

Starting up Axioline E PROFINET IO-Link devices using PC Worx

Quickstart

UM QS EN AXL E PN IOL PC WORX



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This quickstart is valid for Axioline E PROFINET IO-Link devices.

Please observe the following notes

User group of this manual

The use of products described in this manual is oriented exclusively to:

- Qualified electricians or persons instructed by them, who are familiar with applicable standards and other regulations regarding electrical engineering and, in particular, the relevant safety concepts.
- Qualified application programmers and software engineers, who are familiar with the safety concepts of automation technology and applicable standards.

Explanation of symbols used and signal words



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety measures that follow this symbol to avoid possible injury or death.

There are three different categories of personal injury that are indicated with a signal word.

DANGER This indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING This indicates a hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION This indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



This symbol together with the signal word **NOTE** and the accompanying text alert the reader to a situation which may cause damage or malfunction to the device, hardware/software, or surrounding property.



This symbol and the accompanying text provide the reader with additional information or refer to detailed sources of information.

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1 Basics and example project

1.1 Information about this document

This document describes specific features associated with the startup of Axioline E PROFINET IO-Link devices on a Phoenix Contact controller.

The document is aimed at experienced PC Worx users. It does not cover a complete project, just specific features associated with the use of Axioline E devices.

It is assumed the user has knowledge and experience in the operation of PCs and Windows operating systems, knowledge of the PC Worx software from Phoenix Contact and Ethernet basics.

1.2 System requirements

1.2.1 Software requirements

The information refers to firmware Version v2.0.0.0 of the IO-Link devices.

1.2.2 Hardware requirements for PC Worx

Please refer to the PC Worx documentation for the hardware requirements.

1.2.3 Axioline E PROFINET IO-Link devices

The document is valid for the following Axioline E PROFINET IO-Link devices:

Designation	Order No.	DeviceID	ModulidentNumber	Firmware
AXL E PN IOL8 DI4 M12 6P	2701513	0x0104	0x500000	v2.0.0.0 or later
AXL E PN IOL8 DI4 M12 6M	2701519	0x0104	0x510000	v2.0.0.0 or later

1.3 Example network configuration

This example project consists of a Phoenix Contact PROFINET controller, the AXL E-PROFINET IO-Link device, and a PC with PC Worx.

There may be an optional Ethernet switch in your configuration if your controller only has one Ethernet port.

The example system is shown in Figure 1-1.



Figure 1-1 Example system

1.4 General startup steps

Proceed as follows to start up Axioline E PROFINET IO-Link devices:

- Install the devices and connect the power supply.
- Create a new project in the engineering tool.
- Add the controller and I/O devices to the project.
- Enter addresses/names.
- Compile the project and send it to the controller.
- Establish communication with the I/O device and test this.

2 Creating a PC Worx project

To integrate the Axioline E devices into the network, proceed according to the documentation for your Phoenix Contact controller. This section only explains fundamental steps that are relevant to the Axioline E system.



It is assumed that the IP address of the controller is known and that a connection can be established. For further information, please refer to the user manual for the associated controller.

2.1 Creating/opening a project

Perform the following steps to create a new project in PC Worx:

- In the menu bar, click on “File” and select “New Project”.
- Alternatively, you can use the “Ctrl + N” key combination.

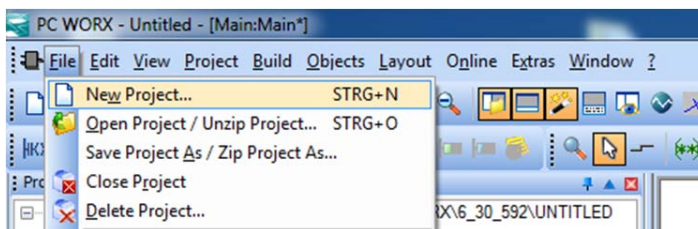


Figure 2-1 Creating a new project

- The “New Project” window opens.
- Select your controller, in this example it is ILC 350 PN (1).
- Click “OK” (2).

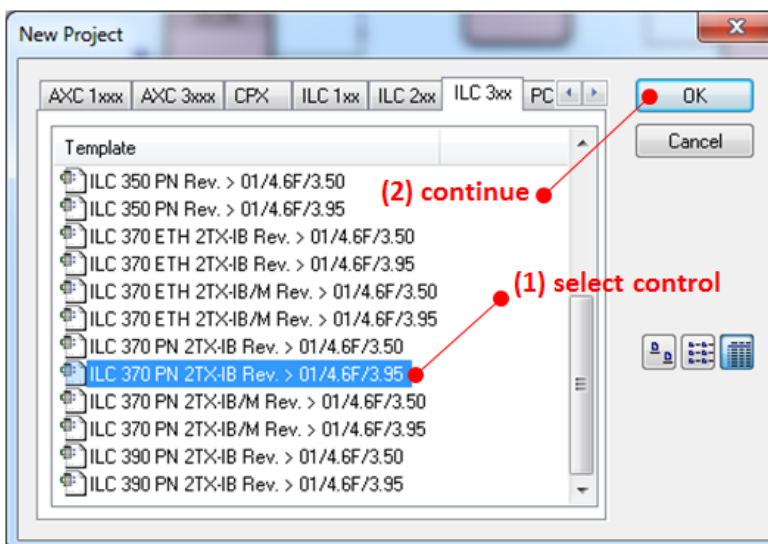


Figure 2-2 Selecting the controller

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All of the relevant data is then automatically added to the project tree.

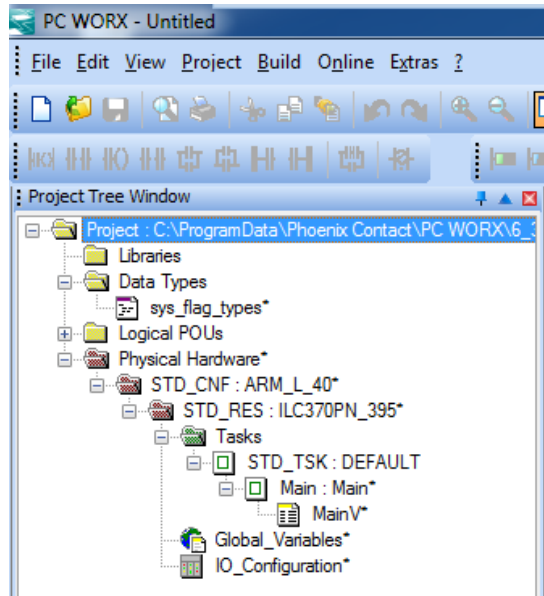


Figure 2-3 Project tree

2.2 Establishing a connection to the controller

The Phoenix Contact ILC 350 PN Inline controller is used in this example. The following steps apply specifically to this controller. Please perform the steps required for your controller according to the associated documentation.



It is assumed that the IP address of the controller is known.

- Click the “Bus configuration” button in the tool bar.

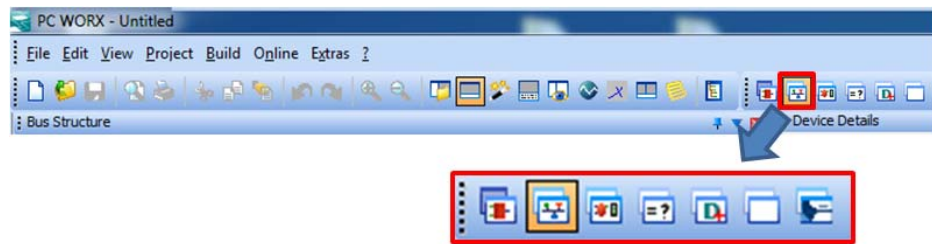


Figure 2-4 Clicking the “Bus configuration” button

The following view appears:

- Select your controller on the left in the “Bus Structure” window.
- In the right-hand window “Device Details”, enter the DNS name, MAC address, and IP address for your controller in the “IP Settings” tab.

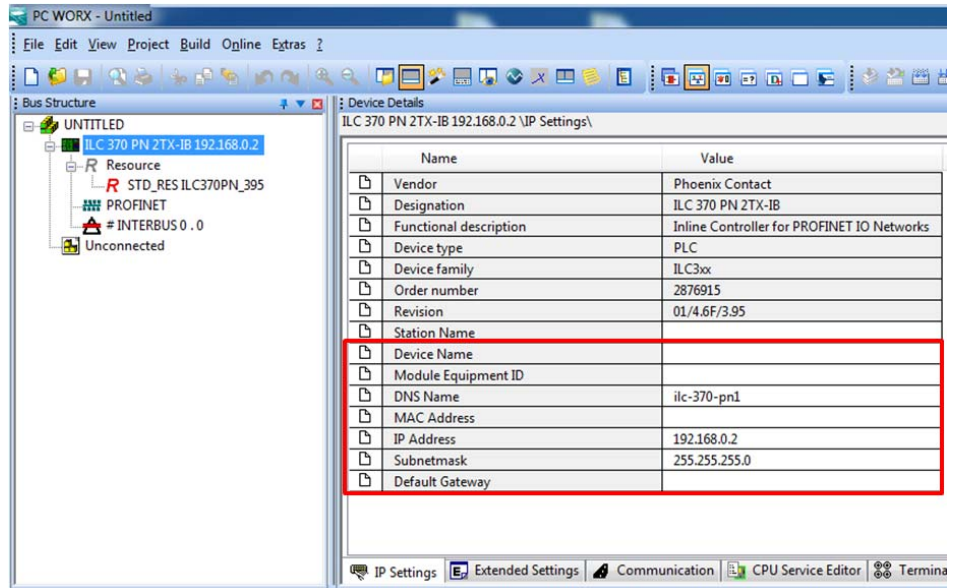


Figure 2-5 Selecting the controller, entering the DNS name, MAC and IP address

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- Then use the “Communication” tab to test the set parameters.
- To do so, click “Test”.

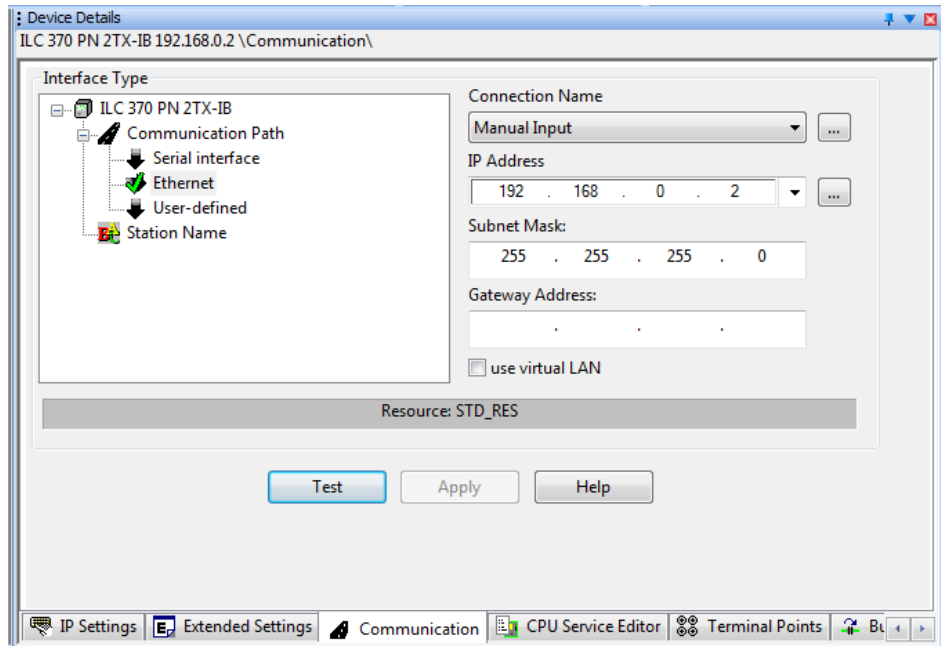


Figure 2-6 Testing parameters



For starting up the controller and assigning the IP address, refer to the appropriate user manual.

2.3 Adding PROFINET devices to the project

There are two ways of adding I/O devices to the project using PC Worx.

- In online mode: by reading in the PROFINET network
- In offline mode: by adding the device manually from the device catalog

2.3.1 Reading in a PROFINET device online

PC Worx allows you to read in the PROFINET network online. This enables you to transfer devices available in the network directly into the project.

To do so, carry out the following steps:

- Click the “Bus configuration” button in the tool bar.

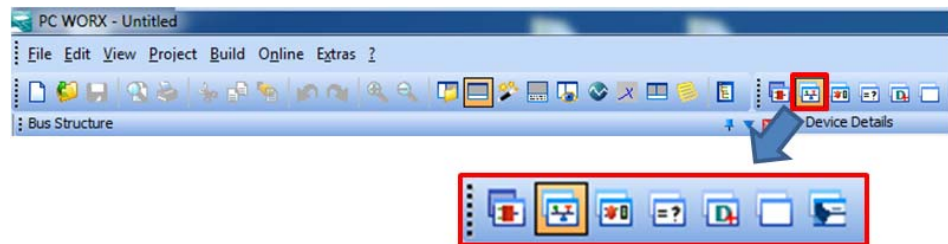


Figure 2-7 Clicking the “Bus configuration” button

- Right-click on “PROFINET” and select the “Read PROFINET...” menu item.

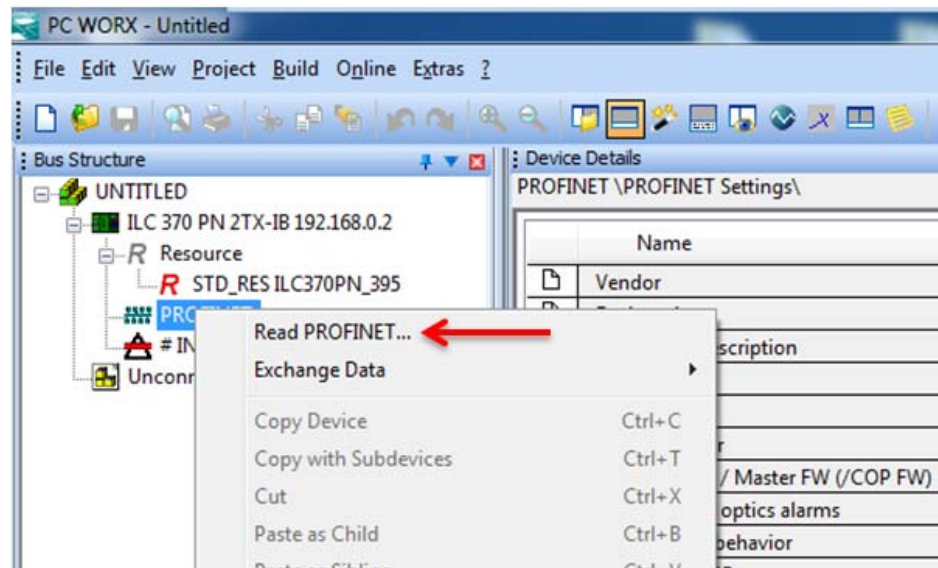


Figure 2-8 Selecting the “Read PROFINET...” menu item

A new “Read PROFINET” window appears in which all devices available online are displayed.

- Select your connected AXL E PROFINET device (1).

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- Then click “Insert” (2).

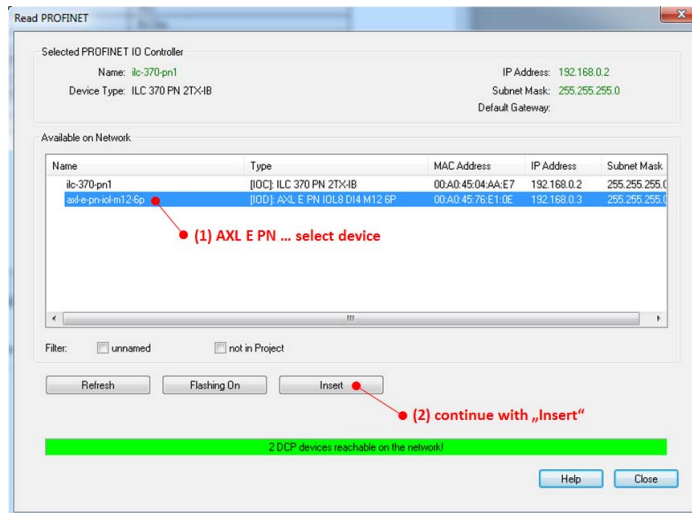


Figure 2-9 Inserting a device



Make sure that you have configured a network card for PROFINET communication via “Extras > PROFINET Configuration ...”.

The “Select PROFINET device description” window opens.

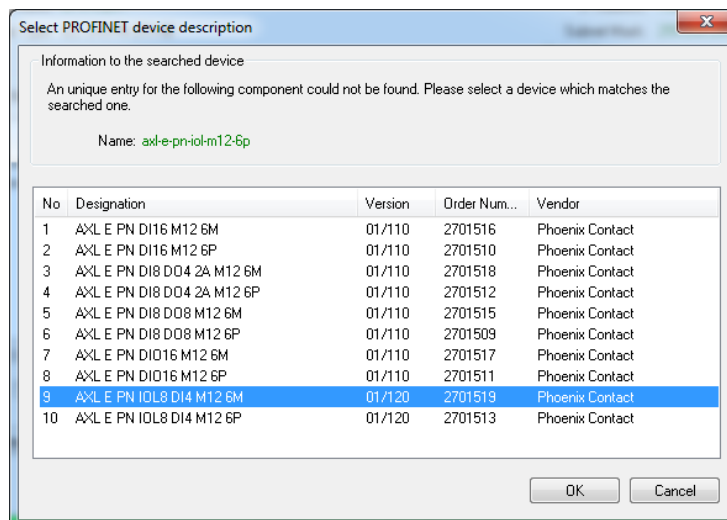


Figure 2-10 Selecting the PROFINET device description

- Select your device type and then click “OK”.



The device type must be selected due to the fact that all AXL E-PROFINET devices share a single GSDML/FDCML file and therefore also have the same device ID.

- Close the “Read PROFINET” window.

2.3.2 Adding a PROFINET device offline

As well as the ability to read in PROFINET devices online, PC Worx also allows you to add devices to the project from the device catalog in offline mode.

To do so, carry out the following steps:

- Click the “Bus configuration” button in the tool bar.



Figure 2-11 Bus configuration

- In the device catalog, select the Axioline E PN device “Phoenix Contact > AXL E > IO-Link Master”.
- Move the selected device to the bus structure, directly next to the word PROFINET, using “drag and drop”.
- Release it as soon as the mouse pointer symbol changes next to the word “PROFINET”.

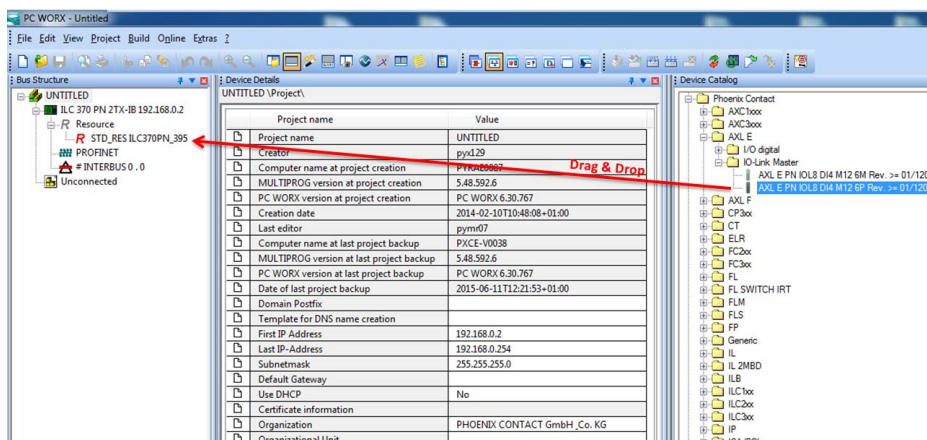


Figure 2-12 Selecting the device and dragging it into the bus structure



If you cannot find the “Device Catalog” window in PC Worx, you can activate it via the menu bar “View > Device Catalog”.

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3 Setting Axioline E PROFINET IO-Link device

The Axioline E PROFINET IO-Link device is modular. Slot 1 always contains the “Status/Control Module” with four bytes of input and four bytes of output process data.

In slots 2 to 9, both the operating mode and the process data length for the respective IO-Link port are parameterized. In the default state, these slots are pre-allocated the “digital input” mode.

The PROFINET device model of an AXL E PN IOL8 DI4 M12 6M is shown as an example.

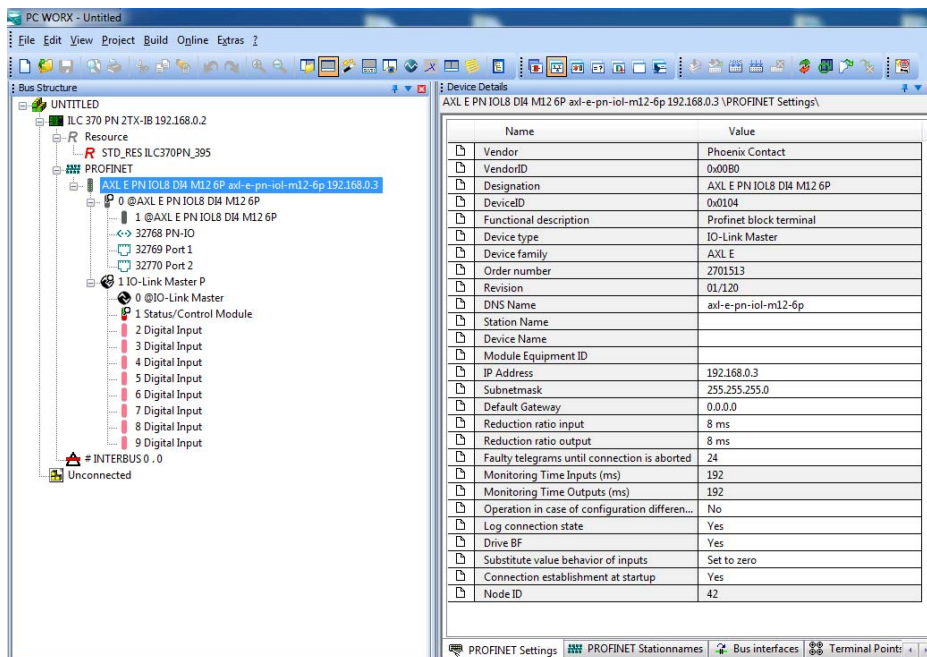


Figure 3-1 PROFINET device model



For further information about the individual operating modes and configuration options, please refer to the device-specific data sheet.

