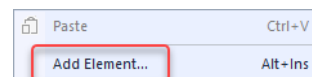


## Add Process Analog Input (PAI) Instruction to Routine

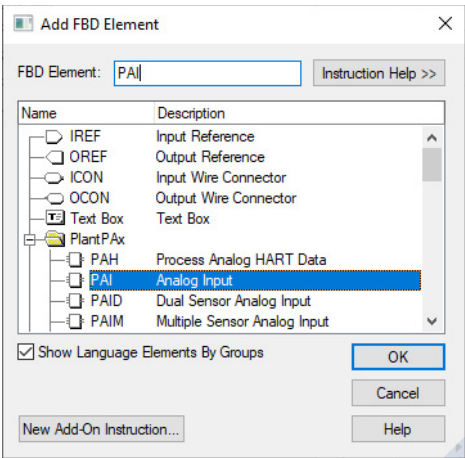


This instruction shows how to add instructions to a Function Block Diagram routine. The instructions can be used in Ladder Diagram and Structured Text routines as well.

1. Right-click the sheet within the routine and choose Add Element to add the PAI instruction to the routine.

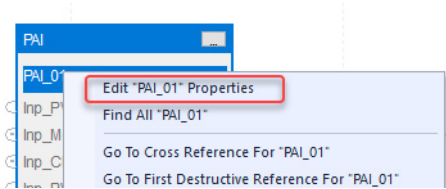


2. Type PAI into the FBD Element text box and select OK.

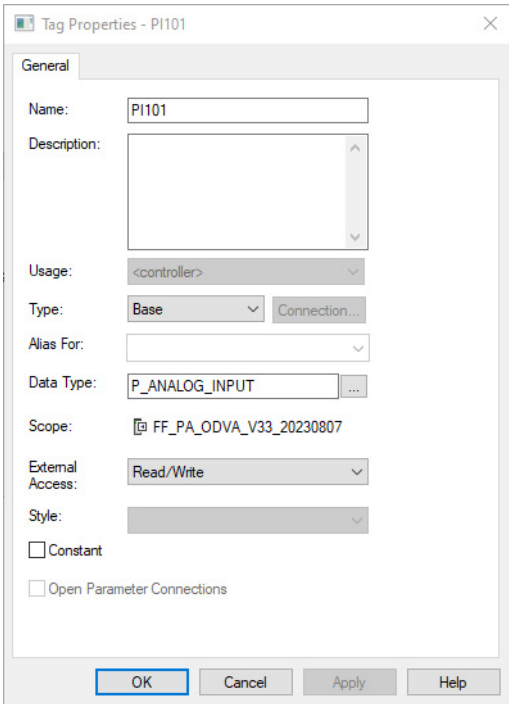



**IMPORTANT** At least one instance of the Process Analog Input (PAI) instruction is used for each channel (device) on the input module.

