



P2M2HBVL OR P2HL IO-LINK
ADD-ON INSTRUCTION FOR
ROCKWELL PLC W/ AB 1734-4IOL
ETHERNET/IP IO-LINK MASTER
QUICK START GUIDE

PREFACE

This Quick Start Guide (QSG) is designed to help integrate Parker Hannifin's P2M or P2H IO-Link valve manifold into an Allen-Bradley (AB) PLC environment utilizing the 1734-4IOL IO-Link Master module connected to 1734-AENT Point IO Module. The QSG assumes that you already have installed the AOP for 1734-4IOL from the Rockwell webpages and have setup the IOL Master in the Rockwell PLC environment.

The QSG is agnostic to IO Link Device Classification, such that it shall function the same whether you are controlling an A-Class or B-Class P2M / P2H Module. The guide will walk the user through obtaining the necessary files, importing/configuring the AOI, and initiating parameter reads and writes from/to the P2M / P2H IO-Link device.

The "P2M2HBVL_P2HL_AB_17344IOL_PRM_Rx" AOI facilitates the call-up of the acyclic service data.

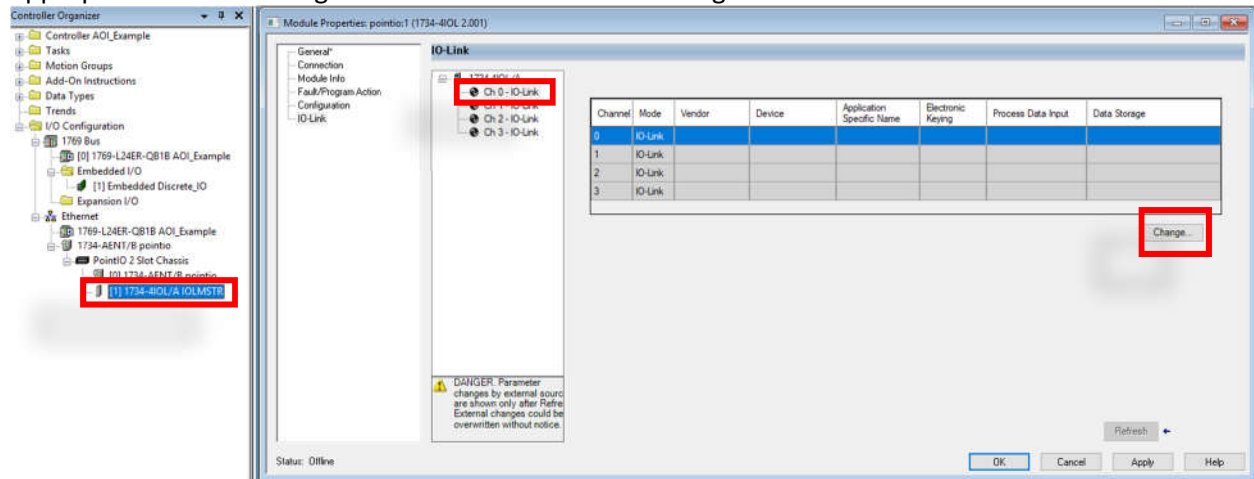
The "P2M2HBVL_P2HL_AB_17344IOL_PD_Rx" AOI facilitates communication and handling of process data between PLC and the IO-Link slave device.

You can download resources such as the IODD configuration file, this QSG, a sample RSLogix5000 file and the full user manual here:

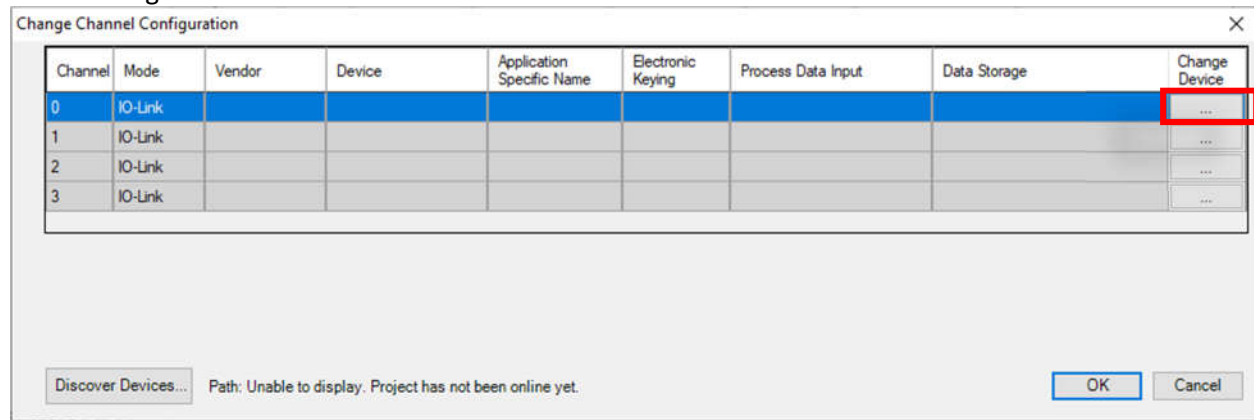
www.parker.com/PDN/io-link

Setting up the IODD File

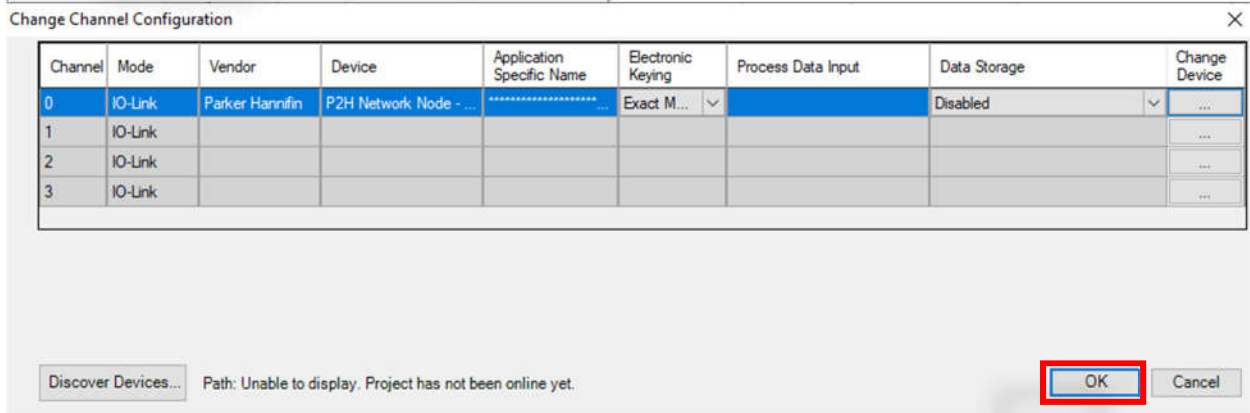
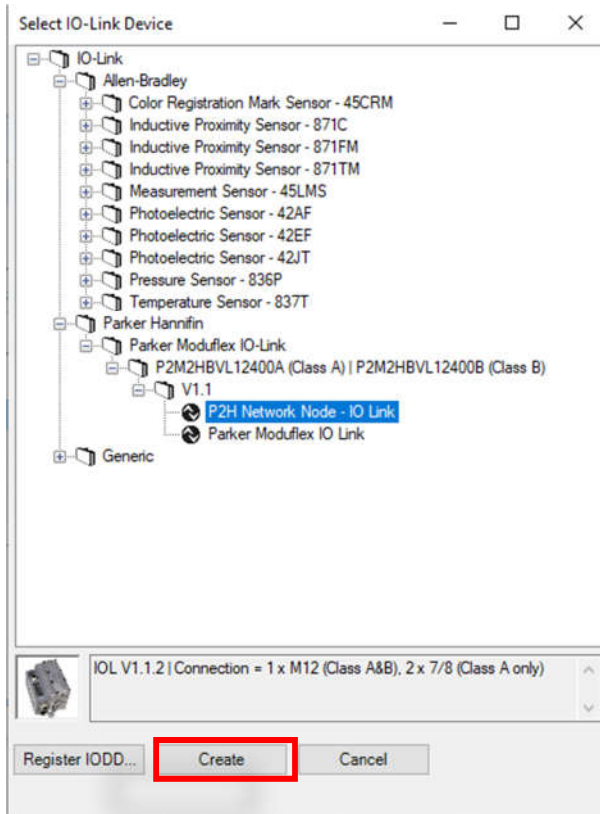
Double click the 1734-4IOL in the IO Tree and navigate to the IO-Link tab on the left-hand column, select appropriate channel on right-hand table and choose “Change”.



Click “Change Device”



Select P2H Network Node or Parker Moduflex and click “Create” and then “OK” on the following screen.

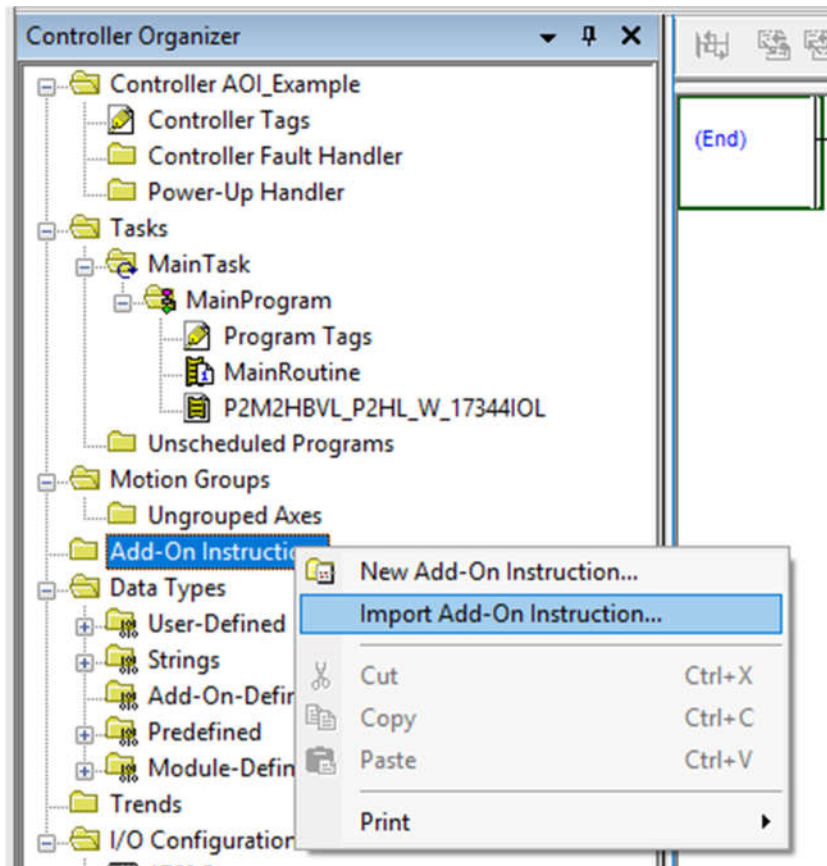


Process Data Add-On Instruction

The “P2M2HBVL_P2HL_AB_17344IOL_PD_Rx” AOI simplifies the usage of Parker P2M and P2H IO-Link devices with Allen-Bradley CompactLogix, ControlLogix and GuardLogix PLCs when connected, via Ethernet/IP, to a 1734-4IOL IO-Link Master. Data is mapped to user-friendly control and diagnostic tags on the PLC side.

IMPORTING THE INSTRUCTION

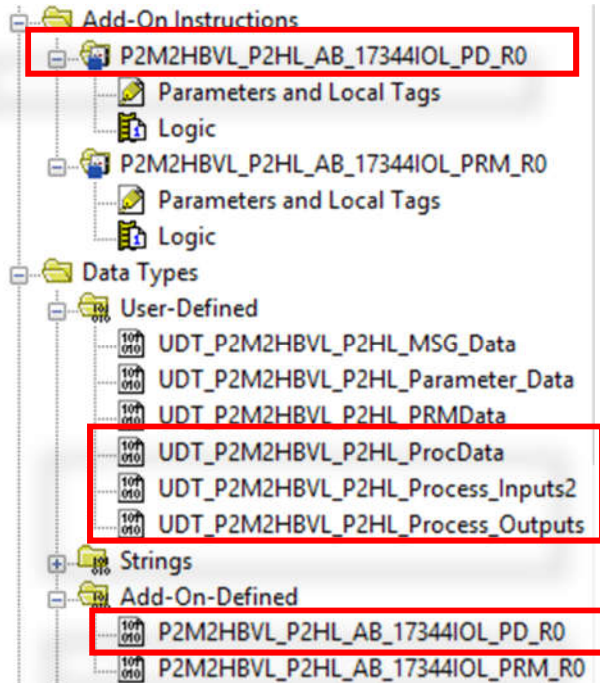
1. Right click Add-On Instruction in Controller Organizer and select “Import Add-On Instruction...”