The following sections describe all the necessary configuration options for the device.

3.1 Performing a flash test

If you want to start up several Axioline E PROFINET devices of the same type, but do not have unique identification, you can uniquely identify these by carrying out a flash test directly on the device.

The PC Worx engineering tool can search all devices located/accessible on the PROFINET network and perform a flash test. This does not need to be available in the created project.

To do so, carry out the following steps:

- Click the “Bus configuration” button in the tool bar.

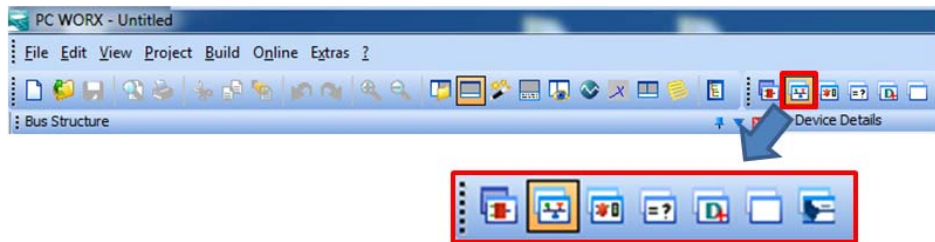


Figure 3-2 Clicking the “Bus configuration” button

- Right-click on “PROFINET” and select the “Read PROFINET...” menu item.

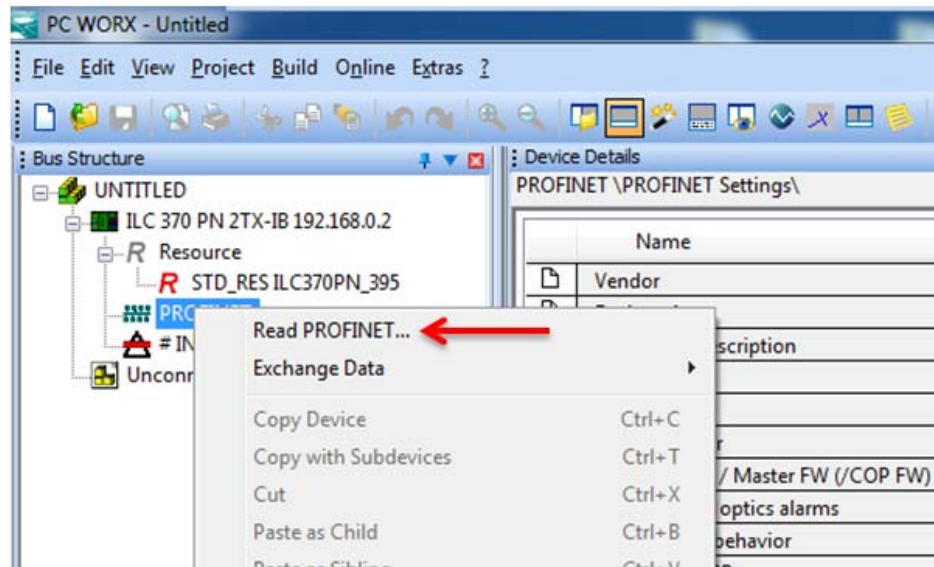


Figure 3-3 Selecting the “Read PROFINET...” menu item

A new “Read PROFINET” window appears.

Setting Axioline E PROFINET IO-Link device

- Select the device to be flashed (1).
- Click “Flashing On” (2).

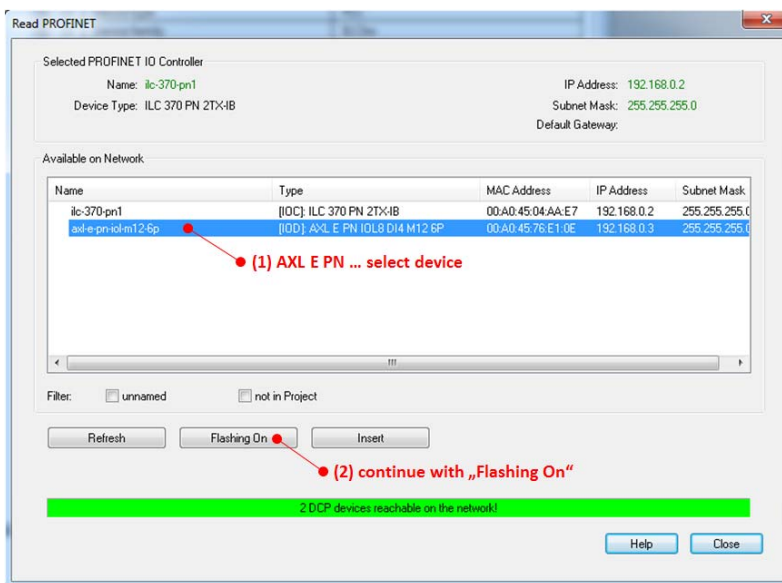


Figure 3-4 Starting the flash test

The window changes and an icon (1) indicates which device is currently flashing.

- You can terminate this function by clicking “Flashing Off” (2).

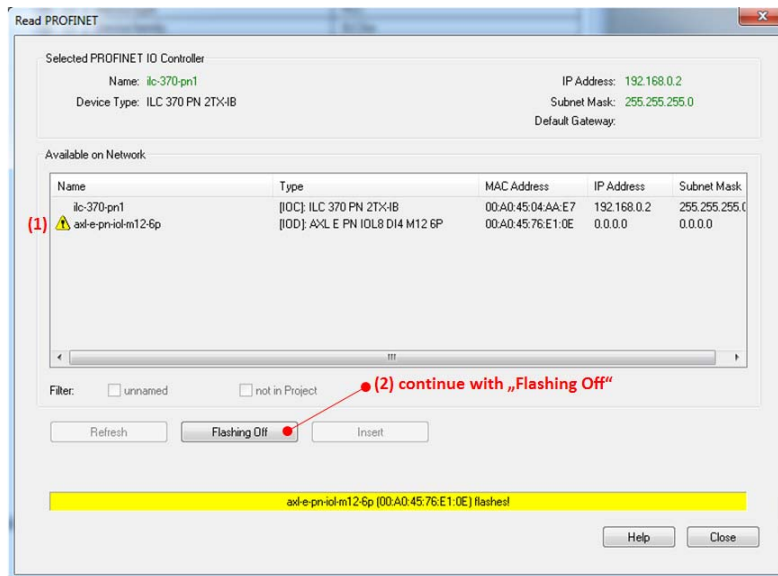


Figure 3-5 Terminating the flash test



On Axioline E PROFINET devices the BF and SF LEDs flash red simultaneously.

3.2 Performing the IO-Link port configuration

A port configuration for slots 2 to 9 which configures the operating mode and the process data length for the relevant IO-Link port is required for the Axioline E PROFINET IO-Link devices.



In the default state, these slots are pre-allocated the “digital input” mode.

Due to the PROFINET specification, port 1 (X01) only starts at slot 2, i.e., all port numbers are offset by one. Please note that the port configuration in engineering must also correspond to the actual configuration on the device, otherwise it will not be possible to carry out a correct upload.

To configure the ports, carry out the following steps:

- Click the “Bus configuration” button in the tool bar.



Figure 3-6 Clicking the “Bus configuration” button

Setting Axioline E PROFINET IO-Link device

In order for the ports to be freely configured, all the default port settings are deleted in this example.

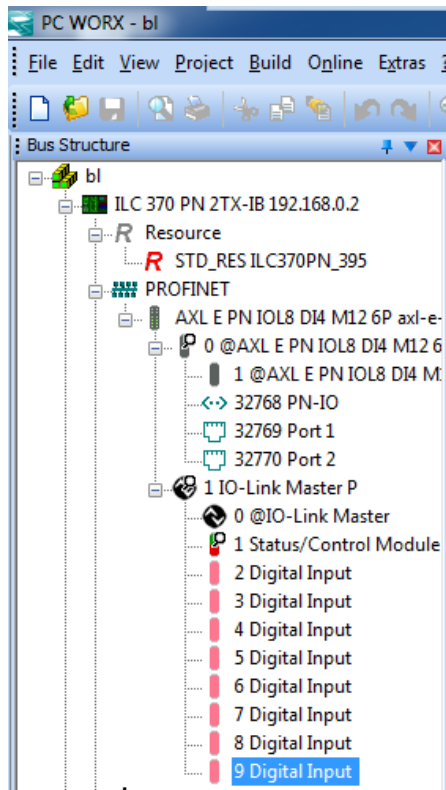


Figure 3-7 Deleting the default port settings

- To do so, click on the last slot 9 and then press the delete key.
- Repeat this for all ports up to port 2.
- Alternatively, you can right-click on the port in question and select the "Delete" option.

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Your configuration should then look like this:

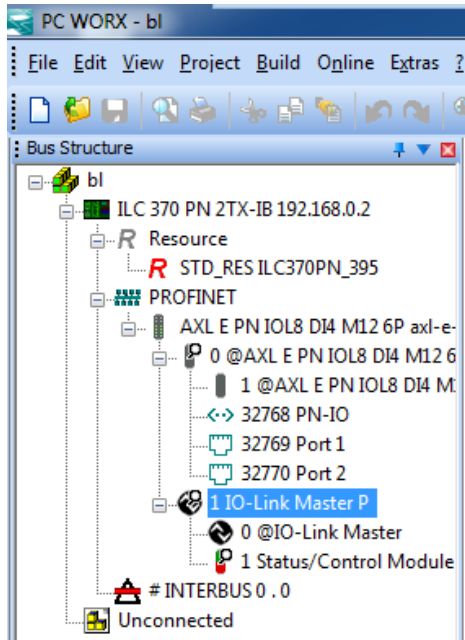


Figure 3-8 Port configuration

- Now open the module catalog via “View > Module Catalog”.

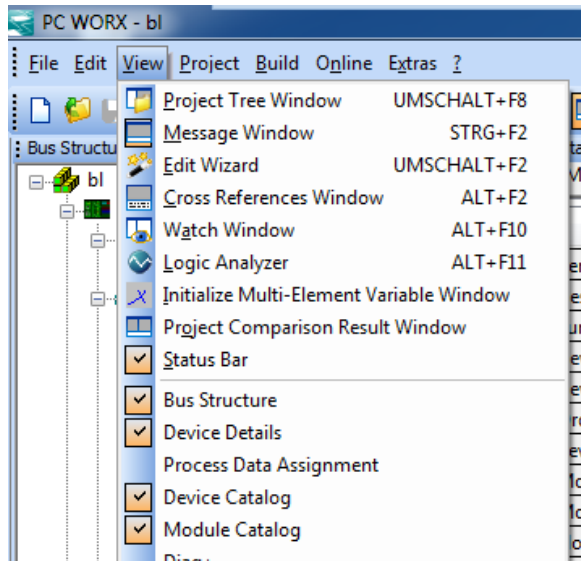


Figure 3-9 Opening the module catalog

Setting Axioline E PROFINET IO-Link device

- Then click on slot 1 “IO-Link Master x” of your previously inserted device in the bus structure.

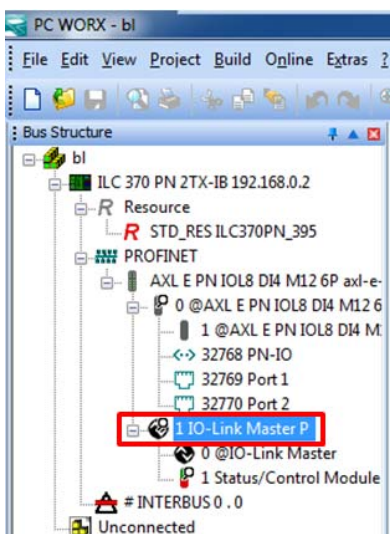


Figure 3-10 Selecting the IO-Link master

- Insert the available submodules (operating modes) of the IO-Link master “Phoenix Contact > MODULE > AXL E > ...” into the configuration from the module catalog by double-clicking on them one after the other. Alternatively, you can also do this via drag and drop.

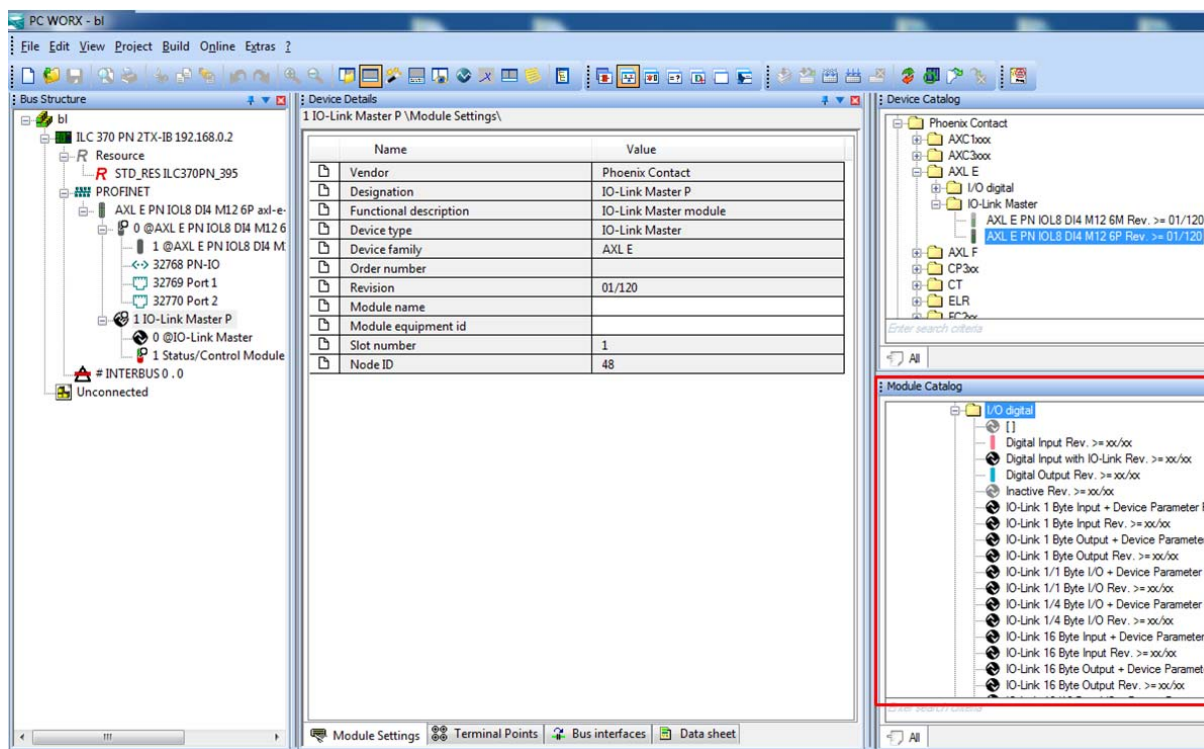


Figure 3-11 Inserting submodules

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Making changes to the port configuration

If you want to make changes to the port configuration, you can use the PC Worx “replace function”

- Select the required operating mode from the module catalog.
- Right-click and select the “Copy Module” option (or press ctrl + C).

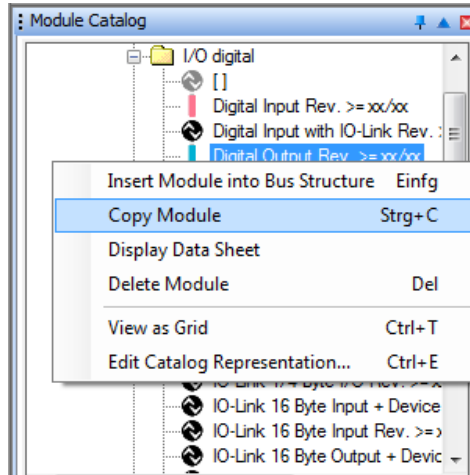


Figure 3-12 Changing the port configuration

- Then click on the port you want to change.
- Right-click and select the “Replace” option.

The port then changes the operating mode.

3.3 Setting IO-Link device identification

The Axioline E PROFINET IO-Link masters support recognition and calibration of connected IO-Link devices. The vendor ID and the device ID can be set for each port.



As soon as the contents of the vendor ID and/or device ID do not equal "0", the "Type Compatible" IO-Link inspection level is activated. It is only when both the parameterized vendor ID and device ID match the IDs that are read (in the device) that communication is established with the device (COM state bit of the corresponding port = 1), otherwise this is rejected (red IO-Link LED on).

To set the device ID perform the following steps:

- Click the "Bus configuration" button in the tool bar.

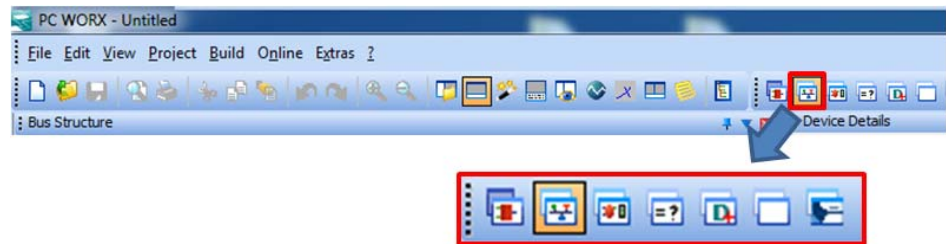


Figure 3-13 Clicking the "Bus configuration" button

- Configure the ports according to section "Performing the IO-Link port configuration" on page 18.
- Switch over the ports, for which device identification should be performed, to IO-Link operating mode.

The port configuration can appear as follows, for instance:

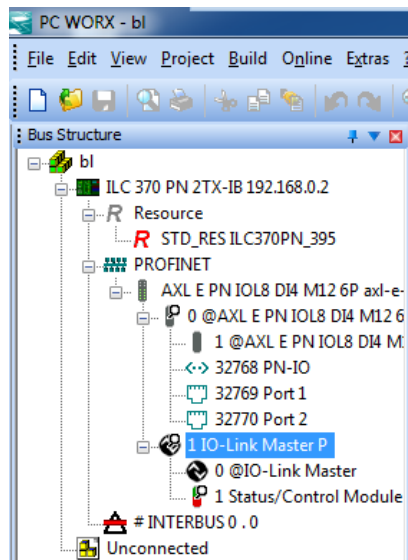


Figure 3-14 Example port configuration

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- Double-click on the IO-Link port to be configured, port 5 or submodule 6 in this case.
- Switch to the “Device parameters” (1) tab.
- Select the “Device Validation” menu item (2).

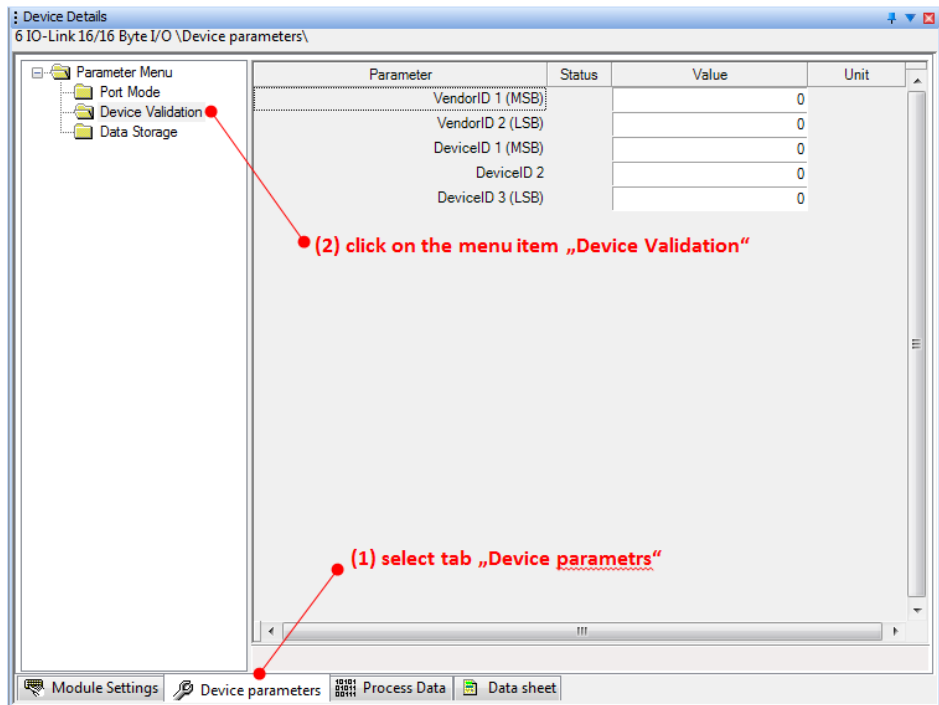


Figure 3-15 Clicking the “Device Validation” menu item

Using the example of a capacitive sensor KQ6005 from ifm, the following settings are required: vendor ID 310d (01 36 h) and device ID 371d (00 01 73 h).

