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Quick Start Guide PROFINET-Switch 4/8/16-port

Version
8 en
as of FW 1.08

PI CERTIFIED
PROFIBUS • PROFINET

www.helmholz.com

Contents

:z-beipack-106

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 Quick Start Guide explains the basic settings for the initial commissioning of PROFI-NET-Switches for use in a PROFINET project.

You can find further information in the manual. You can find this under **www.helmholz.de** or scan the QR code directly.
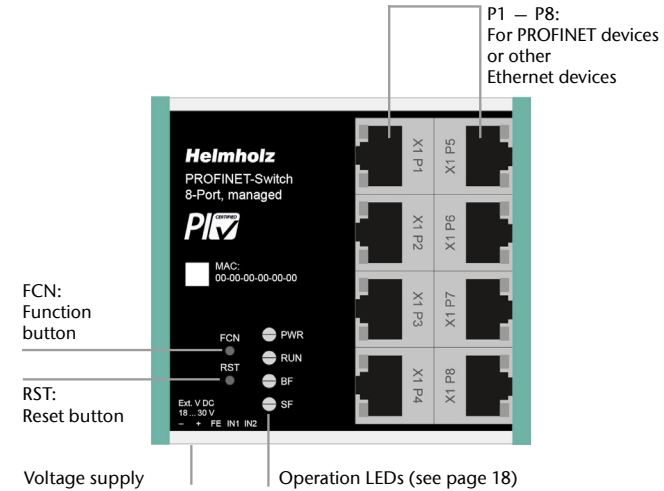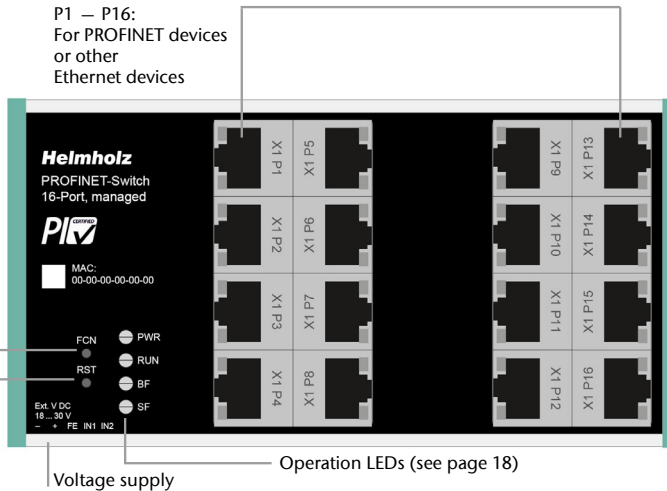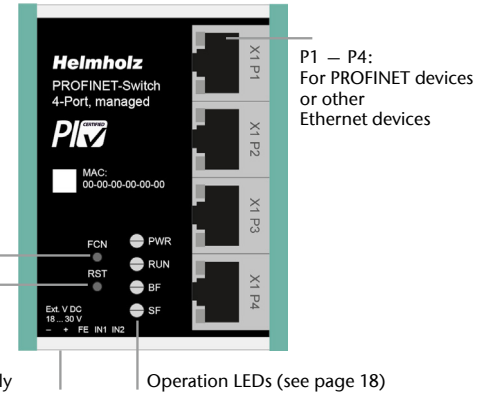
PROFINET-Switch 4-port, managed

PROFINET-Switch 8-port, managed

PROFINET-Switch 16-port, managed

SCAN QR CODE TO GET MANUAL

P1 — P4:
For PROFINET devices or other Ethernet devices

FCN:
Function button

RST:
Reset button

Voltage supply

Operation LEDs (see page 18)

P1 — P16:
For PROFINET devices or other Ethernet devices

FCN:
Function button

RST:
Reset button

Voltage supply

Operation LEDs (see page 18)

P1 — P8:
For PROFINET devices or other Ethernet devices

FCN:
Function button

RST:
Reset button

Voltage supply

Operation LEDs (see page 18)

3. Preparing the PROFINET-Switch

3.1 Connection

The PROFINET-Switch must be supplied with 24 V DC at the wide range input 18 – 30 V DC via the provided connector plug.

The RJ45 sockets "P1 – P4" (4-port switch), "P1 – P8" (8-port switch) and "P1 – P16" (16-port switch) serve the connection of the network participants (PROFINET or Ethernet).

