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Quick Start Guide DP/PN Coupler (V2)

Version
5 en
as of FW 2.00

www.helmholz.com

Contents

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.

BT-beipack-141

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 DP/PN Coupler (700-158-3DP02, V2).

Further information can be found in the manual. You can find this at **www.helmholz.com** or scan the QR code directly.

SCAN QR CODE TO GET MANUAL

DP/PN Coupler
Dokumentation

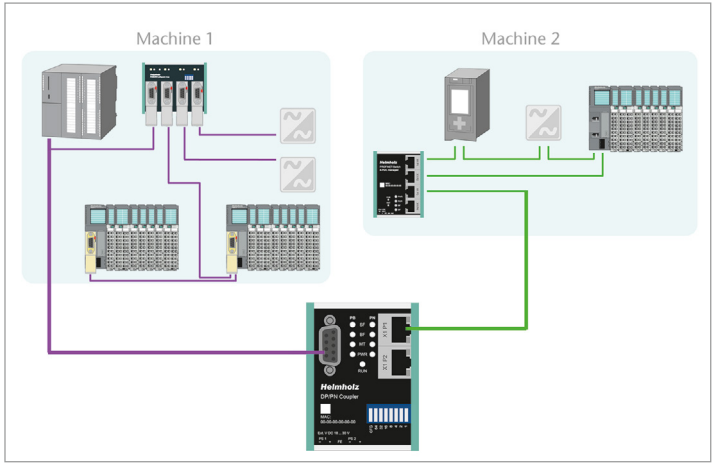
3. Function of the DP/PN Coupler

With the DP/PN Coupler, a simple and uncomplicated connection of PROFIBUS to PROFINET networks is possible. The DP/PN Coupler allows data transmission between the PROFIBUS master and the PROFINET controller and is planned both on the PROFIBUS and PROFINET sides as a slave (device).

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 data is 244 bytes of input data and 244 bytes of output data (max. IO size of PROFIBUS-DP). Up to 16 slots for IO modules of 1 byte and up to 64 words are available.

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



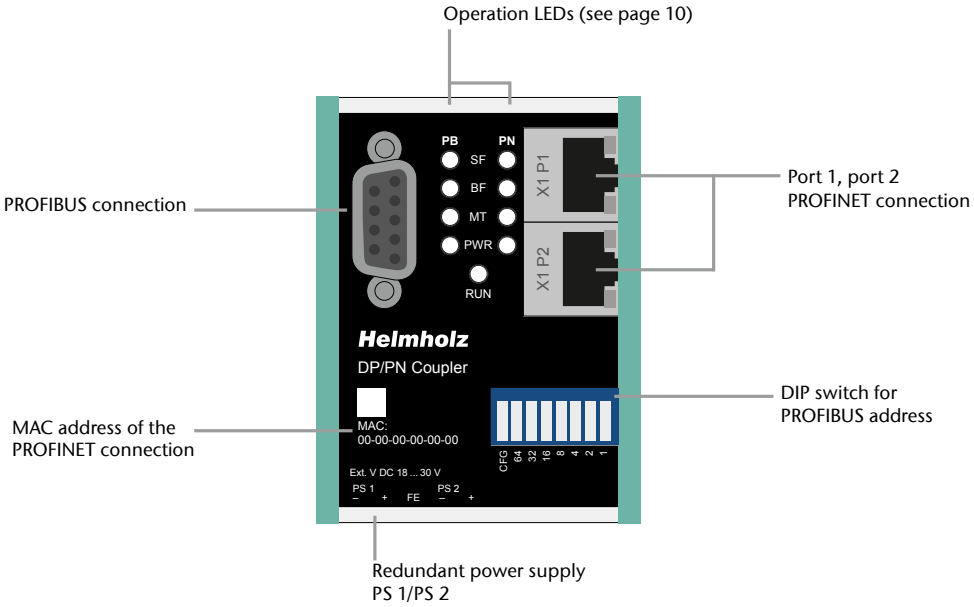
4. Connection

The RJ45 “X1 P1” and “X1 P2” socket is for the connection of the PROFINET network.

