



► PSS u2 P0 F/S PN2

PILZ

THE SPIRIT OF SAFETY

Operating Manual-1005394-EN-05

- Remote I/O system PSS u2



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SD means Secure Digital

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1 Introduction

1.1 Validity of documentation

This operating manual explains the function and operation, describes the installation and provides guidelines on how to connect the product.

This documentation is valid for the product PSS u2 P0 F/S PN2 hardware version 3.0 or higher. It is valid until new documentation is published.

1.2 Using the documentation

This document is intended for instruction. Only install and commission the product if you have read and understood this document. The document should be retained for future reference.

Please refer to the PSS u2 Installation Manual.

1.3 Third-party manufacturer licence information

The head modules include Open Source software with various licences.

Further information is available in the document "Licence information PSS u2 P0 F/S PN2" (document number 1005762) at www.pilz.com.

1.4 Definition of symbols

Information that is particularly important is identified as follows:



DANGER!

This warning must be heeded! It warns of a hazardous situation that poses an immediate threat of serious injury and death and indicates preventive measures that can be taken.



WARNING!

This warning must be heeded! It warns of a hazardous situation that could lead to serious injury and death and indicates preventive measures that can be taken.



CAUTION!

This refers to a hazard that can lead to a less serious or minor injury plus material damage, and also provides information on preventive measures that can be taken.



NOTICE

This describes a situation in which the product or devices could be damaged and also provides information on preventive measures that can be taken. It also highlights areas within the text that are of particular importance.



INFORMATION

This gives advice on applications and provides information on special features.

2 Overview

2.1 Module features

Application of the product PSS u2 P0 F/S PN2:

Head module to connect the system to PROFINET with PROFIsafe profile. The head module can be connected to an IO controller as an IO device.

The product has the following features:

- ▶ **PROFINET** interface with PROFIsafe profile
- ▶ PROFINET Conformance Class C
- ▶ IRT/RT
- ▶ Data set I&M 0-4 (only the data set I&M 0 is supported for the electronic modules)
- ▶ PROFIenergy together with all the digital ST modules
- ▶ Shared Device
- ▶ LEDs for:
 - System status
 - **PROFINET** status
 - **PROFIsafe** status
 - Energy saving mode
 - Module bus
 - Diagnostics
- ▶ Electronic modules that can be used for input/output:
 - All failsafe modules (PSS u2 EF...)
 - All standard modules (PSS u2 ES...)

2.2 Front view

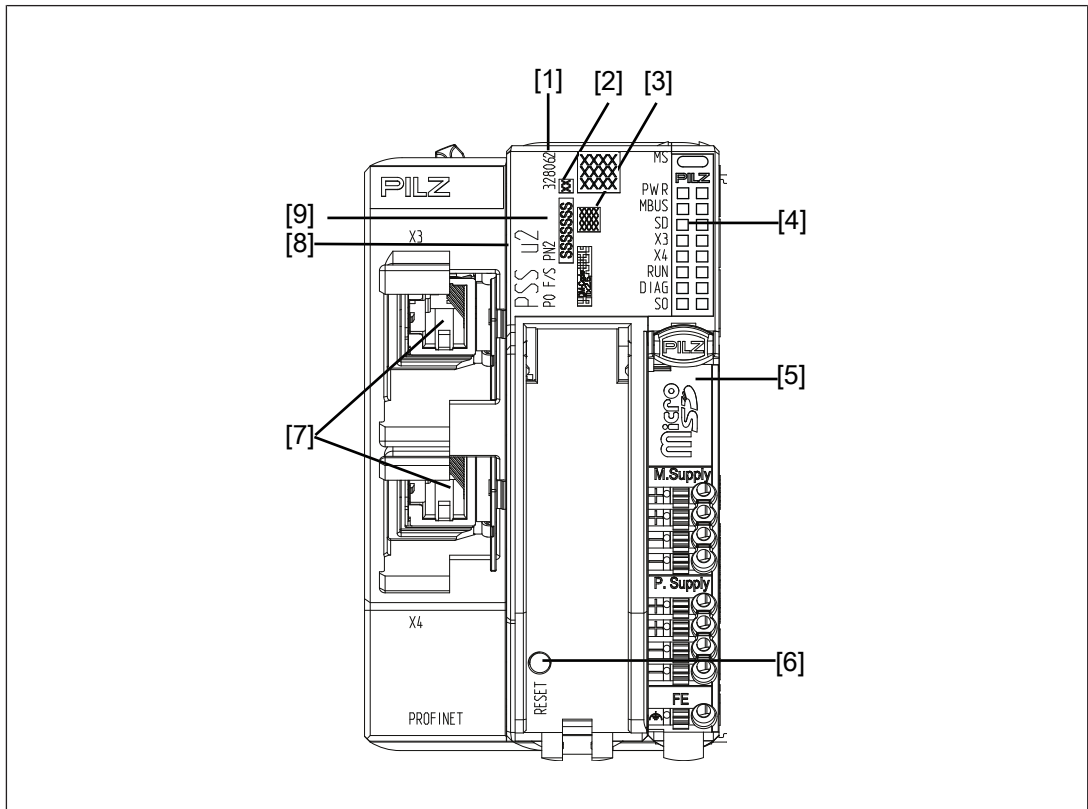


Fig.: Front view PSS u2 P0 F/S PN2

Legend

- 1 Order number
- 2 Hardware version
- 3 Devices MAC address
- 4 LED to display the device status and PROFINET status
- 5 Terminal block for connecting the supply voltages (supplied with the device)
- 6 Reset button for restart
- 7 PROFINET interface X3 and X4: RJ45 socket
- 8 Product name
- 9 Serial number

2.3 Scope of supply

- ▶ Head module PSS u2 P0 F/S PN2 with:
 - 1 x Terminal block 9-pin

3 Safety

3.1 Intended use

The module PSS u2 P0 F/S PN2 may only be used in the PSS u2 system.

The module is designed for use in:

- ▶ Safety-related applications with
 - **PROFINET** with PROFI-safe profile
- ▶ Non-safety-related applications with
 - **PROFINET**

The module meets the requirements of EN IEC 61508 up to SIL CL 3.

The module can be used in furnaces in accordance with EN 298.

Please note:

- ▶ To protect against transient power failures (EN 61000-4-11) the AC power supply used for the system must meet a secondary buffering for 30 ms.

Intended use includes making the electrical installation EMC-compliant. The module is designed for use in an industrial environment. Interference may occur if used in other areas.

The following is deemed improper use in particular

- ▶ Any component, technical or electrical modification to the module,
- ▶ Use of the module outside the areas described in this manual,
- ▶ Any use of the module that is not in accordance with the technical details.

Please also refer to the PROFINET guidelines issued by the "PROFIBUS User Group".

3.2 System requirements



INFORMATION

The module is supported by

- ▶ PASconfig from version 4.0.0
 - We recommend that you always use the latest version (download from www.pilz.com).

