



Quick Start Guide PN/PN Coupler (V2)

Version

6^{en}
As of FW 2.0

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1. Safety instructions 

Target audience

This description is only intended for **trained personnel qualified** in control and automation engineering who are familiar with the applicable national standards.

For installation, commissioning, and operation of the components, compliance with the instructions and explanations in this operating manual is essential. The specialist personnel is to ensure that the application or the use of the products described fulfills all safety requirements, including all applicable laws, regulations, provisions, and standards.

Intended use

The device has a protection rating of IP 20 (open type) and must be installed in an electrical operating room or a control box/cabinet in order to protect it against environmental influences. To prevent unauthorized operation, the doors of control boxes/cabinets must be closed and possibly locked during operation.

The consequences of improper use may include personal injury to the user or third parties, as well as property damage to the control system, the product, or the environment. Use the device only as intended!

Operation

Successful and safe operation of the device requires proper transport, storage, setup, assembly, installation, commissioning, operation, and maintenance.

Operate the device only in flawless condition. The permissible operating conditions and performance limits (technical data) must be adhered to.

Retrofits, changes, or modifications to the device are strictly forbidden.

2. Introduction

This document explains the initial commissioning of the PN/PN Coupler (700-158-3PN02, V2).

You can find the most current version of the documentation under www.helmholz.com or scan the QR code directly.



*PN/PN Coupler
documentation*

3. Function of the PN/PN Coupler

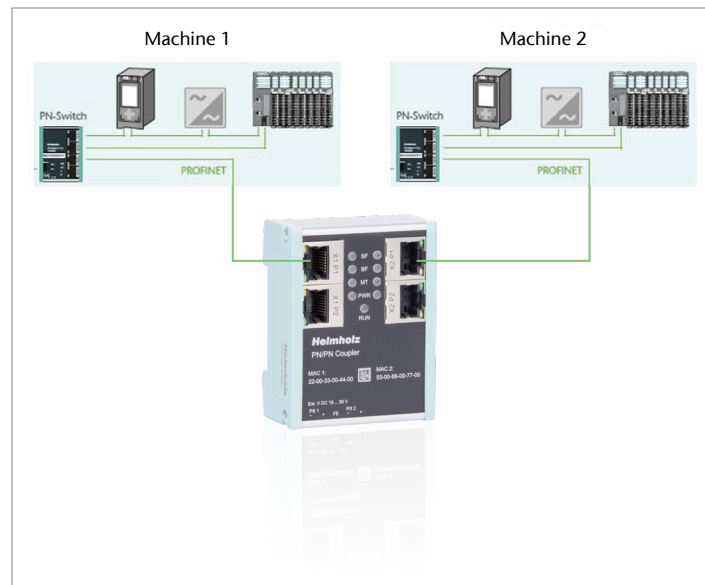
With the PN/PN Coupler, a simple and uncomplicated connection of two separate PROFINET networks is possible. The PN/PN Coupler enables data transmission between two PROFINET controllers. A PROFINET IO device is on both PROFINET network sides.

Received input data on one of the network sides is made available as output data to the other network side. The IO data transfer takes place live and as quickly as possible without additional handling blocks.

The maximum size of the transmitted I/O data is 1,024 bytes. Up to 16 slots for IO modules of 1 byte and up to 128 bytes are available.

The incorporation into the PLC engineering tool is made possible by a GSDML file special configuration software isn't necessary.

