Helmholz®
COMPATIBLE WITH YOU

Quick Start Guide
FLEXtra STAGE PROFINET-Switch 16 Port,
FLEXtra STAGE PROFINET-Switch FO 16-Port
FLEXtra STAGE PROFINET-Switch FO 10-Port

Version 4 en

Order number: 700-855-16P01, 700-856-12F41, 700-856-8FO21

As of firmware V1.10

Helmholz GmbH & Co. KG | Hannberger Weg 2 | 91091 Großenseebach | Germany
Phone +49 9135 7380-0 | Fax +49 9135 7380-110 | info@helmholz.de | www.helmholz.de

24.07.2026

Content

1 Safety instructions 3
2 Introduction 4
3 Preparing the PROFINET Switch 5
3.1 Connecting 5
4 Setup and use 5
4.1 Install GSDML file 5
4.2 Setup in the hardware-configuration 6
4.3 Setup of SFP modules 7
4.4 Setting the port properties 8
4.5 Use of SFP modules 9
4.6 Assign the PROFINET switch a name 10
4.7 Further configuration and diagnosis via the web interface 11
4.7.1 Port Status 11
4.7.2 SFP-Port Information 11
5 Diagnosis via LEDs 12
5.1 System LEDs 12
5.2 Ethernet LEDs P1 – P16 (RJ45) 12
5.3 FO LEDs P13 – P16 (SFP1-4) 12
6 Function of buttons 12
7 Technical data 13
7.1 FLEXtra STAGE PROFINET-Switch 16-port 13
7.2 FLEXtra STAGE PROFINET-Switch FO 16-port 14
7.3 FLEXtra STAGE PROFINET-Switch FO 10-port 15

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

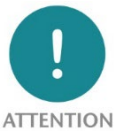
The device has a protection rating of IP 20 (open type) and must be installed in an electrical operating room or a control box/cabinet in order to protect it against environmental influences. To prevent unauthorized operation, the doors of control boxes/cabinets must be closed and possibly locked during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

Security



The device is a network infrastructure component and therefore an important element in the security consideration of a plant. When using the device, therefore, observe the relevant recommendations to prevent unauthorized access to installations and systems. Further information on this can be found in the device manual.

2 Introduction

With the managed FLEXtra STAGE PROFINET switches, both PROFINET components with 100 Mbit/s and Ethernet devices with up to 1000 Mbit/s can be networked. This enables communication from the control level and the machine or the mixing of Ethernet and PROFINET components in one switch. PROFINET prioritization of the machine components according to Conformance Class B is always guaranteed.

In addition to PROFINET, functions such as SNMP, NTP, VLAN, port mirroring, QoS/CoS mapping and extensive statistics are available for managing the Ethernet network.

The practical design with the intelligent arrangement of the Ethernet sockets saves space in the control cabinet. The always clearly visible status LEDs on the top of the FLEXtra PROFINET switches enable easy diagnostics even with full cabling.

In addition to up to 16 RJ45 connections, the FLEXtra STAGE PROFINET switches also support SFP modules for fiber optic connections.

In addition, the FLEXtra STAGE PROFINET switches support the control of ports via inputs and the display of port states via outputs. Bits in the PROFINET-IO image of the switch as well as 4 digital inputs and 2 digital outputs with 24V can be used as inputs and outputs. The assignment and the function of the inputs and outputs can be configured via the GSDML file.

The configuration set via the web interface can be downloaded or saved to an SD card as a backup or for mass commissioning. The SD card is optional.

One of the most important functions of a PROFINET switch is the prioritization of PROFINET telegram traffic in the machine network. The managed switch can distinguish whether the telegram is a web request, an FTP file transfer, a media stream, or a PROFINET telegram. In the event of a high transmission load, the important telegrams can thus be prioritized to prevent telegram losses of the machine components.

The supported PROFINET protocols, such as LLDP, DCP or even diagnostic alarms, can be easily parameterized and managed.

NOTE

This document explains the initial commissioning of the FLEXtra STAGE PROFINET-Switch with a standard use case. The latest version of the document and the detailed manual can be found at www.helmholz.de or scan the QR code directly.

3 Preparing the PROFINET Switch

3.1 Connecting

The FLEXtra STAGE PROFINET Switch must be supplied with 24 VDC via the supplied connector plug at at least one of the two "-/+" wide-range inputs (18 - 30 VDC). The PROFINET Switch has a redundant power supply.

The RJ45 sockets "X1 P1 - X1 P16" are used to connect the network devices (PROFINET or Ethernet).

