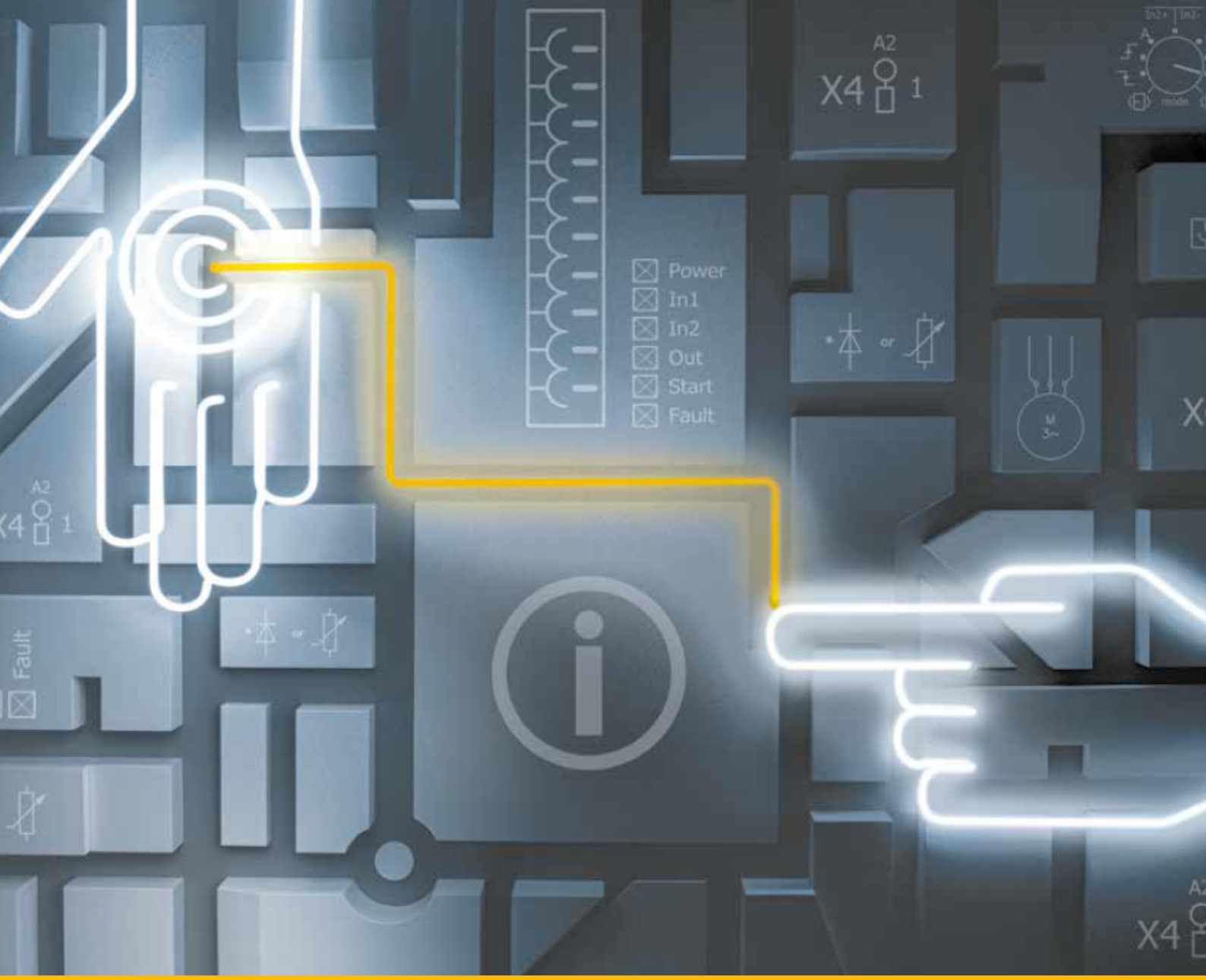


PSSu E F ABS SSI(-T)

PILZ
THE SPIRIT OF SAFETY

Operating Manual-1001455-EN-10

- 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.

1 Introduction

1.1 Validity of documentation

This documentation is valid for the products PSSu E F ABS SSI and PSSu E F ABS SSI-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.

1.1.2 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

The modules PSSu E F ABS SSI and PSSu E F ABS SSI**(-T)** are exclusively for use in system environment B (automation system PSS4000).

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”.

