Catalog | May 2025

Modicon MCM

Modular safety controller

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Life Is On Schneider Electric

Modicon

Discover Modicon

Edge control for Industrial IoT

Modicon IIoT-native edge controllers manage complex interfaces across assets and devices or directly into the cloud, with embedded functional safety and cybersecurity. Modicon provides performance and scalability for a wide range of industrial applications up to high-performance multi-axis machines and high-available redundant processes.

Explore our offer

- Modicon HVAC Controllers
- Modicon PLC
- Modicon Motion Controllers
- Modicon PAC
- Modicon I/O
- Modicon Networking
- Modicon Power Supply
- Modicon Wiring
- Modicon Safety

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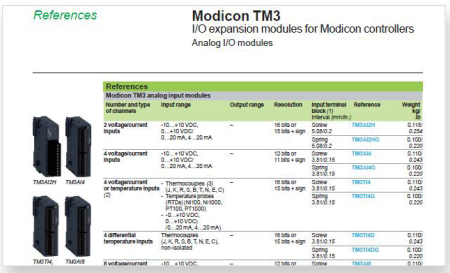
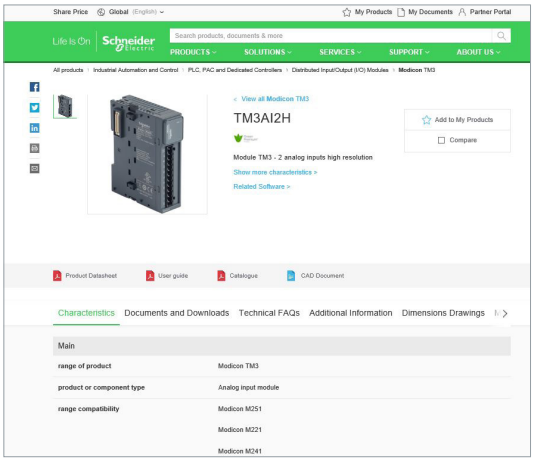
Quick access to product information

Get technical information about your product

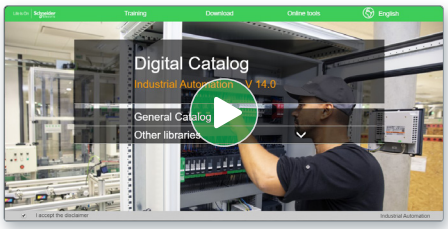


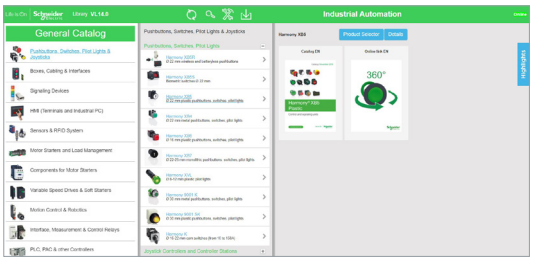


Each commercial reference presented in a catalog contains a hyperlink. Click on it to obtain the technical information of the product:

- Characteristics, Dimensions and drawings, Mounting and clearance, Connections and schemas, Performance curves
- Product image, Instruction sheet, User guide, Product certifications, End of life manual

Find your catalog





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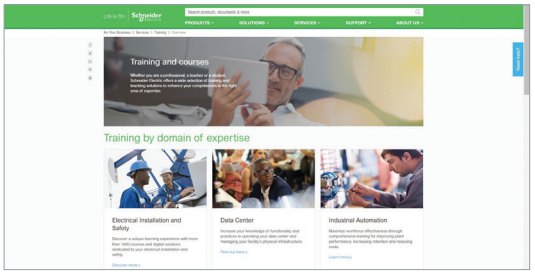

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Life Is On Schneider Electric

General content

Modicon MCM
Modular safety controllers

EcoStruxure™
Innovation At Every Level

To be competitive in today's digital era, machine builders must be innovative. Smart machines, those that are better connected, more flexible, more efficient, and safe, are enabling machine builders to innovate in ways never before possible.

EcoStruxure, Schneider Electric's open, IoT-enabled architecture and platform, offers powerful solutions for the digital era. As part of this, EcoStruxure Machine brings powerful opportunities for machine builders and OEMs, empowering them to offer smart machines and compete in the new, digital era.

EcoStruxure Machine brings together key technologies for product connectivity and edge control on premises, and cloud technologies to provide analytics and digital services. EcoStruxure Machine helps you bring more innovation and added value to your customers throughout the entire machine life cycle.

Innovation at Every Level for Machines is full systems across three layers:

– Connected products
Our connected products for measuring, actuating, device level monitoring, and control adhere to open standards to provide unmatched integration opportunities and flexibility

– Edge Control
We are IIoT-ready with a proven set of tested and validated reference architectures that enable the design of end-to-end open, connected, and interoperable systems based on industry standards. Ethernet and OPC UA facilitates IT/OT convergence meaning machine builders reap benefits from web interfaces and cloud.

– Apps, Analytics & Services
Seamless integration of machines to the IT layer allows the collection and aggregation of data ready for analysis – for machine builders and end users alike this means increased uptime and the ability to find information faster for more efficient operations and maintenance.

These levels are completely integrated from shop floor to top floor. And we have cloud offers and end-to-end cybersecurity wrapped around.

EcoStruxure Machine makes it easier for OEMs/ machine builders to offer their customers smarter machines. The advent of smart machines is driven by the changing needs of end users:

– Evolving workforce
– Reducing costs
– Dynamic markets
– Shorter life cycles
– Prioritizing functional safety and cybersecurity

EcoStruxure Machine provides one solution for the whole machine life cycle:

– With Smart Design & Engineering the time to market is reduced by up to 30% using our automated engineering and the simulation capabilities
– During Commissioning & Operation of the machine, resources such as energy, material and loss can be improved, and with seamless integration to the IT world efficiency can be improved by up to 40%
– Smart Maintenance & Services reduces the time for corrective actions up to 50%

EcoStruxure™ Machine

EcoStruxure™ Architecture

Packaging & Food & Beverage Machinery | Conveying Equipment & Machinery | Material Working | Assembly & Battery Manufacturing | Cranes & Hoists | HVAC & Pumping

Software, Apps, Analytics & Services

AVEVA
Engineering, Operations, Performance

Services
Consulting,
EcoStruxure service Plan,
EcoFit

End-to-end Cybersecurity

Cloud and/or On Premise

Edge Control

Harmony
IIoT Box and Industrial PC

EcoStruxure
Automation Expert

Modicon
Industrial Edge Control for IIoT

EcoStruxure
Machine Expert

EcoStruxure
Machine Expert Twin

EcoStruxure
Machine SCADA Expert

Connected products

Modicon

Edge I/O

Harmony

Advanced operator interfaces and industrial relays

Altivar

Variable speed drives and soft starters

Lexium

Industrial Robotics and smart conveyors

Lexium

Advanced motion control

TeSys

Innovative and connected solutions for motor starters

Galaxy

Uninterruptable 3-phase power for IT and industrial applications

Pact Series

World-class breakers and switches

Modicon MCM
Modular safety controller
Empowering industrial OEMs for the digital era

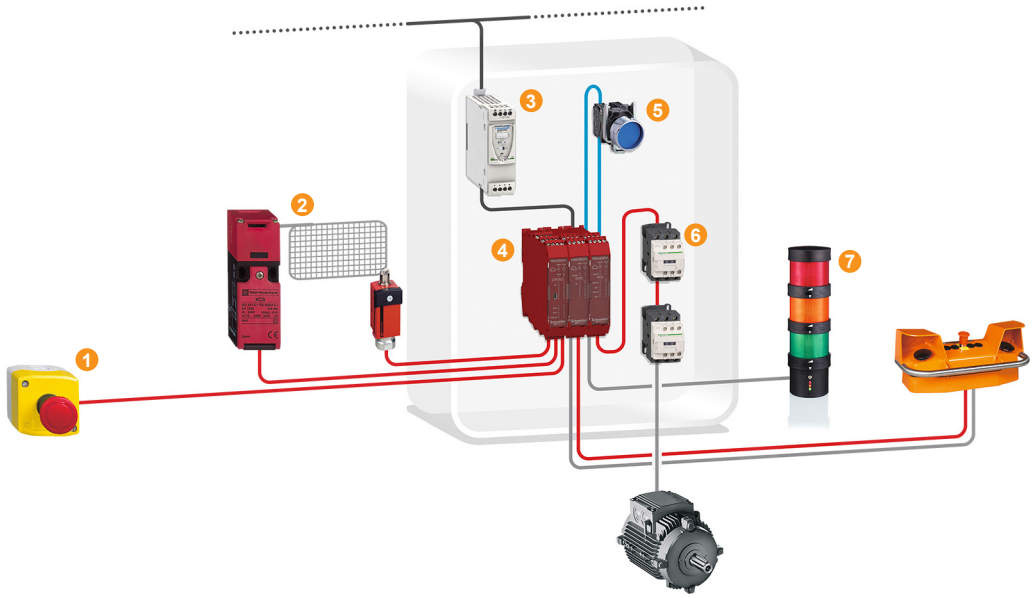
Empowering industrial OEMs for the digital era

To be competitive in today's digital era, machine builders must be innovative. Smart machines, those that are better connected, more flexible, and more efficient, are enabling machine builders to innovate in ways never before possible.

- EcoStruxure™ Machine, our open, interoperable, IoT-enabled system architecture helps you build smarter machines and equipment faster, making your business more efficient, profitable, and sustainable.
- EcoStruxure Machine brings together key technologies for product connectivity and edge control on premises, and cloud technologies to provide analytics and digital services.
- EcoStruxure Machine helps you bring more innovation and added value to your customers throughout the entire machine life cycle;

Safety chain solutions

Save time by using the ready-to-use, easy-to-adapt certified safety chain solutions
The design of the machine, and re-use of the provided documentation with wiring diagram and documented calculations, help to simplify the certification process.



