

**Installation Manual
For
PSCBR modules**

Series PSCBR-E-33-12DI-2DIO-8RO

Installation manual for extension module PSCBR-E-33-12DI-2DIO-8RO.

Note:

The German version if the original version of the installation manual

Status: 06/2014

Valid from FW release 2.0.2.30

Subject to change without prior notification

The contents of this documentation has been collated with greatest care and corresponds with our present status of information.

However, we would like to point out, that this document cannot always be updated at the same time as the technical further development of the products.

Information and specifications can be changed at any time. Please keep yourself informed about the current version under www.schmersal.com.br

Devices of the

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Contents

- 1 IMPORTANT NOTES 4**
- 1.1 Definitions 4
- 1.2 Co-valid documents 4
- 1.3 Abbreviations used 5
- 2 SAFETY REGULATIONS 6**
- 2.1 Intended use 6
- 2.2 Operation and service 6
- 2.1 Transport/storage 6
- 3 DEVICE TYPES 7**
- 3.1 Characteristics of the module 7
- 3.2 Identification 8
- 4 CONNECTION AND INSTALLATION 9**
- 4.1 General notes on installation 9
- 4.2 Installation and assembly of the PSCBR module 11
- 4.3 Installation of backplane bus system 11
- 4.4 Assembling the modules 12
- 4.4.1 Assembly on C-rail 12
- 4.4.2 Assembly on backplane bus 13
- 4.5 Terminal assignment 15
- 4.6 Safety related assessment of the outputs 17
- 4.7 Configuration PSCBR-E-33-12DI-2DIO-8RO 18
- 4.7.1 First step 18
- 4.7.2 Second step 19
- 4.7.3 Third step 19
- 4.7.4 Fourth step 20
- 5 MAINTENANCE 21**
- 5.1 Modification / handling changes to the device 21
- 5.2 Exchanging a module 21
- 5.3 Maintenance intervals 21
- 6 TECHNICAL DATA 22**
- 6.1 Environmental conditions 22
- 6.2 Safety related characteristic data 22

1 Important notes

Definition of individual target groups

Project engineers for safe drive systems:
Engineers and technicians

Assembly, electric installation, maintenance and replacement of devices:
Maintenance electricians and service technicians

Commissioning, operation and configuration:
Technicians and engineers

1.1 Definitions

The designation PSCBR is used as generic term for all derivatives from the PSCBR product range. Wherever this description refers to a certain derivative, the complete designation is used.

The term "safe" used in the following text in any case refers to the classification as a safe function for application up to PI e acc. to EN ISO 13849-1 or SIL3 acc. to EN 61508.

The system software "SafePLC" serves the purpose of configuring and programming PSCBR modules.

The modules of the PSCBR series are internally built up of two independent processing units. In the following these are referred to as system A and system B.

1.2 Co-valid documents

<i>Description</i>	<i>Reference</i>
Installation manual for PSCBR device series PSCBR-10	HB-37350-810-01-xxF-EN PSCBR Installation manual

Note:

- Thoroughly read the manuals before you start the installation and the commissioning of the PSCBR module.
- Paying attention to the documentation is a prerequisite for trouble-free operation and fulfilment of possible warranty claims.

1.3 Abbreviations used

Abbreviation	Meaning
AC	Alternating voltage
IL	Instruction list
ELIA	Employer's liability insurance association
CLK	Clock (cycle)
CPU	Central Processing Unit
DC	Direct voltage
DI1..DI14	Digital Input
DIN	Deutsches Institut für Normung (German Institute for Standardization)
DO	Digital Output
EMU	Emergency Monitoring Unit
EMC	Electromagnetic compatibility
ELC	Emergency Limit Control
EN	European Standard
HISIDE	Output with 24VDC nominal level switching to plus
IP20	Degree of protection for housing
ISO	International Organisation for Standardisation
LED	Light Emitting Diode
LOSIDE	Output switching to reference potential
OLC	Operational Limit Control
PIA	Process image of outputs
PII	Process image of inputs
PESSRAL	Programmable electronic system in safety related applications for elevators
P1,P2	Pulse outputs
PLC	Programmable Logic Controller
POR	Power on Reset
PSC	Position Supervision Control
SELV	Safety Extra Low Voltage
SSI	Synchronous Serial Interface
VDE	Verband der Elektrotechnik, Elektronik und Informationstechnik e. V.