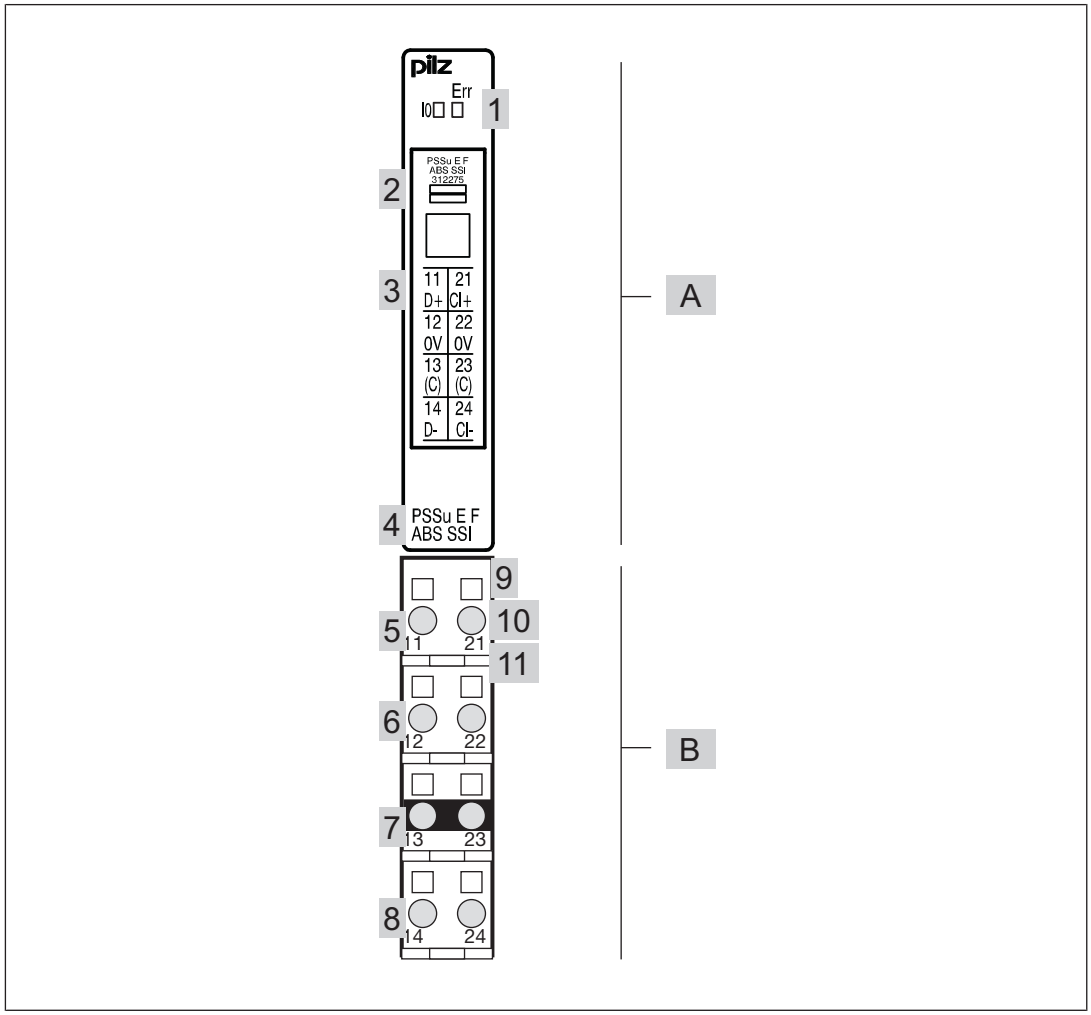
2.2 Module features

The product has the following features:

- Counter input (data)
  - – Input data length up to max. 32 Bit
  - – Differential input
- Test pulse output (clock) for requesting data
  - – Differential output
- Transmission rate up to max. 1.5 MHz
- LED-Anzeigen für:
  - – Data transfer
  - – Module error
- For failsafe applications in system environment B (automation system PSS 4000)
- T-type:

  PSSu E F ABS SSI-T: for increased environmental requirements

2.3 Front view



Legend:

- A: Electronic module
- B: Base module
- 1: LEDs for
  - Module diagnostics
  - Status of the data transfer
- 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 (terminals 11, 21)
- 6: Connection level 2 (terminals 12, 22)

- 7: Connection level 3 (terminals 13, 23)
- 8: Connection level 4 (terminals 14, 24)
- 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 failsafe applications in system environment B (automation system PSS 4000).

The modules PSSu E F ABS SSI and PSSu E F ABS SSI-T can be used as a PESSRAL (programmable electronic system in safety-related applications for lifts) in accordance with the Lifts Directive 2014/33/EU. The modules meet the requirements in accordance with EN 81-20, EN 81-50 for passenger and goods lifts the requirements in accordance with EN 115-1 for escalators and moving walks.

The module/the safety controller should be installed in a protected environment. Example: Protected inside space or control cabinet with protection class and corresponding air conditioning specified in Technical details [📖 29].

With the counter module you can implement the following safety functions:

Monitoring of:

- Position
- Speed
- Standstill

Two counter modules and two sensors have to be used. It is possible to use either two counter modules of the same type or a combination of PSSu E F INC or PSSu K F INC and PSSu E F ABS SSI. Due to redundant and diverse input values and use of the function blocks FS_IncrementalEncoder, FS_AbsoluteEncoder and FS_CounterDual, PL e (Cat. 4) and SIL CL 3 can be achieved.

To apply the module you will need to have read and understood the description of the function blocks (s. Online help).

Requirements of the PSSu system:

- The counter modules must be part of a control system PSSu PLC or PSSu multi (not decentralised I/O system).
- The function blocks have to be assigned to the FS resource of the PSSu system where the counter modules are inserted. Control via SafetyNet is not permitted.

Demands on the sensors:

- Absolute encoders with SSI interfaces may be used as sensors.
- Connect the sensors mechanically independently to the axis. If this is not possible, the connection should be positive-locking without wearing parts as e.g. chains or drive belts. If it is not possible to avoid this, the mechanical connection of the sensors must be monitored. Alternatively, it is possible to use a sensor that internally has 2 independent measured value recording systems.

Please note during configuration and within the user program:

- The input values must be diverse. This can be achieved through different
  - Scaling
  - Direction of rotation/count direction

  - Offset
    To avoid errors during a simultaneous counter overflow, one of the absolute encoders must be equipped with an offset.
- If more than two counters are used, each individual counter module of a PSSu system must supply diverse input values to the other counter modules of the PSSu system.
- Safe standstill monitoring must be carried out by feasibility with a safe travel command in the function block.
- Test the safety functions when commissioning or recommissioning.

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 PAS4000 from Version 1.1.1. We recommend that you always use the latest version (download from www.pilz.de).

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

- PSSu BP 1/8 S
- PSSu BP 1/8 C
- PSSu BP-C 1/8 S
- PSSu BP-C 1/8 C
- PSSu BP 1/12 S
- PSSu BP 1/12 C
- PSSu BP-C1 1/12 S
- PSSu BP-C1 1/12 C

The module PSSu E F ABS SSI-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-C 1/8 S-T
- PSSu BP-C 1/8 C-T
- PSSu BP 1/12 S-T
- PSSu BP 1/12 C-T
- PSSu BP-C1 1/12 S-T
- PSSu BP-C1 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