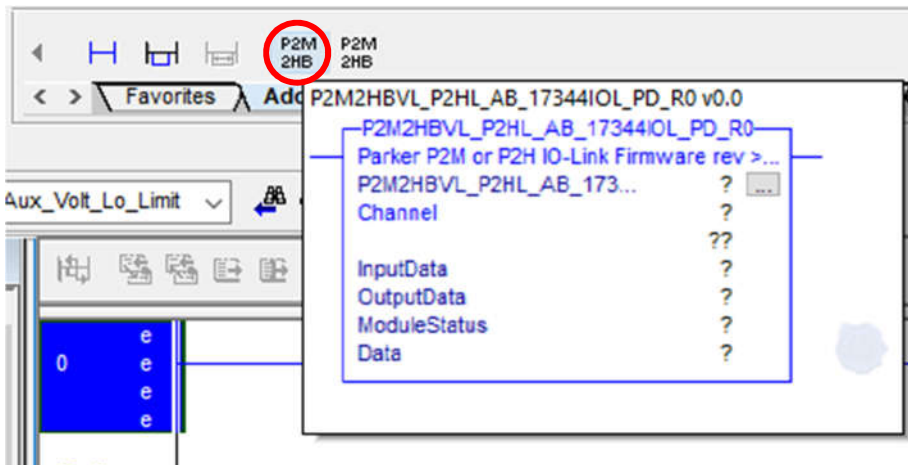
2. Select the “P2M2HBVL_P2HL_AB_17344IOL_PD_Rx” where _Rx is the revision of AOI.

Name	Date modified	Type
P2M2HBVL_P2HL_AB_17344IOL_PD_R0.L5X	1/28/2020 2:06 PM	RSLogix 5I

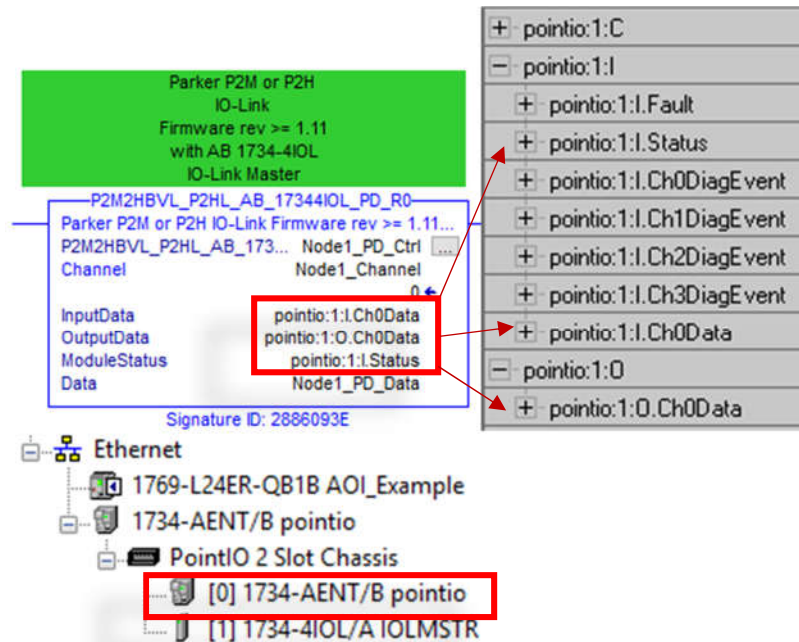
Choose OK on Import Configuration Window and you should then see the new AOI instance along with User-Defined and Add-On Defined data types created in the controller organizer.



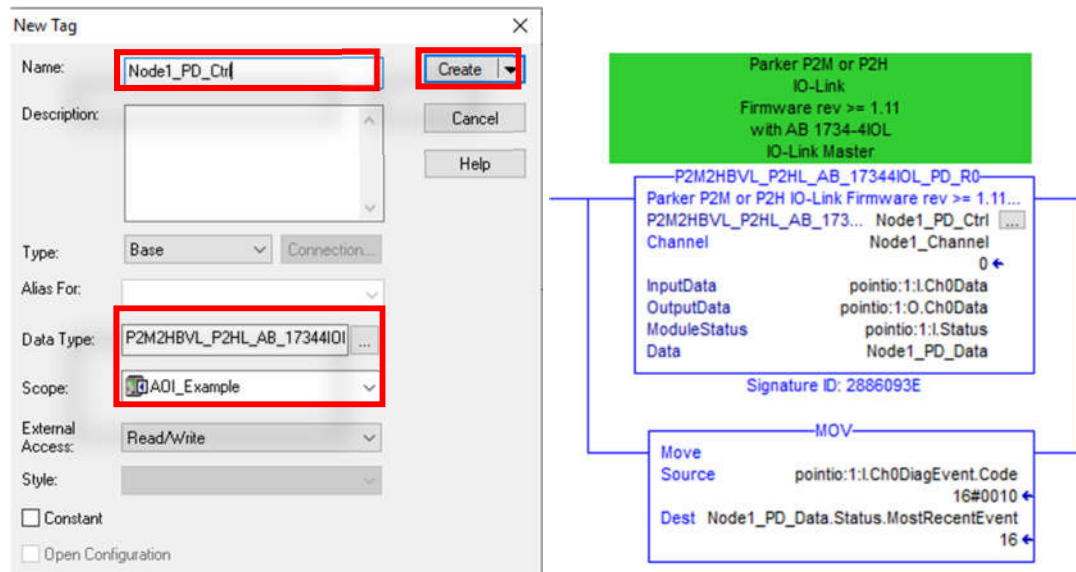
3. Add instance of instruction to an empty rung of ladder by clicking on the P2M2HB under the Add-On tab in the top toolbar. The instruction will drop onto the selected rung.



- Point the InputData, OutputData, and ModuleStatus fields to the controller tags associated with the AENT module that the P2M / P2H is connected to. **The Ch# is dependent on the port you are connected to!** If you choose the incorrect port the AOI will NOT function and undesired results are likely. IO-Link is sensitive to the port which it has been assigned to communicate on.



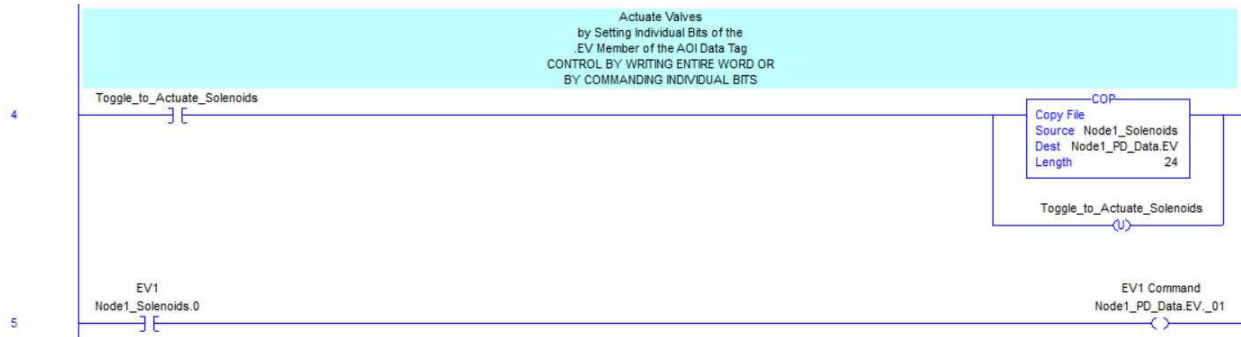
- Assign an instance name for the AOI and create other tags necessary for operation. Right click on the question marks and select “New Tag”. Note that the name must be unique for each tag and each instance of the P2M / P2H AOI. The scope and data type fields will auto-populate with the correct values, so these should not need to be changed. All fields are required. See Appendix for structure breakdown of the “Data” variable. Channel # is a SINT variable between 0-3. All other values are invalid. 0 = channel 0, 1 = channel 1, etc. Additionally a MOV command is used to capture the last Diagnostic Event Code captured for the respective channel of the IO Link master. Refer to the IO Link master manual for more information on event codes.



