

# SMX 121/2

SMXSERIE » Modular » Central expansion » 1 Axis module

**BBH**  
PRODUCTS



## DESCRIPTION

Central axis extension module for safe speed and position of 1 axis for further evaluation in SMXMODULAR - basic modules

- 12 Safe digital inputs
- 3 Encoder interfaces
- Safety controller up to PL e acc. to EN ISO 13849-1 or SIL3 acc. to IEC 61508

## CHARACTERISTIC OF THE MODULE

- » Motion monitoring of one axis up to PI e EN ISO 13849-1 or SIL 3 acc. to IEC 61508
- » Speed monitoring
- » RPM-monitoring
- » Standstill monitoring
- » Sense of rotation monitoring
- » Safe incremental dimension
- » Emergency Stop monitoring
- » Position monitoring
- » Position range monitoring
- » Trend range monitoring
- » Target position monitoring
- » Parameter management for expansion modules in base device
- » Comprehensive diagnostics functions integrated
- » Assembly on top hat rail

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## SAFETY RELATED CHARACTERISTIC DATA

Performance Level	PL e (EN ISO 13849-1)
PFH <sup>1)</sup> / architecture	3,0 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	–
Interface for expansion modules	T-bus connector, pluggable in top-hat rail
Number of safe digital inputs	12
Number of safe digital outputs	–
Number of safe digital I/O	–
Number of relay outputs	–
Number of safe analogue inputs	–
Number of auxiliary outputs	–
Number of pulse outputs (clock outputs)	–
Type of connection	Plug-in terminals with spring or screw connection
Axis monitoring	1
Encoder interfaces (D-Sub / screw terminals)	1 / 2 *
Encoder technology (See table Encoder specifications)	<b>D-SUB X31:</b> SSI-Absolut, SinCos, Incremental-TTL  <b>Terminal X23:</b> HTL- proximity sensor (10kHz)

\* Maximum 2 Encoder / Axis

<sup>1)</sup> Value applies only for extension module. For total assessment in accordance with EN ISO 13849-1 one must use a series connection with the corresponding basic device =>  $PFH_{Logic} = PFH_{Basic} + PFH_{Extension}$

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## ELECTRICAL DATA

Supply voltage (tolerance)	-
Max. Power consumption (logic)	-
Rated data digital inputs	24 VDC; 20 mA Typ1 acc. to IEC 61131-2
Rated data digital outputs	-
Rated data relays	-
Rated data analogue inputs	-

## 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

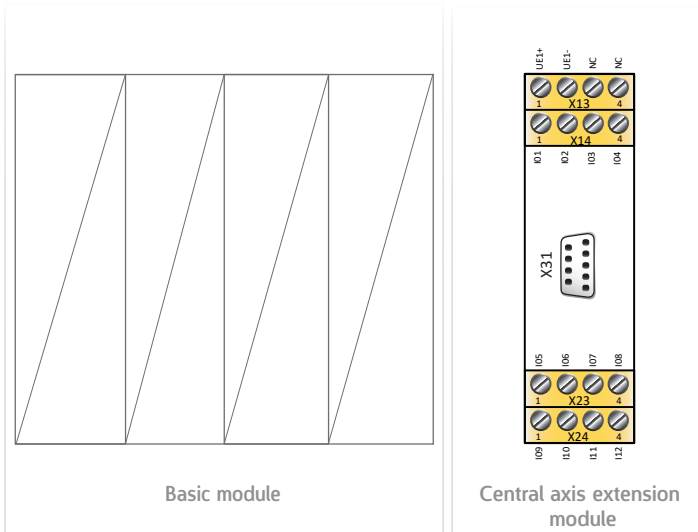
## MECHANICAL DATA

Dimension (HxDxW [mm])	SMX121/2	100x115x22,5
Weight [g]	SMX121/2	210
Mounting	to snap on top-hat rail	
Number of T-Bus	1	
Min. terminal cross-section / AWG	0,2 mm <sup>2</sup> / 24	
Max. terminal cross-section / AWG	2,5 mm <sup>2</sup> / 12	

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## DEVICE INTERFACES



Interface	Description of interface
X13 – X14 / X23 – X24	Voltage supply and I/O interface
X31	Encoder interfaces *
X23	Encoder interfaces *

\* can be configured in the SafePLC<sup>2</sup>.

## VOLTAGE SUPPLY AND I/O INTERFACE

X13		
Pin	1 – UE1+	Voltage supply Encoder +24V DC X31
	2 – UE1-	Voltage supply Encoder 0V DC X31
	3 – NC	No function
	4 – NC	No function
X14		
Pin	1 - I01	Safe digital inputs
	2 - I02	
	3 - I03	
	4 - I04	

X23		
Pin	1 - I05	Safe digital inputs
	2 - I06	
	3 - I07	
	4 - I08	
X24		
Pin	1 - I09	Safe digital inputs
	2 - I10	
	3 - I11	
	4 - I12	



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## ENCODER INTERFACES

### Pin assignment X31

Pin	X31 Inc / Sin/Cos / SSI-Absolut	Front side SMX
1	n.c.	
2	GND_ENC	
3	n.c.	
4	B- / COS - / Clk -	
5	A+ / SIN+ / Data+	
6	A- / SIN- / Data-	
7	n.c.	
8	B+ / COS+ / Clk+	
9	U_ENC	

### Pin assignment X23

Pin	Z1 - Z1 / Z2 - Z2	Terminal
1	A ( $\bar{A}$ ) / A ( $\bar{A}$ )	
2	-- / B ( $\bar{B}$ )	
3	A ( $\bar{A}$ ) / A ( $\bar{A}$ )	
4	-- / B ( $\bar{B}$ )	

## ENCODER SPECIFICATIONS

Incremental - TTL	
Physical Layer	RS-422 compatible
Measuring signal A/B	Track with 90° phase difference
Type of connection	D-SUB 9pole
Max. frequency of input cycles (X31)	200 kHz
Sin/Cos	
Physical Layer	RS-422 compatible
Measuring signal A/B	Track with 90° phase difference
Type of connection	D-SUB 9pole
Standard Mode	
Max. frequency of input clock pulses (X31)	200 kHz
SSI-Absolut	
Data interface	<b>Serial Synchronous Interface (SSI)</b> with variable data length of 12 – 28 Bit
Data format	Binary, Gray code
Physical Layer	RS-422 compatible
Type of connection	D-SUB 9pole
<b>Mode</b>	<b>Master or Listener</b>
SSI-Master operation	
Clock rate	150 kHz
SSI-Listener operation	
Clock rate (X31)	100 kHz ... 200 kHz
Min. clock pause time	150 µsec
Max. clock pause time	1 msec
HTL proximity sensor	
Signal level	24V / 0V
Max. counting pulse frequency (circuit logic de-bounced)	10 kHz
Pulse width	50 µsec
Type of connection (X23)	Plug-in terminals with spring or screw connection
HTL proximity switch - extended monitoring	
Signal level	24V / 0V
Max. counting frequency (circuit logic de-bounced)	4 kHz
Physical Layer	PUSH / PULL
Measuring signal A/B	Track with 90° phase difference
Type of connection (X23)	Plug-in terminals with spring or screw connection

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## ORDER INFORMATION

### EXTENSIONS

item	description	item no.
SMX121/2	Axis extension module for 1 axis	2186

### ACCESSORIES

item	description	item no.
SXxxx-x	Terminal connector, screw terminals (set), encoded for cabling SMX121/2	on request
SXxxx-x	Terminal connector, spring terminals (set), encoded for cabling SMX121/2	on request
SX0000-9	T-Bus connector, voltage-carrying (grey)	1015

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