Safety automation system solutions
Preventa configurable safety controllers
type XPS MC

XPS MC16ZC

XPS MC32ZC

Presentation

Configurable safety controllers XPS MC●●Z● are designed to provide a solution for safety applications requiring conformity to category 4 of standard EN 954-1/EN/ISO 13849-1 and SIL 3 requirements of standard IEC 61508.
The range of configurable safety controllers comprises 6 products, each with different technical characteristics.

Configurable controllers	Safety inputs	Safety outputs (1)	Communication via		
			CANopen bus	Profibus bus	Modbus serial link
XPS MC16Z	16	6 + 2 x 2	–	–	Yes, slave
XPS MC16ZC	16	6 + 2 x 2	Yes, slave	–	Yes, slave
XPS MC16ZP	16	6 + 2 x 2	–	Yes, slave	Yes, slave
XPS MC32Z	32	6 + 2 x 2	–	–	Yes, slave
XPS MC32ZC	32	6 + 2 x 2	Yes, slave	–	Yes, slave
XPS MC32ZP	32	6 + 2 x 2	–	Yes, slave	Yes, slave

Line control

The safety inputs are supplied by the various control outputs *(2)*, in such a manner so as to monitor for short-circuits between the inputs, short-circuits between each input and earth or the presence of residual voltages.
The controller, assisted by the control outputs, continuously tests all the connected inputs. As soon as an error is detected on an input, all the outputs associated with this input are disconnected. Safety outputs associated with other inputs remain active.

Configuration

Safety controllers XPS MC●●Z● are configurable and addressable using software XPS MCWIN running on a PC. Connection accessories required: see page 38789-EN/9.

Connections

For connection of safety inputs and outputs, safety controllers XPS MC●●Z● can be fitted with a choice of:
□ screw connectors type XPS MCTS●●, or
□ spring clip connectors type XPS MCTC●●.
These connectors are to be ordered separately, see page 38789-EN/8.

(1) 8 independent safety outputs = 6 solid-state safety outputs + 2 x 2 relay outputs (4 relay outputs with guided contacts).
(2) 8 control outputs are available but they are not safety outputs.

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Safety functions

Configuration of the safety functions is carried out using software XPSMCWIN which is available on the Safety Suite V2 CD-ROM.

30 certified safety functions are available with this software and they are easily assignable to the safety outputs. The safety functions have multiple combination possibilities and various starting conditions.

The safety functions are:
□ certified in accordance with EN 954-1/EN/ISO 13849-1 and IEC 61508,
□ configurable in controller XPS MC using software XPSMCWIN which is available on the Safety Suite V2 software pack.
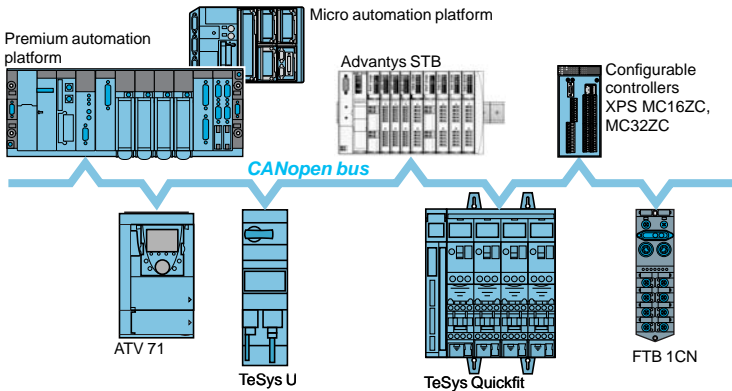
All 8 safety outputs are suitable for use in safety related parts of control systems conforming to category 4 of EN 954-1/EN/ISO 13849-1 and each output can disconnect one of its safety circuits.