Note: The housing of the PROFINET-Switch is not grounded. Please connect the functional grounding connection (FG) of the PROFINET-Switch correctly with the reference potential.

3.2 Install GSDML file

Please download the GSDML file under **www.helmholz.de** or scan the QR code.
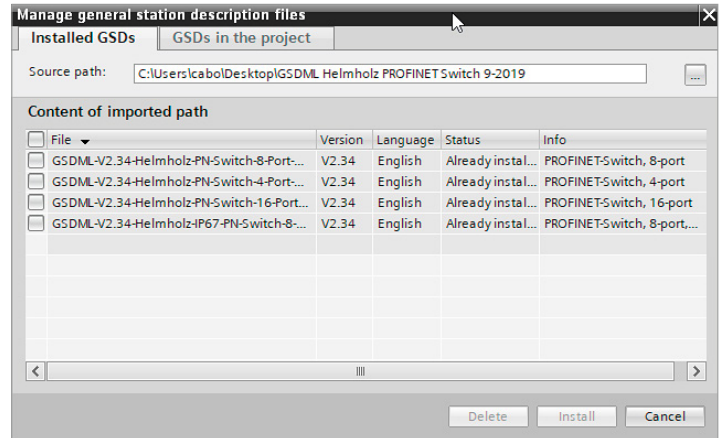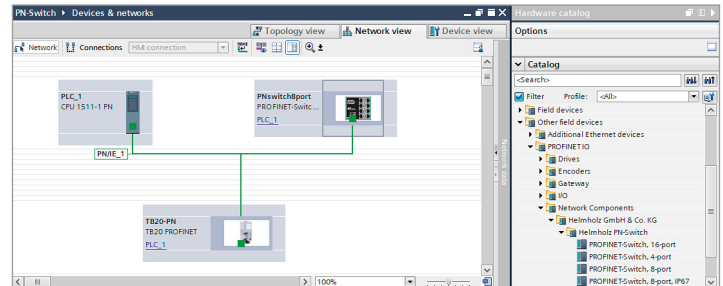
PROFINET-Switch
4-port, managed

PROFINET-Switch
8-port, managed

PROFINET-Switch
16-port, managed

SCAN
QR CODE

TO GET
GSDML

Manage general station description files

Installed GSDs	GSDs in the project

Source path: C:\Users\cabo\Desktop\GSDML Helmholz PROFINET Switch 9-2019

Content of imported path

File	Version	Language	Status	Info
GSDML-V2.34-Helmholz-PN-Switch-8-Port-...	V2.34	English	Already instal...	PROFINET-Switch, 8-port
GSDML-V2.34-Helmholz-PN-Switch-4-Port-...	V2.34	English	Already instal...	PROFINET-Switch, 4-port
GSDML-V2.34-Helmholz-PN-Switch-16-Port...	V2.34	English	Already instal...	PROFINET-Switch, 16-port
GSDML-V2.34-Helmholz-IP67-PN-Switch-8-...	V2.34	English	Already instal...	PROFINET-Switch, 8-port,...

Delete   Install   Cancel

4. Planning of the GSDML files

Following installation, the PROFINET-Switch can be found in the hardware catalog under
"Other field devices → PROFINET IO → Network Components → Helmholz GmbH & Co. KG → Helmholz PN switch". Add the "PROFINET-Switch, 4-port", "PROFINET-Switch 8-port" of "PROFINET-Switch, 16-port" device to the project and connect it with your PROFINET network.

By calling up the object properties, you must assign the PROFINET-Switch a unique PROFINET name and check the IP address for plausibility in the project.

Important: The real device must later be assigned the same name as in the project. See also Chapter 6.
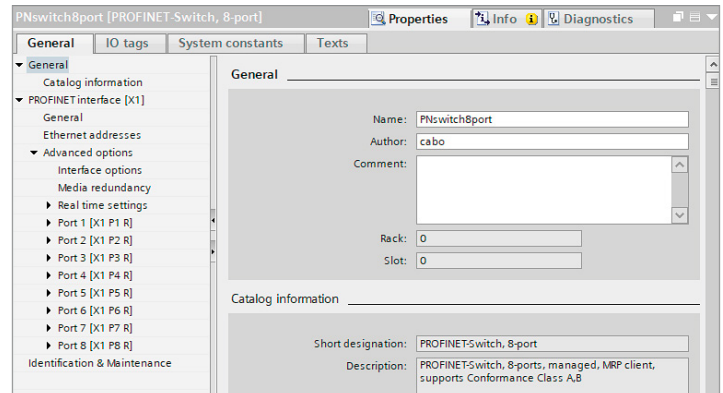
5. Setting the port properties

Each port of the PROFINET-Switch can be individually configured.

