XPSMCMC10804•

Instruction Sheet
(Original Language)

10/2020

https://www.go2se.com/ref=XPSMCMC10804

Schneider Electric

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All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

When devices are used for applications with technical safety requirements, the relevant instructions must be followed.

Failure to use Schneider Electric software or approved software with our hardware products may result in injury, harm, or improper operating results.

Failure to observe this information can result in injury or equipment damage.

Table of Contents

About the Book

At a Glance

Document Scope

This information is about the usage and configuration of XPSMCMC10804• Modular Safety Controller.

Validity Note

The characteristics that are described in the present document should be the same as those characteristics that appear online. In line with our policy of constant improvement, we may revise content over time to improve clarity and accuracy. If you see a difference between the document and online information, use the online information as your reference.

Product Related Information

The XPSMCM• can reach a maximum Safety Integrity Level (SIL) 3 as per IEC 61508, a maximum Safety Integrity Level Claim Limit (SILcl) as per IEC 62061, and a maximum Performance Level (PL) e, category 4, as per ISO 13849-1. However, the definitive SIL and PL of the application depends on a number of safety-related components, their parameters, and the connections that are made, as per the risk analysis.

The module must be configured in accordance with the application-specific risk analysis and all the applicable standards.

Pay particular attention in conforming to any safety information, different electrical requirements, and normative standards that would apply to your adaptation.

⚠ WARNING

INSUFFICIENT SAFETY-RELATED FUNCTIONS

- Perform a risk assessment as per ISO 12100 and/or other equivalent assessment and appropriately consider all applicable regulations and standards that apply to your machine/process before using this software.
- In your risk assessment, determine all requirements regarding the Safety Integrity Level (SIL), the Performance Level (PL), and any other safety-related requirements and capabilities applicable to your machine/process.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

NOTE: Configuration of the module is the sole responsibility of the installer or user.

Consult the specific product documentation and the relative product and/or application standards to ensure correct use of modules connected to the XPSMCMC10804• within your specific application.

XPSMCMC10804• Modular Safety Controller

Safety-related Information

NOTE: The safety-related function can be compromised if this equipment is not used for the intended purpose and in accordance with the instructions in the present document. This equipment must only be used as safety-related equipment on machines intended to protect persons, material, and installations.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Disconnect all power from all equipment including connected input devices, contactors, and drives prior to removing any covers or doors, or installing or removing any accessories, hardware, cables, or wires.
- Install and use this equipment only in locations known to be non-hazardous.
- Do not use the equipment described herein to supply other, external equipment.
- Always use properly rated voltage sensing equipment to confirm that the power is removed.
- Avoid contacting terminals with hand or tools until the power has been confirmed removed.
- Follow all electrical safety regulations and standards (for example, lockout/tag-out, phase grounding, barriers) to reduce the possibility of contact with hazardous voltages in the work area.
- Remove locks, tags, barriers, temporary ground straps, and replace and secure all covers, doors, accessories, hardware, cables, and wires and confirm that a proper ground connection exists before reapplying power to the unit.
- Complete thorough hardware tests and system commissioning to verify that line voltages are not present on the control circuits before using your hardware operationally.
- Use only the specified voltage when operating this equipment and any associated products.

Failure to follow these instructions will result in death or serious injury.

⚠ DANGER

LOSS OF DESIGNATED SAFETY FUNCTION

- Install the XPSMCM• Modular Safety Controller system in an enclosure with a degree of protection of at least IP 54.
- Use a Protective Extra Low Voltage (PELV) power supply to isolate the equipment from line voltage.
- Do not directly connect the equipment to line voltage.

Failure to follow these instructions will result in death or serious injury.

⚠ DANGER

POTENTIAL FOR EXPLOSION

Install and use the Modular Safety Controller in non-hazardous locations only.

Failure to follow these instructions will result in death or serious injury.

