Catalog | October 2025

Modicon M171 / M172 / M173

Logic controllers for HVAC and Pumping applications

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Modicon

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Edge control for industrial internet of things (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.

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- Modicon HVAC Controllers
- Modicon PLC
- Modicon Motion Controllers
- Modicon PAC
- Modicon Edge I/O
- Modicon I/O
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- Modicon Wiring
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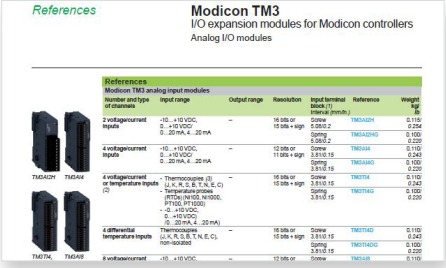
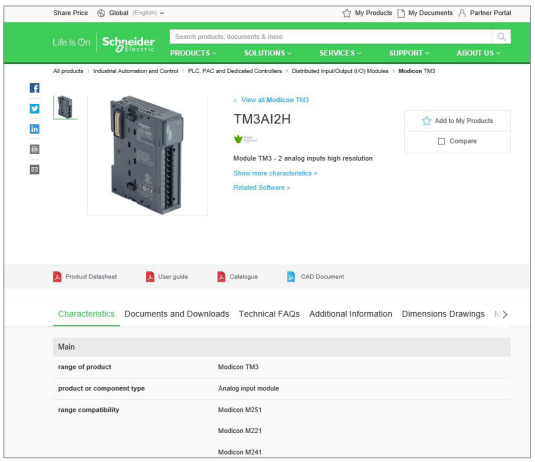
Quick access to product information

Get technical information about your product

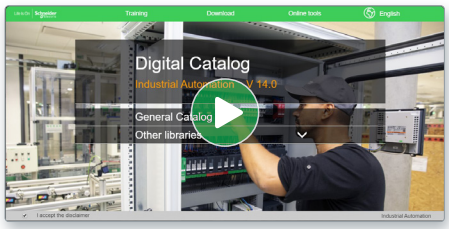


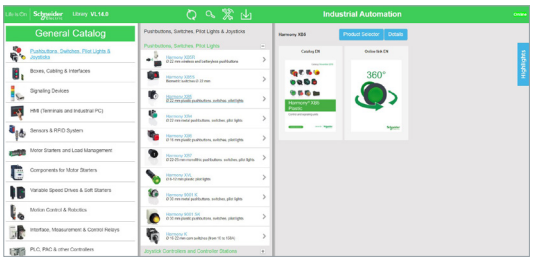


Each commercial reference presented in a catalog contains a hyperlink. Click on it to obtain the technical information of the product:

- 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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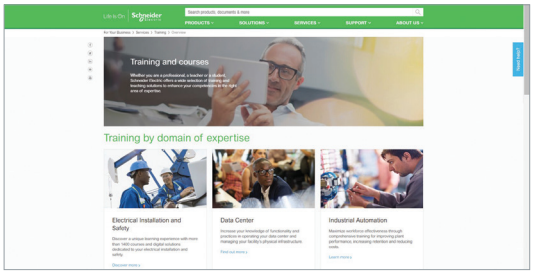

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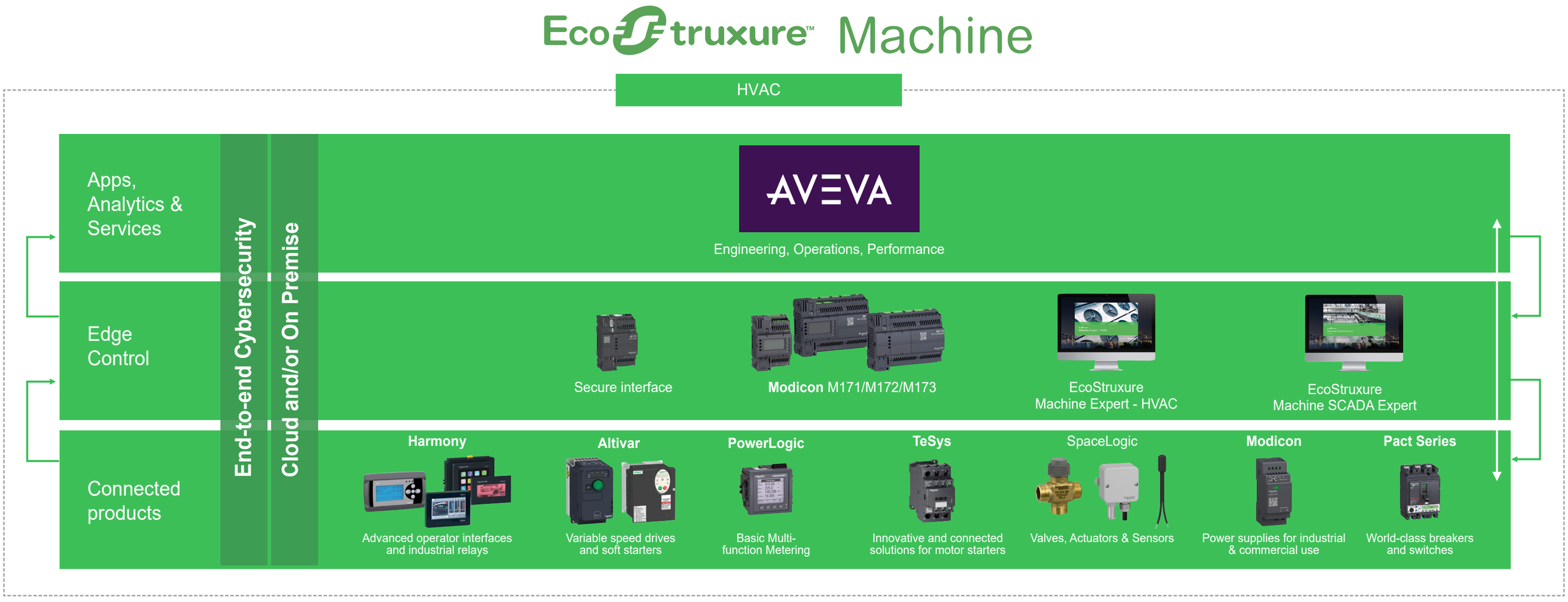
Our solution for Smart HVAC Control Systems

EcoStruxure™ Machine, our open, interoperable, IoT-enabled system architecture, helps OEMs quickly build smarter cost-optimized HVAC control systems with onboard energy-efficiency solutions while reducing maintenance and improving reliability. EcoStruxure Machine encompasses key technologies for product technology and edge control on premises, using cloud technologies to provide analytics and digital services.



Modicon M171/M172/M173

Logic controllers for HVAC and Pumping applications

Maximize business and machine performance with EcoStruxure™ Machine

Maximize business and machine performance with EcoStruxure Machine

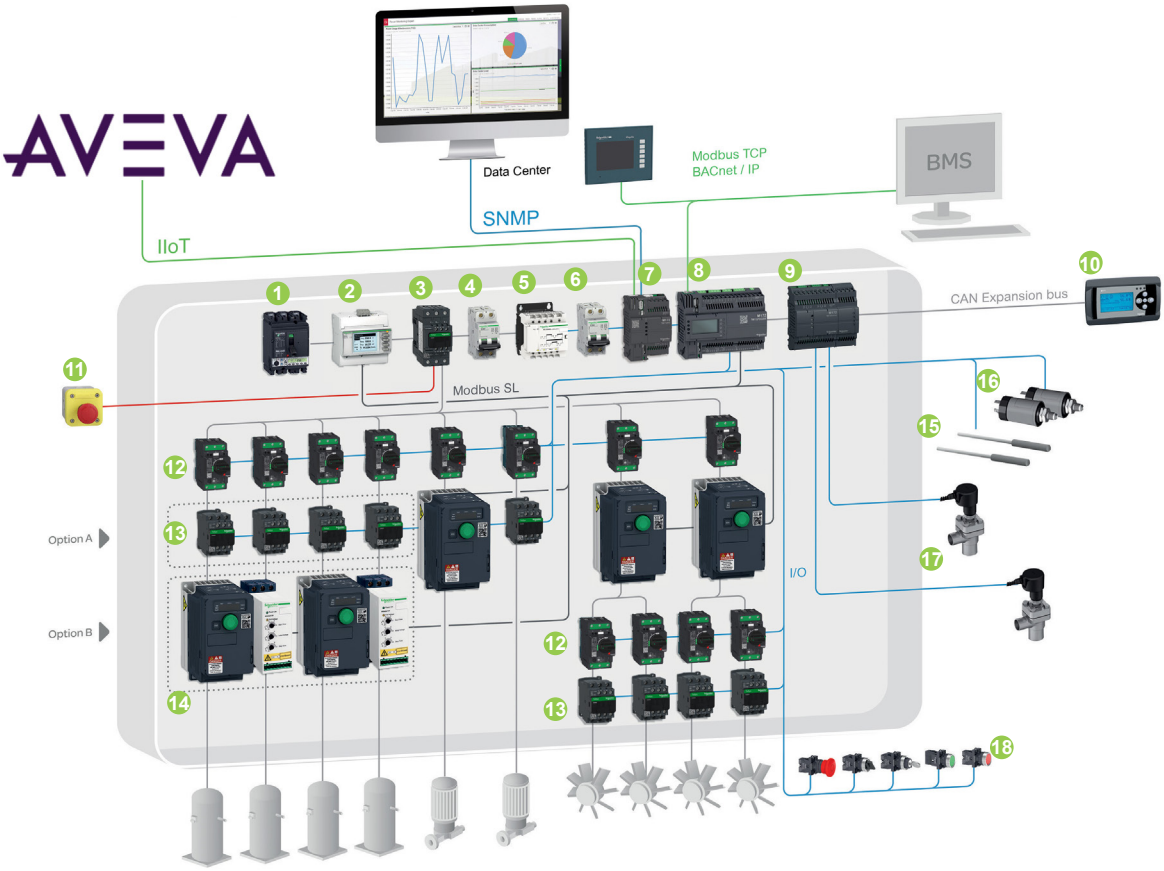
To be competitive in today's digital era, machine builders must be innovative. Smart machines, those that are better connected, more flexible, more efficient, and safe, are enabling machine builders to innovate in ways never before possible.

- EcoStruxure MachineTM, 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 combines key on-premises technologies for product connectivity and edge control with 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.

Ready-to-use architectures and function blocks

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

Modicon M171/M172/M173 is part of EcoStruxure Machine



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

Solution breakdown

1 **Compact NSX** circuit breaker
2 **iEM3000** energy meter
3 **TeSys** Deca contactor
4 **Multi9** circuit breaker
5 **Modicon** Power supply
6 **Multi9** circuit breaker
7 **Modicon M172** IIoT Secure Interface
8 **Modicon M172** performance logic controller
9 **Modicon M172** Electronic expansion valve driver module for single valve
10 **Modicon M171** remote display
11 **Harmony** XALK Emergency stop push button
12 **TeSys Deca** magnetic circuit breaker
13 **TeSys Deca** contactor
14 **Altivar 212** variable speed drive, for 0.75 to 75 kW *(1.0 to 100 hp)* motors
15 **Modicon TM1S●●●●** humidity and temperature probes
16 Pressure transmitter
17 Electronic expansion valve
18 **Harmony** XB4, **Harmony** XB5 signaling units

Modicon M171/M172/M173

Logic controllers for HVAC and Pumping applications

Flexible

Flexible

Flexible and scalable Performance

Whether you specialize in chillers, Air Handling Units for commercial buildings, residential, industrial and Pumping applications, etc.

With the Modicon M171/M172/M173 range, EcoStruxure Machine is well-positioned.

Multiple BMS (Building Management System) connectivity, embedded or as an option, and an embedded web server make remote control and remote access simple to implement. A unique software environment supports the development of algorithms and functions that can be used on any platform.

Scalability

M172 Performance and Optimized

M173 Optimized

M171 Optimized

Performance and connectivity

- **M173 and M171 Optimized**: logic controllers for simple and compact machines, also available for flush mounting, they requires minimal installation time and offers tremendous versatility. M173 provide high level of field connectivity.
- **M172 Performance and Optimized**: logic controllers for any size of connectable or connected HVAC machine: manage small to large HVAC machines, and boosters for buildings, connectable to BMS or the cloud.

- Best-in-class versatility and compact size
- Best-in-class Performance

Modicon M171/M172/M173

Logic controllers for HVAC and Pumping applications

Efficient

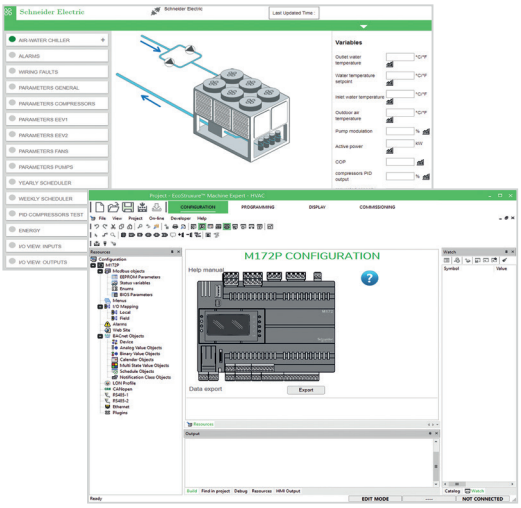
Efficient

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:

- IIoT Edge unit *(1)*
- Controllers
- Remote displays
- Expansion modules
- Communication modules
- Wide range of humidity and temperature probes

(1) IIoT: Industrial Internet of Things.



Intuitive automation with EcoStruxure Machine Expert - HVAC

- **EcoStruxure Machine Expert - HVAC** is the universal programming software for machines automated by Modicon M171, M172 and M173 logic controllers
- Simplified navigation that requires only a few clicks delivers a more efficient engineering process
- **EcoStruxure Machine Expert - HVAC** simplifies each of the steps in machine design and commissioning

Modicon M171/M172/M173

Logic controllers for HVAC and Pumping applications

Connected

Cybersecurity

Connected

Connected everywhere

Depending on your connectivity needs, select the right product

> **M172 Secure Interfaces**:
- FTPs
- HTTPs
- SMTPs
- SNMT
- MQTT
- Cybersecure VPN

> **M172 Optimized and M172 Performance**:
- Modbus RTU
- Modbus TCP
- BACnet MS/TP (B-AAC Profile certified BTL)
- BACnet /IP (B-AAC Profile certified BTL)
- ASCII support for GSM Modem
- CAN Expansion Bus
- LonWorks (FFT-10)
- Webserver, FTP Client/Server, Email, Proxy management, Allow list, SNTP

> **M173 Optimized**:
- Modbus RTU
- CAN Expansion Bus
- LAN Expansion Bus

> **M171 Optimized**:
- Modbus RTU
- LAN Expansion Bus

Customization and services

Our experts help you every step of the way, from perfecting machine design to on-site servicing 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

Fully customized solution and co-design with our Application Design Experts (ADE)

> Design an optimized solution for your machine to create added value, with the help of our experienced ADEs

Turnkey control panel

> Engineering expertise for codes and standards compliance

> Custom engineering to provide the optimum solution and meet specific needs

Collaboration from design to commissioning

> Recruited directly from the industries they serve, ADEs collaborate with you from design through to programming, as well as in the commissioning of turnkey installations

Expert support throughout your system's life cycle

> A dedicated team of Schneider Electric application design experts provides worldwide support for your HVAC solution

Cybersecure

Cybersecurity fo HVAC systems

IIoT-enabled systems are exposed to other devices and networks, which potentially increases the risk of cyberattacks and data privacy breaches.

HVAC machine builders need to implement mechanisms and cybersecurity best practices

> Ensure data protection: Authentication - Authorization - Encryption

> Prohibit unauthorized access: violations, logging, and notification

> Comply with evolving regulations: IEC 62443 standard for cybersecure control system components

Our cybersecurity solutions

> Secure Development Life Cycle Process (SDL)

> A framework for secure product design

> Allows the controller to connect to secured networks

VPN (Virtual Private Network)

> Enables a secure connection to the cloud

> Alternative to a more complex and expensive gateway

Modicon M171/M172/M173

Logic controllers for HVAC and Pumping applications

Modicon M171/M172/M173 range

HVAC

Heat pump

Chiller

Pumping

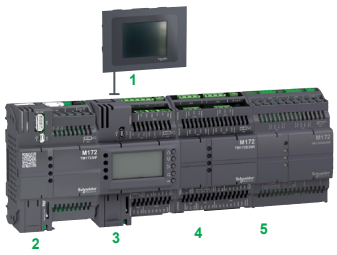
Air handling unit

Modicon M171/M172/M173 range

The range has been developed to manage digital and analog inputs and outputs for controling HVAC machines, Pumping applications, and to offer numerous possibilities for connection to different Building Management System communication networks.