Abbreviation	Meaning
	(association for electrical engineering, electronics and information technology)

2 Safety regulations

2.1 Intended use

The PSCBR-E-33-12DI-2DIO-8RO device can only work with a basic device. So the same safety regulations as device series PSCBR10/11/12 are guilty.

2.2 Operation and service

The module must always be de-energized before installation and removal, or before disconnecting signal lines. For this purpose all live supply lines to the device must be checked for safe isolation from supply

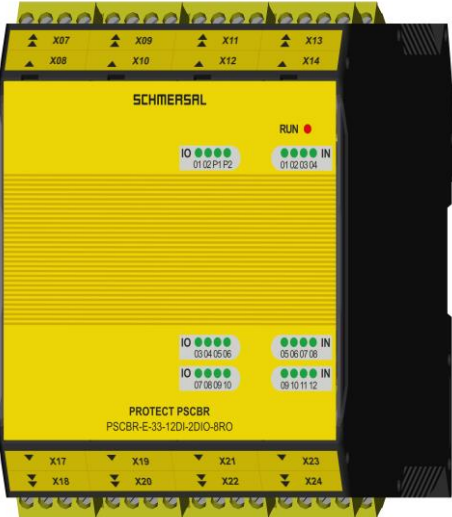
When installing or removing the module appropriate measures must be applied to prevent electrostatic discharge to the externally arranged terminal and plug connections. Contact with such terminals should be reduced to a minimum and earthing should by means of e.g. an earthing strap should take place before and during these procedures.

2.1 Transport/storage

Information concerning transport, storage and proper handling must be strictly followed. The climate related specifications in chapter "Technical data" must be complied with.

3 Device types

3.1 Characteristics of the module

<i>Type designation</i>	<i>Device design</i>
	<p>Design of module with the following periphery:</p> <ul style="list-style-type: none"> 12 digital inputs 2 I/O optionally configurable as input or output 2 pulse outputs 4 safety relay outputs 2 signal outputs 12 status LEDs for inputs 10 status LEDs for I/O 1 backplane bus interface

3.2 Identification

The name plate is located on the left side wall of the module and contains the following information:

- Type designation
- Part number
- Serial number
- Identification of hardware release
- Identification of software release
- Safety category
- Input characteristics
- Output characteristics
- Date of manufacture (week/year)

4 Connection and installation

4.1 General notes on installation

Strictly follow the safety regulations when installing!

Degree of protection IP52

Route all signal lines for the interfacing of digital inputs and contact monitoring separately. You should in any case disconnect 230VAC voltages from low voltage power lines, if these voltages are used in connection with the application.

The cable lengths for digital inputs and outputs must normally not exceed **30 m**. If the cable lengths exceeds 30 m you must apply appropriate measures for fault exclusion concerning impermissible overvoltage. Appropriate measures include e.g. lightning protection for outdoor lines, overvoltage protection of the indoor system, protected routing of cables.

Measures concerning the electromagnetic compatibility (EMC)

The PSCBR module is intended for use in the drive environment and meets the EMC-requirements mentioned above.

It is also assumed that the electromagnetic compatibility of the overall system is ensured by application of appropriate measures.

Use of the module as PESSRAL acc. to EN81:

When using the module as PESSRAL acc. to EN81 (elevator standard), the device must be installed at a minimum distance of 200mm to the transmitting facility with the following frequency ranges (mobile radio, etc.) 166-1000 MHz, 1710-1784 MHz, 1880-1960 MHz. The field strength of the transmitting facility must not exceed the following field strength values: 30V/m at 166-1000 and 1710-1784 MHz, 10V/m at 1880-1960 MHz . Installation in a closed housing with degree of protection IP5X or better is additionally required.