Main safety functions

- Emergency stop monitoring, with or without time delay, 1 or 2-channel wiring
- Two-hand control (type III-C conforming to EN 574/ISO 13851)
- Guard monitoring with 1 or 2 limit switches
- Guard monitoring for injection presses and blowing machines
- Magnetic switch monitoring
- Sensing mat monitoring
- Light curtain (type 4 conforming to EN/IEC 61496, relay or solid-state output) monitoring
- Zero speed detection
- Dynamic monitoring of hydraulic valves on linear presses
- Monitoring safety stop at top dead centre on eccentric press
- Safety time delays
- "Muting" function of light curtains
- Enabling switch monitoring, 2 or 3 contact
- Hydraulic press
- Eccentric press
- Foot switch monitoring
- Chain shaft breakage monitoring
- Position selector

Application schemes and functional diagrams

See from page 38788-EN/2

Presentation

Safety automation system solutions
Preventa configurable safety controllers
type XPS MC

Premium automation platform

Micro automation platform

Advantys STB

Configurable controllers XPS MC16ZC, MC32ZC

CANopen bus

ATV 71

TeSys U

TeSys Quickfit

FTB 1CN

Premium automation platform

Profibus bus

Third-party products

Repeater (3 max.)

Configurable controller XPS MC16ZP, MC32ZP

Premium automation platform

Magelis graphic terminal

Modbus serial link

Configurable controllers XPS MC16Z●/MC32Z●, slaves of the Modbus serial link

Communication

CANopen fieldbus

Configurable safety controllers XPS MC●●ZC incorporate a SUB-D 9-pin male connector for direct connection on CANopen bus.

CANopen bus is an open bus that ensures deterministic and reliable access to the real-time data of automation equipment. The bus uses a shielded dual twisted pair on which a maximum of 127 devices can be connected by chaining. The data rate varies between 10 Kbps and 1Mbps depending on the length of the bus (5000 m to 20 m).
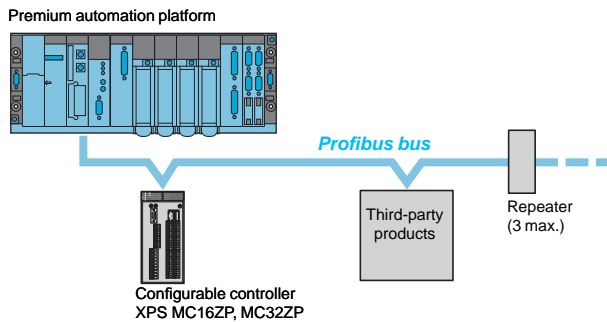
Profibus bus

Configurable safety controllers XPS MC●●ZP incorporate a SUB-D 9-pin female connector for connection on Profibus bus.
Configurable safety controllers XPS MC●●ZP are slaves on the Profibus bus.

Profibus bus is a fieldbus that meets industrial communication requirements. The topology of the Profibus bus is of the linear type with a centralised master/slave type access procedure. The physical link is a single shielded twisted pair.
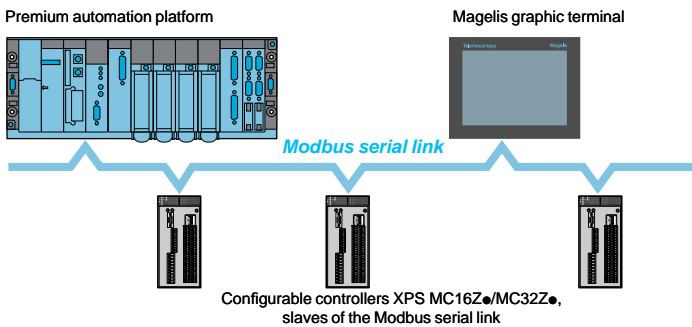
Modbus serial link

Configurable safety controllers XPS MC●●Z● MC incorporate a Modbus communication interface (RJ45 connector) for configuration and diagnostics.
This interface enables connection of the controllers to:
□ a PC (configuration),
□ a PLC (diagnostics), or
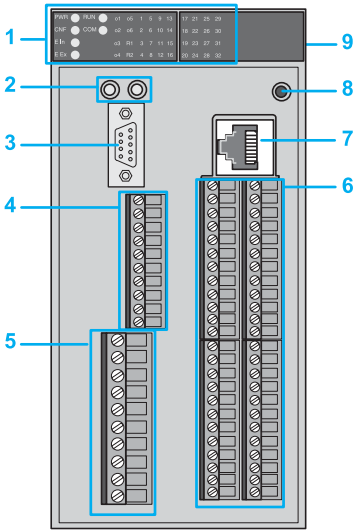□ an operator dialogue terminal (diagnostics).

