Modicon M171/M172 logic controllers, and software

Catalog

October 2015

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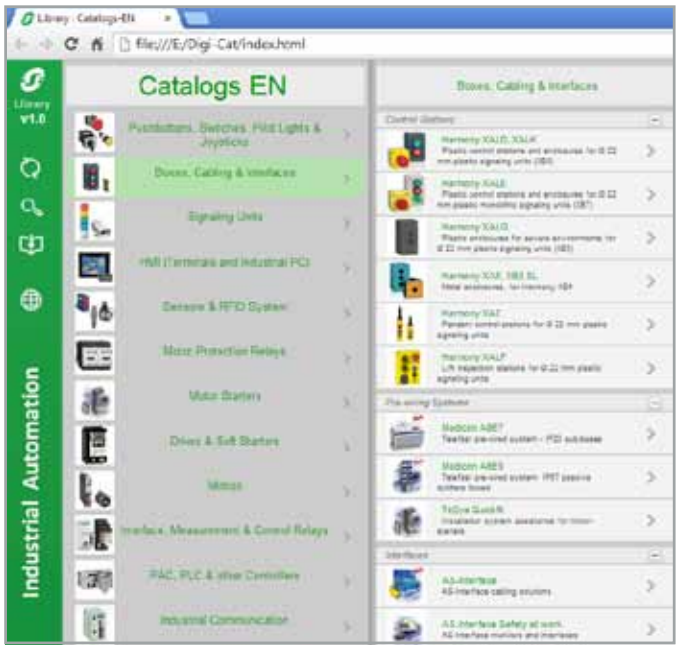

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General contents

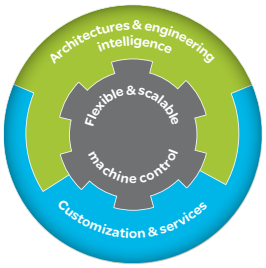
Modicon M171/M172 logic controllers, and software

SoMachine HVAC programming software

Product reference index

Modicon M171/M172 logic controllers

Maximize your business and machine performance with MachineStruxure

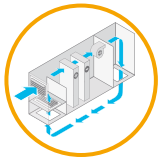


Machine builders are constantly looking for new ways to design and build more innovative machines in less time and at lower costs. MachineStruxure™ can help.

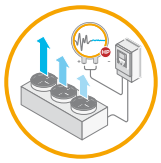
The NEXT generation of MachineStruxure™ is a complete machine automation solution that provides flexible and scalable machine control, ready-to-use architectures, efficient engineering solutions, and comprehensive customization and engineering support services. It can help to meet your challenges for improved efficiency and greater productivity, as well as allow to deliver higher added value to your customers throughout the entire machine life cycle.

Ready-to-use architectures and function blocks

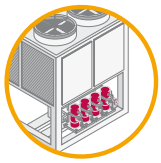
- Tested, Validated, and Documented Architectures (TVDAs) are just one of the ways we help to reduce design time.
- Whether machines are simple or complex, Application Function Blocks (AFBs) make system design fast and easy.



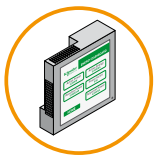
Fan management



Floating High Pressure control



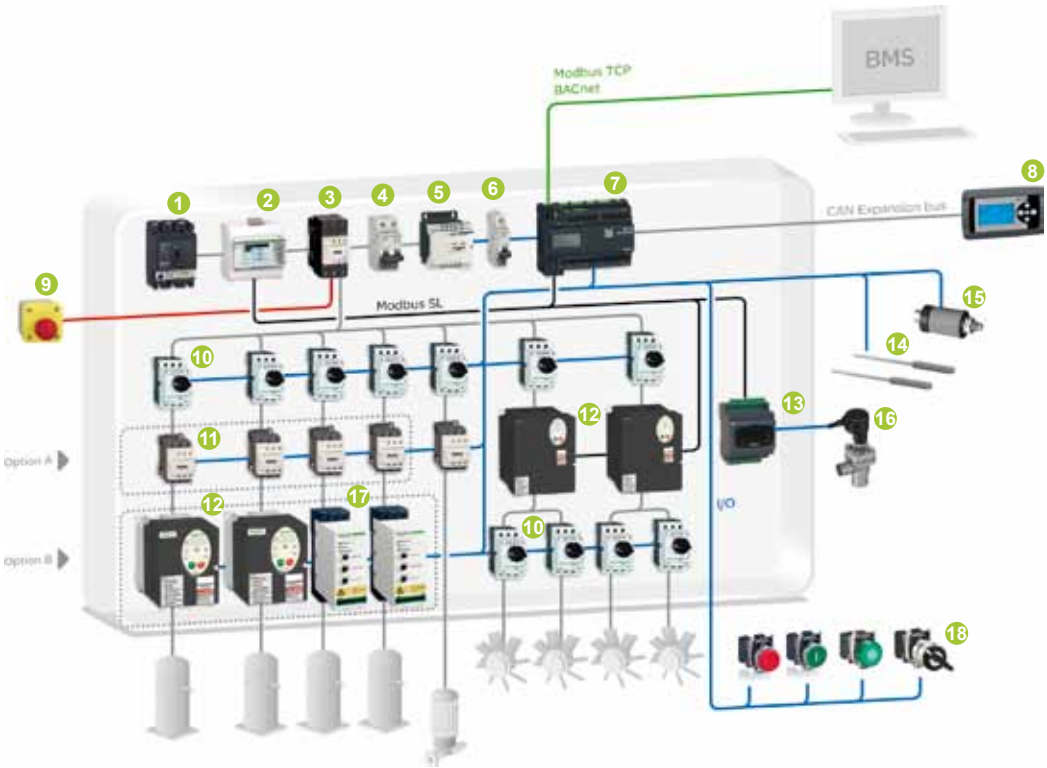
Compressor management



Energy management

Application Function Blocks (AFBs)

Modicon M171/M172 is part of MachineStruxure



HVAC/Chiller/Modbus SL/Modicon M172 performance logic controller

Solution breakdown

1 **Compact NSX** circuit breaker
2 **iEM3000** Energy Meter
3 **TeSys D** contactor
4 **C60L-MA** modular circuit breaker
5 **Phaseo** switch mode power supply
6 **C60L-DC** DC circuit breaker
7 **Modicon M172** performance logic controller
8 **Modicon M171** remote display
9 **Harmony XALK** Emergency stop push button
10 **TeSys GV2L** magnetic circuit breaker
11 **TeSys D** contactor
12 **Altivar 212** variable speed drive, for 0.75 to 75 kW *(1.0 to 100 hp)* motors
13 **Modicon M171** electronic expansion valve driver
14 **Modicon TM1S●●●●** humidity and temperature probes
15 **OsiSense XMLP** pressure sensors
16 Electronic expansion valve
17 **Altistart 01** soft starter
18 **Harmony XB4/XB5** control & signaling units

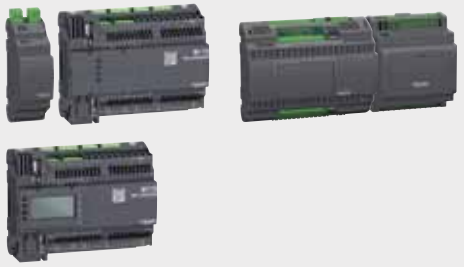
Modicon M171/M172 logic controllers
Improve efficiency

Improve efficiency

Flexible and scalable performance

Whether you focus on chillers, Air Handling Units for commercial buildings, residential, or industrial applications...
With the range of Modicon M171/M172 logic controllers, the next generation of MachineStruxure™ is now better positioned than ever.
Multiple BMS (Building Management System) connectivity, embedded or in option, and an embedded web server enable ease in remote control; while a unique software environment supports the development of algorithms and functions that can be used on all platforms.

Modicon M172 performance logic controllers



Modicon M171 performance logic controllers

Modicon M171 optimized logic controllers

Scalability ★

Performance and connectivity

- Best-in-class versatility and compact size ★
- Best-in-class performance

- Modicon™ **M171 optimized** logic controller for simple and compact machines is one of the smallest programmable controllers on the market. Available also for flush mounting, it requires minimal installation time and offers tremendous versatility.
- Modicon™ **M171 performance** logic controller for complex and BMS connectable machines can be adapted to virtually any application.
- Modicon™ **M172 performance** logic controller for large and connected machines with more scalability and connectivity.

Modicon M171/M172 logic controllers
Increase profitability
Reduce time-to-market

Increase profitability

Everything needed is embedded

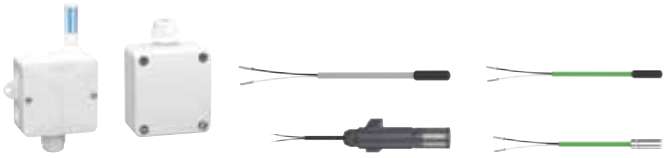
The high degree of flexibility makes it very easy to install additional modules and still keep everything in just one configuration:
- Remote displays
- Expansion modules
- Communication modules
- Wall thermostats
- Wide range of humidity and temperature probes

Remote displays

Expansion modules

Communication modules

Wall thermostat



Humidity and temperature probes

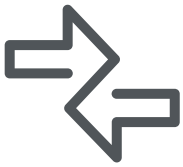
Reduce time-to-market

Intuitive automation with SoMachine HVAC

SoMachine™ HVAC is the universal programming software for machines automated by Modicon M171/M172 logic controllers.
Simplified navigation that requires only a few clicks delivers a more efficient engineering process.

SoMachine HVAC simplifies every step in machine design and commissioning

Simplify integration and maintenance



Connected everywhere

Integration into machines and management systems has never been easier – many needed connectivity features are embedded in the offer:

- Modbus RTU
- BACnet/IP and MS/TP (B-AAC profile)
- Modbus TCP with Webvisu embedded
- ASCII support for GSM Modem
- Profibus
- CAN
- LonWorks (FFT-10)

Customization and services

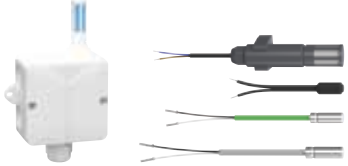
Our experts help you every step of the way, from perfecting machine design to on-site services of the finished machine.
Global support, 24/7 hotline services, and replacement parts centers around the world enable you to deliver superior customer support and satisfaction.

Modicon M171/M172 logic controllers
General presentation

1 *Remote LED display*
2 *Wall thermostat*
3 ***M171 optimized** logic controller*
4 *I/O expansion module*

1 *Remote LCD display*
2 *Communication module*
3 ***M171 performance** logic controller*
4 *I/O expansion module*
5 *Electronic expansion valve driver*

1 *Remote LCD display*
2 *Communication module*
3 ***M172 performance** logic controller*
4 *I/O expansion module*
5 *Electronic expansion valve driver*



Measurement accessories

Presentation

The Modicon M171/M172 logic controller range has been developed to manage digital and analog inputs and outputs, to offer numerous possibilities for connection to different Building Management System communication networks.

Modicon M171/M172 range

The range of Modicon M171/M172 comprises 21 logic controllers, programmable with SoMachine HVAC software, and is divided in 3 types: **M171 optimized** logic controllers, **M171 performance** logic controllers and **M172 performance** logic controllers.