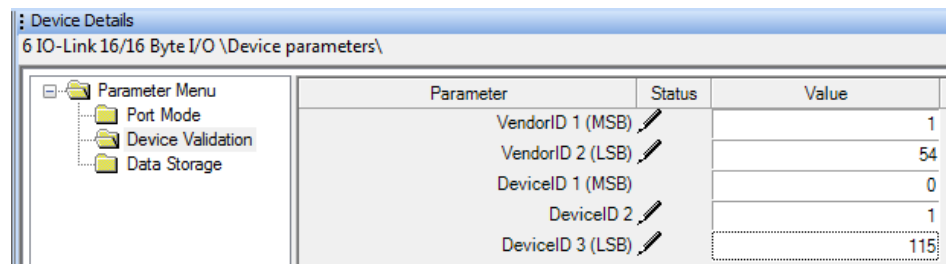


Figure 3-16 Example settings



In the “Value” field, enter the decimal values, i.e., you must convert every hexadecimal byte to decimal in advance and enter it in the corresponding field, in this example:

Vendor ID: 01_{hex} = 1_{dec}; 36_{hex} = 54_{dec}

Device ID: 00_{hex} = 0_{dec}; 01_{hex} = 1_{dec}; 73_{hex} = 115_{dec}

3.4 Setting the IO-Link data storage mechanism (parameter server)

The Axioline E PROFINET IO-Link masters support the data storage mechanism, which enables parameters to be exchanged between the master and device.



Connected devices must support at least IO-Link specification v1.1 in order to use the function.

The options are as follows:

- Deactivated
- Download Only
- Upload Only
- Download/Upload Allowed
- Cleared

To set the data storage mechanism perform the following steps:

- Click the “Bus configuration” button in the tool bar.



For further information about the individual functions, please refer to the device-specific data sheet.

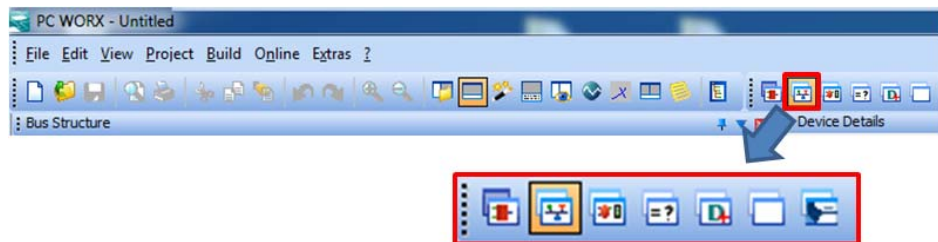


Figure 3-17 Clicking the “Bus configuration” button

- Configure the ports according to section “Performing the IO-Link port configuration” on page 18.
- Switch over the ports, for which device identification should be performed, to IO-Link operating mode.

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The port configuration can appear as follows, for instance:

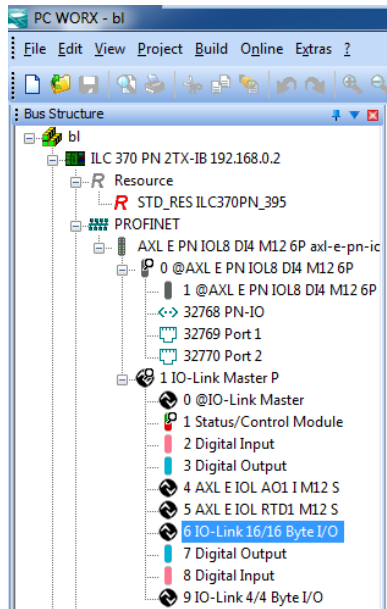


Figure 3-18 Example port configuration

- Double-click on the IO-Link port to be configured, port 5 or submodule 6 in this case.
- Switch to the “Device parameters” (1) tab.
- Select the “Device Storage” menu item (2).

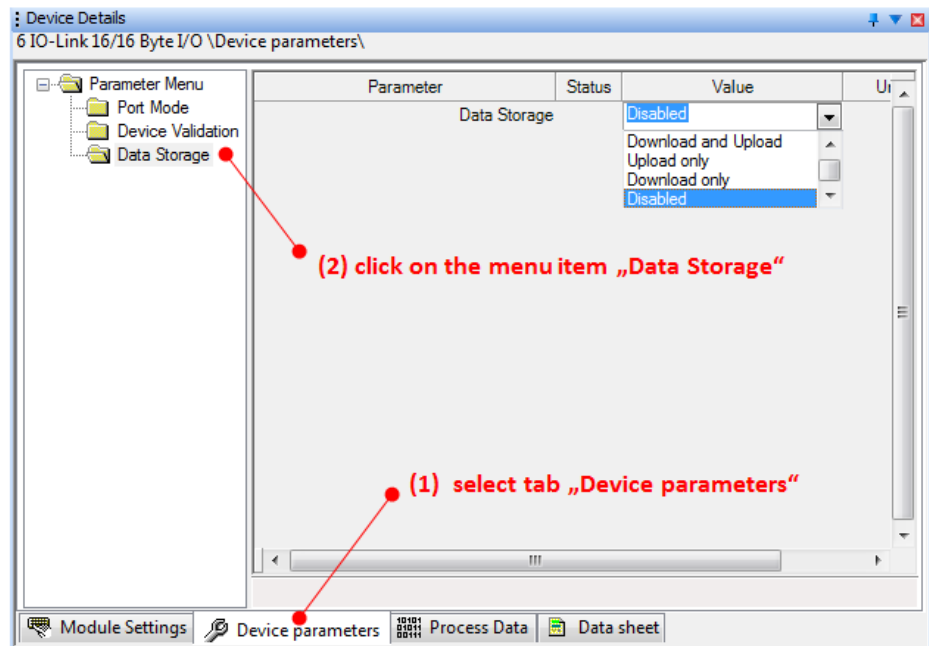


Figure 3-19 Clicking the “Data Storage” menu item

Setting Axioline E PROFINET IO-Link device

In order for the data storage mechanism to work, you should carry out the following steps:

Use of “Upload only” > “Download only”

- 1 Connect a fully parameterized IO-Link device to the appropriate port.
- 2 Configure the port to “Upload only”.
- 3 Download the program and switch the controller to online mode.
 - The parameters are now read by the device and stored in the master on the port.
- 4 The device can now be swapped with a new device.
- 5 Re-parameterize the port to “Download only”.
- 6 Download the program and switch the controller to online mode.
- 7 The parameters are transferred as soon as the master is started and the device has been detected.

Use of “Download/Upload allowed”

- 1 Connect a fully parameterized IO-Link device to the appropriate port.
- 2 Configure the port to “Download/Upload allowed”.
- 3 Download the program and switch the controller to online mode.
 - The parameters are now read by the device and stored in the master on the port.
- 4 The device can now be swapped with a new device.
 - The parameters are written to the device from the master.

3.5 Setting failsafe behavior

If PROFINET communication fails, all device outputs are set to the parameterized replacement values. The Axioline E PROFINET IO-Link device has a modular design, i.e., the operating mode can be flexibly set for each port. The higher-level failsafe behavior of the ports can be set via slot 1 Status/Control Module.

Proceed as follows:

- Select the “Status/Control Module” (1) in the bus structure.
- Select the “Device parameters” (2) tab.
- Click on the “Failsafe (3) menu item.

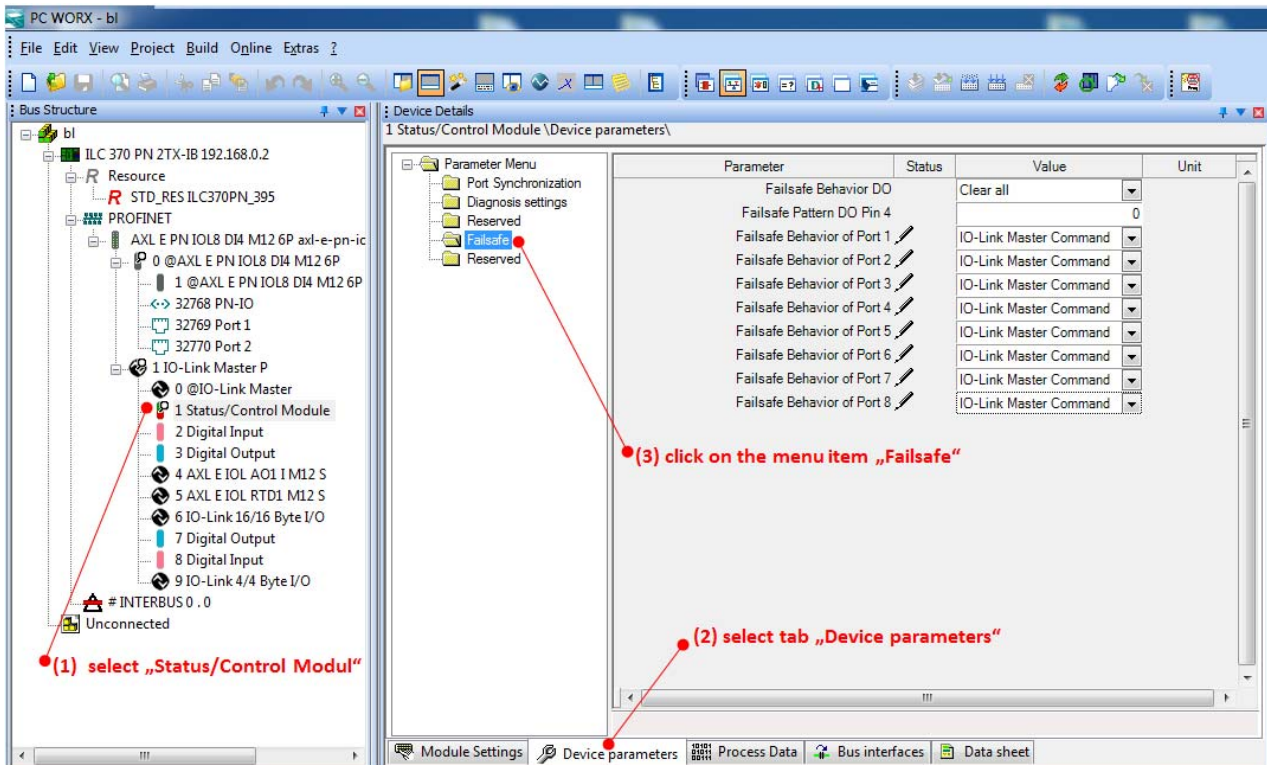


Figure 3-20 Setting failsafe behavior

3.5.1 Ports in “digital output” mode

If there are ports with “Digital output” mode in your configuration, the failsafe behavior can be set via the following parameters.

Behavior in the event of an error for status/control module

- Sets the global behavior for all ports in “digital output” mode

Replacement values for DO

- The behavior for each port can be set using the failsafe pattern.
- This only applies if “Replacement values” is selected in the previous parameter.

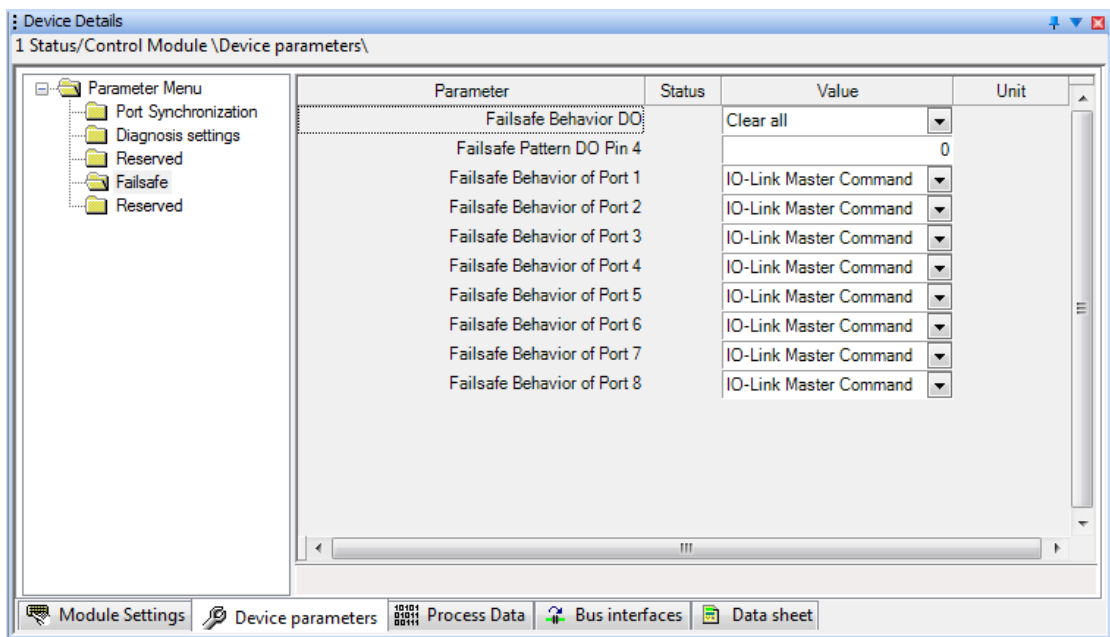


Figure 3-21 Setting failsafe behavior

Example: setting the failsafe pattern

Port 2, 5, and 8 work in “digital output” mode and should be set in the event of an error.

Port	1	2	3	4	5	6	7	8
Bit	0	1	2	3	4	5	6	7
Replacement value	0	1	0	0	1	0	0	1

If the bit pattern is converted to decimal, this results in a value of 146.

- Enter this value into the “Failsafe behavior DO” parameter in order to set the desired behavior.



For additional information, refer to the device-specific data sheet.

3.5.2 Ports in the “IO-Link” mode

If there are ports with IO-Link or AXL E IOL ... mode in your configuration, the failsafe behavior can be set via the “Failsafe Behavior of Port X” parameter.

By default, “IO-Link Master Command” is set for the ports. The “IO-Link Master Command” option enables the use of IO-Link-specific mechanisms for valid/invalid OUT process data. Therefore the IO-Link device itself determines which failsafe behavior should be used.

Alternatively, the Axioline E PROFINET IO-Link can also specify the failsafe behavior. The following options are available.

- Clear all
- Set all
- Hold last value

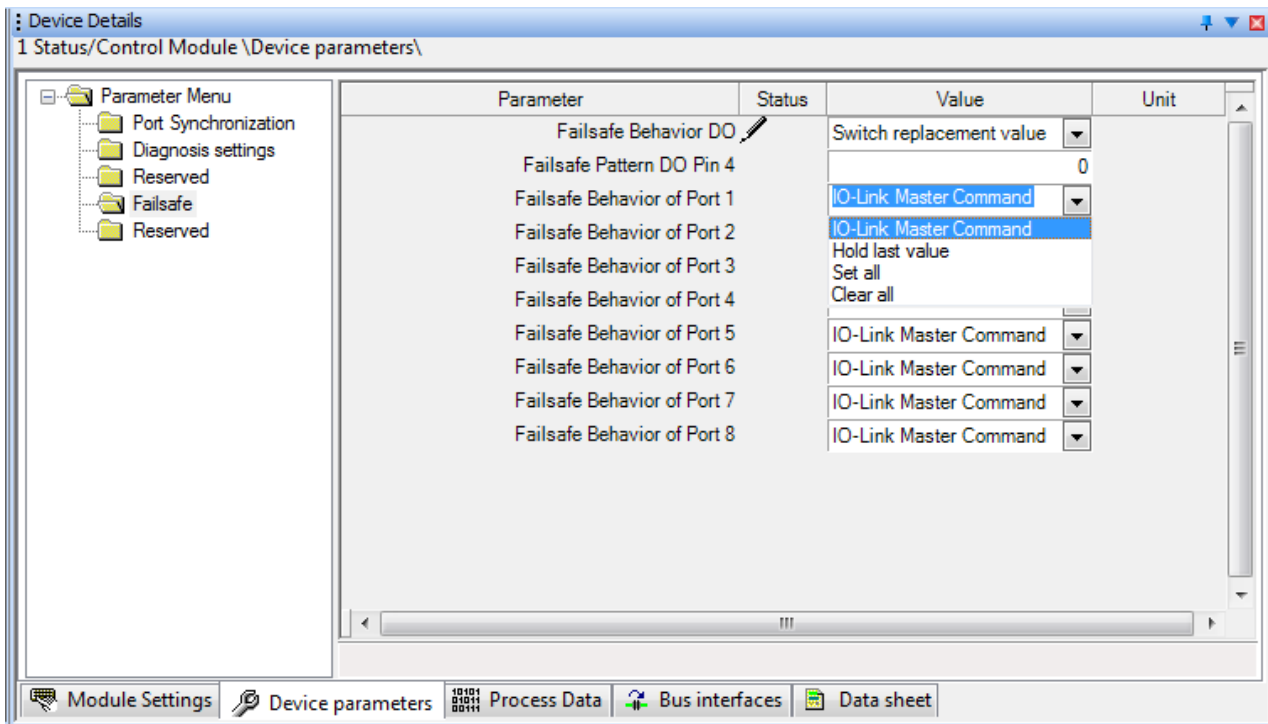


Figure 3-22 Setting failsafe behavior via the “Failsafe Behavior for Port X” parameter



For additional information, refer to the device-specific data sheet.

3.5.3 Assigning PROFINET device names

PROFINET uses names to address the devices.



Make sure that the device name only occurs once in the PROFINET network. Observe the naming conventions listed below when assigning the device name.

Naming conventions for PROFINET device names:

- Limited to 127 characters (letters, numbers, dash, dot).
- A name component within the device name, i.e., a character string between two points, may be a maximum of 63 characters long.
- No special characters such as umlauts, brackets, underscore, slash, space, etc. A dash is the only special character permitted.
- The device name must not start or end with “.” or “.” characters.
- The device name must not start with numbers.
- The device name must not start with the character string “port-xyz-” (x, y, z = 0 ... 9).
- The device name must not take the form n.n.n.n (n = 0 ... 999).

Carry out the following steps to assign the name:

- Click the “Bus configuration” button in the tool bar.

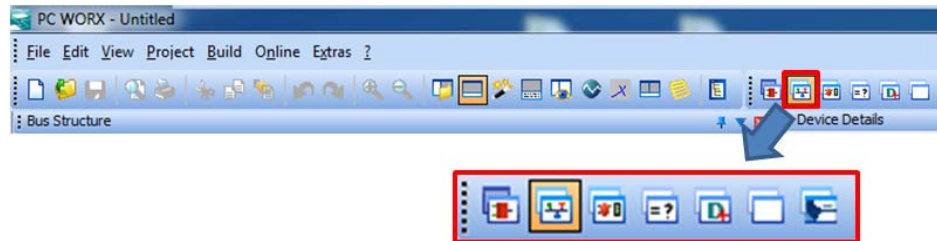


Figure 3-23 Clicking the “Bus configuration” button

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Then select your AXL E PROFINET device in the bus structure.

The screenshot shows the PC WORX software interface. On the left, the 'Bus Structure' window displays a tree view of the system components, including an ILC 370 PN 2TX-IB 192.168.0.2, a Resource, and a PROFINET network. The selected device is 'AXL E PN IOL8 DI4 M12 6P axl-e-pn-ic'. On the right, the 'Device Details' window is open, showing the 'PROFINET Settings' tab. The table below lists the device parameters:

Name	Value
Vendor	Phoenix Contact
VendorID	0x00B0
Designation	AXL E PN IOL8 DI4 M12 6P
DeviceID	0x0104
Functional description	Profinet block terminal
Device type	IO-Link Master
Device family	AXL E
Order number	2701513
Revision	01/120
DNS Name	axl-e-pn-iol-m12-6p
Station Name	
Device Name	
Module Equipment ID	
IP Address	192.168.0.3
Subnetmask	255.255.255.0
Default Gateway	0.0.0.0
Reduction ratio input	8 ms
Reduction ratio output	8 ms
Faulty telegrams until connection is aborted	24
Monitoring Time Inputs (ms)	192
Monitoring Time Outputs (ms)	192
Operation in case of configuration differen...	No
Log connection state	Yes
Drive BF	Yes
Substitute value behavior of inputs	Set to zero
Connection establishment at startup	Yes
Node ID	42

Figure 3-24 PROFINET Settings

- In the right-hand window "Device Details", enter the DNS name, IP address, and standard gateway in the "PROFINET Settings" tab.

Setting Axioline E PROFINET IO-Link device

- Then click on the “PROFINET Stationnames” tab (1).
- Select the device and click on the “Assign Name” (2) and “Assign IP” (3) buttons.