Application example: 1

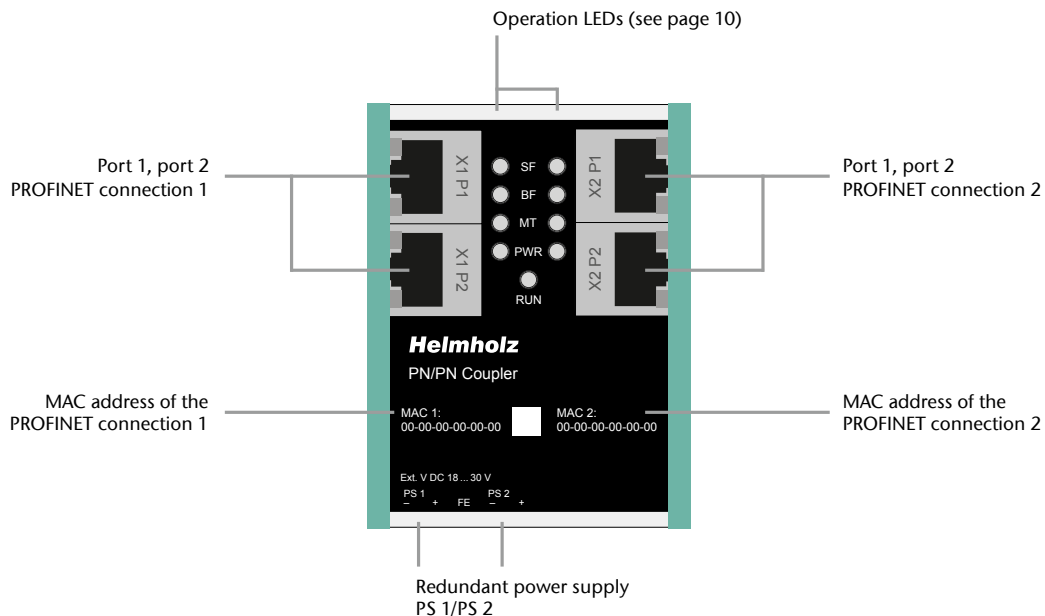


4. Connection

The RJ45 sockets “X1 P1” and “X1 P2” are for the connection of the left PROFINET network, the RJ45 sockets “X2 P1” and “X2 P2” are for the connection of the right PROFINET network.

The PN/PN Coupler must be supplied with 24 V DC at the wide range input 18 ... 30 V via the provided connector. The power supply is designed redundantly. At least one supply path PS 1 or PS 2 must be connected.

Note: The housing of the PN/PN Coupler is not grounded. Please connect the functional grounding connection (FG) of the PN/PN coupler correctly with the reference potential.



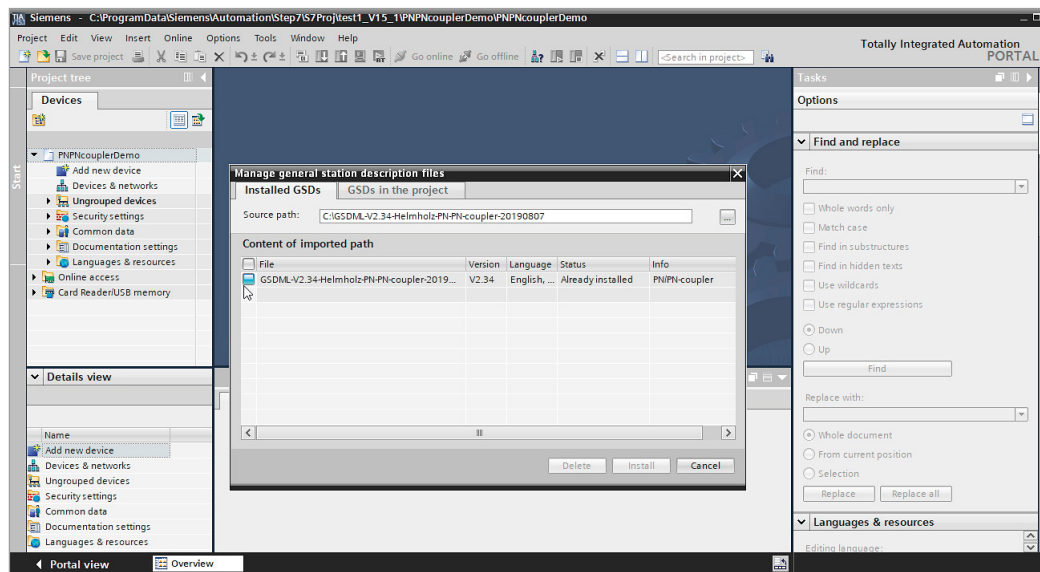
5. Install GSDML file

Please download the GSDML file (“GSDML-V2.34-Helmholz-PN-PN-coupler-_____.xml”) under www.helmholz.com or scan the QR code.

Install the file in the engineering tool so that the PN/PN Coupler is available for configuration.



*PN/PN Coupler
GSDML file*



6. Configuration in the TIA portal

The PN/PN Coupler can be found in the hardware catalog under “Other field devices / PROFINET IO / Gateway / Helmholz GmbH & Co. KG / Helmholz PN/PN Coupler”.

Select either “PN/PN Coupler V2 X1” for the left network side or “PN/PN Coupler V2 X2” for the right network side from the device list.