Transfer medium/duplex:

|	
"Activate"	The port can be switched off here. This option is recommended when the port shouldn't be used. Unauthorized trespass into the network is prevented.
Transmission rate "Automatic"	The port synchronizes itself automatically with the communication partner (auto-negotiation).
"TP 100 Mbps", Transmission rate full duplex	Fixed specification of the transmission rate. This option is recommended when connecting PROFINET IO devices.
Monitor	Send a diagnosis by Link Down
Enable autonegotiation	Automatic recognition of the transmission speed and the cable type (cross or patch cable)
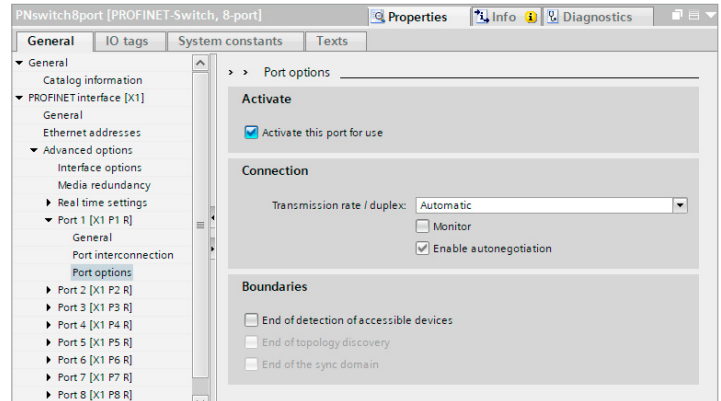
6. Topology detection

The PROFINET-Switch supports the mechanisms for neighborhood detection (LLDP). With this function it is possible to detect the topology of a PROFINET network, or to specify it for purposes of checking for the correct structuring by the configuration.

If the topology was prescribed in the configuration, neighboring devices can also be assigned the PROFINET name in the event of the replacement of a device.

This makes the recognition and testing of the network topology and the "device exchange in operation" of connected PROFINET participants possible.
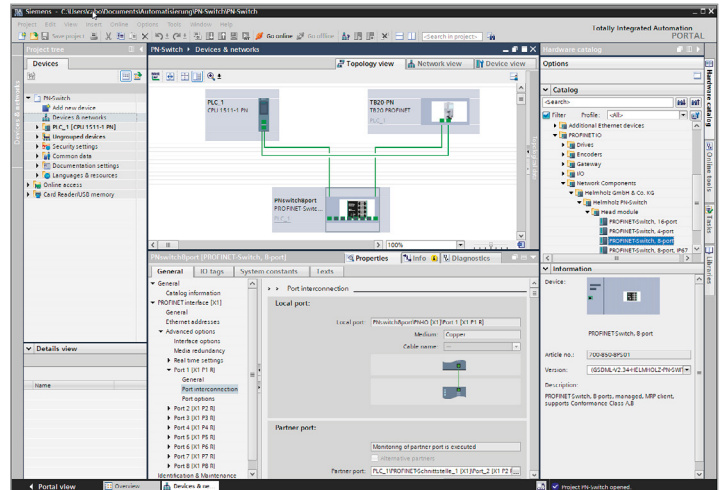
7. Assign the PROFINET-Switch a name