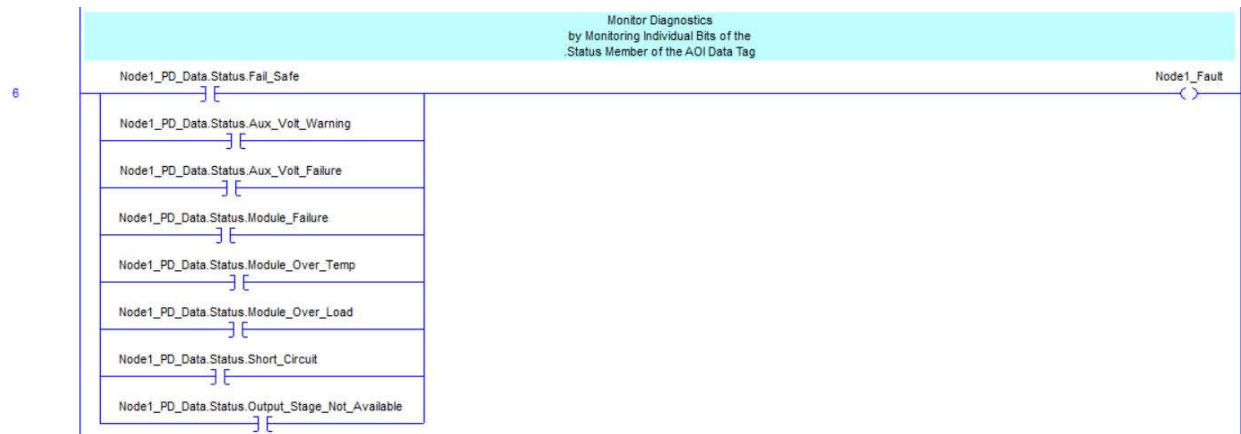
USING THE INSTRUCTION

It is important to note the difference between cyclic and acyclic data. Process Data (cyclic) is updated without a request; whereas Parameter Data (acyclic) requires the program to toggle a bit to pull (or push) data. Cyclic data includes input status and valve output control. This means that Node1_PD_Data.Status.xxx and Node1_PD_Data.EV._## are live tags (containing real data) that exist simply because the AOI instruction was used. See appendix for all data points available. See ladder logic examples below:

a. Toggling Solenoid Valves (Cyclic)



b. Monitoring Status Bits (Cyclic)

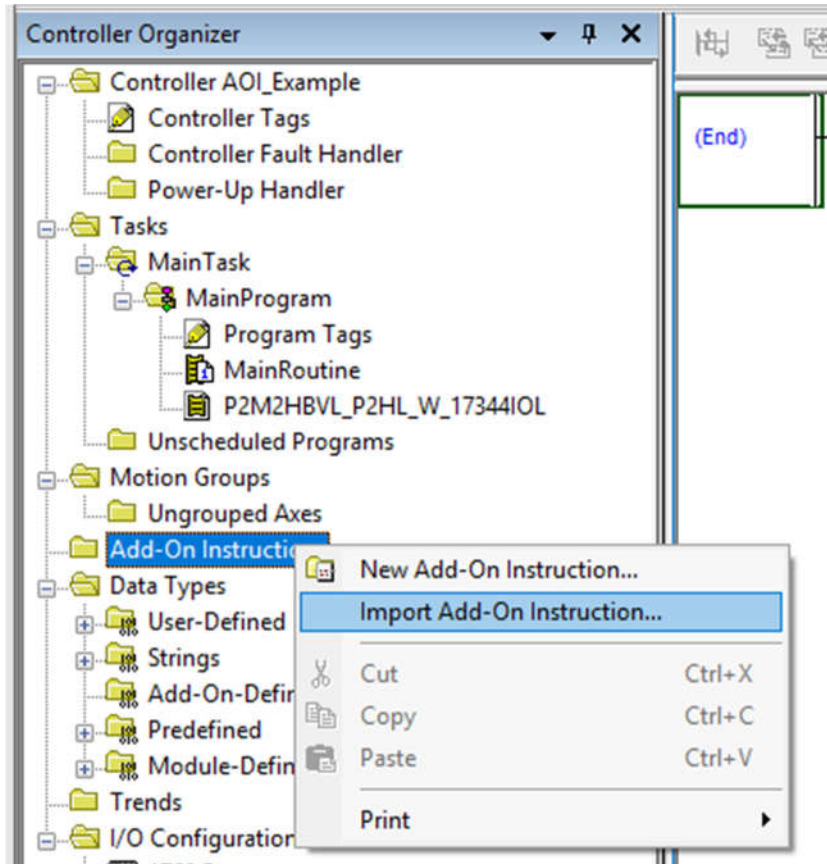


Parameter Data Add-On Instruction

The “P2M2HBVL_P2HL_AB_17344IOL_PRM_Rx” AOI simplifies the usage of Parker P2M and P2H IO-Link devices with Allen-Bradley CompactLogix, ControlLogix and GuardLogix PLCs when connected, via Ethernet/IP, to a 1734-4IOL IO-Link Master. The AOI facilitates the reading and writing of parameter data between the PLC and the Parker P2M or P2H IO-Link device.

IMPORTING THE INSTRUCTION

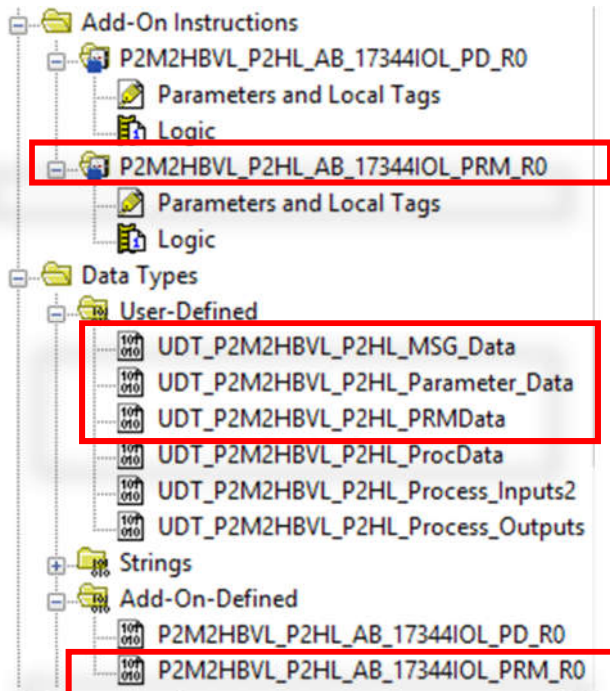
1. Right click Add-On Instruction in Controller Organizer and select “Import Add-On Instruction...”



