PSSnet SHL Series – Devices
Managed Ethernet Switches

Industrial Ethernet Switches – PSSnet S

pilz
more than automation
safe automation

Installation – Mat - No. 22750 – EN - 01

Content

Safety instructions

Notes on safety

This manual contains instructions to be observed for ensuring your personal safety and for preventing damage. The warnings appear next to a warning triangle with a different heading depending on the degree of danger posed:

Danger!
Means that death, serious physical injury or significant damage to property **will occur** if the corresponding safety measures are not carried out.

Warning!
Means that death, serious physical injury or significant damage to property **could occur** if the corresponding safety measures are not carried out.

Caution!
Means that minor physical injury or damage to property can occur if the required safety measures are not carried out.

Note: Contains important information on the product, on how to manage the product, or on the respective section of the documentation to which your special attention is being drawn.

Certified usage

Please observe the following: The device may only be employed for the purposes described in the catalog and technical description, and only in conjunction with external devices and components recommended or approved by the manufacturer. The product can only be operated correctly and safely if it is transported, stored, installed and assembled properly and correctly. Furthermore, it must be operated and serviced carefully.

Supply voltage

For safety reasons the devices have been designed to operate at low voltages. Thus, they may only be connected to the supply voltage connections and to the signal contact with SELV circuits with the voltage restrictions in accordance with IEC/EN 60950-1.
The supply voltage is electrically isolated from the housing.
☐ Use only undamaged parts.

- ☐ Relevant for North America: For use in Class 2 circuits.
  The device may only be connected to a supply voltage of class 2 that fulfills the requirements of the National Electrical Code, Table 11(b). If the voltage is being supplied redundantly (two different voltage sources), the combined supply voltages must fulfill the requirements of the National Electrical Code, Table 11(b).
- ☐ Relevant for North America: For use in Class 2 circuits.
  Only use copper wire/conductors of class 1, 75 °C.
- ☐ Relevant for North America
  for devices certified for hazardous locations:
  Power, input and output (I/O) wiring must be in accordance with Class I, Division 2 wiring methods [Article 501-4(b) of the National Electrical Code, NFPA 70] and in accordance with the authority having jurisdiction.
- ☐ For devices installed in explosive gas atmospheres according to ATEX RL 94/9 EG (only for devices labelled accordingly):
  Relevant for Europe (ATEX RL 94/9 EG): ⟨Ex⟩ II 3G Ex nA II T3 ... T4 - refer to the device label.
  Must be mounted in a suitable certified IP 54 housing –
  tested to 4 J impact due to low risk of mechanical danger.
  For ambient temperatures below -10 °C and above +60 °C use wiring suitable for both the minimum and maximum temperatures.
  Connectors may be connected exclusively in dead-voltage state.
  DIP switches may be switched exclusively in dead-voltage state.
- ☐ The device does not contain any service components. Internal fuses are only triggered if there is a fault in the device. If the device is not functioning correctly, or if it is damaged, switch off the voltage supply and return the device to the plant for inspection.
- ☐ Only switch on the supply voltage to the device if
  - the housing is closed,
  - the terminal blocks are wired up correctly and
  - the terminal blocks are connected.

Supply voltage for PoE power supply units (optional)

- ☐ Connect the protective conductor with the ground screw before you set up the other connections. When removing the connections, you remove the protective conductor last.
- ☐ Make sure that the cross-section of the protective conductor cable is the same size as or bigger than the cross-section of the voltage supply cables.
- ☐ Only use connection cables that are permitted for the specified temperature range.

Warning!
- If the neutral conductor or the negative terminal of the supply voltage is not grounded
- If you are using a DC voltage greater than 125 V DC for the supply voltage install a suitable input fuse.

For RPS90/48V-LV power supply units, use a slow-blow fuse with a nominal rating of 10 A for the voltage supply input.
For RPS90/48V-HV power supply units, use a slow-blow fuse with a nominal rating of 6.3 A.
With AC power supply, use a cable cross-section of at least 0.75 mm² (for North America AWG 18) for the current conductor at the voltage input.
With DC power supply, use a cable cross-section of at least 1.0 mm² (for North America AWG 16) for the current conductor at the voltage input.

Warning!
Only connect a supply voltage that corresponds to the type plate of your device.

- PoE power supply unit RPS90/48V LV:18 V DC to 60 V DC
- PoE power supply unit RPS90/48V HV:48 V DC to 320 V DC or 90 V AC to 265 V AC

Shielding ground

Note: The shielding ground of the connectable twisted pair lines is connected to the front panel as a conductor.

☐ Beware of possible short circuits when connecting a cable section with conductive shielding braiding.