3. Right-click the name of the new instance of PAI and choose Edit...Properties.



4. Change the name according to the project convention. To save the changes, click OK.



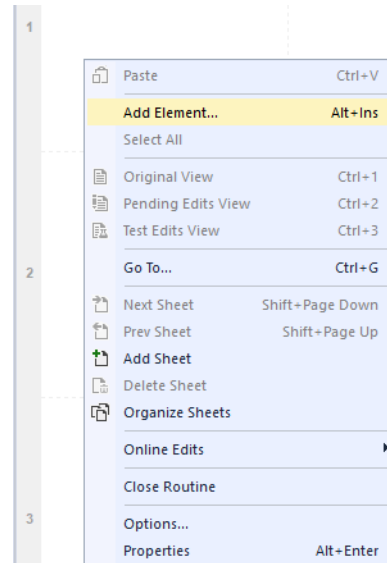
5. To save the project, click 

**Add Device Instruction to Routine**

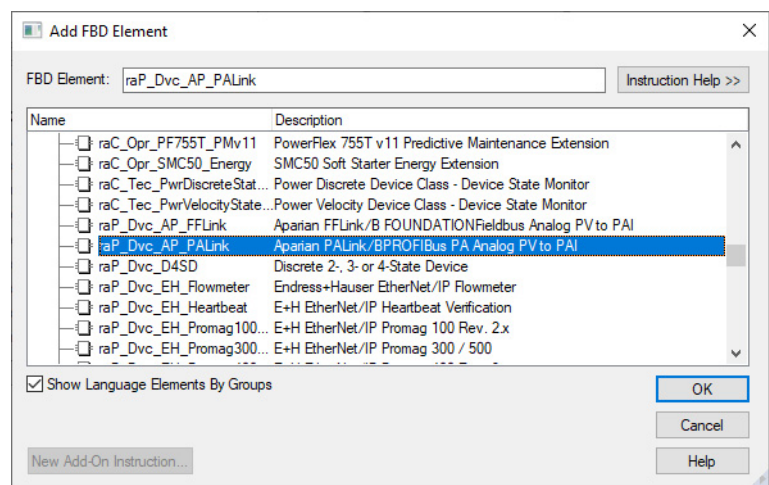
This procedure adds the device logic to the routine. Perform this procedure once for every device.



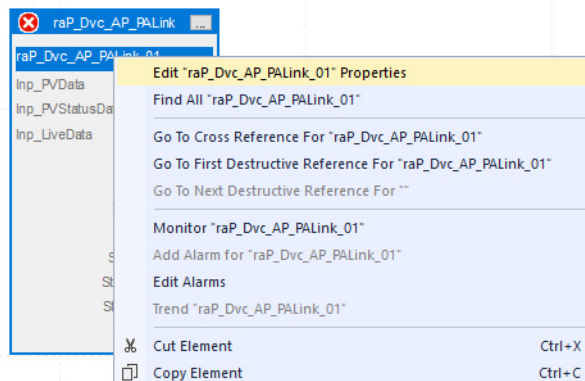
1. Open the routine where the device logic is used.
2. Within the routine, right-click the sheet and click Add Element.



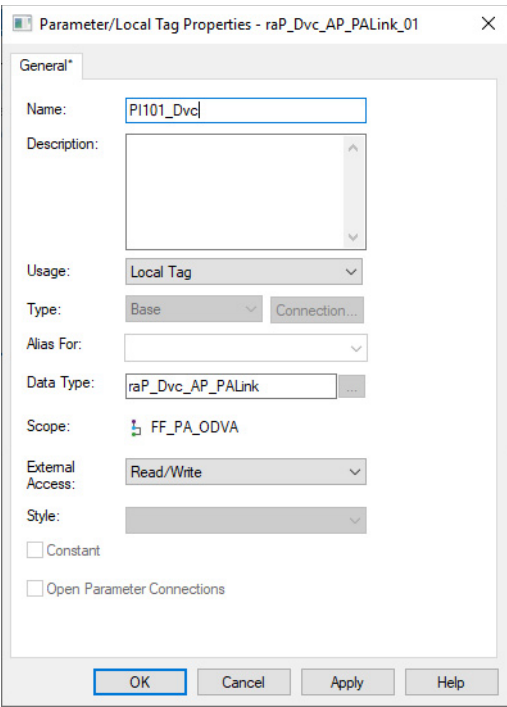
3. Type the device Add-On Instruction name in the FBD Element box; for this example, raP\_Dvc\_AP\_PALink, and then click OK.



4. Right-click the name of the backing tag for the new Add-On Instruction instance and choose Edit...Properties.

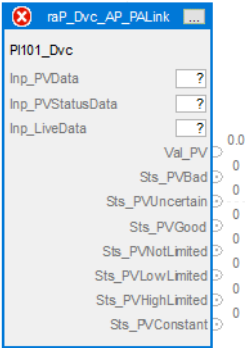


5. Change the name to correspond with the project convention. To save the changes, click OK



**IMPORTANT** The tag name for the raP\_Dvc\_AP\_PALink instance must correspond to the instance of the PAI that it is connected to. The tag name for the raP\_Dvc\_AP\_PALink must be the name of the PAI object appended with “\_Dvc”. For example, if the corresponding PAI instruction is PI101, the raP\_Dvc\_AP\_PALink tag must be PI101\_Dvc. This allows for automatic navigation via the SMART Device button on the HMI faceplate of the PAI.