Safety note:

Electric power supply lines of the PSCBR and "discontinuous-action lines" of the power converter must be isolated from each other.

Signal lines and power lines of the power converter must be routed through separate cable ducts. The distance between the cable ducts should be minimum 10 mm.

Only shielded cables must be used to connect the position and speed sensors. The signal transmission cable must be RS-485-standard compliant (lines twisted in pairs).

Care must be taken to ensure that the shielding is correctly connected in the 9-pin SUB-D plugs of the position and speed sensors. Only metal or metal coated plugs are permitted.

The shielding on the sensor side must comply with appropriate methods.

EMC-compliant installation of the power converter technology in the environment of the PSCBR module must be assured. Special attention must be paid to the routing of cables, the shielding of motor cables and the connection of the braking resistor. Strict compliance with the installation instructions of the power converter manufacturer is mandatory.

All contactors in the environment of the power converter must be equipped with appropriate suppressor circuits.

Suitable measures to protect against overvoltages must be applied.

Additional safety regulations when using as PESSRAL acc. to EN81

Install the device at a distance of at least 200 mm from the HF-transmitting facility (WLAN, GSM, etc.). The transmitting facilities must thereby not exceed the max. field strengths as specified above.

The device must be installed in a closed housing, IP5X or better.

4.2 Installation and assembly of the PSCBR module

The module is solely to be installed in control cabinets with a degree of protection of at least IP54.

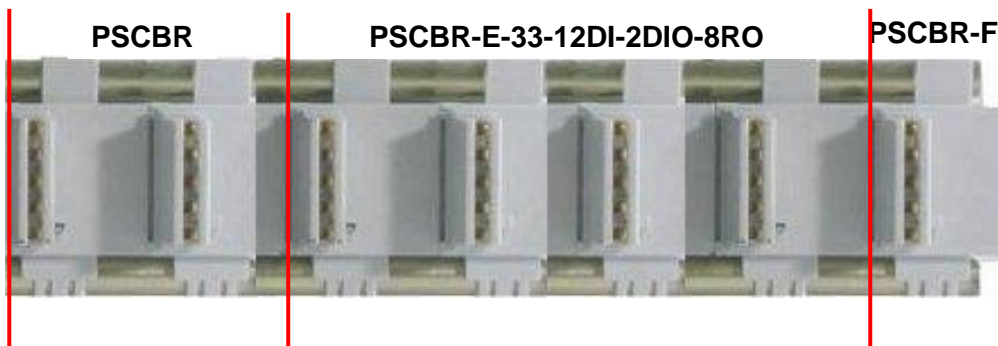
The modules must be vertically fastened on a top hat rail

The ventilation slots must be kept unobstructed, to ensure adequate air circulation inside the module.

4.3 Installation of backplane bus system

Device PSCBR-E-33-12DI-2DIO-8RO is connected to the basic device over backplane bus.

Example: PSCBR-C-10-SDM1 + PSCBR-E-33-12DI-2DIO-8RO + PSCBR-F
(basic device + PSCBR-E-33-12DI-2DIO-8RO + communication device)



Power supply for PSCBR-E-33-12DI-2DIO-8RO module is on the back plane bus and is generated from basic device.

Supply for digital outputs is on X11 of PSCBR-E-33-12DI-2DIO-8RO device.

Note:

- Max. two extension modules can be connected to a basic device (exclusive bus modules).
- Not more than one basic device can be connected on the same backplane bus.

