

## ► PSSu E S RS232(-T)

# PILZ

THE SPIRIT OF SAFETY

Operating Manual-1001378-EN-06

- Decentralised system PSSuniversal I/O



This document is the original document.

Where unavoidable, for reasons of readability, the masculine form has been selected when formulating this document. We do assure you that all persons are regarded without discrimination and on an equal basis.

All rights to this documentation are reserved by Pilz GmbH & Co. KG. Copies may be made for the user's internal purposes. Suggestions and comments for improving this documentation will be gratefully received.

Pilz®, PIT®, PMI®, PNOZ®, Primo®, PSEN®, PSS®, PVIS®, SafetyBUS p®, SafetyEYE®, SafetyNET p®, the spirit of safety® are registered and protected trademarks of Pilz GmbH & Co. KG in some countries.



SD means Secure Digital

<b>1</b>	<b>Introduction</b> .....	<b>5</b>
1.1	Validity of documentation .....	5
1.1.1	Retaining the documentation .....	5
1.1.2	Terminology: System environment A and B .....	5
1.2	Definition of symbols .....	6
<b>2</b>	<b>Overview</b> .....	<b>7</b>
2.1	Module structure .....	7
2.2	Module features .....	7
2.3	Front view .....	8
<b>3</b>	<b>Safety</b> .....	<b>10</b>
3.1	Intended use .....	10
3.2	Safety regulations .....	11
3.2.1	Use of qualified personnel .....	11
3.2.2	Warranty and liability .....	11
3.2.3	Disposal .....	11
<b>4</b>	<b>Function description</b> .....	<b>12</b>
4.1	Block diagram .....	12
4.2	Module features .....	12
4.2.1	Functions .....	12
4.2.2	Integrated protection mechanisms .....	13
4.3	Data exchange .....	13
4.4	Configuration .....	14
4.4.1	Interface parameters .....	14
4.4.2	Receive buffer threshold .....	14
<b>5</b>	<b>Installation</b> .....	<b>15</b>
5.1	General installation guidelines .....	15
5.1.1	Dimensions .....	15
5.2	Installing the base module .....	17
5.3	Inserting and removing an electronic module .....	18
5.3.1	Inserting an electronic module .....	18
5.3.2	Removing an electronic module .....	19
5.3.3	Changing an electronic module during operation .....	19
<b>6</b>	<b>Wiring</b> .....	<b>20</b>
6.1	General wiring guidelines .....	20
6.1.1	Mechanical connection of the base modules .....	20
6.2	Terminal configuration .....	22
6.3	Connecting the module .....	26
<b>7</b>	<b>Operation</b> .....	<b>27</b>
7.1	Messages .....	27
7.2	Display elements .....	27
7.2.1	Display element for operational readiness .....	27
7.2.2	Display element for module error .....	28


7.2.3	Display elements for data transmission .....	28
<b>8</b>	<b>Technical details</b> .....	<b>29</b>
<b>9</b>	<b>Supplementary data</b> .....	<b>32</b>
9.1	Permitted operating height .....	32
<b>10</b>	<b>Order reference</b> .....	<b>33</b>
10.1	Product .....	33
10.2	Accessories .....	33

# 1 Introduction

## 1.1 Validity of documentation

This documentation is valid for the products PSSu E S RS232 and PSSu E S RS232-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.

The module PSSu E S RS232-T is suitable for use where there are increased environmental requirements (see [Technical details](#) [ 29]).

### 1.1.1 Retaining the documentation

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

### 1.1.2 Terminology: System environment A and B

The PSSu system can be used in two different system environments. The module's application area is described in the chapter "Intended Use" of the manual.

The distinction is made between

- ▶ PSSu in system environment A
- ▶ PSSu in system environment B

The distinction is based on the application area of the PSSu system.

PSSu in system environment A may be used in the

- ▶ Decentralised system PSSu I/O
- ▶ **Not** in the automation system PSS 4000

PSSu in system environment B may be used in the

- ▶ Automation system PSS 4000, e.g. with
  - Decentralised system PSSu I/O with SafetyNET p
  - Control system PSSu PLC
  - Control system PSSu multi

## 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.

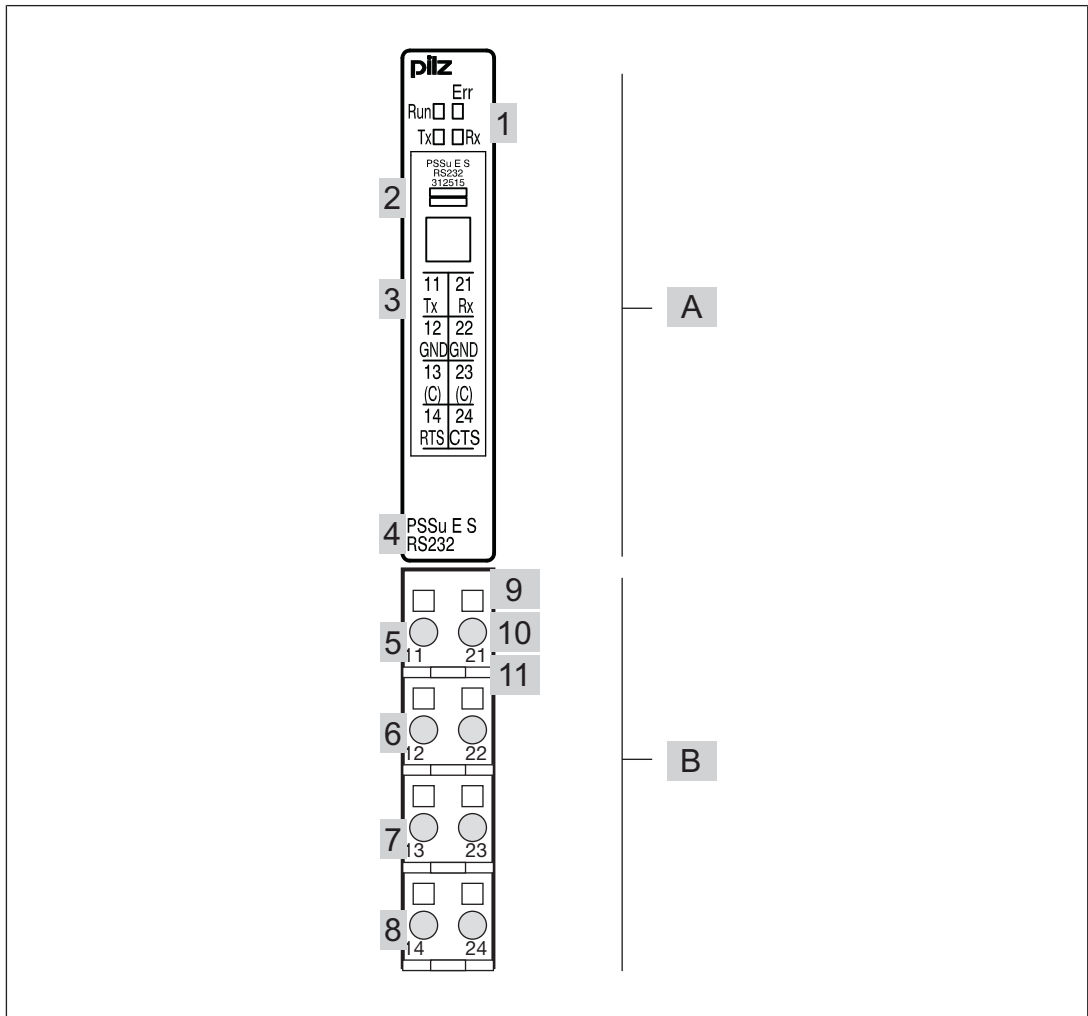
Details of the base modules that can be used are available in the chapter entitled “Intended Use”.

