



Visualisation; Diagnostics

Easy to Configure

Programming IEC 61131-3

Rapid Installation

## PSSu E F PS(-T)

# PILZ

THE SPIRIT OF SAFETY

- ▶ Decentralised system PSSuniversal I/O

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SD means Secure Digital

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# 1 Introduction

## 1.1 Validity of documentation

This documentation is valid for the products PSSu E F PS and PSSu E F PS-T. It is valid until new documentation is published.

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

### 1.1.1 Retaining the documentation

This documentation is intended for instruction and should be retained for future reference.

## 1.2 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 structure

A module consists of

- ▶ Electronic module and
- ▶ Base module with
  - Screw terminals or
  - Cage clamp terminals

The base modules are the carrier units for the electronic modules and are used to connect the field wiring. The electronic modules are inserted on to the base modules and determine the module's function.

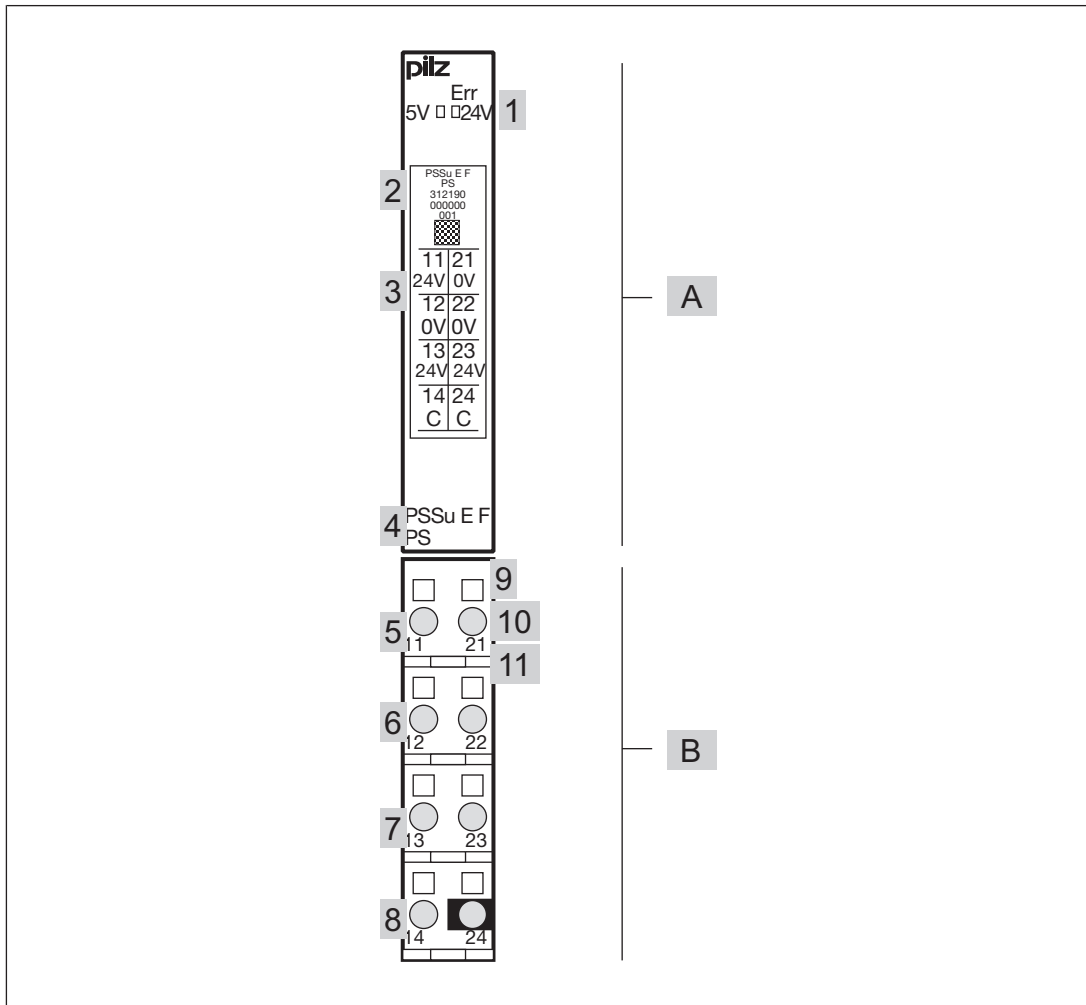
Details of the base modules that can be used are available in the chapter entitled "Intended Use".

### 2.2 Module features

The product has the following features:

- ▶ Current load capacity of module supply max. 1,5 A
- ▶ The module supply is not buffered if the supply voltage is interrupted
- ▶ Separate infeed for periphery supply
- ▶ Separate infeed for module supply
- ▶ Infeed for C-rail supply
- ▶ LEDs for:
  - Module supply
  - Periphery supply
  - Module error
- ▶ Application range depends on the base module
- ▶ T-type:
  - PSSu E F PS-T: for increased environmental requirements

## 2.3 Front view



### Key:

- ▶ A: Electronic module
- ▶ B: Base module
- ▶ 1: LED for module diagnostics
- ▶ 2: Labelling strip with:
  - Name of electronic module
  - Order number
  - Serial number
  - Hardware version number
  - 2D code
- ▶ 3: Labelling strip for the terminal configuration on the base module
- ▶ 4: Name of electronic module
- ▶ 5: Connection level 1
- ▶ 6: Connection level 2
- ▶ 7: Connection level 3
- ▶ 8: Connection level 4



- ▶ 9: Square mounting holes (connection levels 1, 2, 3 and 4)
  - With screw to loosen/tighten the screw terminal on base modules with screw terminals
  - With mechanism to operate the cage clamp on base modules with cage clamp terminals
- ▶ 10: Round connection holes (connection levels 1, 2, 3 and 4) for connecting the signal lines
- ▶ 11: Mounting slot for colour marker to label the connection level (connection levels 1, 2, 3 and 4)

## 3 Safety

### 3.1 Intended use

The module provides the supply for the module supply and periphery supply within the system.

Depending on which base module is used, the module may be used as a:

- ▶ General supply module (first module after a head module, if the head module does not have an integrated supply voltage)
- ▶ Supply module to refresh the module supply and periphery supply
- ▶ Supply module to form supply groups

The module PSSu E F PS-T is suitable for use where there are increased environmental requirements (see Technical Details).

Intended use includes making the electrical installation EMC-compliant. Please refer to the guidelines stated in the "PSSuniversal Installation Manual". The module is designed for use in an industrial environment. It is not suitable for use in a domestic environment, as this can lead to interference.

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.



#### INFORMATION

The module is supported by

- ▶ PSSuniversal Configurator and PSSuniversal Assistant from Version 1.4.0
- ▶ PAS4000 from Version 1.0.0
  - We recommend that you always use the latest version (download from [www.pilz.com](http://www.pilz.com)).

The PSSu E F PS module may be used in conjunction with the following base modules:

- ▶ PSSu BS 1/8 S
- ▶ PSSu BS-R 1/8 S
- ▶ PSSu BS 1/8 C
- ▶ PSSu BS-R 1/8 C

The module PSSu E F PS-T may be used in conjunction with the following base modules:

- ▶ PSSu BS 1/8 S-T
- ▶ PSSu BS-R 1/8 S-T
- ▶ PSSu BS 1/8 C-T
- ▶ PSSu BS-R 1/8 C-T

## 3.2 Safety regulations

### 3.2.1 Use of qualified personnel

The products may only be assembled, installed, programmed, commissioned, operated, maintained and decommissioned by competent persons.

A competent person is a qualified and knowledgeable person who, because of their training, experience and current professional activity, has the specialist knowledge required. To be able to inspect, assess and operate devices, systems and machines, the person has to be informed of 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 this description under "Safety"
- ▶ Have a good knowledge of the generic and specialist standards applicable to the specific application.