Provide the PN/PN Coupler with a PROFINET name under “General”. Connect the PROFINET network of the PROFINET controller with the PN/PN Coupler.

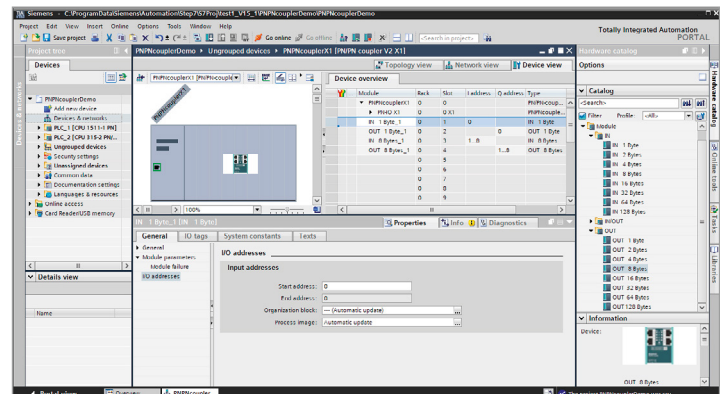
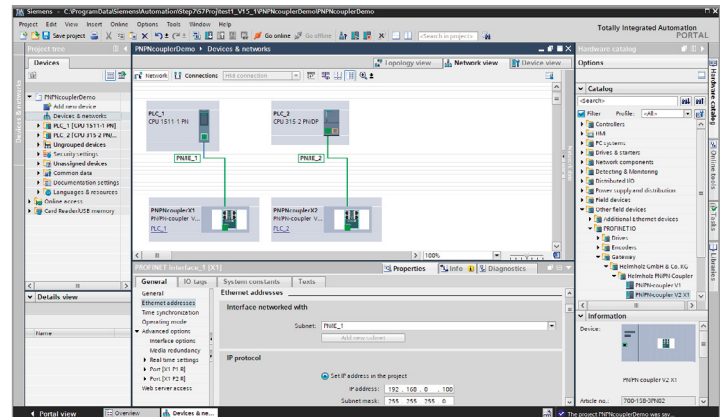
Note: The IP addresses of the PN/PN Coupler must be different on both network sides (X1, X2), but may be located in the same subnet.

Now insert the desired IO modules into the plug points. IO modules for 1, 2, 4, 8, 16, 32, 64, and 128 bytes are available for input and output. Combined IN/OUT modules are also available.

Proceed in exactly the same way in the project of the CPU on the other PROFINET side.

Note: Please note that ,the sequence and the sizes of the modules must always be selected consistently with the modules on the opposite PROFINET side.

Example: A 2-byte output module in slot 1 of the left PROFINET side requires a 2-byte input module in slot 1 of the right PROFINET side!



7. Parameters of the PN/PN Coupler

Separate parameters can be set on both PROFINET sides of the PN/PN Coupler.

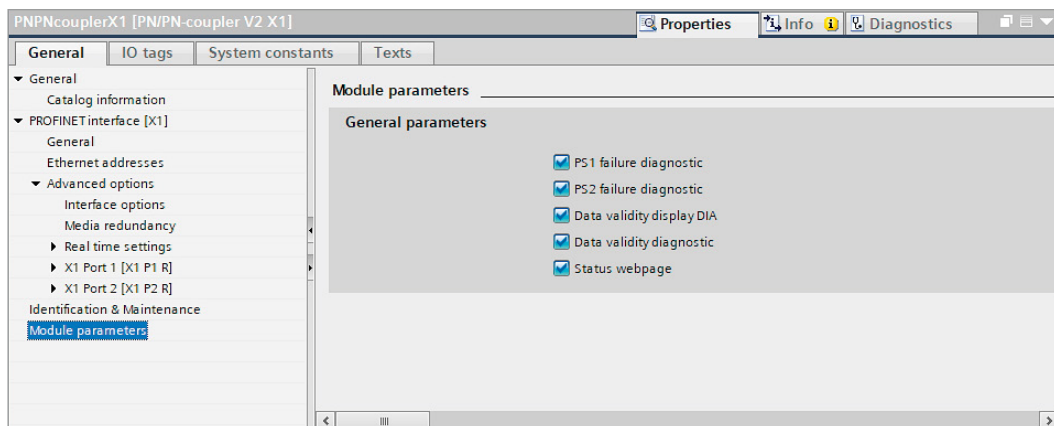
Failure diagnostic PS1/PS2: Sending of a diagnostic message to the PLC in the event of a power supply failure to PS1 (left side) or PS2 (right side).