ATEX RL 94/9 EG

☐ The modules shall be installed in an enclosure in accordance with EN 60079-15 providing a degree of protection of at least IP54 according to EN 60529, taking into account the environmental conditions under which the equipment will be used.
☐ When the temperature under rated conditions exceeds 70 °C at the cable or conduit entry point, or 80 °C at the branching point of the conductors, the temperature specification of the selected cable shall be in compliance with the actual measured temperature values.
☐ Provisions shall be made to prevent the rated voltage from being exceeded by transient disturbances of more than 40%.

EN 60079-0 : 2006 EN 60079-15 : 2005
II 3G Ex nA II T3 ... T4

Housing

Warning!
Never insert sharp objects (small screwdrivers, wires, etc.) into the inside of the product. There is the risk of an electric shock.

Warning!
When installing the device, make sure the ventilation slots remain free, as otherwise damage can occur through overheating. Only technicians authorized by Pilz are permitted to open the housing.
The housing is grounded via the separate ground screw on the bottom left of the front panel.

For the ground conductor, use a cable with a cross section of at least 1.0 mm².

☐ The clearance to the ventilation slits of the housing must be at least 10 cm (3.94 in).

☐ The device must be installed in the vertical position.
☐ If installed in a living area or office environment, the device must be operated exclusively in switch cabinets with fire protection characteristicsin accordance with EN 60950-1.

Environment

The device may only be operated at the specified ambient temperature (temperature of the ambient air at a distance of up to 5 cm (1.97 in) from the device) and relative air humidity.
☐ Install the device in a location where the climatic threshold values specified in the technical data are adhered to.
☐ Only to be used in an environment with the contamination level specified in the technical data.

Qualification requirements for personnel

Qualified personnel as understood in this manual and the warning signs, are persons who are familiar with the setup, assembly, startup, and operation of this product and are appropriately qualified for their job. This includes, for example, those persons who have been:

- trained or directed or authorized to switch on and off, to ground and to label power circuits and devices or systems in accordance with current safety engineering standards;
- trained or directed in the care and use of appropriate safety equipment in accordance with the current standards of safety engineering;
- trained in providing first aid.

General safety instructions

Electricity is used to operate this equipment. Comply in every detail with the safety requirements specified in the operating instructions regarding the voltages to apply (see page 4).

Non-observance of these safety instructions can therefore cause material damage and/or serious injuries.

- ☐ Only appropriately qualified personnel should work on this device or in its vicinity. These personnel must be thoroughly familiar with all the warnings and maintenance procedures in accordance with this operating manual.
- ☐ The proper and safe operation of this device depends on proper handling during transport, proper storage and assembly, and conscientious operation and maintenance procedures.
- ☐ Never start operation with damaged components.
- ☐ Only use the devices in accordance with this manual. In particular, observe all warnings and safety-related information.
- ☐ Any work that may be required on the electrical installation may only be carried out by personnel trained for this purpose.

Note:
LED or LASER components in compliance with IEC 60825-1 (2001):
CLASS 1 LASER PRODUCT
CLASS 1 LED PRODUCT

Warning
Laser light
Do not look into the beam or view it directly with optical instruments (e.g. magnifying glasses, microscopes).
Failure to observe this warning within a distance of 100 mm can endanger your sight.
Light is emitted from the optical connections or from the ends of the optical fibers that are connected to them. Light Emitting Diode CLASS 2M, wave length 650 nm, power <2 mW, according to
DIN EN 60825-1:2003-10.

National and international safety regulations

- ☐ Make sure that the electrical installation meets local or nationally applicable safety regulations.

Note on the CE marking

The devices comply with the regulations contained in the following European directive(s):

2004/108/EG
Directive of the European Parliament and the council for standardizing the regulations of member states with regard to electromagnetic compatibility.

In accordance with the above-named EU directive(s), the EU conformity declaration will be at the disposal of the relevant authorities at the following address:

Pilz GmbH & Co. KG
Felix Wankel Str. 2
73760 Ostfildern
Tel.: +49 711 3409 0

The product can be used in living areas (living area, place of business, small business) and in industrial areas.

- Interference immunity: EN 61000-6-2:2005
- Emitted interference: EN 55022:2006 + A1:2007 Class A

Warning!
This is a class A device. This device can cause interference in living areas, and in this case the operator may be required to take appropriate measures.
The assembly guidelines provided in these instructions must be strictly adhered to in order to observe the EMC threshold values.

FCC note:

Appropriate testing has established that this device fulfills the requirements of a class A digital device in line with part 15 of the FCC regulations.
These requirements are designed to provide sufficient protection against interference when the device is being used in a business environment. The device creates and uses high frequencies and can radiate same, and if it is not installed and used in accordance with this operating manual, it can cause radio transmission interference. The use of this device in a living area can also cause interference, and in this case the user is obliged to cover the costs of removing the interference.