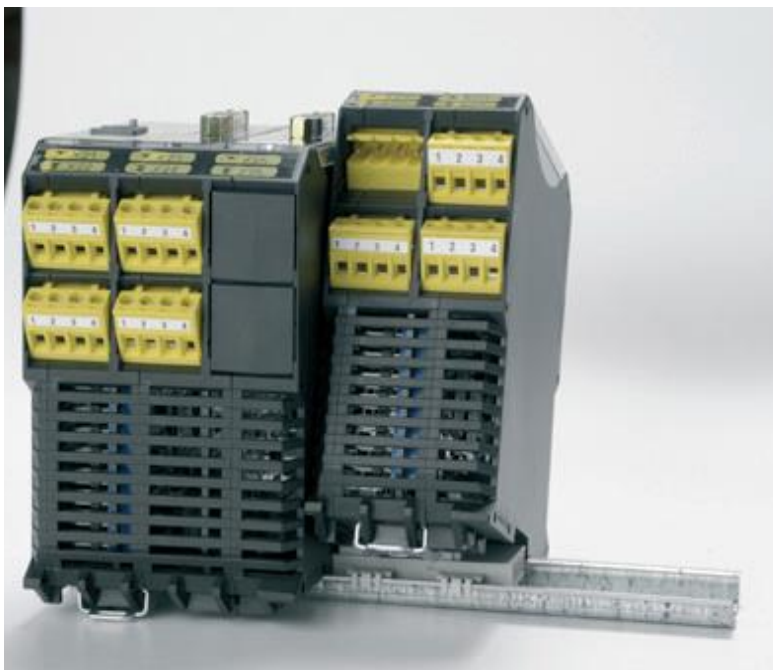
4.4 Assembling the modules

The modules are mounted on C-standard rails by means of snap-on latches.

4.4.1 Assembly on C-rail

The devices are inserted into the rail under an oblique angle and then snapped on downwards.

For disassembling use a screwdriver, insert it into the slot of the downwards pointing latch and then move it up.



4.4.2 Assembly on backplane bus

After assembling the backplane bus the device can be installed. For this purpose insert the module from above into the plug connection under an oblique angle and snap it onto the C-rail.



Insert the module from above under an oblique angle.



Snap-on downwards on to the C-rail.

The backplane plug connection can later be extended. The system configuration can thus be extended by additional modules.



Snap the backplane bus element into the C-rail and insert it into the counter-piece by sliding it sideways.

4.5 Terminal assignment

Pin	Name	Function
X07:1	K1/11	Feedback contact relay 1
X07:2	K1/12	Feedback contact relay 1
X07:3	K2/11	Feedback contact relay 2
X07:4	K2/12	Feedback contact relay 2
X08:1	K3/11	Feedback contact relay 3
X08:2	K3/12	Feedback contact relay 3
X08:3	K4/11	Feedback contact relay 4
X08:4	K4/12	Feedback contact relay 4
X09:1	K5/11	Feedback contact relay 5
X09:2	K5/12	Feedback contact relay 5
X09:3	K6/11	Feedback contact relay 6
X09:4	K6/12	Feedback contact relay 6
X10:1	K7/11	Feedback contact relay 7
X10:2	K7/12	Feedback contact relay 7
X10:3	K8/11	Feedback contact relay 8
X10:4	K8/12	Feedback contact relay 8
X11:1	U24 extern	Power supply IO +24 VDC
X11:2	U24 extern	Power supply IO +24 VDC
X11:3	GND extern	Power supply IO 0 VDC
X11:4	GND extern	Power supply IO 0 VDC
X12:1	IO01	I/O extension 1 (EAEx.1 / EAAx.1)
X12:2	IO02	I/O extension 2 (EAEx.2 / EAAx.2)
X12:3	P1	Pulse output P1
X12:4	P2	Pulse output P2
X13:1		Nicht verwendet
X13:2		Nicht verwendet
X13:3	Ax.1	Auxiliary output Ax.1 (no safety output)
X13:4	Ax.2	Auxiliary output Ax.2 (no safety output)
X14:1	Digital IN01	Digital In 01 (Ex.1)
X14:2	Digital IN02	Digital In 02 (Ex.2)
X14:3	Digital IN03	Digital In 03 (Ex.3)
X14:4	Digital IN04	Digital In 04 (Ex.4)
X17:1	K1.1	Relay output 1
X17:2	K1.2	Relay output 1
X17:3	K2.1	Relay output 2
X17:4	K2.2	Relay output 2
X18:1	K3.1	Relay output 3
X18:2	K3.2	Relay output 3
X18:3	K4.1	Relay output 4
X18:4	K4.2	Relay output 4

