

AUTOMATION



Application note

AH EN PC WORX — AXL PRO

Revision: 01 (2010-09-02)

Starting up Axioline under PC WORX
(for experienced PC WORX users)

This document is valid for:

Designation	Revision
All terminals of the Axioline product range	
PC WORX	6.00 SP3 or later
PC WORX as part of the AUTOMATIONWORX Software Suite 2009	1.50 SP3 or later

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Table of contents

1	Basics and example project.....	4
1.1	Information about this document	4
1.2	System requirements.....	4
1.2.1	Software requirements	4
1.2.2	Hardware requirements for PC WORX	4
1.3	Axioline designations under PC WORX.....	4
1.4	Example for a project with Axioline	5
1.5	Sequence for creating the PROFINET project	6
2	Working completely online.....	8
2.1	Requirements	8
2.2	Reading and inserting PROFINET IO devices (Axioline bus couplers)	8
2.3	Checking/modifying the PROFINET settings for PROFINET IO devices	10
2.4	Sending PROFINET device names and IP settings to PROFINET IO devices.....	11
2.5	Reading Axioline	11
2.6	Parameterizing Axioline modules	12
2.7	Next steps	12
3	Working mostly offline.....	13
3.1	Requirements	13
3.2	Inserting PROFINET IO devices (Axioline bus coupler)	13
3.3	Checking/modifying the PROFINET settings for PROFINET IO devices	14
3.4	Manually inserting Axioline modules.....	15
3.5	Parameterizing Axioline modules	16
3.6	Next steps	17
4	Assigning process data.....	18

1 Basics and example project

1.1 Information about this document

This document describes special requirements when starting up Axioline under PC WORX. The document is for experienced PC WORX users. A complete project will not be considered, but only the special requirements when working with Axioline will be explained. It is assumed the user has knowledge and experience in the operation of PCs and Windows operating systems, and knowledge in IEC 61131 and Ethernet basics.

1.2 System requirements

1.2.1 Software requirements

You are working with Axioline and the Software Suite 1.5 Service Pack 3 or later, or PC WORX 6.00 Service Pack 3.

1.2.2 Hardware requirements for PC WORX

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

1.3 Axioline designations under PC WORX

A complete Axioline item consists of module electronics, the connectors, and a bus base module. PC WORX shows only the module electronics for Axioline.

Example:

AXL BK PN	Complete item
AXL BK PN-ME	Module electronics; representation in PC WORX
AXL DI 32/1	Complete item
AXL DI 32/1-ME	Module electronics; representation in PC WORX

1.4 Example for a project with Axioline

This example project consists of the PROFINET IO controller, a PROFINET IO device (bus coupler) and Axioline modules. The example system is shown in Figure 1.

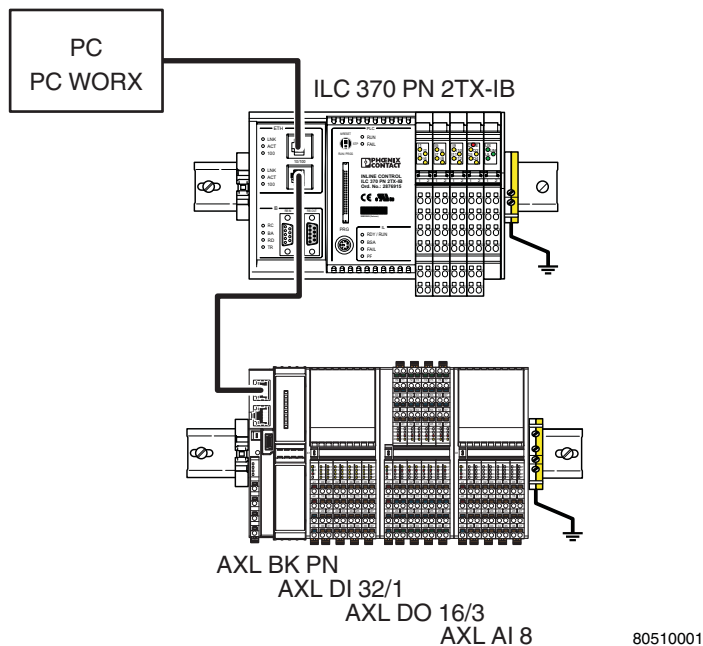


Figure 1 Example system

Table 1 Example system devices

PROFINET IO controller	ILC 370 PN 2TX-IB
PROFINET IO device (Axioline bus coupler)	AXL BK PN
Axioline modules (connected to the Axioline bus coupler)	AXL DI 32/1 AXL DO 16/3 AXL AI 8

1.5 Sequence for creating the PROFINET project

The complete sequence for creating the PROFINET project is shown in Figure 2.

