

PSS67 F 16DI SB-T



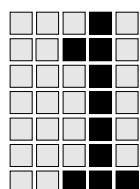
Programmable control systems PSS®

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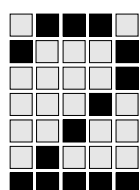


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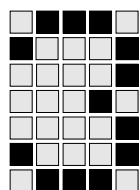
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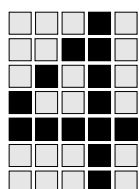
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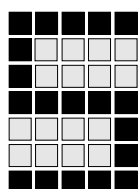
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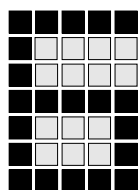
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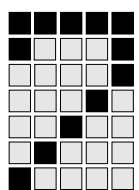
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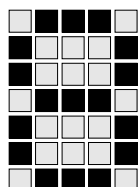
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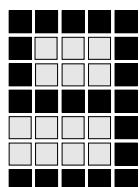
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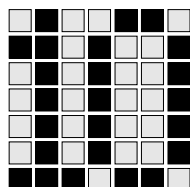
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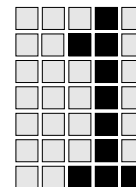
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Introduction

This operating manual explains the function and operation of the decentralised input module PSS67 F 16DI SB-T.

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

Please also refer to the other manuals in the PSS-range, in particular the SafetyBUS p Manual, the “FS System Description” and the “ST System Description”.

You will need to be conversant with the information in these manuals in order to fully understand this manual.

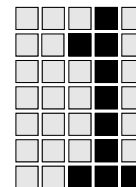
Validity of documentation

This documentation is valid for the PSS67 F 16DI SB-T from Version 1.1. It is valid until new documentation is published. The latest documentation is always enclosed with the unit.

Introduction

Overview of documentation

- 1 Introduction**
The introduction is designed to familiarise you with the contents, structure and specific order of this manual.
- 2 Overview**
This chapter provides information on the most important features of the digital input module.
- 3 Safety**
This chapter **must** be **read** as it contains important information on safety regulations and intended use.
- 4 Function Description**
This chapter describes the individual components of the digital input module: inputs and test pulse outputs.
- 5 Installation**
This chapter explains how to install the digital input module.
- 6 Supply Voltage**
This chapter explains what you need to consider when connecting the supply voltage.
- 7 Wiring the Inputs and Test Pulse Outputs**
This chapter describes the safety-related wiring of the inputs and test pulse outputs.
- 8 SafetyBUS p Interface**
This chapter describes the configuration of the SafetyBUS p interface.
- 9 Operation and Maintenance**
This chapter describes the commissioning of the digital input module.
- 10 Technical Details**



Definition of symbols

Information in this manual that is of particular importance can be 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** which could lead to **serious injury or 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

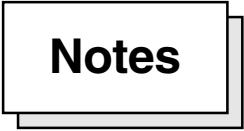
This describes a situation in which the unit(s) could be damaged and also provides information on preventive measures that can be taken.

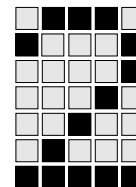


INFORMATION

This gives advice on applications and provides information on special features, as well as highlighting areas within the text that are of particular importance.

Introduction





Overview

The module PSS67 F 16DI SB-T can be used in a rugged industrial environment up to protection type IP67.

It has 16 digital inputs and 4 dedicated test pulse outputs.

The inputs are suitable for connecting single or dual-channel safety-related input devices, with or without test pulses. The inputs can be assigned to two I/O-Groups on SafetyBUS p.

The 4 test pulse outputs are available via 8 M12 plug-in connectors. The test pulses are permanently assigned to the inputs. The test pulse outputs can also be configured as 24 VDC outputs.

The PSS67 F 16DI SB-T requires a 24 V supply, which provides power to both the module electronics and the dedicated test pulse outputs.

The module is isolated from SafetyBUS p through optocouplers.



NOTICE

Before installing the module you should read and take note of the information contained in the “SafetyBUS p Safety Manual”.

Overview

Front view

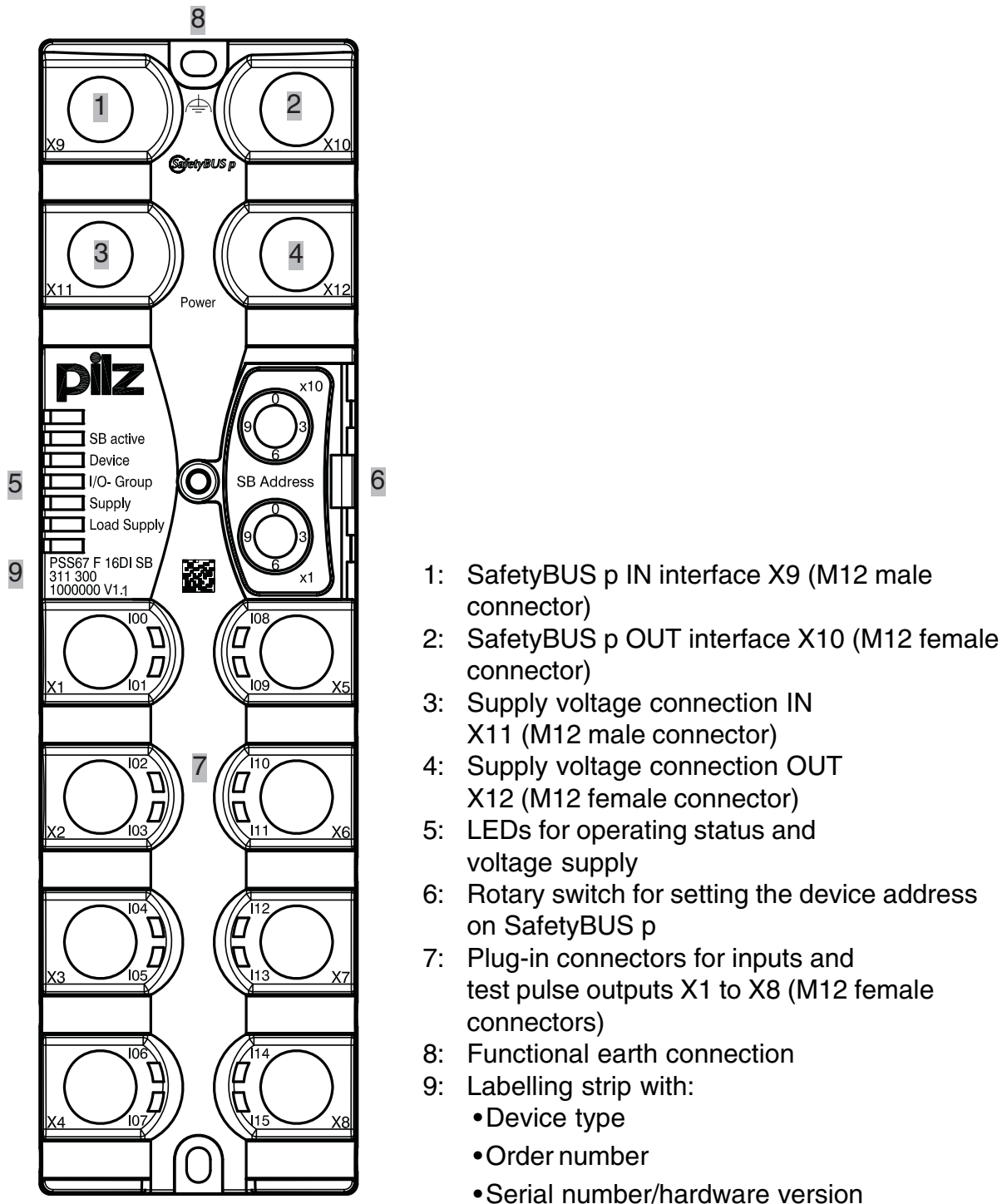
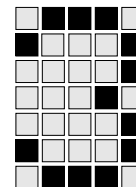


Fig. 2-1: Front view



Safety

Intended use

The PSS67 F 16DI SB-T is a decentralised input module designed for use on SafetyBUS p, where it has the function of an “Input/Output Device”.

The following is deemed improper use:

- Any component, technical or electrical modification to the digital input module
- Use of the digital input module outside the areas described in this manual
- Use of the digital input module outside the documented technical details (see chapter entitled “Technical Details”).

Safety

Categories in accordance with EN 954-1



WARNING!