- The offer is made up of:
  - several types of controller depending on the requested performance and connectivity
  - a variety of communication modules to connect them to the BMS
  - Secure Interfaces (Plug and Use IIoT Gateway) to perform Cybersecure communications based on HTTPs and TLS
  - a choice of expansion modules to increase and adapt the number and type of I/O
  - monochrome and color displays
  - EcoStruxure Machine Expert - HVAC, the dedicated software used to program, commission and debug applications
  - and a set of sensors.
- Applications
  - M173 logic controllers are suitable for:
    - Heat pumps (up to two circuits)
    - Process chillers
    - Pumping
    - Boilers/Heaters
    - and any small and compact machines
  - M171 and M172 logic controllers are suitable for:
    - Air/water-cooled chiller
    - Rooftop unit
    - Heat pump
    - Compressor rack
    - Ventilation unit
    - Precision air conditioner
    - Heat recovery unit
    - Air handling unit
    - Small chillers (up to two circuits)
    - Process chillers
- The offer is flexible and scalable, depending on the application requirements. Any existing controller can evolve later as all M171, M172, and M173 logic controllers are programmed with the same EcoStruxure Machine Expert - HVAC software.
  - M171 Optimized logic controllers: up to 44 I/O, when only Modbus SL is needed
  - M173 Optimized logic controllers: from 22 I/O (stand alone) to 78 I/O (with expansion modules)
  - M172 logic controllers: from 7 to 238 I/O (with expansion modules)

1 *Remote flush mounting display*
2 *M173 Optimized logic controller*
3 *I/O expansion module*

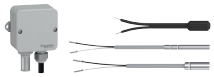


1 *Color touch screen display*
2 *Secure Interface (Plug-in version)*
3 *M172 Optimized logic controller*
4 *I/O expansion module*
5 *Electronic expansion valve driver*

1 *Color touch screen display*
2 *M172 Performance logic controller*
3 *Electronic expansion valve driver*

1 *Remote flush mounting display (1)*
2 *Remote wall mounting display (1)*
3 *LAN-RS-485 Communication adaptor*
4 *M171 Optimized logic controller*
5 *I/O expansion module*

EcoStruxure Machine Expert - HVAC programming software



Measurement accessories

System components

M171, M172 and M173 logic controllers are available with or without an embedded display, with or without SSR output depending on the base product.

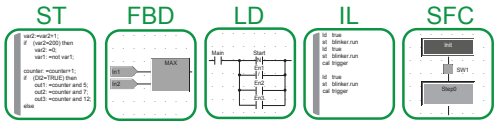
- M171 and M172 logic controllers, are available in both an Optimized and Performance version
- M173 logic controllers are available in Optimized version
- M172 Performance controllers embed connectivity, and M172 Optimized controllers offer optional connectivity.
- I/O expansion modules are mixed digital and analog I/O types

- **M173 Optimized** logic controllers, and **TM173DLED** remote display see page 18, and **TM172E●●R** I/O expansion module, see page 26
- **M172 Optimized** and **M172 Performance** logic controllers, see page 22 and **TM172E●●R** I/O expansion module, see page 26 and **TM172DC●●●●** remote color touch screen displays, see page 28
- **M171 Optimized** logic controllers, see page 32 and **TM171EO●●R** I/O expansion modules, see page 34 and **TM171D●●●●** remote displays, see page 35
- **M171 Performance** logic controllers, see page 36 and **TM171EP●●R** I/O expansion modules, see page 38
- **TM172SI●** Secure Interfaces, designed to establish secure internet connections with Plug-in and Gateway versions, see page 40
- **TM171A●●●●** communication modules (BMS fieldbus Interfaces) provide the **M171 Performance**, **M172 Optimized**, **M172** Performance, and **M173 Optimized** logic controllers with a connection to:
  - BACnet MS/TP (B-AAC profile) or IP
  - Modbus SL (Serial Link)
  - Modbus TCP
  - LonWorks (FFT-10)
  - Profibus
  - CAN bus

  See page 42
- **TM172EVEV●●**: electronic expansion valve drivers compatible with **M172** and **M173 Optimized** logic controllers**,** and also with third party controllers and electronic expansion valves, see page 44
- **TM171VEVM4**: an autonomous expansion valve driver compatible with **M171**, **M172** logic controllers, and also with third party controllers and electronic expansion valves, see page 44
- Specific measurement accessories **TM1S●●●●**: humidity and temperature probes, see page 46
- EcoStruxure Machine Expert - HVAC programming software, and programming accessories, see page 48
- Adapted connection accessories: I/O connectors and cables, see page 35

(1) Remote display can also be used with M171 Optimized with embedded display.

EcoStruxure Machine Expert - HVAC

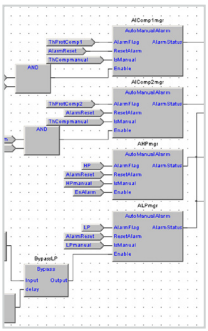


5 languages compliant with IEC 61131-3

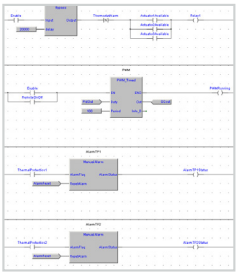
Configuration software

M171, M172 and M173 logic controllers are supported by an intuitive software package: EcoStruxure Machine Expert - HVAC, see page 48.
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.
EcoStruxure Machine Expert - HVAC uses five languages compliant with IEC 61131-3.
Examples:

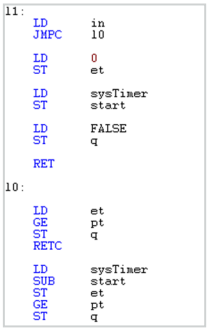
Structured Text language (ST)



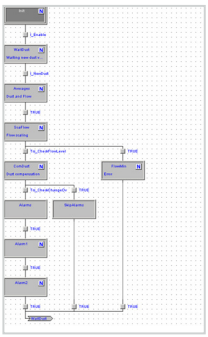
Function Block Diagram language (FBD)



Ladder Diagram language (LD)



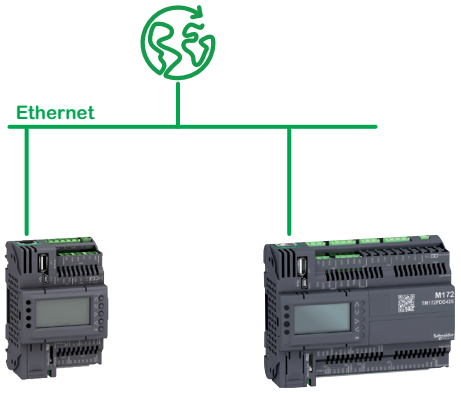
Instruction List language (IL)



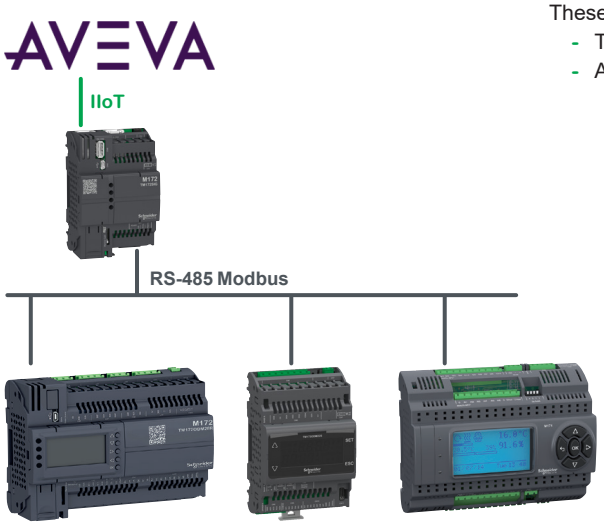
Sequential Function Chart language (SFC)

Available resources on logic controllers for IEC programming

	Logic controller type			
	M173 Optimized	**M172 Optimized** and **Performance**	**M171 Optimized**	**M171 Performance**
CPU	160 MHz	120 MHz, 32 MB RAM	14.7 MHz	72 MHz, 32 MB RAM
Available memory for application	1.0 MB	1.0 MB	188 kB	1.0 MB
Available memory for user Interface	– *(Shared with application)*	1.5 MB	–	1.5 MB
Flash memory data	– *(External flash memory is not available to the user)*	5 MB	–	126 MB
RAM memory (automatic mapping)	378 kB	512 kB (256000 words)	2048 B (1024 words)	512 kB (256000 words)
RAM memory (Modbus mapping)	10 kB (5000 words)	10 kB (5000 words)	1024 B (512 words)	10 kB (5000 words)
Parameters	10 kB (5000 words)	–	–	–
EEPROM variables	–	28 kB (14000 words)	1024 B (512 words)	28 kB (14000 words)



M172 Performance logic controllers linked to Ethernet via the embedded RJ45 ports



*M172 Optimized, M173 Optimized, and M171 Performance logic controllers managed by **AVEVA** industrial software via the Secure Interface (IIoT gateway)*

Ethernet connection

Ethernet access is:

- embedded in M172 Performance logic controllers
- optional with M173 Optimized, M171 Performance, and M172 Optimized logic controllers by means of a communication module or Secure Interface (IIot gateway)

Ethernet access enables several functions, such as:

- HTTP Webserver (Webvisu)
- Remote access
  - Download program
  - Display program download
  - Download, upload parameters
  - Download firmware
  - Debug
  - File management
- Bridge: a specific function allowing controllers connected in Modbus SL to the same controller to be programmed via Modbus
- FTP client/server

These services are not always available:

- The service can be enabled or disabled via the controller programming
- An allowlist is used to provide access (no allowlist defined by default)

Modicon M171/M172/M173

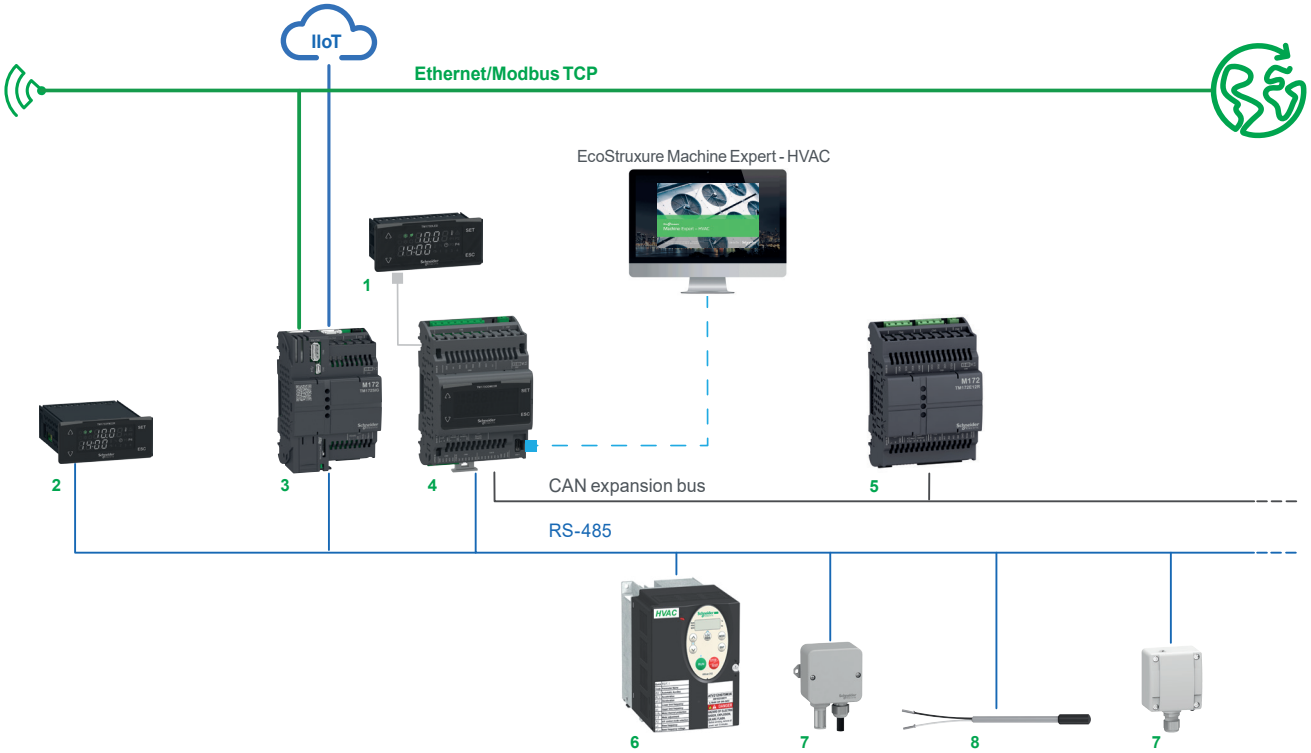
Logic controllers for HVAC and Pumping applications

M173 Optimized logic controllers

M171 Optimized logic controllers

Logic controllers for compact and efficient machines

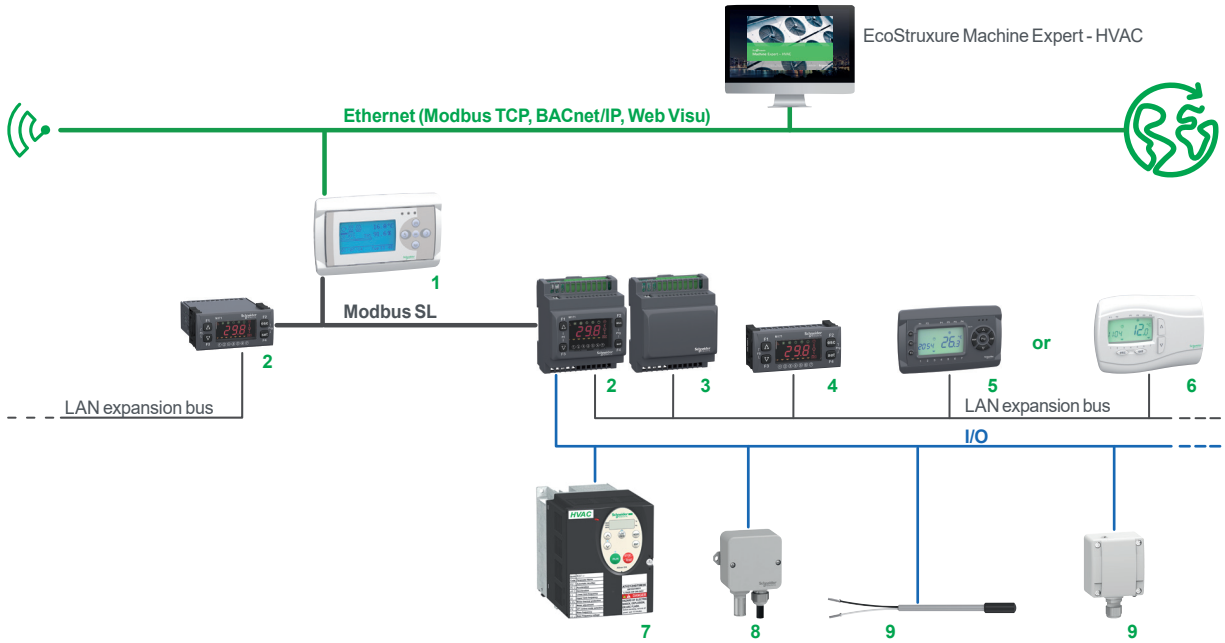
M173 Optimized logic controllers



1 ***TM173DLED*** *remote display, see page 16*
2 ***TM173O*** *logic controller, see page 16*
3 ***TM172SIG*** *Secure Interface, see page 40*
4 ***TM173O*** *logic controller, see page 16*
5 ***TM172E12R*** *I/O expansion module (12 I/O in 4 DIN), see page 26*
6 ***Altivar*** *212 variable speed drive (1)*
7 ***TM1SH●●*** *humidity sensor, see page 47*
8 ***TM1ST●●*** *temperature sensor PT1000 or NTC, see page 46*

