XPSMCMER00••(G) Modules

Instruction Sheet

(Original Language)

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About the Book

Document Scope

This information is about the usage and configuration of the XPSMCMER0002(G), XPSMCMER0004(G) and XPSMCMER0008(G) expansion modules for the XPSMCMCP0802(G), XPSMCMC10804(G) and XPSMCMC10804E(G) Modular Safety Controllers.

Validity Note

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Available Languages of this Document

This document is available in these languages:

- English (EAV8286701)
- French (EAV8286702)
- German (EAV8286703)
- Italian (EAV8286704)
- Spanish (EAV8286705)
- Chinese (EAV8286706)
- Portuguese (EAV828307)
- Turkish (EAV8286708)

Product Related Information

The XPSMCM• can reach a maximum Safety Integrity Level (SIL) 3 as per IEC 61508:2010 and as per IEC 62061:2021, and a maximum Performance Level (PL) e, category 4, as per EN ISO 13849-1:2015.

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.

For all matters concerning functional safety, if necessary, contact the competent safety authorities or the competent trade associations of your country.

Consult the specific product documentation and the relative product and/or application standards to use the modules connected to the XPSMCMER0002(G), XPSMCMER0004(G) or XPSMCMER0008(G) module in your specific application.

The ambient temperature of the installed system must be compatible with the operating temperature parameters stated on the product label and in the characteristics tables.

Information on Non-Inclusive or Insensitive Terminology

As a responsible, inclusive company, Schneider Electric is constantly updating its communications and products that contain non-inclusive or insensitive terminology. However, despite these efforts, our content may still contain terms that are deemed inappropriate by some customers.

XPSMCMER00••(G) Expansion Modules

Safety-related Information

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 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 equipment in an enclosure with a degree of protection of at least IP 54, according to IEC 60529.
- Use a Protective Extra Low Voltage (PELV) power supply according to IEC 60204-1.

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

⚠ DANGER

POTENTIAL FOR EXPLOSION

Install and use the equipment in non-hazardous locations only.

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

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.

There are no user-serviceable parts in this equipment. For reasons of safety and compliance, only the manufacturer should perform repairs to this equipment.

⚠ WARNING

LOSS OF SAFETY-RELATED FUNCTION

Do not attempt to repair or alter this equipment.

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

Qualified Personnel

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

Module and Function Description

The XPSMCMER00••(G) modules are output expansion modules for the XPSMCM• Modular Safety Controller offer. The XPSMCMER00••(G) modules can only be configured in conjunction with the XPSMCMCP0802(G), XPSMCMC10804(G) or XPSMCMC10804E(G) Modular Safety Controller.

The XPSMCMER0002(G) module contains one Category 4 safety-related relay output, the XPSMCMER0004(G) module contains two Category 4 safety-related relay outputs and the XPSMCMER0008(G) module contains four Category 4 safety-related relay outputs. Digital outputs from the XPSMCM• Modular Safety Controller or a digital expansion module with OSSD outputs are physically wired directly to the inputs of the XPSMCMER00••(G). The XPSMCMER00••(G) modules are not connected to the backplane expansion.

Inputs

The XPSMCMER0002(G) module contains two digital inputs, the XPSMCMER0004(G) module contains four digital inputs and the XPSMCMER0008(G) module contains eight digital inputs in order to physically connect the digital outputs from one of the XPSMCM• Modular Safety Controller or expansion modules in order to use potential free outputs.

Outputs

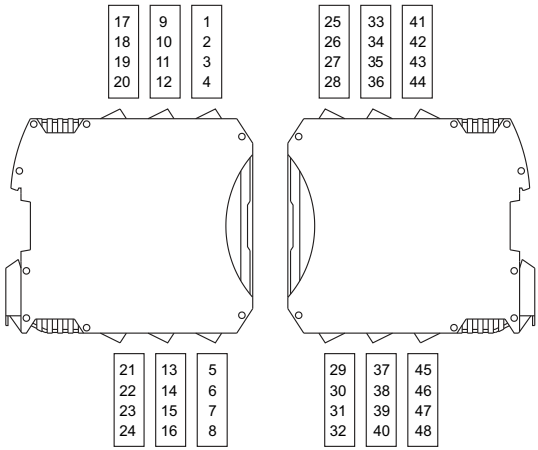
The XPSMCMER00••(G) modules use forcibly guided contact safety-related relays, each of which provides two normally open (NO) contacts

and one normally closed (NC) contact in addition to the NC feedback contact.