Recycling note

After usage, this product must be disposed of properly as electronic waste in accordance with the current disposal regulations of your county / state / country.

About this manual

The following manuals are included as PDF files on the enclosed CD ROM:

- User manual “Installation”
- User manual “Basic configuration”
- User manual “Redundancy configuration”
- Reference manual “Web-based Interface” and
- Reference manual “Command Line Interface”

The Network Management Software HiVision/Industrial HiVision provides you with additional options for smooth configuration and monitoring:

- Configuration of multiple devices simultaneously.
- Graphical interface with network layouts.
- Auto-topology discovery.
- Event log.
- Event handling.
- Client / Server structure.
- Browser interface
- ActiveX control for SCADA integration
- SNMP/OPC gateway

Key

The commendations used in this manual have the following meanings:

▶	Listing
☐	Work step
■	Subheading

1 Device description

The PSSnet SHL family provides you with a range of Switch variants. You can set up your device individually based on different criteria:

- Number of ports
- Media type
- Types of connectors

The PSSnet SHL devices are designed for the special requirements of industrial automation. They meet the relevant industry standards, provide very high operational reliability, even under extreme conditions, and also long-term reliability and flexibility.

The devices allow you to set up switched industrial ETHERNET networks that conform to the IEEE 802.3 and 802.3u standards using copper wires or optical fibers in a line or ring structure.

The devices work without a fan.

The voltage is supplied redundantly.

Mount the devices by

- simply snapping them onto a DIN rail
- mounting them on a wall (only RS22/RS32)

Depending on the device variant, you can choose various media to connect terminal devices and other infrastructure components:

- twisted pair cable
- multimode F/O
- singlemode F/O

The twisted pair ports support:

- Autocrossing
- Autonegotiation
- Autopolarity

There are a number of convenient options for managing the device. Administer your devices via:

- a Web browser
- Telnet
- management software (e.g. HiVision)
- a V.24 interface (locally on the Switch)

The HIPER-Ring / MRP redundancy concept enables a quick reconfiguration. With one additional connection, projection remains simple.

Product configuration data can be provided by:

- diagnosis displays
- displaying the operating parameters
- a label area for the IP address

Depending on the software you choose, the devices provide you with a large range of functions:

- Redundancy functions
  - Rapid Spanning Tree Protocol (RSTP)
  - Redundant ring structure
  - HIPER-Ring
  - Redundant coupling
  - Link aggregation
  - Redundant power supply
- Security
  - Protection from unauthorized access
  - Blocking of unauthorized messages (MAC or IP based)
- Synchronized system time in the network
- Network load control
- Operation diagnosis
- Diagnostics (hardware self-testing)
- Reset
- Priority
- VLAN
- Topology Discovery
- Web-based Interface
- Command Line Interface CLI
- SNMP
- 802.1x port authentication
- Real Time Clock

1.1 Description of the device variants

The devices differ with regard to the range of software functions, the number of interfaces, and the media type for connecting segments.

The table below shows three port categories for each product variant: uplink ports and other ports. The table also shows for each product category the number of ports you can select, and the type of ports. In the column for the port type, the abbreviations F/O (optical fiber) and TP (twisted pair) indicate the media type, while the abbreviations SC and RJ45 indicate the socket type.

Typ	Number of TP Ports / Socket	Number of F/O Ports / Type / Socket
PSSnet SHL 8T MRP	8, RJ 45	
PSSnet SHL 6T 1FMMSC MRP	6, RJ 45	2 Multimode SC
PSSnet SHL 6T 1FSMSC MRP	6, RJ 45	2 Singlemode SC

The devices comply with the specifications of the standard(s):

- ISO/IEC 8802-03 10BASE-T/100BASE-TX/1000BASE-T
- ISO/IEC 8802-03 100BASE-FX
- ISO/IEC 8802-03 1000BASE-SX/LX

1.1.1 Combination options for PSSnet SHL

The product designation of your device is made from combining the desired product characteristics in accordance with the following table. You will find the corresponding short designation in column 3.