The Modbus serial link comprises a master station (Premium automation platform) and slave stations (configurable controllers XPS MC16/32Z●).
Two exchange mechanisms are possible:
■ **Question/response:** the questions from the master are addressed to a given slave. The response is expected by return from the interrogated slave.
■ **Distribution:** the master distributes a message to all the stations of the Modbus serial link. The latter execute the order without transmitting a reply.

| Presentation: page 38789-EN/2 | Characteristics: page 38789-EN/6 | References: page 38789-EN/8 | Dimensions: page 38789-EN/9 | Functions: page 38788-EN/2 |

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Description

Safety automation system solutions
Preventa configurable safety controllers
type XPS MC

*Configurable safety controller XPS MC●●Z●,
with screw connectors*
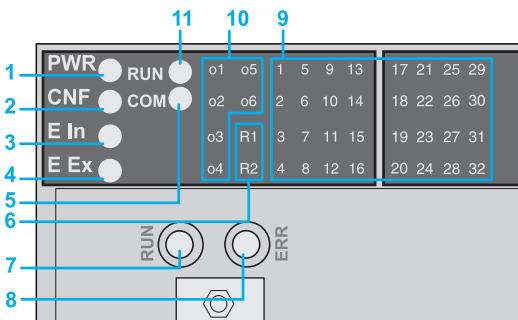
Illuminated display

Description

Configurable safety controllers XPS MC●●Z●

Front face of controllers:

1 LED display and system diagnostics.
2 Two LEDs for CANopen or Profibus *(1)* connection status.
3 SUB-D 9-pin male connector for connection on CANopen bus (**XPS MC16ZC/ MC32ZC**)
or SUB-D 9-pin female connector for connection on Profibus bus (**XPS MC16ZP/ MC32ZP**).
4 Solid-state safety output and "muting" indicator light terminals.
5 Power supply (⎓ 24 V) and relay safety output terminals.
6 Control output terminals for power supply to safety inputs and safety input terminals.
7 RJ45 connector for connection on Modbus serial link.
8 RESET button (resetting of controller).

Rear face of controllers:
9 Fixing plate for mounting on rail.

(1) Depending on controller model.

LED details			
LED	**Colour**	**Status**	**Meaning**
1 PWR	Green	On	Supply voltage present.
2 CNF	Yellow	On	In configuration mode.
		Flashing	Not configured, initial power-up.
3 E In	Red	On	Internal error: all safety outputs deactivated.
4 E Ex	Red	On	External error: all safety outputs associated with the defective circuit are deactivated.
5 COM	Green	On	Controller communicating via the TER (RJ45) connection.
6 R1, R2	Green	On	Relay outputs 13/14, 23/24, 33/34 and 43/44 activated.
		Flashing	Fault on these outputs.
7 RUN	Green	Off	Hardware OK for the Profibus bus or the CANopen bus.
		On	Communicating on Profibus bus or on CANopen bus. Normal status.
8 ERR	Red	On	Communication impossible, configuration error, damaged cabling or absence. Bus deactivated
		Off	Communicating on CANopen or Profibus bus. Normal status.
		Flashing (x 1)	Warning limit reach.
		Flashing (x 2)	Control event error on CANopen bus.
		Flashing (x 3)	Synchronisation error on CANopen bus.
9 1…16 1…32	Green	On	Input circuit closed.
		Flashing	Error detected on input relating to LED.
10 o1…o6	Green	On	Solid-state output activated.
		Flashing	Short-circuit, fault on output.
11 RUN	Green	On	Run mode.
		Flashing	Changing from run mode to stop mode.