When implementing the project some of the tasks can be performed offline (without a connection to the PROFINET IO system).

All tasks related to communication must be performed online (with a connection to the PROFINET IO system).

If the PROFINET system (hardware) has not yet been fully installed or if you would like to perform as many preparatory tasks as possible offline, follow the "Working mostly offline" path.

When the system (hardware) has already been installed, the quickest way is to work online. In this case, follow the "Working completely online" path.

The complete sequence for creating a project is described in the documentation on PC WORX. Therefore, it will not be described in detail. Only the fields with a gray background will be described, as they are of specific interest for Axioline.

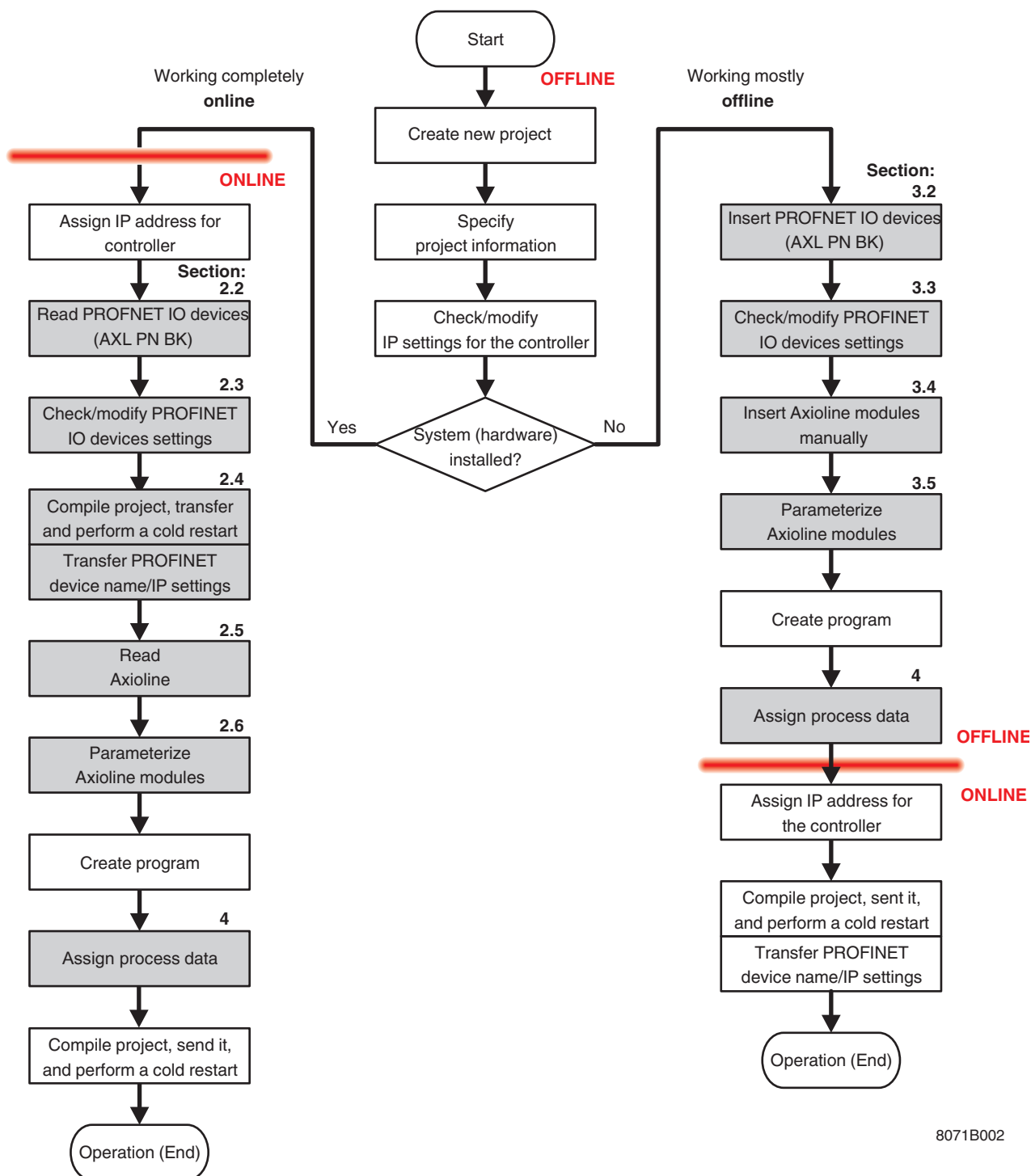


Figure 2 Sequence for creating the PROFINET project

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2 Working completely online

2.1 Requirements

- A project with the corresponding controller (here: ILC 370 PN 2TX-IB Rev. >01/4.6F/3.50) was created.
- The project information was specified
- The IP settings for the PROFINET IO controller have been checked/modified
- The IP address for the PROFINET IO controller was assigned