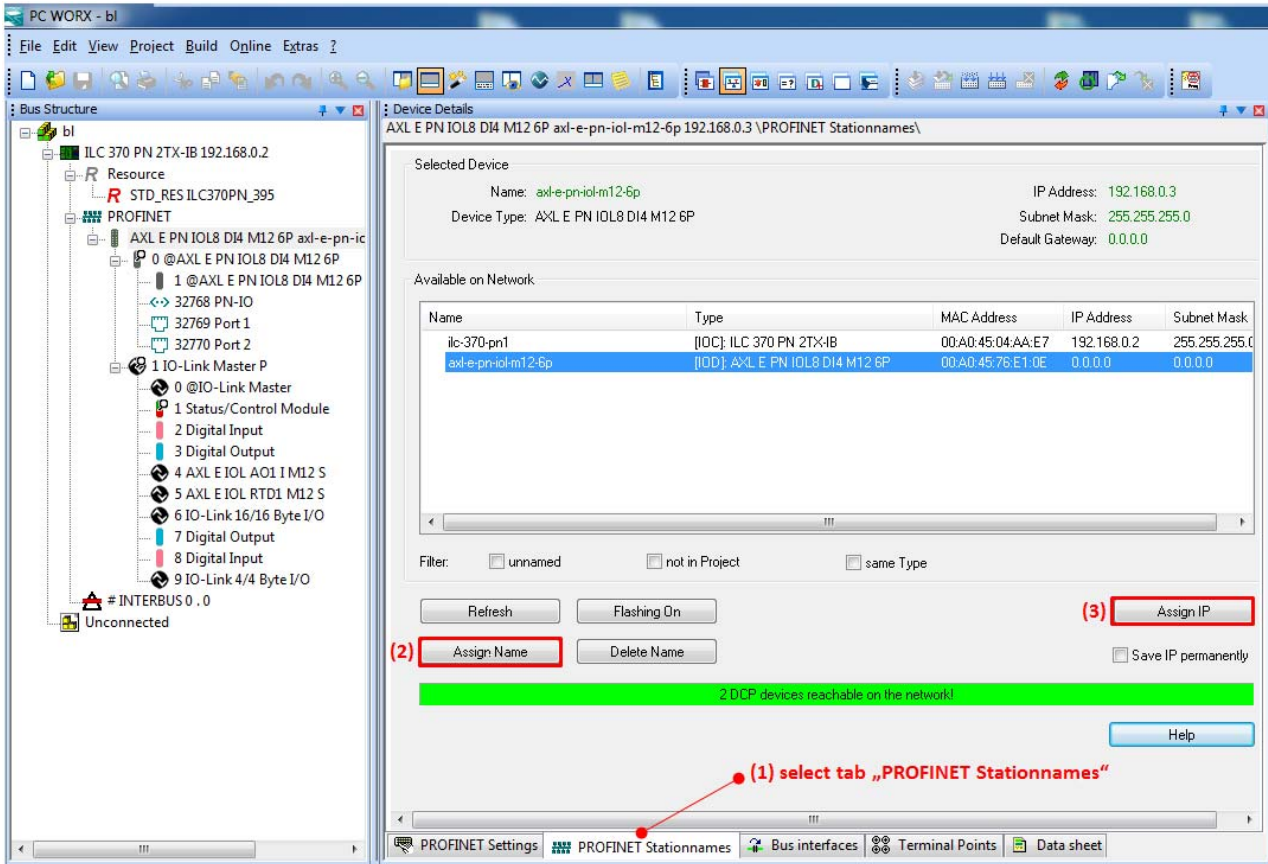


Figure 3-25 Assigning the device name and IP address

3.6 Reading information & maintenance data records with Diag+

The Axioline E PROFINET device supports Identification & Maintenance functions (I&M). I&M data records are online data which is read from the device, i.e. your station must be operational.



For additional information about I&M functions, refer to the device-specific data sheet.

This I&M information is read out in PC Worx via Diag+.

To do so, carry out the following steps:

- Click the “Working area diagnostics” button in the tool bar.

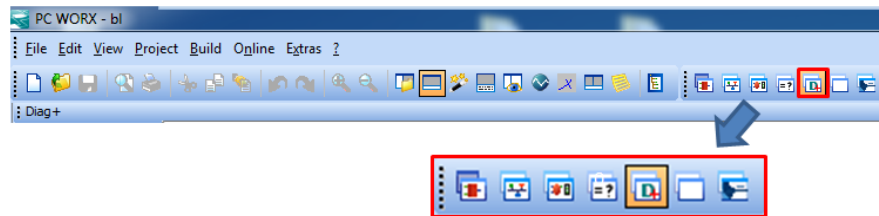


Figure 3-26 Selecting the “Working area diagnostics” button

- Under “Communication Path” select “PC WORX” (1).
- Under “Device Representation”, select “PROFINET IO Devices” (2) next to “Device Type”.
- Then click “Connect” (3).

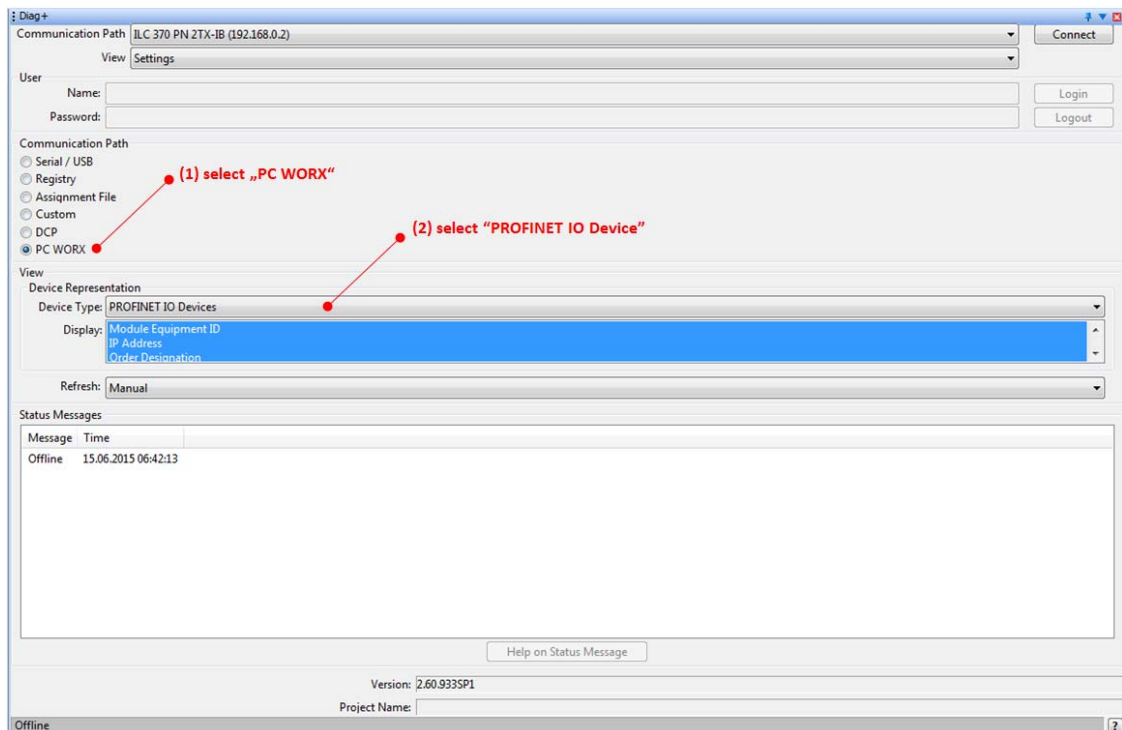


Figure 3-27 Selecting PC Worx and device

Setting Axioline E PROFINET IO-Link device

- In the "View" drop-down menu, select "PROFINET Diagnostic".

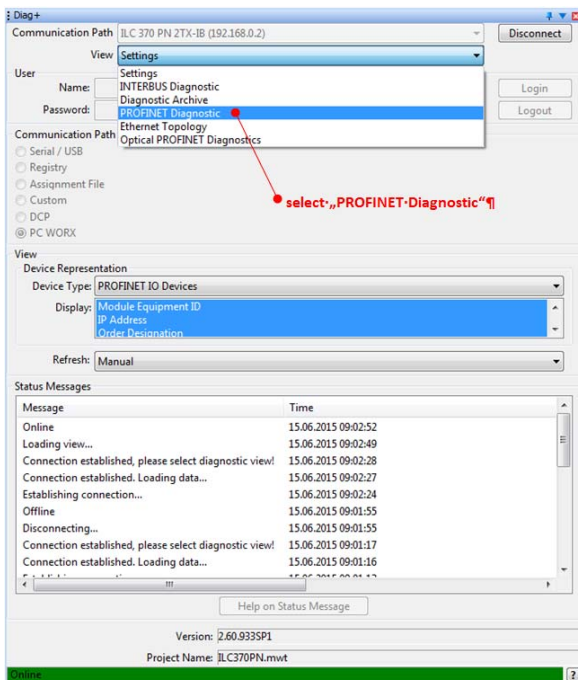


Figure 3-28 Selecting PROFINET Diagnostic

- Then select the connected Axioline E PROFINET device (1).
- Under "PROFINET IO Device" (2) you can see the I&M data of the connected device.

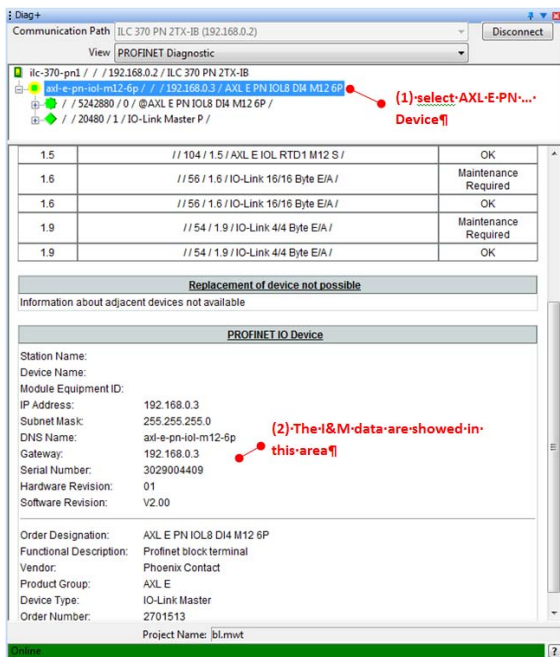


Figure 3-29 I&M data

3.7 Reading diagnostic alarms and IO-Link device events (Diag+)

The Axioline E PROFINET device supports diagnostic alarms. These are saved to the device and the PROFINET controller is informed via incoming and outgoing diagnostics.



For a list of supported alarms and additional information, refer to the device-specific data sheet.

The diagnostic alarms are read out in PC Worx via Diag+.

In order to read out the diagnostic alarms, perform the following steps:

- Click the “Working area diagnostics” button in the tool bar.

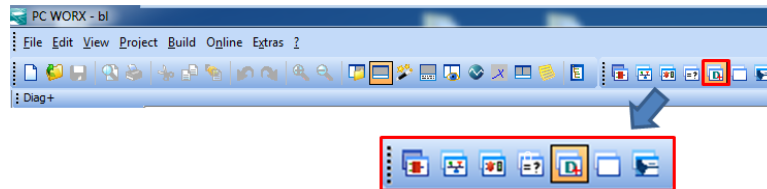


Figure 3-30 Clicking the “Working area diagnostics” button

- Under “Communication Path” select “PC WORX” (1).
- Under “Device Representation”, select “PROFINET IO Devices” (2) next to “Device Type”.
- Then click “Connect” (3).

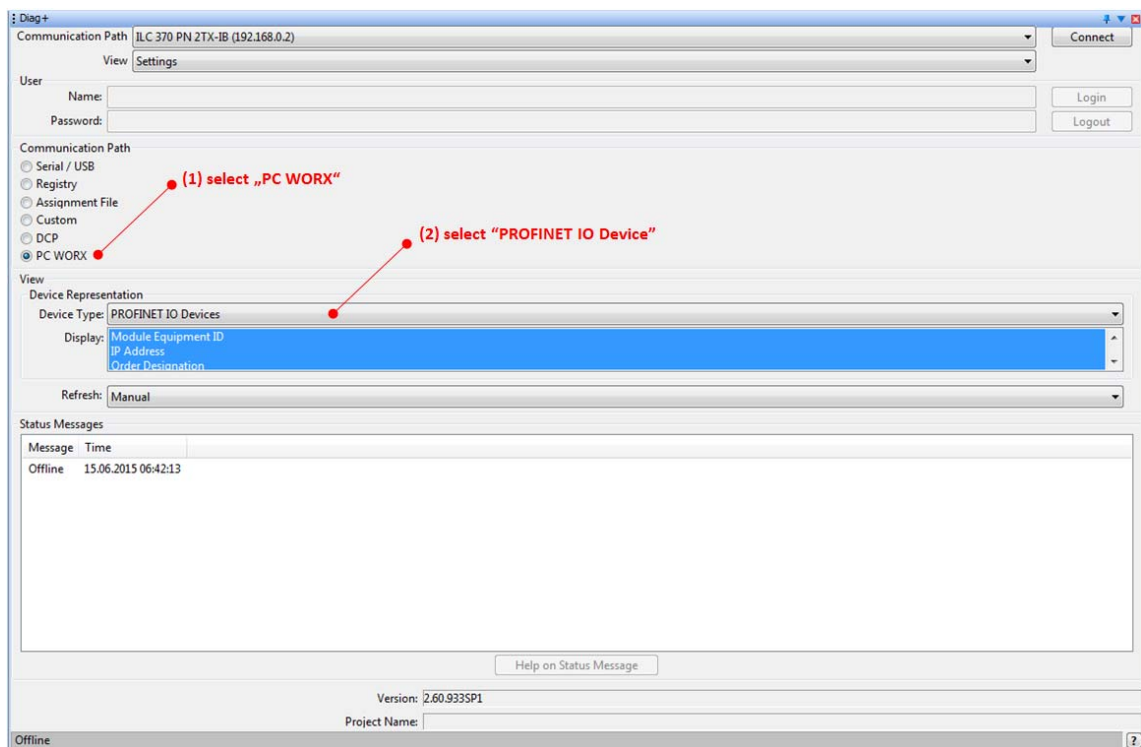


Figure 3-31 Selecting PC Worx and device

Setting Axioline E PROFINET IO-Link device

- In the “View” drop-down menu, select “PROFINET Diagnostic”.

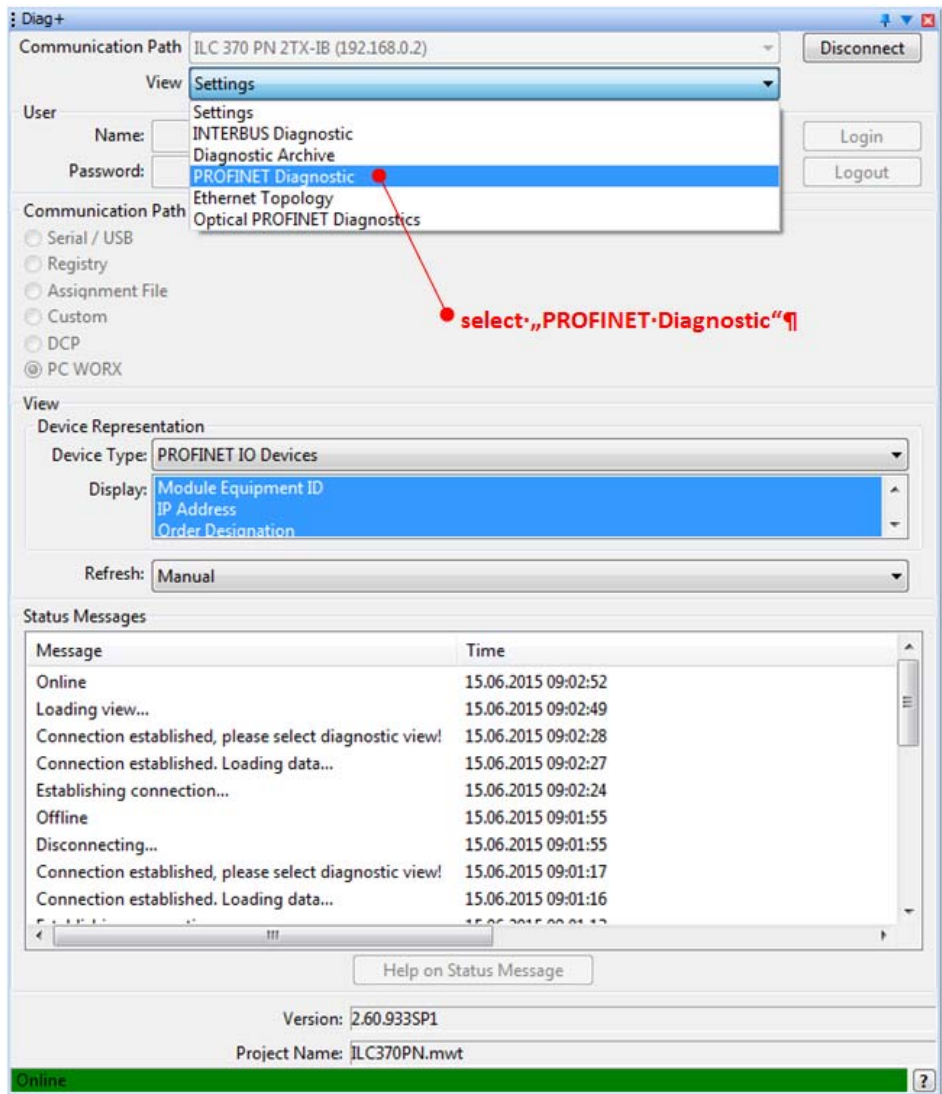


Figure 3-32 Selecting PROFINET Diagnostic

UM QS EN AXL E PN IOL PC WORX

- Then select the connected Axioline E PROFINET device (1).
- Under “PROFINET IO Device” (2) you can see the diagnostics of the connected device.

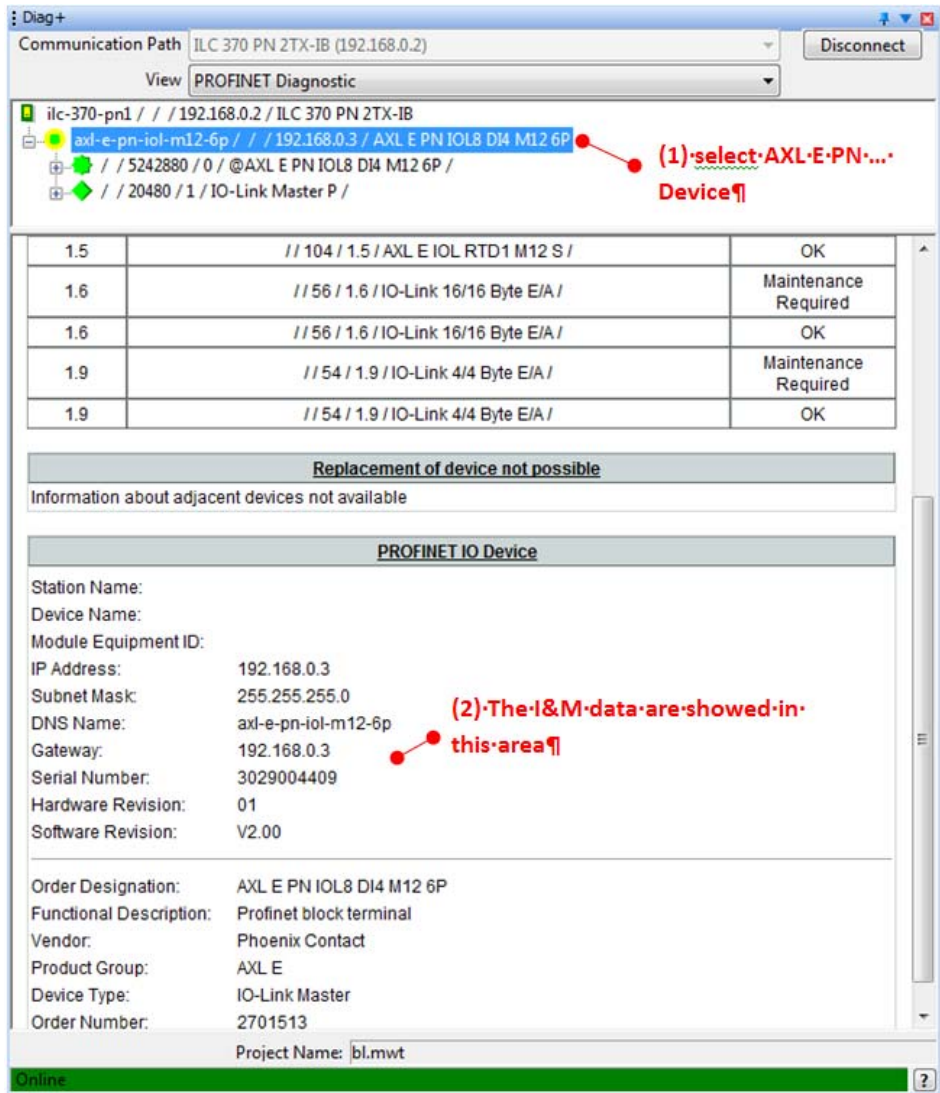


Figure 3-33 Diagnostics indicators

4 Starting up a PC Worx project

4.1 Creating and linking variables

In this section, you will learn how to create variables in PC Worx and link them with real addresses.



In this example, the variables are automatically created. For other methods of creating variables and further information, please refer to the PC Worx documentation.

Carry out the following steps:

- Click the “Process Data Assignment” button in the tool bar.

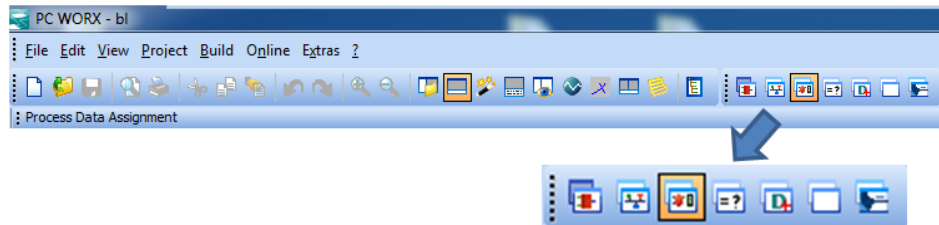


Figure 4-1 Clicking the “Process Data Assignment” button

UM QS EN AXL E PN IOL PC WORX

The new process data view is structured as follows:

- Bus structure (1)
- Process data for the selected device (2)
- The variables stored in the project (3, 4).