The sub-D socket is for the connection of the PROFIBUS network.

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

Note: *The housing has no connection to earth. Please connect the funcitional earth Terminal (FE) correctly with the reference potential.*



5. Install GSD/GSDML file

Please download the GSD and GSDML files from **www.helmholz.com** or scan the QR code.

For the PROFIBUS side, the GSD file (“HELM1130.gsd”), for the PROFINET side, the GSDML file (“GSDML-V2.34-Helmholz-DP-PN-coupler-_____.xml”) is required.

Install both files in the engineering tool so that both are available for configuration.

SCAN QR CODE TO GET GSD-/GSDML

DP/PN Coupler
GSD / GSDML files

6. Project planning of the PROFIBUS side

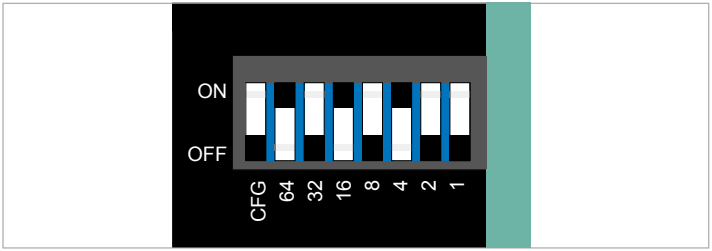
6.1 Setting the PROFIBUS address

The PROFIBUS address of the DP/PN Coupler can be set using the DIP switch of the device (see sketch).

The DIP switch is a toggle switch. If the upper toggle is pressed, the respective position or bit is ON. If the bottom toggle is pressed, the respective position or bit is OFF.

Please note that the button CFG being ON will cause the PROFIBUS address to be determined by the project/software. Put the button CFG to OFF (see sketch) in order to determine the PROFIBUS address using the DIP switch.

A changed address is only adopted following a restart of the device.



6.2 Configuration of the PROFIBUS side

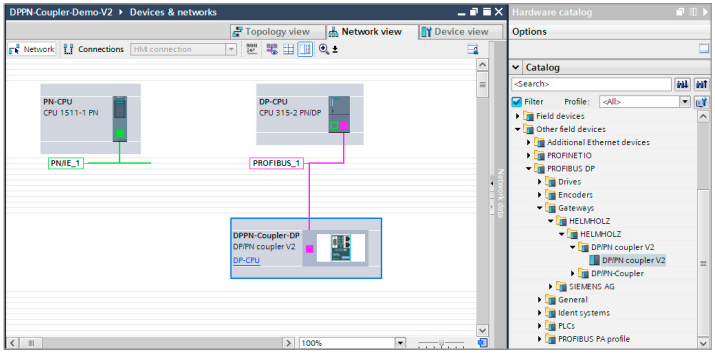
In order to be able to use a DP/PN Coupler in the project, select this in the hardware catalog following installation and add it to the project.

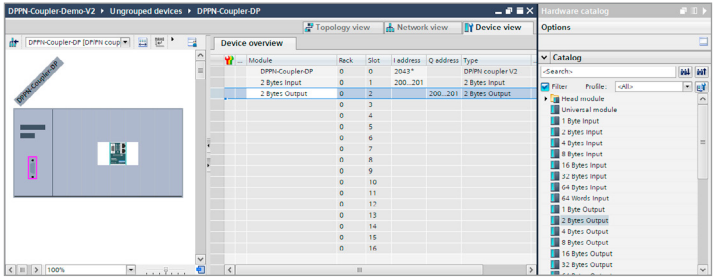
The DP/PN Coupler can be found in the hardware catalog under “Other field devices -> PROFIBUS-DP -> Gateway -> HELMHOLZ -> DP/PN Coupler V2”.

Connect the PROFIBUS network of the PROFIBUS CPU with the DP/PN Coupler. Now insert the desired IO modules into the plug points. IO modules for 1, 2, 4, 8, 16, 32, 64 Bytes and 64 words are available for input and output.

Consistent modules are also available as modules. In the process, the bytes are always transferred completely consistently between the PROFINET and the PROFIBUS sides.