When the configuration of the PROFINET-Switch has been completed in the hardware configurator of the engineering tool, it can be loaded into the PLC.
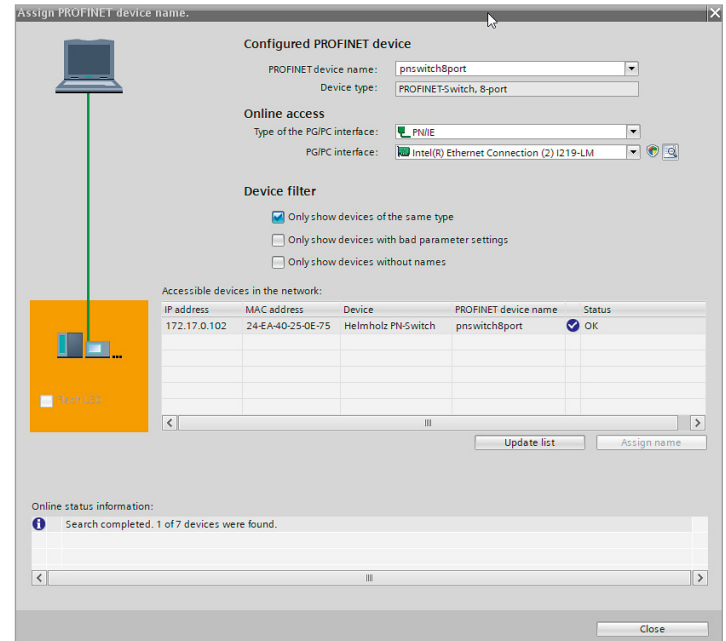
In order that the PROFINET-Switch can be found by the PROFINET controller, the PROFINET device name must be assigned to the PROFINET-Switch. To this purpose, use the function "Assign device name", which you can access in the Online menu with the right mouse button when the PROFINET-Switch is activated.

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 PROFINET-Switch 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 PROFINET-Switch.

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

If the PROFINET-Switch 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.

Assign PROFINET device name.

Configured PROFINET device

PROFINET device name:	pnswitch8port
Device type:	PROFINET-Switch, 8-port

Online access

Type of the PG/PC interface:	PN/IE
PG/PC interface:	Intel(R) Ethernet Connection (2) I219-LM

Device filter

☑ Only show devices of the same type
☐ Only show devices with bad parameter settings
☐ Only show devices without names

Accessible devices in the network:

IP address	MAC address	Device	PROFINET device name	Status
172.17.0.102	24-EA-40-25-0E-75	Helmholz PN-Switch	pnswitch8port	✓ OK

[Update list] [Assign name]

Online status information:
ⓘ Search completed. 1 of 7 devices were found.

[Close]

SCAN QR CODE TO GET IPSET

PROFINET-Switch 4-port, managed

PROFINET-Switch 8-port, managed

PROFINET-Switch 16-port, managed

8. Media Redundancy Protocol (MRP)

The PROFINET-Switch supports the optional media redundancy protocol (MRP) as MRP client. MRP enables ring wiring, which also makes operation of the PROFINET network possible in the event of the failure of a cable or of a participant.

There must be at least one MRP master (e.g. the CPU) in an MRP ring. All other participants of the ring are then MRP clients.
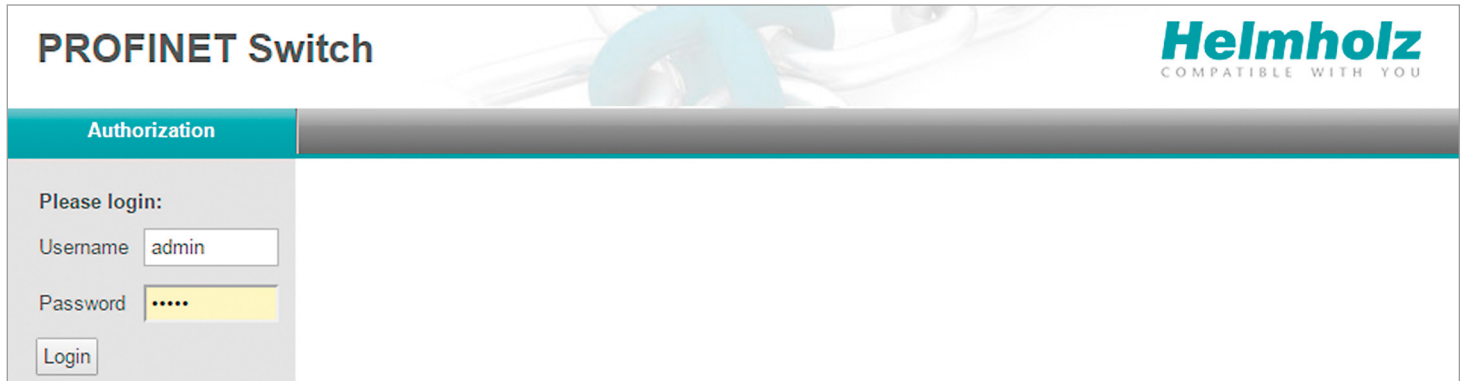
In order to assign the PROFINET-Switch to an MRP ring, the "Client" media redundancy role must be set for the "Media redundancy" option under "Properties/General".