■ **M171 optimized** logic controllers are suitable for customized applications designed to control simple and compacts machines:
- □ Air/water-cooled chiller
- □ Rooftop unit
- □ Heat pump
- □ Compressor rack
- □ Ventilation unit

■ **M171 performance** logic controllers type are suitable for customized applications designed to control complex and BMS connectable machines:
- □ Air/water-cooled chiller
- □ Rooftop unit
- □ Heat pump
- □ Precision air conditioner
- □ Booster station
- □ Compressor rack
- □ Heat recovery unit

■ **M172 performance** logic controllers increase the scalability and the connectivity achieved by M171 performance controllers. They control the same type of applications as the Modicon M171 performance do, and embed more universality and connectivity.

System components

The offer range comprises:

■ 21 logic controllers:
- □ 10 **M171 optimized** logic controllers,
- □ 5 **M171 performance** logic controllers
- □ 6 **M172 performance** logic controllers

The Modicon M171/M172 logic controllers are available with or without embedded display. See pages 12, 16 and 18.

■ 5 I/O expansion module types (mixed digital and analog):
- □ 2 **TM171EP●●R** for **M171** and **M172 performance** logic controllers
- □ 3 **TM171EO●●R** for **M171 optimized** logic controllers. See page 20.

■ 5 remote displays (LED or LCD technology):
- □ 1 **TM171DGRP** for for **M171** and **M172 performance** logic controllers
- □ 4 **TM171D●●●●** for **M171 optimized** logic controllers. See pages 14, 17 and 19.

■ 8 **TM171A●●●●** communication modules (BMS fieldbus interfaces) to provide to the **M171** and **M172 performance** logic controllers a connection to:
- □ BACnet MS/TP (B-AAC profile) or IP
- □ Modbus SL (Serial Link)
- □ Modbus TCP
- □ LonWorks (FFT-10)
- □ Profibus
- □ CAN bus
- □ etc, see page 21.

■ 3 **TM171VEV●●** electronic expansion valve drivers compatible with the entire Modicon M171/M172 logic controller range and also with third party controllers and electronic expansion valves. See page 24

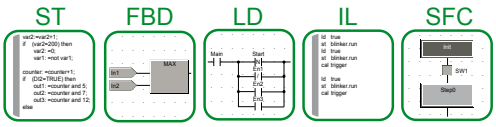
■ 23 specific measurement accessories: **TM1S●●●●** humidity and temperature probes. See page 25.

■ Adapted connection accessories: I/O connectors and cables. See pages 15 and 21.

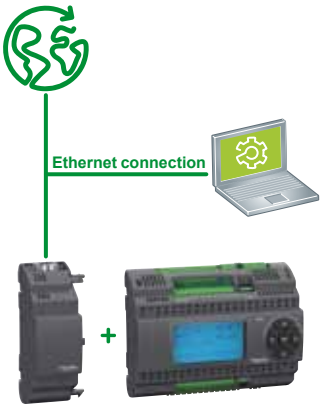
■ SoMachine HVAC programming software. See page 26.

■ Programming accessories. See page 27.

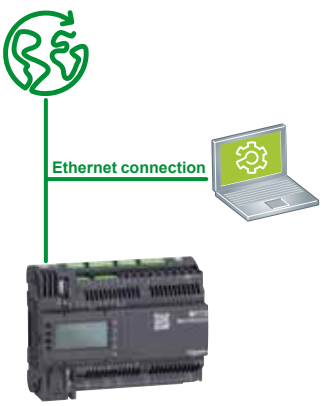
SoMachine HVAC programming software



5 languages compliance IEC 61131-3



*Communication module (TM171AETH or TM171AETHRS485) and **M171 performance** logic controller*



***M172 performance** logic controller*

General presentation (continued)

Configuration software

Modicon M171/M172 logic controllers are supported by a completely intuitive software package SoMachine HVAC (see page 26).

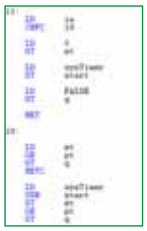
- SoMachine HVAC uses 5 languages compliance IEC 61131-3.
- This software follows a simple drag and drop function block approach to configuration and is completed with a library of Application Function Blocks (AFBs) and logic functions.
- This software runs with 5 programming languages.
- Examples:

□ ST language

□ FBD language

□ LD language

□ IL language



□ SFC language

Available resources on logic controllers for IEC programming

	Logic controller type		
	M171 optimized	**M171 performance**	**M172 performance**
CPU	14.7 MHz	72 MHz, 32 MB RAM	120 MHz, 32 MB RAM
Available memory for application	188 kB	1.0 MB	1.0 MB
Available memory for user interface	–	1.5 MB	1.5 MB
Flash memory data	–	126 MB	5 MB
RAM memory (automatic mapping)	2048 B (1024 word)	512 kB (256000 word)	512 kB (256000 word)
RAM memory (Modbus mapping)	1024 B (512 word)	10 kB (5000 word)	10 kB (5000 word)
EEPROM variables	1024 B (512 word)	28 kB (14000 word)	28 kB (14000 word)

Ethernet connection

Ethernet access is available on **performance** logic controllers:

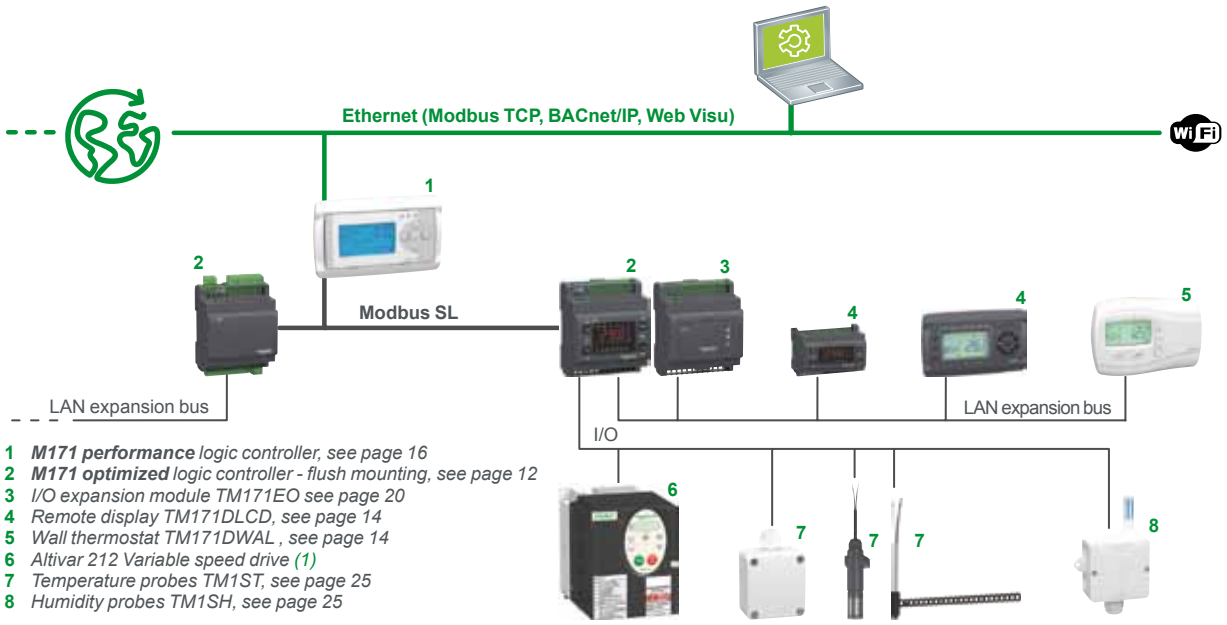
- Ethernet access is optional with **M171 performance** logic controllers by means of a communication module
- Ethernet access is embedded with **M172 performance** logic controllers.

Ethernet access enables several functions to **M171** and **M172 performance** logic controllers, such as:

> Text e-mail (via NMTP server)
> TFTP transfer protocol (for M171 performance only)
> DNS
> Program transfers (upload/download)
> Online debugging
> Firmware updates
> Parameter management
> File management (virtual FTP)
> Bridge: specific function allowing PLCs to be configured via the performance logic controllers, on Modbus
> WebVisu

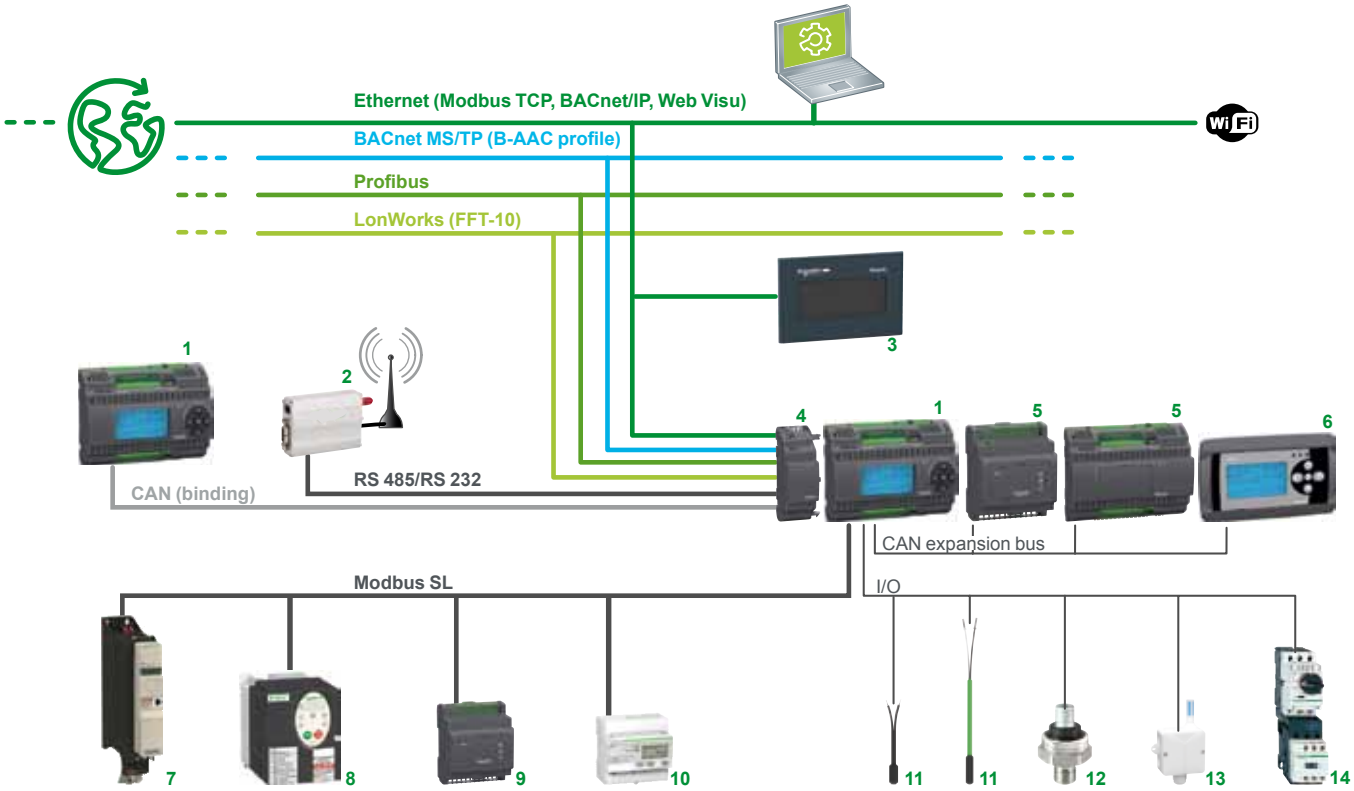
General presentation (continued)