Please note: To achieve the corresponding category or requirement class, the whole system including all safety-related components (parts, devices, user program etc.) must be included in the assessment. For this reason, Pilz cannot accept liability for the correct classification into a category or requirement class.

Digital inputs

Depending on the application area and its respective regulations, the inputs may be used without test pulses for applications up to **Category 3**, in accordance with EN 954-1. The possibility of a short circuit occurring in the external wiring between different inputs or against the supply must be eliminated through appropriate wiring.

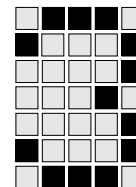
For **Category 4** applications, shorts between the input contacts must be detected. This can be achieved through the use of the module's test pulses or, depending on the type of input device, through a feasibility test or through detection of shorts across the contacts on the input device (e.g. light grid) (for connection examples please see "Wiring the Inputs and Outputs").

System requirements

CPU versions

The PSS67 F 16DI SB-T is supported by the following SafetyBUS p-compatible programmable safety and control systems:

- PSS SB CPU from Version 1.3
- PSS1 SB CPU from Version 1.3
- PSS SB 3006 IBS-S PCP from Version 1.2
- PSS SB 3056 from Version 1.2
- PSS(1) SB CPU3 from Version 1.4
- all Compact 3rd Generation PSS, e.g. PSS SB 3047-3 ETH-2



System software versions

The following system software is required in order to configure the module:

- PSS WIN-PRO from Version 1.7.0

Safety guidelines

Failure to keep to the following safety regulations will render all warranty and liability claims invalid:

- All health and safety / accident prevention regulations for the particular area of application must be observed.
- Before using the unit it is necessary to perform a safety assessment in accordance with the Machinery Directive 98/37/EC.

Use of qualified personnel

The safety system may only be assembled, installed, programmed, commissioned, operated, maintained and decommissioned by qualified personnel. Qualified personnel are people who, because they are:

- Qualified electrical engineers and
- Have received training from qualified electrical engineers,

are suitably experienced to operate devices, systems, plant and machinery in accordance with the general standards and guidelines for safety technology.

EMCD

The module PSS67 F 16DI SB-T is designed for use in an industrial environment. Interference may occur if used within a domestic environment.

Safety

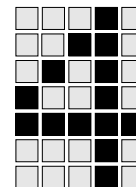
Warranty and liability

All claims to warranty and liability will be rendered invalid if:

- The module PSS67 F 16DI SB-T was used contrary to the purpose for which it was 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.).

Disposal

The module PSS67 F 16DI SB-T must be disposed of properly when it reaches the end of its service life.



Function Description

Inputs

Single and dual-channel input devices can be connected to the inputs, with or without test pulses. The inputs are equipped with input filters.

Input signals must show a “High” (“1” signal) of 15 VDC (+15 ... +30 VDC) and a “Low” (“0” signal) of 0 VDC (-3 ... +5 VDC).

The input status is signalled to the CPU on the controlling PSS via SafetyBUS p. Green LEDs indicate the status of the inputs. An LED lights up as soon as a “1” signal is present at the input.

Diagnostic circuitry checks the function of the inputs and the input filter. If an error is detected, all the outputs in the affected I/O-Group are shut down and the I/O-Group switches to a STOP condition. The module then triggers an error telegram on SafetyBUS p and stores the error in its error buffer.

Where test pulses are not used, inputs with single-channel input devices can be used in applications up to and including Category 2 in accordance with EN 954-1; in the case of dual-channel input devices, this extends to Category 3 applications. The possibility of a short circuit occurring in the external wiring between different inputs or against the supply must be eliminated through appropriate wiring.

Test pulses must be used for applications with single-channel input devices above Category 2 and for applications with dual-channel input devices above Category 3.

Connection examples can be found in the chapter entitled: “Wiring the Inputs and Test Pulse Outputs”.

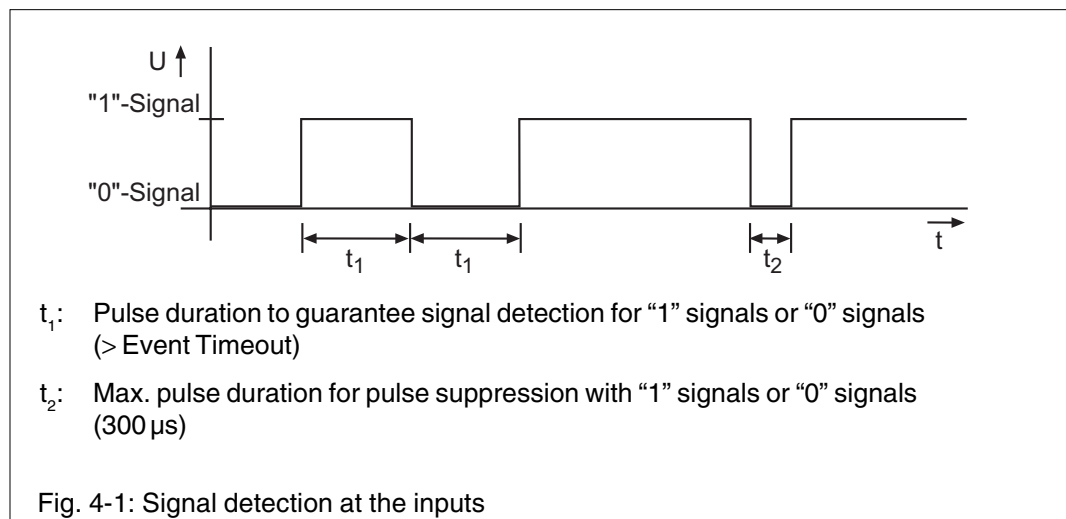
The inputs can be assigned to two I/O-Groups. Please refer to the section entitled “Setting the device address”.

Function Description

Signal detection at the inputs

To guarantee that a signal at an input ("0" signal or "1" signal) is detected, it must be present for a certain time period. This period must be longer than the event timeout configured in the PSS WIN-PRO system software. Once a signal has been detected, a corresponding event telegram will be triggered.

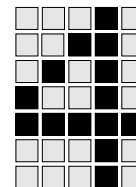
A signal ("0" signal or "1" signal) is ignored if it does not exceed the pulse suppression time of 300 μs . In this case, no event telegram is triggered.



Signal change behaviour

If a signal at an input changes, the module will send an event telegram. The module must then wait for a confirmation telegram (ACK) from the Master LD before it can send out a new event telegram.

If there is another signal change while the module is waiting for the telegram, the module's behaviour will depend on the configured signal change behaviour.



Two behaviour modes can be configured in the software's configurator:

- "default":

The signal changes are not registered.

- "Fast":

Each signal change is temporarily stored in a FIFO telegram buffer. Once the confirmation telegram arrives, the module sends consecutive event telegrams for each detected signal change from the FIFO telegram buffer.

Test pulse outputs/24 VDC pins

The four test pulse outputs T_0 to T_3 may only be used for test pulses or as 24 VDC outputs.

The test pulse outputs are suitable for testing the wiring of input devices. All safety-related inputs must operate in accordance with the failsafe principle (on switching off).

Two test pulses are available on each plug-in connector; these test pulses are permanently assigned to the inputs. The assignment of the test pulses to the inputs cannot be changed in the system software's configurator.

If the test pulse outputs are not being used, they can be configured as 24 VDC pins in the system software's configurator (default setting).

Internal wiring diagram

The diagram on page 4-4 shows an internal wiring diagram of the PSS67 F 16DI SB-T.