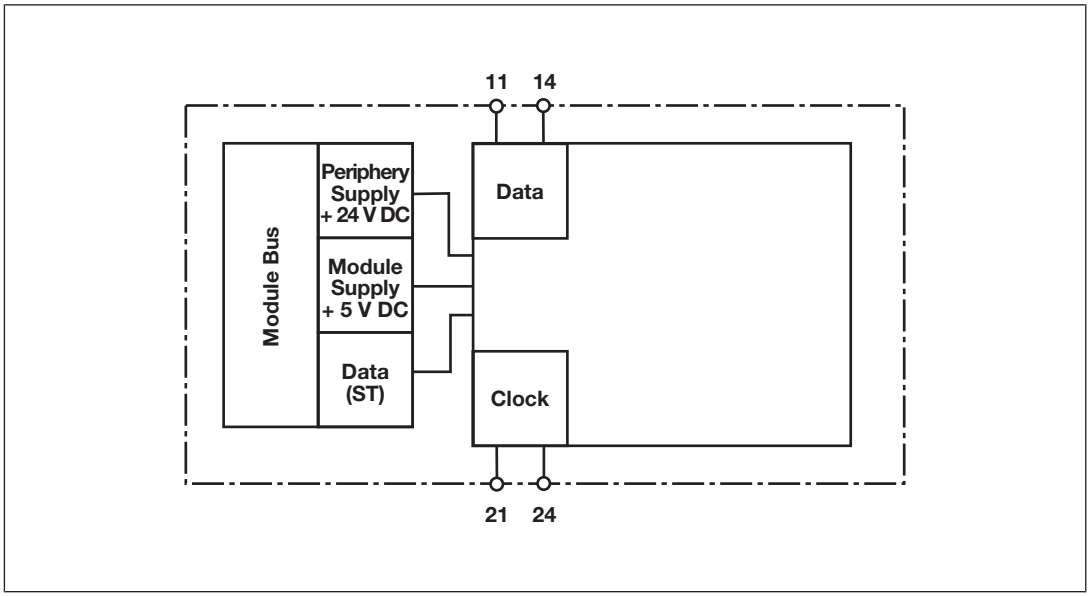
- The product was used contrary to the purpose for which it is intended,
- Damage can be attributed to not having followed the guidelines in the manual,
- Operating personnel are not suitably qualified,
- Any type of modification has been made (e.g. exchanging components on the PCB boards, soldering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

Module supply

- The module supply provides the module with voltage.

Periphery supply

- The supply for the test pulse output is generated from the periphery supply. It is galvanically isolated from the periphery supply.

As part of each cycle the module sends a pulse sequence at the test pulse output (CI) to the SSI absolute encoder. In turn the encoder transmits its position data. The position data is read in at the module's input (D) (see timing diagram: SSI data transfer).

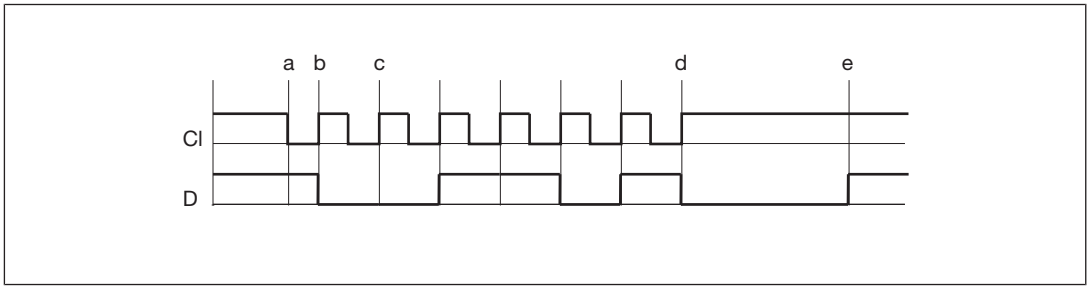
With the system software the user can set the following values to adapt the module to the encoder or higher level control system:

- Transmission rate
  The frequency of the pulses at the test pulse output (CI) determines the transmission rate. The user can adapt the frequency to the encoder in a range from 62.5 kHz up to 1.5 MHz (see Technical Details).
- Input data length:
  The module's input data length must be adjusted to the data length of the absolute encoder.
  The module can process up to 32 Bits. The default is 24 Bits.

- Data format:
  The data format in which the module transmits the position data of the connected absolute encoder to the head module.
  - Gray code (default)
  - Binary code

The position data is transmitted to the head module via the ST module bus with 4 Bytes, irrespective of the configured input data length. The module sends additional status information.

Timing diagram: Example of SSI data transfer**:**



Legend:

The bit width in the example is 6. The position of the encoder is 001101 in gray code, i.e. 9_D.

- a: Data transfer begins with a falling edge at the Cl signal.
- b: The first bit is transmitted with the first rising edge from the Cl signal.
- c: The time up to the second rising edge is the period length T. 1/T is the signal frequency.
- d: The last rising edge from the Cl signal ends the transfer. The encoder acknowledges the end of the transfer with a 0 signal.
- e: The encoder can transfer data again as soon as there is a 1 signal at input D.

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 Configuration

4.3.1 Parameter

The module has the following configuration options:

Configuration	Default value	Meaning
Transmission rate	250 kHz	62.5 kHz 100 kHz 125 kHz 250 kHz 500 kHz 1 MHz 1.5 MHz
Gray code format	On	On: Gray code is activated. Off: Binary code is activated.
Fault detection within the data frame[1]	On	On: Errors within the data frame are identified. Off: Errors within the data frame are ignored.
Input data length	24	2 ... 32 Bit

[1] An error within the data frame means that the absolute encoder does not terminate the serial data transfer with a zero.

4.3.2 Input/output data

4.3.2.1 PSSu assignment in system environment B

Data access is via pre-defined I/O data types:

I/O data name	I/O data type	I/O data element	Meaning
InputData	FS_I_ABS_SSI	Data: DWORD	Current position data
		InputError: BOOL	FALSE: Counter input active TRUE: Counter input passive
		DataFrameError: BOOL	FALSE: No error within the data frame TRUE: Data frame faulty[1]
		ModuleError: BOOL	FALSE: No error within the module TRUE: Module is faulty

[1] "Data frame faulty" indicates that the module is receiving faulty values or no values from the absolute encoder.

- Possible cause for faulty receipt of data:
  - max. input data length of 32 bit exceeded
- Possible cause for not receiving data:
  - Open circuit
  - Absolute encoder is not connected.

5 Installation

5.1 General installation guidelines

Please also refer to the PSSuniversal Installation Manual.