Item	Characteristic	Ident.	Property
1	Product	PSS-net SHL	Managed Industrial Ethernet Switch
2	Number of 10/100	6	4 * 10/100 Mbit/s Ethernet (TX)
	Mbit/s-Ports (TX)	8	8 * 10/100 Mbit/s Ethernet (TX)
3	Number of 10/100 Mbit/s F/O Ports (FX)	2F	2 FX Ports, 100 Mbit/s
4	F/O Ports Type	MM	Multimode FX, 100 Mbit/s
		SM	Singlemode FX, 100 Mbit/s
5	F/O Ports Socket	SC	SC Socket
6	Ring redundancy Type	MRP	Media Redundancy Protocol

Table 1: Combination options of device variants PSSnet SHL

1.1.2 Number of ports and media for PSSnet SHL..

Figure 1: Device variants with 8 10/100 Mbit/s ports (PSSnet SHL 6T 2F... and PSSnet SHL 8T...)*
1 – plug-in terminal block, 6-pin
2 – LED display elements
3 – 2-pin DIP switch
4 – USB interface
5 – V.24 connection for external management
6 – ports in compliance with 10/100BASE-T(X) (RJ45 connections)
7 – port 1 + port 2: Multimode (MM) or Singlemode (SM) Fiber optic ports.
8 – MAC address field
9 – IP address field

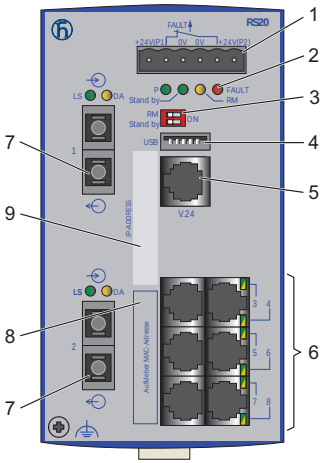

*Figure 2: Device variants with 8 * 10/100 Mbit/s ports 1 to 9 – see fig. 1*

2 Assembly and start-up

The devices have been developed for practical application in a harsh industrial environment. The installation process is correspondingly simple.
On delivery, the device is ready for operation.

The following thematic sequence has proven itself in practice:

- Unpacking and checking
- Installing the SFP modules (optional)
- Insert data in label area
- Adjust DIP switch settings
- Connect PoE power unit (optional)
- Connect the terminal block for voltage supply and signal contact and connect the supply voltage
- Install the device on the DIN rail hub, grounding
- Install the terminal block, start-up procedure
- Connecting the data lines

2.1 Installing the device

2.1.1 Unpacking and checking

☐ Check whether the contents of the package are complete (see “Scope of delivery“.
☐ Check the individual parts for transport damage.

2.1.2 Installing the SFP modules (optional)

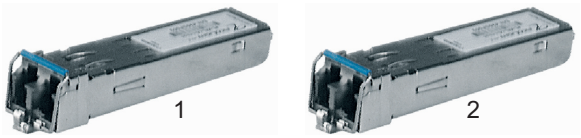

Figure 3: 1 - Fast EHTERNET fiber optic SFP module
2 - Gigabit ETHERNET fiber optic SFP module

☐ Before attaching anSFP module, first remove the protective cap over the socket.
☐ Push the SFP module with the lock closed into the socket until it latches audibly in place.

Note: Only use Pilz SFP modules (see “Scope of delivery“).

2.1.3 Insert data in label area

The information field for the IP address on the front of the device helps you to structure your network installation clearly.

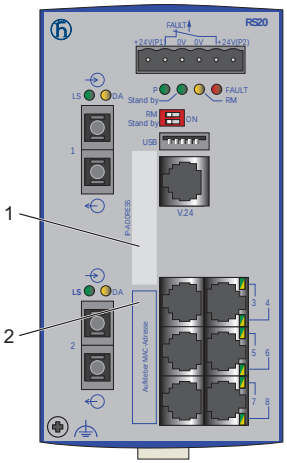

Figure 4: Label area for IP address of device
1 – IP address of device (label area)
2 – MAC address of device (label)

2.1.4 Adjust DIP switch settings

The 2-pin DIP switch on the front panel of the device gives you the following options:

Figure 5: 2-pin DIP switch

Switch RM position	Switch stand-by position	Ring redundancy	Coupling switch	Ring Manager	Coupling Manager	Ring port	Control port	Coupling port	Software configuration
OFF	OFF	on	on	off	off	1 + 2			
ON	OFF	on	on	on	off	1 + 2			
OFF	ON	on	on	off	on	1 + 2	3	4	
ON	ON								SW config. has priority over DIP switch configuration

State on delivery: both DIP switches “ON”.

☐ Before starting operation of the device, check whether the default settings of the DIP switch correspond to your requirements.

2.1.5 Supply voltage and signal contact

The supply voltage and the signal contact are connected via a 6-pin terminal block with a snap lock.

Caution!
Note the safety instructions (see on page 4 “Notes on safety“) and only connect a supply voltage that corresponds to the type plate of your device. Make sure that the contact load capability of the signal contact is not exceeded (see on page 50 “Technical data“).