The XPSMCMER0002(G) module contains one safety-related relay pair, the XPSMCMER0004(G) module contains two safety-related relay pairs and the XPSMCMER0008(G) module contains four safety-related relay pairs.

Terminals

Terminal numbers



XPSMCMER0002(G) module

Terminal	Signal	LED	Type	Description	Operation
1	24 VDC	–	–	24 Vdc power supply	–
4	0 VDC	–	–	0 Vdc power supply	
5	OSSD1_ A	–	Input	Control relay input 1	Input type 3. Maximum applicable resistance 1.2 kΩ.
6	OSSD1_ B				
7	FBK_K1_ K2_1	–	Output	Feedback relay output 1	–
9	A_NC1	RELAY 1		NC contact relay output 1	
10	B_NC1				
13	A_NO11			NO contact 1 relay output 1	
14	B_NO11				
15	A_NO12			NO contact 2 relay output 1	
16	B_NO12				

XPSMCMER0004(G) module

Terminal	Signal	LED	Type	Description	Operation
1	24 VDC	–	–	24 Vdc power supply	–
4	0 VDC			0 Vdc power supply	–
5	OSSD1_ A	–	Input	Control relay input 1	Input type 3. Maximum applicable resistance 1.2 kΩ.
6	OSSD1_ B				
7	FBK_K1_ K2_1	-	Output	Feedback relay output 1	–
9	A_NC1	RELAY 1	Output	NC contact relay output 1	–
10	B_NC1				
13	A_NO11	RELAY 1	Output	NO contact 1 relay output 1	–
14	B_NO11				
15	A_NO12			NO contact 2 relay output 1	
16	B_NO12				
17	OSSD2_ A	–	Input	Control relay input 2	Input type 3. Maximum applicable resistance 1.2 kΩ.
18	OSSD2_ B				
19	FBK_K1_ K2_2	–	Output	Feedback relay output 1	–
11	A_NC2	RELAY 2	Output	NC contact relay output 2	–
12	B_NC2				
21	A_NO21			NO contact 1 relay output 2	
22	B_NO21				
23	A_NO22			NO contact 2 relay output 2	
24	B_NO22				