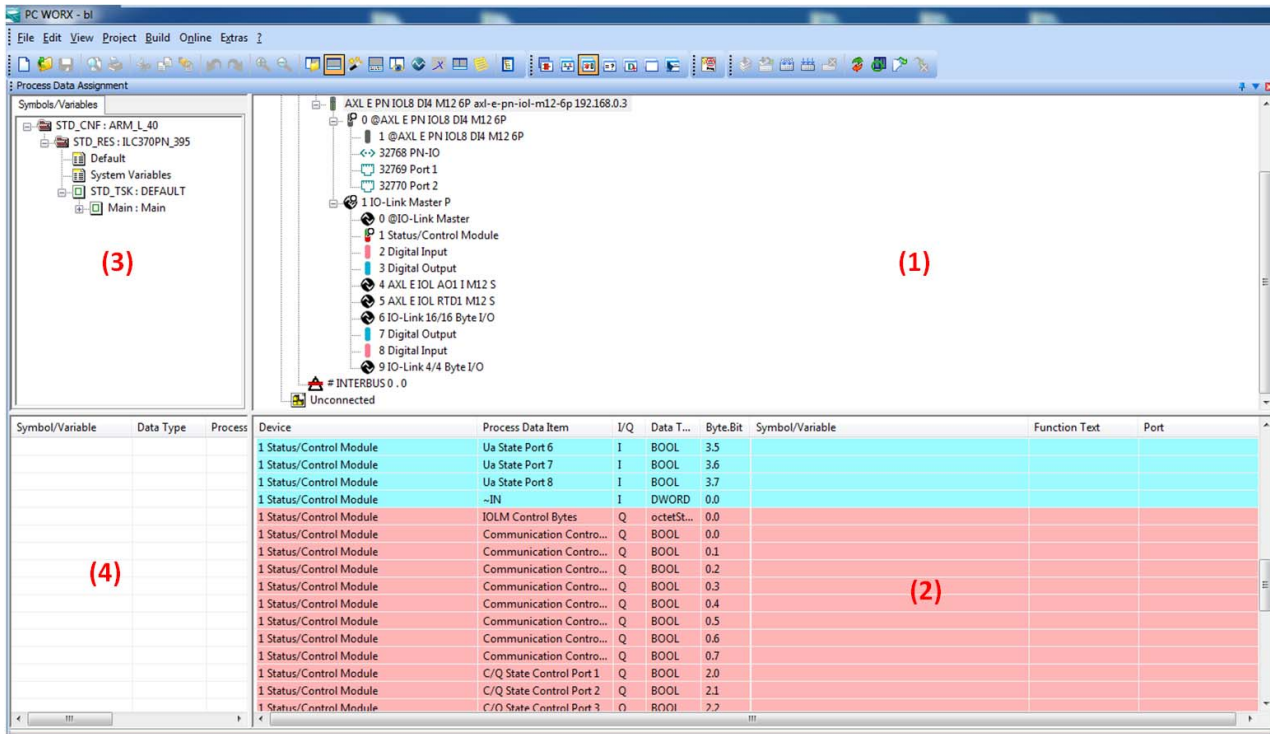


Figure 4-2 Process data view

To create variables automatically, perform the following steps:

- Select the relevant AXL E PN device in (1).
- Then navigate in (3) to "STD_CNF : ARM_L_40 > STD_RES : ILC350PN_395".
- Next, select the required input/output (3) in (2) and move this to the window on the left (4) using drag and drop.
- Do this for all the required variables.

Starting up a PC Worx project

Alternatively, you can right-click on the output in question to open the context menu and create the variable by clicking "Create Variable".

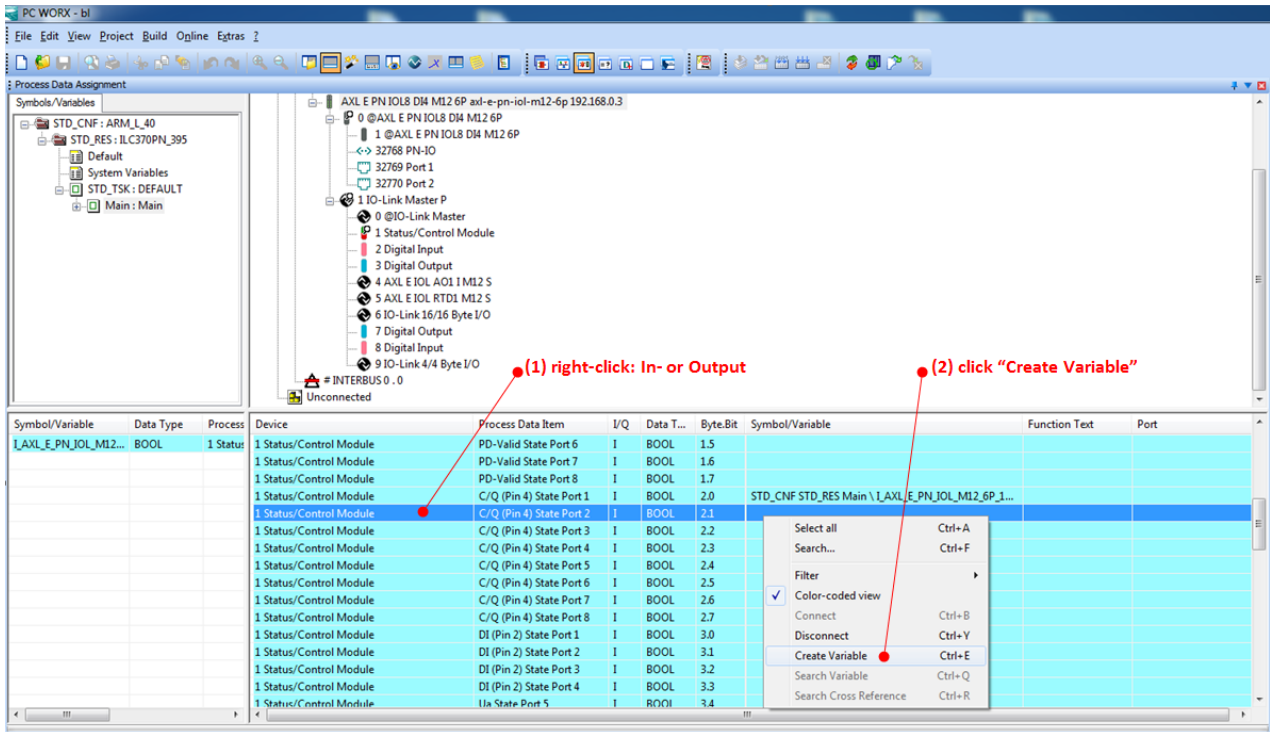


Figure 4-3 Creating a variable by right-clicking

4.2 Compiling and building a project

Each time a new project is created or a change is made, the project must first be compiled and built.

To do so, carry out the following steps:

- Click the “Create new project” button in the tool bar.

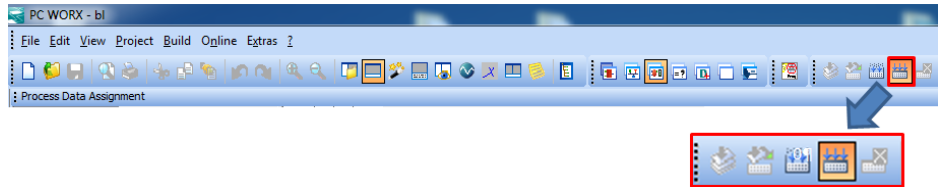


Figure 4-4 Clicking the “Create new project” button



In the event of further program changes within the project, provided the hardware structure has not changed, it is sufficient to click on the neighboring “Make” object to recompile the project.

PC Worx then compiles the entire project and displays the status in the message window at the bottom of the screen in the form of error messages and warnings.

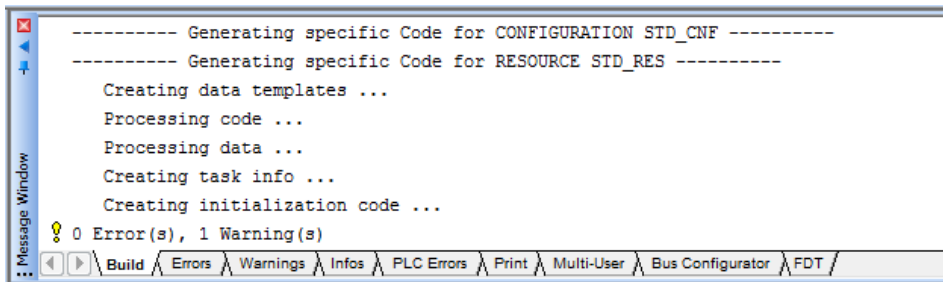


Figure 4-5 Error messages and warnings



Observe the error messages and warnings displayed.

By changing tab you can call up additional information about the individual error messages and warnings.

4.3 Sending and starting a project

If the project could be built without errors, it can be sent to the controller and started.

To do so, carry out the following steps:

- Click on the “Project control dialog” button in the tool bar.

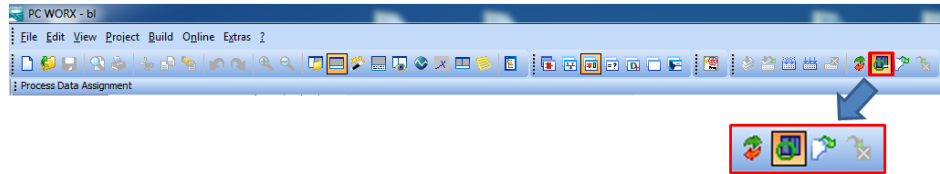


Figure 4-6 Clicking the “Project control dialog” button

A new window then opens which displays the current controller state and options for sending and starting the project as well as additional actions.



Figure 4-7 Sending and starting the project

- Click on the “Download” (1) button to load the current project into the controller's memory.



If the controller is in the “Run” state, a warning appears when you click on the “Download” button to indicate that the controller needs to be stopped before the project can be sent.

- Then start the controller and therefore the application by clicking on the “Cold” (2) button.



If the AXL E PN device cannot be reached and the BF LED lights up, perform a voltage reset.

4.4 Testing the communication

The “Debug and force” function from PC Worx is used to show you how to read inputs or write outputs by means of an example.

4.4.1 Reading digital inputs

On the Axioline E PROFINET IO-Link device, the process data of the hard-wired inputs and also the IO-Link ports in “digital input” operating state is in the “Status/Control Module”. This can be found on process data item “X0N Pin X DI state (C/Q)”.

Device	Process Data Item	I/Q	Data T...	Byte.Bit	Symbol/Variable	Function Text	Port
1 Status/Control Module	PD-Valid State Port 6	1	BOOL	1.5			
1 Status/Control Module	PD-Valid State Port 7	1	BOOL	1.6			
1 Status/Control Module	PD-Valid State Port 8	1	BOOL	1.7			
1 Status/Control Module	C/Q (Pin 4) State Port 1	1	BOOL	2.0	STD_CNF STD_RES Main \1_AXL_E_PN_IOL_M12_6P_1...		
1 Status/Control Module	C/Q (Pin 4) State Port 2	1	BOOL	2.1			
1 Status/Control Module	C/Q (Pin 4) State Port 3	1	BOOL	2.2			
1 Status/Control Module	C/Q (Pin 4) State Port 4	1	BOOL	2.3			
1 Status/Control Module	C/Q (Pin 4) State Port 5	1	BOOL	2.4			
1 Status/Control Module	C/Q (Pin 4) State Port 6	1	BOOL	2.5			
1 Status/Control Module	C/Q (Pin 4) State Port 7	1	BOOL	2.6			
1 Status/Control Module	C/Q (Pin 4) State Port 8	1	BOOL	2.7			
1 Status/Control Module	DI (Pin 2) State Port 1	1	BOOL	3.0			
1 Status/Control Module	DI (Pin 2) State Port 2	1	BOOL	3.1			
1 Status/Control Module	DI (Pin 2) State Port 3	1	BOOL	3.2			
1 Status/Control Module	DI (Pin 2) State Port 4	1	BOOL	3.3			
1 Status/Control Module	DI State Port 5	1	BOOL	3.4			

Figure 4-8 Process data

Carry out the following steps:

- Click the “Process Data Assignment” button in the tool bar.

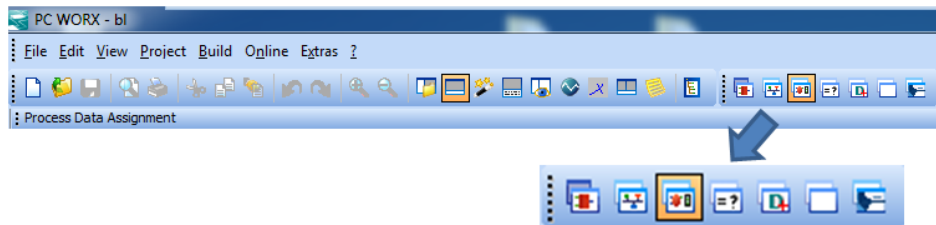


Figure 4-9 Clicking the “Process Data Assignment” button

The inputs now need to be linked with variables or automatically created.

- To do so, perform the steps described in section “Creating and linking variables” on page 39.

Starting up a PC Worx project

In this example, the variables for ports 1 and 7, which are configured as “digital inputs” and the hard-wired input on port 2, have been automatically created.

Device	Process Data Item	I/Q	Data T...	Byte.Bit	Symbol/Variable
1 Status/Control Module	PD-Valid State Port 5	I	BOOL	1.4	
1 Status/Control Module	PD-Valid State Port 6	I	BOOL	1.5	
1 Status/Control Module	PD-Valid State Port 7	I	BOOL	1.6	
1 Status/Control Module	PD-Valid State Port 8	I	BOOL	1.7	
1 Status/Control Module	C/Q (Pin 4) State Port 1	I	BOOL	2.0	STD_CNF STD_RES Main \ I_AXL_E_PN_IOL_M12_6P_1...
1 Status/Control Module	C/Q (Pin 4) State Port 2	I	BOOL	2.1	
1 Status/Control Module	C/Q (Pin 4) State Port 3	I	BOOL	2.2	
1 Status/Control Module	C/Q (Pin 4) State Port 4	I	BOOL	2.3	
1 Status/Control Module	C/Q (Pin 4) State Port 5	I	BOOL	2.4	
1 Status/Control Module	C/Q (Pin 4) State Port 6	I	BOOL	2.5	
1 Status/Control Module	C/Q (Pin 4) State Port 7	I	BOOL	2.6	
1 Status/Control Module	C/Q (Pin 4) State Port 8	I	BOOL	2.7	
1 Status/Control Module	DI (Pin 2) State Port 1	I	BOOL	3.0	
1 Status/Control Module	DI (Pin 2) State Port 2	I	BOOL	3.1	STD_CNF STD_RES Main \ I_AXL_E_PN_IOL_M12_6P_1...
1 Status/Control Module	DI (Pin 2) State Port 3	I	BOOL	3.2	
1 Status/Control Module	DI (Pin 2) State Port 4	I	BOOL	3.3	
1 Status/Control Module	DI (Pin 2) State Port 5	I	BOOL	3.4	

Figure 4-10 Variables

- Compile the project by clicking the “Create new project” button in the tool bar.

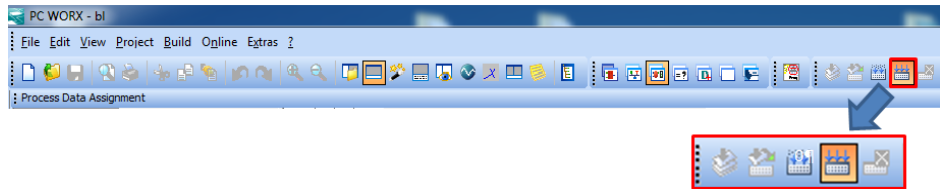


Figure 4-11 Clicking the “Create new project” button

- Then switch to the “IEC programming” area.

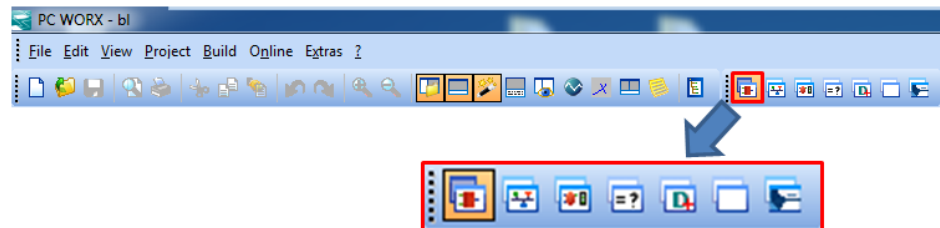


Figure 4-12 Clicking the “IEC programming” button

UM QS EN AXL E PN IOL PC WORX

Navigate to the variable list for Main via “Physical Hardware > STD_CNF : ARM_L_40 > STD_RES : ILC350PN_395 > Global_Variables”

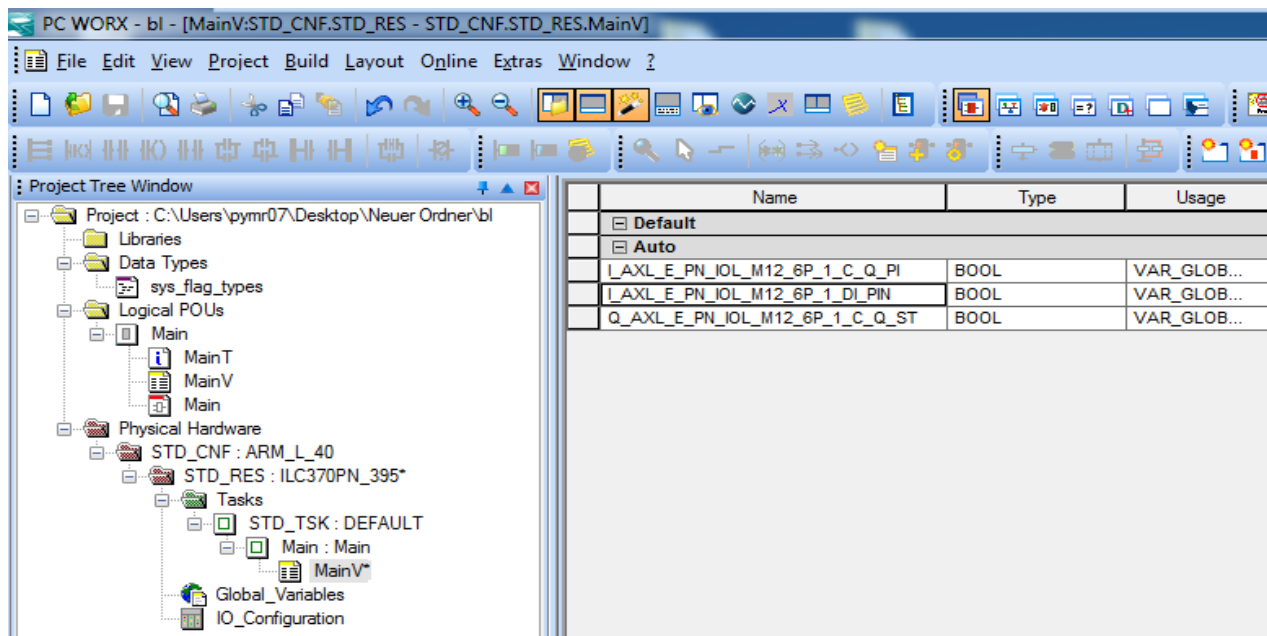


Figure 4-13 Variable list



The path may differ depending on your controller.

- Click on the “Project control dialog” button in the tool bar.

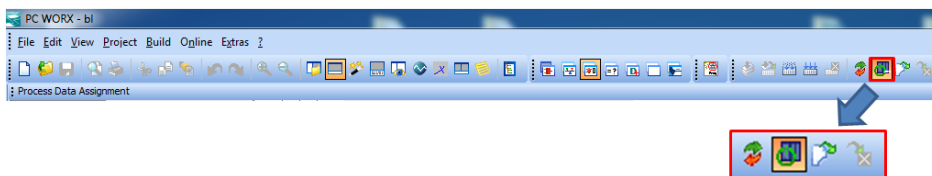


Figure 4-14 Clicking the “Project control dialog” button

Starting up a PC Worx project

- Send the project to the controller (1) and start it by clicking “Cold” (2)



Figure 4-15 Sending and starting the project

- Activate debug mode by clicking “Debug on/off” in the tool bar.



Figure 4-16 Clicking “Debug mode”

This provides you with an overview of the current values.

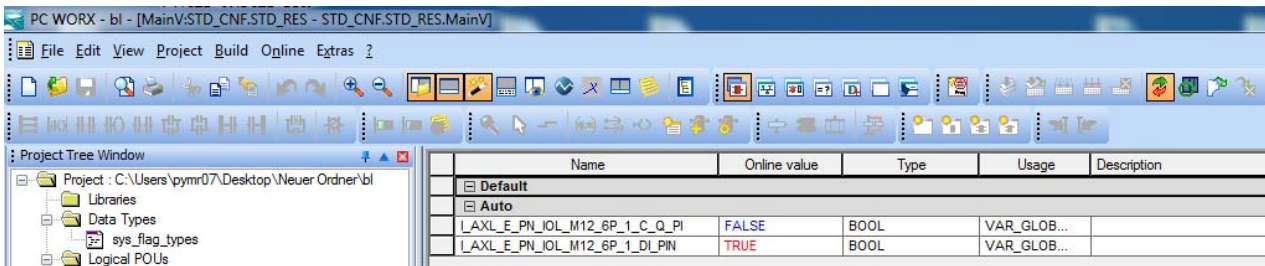


Figure 4-17 Variable values



In this example, the hard-wired input 2 is set, as indicated by the activated variable.

