Visualisation; Diagnostics

Easy to Configure

Programming IEC 61131-3

Rapid Installation

PNOZ m ES RS232

PILZ
THE SPIRIT OF SAFETY

▸ Configurable, safe small controllers PNOZmulti 2

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.

 SD means Secure Digital

Contents

1 Introduction

1.1 Validity of documentation

This documentation is valid for the product PNOZ m ES RS232. 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.

1.2 Using the documentation

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

1.3 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 Scope of supply

▸ Expansion module PNOZ m ES RS232

▸ Jumper

2.2 Unit features

Application of the product PNOZ m ES RS232:

Communication module for connection to a base unit from the configurable control system PNOZmulti 2.

The product has the following features:

▸ Can be configured in the PNOZmulti Configurator

▸ 1 serial interface RS232

▸ Status indicator for supply voltage

▸ Max. 1 communication module can be connected to the left of the base unit PNOZmulti 2

▸ Plug-in connection terminals (either cage clamp terminals or screw terminals)

2.3 Front view
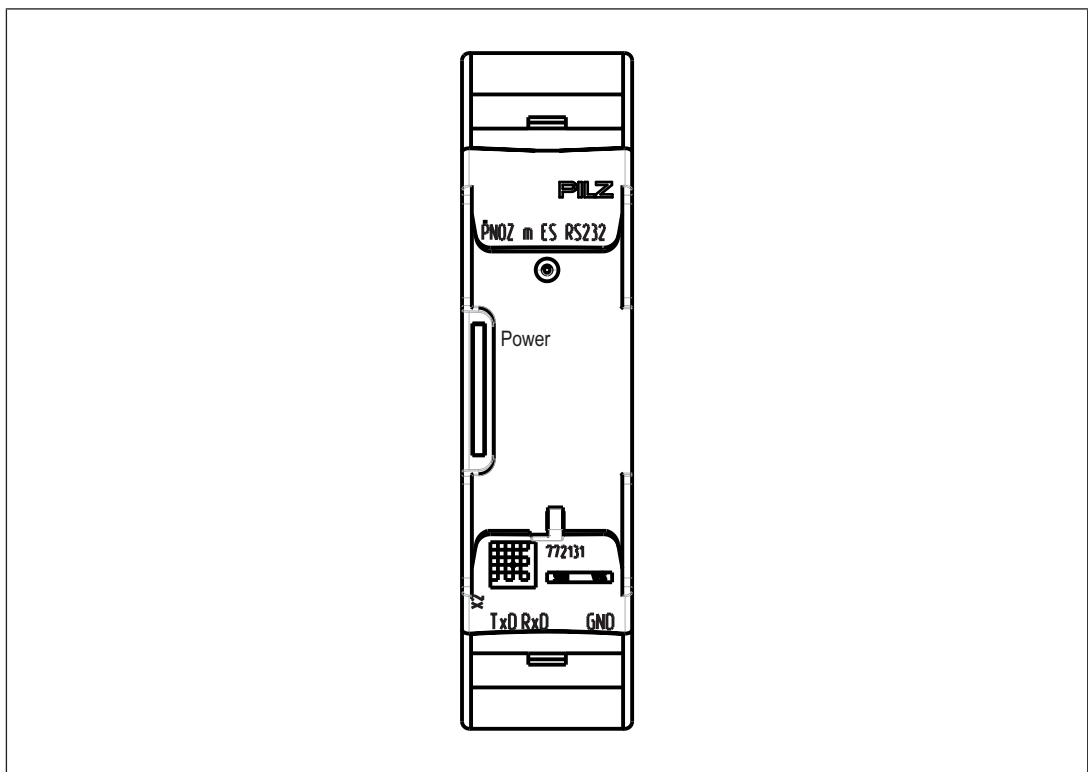
Key:

▸ X2: Serial interface RS 232

▸ LED:

– Power

3 Safety

3.1 Intended use

The expansion module PNOZ m ES RS232 is used for communication of the configurable safety relay PNOZmulti 2 via a serial interface RS232.

The expansion module may only be connected to a base unit from the configurable system PNOZmulti 2 (please refer to the document "PNOZmulti System Expansion" for details of the base units that can be connected).

The configurable system PNOZmulti 2 is used for the safety-related interruption of safety circuits and is designed for use in:

▸ Emergency stop equipment
▸ Safety circuits in accordance with VDE 0113 Part 1 and EN 60204-1

The expansion module may not be used for safety-related functions.