2.2 Reading and inserting PROFINET IO devices (AxioLine bus couplers)



- Make sure you are in the bus configuration workspace.
- In the "Bus Structure" window select the PROFINET node for the control system.
- Open the context menu and select the "Read PROFINET..." menu item.

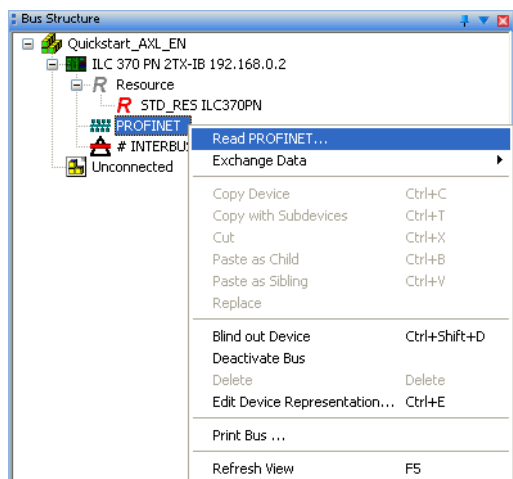


Figure 3 Read PROFINET

All the connected PROFINET IO devices are displayed. When reading, the device name and the IP parameters are read for each device - provided it is present.



Recommendation: When reading in the devices for the first time, deactivate all filters, to display all accessible PROFINET devices. If filters are active, deactivate these filters, and repeat the reading in with the "Refresh" button.

- Select the devices that are to be included in your project.



If your PROFINET IO controller already contains a project, another name can be specified for the controller in the "Read PROFINET" window than the one assigned in the current project. If you are sure you are communicating with the right controller this will not have any adverse effects. The PROFINET IO devices displayed are connected to the controller - regardless of its name. The current name is also transmitted when the current project is sent to the controller.