Function Description

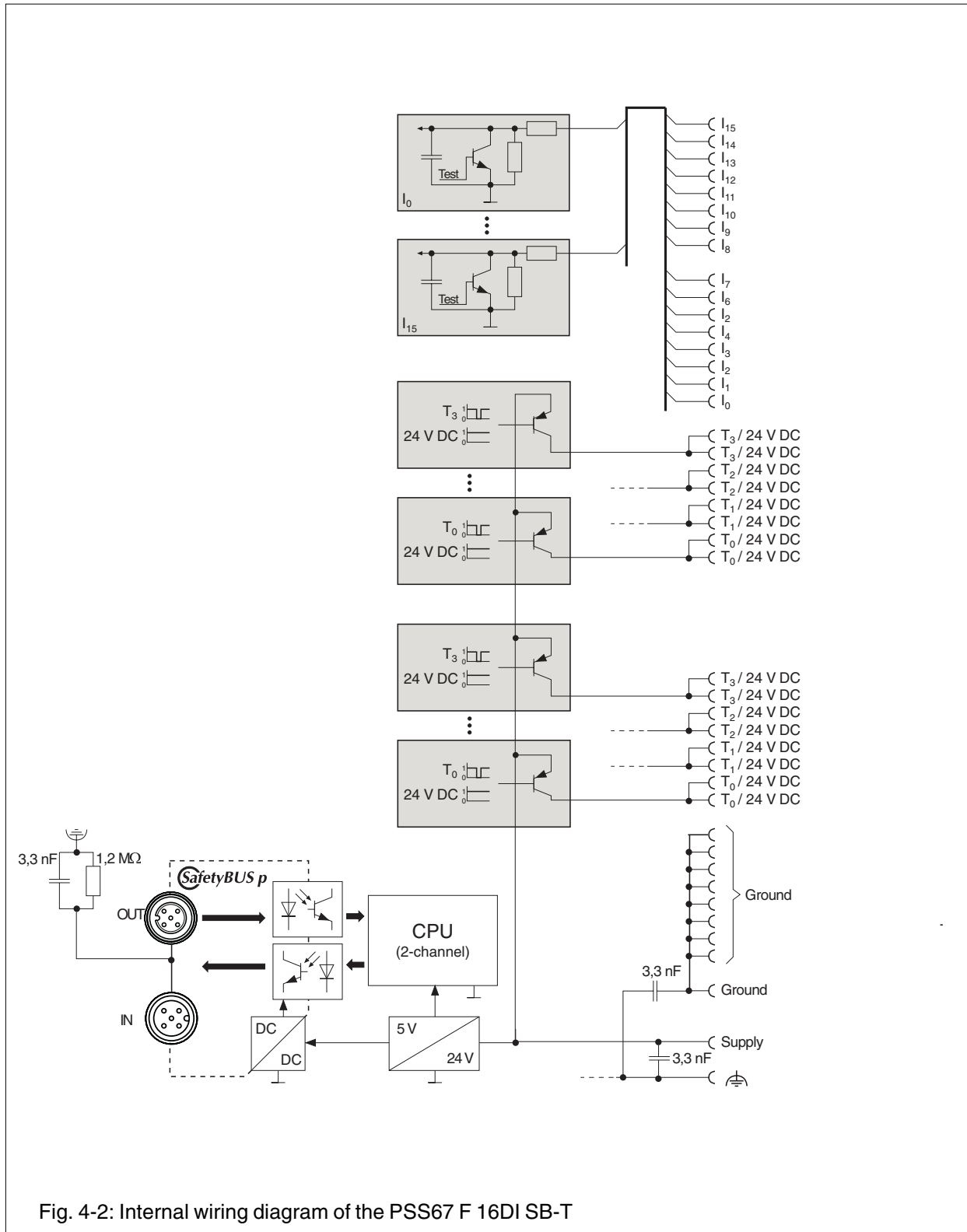
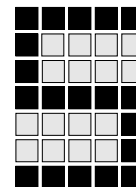


Fig. 4-2: Internal wiring diagram of the PSS67 F 16DI SB-T



Installation



Caution!

Electrostatic discharge can damage components on the PSS67 F 16DI SB-T.

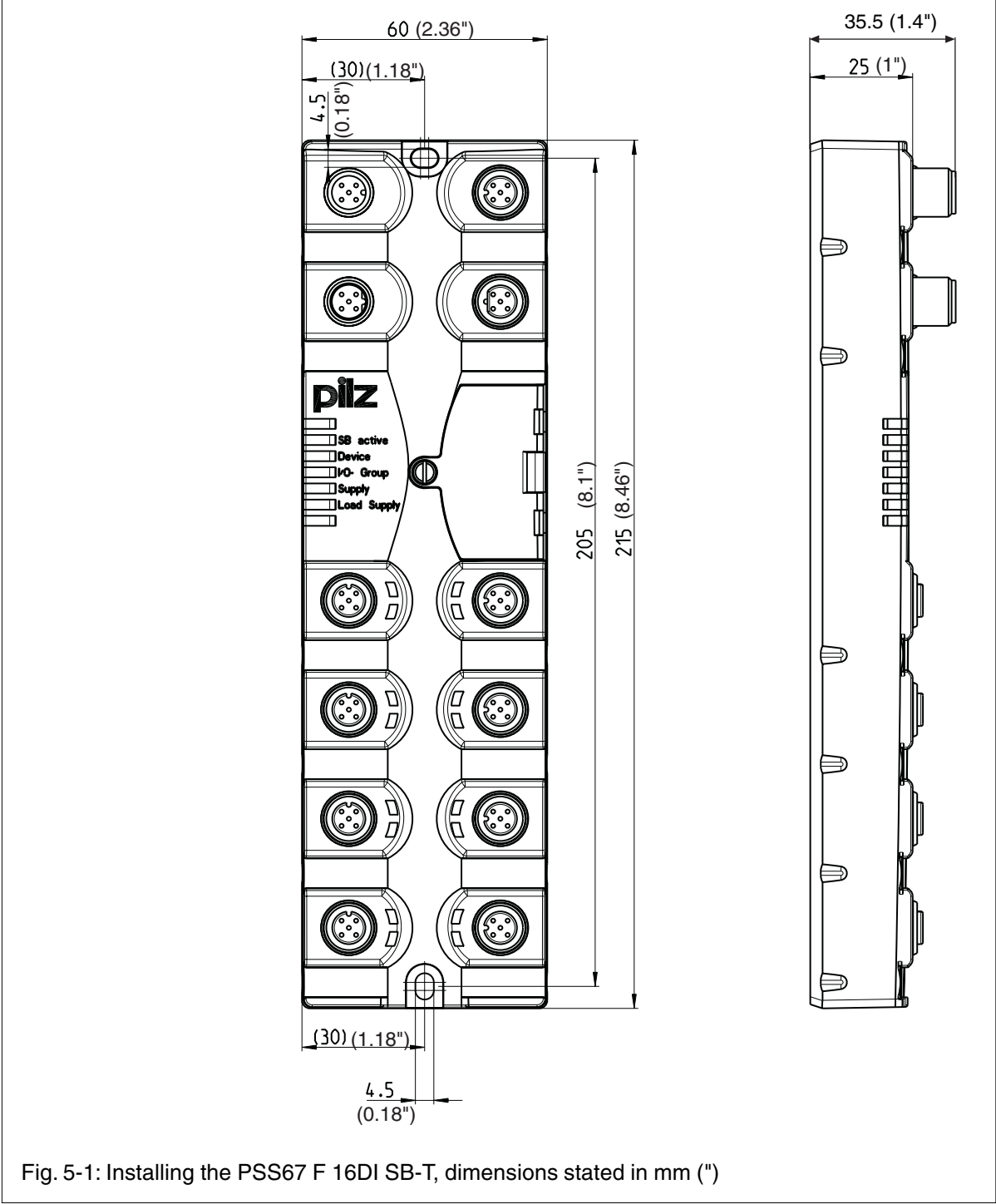
Ensure against discharge before touching the module, e.g. by touching an earthed, conductive surface or by wearing an earthed armband.

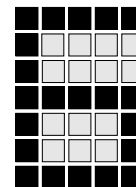
The unit must be fastened to a flat mounting surface, so that there is no strain on the housing when the module is screwed down. The mounting distances will depend on which plug-in connectors are used and the bending radius of the cables

To install the system, proceed as follows:

- Drill 2 x M4 holes (internal thread) in the mounting surface, as shown in Fig. 5-1 (tolerance: ± 0.2 mm/0.01").
- Connect the functional earth to the upper fixing screw. If the functional earth cannot be connected to the upper fixing screw, you will need to connect the functional earth to Pin 5 of the M12 connector for the supply voltage.
- Use two fixing screws to attach the module to the mounting plate.

Installation





Supply Voltage

Please note the following:

- When selecting the power supply, please refer to the requirements stated under “Technical Details”.
- Overvoltage or interference voltage can damage or even destroy the electronics on the PSS67 F 16DI SB-T. If this occurs, the affected I/O-Groups will switch to a STOP condition and all the outputs in the affected groups will be switched off. You should therefore take note of the relevant EMC measures.



- **WARNING!**

Safe electrical isolation must be ensured for the external 24 V supply. Failure to do so could result in electric shock. Power supplies must conform to EN 60950, section 2.3, EN 60742 or EN 50178.