NOTE

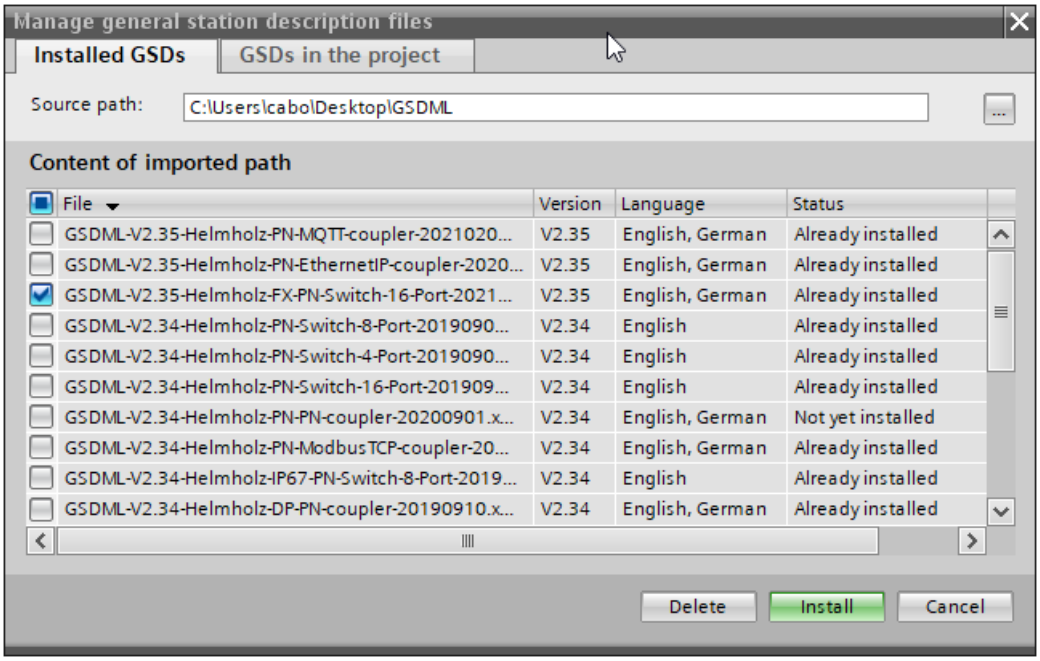
The housing of the PROFINET-Switch is not grounded. Please connect the functional grounding connection (named FE on front) of the PROFINET-Switch correctly with the reference potential.

4 Setup and use

4.1 Install GSDML file

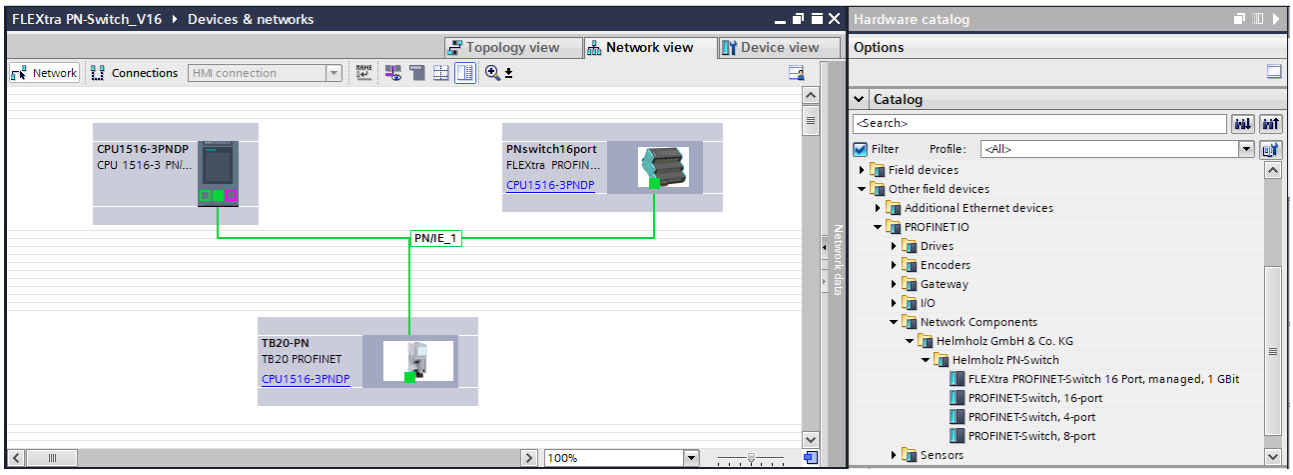
You can download the GSDML file for the FLEXtra STAGE PROFINET-Switch from the website www.helmholz.de in the download area of the product or use the QR code shown.

You can find the “Manage general station description files” dialog in TIA Portal in the menu “Options”.