Modicon M171 optimized logic controllers for simple and compact machines



1 ***M171 performance*** *logic controller, see page 16*
2 ***M171 optimized*** *logic controller - flush mounting, see page 12*
3 *I/O expansion module TM171EO see page 20*
4 *Remote display TM171DLCD, see page 14*
5 *Wall thermostat TM171DWAL , see page 14*
6 *Altivar 212 Variable speed drive (1)*
7 *Temperature probes TM1ST, see page 25*
8 *Humidity probes TM1SH, see page 25*

Modicon M171 performance logic controllers for complex and BMS connectable machines

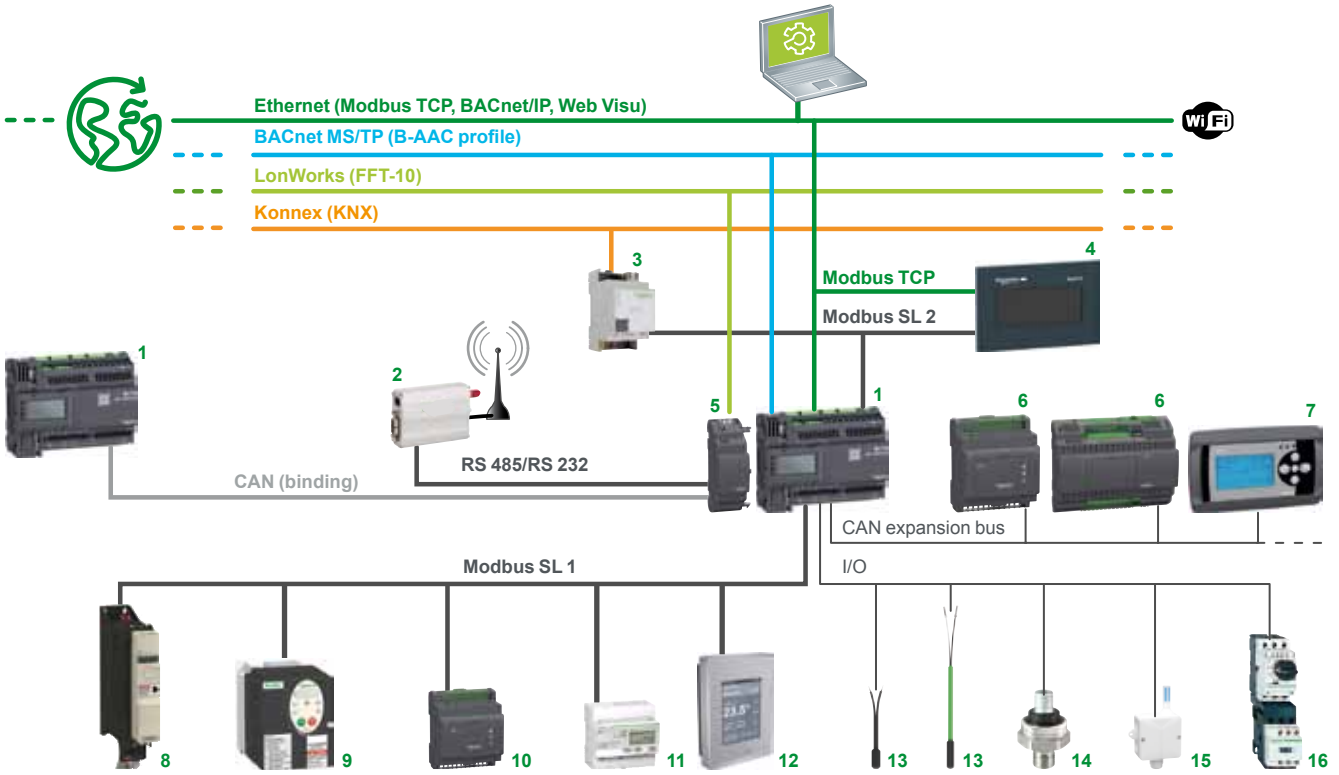


1 ***M171 performance*** *logic controller, see page 16*
2 *Modem*
3 *HMI Magelis STO/STU (1)*
4 *Communication module, see page 22*
5 *I/O expansion module TM171EP, see page 20*
6 *Remote display TM171DGRP, see page 17*
7 *Altivar 32 Variable speed drive (1)*
8 *Altivar 212 Variable speed drive (1)*
9 *Electronic expansion valve driver TM171VEV, see page 24*
10 *Energy Meter iEm 3000 (1)*
11 *Temperature probes TM1ST, see page 25*
12 *XMLP pressure transmitters (2)*
13 *Humidity probes TM1SH, see page 25*
14 *TeSys D contactor (1)*

(1) Schneider Electric offer: please consult our web site: www.schneider-electric.com
(2) Partner offer: please consult on the web site www.tesensors.com/global

General presentation (continued)

M172 performance logic controllers for large and connected machines



1 ***M172 performance*** *logic controller, see page 18*
2 *Modem*
3 *spaceLYnk gateway (1)*
4 *HMI Magelis STO/STU (1)*
5 *Communication module TM171ALON, see page 22*
6 *I/O expansion module TM171EP, see page 20*
7 *Remote display TM171DGRP, see page 17*
8 *Altivar 32 Variable speed drive (1)*
9 *Altivar 212 Variable speed drive (1)*
10 *Electronic expansion valve driver TM171VEV, see page 24*
11 *Energy Meter iEm 3000 (1)*
12 *Room controller SE8000 (1)*
13 *Temperature probes TM1ST, see page 25*
14 *XMLP pressure transmitters (2)*
15 *Humidity probes TM1SH, see page 25*
16 *TeSys D contactor (1)*

(1) Schneider Electric offer: please consult our web site: www.schneider-electric.com
(2) Partner offer: please consult on the web site www.tesensors.com/global

Modicon M171/M172 logic controllers

Modicon M171 optimized, Modicon M171 performance, and Modicon M172 performance logic controllers

Applications		**M171 optimized** logic controllers for simple and compact machines ■ Air/water-cooled chiller ■ Rooftop unit ■ Heat pump ■ Compressor rack ■ Ventilation unit	**M171 performance** logic controllers for complex and BMS connectable machines ■ Air/water-cooled chiller ■ Rooftop unit ■ Heat pump ■ Precision air conditioner ■ Booster station ■ Compressor rack ■ Heat recovery unit	**M172 performance** logic controllers for large and connected machines
				
Programming software		SoMachine HVAC V1.0 or higher	SoMachine HVAC V1.0 or higher	SoMachine HVAC V2.0 or higher
Maximum number of I/O with expansion modules		44 / 28	351 / 327	366
Generic programmable inputs	Digital input	6 digital inputs / 2 digital inputs	9 digital inputs / –	8 or 12 digital inputs
	analog input	5 configurable analog inputs / 5 configurable analog inputs	6 configurable analog inputs / 3 configurable analog inputs	8 or 12 analog inputs
Generic programmable outputs	Digital output	6 digital outputs / 4 digital outputs	7 digital outputs / –	12 digital outputs
	analog output	5 analog outputs / 5 analog outputs	5 analog outputs / –	4 or 6 analog outputs, 8 or 12 digital outputs
Communication	Embedded communication port	□ 1 wired connector for LAN expansion bus □ 1 wired connector for Modbus SL master/slave for TM171O●M●●●	□ 1 removable connector for CAN expansion bus □ 1 removable connector for Modbus SL master/slave	□ 1 removable connector for CAN expansion bus □ 1 RJ45 connector for Modbus TCP and BACnet IP (B-AAC profile) (Webvisu) □ 2 removable connectors for Modbus SL master/slave (Only 1 Master) or 1 BACnet MS/TP (B-AAC profile)
	Optional communication	None except with a gateway	With **TM171A●●●** communication modules: □ Modbus TCP (WebVisu) □ Modbus SL □ BACnet MS/TP (B-AAC profile) □ BACnet IP (B-AAC profile) (Webvisu) □ CAN bus □ RS 232 □ Profibus □ LonWorks (FFT-10)	None except with a gateway	With **TM171A●●●** communication modules: □ Modbus SL □ BACnet MS/TP (B-AAC profile) □ BACnet IP (B-AAC profile) (Webvisu) □ CAN bus □ RS 232 □ LonWorks (FFT-10)
	USB port	No (program can be downloaded with the TM171AMFK programming stick and TM171ADMI programming cable)	Yes: 1 USB-A and 1 USB-Mini-B	No	Yes: 1 USB-A and 1 USB-Mini-B
	Services	Remote download through Modbus SL	□ Remote download □ File management (virtual FTP) □ Text e-mail □ Datalogging		
Power supply		∿ 12-24 V or ⎓ 24 V for all, ∿ 12-24 V for TM171O●●22S / ∿ 100...240 V, isolated	≂ 24 V or ⎓ 48 V		≂ 24 V
Display	Built-in	Yes, on TM171OD●22● / Yes / Yes, on TM171ODM14R	Yes, on TM171PDM27● controllers / Yes		Yes, on TM172PDG●●● controllers
	Remote	Yes, with TM171DLED, TM171DLCD, and TM171DWAL2● displays Or with HMI Magelis offer, Please consult on our web site www.schneider-electric.com	Yes, with TM171DGRP display Or with HMI Magelis offer, Please consult on our web site www.schneider-electric.com		
Mounting		35 mm /*1.38 in.* ⊔ rail / Flush mounting / 35 mm/*1.38 in.* ⊔ rail	35 mm/*1.38 in.* ⊔ rail / Flush mounting		35 mm/*1.38 in.* ⊔ rail, or on panel with an accessory
Product certifications		CE, cURus, CSA, EAC	CE, cURus, CSA, EAC		CE, cURus *(2)*, CSA *(3)*, EAC *(3)*
Logic controller reference		**TM171O●●22●** / **TM171OF22R TM171OFM22R** / **TM171O●M14R TM171OD14R**	**TM171PDM27● TM171PBM27R** / **TM171PFE03●●**		**TM172P●G27● TM172P●G42●**
Page		12 and 13	16 and 17		18 and 19

(1) On the same port at the same time.
(2) November 2015
(3) Pending

More technical information on www.schneider-electric.com

Modicon M171/M172 logic controllers
M171 optimized logic controllers

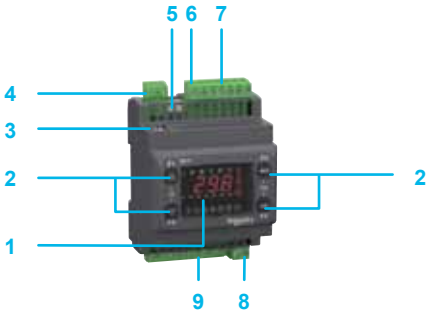
Presentation

The **M171 optimized** logic controllers comprise 10 models that can be used to control from 14 up to 22 embedded I/Os (digital and analog).