- To achieve the lowest possible residual ripple, we recommend that you install a three-phase bridge rectifier or regulated supply.
- The “Ground” connection to the earth bar or earth fault monitor must be in accordance with the relevant national regulations (e.g. EN 60204-1, NFPA 79:17-7, NEC: Article 250).



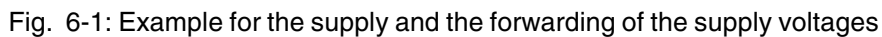
INFORMATION

The module’s output circuits have been designed to guarantee maximum safety. To achieve this, extensive tests are carried out internally. Momentary interruptions to the “Supply” voltage during a test procedure can falsify the test result, causing the following malfunction:

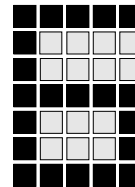
If the “Supply” voltage is interrupted momentarily, the unbuffered test pulse outputs will transmit a “0” signal. The buffered module electronics reads this signal at the pulsed inputs, thereby triggering the user's programmed reaction. Example: The system reacts as though an E-STOP button has been operated, although this is not the case: there has been a supply interruption.

Remedy: “Supply” must be buffered.

The module also has an M12 socket which is physically next to the M12 connector; this is used to distribute the supply voltage to other modules.



6-2



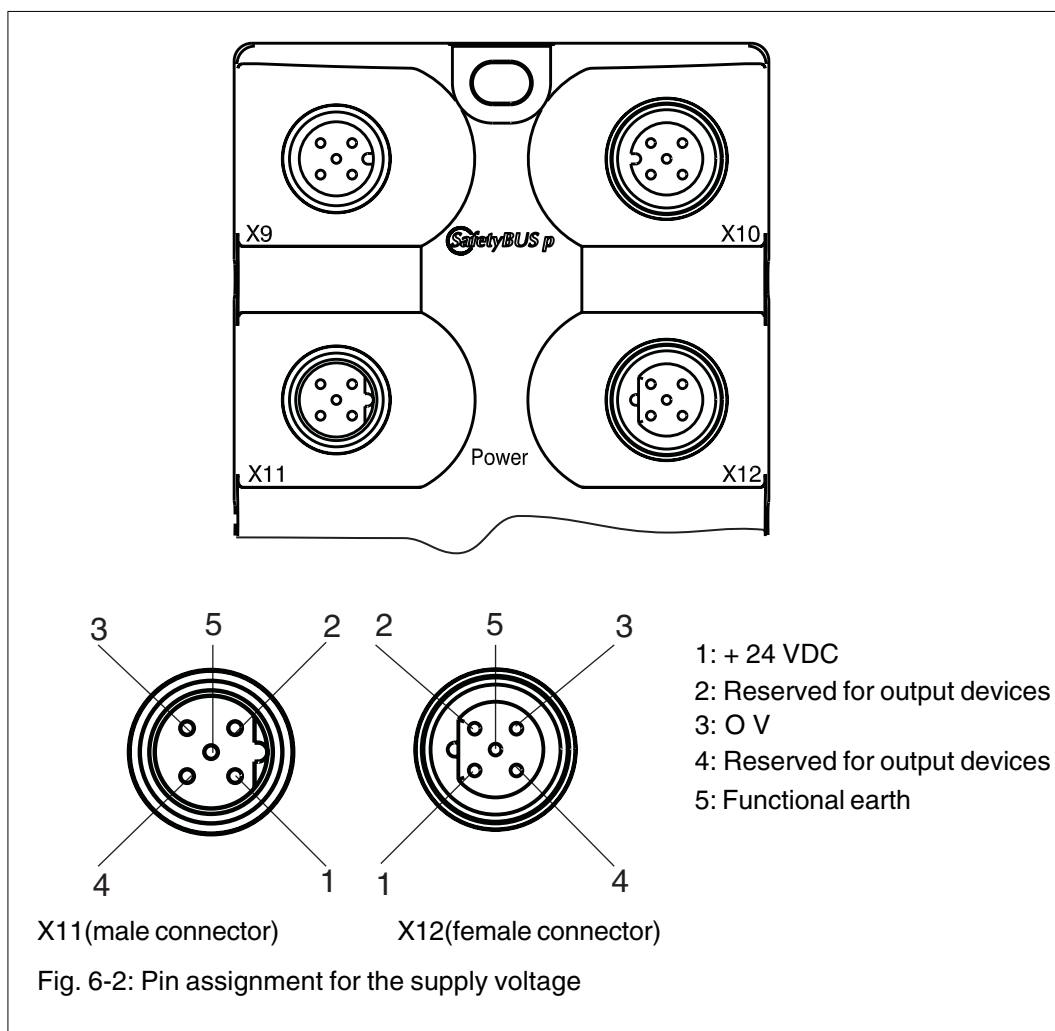
Functional earth

You can connect the functional earth to the upper fixing screw or to Pin 5 of the M12 connector for the supply voltage.



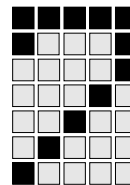
INFORMATION

We recommend that you connect the functional earth to the upper fixing screw.



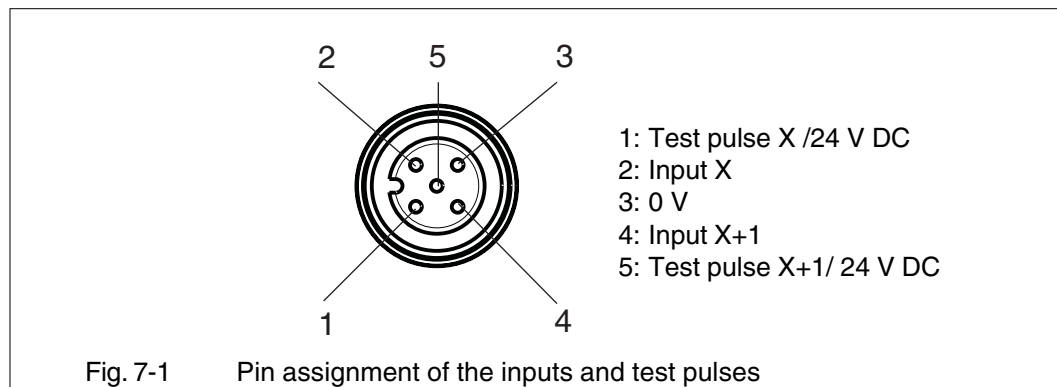
Supply Voltage

Notes



Wiring

Wiring the inputs and test pulse outputs



This chapter describes the safety-related wiring of the digital inputs plus the test pulse outputs.



CAUTION!

In order to guarantee protection type IP67, unused connectors should be sealed using the blind plugs supplied.



CAUTION!

Make sure that the plug-in connectors are connected to the input devices correctly. Once you have run a function test to check that the connectors are connected to the input devices correctly, the inputs should be labelled. If the inputs are connected to the input devices incorrectly, life-threatening situations may arise on the plant.



INFORMATION

We recommend you use ready-made connectors to connect the inputs and test pulse outputs.



INFORMATION

Please refer to the technical details for information on the maximum cable runs when connecting input devices.

Wiring

Notes on wiring

Where safety-related applications are concerned, it is essential that short circuits and open circuits are unable to cause a hazardous condition within a plant.



WARNING!

Safe separation is required when connecting a device with a circuit with over 25 V AC or 60 V DC

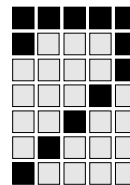
The following terms are important:

- Signal inputs with frequent operation
These are signals that change status on several occasions within a period of time.
- Single-channel safe input devices
These are positively-driven, normally-closed contacts which open on actuation (failsafe principle).
- Elimination of short circuits between signals
This is possible within electrically-enclosed areas and also outside electrically-enclosed areas for signals conducted in different multicore cables. However, all components must meet the relevant regulations in accordance with EN, DIN and VDE.
- In principle, the possibility of earth faults and open circuits cannot be eliminated. With multi-channel input devices with frequent operation, short circuits and open circuits can be detected via feasibility checks in the control program.

The input test on the module uses test pulses to enable the operating program of the PSS67 F 16DI SB-T to carry out a test to detect open circuits and short circuits. The following pages contain details of connection examples which may be of use when wiring the unit.

Labelling the module

You can label the SafetyBUS p and supply voltage connections, as well as the inputs. 12 blank labels are supplied with the module. In addition you can order a DIN A4 sheet with 264 labels as an accessory (order no. 331 250).