3.3 Safety regulations

3.3.1 Safety assessment

Before using a device, a safety assessment in accordance with the Machinery Directive is required.

The product as an individual component fulfils the functional safety requirements in accordance with EN ISO 13849 and EN IEC 62061. However, this does not guarantee the functional safety of the overall plant/machine. To achieve the relevant safety level of the overall plant/machine's required safety functions, each safety function needs to be considered separately.

3.3.2 Use of qualified personnel

The products may only be assembled, installed, programmed, commissioned, operated, decommissioned and maintained by persons who are competent to do so.

A competent person is a qualified and knowledgeable person who, because of their training, experience and current professional activity, has the specialist knowledge required. In order to inspect, assess and handle products, devices, systems, plant and machinery, this person must be familiar with the state of the art and the applicable national, European and international laws, directives and standards.

It is the company's responsibility only to employ personnel who

- ▶ Are familiar with the basic regulations concerning health and safety / accident prevention,
- ▶ Have read and understood the information provided in the section entitled Safety
- ▶ Have a good knowledge of the generic and specialist standards applicable to the specific application.

3.3.3 Warranty and liability

All claims to warranty and liability will be rendered invalid if

- ▶ The product was used contrary to the purpose for which it is intended,
- ▶ Damage can be attributed to not having followed the guidelines in the manual,
- ▶ Operating personnel are not suitably qualified,
- ▶ Any type of modification has been made (e.g. exchanging components on the PCB boards, soldering work etc.).

3.3.4 Disposal

- ▶ In safety-related applications, please comply with the mission time T_M stated in the safety-related characteristic data.
- ▶ When decommissioning, please comply with local regulations regarding the disposal of electronic devices (e.g. Electrical and Electronic Equipment Act).

4 Security

To secure plants, systems, machines and networks against cyberthreats it is necessary to implement (and continuously maintain) an overall industrial security concept that is state of the art.

Perform a risk assessment in accordance with VDI/VDE 2182 or IEC 62443-3-2 and plan the security measures with care. If necessary, seek advice from Pilz Customer Support.

4.1 Implemented security measures

- ▶ The password is saved in an encrypted format.
- ▶ If a password is changed, you will be prompted to enter the old password for authentication.
- ▶ No firmware downgrades are allowed. This prevents outdated firmware with vulnerabilities from being loaded onto the product.

4.2 Required security measures

- ▶ The product is not protected from physical manipulation or from reading of memory contents during physical access. Use appropriate measures to ensure that there is no physical access by unauthorised persons. You should also use security seals so that you can detect any manipulation of the product or interfaces. Installation inside a lockable control cabinet is recommended as a minimum measure.
- ▶ The configuration computer that accesses the product has to be protected from attacks by a firewall or other suitable measures. We recommend that a virus scanner is used on this configuration computer and updated regularly.
- ▶ PASconfig must be installed by an administrator in a secure IT network according to the proven best practice rules for Windows computers.
- ▶ If necessary, protect the configuration computer and the product from unauthorised use by assigning passwords and taking further measures if required. We also recommend that the user logged on to this configuration computer does not have administrator rights.
- ▶ Assign only safe passwords. When assigning passwords, please note:
 - If possible, the password should not be available in dictionaries.
 - The password should not be made up of standard variants and repetitions or keyboard patterns (so not: 1234abcd).
 - Use a password manager for optimum management of complex passwords.
 - Language-independent characters are not available in every keyboard language.
 - Make sure you regularly change the passwords of the user accounts on the system and/or ask the users to change their passwords themselves.
 - Make the users aware of the responsible use of their access data.

- ▶ As soon as possible, install firmware updates that Pilz provides for the product.
- ▶ Log data may contain personal data. Only store exported logs on a storage medium that is adequately protected.
- ▶ Before disposal, the product must be safely decommissioned. To do this, all the data must be deleted from the device.
 - Set the configuration back to its default settings or delete the configuration.
 - Switch off the product.
 - If the product includes a removable data medium, remove it and format it at the computer. Do not carry out a quick formatting. Alternatively, you can use a program to safely delete data or destroy the memory mechanically.

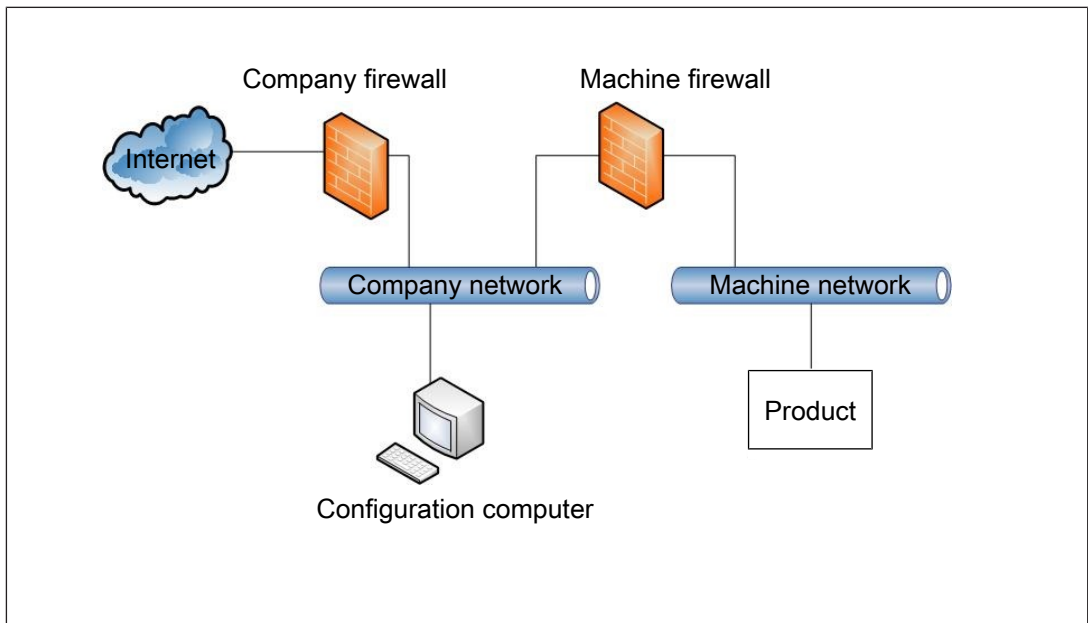


Fig.: Example network topology

- ▶ Note the [network data](#) [36] for risk analysis and the security measures.