### 3.2.2 Warranty and liability

All claims to warranty and liability will be rendered invalid if

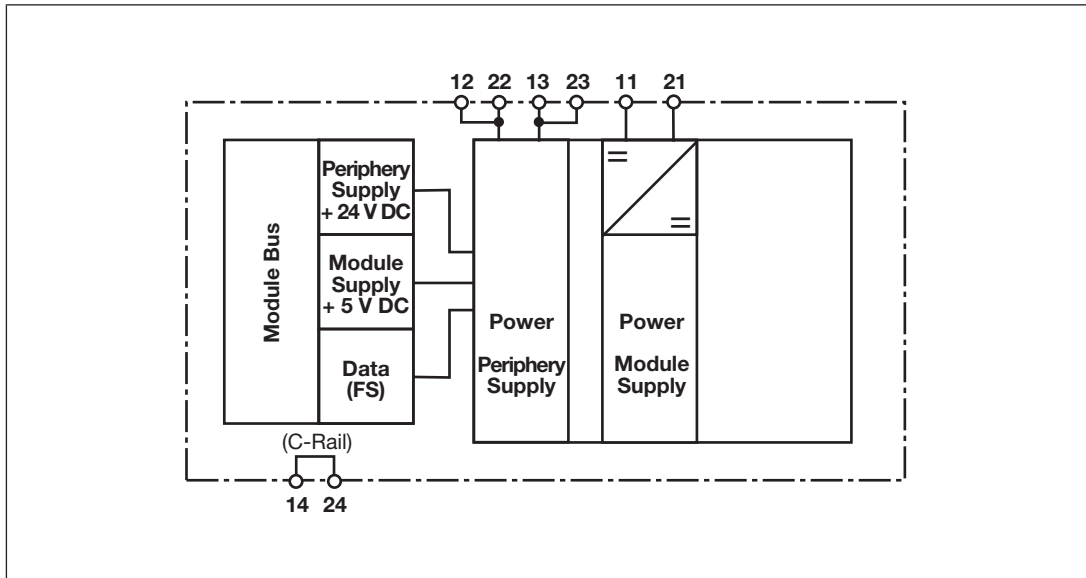
- ▶ The product was used contrary to the purpose for which it is intended
- ▶ Damage can be attributed to not having followed the guidelines in the manual
- ▶ Operating personnel are not suitably qualified
- ▶ Any type of modification has been made (e.g. exchanging components on the PCB boards, soldering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

### 3.2.3 Disposal

- ▶ In safety-related applications, please comply with the mission time  $T_M$  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 Function description

### 4.1 Block diagram



### 4.2 Module features

#### 4.2.1 Supply voltage

The product provides the module supply and periphery supply for the modules on the module bus:

- ▶ Module supply  
Supply voltage for subsequent module (right-hand side)
- ▶ Periphery supply  
Supply voltage for sensors, actuators and test pulses
- ▶ C-rail  
Infeed of the permitted additional supplies for the C-rail; a detailed description of how to use the C-rail can be found in the system description.

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.

The module enables

- ▶ The module supply and periphery supply to be refreshed:  
The relevant base module interrupts the connection to the incoming (left-hand) module supply, periphery supply and C-rail on the module bus. The 0 V supply on the module supply is connected to the left and right.
- ▶ Supply groups to be formed  
The relevant base module interrupts the connection to the incoming (left-hand) periphery supply and C-rail on the module bus. Each supply group requires its own supply module.

#### 4.2.1.1 Current load capacity

Ensure you comply with the current load capacity of the module and periphery supply (see "Technical Details"). If the current load is higher, an additional supply voltage module is required to refresh the module supply and periphery supply.

▶ **Module supply**

The current load is the total current consumption of all the electronic and compact modules.

The module supply does not automatically switch off if values exceed or drop below their limits. However, the "5 V" LED will light and a message will be entered in the error stack or diagnostic log.

▶ **Periphery supply**

The current load is the total current consumption of the sensors, actuators and test pulses supplied via the input/output modules.

The periphery supply does not automatically switch off if values exceed or drop below their limits. However, the "24 V" LED will light and a message will be entered in the error stack or diagnostic log.

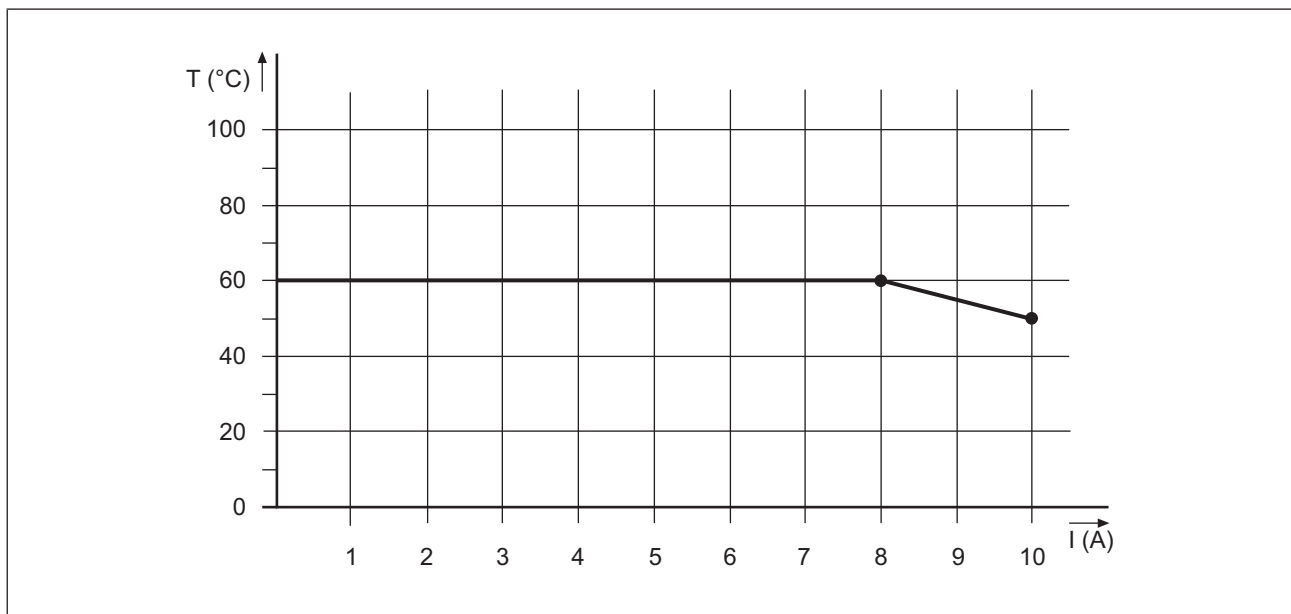
Please refer to the derating diagram.

▶ **C-rail**

If the current load is higher, the C-rail must use a different supply to prevent overload.

Please refer to the derating diagram.

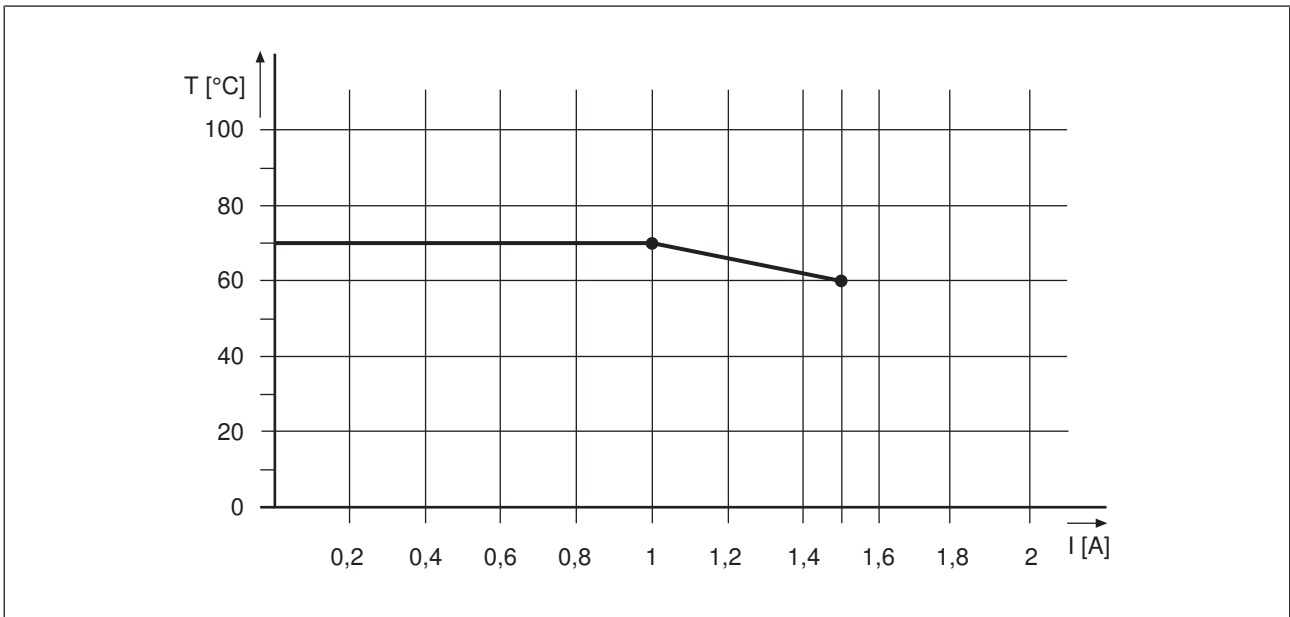
PSSu E F PS: Derating diagram for periphery supply and C-rail: Temperature T dependent on load current I



PSSu E F PS-T: Derating diagram for infeed for periphery supply: Permitted ambient temperature T dependent on load current I



PSSu E F PS-T: Derating diagram for infeed for module supply: Permitted ambient temperature T dependent on load current I



## 4.2.2 Integrated protection mechanisms

The module has the following protection mechanisms:

- ▶ Infeed for module supply
  - Polarity protection
  - Voltage monitoring
  - Transient voltage limitation
- ▶ Module supply
  - Short circuit-proof
- ▶ Periphery supply
  - Voltage monitoring (exceeding upper/lower limit)

The module registers the following errors:

- ▶ Start-up error
- ▶ Configuration error
- ▶ FS communication error
- ▶ Bus termination error
- ▶ Temperature error: too warm
- ▶ Overvoltage error
- ▶ Undervoltage error
- ▶ Error in the overvoltage protection diodes

## 4.3 Configuration

### 4.3.1 Application as a general supply module

The module can provide a standard bus system with various status information. To do this, the general supply voltage module (the first module after the head module) must be configured for read access. The configuration is made in the PSSuniversal Configurator in the PSS WIN-PRO system software:

- ▶ Read access through the standard bus system:  
“R” configuration

Further information on configuration is available in the PSSuniversal Configurator's online help.