NOTE: The observation of operating limits and duty cycles is of particular importance for equipment designed to perform a safety-related function. If this module has been subjected to electrical, mechanical, or environmental stresses in excess of its stated limits, do not use it.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

● Do not exceed any of the rated operating limits for the equipment specified in the present document.
● Immediately cease using and replace any equipment that has or might have been subjected to conditions in excess of its rated operating limits.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

User Responsibilities

The information provided in this documentation contains general descriptions and/or technical characteristics of the performance of the products contained herein. This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications. It is the duty of any such user, machine builder, or system integrator to perform the appropriate and complete risk analysis, evaluation, and testing of the products with respect to the relevant specific application or use thereof.

Neither Schneider Electric nor any of its affiliates or subsidiaries shall be responsible or liable for misuse of the information contained herein. If you have any suggestions for improvements or amendments or have found discrepancies in this publication, notify Schneider Electric. All pertinent safety regulations must be observed when installing and using this product. For reasons of safety and to help ensure compliance with documented system data, only the manufacturer should perform repairs to components.

Qualified Personnel

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. A qualified person is one who has skills and knowledge related to the construction and operation of this electrical equipment and its installation, and has received safety training to recognize and avoid the hazards involved.

Modular Safety Controller

Key safety values	Value	Standard
Probability of a dangerous failure per hour (PFHd)	1.35E-08[3]	IEC 61508
Safety Integrity Level (SIL)	3	
Hardware Fault Tolerance (HFT)	1 (type B)	
Defined "Safe state"[1]	All outputs off	
Safety Integrity Level claim limit (SILcl)	3	IEC 62061
Type	4	EN 61496-1
Performance Level (PL)[2]	e	EN ISO 13849-1
Diagnostic Coverage$_{avg}$	High	
Mean Time to Dangerous Failure (MTTFd)	161 years[3]	
Category[2]	4	
Maximum service life	20 years	

(1) The Modular Safety Controller and expansion modules are in the defined safe state when their functional safety-related outputs are deactivated. To exit the defined safe state condition, a combination of hardware inputs is required.
(2) The EN ISO 13849-1 performance level (PL) and safety category (Cat) of the overall system depends on multiple factors, including the selected modules, wiring practices, the physical environment, and the application.
(3) If expansion modules are added to the configuration, the PFHd and the MTTFd of the overall system are affected, refer to the SoSafe Configurable Project Report.

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- You must carry out a risk assessment in accordance with ISO 12100.
- Validate the entire system/machine in accordance with the required performance level and risk assessment.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Controller and Function Description

XPSMCMC10804• is a Modular Safety Controller providing eight safety-related inputs and four solid-state safety-related outputs, which can be used as four single or two dual (Output Signal Switching Device, OSSD), and can be configured using SoSafe Configurable. In addition, the Modular Safety Controller can be combined with a number of expansion modules through the backplane expansion bus.

Configuration of the controller: The XPSMCMC10804• Modular Safety Controller requires a USB (computer) to Mini B USB (controller) configuration cable connected to a PC via a USB 2.0 (or greater) port to configure the controller. The XPSMCMC10804• requires SoSafe Configurable to configure the controller and system.

Optional memory card: An optional backup memory card can be installed in the XPSMCMC10804• Modular Safety Controller and used to store the software configuration parameters.
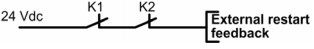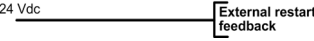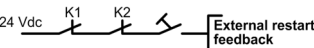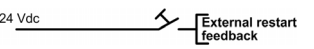
Safety-Related Inputs

The XPSMCMC10804• Modular Safety Controller provides eight digital inputs for connection of safety-related sensors and other input devices such as emergency stop push-buttons, magnetic switches, light curtains.

Input `RESTART` (`RST`)

The `RESTART` (`RST`) signal input allows the XPSMCMC10804• controller to verify an EDM (External Device Monitoring) feedback signal (series of contacts) from external contactors, and to monitor manual/automatic operation.

⚠ WARNING
UNINTENDED EQUIPMENT OPERATION
● The `RESTART` command device must be installed outside the zone of operation in a position where the zone of operation and the entire work area concerned are clearly visible.   ● It must not be possible to operate the `RESTART` command device from inside the zone of operation.
Failure to follow these instructions can result in death, serious injury, or equipment damage.