Logic controllers for simple and compact machines

M171 Optimized logic controllers

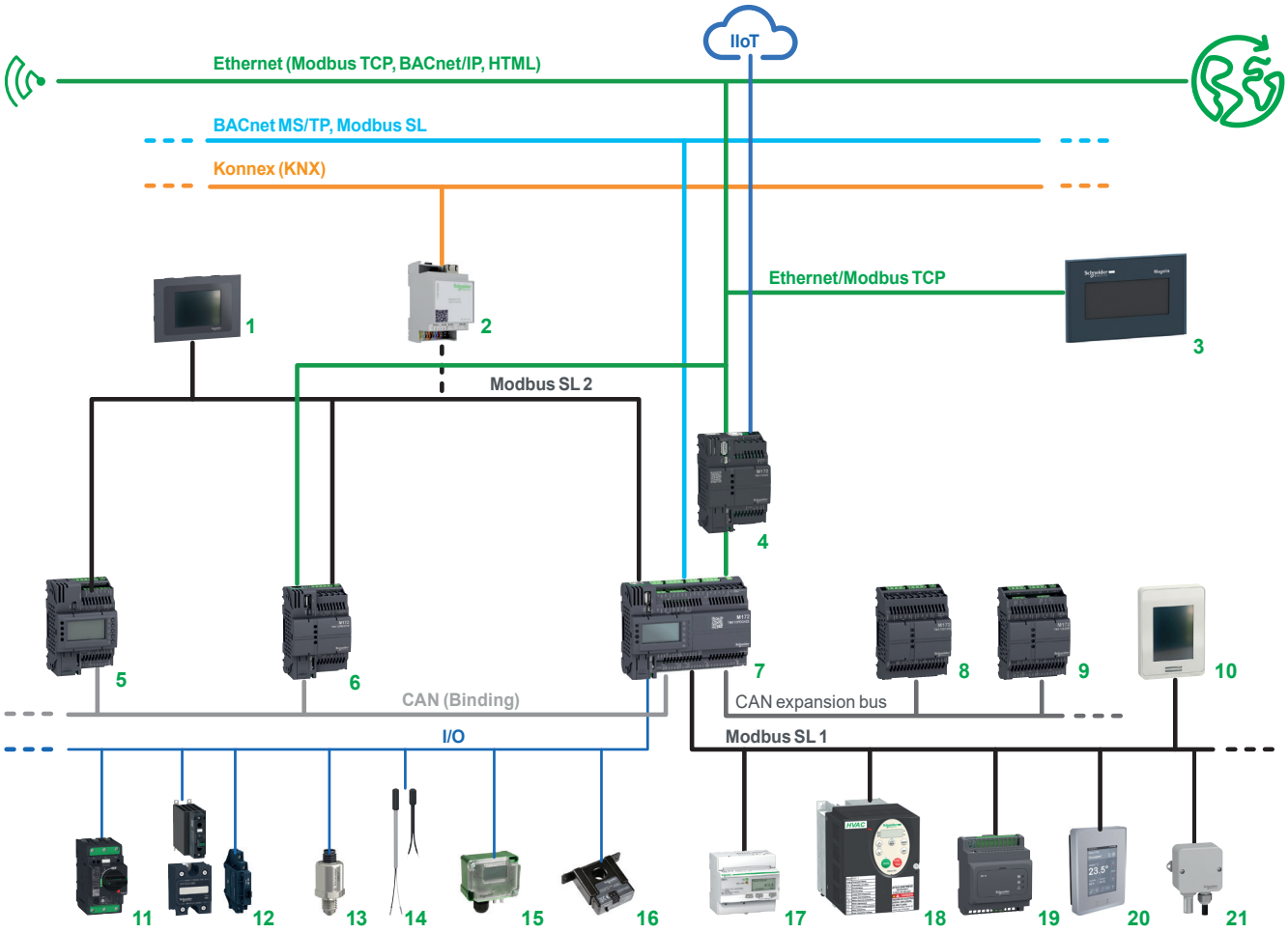


1 ***TM171PFE03*** *Performance logic controller, see page 37*
2 ***TM171OFM22R*** *Optimized logic controller - flush mounting, see page 33*
3 ***TM171EO●●*** *I/O expansion module, see page 38*
4 ***TM171DLED*** *remote display, see page 35*
5 ***TM171DLCD2U*** *remote display, see page 35*
6 ***TM171DWAL●●*** *remote wall mounting display, see page 35*
7 ***Altivar*** *212 variable speed drive (1)*
8 ***TM1SH●●*** *humidity sensor, see page 47*
9 ***TM1ST●●*** *temperature sensor PT1000 or NTC, see page 46*

(1) Consult this offer on our website www.se.com

Logic controllers for any size of connectable or connected HVAC machines

M172 logic controllers



1 ***TM172DCLF●*** *flush mounting display, see page 28*
2 ***spaceLYnk*** *gateway (1)*
3 ***Harmony*** *STO/STU HMI (1)*
4 ***TM172SIG*** *Secure Interface see page 40*
5 ***TM171OD●●●*** *Optimized logic controller (18 I/O in 4 DIN), see page 33*
6 ***TM172PB●●●*** *Performance logic controller (7 or 18 I/O in 4 DIN), see page 25*
7 ***TM172PD●●●*** *Performance logic controller (28 or 42 I/O in 8 DIN), see page 25*
8 ***TM172E12R*** *I/O expansion module (12 I/O in 4 DIN), see page 26*
9 ***TM172E28R*** *I/O expansion module (28 I/O in 4 DIN, see page 26*
10 ***TM172DCLWT●●*** *wall mounting remote display, see page 28*
11 ***TeSys Deca*** *circuit-breakers (1)*
12 *Solid state relays, Electromechanical relays (1)*
13 *Pressure transmitter (third-party product)*
14 ***TM1ST●●*** *temperature sensor PT1000 or NTC, see page 46*
15 *SPD310 Differential pressure sensor (1)*
16 *H721LC-S6 current transducer (1)*
17 ***iEM 3000*** *energy meter (1)*
18 ***Altivar*** *212 variable speed drive (1)*
19 ***TM171VEVM4*** *electronic expansion valve driver, see page 44*
20 ***SE8000*** *room controller (thermostat) (1)*
21 ***TM1SH●●*** *humidity sensor, see page 47*

(1) Consult this offer on our website www.se.com

Modicon M171/M172/M173

Logic controllers for HVAC and Pumping applications

M173 Optimized, M172 Optimized / Performance, and
M171 Optimized logic controllers

Application		**Logic controllers for compact and efficient machines**	**Logic controllers for any size of connectable or connected HVAC machines**		**Logic controllers for simple and compact machines**	
Product name		**M173 Optimized**	**M172 Optimized**	**M172 Performance**	**M171 Optimized**	
HVAC unit type		- Heat pumps (up to two circuits) - Process chillers - Pumping - Boilers/Heaters - and any small and compact machines	- Air/water-cooled chiller - Rooftop unit - Heat pump - Shelters - Compressor rack - Ventilation unit - Precision air conditioner - Heat recovery unit - Packaged unit - AHU		- Air/water-cooled chiller - Rooftop unit - Heat pump - Shelters - Compressor rack - Ventilation unit - Precision air conditioner - Heat recovery unit - Packaged unit - AHU	
Programming Software		EcoStruxure Machine Expert - HVAC V1.6 or higher	EcoStruxure Machine Expert - HVAC V1.0 or higher			
Secure comunication over Internet		Yes, - with TM172SIG Gateway Secure Interface - with TM172SIP Plug-in Secure Interface	Yes, - with TM172SIG Gateway Secure Interface - with TM172SIP Plug-in Secure Interface		Yes, with TM172SIG Gateway Secure Interface	
Maximum number of I/O with expansion modules		78	238		28	44
Power Supply		24 VAC/DC or 230 VAC	24 VAC/DC		100...240 VAC, isolated	24 VAC/DC (except for TM171ODM22S: 12-24 VAC)
Embedded I/Os	Analog Input	7	8 or 12	2, 8 or 12	5	5
	Digital Input	6	2, 8 or 12	2, 8 or 12	2	6
	Analog Output	4	2, 4 or 6	0, 2, 4 or 6	5	5
	Digital Output	5	6, 8 or 12	3, 6, 8 or 12	4	6
Communication fieldbus and networks	Embedded communication ports	• 2 RS-485 (Modbus SL) • 1 CAN expansion bus	• 2 RS-485 (Modbus SL or BACnet MS/TP) • 1 CAN expansion bus	• 2 RS-485 (Modbus SL or BACnet MS/TP) • 1 CAN expansion bus • RJ45 connector • Ethernet	• 1 RS-485 • 1 LAN expansion bus	
	Optional communication ports	None except with a gateway	With TM171A●●● communication modules: • RS-485 (Modbus SL or BACnet MS/TP) • CAN bus • RS232 • LonWorks (FFT-10) • Modbus TCP, BACnet /IP, • Ethernet	With TM171A●●● communication modules: • RS-485 (Modbus SL or BACnet MS/TP) • CAN bus • RS232 • LonWorks (FFT-10)	None except with a gateway	
	USB port	Yes, 1 USB-C	Yes, 1 USB-Mini-B	Yes, 1 USB-A and 1 USB-Mini-B	No (program can be downloaded with the TM171AMFK programming stick and TM171ADMI programming cable)	
	Services	• Remote download via Modbus SL • Download program and firmware via USB-C	• Download the program via USB-A or Modbus SL • Optional services depending on the Ethernet communication module	• Download the program through USB-A or Modbus SL • Remote access • HTTP Webserver (Webvisu) • FTP client/server • SNPT	• Remote download via Modbus SL	
Display	Built-in	Built-in versions available	Built-in versions available	Built-in versions available	Built-in versions available	
	Remote	Yes - with TM173DLED display - with TM172DCL●●●● color touch screen displays - with HMI Harmony STU/STO offer, see on our website	Yes, - with TM172DGRP display - with TM172DCL●●●● color touch screen displays - with HMI Harmony STU/STO offer, see on our website		Yes, - with TM171DLED, TM171DLCD, and TM171DWAL2● displays - with TM172DCL●●●● color touch screen displays - with HMI Harmony STU/STO offer, see on our website	
Mounting		35 mm *(1.38 in)* DIN rail or Flush mounting	35 mm *(1.38 in)* DIN rail, or on panel with TM172AP12PM mounting accessory		35 mm *(1.38 in)* DIN rail or Flush mounting	
Product certifications		CE, cURus (UL Recognized), CSA, RCM, RoHS China, UKCA	CE, cURus (UL Recognized), CSA, EAC, RCM, RoHS China, BACnet BTL		CE, cURus (UL Recognized), CSA, EAC, RCM, RoHS China	
Reference		**TM173O●●●**	**TM172O●●●**	**TM172P●●●**	**TM171O●●●**	
Page		16	20		30	

Modicon M171/M172/M173

Logic controllers for HVAC and Pumping applications

M173 Optimized logic controllers

Application	**Logic controllers for compact and efficient machines**								
Product name	**M173 Optimized**								
Reference	**TM173OBM22R**	**TM173ODM22S**	**TM173ODM22R**	**TM173ODEM22R**	**TM173OFM22S**	**TM173OFM22R**	**TM173OBM22RH**	**TM173ODM22SH**	**TM173ODM22RH**
Power supply	24 VAC/DC				24 VAC/DC		230 VAC		
Type of mounting	4 DIN, 35 mm/1.38 in ⊥⊥ rail mounting				Flush mounting *(1)*		4 DIN, 35 mm/1.38 in ⊥⊥ rail mounting		
Embedded display	–	Yes	Yes	Yes	Yes	Yes	–	Yes	Yes
Total I/Os	**22**	**22**	**22**	**22**	**22**	**22**	**22**	**22**	**22**
Analog Inputs Total	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**	**7**
NTC (β3435 - 10 kW at 25 °C), or 5 V, or 10 V, or digital inputs, pt1000, 4-20mA, or 0-10 V	7	7	7	7	7	7	7	7	7
Digital Inputs Total	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**
volt-free or pulse reading - up to 2 kHz	2	2	2	2	2	2	2	2	2
volt-free	4	4	4	4	4	4	4	4	4
Analog Outputs Total	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**
0-10 V/ 4-20 mA	1	1	1	1	1	1	1	1	1
0-10 V/PWM - 10 Hz...2 kHz	3	3	3	3	3	3	3	3	3
Digital Outputs Total	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
Relay 3 A SPST 3x 1 common, 100 k cycles- no UL derating	3	3	3	3	3	3	3	3	3
Relay 3 A SPST 2x 1 common, 100 k cycles- no UL derating	2	–	2	2	–	2	2	–	2
2 SSR 2x 110/240 VAC and 24 VAC	–	2	–	–	2	–	–	2	–
Maximum I/Os expanded	**78**	**78**	**78**	**78**	**78**	**78**	**78**	**78**	**78**
Compatible Secure Interface	TM172SIG, TM172SIP	TM172SIG, TM172SIP	TM172SIG, TM172SIP	TM172SIG, TM172SIP	TM172SIG, TM172SIP	TM172SIG, TM172SIP	TM172SIG, TM172SIP	TM172SIG, TM172SIP	TM172SIG, TM172SIP
Compatible expansion module	**TM172E12R**, **TM172E28R**, **TM171EP14R** and **TM171EP27R**				–		**TM172E12R**, **TM172E28R**, **TM171EP14R** and **TM171EP27R**		
Compatible expansion valve driver	–			**TM172EVEV1U**	–		–		
Embeded communication ports RS-485 serial ports	2	2	2	2	2	2	2	2	2
CAN expansion bus	3	3	3	3	–	–	3	3	3
Connector for remote display	1	1	1	1	–	–	1	1	1
Connector to communication module	1	1	1	1	1	1	1	1	1
USB-C	1	1	1	1	1	1	1	1	1

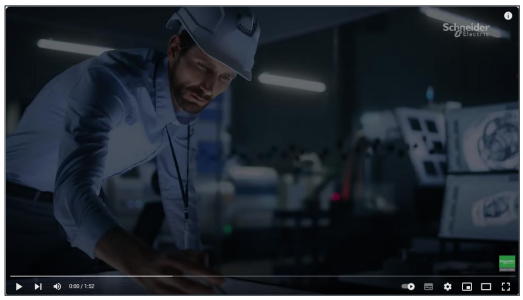
Application	**Remote display** (compatible with each M173 Optimized Logic controller)
Reference	**TM173DLED**
Type of mounting	Flush mounting *(1)*
Description	LED display Keyboard: 4 buttons
Programming software	EcoStruxure Machine Expert - HVAC V1.6 or higher
Product certifications	EN 60730-1EN 60730-2-9 UKCA
Communication	• LAN expansion bus • TTL • WIFI

(1) With the specific brackets provided with logic controllers and remote display.

Modicon M171/M172/M173

Logic controllers for HVAC and Pumping applications

M173 Optimized logic controllers



Make your machine smarter, more sustainable and more efficient with Modicon M173 Optimized logic controllers.
Click to open video (1:52)

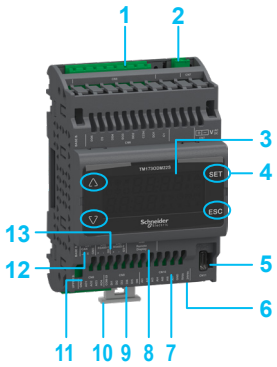
M173 Optimized logic controllers

M173 Optimized logic controllers comprise 5 models that can be used to control up to 22 embedded I/O (digital and analog).

- Power supply:
  - 24 VAC/DC
  - 230 VAC
- Two types of housing:
  - with built-in display
  - without display
- Two types of mounting:
  - On 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 bracket accessories provided with controllers.
- Communication ports on **M173 Optimized** logic controllers:
  - One Modbus SL client/server
  - Three CAN expansion bus (depending on model)
  - One USB-C
- M173 Optimized logic controllers can be connected to I/O expansion modules, see page 26.
- M173 Optimized logic controllers are certified CE, cURus (UL Recognized), CSA, RCM, RoHS China, UKCA.