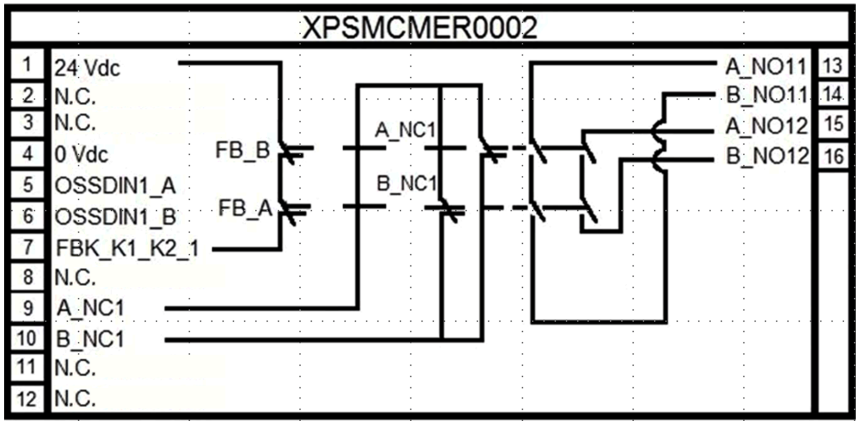
XPSMCMER0008(G) module

Terminal	Signal	LED	Type	Description	Operation
1	24 VDC	–	–	24 Vdc power supply	–
4	0 VDC			0 Vdc power supply	–
5	OSSD1_A		Input	Control relay input 1	Input type 3. Maximum applicable resistance 1.2 kΩ.
6	OSSD1_B				
7	FBK_K1_K2_1_1	-	Output	Feedback relay output 1	–
8	FBK_K1_K2_1_2				
9	A_NC1	RELAY 1	Output	NC contact relay output 1	–
10	B_NC1				
13	A_NO11			NO contact 1 relay output 1	–
14	B_NO11				
15	A_NO12			NO contact 2 relay output 1	
16	B_NO12				
17	OSSD2_A	–	Input	Control relay input 2	Input type 3. Maximum applicable resistance 1.2 kΩ.
18	OSSD2_B				
19	FBK_K1_K2_2_1	–	Output	Feedback relay output 2	–
20	FBK_K1_K2_2_2				
11	A_NC2	RELAY 2		NC contact relay output 2	
12	B_NC2				
21	A_NO21			NO contact 1 relay output 2	
22	B_NO21				
23	A_NO22			NO contact 2 relay output 2	
24	B_NO22				

Terminal	Signal	LED	Type	Description	Operation
25	24 VDC	–	–	24 VDC power supply	–
28	GND			0 VDC power supply	
29	OSSD3_A	–	Input	Control relay output 3	Input type 3. Maximum applicable resistance 1.2 kΩ.
30	OSSD3_B				
31	FBK_K1_K2_3_1	–	Output	Feedback relay output 3	–
32	FBK_K1_K2_3_2				
33	A_NC3	RELAY 3	Output	NC contact relay output 3	
34	B_NC3				
37	A_NO31			NO contact 1 relay output 3	
38	B_NO31				
39	A_NO32			NO contact 2 relay output 3	
40	B_NO32				
41	OSSD4_A	–	Input	Control relay output 4	Input type 3. Maximum applicable resistance 1.2 kΩ.
42	OSSD4_B				
43	FBK_K1_K2_4_1	–	Output	Feedback relay output 4	–
44	FBK_K1_K2_4_2				
35	A_NC4	RELAY 4	Output	NC contact relay output 4	
36	B_NC4				
45	A_NO41			NO contact 1 relay output 4	
46	B_NO41				
47	A_NO42			NO contact 2 relay output 4	
48	B_NO42				

Wiring Example

XPSMCMER0002(G) module

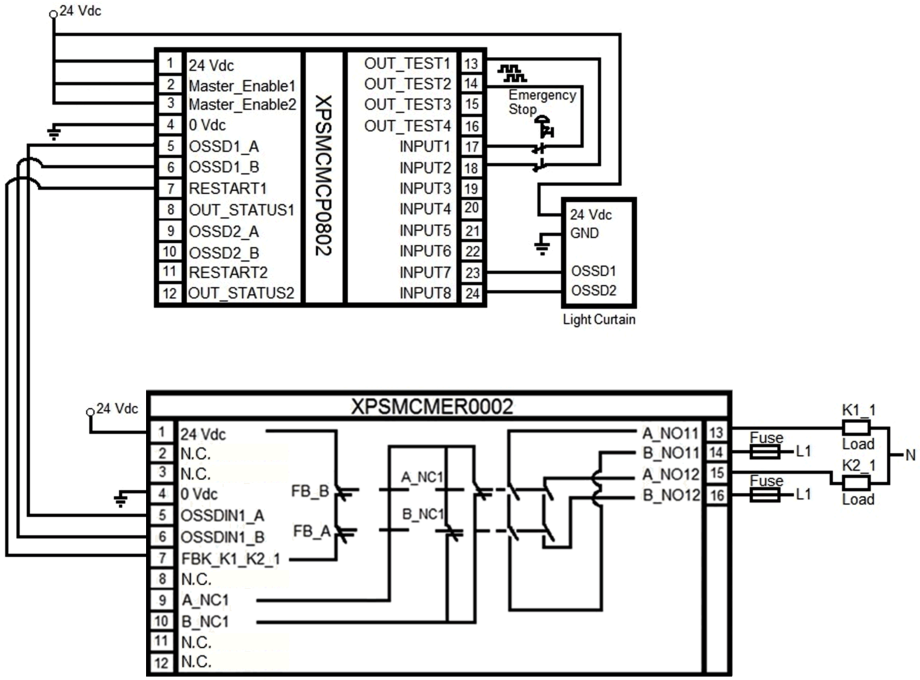


⚠WARNING

UNINTENDED EQUIPMENT OPERATION

Do not connect wires to unused terminals and/or terminals indicated as "No Connection (N.C.)" or Not Connected.

