



PNOZ mc7p

PILZ
THE SPIRIT OF SAFETY

- ▶ Configurable, safe small controllers PNOZmulti Classic

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1 Introduction

1.1 Validity of documentation

This documentation is valid for the product PNOZ mc7p. 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

- ▶ Expansion module PNOZ mc7p
- ▶ Jumper

2.2 Unit features

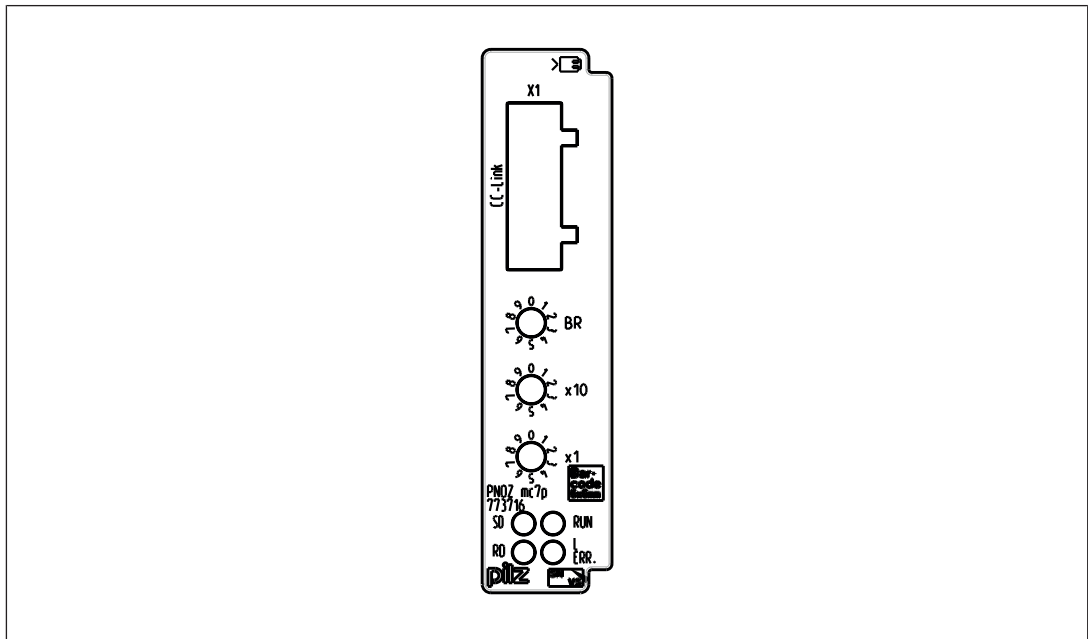
Application of the product PNOZ mc7p:

Expansion module for connection to a base unit from the configurable control system PNOZmulti

The product has the following features:

- ▶ Can be configured in the PNOZmulti Configurator
- ▶ Connection for CC-Link
- ▶ Station addresses from 0 ... 63, selected via rotary switch
- ▶ Station type: Remote Device
- ▶ Occupied stations: 2
- ▶ 24 virtual inputs and outputs on the control system PNOZmulti can be defined in the PNOZmulti Configurator for communication with the fieldbus CC-Link . The number of inputs and outputs can be extended to 128. Please note that when the extended inputs and outputs 24 - 127 are used they have different properties (see document entitled "Communication Interfaces").
- ▶ Max. 1 PNOZ mc7p can be connected to the base unit
- ▶ Please refer to the document "PNOZmulti System Expansion" for the PNOZmulti base units that can be connected.

2.3 Front view



Legend:

► LED:

- Run
- SD
- RD
- L Err

3 Safety

3.1 Intended use

The fieldbus module PNOZ mc7p is an expansion module of the configurable control system PNOZmulti. It is used for communication between the configurable control system PNOZmulti and the CC-Link .