Operation mode	EDM	`Restart_fbk`
Automatic	With `K1_K2` control	
	Without `K1_K2` control	
Manual	With `K1_K2` control	
	Without `K1_K2` control	

Output `STATUS` (SIL 1/PL c in Accordance with Standard EN 61508:2010)

The status outputs are configurable digital diagnostic outputs that indicate the status of safety-related inputs and/or outputs.

Four status outputs are available on the XPSMCMC10804• Modular Safety Controller. The status outputs are shared with the feedback/restart inputs of the OSSDs. To use the status outputs, the corresponding OSSD must be used with automatic reset without external feedback monitoring. For example, to use the `STATUS1` output (Terminal 7), you must program `OSSD1` (by means of the SoSafe Configurable) with automatic reset without K feedback monitoring.

The status outputs are SIL 1/PL c outputs.

⚠ WARNING

INSUFFICIENT SAFETY-RELATED FUNCTIONS

Do not use status outputs for safety-related purposes greater than SIL 1/PL c (EN 61508:2010).

Failure to follow these instructions can result in death, serious injury, or equipment damage.
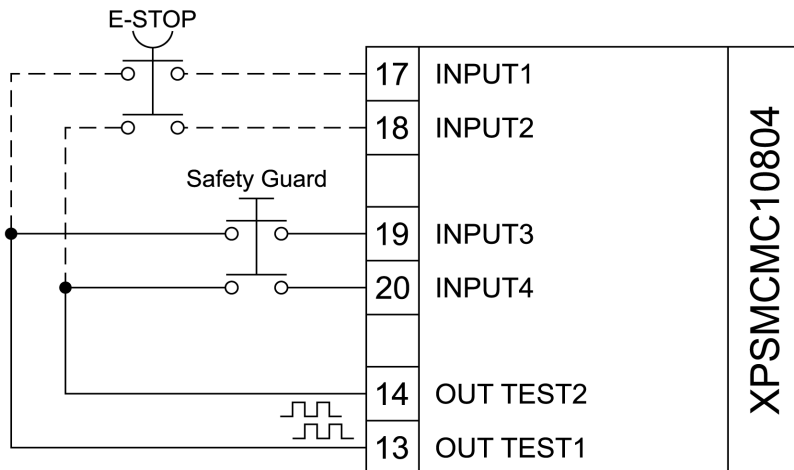

Output `TEST`

The `TEST` outputs are related to be used with the input circuits of the Modular Safety Controller.

The `TEST` outputs must be used to monitor the presence of cross circuits or short-circuits on the inputs. Connecting the test outputs helps to reach PL e in accordance with ISO 13849-1 and SILCL 3 in accordance with IEC 62061.

NOTE: These safety levels can also be obtained by applying other means of fault exclusion as described in ISO 13849-2.

NOTE: The test outputs of a specific module can only be linked to the inputs of the same module.

Each test output is able to drive a maximum of four inputs in parallel.

Interface Type C, class 3 according to "ZVEI CB24I Ed.2" with a maximum test pulse duration of 100 µs.

Solid-State Safety-Related Output (`OSSD`)

┌───┐
│   ⚠ **WARNING**   │
├───┤
│ **UNINTENDED EQUIPMENT OPERATION**   │
│   │
│ Do not connect any equipment to an OSSD unless the OSSD is appropriately configured with SoSafe Configurable. │
│   │
│ **Failure to follow these instructions can result in death, serious injury, or equipment damage.** │
└───┘

The four `OSSD` safety-related outputs are short-circuit protected.

The outputs are able to supply:
● In the ON condition: (Uv - 0.6 V)...Uv (24 Vdc ± 20%);
● In the OFF condition: 0...2 Vrms (root mean square)

The maximum load current of 400 mA (per OSSD). The minimum resistive load is 60 Ω.

The maximum capacitive load is 0.82 µF.

The maximum inductive load is 2.4 mH.

Interface Type C, class 3 according to "ZVEI CB24I Ed.2" with a maximum test pulse duration of 100 µs.