Solution Breakdown

1 Harmony XALK Emergency stop
2 Safety limit switches
3 Modicon power supply 24 V DC
4 Modicon MCM Modular safety controller
5 Harmony XB4 Ø 22 mm modular metal pushbuttons, switches, and pilot lights
6 TeSys D contactor
7 Harmony XVB Ø 70 mm modular beacons and tower lights

Modicon MCM
Modular safety controller
Improve efficiency, Increase profitability

Improve efficiency

Flexible and scalable performance

Schneider Electric offer is covering all the safety functionality and scalability you need for your machine to improve efficiency:

- Single function offer designed for standalone machines
- Multifunctional offer designed for standalone machines
- Multifunctional offer designed for machine lines with safe distributed architectures

Multifunction distributed

Modicon MCM
Modular safety controller

Modicon TM5
Embedded safety PLC

Multifunction

Embedded safety for Altivar drives and Lexium 32 motion controllers

Preventa XPSMC safety controller

Single function

Preventa XPSU safety module

Embedded safety with Modicon TM3 functional module

Performance

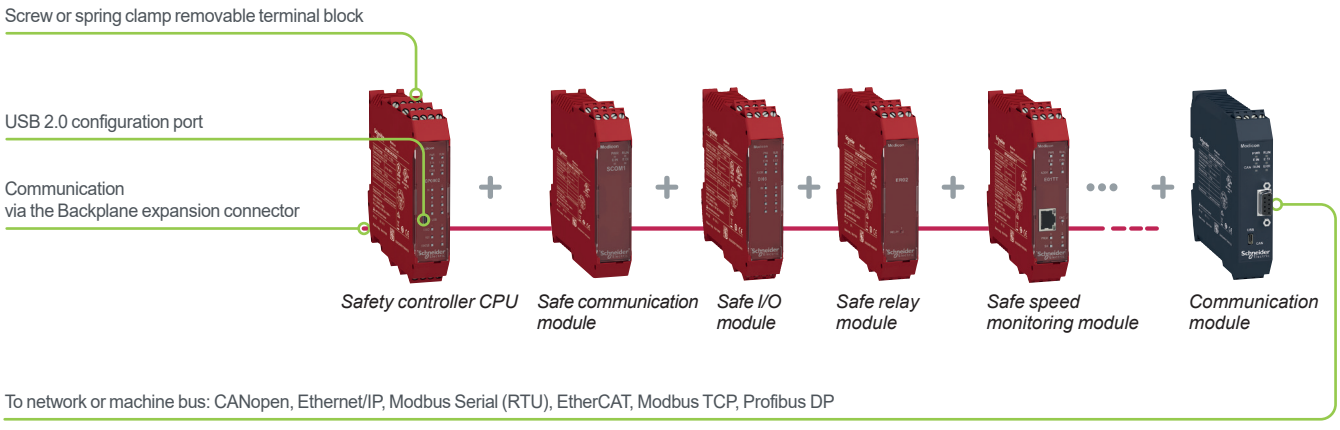
Standalone → Embedded Safety Network

Increase profitability

Up to Cat. 4, PI e, SIL3

Everything you need is embedded

- Find the exact match to your specifications
- Optimize your configuration
- Save space in a cabinet with fewer components
- Expand from small to large configuration by a wide range of expansion and communication modules
- Build up to six island architectures via safety-related communication up to 50 m (164 ft) between each island

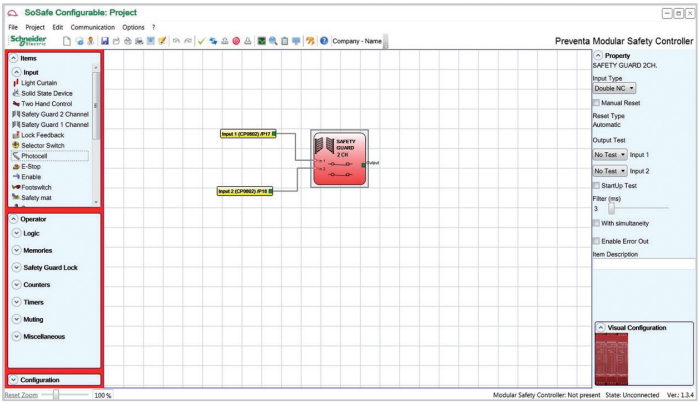


Modicon MCM
Modular safety controller
Reduce your time to market

Reduce your time to market

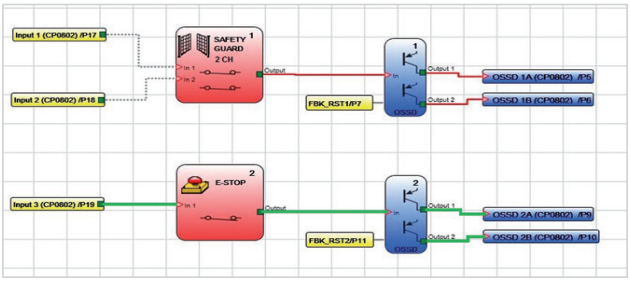
Intuitive automation with **SoSafe Configurable** software

Configuration



- Define hardware module configuration
- Create project configuration: drag and drop function blocks and assignment of inputs and outputs

Offline simulation and Online visualization & testing



- Validate software configuration
- View configuration behavior by offline simulation and online visualization in graphic or text views

Commissioning

- Use project documentation to support the wiring and safety calculation to complete the commissioning

Modicon MCM
Modular safety controller
Simplify integration & maintenance, Safety chain solutions

Simplify integration & maintenance

Connected everywhere

> Variety of communication busses for diagnostics for automation systems (I/O status, alarm and alert information)
> Live diagnostics with PC via USB connection
> Removable memory card transfering configuration data to new controller without using a PC.

Customization and services

Our experts help you every step of the way, from perfecting machine design to on-site services of the finished machine. Global support, 24/7 hotline services, and replacement parts centers around the world enable you to deliver superior customer support and satisfaction.

Safety chain solutions

Safety chain solutions to achieve the safety level

> Schneider Electric provides a complete safety chain which helps you easily achieve the right level of safety for your machine.

Helping to ensure the desired level of functional safety for your machine.

Modicon MCM
Modular safety controller
System applications, System components, Software


Emergency Stop


Guard Monitoring


Perimeter Guarding


Position monitoring


Speed monitoring


Enabling movement


Safety controller CPU


Safety controller CPU with embedded communication interface

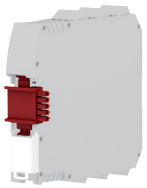

Safe I/O expansion module


Safety relay output module


Safe speed monitoring module


Safe communication expansion module


Non-safe communication module


Backplane expansion connector


Removable memory card


SoSafe Configurable *software*

System applications

The Modicon MCM modular safety controllers are designed to monitor multiple safety functions on and around a machine to minimize the risk of people accessing the dangerous moving parts of the machine including:

> Emergency Stop
> Guard Monitoring
> Perimeter Guarding
> Position monitoring
> Speed monitoring
> Enabling movement

The Modicon MCM system provides numerous advantages compared to traditional safety modules, such as:l

> The hardware architecture of expansion modules and layout can be designed according to the machine specification, thus reducing the number of components and the footprint and wiring.
> The input and output wiring can be simplified by software configuration combining multiple functions.
> It allows machine scalability from 8 inputs and 2 dual or 4 single channel outputs and up to 128 inputs,16 dual outputs or 32 single channel outputs and up to 32 or 48 diagnostic status outputs with the expansion modules connected directly to the safety controller CPU or distributed among six islands.
> It can be connected everywhere with a wide range of communication expansion modules
> It is provided with intuitive software for logical configuration, offline simulation and online visualization, testing, and commissioning.
> Machine maintenance is simplified through a removable memory card, which can be used to transfer the configuration to a new safety controller CPU without software.

System components

Modicon MCM is a modular system composed of:

> Safety controller CPUs used as standalone devices or together with expansion modules, with or without integrated communication interface.
> Safe I/O expansion modules: analog, digital, solid state and relay input/output modules
> Safe speed monitoring modules for proximity sensors and safety encoders, safe analog inputs modules: Sin/Cos, HTL, TTL
> Safe communication expansion modules for creating safe islands
> Non-safe communication modules: interfaces to machine fieldbuses (CANopen, Profibus DP, Modbus Serial (RTU), and networks (EtherCAT, Modbus TCP, Ethernet/IP, and PROFINET)
> A configuration software: **SoSafe Configurable**
> A memory card, to save the configuration data and facilitate maintenance and safety controller CPU setup
> Backplane expansion connectors, to provide the connection between the modules and safety controller CPUs.

Software

The Modicon MCM modular safety controllers are supported by **SoSafe Configurable**, a completely intuitive software.

It follows a simple drag and drop function block approach to configuration and is completed with a library of configurable safety functions and logical functions as well as easy-to-use tools for:

> online configuration monitoring
> offline simulation
> configuration validator
> hardware device scanner
> printable schematics and documentation

SoSafe Configurable supports a quick and easy setup of the machine. Configuration data is transferred to the safety controller CPU (XPSMCMCP0802●, XPSMCMC10804●, or XPSMCMC10804E●) via a USB link (see page 23).

Modicon MCM
Modular safety controller
Certification, Directives and standards

System certification

The Modicon MCM modular safety controllers are certified by TüV SÜD as meeting the industrial safety standards of Category 4, PL e according to EN/ISO 13849-1 and SILCL 3 according to IEC/EN 61508 and IEC/EN 60261.

Directives and standards

Modicon MCM modular safety controllers comply with the following directives and standards:

Directives and standards	Subject
2006/42/EC	Machinery Directive
2004/108/EC	Electromagnetic Compatibility (EMC)
2006/95/EC	Low Voltage Directive (LVD)
IEC/EN 61131-2	Programmable Controllers – Part 2: Equipment requirements and tests
EN/ISO 13849-1	Safety of machinery: Safety-related parts of control systems – Part 1: General principles for design
EN/ISO 13849-2	Safety of machinery: Safety-related parts of control systems – Part 2: Validation
EN 61496-1 (Type 4)	Safety of machinery: Electro-sensitive protection equipment, Part 1: General requirements and tests
IEC/EN 62061	Safety of machinery – Functional safety of safety-related electrical, electronic and programmable electronic control systems
EN 61508-1	Functional safety of electrical, electronic and programmable electronic safety-related systems – Part 1: General requirements
EN 61508-2	Functional safety of electrical, electronic and programmable electronic safety-related systems – Part 2: Requirements for electrical, electronic and programmable electronic safety-related systems
EN 61508-3	Functional safety of electrical, electronic and programmable electronic safety-related systems – Part 3: Software requirements
IEC 61784-3	Industrial communication networks – Profiles – Part 3: Functional safety fieldbuses – General rules and profile definitions
CE marking for Europe cULus marking for USA and Canada RCM marking for Australia UKCA marking for United Kingdom	

Modicon MCM
Modular safety controller
Flexibility and scalability, Key figures

Flexibility and scalability

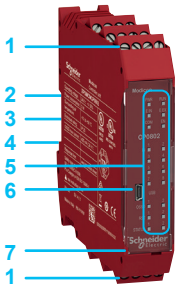
The Modicon MCM modular safety controllers provide flexibility and scalability starting with the safety controller CPU.