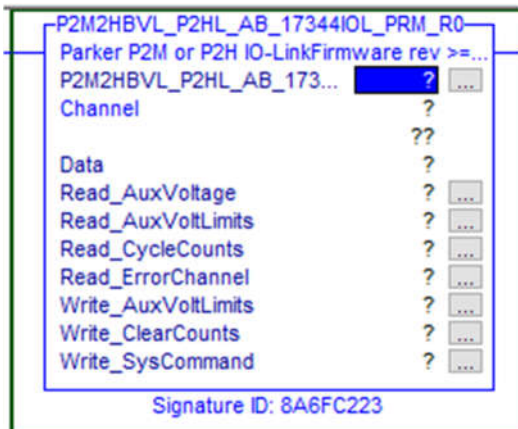
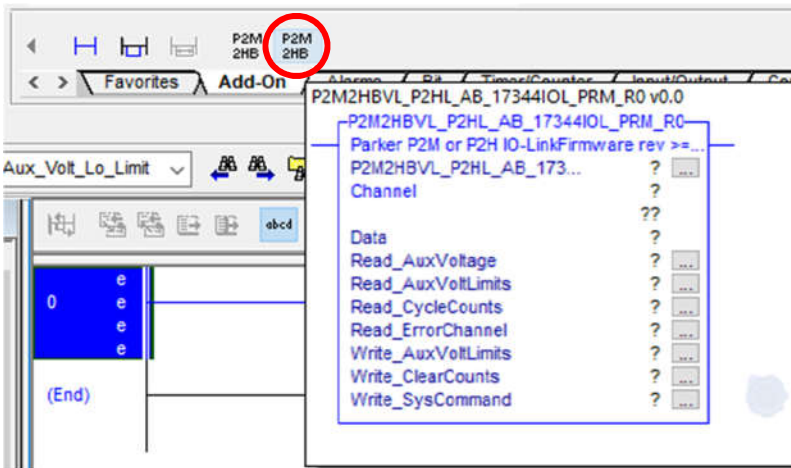
2. Select the “P2M2HBVL_P2HL_AB_17344IOL_PRM_Rx” where _Rx is the revision of AOI.

P2M2HBVL_P2HL_AB_17344IOL_PRM_R0.L5X 1/28/2020 2:06 PM RSLogix 5000

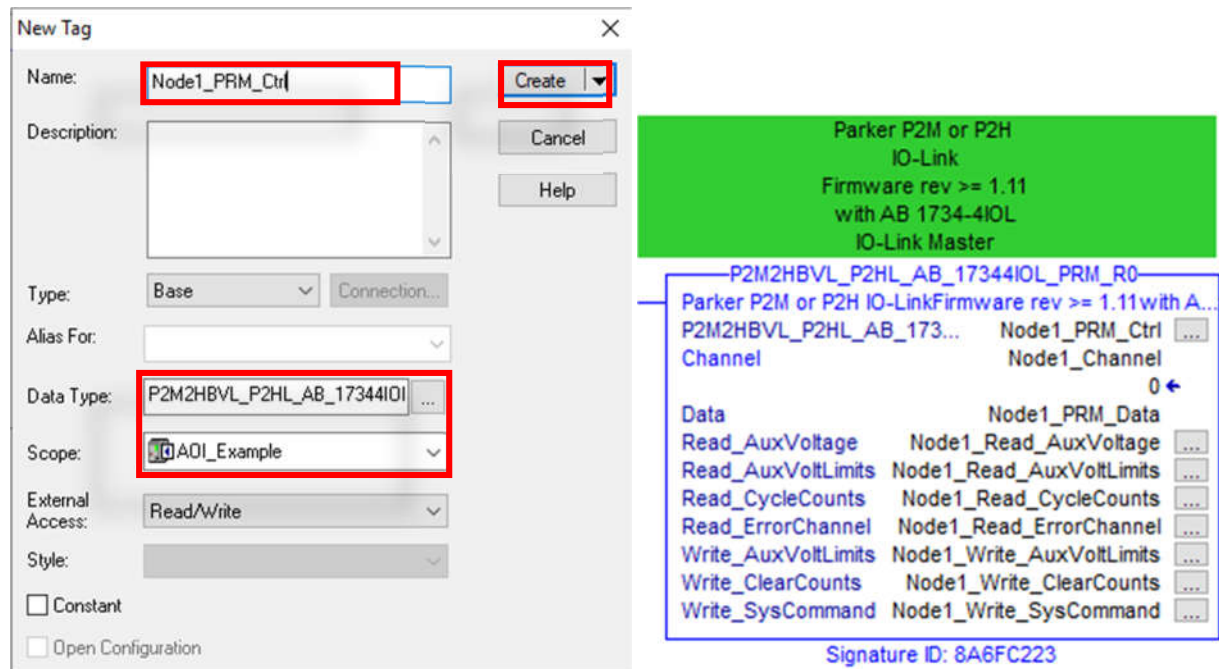
Choose OK on Import Configuration Window and you should then see the new AOI instance along with User-Defined and Add-On Defined data types created in the controller organizer.



3. Add instance of instruction to an empty rung of ladder by clicking on the P2M2HB under the Add-On tab in the top toolbar. The instruction will drop onto the selected rung.



- Assign an instance name for the AOI and create other tags necessary for operation. To do this, right click on the question marks and select “New Tag”. Note that the name must be unique for each tag and each instance of the P2M / P2H AOI. The scope and data type fields will auto-populate with the correct values, so these should not need to be changed. Click the ellipsis button next to each message tag to provide configuration information. Configuration of all tags is required. See Appendix for structure breakdown of the “Data” variable.



Note: for the following configuration windows Service Code is always 4d. **Instance** field represents the IO-Link Index for each parameter of the P2M / P2H. Attribute field is always 0. Class is always 3a3

Read_AuxVoltage Message Configuration:

Message Configuration - Node1_Read_AuxVoltage

Configuration Communication Tag

Message Type: CIP Generic

Service Type: Custom

Source Element: Node1_PRM_Data.M.

Source Length: 1 (Bytes)

Service Code: 4d (Hex) Class: 3a3 (Hex) Instance: 67 Attribute: 0 (Hex)

Destination Element: Node1_PRM_Data.M.

New Tag...