Different output configurations (configurable with SoSafe Configurable) can be set:
- 4 single channels (1 safety-related output per channel with its corresponding feedback input).
- 2 dual channels (2 safety-related outputs with their corresponding feedback input per channel).
- 1 dual channel and 2 single channels.

The following table indicates how each `OSSD` output can be configured:

Automatic	The output is activated according to the configurations set by the SoSafe Configurable software, only if the corresponding `RESTART` input is connected to Uv (24 Vdc ± 20%).
Manual	The output is activated according to the configurations set by the SoSafe Configurable software, only if the level at the corresponding `RESTART` input changes from 0 Vdc to Uv (24 Vdc ± 20%).
Monitored	The output is activated according to the configurations set by the SoSafe Configurable software, only if the level at the corresponding `RESTART` input changes from 0 Vdc to Uv (24 Vdc ± 20%) and back to 0 Vdc.

Terminals

Examples with maximum number of terminals. Regarding terminal designation, refer to table below.
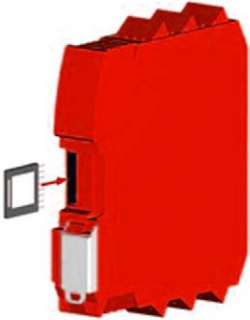
Terminal numbers
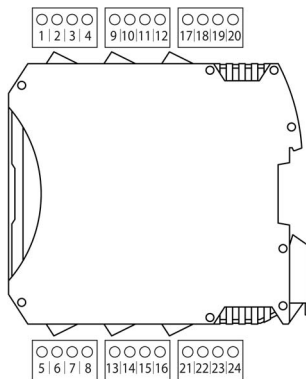
Terminal	Signal	LED	Type	Description	Operation
1	24 VDC	PWR	-	24 Vdc power supply	-
2	NC	–	–	–	–
3	NC	–	–	–	–
4	0 VDC	PWR	-	0 Vdc power supply	-
5	OSSD1	OSSD 1	Output	Safety-related output 1	PNP active at Uv (24 Vdc ± 20%).
6	OSSD2	OSSD 2	Output	Safety-related output 2	

Terminal	Signal	LED	Type	Description	Operation
7	RESTART_FBK1/ STATUS1	STATUS 1	Input/o utput	Feedback/Restart 1 for OSSD1	Input type 3 according to EN 61131-2. Maximum resistance 1.2 kΩ.
				Configurable output 1 for OSSD1	Configurable output (SIL 1/PL c in accordance with EN 61508:2010)
8	RESTART_FBK2/ STATUS2	STATUS 2	Input/o utput	Feedback/Restart 2 for OSSD2	Input type 3 according to EN 61131-2. Maximum resistance 1.2 kΩ.
				Configurable output 2 for OSSD2	Configurable output (SIL 1/PL c in accordance with EN 61508:2010)
9	OSSD3	OSSD 3	Output	Safety-related output 3	PNP active at Uv (24 Vdc ± 20%).
10	OSSD4	OSSD 4	Output	Safety-related output 4	
11	RESTART_FBK3/ STATUS3	STATUS 3	Input/o utput	Feedback/Restart 3 for OSSD3	Input type 3 according to EN 61131-2. Maximum resistance 1.2 kΩ.
				Configurable output 3 for OSSD3	Configurable output (SIL 1/PL c in accordance with EN 61508:2010)
12	RESTART_FBK4/ STATUS4	STATUS 4	Input/o utput	Feedback/Restart 4 for OSSD2	Input type 3 according to EN 61131-2. Maximum resistance 1.2 kΩ.
				Configurable output 4 for OSSD2	Configurable output (SIL 1/PL c in accordance with EN 61508:2010)
13	OUT_TEST1	-	Output	Test output for detection of short circuits/cross circuits in input circuits	PNP active at 24 Vdc.
14	OUT_TEST2	-			
15	OUT_TEST3	-			
16	OUT_TEST4	-			
17	INPUT1	IN 1	Input	Safety-related input 1	Input type 3 according to EN 61131-2. Maximum resistance 1.2 kΩ.
18	INPUT2	IN 2		Safety-related input 2	
19	INPUT3	IN 3		Safety-related input 3	
20	INPUT4	IN 4		Safety-related input 4	
21	INPUT5	IN 5		Safety-related input 5	
22	INPUT6	IN 6		Safety-related input 6	
23	INPUT7	IN 7		Safety-related input 7	
24	INPUT8	IN 8		Safety-related input 8	