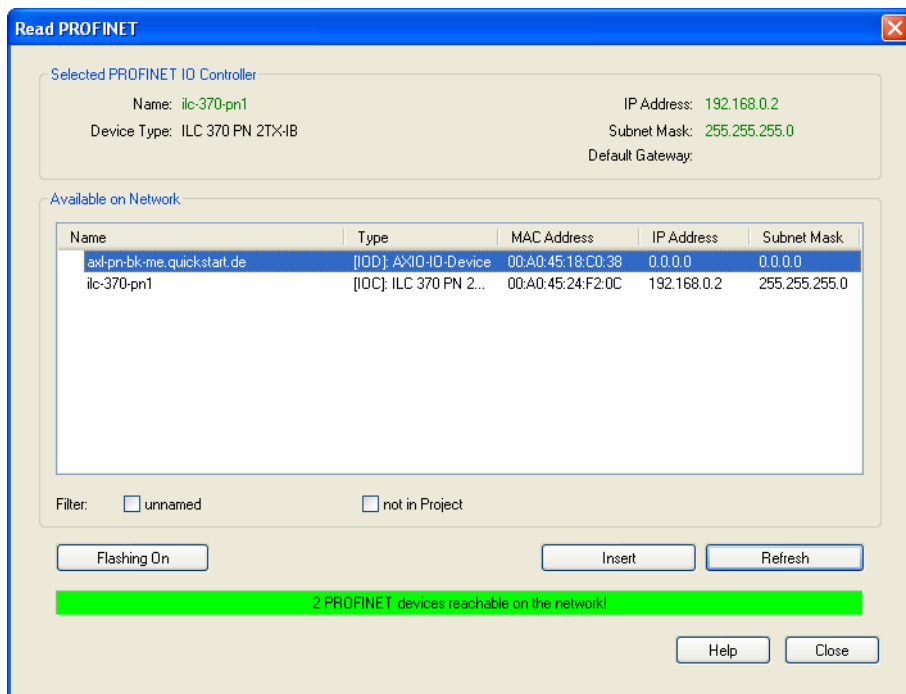


Figure 4 Connected and selected PROFINET IO devices for the project; PROFINET device names and IP addresses are already present

- Include the selected PROFINET IO device in your project by clicking "Insert".
- If a PROFINET device name does not yet exist for a device, a name should be assigned at this point (see PC WORX documentation).

The PROFINET topology is displayed in the "Bus Structure" window.

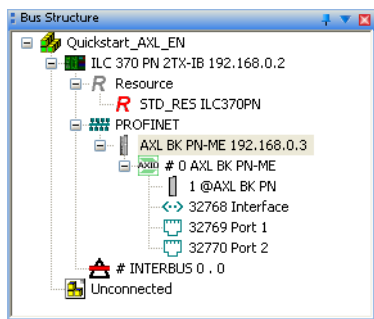
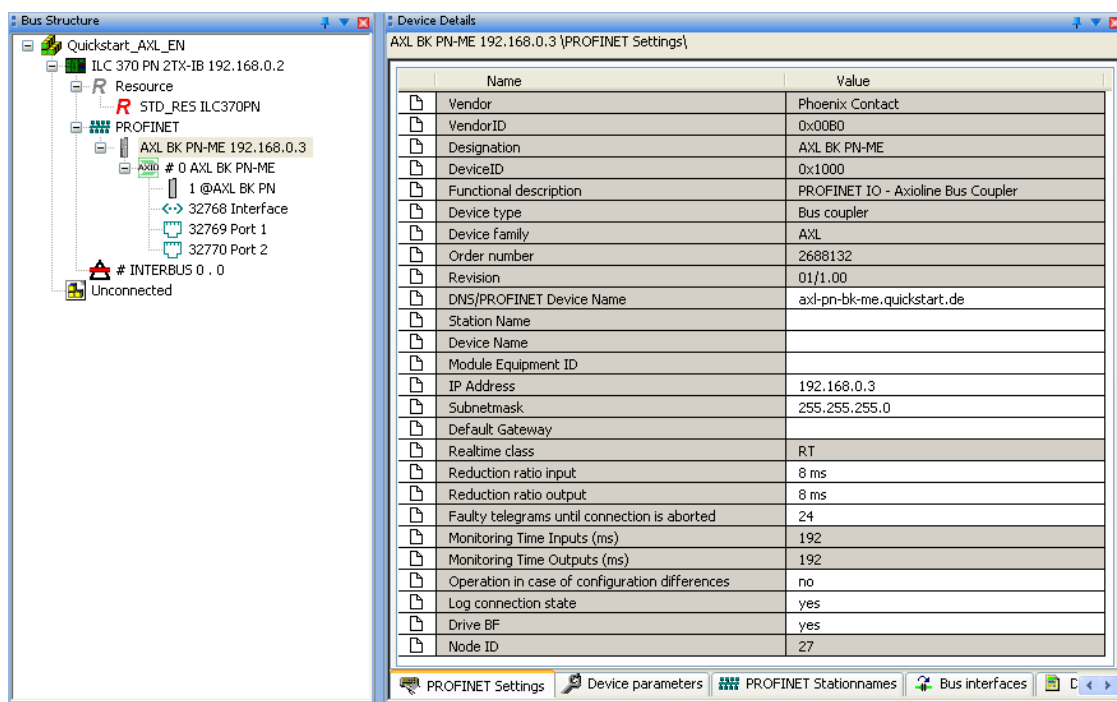


Figure 5 Bus configuration with read PROFINET IO devices

The settings can also be checked in the "Read PROFINET" window. All PROFINET IO devices should now have a PROFINET device name. The IP parameters are assigned later.