> It embeds 8 safety digital inputs, 2 OSSD pairs or 4 single channel OSSD, 2 or 4 status outputs. It is an appropriate solution for machines with a small number of safety functions requiring the configuration flexibility of a safety controller.

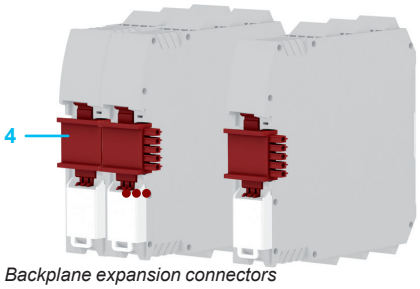
> The safety controller CPU can be used as standalone and also with 14 expansion modules: the system is expandable up to 128 inputs, 16 dual outputs or 32 single channel outputs and up to 32 or 48 diagnostic status outputs, ideal for machines requiring multiple safety function monitoring

Minimum hardware:
- One safety controller CPU used as a standalone device, with 8 safety digital inputs + 2 OSSD pairs or 4 single channel OSSD + 2 or 4 status outputs
- One safety controller CPU with embedded Ethernet based configurable communication protocols, with 8 safety digital inputs + 4 single channel OSSD + 4 status outputs

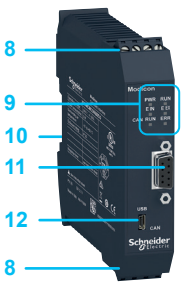
Maximum hardware: One safety controller CPU connected to 14 expansion modules *(1)* via the Backplane expansion connector



Safe components



Backplane expansion connectors



Non safe components: non-safe communication modules

Key figures of Modicon MCM system

> Each component is a compact design: a single module dimensions are 22.5 mm wide x 99 mm high x 114.5 mm deep (*0.89 x 3.9 x 4.51 in*), which is the size of a typical safety relay *(1)*.

> The safe components are red colored and equipped with:

1 Removable spring or screw-type terminal blocks *(2)* for connecting the safety channels and/or the power supply
2 Slot for a memory card (on safety controller only)
3 ⊔ symmetrical rail locking clip
4 Slot for Backplane expansion connector
5 LEDs displaying the status (I/O, communication, power supply, reset, ...)
6 USB 2.0 connector for configuration (on safety controller only)
7 Protective cover

> The non-safe components are black colored and equipped with:

8 Removable spring or screw-type terminal blocks *(3)* for connecting the power supply
9 LEDs displaying the status (I/O, communication, power supply, reset, ...)
10 ⊔ symmetrical rail locking clip
11 Specific connector for connecting to the machine bus or network (depending on model)
12 USB 2.0 connector for configuration

(1) Except the safety CPUs with embedded communication interface XPSMCMC10804E and XPSMCMC10804EG which figure a width of 45 mm (1.8 in).
(2) Each expansion module is provided with a multi-language instruction sheet and a Backplane expansion connector (XPSMCMCN0000SG), except for XPSMCMER0002●/0004●.
(3) Each Modicon MCM component which a part number is ending with a G is equipped with Spring clamp terminal block.

Modicon MCM
Modular safety controller
Safe communication with decentralized I/O's

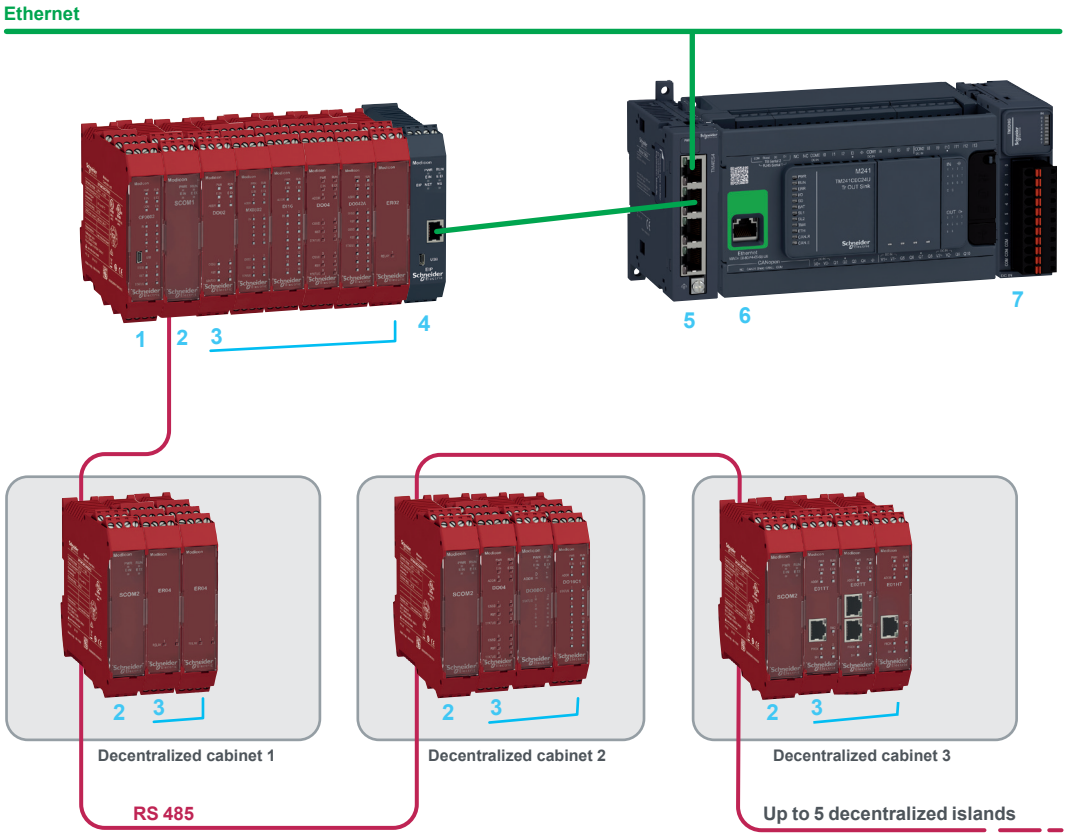
Safe communication with decentralized I/O's

The safety controller CPU has the possibility to monitor up to five decentralized safety-related islands with a distance of 50 m (*164 ft*) between each island on a single Safety controller CPU.

> The safety controller CPU, the expansion modules and the safe communication expansion modules communicate safely through the use of the expansion bus performed with the Backplane expansion connector which is physically located on the back of each safe module.

> The safe communication expansion modules are used in order to create safe decentralized islands (cabinets) ; they are connected in a line or tree configuration.

> The order of the safe expansion modules connected via the Backplane expansion connectors is not important, the configuration automatically recognizes the architecture based on the module addressing.



Safety-related communication

RS 485 serial interface shielded cable (up to 50 m /*164 ft)* between two decentralized islands)

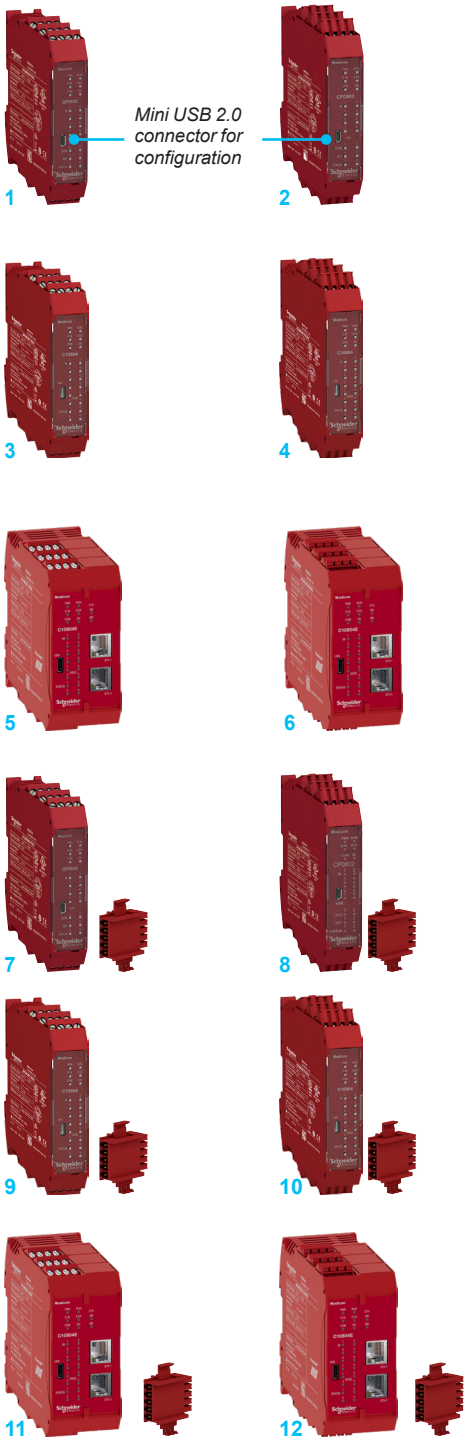
1 Safety controller CPU
2 Safe communication expansion modules (line configuration)
3 Safe I/O expansion modules: mixed I/O modules, Safety relay output modules, Safe speed monitoring modules for proximity sensors and safety encoders

Non-safety-related communication

4 Non-safe communication modules: interfaces to Ethernet/IP network for non-safety-related communication
5 Modicon TM4 communication module (Ethernet switch module) *(1)*
6 Modicon M241 logic controller *(2)*
7 Modicon TM3 I/O expansion module *(3)*

(1) Consult catalog Ref. DIA3ED2140106EN
(2) Consult catalog Ref. DIA3ED2140106EN
(3) Consult catalog Ref. DIA3ED2140109EN

Modicon MCM
Modular safety controller
Safety controller CPUs



Safety controller CPU

XPSMCM●●●●●●G: equipped with a spring clamp terminal block.