5 Function description

5.1 Block diagram

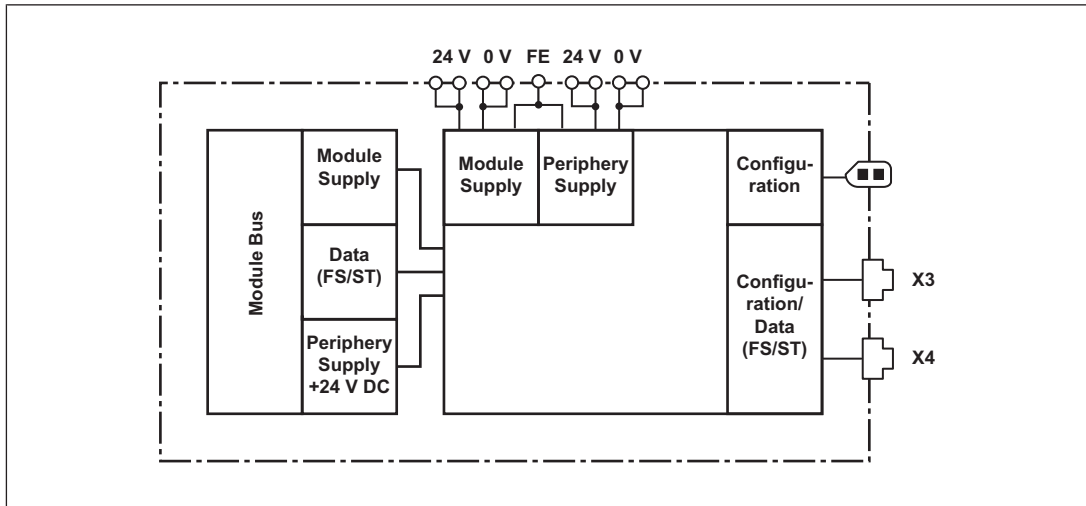


Fig.: Block diagram PSS u2 P0 F/S PN2

5.2 Supply voltage

- ▶ Module supply
 - Supplies voltage to the head module.
 - Supplies voltage to downstream modules (right-hand side)
- ▶ Periphery supply
 - Supplies voltage to the sensors, actuators and test pulses

When the supply voltage is fed in separately, the module supply and periphery supply are galvanically isolated. If galvanic isolation is not required, a common power supply may be used for the periphery supply and module supply.

Ensure you comply with the maximum output power of the module supply and periphery supply (see "[Technical details](#) [[33](#)]"). If the power consumption is higher, an additional supply voltage module is required to refresh the periphery supply. The module supply cannot be refreshed.

- ▶ Module supply
 - The total power consumption of all module racks and electronic modules must be \leq the maximum output power.
- ▶ Periphery supply
 - The total power consumption of the sensors, actuators and test pulses supplied via the input/output modules must be \leq the maximum output power.
 - If the periphery supply is missing, the "PWR" LED flashes and a message is entered in the diagnostic list.

5.3 Integrated protection mechanisms

The module has the following protection mechanisms:

- ▶ Multi-channel diverse processor section
- ▶ Cyclical self tests
- ▶ Potentially isolated **PROFINET** interface

Buffering:

Module supply failures are buffered for 20 ms.

5.4 MicroSD card

If you use the optional removable data medium, then data that is relevant for the device exchange will be stored on the data medium.



NOTICE

The microSD card includes safety data. Ensure that the microSD card is plugged in before commissioning. After commissioning, use PASconfig to check the FS check sum of the system on the microSD card. It has to match to the FS check sum of the configured system. To ensure that final data are stored on the data medium, do not remove the microSD card before completing the checking.

When a device is changed, the stored data can be copied over using the Reset button (see Reset button).

5.5 Reset button

Carrying out a warm reset (restart)

Procedure:

- ▶ Press the Reset pushbutton for less than 5 seconds.

Performing a cold start/reboot command initiates the following procedure:

- ▶ Processing is aborted
 - All LEDs apart from the "PWR" LED are shut down
- ▶ System is initialised
 - Head module is ready for operation and the "MS" LED flashes green
- ▶ System switches to "Operational" state
 - Head module is in operation and the "MS" LED lights up green
- ▶ Operational entry in the error stack

Impact after a restart:

- ▶ Inputs retain their current input values
- ▶ Substitute values are used for the outputs until the connection to the controller has been re-established.

Copying the device project from the removable data medium to the PSS u2 system

Prerequisites

- ▶ A removable data medium must be plugged into the PSS u2 system.
- ▶ The removable data medium may not be empty or defective.
- ▶ The device project on the removable data medium must match the product type.

Procedure:

- ▶ Press the Reset pushbutton for more than 5 seconds. The SD LED flashes yellow.
- ▶ Release the Reset pushbutton, then press and release it again within 10 seconds.
- ▶ The device project will be copied from the removable data medium to the device.

If the required files are not on the removable data medium, the device exchange scenario is not performed and an entry is written in the error stack.

If no removable data medium is inserted, an original reset is performed.

Effects of the original reset:

- ▶ ST and FS configuration data is deleted
- ▶ Profinet Factory Reset is performed
- ▶ Error stack is not deleted
- ▶ The head module is restarted automatically.

5.6 PROFINET

5.6.1 Connection to PROFINET

Decentralised input/output

- ▶ The head module enables the PSS u2 to be used as a modular, decentralised input/output module.
- ▶ The head module receives signals from a higher level control system; it processes these signals and passes them on to the connected input/output modules.
- ▶ The head module receives signals from the connected input/output modules; it processes these signals and passes them on to a higher level control system.

Interfaces:

- ▶ PROFINET interface
 - The PROFINET interface enables standard data to be exchanged with a higher level control system.
- ▶ PROFINET interface with PROFIsafe profile
 - The PROFINET interface with PROFIsafe profile enables data to be transferred safely between the PSS u2 and a master controller.

All the project data is stored in the head module.

5.6.2 MAC addresses

The device MAC address is lasered on to the front of the head module. For "neighbourhood discovery" via the Link Layer Discovery Protocol (LLDP), PROFINET does not need the device MAC address but the MAC address of the physical Ethernet port, through which the device is connected to PROFINET. The head module has an integrated switch with 2 physical Ethernet ports. Both ports use the two MAC addresses that follow the device MAC address; i.e. a head module has 3 consecutive MAC addresses.

5.6.3 PROFIsafe

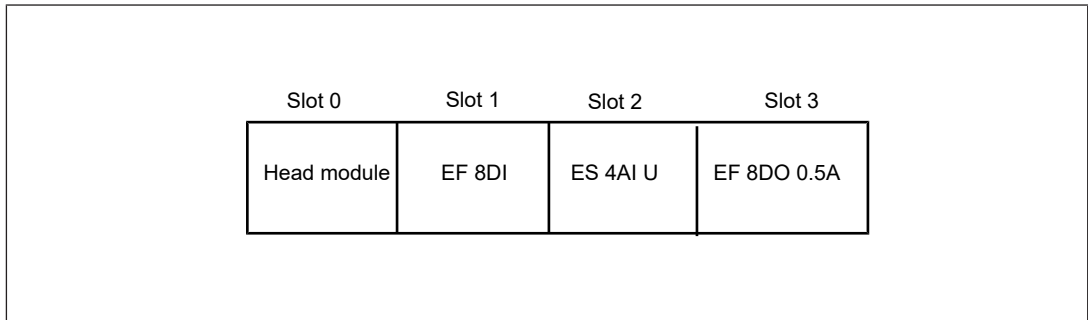
The head module supports a total of up to 24 FS input and FS output modules.