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



⚠WARNING

UNINTENDED EQUIPMENT OPERATION

Do not connect wires to unused terminals and/or terminals indicated as "No Connection (N.C.)" or Not Connected.

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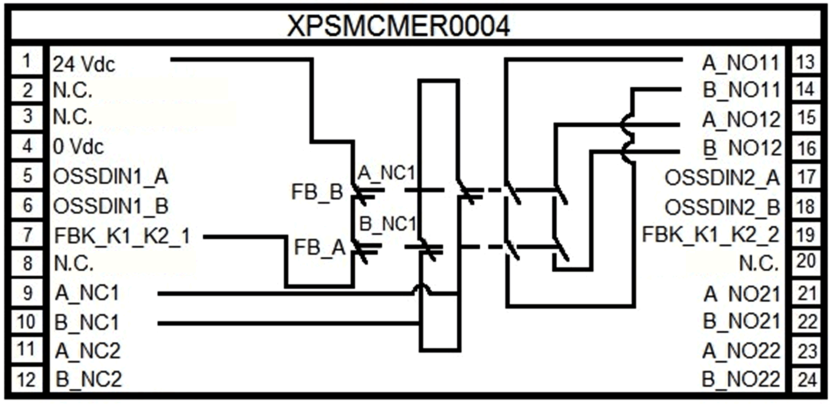
XPSMCMER0004(G) module



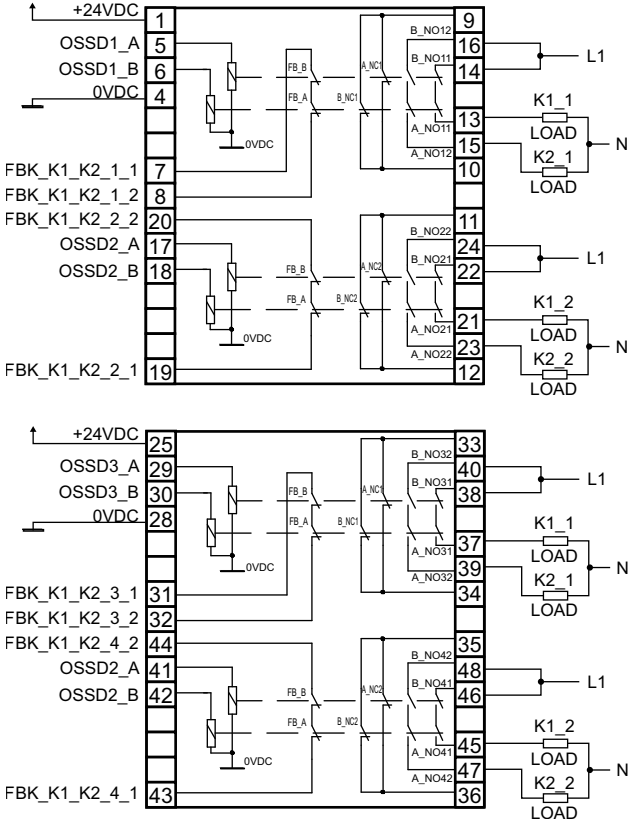
⚠WARNING

UNINTENDED EQUIPMENT OPERATION

Do not connect wires to unused terminals and/or terminals indicated as "No Connection (N.C.)" or Not Connected.