6. Set the Inp\_ Values.



Inp\_LiveData and Inp\_PVStatusData come from the following table:

Name	Value	Force	Style	Data Type	Description	Cor
▶ PALink_MasterControl	(...)	(...)	(...)	PALinkMasterControl		
▶ PALink_MasterStatus	(...)	(...)	(...)	PALinkMasterStatus		
▲ PALink_PT101	(...)	(...)	(...)	PALink_151CA4DF		
▶ PALink_PT101.Input	(...)	(...)	(...)	PALink_151CA4DFInput		
▶ PALink_PT101.Input.Status	(...)	(...)	(...)	PALinkSlaveStatus		
PALink_PT101.Input.Status.Online	0		Decimal	BOOL	Device Online (0=Offline, 1=Online)	
PALink_PT101.Input.Status.DataExchangeActive	0		Decimal	BOOL	Data Exchange Active (0=Inactive, 1=...	
PALink_PT101.Input.Status.IdentMismatch	0		Decimal	BOOL	Device Identity Mismatch (0=Ok, 1=...	
PALink_PT101.Input.Status.DisabledByOutputAssem...	0		Decimal	BOOL	Disabled by Output (0=Enabled, 1=D...	
PALink_PT101.Input.Status.DeviceError	0		Decimal	BOOL	Profibus Device Error (0=Ok, 1=Error)	
PALink_PT101.Input.Status.AlarmPending	0		Decimal	BOOL	Alarm Pending (0=Not Pending, 1=...	
PALink_PT101.Input.Status.DiagnosticsPending	0		Decimal	BOOL	Diagnostics Pending (0=Not Penden...	
PALink_PT101.Input.Status.OutputAssemblyNodeA...	0		Decimal	BOOL	Station Number Mismatch (0=Ok, 1=...	
PALink_PT101.Input.Status.MappingCRCMismatch	0		Decimal	BOOL	Mapping Checksum Mismatch (0=O...	
▶ PALink_PT101.Input.Status.StationNumber	7		Decimal	SINT	Device Station Number	
▶ PALink_PT101.Input.Status.DeviceMappingCRC	16#44df		Hex	INT	Mapping checksum	
PALink_PT101.Input.MainProcessValue	0.0		Float	REAL		
▶ PALink_PT101.Input.MainProcessValu1	0		Decimal	SINT		
▶ PALink_PT101.Output	(...)	(...)	(...)	PALink_151CA4DFOutput		
▶ PI101	(...)	(...)	(...)	P_ANALOG_INPUT	Analog Input	
▶ PI101_Dvc	(...)	(...)	(...)	raP_Dvc_AP_PALink_PV_to_PAI	Aparian PALink/B PROFIBUS PA Anal...	
▶ PI202	(...)	(...)	(...)	P_ANALOG_INPUT	Analog Input	
▶ PI202_Dvc	(...)	(...)	(...)	raP_Dvc_AP_FFLink_PV_to_PAI	Aparian FFLink/B FOUNDATION Field...	
▶ PI303	(...)	(...)	(...)	P_ANALOG_INPUT	Analog Input	
▶ PI303_Dvc	(...)	(...)	(...)	raP_Dvc_EN2PAR_PV_to_PAI	1788-EN2PAR Profibus PA Analog PV ...	

### IMPORTANT

These tags are imported with the L5X mapping routine that is generated by the Aparian configuration software Slate.

Inp\_PVData comes from the following table:

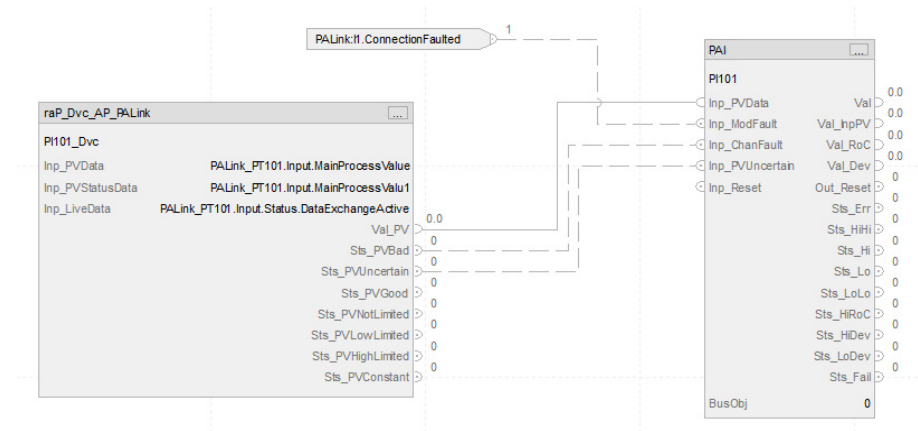
Name	Value	Force	Style	Data Type	Description	Cor
▶ PALink_MasterControl	(...)	(...)	(...)	PALinkMasterControl		
▶ PALink_MasterStatus	(...)	(...)	(...)	PALinkMasterStatus		
▲ PALink_PT101	(...)	(...)	(...)	PALink_151CA4DF		
▶ PALink_PT101.Input	(...)	(...)	(...)	PALink_151CA4DFInput		
▶ PALink_PT101.Input.Status	(...)	(...)	(...)	PALinkSlaveStatus		
PALink_PT101.Input.Status.Online	0		Decimal	BOOL	Device Online (0=Offline, 1=Online)	
PALink_PT101.Input.Status.DataExchangeActive	0		Decimal	BOOL	Data Exchange Active (0=Inactive, 1=...	
PALink_PT101.Input.Status.IdentMismatch	0		Decimal	BOOL	Device Identity Mismatch (0=Ok, 1=...	
PALink_PT101.Input.Status.DisabledByOutputAssem...	0		Decimal	BOOL	Disabled by Output (0=Enabled, 1=D...	
PALink_PT101.Input.Status.DeviceError	0		Decimal	BOOL	Profibus Device Error (0=Ok, 1=Error)	
PALink_PT101.Input.Status.AlarmPending	0		Decimal	BOOL	Alarm Pending (0=Not Pending, 1=...	
PALink_PT101.Input.Status.DiagnosticsPending	0		Decimal	BOOL	Diagnostics Pending (0=Not Penden...	
PALink_PT101.Input.Status.OutputAssemblyNodeA...	0		Decimal	BOOL	Station Number Mismatch (0=Ok, 1=...	
PALink_PT101.Input.Status.MappingCRCMismatch	0		Decimal	BOOL	Mapping Checksum Mismatch (0=O...	
▶ PALink_PT101.Input.Status.StationNumber	7		Decimal	SINT	Device Station Number	
▶ PALink_PT101.Input.Status.DeviceMappingCRC	16#44df		Hex	INT	Mapping checksum	
PALink_PT101.Input.MainProcessValue	0.0		Float	REAL		
▶ PALink_PT101.Input.MainProcessValu1	0		Decimal	SINT		
▶ PALink_PT101.Output	(...)	(...)	(...)	PALink_151CA4DFOutput		
▶ PI101	(...)	(...)	(...)	P_ANALOG_INPUT	Analog Input	
▶ PI101_Dvc	(...)	(...)	(...)	raP_Dvc_AP_PALink_PV_to_PAI	Aparian PALink/B PROFIBUS PA Anal...	
▶ PI202	(...)	(...)	(...)	P_ANALOG_INPUT	Analog Input	
▶ PI202_Dvc	(...)	(...)	(...)	raP_Dvc_AP_FFLink_PV_to_PAI	Aparian FFLink/B FOUNDATION Field...	
▶ PI303	(...)	(...)	(...)	P_ANALOG_INPUT	Analog Input	
▶ PI303_Dvc	(...)	(...)	(...)	raP_Dvc_EN2PAR_PV_to_PAI	1788-EN2PAR Profibus PA Analog PV ...	

Final configuration.

raP_Dvc_AP_PALink	
PI101_Dvc	
Inp_PVData	PALink_PT101.Input.MainProcessValue
Inp_PVStatusData	PALink_PT101.Input.MainProcessValu1
Inp_LiveData	PALink_PT101.Input.Status.DataExchangeActive
	Va_PV > 0.0
	Sts_PVBad > 0
	Sts_PVUncertain > 0
	Sts_PVGood > 0
	Sts_PVNotLimited > 0
	Sts_PVLowLimited > 0
	Sts_PVHighLimited > 0
	Sts_PVConstant > 0

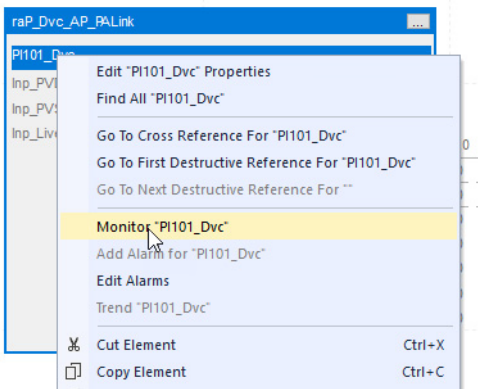
### Connect the PAI Instance to the raP\_Dvc\_AP\_FFLink Instance