Adding submodules

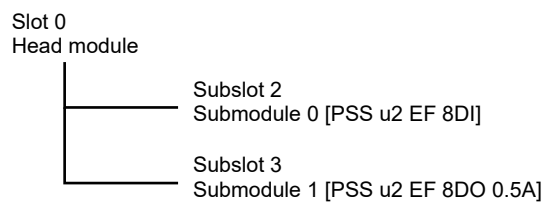
The head module is located in the TIA Portal in the device view on slot 0. Under this slot, the FS modules required for FS operation are configured as submodules. The submodules must be configured on the subslots 2 to 25. They must be configured in the TIA Portal in the same sequence in which they are plugged into the PSSu 2 system. No empty sub-slots must be present between the submodules.

Example:

Slots in the PSS u2 system:



Configuration in TIA Portal:



In the example, there is no empty subslot between subslot 2 and subslot 3, although an ST module is plugged between the FS modules in the PSS u2 system.

Adding the input and output modules

Further hardware modules (FS and ST modules) are added after the head module in the slots starting with slot 1 according to the hardware configuration.

Process data

The length of the process data depends on the number and type of the configured modules. The description of the process image can be found in the manuals of the modules.

System limits

- ▶ A maximum of 24 FS modules can be used.

5.6.3.1 Setting the F-address

An F address is configured for each submodule. F-addresses can be set using PASconfig. The first F address for submodule 0 is also required for establishing the connection between the PASconfig PC and the PSS u2 system.



INFORMATION

Each F address may only occur once on PROFINET with PROFIsafe.

5.6.3.2 Deactivation and reactivation

A submodule can be brought to a safe condition via the F-host. This is called modular granular passivation.

- ▶ In the event of an error of an FS input module:
 - The VALID bit of the faulty input module becomes "0"
 - The PII of the faulty input module is set to its safe value (=zero).
- ▶ In the event of an error of an FS output module:
 - The VALID bit of the faulty output module becomes "0"
 - The PIO of the faulty output module is set to its safe value (=zero).

If the error is no longer present, the submodule can be reintegrated. This is called reactivation. For reactivation, automatic or manual reintegration can be configured in the F-host. Automatic reintegration may only be configured if it is permitted for the respective process in terms of safety.

- ▶ Behaviour after reactivation
 - The VALID bit becomes "1", provided there is no PROFIsafe module error.

5.6.4 Projects

To configure the head module you will need the STEP 7 software or TIA Portal from Siemens and PASconfig. PASconfig can be called directly from STEP 7 or TIA Portal. The system data can be transferred to the head module with PASconfig via the PROFINET interfaces X3 or X4.



NOTICE

If a double-width module is used, a free slot must be left after the module in the Siemens STEP 7 software or TIA Portal. Reason: the module occupies two slots on the module rack but only one slot in STEP 7 or the TIA Portal.

5.6.5 PROFlenergy

If the head module receives the energy saving command from the higher level controller, then it will activate the energy saving functions for all ST modules. The following energy saving functions are supported for ST modules:

- ▶ Switching off the LEDs
- ▶ Switching off the terminals on ST output modules

The head module does not support any energy saving functions for FS modules.

5.6.6 Shared Device

With the Shared Device function, the data of an IO-Device can be made available to several IO-Controllers. The head module PSS u2 P0 F/S PN2 as IO-Device can assign its data to a maximum of two IO-Controllers. Please note that all FS submodules may only be assigned to one IO controller at a time.

Example: It is not allowed to assign one FS submodule to IO-Controller 1 and another FS submodule to IO-Controller 2. Both must be assigned to either IO-Controller 1 or IO-Controller 2.

5.7 System reaction times

Calculation of the processing times for dual-channel signals.

FS cycle time of the module

The FS cycle time t_{FS_Cycle} of the module depends on the number of connected FS modules:

With up to 6 FS modules

$$t_{FS_Cycle} = 4 \text{ ms}$$

With 7 to 12 FS modules

$$t_{FS_Cycle} = 8 \text{ ms}$$

With 13 to 24 FS modules

$$t_{FS_Cycle} = 16 \text{ ms}$$

Worst-Case Delay Time (WCDT) input

Calculation of the maximum time between a signal changing at the input and the signal being available at the fieldbus interface:

$$WCDT_{Input} = 7 * t_{FS_Cycle} + t_{ProclM_wcd}$$

t_{ProclM_wcd} : Maximum processing time of the input module, see under "Reaction time" of the input module.

One Fault Delay Time (OFDT) input

Calculation of the maximum time between a signal changing at the input and the signal being available at the fieldbus interface when a fault occurs:

$$OFDT_{Input} = WCDT_{Input} = 7 * t_{FS_Cycle} + t_{ProclM_ofd}$$

t_{ProclM_ofd} : Maximum processing time of the input module when a fault occurs, see under "Reaction time" of the input module.

Worst-Case Delay Time (WCDT) output

Calculation of the maximum time between the signal being received at the fieldbus interface and the output switching:

$$WCDT_{Output} = 6 * t_{FS_Cycle} + t_{ProcOM_wcd}$$

t_{ProcOM_wcd} : Maximum processing time of the output module, see under "Reaction time" of the output module.

One Fault Delay Time (OFDT) output

Calculation of the maximum time between the signal being received at the fieldbus interface and the output switching when a fault is present:

$$OFDT_{Output} = WCDT_{Output} = 6 * t_{FS_Cycle} + t_{ProcOM_ofd}$$

t_{ProcOM_ofd} : Maximum processing time of the output module when a fault occurs, see under "Reaction time" of the output module.

Device Acknowledge Time (DAT)

Calculation of the time between the signal being received at the fieldbus interface, the signal being confirmed and the confirmed signal being available at the fieldbus interface:

$$DAT = 2 * t_{FS_Cycle}$$

5.8 Substitute values

If the valid bit has the value "0", then the process image is invalid and may not be used. If this is the case, the modules' process image has a substitute value which is used instead of the module's process value. Substitute values can be configured for ST output modules. For all other modules, the substitute value is the safe state ("0").

Situations that mean that substitute values are used and the valid bit has the value "0":

- ▶ Input error:
 - FS modules and ST modules with expanded diagnostics (e.g. PSS u2 ES 4DID) use the substitute value "0" for the affected input on the module.
- ▶ Output error
 - FS modules and ST modules with expanded diagnostics (e.g. PSS u2 ES 16DOD 0.5A) use the substitute value "0" for the affected output on the module.
- ▶ Module error (e.g. module overheats)
 - FS modules and ST modules with expanded diagnostics (e.g. PSS u2 ES 16DOD 0.5A) use the substitute values "0" for all the inputs/outputs on the module.
- ▶ Communication is stopped (even during firmware update)
 - FS modules and ST modules with expanded diagnostics (e.g. PSS u2 ES 16DOD 0.5A) use the substitute values "0" for all the inputs/outputs on the module.

6 Installation

6.1 General installation guidelines

Please refer to the PSS u2 Installation Manual.