### 2.2 Module features

The product has the following features:

- ▶ Serial interface: RS 232
- ▶ Communication channels: 2 (Tx/Rx, full duplex)
- ▶ Configurable transmission rates
- ▶ Receive buffer: 1023 Byte
- ▶ Send buffer: 127 Byte
- ▶ Max. number per system: 6
- ▶ LEDs for:
  - Operational readiness
  - Module error
  - Data transmission
- ▶ For standard applications in system environment A and B
- ▶ T-type:
  - PSSu E S RS232-T: for increased environmental requirements

## 2.3 Front view



### Legend:

- ▶ 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 may be used for standard applications in system environment A and B.

The module provides a serial interface, which is intended for communication in non-safety-related applications.

The module PSSu E S RS232-T is suitable for use where there are increased environmental requirements (see [Technical details](#)  29]).

With reference to the standard IEC 61131-2 the values stated in the technical details for ambient temperature are reduced at heights >2000 m operating height above sea level (see [Supplementary data](#)  32]).

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 1.8.1
- ▶ PAS4000 from Version 1.1.1
  - We recommend that you always use the latest version (download from [www.pilz.de](http://www.pilz.de)).

The PSSu E S RS232 module may be used in conjunction with the following base modules:

- ▶ PSSu BP 1/8 S
- ▶ PSSu BP 1/8 C
- ▶ PSSu BP 1/12 S
- ▶ PSSu BP 1/12 C
- ▶ PSSu BP-C 1/8 S
- ▶ PSSu BP-C 1/8 C
- ▶ PSSu BP-C 1/12 S
- ▶ PSSu BP-C 1/12 C

The module PSSu E S RS232-T may be used in conjunction with the following base modules:

- ▶ PSSu BP 1/8 S-T
- ▶ PSSu BP 1/8 C-T
- ▶ PSSu BP 1/12 S-T

- ▶ PSSu BP 1/12 C-T
- ▶ PSSu BP-C 1/8 S-T
- ▶ PSSu BP-C 1/8 C-T
- ▶ PSSu BP-C 1/12 S-T
- ▶ PSSu BP-C 1/12 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 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. 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 the section entitled 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

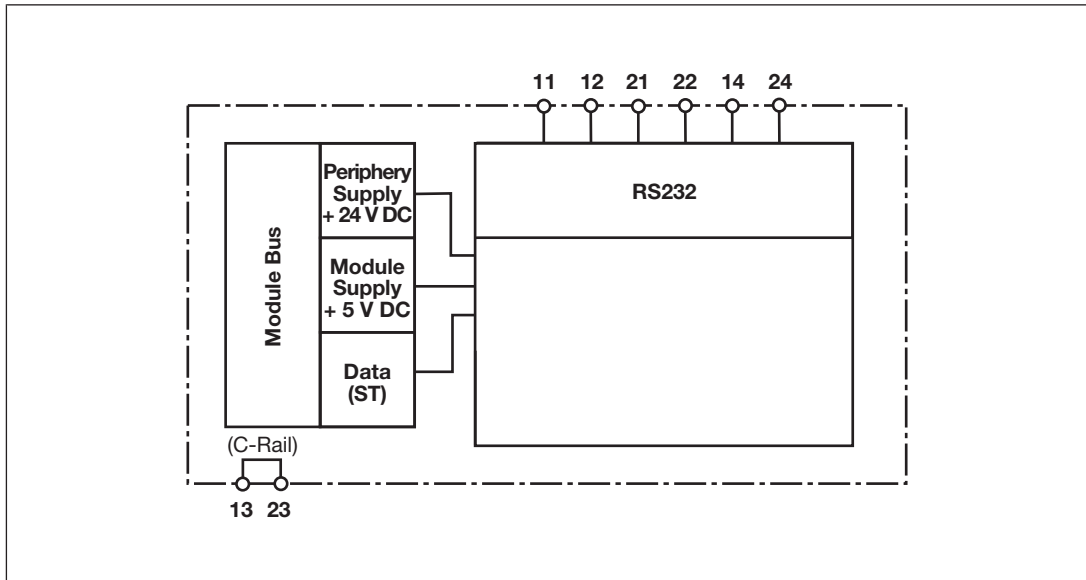
- ▶ The product was used contrary to the purpose for which it is intended,
- ▶ Damage can be attributed to not having followed the guidelines in the manual,
- ▶ Operating personnel are not suitably qualified,
- ▶ Any type of modification has been made (e.g. exchanging components on the PCB boards, soldering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

The module enables communication via a serial interface.

Module supply

- ▶ The module supply provides the module with voltage.

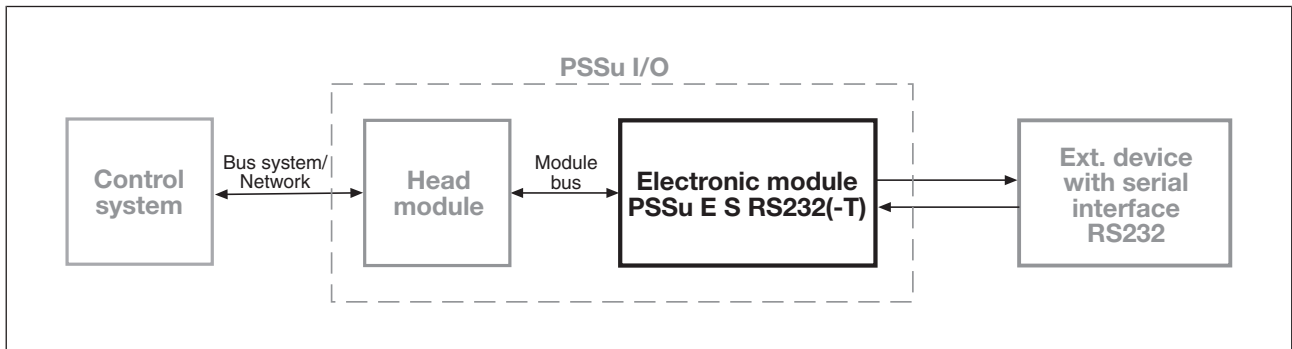
Periphery supply

- ▶ The periphery supply provides the serial interface with voltage.