1. Connect the instruction instances as shown in the following diagram.

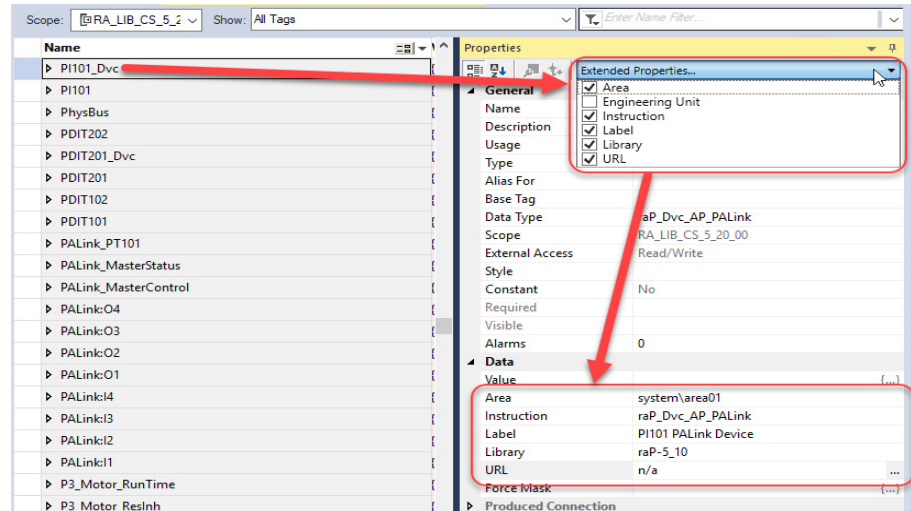


### Update the Extended Tag Properties of the raP\_Dvc\_AP\_FFLink Instance


1. Right-click the name of the raP\_Dvc\_AP\_FFLink Add-On Instruction and choose Monitor... The tags list opens with the flowmeter tag selected.



- In the right-hand panel, the properties for that tag will be shown. Confirm that the following extended tag properties are enabled and the correct information is entered.



Extended Tag Property	Typical Value	Action
Area	Area01	Update per project conventions
Instruction	raP_Dvc_AP_PALink	Leave as is
Label	Device name	Update per project conventions
Library	raP-5_10	Leave as is
URL	n/a	Update per project conventions

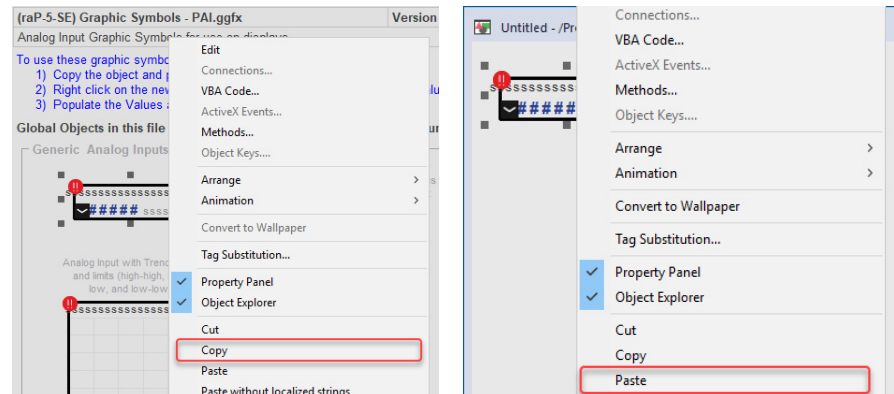
- To save the project, click 

## Add HMI Graphic Symbol to FactoryTalk View SE Application and Link to PAI Tag

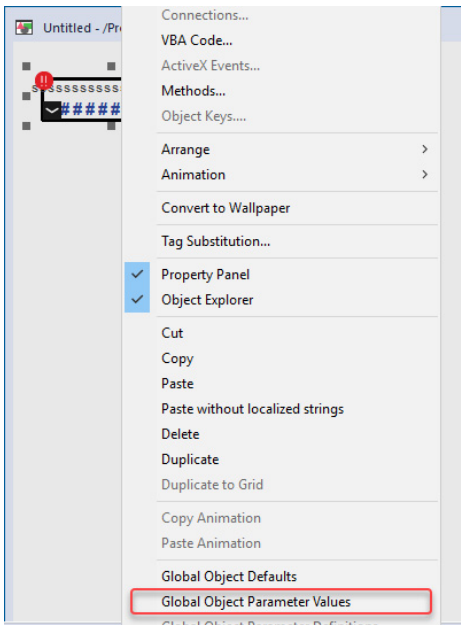
Global objects are typically found in the global objects file per instruction. For example: (raP-5-SE) Graphic Symbols - PAI. The PALink faceplate is accessed from the associated PAI faceplate.

