



## DESCRIPTION

### Open programmable compact-type safety control

- 14 Digital inputs
- 2 Relay outputs
- 2 /4 pn- or pp-switching outputs
- Safety Controller up to PL e acc. to EN ISO 13849-1 or SIL3 acc. to IEC 61508
- optional: safe/non-safe Communication interface

## CHARACTERISTICS OF THE MODULE:

- » Extendable up to:
  - max. 42 safe digital inputs,
  - max. 12 safe digital outputs,
  - max. 20 safe digital I/O's,
  - max. 11 safe relay outputs,
  - max. 10 auxiliary outputs
- » Logic processing up to PL e acc. to EN ISO 13849-1 or SIL 3 acc. to IEC 61508
- » Logic diagram oriented programming via SafePLC<sup>2</sup>
- » Pulse outputs for cross-shorting detection of digital input signals
- » External contact monitoring of connected switchgear (EMU)
- » Monitored relay outputs for safety relevant functions
- » Switchable safe semi-conductor outputs pn-, pp-switching for safety-relevant functions
- » Comprehensive diagnostics functions integrated
- » Parameter management for expansion modules in base device
- » Status monitoring by coded 7-segment-display and status LEDs
- » Multifunction buttons (quit, start, reset) can be operated from the front side
- » Configurable via SafePLC<sup>2</sup> Serial USB-adaptor or Ethernet-based fieldbus
- » Optional: Communication interface:
  - Standard and safe field bus protocols for communication with a higher level controller (PROFIBUS, PROFINET, DeviceNet, CANopen, EtherNET/IP, EtherCAT, Modbus TCP, PROFIsafe, FSoE)
  - Safe cross communication (SMMC) for data exchange between multiple base devices
  - Field bus protocols with the same hardware can be switched with SafePLC<sup>2</sup>
  - Safe remote I/O communication for data exchange with distributed I/O systems
- » The mechanical construction of the SMX10/2 (/x\*) is dependent on the respective forms of the base module

\* Optional: integrated Communication interface (/DNM, /DBM)

## SAFETY RELATED CHARACTERISTIC DATA

Performance Level	PL e (EN ISO 13849-1)
PFH / architecture	12,6 FIT / Cat 4
Safety Integrity Level	SIL 3 (IEC 61508)
Proof test interval	20 years = max. operating period

## GENERAL DATA

Max. no. of expansion modules	2
Interface for expansion modules	T-bus connector, pluggable in top-hat rail
Number of safe digital inputs	14
Number of safe digital outputs	
	pp-switching ** 4
	pn-switching ** 2
Number of safe digital I/O	–
Number of relay outputs	2
Number of safe analogue inputs	–
Number of auxiliary outputs	2
Number of pulse outputs (clock outputs)	2
Type of connection	Plug-in terminals with spring or screw connection
Axis monitoring	–
Encoder interfaces (D-Sub / screw terminals)	–

\*\* pn/pp are configurable via SafePLC<sup>2</sup>

## ELECTRICAL DATA

Supply voltage (tolerance)		24 VDC; 2A (-15%, +20%)
Fuse	X11.1	min. 30 VDC; max. 3,15A
	X11.2	min. 30 VDC; max. 10A
Max. power consumption (logic)		
	SMX10/2	3,1 W
	SMX 10/2/x	6,5 W
Rated data digital inputs		24 VDC; 20 mA Typ1 acc. to EN 61131-2
Rated data digital outputs		
	pn-switching	24 VDC; 2A *
	pp-switching	24 VDC; 2A *
	auxiliary outputs	24 VDC; 250mA
	pulse outputs (clock outputs)	24 VDC; 250mA
Rated data relays		
Normally open	DC 13	24 VDC; 2A
	AC 15	230 VAC; 2A
Normalay closed (read back contact)	DC13	24 VDC; 2A

\* see „Derating outputs“

## DERATING OUTPUTS

- » Maximum current load based on temperature.
- » The maximum total current is 10A.