The module PNOZ m ES RS232 can be used as a non-safety-related component in accordance with the Lifts Directive 2014/33/EU.
It meets the environmental requirements for passenger and goods lifts in accordance with EN 81-1/2, EN 81-20, EN 81-22 and EN 81-50, as well as the requirements for escalators and moving walks in accordance with EN 115-1.

The safety controller should be installed in a protected environment that meets at least the requirements of pollution degree 2.
Example: Protected inside space or control cabinet with protection type IP54 and appropriate air conditioning.

Improper use

The following is deemed improper use in particular

▸ Any component, technical or electrical modification to the product,
▸ Use of the product outside the areas described in this operating manual,
▸ Use of the product outside the technical details (see Technical details [14]).

> **NOTICE**
>
> **EMC-compliant electrical installation**
>
> The product is designed for use in an industrial environment. The product may cause interference if installed in other environments. If installed in other environments, measures should be taken to comply with the applicable standards and directives for the respective installation site with regard to interference.

3.1.1 System requirements

Please refer to the "Product Modifications PNOZmulti" document in the "Version overview" section for details of which versions of the base unit and PNOZmulti Configurator can be used for this product.

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3.3 Safety regulations

3.3.1 Use of qualified personnel

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

A competent person is someone who, because of their training, experience and current professional activity, has the specialist knowledge required to test, assess and operate the work equipment, devices, systems, plant and machinery in accordance with the general standards and guidelines for safety technology.

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

▸ Are familiar with the basic regulations concerning health and safety / accident prevention,

▸ Have read and understood the information provided in this description under "Safety",

▸ And have a good knowledge of the generic and specialist standards applicable to the specific application.

3.3.2 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.).

3.3.3 Disposal

▸ When decommissioning, please comply with local regulations regarding the disposal of electronic devices (e.g. Electrical and Electronic Equipment Act).

3.3.4 For your safety

The unit meets all the necessary conditions for safe operation. However, you should always ensure that the following safety requirements are met:

▸ This operating manual only describes the basic functions of the unit. The expanded functions are described in the PNOZmulti Configurator's online help. Only use these functions once you have read and understood the documentations.

▸ Do not open the housing or make any unauthorised modifications.

▸ Please make sure you shut down the supply voltage when performing maintenance work (e.g. exchanging contactors).
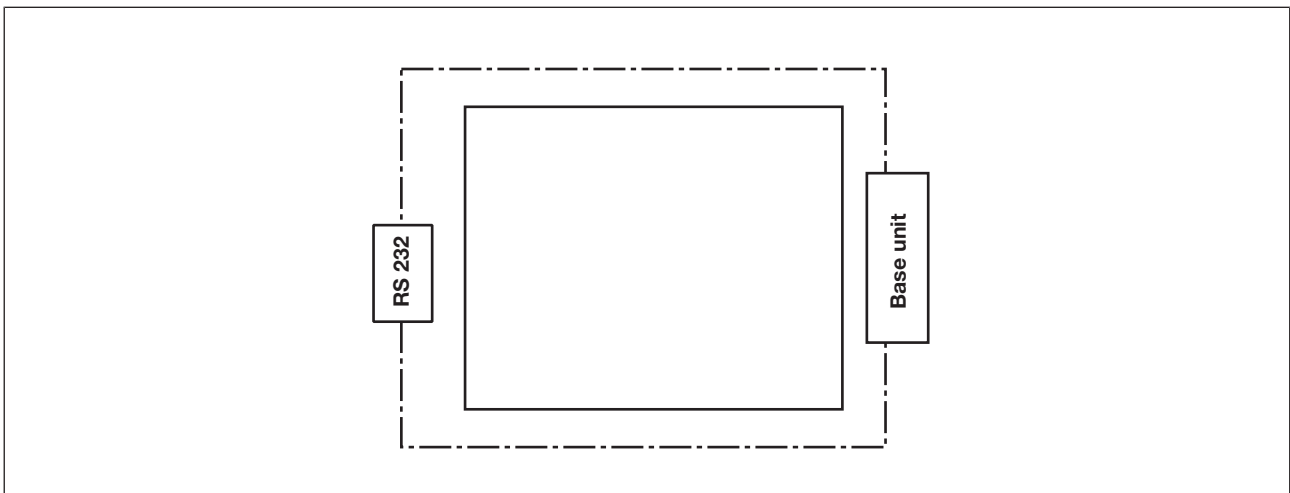
4 Function description

4.1 Functions

The product PNOZ m ES RS232 has a serial interface RS232 interface to

▸ Download the project

▸ Read the diagnostic data

▸ Set virtual inputs for standard functions

▸ Read virtual outputs for standard functions.