Follow these steps to use a global object.

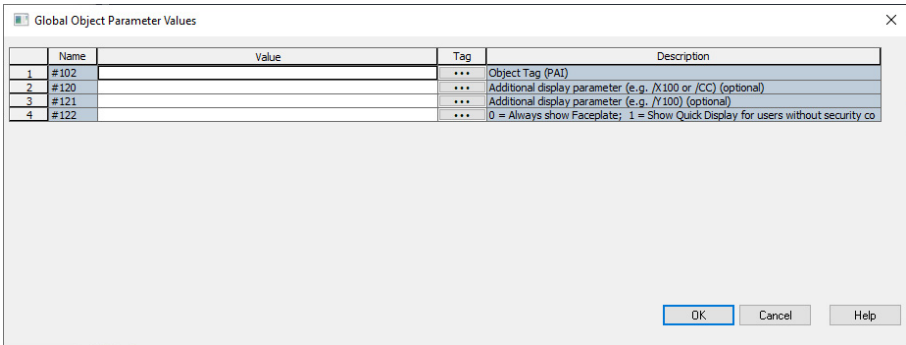
- Copy the global object from the global object file and paste it in the display file.



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



The Global Object Parameter Values dialog box appears.



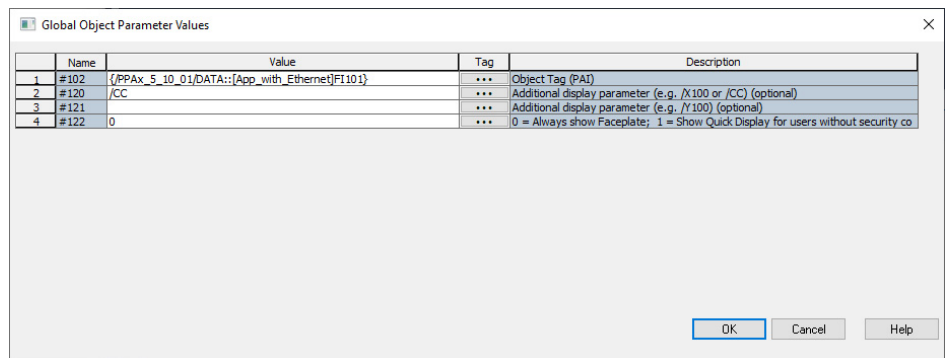
he global object parameters are as follows.

Parameter	Required	Description
#102	Y	Object tag to point to the name of the associated object in the controller.
#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

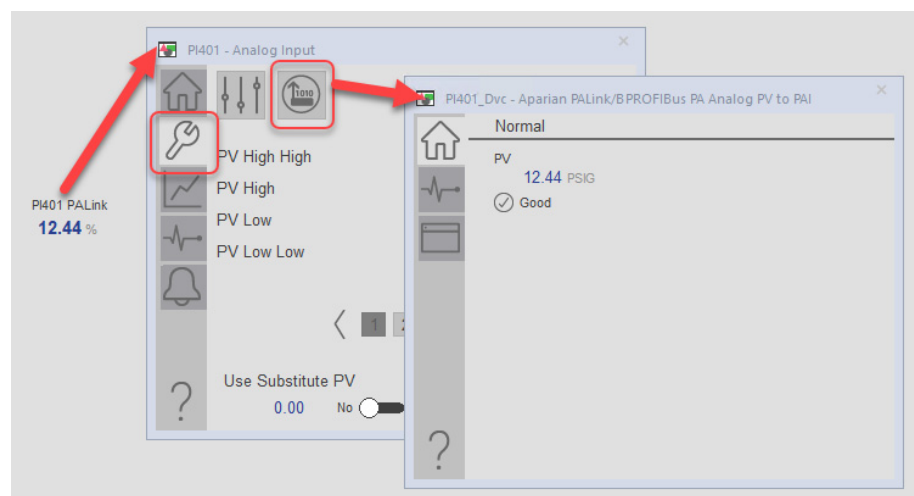
3. In the Value column, type the tag or value as specified in the Description column.