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

XPSMCMER0008(G) module



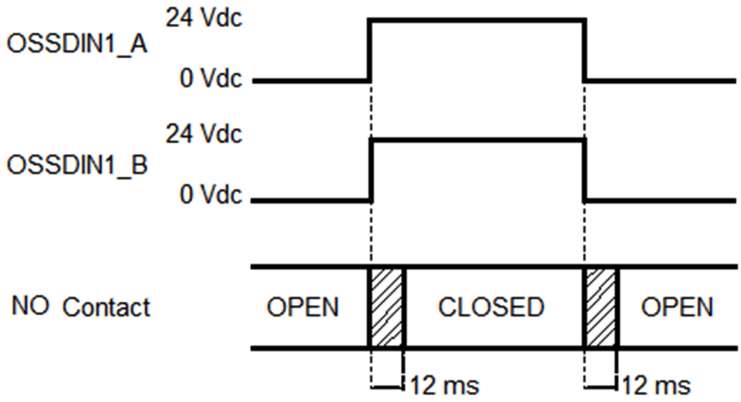
⚠WARNING

UNINTENDED EQUIPMENT OPERATION

Do not connect wires to unused terminals and/or terminals indicated as "No Connection (N.C.)" or Not Connected.

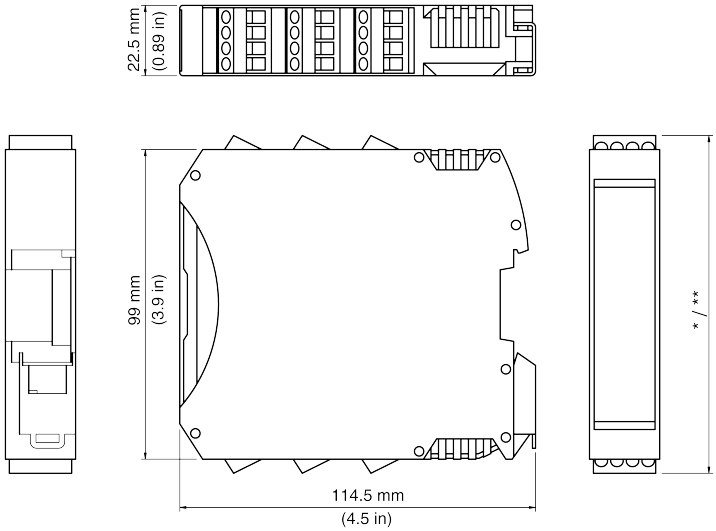
Failure to follow these instructions can result in death, serious injury, or equipment damage.

Timing diagram



Dimensions

XPSMCMER0002(G) and XPSMCMER0004(G) modules:

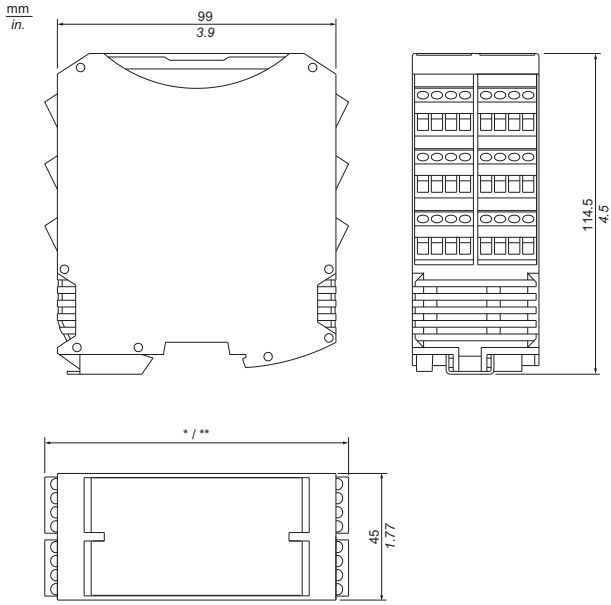


***** Screw terminals 108 mm (4.25 in)

****** 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. Allow at least 100 mm 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); however, other equipment in proximity may require larger distances and those clearances must also be taken into account.