☐ Enable
 ☐ Enable Waiting
 ☐ Start
 ☐ Done
 Done Length: 2

☐ Error Code:
 Extended Error Code:
 ☐ Timed Out

Error Path:

Error Text:

OK Cancel Apply Help

Read_AuxVoltLimits Message Configuration:

Message Configuration - Node1_Read_AuxVoltLimits

Configuration Communication Tag

Message Type: CIP Generic

Service Type: Custom

Source Element: Node1_PRM_Data.M.

Source Length: 1 (Bytes)

Service Code: 4d (Hex) Class: 3a3 (Hex) Instance: 70 Attribute: 0 (Hex)

Destination Element: Node1_PRM_Data.M.

New Tag...

☐ Enable
 ☐ Enable Waiting
 ☐ Start
 ☐ Done
 Done Length: 4

☐ Error Code:
 Extended Error Code:
 ☐ Timed Out

Error Path:

Error Text:

OK Cancel Apply Help

Read_CycleCounts Message Configuration:

Message Configuration - Node1_Read_CycleCounts

Configuration Communication Tag

Message Type: CIP Generic

Service Type: Custom

Source Element: Node1_PRM_Data.M.

Source Length: 1 (Bytes)

Service Code: 4d (Hex) Class: 3a3 (Hex) Destination Element: Node1_PRM_Data.M

Instance: 64 Attribute: 0 (Hex)

New Tag...

☐ Enable
 ☐ Enable Waiting
 ☐ Start
 ☐ Done
 Done Length: 96

☐ Error Code:
 Extended Error Code:
 ☐ Timed Out

Error Path:

Error Text:

OK Cancel Apply Help

Read_ErrorChannel Message Configuration:

Message Configuration - Node1_Read_ErrorChannel

Configuration Communication Tag

Message Type: CIP Generic

Service Type: Custom

Source Element: Node1_PRM_Data.M.

Source Length: 1 (Bytes)

Service Code: 4d (Hex) Class: 3a3 (Hex) Destination Element: Node1_PRM_Data.M

Instance: 66 Attribute: 0 (Hex)

New Tag...

☐ Enable
 ☐ Enable Waiting
 ☐ Start
 ☐ Done
 Done Length: 4

☐ Error Code:
 Extended Error Code:
 ☐ Timed Out

Error Path:

Error Text:

OK Cancel Apply Help

Note: for the following configuration windows Service Code is always 4c. **Instance** field represents the IO-Link Index for each parameter of the P2M / P2H. Attribute field is always 0. Class is always 3a3. Source Length = 6 bytes for AuxVoltLimits and ClearCounts. Source Length = 3 bytes for SysCommand.

Write_AuxVoltLimits Message Configuration:

Message Configuration - Node1_Write_AuxVoltLimits

Configuration Communication Tag

Message Type: CIP Generic

Service Type: Custom

Service Code: 4c (Hex) Class: 3a3 (Hex) Instance: 70 Attribute: 0 (Hex)

Source Element: Node1_PRM_Data.M. Source Length: 6 (Bytes) Destination Element: Node1_PRM_Data.M.

Enable Enable Waiting Start Done Done Length: 0

Error Code: Extended Error Code: Timed Out

Error Path: Error Text:

OK Cancel Apply Help

Write_ClearCounts Message Configuration:

Message Configuration - Node1_Write_ClearCounts

Configuration Communication Tag

Message Type: CIP Generic

Service Type: Custom

Service Code: 4c (Hex) Class: 3a3 (Hex) Instance: 65 Attribute: 0 (Hex)

Source Element: Node1_PRM_Data.M. Source Length: 6 (Bytes) Destination Element: Node1_PRM_Data.M.

Enable Enable Waiting Start Done Done Length: 0

Error Code: Extended Error Code: Timed Out

Error Path: Error Text:

OK Cancel Apply Help

Write_SysCommand Message Configuration:

Message Configuration - Node1_Write_SysCommand

Configuration Communication Tag

Message Type: CIP Generic

Service Type: Custom Source Element: Node1_PRM_Data.M. Source Length: 3 (Bytes) Destination Element: Node1_PRM_Data.M.

Service Code: 4c (Hex) Class: 3a3 (Hex) Instance: 2 Attribute: 0 (Hex)

Enable Enable Waiting Start Done Done Length: 0

Error Code: Extended Error Code: Timed Out

Error Path: Error Text:

OK Cancel Apply Help

For each message tag, the device path must also be selected within the “Communication” tab. Select the “Browse” button and select the appropriate 1734-4IOL master