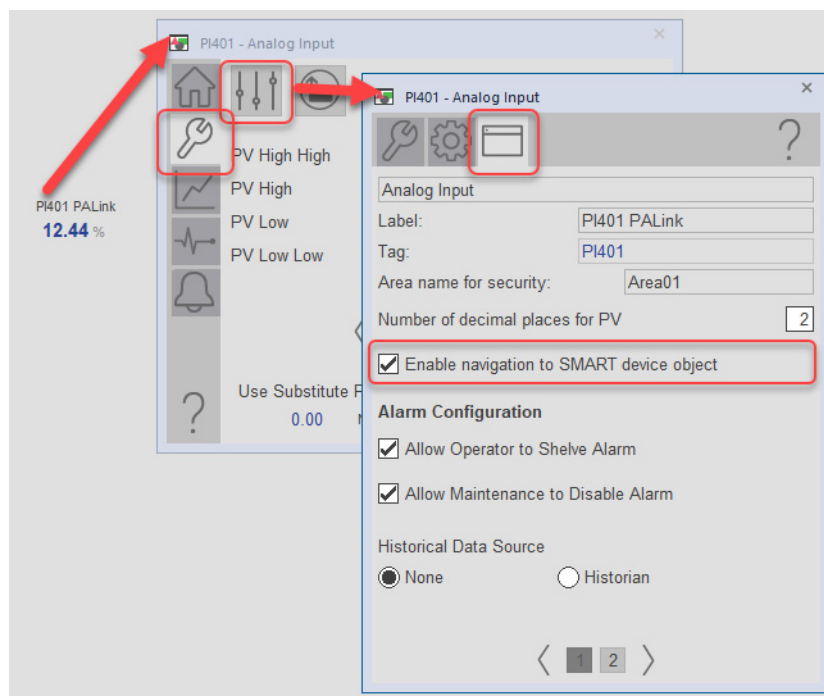
Click the ellipsis (...) to browse and select a tag.  
Values for items that are not required can be left blank.



4. Click OK.
5. From the runtime client, you can now navigate to the new PAI object faceplate. Open the faceplate and navigate to the Maintenance tab. Click the SMART device button to access the PALink.



If the SMART device button is not visible on the PAI faceplate, verify that Cfg\_HasSmartDvc is enabled.

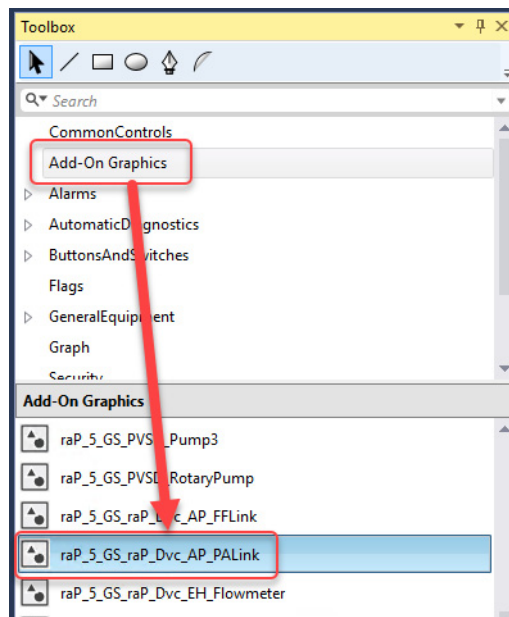


## Add HMI Graphic Symbol to Studio 5000 View Designer and Link to Object

Graphic symbols are created from Add-on Graphic objects. The PALink faceplate is accessed from the Add-on Graphic object.