Information on diagnostics can be found in the document "Communication Interfaces".

4.2 Block diagram

5 Installation

5.1 General installation guidelines

▸ The unit should be installed in a control cabinet with a protection type of at least IP54.

▸ Fit the safety system to a horizontal mounting rail. The venting slots must face upward and downward. Other mounting positions could damage the safety system.

▸ Use the locking elements on the rear of the unit to attach it to a mounting rail.

▸ In environments exposed to heavy vibration, the unit should be secured using a fixing element (e.g. retaining bracket or end angle).

▸ Open the locking slide before lifting the unit from the mounting rail.

▸ To comply with EMC requirements, the mounting rail must have a low impedance connection to the control cabinet housing.

▸ The ambient temperature of the PNOZmulti units in the control cabinet must not exceed the figure stated in the technical details. Air conditioning may otherwise be required.

> **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.

5.2 Dimensions in mm
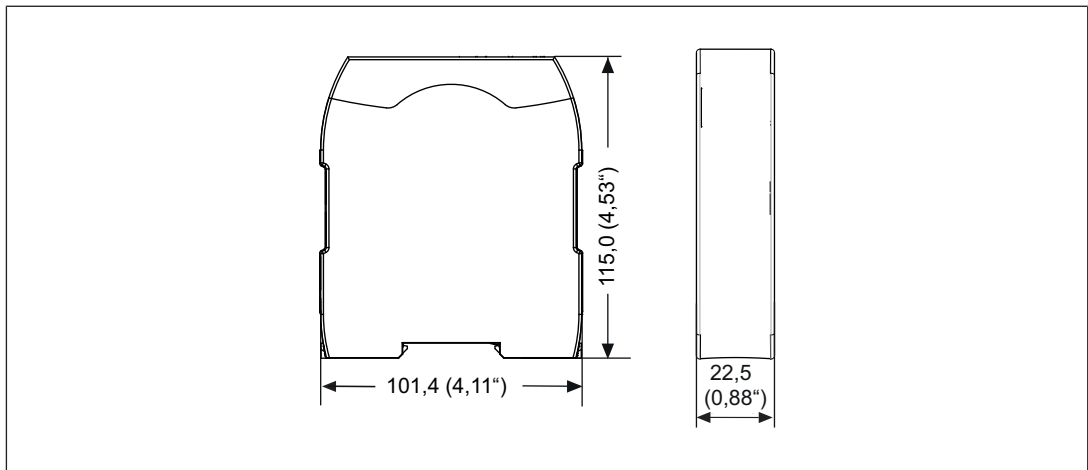
5.3 Connect the base unit and expansion modules

Connect the base unit and the expansion module as described in the operating instructions for the base units.

▸ Connect the black/yellow terminator to the expansion module.

▸ Install the expansion module in the position in which it is configured in the PNOZmulti Configurator.

The position of the expansion modules is defined in the PNOZmulti Configurator. The expansion modules are connected to the left or right of the base unit, depending on the type.

Please refer to the document "PNOZmulti System Expansion" for details of the number of modules that can be connected to the base unit and the module types.

6 Commissioning
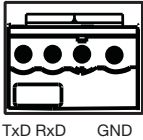
6.1 General wiring guidelines

The wiring is defined in the circuit diagram of the PNOZmulti Configurator.

Please note:

▸ Information given in the Technical details [📖 14] must be followed.

▸ The position of the expansion module is specified in the Hardware configuration of the PNOZmulti Configurator.

▸ Use copper wiring with a temperature stability of 75 °C.

6.2 Interface configuration

Serial interface RS232	Standard
TxD RxD GND	TxD (Transmit)
	RxD (Receive)
	GND (Ground)

6.3 Preparing for operation

The serial interface RS 232 is activated and detected depending on the USB interface on the base unit:

▸ **USB interface on the base unit not connected**

In this case, the serial interface RS 232 will be detected and activated by the base unit as soon as the communication module has been connected to the base unit.

▸ **USB interface on the base unit connected**

If the USB interface on the base unit is already connected, the "External" interface will first need to be selected on the base unit display to enable the serial interface RS 232 on the base unit to be detected and activated (see operating manual for the base unit for details of the setting).

6.4 Download modified project to the PNOZmulti system

As soon as an additional expansion module has been connected to the system, the project must be amended in the PNOZmulti Configurator and downloaded back into the base unit. Proceed as described in the operating manual for the base unit.

> **NOTICE**
>
> For the commissioning and after every user program change, you must check whether the safety devices are functioning correctly.

7 Operation

7.1 Messages

When the supply voltage is switched on, the PNOZmulti copies the configuration from the chip card.