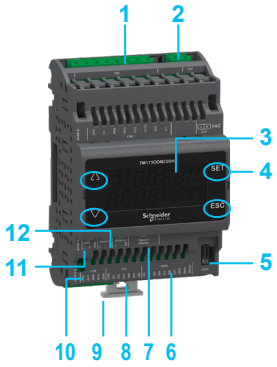
35 mm/*1.38 in* ⊔ rail mounting

24 VAC/DC



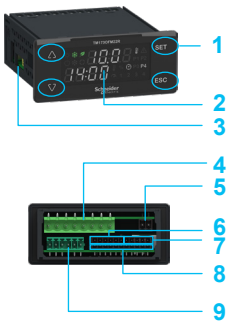
1 Connector for removable terminal block for digital outputs *(1)*- CN6
2 Connector for removable terminal block for isolated power supply *(1)*- CN7
3 Display (except for **TM173OBM22R** model)
4 4x control keys for setting controller parameters (Enter, Escape, Navigation)
5 USB-C port to connect a PC - CN11
6 Only on TM173ODEM22R: connector for removable terminal block to connect the electronic expansion valve driver ref. **TM172EVEV1U**
7 Connector for removable terminal block for analog inputs *(1)*- CN10
8 Remote display connector - CN4
9 Connector for removable terminal block for digital inputs *(1)* - CN9
10 Clip-on lock for 35 mm/*1.38 in* ⊔ rail mounting
11 Connector for removable terminal block for analog outputs *(1)*- CN8
12 Connector for removable terminal block for CAN expansion bus - CN1
13 RS-485 serial port (Modbus SL) - CN2, CN3

230 VAC



1 Connector for removable terminal block for digital outputs *(1)*- CN6
2 Connector for removable terminal block for isolated power supply *(1)*- CN7
3 Display (except for **TM173OBM22RH** model)
4 4x control keys for setting controller parameters (Enter, Escape, Navigation)
5 USB-C port to connect a PC - CN11
6 Connector for removable terminal block for analog inputs *(1)*- CN10
7 Remote display connector - CN4
8 Connector for removable terminal block for digital inputs *(1)* - CN9
9 Clip-on lock for 35 mm/*1.38 in* ⊔ rail mounting
10 Connector for removable terminal block for analog outputs *(1)*- CN8
11 Connector for removable terminal block for CAN expansion bus - CN1
12 RS-485 serial port (Modbus SL) - CN2, CN3

Flush mounting controllers



1 4x control keys for setting controller parameters (Enter, Escape, Navigation)
2 Display
3 USB-C port to connect a PC

On the back of the controllers

4 Connector for removable terminal block for digital outputs
5 Connector for removable terminal block for power supply
6 Connector for removable terminal block digital inputs
7 Connector for removable terminal block for analog outputs
8 Connector for removable terminal block for analog inputs
9 RS-485 serial port (Modbus SL)

(1) M173 Optimized logic controllers are provided with removable terminal blocks for IO, power connections.

Modicon M171/M172/M173

Logic controllers for HVAC and Pumping applications

M173 Optimized logic controllers

TM173ODM22S
TM173ODM22R

TM173ODEM22R (3)

TM173OBM22R

TM173OFM22S

TM173OFM22R

TM173ACB1M
TM173ACB2M

TM173ODM22RH
TM173ODM22SH

TM173OBM22RH

TM173DLED

M173 Optimized logic controllers: Power supply: 24 VAC/DC

No.of I/O	Number and type of channels: Inputs	Number and type of channels: Outputs	Embedded communication ports	Display	Reference	Weight kg/*lb*
35 mm/*1.38 in* ⊥ rail mounting *(1)*						
22	**6 digital inputs:** ■ 2x Volt-free or pulse reading - up to 2 kHz ■ 4x volt-free **7 analog inputs** (configurable in pairs): ■ 1x NTC (β3435 - 10 kW at 25°C), or PT1000, or digital input, or 0-10 V ■ 6x NTC (β3435 - 10 kW at 25°C), or PT1000, or 4-20 mA, or 5 V, or 10 V, or digital inputs	**5 digital outputs:** ■ 3x Relay 3 A SPST, 3x 1 common *(2)* ■ 2x SSR (2x 110/240 VAC and 24 VAC) **4 analog outputs:** ■ 1x 0-10 V/ 4-20 mA ■ 3x 0-10 V/PWM (10Hz...2kHz)	● 3 CAN expansion bus ● 2 RS-485 ● 1 USB-C	Built-in display	TM173ODM22S	0.265 *0.585*
		5 digital outputs: ■ 3x Relay 3 A SPST, 3x 1 common *(2)* ■ 2 Relay 3 A SPST, 2x 1 common *(2)* **4 analog outputs:** ■ 1x 0-10 V/ 4-20 mA ■ 3x 0-10 V/PWM (10Hz...2kHz)	● 3 CAN expansion bus ● 2 RS-485 ● 1 USB-C	Built-in display	TM173ODM22R	0.267 *0.591*
					TM173ODEM22R *(3)*	0.270 *0.595*
			● 3 CAN expansion bus ● 2 RS-485 ● 1 USB-C	Remote display (optional)	TM173OBM22R	0.259 *0.573*
Flush mounting (provided with specific brackets) *(1))*						
22	**6 digital inputs:** ■ 2x Volt-free or pulse reading - up to 2 kHz ■ 4x Volt-free **7 analog inputs** (configurable in pairs): NTC (β3435 - 10 kW at 25 °C), or 5 V, or 10 V, or digital inputs, or pt1000, or 4-20 mA, or 0-10 V	**5 digital outputs:** ■ 3x Relay 5 A SPST, 3x 1 common *(2)* ■ 2x Relay 5 A SPST, 2x 1 common *(2)* **4 analog outputs:** ■ 1x 0-10 V/ 4-20 mA ■ 3x 0-10 V/PWM (10Hz...2kHZ)	● 2 RS-485 ● 1 USB-C	Built-in display	TM173OFM22R *(4)*	0.183 *0.404*
		5 digital outputs: ■ 3x Relay 5 A SPST, 3x 1 common *(2)* ■ 2 SSR (2x 110/240 VAC and 24 VAC) **4 analog outputs:** ■ 1x 0-10 V/ 4-20 mA ■ 3x 0-10 V/PWM (10Hz...2kHZ)	● 2 RS-485 ● 1 USB-C	Built-in display	TM173OFM22S *(4)*	0.180 *0.399*
Connection cables for M173 (Flush monting) (to be ordered separately)						
Flexible, unipolar I/O wire with PVC insulation, featuring a 22-pole microfit terminal	To use with TM173OFM22R and TM173OFM22S			1 m *(3.28 ft.)*	TM173ACB1M	0.185 *0.407*
				2 m *(6.56 ft.)*	TM173ACB2M	0.367 *0.807*

M173 Optimized logic controllers: Power supply: 230 VAC

No. of I/O	Number and type of channels: Inputs	Number and type of channels: Outputs	Embedded communication ports	Display	Reference	Weight kg/*lb*
35 mm/*1.38 in* ⊥ rail mounting *(1)*						
22	**6 digital inputs:** ■ 2x Volt-free or pulse reading - up to 2 kHz ■ 4x volt-free **7 analog inputs** (configurable in pairs): ■ 1x NTC (β3435 - 10 kW at 25°C), or PT1000, or digital input, or 0-10 V ■ 6x NTC (β3435 - 10 kW at 25°C), or PT1000, or 4-20 mA, or 5 V, or 10 V, or digital inputs	**5 digital outputs:** ■ 3x Relay 3 A SPST, 3x 1 common *(2)* ■ 2x SSR (2x 110/240 VAC and 24 VAC) **4 analog outputs:** ■ 1x 0-10 V/ 4-20 mA ■ 3x 0-10 V/PWM (10Hz...2kHz)	● 3 CAN expansion bus ● 2 RS-485 ● 1 USB-C	Built-in display	TM173ODM22RH	0.265 *0.584*
		5 digital outputs: ■ 3x Relay 3 A SPST, 3x 1 common *(2)* ■ 2 Relay 3 A SPST, 2x 1 common *(2)* **4 analog outputs:** ■ 1x 0-10 V/ 4-20 mA ■ 3x 0-10 V/PWM (10Hz...2kHz)	● 3 CAN expansion bus ● 2 RS-485 ● 1 USB-C	Built-in display	TM173ODM22SH	0.180 *0.396*
			● 3 CAN expansion bus ● 2 RS-485 ● 1 USB-C	Remote display (optional)	TM173OBM22RH	0.260 *0.573*

Remote display for M173 Optimized logic controllers

Designation	Description	Reference	Weight kg/*lb*
Remote LED display	Powered by the controller	TM173DLED	0.099 *0.220*

(1) Removable terminal blocks are supplied with TM173 Optimized logic controllers.
(2) 100 k cycles- no UL derating.
(3) This controller is equipped with one valve driver output and is compatible with the electronic expansion valve driver ref. TM172EVEV1U.
(4) This controller requires a connection cble type TM173ACB1●M.

Modicon M171/M172/M173

Logic controllers for HVAC and Pumping applications

M172 Optimized and Performance logic controllers, Remote displays

Application	**Logic controllers for any size of connectable machines**						
Product name	**M172 Performance**		**M172 Optimized**		**M172 Performance**		
Reference *(1)*	**TM172PBG07R**	**TM172PDG07R**	**TM172OBM18R**	**TM172ODM18R**	**TM172PBG18R**	**TM172PDG18R**	**TM172PDG18S**
Power supply	24 VAC/DC						
Type of mounting	4 DIN, 35 mm/1.38 in ⊥⊥ rail mounting Performance controllers, and Panel mounting with TM172AP12PM mounting accessory*(2)*						
Embedded display	–	Yes	–	Built-in display 128x64 LCD with backlight	–	Built-in display 128x64 LCD with backlight	
Total I/Os	**7**		**18**		**18**		
Analog Input Total	**2**		**8**		**8**		
NTC, or PT1000, or PTC, or 0-20 mA, or 4-20 mA, or 0-5 V, or 0-10 V, or hOhm, or daOhm, or digital input	2		8		8		
Digital Inputs Total	**2**		**2**		**2**		
High speed counter (2 kHz), dry contact	2		2		2		
24 VAC/DC	–		–		–		
Analog Outputs Total	–		**2**		**2**		
0-10 V, or 4-20 mA, or PWM (2 kHz, 24 VDC)	–		2		2		
0-10 V	–		2		2		
Digital Outputs Total	**3**		**6**		**6**		
Relay 3 A	3		6		6	4	
SSR 0.5 A	–		–		–	2	
Compatible Secure Interface	**TM172SIG, TM172SIP**						
Compatible expansion module	**TM172E12R**, **TM172E28R**, **TM171EP14R** and **TM171EP27R** (up to 7 I/O expansions max.)						
Compatible expansion valve driver	**TM172EVEV1U, TM172EVEV1B, TM172EVEV2B** (up to 4 expansion valve drivers max.)						
Embedded communication ports Ethernet (Modbus TCP, BACnet IP (B-AAC profile), WebVisu)	1		–		1		
RS-485 (Modbus SL or BACnet MS/TP (B-AAC profile)	2		2		2		
CAN expansion bus	1		1		1		
Communication module ports	1		1		1		
USB-B	1		1		1		
USB-A	1		–		1		
µSD Card slot	1		–		1		
Optional communication ports With communication module (see page 42)	• CAN expansion bus • Modbus TCP • Modbus SL(RS-485) • BACnet MS/TP (B-AAC profile) • BACnet IP (B-AAC profile) • RS232 Serial link • LonWorks (FFT-10)						
With Secure Interfaces (see page 40)	• FTPs • HTTPs • SMTPs • SNMT • MQTT • Cybersecure VPN						

Application	**Logic controllers for any size of connectable machines**								
Product name	**M172 Optimized**		**M172 Performance**			**M172 Optimized**		**M172 Performance**	
Reference *(1)*	**TM172OBM28R**	**TM172ODM28R**	**TM172PBG28R, TM172PBG28RI**	**TM172PDG28R, TM172PDG28RI**	**TM172PDG28SI**	**TM172OBM42R**	**TM172ODM42R**	**TM172PBG42R, TM172PBG42RI**	**TM172PDG42R, TM172PDG42RI**	**TM172PDG42S, TM172PDG42SI**
Power supply	24 VAC/DC								
Type of mounting	8 DIN, 35 mm/1.38 in ⊥⊥ rail mounting Performance controllers, and Panel mounting with TM172AP12PM mounting accessory *(2)*								
Embedded display	–	Built-in display 128x64 LCD with backlight	–	Built-in display 128x64 LCD with backlight		–	Built-in display 128x64 LCD with backlight	–	Built-in display 128x64 LCD with backlight	
Total I/Os	**28**					**42**				
Analog Input Total	**8**					**12**				
NTC, or PT1000, or PTC, or 0-20 mA, or 4-20 mA, or 0-5 V, or 0-10 V, or hOhm, or daOhm, or digital input	8					12				
Digital Inputs Total	**8**					**12**				
High speed counter (2 kHz), dry contact	2					2				
24 VAC/DC	6					10				
Analog Outputs Total	**4**					**6**				
0-10 V, or 4-20 mA, or PWM (2 kHz, 24 VDC)	2					2				
0-10 V	2					4				
Digital Outputs Total	**8**					**12**				
Relay 3 A	8				6	12				10
SSR 0.5 A	–				2	–				2
Compatible Secure Interface	**TM172SIG, TM172SIP**								
Compatible expansion module	**TM172E12R**, **TM172E28R**, **TM171EP14R** and **TM171EP27R** (up to 7 I/O expansions max.)								
Compatible expansion valve driver	**TM172EVEV1U, TM172EVEV1B, TM172EVEV2B** (up to 4 expansion valve drivers max.)								
Embedded communication ports Ethernet (Modbus TCP, BACnet IP (B-AAC profile), WebVisu)	–		1			–		1		
RS-485 (Modbus SL or BACnet MS/TP (B-AAC profile)	2		2			2		2		
CAN expansion bus	1		1			1		1		
Communication module ports	1		1			1		1		
USB-B	1		1			1		1		
USB-A	–		1			–		1		
µSD Card slot	–		1			–		1		
Optional communication ports With communication module (see page 42)	• CAN expansion bus • Modbus TCP • Modbus SL(RS-485) • BACnet MS/TP (B-AAC profile) • BACnet IP (B-AAC profile) • RS232 Serial link • LonWorks (FFT-10)								
With Secure Interfaces (see page 40)	• FTPs • HTTPs • SMTPs • SNMT • MQTT • Cybersecure VPN								

(1) Products equipped with an isolated power supply, and two isolated RS-485 ports. (2) Accessories to be ordered separately.

Application	**Remote displays (compatible with each M172 Logic controller)**					
References	**TM172DGRP**	**TM172DCLWT**	**TM172DCLWTH**	**TM172DCLWTHP**	**TM172DCLFW**	**TM172DCLFG**
Type of mounting	Remote wall	Remote wall	Remote wall	Remote wall	Remote flush	Remote flush
Description	LCD display with backlight	LCD display, Color touchscreen Temperature	LCD display, Color touchscreen Temperature, Relative humidity	LCD display, Color touchscreen Temperature, Relative humidity, Presence PIR	LCD display, Color touchscreen IP65 (front face)	LCD display, Color touchscreen IP65 (front face)
Programming software	EcoStruxure Machine Expert - HVAC V1.0 or higher					
Product certifications	CE, cURus (UL Recognized), CSA, EAC, RCM, RoHS China					
Communication	• CAN expansion bus	• Modbus SL		• Modbus SL		

4 DIN - with display

8 DIN - without display

M172 Optimized logic controller

4 DIN - without display

8 DIN - with display

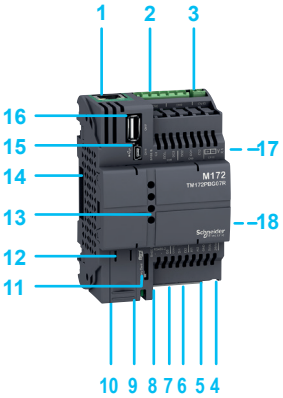
M172 Performance logic controller

M172 Optimized and Performance logic controllers

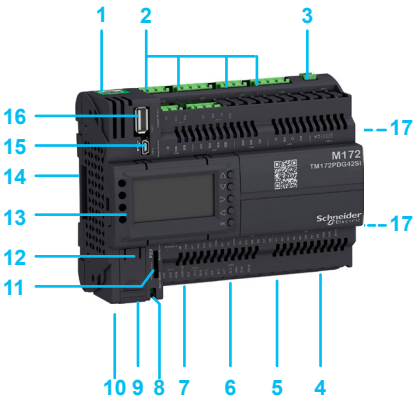
M172 Optimized and M172 Performance logic controllers are differentiated by the connectivity: embedded on M172 Performance, optional on M172 Optimized. M172 logic controllers embed 7, 18, 28 or 42 I/O, and can be fitted with a display, with relay outputs, and with SSR outputs, depending on the model.