The description below assumes that the mounting rail is already installed.



NOTICE

Damage due to electrostatic discharge!

Electrostatic discharge can damage components. Ensure against discharge before touching the product, e.g. by touching an earthed, conductive surface or by wearing an earthed armband.

6.2 Dimensions in mm

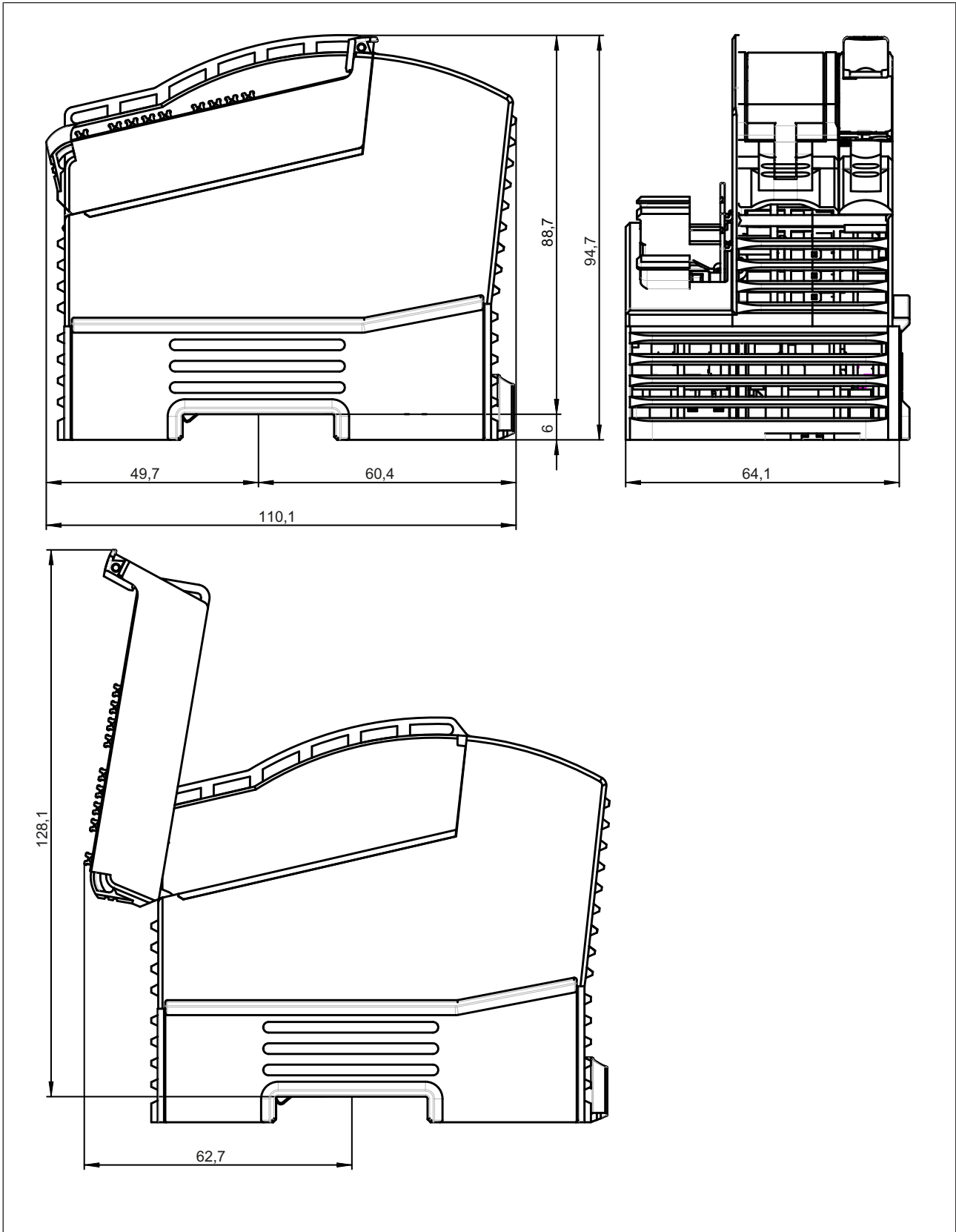


Fig.: Dimensions in mm

6.3 Installing the head module

Prerequisite:

The mounting rail must be installed.

1. Plug the head module on to the mounting rail.

Please note:

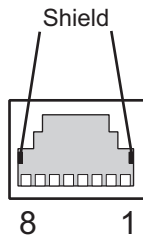
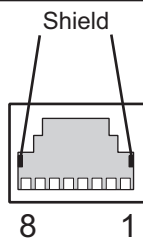
The mounting rail interlock must be in the open position, to the left.



2. Rotate the mounting rail interlock to the right to lock the head module on the mounting rail



7 Interfaces

X3		
Female RJ45 connector in accordance with the guidelines of the PROFINET User Group (PNO)	8-core CAT-5 Ethernet patch cable	
X4		
Female RJ45 connector in accordance with the guidelines of the PROFINET User Group (PNO)	8-core CAT-5 Ethernet patch cable	



INFORMATION

With the plug-in connection, please note that the data cable and connector have a limited mechanical load capacity. Appropriate design measures should be used to ensure that the plug-in connection is insensitive to increased mechanical stress (e.g. through shock, vibration). Such measures include, for example, fixed installation and strain relief (see graphic "Options for attaching the data cable to the head module").

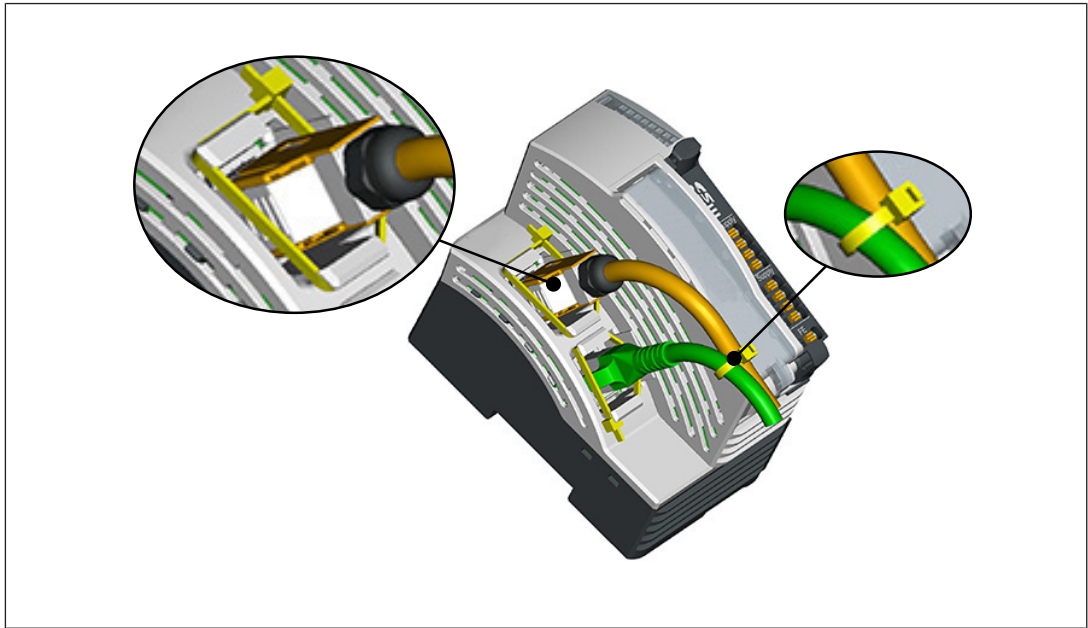


Fig.: Additional options for fastening the data cable on the head module and locking the connector using cable ties

- ▶ Remove the cable ties before pulling the plug.