#### 4.3.1.1 Addresses in the process image

If read access is configured, the module occupies 8 consecutive bit addresses in the ST-PII process image. The first supply module after the head module on slot 0 supplies status information about the PSSu system.

Configuration	SafetyBUS p	Standard bus system	
	FS-PIO	ST-PII	ST-PIO
None	---	---	---
Read ST ("R")		8 Bit	---



#### INFORMATION

Further information on the structure and contents of the status byte can be found under "Operation".

#### 4.3.1.2 FS error behaviour

In the case of a safety-related error on an FS output, all FS outputs in the affected I/O-Group (SafetyBUS p) are shut down.

In the case of a safety-related error on an FS input, the process image of all FS inputs in the affected I/O-Group (SafetyBUS p) is set to zero.

The I/O-Group switches to a STOP condition. An error telegram is then triggered on Safety-BUS p and the error is entered in the PSSuniversal error stack.



## 5 Installation

### 5.1 General installation guidelines

Please refer also to the PSSuniversal Installation Manual.



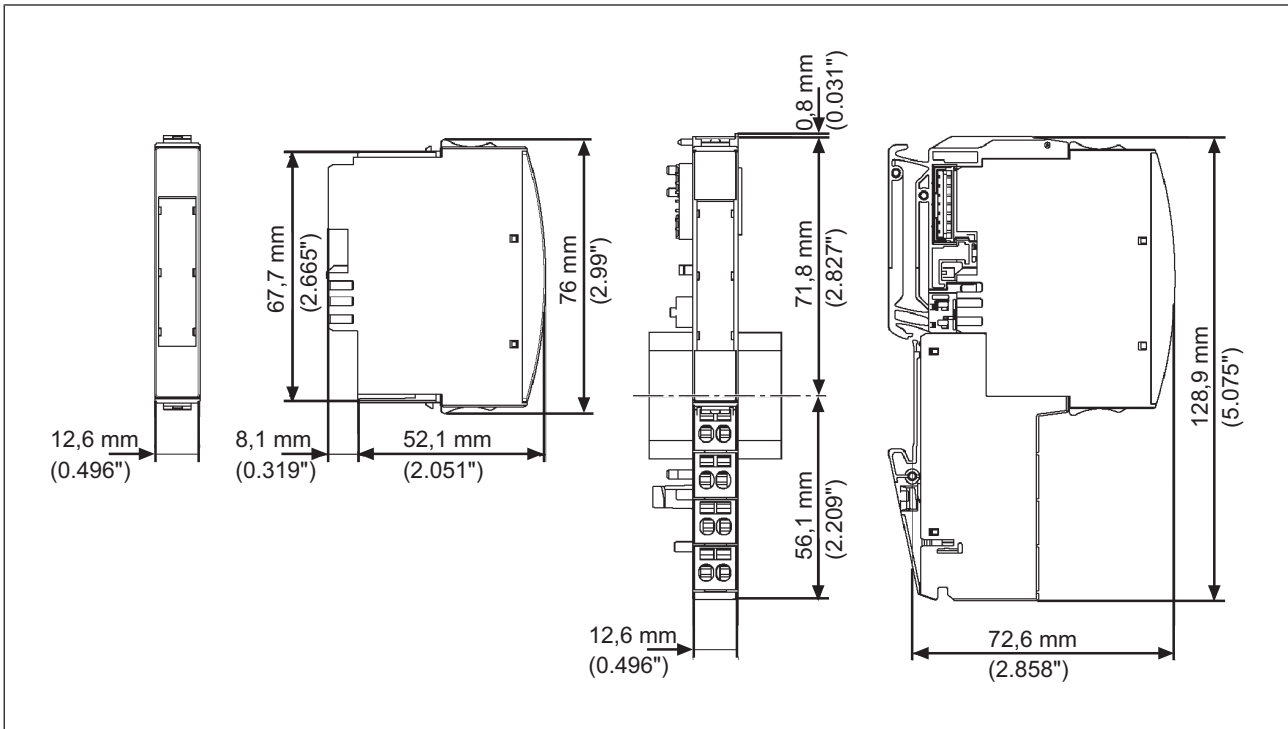
#### NOTICE

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.

#### 5.1.1 Dimensions

Base modules with four connection levels:



## 5.2 Installing the base module

Prerequisite:

- ▶ The head module must be installed.
- ▶ If the head module does not have an integrated power supply, a supply voltage module must be installed to the right of the head module.

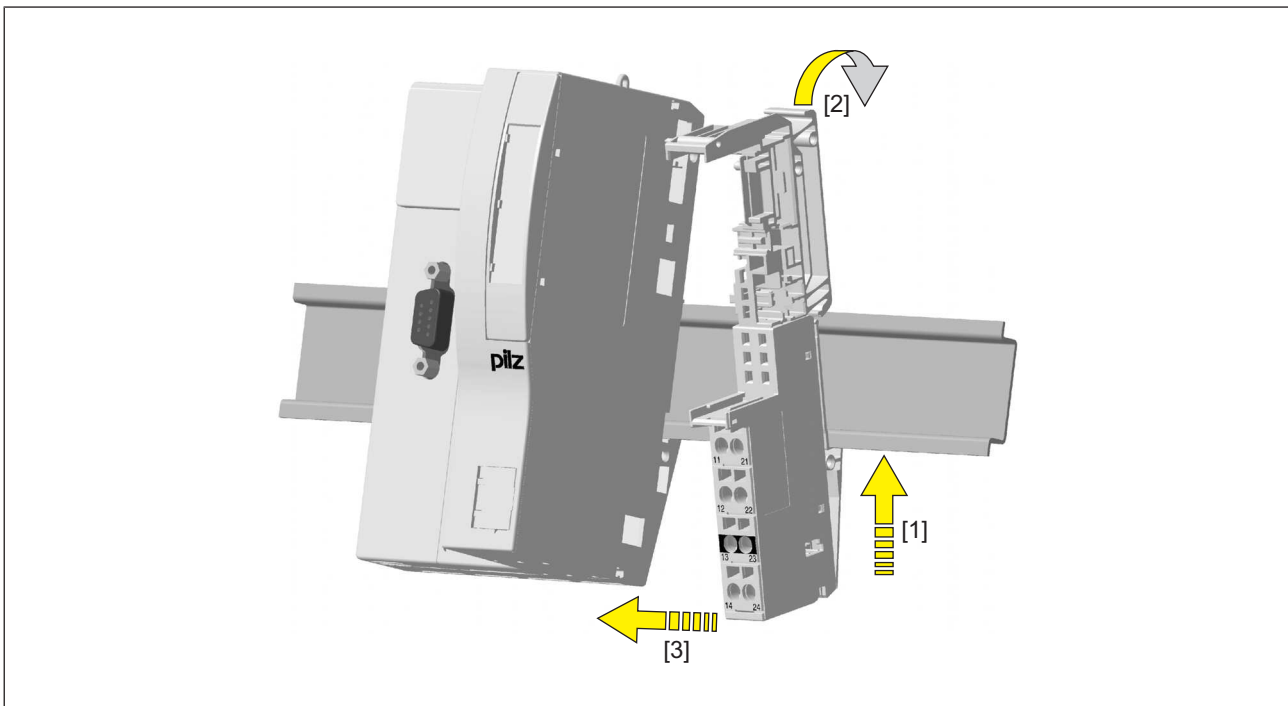
Please note:

- ▶ For mechanical reasons it is not possible to mix base modules with screw terminals and base modules with cage clamp terminals.
- ▶ All contacts should be protected from contamination.
- ▶ The mechanics of the base modules are designed for 50 plug in/out cycles.