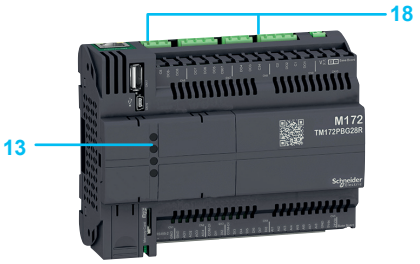
- The M172 logic controller offer comprises:
  - a M172 model to control from 7 up to 18 embedded I/O (digital and analog), in 4 DIN (controller width is 72 mm /*2.83 in)*
  - and M172 models to control from 28 up to 42 embedded I/O (digital and analog), in 8 DIN (controller width 144 mm /*5.66 in)*
- Power supply: 24 VAC/DC
- Two types of housing:
  - with built-in display
  - without display
- Two types of mounting:
  - On 35 mm/*1.38 in* ⊥ rail mounting: for M172 logic controller to be mounted inside a cabinet
  - On panel: with **TM172AP12PM** fixing accessory
- Communication ports on M172 Optimized logic controllers:
  - Two RS-485 for Modbus SL (client/server) (only 1 client) or 1 for BACnet MS/TP (B-AAC profile, BACnet BTL certified)
  - One for CAN expansion bus
  - Plus one communication module connector
- Communication ports on M172 Performance logic controllers: same as M172 Optimized, plus one RJ45 for Modbus TCP, BACnet IP (B-AAC profile, BACnet BTL certified) and Ethernet
- M172 logic controllers can be connected to communication modules, offering another connection to a CAN expansion bus, Modbus SL or LonWorks, etc., see page 42.
- M172 logic controllers are certified CE, cURus (UL Recognized), CSA, EAC, RCM, RoHS China, and BACnet BTL certified.
- Micro SD card: a slot for a micro SD memory card is available on the front face of the M172 Performance logic controllers *(1)*.
  The micro SD card is used for:
  - Data logging
  - Webserver storage
- USB programming ports
  - The USB-A port is available on M172 Performance logic controllers, used to transfer programs with a memory stick.
  - USB mini B is available on M172 Optimized and Performance logic controllers, used to connect to a PC for programming, see page 49.

(1) M172 Optimized logic controllers do not have a slot for a micro SD card (no slot can be added later).



4 DIN controller





8 DIN controller

M172 Optimized and Performance logic controllers

M172 logic controllers with 7 or 18 I/O (in 4 DIN: controller width is 72 mm /*2.83 in*) *(1)*

1 RJ45 connector for Ethernet Modbus TCP, BACnet IP (B-AAC profile) *(2)*
2 Connector for removable terminal block for digital outputs
3 Connector for removable terminal block for power supply (24 VAC/DC) *(3)*
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 inputs (high speed counter)
7 Connector for removable terminal block for analog outputs
8 Connector for removable terminal block for RS-485-1 (Modbus SL or BACnet MS/TP) *(3)*
9 Connector for removable terminal block for RS-485-2 (Modbus SL or BACnet MS/TP) *(3)*
10 Connector for removable terminal block for CAN expansion bus
11 Slot for micro SD card *(2)*
12 Slot for battery (behind the front flap)
13 On TM17●D●●●: Built-in display, 4 status LEDs and 5 control keys for setting controller parameters
On TM17●B●●●: 4 status LEDs and 5 control keys for setting controller parameters, behind a front panel
14 Connector for communication module
15 USB-B port to link a PC
16 USB-A port for USB stick *(2)*
17 Clip-on lock for 35 mm/*1.38 in* ⊔ rail mounting
18 Two slots for the **TM172AP12PM** fixing accessory

M172 logic controllers with 28 or 42 I/O (in 8 DIN: controller width is 144 mm /*5.66 in*) *(1)*

1 RJ45 connector for Ethernet Modbus TCP and BACnet IP (B-AAC profile) *(2)*
2 Connector for removable terminal block for digital outputs
3 Connector for removable terminal block for power supply (24 VAC/DC) *(3)*
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 inputs (high speed counter)
7 Connector for removable terminal block for analog outputs
8 Connector for removable terminal block for RS-485-1 (Modbus SL or BACnet MS/TP) *(3)*
9 Connector for removable terminal block for RS-485-2 (Modbus SL or BACnet MS/TP) *(3)*
10 Connector for removable terminal block for CAN expansion bus
11 Slot for micro SD card *(2)*
12 Slot for battery (behind the front flap)
13 On **TM172●D●●●●**: Built-in display, 4 status LEDs and 5 control keys for setting controller parameters
On **TM172●B●●●●**: 4 status LEDs and 5 control keys for setting controller parameters, behind a front panel
14 Connector for communication modules
15 USB-B port to connect a PC
16 USB-A port for USB stick *(2)*
17 Clip-on lock for 35 mm/*1.38 in* ⊔ rail mounting
18 Two slots for the **TM172AP12PM** fixing accessory

(1) TM172ASCTB●●● removable terminal blocks to be ordered separately, see page 27.
(2) Only for M172 Performance.
(3) TM172O●●●●, TM172P●G07R, TM172P●G18●, TM172P●G28●I and TM172P●G42●I have an isolated power supply and two isolated RS-485 ports.

Modicon M171/M172/M173

Logic controllers for HVAC and Pumping applications

M172 Optimized logic controllers

TM172OBM18R

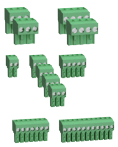
TM172ODM18R

TM172OBM28R

TM172ODM28R

TM172OBM42R

TM172ODM42R


TM172ASCTB28

TM172AP12PM

M172 Optimized logic controllers: Power supply: 24 VAC/DC

35 mm/*1.38 in* ⊥ rail mounting, and Panel mounting with accessory

No. of I/O	Number and type of channels: Inputs	Number and type of channels: Outputs	Embedded communication ports	Display	Reference	Weight kg/*lb*
18	**2 digital inputs:** ■ 2x high speed counter (2 kHz), dry contact **8 analog inputs** (configurable in pairs): ■ 8x NTC, or PT1000, or PTC, or 0-20 mA, or 4-20 mA, or 0-5 V, or 0-10 V, or hOhm, or daOhm, or digital input	**6 digital outputs:** ■ 1x SPDT relay 3 A ■ 2x SPST 3 A with the same common ■ 1x SPST 3 A ■ 2x SPST 3 A with independent common **2 analog outputs:** ■ 2x 0-10 V, or 4-20 mA, or PWM (2 kHz, 24 VDC)	● 1 CAN expansion bus ● 2 RS-485 ● 1 USB-B ● 1 Communication module port	Remote display (optional)	TM172OBM18R *(1)*	0.170/ *0.375*
				Built-in display 128x64 LCD with backlight	TM172ODM18R *(1)*	0.195/ *0.430*
28	**8 digital inputs:** ■ 6x 24 VAC or DC ■ 2x high speed counters, dry contact **8 analog inputs** (configurable in pairs): ■ 8x NTC, or PT1000, or PTC, or 0-20 mA, or 4-20 mA, or 0-5 V, or 0-10 V, or digital input	**8 digital outputs:** ■ 1x SPDT Relay 3 A ■ 3x SPST 3 A with the same common ■ 2x SPST 3 A with the same common ■ 2x SPST 3 A with independent common **4 analog outputs** ■ 2x 0-10 V, or 4-20 mA, or PWM (2 kHz, 24 VDC) ■ 2x 0-10 V	● 1 CAN expansion bus ● 2 RS-485 ● 1 USB-B ● 1 Communication module port	Remote display (optional)	TM172OBM28R *(1)*	0.390/ *0.859*
				Built-in display 128x64 LCD with backlight	TM172ODM28R *(1)*	0.390/ *0.859*
42	**12 digital inputs:** ■ 10x 24 VAC or DC ■ 2x high speed counters, dry contact **12 analog inputs** (configurable in pairs): ■ 12x NTC, or PT1000, or PTC, or 0-20 mA, or 4-20 mA, or 0-5 V, or 0-10 V, or digital input	**12 digital outputs:** ■ 2x SPDT Relay 3 A ■ 3x SPST 3 A with the same common ■ 3x SPST 3 A with the same common ■ 2x SPST 3 A with the same common ■ 2x SPST 3 A with independent common **6 analog outputs:** ■ 2x 0-10 V, or 4-20 mA, or PWM (2 kHz, 24 VDC) ■ 4x 0-10 V	● 1 CAN expansion bus ● 2 RS-485 ● 1 USB-B ● 1 Communication module port	Remote display (optional)	TM172OBM42R *(1)*	0.480/ *1.058*
				Built-in display 128x64 LCD with backlight	TM172ODM42R *(1)*	0.480/ *1.058*

Accessories to be ordered separately

Designation	Use for	Reference	Weight kg/*lb*
I/O screw terminal blocks	**TM172●●●07R** logic controllers	TM172ASCTB07	0.025/ *0.055*
	TM172●●●18● logic controllers	TM172ASCTB18	0.040/ *0.088*
	TM172P●●●28●, **TM172P●●●28●I** logic controllers	TM172ASCTB28	0.100/ *0.220*
	TM172P●●●42●, **TM172P●●●42●I** logic controllers	TM172ASCTB42	0.150/ *0.331*
Fixing accessory: 12 clip-on locks for panel mounting	For mounting M172 logic controllers and M172 expansion modules on panel	TM172AP12PM	0.050/ *0.110*

(1) Products equipped with an isolated power supply, and two isolated RS-485 ports.

M172 Performance logic controllers: Power supply: 24 VAC/DC

35 mm/*1.38 in* ⊥ rail mounting, and panel mounting with accessory

No. of I/O	Number and type of channels: Inputs	Number and type of channels: Outputs	Embedded communication ports	Display	Reference	Weight kg/*lb*
7	**2 digital inputs:** ■ 2x high speed counter (2 kHz), dry contact **2 analog inputs** (configurable in pairs): ■ 2x NTC, or PT1000, or PTC, or 0-20 mA, or 4-20 mA, or 0-5 V, or 0-10 V, or hOhm, or daOhm, or digital input	**3 digital outputs:** ■ 1x SPDT relay 3 A ■ 2x SPST 3 A with the same common	● 1 Ethernet ● 1 CAN expansion bus ● 2 RS-485 ● 1 USB-A ● 1 USB-B ● 1 Communication module port ● 1 µSD Card slot	Remote display (optional)	TM172PBG07R (1)	0.175/ *0.386*
				Built-in display 128x64 LCD with backlight	TM172PDG07R (1)	0.200/ *0.441*
18	**2 digital inputs:** ■ 2x high speed counters, dry contact **8 analog inputs** (configurable in pairs): ■ 8x NTC, or PT1000, or PTC, or 0-20 mA, or 4-20 mA, or 0-5 V, or 0-10 V, or hOhm, or daOhm, or digital input	**6 digital outputs** ■ 1x SPDT relay 3 A ■ 2xSPST 3 A with the same common ■ 1x SPST 3 A ■ 2x SPST 3 A with independent common ■ Optional 2x SSR 0.5 A with independent common for TM172PDG18S only **2 Analog outputs:** ■ 2x 0-10 V, or 4-20 mA, or PWM (2 kHz, 24 VDC)	● 1 Ethernet ● 1 CAN expansion bus ● 2 RS-485 ● 1 USB-A ● 1 USB-B ● 1 Communication module port ● 1 µSD Card slot	Remote display (optional)	TM172PBG18R (1)	0.200/ *0.441*
				Built-in display 128x64 LCD with backlight	TM172PDG18R (1)	0.225/ *0.496*
					TM172PDG18S (1)	0.225/ *0.496*
28	**8 digital inputs:** ■ 6x 24 VAC or DC ■ 2x high speed counters, dry contact **8 analog inputs,** (configurable in pairs): ■ 8x NTC, or PT1000, or PTC, or 0-20 mA, or 4-20 mA, or 0-5 V, or 0-10 V, or digital input	**8 digital outputs:** ■ 1x SPDT Relay 1 A or 3 A for TM172P●G28●I ■ 3x SPST 3 A with the same common ■ 2x SPST 3 A with the same common ■ 2x SPST 3 A with independent common ■ Optional 2x SSR 0.5 A with independent common for TM172PDG28SI only **4 analog outputs:** ■ 2x 0-10 V, or 4-20 mA, or PWM (2 kHz, 24 VDC) ■ 2x 0-10 V	● 1 Ethernet ● 1 CAN expansion bus ● 2 RS-485 ● 1 USB-A ● 1 USB-B ● 1 Communication module port ● 1 µSD Card slot	Remote display (optional)	TM172PBG28R	0.300/ *0.661*
				Built-in display 128x64 LCD with backlight	TM172PDG28R	0.300/ *0.661*
				Remote display (optional)	TM172PBG28RI (1)	0.390/ *0.859*
				Built-in display 128x64 LCD with backlight	TM172PDG28RI (1)	0.390/ *0.859*
					TM172PDG28SI (1)	0.390/ *0.859*
42	**12 digital inputs:** ■ 10x 24 VDC ■ 2x high speed counter, dry contact **12 analog inputs,** (configurable in pairs): ■ 12x NTC, or PT1000, or PTC, or 0-20 mA, or 4-20 mA, or 0-5 V, or 0-10 V, or digital input	**12 digital outputs:** ■ 2x SPDT relay 1 A or 3 A for TM172P●G42●I ■ 3x SPST 3 A with the same common ■ 3x SPST 3 A with the same common ■ 2x SPST 3 A with the same common ■ 2x SPST 3 A with independent common ■ Optional 2x SSR 0.5 A with independent common for TM172PDG42S and TM172PDG42SI only **6 analog outputs:** ■ 2x 0-10 V, or 4-20 mA, or PWM (2 kHz, 24 VDC) ■ 4x 0-10 V	● 1 Ethernet ● 1 CAN expansion bus ● 2 RS-485 ● 1 USB-A ● 1 USB-B ● 1 Communication module port ● 1 µSD Card slot	Remote display (optional)	TM172PBG42R	0.385/ *0.849*
				Built-in display 128x64 LCD with backlight	TM172PDG42R	0.385/ *0.849*
					TM172PDG42S	0.385/ *0.849*
				Remote display (optional)	TM172PBG42RI (1)	0.480/ *1.058*
				Built-in display 128x64 LCD with backlight	TM172PDG42RI (1)	0.480/ *1.058*
					TM172PDG42SI (1)	0.480/ *1.058*

TM172PBG07R

TM172PDG18R

TM172PBG28RI

TM172PDG28RI

TM172PBG42RI

TM172PDG42SI

Accessories to be ordered separately

I/O screw terminal blocks, Fixing accessory	See page 27

(1) Products equipped with an isolated power supply, and two isolated RS-485 ports.

I/O expansion modules

Two I/O expansion modules are available to increase the number of I/O:

- up to 78 on M173 logic controllers,
- up to 238 on M172 logic controllers.