4.2 Setup in the hardware-configuration

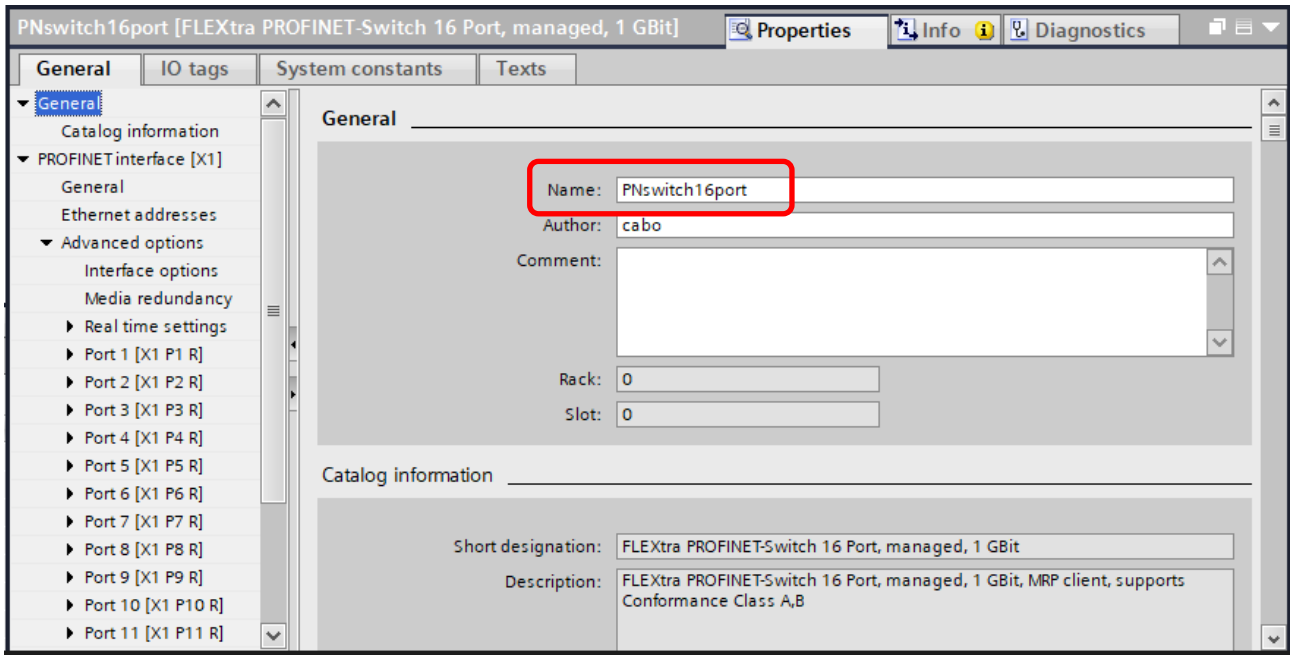
After installation, the FLEXtra STAGE PROFINET-Switch is listed in the hardware catalog under "Other field devices → PROFINET IO → Network Components → Helmholz GmbH & Co. KG → Helmholz PN-Switch" in the hardware catalog. Insert the "FLEXtra PROFINET Switch 16 port" device into the project and connect it to your PROFINET network.



By calling up the object properties, you must give the FLEXtra STAGE PROFINET switch a unique PROFINET name in the project and check the IP address for plausibility.

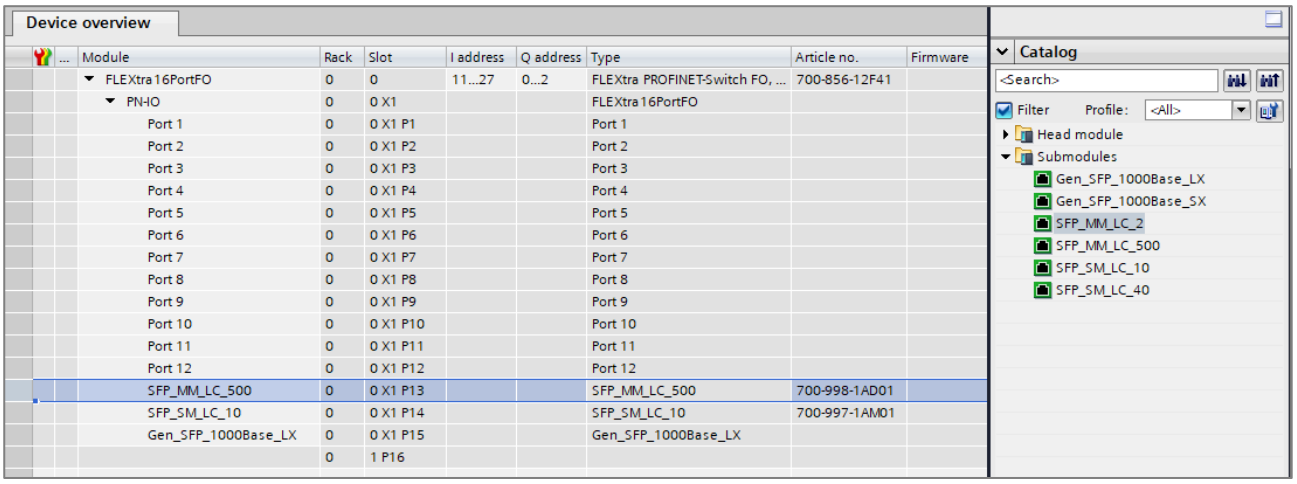
NOTE

The real device must later be assigned to the same name as in the project.