Note: *Please note that,the sequence and the sizes of the modules must always be selected to be consistent with the modules on the PROFINET side. A 2-byte input module in the slot 1 of the PROFIBUS side requires a 2-byte output module in the slot 1 of the PROFINET side!*





6.3 Parameters of the PROFIBUS side

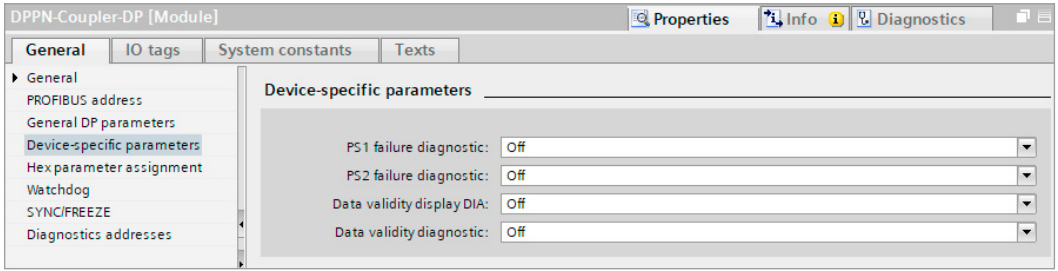
Diagnostic failure PS1/PS2: Send a diagnostic message to the PLC if the power supply fails at PS1 (left side) or PS2 (right side).

Data validity display DIA: The validity of the data is displayed in the least significant bit (bit 0) of the first input byte.

0 = Data could not be transferred.

1 = All data are valid.

Data validity diagnosis: Sending a diagnostic message to the PLC if the data is not valid.



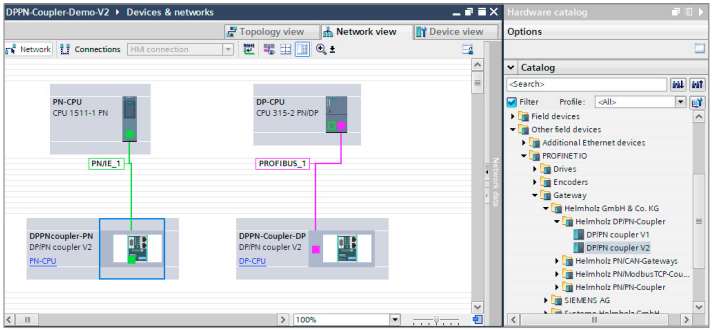
7. Project planning of the PROFINET side

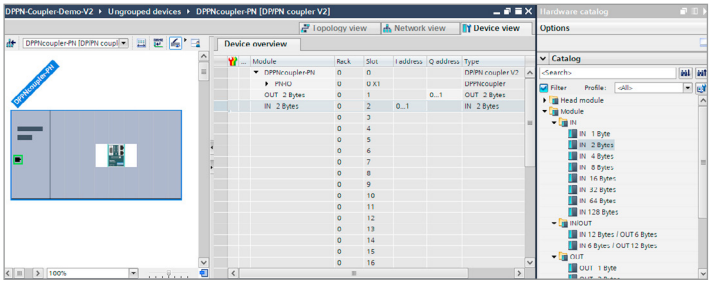
The DP/PN Coupler can be found in the hardware catalog under “Other field devices -> PROFINET IO -> Gateway -> Helmholz GmbH & Co. KG -> Helmholz DP/PN Coupler”. Select the entry “DP/PN Coupler V2“.

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

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.

Note: *Please note that, the sequence and the sizes of the modules must always be selected to be consistent with the modules on the PROFIBUS side. A 2-byte output module in the slot 1 of the PROFINET side requires a 2-byte input module in the slot 1 of the PROFIBUS side!*