- Expanded I/O types are digital and analog; the mix between inputs and outputs differs according to the module, making it easier to adapt the configuration to each need.
- They are connected via the CAN expansion bus of the logic controllers.
- The maximum number of expansion modules on the CAN expansion bus is 7, in any combination (if more expansions are needed, please contact our Customer Care Centre).
- The expansion modules are equipped with DIP switches which can be used to set the baud rate, the network address and also to incorporate a 120 ohm terminal resistor.
- The I/O can be configured in pairs, like M172 controllers.
- I/O expansion modules compatibility:

Logic controllers	Compatible I/O expansion module (reference)
M172 Optimized (**TM172O●●●●**) M172 Performance (**TM172P●●●●**)	**TM172E12R** **TM172E28R** *Legacy **TM171EP** expansion modules are also compatible with M172 controllers.*
M173 Optimized (**TM173O●●●●**)	**TM172E12R** **TM172E28R**

TM172E12R

TM172E28R

TM172E28R

TM172E12R and **TM172E28R** expansion modules *(1)*

1 Connector for removable terminal block for power supply (24 VAC/DC)
2 Removable terminal block for digital outputs
3 Connector for removable terminal block for CAN expansion bus
4 DIP switches
5 Clip-on lock for 35 mm/*1.38 in* ⊥ rail mounting
6 Connector for removable terminal block for digital inputs
7 Connector for removable terminal block for analog inputs with 5 VDC/24 VDC output power supply

TM172E28R expansion module *(1)*
8 Connector for removable terminal block for analog outputs
9 Two slots for **TM172AP12PM** fixing accessory

(1) Removable terminal blocks to be ordered separately, see page 27.

Modicon M171/M172/M173

Logic controllers for HVAC and Pumping applications

I/O expansion modules for M173 and M172 logic controllers

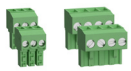
TM172E12R

TM172E28R

I/O expansion modules

35 mm/*1.38 in* ⊔ rail mounting

No. of I/O	Number and type of channels: Inputs *(1)*	Number and type of channels: Outputs *(1)*	Compatibility	Embedded communication ports	Reference	Weight kg/*lb*
12	**2 digital inputs:** ■ 2x high speed counters, dry contact **4 analog inputs:** ■ 4x NTC or PT1000, or PTC, or 0-20 mA, or 4-20 mA, or 0-5 V, or 0-10 V, or hOhm, or daOhm, or digital inputs	**6 digital outputs:** ■ 3x SPST 3 A with the same common ■ 3x SPST 3 A with the same common	**TM173O●●●●** **TM172O●●●●** **TM172P●●●●**	● 1 CAN expansion bus	**TM172E12R**	0.140/ *0.308*
28	**6 digital inputs:** ■ 4x 24 VAC or DC ■ 2x high speed counters, dry contact **10 analog inputs**: ■ 10x NTCor PT1000, or PTC, or 0-20 mA, or 4-20 mA, or 0-5 V, or 0-10 V, or hOhm, or daOhm, or digital inputs	**10 digital outputs:** ■ 3x SPST 3 A with the same common ■ 3x SPST 3 A with the same common ■ 2x SPST 3 A with the same common ■ 2x SPST 3 A with the same common **2 analog outputs:** ■ 2x 0-10 V, or 4-20 mA,or PWM (2 kHz, 24 VDC)	**TM173O●●●●** **TM172O●●●●** **TM172P●●●●**	● 1 CAN expansion bus	**TM172E28R**	0.190/ *0.418*



TM172ASCTB12E

TM172ASCTB28E

TM172AP12PM

Accessories to be ordered separately

Designation	Compatibility	Reference	Weight kg/*lb*
Screw terminal blocks (inputs, outputs, and communication bus)	**TM172E12R** expansion module	**TM172ASCTB12E**	0.070/ *0.154*
	TM172E28R expansion module	**TM172ASCTB28E**	0.100/ *0.220*
Fixing accessory: 12 clip-on locks for panel mounting	**TM172E●●R** expansion modules	**TM172AP12PM**	0.055/ *0.110*

(1) Removable terminal blocks to be ordered separately.

Modicon M171/M172/M173

Logic controllers for HVAC and Pumping applications

Remote displays for M172 logic controllers

Remote displays

Remote color touch screen displays
Six remote color touch screen displays are dedicated to the M172 Optimized and Performance logic controllers, distinguished by use and type of mounting.
These displays can be also used with M171 controllers with Modbus SL or with third-party products equipped via Modbus SL.
They are all programmable with EcoStruxure Machine Expert - HVAC. The remote color touch screen displays have the same firmware, meaning they can be swapped interchangeably.

- TM172DCLWT●● are designed for wall mounting and indoor use, depending on the reference, for controlling temperature, relative humidity and PIR presence with built-in sensor.
- TM172DCLF● are designed for flush mounting, and wall mounting with an accessory, and either indoor or outdoor uses, with a or dark gray housing.An installation on a wall with TM172ABKP●● accessories, useful for a plant room.
- TM172DCLWT● and TM172DCLF● displays can be mounted vertically (portrait) or horizontally (landscape) *(1)*. They can be configured for Modbus SL as client or server, by means of the software.
  - On Modbus SL Server, up to 8 displays can be installed in the same network.
  - On Modbus SL Client, up to 8 devices can be managed via the display.

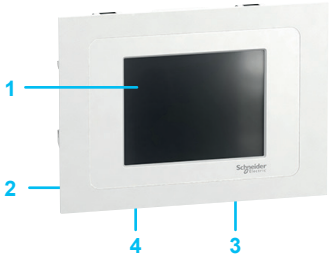
Remote monochrome display

- TM172DGRP monochrome display is dedicated to the M172 Optimized and M172 Performance logic controllers. It is designed for flush mounting, and wall mounting with an accessory, and indoor use. It is programmable with EcoStruxure Machine Expert - HVAC.

TM172DCLWT●●

TM172DCLWT●●

1 3.5" color touch screen LCD (320 x 240 pixels)
2 Holes for presence (motion) detection
3 Input connector (USB Micro-B port)
4 Power Supply (24 VAC/DC)
5 RS-485 Modbus serial line
6 Holes for temperature and humidity measurement



TM172DCLFW

TM172DCLFW, TM172DCLFG

1 3.5" color touch screen LCD (320 x 240 pixels)
2 Input connector (USB Micro-B port)
3 Power Supply (24 VAC/DC)
5 RS-485 Modbus serial line

TM172DCLFG

TM172DGRP

1 Backlight monochrome LCD screen (240 x 140 pixels)
2 5 control keys
3 CAN bus connector

TM172DGRP

(1) With landscape mounting, temperature and humidity sensors cannot be used as they are not accurate.

Modicon M171/M172/M173

Logic controllers for HVAC and Pumping applications

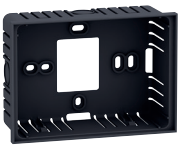
Remote displays for M172 logic controllers

TM172DCLWT●●

TM172DCLFW

TM172DCLFG

TM172DGRP



TM172ABKPG

TM171ABKPG

Remote displays

Type	Description	Housing	Built-in sensor for	Reference	Weight kg/*lb*
Remote color touch screen wall mounting displays	■ Power supply: 24 VAC/DC ■ Color touchscreen ■ Size: 3.5“ ■ Resolution: 320 x 240 pixels ■ IP20 ■ Communication port: 1 RS-485, Modbus SL with terminal blocks	White	■ Temperature	TM172DCLWT	0.340/ *0.749*
			■ Temperature ■ Relative humidity	TM172DCLWTH	0.340/ *0.749*
			■ Temperature ■ Relative humidity ■ Presence PIR	TM172DCLWTHP	0.340/ *0.749*
Remote color touch screen flush mounting displays	■ Power supply: 24 VAC/DC ■ Color touchscreen ■ Size: 3.5“ ■ Resolution: 320 x 240 pixels ■ IP65 (front face) ■ Communication port: 1 RS-485, Modbus SL with terminal blocks	White	–	TM172DCLFW	0.205/ *0.452*
		Grey	–	TM172DCLFG	0.205/ *0.452*
Remote display monochrome	■ 5 control keys ■ Backlit LCD, ■ 240 x 140 pixels, ■ Monochrome, ■ With real time clock	Grey		TM172DGRP	0.197/ *0.430*

Accessories to be ordered separately

Type	Use	Reference	Weight kg/*lb*
Mounting accessories *(1)*	White wall support for TM172DCLFW display	TM172ABKPW	0.060/ *0.132*
	Grey wall support for TM172DCLFG display	TM172ABKPG	0.060/ *0.132*
	Wall bracket For TM172DGRP display	TM171ABKPG	0.015/ *0.030*

(1) With the use of TM172ABKP●● accessories, the degree of protection for the TM172DCLF● displays is IP20.

Modicon M171/M172/M173

Logic controllers for HVAC and Pumping applications

M171 Optimized logic controllers and Remote displays

Application	Logic controllers for Simple and compact machines								
Product name	M171 Optimized								
Reference	**TM171OBM14R** *(1)*	**TM171OD14R** *(1)*	**TM171ODM14R** *(1)*	**TM171OBM22R**	**TM171OD22R**	**TM171ODM22R**	**TM171ODM22S**	**TM171OF22R**	**TM171OFM22R**
Power supply	100-240 VAC			24 VAC/DC *(3) (4)*					
Type of mounting	4 DIN, 35 mm/1.38 in ⊥⊥ rail mounting			4 DIN, 35 mm/1.38 in ⊥⊥ rail mounting				Flush mounting	
Embedded display	–	Built-in display		–	Built-in display				
Total I/Os	**14**			**22**					
Analog Inputs Total	**5**			**5**					
NTC, or PT1000, or digital inputs	2			–					
NTC, or 0-20 mA, or 4-20 mA, or 0-10 V, or 0-5 V, or 0-1 V, or digital inputs	2			2					
NTC, or PT1000, or 0-20 mA, or 4-20 mA, or 0-10 V, or 0-5 V, or 0-1 V, or digital input	1			–					
NTC or digital inputs	–			3					
Digital Inputs Total	**2**			**6**					
open collector or digital inputs *(2)*	2			–					
volt-free in 1 group	–			6					
Analog Outputs Total	**5**			**5**					
open collector *(2)* for 12 V PWM/PPM or digital inputs	2			–					
open collector for 12 V PWM/PPM	–			2					
0-10 V	2			3					
4-20 mA	1			–					
Digital Outputs Total	**4**			**6**					
Relay 2 A, 230 VAC	4			5			3	5	
open collector	–			1			1	1	
SSR (3 A, 230 VAC)	–			–			2	–	
Maximum I/Os expanded	**22**			**44**					
Compatible Secure Interface	**TM172SIG**	**TM172SIG** *(5)*	**TM172SIG**	**TM172SIG**	**TM172SIG** *(5)*	**TM172SIG**	**TM172SIG**	**TM172SIG** *(5)*	**TM172SIG**
Compatible expansion module	**TM171EO14R**			**TM171EO15R, TM171EO22R**					
Embeded communication ports RS-485	1	–	1	1	–	1	1	–	1
LAN expansion bus	1			1					
Connection accessories references (sold in lots of 5)									
Low voltage connector	–			**TM171ACB4OI1M, TM171ACB4OI2M**					
Analog output connector	–			**TM171ACB4OAO1M, TM171ACB4OAO2M**					
Modbus SL connector	–			**TM171ACB4ORS485**	–	**TM171ACB4ORS485**	**TM171ACB4ORS485**	–	**TM171ACB4ORS485**
LAN expansion bus connector	**TM171ACB4OLAN**			**TM171ACB4OLAN**					

(1) Terminal blocks are supplied with TM171OBM14R, TM171OD14R, and TM171ODM14R.
(2) Both I/O are the same. On the same channel: 2 digital inputs or 2 analog outputs (depending on the configuration).
(3) Except for for TM171ODM22S: 12-24 VAC.
(4) Connectors to be ordered separately, see page 35.
(5) When controller is associated to a TM171AMB Communication module.

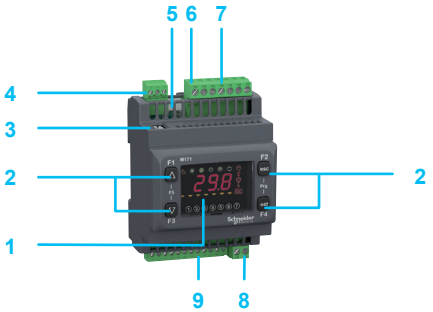
Application	Remote Displays (compatible with each M171 Logic controller)								
Reference	**TM171DLED**	**TM171DLCD2U**	**TM171DWAL2U**	**TM171DWAL2L**	**TM172DCLWT**	**TM172DCLWTH**	**TM172DCLWTHP**	**TM172DCLFW**	**TM172DCLFG**
Type of mounting	Remote flush	Remote flush	Remote wall	Remote wall	Remote wall	Remote wall	Remote wall	Remote wall	Remote flush
Description	LED display Keyboard: 4 buttons	LCD display Keyboard: 7 buttons	LCD display Keyboard: 4 buttons Without backlight	LCD display Keyboard: 4 buttons With backlight	LCD display Color touchscreen Temperature	LCD display Color touchscreen Temperature, Relative humidity	LCD display Color touchscreen Temperature, Relative humidity Presence PIR	LCD display Color touchscreen IP65 (front face)	LCD display Color touchscreen IP65 (front face)
Programming software	EcoStruxure Machine Expert - HVAC V1.0 or higher			EcoStruxure Machine Expert - HVAC V1.0 or higher					
Product certifications	CE, UL (recognized), cURus, CSA, EAC, RCM, RoHS China.			CE, UL (recognized), cURus, CSA, EAC, RCM, RoHS China.					
Communication	• LAN expansion bus			• LAN expansion bus	• Modbus SL	–	–	–	–

M171 Optimized logic controllers

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

- Two types of power supply are available:
  - 100-240 VAC
  - 12-24 VAC or 24 VDC
- Two types of housing:
  - with built-in display
  - with remote display that can be added by means of the LAN expansion bus
- Two types of mounting:
  - Flush mounting: controllers to be mounted on a cabinet door
  - On 35 mm/1.38 in ⊔ rail mounting: controllers to be mounted inside a cabinet
- Communication ports on M171 Optimized logic controllers:
  - One optional Modbus SL bus
  - One LAN expansion bus
- M171 Optimized logic controllers are certified CE, UL (recognized), cURus, CSA, EAC, RCM, RoHS China.

35 mm/*1.38 in* ⊔ rail mounting



TM171O●14R Optimized logic controllers

1 Display
2 4x control keys for setting controller parameters (Enter, Escape, Navigation)
3 Programming port (TTL)
4 Removable terminal block for RS-485 serial port (**TM171O●M14R**)
5 Wired connector for LAN expansion bus
6 Clip-on lock for 35 mm/*1.38 in* ⊔ rail mounting
7 Removable terminal block for digital outputs
8 Removable terminal block for 100…240 VAC power supply
9 Removable terminal block for I/O

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

1 Display
2 4x control keys for setting controller parameters (Enter, Escape, Navigation)
3 Programming port (TTL)
4 Wired connector for RS-485 serial port (**TM171O●M14R**)
5 Clip-on lock for 35 mm/*1.38 in* ⊔ rail mounting
6 Removable terminal block for outputs
7 Wired connector for 12-24 VAC or 24 VDC power supply, and for low voltage I/O
8 Wired connector for analog output
9 Wired connector for LAN expansion bus

Flush mounting

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

1 Display
2 4x control keys for setting controller parameters (Enter, Escape, Navigation)
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 35*.