Digital inputs

Features:

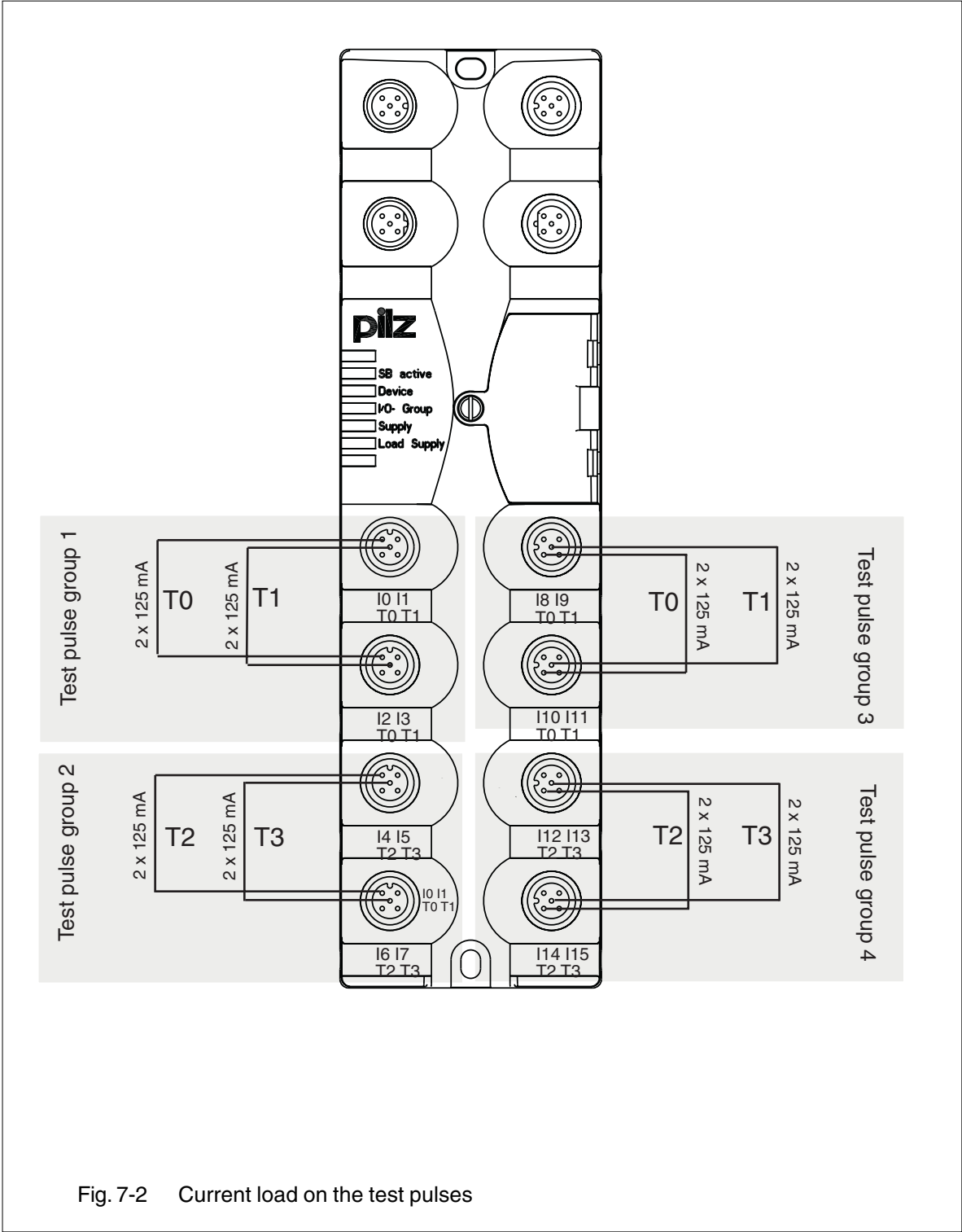
- 16 digital inputs $I_0 \dots I_{15}$
- The inputs are connected using 8 5-pin M12 plug-in connectors. Two inputs are available on each M12 plug-in connector.
- Only input signals that operate in accordance with the failsafe principle (on switching off) are permitted for safety-related applications.
- Signals may be connected using unshielded cables.

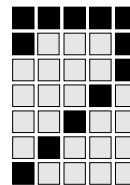
Test pulse outputs

Features:

- 4 test pulse outputs T_0 to T_3
- The assignment of test pulses to inputs is permanently specified and cannot be configured using the system software's configurator.
- Test pulses cannot be addressed via the PSS process I/O-image.
- Test pulses must only be used for test signals.
- Identical test pulses within a test pulse group (see Fig. 7.4) can take a maximum 250 mA load. If you use all the test pulses, the maximum permitted current load per plug-in connector and test pulse is 125 mA.

Wiring





Example: Single-channel, failsafe input device, without test pulse

Features:

- Depending on the application area and its respective regulations, this connection diagram is suitable for **input devices with frequent and infrequent operation** in accordance with EN 954-1, **up to Category 2**. The possibility of a short circuit occurring in the external wiring between different inputs or against the supply must be eliminated through appropriate wiring.
- The input device must be approved for failsafe applications.
- Please read the instructions provided with the input device.

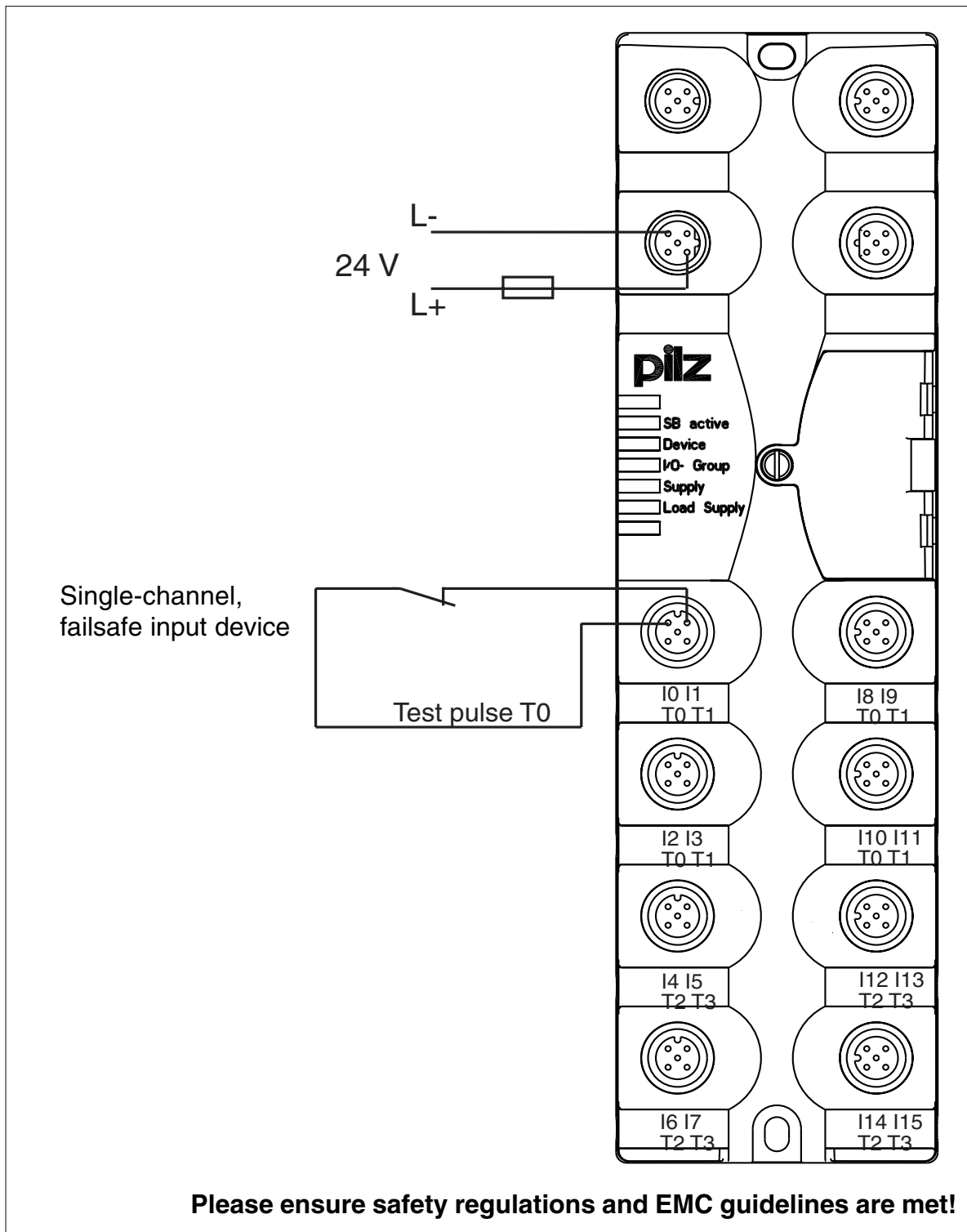


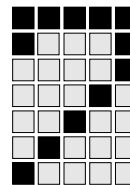
CAUTION!