Optional Configuration Memory Card

Presentation	Rear view of the controller
The XPSMCMME0000 memory card can be installed in the Modular Safety Controller and is used to save/restore the hardware/software configuration. The XPSMCMME0000 memory card is specific to the XPSMCMCP0802• or XPSMCMC10804• controller, and therefore, only this reference can be used within the controller. The memory card is only written to using SoSafe Configurable software during download of the configuration. If the memory card is inserted without any configuration, the XPSMCMCP0802• or XPSMCMC10804• controller continues to operate usually with the previously loaded configuration held in its non-volatile memory. If a memory card is inserted with a configuration which does not match the one contained in the controller, the configuration on the memory card will overwrite that which is in the controller, erasing definitively the previous configuration therein. That is, all data (password included) previously contained in XPSMCMCP0802• or XPSMCMC10804• controller will be overwritten.	

⚠ WARNING

UNINTENDED EQUIPMENT OPERATION

- First remove power from the Modular Safety Controller before attempting to insert or remove the memory card.
- Each time the memory card is used, carefully verify that the loaded configuration is the one that was intended for the particular system.
- Conduct a full functional test (see *Validation* in the *Modular Safety Controller User Guide*) of the system, composed of the Modular Safety Controller plus all input and output hardware connected to it, after using the memory card to overwrite your safety-related application.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

Multiple load function: To perform the configuration of several XPSMCMCP0802• or XPSMCMC10804• Modular Safety Controllers without using a PC and the USB connector, you can save the desired configuration on a single memory card and then use it to download data on the XPSMCMCP0802• or XPSMCMC10804• Modular Safety Controllers.

Restore function: If the XPSMCMCP0802• or XPSMCMC10804• controller is damaged, replace it with a new XPSMCMCP0802• or XPSMCMC10804• Modular Safety Controller. When the memory card has been used, remove the memory card from the damaged controller, insert the memory card in the new XPSMCMCP0802• controller, and power the Modular Safety Controller. The configuration of the memory card is automatically loaded into the new controller.

Wiring Example

Category 4 wiring for XPSMCMC10804• with feedback of the contactors K1 and K2:
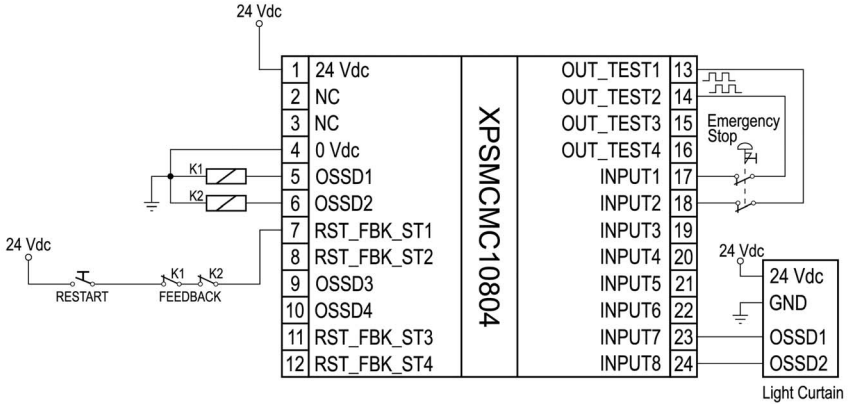
NOTE: Best practice dictates the use of fusing on the incoming 24 Vdc power, and sized appropriately for the requirements of the module.
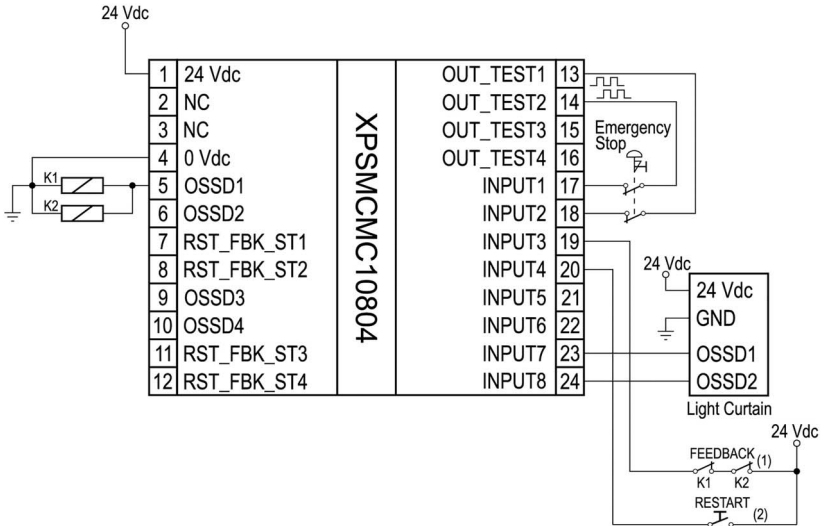