X19:1	K5.1	Relay output 5
X19:2	K5.2	Relay output 5
X19:3	K6.1	Relay output 6
X19:4	K6.2	Relay output 6
X20:1	K7.1	Relay output 7
X20:2	K7.2	Relay output 7
X20:3	K8.1	Relay output 8
X20:4	K8.2	Relay output 8
X21:1		Not used
X21:2		
X21:3		
X21:4		
X22:1		Not used
X22:2		
X22:3		
X22:4		
X23:1	Digital IN05	Digital In 05 (Ex.5)
X23:2	Digital IN06	Digital In 06 (Ex.6)
X23:3	Digital IN07	Digital In 07 (Ex.7)
X23:4	Digital IN08	Digital In 08 (Ex.8)
X24:1	Digital IN09	Digital In 09 (Ex.9) (OSSD)
X24:2	Digital IN10	Digital In 10 (Ex.10) (OSSD)
X24:3	Digital IN11	Digital In 11 (Ex.11) (OSSD)
X24:4	Digital IN12	Digital In 12 (Ex.12) (OSSD)

Note)

- X: 1-> PSCBR-E-33-12DI-2DIO-8RO device number 1
 2-> PSCBR-E-33-12DI-2DIO-8RO device number 2

4.6 Safety related assessment of the outputs

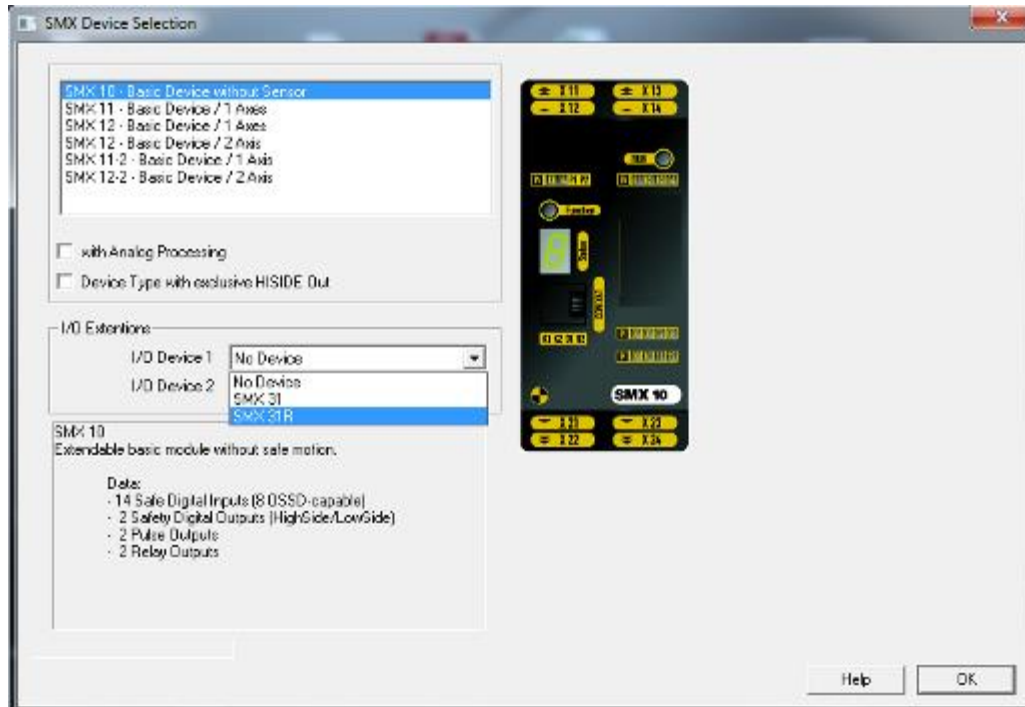
The outputs can be loaded as follows:

<i>Output</i>	<i>Voltage</i>	<i>Current</i>
Ax.1, Ax.2	24 VDC	100 mA
EAAx.1-2	24 VDC	250 mA
K1-K8	24 VDC	2 A
	48 VDC	2 A
	230 VAC	2 A

4.7 Configuration PSCBR-E-33-12DI-2DIO-8RO

4.7.1 First step

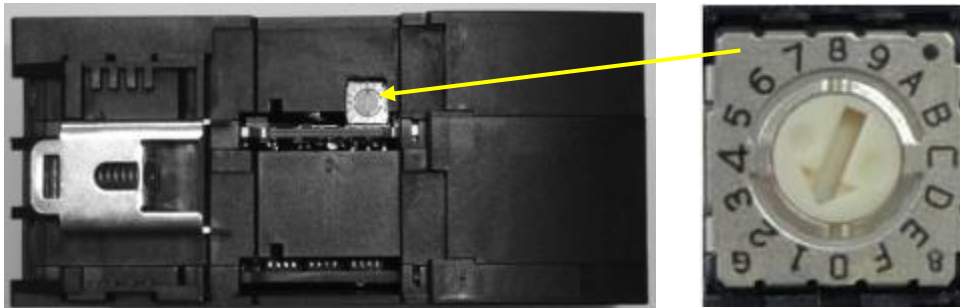
After the start of „SafePLC“ program first the basic device has to be selected and second the extension module PSCBR-E-33-12DI-2DIO-8RO.



4.7.2 Second step

On the PSCBR-E-33-12DI-2DIO-8RO module the bus address must be set with the help of the address switch.

This setting is made on the back of the module

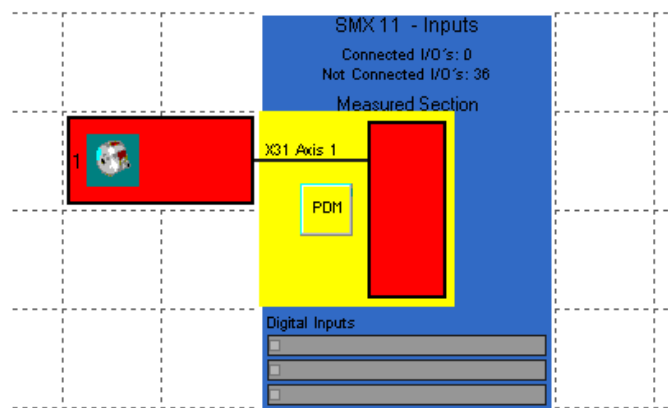


Note:

- Address range of the PSCBR-E-33-12DI-2DIO-8RO module from 1...15.
- Address "0" is reserved for the basic device.

4.7.3 Third step

In the main menu of the "Safe PLC" program one can open the configuration dialog for the PSCBR-E-33-12DI-2DIO-8RO module by "double-clicking" on the basic device.