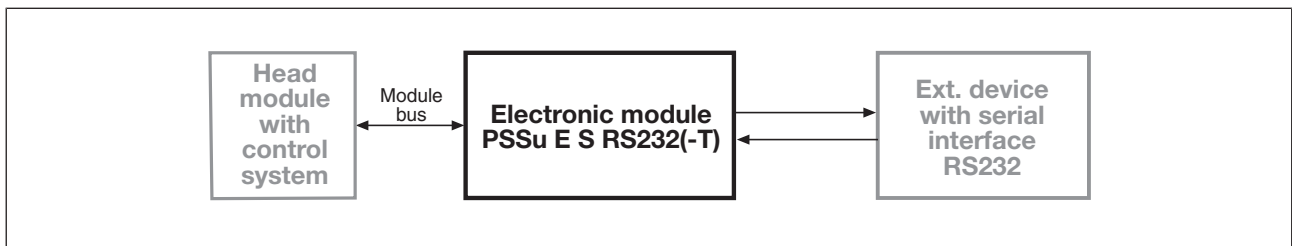
Signal processing

- ▶ In each cycle, a max. of 8 Bytes of data can be transferred in both directions between control system and module. The data to be transferred is stored temporarily in a send and receive buffer.
- ▶ Two additional status bytes and control bytes are available in the process image for data exchange between control system and module.
- ▶ All the configuration data is stored in the head module and is assigned to the module on restart. This way the configuration data is retained even if you change the module.

Schematic representation of signal processing with decentralised system PSSu I/O:



Schematic representation of signal processing with the PSSu PLC/PSSu multi control system:



#### 4.2.2 Integrated protection mechanisms

When the PSSu E F PS1(-T) or PSSu E F PS2(-T)(-R) is used to supply the system, the module supply is buffered for 20 ms if the supply voltage is interrupted.

The module detects the following errors:

- ▶ Start-up error
- ▶ Configuration error
- ▶ ST communication error
- ▶ Bus termination error

#### 4.3 Data exchange

A function block is required for data exchange between the bus subscribers.



##### INFORMATION

The necessary function block is available from Technical Support (telephone: +49 711 3409-444).

## **4.4 Configuration**

The module has the following configuration options:

- ▶ Interface parameter
- ▶ Threshold receive buffer

### **4.4.1 Interface parameters**

The following interface parameters can be configured:

- ▶ Transmission rate
- ▶ Block size (data bits and parity)
- ▶ Number of stop bits
- ▶ Continuous sending
- ▶ Xon/Xoff when sending
- ▶ Xon/Xoff when receiving
- ▶ RTS and CTS activated

### **4.4.2 Receive buffer threshold**

The number of Bytes in a receive buffer of the module is defined with this value, from which the status bit "Receive buffer full" is set (default value: 512).

## 5 Installation

### 5.1 General installation guidelines

Please refer also to the PSSuniversal Installation Manual.