Important: If ring wiring is produced without the MRP roles being configured for all devices involved, this can result in functional disruptions of the PROFINET network!
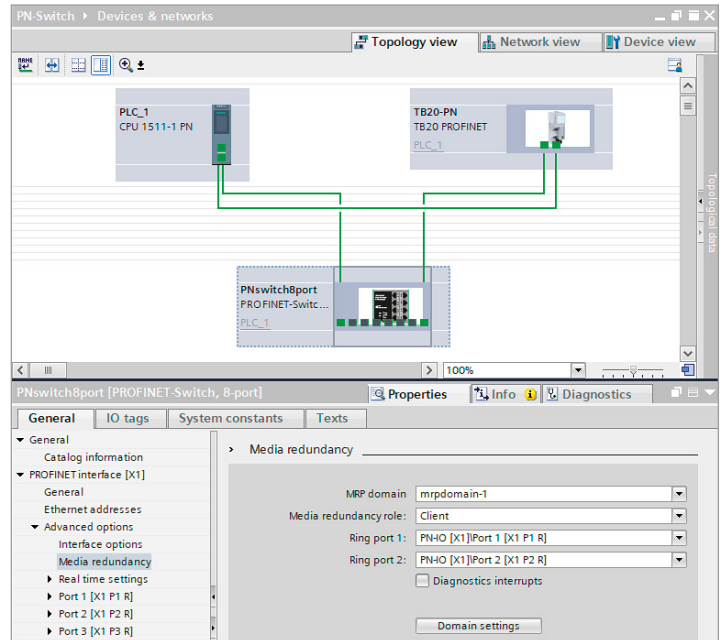
9. Diagnosis and configuration via the web interface
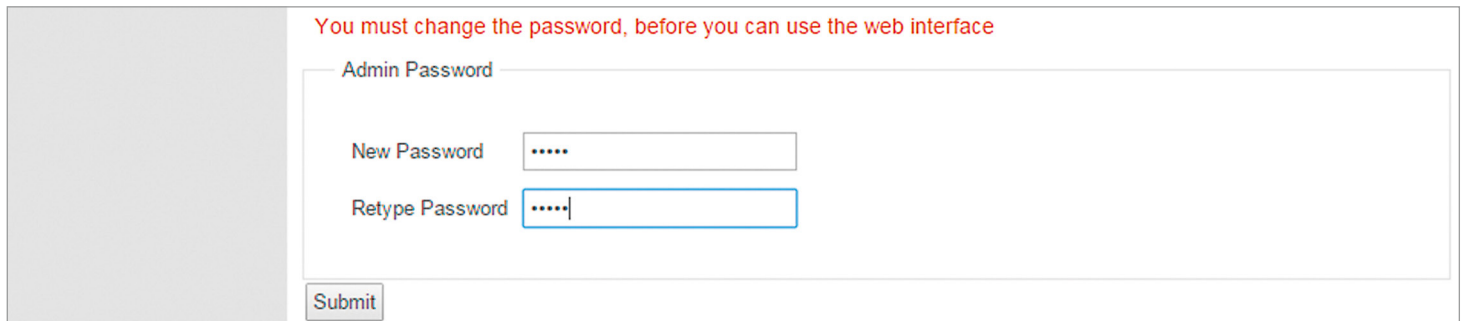
The web interface is also accessible under the IP address assigned to the PROFINET-Switch in the PROFINET network.