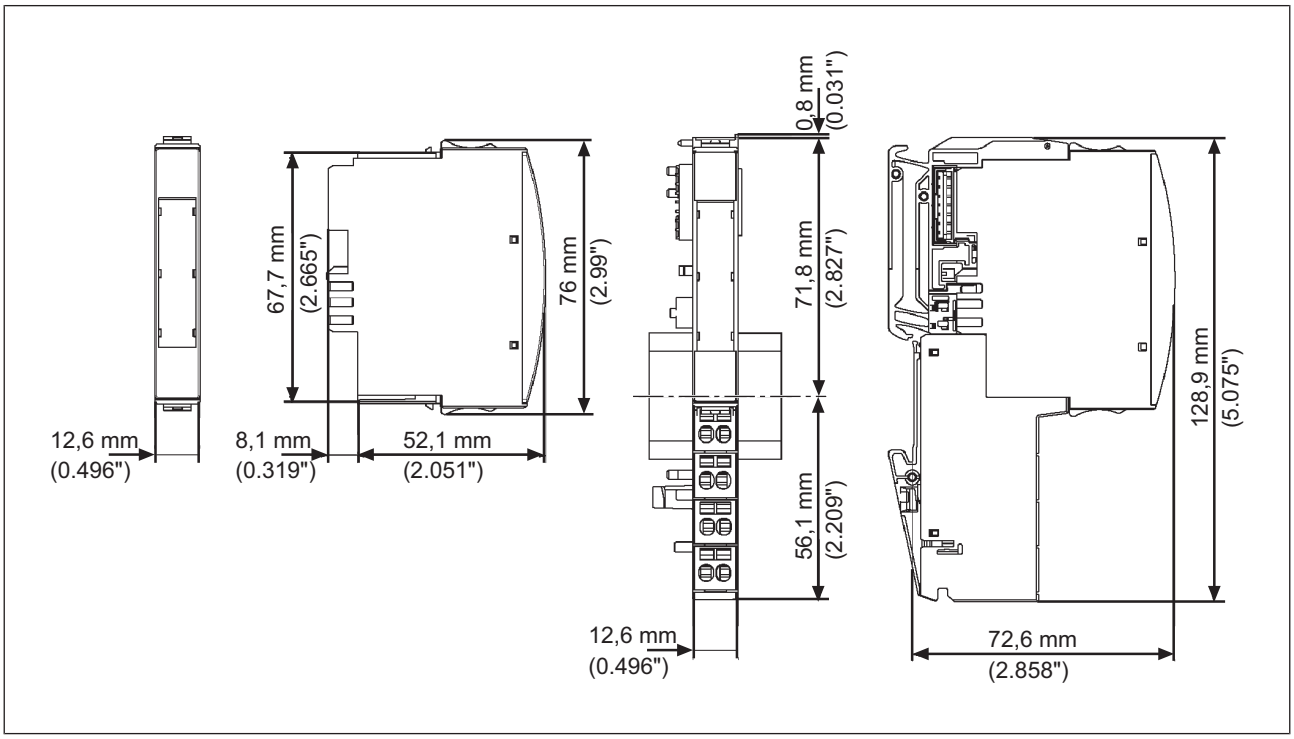
NOTICE

Damage due to electrostatic discharge!

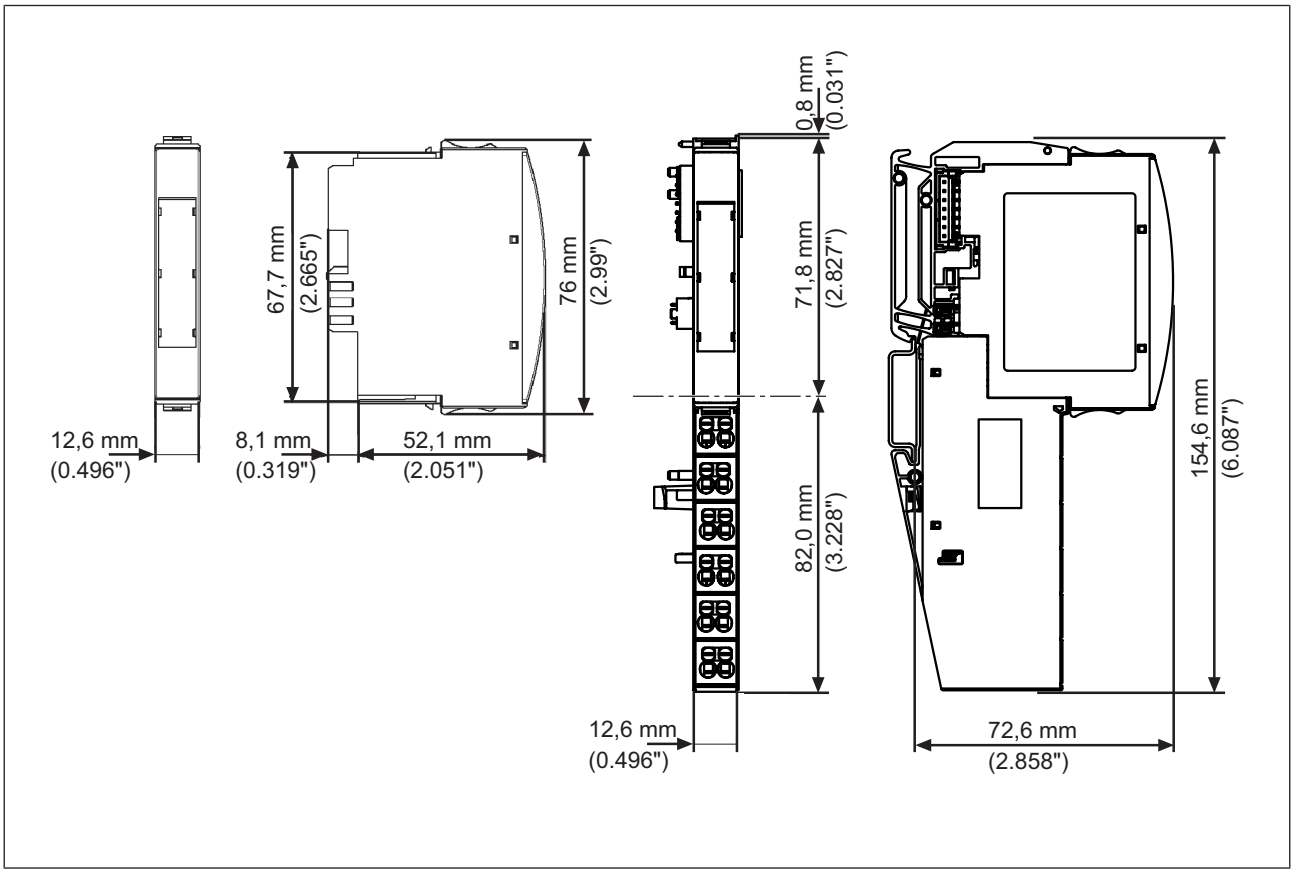
Electrostatic discharge can damage components. Ensure against discharge before touching the product, e.g. by touching an earthed, conductive surface or by wearing an earthed armband.

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.