type of module	outputs	temperature 30°C / 50°C
SMX1x/2/x	Q 1 – Q 4	2A / 1,8A

## ENVIRONMENTAL DATA

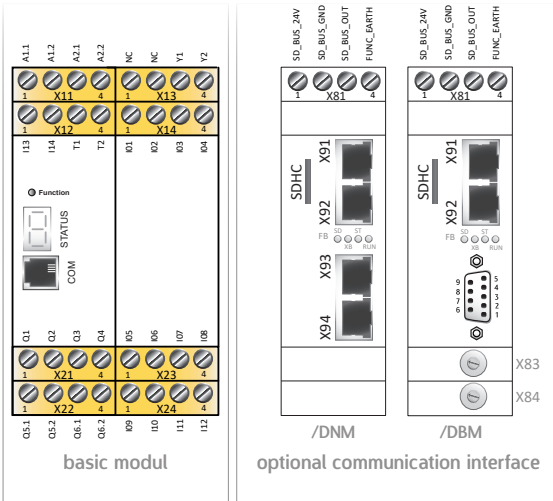
Temperature	0°C ... +50°C operation -25°C ... +70°C storage and transport
Class of protection	IP 20
Climatic category	3K3 acc. to DIN EN 60721-3
Min-, Maximum relative humidity (no condensation)	5% - 85%
EMC	DIN EN 61000-6-2, DIN EN 61000-6-4, DIN EN 61000-6-7, DIN EN 61800-3, DIN EN 61326-3, DIN EN 62061
Operating altitude	2000m

## MECHANICAL DATA

Dimension (HxDxW [mm])	SMX10/2	100x115x45
	SMX10/2/x *	100x115x67,5
Weight [g]	SMX10/2	300
	SMX10/2/x *	400
Mounting	to snap on top-hat rail	
Number of T-Bus	SMX10/2	2
	SMX10/2/x *	3
Min. terminal cross-section / AWG	0,2 mm <sup>2</sup> / 24	
Max. terminal cross-section / AWG	2,5 mm <sup>2</sup> / 12	

\* Specification, see: " Optional integrated communication interface"

## DEVICE INTERFACES



Interface	Description of interface
X11 – X14 / X21 – X24 / X81	Voltage supply and I/O interface
COM	Diagnostic- and configuration interface
X91 / X92	Decentralized SDDC ETH and SMMC interface
X93 / X94	Field bus interfaces

## VOLTAGE SUPPLY AND I/O INTERFACE

X 11		
Pin	1 - A1.1	Voltage supply device +24 VDC
	2 - A1.2	Voltage supply device +24 VDC outputs
	3 - A2.1	Voltage supply device
	4 - A2.2	0 VDC
X 12		
Pin	1 - I13	Safe digital inputs
	2 - I14	
	3 - T1	Clock outputs
	4 - T2	

X 13		
Pin	1 - NC	No function
	2 - NC	No function
	3 - Y1 4 - Y2	Messaging and auxiliary outputs
X 14		
Pin	1 - I01	Safe digital inputs
	2 - I02	
	3 - I03	
	4 - I04	

X 21		
Pin	1 - Q1	Output of the pn-switching Q1_PP / pp-switching Q1
	2 - Q2	Output of the pn-switching Q2_PN / pp-switching Q2
	3 - Q3	Output of the pn-switching Q3_PP / pp-switching Q3
	4 - Q4	Output of the pn-switching Q4_PN / pp-switching Q4
X22		
Pin	1 - Q5.1	Safe relay output
	2 - Q5.2	
	3 - Q6.1	Safe relay output
	4 - Q6.2	
X 23		
Pin	1 - I05	Safe digital inputs
	2 - I06	
	3 - I07	
	4 - I08	

X 24		
Pin	1 - I09	Safe digital inputs
	2 - I10	
	3 - I11	
	4 - I12	
X 81 *		
Pin	1 - SD_BUS_24V	Power supply SD-BUS +24 VDC
	2 - SD_BUS_GND	Power supply SD-BUS 0 VDC
	3 - SD_BUS_OUT	SD-BUS Output
	4 - FUNC_EARTH	Funktional Earth
* only available at fieldbus interfaces		

## DIAGNOSTIC AND CONFIGURATION INTERFACE

### Pin assignment

RJ 10, 4-pin		
Pin	Description	COM front side
1	GND	
2	RS485-	
3	RS485+	
4	VCCH	

» With existing Ethernet-based fieldbus interface, it can be used as a diagnostic and configuration interface.

## DECENTRALIZED SDDC ETH AND SMMC INTERFACE

### Pin assignment female connector

Communication interface (RJ45)				Front side
Pin	Name	Description	Colour	X91 / X92
1	TX+	Transmit Data +	white-orange	
2	TX-	Transmit Data -	orange	
3	RX+	Receive Data +	white-green	
4	nc	not used	blue	
5	nc	not used	white-blue	
6	RX-	Receive Data -	green	
7	nc	not used	white-brown	
8	nc	not used	brown	

### Safe Master – Master Communication (SMMC)

SMMC communication enable a secure data exchange of 2 bytes between multiple SDDC masters. Communication takes place without a master for coordinating the data. This means that data exchange between available subscribers is always possible. This principle means that an incomplete or separates network can work in part areas without chnaging the configuration.