- 2 types of power supply are available:
  - ∿ 100-240 V
  - ∿ 12-24 V or ⎓ 24 V
- 2 types of housing:
  - with built-in display
  - with remote display that can be added through the LAN expansion bus.
- 2 types of mounting:
  - Flush mounting: controllers to be mounted on a cabinet door
  - 35 mm/*1.38 in.* ⊔ rail mounting: controllers to be mounted inside a cabinet
- Optimized logic controllers embed up to 2 communication ports (depending on the model):
  - 1 optional Modbus SL bus
  - 1 LAN expansion bus
- The **M171 optimized logic controllers are** certified CE, cURus, CSA, EAC.

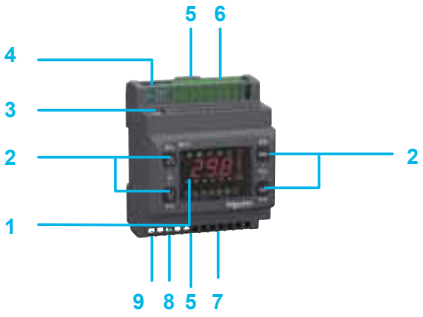
Description

35 mm/*1.38 in.* ⊔ rail mounting optimized controllers



TM171O●14R optimized logic controllers *(1)*

1 Display
2 4 navigation keys for setting controller parameters
3 Programming port (TTL)
4 Removable terminal block for RS 485 serial port (TM171O●M14R)
5 Wired connector for LAN expansion bus
6 Mounting clip for 35 mm/*1.38 in.* ⊔ rail mounting
7 Removable terminal block for digital outputs
8 Removable terminal block for ∿ 100…240 V power supply
9 Removable terminal block for I/Os



TM171O●22R● optimized logic controllers *(1)*

1 Display
2 4 navigation keys for setting controller parameters
3 Programming port (TTL)
4 Wired connector for RS 485 serial port (TM171O●M14R)
5 Mounting clip for 35 mm/*1.38 in.* ⊔ rail mounting
6 Removable terminal block for outputs
7 Wired connector for ∿ 12-24 V or ⎓ 24 V power supply, and for low voltage I/Os
8 Wired connector for analog output
9 Wired connector for LAN expansion bus

Flush mounting controllers

TM171OF●22R● optimized logic controllers *(1)*

1 Display
2 4 navigation keys for setting controller parameters
3 Wired connector for RS 485 serial port (TM171OF●M22R)
4 Wired connector for analog outputs
5 Wired connector for LAN expansion bus
6 Programming port (TTL)

(1) Connectors to be ordered separately, see page 15.

Modicon M171/M172 logic controllers
M171 optimized logic controllers


TM171OBM14R


TM171OD14R


TM171ODM14R


TM171OB22R


TM171OBM22R


TM171OD22R


TM171ODM22R


TM171ODM22S


TM171OF22R


TM171OFM22R

Power supply: ∿ 100-240 V

35 mm/*1.38 in.* ⊔ rail mounting optimized controllers

No. of I/Os	Number and type of channels: Inputs	Number and type of channels: Outputs	Display	Embedded communication	Reference	Weight kg/*lb*
14	**2 digital inputs:** 2 open collector or digital inputs *(1)* **5 configurable analog inputs:** □ 2 NTC, PT1000, or digital inputs □ 2 NTC, 0-20 mA, 4-20 mA, 0-10 V, 0-5 V, 0-1 V, or digital inputs □ 1 NTC, PT1000, 0-20 mA, 4-20 mA, 0-10 V, 0-5 V, 0-1 V, or digital inputs	**4 digital outputs:** □ 3 SPST (2 A, ∿ 230 V) with the same common □ 1 SPDT (2 A, ∿ 230 V) **5 analog outputs:** □ 2 open collector *(1)* for 12 V PWM/PPM or digital inputs □ 2x 0-10 V □ 1x 4-20 mA	Remote display (optional)	□ 1 wired connector for Modbus SL (master/slave) □ 1 wired connector for LAN expansion bus	**TM171OBM14R**	0.190/ *0.420*
			Built-in display	□ 1 wired connector for LAN expansion bus	**TM171OD14R**	0.190/ *0.420*
				□ 1 wired connector for Modbus SL (master/slave) □ 1 wired connector for LAN expansion bus	**TM171ODM14R**	0.190/ *0.420*

Power supply: ∿ 12-24 V or ⎓ 24 V *(2)*

35 mm/*1.38 in.* ⊔ rail mounting optimized controllers

22	**6 digital inputs:** □ 6 volt-free in 1 group **5 configurable analog inputs:** □ 3 NTC or digital inputs □ 2 NTC, 0-20 mA, 4-20 mA, 0-10 V, 0-5 V, 0-1 V, or digital inputs	**6 digital outputs:** □ 3 SPST (2 A, ∿ 230 V) with the same common □ 2 SPST (2 A, ∿ 230 V) with independent common □ 1 open collector **5 analog outputs:** □ 2 open collector for 12 V PWM/PPM □ 3x 0-10 V	Remote display (optional)	□ 1 wired connector for LAN expansion bus	**TM171OB22R**	0.190/ *0.420*
				□ 1 wired connector for Modbus SL (master/slave) □ 1 wired connector for LAN expansion bus	**TM171OBM22R**	0.190/ *0.420*
			Built-in display	□ 1 wired connector for LAN expansion bus	**TM171OD22R**	0.190/ *0.420*
				□ 1 wired connector for Modbus SL (master/slave) □ 1 wired connector for LAN expansion bus	**TM171ODM22R**	0.190/ *0.420*
		6 digital outputs: □ 3 SPST (2 A, ∿ 230 V) with the same common □ 2 SSR (3 A, ∿ 230 V) □ 1 open collector **5 analog outputs:** □ 2 open collector for 12 V PWM/PPM □ 3x 0-10 V	Built-in display	□ 1 wired connector for Modbus SL (master/slave) □ 1 wired connector for LAN expansion bus	**TM171ODM22S**	0.190/ *0.420*
Flush mounting optimized controllers						
22	**6 digital inputs:** □ 6 volt-free in 1 group **5 configurable analog inputs:** □ 3 NTC or digital input □ 2 NTC, 0-20 mA, 4-20 mA, 0-10 V, 0-5 V, 0-1 V, or digital inputs	**6 digital outputs:** □ 3 SPST (2 A, ∿ 230 V) with the same common □ 2 SPST (2 A, ∿ 230 V) with independent common □ 1 open collector **5 analog outputs:** □ 2 open collector for 12 V PWM/PPM □ 3x 0-10 V	Built-in display	1 wired connector for LAN expansion bus	**TM171OF22R**	0.164/ *0.360*
				1 wired connector for Modbus SL (master/slave) 1 wired connector for LAN expansion bus	**TM171OFM22R**	0.164/ *0.360*

Remote display for M171 optimized logic controllers

Remote displays	see page 15
Wall thermostats	see page 15

Connection accessories for M171 optimized logic controllers

See page 15

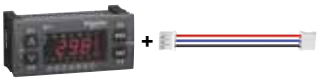
(1) The 2 I/Os are the same. On the same channel: 2 digital inputs or 2 analog outputs (depending on the configuration).
(2) Except for for TM171ODM22S: ∿ 12-24 V

Modicon M171/M172 logic controllers

M171 optimized logic controllers

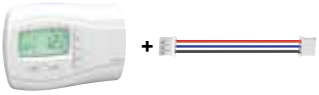
Remote display

Wall thermostats

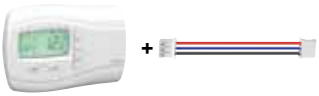


TM171DLED (1)

TM171DLCD2U



TM171DWAL2U



TM171DWAL2L

Remote display for M171 optimized logic controllers

The two available remote displays for the M171 optimized logic controllers offer, are distinguished by technology and mounting.

- □ Technology: LED display or LCD display
- □ Mounting: flush mounting – can be mounted on a cabinet door

The remote displays are connected to the LAN expansion bus which provides the power supply.

Reference

Type	Description	Reference	Weight kg/*lb*
Remote displays With realtime clock	■ LED display: 4 digits,7 segments ■ Keyboard: 4 buttons ■ Flush mounting ■ Communication port: 1 for LAN expansion bus – with wired connector *(1)* or screw terminal blocks	**TM171DLED**	0.042/ *0.090*
	■ LCD display (with segments) ■ Keyboard: 7 buttons ■ Flush mounting ■ Communication port: 1 for LAN expansion bus – with screw terminal blocks ■ 2 analog inputs □ 1 NTC or digital input □ 1 NTC or 4-20 mA or digital input	**TM171DLCD2U**	0.170/ *0.370*

Wall thermostats for M171 optimized logic controllers

The two types of electronic wall thermostats available for the M171 optimized logic controllers offer are delivered with ot without backlight.

The wall thermostats have a realtime clock.

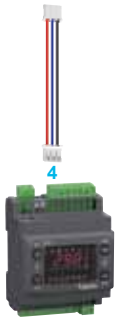
Reference

Type	Description	Reference	Weight kg/*lb*
Wall thermostats	Without backlight	**TM171DWAL2U**	0.143/ *0.320*
	With backlight	**TM171DWAL2L**	0.143/ *0.320*

*(1) Supplied with LAN expansion bus connector **TM171ACB4OLAN***

Connection accessories *(1) for M171 optimized logic controller (rail mounting): TM171OB22R, TM171OBM22R, TM171OD22R, TM171ODM22R, and TM171ODM22S*

Connection accessories *(1) for M171 optimized logic controller (flush mounting): TM171OF22R, and TM171OFM22R*



Connection accessories *(1) for M171 optimized logic controller (rail mounting): TM171OBM14R, TM171OD14R, TM171ODM14R*
Nota*: terminal blocks are supplied with TM171OBM14R, TM171OD14R, and TM171ODM14R*

Connection accessories for M171 optimized logic controllers

To be ordered separately

Type	Item	Description	Cable length (m/*ft.*)	Unit reference	Weight kg/*lb*
Low voltage connector **Sold in lots of 5**	1	Screw terminal block and a cordset equipped with a 20-pin connector on one end	1/*3.3*	**TM171ACB4OI1M**	0.575/ *1.270*
			2/*6.6*	**TM171ACB4OI2M**	1.120/ *2.470*
analog output connector (0-10 V outputs) **Sold in lots of 5**	2	Cordset equipped with a 4-pin connector on one end	1/*3.3*	**TM171ACB4OAO1M**	0.075/ *0.170*
			2/*6.6*	**TM171ACB4OAO2M**	0.125/ *0.280*
Modbus SL connector **Sold in lots of 5**	3	Cordset equipped with a 3-pin connector on one end	1/*3.3*	**TM171ACB4ORS485**	0.052/ *0.110*
LAN expansion bus connector **Sold in lots of 5**	4	Cordset equipped with a 3-pin connector at each end	2/*6.6*	**TM171ACB4OLAN**	0.060/ *0.130*

(1) Minimum set for operating controllers.

Modicon M171/M172 logic controllers
M171 performance logic controllers

Presentation

The **M171 performance** logic controllers comprise 5 models that can be used to control from 3 up to 27 embedded I/Os (digital and analog).