4.4.2 Writing digital outputs

On the Axioline E PROFINET IO-Link device, the process data of the IO-Link ports in “digital output” operating state is in the “Status/Control Module”. This can be found on process data item “X0N Pin 4 DO state (C/Q)”.

Device	Process Data Item	I/Q	Data T...	Byte.Bit	Symbol/Variable
1 Status/Control Module	C/Q State Control Port 1	Q	BOOL	2.0	STD_CNF STD_RES Main \ Q_AXL_E_PN_IO...
1 Status/Control Module	C/Q State Control Port 2	Q	BOOL	2.1	STD_CNF STD_RES Main \ Q_AXL_E_PN_IO...
1 Status/Control Module	C/Q State Control Port 3	Q	BOOL	2.2	STD_CNF STD_RES Main \ Q_AXL_E_PN_IO...
1 Status/Control Module	C/Q State Control Port 4	Q	BOOL	2.3	STD_CNF STD_RES Main \ Q_AXL_E_PN_IO...
1 Status/Control Module	C/Q State Control Port 5	Q	BOOL	2.4	STD_CNF STD_RES Main \ Q_AXL_E_PN_IO...
1 Status/Control Module	C/Q State Control Port 6	Q	BOOL	2.5	STD_CNF STD_RES Main \ Q_AXL_E_PN_IO...
1 Status/Control Module	C/Q State Control Port 7	Q	BOOL	2.6	STD_CNF STD_RES Main \ Q_AXL_E_PN_IO...
1 Status/Control Module	C/Q State Control Port 8	Q	BOOL	2.7	STD_CNF STD_RES Main \ Q_AXL_E_PN_IO...
1 Status/Control Module	~OUT	Q	DWORD	0.0	

Figure 4-18 Process data

- Carry out the following steps to write process data or outputs:
- Click the “Process Data Assignment” button in the tool bar.

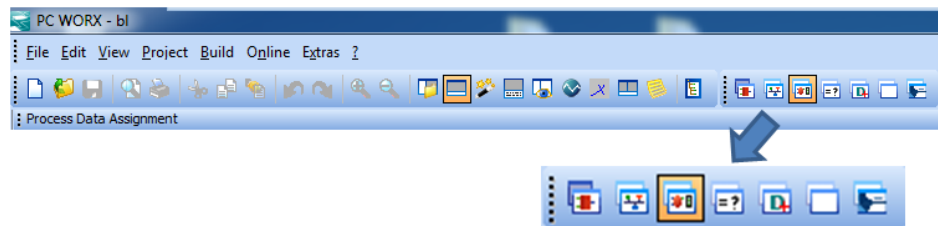


Figure 4-19 Clicking the “Process Data Assignment” button

The outputs now need to be linked with variables or automatically created.

- To do so, perform the steps described in section “Creating and linking variables” on page 39.

In this example, variables for ports 2 and 6, which are configured as “digital outputs”, have been automatically created.

Device	Process Data Item	I/Q	Data T...	Byte.Bit	Symbol/Variable
1 Status/Control Module	C/Q State Control Port 1	Q	BOOL	2.0	
1 Status/Control Module	C/Q State Control Port 2	Q	BOOL	2.1	STD_CNF STD_RES Main \ Q_AXL_E_PN_IO...
1 Status/Control Module	C/Q State Control Port 3	Q	BOOL	2.2	
1 Status/Control Module	C/Q State Control Port 4	Q	BOOL	2.3	
1 Status/Control Module	C/Q State Control Port 5	Q	BOOL	2.4	
1 Status/Control Module	C/Q State Control Port 6	Q	BOOL	2.5	STD_CNF STD_RES Main \ Q_AXL_E_PN_IO...
1 Status/Control Module	C/Q State Control Port 7	Q	BOOL	2.6	
1 Status/Control Module	C/Q State Control Port 8	Q	BOOL	2.7	
1 Status/Control Module	~OUT	Q	DWORD	0.0	

Figure 4-20 Variables

Starting up a PC Worx project

- Compile the project by clicking the “Create new project” button in the tool bar.

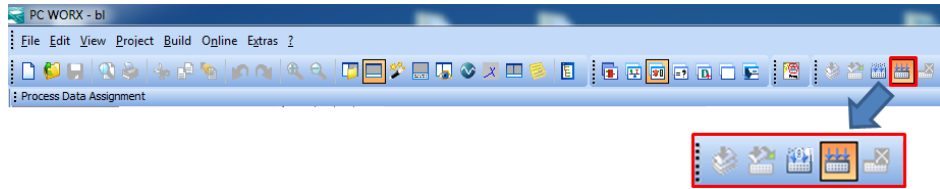


Figure 4-21 Clicking the “Create new project” button

- Then switch to the “IEC programming” area.

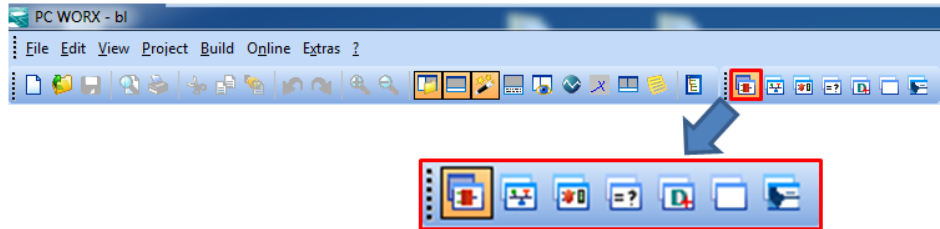


Figure 4-22 Clicking the “IEC programming” button

UM QS EN AXL E PN IOL PC WORX

Navigate to the variable list for Main via “Physical Hardware > STD_CNF : ARM_L_40 > STD_RES : ILC350PN_395 > Global_Variables”

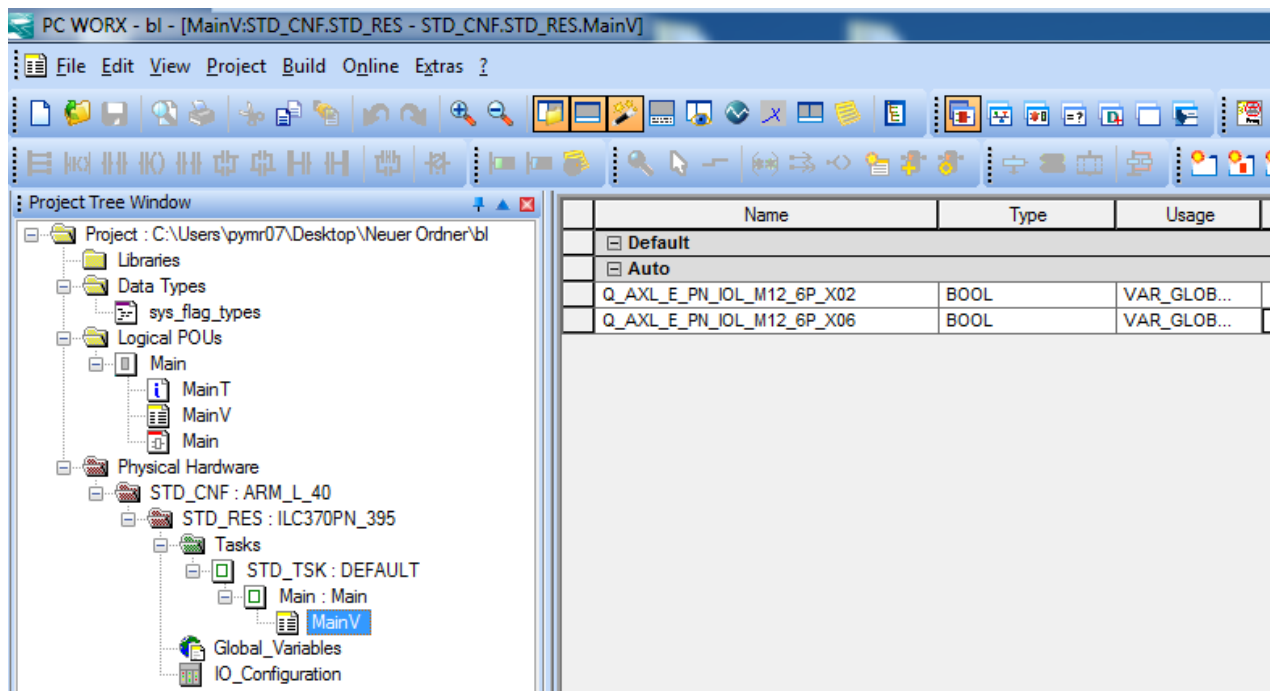


Figure 4-23 Variable list



The path may differ depending on your controller.

- Click on the “Project control dialog” button in the tool bar.

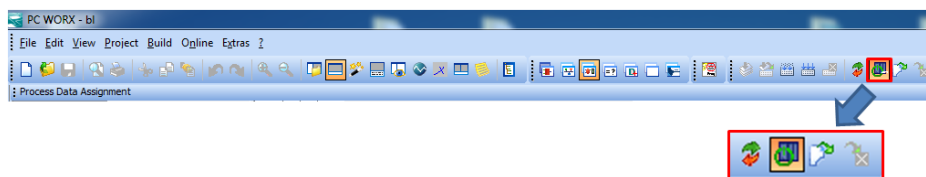


Figure 4-24 Clicking the “Project control dialog” button

Starting up a PC Worx project

- Send the project to the controller (1) and start it by clicking “Cold” (2)



Figure 4-25 Sending and starting the project

- Activate debug mode by clicking “Debug on/off” in the tool bar.

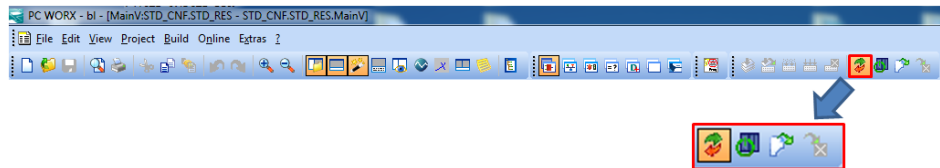


Figure 4-26 Debug mode

This provides you with an overview of the current values.

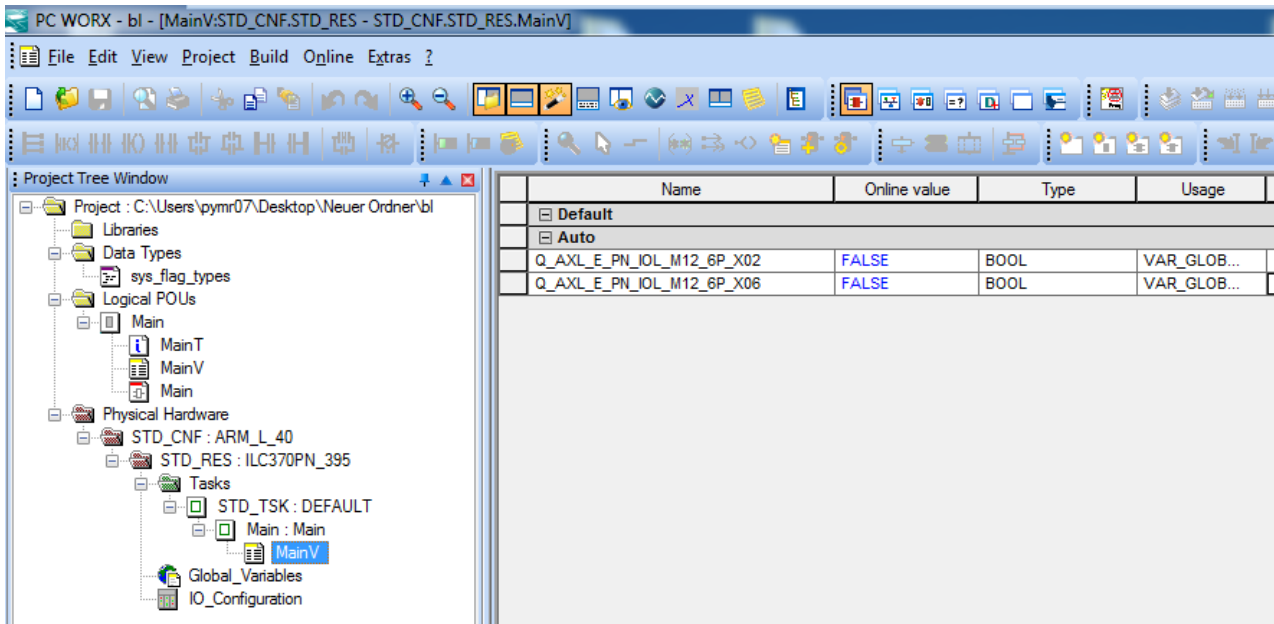


Figure 4-27 Variable values

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- To set or “force” outputs, right-click (1) on the relevant output variable.
- Select the “Debug dialog ...” (2) option.

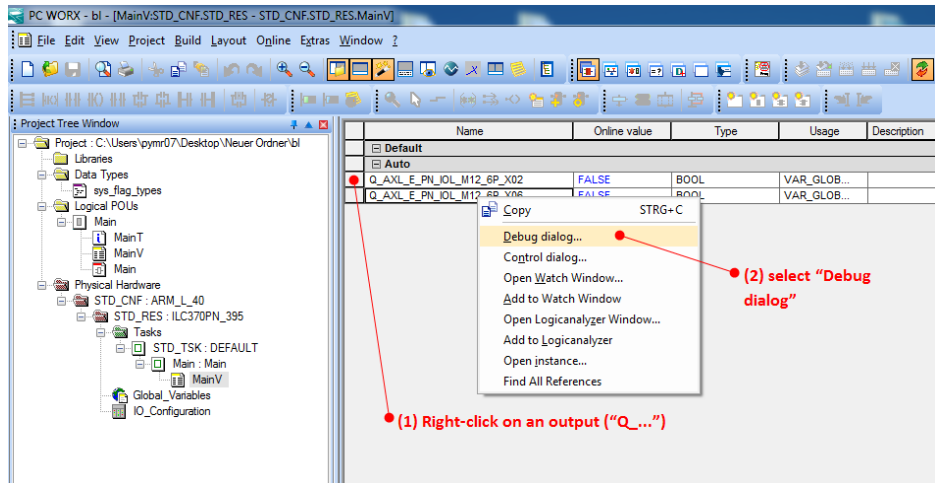


Figure 4-28 Selecting the “Debug dialog”

- In the window that opens, set the state of the output to “TRUE” or “FALSE” (1) in the “Value” field.
- Then set the output via the “Force” button (2). The window closes automatically.

The forced value appears in your variable list in the “Online value” column with a red background color.

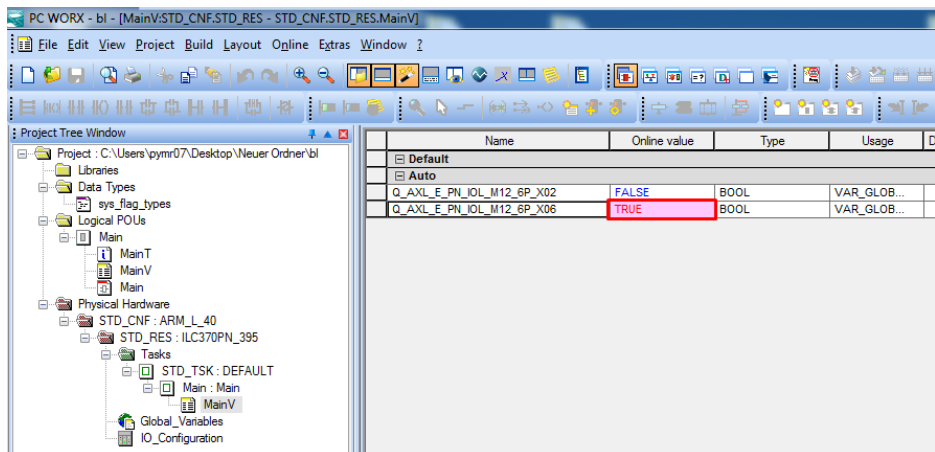


Figure 4-29 Variable list



Once all the required I/Os have been tested, reset the forced outputs by clicking the “Reset Force List” button in the “Debug dialog” window.

4.4.3 Reading/writing IO-Link process data

You can also use the debug or force function for test purposes to read the process data of the connected IO-Link devices or to transmit data.

The process data is mapped according to the IO-Link master configuration. Unique assignment is possible using the device name and the slot number

In this example, the following IO-Link master configuration is used, the corresponding process data for the individual slots can be seen in the following illustration on the right.

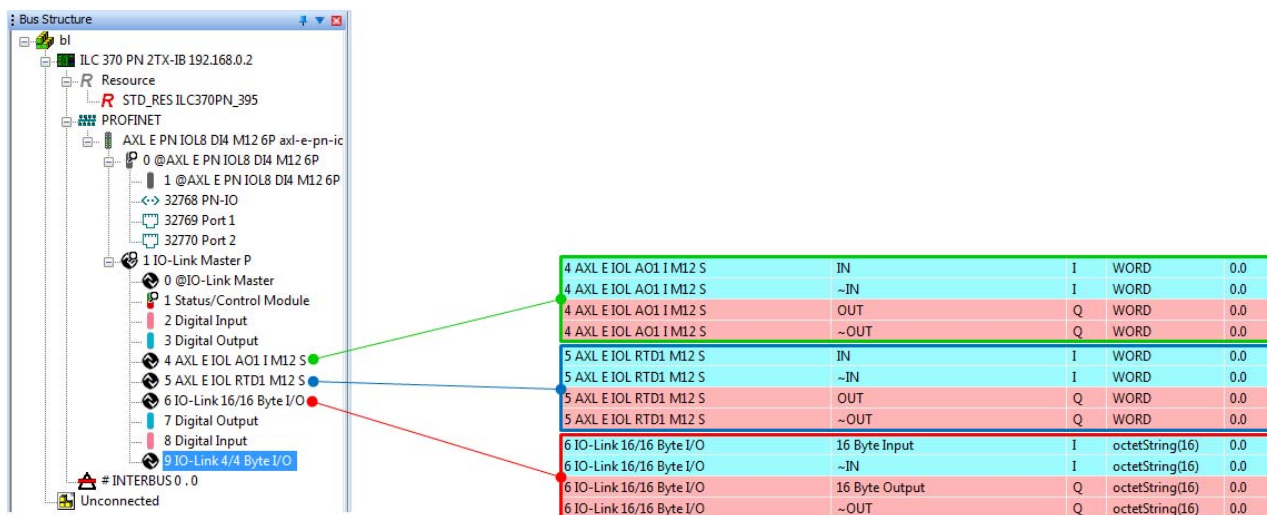


Figure 4-30 Process data for the individual slots

The necessary steps for reading and writing IO-Link process data for test purposes can be found in section "Reading digital inputs" on page 44 and "Writing digital outputs" on page 48.

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5 Using the PC Worx IOL_COM function block

5.1 Basics

The Axioline E PROFINET IO-Link device supports the Phoenix Contact PC Worx IOL_COM function block.

The function block helps to make it possible to write data to an IO-Link device or read data from an IO-Link device. To do so, the IO-Link protocol uses ISDU objects (Index Service Data Unit). These have an index and a sub index. For a description of the ISDU objects supported by a device, please refer to the specific data sheet of the IO-Link device.



The IOL_COM function block is only required if your IO-Link device has ISDU objects and you want to read or write these or read diagnostics information. Otherwise, the process data communication is sufficient.



The IOL_COM function block must be downloaded separately from the Phoenix Contact homepage and imported into PC Worx.

- Navigate to "Home > Service and Support > Downloads > Function blocks > Free function blocks for PC Worx".
- Download the "Function modules" function block library. This library contains the IOL_COM function block.



The "AsynCom_PN_V1_XX_X" function module must also be inserted into the project to enable asynchronous communication with PROFINET devices. This is supplied with the setup.

5.2 Prerequisites

You should have an executable project and observe the following points:

- The FDCML file of the Axioline E PROFINET IO-Link devices is installed in PC Worx.



Normally, this is automatically installed with PC Worx. If this is not the case, then you must have an old version of PC Worx. In this case, cannot guarantee that this will work with the Axioline E device and the block. Please contact support.

- A connection can be established with the controller and the IO-Link device.
- The IOL_COM function block has been imported into PC Worx.

5.3 Installing the function block



It is assumed that you have already downloaded the block or the EXE file (in this case: pc_worx_6_x_functionmodules_1_13.exe) and saved it on your PC.

- Start the installation by double-clicking the EXE file and then follow the installation instructions.

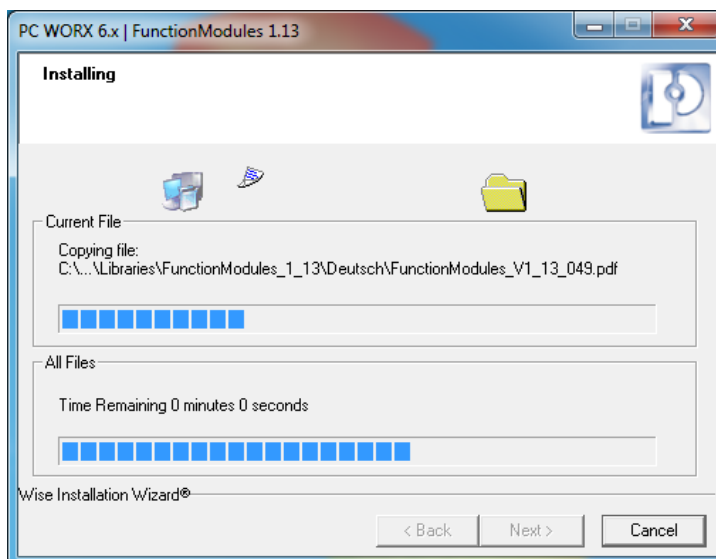


Figure 5-1 Starting the installation

- Complete the installation by clicking “Finish”.