Safety controller CPU

The safety controller CPU is designed to monitor a safety configuration created using the software **SoSafe Configurable**.
The safety controller CPU is usable as a standalone device or able to be connected to any of the expansion units of the Modicon MCM system such as/

> I/O expansion modules
> relay output modules
> communication expansion modules
> speed monitoring modules
> non-safe fieldbus communication modules

The safety controller CPU features:

> A configuration memory card (optional)
> A log file containing the last 5 configuration modifications in chronological order, with date of modification
> 24 terminals in 22.5 mm *(0.89 in)*
> Connection with other expansion modules via the Backplane expansion connectors (sold separately)
> USB 2.0 connector for configuration

Reference *(1)*		Description
1 2	XPSMCMCP0802 XPSMCMCP0802G *(2)*	> 8 safety digital inputs > 2 OSSD pairs with 400 mA output current > 4 test outputs for line control monitoring of input circuits > 2 inputs for Start/Restart interlock and external device monitoring (EDM) > 2 configurable status outputs
3 4	XPSMCMC10804 XPSMCMC10804G *(3)*	> 8 safety digital inputs > 4 single channel OSSD with 400 mA output current > 4 test outputs for line control monitoring of input circuits > 4 inputs for Start/Restart interlock and external device monitoring (EDM) > 4 configurable status outputs
5 6	XPSMCMC10804E XPSMCMC10804EG *(4)*	> 8 safety digital inputs > 4 single channel OSSD > 4 status outputs > With an embedded communication interface supporting four protocols (Modbus TCP, Ethernet/IP, EtherCAT, and PROFINET). > The selection of the protocol and setup of the fieldbus param can be done using **SoSafe Configurable** software version 1.9.0 or greater.
7 8	XPSMCMCP0802BC XPSMCMCP0802BCG	> Safety controller with Backplane expansion connector
9 10	XPSMCMC10804B XPSMCMC10804BG	> Safety controller with Backplane expansion connector
11 12	XPSMCMC10804BE XPSMCMC10804BEG	> Safety controller with configurable embedded communication networks, and with Backplane expansion connector

(1) Safety controllers can be equipped with a spring clamp terminal block. The reference ends with a G.
(2) Those safety controllers use USB Mini B.
(3) Those Safety controllers use USB Mini B when the firmware version (SV) is 6.0 or lower, and USB C when the firmware version (SV) is above 8.0.
(4) Those safety controllers use USB C.

Modicon MCM
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Safe I/O expansion modules


1


2

Safe analog I/O expansion modules


3


4


5


6


7


8


9


10

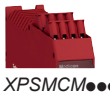

11

Safe digital I/O expansion modules


12


13

Safe mixed I/O expansion modules



XPSMCM●●●●●●G: equipped with a spring clamp terminal block.

Safe I/O expansion modules

The safe expansion modules are designed for safety inputs and outputs.
The safety inputs/outputs are configurable individually or in pairs, with several possibilities:

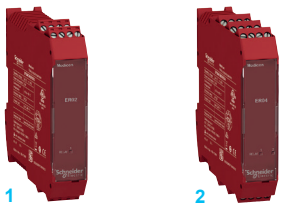
> Monitoring using line control via dedicated test outputs
> Configurable filters and delays for each single input
> Configurable output activation and deactivation delays
> Independent control of pairs of outputs
> Configurable diagnostic output signals
> Simple diagnostics via front *LED* signalling, configuration software, communication expansion modules

	Reference *(1)*	Description
1	XPSMCMAI0200 XPSMCMAI0200G	> 2 configurable analog inputs 0...20 mA/0...10 V (selectable via **SoSafe configurable** software) *XPSMCMAI0200● modules can only be configured with the XPSMCMC10804● safety controller CPUs.*
2	XPSMCMAI0400 XPSMCMAI0400G	> 4 configurable analog inputs 0...20 mA/0...10 V (selectable via **SoSafe configurable** software) *XPSMCMAI0400● modules can only be configured with the XPSMCMC10804● safety controller CPUs.*
3	XPSMCMDI0800 XPSMCMDI0800G	> 8 digital inputs > 4 test outputs for line control monitoring of input circuits
4	XPSMCMDI1200MT XPSMCMDI1200MTG	> 12 digital inputs > 8 test outputs for line control monitoring: dedicated to monitor up to four 4-wire safety mats
5	XPSMCMDI1600 XPSMCMDI1600G	> 16 digital inputs > 4 test outputs for line control monitoring of input circuits
6	XPSMCMDO0002 XPSMCMDO0002G	> 2 OSSD pairs with 400 mA output current > 2 inputs for Start/Restart interlock and external device monitoring (EDM) > 2 configurable status outputs
7	XPSMCMDO0004 XPSMCMDO0004G	> 4 inputs for Start/Restart interlock and external device monitoring (EDM) > 4 OSSD pairs with 400 mA output current > 4 configurable status outputs
8	XPSMCMDO00042A XPSMCMDO00042AG	> 4 single channel solid state OSSD high current (2 A), which can be used as 4 single or 2 dual OSSD + 8 status outputs SIL 1/PL c
9	XPSMCMDO0004S XPSMCMDO0004SG	> 4 single channel OSSD with 400 mA output current > 4 status outputs SIL 1/PL c *XPSMCMDO0004S● modules can only be configured with the XPSMCMC10804● safety controller CPUs.*
10	XPSMCMDO0008C1 XPSMCMDO0008C1G	> 8 digital outputs SIL 1/PL c
11	XPSMCMDO0016C1 XPSMCMDO0016C1G	> 16 digital outputs SIL 1/PL c
12	XPSMCMMX0802 XPSMCMMX0802G	> 8 digital inputs > 2 OSSD pairs with 400 mA output current > 4 test outputs for line control monitoring of input circuits > 2 configurable status outputs > 2 inputs for Start/Restart interlock and external device monitoring (EDM)
13	XPSMCMMX0804 XPSMCMMX0804G	> 8 digital inputs > 4 single channel OSSD with 400 mA output current > 4 test outputs for line control monitoring of input circuits > 4 configurable status outputs > 4 inputs for Start/Restart interlock and external device monitoring (EDM) *XPSMCMMX0804● modules can only be configured with the XPSMCMC10804● safety controller CPU.*

> The safe expansion modules are connected to the safety controller via the Backplane expansion connectors.

(1) Safe I/O expansion module can be equipped with a spring clamp terminal block. The reference ends with a G.

Modicon MCM
Modular safety controller
Safety relay output modules



Safety relay output modules

Safety relay output modules

Five types of safety relay output modules are available.

	Reference *(1)*	Description
1	XPSMCMER0002 XPSMCMER0002G	> 2 forcibly guided contact safety relay output (2 NO + 1 NC) modules for 1 output without expansion bus connection > 1 input for Start/Restart interlock and external device monitoring (EDM)
2	XPSMCMER0004 XPSMCMER0004G	> 4 forcibly guided contact safety relay output (4 NO + 2 NC) modules for 2 independent outputs without expansion bus connection > 2 inputs for Start/Restart interlock and external device monitoring (EDM)
3	XPSMCMER0008 XPSMCMER0008G	> 8 forcibly guided contact safety relay output (8 NO + 4 NC) modules for 4 independent outputs without expansion bus connection > 4 inputs for Start/Restart interlock and external device monitoring (EDM)

> The safety relay output modules **XPSMCMER000●** do not require the Backplane expansion connectors as they are directly wired to the selected OSSD.

4	XPSMCMRO0004 XPSMCMRO0004G	> 4 forcibly guided contact safety relay output modules with expansion bus connection > Expansion module with 4 independent safety relay outputs and the corresponding 4 inputs for the external feedback contacts (EDM) > The relay can be configured according to Category 1, 2 and 4 architectures
5	XPSMCMRO0004DA XPSMCMRO0004DAG	> 4 forcibly guided contact safety relay output modules with expansion bus connection > Expansion module with 4 independent safety relay outputs and the corresponding 4 inputs for the external feedback contacts (EDM) > The relay can be configured according to Category 1, 2 and 4 architectures > 8 configurable status outputs

> The safety relay output modules **XPSMCMRO000●** are connected to the safety controller via the Backplane expansion connector.

(1) Safety relay output module or safe speed monitoring module can be equipped with a spring clamp terminal block. The reference ends with a G.

XPSMCM●●●●●●G: equipped with a spring clamp terminal block.

Modicon MCM
Modular safety controller
Safe speed monitoring modules


1


2


3


4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6


7

Safe speed monitoring modules

Safe speed monitoring modules

The safe speed monitoring modules are designed to monitor zero speed, maximum speed (limited speed), speed range, and direction.

> Up to four logically selectable limited speed thresholds (freely configurable via **SoSafe Configurable** software) for each logical intput (axis)

> The safe speed monitoring modules (excluding XPSMCMEN0200) are equipped with RJ45 connectors (one or two depending on the model) for encoders and terminal blocks for proximity switches

> Maximum input frequency: 500 kHz for encoder monitoring and 5 kHz for proximity sensors

> The modules can be configured with incremental encoders and PNP/NPN proximity switches as described below:

	Reference *(1)*	Description	Connector type
1	XPSMCMEN0100HT XPSMCMEN0100HTG	> 1 input for HTL encoder + 1 or 2 proximity switches	1x RJ45 (ENC1) and terminal blocks for proximity sensor wiring
2	XPSMCMEN0100SC XPSMCMEN0100SCG	> 1 input for Sin/Cos encoder + 1 or 2 proximity switches	1x RJ45 (ENC1) and terminal blocks for proximity sensor wiring
3	XPSMCMEN0100TT XPSMCMEN0100TTG	> 1 input for TTL encoder+ 1 or 2 proximity switches	1x RJ45 (ENC1) and terminal blocks for proximity sensor wiring
4	XPSMCMEN0200 XPSMCMEN0200G	> 2 inputs for proximity switches	Terminal blocks for proximity sensor wiring
5	XPSMCMEN0200HT XPSMCMEN0200HTG	> 1 or 2 inputs for HTL encoders + 1 or 2 proximity switches	2x RJ45 (ENC1/ENC2) and terminal blocks for proximity sensor wiring
6	XPSMCMEN0200SC XPSMCMEN0200SCG	> 1 or 2 inputs for Sin/Cos encoders + 1 or 2 proximity switches	2x RJ45 (ENC1/ENC2) and terminal blocks for proximity sensor wiring
7	XPSMCMEN0200TT XPSMCMEN0200TTG	> 1 or 2 inputs for TTL encoders + 1 or 2 proximity switches	2x RJ45 (ENC1/ENC2) and terminal blocks for proximity sensor wiring

> The safe speed monitoring modules are connected to the safety controller via the Backplane expansion connector.