Supply voltage

The supply voltage can be connected redundantly. Both inputs are uncoupled. There is no distributed load. With redundant supply, the power supply unit supplies the device alone with the higher output voltage. The supply voltage is electrically isolated from the housing.
See “Insulation voltage” in chapter “Technical data“ on page 50.

You can choose between DC or AC voltage when connecting the supply voltage. You use the +24V and 0V pins to connect the AC voltage (see fig. 16).

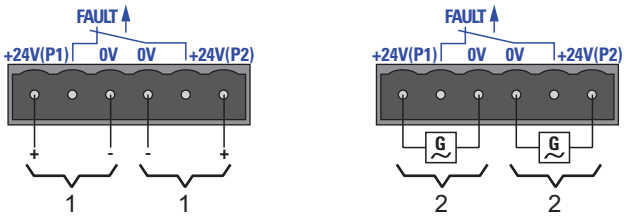

Figure 6: Connecting the supply voltage at the 6-pin terminal block
1 – DC voltage, voltage range: 9.6 V DC to 60 V DC
2 – AC voltage, voltage range: 18 V AC to 30 V AC

Note: With non-redundant supply of the main voltage, the device reports a loss of power. You can avert this message by applying the supply voltage via both inputs, or by changing the configuration in the Management.

Signal contact

- The signal contact (“FAULT”, for pin assignment of terminal block, see fig. 16) monitors the functioning of the device, thus enabling remote diagnostics. You can specify the type of function monitoring in the Management.
- You can also use the switch Web page to switch the signal contact manually and thus control external devices.

A break in contact is used to report the following conditions via the potential-free signal contact (relay contact, closed circuit):

- The detected inoperability of at least one of the two voltage supplies (voltage supply 1 or 2 is below the threshold value).
- A continuous malfunction in the device.
- The loss of connection at at least one port. The report of the link status can be masked by the Management for each port. In the delivery state,link status monitoring is deactivated.
- The loss of ring redundancy reserve.
- A detected error during the self-test.
- Incorrect configuration of the HIPER-Ring /MRP or ring coupling.

The following condition is also reported in RM mode:

- Ring redundancy reserve is available. On delivery, there is no ring redundancy monitoring.

☐ Pull the terminal block off the device and connect the power supply and signal lines.

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2.1.6 Installing the device on the DIN rail hub, grounding

Mounting on the DIN rail

The devices are mounted very quickly by snapping them onto the DIN rail.

☐ Mount the device on a 35 mm DIN rail in accordance with DIN EN 60175.

☐ Attach the upper snap-in guide of the device into the DIN rail and press it down against the DIN rail until it snaps into place.

Note: The shielding ground of the connectable twisted pair lines is connected to the front panel as a conductor.

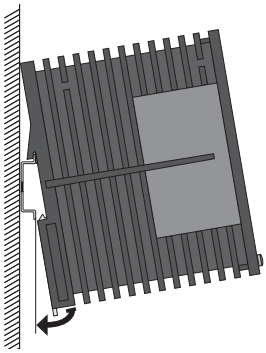


Figure 7: Mounting on the DIN rail

☐ .

Grounding

With the PSSnet SHL, the front panel of the device is grounded via the separate ground screw.

☐ For the ground conductor, use a cable with a cross section of at least 1.0 mm².

2.1.7 Dimension drawings

Dimension drawings for PSSnet SHL

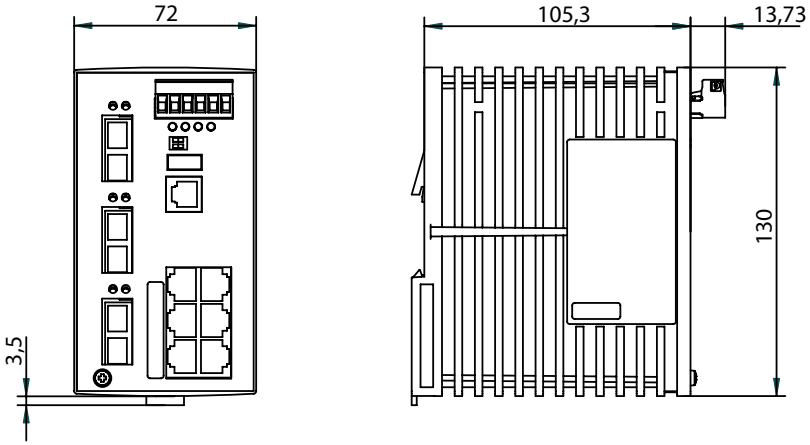


Figure 8: Dimensions of device variants with 8 ports

2.1.8 Installing the terminal block, start-up procedure

☐ Mount the terminal block for the voltage supply and signal contact on the front of the device using the snap lock. Make sure that the snap lock snaps into place.