Procedure:

- ▶ We recommend that you wire up the base modules before inserting the electronic modules.
- ▶ Slot the groove on the base module on to the mounting rail from below [1].
- ▶ Push the base module back [2] until you hear it lock into position.
- ▶ On the mounting rail, slide the base module to the left until you hear the two lateral mounting hooks on the adjacent module lock into position [3].

Schematic representation:



## 5.3 Inserting and removing an electronic module

Please note:

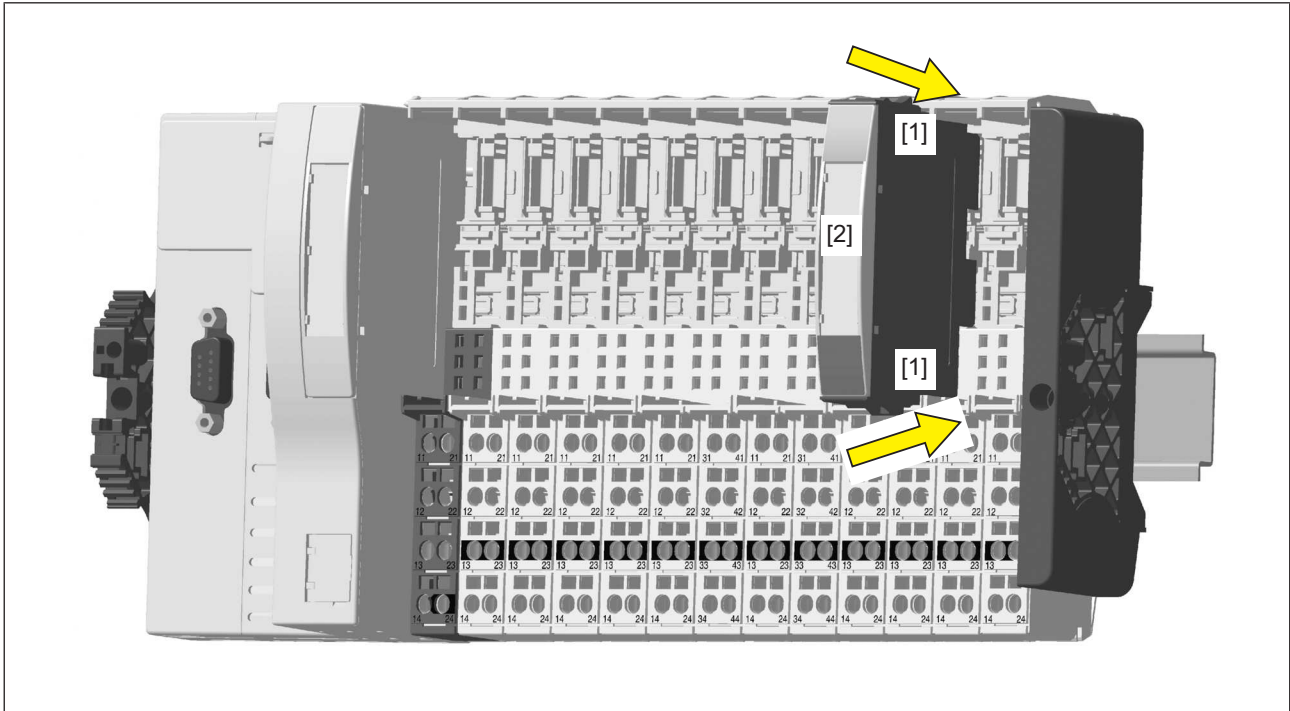
- ▶ Only insert on to base modules that are already installed.
- ▶ Preferably these base modules should be ready wired.
- ▶ Electronic modules with outputs may only be inserted and removed when the load is switched off. Unforeseeable error reactions may be triggered if modules are inserted and removed under load.
- ▶ When an electronic module is plugged into a base module for the first time, one part of the coding element remains on the electronic module, while its counterpart is fixed on to the base module. This is how the base module is coded.
- ▶ The mechanics of the electronic modules are designed for 50 plug in/out cycles.

### 5.3.1 Inserting an electronic module

Procedure:

- ▶ The electronic module must audibly lock into position [1].
- ▶ Mark the electronic module using the labelling strips [2].

Schematic representation:

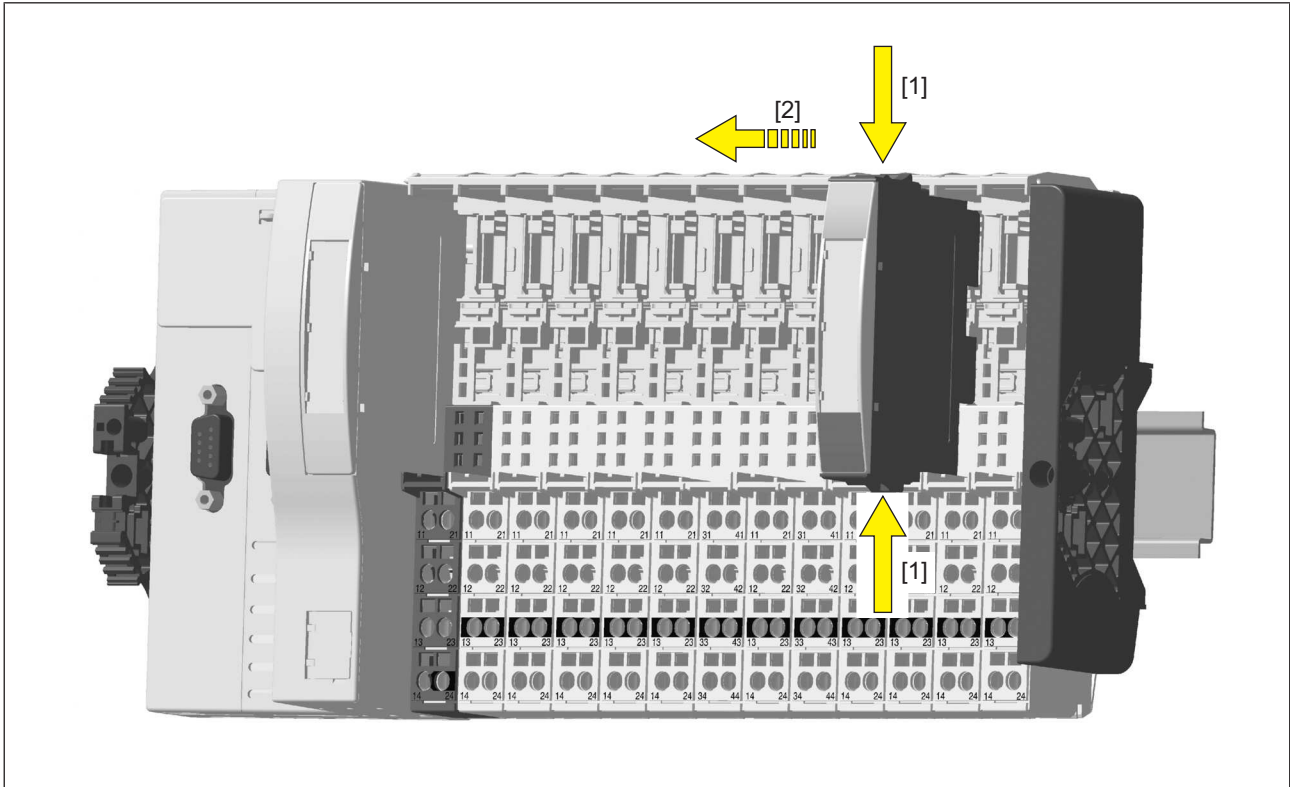


### 5.3.2 Removing an electronic module

Procedure:

- ▶ Press the locking mechanisms [1] together simultaneously.
- ▶ Pull out the electronic module [2].

Schematic representation:



### 5.3.3 Changing an electronic module during operation

It is possible to change an electronic module during operation. The configuration data is retained when a module is changed.

Effects:

- ▶ System environment A:
  - In the event of a potential FS communication error, the FS section of the PSSu system and all relevant I/O-Groups (SafetyBUS p) switch to a STOP condition.
- ▶ System environment B:
  - All FS hardware outputs on the PSSu system switch to a safe condition.
  - The substitute values are used for the modules' FS outputs, with Valid Bits = FALSE.



#### CAUTION!

Sparking can cause interference and errors!

Only change the module when the load is switched off!