(1) Safety relay output module or Safe speed monitoring module can be equipped with a spring clamp terminal block. The reference ends with a G.

XPSMCM●●●●●●G: equipped with a spring clamp terminal block.

Modicon MCM
Modular safety controller
Safe communication expansion modules, Non-safe communication modules

1 2
Safe communication expansion modules

Safe communication expansion modules

The safe communication expansion modules enable the connection of a safety controller CPU (XPSMCMCP0802●, XPSMCMC10804●, or XPSMCMC10804E●) with the expansion modules placed remotely (≤ 50 m *(≤ 164 ft)*).
Using RS 485 shielded cable, the two modules (XPSMCMCO0000S1 and XPSMCMCO0000S2) placed at the desired distance can be linked together thus joining the expansion modules to the safety controller CPU.

- **XPSMCMCO0000S2** safe communication expansion module has two independent connection channels; typically used in between two **XPSMCMCO0000S1** modules.
- **XPSMCMCO0000S1** safe communication expansion module has one channel connection for transmitting/receiving data and must be connected as the first or last module.
- Up to five islands can be created using the safe communication modules with a total length of 250 m *(820ft)* and a maximum of 50 m *(164 ft)* between two safe communication modules. The system response time does not change with the use of the safety communication modules.

Reference *(1)*		Description
1	XPSMCMCO0000S1 XPSMCMCO0000S1G	> 1-connection interface: single channel transmitter/receiver *(2)*
2	XPSMCMCO0000S2 XPSMCMCO0000S2G	> 2-cconnection interface: dual channel transmitter/receiver

1 2 3 4 5 6 7
Non-safe communication modules

Non-safe fieldbus communication modules

The non-safe communication modules are designed for diagnostics connection and data communication purposes with machine fieldbuses or network systems.

Reference *(1)*		Network interface	USB for configuration	Connector type
1	XPSMCMCO0000CO XPSMCMCO0000COG	> CANopen	USB Mini B	SUB-D 9-way (female)
2	XPSMCMCO0000EC XPSMCMCO0000ECG	> EtherCAT	USB Mini B	2x RJ45 (in/out)
3	XPSMCMCO0000EI XPSMCMCO0000EIG	> Ethernet/IP	USB Mini B	1x RJ45 (in/out)
4	XPSMCMCO0000EM XPSMCMCO0000EMG	> Modbus TCP	USB Mini B	1x RJ45 (in/out)
5	XPSMCMCO0000MB XPSMCMCO0000MBG	> Modbus Serial (RTU)	USB Mini B	1x RJ45
6	XPSMCMCO0000PB XPSMCMCO0000PBG	> Profibus DP	USB Mini B	SUB-D 9-way (male)
7	XPSMCMCO0000E XPSMCMCO0000EG	Selection of the network is made via **SoSafe Configurable** software for a communication over: > Ethernet/IP > Modbus TCP > EtherCAT > PROFINET	USB C	2x RJ45 (in/out)

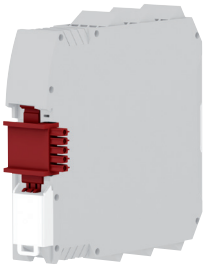
- The non-safe communication modules are connected to the safety controller via the Backplane expansion connector.
- Only one non-safe communication module type can be connected on a safety controller.

(1) Safe communication expansion module and non-safe communication module can be equipped with a spring clamp terminal block. The reference ends with a G.
(2) End of the network or Start of the network if connected to a single RS 485 cable.

XPSMCM●●●●●●G: equipped with a spring clamp terminal block.

Modicon MCM
Modular safety controller
Accessories

Memory card



Backplane expansion connector

Accessories

■ Memory card

The **XPSMCMME0000** removable memory card is used to save configuration data for subsequent transfer to a new device without using a PC.

> The configuration in the XPSMCMME0000 overwrites any other configuration present on the safety controller CPU [XPSMCMCP0802 (G), XPSMCMC10804 (G) or XPSMCMC10804E (G)], replacing the old configuration contained in the card with the newest one.
> This configuration replacement function can be disabled on the safety controller via **SoSafe Configurable** software.
> Overwrite operations are recorded in chronological order in the safety controller CPUT.

■ Backplane expansion connector

XPSMCMCN0000SG Backplane expansion connector provides safe communication between safe expansion components and the safety controller CPU.

> The safety controller CPU [XPSMCMCP0802 (G), XPSMCMC10804 (G) or XPSMCMC10804E (G)] requires the purchase of the Backplane expansion connector.
> Expansion modules are provided with one Backplane expansion connector.
> Use references XPSMCMCP0802BC, XPSMCMCP0802BCG, XPSMCMC10804B, XPSMCMC10804BG, XPSMCMC10804BE, and XPSMCMC10804BEG when I/O expansion is required. The references includes both the safety controller and Backplane expansion connector.

■ Configuration cable

The **TCSXCNAMUM3P** cable is used for software configuration between a PC, the safety controller XPSMCMCP0802 (G), and XPSMCMC10804 (G) (with firmware version (SV) lower or equal than 6.0), and the single fieldbus communication modules.

> Length 3 m *(9.84 ft)*
> It is equipped with USB connectors: USB A and USB mini B

■ Safe communication cable

RS 485 serial interface shielded cable is used between the safe communications expansion modules to create up to six decentralized safety-related islands.

> Available lengths: 10 to 50 m *(33 to 164 ft)*

■ Encoder splitter cable

The encoder splitter cable enables the connection of an embedded encoder within the servo drives (Lexium 32, Lexium 52, and Lexium 62) to the speed monitoring module of the modular safety controller.

> Available lengths: 1 to 5 m *(3.3 to 16.4 ft)*

Modicon MCM
Modular safety controller
Safety controller CPUs


XPSMCMMX0802


XPSMCMC10804


XPSMCMC10804E


XPSMCMCP0802BC


XPSMCMC10804BE

Safety controller CPUs

Description	Inputs	Outputs	Terminal block type	Reference	Weight kg/lb
Safety controller CPUs	8 safety-related digital inputs + 2 for Start/Restart interlock	2 OSSD pairs + 4 test outputs + 2 status outputs	Screw	XPSMCMCP0802	0.250 *0.55*
			Spring clamp	XPSMCMCP0802G	
	8 safety digital inputs + 4 for Start/Restart interlock	4 single channel OSSD with 400 mA output current + 4 configurable status outputs	Screw	XPSMCMC10804	
			Spring clamp	XPSMCMC10804G	
Safety controller CPUs with embedded communication interface supporting four protocols (Modbus TCP, Ethernet/IP, EtherCAT, and PROFINET). (configurable by **SoSafe Configurable** software version 1.9.0 or greater)	8 safety digital inputs + 4 for Start/Restart interlock	4 single channel OSSD with 400 mA output current + 4 configurable status outputs	Screw	XPSMCMC10804E	0.225 *0.49*
			Spring clamp	XPSMCMC10804EG	0.225 *0.49*

Description	Composition	Terminal block type	Reference	Weight kg/lb
Safety controller CPUs combined with Backplane expansion connector	XPSMCMCP0802 + XPSMCMCN0000SG	Screw	XPSMCMCP0802BC	0.260 *0.57*
	XPSMCMC10804 + XPSMCMCN0000SG		XPSMCMC10804B	
	XPSMCMCP0802G + XPSMCMCN0000SG	Spring clamp	XPSMCMCP0802BCG	
	XPSMCMC10804G + XPSMCMCN0000SG		XPSMCMC10804BG	
Safety controller CPUs with embedded communication interface supporting four protocols (Modbus TCP, Ethernet/IP, EtherCAT, and PROFINET) combined with Backplane expansion connector	XPSMCMC10804E + XPSMCMCN0000SG	Screw	XPSMCMC10804BE	0.225 *0.49*
	XPSMCMC10804EG + XPSMCMCN0000SG	Spring clamp	XPSMCMC10804BEG	0.225 *0.49*


XPSMCM●●●●●●G: equipped with a spring clamp terminal block.