4.3 Setup of SFP modules

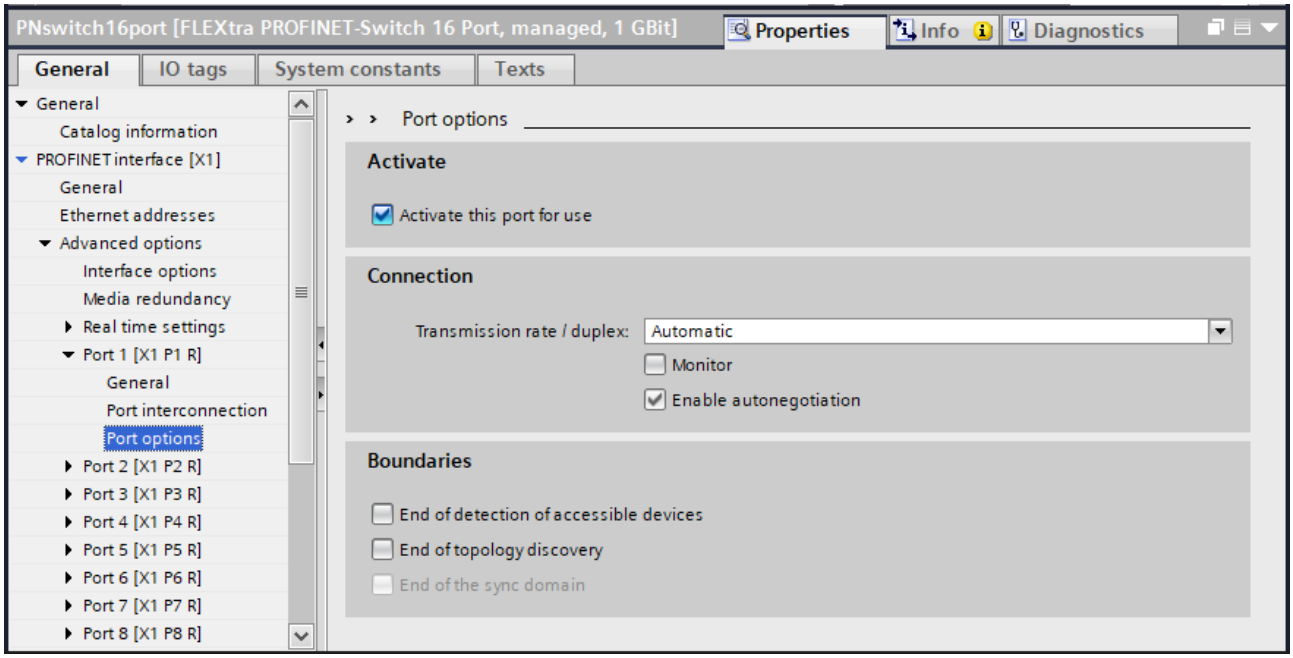
The required SFP modules can be preconfigured for SFP ports 13- 16 in the configuration. The Helmholz SFP modules (see page 9) or an entry for any other SFP module ("Gen_SFP_xxx") are available.



If the Helmholz SFP modules are configured, the FLEXtra PROFINET switch checks whether exactly the configured SFP module has been plugged into the specified port. If an SFP module is missing or an SFP module of a different type is plugged, a diagnosis is triggered. Thus a wrong configuration or a wrong cabling can be detected easily.

4.4 Setting the port properties

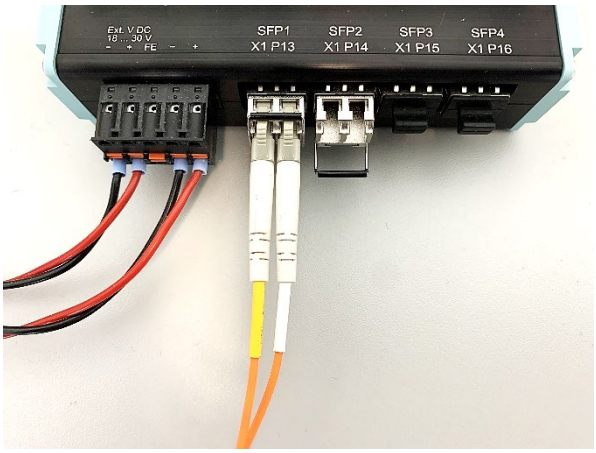
Each port of the PROFINET switch can be individually configured.