When the web interface is first called up, the password of the "admin" user is the serial number of the device. The serial number is indicated on the right housing side part (e.g. "50001234"). It is absolutely necessary to assign a new password following the first login:
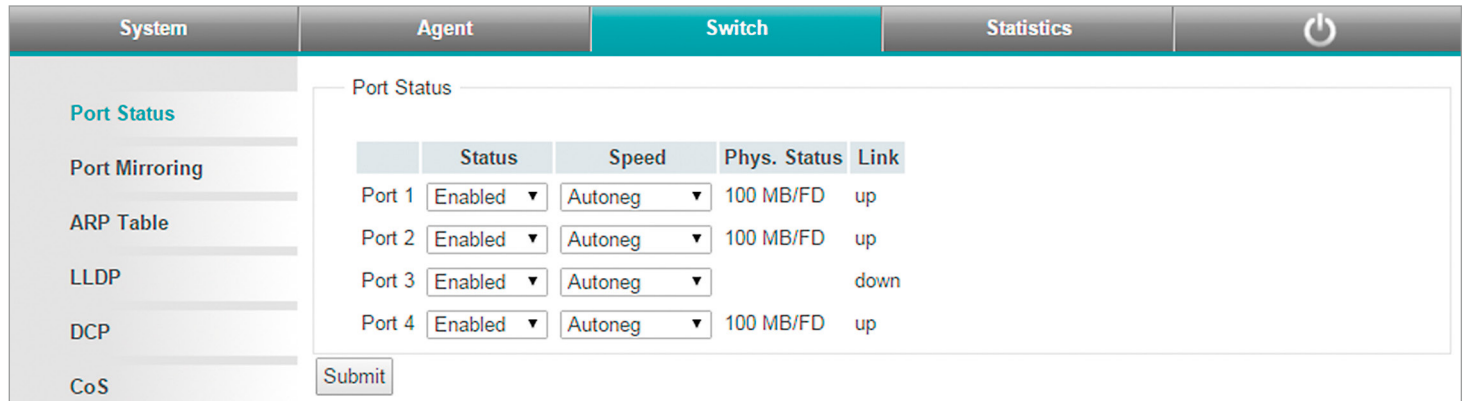
One goes to the system view following entry of the new password:

System	Agent	Switch	Statistics	⏻

System Status

- **Status**
- **Network**
- **Restart**
- **Password**
- **Event Log**

Device Type: Helmholz PN-Switch
Device MAC: 24-EA-40-20-00-D0
Protocol Status: Connected
System Failure: no
System Time: --/--/---- --:--:--
System Up Time: 0 days 00:12:03

Note: If the PROFINET-Switch is configured and used in a PROFINET network, settings in the web interface are only to be viewed as a diagnosis.
A reconfiguration of PROFINET-related settings (Port Status, LLDP, DCP, Ring Redundancy) is then not possible in the web interface.

10. Switch diagnosis and settings

Extensive information and settings for the function of the switch are accessible in the Switch menu.
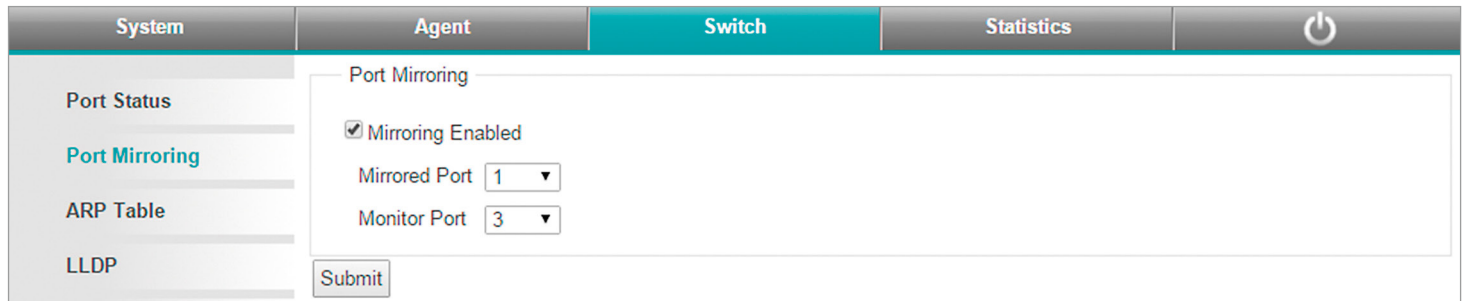
System	Agent	**Switch**	Statistics	⏻

Port Status

Port Status				
	Status	**Speed**	**Phys. Status**	**Link**
Port 1	Enabled ▼	Autoneg ▼	100 MB/FD	up
Port 2	Enabled ▼	Autoneg ▼	100 MB/FD	up
Port 3	Enabled ▼	Autoneg ▼		down
Port 4	Enabled ▼	Autoneg ▼	100 MB/FD	up

Sidebar: Port Status, Port Mirroring, ARP Table, LLDP, DCP, CoS

Submit

11. Port mirroring

In order to be able to carry out frame analyses or recordings, Port Mirroring can be activated in the PROFINET-Switch. With Port Mirroring, the frame transfer from one "mirrored port" to the "Monitor Port" is completely mirrored, on which an analysis PC can then record everything.