2.3 Checking/modifying the PROFINET settings for PROFINET IO devices

When **reading**, the PROFINET settings of the relevant PROFINET IO devices are included with default values. Check these settings and modify, if necessary.



The screenshot shows two windows from the PC WORX software. The left window, titled "Bus Structure", displays a hierarchical tree of the network configuration. The right window, titled "Device Details", shows the PROFINET settings for the device AXL BK PN-ME 192.168.0.3.

Name	Value
Vendor	Phoenix Contact
VendorID	0x00B0
Designation	AXL BK PN-ME
DeviceID	0x1000
Functional description	PROFINET IO - Axixline Bus Coupler
Device type	Bus coupler
Device family	AXL
Order number	2688132
Revision	01/1.00
DNS/PROFINET Device Name	axl-pn-bk-me.quickstart.de
Station Name	
Device Name	
Module Equipment ID	
IP Address	192.168.0.3
Subnetmask	255.255.255.0
Default Gateway	
Realtime class	RT
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 differences	no
Log connection state	yes
Drive BF	yes
Node ID	27

Figure 6 PROFINET settings of the device AXL BK PN

2.4 Sending PROFINET device names and IP settings to PROFINET IO devices

Before a PROFINET IO device is operated in a PROFINET IO network, the PROFINET device name and IP address configured in PC WORX must also be made known to the device itself.

- Make sure that the PROFINET IO controller can establish communication with the PROFINET IO devices.
- Compile the project, send it to the control system, and perform a cold restart.

During startup, the PROFINET controller automatically assigns the IP settings and device parameterizations specified in the project to the PROFINET IO devices.

The BF LED is now OFF on all PROFINET IO devices.
The PROFINET network is running.

2.5 Reading Axioline

The bus configuration must actually be available and power must be supplied to the modules.

- In the bus configuration select the AXL BK PN-ME entry under the Axioline bus coupler.
- In the context menu select the "Reading Axioline" command to read in the connected Axio-Bus.

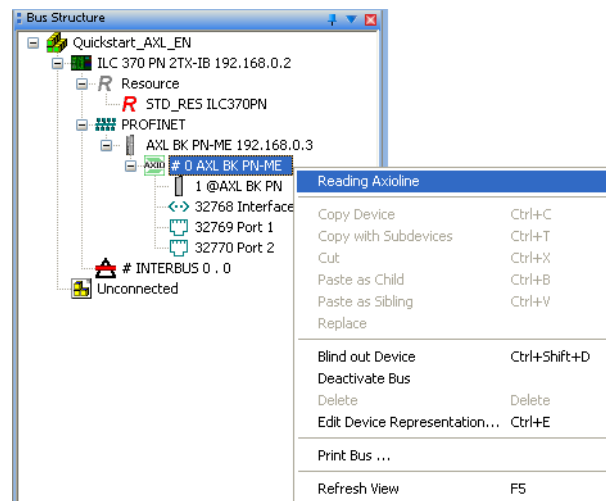


Figure 7 "Reading Axioline" command

2.6 Parameterizing Axioline modules

Parameterize all Axioline modules according to your requirements.



- Make sure you are in the bus configuration workspace.
- In the "Bus Structure" window select an Axioline module.
- Under "Device Details" select the "Device parameters" tab.
- Define the startup parameterization in the parameter menu.

The default settings are used for the example.