“Activate this port”	The port can be switched off here. This option is recommended when the port should not be used. Unauthorized trespass into the network is prevented.
Transmission rate / duplex “Automatic”	The port synchronizes itself automatically with the communication partner (auto-negotiation).
Transmission rate / duplex “TP 100 Mbps 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)
End of detection of accessible devices	The DCP telegrams for recording accessible devices are not forwarded from this port. Subscribers behind this port are no longer displayed under "Accessible subscribers" in the topology. Users behind this port can no longer be reached by the CPU.
End of topology discovery	LLDP frames for topology discovery are not forwarded on this port.

4.5 Use of SFP modules

Up to four SFP transceivers can be plugged into the FLEXtra PROFINET switch FO (SFP1 - SFP4). Each SFP transceiver is a separate port in the switch (ports 13 - 16).



The FLEXtra PROFINET Switch FO has no manufacturer lock-in, i.e. SFP modules from any manufacturer can be used (see below for restrictions).

However, since there are a large number of manufacturers and SFP transceivers on the market, we cannot provide a functional guarantee for all transceivers.

Helmholz offers the following SFP transceiver modules tested with the FLEXtra PROFINET Switch FO:

700-997-1AM01 SFP Transceiver 1000 Mbps, single mode1310 nm, LC-Anschluss, up to 10 km

700-997-1AN01 SFP Transceiver 1000 Mbps, single mode1310 nm, LC-Anschluss, up to 40 km

700-998-1AD01 SFP Transceiver 1000 Mbps, multimode850 nm, LC-Anschluss, up to 500 m

700-998-1AG01 SFP Transceiver 1000 Mbps, multimode1310 nm, LC-Anschluss, up to 2 km

Please ensure that an SFP transceiver with the same technical data is used on the opposite side of the fiber optic connection.

ATTENTION

The FLEXtra PROFINET switch currently only supports SFP transceivers with a transmission speed of 1000Mbit/s.

The FLEXtra PROFINET switch FO does not support SFP+ transceivers.

To plug in a SFP transceiver, the protective cap on the SFP slot must be removed. Please keep the protective cap in case the SFP transceiver is removed again. The protective cap prevents dirt from contaminating the empty SFP slot, which could lead to malfunctions.

NOTE

SFP transceivers can also be plugged in when the FLEXtra PROFINET switch FO is powered and the other ports are in operation. The switch automatically detects newly inserted SFP modules and puts them into operation.

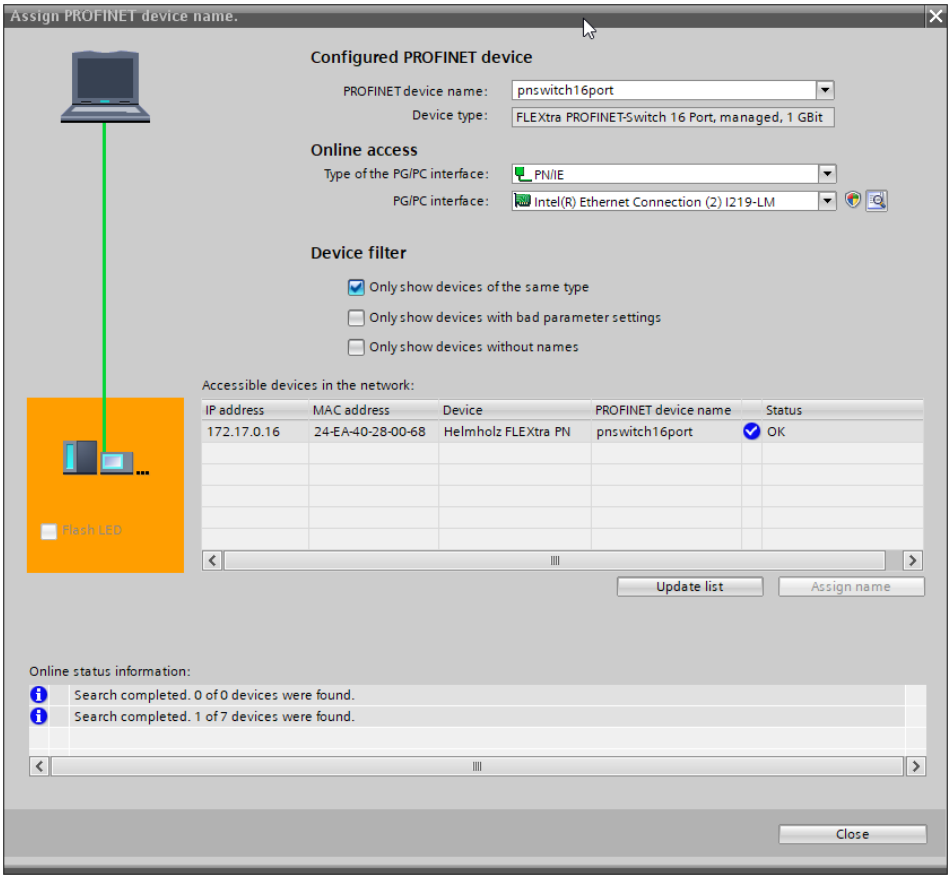
The port properties correspond to those of the RJ45 ports. However, currently only 1000Mbit/s can be used as transmission speed for SFP port and autonegotiation is not available for FO.