Characteristics

Safety automation system solutions
Preventa configurable safety controllers
type XPS MC

Characteristics

Configurable safety controller type				XPS MC16Z and MC32Z, XPS MC16ZC and MC32ZC, XPS MC16ZP and MC32ZP
Conformity to standards				EN/IEC 60204-1, EN 1760-1/ISO 13856-1, EN/IEC 60947-5-1, EN/IEC 61496-1, EN 574/ISO 13851, EN 954-1/EN/ISO 13849-1, IEC 61508
Product certifications				UL, CSA, TÜV
Products designed for max. use in safety related parts of control systems (conforming to EN 954-1/EN/ISO 13849-1 and IEC 61508)				Category 4 max. (EN 954-1/EN/ISO 13849-1), SIL 3 max. (IEC 61508)
Supply voltage			V	$-\!-\!-$ 24 ± 20%
Maximum consumption			W	12
Fuse protection			A	16 gL max.
Start button monitoring				Configurable
Control circuit voltage				28.8 V/13 mA (between input terminals C1-I1 to C8-I16, resp. I32)
Calculation of wiring resistance RL			Ω	100 max, maximum cable length: 2000 m (Between input terminals)
Synchronisation time between inputs			s	Depending on configuration selected
Outputs	Relay	Voltage reference		Volt-free
		Safety circuit		2 N/O per function (4 N/O total) (13-14, 23-24, 33-34, 43-44)
		Breaking capacity in AC-15	VA	C300: inrush 1800, maintained 180
		Breaking capacity in DC-13		24 V/1.5 A L/R = 50 ms
		Thermal current (Ithe) for each group of 2 outputs	A	6 for 1 output and 2 for the other, **or** 4 for both outputs.
		Current limit	A	Ith ≤ 16 (with several relay output circuits simultaneously loaded)
		Output fuse protection	A	4 gL or 6 quick blow
		Minimum current	mA	10 *(1)*
		Minimum voltage	V	17 *(1)*
	Solid-state	Breaking capacity		24 V/2 A
		Safety circuit		6 solid-state (O1, O2, O3, O4, O5, O6)
		Current limit	A	Ith ≤ 6.5 (with several solid-state output circuits simultaneously loaded)
Electrical durability				See page 38610-EN/2
Response time on input opening			ms	Response time = 20 or 30, configurable using software XPSMCWIN □ if 20 for controllers XPS MC●●Z●: 30 for a safety mat □ if 30 for controllers XPS MC●●Z●: 45 for a safety mat
Rated insulation voltage (Ui)			V	300 (degree of pollution 2 conforming to IEC 60647-5-1, DIN VDE 0110 part 1)
Rated impulse withstand voltage (Uimp.)			kV	4 (overvoltage category III, conforming to IEC 60647-5-1, DIN VDE 0110 part 1)
LED display				30 (XPS MC16Z), 46 (XPS MC32Z) 32 (XPS MC16ZC/MC16ZP, 48 (XPS MC32ZC/MC32ZP)
Temperature	Operating		°C	- 10…+ 55
	Storage		°C	- 25…+ 85
Degree of protection				IP 20 conforming to EN/IEC 60529 (connector and enclosure)

(1) The controller is also capable of switching low power loads (17 V/10 mA minimum) provided that the contact has not been used for switching high power loads (possible contamination or wear of the gold layer on the contact tips).

| Presentation: page 38789-EN/2 | Characteristics: page 38789-EN/6 | References: page 38789-EN/8 | Dimensions: page 38789-EN/9 | Functions: page 38788-EN/2 |

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Characteristics

Safety automation system solutions
Preventa configurable safety controllers
type XPS MC

Communication

Modbus serial link

Compatibility			XPS MC16Z, XPS MC32Z, XPS MC16ZC, XPS MC32ZC, XPS MC16ZP, XPS MC32ZP
Serial link ports	Number and type		1 x RJ45
	Status		Slave
Data exchange			14 words
Addressing			1 …247
Baud rate		**bps**	1200, 2400, 4800, 9600 or 19200
Parity			Even, odd, none
Fixed parameters			RTU (Remote Terminal Unit) mode 1 start bit / 8 data bits 1 stop bit stop with "even" or "odd" parity 2 stop bits without parity
Functions supported			01: 8-bit output data / 32-bit input data (0 = OFF, 1 = ON) 02: 32-bit input data / 8-bit output data (0 = OFF, 1 = ON) 03: information and errors