CC-Link is designed for fast data exchange at field level. The expansion module CC-Link is a passive subscriber (Slave) in CC-Link. The basic communication functions with CC-Link conform to CC-Link V1.10. The central controller (master) reads input information from the slaves and writes output information to the slaves as part of each cycle. As well as the cyclical transfer of usable data, the expansion module PNOZ mc7p also has diagnostic and commissioning functions. Data traffic is monitored on the Master/Slave side.


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

The configurable small control systems PNOZmulti are used for the safety-related interruption of safety circuits and are designed for use in:

- ▶ E-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 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 manual,
- ▶ Use of the product outside the technical details (see [Technical details](#)  17).



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.

3.2 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.

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 virtual inputs and outputs that are to be transferred via the fieldbus CC-Link are selected and configured in the PNOZmulti Configurator. The base unit and the fieldbus module PNOZ mc7p are connected via a jumper. The fieldbus module is also supplied with voltage via this jumper. After the supply voltage is switched on or the control system PNOZmulti is reset, the fieldbus module PNOZ mc7p is configured and started automatically.

LEDs indicate the status of the fieldbus module on the fieldbus CC-Link .

The configuration is described in detail in the PNOZmulti Configurator's online help.

4.2 Input and output data

The data is structured as follows:

► Input area

- Inputs on PNOZmulti Configurator: i00 ... i23
- Input data CC-Link: RY0n, RY1n with n = 0 ... F

Example: i23 -> RY17

n	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RY0n	i15	i14	i13	i12	i11	i10	i09	i08	i07	i06	i05	i04	i03	i02	i01	i00
RY1n	-	-	-	-	-	-	-	-	i23	i22	i21	i20	i19	i18	i17	i16

► Output range

- Outputs on PNOZmulti Configurator: o00 ... o23
- Output data CC-Link: RXn, RX1n with n = 0 ... F

Example: o22 -> Rx16

n	F	E	D	C	B	A	9	8	7	6	5	4	3	2	1	0
RX 0n	o15	o14	o13	o12	o11	o10	o09	o08	o07	o06	o05	o04	o03	o02	o01	o00
RX 1n	-	-	-	-	-	-	-	-	o23	o22	o21	o20	o19	o18	o17	o16

The number of virtual inputs and outputs can be extended to 128 (see document "Communication Interfaces" in the section entitled "Fieldbus modules")

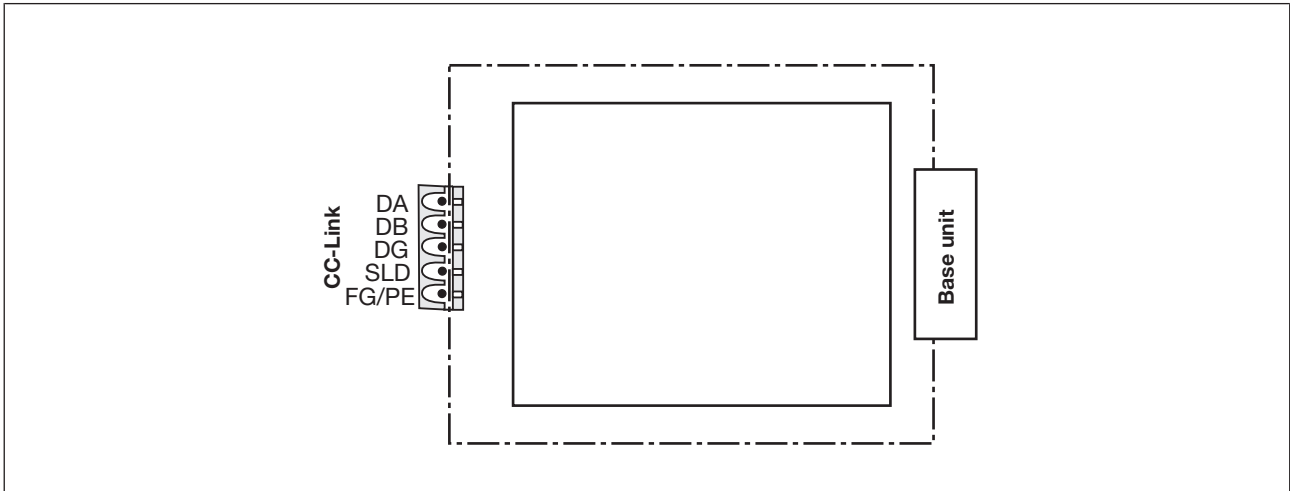
Detailed information on data exchange is available in the document "Communication Interfaces PNOZmulti 2" in the section entitled "Fieldbus modules".