4.6 Assign the PROFINET switch a name

When the configuration of the FLEXtra STAGE PROFINET switch has been completed in the hardware configurator of the engineering tool, it can be loaded into the PLC.

In order that the FLEXtra STAGE 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”.



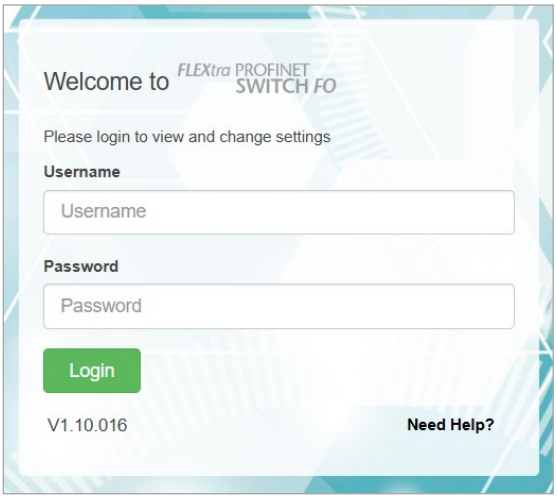
The clear identification of the FLEXtra STAGE PROFINET switch is ensured here by the MAC address of the device. The MAC address of the device can be found on the device front of the PROFINET switch.

If the PROFINET switch has been assigned the correct PROFINET name, it is recognized by the PLC and configured. If configuration has taken place correctly, the PROFINET “BF” LED is off.

The Helmholz IPSet tool, which can be downloaded at no charge from the Helmholz website, can also be used to set the PROFINET name. Scan the following QR code to download the IPSet tool:

4.7 Further configuration and diagnosis via the web interface

Via the web interface, the status of the PROFINET switch can be queried and further functions can be configured. Furthermore, a firmware update can be performed via the web interface.

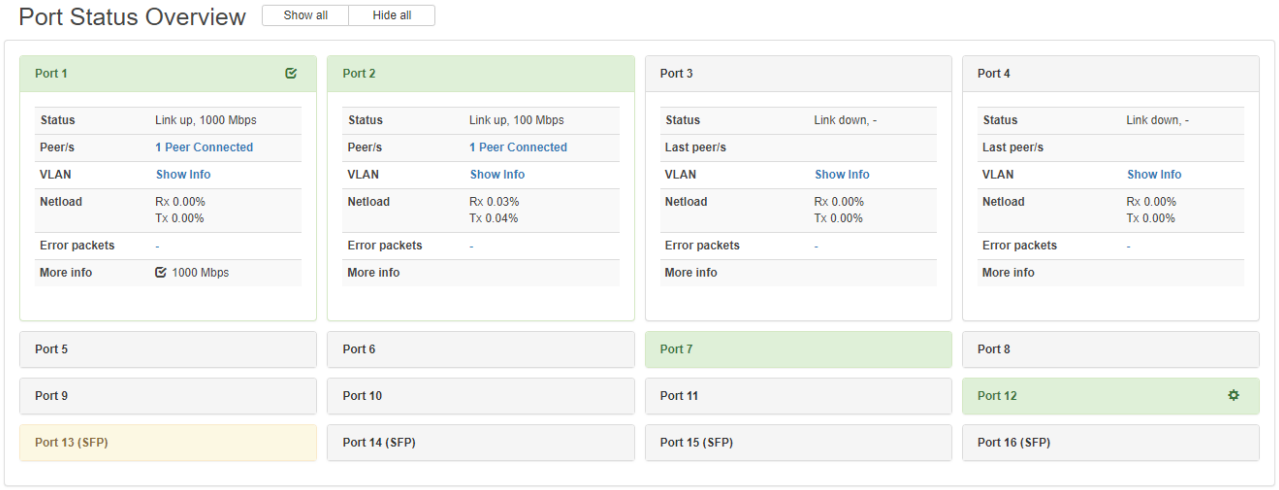


The web interface can be operated as soon as the device has a network configuration. The IP address of the device must be entered as URL.

In the following login dialog, the username is "admin" and the password is the serial number of the PROFINET switch which can be read at the device side. For the first login the default password must be changed.