## 6 Wiring

### 6.1 General wiring guidelines

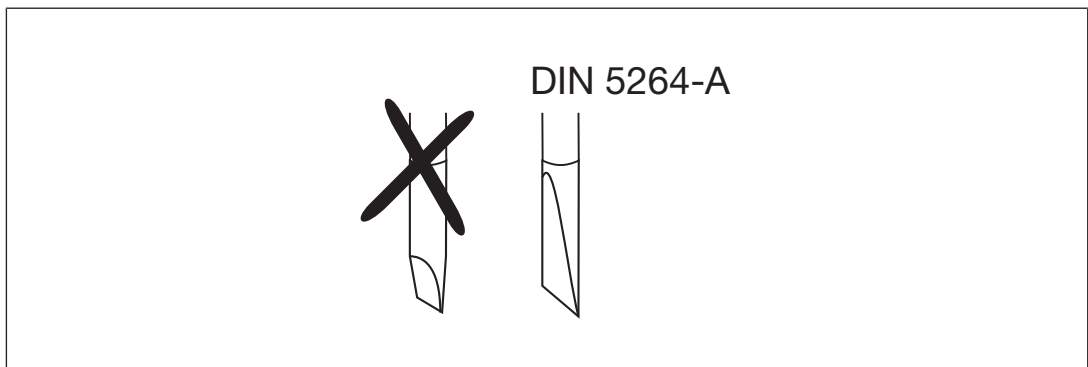
Please note:

- ▶ The requirements of the supply voltages can be found in the chapter entitled "Technical Details".
- ▶ 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 external power supplies must comply with the current applicable standard EN 60950-1, EN 61140, EN 50178 or EN 61558-1.
- ▶ The maximum current load for the periphery supply on the module bus is 10 A. Please refer to the derating diagram in the chapter entitled "Function Description".
- ▶ 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 conductor cross sections on connection terminals can be found in the section entitled "Technical Details".
- ▶ Use copper wiring.

#### 6.1.1 Mechanical connection of the base modules

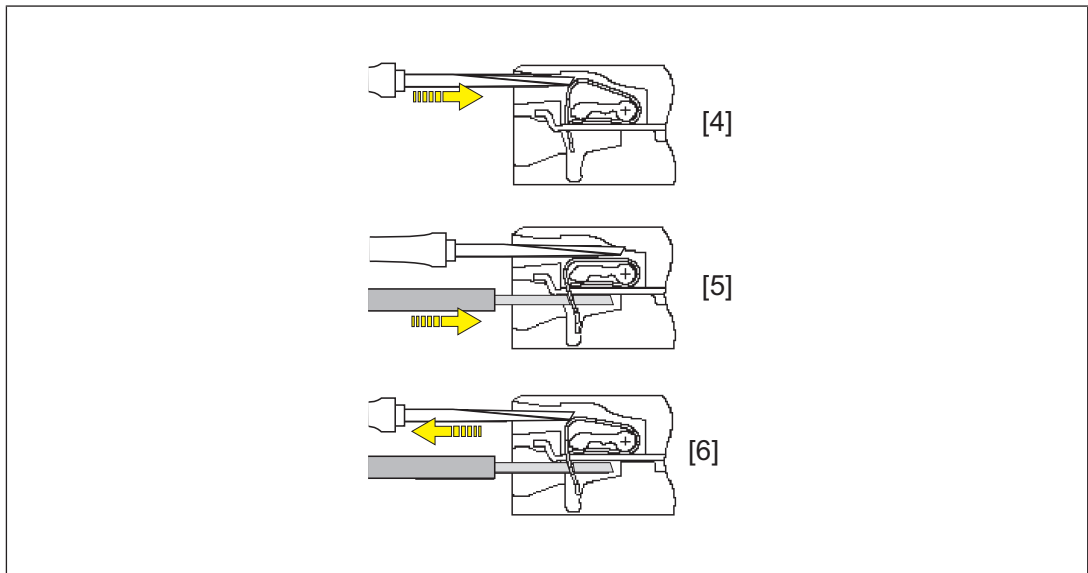
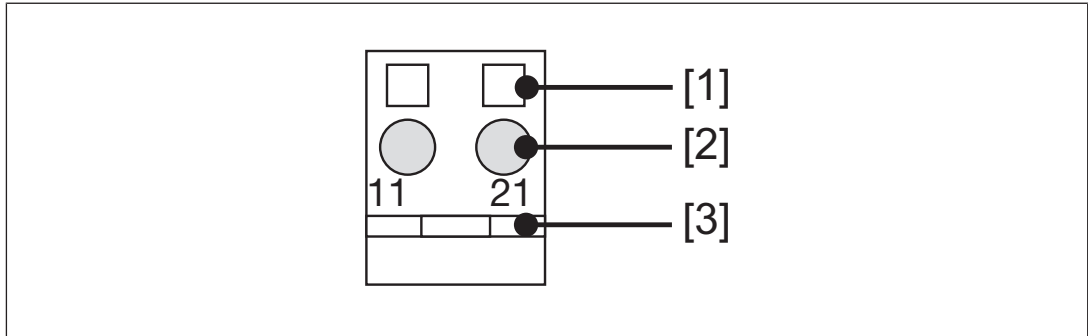
Procedure:

- ▶ Use a flat blade screwdriver (DIN 5264-A)!



- ▶ Strip the wire back 8 mm.
- ▶ If necessary, label the connection level with a colour marker [3].
- ▶ Base module with screw terminals:
  - Use a screwdriver to loosen the screw on the screw terminal [1]
  - Insert the stripped cable into the round fixing hole [2], as far as it will go.
  - Tighten up the screw on the screw terminal.
  - Check that the cable is firmly seated.

- ▶ Base module with cage clamp terminals:
  - Insert the screwdriver [4] into the square hole [1].
  - Insert the stripped cable into the round fixing hole [2], as far as it will go [5].
  - Pull out the screwdriver [6].
  - Check that the cable is firmly seated.



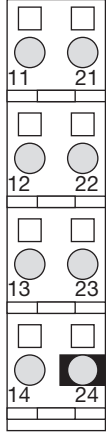
Please note:

- ▶ The minimum cable cross section for field connection terminals on the base modules is  $0.14 \text{ mm}^2$  (AWG26).
- ▶ The maximum cable cross section for field connection terminals is:
  - Digital inputs:  $1.5 \text{ mm}^2$  (AWG16)
  - Digital outputs:  $2.0 \text{ mm}^2$  (AWG14)
  - Inputs/outputs on the counter modules:  $1.5 \text{ mm}^2$  (AWG16)
  - Analogue inputs/outputs:  $1.5 \text{ mm}^2$  (AWG16)
  - Communication cables:  $1.5 \text{ mm}^2$  (AWG16)
  - Test pulse outputs:  $1.5 \text{ mm}^2$  (AWG16)
  - Power supply:  $2.5 \text{ mm}^2$  (AWG12)
  - Functional earth:  $2.5 \text{ mm}^2$  (AWG12)