(1) Contacts connected to the `OSSD EDM` functional block

(2) Contacts connected to the `USER RESTART MANUAL, USER RESTART MONITORED or MACRO RESTART MANUAL, MACRO RESTART MONITORED` function block.

NOTE: Best practice dictates the use of fusing on the incoming 24 Vdc power, and sized appropriately for the requirements of the module.

Dimensions
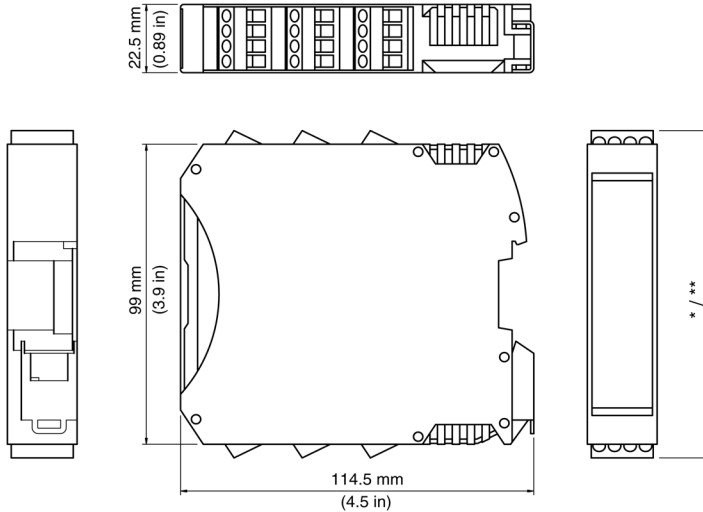
* Screw terminals 108 mm (4.25 in)
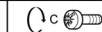** Spring terminals 118 mm (4.67 in)

Mount the modules (Modular Safety Controller and any I/O expansion modules) in an electric cabinet with an IP54 degree of protection. The minimum clearance below and above the controller is 40 mm (1.57 in). Allow at least 100 mm (3.93 in) distance between the cabinet door and the front face of the module(s). There are no clearances required on the left or right side of the module(s), but for XPSMCMDO00042A• module an additional distance to adjacent modules is mandatory *(see Modular Safety Controller, Hardware Guide)*. Other equipment in proximity may require larger distances and those clearances must also be taken into account.

Technical Data

Cable types and wire sizes

for a 5.08 pitch removable **screw** terminal block

mm / in. 7 / 0.28								
mm²	0.2…2.5	0.2…2.5	0.25…2.5	0.25…1.5	2 x 0.2…1	2 x 0.2…1.5	2 x 0.25…1	2 x 0.5…1.5
AWG	24…14	24…14	23…14	23…16	2 x 24…18	2 x 24…16	2 x 23…18	2 x 20…16

Ø 3,5 mm (0.14 in.)	C	N•m	0.5
		lb-in	4.42

Cable types and wire sizes

for a 5.08 pitch removable **spring** terminal block (used by XPSMCM•••G).