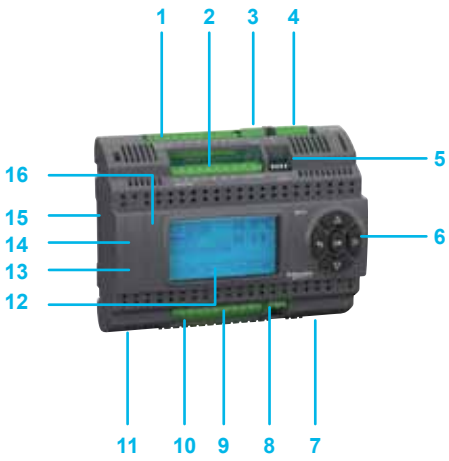
- Power supply: ⏦ 24 V or ⎓ 48 V
- 2 types of housing:
  - with built-in display
  - without display

Each controller includes a connection (through the CAN expansion bus or through Modbus) for a remote display, available in the catalog.

- 2 types of mounting:
  - 35 mm/*1.38 in.* ⊔ rail mounting: controllers to be mounted inside a cabinet
  - Flush mounting: controllers to be mounted on a cabinet door or wall-mounted using the wall support accessory, see page 17.
- **M171 performance** logic controllers embed up to 3 communication ports:
  - On 35 mm/*1.38 in.* ⊔ rail mounting version:
    - 1 Modbus SL master/slave
    - 2 USB
    - 1 CAN expansion bus
  - On flush-mounting version:
    - 1 Modbus SL master/slave
    - 1 Modbus TCP and BACnet IP (B-AAC profile) (WebVisu)
    - 1 CAN expansion bus
- **M171 performance** logic controllers are certified CE, cURus, CSA, EAC

Description

35 mm/*1.38 in.* ⊔ rail mounting performance controllers



TM171P●M27● performance logic controllers *(1)*

1 Connector for removable terminal block for digital inputs
2 Connector for removable terminal block for analog inputs
3 Connector for removable terminal block for Modbus SL
4 Connector for removable terminal block for CAN expansion bus
5 4-position DIP switches for address selection
6 5 command keys for setting controller parameters
7 Connector for removable terminal block for power supply (⏦ 24 V, ⎓ 48 V)
8 Connector for removable terminal block for fast digital input (high speed counter)
9 Connector for removable terminal block for digital outputs
10 Connector for removable terminal block for analog outputs
11 Mounting clips for 35 mm/*1.38 in.* ⊔ rail mounting
12 On TM171PDM27●: display
On TM171PBM27R: 6- and 10-position DIP switches, behind a front panel

Behind the removable protective cover: 13 and 14

13 USB mini-B port to link a PC
14 USB-A port for USB stick
15 Connector for communication modules
16 3 status LEDs

Flush mounting performance controllers

TM171PFE03R●●● performance logic controllers *(2)*

1 Display
2 3 status LEDs
3 5 command keys for setting controller parameters

On the rear side of the controller

4 Terminal block for power supply (⏦ 24 V or ⎓ 48 V)
5 Terminal block for CAN expansion bus
6 Terminal block for Modbus SL
7 Terminal block for analog input
8 RJ45 connector for Ethernet
9 Built-in NTC sensor (analog)
10 Built-in humidity sensor (analog) (on TM171PFE03HR)

(1) TM171ASCTB27 removable terminal blocks to be ordered separately (see page 17).
(2) Terminal blocks supplied with flush-mounting version of performance controllers.

Modicon M171/M172 logic controllers
M171 performance logic controllers


TM171PBM27R


TM171PDM27R


TM171PDM27S


TM171PFE03


TM171PFE03HR


TM171ABKPB


TM171ABKPG


TM171ASCTB27


TM171DGRP

M171 performance logic controllers

Power supply: ⎓ 24 V, ⎓ 48 V

35 mm/*1.38 in.* ⊔ rail mounting performance controllers

No. of I/Os	Number and type of channels		Display	Embedded communication port	Reference	Weight kg/*lb*
	Inputs	Outputs				
27	**9 digital inputs (8 + 1):** □ 2 groups of 4 digital inputs, ⎓ 24 V or ⎓ 48 V □ 1 fast digital input or high speed counter, volt-free **6 configurable analog inputs:** □ 2 NTC or digital input □ 4 NTC, PT1000, 4-20 mA, 0-5 V, 0-10 V, 0-30 kΩ/0-5 kΩ variable resistor, or digital inputs	**7 digital outputs:** □ 2 SPDT (8 A, ∿ 230 V) with independent common □ 5 SPST (5 A, ∿ 230 V) with independent common **5 analog outputs:** □ 3x 0...+10 V or 4-20 mA □ 2x 0...+10 V, or 4-20 mA, or digital output open collector	Remote display (optional)	□ 1 removable connector for Modbus SL (master/slave) □ 1 removable connector for CAN expansion bus	**TM171PBM27R**	0.385/ *0.850*
			Built-in display 128 x 64 LCD with backlight	□ 1 removable connector for Modbus SL (master/slave) □ 1 removable connector for CAN expansion bus	**TM171PDM27R**	0.385/ *0.850*
		7 digital outputs: □ 2 SPDT (8 A, ∿ 230 V) with independent common □ 3 SPST (5 A, ∿ 230 V) with independent common □ 2 SSR (1 A, ∿ 230 V) outputs **5 analog outputs:** □ 3x 0...+10 V or 4-20 mA □ 2x 0...+10 V, or 4-20 mA, or digital output open collector	Built-in display	□ 1 removable connector for Modbus SL (master/slave) □ 1 removable connector for CAN expansion bus	**TM171PDM27S**	0.385/ *0.850*

Flush mounting performance controllers (to be used with the wall support accessory – see below)

No. of I/Os	Number and type of channels		Display	Embedded communication port	Reference	Weight kg/*lb*
	Inputs	Outputs				
3	**3 configurable analog inputs:** □ 1 built-in NTC □ 1 NTC or digital input □ 1x 4-20 mA or 0-10 V	–	Built-in display	□ 1 removable connector for Modbus SL (master/slave) or BACnet MS/TP (B-AAC profile) □ 1 removable connector for CAN expansion bus □ 1 RJ45 for Modbus TCP and BACnet/IP	**TM171PFE03**	0.320/ *0.710*
	3 configurable analog inputs: □ 1 built-in NTC □ 1 NTC or digital input □ 1 built-in humidity sensor	–	Built-in display	□ 1 removable connector for Modbus SL (master/slave) □ 1 removable connector for CAN expansion bus □ 1 RJ45 for Modbus TCP and BACnet IP (B-AAC profile) and MS/TP (B-AAC profile)	**TM171PFE03HR**	0.350/ *0.770*

Accessories for M171 performance logic controllers

To be ordered separately

Designation	Use	Reference	Weight kg/*lb*
Screw terminal blocks	For TM171PBM27R, TM171PDM27R, and TM171PDM27S	**TM171ASCTB27**	0.100/ *0.220*

Designation	Use	Description	Reference	Weight kg/*lb*
Wall support for flush mounting performance logic controllers	For TM171PFE03 and TM171PFE03HR	White	**TM171ABKPB**	0.015/ *0.030*
		Grey	**TM171ABKPG**	0.015/ *0.030*

Remote display, HMI

Type	Description	Reference	Weight kg/*lb*
Remote display	128 x 64 LCD, with backlight Use for **M171** and **M172 performance** logic controllers	**TM171DGRP**	0.197/ *0.430*
HMI Magelis STU/STO	Please consult on our web site www.schneider-electric.com		

Modicon M171/M172 logic controllers
M172 performance logic controllers

Presentation

The **M172 performance** logic controllers comprise 6 models that can be used to control from 28 up to 42 embedded I/Os (digital and analog).

- Power supply: ⎓ 24 V
- 2 types of housing:
  - with built-in display
  - without display

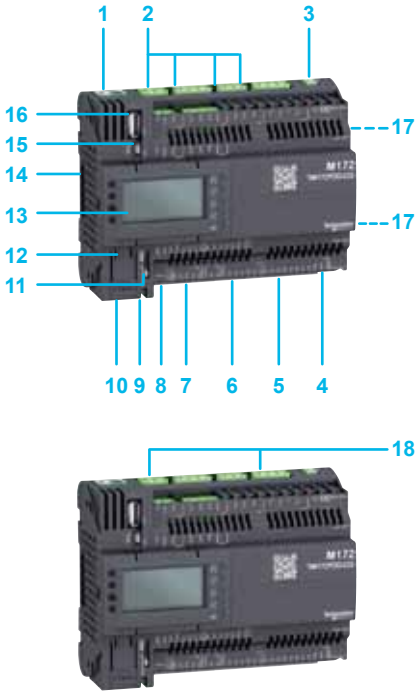
Each performance controller type TM172P includes a connection (through the CAN expansion bus or through Modbus) for a remote display, available in the catalog.

- 2 types of mounting:
  - 35 mm/*1.38 in.* ⊔ rail mounting: controllers to be mounted inside a cabinet
  - on panel with an accessory: each M172 performance controller can be mounted on a panel with the **TM172AP12PM** fixing accessory.
- **M172 performance** logic controllers embed up to 4 communication ports:
  - 2 for Modbus SL (master/slave) (only 1 master) or 1 for BACnet MS/TP (B-AAC profile)
  - 1 for Modbus TCP and BACnet IP (B-AAC profile) (RJ45)
  - 1 for CAN expansion bus,
  - plus a communication module connector.
- The **M172 performance** logic controllers are certified CE, cURus *(1)*, CSA *(2)*, EAC *(2)*.

Micro SD card

A slot for a micro SD memory card is available on the front face of each Modicon M172 performance controllers.
The micro SD card is used for:
- Data-logging
- Webserver storage

Description



M172 performance controllers logic controllers *(3)*

1 RJ45 connector for Modbus TCP and BACnet IP (B-AAC profile)
2 Connector for removable terminal block for digital outputs
3 Connector for removable terminal block for power supply (⎓ 24 V)
4 Connector for removable terminal block for analog inputs
5 Connector for removable terminal block for digital intputs
6 Connector for removable terminal block for fast digital input (high speed counter)
7 Connector for removable terminal block for analog outputs
8 Connector for removable terminal block for RS485-1 (Modbus SL or BACnet MS/TP)
9 Connector for removable terminal block for RS485-2 (Modbus SL or BACnet MS/TP)
10 Connector for removable terminal block for CAN expansion bus
11 Slot for micro SD card
12 Slot for battery (behind the front flap)
13 On TM172PDG●●●: Built-in display, 4 status LEDs and 5 command keys for setting controller parameters
On TM172PBG●●●: 4 status LEDs and 5 command keys for setting controller parameters, behind a front panel
14 Connector for communication modules
15 USB mini-B port to link a PC
16 USB-A port for USB stick
17 Mounting clips for 35 mm/*1.38 in.* ⊔ rail mounting
18 2 Slots for the **TM172AP12PM** fixing accessory

(1) November 2015
(2) Pending
(3) TM172ASCTB28 and TM172ASCTB42 removable terminal blocks to be ordered separately (see page 19).