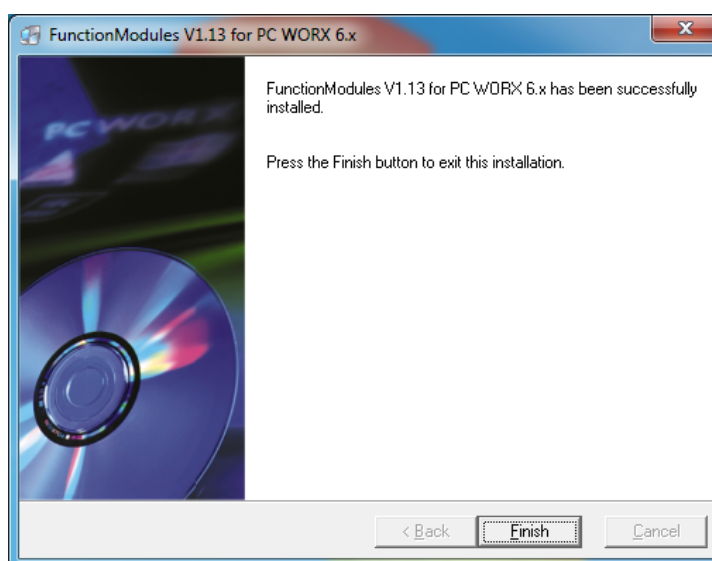


Figure 5-2 Completing installation

5.4 Porting the function block to the PC Worx version in use



It is assumed that you have already installed the block (pc_worx_6_x_functionmodules_1_13.exe).

Before you can use the function block in PC Worx, this must be ported to the version you are using, as the function block may have been created in an older version of PC Worx. To do so, carry out the following steps:

- Select “File > Open Project / Unzip Project” (or ctrl + O).

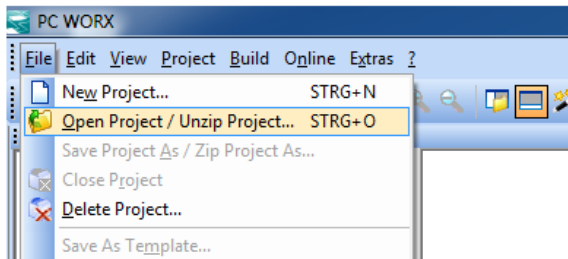


Figure 5-3 Opening a project

- Then navigate to the folder in which the function block was installed. This is normally “C:\PC WORX 6.x\Libraries\FunctionModules_1_13”.
- Select the “FunctionModules_V1_13.mwt” file.
- Click “Open”.

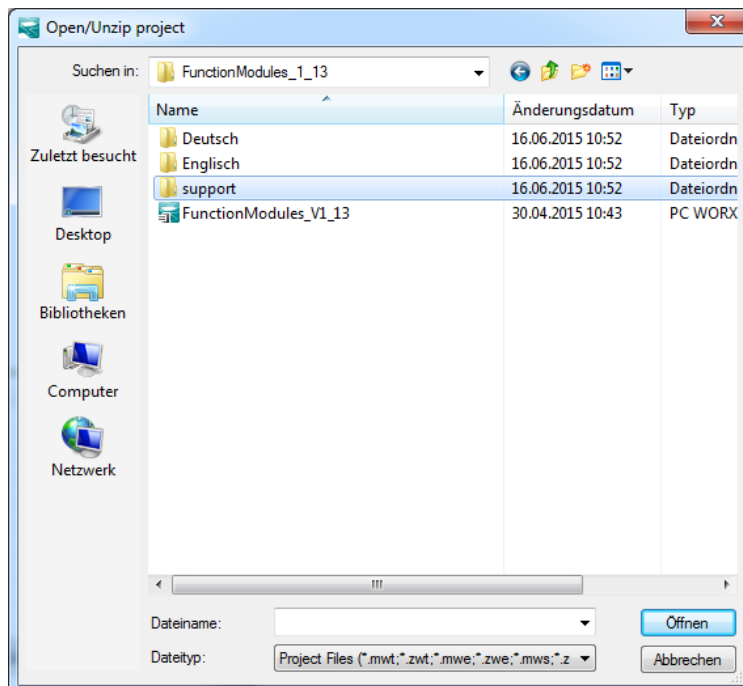


Figure 5-4 Selecting the “FunctionModules_V1_13.mwt” file

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- Answer the following warnings with “Yes”.

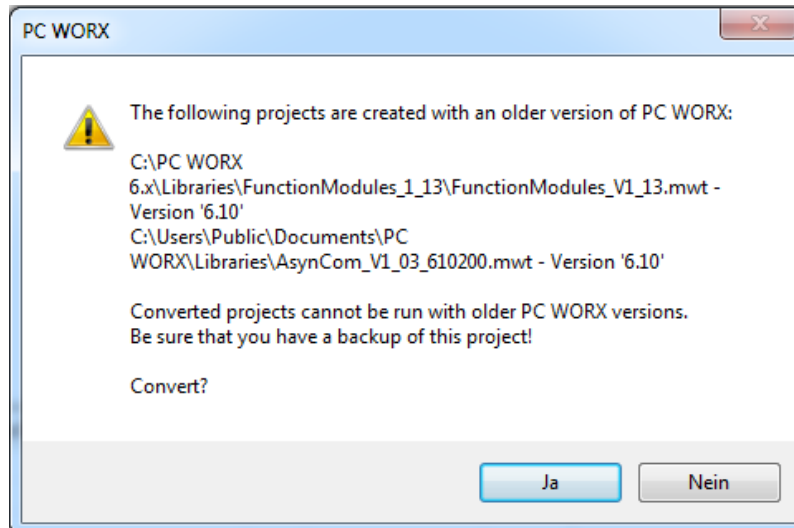


Figure 5-5 Converting a project

The function block is now loaded as an independent project.

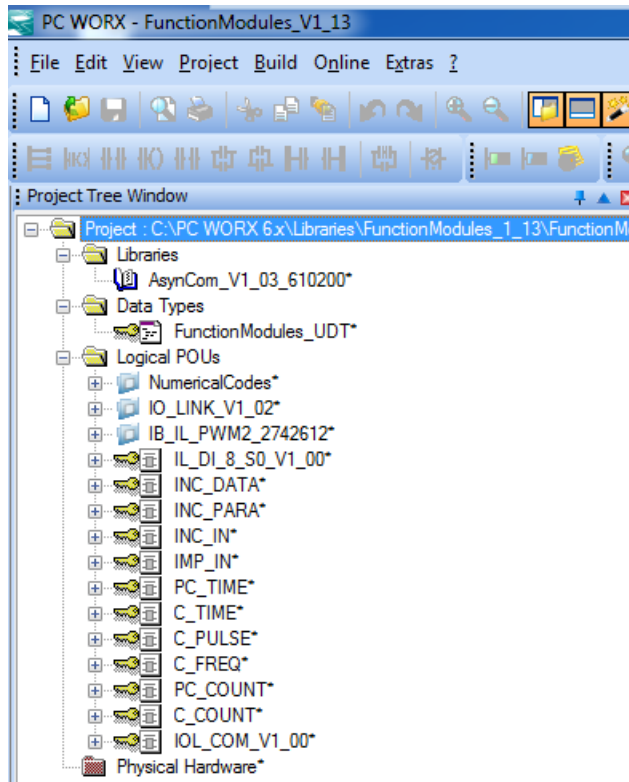


Figure 5-6 Function block as an independent project

Using the PC Worx IOL_COM function block

- Finally, recompile the project by clicking the “Create new project” button in the tool bar.

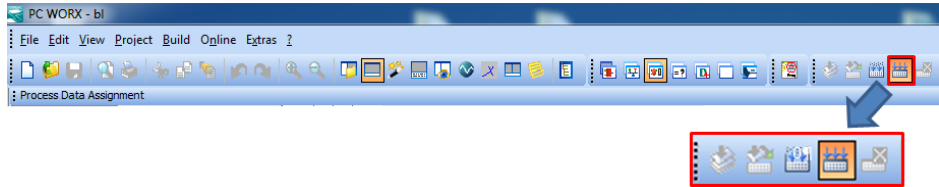


Figure 5-7 Clicking the “Create new project” button

The function block has now been ported to the version of PC Worx in use.

5.5 Inserting a function block into your project

Once you have carried out the steps in the previous section, the function block has been ported for the version of PC Worx that you are using and can be used.

To use the function block in your actual project, the following steps must be carried out.

- In the menu bar, select “Project > Add Library > User Library ...”.

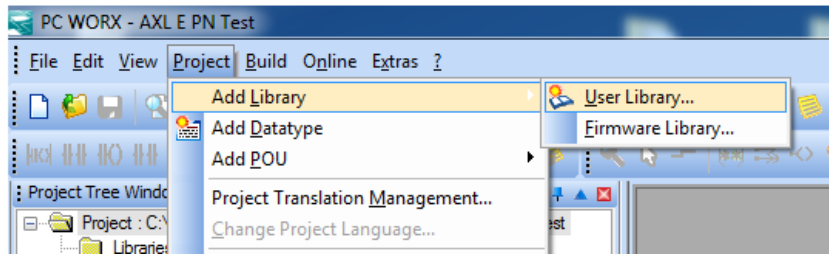


Figure 5-8 Selecting the user library

- Then navigate to the folder in which the function block was installed. This is normally “C:\PC WORX 6.x\Libraries\FunctionModules_1_13”.
- Select the “FunctionModules_V1_13.mwt” file.
- Click “Include”.

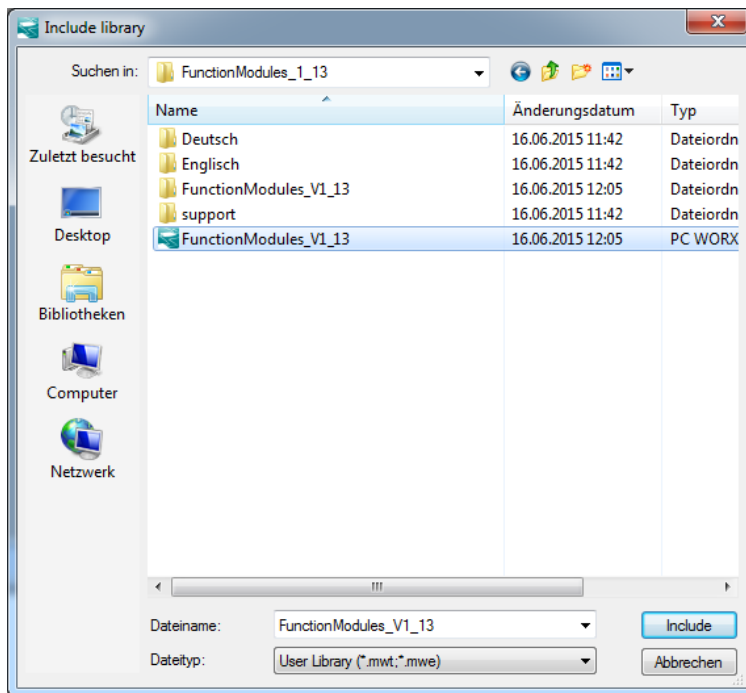


Figure 5-9 Selecting the “FunctionModules_V1_13.mwt” file

Using the PC Worx IOL_COM function block

This loads the function block library into your project and it appears in the project tree under “Libraries”.

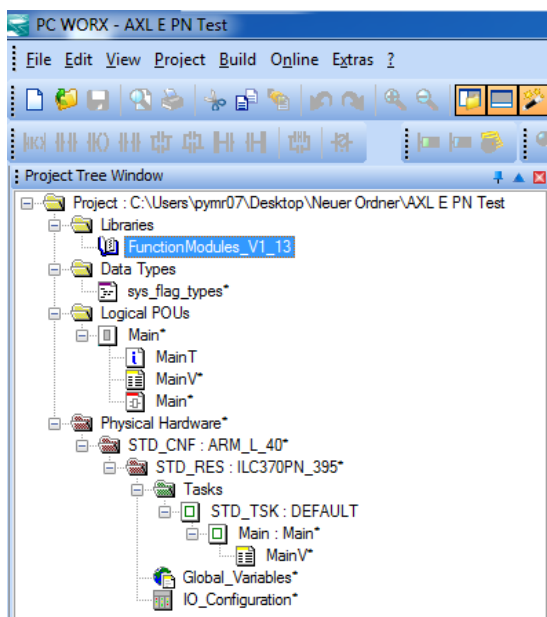


Figure 5-10 Function block in the project tree

The IOL_COM function block can be found in the Edit Wizard under the name “IOL_COM_V1_XX”.

- Add the function block to your main program via drag and drop.

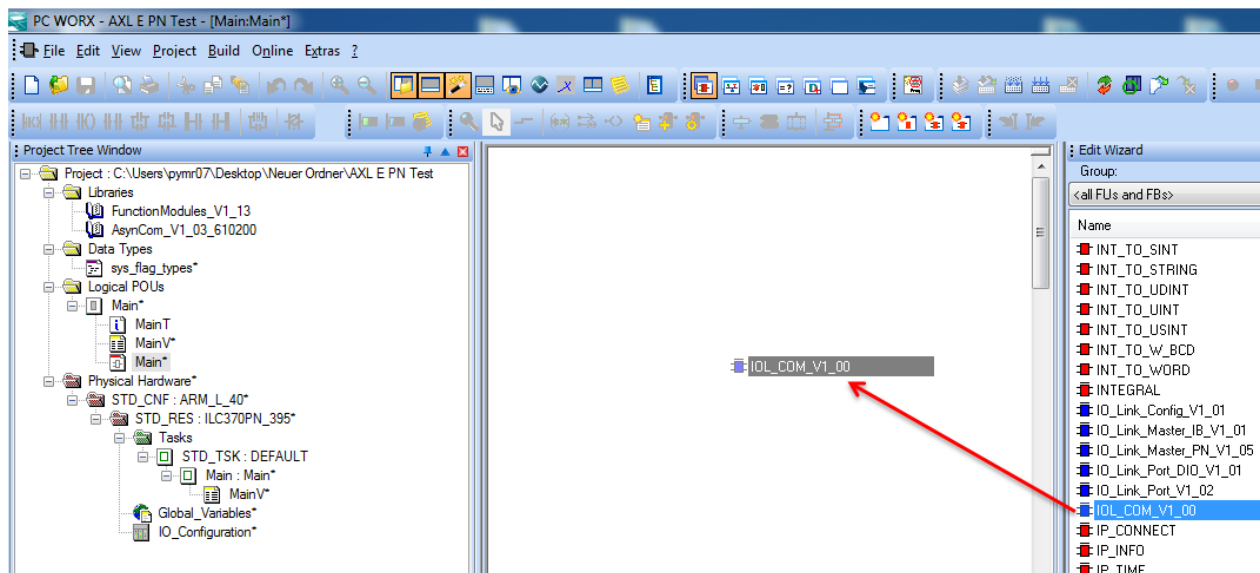


Figure 5-11 Inserting the function block

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- You must also insert the “AsynCom_PN_V1_XX_X” function block into the project to enable asynchronous communication with PROFINET devices.

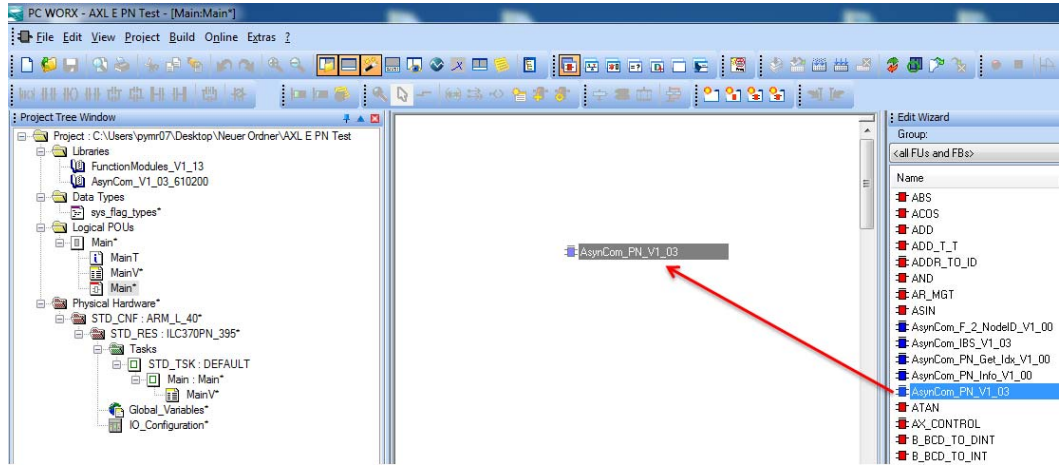


Figure 5-12 Inserting function block “AsynCom_PN_V1_XX”

- Then add the corresponding variable for each input/output. You can do this by right-clicking on the input/output and selecting the “Variable...” entry.

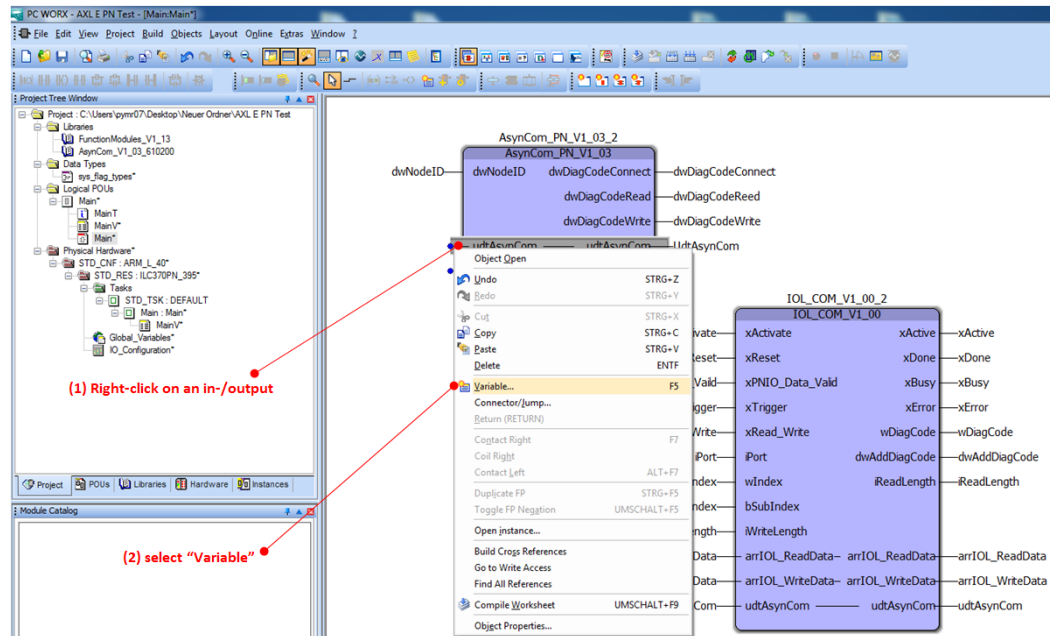




Figure 5-13 Inserting variables



The udtAsynCom structure of the function block must be connected to the IOL_COM system block. If multiple AsynCom_PN blocks are used in the same PROFINET environment, it must be ensured that the same variable is used for all these AsynCom_PN blocks.

5.6 IOL_COM parameter description

The function block is structured as follows.

Function block	Variable	Description
	xActivate	"True: block activation "False: block deactivation
	xReset	The block is reset on a rising edge and communication is re-initialized.
	xPNIO_Data_Valid	Status bit for the evaluation of a valid PROFINET connection (optional).
	xTrigger	An IO-Link service is read or written with a positive edge.
	xRead_Write	True = write access False = read access
	iPort	Number of port on which to read or write 0: IO-Link master 1..8: port number
	wIndex	Index of the IOL object to be accessed
	bSubIndex	Subindex of the IOL object
	iWriteLength	Number of bytes to be written
	arrIOL_ReadData	The array contains the received data. Every successful read access will overwrite the data in this array with the newly received data.
	arrIOL_WriteData	The array contains the data to be written.
	udtAsynCom	Structure for the communication with the function block of the AsynCom library. <div style="border: 1px solid black; padding: 5px; display: inline-block;">  The assigned variable must be the same for both for IOL_COM and the AsynCom_PN block </div>
	xActive	True: the block is initialized without errors and running. False: the block is not ready to operate.
	xDone	True: service has been successfully written/read. The parameter is True as long as xTrigger is True (for at least one cycle).
	xBusy	True: the block is busy with the service execution. False: block is ready for the next access.
	xError	This parameter indicates an error. The error message can be deleted by deactivating/re-initializing the block.
	wDiagCode	Diagnostic code
	dwAddDiagCode	Advanced diagnostic code
	iReadLength	Number of bytes received

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For further information, please refer to the documentation for the block or the help function.
You can open this by right-clicking on the block and selecting "Help for FB/FU".

5.7 IOL_COM error codes (wDiagCode)

The “xError” variable contains the value 0 if the data transfer was completed without errors. If errors occur during transfer, the “wDiagCode” and “dwAddDiagCode” variable contain the relevant diagnostic codes for aid troubleshooting.