CANopen bus

Compatibility			XPS MC16ZC, XPS MC32ZC
Serial link ports	Number and type		1 x SUB-D 9-pin male
	Status		Slave
Data exchange			14 words By included dual port memory: only data addresses, diagnostics, but no baud rates
Parameters (adjustable using software XPSMCWIN)	Baud rate	**Kbps**	20, 50, 125, 250, 500, 800
		Mbps	1
	Address		1…127

Profibus bus

Compatibility			XPS MC16ZP, XPS MC32ZP
Serial link ports	Number and type		1 x SUB-D 9-pin female
	Status		Slave
Data exchange			14 words By included dual port memory: only data addresses
Parameters	Baud rate	**Mbps**	12
	Address		1…125

Connections

Type			Separate plug-in screw connector XPS MCTS●● (1)	Separate plug-in spring clip connector XPS MCTS●● (1)
Power supply and relay output terminals				
	1 conductor	Without cable end	Solid or flexible cable: 0.2…2.5 mm², AWG 24-12	
		With cable end **mm²**	Without bezel, flexible cable: 0.25…2.5	
		mm²	With bezel, flexible cable: 0.25…2.5	
	2 conductors	Without cable end **mm²**	Solid or flexible cable: 0.2…1.5	–
		With cable end **mm²**	Without bezel, flexible cable: 0.25…1.5	–
		mm²	Double, with bezel, flexible cable: 0.5…1.5	Double, with bezel, flexible cable: 0.5…1
	Tightening torque of screw terminals	**Nm**	0.5…0.6	–
	Wire stripping length	**mm**	10	
Other terminals				
	1 conductor	Without cable end	Solid or flexible cable: 0.14…1.5 mm², AWG 28-16	
		With cable end **mm²**	Without bezel, flexible cable: 0.25…1.5	
		mm²	With bezel, flexible cable: 0.25…0.5	
	2 conductors	Without cable end **mm²**	Solid cable: 0.14…0.5 Flexible cable: 0.14…0.75	–
		With cable end **mm²**	Without bezel, flexible cable: 0.25…0.34	–
		mm²	Double, with bezel, flexible cable: 0.5	–
Enclosure fixing (conforming to DIN EN 50022)			Metal adaptor for fixing on ⌐ 35 mm metal rail	

(1) To be ordered separately.

References

Safety automation system solutions
Preventa configurable safety controllers
type XPS MC

XPS MC16Z

XPS MC32Z

XPS MC16ZC

XPS MC32ZC

XPS MC16ZP

XPS MC32ZP

References

Configurable safety controllers (connector not included)

Number of inputs	Number of outputs		Communi-cation (Link and bus)	Reference	Weight kg
	Relay	Solid-state			
16	**4 (2 x 2)**	**6**	Modbus	**XPS MC16Z**	0.820
			Modbus, CANopen	**XPS MC16ZC**	0.820
			Modbus, Profibus	**XPS MC16ZP**	0.820
32	**4 (2 x 2)**	**6**	Modbus	**XPS MC32Z**	0.840
			Modbus, CANopen	**XPS MC32ZC**	0.840
			Modbus, Profibus	**XPS MC32ZP**	0.840

Plug-in connectors for configurable safety controllers (1)

Description	For use with	Reference	Weight kg
Screw connectors	XPS MC16Z, MC16ZC, MC16ZP	**XPS MCTS16**	0.080
	XPS MC32Z, MC32ZC, MC32ZP	**XPS MCTS32**	0.110
Spring clip connectors	XPS MC16Z, MC16ZC, MC16ZP	**XPS MCTC16**	0.080
	XPS MC32Z, MC32ZC, MC32ZP	**XPS MCTC32**	0.110

Configuration software

■ Reference XPS MCWIN is the full version of configuration software XPSMCWIN version 2.10 and must be installed if no previous version of this software has been installed.

■ Reference SSVXPSMCWINUP is an update for software XPSMCWIN and can be used if SSVXPSMCWINUP has been installed using Safety Suite V1. An update from version 2.0 to version 2.10 for the software XPSMCWIN will then be performed.

