Safety modules

| Safety drive controller | Speed and position monitoring for 1 axis | Safety-MSP1 |

Compact safety control with integrated drive monitoring for one axis and extended encoder interface. This device is freely programmable for the safe processing of drive-related safety functions as well as of EMERGENCY STOP switches, two-hand operator controls, light barriers, operating mode selectors, etc.

The basic version allows achieving 1 safe encoder connection. 14 safe inputs and 3 shut-off channels are available.

1-encoder solutions (Incr-TTL/HTL, Resolver, SinCos, Proxi-SW.) and to a limited extent also 2-encoder solutions (combinations of any encoder technology) are supported for the safe speed and/or position detection.

- Extensive bibliotheca of pre-configured safe sensors and command device
- Complete range of speed- and position-related safe drive monitoring functions as per EN 61800 already integrated
- Encoder interface with many parameters and configuration options for 2 x Incr-TTL / SinCos / SSI / Resolver on front side and 1x HTL or Proxi-SW by terminals
- Graphical programming interface by SafePLC-SW

- Basic unit comes with 14 safe input lines, 3 cut off channels, hereof 1 safe relay output and 2 standard outputs
- Cross-short-cut monitoring functionality
- Output contact multiplication or increase of power capability by external contactors in connection with the device-internal monitoring function for external contacts
- Extensive diagnostic functionality integrated in FW
- Status monitoring by coded 7-segment-display and status LED's
- Quit- / Start- / Reset button on the front display
- Extendable up to max. 65 safe I/O lines by means of an integrated backplane bus (connector for top hat rail mount)
- Interface modules for all major fieldbus systems available (Profibus, ProfiNet, CANopen, EtherCAT)

Order-No.

| Safety-MSP1 | Speed and position monitoring for 1 axis | **8.MSP1.000** |

The programming software SafePLC and the programming cable are required for programming. The T-BUS connector is required for connecting a BUS module or an extension module.

Accessories	
T-bus connector	**05.TBMS.000**
Programming cable	**8.0010.9000.0020**
Programming software Safe PLC	**05.SPLC.001**
Parameterising software - Free	**05.SPMT.000**

General data

Max. number of extension modules	2
Interface for extension modules	T-bus connector for top hat rail mount
Safe digital input lines	14 incl. 8 OSSD
Safe digital output lines	2
Safe relay outputs	1
Standard output lines	2
Pulse output lines	2
Type of connection	pluggable terminals
Drive monitoring - number of axis	1 axis
Encoder interface front side	2 x SSI; SinCos; Incr-TTL, Resolver
Max. frequency SinCos; Incr-TTL	200 kHz
Clock frequency / mode SSI	Master Mode 150 kHz / Slave Mode max. 250 kHz
Type of connection	D-SUB 9 pol
Encoder interface terminals	1 x Proxi-Sw.; Incr-HTL
Max. frequency HTL	10 kHz
Type of connection	pluggable terminals

Safety characteristics

PL acc. to EN 13849	PLe
PFH / Architecture	2,2 x 10^{-9} [1)]; 3,0 x 10^{-9} [2)]/ Architecture Cl. 4
SIL acc. to EN 61508	SIL 3
Proof-test-interval	20 years = max. period of application

Electrical characteristics

Supply voltage	24 V DC / 2 A
Tolerance	-15%, +20%
Power consumption	2,4 W
Rated data digital inputs	24 V DC / 20 mA, Typ 1 to EN 61131-2
Rated data digital outputs	24 V DC / 250 mA
Rated data relay outputs	24 V DC / 2 A and 230 V AC / 2 A
Pulse output lines	max. 250 mA
Max. fuse on supply voltage	max. 2 A

Environmental data

Operating temperature	0°C ... +50°C
Storage temperature	-10°C ... +70°C
Type of protection	IP52
Climate class	3 acc. to DIN 50178
EMI	acc. to EN 55011 and EN 61000-6-2

Mechanical characteristics

Size h x d x w [mm]	100 x 115 x 67,5
Weight	390 g
Mounting	snap-on mounting on standard head rail
Max. terminal cross section	1,5 mm^2

1) When using 2 independent encoders   2) When using 1 encoder

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Safety modules

Safety drive controller	Speed and position monitoring for 1 axis	Safety-MSP1

Terminal assignment

X11
→ ●	Power supply module +24 V DC	U24 external
2 ●	Power supply module +24 V DC	U24 external
3 ●	Power supply module 0 V DC	GND external
4 ●	Power supply module 0 V DC	GND external

X12
→ ●	Digital IN 13	DI 13
2 ●	Digital IN 14	DI 14
3 ●	Pulse output P1	P1
4 ●	Pulse output P2	P2

X13
→ ●	Power supply encoder interface X31	U_ENC_1
2 ●	Power supply encoder interface X31	GND_ENC_1
3 ●	Messaging and auxiliary output DO 0.1	DO 0.1
4 ●	Messaging and auxiliary output DO 0.2	DO 0.2

X14
→ ●	Digital IN 01 OSSD compatible	DI 01
2 ●	Digital IN 02 OSSD compatible	DI 02
3 ●	Digital IN 03 OSSD compatible	DI 03
4 ●	Digital IN 04 OSSD compatible	DI 04

X21
→ ●	HISIDE output 0	DO 0-HI
2 ●	LOSIDE output 0	DO 0-LO
3 ●	HISIDE output 1	DO 1-HI
4 ●	LOSIDE output 1	DO 1-LO

X22
→ ●	Relay output 1	K1.1
2 ●	Relay output 1	K1.2
3 ●	Relay output 2	K2.1
4 ●	Relay output 2	K2.2

X23
→ ●	Digital IN 05	DI 05
2 ●	Digital IN 06	DI 06
3 ●	Digital IN 07	DI 07
4 ●	Digital IN 08	DI 08

X24
→ ●	Digital IN 09 OSSD compatible	DI 09
2 ●	Digital IN 10 OSSD compatible	DI 10
3 ●	Digital IN 11 OSSD compatible	DI 11
4 ●	Digital IN 12 OSSD compatible	DI 12

X17
→ ●	Power supply Encoder 3	U_ENC_3
2 ●	Ground Encoder 3	GND_ENC_3
3 ●	U_Ref_Encoder 3	U_Ref_3
4 ●	NC	NC

X18
→ ●	NC	NC
2 ●	NC	NC
3 ●	NC	NC
4 ●	NC	NC

X27
→ ●	HTL_A_1	HTL_A_1
2 ●	HTL_A_2	HTL_A_2
3 ●	HTL_A_3	HTL_A_3
4 ●	NC	NC

X28
→ ●	HTL_B_1	HTL_B_1
2 ●	HTL_B_2	HTL_B_2
3 ●	HTL_B_3	HTL_B_3
4 ●	NC	NC

The variable encoder supply has to be provided external. It will be internal monitored.

Sensor pin assignment
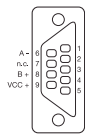
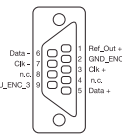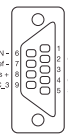| Incremental encoder	SinCos	SSI - Absolute X31 / X32	SSI - Absolute X33 / X34	Resolver
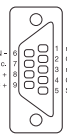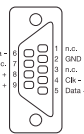
Overview inputs / outputs

14 x	digital inputs
2 x	pulse outputs
2 x	digital outputs relays
2 x	digital outputs LOSIDE
2 x	digital outputs HISIDE
2 x	messaging outputs

Connection example

Standard fieldbus interface

Extension modules for additional inputs and outputs (upon request)

BM

MSP1

power supply 24 V DC

alarm message

Enable→

Brake active→