Data validity display DIA: The validity of the data is displayed in the bit with the lowest value (Bit 0) of the first input byte of the corresponding PROFINET side.

0 = data could not be transmitted.
1 = data is all valid.

Data validity diagnostic: the PLC when the data is not valid.

Status webpage: Display of webpage.



8. Assign a PROFINET device name to the PN/PN Coupler

When the configuration of the PN/PN Coupler has been completed in the hardware configurator of the engineering tool, it can be loaded into the PLC.

In order that the PN/PN Coupler can be found by the PROFINET controller, the PROFINET device name must be assigned to the PN/PN Coupler. To this purpose, use the function “Assign device name”, which you can access in the Online menu with the right mouse button when the PN/PN Coupler is selected.

With the “Update list...” button, the network can be browsed for PROFINET participants. The PROFINET device name can be assigned to the device with “Assign name”.

The clear identification of the PN/PN Coupler is ensured here by the MAC address of the device. The MAC address of the device can be found on the device front of the PN/PN coupler.

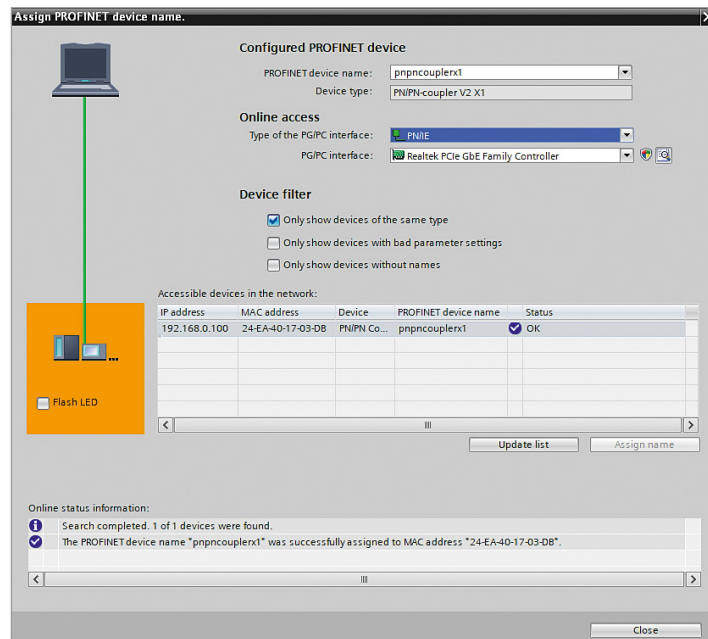
The Helmholtz IPSet tool, which can be downloaded at no charge from the Helmholtz website, can also be used to set the PROFINET name.

If the PN/PN Coupler has been assigned the correct PROFINET name, it is recognized by the PLC and configured. If configuration was done correctly, the PROFINET “BF” LED is off.

Proceed as described above for both PROFINET networks.



*PN/PN Coupler
IPSet*



9. Web interface of the PN/PN Coupler

The web interface of the PN/PN coupler provides an overview of the status and the configuration of the device, as well as the possibility for carrying out a firmware update.

Please download the current firmware under www.helmholz.com or scan the QR code.



PN/PN Coupler
firmware

Note: Calling up the website can influence the transmission capacity of the PN/PN Coupler.

PN/PN
COUPLER

Helmholz

COMPATIBLE WITH YOU

OverviewModule configFirmware upgrade

Overview

PN Configuration X1 (left)

PN Configuration X2 (right)

Device namepnpcoupler1

Operating modeConnected

LEDsSF BF MT PWR

MAC address24 ea 40 17 06 5d

IP address172.17.0.92

Port 1 statusLink up, 100 MB/FD

Port 2 statusLink down, -/-

Device namepnpcoupler2

Operating modeConnected

LEDsSF BF MT PWR

MAC address24 ea 40 17 06 5d

IP address172.17.0.93

Port 1 statusLink up, 100 MB/FD

Port 2 statusLink down, -/-

Software

Hardware

Firmware versionV2.00.114

Linux kernel version4.9.4

License termspn-pn-coupler-licenses.txt

Serial Number30031537

Order Number700-158-3PN02

Hardware Revision2A-1A

www.helmholz.de

PN/PN
COUPLER

Helmholz

COMPATIBLE WITH YOU

OverviewModule configFirmware upgrade

Module Configuration

PN Configuration X1 (left)