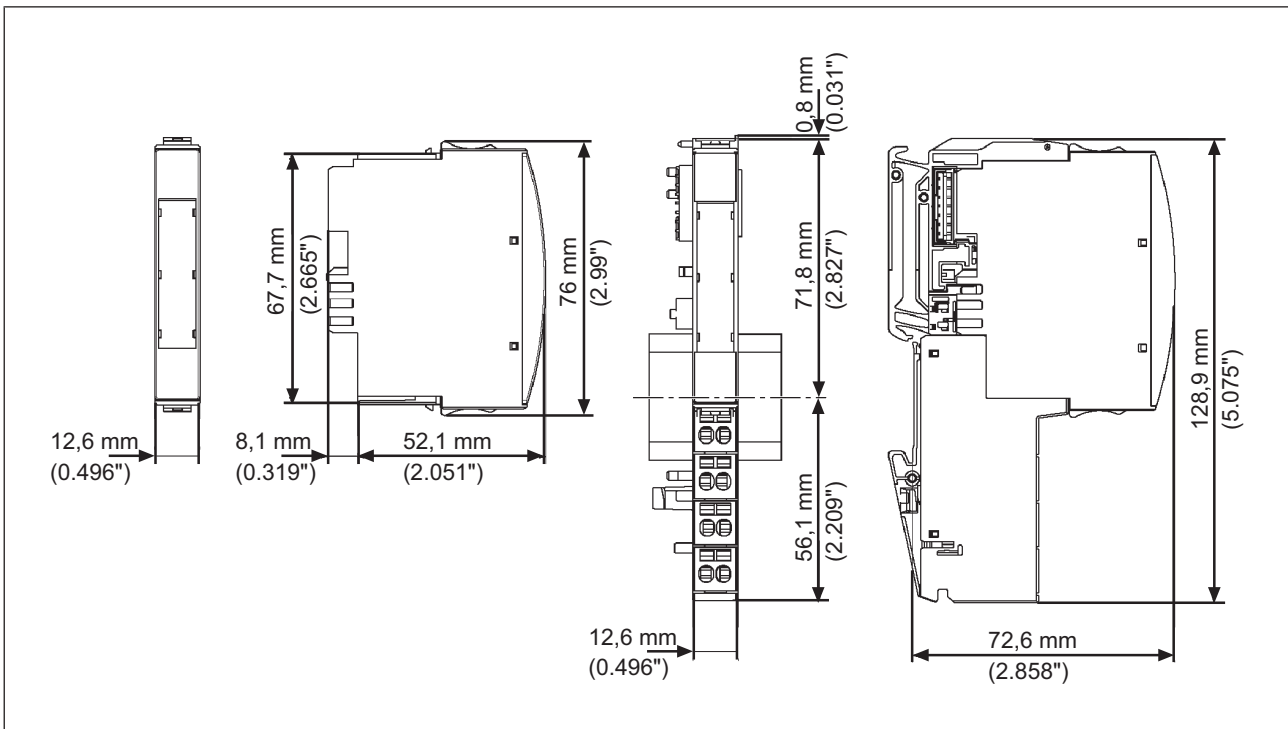
#### NOTICE

#### Damage due to electrostatic discharge!

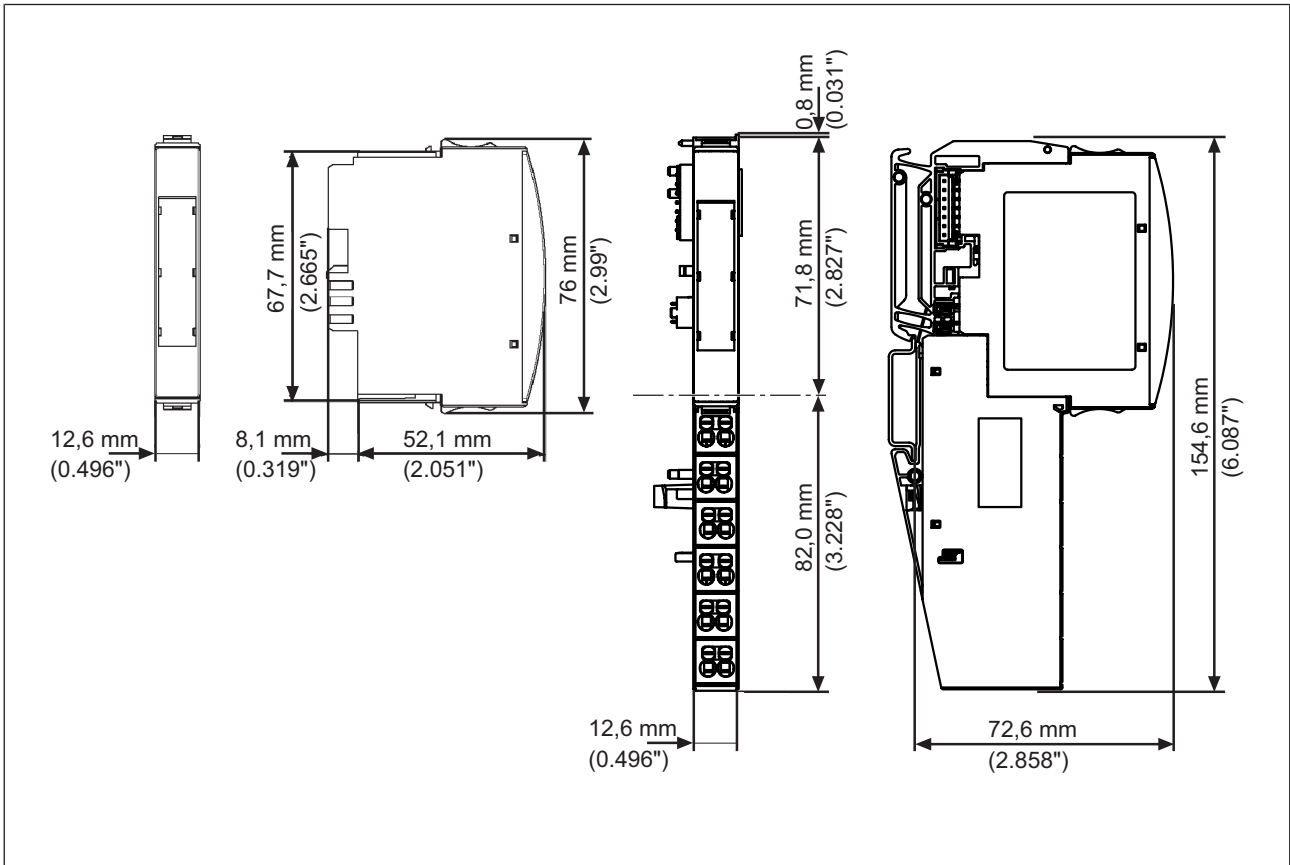
Electrostatic discharge can damage components. Ensure against discharge before touching the product, e.g. by touching an earthed, conductive surface or by wearing an earthed armband.

#### 5.1.1 Dimensions

Base modules with four connection levels:



Base modules with six 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.

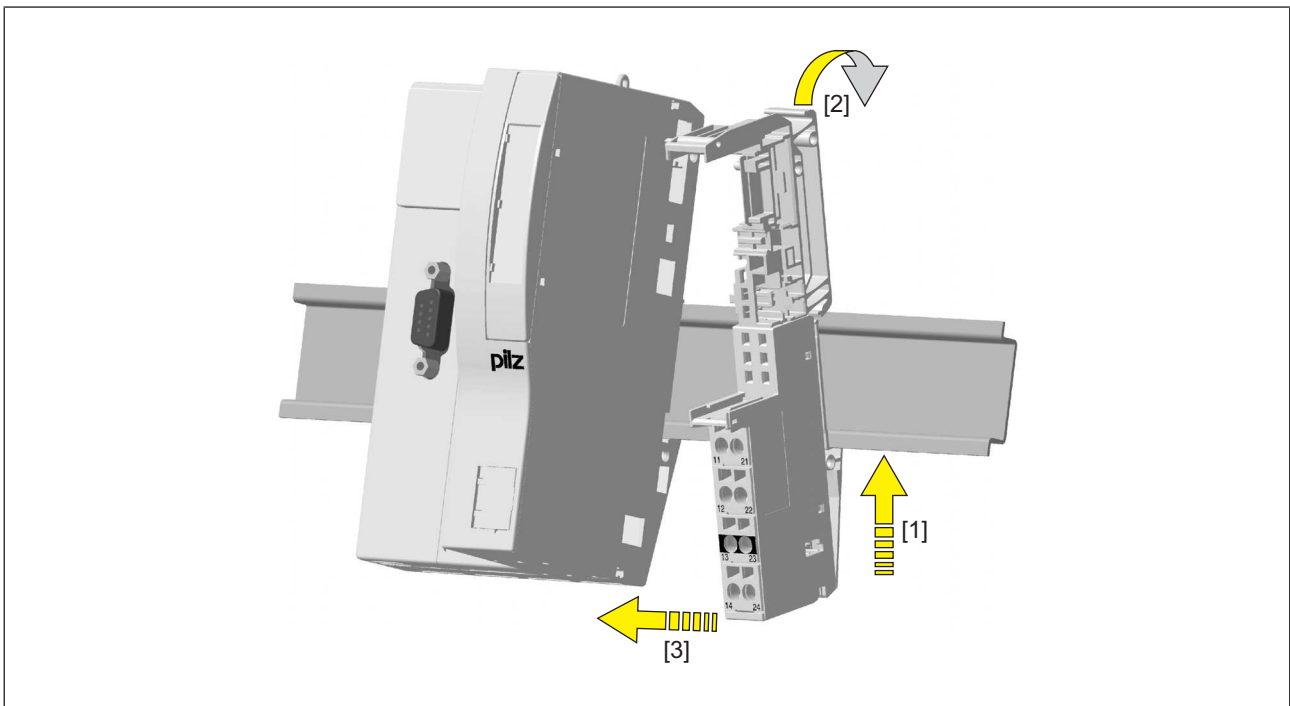
Please note:

- ▶ 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:

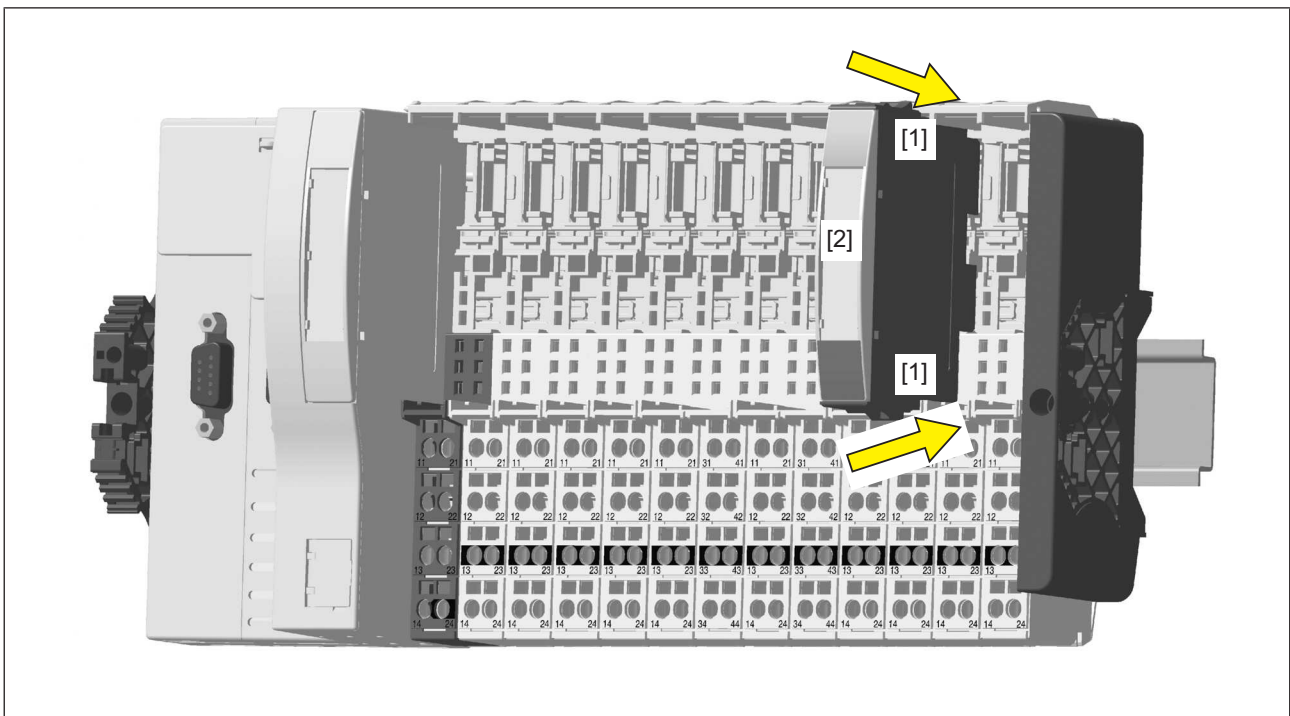
- ▶ Only insert on to base modules that are already installed.
- ▶ Preferably these base modules should be ready wired.
- ▶ Electronic modules with outputs may only be inserted and removed when the load is switched off. Unforeseeable error reactions may be triggered if modules are inserted and removed 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:

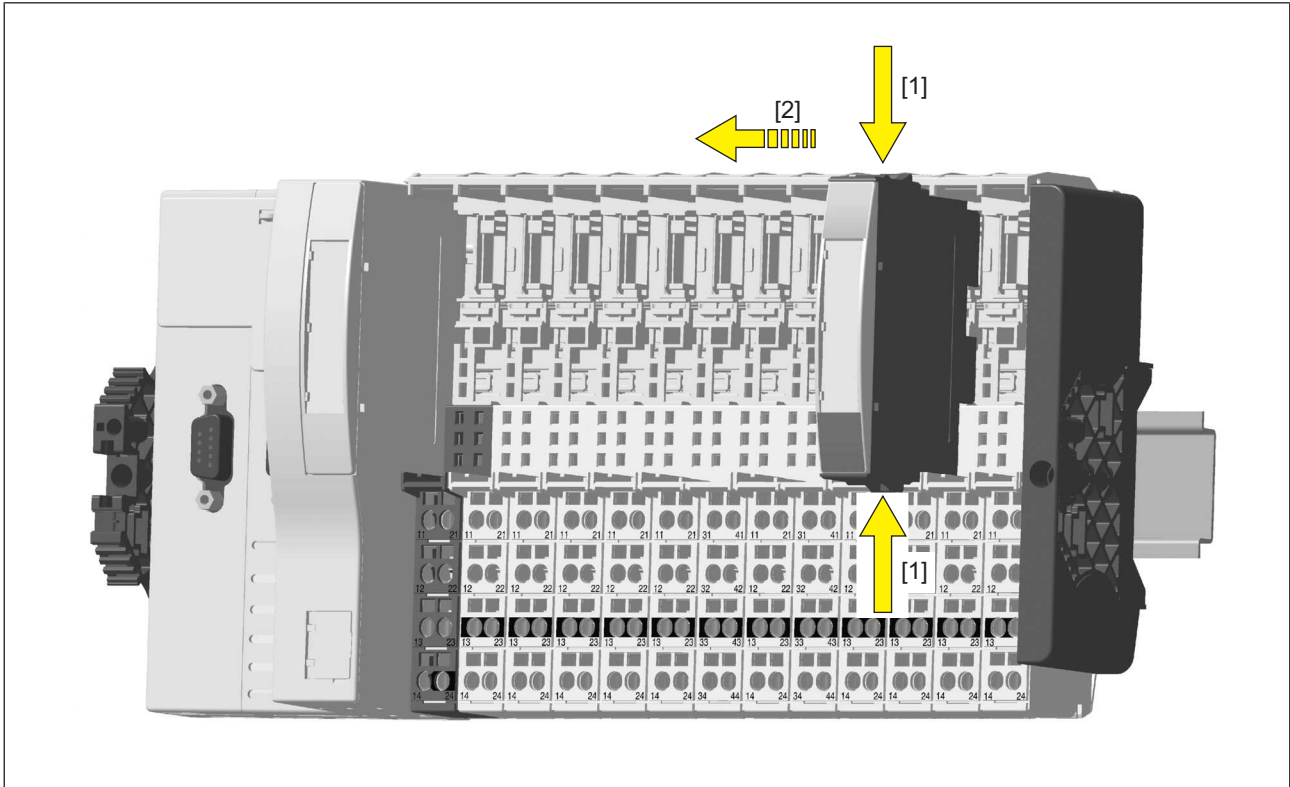


### 5.3.2 Removing an electronic module

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. However, changing an electronic module during operation may cause an ST communication error. The configuration data is retained when a module is changed.