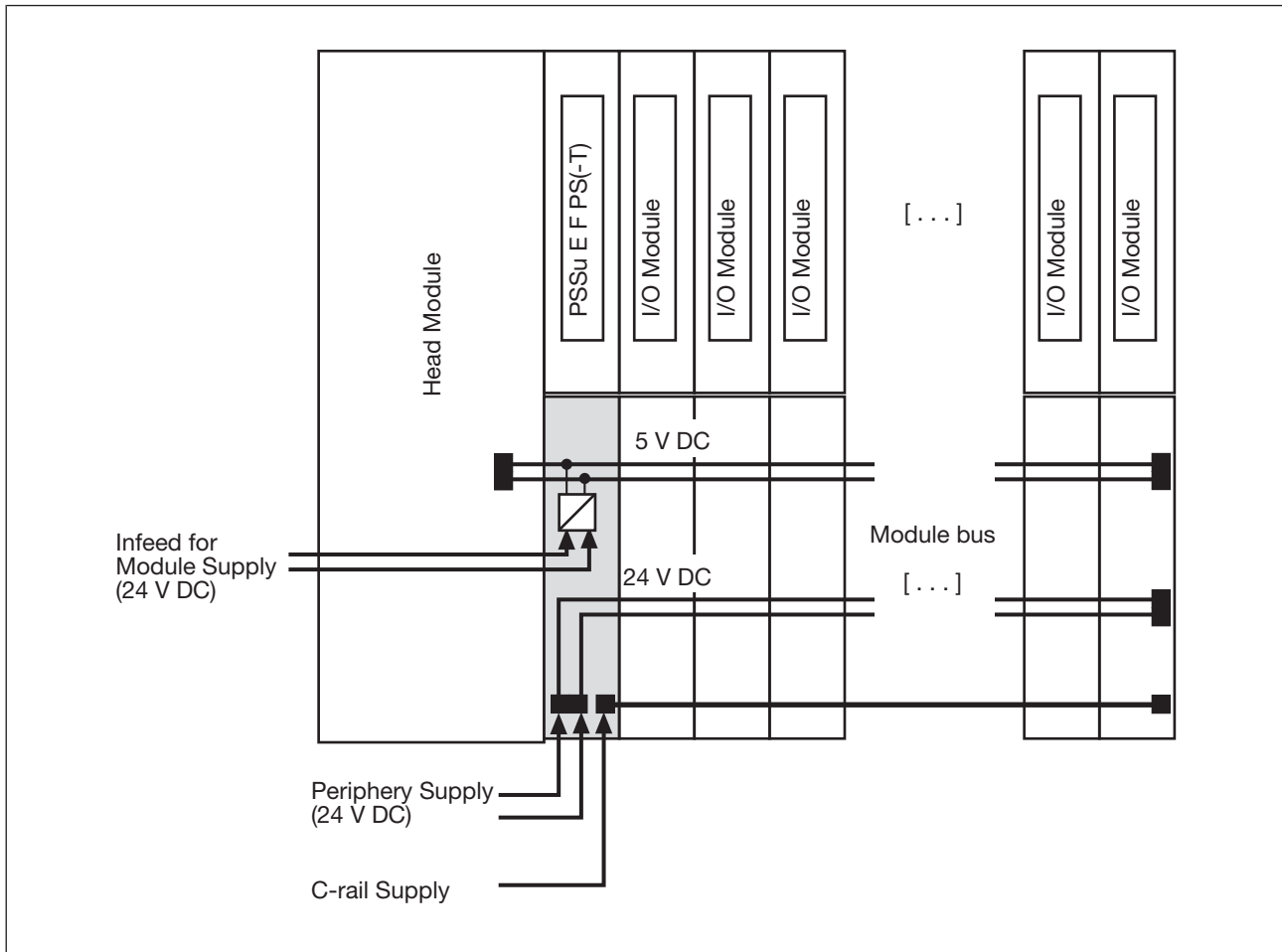
- ▶ On base modules with screw terminals:
  - If you use a multi-strand cable to connect the I/Os, it is recommended that you use ferrules conforming to Parts 1 and 2 of DIN 46228, 0.14 ... 1.5 mm<sup>2</sup>, Form A or C, although this is not essential. To crimp the ferrules you can use crimp pliers (crimp form A or C) conforming to EN 60947-1, such as the PZ 1.5 or PZ 6.5 from Weidmüller, for example.
  - Maximum torque setting: 0.8 Nm
- ▶ Use copper wiring.

## 6.2 Terminal configuration

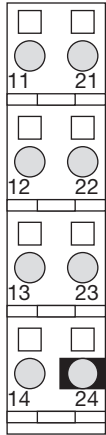
- ▶ For use as a general supply module, supplying a head module and subsequent modules

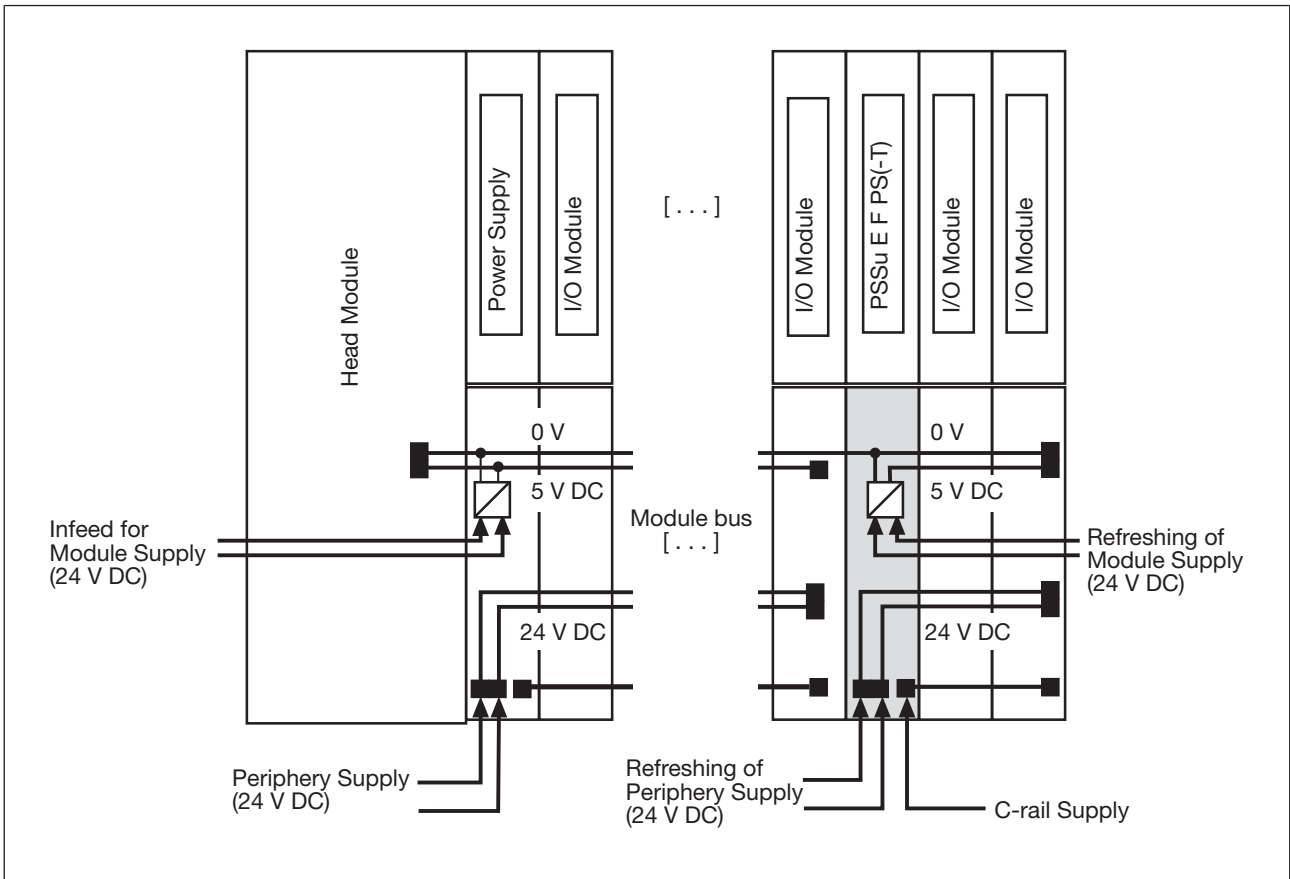
Base module	Terminal configuration	
Screw terminals: PSSu BS 1/8 S PSSu BS 1/8 S-T  Cage clamp terminals: PSSu BS 1/8 C PSSu BS 1/8 C-T	11: +24 V infeed for module supply  21: 0 V infeed for module supply  12 -22: 0 V periphery supply, interrupted to the left (12-22 linked within the base module)  13 -23: +24 V periphery supply, interrupted to the left (13-23 linked within the base module)  14-24 C-rail supply, interrupted to the left (14-24 linked within the base module)	





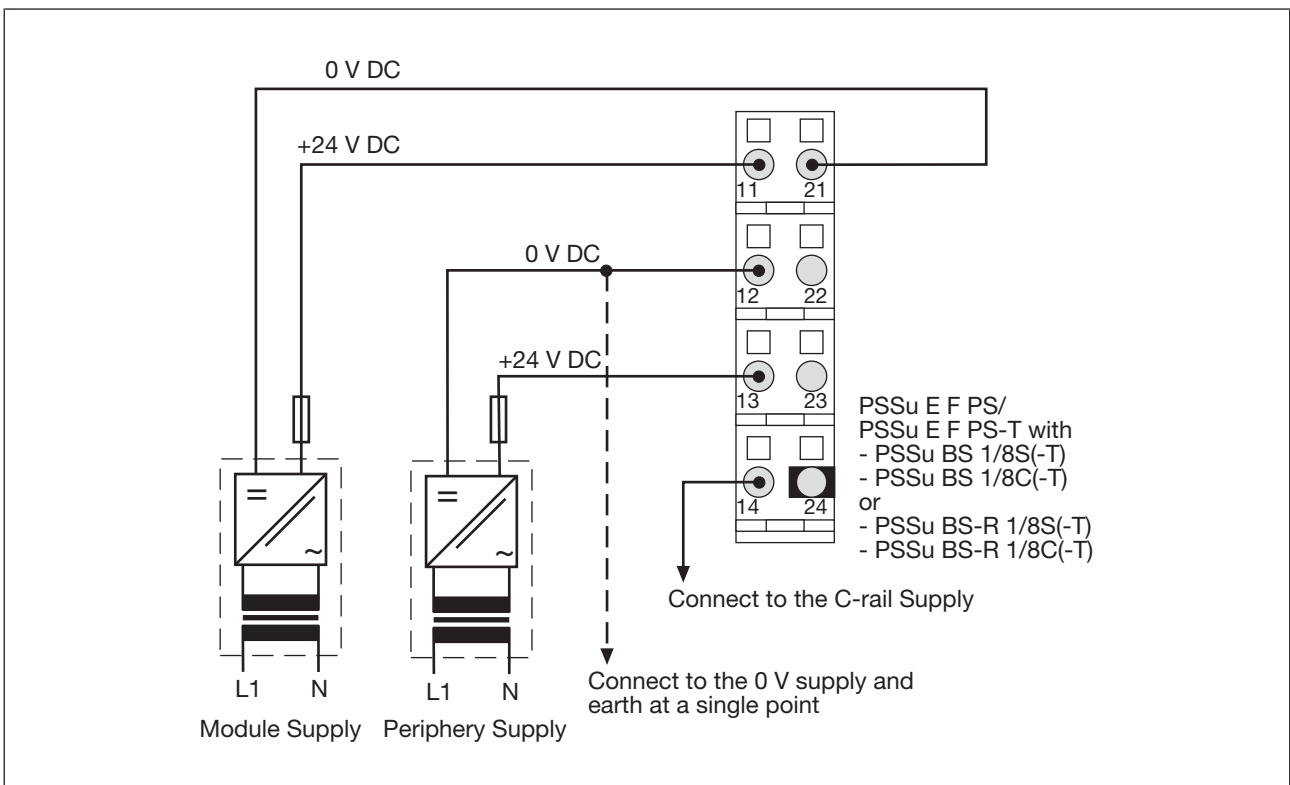
- ▶ For use as a supply module to refresh the module supply and periphery supply
- ▶ For use as a supply module to form supply groups
  - To interrupt the incoming periphery supply and C-rail
  - To provide subsequent modules with the module supply, periphery supply and C-rail supply
- ▶ With these base modules the supply module cannot be used as the first module after the head module.