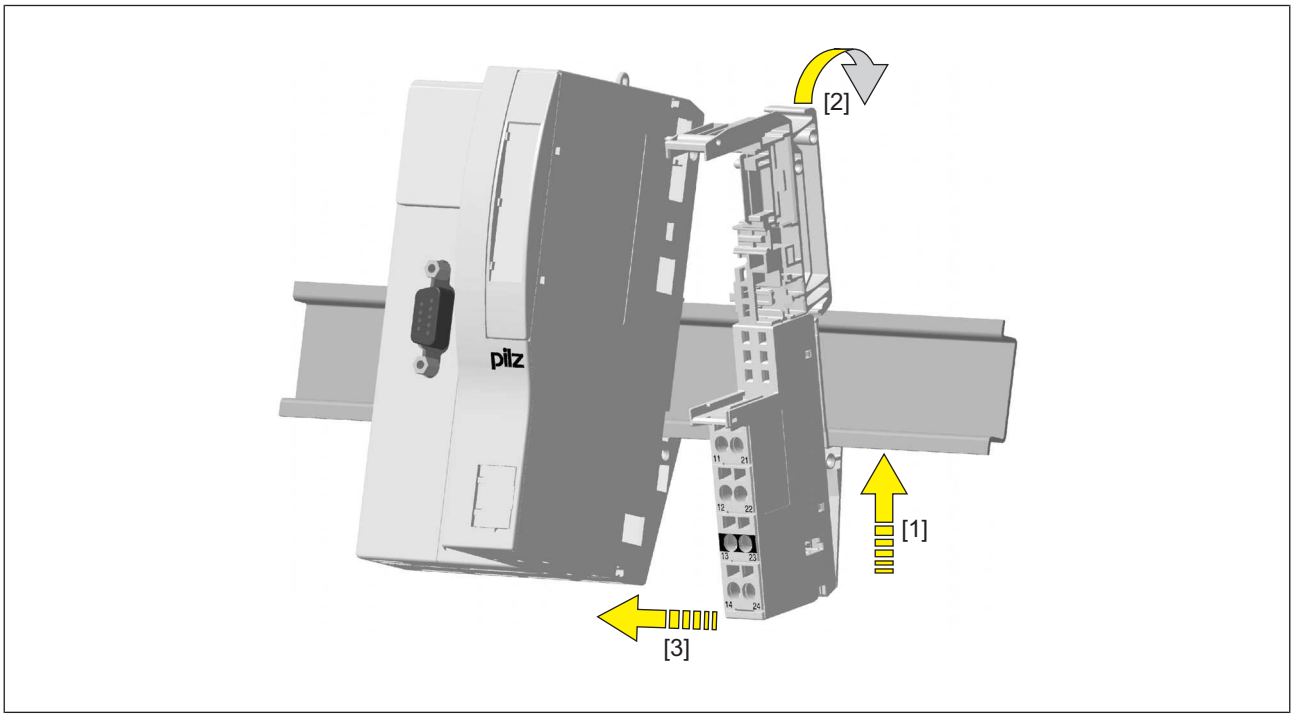
Please note:

- 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:

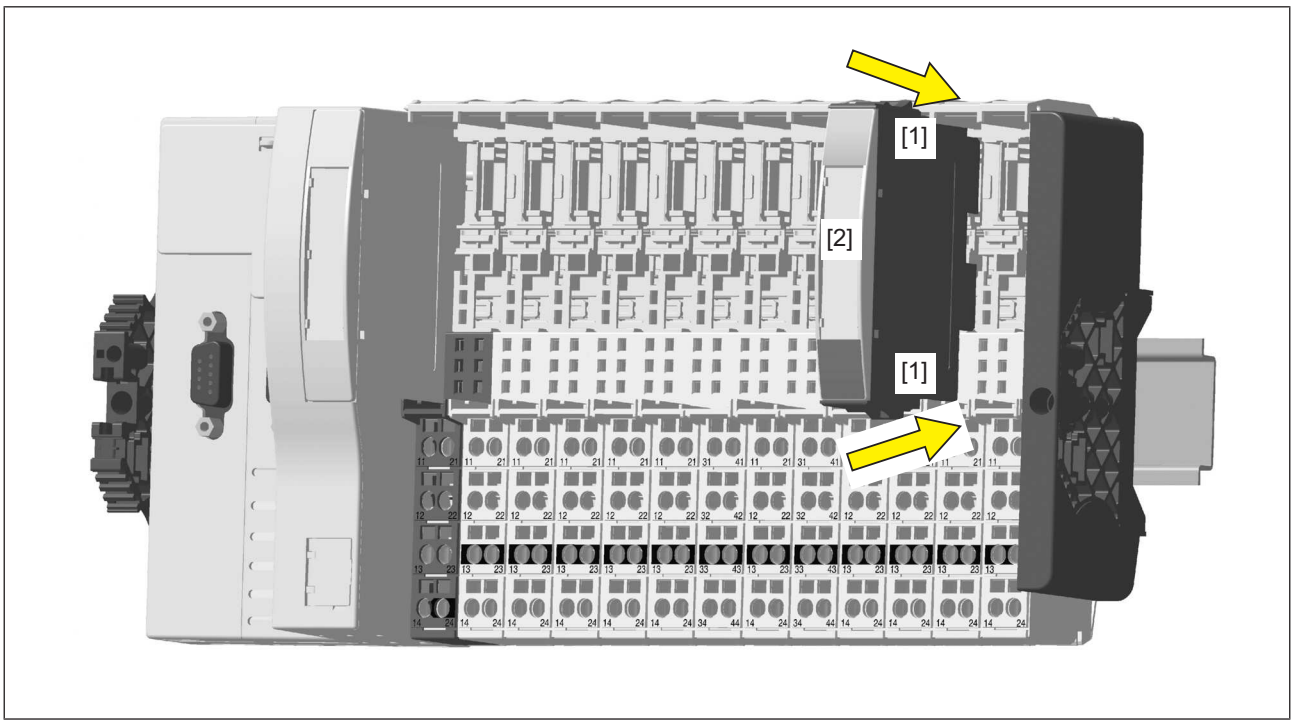
- Only insert on to base modules that are already installed.
- Preferably these base modules should be ready wired.
- Electronic modules with outputs may only be inserted and removed when the load is switched off. Unforeseeable error reactions may be triggered if modules are inserted and removed under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