A short circuit in the cable between the input device and input with the 24 VDC line or between adjacent input devices will not be detected. Depending on the type of input device connected, this could create a risk to both personnel and machinery (e.g. E-STOP). Always ensure that the unit is suitably wired to eliminate the risk of short circuits.

Wiring

Example: Single-channel, failsafe input device, without test pulse





Example: Dual-channel input devices, without test pulses

Features:

- This type of connection is mainly used for signal inputs with frequent operation.
- Depending on the application area and its respective regulations, this connection diagram is suitable for input devices with **frequent operation** and diverse channels, up to **Category 4** in accordance with EN 954-1, provided the functionality of both input device channels is monitored in the user program via a **feasibility check**.
- Depending on the application area and its respective regulations, this connection diagram is suitable for input devices with **infrequent operation up to Category 3** in accordance with EN 954-1, provided the functionality of both input device channels is monitored in the user program via a **feasibility check**.
- If you are using input devices with different (diverse) channels, adjacent inputs may be used. Short circuits will be detected in the user program via the feasibility check (see example in the PSS-Range Programming Manual).

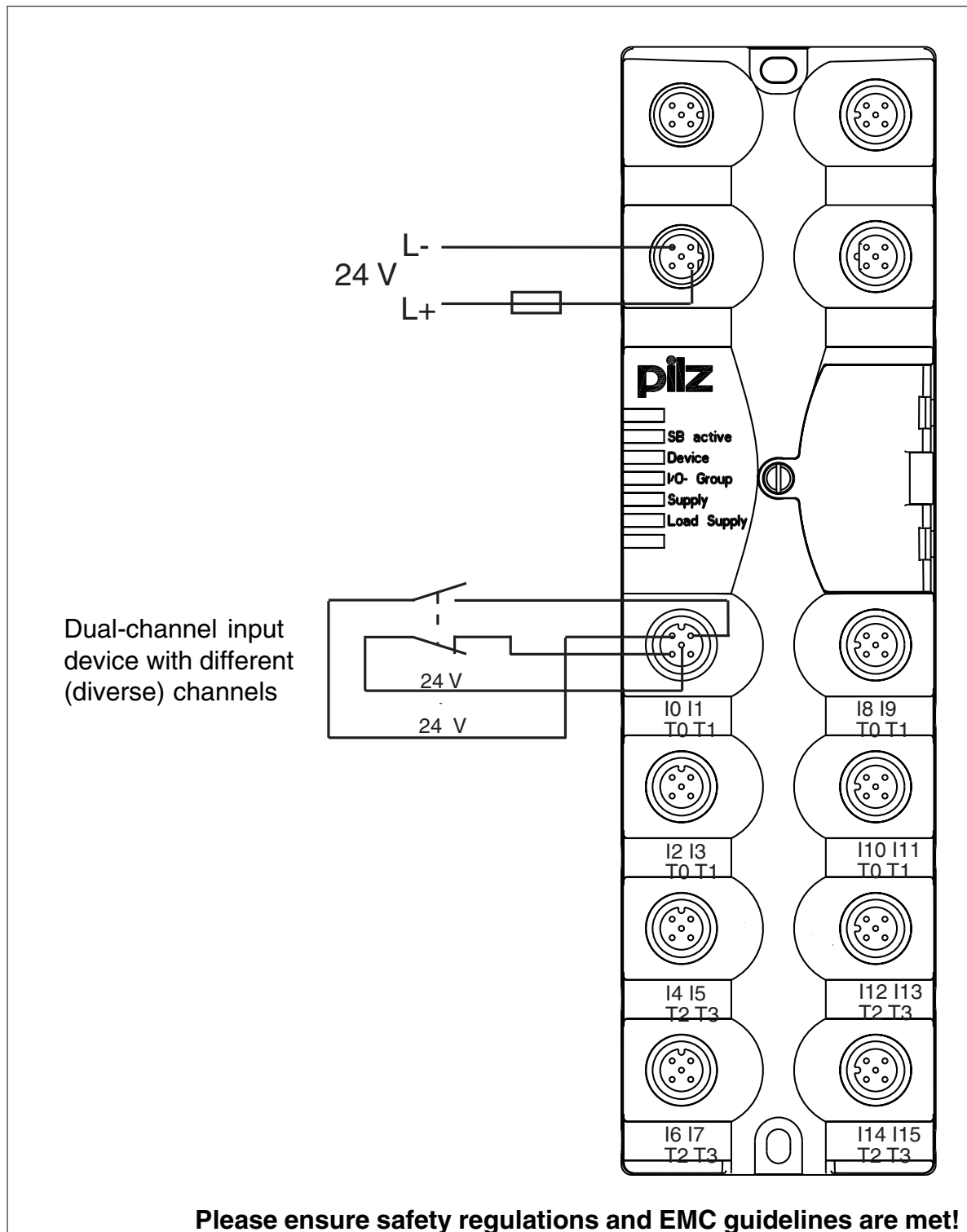


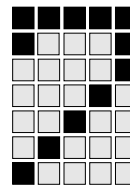
CAUTION!

A short circuit in the cable between the input device and input with the 24 VDC line or between adjacent input devices will not be detected. Depending on the type of input device connected, this could create a risk to both personnel and machinery (e.g. E-STOP). Always ensure that the unit is suitably wired to eliminate the risk of short circuits.

Wiring

Example: Dual-channel input devices, without test pulses





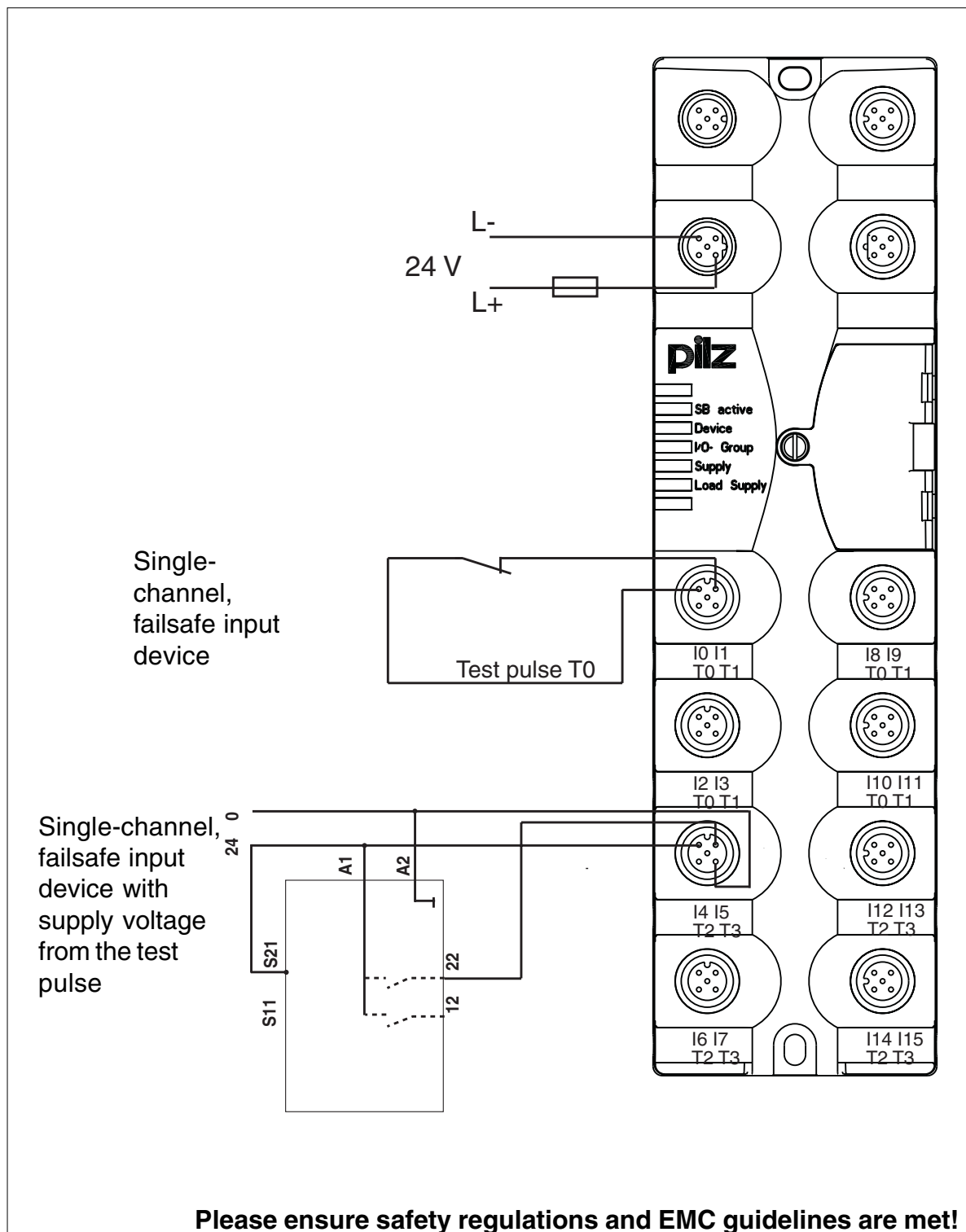
Example: Single-channel, failsafe input device, with test pulse