Each port can be configured in the SafePLC<sup>2</sup>.

## FIELDBUS INTERFACES

### Pin assignment female connector

Ethernet-based fieldbus interface /xNx (RJ45)				Front side
Pin	Name	Description	Colour	X93 / X94
1	TX+	Transmit Data +	white-orange	
2	TX-	Transmit Data -	orange	
3	RX+	Receive Data +	white-green	
4	nc	not used	blue	
5	nc	not used	white-blue	
6	RX-	Receive Data -	green	
7	nc	not used	white-brown	
8	nc	not used	brown	

CAN-based fieldbus interface /DBM, /xBM (D-Sub)				Front side
Pin	CANopen	PROFIBUS	DeviceNet	
1	—	—	V-	
2	CAN_L	—	CAN_H	
3	isoGND	RXD/TXD-P (B)	DRAIN	
4	—	CNTR-P	CAN_L	
5	—	GND	V+	
6	—	VP (+5V)	—	
7	CAN_H	—	—	
8	—	RXD/TXD-N (A)	—	
9	—	CNTR-N	—	

## OPTIONAL INTEGRATED COMMUNICATION INTERFACE

- » Subsequent expansion capability of standard to safe field bus via additional Mini SD card on the back of the module is possible (/xNx und /xBx)
- » Different specifications can be combined

General data	
Decentralized communication interface	
/D	2x RJ 45 *
Field bus interface	
/xN	2x RJ 45 **
/xB	1x Sub-D ***
Memory Card (safety program)	
/xxM	1x Mini SD (front side)
Memory Card (license for safe field bus)	
/xNx	1x Mini SD (rear side)
/xBx	
SD bus	plug-in terminals
Status LEDs	4
Field bus address rotary switch	
/xBx	2

\* optional for SDDC or SMMC

\*\* available field buses PROFINET, EtherCAT, Modbus TCP and Ethernet TCP/IP

\*\*\* available field buses PROFIBUS, CANopen und DeviceNet

## Combination options

	/D	/DNM	/xNM	/xxM	/DBM	/xBM
<b>Field bus protocols</b>						
PROFIBUS			X			
DeviceNet			X			
CANopen			X			
PROFINET					X	X
Ethernet IP					X	X
EtherCAT					X	X
Modbus TCP					X	X
PROFIsafe *	X		X		X	X
FSoE *					X	X

\* Specification required in your order

» The CAN-based and Ethernet-based fieldbus interfaces can be switched via the SafePLC<sup>2</sup> between the fieldbus protocols

## ORDER INFORMATIONS

### BASIC MODULES

item	description	item no.
SMX10/2	Basic module, without Safe Motion	1733
SMX10/2/D	Basic module + decentralized communication	1625
SMX10/2/DNM	Basic module + decentralized communication + Ethernet-based field bus interface + Memory Card	1739
SMX10/2/DNM- FSoE	Basic module + decentralized communication + Ethernet-based field bus interface + Memory Card	1814
SMX10/2/xNM	Basic module + Ethernet-based field bus interface + Memory Card	1740
SMX10/2/xNM-FSoE	Basic module + Ethernet-based field bus interface + Memory Card	1824
SMX10/2/xxM	Basic module + Memory Card	1834
SMX10/2/DBM	Basic module + decentralized communication + CAN-based field bus interface + Memory Card	1844
SMX10/2/xBM	Basic module + CAN-based field bus interface + Memory Card	1854

### ACCESSORIES

item	description	item no.
SMX91	Programming adapter	1010
SX0001-1	Terminal connector, screw terminals (set), encoded for cabling SMX10/2	1652
SXxxxx-x	Terminal connector, spring terminals (set), encoded for cabling SMX10/2	on request
SX0000-9	T-Bus connector voltage-carrying (grey)	1015
SXxxxx-x	Y-cable for encoder splitting	on request
FSoE License	Fieldbus license for FSoE	2366
PROFIsafe License	Fieldbus license for PROFIsafe	2319

### EXTENSIONS

item	description	item no.
SMX31/2	I/O expansion module	1705
SMX31R/2	I/O expansion module with relay option	2046
SMX31R-4/2	I/O expansion module with relay option	2047

### SOFTWARE

item	description	item no.
SafePLC <sup>2</sup> 1st	Programming software, 1te License incl. Hardlock	1244
SafePLC <sup>2</sup> 2nd	Programming software, 2te License incl. Hardlock	1646
SafePLC <sup>2</sup> 3rd	Programming software, 3te License incl. Hardlock	1647