Base module	Terminal configuration	
<p>Screw terminals: PSSu BS-R 1/8 S PSSu BS-R 1/8 S-T</p> <p>Cage clamp terminals: PSSu BS-R 1/8 C PSSu BS-R 1/8 C-T</p>	<p>11: +24 V infeed for module supply, interrupted to the left</p> <p>21: 0 V infeed for module supply</p> <p>12 -22: 0 V periphery supply, interrupted to the left (12-22 linked within the base module)</p> <p>13 -23: +24 V periphery supply, interrupted to the left (13-23 linked within the base module)</p> <p>14-24 C-rail supply, interrupted to the left (14-24 linked within the base module)</p>	

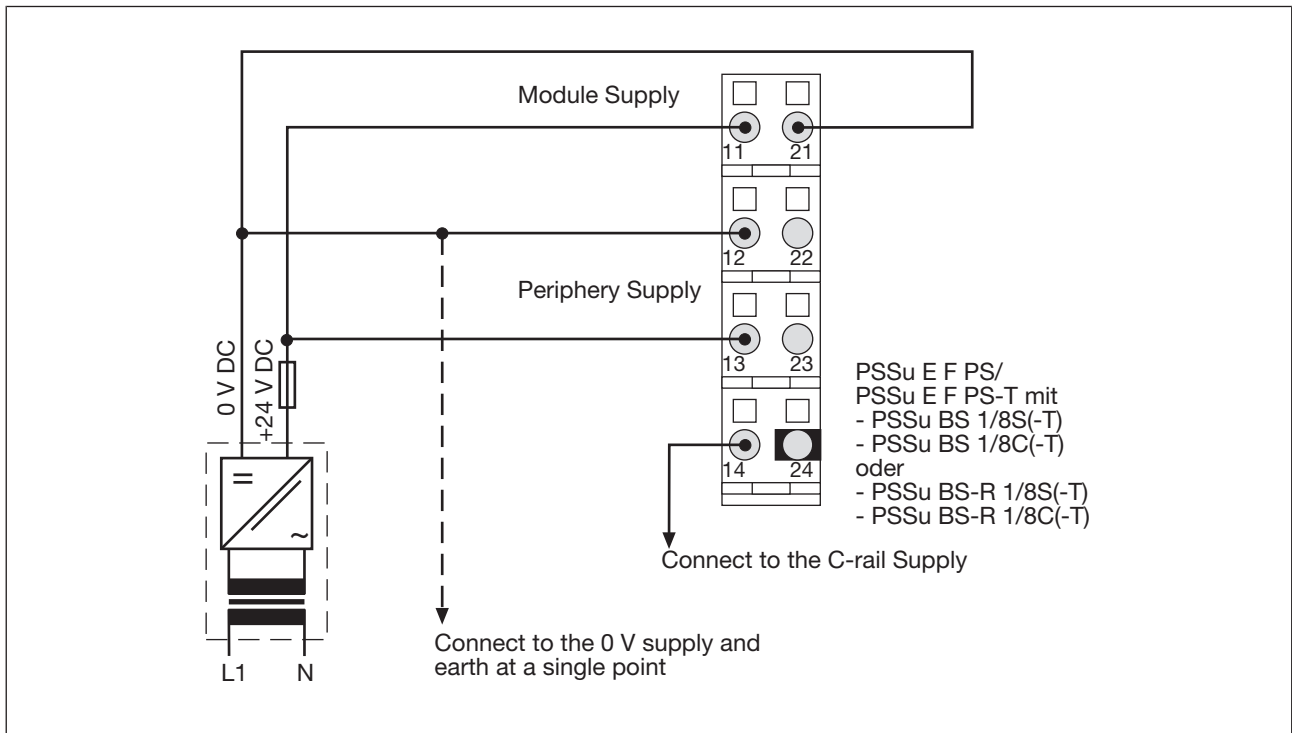


### 6.3 Connecting the module

Separate power supplies for module supply and periphery supply



Common power supply for module supply and periphery supply



## 7 Operation

### 7.1 Messages

A module error is displayed via the “Err” LED (see section entitled “Display elements”), signalled to the head module and then entered in the head module's error stack or diagnostic log.




The module can detect the following errors:

Module error	Explanation	Remedy
Start-up error	Error as the PSSu system starts up	Change faulty module.
Configuration error	Incorrect module type configured.	The configured hardware registry does not match the actual hardware registry.
FS communication error	Error during FS communication	Change faulty module.
Temperature error: too warm	Ambient temperature too high: Entry in the error stack or diagnostic log	Ensure there is sufficient ventilation in the control cabinet or prevent overload.
Overvoltage error	A system voltage or infeed is too high.	Stabilise the supply or change the faulty supply voltage module.
Undervoltage error	A system voltage or infeed is too low.	Stabilise the supply or change the faulty supply voltage module.
Error in the overvoltage protection diodes	Overvoltage protection diodes are defective.	Change faulty supply voltage module.

Further information on PSSu error messages is available in the online help for PSS WIN-PRO or PAS4000.

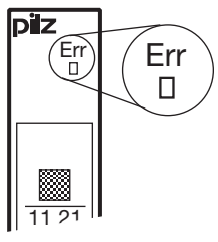


### 7.2 Display elements

#### Legend

-  LED on
-  LED flashes
-  LED off

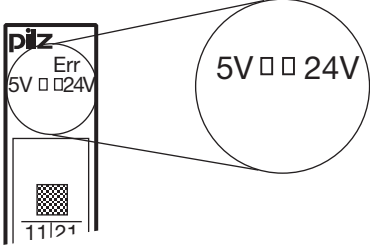
#### 7.2.1 Anzeigeelemente zur Moduldiagnose

The module has an LED for displaying module errors (“Err” LED).

	LED			Meaning
	Name	Colour	Status	
	Err	---		No error
	Red		Module error	

### 7.2.2 Display elements for the status of the module supply and periphery supply

A status LED is assigned to both the module supply and periphery supply ("5 V" and "24 V" LEDs).

	LED			Meaning
	Designation	Colour	Status	
	5 V	---	●	No supply voltage or error in the supply voltage for module supply
		green	☀	Error-free supply voltage for module supply
	24 V	---	●	Error in the supply voltage for periphery supply
		red	●	No supply voltage for periphery supply
green		☀	Supply voltage for periphery supply is error-free	

### 7.3 Status byte

The first supply module after the head module can communicate a variety of status information to the ST-PII (see table below). The information is transmitted using the module's status byte. Read access (R) is configured for that purpose.