XPSMCMER0008(G) module:



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****** 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. Allow at least 100 mm 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); however, 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*

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

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

General characteristics	
Rated voltage	24 Vdc ± 20 % (PELV supply)
Dissipated power	3 W maximum
Overvoltage category	II
Ambient operating temperature	-10...+55 °C (14...131 °F)

General characteristics	
Storage temperature	-20...+85 °C (-4...185 °F)
Relative humidity	10...95%
Maximum operation altitude	2000 m (6562 ft)
Pollution degree	2
Vibration resistance (IEC/EN 61496-1)	+/- 3.5 mm (0.138 in) 5...8.4 Hz 1 g (8.4...150 Hz)
Shock resistance (IEC/EN 61496-1)	15 g (11 ms half-sine)
EMC Category	Zone B

Module-specific characteristics	**XPSMCMER0002(G)**	**XPSMCMER0004(G)**	**XPSMCMER0008(G)**
Reference description	Electronic housing maximum 16-pole, with locking latch mounting	Electronic housing maximum 24-pole, with locking latch mounting	Electronic housing maximum 48-pole, with locking latch mounting
Switching capacity according to EN 60947-5-1	AC-15, 240 V, 3 A or DC-13, 24 V, 2 A		
Switching current (resistive)	6 A maximum (minimum 17 V @ 10 mA)		
Relay contact type	2 NO + 1 NC	2 x (2 NO + 1 NC)	4 x (2 NO + 1 NC)
FEEDBACK contacts	1	2	4
Response time	12 ms		
Mechanical life of contacts	> 20 x 10^6		
Connection to expansion modules	No backplane expansion available, connection to digital outputs by hardwiring		
Weight	0.250 kg (8.8 oz)	0.300 kg (10.6 oz)	0.375 kg (13.2 oz)

Module-specific characteristics concerning safety (XPSMCMER00••(G))									
-		Feedback contact used				Feedback contact not used			
-		PFHd	SFF (%)	MTTFd (years)	DC-avg	PFHd	SFF (%)	MTTFd (years)	DCa-vg
DC-13 (2A)	t_{cycle1}	3.09E-10	99.6	2335	98.9	9.46E-10	60	2335	0
	t_{cycle2}	8.53E-11	99.7	24453	97.7	1.08E-10	87	24453	0
	t_{cycle3}	6.63E-11	99.8	126678	92.5	6.75E-11	97	126678	0
AC-15 (3A)	t_{cycle1}	8.23E-09	99.5	70	99.0	4.60E-07	50	70	0
	t_{cycle2}	7.42E-10	99.5	848	99.0	4.49E-09	54	848	0
	t_{cycle3}	1.07E-10	99.7	12653	98.4	1.61E-10	79	12653	0
AC-15 (1A)	t_{cycle1}	3.32E-09	99.5	177	99.0	7.75E-08	51	177	0
	t_{cycle2}	3.36E-10	99.6	2105	98.9	1.09E-09	60	2105	0
	t_{cycle3}	8.19E-11	99.7	28549	97.5	1.00E-10	88	28549	0

t_{cycle1} 300 s (1 commutation every 5 minutes)

t_{cycle2} 3600s (1 commutation every hour)

t_{cycle3} 1 commutation every day

PFHd Probability of a dangerous failure per hour according IEC 61508

MTTFd and DCavg Mean Time to dangerous Failure and Diagnostic Coverage average according EN ISO 13849-1

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 User 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•.

Step	Action
5	Verify the correct mounting of XPSMCM• to the DIN rail.
6	Verify that all the external indicators (lamps/beacons/sirens) are correctly functioning.

⚠WARNING

UNINTENDED EQUIPMENT OPERATION

- Use shielded cables for communication signals and any I/O that may be susceptible to electromagnetic radiation.
- Ground cable shield at a single point(1).
- Route communication and I/O cables separately from power cables.

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

[1]Multipoint grounding is permissible (and in some cases inevitable) if connections are made to an equipotential ground plane dimensioned to help avoid cable shield damage in the event of power system short-circuit currents.

Schneider Electric Automation GmbH
Schneiderplatz 1
97828 Marktheidenfeld
Germany

+ 33 (0) 1 41 29 70 00

www.se.com

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