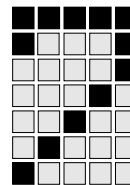
Features:

- Depending on the application area and its respective regulations, this connection diagram is suitable for applications **up to Category 2** in accordance with EN 954-1.
- The input device must be approved for failsafe applications.
- Please read the instructions provided with the input device.
- Short circuits between the cable from the test pulse to the input device and the cable from the input device to the input will **not** be detected.
- Only input devices with N/C contacts can be tested.

Wiring

Example: Single-channel, failsafe input device, with test pulse





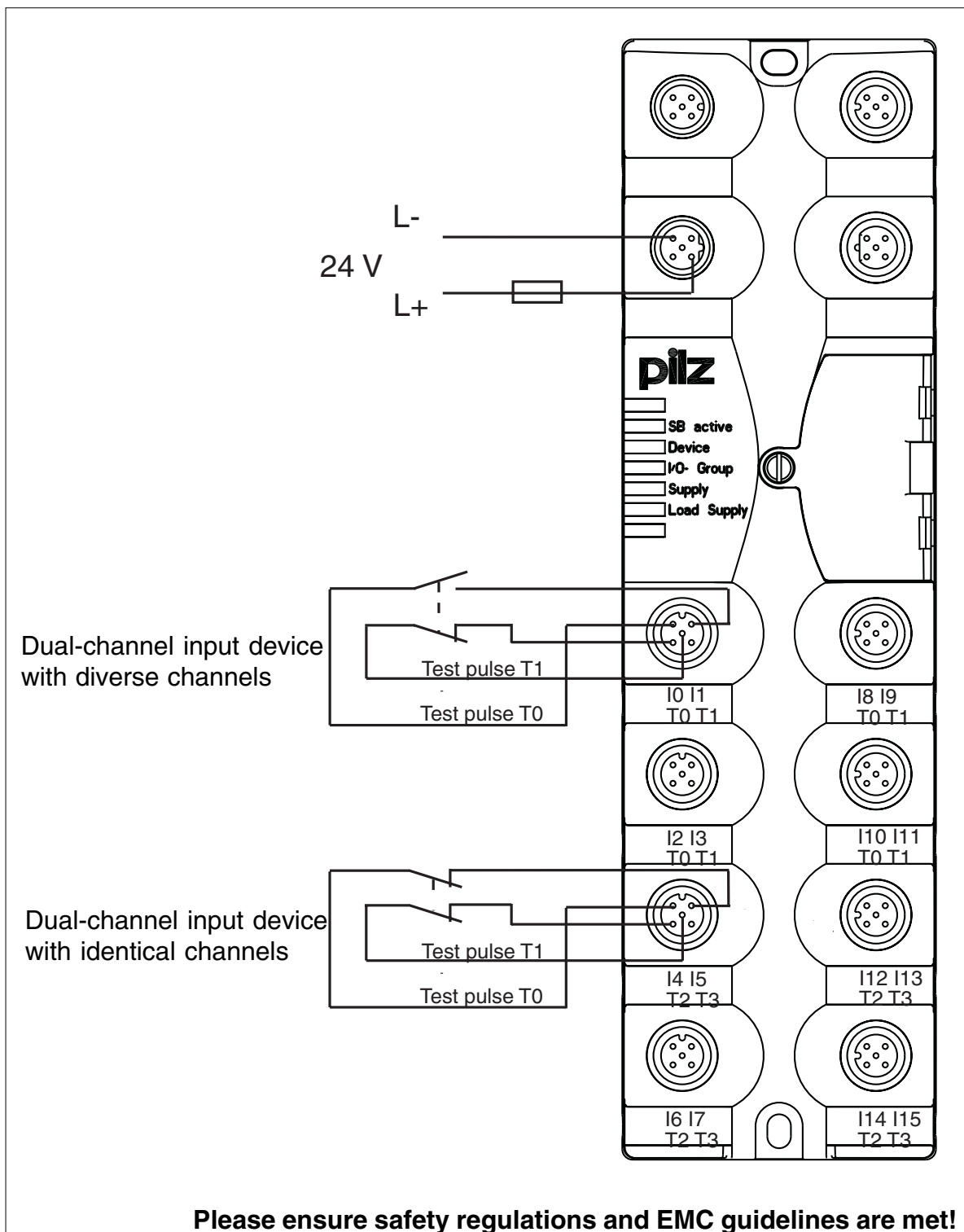
Example: Dual-channel, failsafe input device, with test pulse

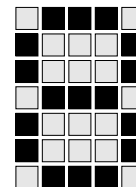
Features:

- Depending on the application area and its respective regulations, this connection diagram is suitable for applications **up to Category 4** in accordance with EN 954-1.
- This type of connection is mainly used for signal inputs with infrequent operation.
- On input devices with identical channels, each channel should be given a separate test pulse, where possible. This will ensure that all short circuits are detected, with the exception of short circuits which short out the input device (cable from the test pulse to the input device and cable from the input device to the input).
- If the input device has only one test pulse, a short circuit between the cables from the input device to the inputs will **not** be detected. In this case the unit should be suitably wired to avoid the risk of this type of short circuit. If diverse input devices are used, this type of error will be detected.

Wiring

Example: Dual-channel, failsafe input device, with test pulse



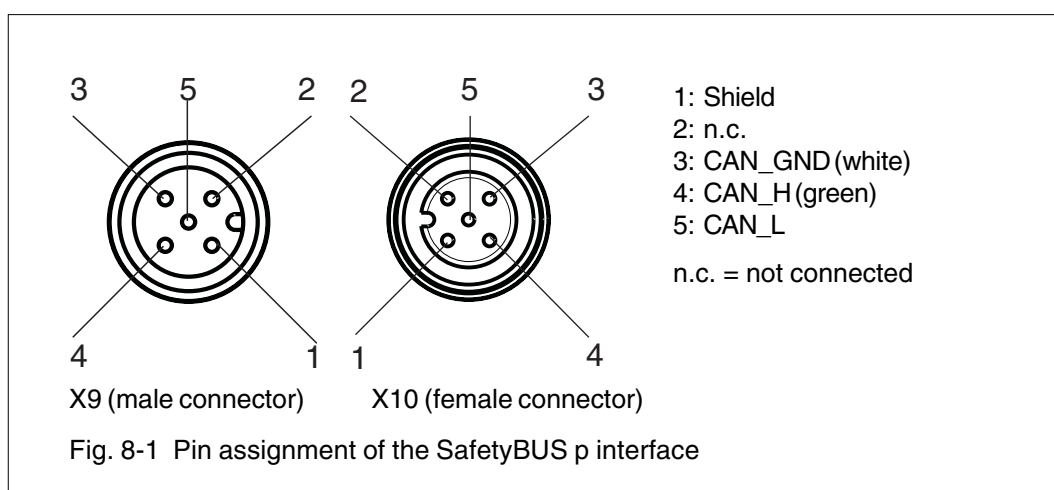


SafetyBUS p Interface

The module is connected to SafetyBUS p using a 5-pin A-coded M12 connector (X9). A 5-pin A-coded M12 socket (X10) is available to distribute the bus signal to the other bus subscribers.