Modicon M171/M172 logic controllers
M172 performance logic controllers


TM172PBG●●●


TM172PDG●●●


TM172ASCTB28


TM172ASCTB42


TM172AP12PM


TM171DGRP

M172 performance logic controllers

Power supply: ⎓ 24 V

35 mm/*1.38 in.* ⊔ rail mounting performance controllers, and Panel mounting with accessory

No. of I/Os	Number and type of channels		Display	Embedded communication port	Reference	Weight kg/*lb*
	Inputs *(1)*	Outputs				
28	**8 digital inputs:** □ 6 ⎓ or ⎓ 24 V □ 2 high speed counters, dry contact **8 analog inputs, configurable by pair:** 8 NTC, or PT1000 (- 200 to +850 °C/ - *328 to +1562 °F*), or PTC, or 0-20 mA , or 4-20 mA, or 0-5 V, or 0-10 V, or digital input	**8 digital outputs:** □ 1 SPDT Relay 1 A □ 3 SPST with the same common □ 2 SPST with the same common □ 2 SPST with independent common □ Optional 2 SSR with independent common for **TM172PDG28S** only **4 analog outputs:** □ 2x 0-10 V, or 4-20 mA, or PWM (2 kHz, ⎓ 24 V) □ 2x 0-10 V	Remote display (optional)	□ 2 removable connectors for Modbus SL (master/ slave) (only 1 master), or 1 for BACnet MS/TP (B-AAC profile) □ 1 RJ45 connector for Modbus TCP and BACnet IP (B-AAC profile) (RJ45) □ 1 removable connector for CAN expansion bus	**TM172PBG28R**	0.300/ *0.661*
			Built-in display 128 x 64 LCD with backlight	□ 2 removable connectors for Modbus SL (master/ slave) (only 1 master), or 1 for BACnet MS/TP (B-AAC profile) □ 1 RJ45 connector for Modbus TCP and BACnet IP (B-AAC profile) (RJ45) □ 1 removable connector for CAN expansion bus	**TM172PDG28R**	0.300/ *0.661*
					TM172PDG28S	0.300/ *0.661*
42	**12 digital inputs:** □ 10 ⎓ or ⎓ 24 V □ 2 high speed counter, dry contact **12 analog inputs, configurable by pair:** □ 12 NTC, or PT1000 (- 200 to +850 °C/ - *328 to +1562 °F*), or PTC, or 0-20 mA, or 4-20 mA, or 0-5 V, or 0-10 V, or digital input	**12 digital outputs:** □ 2 SPDT relay 1 A □ 3 SPST with the same common □ 3 SPST with the same common □ 2 SPST with the same common □ 2 SPST with independent common □ Optional 2 SSR with independent common for **TM172PDG42S** only **6 analog outputs:** □ 2x 0-10 V, or 4-20 mA, or PWM (2 kHz, ⎓ 24 V) □ 4x 0-10 V	Remote display (optional)	□ 2 removable connectors for Modbus SL master/slave (only 1 Master), or 1 for BACnet MS/TP (B-AAC profile) □ 1 RJ45 connector for Modbus TCP and BACnet IP (B-AAC profile) (RJ45) □ 1 removable connector for CAN expansion bus	**TM172PBG42R**	0.385/ *0.849*
			Built-in display 128 x 64 LCD with backlight	□ 2 removable connectors for Modbus SL master/slave (only 1 Master), or 1 for BACnet MS/TP (B-AAC profile) □ 1 RJ45 connector for Modbus TCP and BACnet IP (B-AAC profile) (RJ45) □ 1 removable connector for CAN expansion bus	**TM172PDG42R**	0.385/ *0.849*
					TM172PDG42S	0.385/ *0.849*

Accessories for M172 performance logic controllers

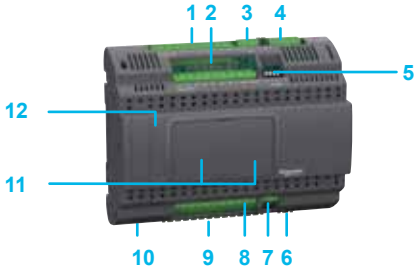
To be ordered separately

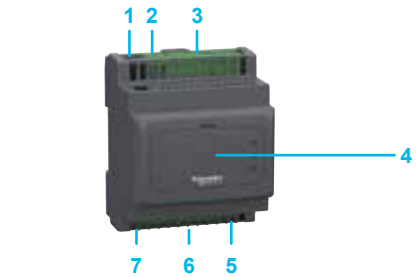
Designation	Use	Reference	Weight kg/*lb*
Screw terminal blocks	For TM172P●●●28● performance logic controllers	**TM172ASCTB28**	0.100/ *0.220*
	For TM172P●●●42● performance logic controllers	**TM172ASCTB42**	0.150/ *0.331*
Fixing accessory: 12 clips-on lock for panel mounting	For mounting M172 performance logic controllers on panel	**TM172AP12PM**	0.050/ *0.110*

Remote display, HMI

Type	Use	Description	Reference	Weight kg/*lb*
Remote display	For M172 performance logic controllers	128 x 64 LCD, with backlight	**TM171DGRP**	0.197/ *0.430*
HMI Magelis STU/STO	Please consult on our web site www.schneider-electric.com			

Modicon M171/M172 logic controllers
I/O expansion modules





Presentation

5 I/O expansion modules are available, 2 of which are dedicated to **M171** and **M172 performance** logic controllers, and 3 of which are for **M171 optimized** logic controllers (see compatibility table below).

- They are used to increase the number of I/Os:
  - up to 44 on **M171 optimized** logic controllers
  - up to 351 on **M171 performance** logic controllers
  - up to 366 on **M172 performance** logic controllers
- Expanded I/O types are digital and analog I/Os
- They are connected:
  - Via the LAN expansion bus on **M171 optimized** logic controllers
  - Via the CAN expansion bus on **M171** and **M172 performance** logic controllers

Compatibility between logic controllers and I/O expansion modules

Logic controller type	Reference	Compatible I/O expansion module (reference)
M171 optimized	TM171OBM14R TM171OD14R TM171ODM14R	TM171EO14R
	TM171OB22R TM171OBM22R TM171OD22R TM171ODM22R TM171ODM22S TM171OF22R TM171OFM22R	TM171EO15R TM171EO22R
M171 performance	TM171PBM27R TM171PDM27R TM171PDM27S TM171PFE03 TM171PFE03HR	TM171EP14R TM171EP27R
M172 performance	TM172PBG28R TM172PDG28R TM172PDG28S TM172PBG42R TM172PDG42R TM172PDG42S	

Description

35 mm/*1.38 in.* ⊔ rail mounting I/O expansion modules

TM171EP27R expansion module *(1)*

1 Connector for removable terminal block for digital inputs
2 Connector for removable terminal block for analog inputs
3 Connector for removable terminal block for Modbus SL
4 Connector for removable terminal block for CAN expansion bus
5 4-position DIP switches for address selection
6 Connector for removable terminal block for power supply (≂ 24 V, ⎓ 48 V)
7 Connector for removable terminal block for fast digital input
8 Connector for removable terminal block for digital outputs
9 Connector for removable terminal block for analog outputs
10 Clip for 35 mm/*1.38 in.* ⊔ rail mounting
11 6- and 10-position DIP switches for address selection
12 3 status LEDs

TM171EP14R expansion module *(1)*

1 4-position DIP switches
2 Connector for removable terminal block for CAN expansion bus
3 Removable terminal block for digital outputs
4 Behind the removable protective cover: Service port (TTL)
5 Connector for low voltage I/Os
6 Clip for 35 mm/*1.38 in.* ⊔ rail mounting
7 Connector for removable terminal block for power supply (≂ 24 V

TM171EO●●R expansion modules *(1)*

1 Service port (TTL)
2 Wired connector for removable terminal block for Modbus SL
3 Connector for removable terminal block for digital outputs
4 Wired connector for removable terminal block for power supply (∿ 12-24 V or ⎓ 24 V),
5 Wired connector for low voltage I/Os
6 Clip for 35 mm/*1.38 in.* ⊔ rail mounting
7 Wired connector for removable terminal block for analog outputs
8 Wired connector for removable terminal block for LAN expansion bus

(1) Removable terminal blocks to be ordered separately, except for TM171EO14R, see page 21.

Modicon M171/M172 logic controllers
I/O expansion modules


TM171EP14R

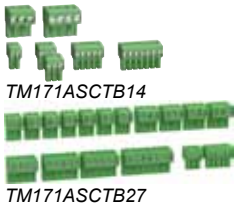

TM171EP27R


TM171EO14R


TM171EO15R


TM171EO22R

***Connection accessories** (2) for expansion modules: TM171EO15R, M171EO22R*


TM171ASCTB14
TM171ASCTB27

I/O expansion modules for Modicon M171 and M172 performance logic controllers

35 mm/*1.38 in.* ⊔ rail mounting expansion modules

No. of I/Os	Number and type of channels: Inputs	Number and type of channels: Outputs	Compatibility with logic controller	Embedded communication connection	Reference	Weight kg/*lb*
14	**4 digital inputs:** ∿ 24 V or ⎓ 24V **4 analog inputs:** (configurable by pair) NTC, PT1000, PTC, 4-20 mA, 0-5 V, 0-10 V, or digital inputs	**4 digital outputs:** □ 1 SPDT (5 A, ∿ 230 V) with independent common □ 3 SPST (3 A, ∿ 230 V) with independent common **2 analog outputs:** 0-10 V	TM171P●●●● TM172P●●●●	□ 1 removable connector for CAN expansion bus	**TM171EP14R**	0.190/ *0.420*
27	**9 digital inputs (8 + 1):** □ 2 groups of 4 digital inputs, ⎓ 24 V or ⎓ 48 V □ 1 fast digital input or high speed counter, volt-free **6 analog inputs:** □ 2 NTC or digital inputs □ 4 NTC, 4-20 mA, 0-10 V, or digital inputs	**7 digital outputs:** □ 2 SPDT (8 A, ∿ 230 V) with independent common □ 5 SPST (5 A, ∿ 230 V) with independent common **5 analog outputs:** □ 0-10 V, or 4-20 mA	TM171P●●●● TM172P●●●●	□ 1 removable connector for CAN expansion bus	**TM171EP27R**	0.385/ *0.850*

I/O expansion modules for Modicon M171 optimized logic controllers

35 mm/*1.38 in.* ⊔ rail mounting expansion modules

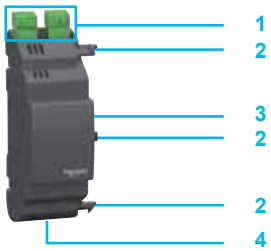
No. of I/Os	Number and type of channels: Inputs	Number and type of channels: Outputs	Compatibility with logic controller	Embedded communication connection	Reference	Weight kg/*lb*
14	**2 digital inputs:** 2 open collector or digital inputs *(1)* **5 configurable analog inputs:** □ 2 NTC, PT1000 or digital inputs □ 2 NTC, 0-20 mA, 4-20 mA, 0-10 V, 0-5 V, 0-1 V, or digital inputs □ 1 NTC, PT1000, 0-20 mA, 4-20 mA, 0-10 V, 0-5 V, 0-1 V, or digital inputs	**4 digital outputs:** □ 3 SPST (2 A, ∿ 230 V) with the same common □ 1 SPDT (2 A, ∿ 230 V) **5 analog outputs:** □ 2 open collector for 12 V PWM/PPM or digital inputs *(1)* □ 2x 0-10 V □ 1x 4-20 mA	TM171OBM14R TM171OD14R TM171ODM14R	□ 1 wired connector for LAN expansion bus	**TM171EO14R**	0.190/ *0.420*
15	**6 digital inputs:** volt-free **3 analog inputs:** NTC or digital inputs	**4 digital outputs:** □ 3x 2 A, ∿ 250 V □ 1 open collector **2 analog outputs:** open collector (PPM/PWM)	TM171OB22R TM171OBM22R TM171OD22R TM171ODM22R TM171ODM22S TM171OF22R TM171OFM22R	□ 1 wired connector for LAN expansion bus	**TM171EO15R**	0.190/ *0.420*
22	**6 digital inputs:** volt-free **5 analog inputs:** □ 3 NTC or digital inputs □ 2 NTC, 0-20 mA, 4-20 mA, 0-10 V, or digital inputs	**6 digital outputs:** □ 5x 2 A, ∿ 250 V □ 1 open collector **5 analog outputs:** □ 2 open collector (PPM/PWM) □ 2x 0-10 V □ 1x 0-20 mA/4-20 mA	TM171OB22R TM171OBM22R TM171OD22R TM171ODM22R TM171ODM22S TM171OF22R TM171OFM22R	□ 1 wired connector for LAN expansion bus	**TM171EO22R**	0.190/ *0.420*