8 Wiring

8.1 General wiring guidelines

- ▶ The requirements of the supply voltages can be found under "[Technical details !\[\]\(072b85bca7e3c3f0df32e9cb1d6321d2_img.jpg\) 33](#)".
- ▶ Protective separation must be ensured for the external power supplies that generate the supply voltages. Failure to do so could result in electric shock.
- ▶ The supply voltages must be extra low voltages with safe electrical separation (PELV or SELV) in accordance with VDE 0100, Part 410. The external power supplies must comply with the current applicable standard EN 60950-1, EN 61140, EN 50178 or EN 61558-1.
- ▶ UL requirement: The supply voltages for module supply and periphery supply must be extra low voltages with safe electrical separation (PELV or SELV) in accordance with UL 61010-2-201 (IEC 61010-2-201:2013).
- ▶ The maximum current load for the periphery supply is 8 A.
- ▶ Earth the 0 V supply on the periphery supply or monitor each supply group for earth faults.
- ▶ The connection of the 0 V supply to the central earth bar or earth fault monitor must be in accordance with relevant national regulations (e.g. EN 60204-1, NFPA 79:17-7, NEC: Article 250).
- ▶ Details of the minimum range for cable cross sections on connection terminals can be found under "[Technical details !\[\]\(c08b2954ced52bd12b7d0886396aa8f5_img.jpg\) 33](#)".
- ▶ Use copper wiring.
- ▶ The mounting rail must be earthed on both sides.