Description	Operating system	Details (2)	Languages	Reference	Weight kg
Configuration software for controllers XPS MC●●Z● CD-ROM + user manual	Windows 2000, Windows XP	Software available on Safety Suite V2 software pack	EN, FR, DE, IT, ES, PT	**XPS MCWIN**	0.520
XPSMCWIN software update CD-ROM + user manual	Windows 2000, Windows XP	Software available on Safety Suite V2 software pack	EN, FR, DE, IT, ES, PT	**SSVXPSMCWINUP**	0.520

(1) To be ordered separately to the controllers.
(2) EDS and GSD files are available on the XPSMCWIN configuration software CD-ROM.

Safety automation system solutions
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type XPS MC

XPS MCCPC

TSX PCX 1031

490 NT● 000 ●●

TSX CUSB485

TSX CAN TDM4

ABL 8RPS24100

References

Connecting cables (1)

Function		Length m	Reference	Weight kg
Diagnostics using Magelis operator dialogue terminal type XBT GT		3	**VW3 A8 306 R30**	1.130
Configuration software	**1** Adaptor: RJ45 socket/PC connection cables	–	**XPS MCCPC**	0.011
	2 Cable to PC serial port (type SUB-D9)	2.5	**TSX PCX 1031**	0.170
	3 Straight shielded twisted pair cables, EIA/TIA 568 standard (RJ45 connector at each end)	2	**490 NTW 000 02**	–
		5	**490 NTW 000 05**	–
		12	**490 NTW 000 12**	–
	Straight shielded twisted pair cables, UL and CSA 22.1 approved (RJ45 connector at each end)	2	**490 NTW 000 02U**	–
		5	**490 NTW 000 05U**	–
		12	**490 NTW 000 12U**	–
	with RJ45/PC USB port converter (2)	0.4	**TSX CUSB485**	–

Function	Medium	Length m	Reference	Weight kg
Modbus serial link access	Premium automation platform TSX SCY 21601	–	**XPS MCSCY**	–
CANopen bus access	**1** CANopen connection cables (fitted with: 1 SUB-D 9-pin female connector at each end)	0.3	**TSX CANCADD03**	–
		1	**TSX CANCADD1**	–
		3	**TSX CANCADD3**	–
		5	**TSX CANCADD5**	–
	2 CANopen tap-off box	–	**TSC CANTDM4**	–
	3 Standard CANopen cables	50	**TSX CANCA50**	–
		100	**TSX CANCA100**	–
		300	**TSX CANCA300**	–
Profibus bus access		100	**TSX PBS CA100**	–
		400	**TSX PBS CA400**	–

Accessories (1)

|				
Regulated switch mode power supply, single-phase	Output voltage: ⎓ 24…28.8 V Nominal current: 10 A Nominal power: 240 W		**ABL 8RPS24100**	1.000

(1) To be ordered separately.
*(2) The converter **TSX CUSB485** is installed using **Driver Pack V2.3**. This "driver" is available on the Safety Suite V2 software pack or downloadable from our site: www.schneider-electric.com*

Dimensions, mounting

XPS MC●●Z●
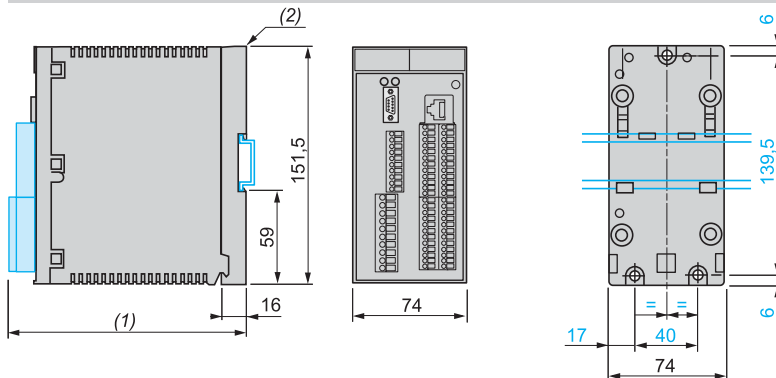
(1) 153 mm with screw connector XPS MCTS●●. 151.4 mm with spring clip connector XPS MCTC●●.
(2) Metal adaptor for fixing on metal ⌐ 35 mm rail.