The following diagnostics codes are possible:

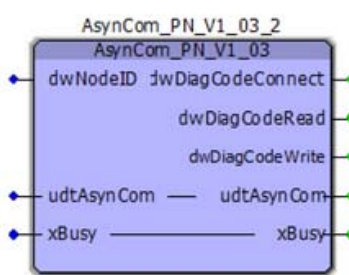



DiagCode	Description			
0000 _{hex}	Block is not active.			
8000 _{hex}	Block is active and operating without errors.			
C100 _{hex}	Communication error			
	AddDiagCode	Meaning		
	00000000 _{hex}	PROFINET connection timeout or error. The parameter PNIO_Data_Valid (optional) is False.		
	00000010 _{hex}	Invalid communication reference, e.g., strPartner is zero.		
	09B00005 _{hex}	There is no communication reference.		
xxxxxxx _{hex}	Communication error (error from PCP_CONNECT firmware block, see firmware block description in PC Worx)			
C200 _{hex}	Configuration error			
	AddDiagCode	Meaning		
	00000001 _{hex}	Invalid parameter at the iWriteLength input		
C300 _{hex}	IO-Link error			
	AddDiagCode	Meaning		
	xxxxxxx _{hex}	The parameter is structured as follows:		
		WORD 1	WORD 0	
			Byte 1	Byte 0
IOL_M Error_Code		IOL Error_Code	IOL Add_Error_Code	
	The meaning of this diagnostic information is described in the IO-Link specification.			
C400 _{hex}	Error during Send service			
	AddDiagCode	Meaning		
	xxxxxxx _{hex}	Error from WRREC or PCP-Write firmware block, see firmware block description in PC Worx		
	DF80A1xx _{hex}	Negative acknowledgement when writing to the module: cause: incorrect service content, index, subindex, incorrect port number or length of the data to be written		
	0000F003 _{hex}	Invalid node ID		
	0000F016 _{hex}	The service used to write the RECORD data record could not be run.		
	06050000 _{hex}	Invalid length of the data to be written.		
06070000 _{hex}	Invalid index			

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DiagCode	Description	
C500 _{hex}	Error during Read service	
	AddDiagCode	Meaning
	xxxxxxx _{hex}	Error from RDREC or PCP-Read firmware block, see firmware block description in PC Worx
	DE80A0x _{hex}	Negative acknowledgement when reading the module: cause: incorrect service content, index, subindex or incorrect port number
	0000F003 _{hex}	Invalid node ID
	0000F015 _{hex}	The service used to read the RECORD data record could not be run.
	06070000 _{hex}	Invalid index

5.8 AsynCom_PN parameter description

The function block is structured as follows.

Function block	Variable	Description
	dwNodeID	Device communication error  On Axioline E, this is the node ID of the “status/control module” in the bus structure under the “Module Settings” tab.  The node ID is generated automatically by PC Worx and may therefore vary in the individual projects.
	udtAsynCom	Communication structure  The assigned variable must be the same for both for IOL_COM and the AsynCom_PN block
	xBusy	The variable is true, as long as a communication block transmits or receives data.
	dwDiagCodeConnect	Error code with regard to the communication status
	dwDiagCodeRead	Error code with regard to the reading of objects
	dwDiagCodeWrite	Error code with regard to the writing of objects



For further information, please refer to the documentation for the block or the help function. You can open this by right-clicking on the block and selecting “Help for FB/FU”.

5.9 AsynCom_PN error codes (dwDiagCode...)

The errors codes are transferred to the IOL_COM function block output “wDiagCode” and can be understood using the table in section “IOL_COM error codes (wDiagCode)” on page 65.

5.10 Reading IO-Link device parameters

In the case of read access ($xRead_Write = 0$), the data from the IO-Link device is stored in the array on the “arrIOL_ReadData” input and the number of read bytes is displayed at the “iReadLength” output.

During data transfer, the “xBusy” output = TRUE (1) as long as “xTrigger” = TRUE (1).

If data transfer is successful, the “xDone” output = TRUE (1), “xError” = FALSE (0) and “wDiagCode” contains the value 16#8000.

In the event of an error, the “xError” output = TRUE (1) and the diagnostic information is output via the “wDiagCode” and “dwAddDiagCode” outputs.

5.10.1 Example: reading the order number of the AXL E IOL AO1 I M12 S device

The following structure is used in this example:

- The status/control module of the IO-Link master has node ID 50.
- The AXL E IOL AO1 I M12 S device is connected to port 3.

The screenshot shows the PC WORX interface. On the left, the 'Bus Structure' tree displays a hierarchy starting with 'AXL E PN Test', followed by 'ILC 370 PN 2TX-IB 192.168.0.2', 'Resource', 'STD_RES ILC370PN_395', and 'PROFINET'. Under 'PROFINET', there are several IO-Link devices, including '1 IO-Link Master P' which contains '1 Status/Control Module' (highlighted in blue). On the right, the 'Device Details' window shows the settings for '1 Status/Control Module \Module Settings\'. The details are as follows:

Name	Value
Vendor	Phoenix Contact
Designation	Status/Control Module
Functional description	Status and control module
Device type	I/O digital
Device family	AXL E
Order number	
Revision	01/120
Module name	
Module equipment id	
Slot number	1
Node ID	50

Figure 5-14 Status/control module of the IO-Link master

By referring to the data sheet for the AXL E IOL AO1 I M12 S device, you can determine that the ISDU object with index 13_{hex} , decimal 19, contains the order number to be read.

Using the PC Worx IOL_COM function block

Perform the following steps to read the device order number:

- Make the following settings on the IOL_COM function block.

Parameters	Description
xActivate	= 1 (true)
xReset	= 0 (false)
xPNIO_Data_Valid	= 0 (false, optional use)
xTrigger	= 1 (true)
xRead_Write	= 0 (false, as read access)
iPort	= 3
wIndex	= 16#0013 (refer to the device data sheet for this)
bSubIndex	= 16#00 (no subindex)
iWriteLength	= 0 (as read access)
arrIOL_ReadData	= Target array for the read data

- Also enter the node ID of the status/control module into the “dwNodeID” input of the AsynCom_PN block, in this case 65.

Successful execution of the service should look as follows:

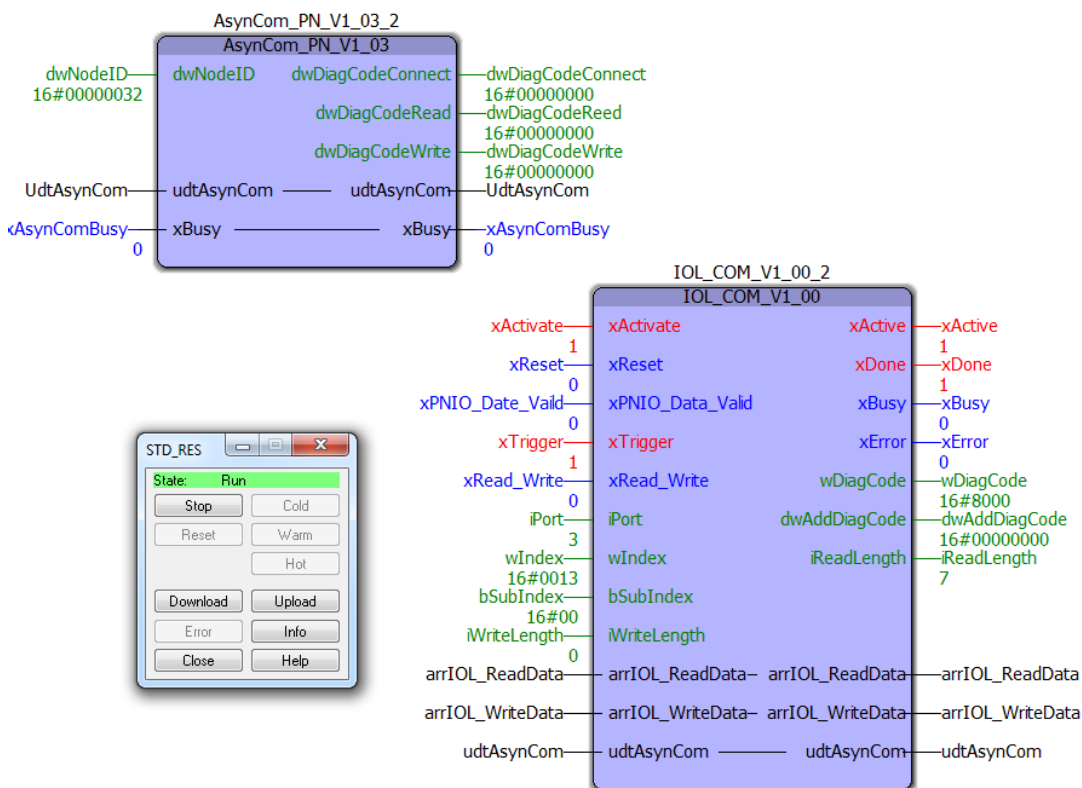


Figure 5-15 Online view of the configured function block

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You can monitor the data of the “arrIOL_ReadData” array via the Watch Window.

- Right-click on the input (1).
- Select “Add to Watch Window” (2) and then “Open Watch Window...” (3).

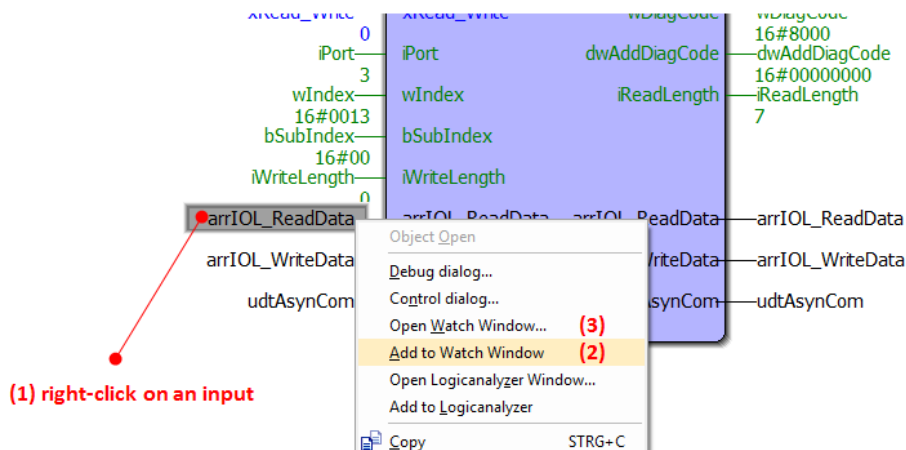


Figure 5-16 Opening Watch Window

In this example, the data appears as follows:

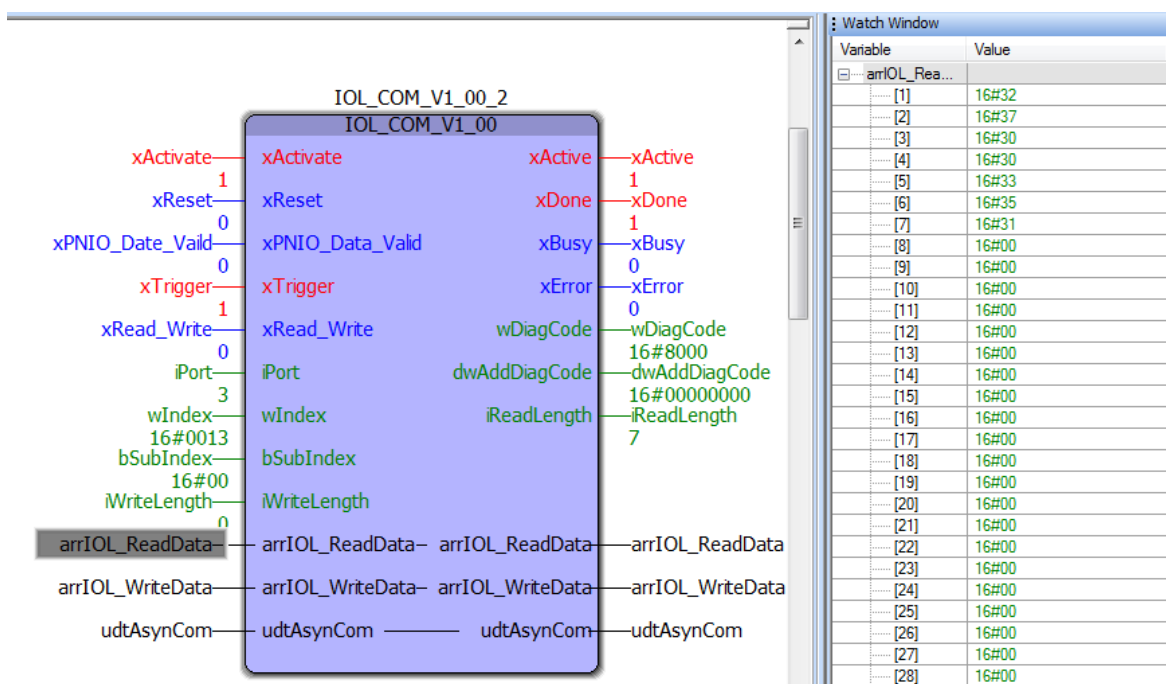


Figure 5-17 Online view of the order number

If these are converted from HEX to ASCII, entry [1] to [7], the result is: 2700351.

5.11 Writing IO-Link device parameters

In the case of write access ($xRead_Write = 1$), the data from the array is read at the "arrIOL_WriteData" and transferred to the connected IO-Link device. The amount of data to be written is specified in the "iWriteLength" variable.

During data transfer, the "xBusy" output = TRUE (1) as long as "xTrigger" = TRUE (1).

If data transfer is successful, the "xDone" output = TRUE (1), "xError" = FALSE (0) and "wDiagCode" contains the value 16#8000.

In the event of an error, the "xError" output = TRUE (1) and the diagnostic information is output via the "wDiagCode" and "dwAddDiagCode" outputs.

5.11.1 Example: writing the ParaWord of the AXL E IOL RTD1 M12 S device

The following structure is used in this example:

- The status/control module of the IO-Link master has node ID 50.
- The AXL E IOL RTD1 M12 S device is connected to port 4.

The screenshot shows the PC WORX interface. On the left, the 'Bus Structure' tree is expanded to show the '1 IO-Link Master P' node, with '1 Status/Control Module' selected. On the right, the 'Device Details' window displays the following information:

Name	Value
Vendor	Phoenix Contact
Designation	Status/Control Module
Functional description	Status and control module
Device type	I/O digital
Device family	AXL E
Order number	
Revision	01/120
Module name	
Module equipment id	
Slot number	1
Node ID	50

Figure 5-18 Status/control module of the IO-Link master

By referring to the data sheet for the AXL E IOL RTD1 M12 S device, you can determine that the ISDU object with index 80_{hex}, decimal 128, contains the parameter word (ParaWord) to be written.

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In this example, the format is to be changed to IB IL and the sensor type to linear R0 Ohm ... 5k Ohm. The data to be written are therefore 002F_{hex}.

Perform the following steps to write the device order number:

- Make the following settings on the IOL_COM function block.

Parameters	Description
xActivate	= 1 (true)
xReset	= 0 (false)
xPNIO_Data_Valid	= 0 (false, optional use)
xTrigger	= 1 (true)
xRead_Write	= 1 (true, as write access)
iPort	= 4
wIndex	= 16#0080 (refer to the device data sheet for this.)
bSubIndex	= 16#00 (no subindex)
iWriteLength	= 2 (ParaWord is 2 bytes in size)
arrIOL_WriteData	= source array for the data to be written (002F _{hex})

- Also enter the node ID of the status/control module into the “dwNodeID” input of the AsynCom_PN block, in this case 65.

You can enter the data of the “arrIOL_WriteData” array via the Watch Window.

- Right-click on the output (1).
- Select “Add to Watch Window” (2) and then “Open Watch Window...” (3).

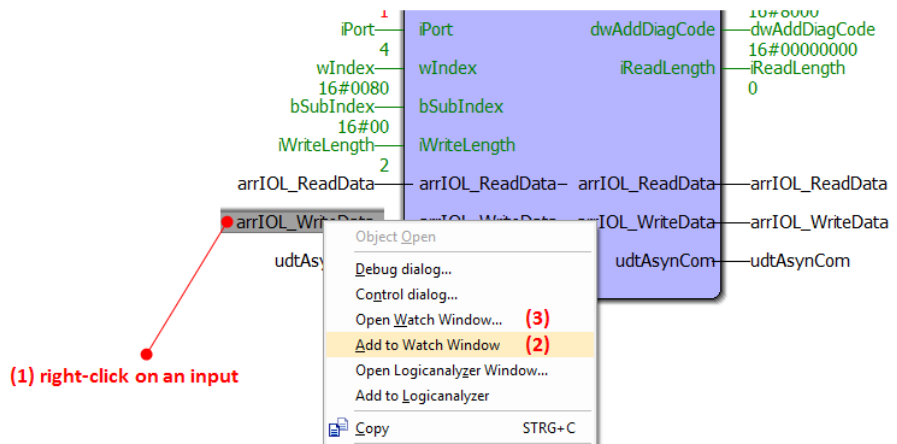


Figure 5-19 Opening Watch Window

Using the PC Worx IOL_COM function block

- Next, you can write the data for each entry (array element) by right-clicking and selecting the debug dialog.

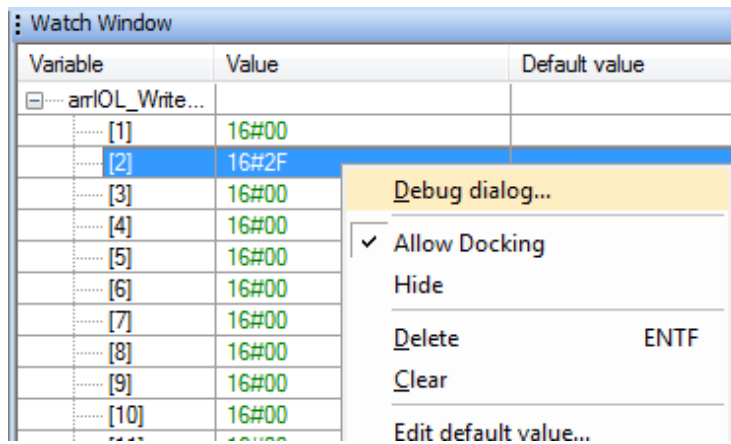


Figure 5-20 Opening the debug dialog

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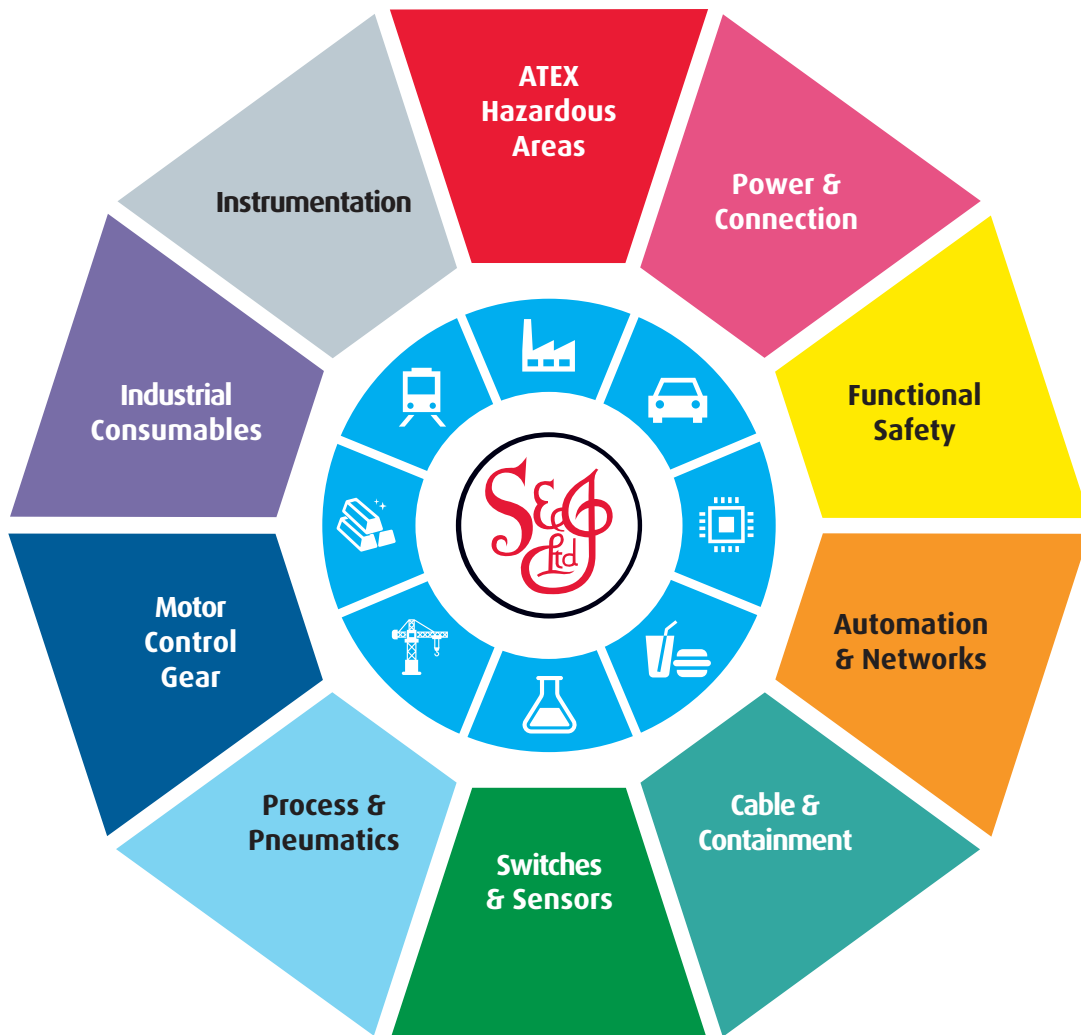
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