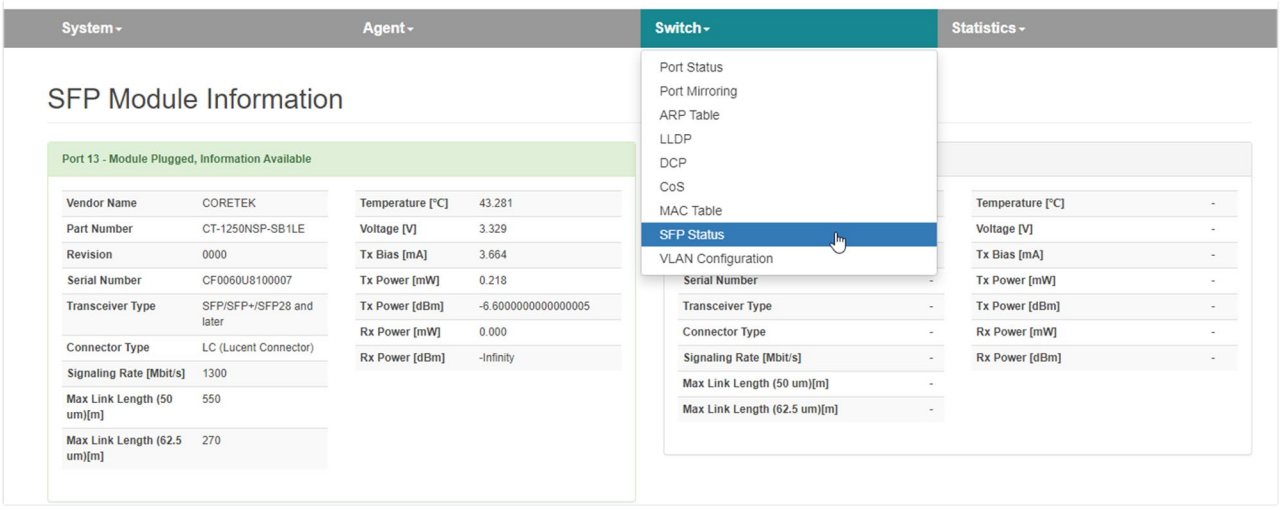
4.7.1 Port Status

On the start page after login, the status of all ports is displayed as an overview:



4.7.2 SFP-Port Information

In the "Switch/SFP Status" menu, the information read out by the switch from the SFP transceiver can be viewed.

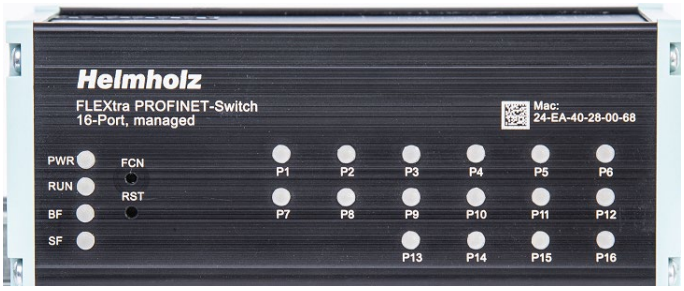


Further information about the web interface can be taken from the manual.

5 Diagnosis via LEDs

The two system LEDs "**PWR**" and "**RUN**" and the two PROFINET LEDs "**BF**" and "**SF**" indicate the system status of the switch. After power-up or a reset, all 4 LEDs remain lit for approx. 5 seconds to indicate the start-up process.

The LEDs P1-P16 indicate the status of the ports.



5.1 System LEDs

PWR	Off	No power supply or device defective
	On	Device is correctly supplied with voltage
RUN	Off	Device is defective
	On	Device is ready to operate
	Flashing	Device is starting up
	Flashing synchronous with BF and SF LED	PROFINET function device identification
BF	On	Bus error, no configuration
	Flashing synchronous with RUN and SF LED	PROFINET function device identification
SF	On	System error, network status in error
	Flashing synchronous with RUN and BF LED	PROFINET function device identification

5.2 Ethernet LEDs P1 – P16 (RJ45)

Off		No network cable connected or network cable defective or partner device off
Green	On	Ethernet connection with 10/100 MBps
	Flashing	Ethernet communication with 10/100 Mbps
Orange	On	Ethernet connection with 1000 Mbps
	Flashing	Ethernet communication with 1000 Mbps

5.3 FO LEDs P13 – P16 (SFP1-4)

Off		No SFP module plugged, FO connection not possible or connected device not present
Orange	On	FO connection with 1000 Mbps
	Flashing	FO communication with 1000 Mbps

6 Function of buttons

The "**RST**" button triggers an immediate restart of the PROFINET switch in which all stored settings are retained. A restart is indicated by the permanent illumination of all 4 status LEDs.

With the "**FCN**" button the PROFINET switch can be reset to factory settings. If the "**FCN**" button is pressed during the switch start-up phase or after a reset, the green "**PWR**" and the orange "**SF**" LEDs light up continuously. This indicates that the switch has loaded the factory setting. After releasing the button, the switch is restarted.