## 6 Wiring

### 6.1 General wiring guidelines

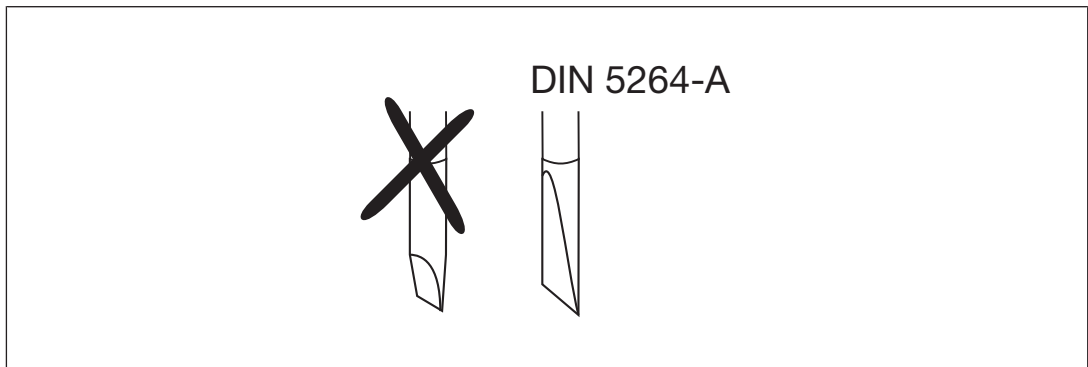
Please note:

- ▶ The supply voltages for actuators and sensors must be extra low voltages with protective electrical separation (PELV or SELV) in accordance with VDE 0100, Part 410. Failure to do so could result in electric shock.
- ▶ We recommend that you use shielded signal lines.
- ▶ On base modules with C-rail:
  - Connect the shield to the terminals on the C-rail.
  - Connect the C-rail with low impedance to the functional earth.
- ▶ On base modules without C-rail:
  - Connect the shield as shown in the terminal configuration section. The module connects the shield to the mounting rail.
  - Connect the mounting rail to the functional earth via an earthing terminal.
- ▶ In environments with strong EMC interference, base modules without a C-rail provide better protection if the shield is connected.
- ▶ Use copper wiring.
- ▶ The terminal configuration as stated on the front plate applies for base modules with C-rail. The terminal configuration as stated in the technical documentation applies for all other base modules.

#### 6.1.1 Mechanical connection of the base modules

Procedure:

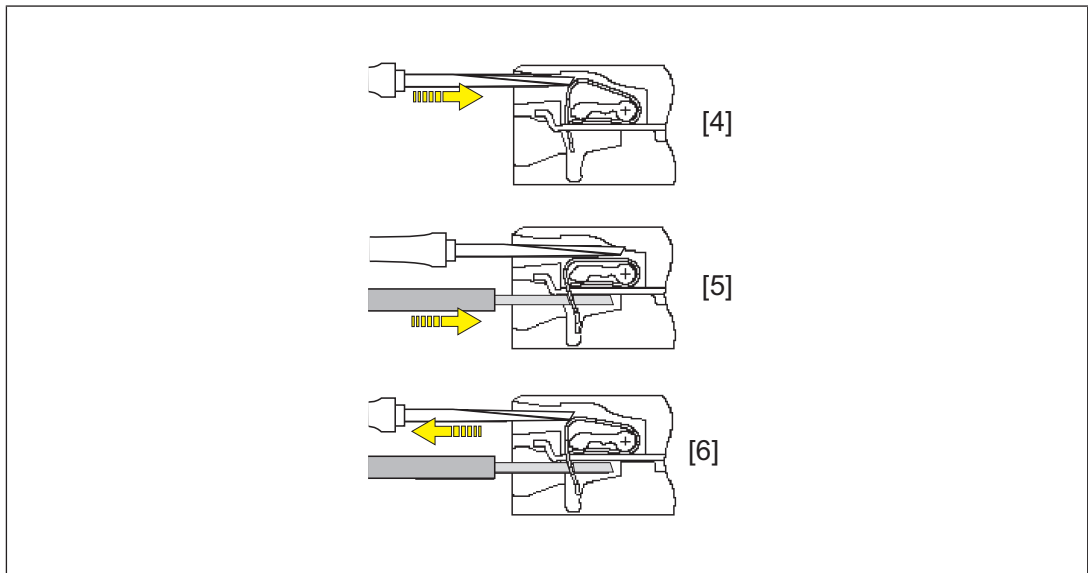
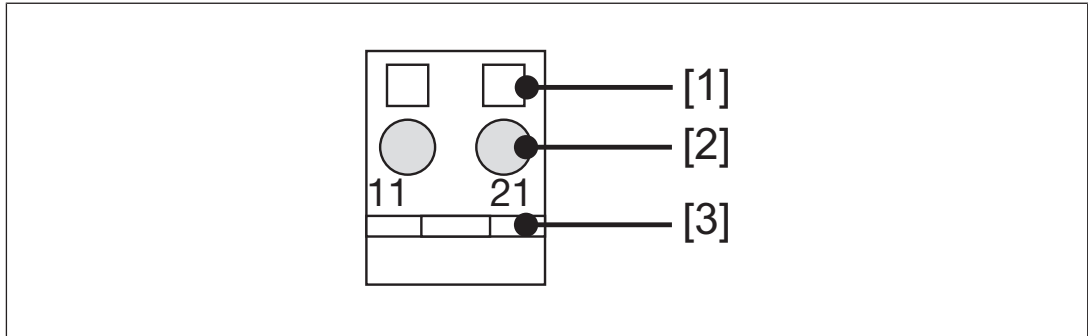
- ▶ Use a flat blade screwdriver (DIN 5264-A)!



- ▶ 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.



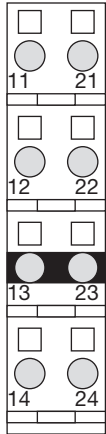
Please note:

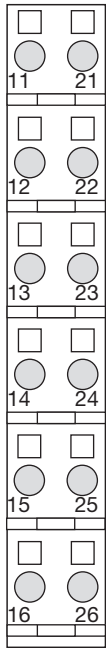
- The minimum cable cross section for field connection terminals on the base modules is 0.14 mm<sup>2</sup> (AWG26).
- The maximum cable cross section for field connection terminals is:
  - Digital inputs: 1.5 mm<sup>2</sup> (AWG16)
  - Digital outputs: 2.0 mm<sup>2</sup> (AWG14)
  - Inputs/outputs on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

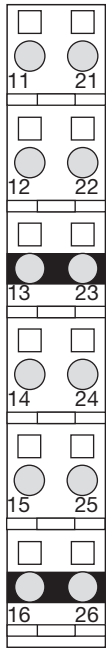
## 6.2 Terminal configuration

Base module	Terminal configuration	
Screw terminals: PSSu BP 1/8 S PSSu BP 1/8 S-T  Cage clamp terminals: PSSu BP 1/8 C PSSu BP 1/8 C-T	Without C-rail:  11: Output Tx (send data)  21: Input Rx (receive data)  12-22: GND (12-22 linked within the base module)  13-23: Shield connection (13-23 linked within the base module)  14: Output RTS  24: Input CTS	