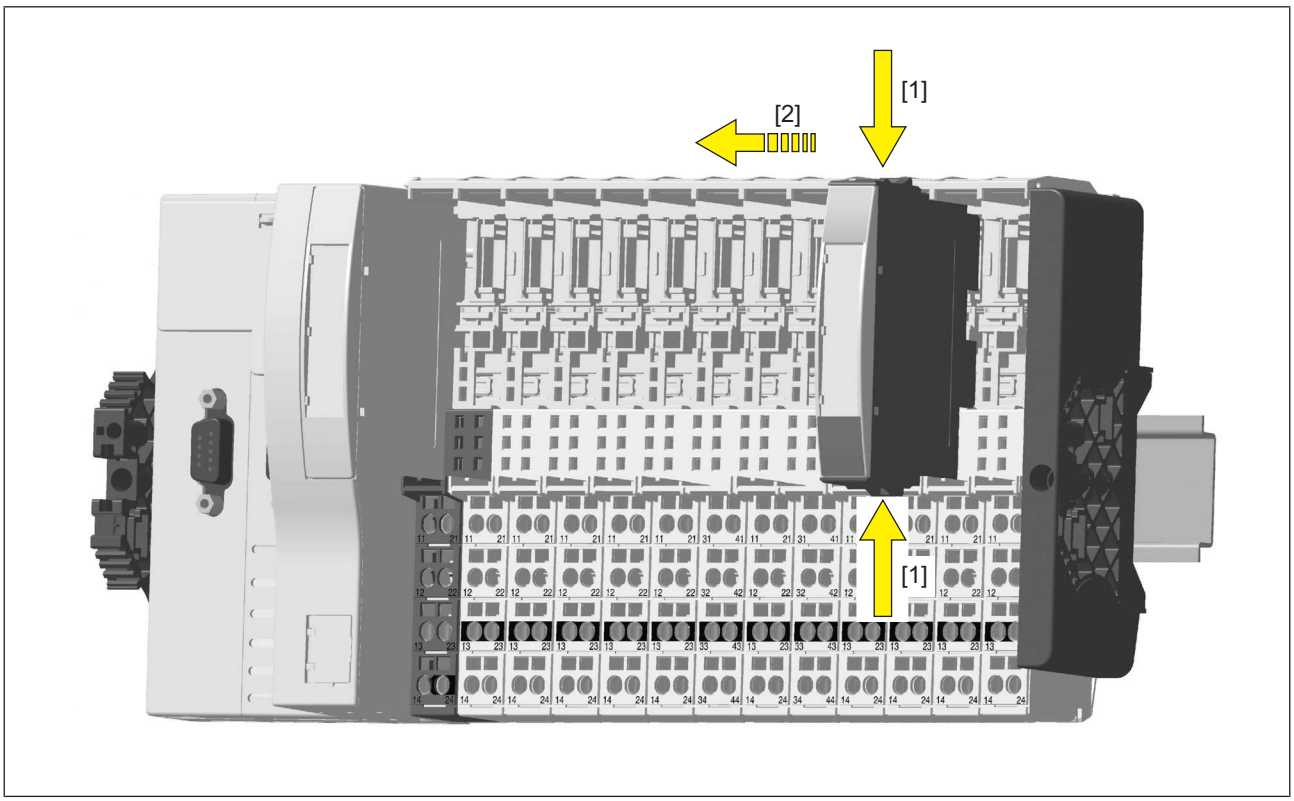


5.3.2 Removing an electronic module

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. 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:

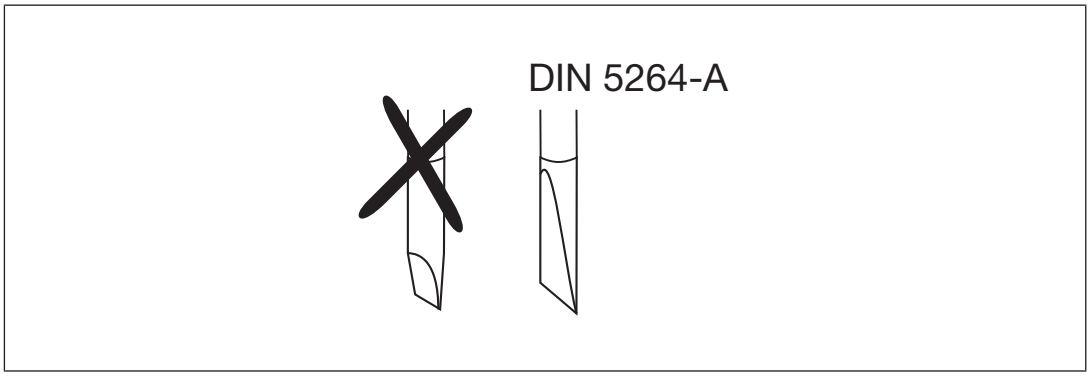
- Use twisted pair cables to carry the differential signals (D+/D- and Cl+/Cl-). This will increase the noise immunity.
- Use shielded signal cables with metallic plugs.
- On base modules with C-rail:
  - Connect the shield to the terminals on the C-rail.
  - Connect the C-rail with low impedance to 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.
- The supply voltages must meet the regulations for extra low voltages with safe electrical separation (SELV, PELV).
- Use copper wiring.
- Connect the two sensors via separate cables. This also applies to compact encoders.
- 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.
- Counter modules with low input signals detect even very small signal changes. In a particularly disturbed environment it can happen that signal changes caused by interferences are also detected.

  In these cases, we recommend the following measures:
  - Earth the mounting rail on both sides of the modules.
  - Earth the shield connection of the cables on both sides (on the sensor/encoder and either on the module or directly on the point where the cable enters the control cabinet).
  - Ensure that no transient currents flow across the cable screening, which may damage the cables or the connectors.

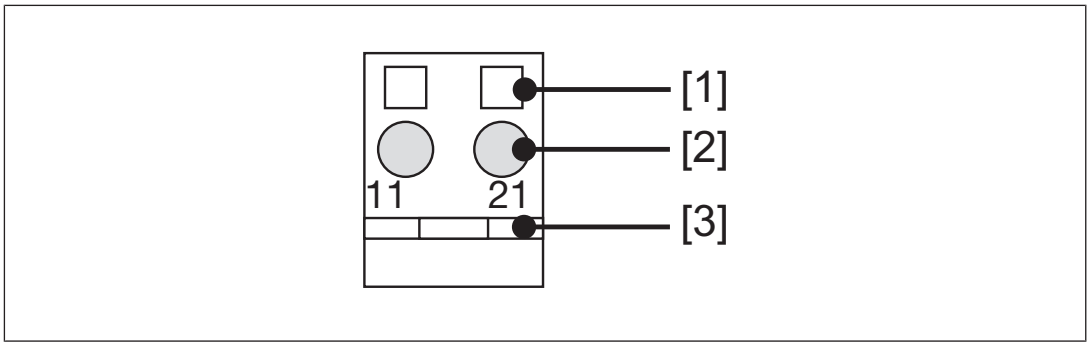
6.1.1 Mechanical connection of the base modules

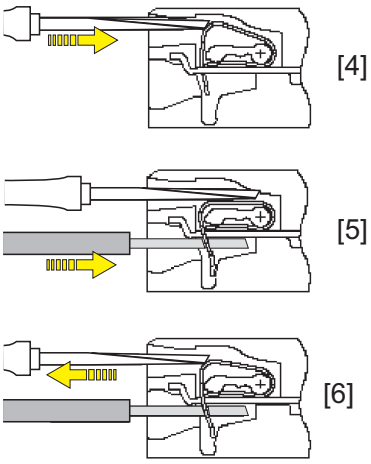
Procedure:

- 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.