7.1 Parameters of the PROFINET side

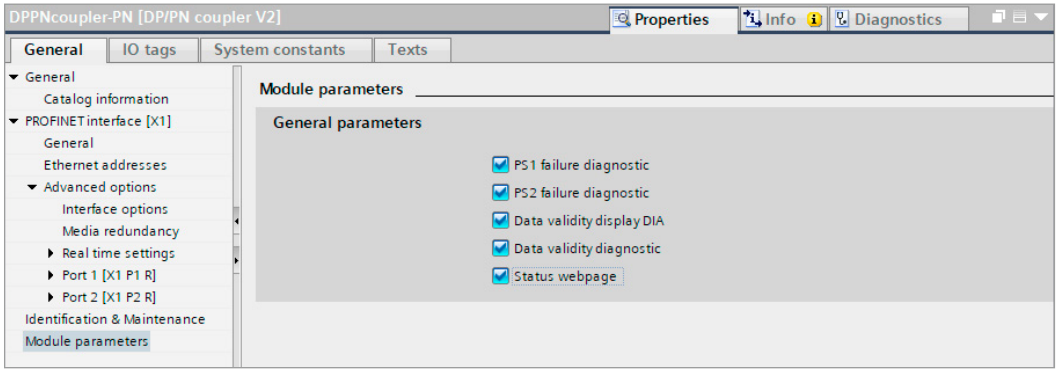
Diagnostic PS1/PS2 failure: Sending of a diagnostic message to the PLC in the event of a power supply failure to PS1 (left side) or PS2 (right side).

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.

Diagnostic data validity: Sending of a diagnostic message to the PLC when the data is not valid.

Status webpage: Display of webpage.



7.2 Assign a PROFINET device name to the DP/PN Coupler

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

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

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”.

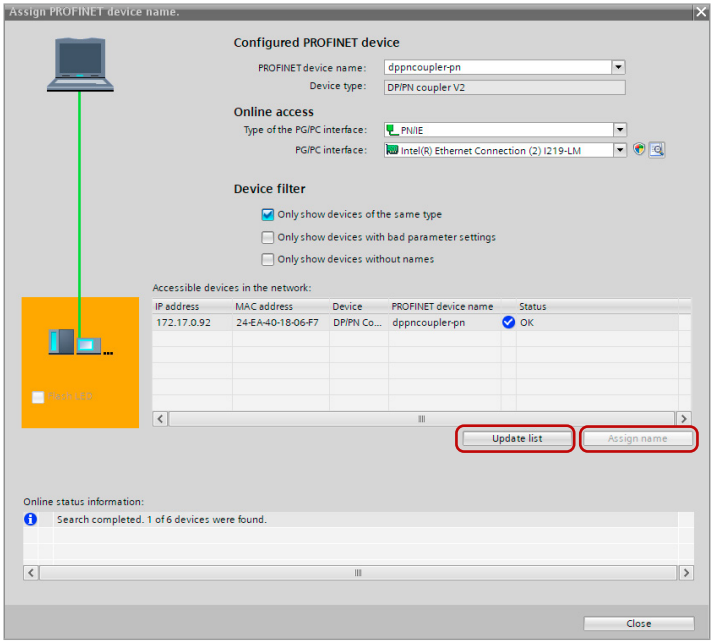
The clear identification of the DP/PN Coupler is ensured here by the MAC address of the device. The MAC address of the device can be found on the device front of the DP/PN coupler.

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

If the DP/PN Coupler has been assigned the correct name, it is recognized by the PLC and configured. If configuration has taken place correctly, the PROFINET “BF” LED should be off.

If configuration has also taken place correctly on the PROFIBUS side, the PROFIBUS “BF” LED should also be off. When both network sides have been configured appropriately (number and size of the IO areas agree), the “SF” LEDs on both sides should also be out on both sides and data transmission be underway.