By connecting thevoltage supply via the terminal block, you start the operation of the device.

2.1.9 Connecting the data lines

You can connect terminal devices and other segments at the ports of the device via twisted pair cables or F/O cables.

☐ Install the data lines according to your requirements.

10/100 Mbit/stwisted pair connection

These connections are RJ45 sockets.
10/100 Mbit/s TP ports enable the connection of terminal devices or independent network segments according to the IEEE 802.3 10BASE-T/ 100BASE-TX standard.
These ports support:

- Autonegotiation
- Autopolarity
- Autocrossing (if autonegotiation is activated)
- 100 Mbit/s half-duplex mode, 100 Mbit/s full duplex mode
- 10 Mbit/s half-duplex mode, 10 Mbit/s full duplex mode

State on delivery: autonegotiation activated.
The socket housing is electrically connected to the front panel.

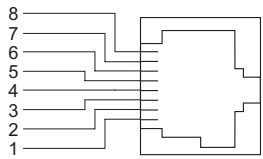
Figure	Pin	Function
	1+2	One line pair
	3+6	One line pair
	4,5,7,8	Not used

Table 2: Pin assignment of a TP/TX interface in MDI-X mode, RJ45 socket

100 Mbit/s F/O connection

In device variants PSSnet SHL....SC....these ports are SC connectors. 100 MBit/s F/O ports enable the connection of terminal devices or independent network segments in compliance with the IEEE 802.3 100BASE-FX standard.

These ports support:

- Full or half duplex mode

State on delivery: full duplex FDX

Note: Make sure that SM ports are only connected with SM ports, and MM ports only with MM ports.

2.2 Display elements

After the operating voltage is set up, the software starts and initializes itself. Afterwards, the device performs aself-test. During this process, various LEDs light up. The process takes around 60 seconds.

Device state

These LEDs provide information about conditions which affect the operation of the whole device.

Figure 9: Device status LEDs

P - Power (green/yellow LED)	
Glowing green	Both supply voltages are on
Glowing yellow	There is only one supply voltage (P1 or P2) on
Not glowing	Supply voltages P1 and P2 are too low

FAULT - error, signal contact (red LED)[a]	
Glowing red	The signal contact is open, i.e. it is reporting an error.
Not glowing	The signal contact is closed, i.e. it is not reporting an error.

a. If the manual adjustment is active on the “FAULT” signal contact, then the detected error display is independent of the setting of the signal contact.

RM - Ring Manager (green/yellow LED)	
Glowing green	RM function active,redundant port disabled
Glowing yellow	RM function active, redundant port enabled
Not glowing	RM function not active
Flashing green	Incorrect configuration of the HIPER-Ring (e.g. the ring is not connected to the ring port).

Stand-by	
Glowing green	Stand-by mode enabled
Not glowing	Stand-by mode not enabled
RM and Stand-by - display saving processes of the AutoConfiguration Adapter (ACA)	
Flashing alternately	Error during saving process.
LEDs flash synchronously, two times a second	Loading configuration from the ACA.
LEDs flash synchronously, once a second	Saving the configuration in the ACA.

Port state

The green and yellow LEDs at the individual port display port-related information. During the boot phase, these LEDs are used to display the status of the boot procedure.

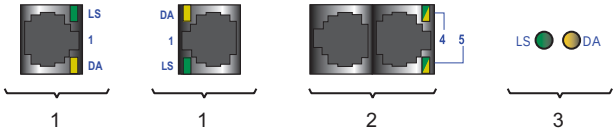


Figure 10: Port status LEDs

1 – Port status LEDs for isolated or single-row RJ45 sockets: one green and one yellow LED per port.

2 – Port status LEDs for double-row RJ45 sockets: one LED per port, glowing/flashing either green or yellow.

3 – Port status LEDs for DSC, ST, SFP

LS - link status (green LED)	
Not glowing	No valid connection.
Glowing green	Valid connection.

LS - link status (green LED)	
Flashing green (1 time a period)	Port is switched to stand-by.
Flashing green (3 times a period)	Port is switched off.

DA - data (yellow LED)	
Not glowing	No data reception at corresponding port
Flashing yellow	Data reception at corresponding port

2.3 Basic set-up

The IP parameters must be entered when the device is installed for the first time. The device provides the following options for configuring IP addresses:

- Configuration via V.24 connection
- Configuration using the HiDiscovery protocol
- Configuration via BOOTP
- Configuration via DHCP
- Configuration via DHCP Option 82
- Configuration using AutoConfiguration Adapter

Further information on the basic settings of the device can be found in the "Basic Configuration" user manual on the CD ROM.