System	Agent	**Switch**	Statistics	⏻

Port Mirroring

☑ Mirroring Enabled

Mirrored Port 1 ▼

Monitor Port 3 ▼

Submit

Sidebar: Port Status, Port Mirroring, ARP Table, LLDP

12. Statistics

Detailed statistics on the data transfer can be queried in the "Statistics" menu.

Among other things, the quality of the transmission can be monitored in the sub-menu "Statistics by Error".

System	Agent	Switch	Statistics	⏻

Statistics By Size						
	Received Packages By Size					
Statistics By Type		**64**	**65-127**	**128-255**	**256-511**	**512-1023**	**1024-max.**
	Port 1	2628	1575741	625	8	3	1
Statistics By Error	Port 2	2593	1551554	3	622	1	0
	Port 3	0	0	0	0	0	0
	Port 4	204	74	401	7	52	0

Refresh   Reset Statistics

13. Agents

In order to already be able to view basic information about the switch at the start website, before or without having logged in, the option "System Status Without Login" can be selected. With "Web Session Timeout", it can be established whether an automatic logout should take place in the event of inactivity at the website for security reasons.

System	Agent	Switch	Statistics	⏻

WEB

I&M0

SNMP

Ring Redundancy

Agent Configuration

System Status Without Login ☑

Web Session Timeout (Minutes) `10`

[Submit]

14. SNMP

The PROFINET-Switch supports SNMP ("Simple Network Management Protocol") in order to also enable the identification and diagnosis of the switch for IT administration tools.

System	Agent	Switch	Statistics	⏻

CLI & WEB

I&M0

SNMP

Ring Redundancy

SNMP Settings

System Contact   Muster GmbH

System Name   Max Mustermann

System Location   Maschine 7

Submit

15. Setting the time

The PROFINET-Switch contains a system clock for the issuing of logs and alarm messages. This can be set either manually or automatically by an SNTP server.

System	Agent	Switch	Statistics	⏻

Status
Network
Restart
Password
Event Log
Firmware
Time

Base Configuration

Time Synchronization: Manual Setting ▼
Timezone Offset (Minutes): 0

Submit

Manual Time Setting

TIME (UTC): 19 November ▼ 2015 13:16:00

Submit

Daylight Saving Time

Year	Start	End
YYYY	MMDDhh	MMDDhh

Submit

16. Resetting to factory settings

In order to reset the PROFINET-Switch to the delivery status, the function "Factory Reset" can be used in the web interface under "System" → "Restart".

Alternatively, the PROFINET-Switch can be reset by pressing and holding the "FCN" button while the device restarts. A restart can be carried out by switching the power supply off and on or by activating the RST button.

The successful resetting of the parameters and settings is acknowledged during the boot process by the SF LED lighting up together with the PWR LED.

17. Firmware update

A firmware update can be carried out via the web interface.
The firmware update file can be selected in the menu "System → Firmware".
The file has the ending "HUF" (Helmholz Update File).

The firmware is transferred to the PROFINET-Switch and burned with the "Send" button.

The new firmware is active following a restart of the PROFINET-Switch.

Important: Switching off the power supply during the update process can make the device unusable.

Please download the firmware update file under **www.helmholz.de** or scan the QR code.
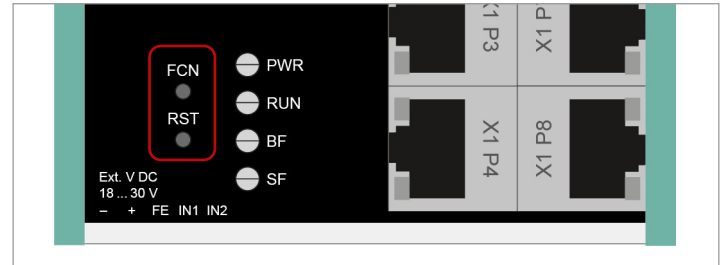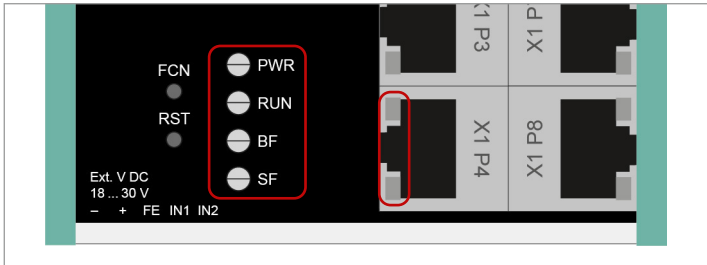