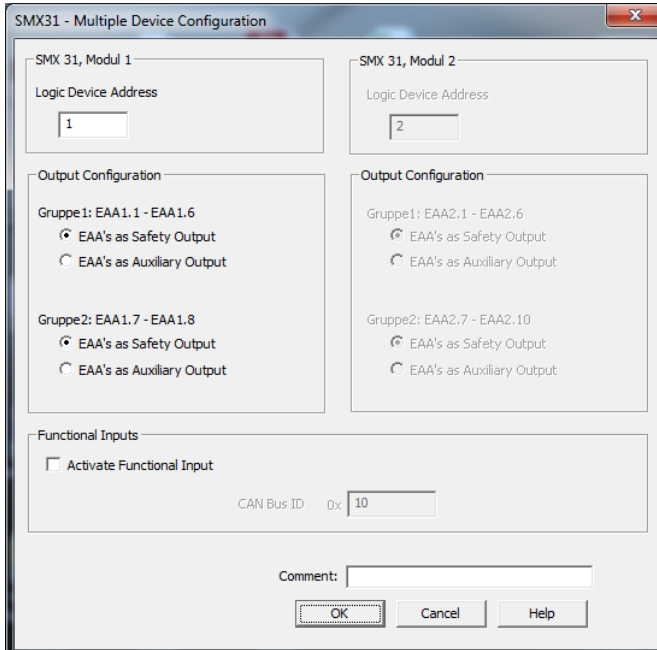
4.7.4 Fourth step

The following settings must be made in the PSCBR-E-33-12DI-2DIO-8RO configuration dialogue:

- Logic address PSCBR-E-33-12DI-2DIO-8RO device x: Setting the address switch of the PSCBR module x
- Group1 EAAx.1-EAAx.6 or group1 EAAx.7-EAAx.10: When using these outputs one can choose between safety and standard outputs.

Safety note:

Group1 EAAx.1-EAAx.6 or group1 EAAx.7-EAAx.10 should always be set to safety outputs for using in a safety application.



SMX31 - Multiple Device Configuration

SMX 31, Modul 1

Logic Device Address: 1

Output Configuration

Gruppe1: EAA1.1 - EAA1.6

EAA's as Safety Output

EAA's as Auxiliary Output

Gruppe2: EAA1.7 - EAA1.8

EAA's as Safety Output

EAA's as Auxiliary Output

Functional Inputs

Activate Functional Input

CAN Bus ID 0x: 10

SMX 31, Modul 2

Logic Device Address: 2

Output Configuration

Gruppe1: EAA2.1 - EAA2.6

EAA's as Safety Output

EAA's as Auxiliary Output

Gruppe2: EAA2.7 - EAA2.10

EAA's as Safety Output

EAA's as Auxiliary Output

Comment:

OK Cancel Help

5 Maintenance

5.1 Modification / handling changes to the device

Maintenance work must solely be carried out by qualified personnel.
Regular maintenance work is not required.

Repair

The devices must always be replaced as whole units
Repair work on the device can only be performed in the factory.

Warranty

By opening the module without permission the warranty will become null and void.

Note:

By modifying the module the safety approval will become null and void!

5.2 Exchanging a module

The following should be noted when exchanging a module PSCBR-E-33-12DI-2DIO-8RO:

Disconnect the electric power converter from the main supply.
Switch off the electric power supply for the device and disconnect.
Take the module off the top hat rail and pack up EMC-compliant.
Setting bus address on the new device and mount the new module on the top hat rail
Reconnect all connections.
Switch on the electric power converter.
Switch on the supply voltage.

Note:

Pluggable connections of the PSCBR module must generally not be disconnected or connected in live condition.

5.3 Maintenance intervals

Module replacement	See technical data
Function test	See chapter "Installation"

6 Technical data

6.1 Environmental conditions

Class of protection	IP 20
Ambient temperature	0 °C* ... 50 °C
Climatic category	3 acc. to DIN 50 178
Lifetime	90000h at 50 °C ambient

6.2 Safety related characteristic data

Max. obtainable safety class	<ul style="list-style-type: none">• SIL 3 acc. to EN61508• Category 4 acc. to EN945-1• Performance-Level e acc. to EN ISO 13849-1
System structure	2-channel with diagnose (1002)
Rating of operating mode	"high demand" acc. to EN 61508 (high demand rate)
Probability of an endangering failure per hour (PFH-value)	< 1,4 E-8 (14FIT)
Proof-Test-Interval (EN61508)	20 years, after this time the module must be replaced