Modicon MCM
Modular safety controller
Safe I/O expansion modules


XPSMCMAI0200


XPSMCMAI0400


XPSMCMDI0800


XPSMCMDI1600


XPSMCMDI1200MT


XPSMCMDO0002


XPSMCMDO0004


XPSMCMDO00042A


XPSMCMDO0004S


XPSMCMDO0008C1


XPSMCMDO0016C1


XPSMCMMX0804

Safe I/O expansion modules

Description	Inputs	Outputs	Terminal block type	Reference	Weight kg/*lb*
Safe analog I/O expansion modules					
Safe analog I/O expansion modules	2 configurable analog inputs 0...20 mA/0...10 V (selectable via **SoSafe configurable** software)	–	Screw	XPSMCMAI0200 *(1)*	0.127
			Spring clamp	XPSMCMAI0200G *(1)*	0.164 *0.36*
	4 configurable analog inputs 0...20 mA/0...10 V (selectable via **SoSafe configurable** software)		Screw	XPSMCMAI0400 *(1)*	0.164 *0.36*
			Spring clamp	XPSMCMAI0400G *(1)*	
Safe digital I/O expansion modules					
Safe digital I/O expansion modules	8 digital inputs	4 test outputs	Screw	XPSMCMDI0800	0.230 *0.51*
			Spring clamp	XPSMCMDI0800G	
	12 digital inputs	8 test ouputs for 4-wire safety mats	Screw	XPSMCMDI1200MT	0.250 *0.55*
			Spring clamp	XPSMCMDI1200MTG	
	16 digital inputs	4 test outputs	Screw	XPSMCMDI1600	0.250 *0.55*
			Spring clamp	XPSMCMDI1600G	
	2 for Start/Restart interlock	2 OSSD pairs + 2 configurable status outputs	Screw	XPSMCMDO0002	0.230 *0.51*
			Spring clamp	XPSMCMDO0002G	
	4 for Start/Restart interlock	4 OSSD pairs + 4 configurable status outputs	Screw	XPSMCMDO0004	0.250 *0.55*
			Spring clamp	XPSMCMDO0004G	
	–	4 single channel solid state OSSD high current (2 A), which can be used as 4 single or 2 dual OSSD + 8 status outputs SIL 1/PL c	Screw	XPSMCMDO00042A	0.150 *0.33*
			Spring clamp	XPSMCMDO00042AG	
		4 single channel OSSD with 400 mA output current 4 status outputs SIL 1/PL c	Screw	XPSMCMDO0004S *(1)*	0.138 *0.30*
			Spring clamp	XPSMCMDO0004SG *(1)*	
		8 digital outputs SIL 1/PL c	Screw	XPSMCMDO0008C1	0.130 *0.28*
			Spring clamp	XPSMCMDO0008C1G	
		16 digital outputs SIL 1/PL c	Screw	XPSMCMDO0016C1	0.145 *0.31*
			Spring clamp	XPSMCMDO0016C1G	
Safe mixed I/O expansion modules					
Safe mixed I/O expansion modules	8 digital inputs + 2 for Start/Restart interlock	2 OSSD pairs + 4 test outputs + 2 status outputs	Screw	XPSMCMMX0802	0.250 *0.55*
			Spring clamp	XPSMCMMX0802G	
	8 digital inputs + 4 for Start/Restart interlock	4 single channel OSSD with 400 mA output current + 4 test outputs for line control monitoring of input circuits + 4 configurable status outputs	Screw	XPSMCMMX0804 *(1)*	0.150 *0.33*
			Spring clamp	XPSMCMMX0804G *(1)*	

(1) XPAMCMAI0200●, XPSMCMAI0400●, XPSMCMDO0004S●, and XPSMCMMX0804● modules can only be configured with a XPSMCMC10804 (G), and XPSMCMC10804E (G) safety controllers CPU.


XPSMCM●●●●●●G: equipped with a spring clamp terminal block.

Modicon MCM
Modular safety controller
Safety relay output modules, Safe speed monitoring modules


XPSMCMER0002


XPSMCMER0004


XPSMCMRO0004


XPSMCMER0008


XPSMCMRO0004DA


XPSMCMEN0100HT


XPSMCMEN0100SC


XPSMCMEN0100TT


XPSMCMEN0200


XPSMCMEN0200HT


XPSMCMEN0200SC


XPSMCMEN0200TT

Safety relay output modules

Description	Inputs	Outputs	Terminal block type	Reference	Weight kg/lb
Safety relay output modules (without expansion bus connection)	1 for Start/Restart interlock	2 relays for 1 output (2 NO + 1 NC)	Screw	XPSMCMER0002	0.250 *0.55*
			Spring clamp	XPSMCMER0002G	
	2 for Start/Restart interlock	4 relays for 2 independent outputs (4 NO + 2 NC)	Screw	XPSMCMER0004	0.300 *0.66*
			Spring clamp	XPSMCMER0004G	
	4 for Start/Restart interlock	8 relays for 4 independent outputs (8 NO + 4 NC)	Screw	XPSMCMER0008	
			Spring clamp	XPSMCMER0008G	
Safety relay output modules (connected with theBackplane expansion connector)	4 for Start/Restart interlock	4 relays	Screw	XPSMCMRO0004	0.300 *0.66*
			Spring clamp	XPSMCMRO0004G	
	4 for Start/Restart interlock	4 relays with 8 status outputs	Screw	XPSMCMRO0004DA	0.330 *0.73*
			Spring clamp	XPSMCMRO0004DAG	

Safe speed monitoring modules

Description	■ Inputs (number & type) ■ Connector type	Terminal block type	Reference	Weight kg/lb
Safe speed monitoring modules	■ 1 HTL encoder and 2 proximity sensor inputs *(1)* ■ 1x RJ45 (ENC1)	Screw	XPSMCMEN0100HT	0.280 *0.62*
		Spring clamp	XPSMCMEN0100HTG	
	■ 1 Sin/Cos encoder and 2 proximity sensor inputs *(1)* ■ 1x RJ45 (ENC1)	Screw	XPSMCMEN0100SC	0.280 *0.62*
		Spring clamp	XPSMCMEN0100SCG	
	■ 1 TTL encoder and 2 proximity sensor inputs *(1)* ■ 1x RJ45 (ENC1)	Screw	XPSMCMEN0100TT	0.280 *0.62*
		Spring clamp	XPSMCMEN0100TTG	
	■ 2 inputs for proximity switches *(1)* ■ None	Screw	XPSMCMEN0200	0.230 *0.51*
		Spring clamp	XPSMCMEN0200G	
	■ Up to 2 HTL encoders and 2 proximity sensor inputs *(1)* ■ 2x RJ45 (ENC1/ENC2)	Screw	XPSMCMEN0200HT	0.300 *0.66*
		Spring clamp	XPSMCMEN0200HTG	
	■ Up to 2 Sin/Cos encoders and 2 proximity sensor inputs *(1)* ■ 2x RJ45 (ENC1/ENC2)	Screw	XPSMCMEN0200SC	0.300 *0.66*
		Spring clamp	XPSMCMEN0200SCG	
	■ Up to 2 TTL encoders and 2 proximity sensor inputs *(1)* ■ 2x RJ45 (ENC1/ENC2)	Screw	XPSMCMEN0200TT	0.300 *0.66*
		Spring clamp	XPSMCMEN0200TTG	

(1) Proximity sensor connection via terminal blocks.


XPSMCM●●●●●●G: equipped with a spring clamp terminal block.

Modicon MCM
Modular safety controller
Safe communication expansion modules, Non-safe communication modules


XPSMCMCO0000S1


XPSMCMCO0000S2

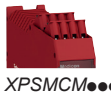
Safe communication expansion modules

Description	Characteristics	Terminal block type	Reference	Weight kg/*lb*
Safe RS 485 bus expansion module for remote extension	1-connection interface: single channel transmitter/ receiver network connection	Screw	XPSMCMCO0000S1	0.300 *0.66*
		Spring clamp	XPSMCMCO0000S1G	
	2-connection interface: dual channel transmitter/ receiver network connection	Screw	XPSMCMCO0000S2	0.300 *0.66*
		Spring clamp	XPSMCMCO0000S2G	


XPSMCMCO0000E

Non-safe communication modules

Description	■ **Fieldbus/network type** - Connector type	Terminal block type	Reference	Weight kg/*lb*
Multi protocol communication module	■ Ethernet/IP, Modbus TCP, EtherCAT or PROFINET (selectable via **SoSafe Configurable** software) - 2x RJ45 (in/out)	Screw	XPSMCMCO0000E	0.300 *0.66*
		Spring clamp	XPSMCMCO0000EG	0.300 *0.66*
Communication modules	■ CANopen - SUB-D 9-way (female)	Screw	XPSMCMCO0000CO	0.300 *0.66*
		Spring clamp	XPSMCMCO0000COG	
	■ EtherCAT - 2x RJ45 (in/out)	Screw	XPSMCMCO0000EC	0.300 *0.66*
		Spring clamp	XPSMCMCO0000ECG	
	■ Ethernet/IP - 1x RJ45 (in/out)	Screw	XPSMCMCO0000EI	0.300 *0.66*
		Spring clamp	XPSMCMCO0000EIG	
	■ Modbus TCP - 1x RJ45 (in/out)	Screw	XPSMCMCO0000EM	0.300 *0.66*
		Spring clamp	XPSMCMCO0000EMG	
	■ Modbus Serial (RTU) - 1x RJ45	Screw	XPSMCMCO0000MB	0.300 *0.66*
		Spring clamp	XPSMCMCO0000MBG	
	■ Profibus DP - SUB-D 9-way (male)	Screw	XPSMCMCO0000PB	0.300 *0.66*
		Spring clamp	XPSMCMCO0000PBG	


XPSMCMCO0000CO


XPSMCMCO0000EC


XPSMCMCO0000EI

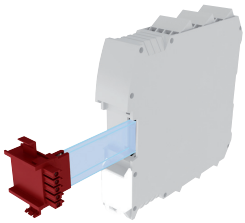

XPSMCMCO0000EM


XPSMCMCO0000MB


XPSMCMCO0000PB

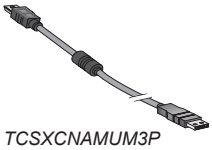
XPSMCM●●●●●●G: equipped with a spring clamp terminal block.