DP/PN Coupler
IPSet



8. Web interface of the DP/PN Coupler

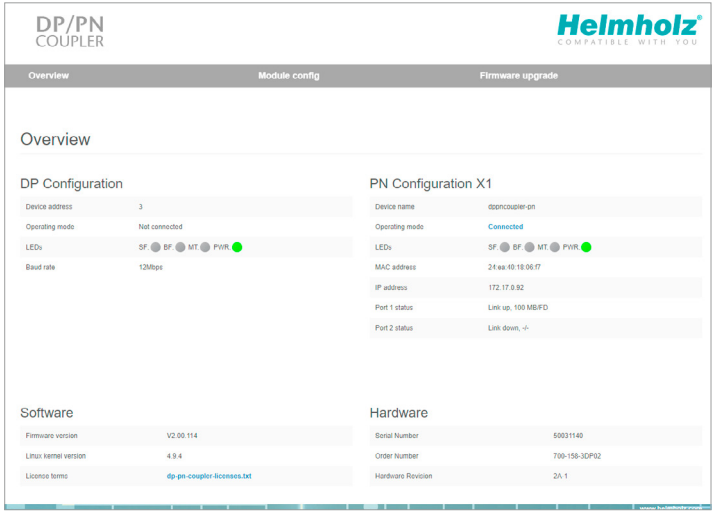
The web interface of the DP/PN coupler provides an overview of the status and the configuration of the device, as well as the possibility to perform a firmware update.

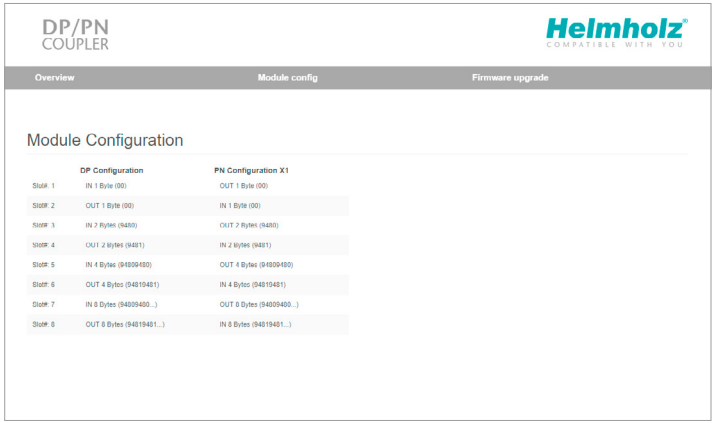
Please download the current firmware from **www.helmholz.com** or scan the QR code.

SCAN QR CODE TO GET FIRMWARE

DP/PN Coupler
Firmware

Note: *Calling the web page can influence the transmission performance of the DP/PN-Coupler.*





9. LED status information

	PB (PROFIBUS)	PN (PROFINET)
SF (red)		
Off	Configuration correct	Configuration correct
On	There is no configuration, the PROFINET configuration does not agree with the PROFIBUS configuration, or a diagnosis exists.	There is no configuration, the PROFIBUS configuration does not agree with the PROFINET configuration, or a diagnosis exists.
Flashing	-	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 PROFIBUS address is incorrect, or there is no connection with the PROFIBUS master.	The device has no configuration, the PROFINET device name is incorrect, or there is no connection with the PROFINET controller.
Flashing	-	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
PWR		
On	PS1 Power supply present	PS2 Power supply present
RUN (orange)		
Off	Firmware or device defective. Please contact Support	
On	The device is ready to operate	
RJ45 LEDs	X1 P1/X1 P2	
Link (green)	Connected	
Act (orange)	Data transfer at the port running	

10. Technical data

Order no.	**700-158-3DP02**
Article name	DP/PN Coupler
Scope of delivery	DP/PN Coupler, Quick Start Guide
PROFINET interface	
- Protocol	PROFINET IO as defined in IEC 61158-6-10
- Transmission rate	100 Mbps full duplex
- Number of configurable slots	16
- Connection	2x RJ45, integrated switch
- Features	Media Redundancy Protocol (MRP), automatic addressing, topology detection (LLDP, DCP), diagnosis alarm
PROFIBUS interface	
- Transmission rate	max. 12 Mbps, autom. detection
- Protocol	PROFIBUS-DP
- I/O image size	max. 244 bytes of input / 244 bytes of output data
- Connection	9-pin D-sub female connector
Status indicator	9 LEDs function status 4 LEDs Ethernet status
Voltage supply	24 V DC (18 ... 28 V DC)
Current draw	Max. 200 mA
Power dissipation	Max. 5W
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 on the Internet at www.helmholz.de.

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We also offer to send you or any third party the complete corresponding source text of the respective open source software for an at-cost fee of 10.00 Euro as a DVD upon request. This offer is valid for a period of three years, starting from the date of product delivery.

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