$\frac{mm}{in.}$ **10** **0.39**	⊏━	⊏━>	⊏▣━	⊏▣━>	⊏▣━❯
mm²	0.2…2.5	0.2…2.5	0.25…2.5	0.25…2.5	2 x 0.5…1
AWG	24…14	24…14	23…14	23…14	2 x 20…18

The following instructions concerning connection cables must be observed:
- Use 60/75 °C copper (Cu) conductor only. Maximum cable length 100 m (328 ft).
- Cables used for connections of longer than 50 m (164 ft) must have a cross-section of at least 1 mm² (AWG 16).

Housing characteristics

Housing material	Polyamide
Housing degree of protection	IP20
Terminal blocks degree of protection	IP2x
Mounting	35 mm DIN rail according to EN/IEC 60715
Mounting position	Vertical or horizontal
Dimensions (h x l x d)	• with screw terminals: 108 x 22.5 x 114.5 mm (4.25 x 0.89 x 4.5 in) • with spring terminals: 118.5 x 22.5 x 114.5 mm (4.67 x 0.89 x 4.5 in)

General characteristics

Rated voltage	24 Vdc ± 20 % (PELV supply)
Dissipated power	3 W maximum (per module)
Overvoltage category	II
Ambient operating temperature	-10...+55 °C (14...131 °F), for vertical or horizontal mounting position
Storage temperature	-20...+85 °C (-4...185 °F)
Relative humidity	10...95%
Maximum operation altitude	2000 m (6562 ft)
Pollution degree	2
Vibration resistance (EN 61496-1)	+/- 0.35 mm (0.014 in) 10...55 Hz
Bump resistance (EN 61496-1)	10 g (16 ms half-sine)

General characteristics			
Response time (ms) The response time depends on the following parameters: • Number of expansion modules installed • Number of operators • Number of OSSD outputs • Status outputs For the overall system response time, refer to the one calculated by the SoSafe Configurable software (see project report). T_{Input_filter} = filtering time set in the project for the inputs. For details, refer to the Input functions *(see Modular Safety Controller, Library and Programming Guide)*.	Controller (XPSMCMCP0802•)	10.6...12.6	$+ T_{Input\_filter}$
	Controller + 1 expansion module	11.8...26.5	$+ T_{Input\_filter}$
	Controller + 2 expansion modules	12.8...28.7	$+ T_{Input\_filter}$
	Controller + 3 expansion modules	13.9...30.8	$+ T_{Input\_filter}$
	Controller + 4 expansion modules	15...33	$+ T_{Input\_filter}$
	Controller + 5 expansion modules	16...35	$+ T_{Input\_filter}$
	Controller + 6 expansion modules	17...37.3	$+ T_{Input\_filter}$
	Controller + 7 expansion modules	18.2...39.5	$+ T_{Input\_filter}$
	Controller + 8 expansion modules	19.3...41.7	$+ T_{Input\_filter}$
	Controller + 9 expansion modules	20.4...43.8	$+ T_{Input\_filter}$
	Controller + 10 expansion modules	21.5...46	$+ T_{Input\_filter}$
	Controller + 11 expansion modules	22.5...48.1	$+ T_{Input\_filter}$
	Controller + 12 expansion modules	23.6...50.3	$+ T_{Input\_filter}$
	Controller + 13 expansion modules	24.7...52.5	$+ T_{Input\_filter}$
	Controller + 14 expansion modules	25.8...54.6	$+ T_{Input\_filter}$
Response time (ms) The response time depends on the following parameters: • Number of expansion modules installed • Number of operators • Number of OSSD outputs • Status outputs For the overall response time, refer to the one calculated by the SoSafe Configurable software (see project report). T_{Input_filter} = filtering time set in the project for the inputs. For details, refer to the Input functions *(see Modular Safety Controller, Library and Programming Guide)*.	Controller (XPSMCMC10804•)	12.75...14.75	$+ T_{Input\_filter}$
	Controller + 1 expansion module	13.83...37.84	$+ T_{Input\_filter}$
	Controller + 2 expansion modules	14.91...40.00	$+ T_{Input\_filter}$
	Controller + 3 expansion modules	15.99...42.16	$+ T_{Input\_filter}$
	Controller + 4 expansion modules	17.07...44.32	$+ T_{Input\_filter}$
	Controller + 5 expansion modules	18.15...46.48	$+ T_{Input\_filter}$
	Controller + 6 expansion modules	19.23...48.64	$+ T_{Input\_filter}$
	Controller + 7 expansion modules	20.31...50.80	$+ T_{Input\_filter}$
	Controller + 8 expansion modules	21.39...52.96	$+ T_{Input\_filter}$
	Controller + 9 expansion modules	22.47...55.12	$+ T_{Input\_filter}$
	Controller + 10 expansion modules	23.55...57.28	$+ T_{Input\_filter}$
	Controller + 11 expansion modules	24.63...59.44	$+ T_{Input\_filter}$
	Controller + 12 expansion modules	25.71...61.60	$+ T_{Input\_filter}$
	Controller + 13 expansion modules	26.79...63.76	$+ T_{Input\_filter}$
	Controller + 14 expansion modules	27.87...65.92	$+ T_{Input\_filter}$