Default settings

- IP address: The device looks for the IP address using DHCP
- Password for management:
  Login: user; password: public (read only)
  Login: admin; password: private (read and write)
- V.24 data rate: 9,600 Baud
- Ring redundancy: disabled
- Ethernet ports: link status is not evaluated (signal contact)
- Optical 100 Mbit/s ports: 100 Mbit/s, full duplex
  All other ports: autonegotiation
- Ring Manager disabled (DIP switch RM and stand-by: ON)
- Stand-by coupling disabled (DIP switch RM and stand-by: ON)
  Port 4 = control port, port 3 = coupling port for red. Ring coupling
- Rapid Spanning Tree enabled

USB interface

The USB socket has an interface for the local connection of an AutoConfiguration Adapter PSSnet SCA. It is used for saving/loading the configuration data and diagnostic information, and for loading the software.

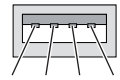
Figure	Pin	Function
	1	VCC (VBus)
	2	- Data
	3	+ Data
	4	Ground (GND)

Table 3: Pin assignment of the USB interface

V.24 interface (external management)

The V.24 interface is an RJ11 socket.
At the V.24 connection, a serial interface is provided for the local connection of an external management station (VT100 terminal or PC with corresponding terminal emulation). This enables you to set up a connection to the Command Line Interface (CLI) and to the system monitor.

VT 100 terminal settings	
Speed	9,600 Baud
Data	8 bit
Stopbit	1 bit
Handshake	off
Parity	none

The socket housing is electrically connected to the front panel of the device.
The V.24 interface is not electrically isolated from the supply voltage.

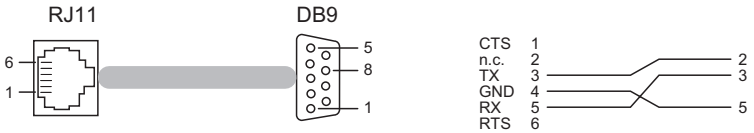


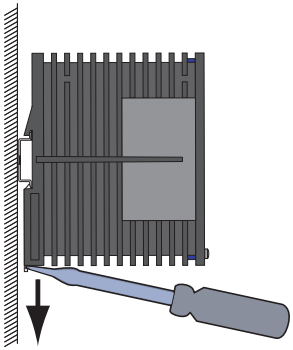
Figure 11: Pin assignment of the V.24 interface and wiring to the DB9 connector

You will find a description of the V.24 interface in the “Basic Configuration User Manual” on the CD-ROM.

2.4 Disassembly

Removing the device from the DIN rail

☐ To take the device off the DIN rail, insert a screwdriver horizontally under the housing into the locking slide, pull it (without tipping the screwdriver) downwards and lift the device upwards.



3 Technical data

General technical data

Dimensions W x H x D	PSSnet SHL 6T... PSSnet SHL 8T....	74 mm x 131 mm x 111 mm
Weight	PSSnet SHL 6T... PSSnet SHL 8T..	410 g
Power supply	Operating volta Rated voltage range DC Max. voltage range DC Rated voltage range AC Max. voltage range AC	 12 to 48 V DC min. 9.6 to max. 60 V DC 24 V AC min. 18 to max. 30 V AC Safety extra-low voltage (SELV), redundant inputs disconnected. Relevant for North America: Nec Class 2 power source max. 5A.
Overload current protection at input		Non-replaceable fuse
Insulation voltage between operating voltage connections and housing		800 V DC Protective elements limit the insulation voltage to 90 V DC (1mA)
"FAULT" signal contact	Switching current	max. 1 A, SELV
	Switching voltage	max. 60 V DC or max. 30 V AC, SELV
Environment	Storage temperature (ambient air)	-40 °C to +70 °C
	Humidity	10% to 95% (non-condensing)
	Air pressure	Up to 2000 m (795 hPa), higher altitudes on request
Operating temperature		0 °C to +60 °C
Contamination level		2
Protection classes	Laser protection	Class 1 according to EN 60825-1 (2001)
	Protection class	IP 20

EMC and immunity

EMC interference immunity		
IEC/EN 61000-4-2	Electrostatic discharge	
	Contact discharge	4 kV
	Air discharge	8 kV