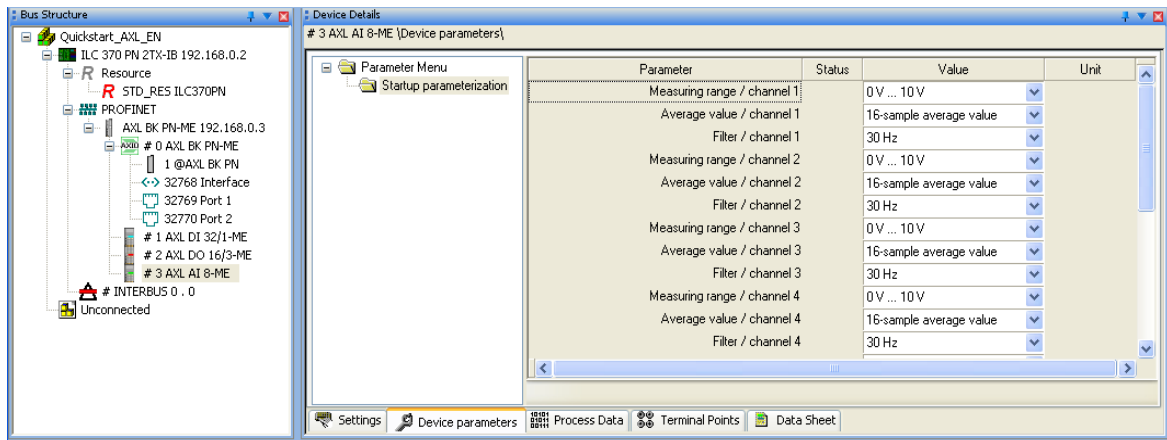


Figure 8 Parameterization of Axioline modules

2.7 Next steps

Execute the next steps:

- Create your program
- Assign the process data
Examples for process data assignment for Axioline are given in Section "Assigning process data" on page 18.
- Compile the project, send it to the control system, and perform a cold restart.

All preparations have now been completed and you can now start up your project.

3 Working mostly offline

3.1 Requirements

- A project with the corresponding controller (here: ILC 370 PN 2TX-IB Rev. >01/4.6F/3.50) was created.
- The project information was specified.
- The IP settings for the PROFINET IO controller have been checked/modified.

3.2 Inserting PROFINET IO devices (Axioline bus coupler)

In the example the AXL BK PN bus coupler is a PROFINET IO device.



- Make sure you are in the bus configuration workspace.

Insert the bus coupler below the PROFINET node.

- If the device catalog is hidden, show it by selecting the "View/Device Catalog" menu.
- Open the "Phoenix Contact" device catalog. The bus coupler is located in the "AXL...Bus coupler" folder.
- Select the bus coupler. The device catalog shows the ME version of the modules. That is the module electronics without connector and without bus base module.

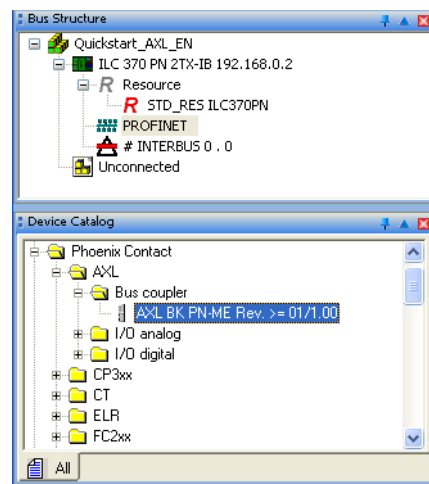


Figure 9 Selecting the bus coupler

- Hold down the left mouse button and move the first PROFINET IO device (the bus coupler) in the "Bus Structure" window to the right of the PROFINET icon until the "Insert in the lower level" icon appears.
- Move all other PROFINET IO devices to below the preceding PROFINET IO device until the "Insert at the same level" icon appears, if you want to add further PROFINET IO devices. (Not required for the example.)

Figure 10 illustrates the bus configuration with inserted PROFINET IO devices.

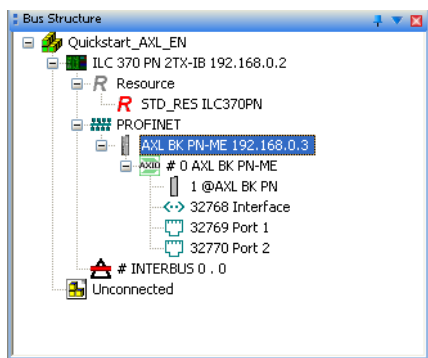


Figure 10 Inserting PROFINET IO device (bus coupler)

3.3 Checking/modifying the PROFINET settings for PROFINET IO devices

When **inserting** each PROFINET IO device, the PROFINET settings are assigned automatically according to the entries defined in the project information.

The PROFINET settings can be checked and modified via the "PROFINET Settings" tab.