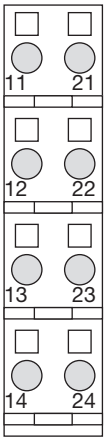


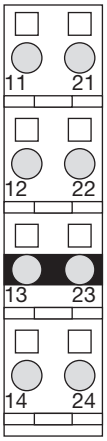


Please note:

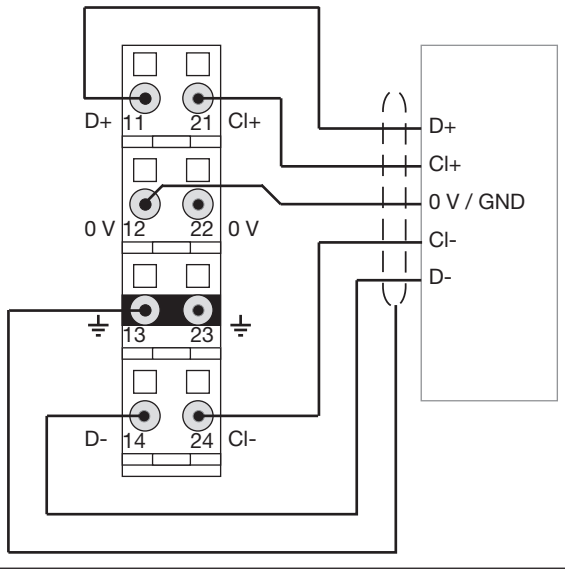
- The minimum cable cross section for field connection terminals on the base modules is 0.14 mm^2 (AWG26).
- The maximum cable cross section for field connection terminals is:
  - Digital inputs: 1.5 mm^2 (AWG16)
  - Digital outputs: 2.0 mm^2 (AWG14)
  - Inputs/outputs on the counter modules: 1.5 mm^2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

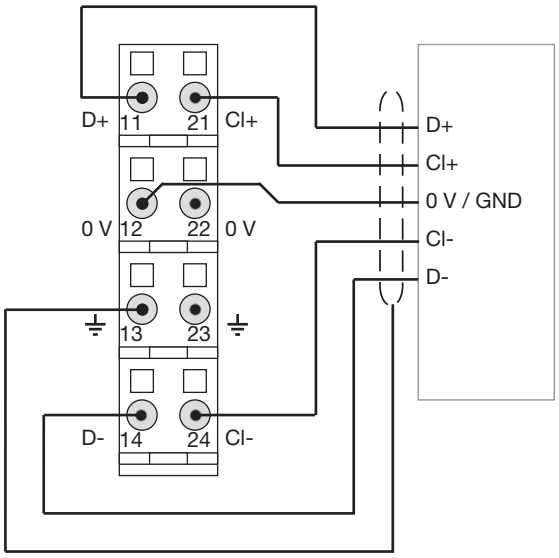
6.2 Terminal configuration

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: Input D+ (Data +) 21: Output Cl+ (Clock +) 12-22: 0 V counter (12-22 linked within the base module) 13-23: Shield connection (13-23 linked within the base module) 14: Input D- (Data -) 24: Output Cl- (Clock -)	

Base module	Terminal configuration	
Screw terminals: PSSu BP-C 1/8 S PSSu BP-C 1/8 S-T Cage clamp terminals: PSSu BP-C 1/8 C PSSu BP-C 1/8 C-T	With C-rail: 11: Input D+ (Data +) 21: Output Cl+ (Clock +) 12-22: 0 V counter (12-22 linked within the base module) 13-23: C-rail supply, shield connection (13-23 linked within the base module) 14: Input D- (Data -) 24: Output Cl- (Clock -)	

6.3 Connecting the module

Input and output circuit	
Connecting an SSI encoder (master mode) With C-rail Encoder supply via the PSSu E PD module 0 V connection is not absolutely essential.	

Input and output circuit	
Connecting an SSI encoder (master mode) Without C-rail Encoder supply via the PSSu E PD module 0 V connection is not absolutely essential.	

INFORMATION

To achieve the safety values PL e (Cat. 4) and SIL CL 3, two modules must be used.

7 Operation

7.1 Messages

A module error is displayed via the "Err" LED, signalled to the head module and then entered in the head module's diagnostic log.

The module can detect the following errors:

Module error	Declaration	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.
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

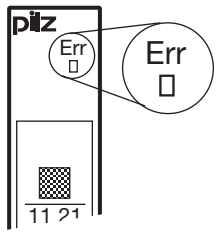
Legend

☼ LED on

● LED off

7.2.1 Display elements for module diagnostics

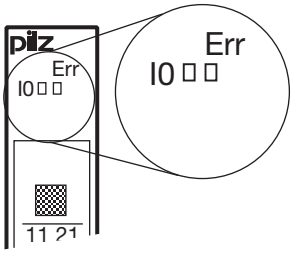
The module has an LED for displaying module errors ("Err" LED).



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

7.2.2 Display elements for counter status

The module has an LED, which displays the status of data transfer ("I0" LED).



LED			Meaning
Name	Colour	Status	Signal
I0	- - -	●	Data transfer error
	Green	☼	Data transfer running without error.

7.3 Status information

The way in which status information is assigned to the status byte and I/O data is described in the chapter entitled "Function Description", under "Input/output data".