EMC interference immunity		
IEC/EN 61000-4-3	Electromagnetic field	
	80 - 2,000 MHz	10 V/m
IEC/EN 61000-4-4	Fast transients (burst)	
	Power line Data line	2 kV 1 kV
IEC/EN 61000-4-5	Voltage surges	
	Power line, line / line Power line, line / earth Data line	0.5 kV 1 kV 1 kV
IEC/EN 61000-4-6	Line-conducted interference voltages	
	10 kHz - 150 kHz 150 kHz - 80 MHz	3 V 10 V
EN 61000-4-9	Impulse-shaped magnetic fields	—
EMC emitted interference		
EN 55022	Class A	Yes
FCC 47 CFR Part 15	Class A	Yes
German Lloyd	Classification + Construction Guidelines VI-7-3 Part 1 Ed.2001	—
Stability		**Bi)**
Vibration	IEC 60068-2-6 Test FC test level according to IEC 61131-2	Yes Yes
	Germanischer Lloyd Guidelines for the Performance of Type Tests Part 1	— Yes
	IEC 870-2-2 table 3 normal installation according to EN 61850-3	—
Shock	IEC 60068-2-27 Test Ea test level according to IEC 61131-2	Yes
	IEC 870-2-2 table 3 normal installation according to EN 61850-3	—

Network range

TP port	
Length of a twisted pair segment	max. 100 m / 300 ft

Table 4: TP port 10BASE-T / 100BASE-TX

Product code	Wave length	Fiber	System attenuation	Expansion	Fiber data
MM	1300 nm	50/125 µm	0-8 dB	0-5 km	1.0 dB/km, 800 MHz*km
MM	1300 nm	62.5/125 µm	0-11 dB	0-4 km	1.0 dB/km, 500 MHz*km
SM	1300 nm	9/125 µm	0-16 dB	0-30 km	0.4 dB/km; 3.5 ps/(nm*km)

Table 5: F/O port 100BASE-FX

MM = Multimode, SM = Singlemode,

Power consumption/power output

Device name	Device model	Maximum power consumption	Power output
	Uplink Ports		
PSSnt SHL 8T...	2xTX port	5.3 W	18.1 Btu (IT)/h
PSSnet SHL 6T 2F...	2xFX port	7.7 W	26.3 Btu (IT)/h

Table 6: Power consumption/power output PSSnet SHL

Scope of delivery

Device	Scope of delivery
PSSnet SHL.....	Device
	Terminal block for supply voltage and signal contact
	Installation user manual and CD-ROM

Order numbers

.

Name	Order number
PSSnet SHL 8T MRP	380 601
PSSnet SHL 6T 2FMMSC MRP	380 602
PSSnet SHl 6T 2FMMSC MRP	380 650

Accessories

Name	Order number
PSSnet SCA	380 630

Underlying norms and standards

Name	
cUL 508:1998	Safety for Industrial Control Equipment
EN 50121-4:2006	Railway applications - EMC - emitted interference and interference immunity for signal and telecommunication systems
EN 55022:2006 + A1:2007	IT equipment – radio interference characteristics
EN 60079-15	Electrical equipment for explosive gas atmospheres – part 15: Construction, testing and marking of protection type "n" electrical apparatus.
EN 61000-6-2:2005	Generic norm – immunity in industrial environments
EN 61131-2:2003	Programmable logic controllers
FCC 47 CFR Part 15:2006	Code of Federal Regulations
Germanischer Lloyd	Ship Applications - Classification and Construction Guidelines VI-7-3 Part 1 Ed.2003
IEC/EN 60950-1:2006	Safety for the installation of IT equipment
IEC/EN 61850-3	Communications networks and systems in stations
IEEE 802.1 D	Switching, GARP, GMRP, Spanning Tree
IEEE 802.1 D-1998	Media access control (MAC) bridges (includes IEEE 802.1p Priority and Dynamic Multicast Filtering, GARP, GMRP)
IEEE 802.1 Q	Tagging
IEEE 802.1 Q-1998	Virtual Bridged Local Area Networks (VLAN Tagging, GVRP)
IEEE 802.1 w.2001	Rapid Reconfiguration
IEEE 802.3-2002	Ethernet
IEEE 1613	Standard Environment and Testing Requirements for Communication Networking Devices in Electric Power Substations
ISA 12.12.01 (cUL 1604), CSA C22.2 No. 213	Electrical Equipment for Use in Class I and Class II, Div.2 and Class III Hazardous (Classified) Locations

Table 7: List of norms and standards. Certified devices are marked with a certification indicator. From the imprint on the device label you will see the current certification status of your device.

Certifications

Standard	
cUL 508 / CSA C22.2 No.142	Yes
ISA 12.12.01 / CSA C22.2 No.213	Yes
German Lloyd	
ATEX RL 94/9 EG	

Table 8: Certifications

A Further support

Technical questions and training courses

In the event of technical queries, please contact your local Pilz distributor or Pilz office.
You can find the addresses of our distributors on the Internet: www.pilz.de.

Our support line is also at your disposal:

- Tel. +49 711 3409 0
- Fax +49 711 3409 133

The current training courses to technology and products can be found under http://www.pilz.de

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In many countries we are represented by our subsidiaries and sales partners.

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