Structure and contents of the status byte

Bit number	Signal	Key
0	0	SafetyBUS p in a STOP condition
	1	SafetyBUS p in a RUN condition
1	0	The PSSu section configured for the FS inputs (section A or B) is in a STOP condition.
	1	The PSSu section configured for the FS inputs (section A or B) is in a RUN condition.
2	0	The PSSu section configured for the FS outputs (section A) is in a STOP condition.
	1	The PSSu section configured for the FS outputs (section A) is in a RUN condition.
3	0	No general error in the PSSu FS section
	1	General error in the PSSu FS section
4	0	No general error in the PSSu ST section
	1	General error in the PSSu ST section
5	0	No error on the FS modules
	1	At least one FS module is registering an error
6	0	No error on the ST modules
	1	At least one ST module is registering an error
7	0	Reserved
	1	

## 8 Technical details

<b>General</b>	<b>312190</b>	<b>314190</b>
Approvals	<b>CE, EAC (Eurasian), KOSHA, TÜV, cULus Listed</b>	<b>CE, EAC (Eurasian), KOSHA, TÜV, cULus Listed</b>
Application range	<b>Standard/failsafe</b>	<b>Standard/failsafe</b>
Module's device code	<b>0801h</b>	<b>0801h</b>
Application in system environment		
A		
From FS firmware version, other head modules	<b>4</b>	<b>4</b>
From ST firmware version, other head modules	<b>5</b>	<b>5</b>
From FS firmware version PSSu H F PN	<b>1</b>	<b>1</b>
From ST firmware version PSSu H S PN	<b>1</b>	<b>1</b>
From ST firmware version PSSu WR S IDN	<b>6</b>	<b>6</b>
Application in system environment		
B		
From FS firmware version, head modules	<b>1.0.0</b>	<b>1.0.0</b>
From ST firmware version, head modules	<b>1.0.0</b>	<b>1.0.0</b>
<b>Electrical data</b>	<b>312190</b>	<b>314190</b>
Supply voltage		
for	<b>Module supply</b>	<b>Module supply</b>
Voltage	<b>24 V</b>	<b>24 V</b>
Kind	<b>DC</b>	<b>DC</b>
Voltage tolerance	<b>-30 %/+25 %</b>	<b>-30 %/+25 %</b>
Current load capacity at UB	<b>0,6 A</b>	<b>0,6 A</b>
Inrush current that the external power supply must provide	<b>4 A</b>	<b>4 A</b>
Output of external power supply (DC)	<b>9 W</b>	<b>9 W</b>
Supply voltage		
for	<b>Periphery supply</b>	<b>Periphery supply</b>
Voltage	<b>24 V</b>	<b>24 V</b>
Kind	<b>DC</b>	<b>DC</b>
Voltage tolerance	<b>-30 %/+25 %</b>	<b>-30 %/+25 %</b>
Current load capacity at UB	<b>10 A</b>	<b>10 A</b>
Rated surge voltage	<b>3050 V</b>	<b>3050 V</b>
Potential isolation between module supply and periphery supply	<b>3050 V</b>	<b>3050 V</b>



<b>Electrical data</b>	<b>312190</b>	<b>314190</b>
Internal supply voltage (module supply)		
Output voltage	<b>int. system</b>	<b>int. system</b>
Voltage	<b>5 V</b>	<b>5 V</b>
Voltage tolerance	<b>-2 %/+3 %</b>	<b>-2 %/+3 %</b>
Module's power consumption	<b>0,12 W</b>	<b>0,12 W</b>
Potential isolation	<b>3050 V</b>	<b>3050 V</b>
Current load capacity	<b>1,5 A</b>	<b>1,5 A</b>
Short circuit-proof	<b>yes</b>	<b>yes</b>
Periphery's supply voltage (periphery supply)		
Module's current consumption with no load	<b>5 mA</b>	<b>5 mA</b>
Module's power consumption with no load	<b>0,12 W</b>	<b>0,12 W</b>
Max. power dissipation of module	<b>1,5 W</b>	<b>1,5 W</b>
<b>Environmental data</b>	<b>312190</b>	<b>314190</b>
Climatic suitability	<b>EN 60068-2-1, EN 60068-2-14, EN 60068-2-2, EN 60068-2-30, EN 60068-2-78</b>	<b>EN 60068-2-1, EN 60068-2-14, EN 60068-2-2, EN 60068-2-30, EN 60068-2-78</b>
Ambient temperature		
Temperature range	<b>0 - 60 °C</b>	<b>-40 - 70 °C</b>
Max. temperature in accordance with UL	<b>–</b>	<b>0 ... 60 °C</b>
Storage temperature		
Temperature range	<b>-25 - 70 °C</b>	<b>-40 - 70 °C</b>
Climatic suitability		
In accordance with the standard	<b>EN 60068-2-30, EN 60068-2-78</b>	<b>EN 60068-2-30, EN 60068-2-78</b>
Humidity	<b>93 % r. h. at 40 °C</b>	<b>93 % r. h. at 40 °C</b>
Condensation during operation	<b>Not permitted</b>	<b>Short-term</b>
Max. operating height above sea level	<b>2000 m</b>	<b>5000 m</b>
EMC	<b>EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-6-2, EN 61000-6-4</b>	<b>EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-6-2, EN 61000-6-4</b>
Vibration		
In accordance with the standard	<b>EN 60068-2-6</b>	<b>EN 60068-2-6</b>
Frequency	<b>10 - 150 Hz</b>	<b>10 - 1000 Hz</b>
Amplitude	<b>0,35 mm</b>	<b>0,35 mm</b>
Acceleration	<b>1g</b>	<b>5g</b>
Broadband noise		
In accordance with the standard	<b>–</b>	<b>EN 60068-2-64</b>
Frequency	<b>–</b>	<b>5 - 500 Hz</b>
Acceleration	<b>–</b>	<b>1,9grms</b>

<b>Environmental data</b>	<b>312190</b>	<b>314190</b>
<b>Shock stress</b>		
In accordance with the standard	<b>EN 60068-2-27</b>	<b>EN 60068-2-27</b>
Number of shocks	<b>6</b>	<b>6</b>
Acceleration	<b>15g</b>	<b>15g</b>
Duration	<b>11 ms</b>	<b>11 ms</b>
In accordance with the standard	<b>EN 60068-2-27</b>	<b>EN 60068-2-27</b>
Number of shocks	<b>1000</b>	<b>1000</b>
Acceleration	<b>10g</b>	<b>25g</b>
Duration	<b>16 ms</b>	<b>6 ms</b>
<b>Airgap creepage</b>		
In accordance with the standard	<b>EN 60664-1</b>	<b>EN 60664-1</b>
Overvoltage category	<b>II</b>	<b>II</b>
Pollution degree	<b>2</b>	<b>2</b>
<b>Protection type</b>		
In accordance with the standard	<b>EN 60529</b>	<b>EN 60529</b>
Housing	<b>IP20</b>	<b>IP20</b>
Terminals	<b>IP20</b>	<b>IP20</b>
Mounting area (e.g. control cabinet)	<b>IP54</b>	<b>IP54</b>
<b>Mechanical data</b>	<b>312190</b>	<b>314190</b>
<b>Material</b>		
Bottom	<b>PC</b>	<b>PC</b>
Front	<b>PC</b>	<b>PC</b>
Coding	<b>PA</b>	<b>PA</b>
Mounting type	<b>plug-in</b>	<b>plug-in</b>
<b>Dimensions</b>		
Height	<b>76 mm</b>	<b>76 mm</b>
Width	<b>12,6 mm</b>	<b>12,6 mm</b>
Depth	<b>60,2 mm</b>	<b>60,2 mm</b>
Weight	<b>39 g</b>	<b>40 g</b>
<b>Mechanical coding</b>		
Type	<b>B</b>	<b>B</b>
Colour	<b>Yellow</b>	<b>Yellow</b>

Where standards are undated, the 2015-03 latest editions shall apply.

## 9 Order reference

### 9.1 Product

Product type	Features	Order No.
PSSu E F PS	Electronic module, base type	312 190
PSSu E F PS-T	Electronic module, T-type	314 190

### 9.2 Accessories

#### Base modules

Product type	Features	Order No.
PSSu BS 1/8 S	Base module with screw terminals, for use only as the first module after the head module	312 650
PSSu BS 1/8 S-T	Base module with screw terminals, for use only as the first module after the head module, T-type	314 650
PSSu BS 1/8 C	Base module with cage clamp terminals, for use only as the first module after the head module	312 651
PSSu BS 1/8 C-T	Base module with cage clamp terminals, for use only as the first module after the head module, T-type	314 651
PSSu BS-R 1/8 S	Base module with screw terminals, for use only to refresh the voltage and form supply groups	312 652
PSSu BS-R 1/8 S-T	Base module with screw terminals, for use only to refresh the voltage and form supply groups, T-type	314 652
PSSu BS-R 1/8 C	Base module with cage clamp terminals, for use only to refresh the voltage and form supply groups	312 653
PSSu BS-R 1/8 C-T	Base module with cage clamp terminals, for use only to refresh the voltage and form supply groups, T-type	314 653

# ► Support

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