Accessories for I/O expansion modules

Designation	Description	Cable length (m/*ft.*)	Unit reference	Weight kg/*lb*
Accessories – To be ordered separately				
analog output connector (0-10 V outputs) **Sold in lots of 5 (item 1)**	Cordset equipped with a 4-pin connector on one end	1/*3.3*	**TM171ACB4OAO1M**	0.075/ *0.170*
		2/*6.6*	**TM171ACB4OAO2M**	0.125/ *0.280*
Low voltage connector **Sold in lots of 5 (item 2)**	Screw terminal block and a cordset equipped with a 20-pin connector on one end	1/*3.3*	**TM171ACB4OI1M**	0.575/ *1.270*
		2/*6.6*	**TM171ACB4OI2M**	1.120/ *2.470*
Accessory – Supplied with each expansion module				
LAN expansion bus connector **Sold in lots of 5 (item 3)**	Cordset equipped with a 3-pin connector at each end	2/*6.6*	**TM171ACB4OLAN**	0.060/ *0.130*
Accessories – Supplied with TM171EP14R TM171EP27R				
Screw terminal blocks (inputs, outputs, and communication bus)	14 I/Os – For TM171EP14R	_	**TM171ASCTB14**	0.050/ *0.110*
	27 I/Os – For TM171EP27R	_	**TM171ASCTB27**	0.100/ *0.220*

(1) On the same channel: 2 digital inputs or 2 analog outputs (depending on the configuration).
(2) Minimum set for operating controllers.

Modicon M171/M172 logic controllers
Communication modules for M171 performance and M172 performance logic controllers



Presentation

The communication module offer is dedicated to the 35 mm/*1.38 in.* ⊔ rail mounting version of **M171 performance** and **M172 performance** logic controllers *(1)*.
The 8 optional modules provide specific connections:

- To fieldbuses, including:
  - CAN bus
  - Modbus TCP
  - Profibus
  - Modbus SL (RS 485)
  - BACnet MS/TP (B-AAC profile)
  - BACnet IP (B-AAC profile)
  - RS 232 serial link
  - LonWorks (FFT-10)
  - Konnex (KNX) via Schneider Electric' spaceLYnk gateway, Please consult on our web site www.schneider-electric.com
- To services, including:
  - Ethernet
  - WebVisu and remote download functions
- They are mounted by simple interlocking on the left-hand side of an **M171 performance** or an **M172 performance** logic controller *(1)*.
- Only one communication module can be added to a performance logic controller. The communication module is powered by the controller.
- Each communication module has its own type of connector, adapted to the bus or communication network (see details in the reference table, page 23).

Description

35 mm/*1.38 in.* ⊔ **rail mounting**

TM171A●●●● I/O communication modules
1 Communication connector *(2)*
2 Locking device
3 Expansion connector to the performance controller type TM171P or TM172P *(1)*
4 Clip for 35 mm/*1.38 in.* ⊔ rail mounting

*(1) Compatibility between **M171** and **M172 performance** logic controllers and communication modules, see table below:*

Compatibility between performance logic controllers and communication modules

Logic controller		Compatible communication modules
Type	**Reference**	
M171 performance logic controller	**TM171PBM27R** **TM171PDM27R** **TM171PDM27S**	**TM171ACAN** **TM171AETH** **TM171APBUS** **TM171AMB** **TM171ARS485** **TM171ARS232** **TM171AETHRS485** **TM171ALON**
M172 performance logic controller	**TM172PBG28R** **TM172PDG28R** **TM172PDG28S** **TM172PBG42R** **TM172PDG42R** **TM172PDG42S**	**TM171ACAN** **TM171AMB** **TM171ARS485** **TM171ARS232** **TM171ALON**

(2) Communication connector type depends on communication modules, see detail next page.

Modicon M171/M172 logic controllers
Communication modules for M171 performance and M172 performance logic controllers

Communication modules

For M171 and M172 performance logic controllers (35 mm/*1.38 in.* ⊔ rail mounting version)

Designation	Compatibility with logic controller	Fieldbus, services access	Communication port	Reference *(1)*	Weight kg/*lb*
Communication modules	**M171 performance, M172 performance**	□ CAN	□ 2 screw terminal blocks *(1)*	**TM171ACAN**	0.077/ *0.170*
	M171 performance	□ Modbus TCP □ Ethernet □ BACnet IP (B-AAC profile) □ WebVisu and remote download functions	□ 1 RJ45	**TM171AETH**	0.077/ *0.170*
	M171 performance	□ Profibus	□ 1 SUB-D 9	**TM171APBUS**	0.077/ *0.170*
	M171 performance, M172 performance	□ Modbus SL (RS 485)	□ 2 screw terminal blocks *(1)*	**TM171AMB**	0.077/ *0.170*
	M171 performance, M172 performance	□ Modbus SL or BACnet MS/TP (B-AAC profile)	□ 2 screw terminal blocks *(1)*	**TM171ARS485**	0.077/ *0.170*
	M171 performance, M172 performance	□ RS 232 serial link □ Relay output	□ 1 SUB-D 9 for RS 232 □ 1 screw terminal block for relay output *(1)*	**TM171ARS232**	0.077/ *0.170*
	M171 performance	□ Modbus TCP and BACnet/IP □ Modbus SL or BACnet MS/TP (B-AAC profile) □ WebVisu and remote download functions □ Ethernet	□ 1 RJ45 for Ethernet □ 2 screw terminal blocks for RS 485 *(1)*	**TM171AETHRS485**	0.077/ *0.170*
	M171 performance, M172 performance	□ LonWorks (FFT-10)	□ 1 screw terminal block for LON bus	**TM171ALON**	0.077/ *0.170*


TM171ACAN


TM171AETH


TM171APBUS


TM171AMB


TM171ARS485


TM171ARS232


TM171AETHRS485


TM171ALON

(1) Removable terminal blocks supplied with communication modules.

Modicon M171/M172 logic controllers
Electronic expansion valve drivers

Presentation

Electronic expansion valve drivers

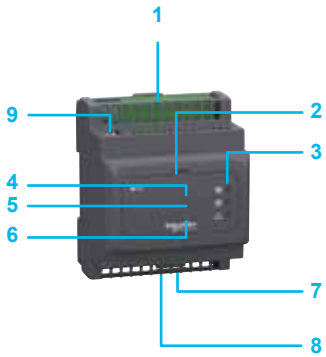
The 3 types of electronic expansion valve drivers are used to control the electronic expansion valve so as to control superheat after the evaporator.

- They are compatible with each performance or optimized logic controllers.
- They operate independently on measurement accessories such as:
  - NTC or PT1000 probes
  - Pressure transducers
- The 3 available electronic expansion valve drivers are compatible with competing valve brands such as those given in the table below:

Electronic expansion valve drivers: Brand (type)	Expansion valves: Brand (type)
Schneider Electric (TM171VEVA2, TM171VEVD4, TM171VEVM4)	**ELIWELL™** (SXVB)
	ALCO™ (EX4, EX5, EX6, EX7, EX8, EXM246, EXL246)
	DANFOSS™ (ETS50, ETS100)
	SPORLAN™ (SER(I) G/J/K/B/C/D, SER1.5 to 20, SEI 30/50, SEH)
	SANHUA™ (DPF-Q,DPF-T01)

Description

35 mm/*1.38 in.* ⊔ rail mounting



TM171V●● electronic expansion valve drivers *(1)*
1 Output terminal block and power supply connector (≂ 24 V)
2 Protective cover
3 3 status LEDs
Behind the removable protective cover:
4 6-position DIP switches
5 Status LED (for operation with TM171AMFK programming stick)
6 LAN serial port for connecting TM171DLED remote display
7 Terminal block for analog/digital inputs
8 Clip for 35 mm/*1.38 in.* ⊔ rail mounting
9 TTL programming port

References

Electronic expansion valve drivers

Application	Number and type of channels Inputs	Outputs	Reference	Weight kg/ *lb*
Actuator, convert 0-10 V or 4-20 mA in opening position contact	**1 analog input:** □ 1x 4-20 mA, 0-5 V, or 0-10V	**1 digital output:** □ 1 open collector (100 mA, ⎓ 12 V)	**TM171VEVA2**	0.190/ *0.420*
Autonomous, wired to manage On/Off contact	**2 digital inputs:** □ 2 volt-free **4 analog inputs:** □ 2 NTC (-50…+110 °C, -40…+150 °C /*-58…+203 °F, -40…+302 °F*), PT1000, 4-20 mA, 0-5 V, or 0-10 V □ 2 NTC (-50…+110 °C, -40…+150 °C /*-58…+203 °F, -40…+302 °F*), or PT1000 *(2)*	**2 digital outputs:** □ 1 open collector (100 mA, ⎓ 12 V) □ 1 SPST NO relay contact, 5 A, ∿ 250 V	**TM171VEVD4**	0.190/ *0.420*
Autonomous, managed by Modbus (RS 485)	**2 digital inputs:** □ 2 volt-free **4 analog inputs:** □ 2 NTC (-50…+110 °C, -40…+150 °C/ *-58…+203 °F, -40…+302 °F*), PT1000, 4-20 mA, 0-5 V, or 0-10 V *(2)* □ 2 NTC (-50…+110 °C, -40…+150 °C/ *-58…+203 °F, -40…+302 °F*), or PT1000 *(2)*	**2 digital outputs:** □ 1 open collector (100 mA, ⎓ 12 V) □ 1 SPST NO relay contact, 5 A, ∿ 250 V	**TM171VEVM4**	0.190/ *0.420*


TM171VEVA2


TM171VEVD4


TM171VEVM4

Accessories for Electronic expansion valve drivers

To be ordered separately

Designation	For connecting	Reference	Weight kg/ *lb*
Screw terminal block for electronic expansion valve drivers	Power supply, sensor power supply, digital and analog I/O, Modbus link	**TM171ASCTBVEV**	0.050/ *0.110*


TM171ASCTBVEV

(1) TM171ASCTBVEV screw terminal block to be ordered separately.
(2) 2 PT1000 (-50…+99.9 ° C / -58… + 211.82 °F)