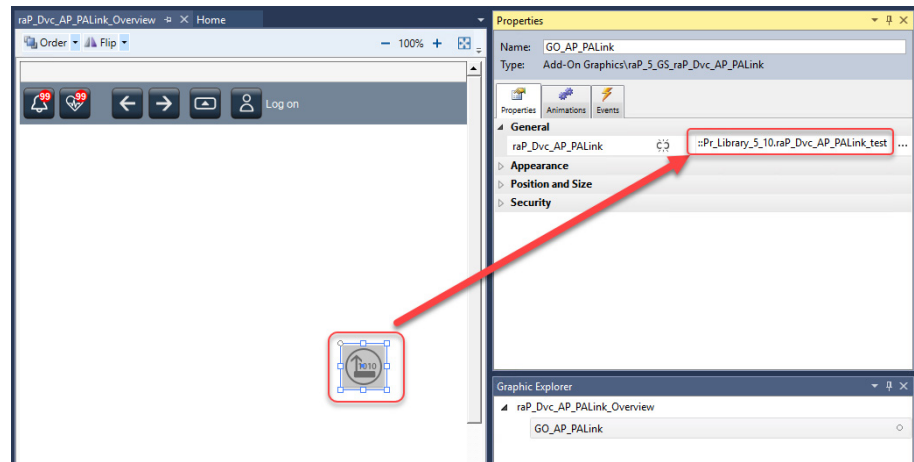
Follow these steps to use the Add-on Graphics.

1. Open the user screen that the PALink faceplate will be accessed from. From the Toolbox in View Designer, select Add-On Graphics and select the Add-on Graphic "raP\_5\_GS\_raP\_Dvc\_PALink". Drag the object into the user screen.





2. Select the new object and enter the binding property for the device tag.



The PALink faceplate is now accessible from the display.

**Notes:**



# Rockwell Automation Support

Use these resources to access support information.

<b>Technical Support Center</b>	Find help with how-to videos, FAQs, chat, user forums, Knowledgebase, and product notification updates.	<a href="http://rok.auto/support">rok.auto/support</a>
<b>Local Technical Support Phone Numbers</b>	Locate the telephone number for your country.	<a href="http://rok.auto/phonesupport">rok.auto/phonesupport</a>
<b>Technical Documentation Center</b>	Quickly access and download technical specifications, installation instructions, and user manuals.	<a href="http://rok.auto/techdocs">rok.auto/techdocs</a>
<b>Literature Library</b>	Find installation instructions, manuals, brochures, and technical data publications.	<a href="http://rok.auto/literature">rok.auto/literature</a>
<b>Product Compatibility and Download Center (PCDC)</b>	Download firmware, associated files (such as AOP, EDS, and DTM), and access product release notes.	<a href="http://rok.auto/pcdc">rok.auto/pcdc</a>

## Documentation Feedback

Your comments help us serve your documentation needs better. If you have any suggestions on how to improve our content, complete the form at [rok.auto/docfeedback](http://rok.auto/docfeedback).

## Waste Electrical and Electronic Equipment (WEEE)



At the end of life, this equipment should be collected separately from any unsorted municipal waste.

Rockwell Automation maintains current product environmental compliance information on its website at [rok.auto/pec](http://rok.auto/pec).

Allen-Bradley, ControlLogix, expanding human possibility, FactoryTalk, Logix 5000, PlantPAx, Rockwell Automation, Studio 5000 Logix Designer, and Studio 5000 View Designer are trademarks of Rockwell Automation, Inc.

ControlNet and EtherNet/IP are a trademark of ODVA, Inc.

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

Rockwell Otomasyon Ticaret A.Ş. Kar Plaza İş Merkezi E Blok Kat:6 34752, İçerenköy, İstanbul, Tel: +90 (216) 5698400 EEE Yönetmeliğine Uygundur

Connect with us.    

**rockwellautomation.com** — expanding **human possibility**<sup>®</sup>

AMERICAS: Rockwell Automation, 1201 South Second Street, Milwaukee, WI 53204-2496 USA, Tel: (1) 414.382.2000, Fax: (1) 414.382.4444

EUROPE/MIDDLE EAST/AFRICA: Rockwell Automation NV, Pegasus Park, De Kleetlaan 12a, 1831 Diegem, Belgium, Tel: (32) 2663 0600, Fax: (32) 2 663 0640

ASIA PACIFIC: Rockwell Automation SEA Pte Ltd, 2 Corporation Road, #04-05, Main Lobby, Corporation Place, Singapore 618494, Tel: (65) 6510 6608, FAX: (65) 6510 6699

UNITED KINGDOM: Rockwell Automation Ltd., Pitfield, Kiln Farm, Milton Keynes, MK11 3DR, United Kingdom, Tel: (44)(1908) 838-800, Fax: (44)(1908) 261-917

Publication PROCES-RM213A-EN-P - December 2023

Copyright © 2023 Rockwell Automation, Inc. All rights reserved. Printed in the U.S.A.