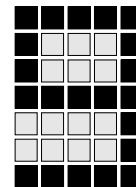
The X10 socket can also be used for bus subscriber termination.

To avoid reflection on the bus cable, the last bus subscriber must be fitted with a terminating resistor. If the module is connected using 1:1 connection cable, the terminating resistor is plugged into the free X10 socket. The M12 terminator (Order no. 311 032) PSS SB M12 TERMINATOR is used for termination via the SafetyBUS p socket.



SafetyBUS p Interface

Notes



Operation and Maintenance

Operation and maintenance

Commissioning

- Install the digital input module as described in the chapter entitled “Installation” on page 5-1.
- Connect the inputs and outputs as described in the chapter entitled “Wiring the Inputs and Outputs” on page 7-1.
- Connect the supply voltage for the digital input module as described in the chapter entitled “Supply Voltage” on page 6-1.
- Connect SafetyBUS p
- Set the device address.
- Configure the module using the system software’s configurator

Operation and Maintenance

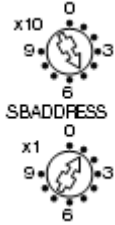
Setting the device address

In order to operate the module on SafetyBUS p you will need to set the device address that was defined for the module in the system software's configurator.

To do this you will need to use a screwdriver to open the transparent cover on the rotary switches.

Use the rotary switches to set the required address. The rotary switch labelled "x1" is used to set the units and the rotary switch labelled "x10" is used to set the tens.

Permitted device addresses are in the range 32D ... 95D. The same applies if the module is configured for SafetyBUS p 1 in the SafetyBUS p Configurator on the PSS WIN-PRO system software. The offset of 100D for device addresses on SafetyBUS p 1 is calculated automatically from the bus configuration.

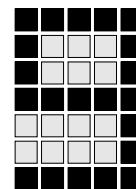
Rotary switch "SB Address"	Key	Example: Device address 51D
x10	Set the tens	
x1	Set the unit	

The I/O-Groups to which the module belongs must also be defined in the system software's configurator.

The module can be divided into sections A and B for this purpose. Section A and section B may belong to different I/O-Groups. The module may either have section A alone, section B alone, or both section A and section B. The inputs can be assigned to both sections at will.

Membership of section A or section B is used in conjunction with the device address to form the addresses under which the inputs can be addressed by the controlling PSS.

In the process image of the controlling PSS, the inputs from Section A are addressed under the device address as slot number and bit number



0 ... 15. The inputs from Section B are addressed under the device address as slot number and bit number 16 ... 31; this corresponds to an offset of 16 in the bit number.

So if input I_6 from Section A is reconfigured into Section B, for example, the address will change from x.06 to x.22.

Example: Device address is 36

Input	Section	Address	Input	Section	Address
I_0	A	E36.00	I_8	A	E36.08
I_1	A	E36.01	I_9	A	E36.09
I_2	B	E36.18	I_{10}	A	E36.10
I_3	B	E36.19	I_{11}	A	E36.11
I_4	B	E36.20	I_{12}	A	E36.12
I_5	A	E36.05	I_{13}	B	E36.29
I_6	A	E36.06	I_{14}	B	E36.30
I_7	A	E36.07	I_{15}	B	E36.31



WARNING!

Any errors made when setting the device address will result in the loss of the safety function.

If the same device address is set on two modules or the device addresses of two modules are transposed, the controlling PSS may unknowingly address the wrong inputs/outputs.

This will cause the plant to malfunction. The safe operation of the plant is no longer guaranteed.

To avoid this, the greatest possible care must be taken when setting the device addresses.

The device address may not be modified while the module is being operated on SafetyBUS p ("SB active" LED lights up green or flashes), otherwise all the I/O-Groups configured on the module will switch to a STOP condition.

If it is necessary to change the set device address while the bus is running, you will need to disconnect the module from SafetyBUS p while you make the change. When you re-establish the connection to SafetyBUS p, the module will quickly be ready for operation again ("Device" LED lights up green).

Operation and Maintenance

Display elements

Status LEDs

Each input is assigned a status LED (I00 to I15).

The corresponding LED will light when its respective input has the status “1”, otherwise it will remain unlit.

“Supply” LED

Indicates the presence of the supply voltage, “Supply”.

“Device” LED

This dual-colour LED indicates the device status.

- Red: A device error has occurred. The device error may involve one or both of the I/O-Groups configured on the module.
- Flashing red: There is a periphery error.
- Green: The module is operating without error.
- LED off: A system error is preventing the module from starting up.

“SB active” LED

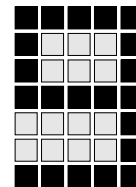
Indicates the presence of a connection between the module and the Management Device.

- Green: Connection to the Management Device has been established
- LED off: No contact with SafetyBUS p (faulty wiring or Management Device not in operation)
- Flashing green: There is contact with SafetyBUS p, but the Management Device does not recognise the module (faulty device address or configuration)

“I/O-Group” LED

Indicates the status of the I/O-Groups configured on the module.

- Green: All I/O-Groups configured on the module have “RUN” status
- LED off: All I/O-Groups configured on the module have “STOP” status
- Flashing green: One of the I/O-Groups configured on the module has “STOP” status.



“Load Supply” LED

Reserved for output devices

Recommissioning



NOTICE

When recommissioning, errors may occur when plugging in the connectors as there is no protection against them being inserted incorrectly. Always carry out a function test when recommissioning to ensure you exclude the possibility of such an error.

Faults

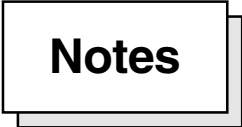
If the module is defective or there is a wiring error, all the outputs in the affected I/O-Group are shut down and the I/O-Group switches to a STOP condition. An error telegram is then triggered on SafetyBUS p and the error is entered in the error buffer of the PSS67 F 16DI SB-T.

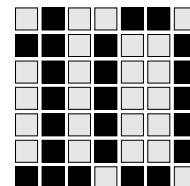
An error message appears on the display of the controlling PSS. The error stack display in the programming device can be used to locate the error (see “SafetyBUS p System Description”).

Module configuration

The procedure for configuring SafetyBUS p and the module PSS67 F 16DI SB-T is described in the online help of the PSS WIN-PRO system software.

Operation and Maintenance





Technical Details

Electrical data	
Supply voltage	24 VDC
Voltage tolerance	-15 %/+20 %
Residual ripple DC	5%
Current consumption	90 mA plus load currents taken from the test pulse outputs
Galvanic isolation	Yes, between inputs and SafetyBUS p
Connection	B-coded M12 connector
SafetyBUS p	
Transmission rate	Max. 500 kBit/s
Cable runs	Max. 3500 m
Transmission type	Differential two-wire cable
Connection	A-coded M12 connector
Digital inputs	
Number of inputs	16
Type according to 61101-2	24 VDC Type 1
Separation of supply	Yes, between inputs and SafetyBUS p
“1” Signal	+15 ... +30 VDC
“0” Signal	-3 ... +5 VDC
Input current	Typ. 3.5 mA
Input delay	< 1 ms
Pulse suppression	< 300 µs
Status indicator	Green LED
Dedicated test pulses	
Number	4 (configurable in pairs as test pulse or 24 VDC output)
Output current at “1” signal	Max. 0.125 A per pin
Total load capacity	Max. 0.25 A per test pulse group
Cable runs	Between test pulse output and input Max. 100 m

Technical Details

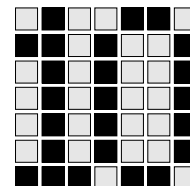
Environmental data	
Protection type (EN 60529)	IP67
Mounting position	Any
Climatic suitability	EN 60068-2-1, EN 60068-2-2, EN 60068-2-14
Ambient temperature (EN 60068-2-14)	-40 ... +60 °C
Storage temperature (EN 60068-2-1/-2)	-40 ... +70 °C
EMC	EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-6-2, EN 61000-6-4
Vibration (EN 60068-2-6)	10 ... 150 Hz, 1g 10 ... 55 Hz, 0,35 mm
Shock (EN 60068-2-27) (EN 60068-2-29)	15g, 11 ms 10g, 16 ms
Mechanical data	
Weight	500 g
Dimensions (H x W x D)	215 x 60 x 35,5 mm

The names of products, goods and technologies used in this manual are trademarks of the respective companies.

The standards current on 2007/10 apply.

Order reference

Description	Order No.
Marking labels (264 pcs.)	311 250
Cover for unused male connectors	311 252
Cover for unused female connectors	311 251



Technical Details



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