8.2 Connecting the module

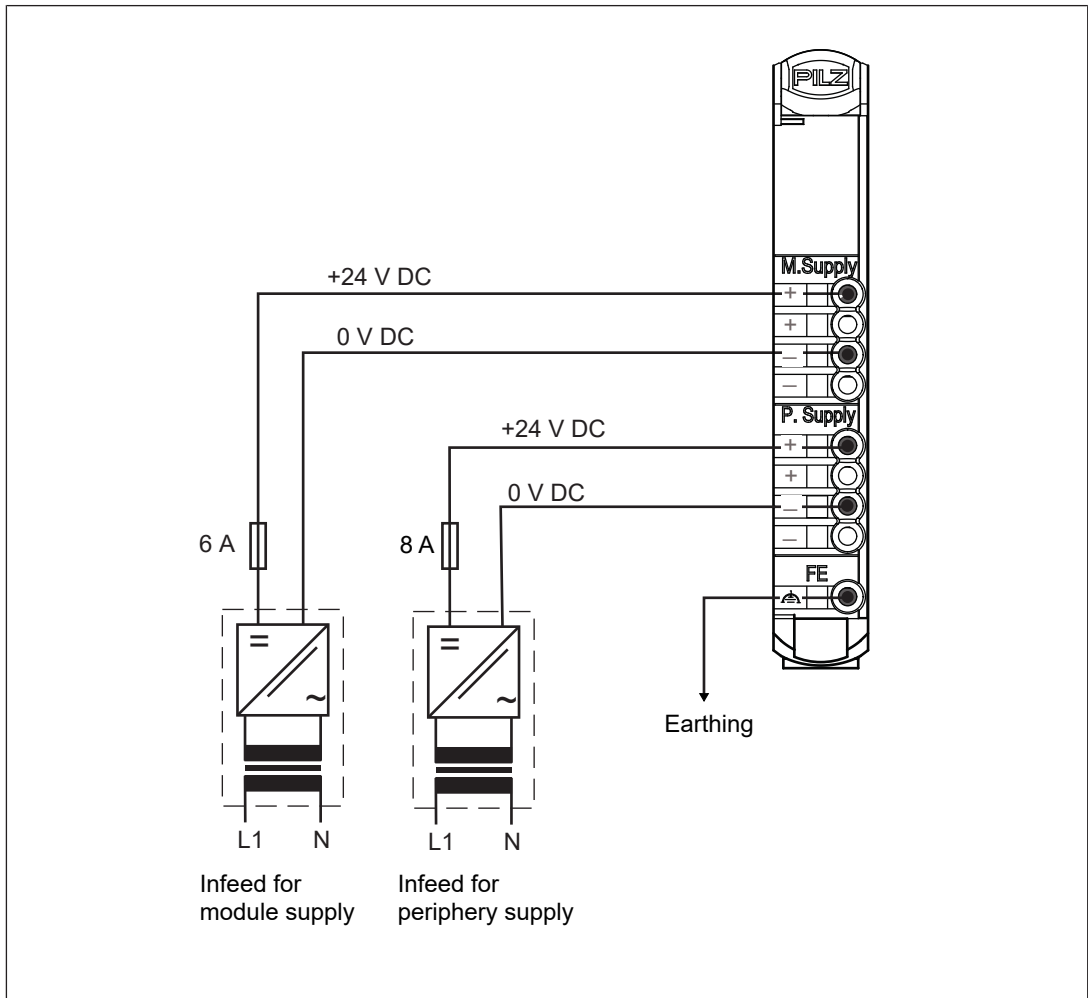


Fig.: Separate power supplies for module supply and periphery supply

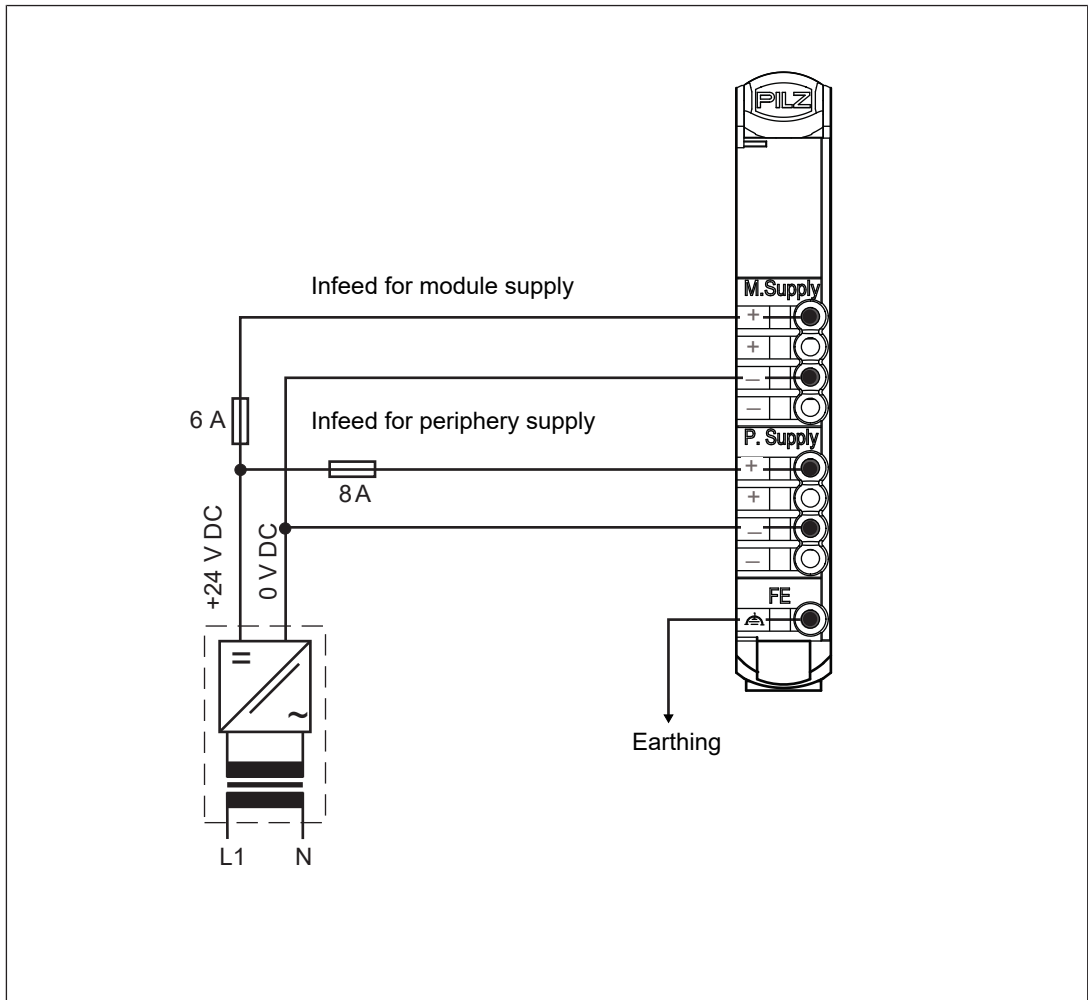


Fig.: Common power supply for module supply and periphery supply

Use the following fuses:

Module supply: max. 6 A characteristic B/C

Periphery supply: max. 8 A characteristic B/C

9 Operation

9.1 Display elements

The head module contains a number of status LEDs, which provide information on the status of various system sections.

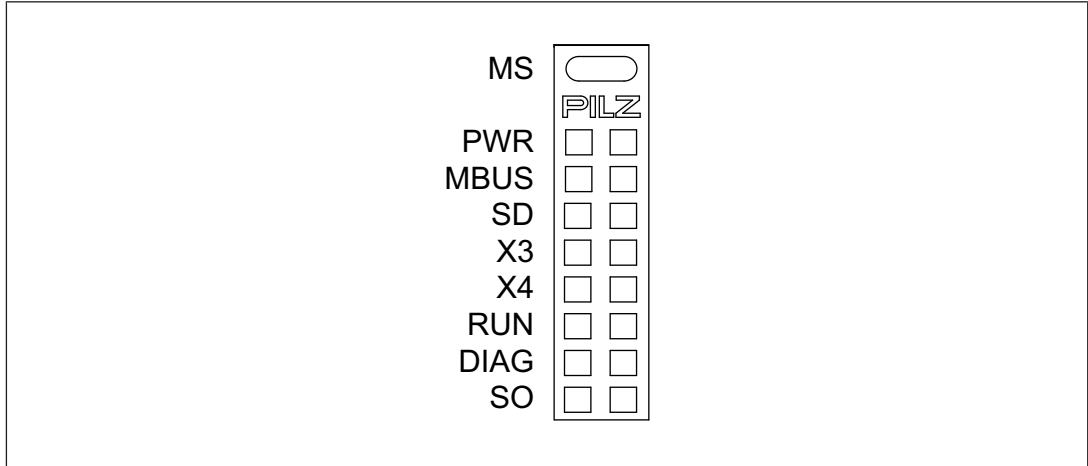











Fig.: LEDs on the head module PSS u2 P0 F/S PN2

Legend

-  LED on
-  LED flashes
-  LED flashes briefly
-  LED off

9.1.1

MS

Colour	State	Meaning
- - -	●	No supply voltage/not ready for operation
Green		Head module ready for operation
Green		Head module in operation
Red		Module bus error
Red		Head module error
Red		Updating firmware

9.1.2 PWR

Colour	State	Meaning
---	●	No supply voltage
Yellow	☀	Periphery supply is not available
Green	☀	Periphery supply and module supply ok

9.1.3 MBUS

The "MBUS" LED indicates the status of the ST module bus.

Colour	State	Meaning
---	●	ST module bus not in operation
Green	☀	ST module bus operating without error
Yellow	☀	The configured hardware registry does not match the actual hardware registry

9.1.4 SD

Colour	State	Meaning
---	●	No microSD card present
Yellow	☀	Confirmation for accepting the device project and configuration expected
Green	☀	microSD card present

9.1.5 X3, X4

These status LEDs are the display elements for the interfaces (X3 and X4). Each of the two interfaces is assigned an LED. Various operating and fault states are displayed via the LEDs.

X3, X4

Colour	State	Meaning
---	●	No network connection
Green	☀	Network connection present
Green	☀	Data traffic is error-free

9.1.6 RUN and DIAG

The LEDs "RUN" and "DIAG" indicate the status of the PROFINET interface.

DIAG		RUN		Meaning
green		green		Device identification activated by user
red		---		Diagnostic entry available/no PROFINET connection
red		green		Diagnostic entry available/PROFINET connection available
---		green		Data exchange with PROFINET Controller
---		green		Head module does not yet have a device name

9.1.7 SO

The "SO" LED indicates the status of the PROFIsafe interface

Colour	State	Meaning
---		<ul style="list-style-type: none"> ▶ At least one submodule is not configured in the F-Host ▶ At least one submodule is not active ▶ At least one submodule reports errors. Other submodules may be in operation.
green		All submodules in operation
green		▶ At least one submodule is not in operation and requires reintegration (e.g. after the exchange of an FS module). All other sub-modules that do not require reintegration are in operation.

10 Maintenance and repair

No maintenance work is required on a PSS u2 system. Please return faulty PSS u2 systems and/or modules to Pilz.



INFORMATION

When replacing modules and PSS u2 systems, observe the information on assembly/disassembly in the PSS u2 installation guidelines.