Modicon M171/M172 logic controllers
Measurement accessories


TM1SH3●4


TM1SH284


TM1STNTCRN615●●


TM1STNTCSF440●●


TM1STNTCSN620●●


TM1STNTCTN620●●


TM1STNTCRN520●●


TM1STNTCWN65605●●


TM1STNTCWN75750●●


TM1STPTTSN620●●


TM1STPTTSN520●●

Measurement accessories

Application	Description	Sold in lots of	Cable length m/*ft.*	Unit reference	Weight kg/*lb*
Humidity & temperature probe	□ IP 65 □ 4-20 mA □ Wall mounting □ Measuring ranges: 0…100%, - 40…60 °C / *-40...140 °F*	–	–	**TM1SH314**	0.176/ *0.390*
Humidity probe	□ IP 65 □ 4-20 mA □ Wall mounting □ Measuring ranges: 0…100%	–	–	**TM1SH304**	0.170/ *0.370*
Humidity probe (sensor equipped with a cable)	□ IP 54 □ 4-20 mA □ Measuring ranges: 15…90%	–	3/*9.84*	**TM1SH284**	0.138/ *0.300*
NTC probes (sensor equipped with a cable)	□ IP 67 □ Sensor 6x 15 mm / *0,591 in.* □ -50…+110 °C/*-122…+230 °F* □ Grey	8	1.5/*4.92*	**TM1STNTCRN61515**	0.104/ *0.230*
		5	3/*9.84*	**TM1STNTCRN61530**	0.125/ *0.280*
		4	5/*16.40*	**TM1STNTCRN61550**	0.164/ *0.360*
	□ FAST IP 67 □ 4x 40 mm / *1.57 in.* □ -50…+110 °C/*-122…+230 °F* □ Grey	8	1.5/*4.92*	**TM1STNTCSF44015**	0.144/ *0.320*
		5	3/*9.84*	**TM1STNTCSF44030**	0.175/ *0.390*
	□ IP 68 □ 6x 20 mm / *0,79 in.* □ -50…+110 °C/*-122…+230 °F* □ Grey	8	1.5/*4.92*	**TM1STNTCSN62015**	0.144/ *0.320*
		5	3/*9.84*	**TM1STNTCSN62030**	0.175/ *0.390*
		4	5/*16.40*	**TM1STNTCSN62050**	0.232/ *0.510*
	□ IP 68 □ 6x 20 mm / *0,79 in.* □ TPE □ with strap □ Grey	8	1.5/*4.92*	**TM1STNTCTN62015**	0.152/ *0.340*
		5	3/*9.84*	**TM1STNTCTN62030**	0.180/ *0.400*
	□ IP 68 □ 5x 20 mm / *0,79 in.* □ -50…+110 °C/*-122…+230 °F* □ Grey	8	1.5/*4.92*	**TM1STNTCRN52015**	0.144/ *0.320*
		5	3/*9.84*	**TM1STNTCRN52030**	0.180/ *0.400*
		4	5/*16.40*	**TM1STNTCRN52050**	0.228/ *0.500*
NTC probes for air wall mounting	□ Outdoor mounting	–	–	**TM1STNTCWN65605**	0.050/ *0.110*
	□ Indoor mounting	–	–	**TM1STNTCWN75750**	0.050/ *0.110*
PT1000 probes	□ IP 68 □ 6x 20 mm / *0,79 in.* □ -50…+110 °C/*-122…+230 °F* □ Green	8	1.5/*4.92*	**TM1STPTTSN62015**	0.144/ *0.320*
		5	3/*9.84*	**TM1STPTTSN62030**	0.175/ *0.390*
	□ IP 68 □ 5x 20 mm / *0,79 in.* □ -50…+110 °C/*-122…+230 °F* □ Green	8	1.5/*4.92*	**TM1STPTTSN52015**	0.136/ *0.300*
		5	3/*9.84*	**TM1STPTTSN52030**	0.175/ *0.390*
		4	5/*16.40*	**TM1STPTTSN52050**	0.232/ *0.510*

SoMachine HVAC programming software
for Modicon M171/M172 logic controllers

Presentation

SoMachine HVAC programming software

Software solution

SoMachine HVAC programming software is compliant with IEC 61131-3. It can be used to develop, configure, and commission entire HVAC or Pumping solution systems.

It includes:

- Programming Modicon M171/M172 logic controllers (performance and optimized) and remote display units
- Setting up expansion buses and networks
- Creating the screen of the displays (built-in and displays of the M171/M172 logic controller offer)
- Configuring BMS communication modules on BACnet MS/TP (B-AAC profile), Modbus SL, Modbus TCP, BAcnet MS/TP, BACnet IP (B-AAC profile), and LonWorks (FFT-10)
- Dedicated libraries such as:
  - a library of application function blocks *(1)*
  - a library of Tested, Validated, and Documented Applications (TVDA)
- Full simulation mode

General characteristics

Overview

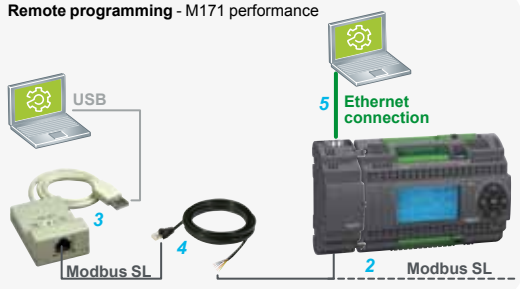
Programming languages	■ ST (Structured Text) ■ FBD (Function Block Diagram) ■ LD (Ladder) ■ IL (Instruction List) ■ SFC (Sequential Function Chart)
Applications	■ Graphical and text-based languages: □ Adaptation to each developer background □ Library management □ Code debugging □ Parameter definition □ Simulation mode ■ Advanced programming: □ Vectors □ Pointers
System solutions management	■ Multi-target project ■ Management of Modbus data ■ Data exchange between several Modicon **M171/M172 performance** logic controllers
Graphical user interface	■ Graphic display: □ Multipage □ Buttons □ Edit box □ Static text □ Images □ Animations □ Bars □ Lists of data (parameters/variables/alarms) ■ Configurable buttons ■ Multilanguage ■ Automatic documentation
Communication bus configurators	■ Control networks: Modbus TCP, Modbus SL, Profibus ■ Expansion bus fieldbus: CAN expansion bus ■ BMS connectivity: BACnet MS/TP (B-AAC profile), BACnet IP (B-AAC profile), LonWorks (FFT-10)
Advanced simulation options	■ Full simulation □ I/O emulation □ HMI □ IEC code □ Live debug □ Triggers □ Oscilloscope
Advanced debugging and simulation options	■ Remote control/download: □ Modbus SL & TCP □ CAN □ Modem ■ Parameter management ■ Status monitoring ■ Field test: □ Oscilloscope □ Debug window □ Export to Excel

(1) For more information about Application Function Blocks, see chapter 2.

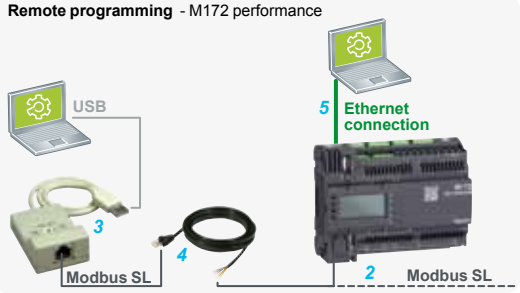
SoMachine HVAC programming software
for Modicon M171/M172 logic controllers

Local programming, download - M171 & M172 performance - through USB port

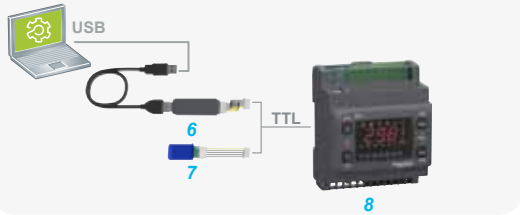
Remote programming - M171 performance



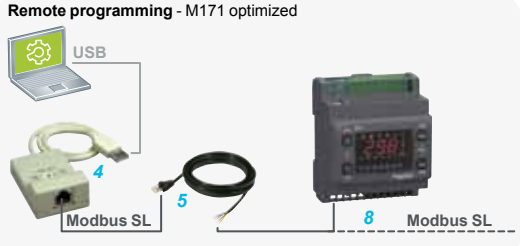
Remote programming - M172 performance



Local programming, download - M171 optimized - through TTL port



Remote programming - M171 optimized



Product offer

SoMachine HVAC software is supplied on a DVD or can be downloaded from our web site: www.schneider-electric.com > Solutions > Systems > Machine Control > HVAC control.
The product version concerned offers the SoMachine HVAC functions associated with logic controllers.

References

System configuration:
- Processor: Pentium 1.6 GHz or higher
- RAM: 1 GB; 2 GB recommended
- Hard disk: 500 MB minimum
- OS: 32-bit Windows; XP Pro SP3 or Windows 7 (32-bit or 64-bit) or Windows 8
- Drive: DVD drive
- Display: SVGA video card; 800×600, 128 MB; 1024×768, 256 MB recommended
- Peripheral device: A mouse or compatible pointing device
- Peripheral device: USB interface

SoMachine HVAC programming software

Application	Reference	Weight kg/*lb*
M171 optimized logic controllers, **M171 performance** logic controllers, and **M172 performance** logic controllers	**TM171SW**	0.050/ *0.110*

Programming accessories for M171 and M172 performance logic controllers

- The USB cable is recommanded for local programmation.
- Ethernet port is recommanded for remote download or remote programmation.

Description	Characteristics and use	Length m/*ft.*	Reference	Weight kg/*lb*
Programming through USB port				
Programming cables *(1)*	From the PC USB-A port to the USB mini-B port on M171 *(2)* and M172 performance logic controllers *(2)*	3/*0.98*	**TCSXCNAMUM3P** *(1)*	0.065/ *0.143*
		1.8/*5.90*	**BMXXCAUSBH018**	0.065/ *0.143*
Programming through Modbus SL and/or Ethernet				
USB to RS485 converter *(3)*	To be used on M171 *(2)* and M172 performance logic controllers *(2)* Equipped with 1 RJ45 connector on the controller side and 1 USB-A connector on the PC side	0.4/*1.31*	**TSXCUSB485**	0.144/ *0.320*
Connection cable for Modbus serial link *(4)*	Equipped with 1 RJ45 connector at one end and flying leads at the other end	3/*9.84*	**VW3A8306D30**	0.250/ *0.550*
Ethernet connection cable				
Ethernet ConneXium cable - shielded twisted pair straight cord *(5)* CE compatible	For connection to terminal devices (DTE) Equipped with 1 RJ45 connector at each end	2/*6.56* *(2)*	**490NTW00002**	–

(1) Unshielded cable without grounding. To be used only for temporary connections. For permanent connections, use the reference BMXXCAUSBH018.
(2) Other length available: 5 m/16.40 ft, 12 m/39.37 ft, 40 m/131.23 ft, and 80 m/262.47 ft

Programming accessories for M171 optimized logic controllers

Programming through TTL programming port

Description	Characteristics and use	Reference	Weight kg/*lb*
Programming cable *(6)*	To be used between a PC and the TTL programming port of M171 optimized logic controllers *(8)*	**TM171ADMI**	0.157/ *0.350*
Programming stick *(7)*	To be used to transfer parameters from one M171 optimized logic controller *(8)* to another, or to download the program	**TM171AMFK**	0.010/ *0.020*
Programming through USB port			
USB to RS485 converter *(3)*		See above	
Connection cable for Modbus serial link *(4)*		See above	

Modicon M171/M172, logic controllers and software
Product reference index

The Next Generation

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