INFORMATION

When polling the tables and segments of the PNOZmulti, please note that communication on the CC-Link is via the Register.

4.3 Block diagram



5 Installation

5.1 General installation guidelines

- ▶ The control system should be installed in a control cabinet with a protection type of at least IP54. Fit the control system to a horizontal mounting rail. The venting slots must face upward and downward. Other mounting positions could destroy the control system.
- ▶ Use the locking elements on the rear of the unit to attach it to a mounting rail. Connect the control system to the mounting rail in an upright position, so that the earthing springs on the control system are pressed on to the mounting rail.
- ▶ The ambient temperature of the devices in the control cabinet must not exceed the figure stated in the technical details. Air conditioning may otherwise be required.
- ▶ To comply with EMC requirements, the mounting rail must have a low impedance connection to the control cabinet housing.

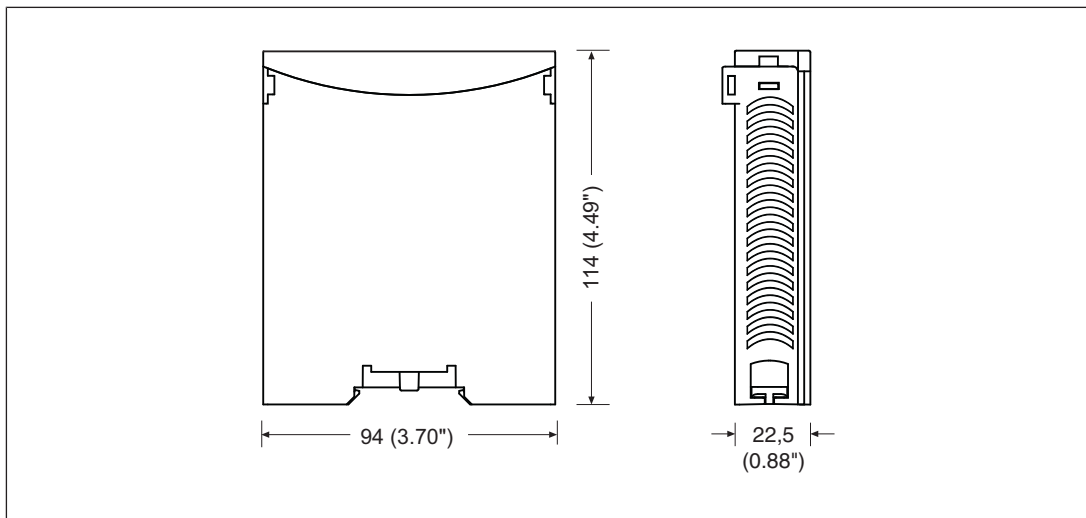


NOTICE

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 Connecting the base unit and expansion modules

You can install a maximum of 1 PNOZ mc7p to the left of the base unit.

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

- ▶ Do **not** connect a terminator to the last expansion module on the left-hand side.
- ▶ Install the expansion module in the position in which it is configured in the PNOZmulti Configurator.

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 \[17\]](#) 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.
- ▶ Always connect the mounting rail to the protective earth via an earthing terminal. This will be used to dissipate hazardous voltages in the case of a fault.
- ▶ The power supply must meet the regulations for extra low voltages with safe separation (SELV, PELV).