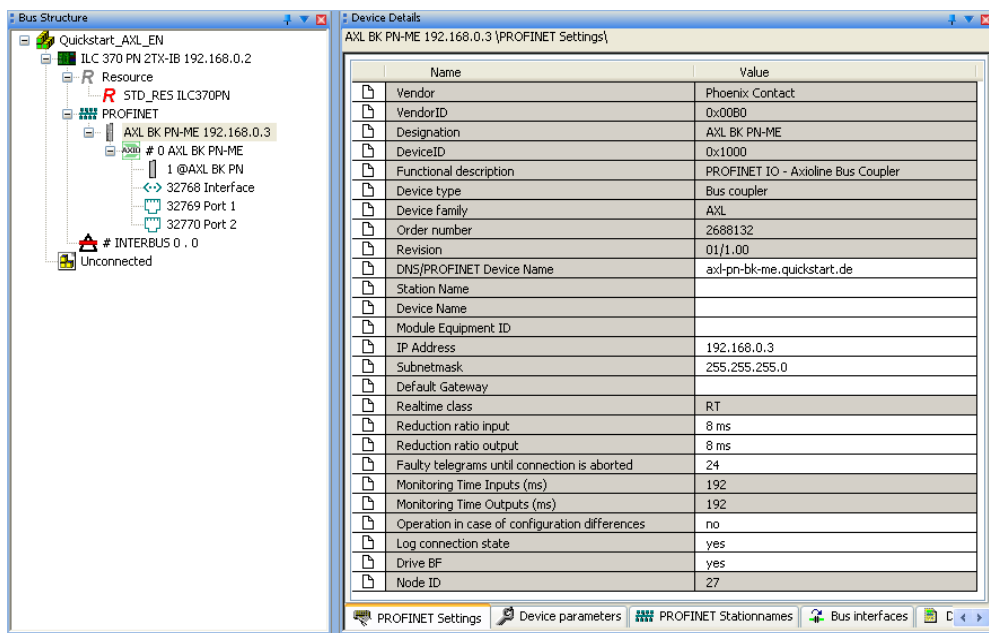


Figure 11 PROFINET settings of the device AXL BK PN

3.4 Manually inserting Axioline modules

If the bus configuration is not actually available yet or you wish to create the configuration offline, the bus configuration can be created manually.

- Open the Axioline (AXL) product range in the device catalog under "Phoenix Contact".
- Under the product range, open the product group (e.g., I/O digital).
- Select the device to be inserted (e.g., AXL DI 32/1-ME).

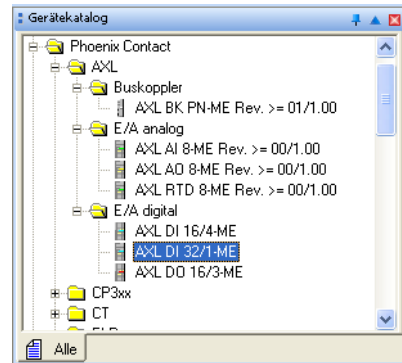


Figure 12 Select the device

- Hold down the mouse button and drag the selected device to the insertion point. The insertion point for Axioline modules is the AXIO node of the bus coupler.

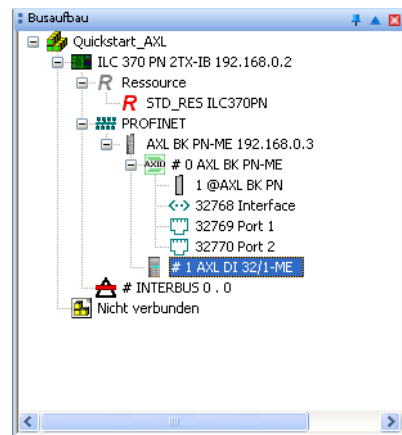


Figure 13 Device inserted (here: AXL DI 32/1-ME)

- Insert all the other devices.