The safety system PNOZmulti is ready for operation when the "POWER" and "RUN" LEDs on the base unit and the "POWER" LED on the PNOZ m ES RS232 are lit continuously.

7.1.1 Display elements for device diagnostics

Legend

$\overset{\cdot}{\ominus}$ LED on

$\mathbb{C}$ LED flashes

●   LED off

LED	LED status		Meaning
Power	●		No supply voltage
	$\overset{\cdot}{\ominus}$	Green	Supply voltage is present

8 Technical details

General	
Certifications	**CE, EAC, UKCA, cULus Listed**
Application range	**Standard**
Electrical data	
Supply voltage	
internal	**Via base unit**
Voltage	**3,3 V**
Current consumption	**9 mA**
Power consumption	**30 mW**
Max. power dissipation of module	**30 mW**
Status indicator	**LED**
Fieldbus interface	
Galvanic isolation	**No**
Serial interface	
Number of RS232 interfaces	**1**
Environmental data	
Ambient temperature	
In accordance with the standard	**EN 60068-2-14**
Temperature range	**0 - 60 °C**
Forced convection in control cabinet off	**55 °C**
Storage temperature	
In accordance with the standard	**EN 60068-2-1/-2**
Temperature range	**-25 - 70 °C**
Climatic suitability	
In accordance with the standard	**EN 60068-2-30, EN 60068-2-78**
Condensation during operation	**Not permitted**
Max. operating height above sea level	**2000 m**
EMC	**EN 61131-2**
Vibration	
In accordance with the standard	**EN 60068-2-6**
Frequency	**10 - 150 Hz**
Acceleration	**1g**
Shock stress	
In accordance with the standard	**EN 60068-2-27**
Acceleration	**15g**
Duration	**11 ms**
Airgap creepage	
In accordance with the standard	**EN 61131-2**
Overvoltage category	**II**
Rated insulation voltage	**30 V**

Environmental data	
Protection type	
In accordance with the standard	**EN 60529**
Housing	**IP20**
Terminals	**IP20**
Mounting area (e.g. control cabinet)	**IP54**
Mechanical data	
Mounting position	**horizontally on mounting rail**
DIN rail	
Top hat rail	**35 x 7,5 EN 50022**
Recess width	**27 mm**
Cable length	
Max. cable length per input	**22 m**
Material	
Bottom	**PC**
Front	**PC**
Top	**PC**
Connection type	**Spring-loaded terminal, screw terminal**
Mounting type	**plug-in**
Conductor cross section with screw terminals	
1 core flexible	**0,25 - 2,5 mm², 24 - 12 AWG**
2 core with the same cross section, flexible without crimp connectors or with TWIN crimp connectors	**0,2 - 1,5 mm², 24 - 16 AWG**
Torque setting with screw terminals	**0,5 Nm**
Conductor cross section with spring-loaded terminals: Flexible with/without crimp connector	**0,2 - 2,5 mm², 24 - 12 AWG**
Spring-loaded terminals: Terminal points per connection	**2**
Stripping length with spring-loaded terminals	**9 mm**
Dimensions	
Height	**101,4 mm**
Width	**22,5 mm**
Depth	**120 mm**
Weight	**85 g**

Where standards are undated, the 2012-04 latest editions shall apply.

9   Order reference

9.1   Product

Product type	Features	Order no.
PNOZ m ES RS232	Configurable safe small controllers PNOZmulti 2, communication module, 1 serial interface RS232.	772131

9.2   Accessories

9.2.1   Terminals

Product type	Features	Order no.
Spring terminals PNOZ mmc2p, mml1p 1 pc.	Spring-loaded terminals, PNOZ mmc2p, PNOZ mml1p, 1 set.	783538
Screw terminals PNOZ mmc2p, mml1p 1 pc.	Plug-in screw terminals, PNOZ mmc2p, PNOZ mml1p, 1 set.	793538
Spring terminals PNOZ mmc2p,mml1p 10 pcs	Spring-loaded terminals, PNOZ mmc2p, PNOZ mml1p, 10 sets.	783539
Screw terminals PNOZ mmc2p,mml1p 10 pcs.	Plug-in screw terminals, PNOZ mmc2p, PNOZ mml1p, 10 sets.	793539

9.2.2   Connector plug

Product type	Features	Order no.
PNOZ mm0.xp connector left (10 pcs)	Connector plug to connect the modules to the left-hand side of the PNOZmulti base unit, yellow/black (10 pieces).	779260

▶ Support

Technical support is available from Pilz round the clock.

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