Modicon MCM
Modular safety controller
Accessories



XPSMCMCN0000SG

XPSMCMME0000



TCSXCNAMUM3P

TSXSCMCN0●●

TSXESPP300●

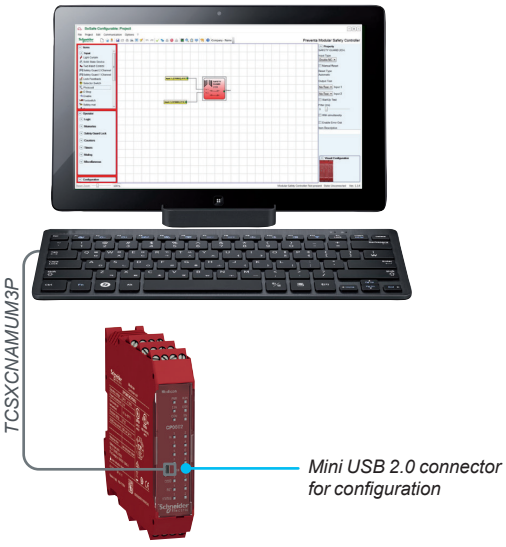
Accessories

Description	Application		Reference	Weight kg/lb
Backplane expansion connector *(1)*	To connect the various expansion modules to the safety controller		XPSMCMCN0000SG	0.001 *0.002*
Memory card	For saving configuration data for subsequent transfer to a new device without using a PC		XPSMCMME0000	0.004 *0.009*
Description	**Use**	**Length**	**Reference**	**Weight kg/lb**
Configuration cable	For software configuration, between a PC, some of the safety controllers, and some of the fieldbus communication modules Equipped with 2x USB connectors: USB A and USB mini B	3 m/*9.84 ft*	TCSXCNAMUM3P	0.065 *0.143*
RS 485 shielded cables	Between two safe communication expansion modules	10 m/*33 ft*	TSXSCMCN010	0.920 *2.03*
		25 m/*82.02 ft*	TSXSCMCN025	2.300 *5.07*
		50 m/*164 ft*	TSXSCMCN050	4.600 *10.14*
Encoder splitter cables	Between SIN/COS safe speed monitoring modules, **Lexium 32/52/62** servo drives and the associated servo motors		TSXESPP3001	0.150 *0.33*
		3 m/*9.84 ft*	TSXESPP3003	0.450 *0.99*
		5 m/*16.40 ft*	TSXESPP3005	0.750 *1.65*

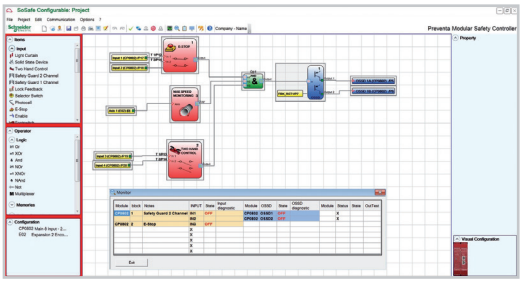
(1) This reference needs to be ordered for the XPSMCMCP0802 safety controller CPU when it is connected to expansion modules only.

Modicon MCM
Modular safety controller
SoSafe Configurable software

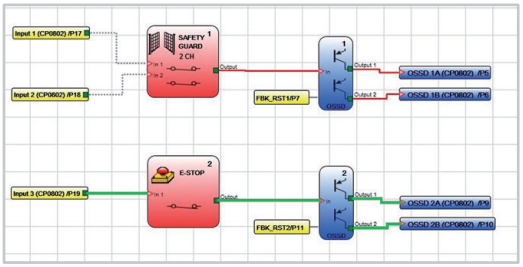
SoSafe Configurable software



Safety controller CPU



Text visualization



Graphic visualization

The I/O MONITOR allows the realtime monitoring of all the I/O in a Modicon MCM system as well as the diagnostic data from a system when it is running..

SoSafe Configurable software

SoSafe Configurable is used to create complex logical conditions using logical operators and safety functions, such as muting, timer, counters, memories, etc. via a simple and intuitive graphic configuration interface.
Configuration data is transferred to the safety controller CPU (XPSMCMCP0802●, XPSMCMC10804●, or XPSMCMC10804E●) via a USB link.

> Safety controller CPUs have a USB 2.0 connection to connect to a PC where the **SoSafe Configurable** software is installed.

> An application held on a safety controller CPU can be saved on the memory card (optional) for fast transfer of the configuration data to other modules.

Password
The software is protected with 2 levels of alphanumerical password (maximum 8 characters.)

> The level 1 password is an operation and maintenance password. It allows to view the log file only and the system and use the real time MONITOR.

> The level 2 password enables access to all features of the software. Users can load, modify, and save a project configuration, as well as download it (from the PC to the safety controller CPU)..

Log file (Level 1 password)

A log file with the creation date and CRC checksum (4-digit hexadecimal identification) of a project are stored in the safety controller.

> A logbook can record up to five consecutive events, after which these are overwritten, starting from the least recent event.

> The log file can be visualized using the icon in the standard tool bar.

Main features

SoSafe Configurable software main features are:

> "Drag & Drop" configuration of all safety functions and logic

> Functional validation of design

> 2-level password management for the prevention of unauthorized access and therefore of incidental modifications or tampering with system configuration

> Configuration of param of function blocks, for example:
- single – or dual – channel NO or NC inputs
- test outputs for monitoring of electro-mechanical input devices and photocells and related electrical connections
- automatic, manual, and monitored manual restart
- synchronization control of two channels
- contact anti-rebound filters and timers
- start-up test.

> Single or bi-directional 2- or 4-sensor muting function blocks

> Online monitoring of I/O status

> Offline simulation of configuration

> Project documentation and schematics

System requirements

SoSafe Configurable is downloadable from our website.
It runs on a PC with:

> RAM: 256 MB

> Hard disk: free space > 300 MB

> USB connector: 1.1 or 2.0

> Microsoft Windows® 10, Microsoft Windows® 7 (32- and 64-bit), Microsoft Windows® 8.1 (32- and 64-bit)

> Microsoft Framework 3.5 (or higher).

> Available language: English

Safety level param

Parameter	Value	Standard
PFH_d	$\geq 10^{-8}$ $PFH_d < 10^{-7}$	IEC 61508
SIL	3	
SILCL	3	IEC 62061
Type	4	EN 61496-1
PL	e	ISO 13849-1
DCavg	High	
$MTTF_d$ (years)	100 years	
Category	4	
Operation life time	20 years	

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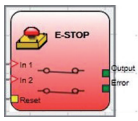
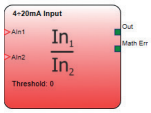
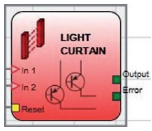
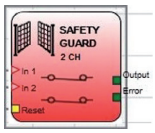
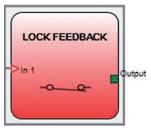
Modular safety controller
SoSafe Configurable software

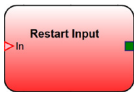


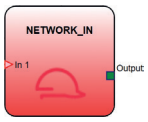


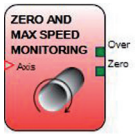


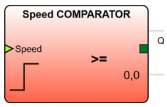


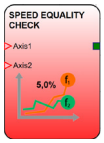


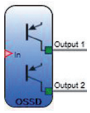


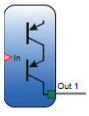












Function blocks

Input objects	
E-STOP	Verifies an emergency stop device inputs status. If the emergency stop button has been pressed (contacts open), the output is 0. Otherwise the output is 1.
SAFETY GUARD	Verifies a mobile guard or safety gate device input status. If the mobile guard or safety gate is open, the output is 0. Otherwise the output is 1.
ENABLE (enable key)	Verifies a manual key device input status. If the key is not turned, the output is 0. Otherwise the output is 1.
LIGHT CURTAIN (optoelectronic safety light curtain/ laser scanner)	Verifies an optoelectronic safety light curtain (or laser scanner) inputs state. If the area protected by the light curtain is occupied (light curtain outputs 0) t,he output is 0. Otherwise, with the area clear and outputs to 1, the output of this function block is 1.
FOOTSWITCH (safety pedal)	Verifies the status of the inputs of a safety pedal device. If the pedal is not pressed, the output is 0. Otherwise the output is 1.
PHOTOCELL (safety photocell)	Verifies the status of the inputs of an optoelectronic safety photocell. If the beam of the photocell is occupied (photocell output 0), the output is 0. Otherwise with the beam clear and an output of 1, the output is 1.
SELECTOR SWITCH	Verifies the status of the inputs from a mode selector (up to 4 inputs). If only one input is 1, the corresponding output is also 1. In all other cases, and thus when all inputs are 0 or more than one input is 1, all the outputs are 0.
TWO HAND CONTROL	Verifies the status of the inputs of a two hand control switch. If both the buttons are pressed within 500 ms, the output is 1. Otherwise the output is 0.
SAFETY MAT (safety mat or safety edge)	Verifies the status of the inputs of a safety mat or safety edge. If a person stands on the mat, the output is 0. Otherwise, with the mat clear, the output is 1. Test outputs must be used. Cannot be used with 2-wire or termination resistance mats.
ENABLE SWITCH	Verifies the status of input Inx of an enabling switch. In the event that the switch is not pressed (position 1) or completely pressed (position 3), the output will be 0. If it is pressed in the middle (position 2), the output will be 1.
TESTABLE SAFETY DEVICE	This function can be used with either every generic input either one or two channels and either NO or NC contacts.
SENSOR	Verifies the status of the of non-safety sensor. If its beam is occupied (sensor output 0), the output is 0. Otherwise, with the beam clear and an output of 1, the output is 1.
LOCK FEEDBACK	Verifies the feedback from the guardlock solenoid generating a 1 when the guardlock is locked and 0 when open.
SWITCH	Verifies the status of the a pushbutton or switch (non-safety switch). If the pushbutton is pressed the output is 1. Otherwise, the output is 0.
SOLID STATE DEVICE	Verifies the status of input INx. If the the inputs are High, the output is 1. Otherwise the output is 0.
FIELDBUS INPUT	Verifies the fieldbus input value signals (up to 8 bits) from the machine control unit via the field-bus module. The signal is connected directly into the configuration.
LL0	0 input value.
LL1	1 input value.
RESTART INPUT	Enables the use of one OSSD dedicated input pin signal to be used for several restart purposes in the application, allowing the safety-related inputs to be used for the restart function.
NETWORK_IN	Used to connect the network inputs to the NETWORK function block. When the inputs are set to TRUE, the associated output is set to TRUE.
Analog monitoring	
ANALOG INPUT	Configures the single or redundant analog input 4... 20 mA or 0... 0V. It is available with XPSMCMC10804● safety controller CPU and XPSMCMAI0400● safe I/O expansion module.
ANALOG DIVISION	Allows the arithmetic division of the values of two inputs. The inputs can be single or redundant. ANALOG DIVISION allows also the configuration of one THRESHOLD COMPARATOR (or one WINDOW COMPARATOR) and an ALERT COMPARATOR.
Speed monitoring	
ZERO SPEED MONITORING	Verifies the speed of a device generating an output 1 when the speed is 0. If the speed is different from 0, generates an output 0.
ZERO AND MAX SPEED MONITORING	Verifies the speed of a device generating an output Zero = 1 when the speed is 0. If the speed is different from 0, generates an output Zero = 0. Moreover, this block verifies the speed of a device generating an output Over = 0 when the speed is over a defined threshold.
MAXIMUM SPEED MONITORING	Verifies the speed of a device generating an output 0 when the speed is over a defined threshold.
SPEED RANGE MONITORING	Verifies the speed of a device generating an output 1 when the speed is within a defined range.
SPEED COMPARATOR	Monitors the speed of two different input devices, checking if they are equal or not.
SPEED EQUALITY CHECK	Compares and monitors the frequency value of one or two encoders.
Output objects	
SINGLE-DOUBLE OSSD (safety outputs)	OSSD semiconductor PNP safety static output single or dual channel (single channel, 400 mA). The outputs can operate independently or in pairs. Each OSSD single or dual channel can work in both AUTO/Manual restart mode and can perform the EDM of external relays or contactors using the dedicated RESTART_FBK input.
STATUS (signal output)	The status outputs are non-safety diagnostic outputs which can be used to provide the status of part of the logic within the configuration.
RELAY	Used with the XPSMCMRO0004● modules and is configurable to Category 1, 2, and 4.
FIELDBUS PROBE OUTPUT	Used to provide the status of part of the logic within the configuration to a PLC or HMI device.