Modicon M171/M172/M173

Logic controllers for HVAC and Pumping applications

M171 Optimized logic controllers

TM171OBM14R

TM171OD14R

TM171ODM14R

TM171OBM22R

TM171OD22R

TM171ODM22R

TM171OF22R

TM171OFM22R

M171 Optimized logic controllers: Power supply: 100-240 VAC

No. of I/O	Number and type of channels: Inputs	Number and type of channels: Outputs	Embedded communication	Display	Reference	Weight kg/*lb*
35 mm/*1.38 in* rail mounting *(1)*						
14	**2 digital inputs:** ■ 2x open collector or digital inputs *(2)* **5 configurable analog inputs:** ■ 3x NTC, or PT1000, or digital inputs ■ 2x NTC, or 0-20 mA, or 4-20 mA, or 0-10 V, or 0-5 V, or 0-1 V, or digital inputs	**4 digital outputs:** ■ 3x SPST (2 A, 230 VAC)with the same common ■ 1x SPDT (2 A, 230 VAC) **5 analog outputs:** ■ 2x open collector (2) for 12 V PWM/PPM or digital inputs ■ 2x 0-10 V ■ 1x 4-20 mA	● 1 RS-485 ● 1 LAN expansion bus	Remote display (optional)	TM171OBM14R	0.190/ *0.420*
			● 1 LAN expansion bus	Built-in display	TM171OD14R	0.190/ *0.420*
			● 1 RS-485 ● 1 LAN expansion bus	Built-in display	TM171ODM14R	0.190/ *0.420*

M171 Optimized logic controllers: Power supply: 12-24 VAC or 24 VDC *(3) (4)*

No. of I/O	Number and type of channels: Inputs	Number and type of channels: Outputs	Embedded communication	Display	Reference	Weight kg/*lb*
35 mm/*1.38 in* rail mounting						
22	**6 digital inputs:** ■ 6x volt-free in 1 group **5 configurable analog inputs:** ■ 3x NTC or digital inputs ■ 2x NTC, or 0-20 mA, or 4-20 mA, or 0-10 V, or 0-5 V, or 0-1 V, or digital inputs	**6 digital outputs:** ■ 3x SPST (2 A, 230 VAC) with the same common ■ 2x SPST (2 A, 230 VAC) with independent common ■ 1x open collector **5 analog outputs:** ■ 2x open collector for 12 V PWM/PPM ■ 3x 0-10 V	● 1 RS-485 ● 1 LAN expansion bus	Remote display (optional)	TM171OBM22R	0.190/ *0.420*
			● 1 LAN expansion bus	Built-in display	TM171OD22R	0.190/ *0.420*
			● 1 RS-485 ● 1 LAN expansion bus	Built-in display	TM171ODM22R	0.190/ *0.420*
		6 digital outputs: ■ 3x SPST (2 A, 230 VAC) with the same common ■ 2x SSR (3 A, 230 VAC) ■ 1x open collector **5 analog outputs:** ■ 2x open collector for 12 V PWM/PPM ■ 3x 0-10 V	● 1 RS-485 ● 1 LAN expansion bus	Built-in display	TM171ODM22S	0.190/ *0.420*
Flush mounting						
22	**6 digital inputs:** ■ 6x volt-free in 1 group **5 configurable analog inputs:** ■ 3x NTC or digital input ■ 2x NTC, or 0-20 mA, or 4-20 mA, or 0-10 V, or 0-5 V, or 0-1 V, or digital inputs	**6 digital outputs:** ■ x3 SPST (2 A, 230 VAC) with the same common ■ 2x SPST (2 A, 230 VAC) with independent common ■ 1x open collector **5 analog outputs:** ■ 2x open collector for 12 V PWM/PPM ■ 3x 0-10 V	● 1 LAN expansion bus	Built-in display	TM171OF22R	0.164/ *0.360*
			● 1 RS-485 ● 1 LAN expansion bus	Built-in display	TM171OFM22R	0.164/ *0.360*

Remote display for M171 Optimized logic controllers

Remote displays		See page 35

Connection accessories for M171 Optimized logic controllers

Connectors	Low voltage connector, Analog output connector, Modbus SL connector, LAN expansion bus connector	See page 35

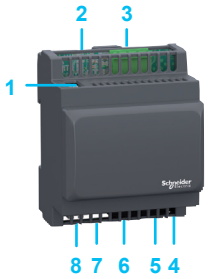
*(1) Terminal blocks are supplied with **TM171OBM14R**, **TM171OD14R**, and **TM171ODM14R**.*
(2) Both I/O are the same. On the same channel: 2 digital inputs or 2 analog outputs (depending on the configuration).
*(3) Except for for **TM171ODM22S**: 12-24 VAC.*
(4) Connectors to be ordered separately, see page 35.

I/O expansion modules

Three I/O expansion modules are available to increase the number of I/O up to 44 on M171 Optimized logic controllers:

- Expanded I/O types are digital and analog
- I/O expansion modules are connected via the LAN expansion bus on M171 Optimized logic controllers
- I/O expansion modules compatibilty:

Logic controller type	Reference	Compatible I/O expansion module Reference
M171 Optimized	TM171OBM14R, TM171OD14R, TM171ODM14R	TM171EO14R
	TM171OBM22R, TM171OD22R, TM171ODM22R, TM171ODM22S, TM171OF22R, TM171OFM22R	TM171EO15R TM171EO22R



35 mm/*1.38 in* ⊥ rail mounting

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 VAC or 24 VDC),
5 Wired connector for low voltage I/O
6 Clip-on lock 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**.*

I/O expansion modules *(1)*

35 mm/*1.38 in* ⊥ rail mounting

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

TM171EO14R

TM171EO15R

TM171EO22R

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 at 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 at 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*

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

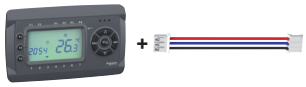
Connection accessories (2) for expansion modules: TM171EO15R, M171EO22R

Modicon M171/M172/M173

Logic controllers for HVAC and Pumping applications

Remote displays, Connection accessories for M171 Optimized logic controllers

TM171DLED (1)



TM171DLCD2U

TM171DWAL2U

TM171DWAL2L

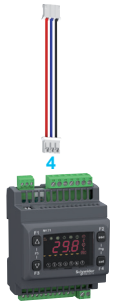
Remote displays for M171 Optimized logic controllers

The four available remote displays are distinguished by:
- Technology: LED display or LCD display, with or without backlight
- Mounting: flush mounting or wall mounting

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

Type	Description	Reference	Weight kg/*lb*
Remote flush mounting displays With realtime clock	■ LED display: 4 digits,7 segments ■ Keyboard: 4 buttons ■ 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*
Remote wall mounting displays With realtime clock	■ Without backlight	TM171DWAL2U	0.143/ *0.320*
	■ With backlight	TM171DWAL2L	0.143/ *0.320*

Connection accessories (2) for M171 Optimized logic controller (rail mounting): TM171OBM22R, TM171OD22R, TM171ODM22R and TM171ODM22S for M171 Optimized logic controller (flush mounting): TM171OF22R and TM171OFM22R



Connection accessories (2) for M171 Optimized logic controller (rail mounting): TM171OBM14R, TM171OD14R, TM171ODM14R
N.B.: 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 at 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 at one end	1/*3.3*	TM171ACB4OAO1M	0.075/ *0.170*
			2/*6.6*	TM171ACB4OAO2M	0.125/ *0.280*
Modbus connector **Sold in lots of 5**	3	Cordset equipped with a 3-pin connector at one end	1/*3.3*	TM171ACB4ORS485 *(3)*	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*
LAN Communication adaptor *Supplied with removable terminal blocs for bus connections*		LAN-RS-485 converter (accessory which allows to connect Modbus devices through the LAN connector of the M171 Optimized controller)		TM171ALAN	0.170/ *0.374*

TM171ALAN

(1) Supplied with LAN expansion bus connector TM171ACB4OLAN.
(2) Minimum set for operating controllers.
(3) This product is only compatible for modbus version of M171 Optimized 22 I/Os.

M171 Performance logic controllers

M171 Performance logic controllers comprise four models that can be used to control from 3 up to 27 embedded I/O (digital and analog).

- Power supply: 24 VAC/DC or 48 VDC
- Two types of housing:
  - with built-in display
  - without display

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

- Two types of mounting:
  - On 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 bracket accessory;
- Communication ports on M171 Performance logic controllers:
  - One Modbus SL client/server
  - Two USB
  - One CAN expansion bus

On flush mounting version:
  - One Modbus SL client/server
  - One Modbus TCP and BACnet IP (B-AAC profile) (WebVisu)
  - One CAN expansion bus

- M171 Performance logic controllers can be connected to communication modules, adding another connection for the CAN expansion bus, Ethernet network, or Profibus, etc., see page 42.
- M171 Performance logic controllers are certified CE, cURus (UL Recognized), CSA, EAC, RCM, RoHS China.

35 mm/*1.38 in* ⊔ rail mounting

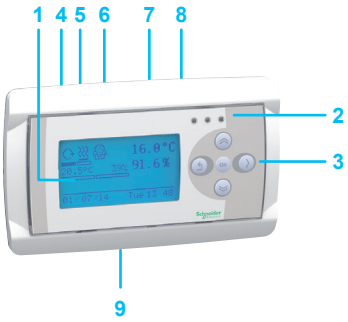
TM171P●M27● Performance logic controllers *(1)*

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 Five control keys for setting controller parameters
7 Connector for removable terminal block for power supply (24 VAC/DC, 48 VDC)
8 Connector for removable terminal block for fast digital inputs (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-B port to connect a PC
14 USB-A port for USB stick
15 Connector for communication module
16 Three status LEDs

Flush mounting



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

1 Display
2 Three status LEDs
3 Five control keys for setting controller parameters

On the rear side of the controller

4 Terminal block for power supply (24 VAC/DC or 48 VDC)
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)

*(1) **TM171ASCTB27** removable terminal blocks to be ordered separately, see page 37.*
(2) Terminal blocks supplied with flush mounting version of Performance controllers.

Modicon M171/M172/M173

Logic controllers for HVAC and Pumping applications

M171 Performance logic controllers

TM171PBM27R

TM171PDM27R

TM171PDM27S

M171 Performance logic controllers: Power supply: 24 VAC/DC, 48 VDC

35 mm/*1.38 in* ⊥ rail mounting

No. of I/O	Number and type of channels: Inputs	Number and type of channels: Outputs	Embedded communication ports	Display	Reference	Weight kg/*lb*
27	**9 digital inputs (8 + 1):** ■ 2 groups of 4 digital inputs, 24 VAC/DC or 48 VDC ■ 1x fast digital input, or high speed counter volt-free **6 configurable analog inputs:** ■ 2x NTC or digital inputs, ■ 4x NTC, or PT1000, or 4-20 mA, or 0-5 V, or 0-10 V, or 0-30 kΩ/0-5 kΩ variable resistor, or digital inputs	**7 digital outputs:** ■ 2x SPDT (8 A, 230 VAC) with independent common ■ 5x SPST (5 A, 230 VAC) 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	● 1 RS-485 ● 1 CAN expansion bus	Remote display (optional)	TM171PBM27R	0.385/ *0.850*
				Built-in display 128x64 LCD with backlight	TM171PDM27R	0.385/ *0.850*
		7 digital outputs: ■ 2x SPDT (8 A, 230 VAC) with independent common ■ 3x SPST (5 A, 230 VAC) with independent common ■ 2x SSR (1 A, 230 VAC) 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	● 1 RS-485 ● 1 CAN expansion bus	Built-in display	TM171PDM27S	0.385/ *0.850*

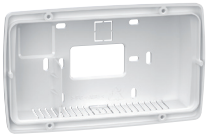
TM171PFE03

Flush mounting (to be used with the wall bracket accessory – see below)

No. of I/O	Number and type of channels: Inputs	Number and type of channels: Outputs	Embedded communication ports	Display	Reference	Weight kg/*lb*
3	**3 configurable analog inputs:** ■ 1x built-in NTC ■ 1x NTC or digital input ■ 1x 4-20 mA or 0-10 V	–	● 1 RS-485 ● 1 CAN expansion bus ● 1 RJ45 for Modbus TCP and BACnet IP (B-AAC profile) and MS/TP (B-AAC profile)	Built-in display	TM171PFE03	0.320/ *0.710*

Accessories for M171 Performance logic controllers to be ordered separately

TM171ASCTB27



TM171ABKPB

Designation	Use	Reference	Weight kg/*lb*
Screw terminal blocks	For **TM171PBM27R**, **TM171PDM27R**, and **TM171PDM27S**	TM171ASCTB27	0.100/ *0.220*
Wall bracket for flush mounting Performance logic controllers	For **TM171PFE03**	TM171ABKPB	0.015/ *0.030*

I/O expansion modules

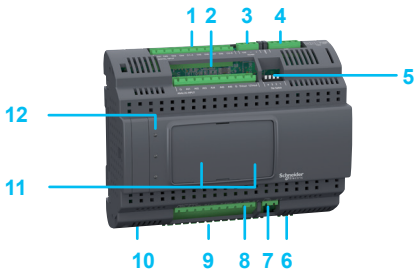
Two I/O expansion modules are available to increase the number of I/O:
- up to 351 on M171 Performance logic controllers
- up to 366 on M172 logic controllers
- up to 78 on M173 logic controllers,

- Expanded I/O types are digital and analog
- They are connected via the CAN expansion bus on M171 Performance, M172 and M173 Optimized logic controllers
- I/O expansion modules compatibility:

Logic controllers	Compatible I/O expansion module (reference)
M173 Optimized (**TM173O●●●●**)	**TM171EP14R**, **TM171EP27R**
M172 Optimized (**TM172O●●●●**)	**TM171EP14R**, **TM171EP27R**
M172 Performance (**TM172P●●●●**)	**TM171EP14R**, **TM171EP27R**
M171 Performance (**TM171P●●●●**)	**TM171EP14R, TM171EP27R**

- They are certified CE, UL, CSA, EAC, RoHS China

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 VAC/DC, 48 VDC)
7 Connector for removable terminal block for fast digital inputs
8 Connector for removable terminal block for digital outputs
9 Connector for removable terminal block for analog outputs
10 Clip-on lock 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/O
6 Clip-on lock for 35 mm/*1.38 in* ⊔ rail mounting
7 Connector for removable terminal block for power supply (24 VAC/DC)

(1) Removable terminal blocks to be ordered separately, see *page 39*.

Modicon M171/M172/M173

Logic controllers for HVAC and Pumping applications

I/O expansion modules

TM171EP14R

TM171EP27R

I/O expansion modules

35 mm/*1.38 in* ⊔ rail mounting

No. of I/O	Number and type of channels: Inputs	Number and type of channels: Outputs	Compatibility with logic controller	Embedded communication ports	Reference	Weight kg/*lb*
14	**4 digital inputs:** 4x 24 VAC or 24VDC *(1)* **4 analog inputs:** (configurable in pairs) 4x NTC, or PT1000, or PTC, or 4-20 mA, or 0-5 V, or 0-10 V, or digital inputs	**4 digital outputs:** ■ 1x SPDT (5 A, 230 VAC) with independent common ■ 3x SPST (3 A, 230 VAC) with independent common **2 analog outputs:** ■ 2x 0-10 V (1)	TM171P●●●● TM172●●●● TM173O●●●●	● 1 CAN expansion bus	**TM171EP14R**	0.190/ *0.420*
27	**9 digital inputs (8 + 1):** ■ 2 groups of 4 digital inputs, 24 VAC/DC or 48 VDC ■ 1x fast digital input or high speed counter, volt-free **6 analog inputs:** ■ 2x NTC or digital inputs ■ 4x NTC, or 4-20 mA, or 0-10 V, or digital inputs	**7 digital outputs:** ■ 2x SPDT (8 A, 230 VAC) with independent common ■ 5x SPST (5 A, 230 VAC) with independent common **5 analog outputs:** ■ 5x 0-10 V, or 4-20 mA	TM171P●●●● TM172●●●● TM173O●●●●	● 1 CAN expansion bus	**TM171EP27R**	0.385/ *0.850*

TM171ASCTB14

TM171ASCTB27

Accessories for I/O expansion modules to be ordered separately

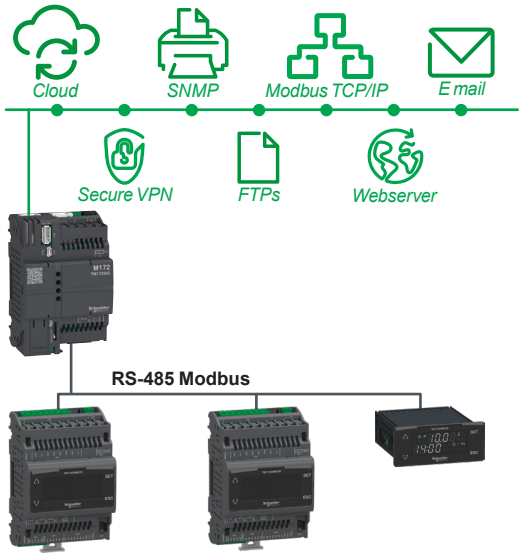
Designation	Description	Unit reference	Weight kg/*lb*
Screw terminal blocks (inputs, outputs, and communication bus)	14 I/O – For TM171EP14R	**TM171ASCTB14**	0.050/ *0.110*
	27 I/O – For TM171EP27R	**TM171ASCTB27**	0.100/ *0.220*

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

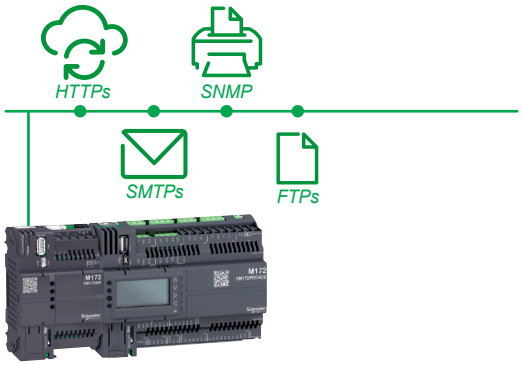
Modicon M171/M172/M173

Logic controllers for HVAC and Pumping applications

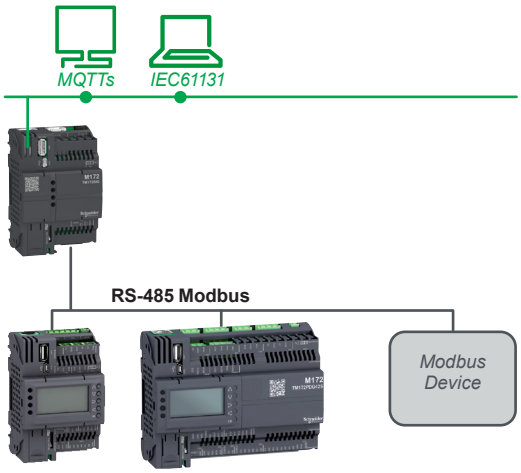
Secure Interfaces



M173 Optimized logic controller and Plug-in Interface for secure Ethernet communication:
- *Secure connection via HTTPs (TLS1.2) to the webserver*
- *Secure email SMTPs (TLS1.2)*
- *Secure file transport protocol FTPs (TLS1.2)*



M172 Performance logic controller and Plug-in Interface for:
- *Secure connection via HTTPs (TLS1.2) to the webserver*
- *Secure email SMTPs (TLS1.2)*
- *Secure file transport protocol FTPs (TLS1.2)*



M171Optimized / M172 Performance logic controllers and Gateway Interface for cybersecure connection to the cloud for machine monitoring

Secure Interfaces

TM172SI● Secure Interfaces are designed to establish a secure Internet connection, and to connect unsafe devices to a secure Ethernet network.
Two versions are available to perform different types of secured operations, and compatible with existing machines or installations.