Message Configuration - Node1_Write_SysCommand

Configuration Communication Tag

Path: IOLMSTR

IOLMSTR

[0] 1769-L24ER-QB1B AOI_Example

Embedded I/O

[1] Embedded Discrete_IO

Expansion I/O

Ethernet

1769-L24ER-QB1B AOI_Example

1734-AENT/B pointio

PointIO 2 Slot Chassis

[0] 1734-AENT/B pointio

[1] 1734-4IOL/A IOLMSTR

OK Cancel Help

OK Cancel Apply Help

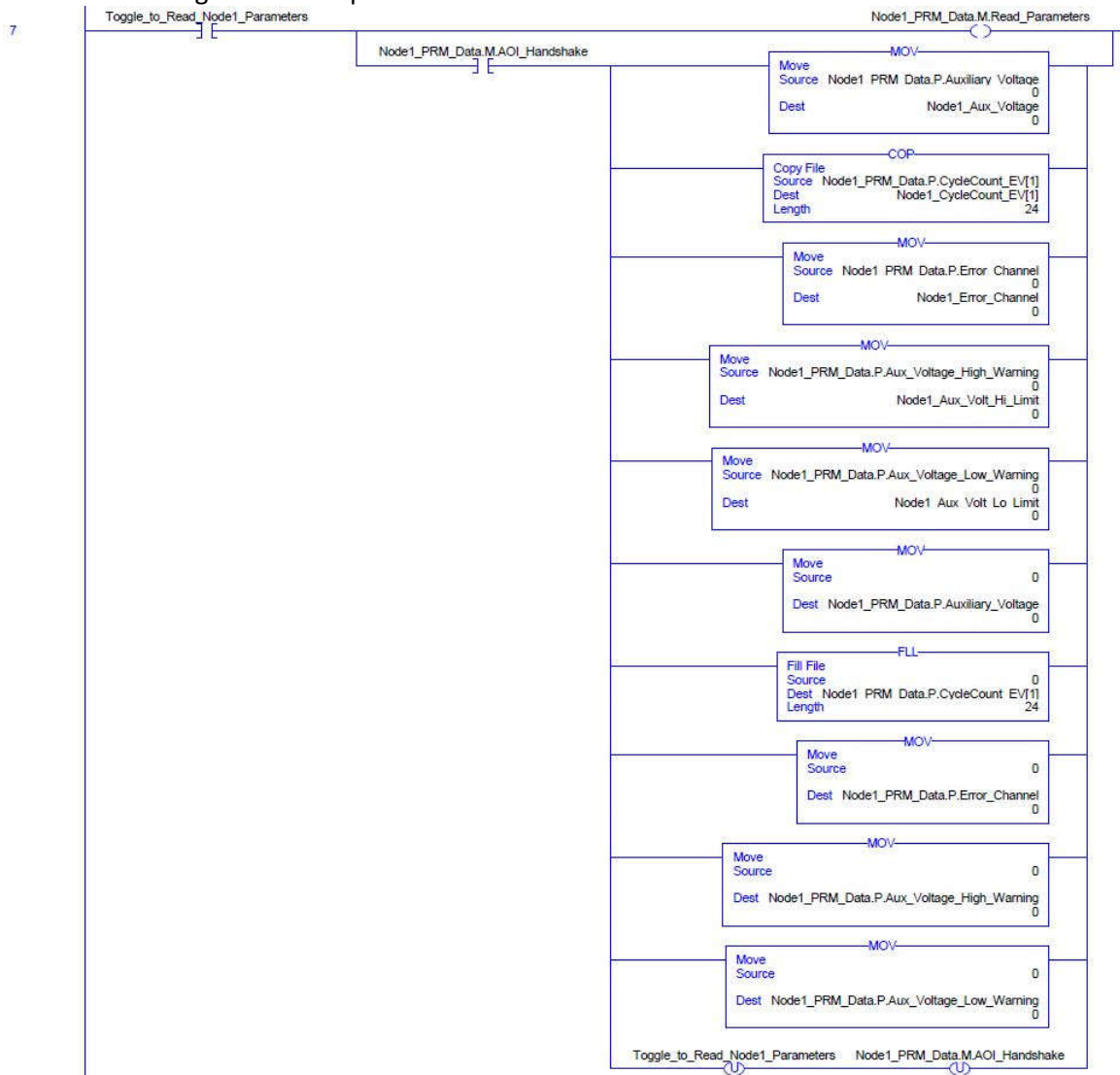
USING THE INSTRUCTION

It is important to note the difference between cyclic and acyclic data. Process Data (cyclic) is updated without a request; whereas Parameter Data (acyclic) requires the program to toggle a bit to read or write data contained inside the slave device. See appendix for all data points available. See ladder logic examples below:

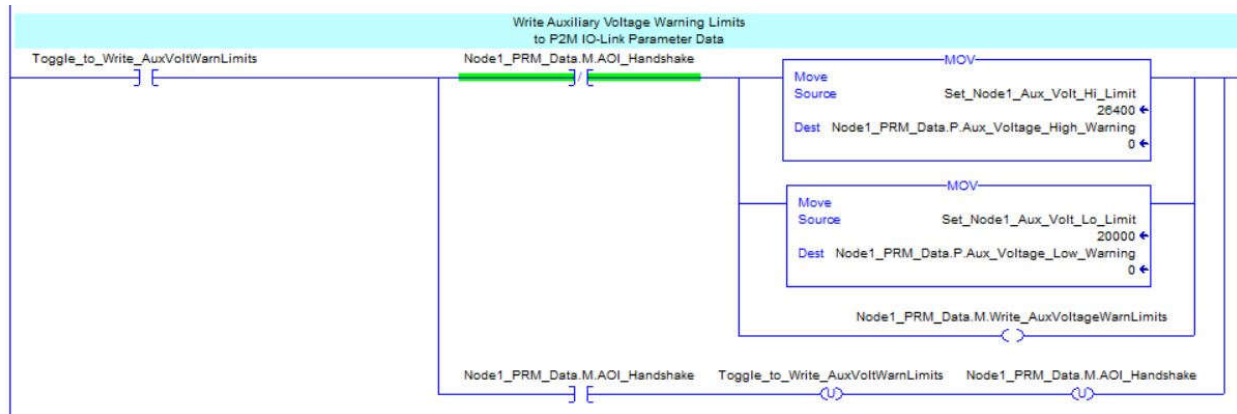
Read Parameter Data (Acyclic)

*****When initiating a read OR a write request you must reset the “Node1_PRM_Data.M.AOI_Handshake” bit AFTER processing the data*****

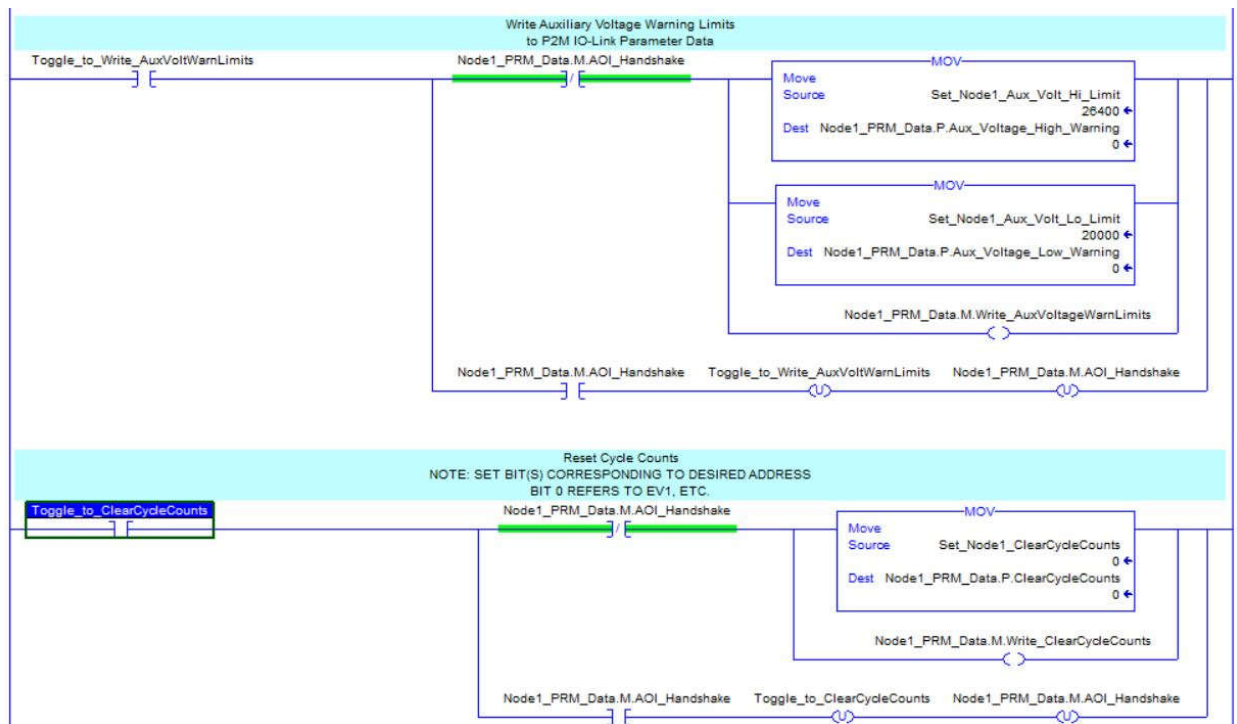
It is also important to not initiate multiple read or write requests at the same time. Write your logic such that only one of the request bits is turned on at a time and wait for the Handshake bit to go high before executing the next request.



a. Write Parameter Data (Acyclic)



Note: When sending new limit setpoints to the P2M module, the values will not be written unless the high limit is more than one volt greater than the low limit, and greater than zero.