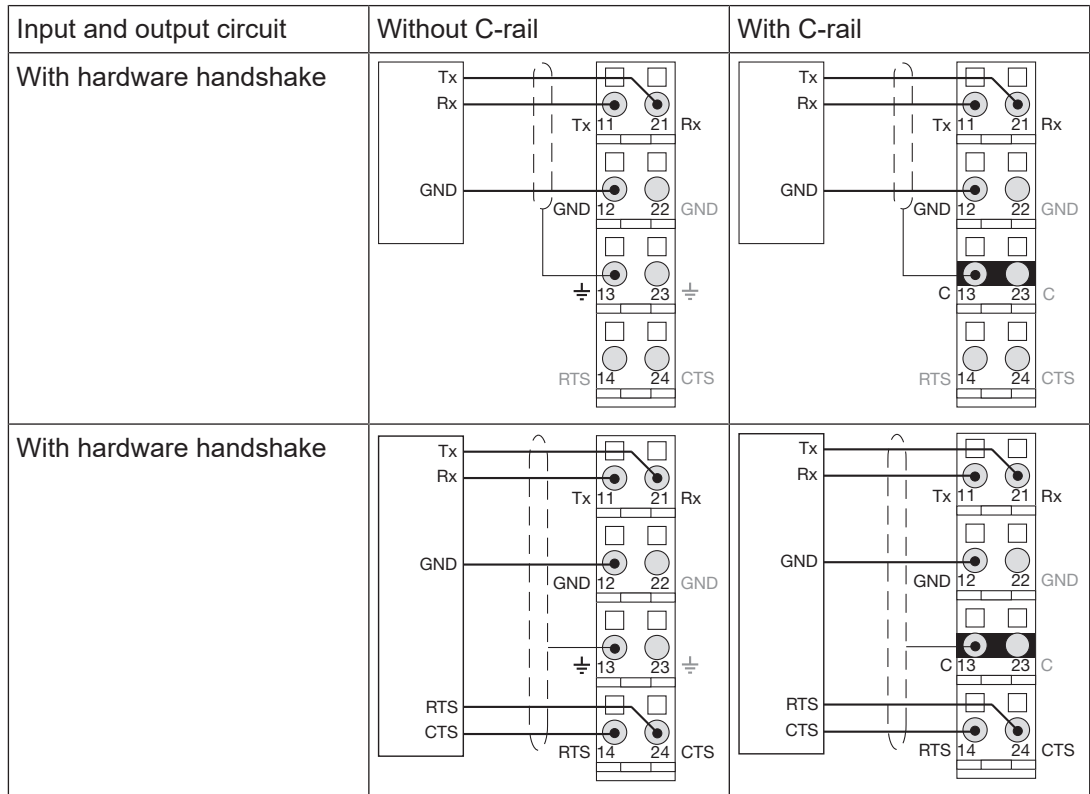
Base module	Terminal configuration	
<p>Screw terminals: PSSu BP-C 1/8 S PSSu BP-C 1/8 S-T</p> <p>Cage clamp terminals: PSSu BP-C 1/8 C PSSu BP-C 1/8 C-T</p>	<p>With C-rail:</p> <p>11: Output Tx (send data)</p> <p>21: Input Rx (receive data)</p> <p>12-22: GND (12-22 linked within the base module)</p> <p>13-23: C-rail supply, shield connection (13-23 linked within the base module)</p> <p>14: Output RTS</p> <p>24: Input CTS</p>	

Base module	Terminal configuration	
<p>Screw terminals: PSSu BP 1/12 S PSSu BP 1/12 S-T</p> <p>Cage clamp terminals: PSSu BP 1/12 C PSSu BP 1/12 C-T</p>	<p>Without C-rail:</p> <p>11: Output Tx (send data)</p> <p>21: Input Rx (receive data)</p> <p>12-22: GND (12-22-15-25 linked within the base module)</p> <p>13-23: Shield connection (13-23-16-26 linked within the base module)</p> <p>14: Output RTS</p> <p>24: Input CTS</p> <p>15-25: GND (12-22-15-25 linked within the base module)</p> <p>16-26: Shield connection (13-23-16-26 linked within the base module)</p>	



Base module	Terminal configuration	
<p>Screw terminals: PSSu BP-C 1/12 S PSSu BP-C 1/12 S-T</p> <p>Cage clamp terminals: PSSu BP-C 1/12 C PSSu BP-C 1/12 C-T</p>	<p>With C-rail:</p> <p>11: Output Tx (send data)</p> <p>21: Input Rx (receive data)</p> <p>12-22: GND (12-22 linked within the base module)</p> <p>13-23: C-rail supply, shield connection (13-23 linked within the base module)</p> <p>14: Output RTS</p> <p>24: Input CTS</p> <p>15-25: GND (12-22-15-25 linked within the base module)</p> <p>16-26: C-rail supply, shield connection (13-23-16-26 linked within the base module)</p>	

### 6.3 Connecting the module



## 7 Operation

### 7.1 Messages

A module error is displayed via the "Err" LED (see section entitled "Display elements"). It is signalled to the head module and then entered in the

- ▶ Error stack, with PSSu in system environment A
- ▶ Diagnostic log, with PSSu in system environment B.



of the head module.

The module can detect the following errors:

Errors	Statement	Remedy
Start-up error	Error as the PSSu system starts up	Change faulty module.
Configuration error	Wrong module type selected or invalid module configuration	Adjust the configured hardware registry to the actual hardware registry so that they match, or correct the module configuration.
ST communication error	Error during ST communication	Change faulty module
Bus termination error	There is no terminating plate or there is a bad contact with the module bus.	Install a terminating plate with integrated end bracket or insert the base modules together correctly.




### 7.2 Display elements

#### Legend

-  LED on
-  LED off

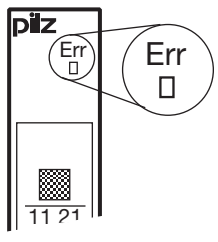
#### 7.2.1 Display element for operational readiness

The module has an LED to display operational readiness ("Run" LED).

	LED			Key
	Description	Colour	Status	
	Run	---		Module not ready for operation
	Green		Module ready for operation	

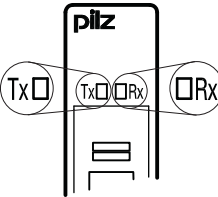
### 7.2.2 Display element for module error

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

	LED			Meaning
	Designation	Colour	Status	
	Err	---	●	No error
		Red	☀	Module is faulty

### 7.2.3 Display elements for data transmission

The module has the LEDs Tx and Rx for displaying the data transfer (LEDs "Tx" and "Rx").