**PROFINET-Switch
4-port, managed**

**PROFINET-Switch
8-port, managed**

**PROFINET-Switch
16-port, managed**

SCAN
QR CODE
TO GET
FIRMWARE

18. LED status information

PWR

Off	No power supply or device defective
On	Device is correctly supplied with voltage

RUN

Flashing light	The device starts
On	The device is ready to operate

BF

On	The device has no configuration and/or there is no connection with the PROFINET controller

SF

On	A PROFINET diagnosis is available

RJ45 LEDs

Green (Link)	Connected
Orange (Act)	Data transfer at the network

Note: The LEDs "RUN", "BF", and "SF" all flash synchronously when the PROFINET function for device identification has been activated.

19. Button functions

FCN	The PROFINET-Switch can be reset to factory settings with the "FCN" button.
	If the "FCN" button is pressed during the run-up time of the switch, the orange "SF" LED begins to flash. The blinking indicates that the switch will be immediately reset to factory settings and restarted as soon as the switch is released.
	The run-up phase is indicated by the blinking of the "RUN" LED.
RST	The "RST" button triggers an immediate restart of the PROFINET-Switch, in the course of which all saved settings are retained.

20. Technical data

	PROFINET-Switch, 4-port, managed 700-850-4PS01	PROFINET-Switch, 8-port, managed 700-850-8PS01	PROFINET-Switch, 16-port, managed 700-850-16P01
Dimensions (D x W x H)	32,5 x 58,5 x 76,5 mm	32,5 x 83,5 x 76,5 mm	32,5 x 147 x 76,5 mm
Weight	Approx. 130 g	Approx. 180 g	Approx. 310 g
PROFINET ports			
- Protocol	PROFINET IO as defined in IEC 61158-6-10	PROFINET IO as defined in IEC 61158-6-10	PROFINET IO as defined in IEC 61158-6-10
- Physical layer	Ethernet	Ethernet	Ethernet
- Transmission rate	100 Mbps, full duplex	100 Mbps, full duplex	100 Mbps, full duplex
- Connection	4 x RJ45, integrated switch	8 x RJ45, integrated switch	16 x RJ45, integrated switch
- Features	Media Redundancy Protocol (MRP) Automatic addressing/ Topology recognition (LLDP, DCP)	Media Redundancy Protocol (MRP) Automatic addressing/ Topology recognition (LLDP, DCP)	Media Redundancy Protocol (MRP) Automatic addressing/ Topology recognition (LLDP, DCP)
Status indicator	4 LEDs function status, 8 LEDs Ethernet status	4 LEDs function status, 16 LEDs Ethernet status	4 LEDs function status, 32 LEDs Ethernet status
Voltage supply	DC 24 V (18 ... 30 V DC)	DC 24 V (18 ... 30 V DC)	DC 24 V (18 ... 30 V DC)
Current draw	Max. 250 mA at 24 V DC	Max. 350 mA at 24 V DC	Max. 290 mA at 24 V DC
Power dissipation	Max. 2.4 W	Max. 2 W	Max. 5.5 W
Permissible ambient temperature	-40 °C ... +75 °C	-40 °C ... +75 °C	0 °C ... +60 °C
Transport and storage temperature	-40 °C ... +85 °C	-40 °C ... +85 °C	-40 °C ... +85 °C
Protection rating	IP 20	IP 20	IP20
Certifications	CE, UL	CE, UL	CE, UL
UL	UL 61010-1/ UL 61010-2-201	UL 61010-1/ UL 61010-2-201	UL 61010-1/ UL 61010-2-201
- Voltage supply	24 V DC (18 ... 30 V DC, SELV and limited energy circuit)	24 V DC (18 ... 30 V DC, SELV and limited energy circuit)	24 V DC (18 ... 30 V DC, SELV and limited energy circuit)
- Pollution degree	2	2	2
- Altitude	Up to 2,000 m	Up to 2,000 m	Up to 2,000 m
- Temperature cable rating	87 °C	87 °C	87 °C