APPENDIX**Process Data Structures**

User Defined / Add-On Defined Data Structures utilized by AOI

“P2M2HBVL_P2HL_AB_13744IOL_PD_Rx”

Name:

Description:

Members: Data Type Size: 8 byte(s)

Name	Data Type	Style	Description	External Access
Status	UDT_P2M2HBVL_P2HL_Process_Inputs2			Read/Write
Fail_Safe	BOOL	Decimal		Read/Write
Aux_Volt_Warning	BOOL	Decimal		Read/Write
Aux_Volt_Failure	BOOL	Decimal		Read/Write
Module_Failure	BOOL	Decimal		Read/Write
Module_Over_Temp	BOOL	Decimal		Read/Write
Module_Over_Load	BOOL	Decimal		Read/Write
Short_Circuit	BOOL	Decimal		Read/Write
Output_Stage_Not_Available	BOOL	Decimal		Read/Write
Device_OK	BOOL	Decimal		Read/Write
Mismatch_Fault	BOOL	Decimal		Read/Write
Comm_Fault	BOOL	Decimal		Read/Write
Validation_Failed	BOOL	Decimal		Read/Write
MostRecentEvent	INT	Decimal		Read/Write
EV	UDT_P2M2HBVL_P2HL_Process_Outputs			Read/Write

P2M2HBVL or P2HL with AB 1734-4IOL – AOI QSG

Name:

Description:

Members:
Data Type Size: 16 byte(s)

Name	Data Type	Style	Description	External Access
<input type="checkbox"/> EV	UDT_P2M2HBVL_P2HL_Process_Outputs			Read/Write
<input type="checkbox"/> _01	BOOL	Decimal	EV1 Command	Read/Write
<input type="checkbox"/> _02	BOOL	Decimal	EV2 Command	Read/Write
<input type="checkbox"/> _03	BOOL	Decimal	EV3 Command	Read/Write
<input type="checkbox"/> _04	BOOL	Decimal	EV4 Command	Read/Write
<input type="checkbox"/> _05	BOOL	Decimal	EV5 Command	Read/Write
<input type="checkbox"/> _06	BOOL	Decimal	EV6 Command	Read/Write
<input type="checkbox"/> _07	BOOL	Decimal	EV7 Command	Read/Write
<input type="checkbox"/> _08	BOOL	Decimal	EV8 Command	Read/Write
<input type="checkbox"/> _09	BOOL	Decimal	EV9 Command	Read/Write
<input type="checkbox"/> _10	BOOL	Decimal	EV10 Command	Read/Write
<input type="checkbox"/> _11	BOOL	Decimal	EV11 Command	Read/Write
<input type="checkbox"/> _12	BOOL	Decimal	EV12 Command	Read/Write
<input type="checkbox"/> _13	BOOL	Decimal	EV13 Command	Read/Write
<input type="checkbox"/> _14	BOOL	Decimal	EV14 Command	Read/Write
<input type="checkbox"/> _15	BOOL	Decimal	EV15 Command	Read/Write
<input type="checkbox"/> _16	BOOL	Decimal	EV16 Command	Read/Write
<input type="checkbox"/> _17	BOOL	Decimal	EV17 Command	Read/Write
<input type="checkbox"/> _18	BOOL	Decimal	EV18 Command	Read/Write
<input type="checkbox"/> _19	BOOL	Decimal	EV19 Command	Read/Write
<input type="checkbox"/> _20	BOOL	Decimal	EV20 Command	Read/Write
<input type="checkbox"/> _21	BOOL	Decimal	EV21 Command	Read/Write
<input type="checkbox"/> _22	BOOL	Decimal	EV22 Command	Read/Write
<input type="checkbox"/> _23	BOOL	Decimal	EV23 Command	Read/Write
<input type="checkbox"/> _24	BOOL	Decimal	EV24 Command	Read/Write

Parameter Data Structures

User Defined / Add-On Defined Data Structures utilized by AOI

“P2M2HBVL_P2HL_AB_17344IOL_PRM_Rx”

Name:

Description:

Members: Data Type Size: 328 byte(s)

	Name	Data Type	Style	Description	External Access
<input checked="" type="checkbox"/>	P	UDT_P2M2HBVL_P2HL_Parameter_Data			Read/Write
<input checked="" type="checkbox"/>	M	UDT_P2M2HBVL_P2HL_MSG_Data			Read/Write

Name:

Description:

Members: Data Type Size: 328 byte(s)

	Name	Data Type	Style	Description	External Access
<input checked="" type="checkbox"/>	P	UDT_P2M2HBVL_P2HL_Parameter_Data			Read/Write
<input type="checkbox"/>	Auxiliary_Voltage	INT	Decimal		Read/Write
<input type="checkbox"/>	Error_Channel	DINT	Decimal		Read/Write
<input type="checkbox"/>	Aux_Voltage_High_Warning	INT	Decimal		Read/Write
<input type="checkbox"/>	Aux_Voltage_Low_Warning	INT	Decimal		Read/Write
<input type="checkbox"/>	CycleCount_EV	DINT[25]	Decimal		Read/Write
<input type="checkbox"/>	ClearCycleCounts	DINT	Decimal		Read/Write
<input type="checkbox"/>	SystemCommand	INT	Decimal		Read/Write

P2M2HBVL or P2HL with AB 1734-4IOL – AOI QSG

Name:

UDT_P2M2HBVL_P2HL_PRMDData

Description:

Members:

Data Type Size: 328 byte(s)

	Name	Data Type	Style	Description	External Access
	P	UDT_P2M2HBVL_P2HL_Parameter_Data			Read/Write
	M	UDT_P2M2HBVL_P2HL_MSG_Data			Read/Write
	Read_Parameters	BOOL	Decimal		None
	Write_AuxVoltageWarnLimits	BOOL	Decimal		None
	Write_ClearCycleCounts	BOOL	Decimal		None
	Write_SysCommand	BOOL	Decimal		None
	AOI_Handshake	BOOL	Decimal		None
	Write	BOOL	Decimal		None
	Reset	BOOL	Decimal		None
	Done	BOOL	Decimal		None
	Error	BOOL	Decimal		None
	status	INT	Decimal		None
	ReceiveData	SINT[97]	Decimal		None
	SendData	SINT[97]	Decimal		None
	WriteData	DINT	Decimal		None