8 Technical Details

General	312275	314275
Certifications	**CE, EAC, KOSHA, TÜV, UKCA, cULus Listed**	**CE, EAC, TÜV, UKCA, cULus Listed**
Application range	**Failsafe**	**Failsafe**
Module's device code	**0323h**	**0323h**
Number of ST input bits	**32**	**32**
Number of ST status bits	**8**	**8**
Application in system environment B		
from FS firmware version, head modules	**1.0.0**	**1.0.0**
Electrical data	**312275**	**314275**
Internal supply voltage (module supply)		
Module's power consumption	**0,51 W**	**0,51 W**
Periphery's supply voltage (periphery supply)		
Voltage range	**16,8 - 30 V**	**16,8 - 30 V**
Module's current consumption with no load	**10 mA**	**10 mA**
Module's power consumption with no load	**0,24 W**	**0,24 W**
Max. power dissipation of module	**0,75 W**	**0,75 W**
Absolute encoder input	**312275**	**314275**
Number of counter inputs	**1**	**1**
Type of counter inputs	**SSI encoder**	**SSI encoder**
Output signal (clock)	**Differential signal (RS-422/TTL)**	**Differential signal (RS-422/TTL)**
Max. number of bits on the counter input	**32 Bit**	**32 Bit**
Transmission rate	**62,5 kHz, 100 kHz, 125 kHz, 250 kHz, 500 kHz, 1.000 kHz, 1.500 kHz**	**62,5 kHz, 100 kHz, 125 kHz, 250 kHz, 500 kHz, 1.000 kHz, 1.500 kHz**
Coding of the input signal	**Binary, Gray**	**Binary, Gray**
Signal at the data input	**Differential signal (RS-422/TTL)**	**Differential signal (RS-422/TTL)**
Potential isolation between input/ output and periphery supply	**Yes**	**Yes**
Potential isolation between input/ output and voltage for the internal module bus	**Yes**	**Yes**
Typ. processing time	**0,1 ms**	**0,1 ms**
Environmental data	**312275**	**314275**
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**

Environmental data	312275	314275
Ambient temperature		
in accordance with the standard	**EN 60068-2-14**	**EN 60068-2-14**
Temperature range	**0 - 60 °C**	**-40 - 70 °C**
Storage temperature		
in accordance with the standard	**EN 60068-2-1/-2**	**EN 60068-2-1/-2**
Temperature range	**-40 - 70 °C**	**-40 - 70 °C**
Climatic suitability		
in accordance with the standard	**EN 60068-2-78**	**EN 60068-2-78**
Humidity	**93 % r. h. at 40 °C**	**93 % r. h. at 40 °C**
Condensation during operation	**Not permitted**	**EN 60068-2-30, short-term**
Max. operating height above SL	**2000 m**	**5000 m**
EMC	**EN 12015, EN 12016, EN 61000-6-2, EN 61000-6-4, EN 61131-2**	**EN 12015, EN 12016, EN 61000-6-2, EN 61000-6-4, EN 61131-2**
Vibration		
in accordance with the standard	**EN 60068-2-6**	**EN 60068-2-6**
Frequency	**10 - 150 Hz**	**10 - 1000 Hz**
Acceleration	**10 m/s²**	**50 m/s²**
Broadband noise		
in accordance with the standard	–	**EN 60068-2-64**
Frequency	–	**5 - 500 Hz**
Acceleration	–	**19 m/s² eff.**
Shock stress		
in accordance with the standard	**EN 60068-2-27**	**EN 60068-2-27**
Number of shocks	**6**	**6**
Acceleration	**150 m/s²**	**150 m/s²**
Duration	**11 ms**	**11 ms**
Airgap creepage		
in accordance with the standard	**EN 61131-2**	**EN 61131-2**
Overvoltage category	**II**	**II**
Pollution degree	**2**	**2**
Protection type		
in accordance with the standard	**EN 60529**	**EN 60529**
Housing	**IP20**	**IP20**
Terminals	**IP20**	**IP20**
Mounting area (e.g. control cabinet)	**IP54**	**IP54**
Mechanical data	**312275**	**314275**
Material		
Bottom	**PC**	**PC**
Front	**PC**	**PC**
Coding	**PA**	**PA**
Mounting type	**plug-in**	**plug-in**

Mechanical data	312275	314275
Dimensions		
Height	**76 mm**	**76 mm**
Width	**12,6 mm**	**12,6 mm**
Depth	**60,2 mm**	**60,2 mm**
Weight	**35 g**	**35 g**
Mechanical coding		
Type	**J**	**J**
Colour	**Yellow**	**Yellow**

Where standards are undated, the 2022-01 latest editions shall apply.

8.1 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 PL	EN ISO 13849-1: 2015 Category	EN IEC 62061 SIL CL/ maximum SIL	EN IEC 62061 PFH_D [1/h]	EN/IEC 61511 SIL	EN/IEC 61511 PFD	EN ISO 13849-1: 2015 T_M [year]
–	**PL e**	**Cat. 4**	**SIL CL 3**	**2,61E-09**	**SIL 3**	**4,43E-06**	**20**

If the module is operated at an ambient temperature above 60° C, the values stated in the table for PFH_D and PFD will need to be doubled when a safety function is calculated.

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 be different. We recommend that you use the PAScal software tool to calculate the safety function's SIL/PL values.

9 Order reference

9.1 Product

Product type	Features	Order no.
PSSu E F ABS SSI	Electronic module	312275
PSSu E F ABS SSI-T	Electronic module, T-type	314275

9.2 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-C1 1/12 S	Base module with C-rail and screw terminals	312622
PSSu BP-C1 1/12 S-T	Base module with C-rail and screw terminals, T-type	314622
PSSu BP-C1 1/12 C	Base module with C-rail and cage clamp terminals	312623
PSSu BP-C1 1/12 C-T	Base module with C-rail and cage clamp terminals, T-type	314623

10 EC declaration of conformity

This product/these products meet the requirements of the directive 2006/42/EC for 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.
Authorised representative: Norbert Fröhlich, Pilz GmbH & Co. KG, Felix-Wankel-Str. 2, 73760 Ostfildern, Germany

11 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

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.

BLUEECOMPETENCE Alliance Member
Partner of the Engineering Industry Sustainability Initiative

BRANDS OF THE CENTURY PILZ 2019 GERMAN STANDARDS

Quality Management ISO 9001:2015 REG. NO. 2462
Environmental Management ISO 14001 REG. NO. 2462
Energy Management ISO 50001 REG. NO. 2462

1001455-EN-10, 2023-05 Printed in Germany

We are represented internationally. Please refer to our homepage 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, Internet: www.pilz.com

PILZ
THE SPIRIT OF SAFETY