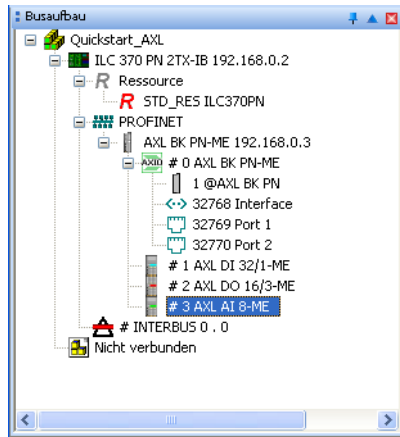


Figure 14 Example of a bus configuration

3.5 Parameterizing Axioline modules

Parameterize all Axioline modules according to your requirements.



- Make sure you are in the bus configuration workspace.
- In the "Bus Structure" window select an Axioline module.
- Under "Device Details" select the "Device parameters" tab.
- Define the startup parameterization in the parameter menu.

The default settings are used for the example.

Parameter	Status	Value	Unit
Measuring range / channel 1		0 V ... 10 V	
Average value / channel 1		16-sample average value	
Filter / channel 1		30 Hz	
Measuring range / channel 2		0 V ... 10 V	
Average value / channel 2		16-sample average value	
Filter / channel 2		30 Hz	
Measuring range / channel 3		0 V ... 10 V	
Average value / channel 3		16-sample average value	
Filter / channel 3		30 Hz	
Measuring range / channel 4		0 V ... 10 V	
Average value / channel 4		16-sample average value	
Filter / channel 4		30 Hz	

Figure 15 Parameterization of Axioline modules

3.6 Next steps

Execute the next steps:

- Create your program.
- Assign the process data
Examples for process data assignment for Axioline are given in Section "Assigning process data" on page 18.
- Assign the address for the PROFINET IO controller.
- Compile the project, send it to the control system, and perform a cold restart.
During startup, the PROFINET controller automatically assigns the IP settings and device parameterizations specified in the project to the PROFINET IO devices.

If all steps have been carried out without errors, you have the following status:

- The BF LED is now off on all PROFINET IO devices.
- The PROFINET network is running.

All preparations have now been completed and you can now start up your project.

4 Assigning process data

Process data and control variables are assigned in the process data assignment workspace. This is identical to other product ranges. Therefore, only an example for process data assignment is shown here.

Symbol/Variable	Data T...	Process Data Item
wAI8_1	WORD	# 3 AXL AI 8-ME \ IN1
wMAX	WORD	
T2	TIME	
bDI32_1	BOOL	# 1 AXL DI 32/1-ME \ IN00
bDI32_24	BOOL	# 1 AXL DI 32/1-ME \ IN23
wDO16	WORD	# 2 AXL DO 16/3-ME \ ~OUT
I_AXL_PN_BK_ME_PNIO_...	BOOL	AXL BK PN-ME 192.168.0.3 \ PNIO_...

Device	Process Data Item	I/Q	Data Type	Byte.Bit	Address	Symbol/Variable
# 2 AXL DO 16/3-ME	OUT00	Q	BOOL	0.0		
# 2 AXL DO 16/3-ME	OUT01	Q	BOOL	0.1		
# 2 AXL DO 16/3-ME	OUT02	Q	BOOL	0.2		
# 2 AXL DO 16/3-ME	OUT03	Q	BOOL	0.3		
# 2 AXL DO 16/3-ME	OUT04	Q	BOOL	0.4		
# 2 AXL DO 16/3-ME	OUT05	Q	BOOL	0.5		
# 2 AXL DO 16/3-ME	OUT06	Q	BOOL	0.6		
# 2 AXL DO 16/3-ME	OUT07	Q	BOOL	0.7		
# 2 AXL DO 16/3-ME	OUT08	Q	BOOL	1.0		
# 2 AXL DO 16/3-ME	OUT09	Q	BOOL	1.1		
# 2 AXL DO 16/3-ME	OUT10	Q	BOOL	1.2		
# 2 AXL DO 16/3-ME	OUT11	Q	BOOL	1.3		
# 2 AXL DO 16/3-ME	OUT12	Q	BOOL	1.4		
# 2 AXL DO 16/3-ME	OUT13	Q	BOOL	1.5		
# 2 AXL DO 16/3-ME	OUT14	Q	BOOL	1.6		
# 2 AXL DO 16/3-ME	OUT15	Q	BOOL	1.7		
# 2 AXL DO 16/3-ME	~OUT	Q	WORD	0.0		STD_CNCF STD...

Figure 16 All used process data assigned to variables



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