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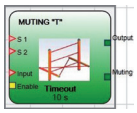

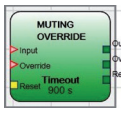

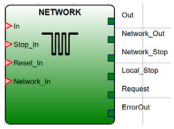

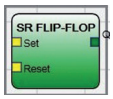

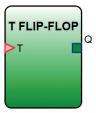

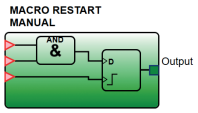

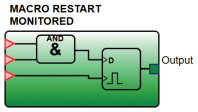

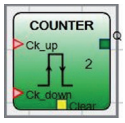

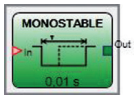

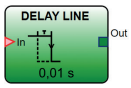

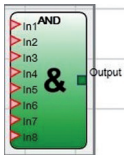

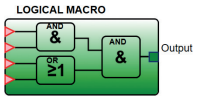

Function blocks

Muting operators	
MUTING "L" with 2 muting sensors, only for one-way openings	Monitors the 2 muting sensors along with the light curtain for L muting setup.
MUTING "T" with 2 muting sensors for two-way openings	Monitors the 2 muting sensors along with the light curtain for T muting setup.
MUTING "SEQUENTIAL" with 4 muting sensors for two-way openings	Monitors the 4 muting sensors along with the light curtain for sequential muting setup.
MUTING "CONCURRENT" with 4 muting sensors for two-way openings	Monitors the 4 muting sensors along with the light curtain for concurrent muting setup.
MUTING OVERRIDE	Forces the output to high to allow the material obstructing the gate to be removed. Two different operations are available: Manual action with hold to run, and Automatic with pulse command.
Analog operators	
ANALOG COMPARATOR	Works as a comparator of an analog signal connected with XPSMCMC10804● controllers only.
MATH	Calculates the sum or the difference of analog signals coming from ANALOG INPUT blocks. This works with XPSMCMC10804● controllers only.
EQUALITY CHECK	Verifies if two analog inputs are equal within a selectable tolerance. This works with XPSMCMC10804● controllers only.
General/Miscellaneous	
SERIAL OUTPUT	Transfers the state of up to a maximum of 8 inputs into a serial line data output.
NETWORK	Allows Stop and Reset commands to be distributed between safety controller CPUs into a local network.
NETWORK-FB RESET	With the Network function a designer can connect up to 10 different CPUs in a single or redundant hard-wired ring to share an emergency stop condition with all the CPU systems in the ring.
INTERPAGE IN AND INTERPAGE OUT	Memory bits which are reused from inputs to multiple outputs.
RESET	Initiates a system reset when there is an OFF-ON-OFF transition on the corresponding input which lasts less than 5 s.
Memory operators	
D FLIP FLOP	Saves the previously set status on output Q on the clock rising edge.
SR FLIP FLOP	Provides an output Q at 1 with Set, 0 with Reset.
T FLIP FLOP	Changes state whenever the input is triggered. If the T input is low, the flip-flop holds the previous value.
T FLIP-FLOP	Switches the Q output on each rising edge of the T input (toggle).
USER RESTART MANUAL	Used to create a common reset for multiple input functions on a rising edge of the reset input.
MACRO RESTART MANUAL	Used to combine a logic gate of your choice with the USER RESTART MANUAL function block according to the pre-defined truth table.
USER RESTART MONITORED	Used to create a common reset for multiple input functions on rising edge and falling edge of the reset input.
MACRO RESTART MONITORED	Used to combine a logic gate of your choice with the USER RESTART MONITORED function block according to the pre-defined truth table.
Counter operator	
COUNTER	Generates a pulse as soon as the set count is reached.
Timer operators	
PULSE GENERATOR	Generates a clock signal output with the desired period if the input In is 1.
MONOSTABLE	Generates a level 1 output activated by the rising edge of the input and remains in this condition for the set time.
MONOSTABLE_B	Generates a 1 (TRUE) output activated by the rising/falling edge of the input and remains in this condition for the set time.
PASSING MAKE CONTACT	The output follows the signal on the input. However, if this is 1 for longer than the set time, the output changes to 0.
DELAY	Applies a delay to a signal by setting the output to 1 after the set time, against a change in the level of the input signal.
DELAY LINE	Applies a delay to a signal by setting the output to 0 (FALSE) after the set time. The delay is set on a falling edge of the input signal.
TIMER	Generates a signal (TRUE or FALSE) for a user-definable period.
Logical operators	
AND	Returns 1 as output if all the inputs are 1.
NAND	Returns 0 as output if all the inputs are 1.
NOT	Inverts the logical state of the input.
OR	Returns 1 as output if at least one of the inputs is 1.
NOR	Returns 0 as output if at least one of the inputs is 1.
XOR	Returns 0 as output if all the inputs are in the same logical state.
XNOR	Returns 1 as output if all the inputs are in the same logical state.
MULTIPLEXER	Forwards the signal of the inputs to the output according to the Sel selection.
LOGICAL MACRO	Enables the grouping of two or three logic gates. The result of the third logic gate is provided at the output.
IntFbk	
INTFBK IN & INTFBK OUT	Configures up to 8 internal feedback loops. Possible to connect the output of a function block by using the IntFbk_Out operator to the input of a function block by using the IntFbk_In operator. This works with XPSMCMC10804● controllers only.

Modicon MCM
Modular safety controller
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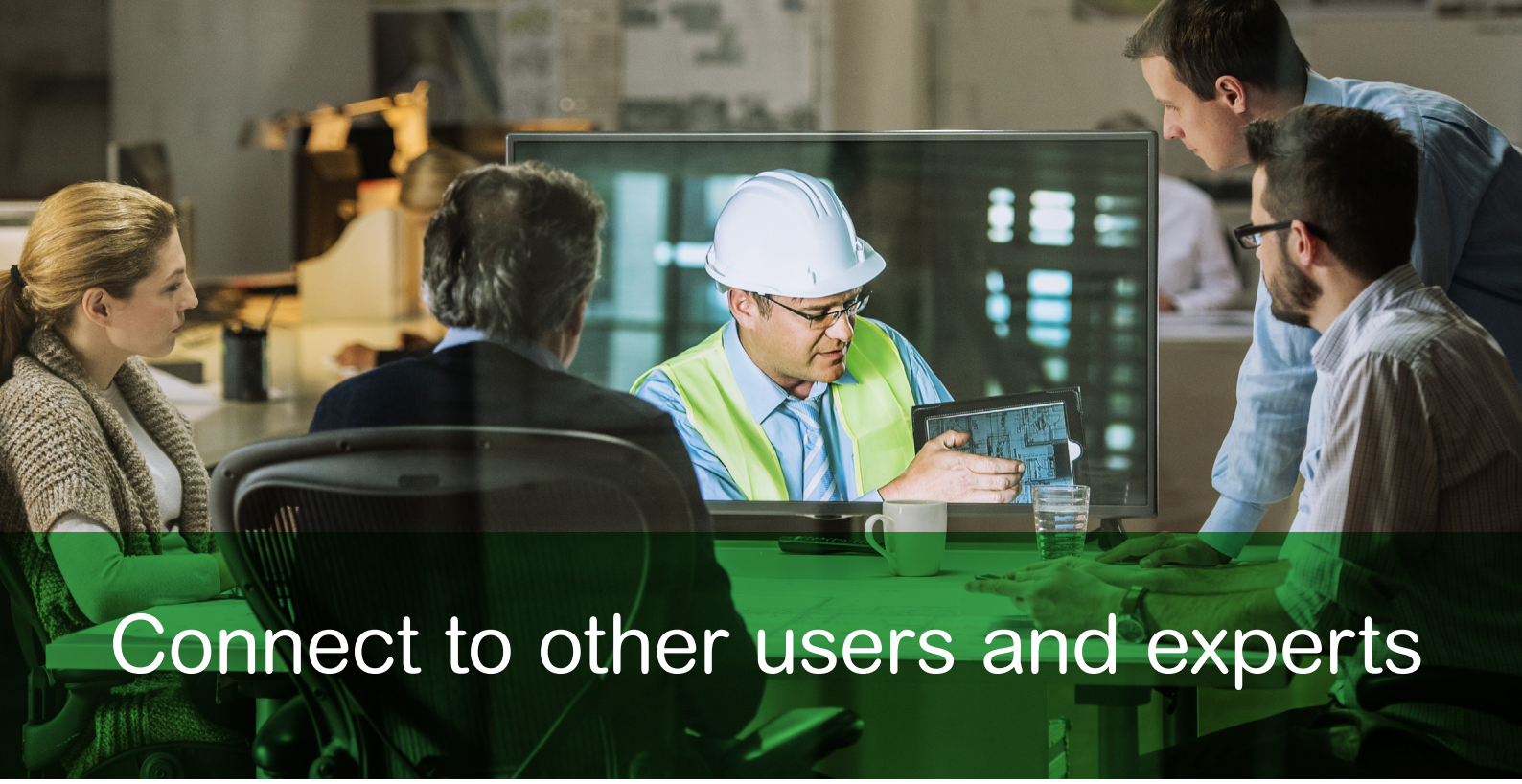

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- Engineering software

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