Controller-specific characteristics	
Description	Electronic housing maximum 24-poles, with locking latch mounting

Controller-specific characteristics	
Mounting	DIN rail mounting with locking latch
Maximum number of inputs of a complete MCM system	128
Maximum number of OSSD safety-related outputs of a complete MCM system	32
Maximum number of expansion modules (excluding XPSMCMER0002 and XPSMCMER0004)	14
Maximum number of expansion modules of the same reference (excluding XPSMCMER0002 and XPSMCMER0004)	4
Safety-related input (number / description)	8 / Input type 3 according to EN 61131-2. Maximum resistance 1.2 kΩ.
Restart Input (optional to status outputs) (number / description)	4 / EDM (External Device Monitoring) type 3 according to EN 61131-2. Maximum resistance 1.2 kΩ. Possible automatic restart function or manual operation with restart pushbutton.
Status outputs (optional to restart input) (number / description)	4 / SIL 1/PL c in accordance with standard EN 61508:2010. Maximum current per output: 100 mA, nominal voltage 24 Vdc.
Test output (number / description)	4 / For cross circuit/short circuit monitoring, maximum current 100 mA, nominal voltage 24 Vdc.
Controller to controller by Network function	Maximum 10 Modular Safety Controllers with distance of up to 100 m (328 ft) between each controller.
Solid-state safety-related output (OSSD)	4 / solid-state safety-related outputs PNP active high • Interface type C class 3 (ZVEI CB24I Ed.2) • The outputs are able to supply: ❍ In the ON condition: (Uv-0.6 Vdc)...Uv (24 Vdc ± 20 %) ❍ In the OFF condition: 0...2 Vrms (root mean square) • The maximum load current of 400 mA (per OSSD) corresponds to a minimum resistive load of 60 Ω. ❍ The maximum capacitive load is 0.82 μF. ❍ The maximum inductive load is 2.4 mH. • Test pulses are used to detect short circuits and interruptions of wire continuity. The switch-off test pulse interval is every 650 ms, the test pulse duration is 100 μs.
Probability of a Dangerous Failure per Hour (PFHd)	1.35E-08
Mean Time to Dangerous Failure (MTTFd) in years	161
Connection to PC	USB 2.0 or greater (high speed), no insulation. Maximum cable length: 3 m (9.84 ft)

Controller-specific characteristics	
Connection to expansion modules	5-way backplane expansion
Weight	0.155 kg (5.46 oz)
Slot for memory card	Yes

Checklist After Installation

The following must be verified:

Step	Action
1	Conduct a full functional test of the system (see *Validation* in the *Modular Safety Controller Library and Programming Guide*.)
2	Verify that all the cables are correctly inserted and the terminal blocks are within correct torque for screw terminals.
3	Verify that all the LED indicators are correctly illuminating for the inputs and outputs used.
4	Verify the positioning and function of all input and output sensors and actuators used with the XPSMCM•.
5	Verify the correct mounting of XPSMCM• to the DIN rail.
6	Verify that all the external indicators (lamps/beacons/sirens) are correctly functioning.