CAUTION!

Only connect and disconnect the expansion module when the supply voltage is switched off.

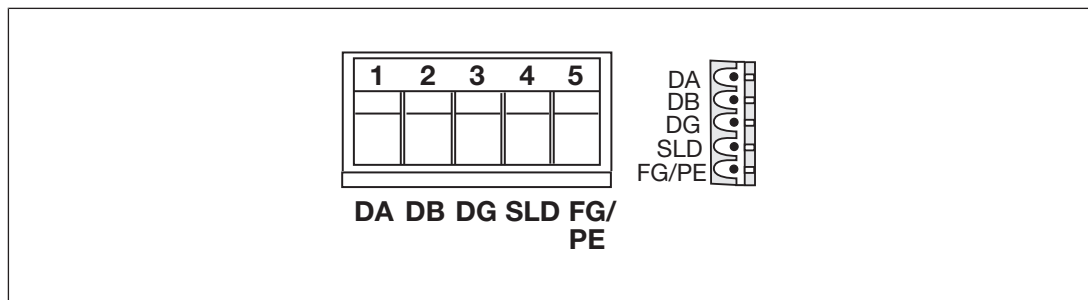


NOTICE

When installing, you must refer to the guidelines of the CANopenUser Group.

6.2 Interface assignment

It is possible to define which outputs on the safety system will communicate with CC-Link. The connection to CC-Link is made via a 5-pin screw connector.



- 1: DA (Channel A)
- 2: DB (Channel B)
- 3: DG (Earth)
- 4: SLD (Cable shield)
- 5: FG/PE (Functional earth)

6.3 Download modified project to the PNOZmulti safety system

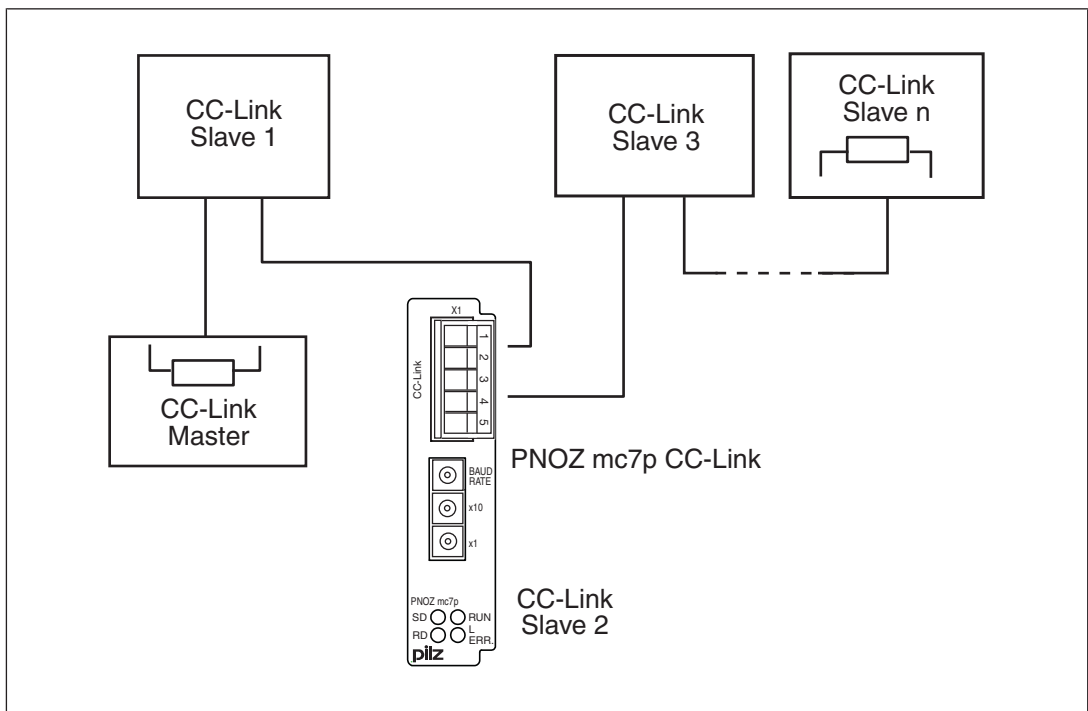
As soon as an additional expansion module has been connected to the system, the project must be amended in the PNOZmulti Configurator and downloaded back into the base unit. Proceed as described in the operating manual for the base unit.