11 Technical Details

General

Certifications	CE, EAC, TÜV, UKCA, cULus Listed
Application range	Standard/failsafe
Module's device code	C007h

Electrical data

Supply voltage	
for	Module supply
Voltage	24 V
Kind	DC
Voltage tolerance	-30 %/+25 %
Output of external power supply (DC)	28,8 W
Output of external power supply (DC) at no load	5 W
Max. output power	22 W
Residual ripple DC	5 %
Potential isolation	Yes
Buffer time	20 ms

Supply voltage	
for	Periphery supply
Voltage	24 V
Kind	DC
Voltage tolerance	-30 %/+25 %
Max. permitted current	8 A
Output of external power supply (DC)	192 W
Output of external power supply (DC) at no load	0,5 W
Residual ripple DC	5 %
Potential isolation	Yes

Removable data medium

Type	microSD
------	---------

PROFINET interface

Quantity	2
Input	1.440 Byte
Output	1.440 Byte
Transmission rates	100 MBit/s
Transmission rate selectable via	Automatic
Certification	PNO
Vendor ID	092Fh
Connection	RJ45
Device type	IO-Device
Cycle time (RT)	1 ... 512 ms
Cycle time (IRT)	1 ... 16 ms

Environmental data	
Climatic suitability	EN 60068-2-1, EN 60068-2-14, EN 60068-2-2, EN 60068-2-30, EN 60068-2-78
Ambient temperature	
in accordance with the standard	EN 60068-2-14
Temperature range	0 - 60 °C
Storage temperature	
in accordance with the standard	EN 60068-2-1/-2
Temperature range	-40 - 70 °C
Climatic suitability	
in accordance with the standard	EN 60068-2-78
Humidity	93 % r. h. at 40 °C
Condensation during operation	Not permitted
Max. operating height above SL	2000 m
EMC	EN 61131-2 (Zone B)
Vibration	
in accordance with the standard	EN 60068-2-6
Frequency	8,4 - 150 Hz
Acceleration	10 m/s²
Shock stress	
in accordance with the standard	EN 60068-2-27
Acceleration	150 m/s²
Duration	11 ms
Airgap creepage	
in accordance with the standard	EN 61131-2, UL/IEC 61010-2-201
Overvoltage category	II
Pollution degree	2
Protection type	
Housing	IP20
Mounting area (e.g. control cabinet)	IP54
Potential isolation	
Potential isolation between	Supply voltage for module supply and periphery supply
Type of potential isolation	Functional insulation
Rated surge voltage	2500 V
Potential isolation between	Supply voltage for module supply and module supply
Type of potential isolation	Functional insulation
Rated surge voltage	2500 V
Potential isolation between	Periphery supply and module supply
Type of potential isolation	Functional insulation
Rated surge voltage	2500 V
Potential isolation between	Module Supply and PROFINET
Type of potential isolation	Functional insulation
Rated surge voltage	1500 V

Mechanical data

Material	
Bottom	PPE
Top	PC
Connection type	Spring-loaded terminal
Mounting type	plug-in
Conductor cross section with spring-loaded terminals: Flexible with/without crimp connector	0,15 - 1,5 mm ² , 26 - 14 AWG
Dimensions	
Height	110,1 mm
Width	64,1 mm
Depth	94,7 mm
Weight	240 g

Where standards are undated, the 2015-04 latest editions shall apply.

11.1 Safety characteristic data



NOTICE

You must comply with the safety characteristic data in order to achieve the required safety level for your plant/machine.

Operating mode	EN ISO 13849-1: 2015	EN ISO 13849-1: 2015	EN IEC 62061 SIL CL/max.	EN IEC 62061 61508	EN/IEC 61511 61508	EN/IEC 61511 61508	EN ISO 13849-1: 2015
	PL	Category	SIL	PFH [1/h]	SIL	PFD	T _M [year]
2-channel	PL e	Cat. 4	SIL CL 3	2,80E-09	SIL 3	8,91E-05	20

All the units used within a safety function must be considered when calculating the safety characteristic data.



INFORMATION

A safety function's SIL/PL values are **not** identical to the SIL/PL values of the units that are used and may differ from these.

The safety-related characteristic data (PFH, PFD) are mean values. They have been calculated at an average ambient component temperature of 40 °C.

12 Network data

Protocol	Direction	Transport protocol	Port no.	Can be deactivated	Time-critical	Description
Tool interface	In	TCP	18080	No	No	Communication with the configuration tool
PROFINET	In	UDP	161	No	No	SNMP Server port
PROFINET	In	UDP	34962	No	No	UDP Unicast port
PROFINET	In	UDP	34963	No	No	UDP Multicast port
PROFINET	In	UDP	34964	No	No	RCP Endpoint Mapper port
PROFINET	In	UDP	49152 ... 65535	No	No	Service Request ports

13 Order reference

Product type	Features	Order No.
PSS u2 P0 F/S PN2	Head module with PROFIsafe interface	328062

13.1 Accessories

Terminal block

Product type	Features	Order no.
PSS u2 T 9 SD (1 pc.)	Terminal block 9-pin for head module, supplied with: 1 piece	328831

microSD card

Product type	Features	Order no.
μSD memory card 1GB industrial	microSD memory card 1GB, industrial version, for PSS u2 head modules	328836

Shield connection element

Product type	Features	Order No.
PSS u2 A SH 4 (10 pcs.)	Shield connection element for backplane with 4 slots, scope of delivery: 10 pieces	328820

Labelling bracket

Product type	Features	Order No.
PSS u2 A LC E1 (10 pcs.)	Labelling bracket for electronic module 23.5 x 10.5 mm, scope of delivery: 10 pieces	328910
PSS u2 A LC E2 (10 pcs.)	Labelling bracket for electronic module 103 x 10.5 mm, scope of delivery: 10 pieces	328911
PSS u2 A LA E1 (10 pcs.)	Labelling strips for electronic module 23.5 x 10.5 mm (10 x DIN A4 sheet)	328913
PSS u2 A LA E2 (10 pcs.)	Labelling strips for electronic module 103 x 10.5 mm (10 x DIN A4 sheet)	328914

14 **EC declaration of conformity**

This product/these products meet the requirements of the directive 2006/42/EC on machinery of the European Parliament and of the Council. The complete EC Declaration of Conformity is available on the Internet at www.pilz.com/downloads.

Representative: Pilz GmbH & Co. KG, Felix-Wankel-Str. 2, 73760 Ostfildern, Germany

15 UKCA-Declaration of Conformity

This product(s) complies with following UK legislation: Supply of Machinery (Safety) Regulation 2008.

The complete UKCA Declaration of Conformity is available on the Internet at www.pilz.com/downloads.

Representative: Pilz Automation Technology, Pilz House, Little Colliers Field, Corby, Northamptonshire, NN18 8TJ United Kingdom, eMail: mail@pilz.co.uk

► Support

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Pilz develops environmentally-friendly products using ecological materials and energy-saving technologies. Offices and production facilities are ecologically designed, environmentally-aware and energy-saving. So Pilz offers sustainability, plus the security of using energy-efficient products and environmentally-friendly solutions.



We are represented internationally. Please refer to our homepage www.pilz.com for further details or contact our headquarters.

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