	LED			Meaning	
	Designation	Colour	Status	Signal	Terminal
	Tx	---	●	No data transfer	11
		green	☀	Send data	
	Rx	---	●	No data transfer	21
green		☀	Receive data		

## 8 Technical details

<b>General</b>	<b>312515</b>	<b>314515</b>
Certifications	CE, UKCA, cULus Listed	CE, UKCA, cULus Listed
Application range	Standard	Standard
Module's device code	0720h	0720h
Number of ST input bits	64	64
Number of ST output bits	64	64
Number of ST status bits	16	16
Number of ST control bits	16	16
Application in system environment A		
from ST firmware version, other head modules	17	17
from ST firmware version PSSu H S PN	1	1
Application in system environment B		
from ST firmware version, head modules	1.0.0	1.0.0
<b>Electrical data</b>	<b>312515</b>	<b>314515</b>
Internal supply voltage (module supply)		
Module's power consumption	0,63 W	0,63 W
Periphery's supply voltage (periphery supply)		
Voltage range	16,8 - 30 V	16,8 - 30 V
Module's current consumption with no load	20 mA	20 mA
Module's power consumption with no load	0,48 W	0,48 W
Max. power dissipation of module	1,2 W	1,2 W
<b>Serial interface</b>	<b>312515</b>	<b>314515</b>
Number of RS232 interfaces	1	1
Transmission rate (configurable)	1,2 kBit/s, 19,2 kBit/s, 2,4 kBit/s, 300 Bit/s, 4,8 kBit/s, 600 Bit/s, 9,6 kBit/s	1,2 kBit/s, 19,2 kBit/s, 2,4 kBit/s, 300 Bit/s, 4,8 kBit/s, 600 Bit/s, 9,6 kBit/s
Max. cable length	15 m	15 m
Size of receive buffer	1.023 Byte	1.023 Byte
Size of send buffer	127 Byte	127 Byte
Potential isolation between interface and module supply	Yes	Yes
Potential isolation between interface and periphery supply	Yes	Yes
<b>Environmental data</b>	<b>312515</b>	<b>314515</b>
Climatic suitability	EN 60068-2-1, EN 60068-2-14, EN 60068-2-2, EN 60068-2-30, EN 60068-2-78	EN 60068-2-1, EN 60068-2-14, EN 60068-2-2, EN 60068-2-30, EN 60068-2-78

<b>Environmental data</b>	<b>312515</b>	<b>314515</b>
Ambient temperature		
in accordance with the standard	<b>EN 60068-2-14</b>	<b>EN 60068-2-14</b>
Temperature range	<b>0 - 60 °C</b>	<b>-40 - 70 °C</b>
Storage temperature		
in accordance with the standard	<b>EN 60068-2-1/-2</b>	<b>EN 60068-2-1/-2</b>
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 SL	<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 61131-2</b>	<b>EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61131-2</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>
Acceleration	<b>1g</b>	<b>5g</b>
Shock stress		
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>
Airgap creepage		
in accordance with the standard	<b>EN 60664-1, EN 61131-2</b>	<b>EN 60664-1, EN 61131-2</b>
Overvoltage category	<b>II</b>	<b>II</b>
Pollution degree	<b>2</b>	<b>2</b>
Protection type		
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>312515</b>	<b>314515</b>
Material		
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>Mechanical data</b>	<b>312515</b>	<b>314515</b>
Dimensions		
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>36 g</b>	<b>37 g</b>
Mechanical coding		
Type	<b>K</b>	<b>K</b>
Colour	<b>Dark grey</b>	<b>Dark grey</b>

Where standards are undated, the 2009-03 latest editions shall apply.

## 9 Supplementary data

### 9.1 Permitted operating height

The values stated in the technical details apply to the use of the device in operating heights up to max. 2000 m above SL. When used at higher levels, restrictions of the ambient temperature (standard IEC 61131-2) must be taken into account.

Operating height above SL [m]	Multiplication factors for the devices' ambient temperature
0 ... 2000	1.0
3000	0.9
4000	0.8
5000	0.7



## 10 Order reference

### 10.1 Product

Product type	Features	Order no.
PSSu E S RS232	Electronic module, base type	312515
PSSu E S RS232-T	Electronic module, T-type	314515

### 10.2 Accessories

#### Base modules

Product type	Features	Order no.
PSSu BP 1/8 S	Base module without C-rail with screw terminals	312600
PSSu BP 1/8 S-T	Base module without C-rail with screw terminals, T-type	314600
PSSu BP 1/8 C	Base module without C-rail with cage clamp terminals	312601
PSSu BP 1/8 C-T	Base module without C-rail with cage clamp terminals, T-type	314601
PSSu BP-C 1/8 S	Base module with C-rail and screw terminals	312610
PSSu BP-C 1/8 S-T	Base module with C-rail and screw terminals, T-type	314610
PSSu BP-C 1/8 C	Base module with C-rail and cage clamp terminals	312611
PSSu BP-C 1/8 C-T	Base module with C-rail and cage clamp terminals, T-type	314611
PSSu BP 1/12 S	Base module without C-rail with screw terminals	312618
PSSu BP 1/12 S-T	Base module without C-rail with screw terminals, T-type	314618
PSSu BP 1/12 C	Base module without C-rail with cage clamp terminals	312619
PSSu BP 1/12 C-T	Base module without C-rail with cage clamp terminals, T-type	314619
PSSu BP-C 1/12 S	Base module with C-rail and screw terminals	312620
PSSu BP-C 1/12 S-T	Base module with C-rail and screw terminals, T-type	314620
PSSu BP-C 1/12 C	Base module with C-rail and cage clamp terminals	312621
PSSu BP-C 1/12 C-T	Base module with C-rail and cage clamp terminals, T-type	314621

# ▶ Support

Technical support is available from Pilz round the clock.

## Americas

### Brazil

+55 11 97569-2804

### Canada

+1 888 315 7459

### Mexico

+52 55 5572 1300

### USA (toll-free)

+1 877-PILZUSA (745-9872)

## Asia

### China

+86 21 60880878-216

### Japan

+81 45 471-2281

### South Korea

+82 31 778 3300

## Australia and Oceania

### Australia

+61 3 95600621

### New Zealand

+64 9 6345350

## Europe

### Austria

+43 1 7986263-0

### Belgium, Luxembourg

+32 9 3217570

### France

+33 3 88104003

### Germany

+49 711 3409-444

### Ireland

+353 21 4804983

### Italy, Malta

+39 0362 1826711

## Scandinavia

+45 74436332

## Spain

+34 938497433

## Switzerland

+41 62 88979-32

## The Netherlands

+31 347 320477

## Turkey

+90 216 5775552

## United Kingdom

+44 1536 462203

## You can reach our international hotline on:

+49 711 3409-222

support@pilz.com

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](http://www.pilz.com) for further details or contact our headquarters.

Headquarters: Pilz GmbH & Co. KG, Felix-Wankel-Straße 2, 73760 Ostfildern, Germany  
Telephone: +49 711 3409-0, Telefax: +49 711 3409-133, E-Mail: [info@pilz.com](mailto:info@pilz.com), Internet: [www.pilz.com](http://www.pilz.com)

# PILZ

THE SPIRIT OF SAFETY