NOTICE

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

6.4 Connection example



7 Operation










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

The expansion module PNOZ mc7p is configured and started automatically.

7.1 Messages

Legend

-  LED on
-  LED off

LED		Color	Meaning
RUN		Green	Bus connection available
			<ul style="list-style-type: none"> ▶ Bus connection is not available ▶ Status: timeout ▶ No supply voltage at the fieldbus module PNOZ mc7p
L Err		Red	Fault detected: Wrong station address or transmission rate
			<ul style="list-style-type: none"> ▶ Flashes evenly: setting has been changed during operation and PNOZ mc7p has not been restarted ▶ Flashes unevenly: faulty connection, e.g. terminating resistor is missing
			<ul style="list-style-type: none"> ▶ Bus connection available ▶ No supply voltage at the fieldbus module PNOZ mc7p
RD		Green	PNOZ mc7p Receiving data
			<ul style="list-style-type: none"> ▶ PNOZ mc7p Not receiving data ▶ No supply voltage at the fieldbus module PNOZ mc7p
SD		Green	PNOZ mc7p Sending data
			<ul style="list-style-type: none"> ▶ PNOZ mc7p Not sending data ▶ No supply voltage at the fieldbus module PNOZ mc7p

8 Technical Details

General	
Certifications	CCC, CE, EAC (Eurasian), cULus Listed
Electrical data	
Supply voltage	
for	Module supply
Voltage	5 V
Kind	DC
Voltage tolerance	-2 %/+2 %
Power consumption	2,5 W
Status indicator	LED
Fieldbus interface	
Fieldbus interface	CC-Link V1.10
Device type	Slave
Station address	0 ... 63d
Transmission rates	10 MBit/s, 156 kbit/s, 2,5 MBit/s, 5 MBit/s, 625 kbit/s
Connection	5-pin Combicon plug-in connector
Assigned stations	2
Galvanic isolation	yes
Test voltage	500 V AC
Times	
Supply interruption before de-energisation	20 ms
Environmental data	
Ambient temperature	
In accordance with the standard	EN 60068-2-14
Temperature range	0 - 60 °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
Humidity	93 % r. h. at 40 °C
Condensation during operation	Not permitted
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
Max. operating height above sea level	2000 m

Environmental data

Airgap creepage	
In accordance with the standard	EN 61131-2
Overvoltage category	III
Pollution degree	2
Rated insulation voltage	30 V
Protection type	
In accordance with the standard	EN 60529
Mounting area (e.g. control cabinet)	IP54
Housing	IP20
Terminals	IP20

Potential isolation

Potential isolation between	Fieldbus and module voltage
Type of potential isolation	Functional insulation
Rated surge voltage	500 V

Mechanical data

Mounting position	horizontally on mounting rail
DIN rail	
Top hat rail	35 x 7,5 EN 50022
Recess width	27 mm
Material	
Bottom	PPO UL 94 V0
Front	ABS UL 94 V0
Dimensions	
Height	94 mm
Width	22,5 mm
Depth	122 mm
Weight	110 g

Where standards are undated, the 2020-07 latest editions shall apply.

9 Order reference

9.1 Product

Product type	Features	Order no.
PNOZ mc7p	Fieldbus module, CC-Link	773 716

9.2 Accessories

Jumper

Product type	Features	Order No.
KOP-XE	Jumper	774 639

► Support

Technical support is available from Pilz round the clock.

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