7 Technical data

7.1 FLEXtra STAGE PROFINET-Switch 16-port

Order number	**700-855-16P01**
Name	FLEXtra STAGE PROFINET-Switch 16-Port, managed, 100/1000Mbit
Scope of delivery	PROFINET-Switch 16-Port with power supply plug
Dimensions (D x W x H)	78 x 125 x 112 mm
Weight	Ca. 550 g
PROFINET/Ethernet interfaces (X1)	
Connection	16 x RJ45, integrated Switch
Transmission rate	10/100/1000 Mbps
Protocol	PROFINET IO Device as defined in IEC 61158-6-10
Features	PROFINET Conformance Class B, Media Redundancy (MRP), automatic addressing (DCP), topology detection (LLDP), diagnostic alarms, VLAN, SNMP V2/V3, Port-Mirroring, Port statistics
Digital IO	
Inputs	4, Type 3 as of DIN EN 61131-2
Outputs	2, 500mA 24V DC, with electronic fuse
Status indication	
Function status	4 LEDs
Ethernet status	16 LEDs (bi-colored)
Power supply	
Operating voltage	2x DC 24 V, 18 – 30 V DC, redundant
Current draw	max. 400 mA with DC 24 V
Power dissipation	Max. 9,6 W
Ambient conditions	
Ambient temperature	-40° C to +75° C
Transport and storage temperature	-40° C to +85° C
Relative humidity	95% without condensation
Protection rating	IP 20
Mounting position	As desired
Approvals	CE

7.2 FLEXtra STAGE PROFINET-Switch FO 16-port

Order number	**700-856-12F41**
Name	FLEXtra STAGE PROFINET-Switch FO 16-Port, managed, 100/1000Mbit
Scope of delivery	PROFINET-Switch FO 16-Port with power supply plug
Dimensions (D x W x H)	78 x 125 x 112 mm
Weight	Ca. 550 g
PROFINET/Ethernet interfaces (X1)	
Connection	12 x RJ45 4 x Fiber Optic (FO) for SFP Transceiver modules, Single mode or Multimode integrated Switch
Transmission rate	RJ45: 10/100/1000 Mbps SFP: 1000 Mbps
Protocol	PROFINET IO Device as defined in IEC 61158-6-10
Features	PROFINET Conformance Class B *(in Preparation)*, Media Redundancy (MRP), automatic addressing (DCP), topology detection (LLDP), diagnostic alarms, VLAN, SNMP V2/V3, Port-Mirroring, Port statistics
Digital IO	
Inputs	4, Type 3 as of DIN EN 61131-2
Outputs	2, 500mA 24V DC, with electronic fuse
Status indication	
Function status	4 LEDs
Ethernet status	16 LEDs (bi-colored)
Power supply	
Operating voltage	2x DC 24 V, 18 – 30 V DC, redundant
Current draw	max. 400 mA with DC 24 V
Power dissipation	Max. 9,6 W
Ambient conditions	
Ambient temperature	-40° C to +75° C
Transport and storage temperature	-40° C to +85° C
Relative humidity	95% without condensation
Protection rating	IP 20
Mounting position	As desired
Approvals	CE

7.3 FLEXtra STAGE PROFINET-Switch FO 10-port

Order number	**700-856-8FO21**
Name	FLEXtra STAGE PROFINET-Switch FO 10-Port, managed, 100/1000Mbit
Scope of delivery	PROFINET-Switch FO 10-Port with power supply plug
Dimensions (D x W x H)	78 x 93 x 112 mm
Weight	Ca. 420 g
PROFINET/Ethernet interfaces (X1)	
Connection	8 x RJ45 2 x Fiber Optic (FO) for SFP Transceiver modules, Single mode or Multimode integrated Switch
Transmission rate	RJ45: 10/100/1000 Mbps SFP: 1000 Mbps
Protocol	PROFINET IO Device as defined in IEC 61158-6-10
Features	PROFINET Conformance Class B, Media Redundancy (MRP), automatic addressing (DCP), topology detection (LLDP), diagnostic alarms, VLAN, SNMP V2/V3, Port-Mirroring, Port statistics
Status indication	
Function status	4 LEDs
Ethernet status	10 LEDs (bi-colored)
Power supply	
Operating voltage	2x DC 24 V, 18 – 30 V DC, redundant
Current draw	max. 370 mA with DC 24 V
Power dissipation	Max. 9,3 W
Ambient conditions	
Ambient temperature	-40° C to +75° C
Transport and storage temperature	-20° C to +80° C
Relative humidity	95% without condensation
Protection rating	IP 20
Mounting position	As desired
Approvals	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 from www.helmholz.de.

Our products contain open source software, among others. This software is subject to the respectively relevant license conditions. We can send you the corresponding license conditions, including a copy of the complete license text together with the product. They are also provided in our download area of the respective products under www.helmholz.de. 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.

Our customers are important to us, we are happy to receive suggestions and ideas for improvement. If you have any questions regarding the use of the product, please contact Helmholz Support by phone or send an e-mail to support@helmholz.de.

All trademarks shown or mentioned in this document are the property of their respective owners or manufacturers. The representation and naming serve exclusively to explain the use and setting options of the products documented here.