PN Configuration X2 (right)

Slot# 1OUT 1 Byte (0x00)

IN 1 Byte (0x01)

Slot# 2IN 1 Byte (0x01)

OUT 1 Byte (0x00)

Slot# 3OUT 2 Bytes (0x7F 20)

IN 2 Bytes (0x7F 20)

Slot# 4IN 2 Bytes (0x7F 20)

OUT 2 Bytes (0x7F 20)

Slot# 5OUT 4 Bytes (0x7F 20 7F 20)

IN 4 Bytes (0x7F 20 7F 20)

Slot# 6IN 4 Bytes (0x7F 20 7F 20)

OUT 4 Bytes (0x7F 20 7F 20)

Slot# 7OUT 8 Bytes (0x7F 20 7F 20 ...)

IN 8 Bytes (0x7F 20 7F 20 ...)

Slot# 8IN 8 Bytes (0x7F 21 7F 21 ...)

OUT 8 Bytes (0x7F 21 7F 21 ...)

Slot# 9OUT 16 Bytes (0x7F 21 7F 21 ...)

IN 16 Bytes (0x7F 21 7F 21 ...)

Slot# 10IN 16 Bytes (0x7F 21 7F 21 ...)

OUT 16 Bytes (0x7F 21 7F 21 ...)

10. LED status information

	X1 PROFINET	X2 PROFINET
SF (rot)		
Off	Configuration correct	Configuration correct
On	There is no configuration, the configuration does not match the configuration on the right side (X2), or a diagnosis exists.	There is no configuration, the configuration does not match the configuration on the left side (X1), or a diagnosis exists.
Blinking together with BF and MT	PROFINET function "LED flashing" for finding the device is being carried out.	PROFINET function "LED flashing" for finding the device is being carried out.
BF (red)		
Off	The device is configured	The device is configured
On	The device has no configuration, the PROFINET device name is incorrect, or there is no connection with the PROFINET controller.	The device has no configuration, the PROFINET device name is incorrect, or there is no connection with the PROFINET controller.
Blinking together with SF and MT	PROFINET function "LED flashing" for finding the device is being carried out.	PROFINET function "LED flashing" for finding the device is being carried out.
MT (yellow)		
Flashing	A firmware update is being carried out.	A firmware update is being carried out.
Blinking together with SF and BF.	PROFINET function "LED flashing" for finding the device is being carried out.	PROFINET function "LED flashing" for finding the device is being carried out.
PWR (green)		
On	PS1 Power supply present	PS2 Power supply present
RUN (green)		
Off	Firmware or device defective. Please contact Support	
On	The device is ready to operate	
RJ45 LEDs	X1 P1/P2 and X2 P1/P2	
Green (Link)	Connected	
Orange (Act)	Data transfer at the port running	

11. Technical data

Order no.	700-158-3PN02
Article designation	PN/PN Coupler V2
Scope of delivery	PN/PN Coupler V2 incl. Quick Start Guide
PROFINET interface	
- Number	2 with 2 ports each
- Protocol	PROFINET IO Device as defined in IEC 61158-6-10
- Transmission rate	100 Mbps full duplex
- I/O image size	max. 1,024 bytes
- Number of configurable slots	16
- Connection	4x RJ45, integrated switch
- Features	Media redundancy (MRP client), automatic addressing, topology detection (LLDP, DCP), diagnostic alarms, conformance class B
Status indicator	9 LEDs function status 8 LEDs Ethernet status
Voltage supply	24 V DC (18 - 28 V DC)
Current draw	Max. 160 mA
Power loss	Max. 4 W
Dimensions (D x W x H)	35 mm x 58 mm x 72 mm
Weight	Approx. 135 g
Ambient temperature	0 °C to 60 °C
Transport and storage temperature	-20 °C to 80 °C
Protection rating	IP 20
Certifications	CE

Note:

The contents of this Quick Start Guide have been checked by us so as to ensure that they match the hardware and software described. However, we assume no liability for any existing differences, as these cannot be fully ruled out.

The information in this Quick Start Guide is, however, updated on a regular basis. When using your purchased products, please make sure to use the latest version of this Quick Start Guide, which can be viewed and downloaded in the Internet at www.helmholz.de.

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