- TM172SIP: Plug-in version for M173 Optimized and M172 logic controllers
  - to send files to an FTPs server (when related to Secure Interfaces only), to reply to an FTPs client (having an FTPs server)
  - to send e-mails to providers using secure encryption algorithms
  - to manage SNMP protocol, that allows to exchange Object ID information relating to SNMP protocol in an Ethernet network
  - to access the machine via a secure webserver.
- TM172SIG: Gateway version to ensure a cyberSecure connection on M173 Optimized and M172 logic controllers, and On M171 Optimized logic controllers via the Modbus communication module.
- It is possible to create programs within TM172SI● Secure Interfaces that allow the PLC to be able to find variables or parameters in connected devices, and to save files through micro SD, USB memory key or in the NAND flash memory of TM172SI● Secure Interfaces.
- Secure Interface compatibilty:

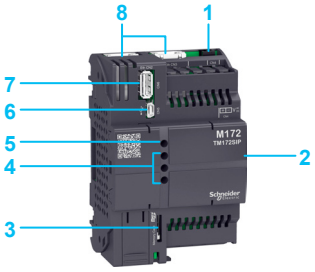
Logic controller type	Reference	Compatible Secure Interface (reference)
M173 Optimized	**TM173OBM22R**, **TM173ODM22S**, **TM173ODM22R**, **TM173ODEM22R**, **TM173OFM22S**, **TM173OFM22R**, **TM173OBM22RH**, **M173ODM22SH**, **TM173ODM22RH**	**TM172SIG** **TM172SIP**
M172 Optimized **M172 Performance**	**TM172OBM18R**, **TM172ODM18R**, **TM172OBM28R**, **TM172ODM28R**, **TM172OBM42R**, **TM172ODM42R**, **TM172PBG07R**, **TM172PDG07R**, **TM172PBG18R**, **TM172PDG18R**, **TM172PDG18S**, **TM172PBG28R**, **TM172PDG28R**, **TM172PBG28RI**, **TM172PDG28RI**, **TM172PDG28SI**, **TM172PBG42R**, **TM172PDG42R**, **TM172PDG42S**, **TM172PBG42RI**, **TM172PDG42RI**, **TM172PDG42SI**	**TM172SIG** **TM172SIP**
M171 Optimized *(when controller is associated to TM171AMB Modbus communication module)*	**TM171OBM14R**, **TM171ODM14R**, **TM171OBM22R**, **TM171ODM22R**, **TM171ODM22S**, **TM171OFM22R**	**TM172SIG**
M171 Optimized *(when controller is associated to TM171AMB Modbus communication module)*	**TM171OD14R**, **TM171OD22R**, **TM171OF22R**	**TM172SIG**

- EcoStruxure Machine Expert - HVAC programming software is available to program and customize applications in association with M171, M172 and M173 logic controllers.
- The Secure Interfaces are certified CE, UL, CSA, EAC, RCM, UKCA.
- Secure Interface Security
  - The TM172SI● Secure Interfaces are designed to meet cybersecurity requirements in accordance with the standard IEC 62443-4-1 (2020 edition).
  - Within the TM172SI● interface, you can enhance cybersecurity by the following methods:
    - Configure user rights
    - Disable unused services (for example, FTP, HTTP)
    - Use secure communication to connect to the web server.
  - Follow the Recommended Cybersecurity Best Practices | Schneider Electric

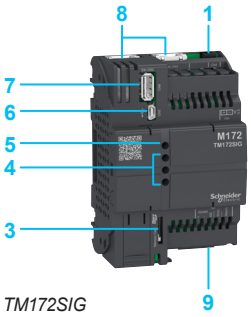
Modicon M171/M172/M173

Logic controllers for HVAC and Pumping applications

Secure Interfaces



TM172SIP



TM172SIG

Secure Interfaces

35 mm/*1.38 in* ⊔ rail mounting Secure Interfaces *(1)*

1 Connector for removable terminal block for power supply (24 VAC/DC)
2 TTL communication port to logic controller (Only on TM172SIP)
3 Memory card slot (Micro SD)
4 Programmable LEDs (red, yellow, green)
5 Power LED (green)
6 USB-B port
7 USB A port
8 Ethernet ports (2x RJ45)
9 Serial line port (RS-485) (Only on TM172SIG)

Designation	Description	Reference	Weight kg/*lb*
Secure Interface Plug-in *(1)*	Size: 4 DIN *(2)* ● Double Ethernet port with switch capabilities ● Equipped with a intergrated TTL communication port, to communicate with the controller	TM172SIP	0.165 *0.363*
Secure Interface Gateway *(1)*	Size: 4 DIN *(2)* ● Double Ethernet port with switch capabilities ● Equipped with a RS-485 serial port used to communicate with a controller via a Modbus RTU connection	TM172SIG	*0.165* *0.363*

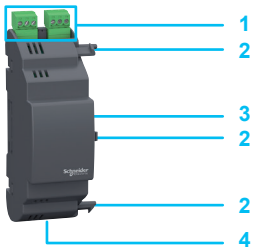
(1) Removable screw terminal blocks are included with TM172SI●.
(2) 4 DIN: Interface width is 72 mm (2.83 in).

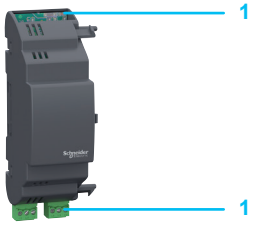
Communication modules

The communication module offer is dedicated to M171 Performance, and M172 logic controllers *(1)*.
The 8 optional modules provide specific connections:

- To fieldbuses, including:
  - CAN bus
  - Modbus TCP
  - Profibus (only with M171 Performance)
  - 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 *(1)*
- To services, including:
  - Ethernet
  - WebVisu and remote download functions
- They are mounted by simply interlocking on the left-hand side of M171 Performance or M172 logic controllers *(1)*. Only one communication module can be added to a 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 page 43.
- Communication modules compatibilty:

Logic controllers	Compatible communication modules (reference)
M172 Optimized (**TM172O●●●●**)	**TM171ACAN, TM171AMB, TM171ARS485, TM171ARS232, TM171ALON, TM171AETH, TM171AETHRS485**
M172 Performance (**TM172P●●●●**)	**TM171ACAN, TM171AMB, TM171ARS485, TM171ARS232, TM171ALON**
M171 Optimized (**TM171O●●●●**)	–
M171 Performance (**TM171P●●●●**)	**TM171ACAN, TM171AETH, TM171APBUS, TM171AMB, TM171ARS485, TM171ARS232, TM171AETHRS485, TM171ALON**





TM171A●●● communication modules

1 Communication connector *(2)*
2 Locking device
3 Expansion connector to the controller
4 Clip-on lock for 35 mm/*1.38 in* ⊔ rail mounting

(1) spaceLYnk offer: please consult the offer on our website.
(2) The communication connector type depends on the communication modules, see page 43.

Modicon M171/M172/M173

Logic controllers for HVAC and Pumping applications

Communication modules

TM171ACAN

TM171AETH

TM171APBUS

TM171AMB

TM171ARS485

TM171ARS232

TM171AETHRS485

TM171ALON

Communication modules				
35 mm/*1.38 in* ⊔ rail mounting				
Fieldbus, services access	**Communication ports**	**Compatibility with logic controller**	**Reference** *(1)*	**Weight kg/*lb***
• CAN	• 2 screw terminal blocks *(1)*	M172 Optimized, M172 Performance, M171 Performance	**TM171ACAN**	0.077/ *0.170*
• Modbus TCP • Ethernet • BACnet IP (B-AAC profile) • WebVisu and remote download functions	• 1 RJ45	M171 Performance M172 Optimized,	**TM171AETH**	0.077/ *0.170*
• Profibus	• 1 SUB-D 9	M171 Performance,	**TM171APBUS**	0.077/ *0.170*
• Modbus SL (RS-485)	• 2 screw terminal blocks *(1)*	M172 Optimized, M172 Performance, M171 Performance	**TM171AMB**	0.077/ *0.170*
• Modbus SL or BACnet MS/TP (B-AAC profile)	• 2 screw terminal blocks *(1)*	M172 Optimized, M172 Performance, M171 Performance	**TM171ARS485**	0.077/ *0.170*
• RS 232 serial link • Relay output	• 1 SUB-D 9 for RS 232 • 1 screw terminal block for relay output *(1)*	M172 Optimized, M172 Performance, M171 Performance	**TM171ARS232**	0.077/ *0.170*
• 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)*	M171 Performance M172 Optimized	**TM171AETHRS485**	0.077/ *0.170*
• LonWorks (FFT-10)	• 1 screw terminal block for LON bus	M172 Optimized, M172 Performance, M171 Performance	**TM171ALON**	0.077/ *0.170*

(1) Removable terminal blocks supplied with communication modules.

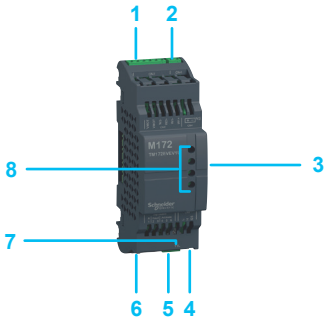
Modicon M171/M172/M173

Logic controllers for HVAC and Pumping applications

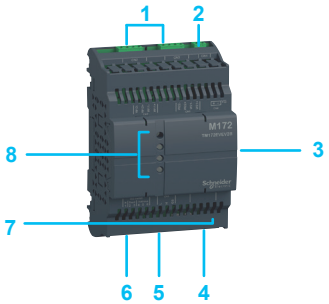
Electronic expansion valve drivers

***M172** EEVD*

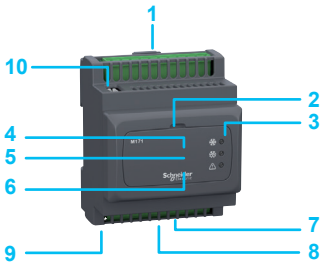
***M171** EEVD*



TM172EVEV1U, TM172EVEV1B



TM172EVEV2B



TM171VEVM4

Electronic expansion valve drivers

Electronic expansion valves drivers are specifically designed to control electronic expansion valves used in various types of refrigeration systems.
They regulate the superheat level by modulating the valve position and can be used with various type of refrigerants and for many applications, from small residential unit to large HVAC systems. The control system optimizes the superheat control and increase the energy savings of the unit.

Two versions of drivers:

- **TM172EVEV1●**: Electronic Expansion Valve Drivers that are used in combination with M172 and M173 logic controllers *(1)*. The pressure and temperatures sensors are wired to the controller which manages the control algorithm. The user has the choice to use preprogrammed superheat functions or to create his own control algorithm. This provides a very optimized and flexible solution.
  Several versions are available depending of the valve technology (unipolar or bipolar) and the number of valves to control (single or dual valves). Those drivers are compatible with the battery backup which provides energy to close the valve in case of power failure.
- **TM171VEVM4**: Superheat Electronic Expansion Valve Driver that can be used independently to any other controller. The temperature and pressure sensors are directly wired to the driver and the embedded control algorithm regulates the superheat. This driver is equipped with Modbus SL communication which allows to communicate with the M171 and M172 logic controllers or third party Modbus devices for remote monitoring and setting configuration.
- Electronic expansion valve drivers compatibilty:

Logic controller	Compatible EEVD	
M173 Optimized (**TM173ODEM22R**)	TM172EVEV1U	–
M172 Optimized (**TM172O●●●●**)	TM172EVEV1U TM172EVEV1B TM172EVEV2B	TM171VEVM4
M172 Performance (**TM172P●●●●**)		
M171 Optimized (**TM171O●●●●**)	–	
M171 Performance (**TM171P●●●●**)		

- They are certified CE, UL, CSA, EAC, RoHS China

35 mm/*1.38 in* ⊥ rail mounting

TM172EVEV1UTM172EVEV1B, TM172EVEV2B *(2)*
1 Valve Outputs terminal block - CN2, CN3
2 Power supply terminal block - CN4
3 Battery backup connector
4 CAN Expansion bus port terminal block - CN1
5 Clip-on lock for 35 mm/1.38 in ⊥ rail
6 Dip switch
7 TTL programming port
8 Status LEDs

TM171VEVM4 *(1)*
1 Output terminal block and power supply connector (24 VAC/DC)
2 Protective cover
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-on lock for 35 mm/1.38 in ⊥ rail mounting
9 Modbus (RS-485) port
10 TTL programming port

(1) Depending on model.
(2) Screw terminal blocks are delivered with electronic expansion valve drivers.

Modicon M171/M172/M173

Logic controllers for HVAC and Pumping applications

Electronic expansion valve drivers

TM172EVEV1U

TM172EVEV1B

TM172EVEV2B

TM171VEVM4

TM172EVEVBAT

M172 EEVD

Application	Communication ports	Size *(3)*	Reference	Weight kg/*lb*
EEVD for single valve unipolar *(1) (2)*	● 1 CAN expansion Bus	2 DIN	TM172EVEV1U	0.087/ *0.191*
EEVD for single valve bipolar *(1) (2)*	● 1 CAN expansion Bus	2 DIN	TM172EVEV1B	0.089/ *0.196*
EEVD for dual valves bipolar *(1) (2)*	● 1 CAN expansion Bus	4 DIN	TM172EVEV2B	0.119/ *0.262*

M171 EEVD

Application	Number and type of channels		Reference	Weight kg/*lb*
	Inputs	Outputs		
Superheat EEVD RS-485 for Modbus SL, for single valve Size: 4 DIN *(2) (3)*	**2 digital inputs:** ■ 2x volt-free **4 analog inputs:** ■ 2x NTC ■ 2x PT1000, 4-20 mA, or 0-5 V, or 0-10 V	**2 digital outputs:** ■ 1x open collector (100 mA, 12 VDC) ■ 1x SPST NO relay contact, 5 A, 250 VAC	TM171VEVM4	0.190/ *0.420*

Accessories for electronic expansion valve drivers: to be ordered separately

Designation	Use	To use with	Reference	Weight kg/*lb*
Battery backup	To provide power when the primary source of power is unavailable.	TM172EVEV1U TM172EVEV1B TM172EVEV2B	TM172EVEVBAT	0.157/ *0.346*

(1) Compatible with Battery backup TM172EVEVBAT.
(2) Removable screw terminal blocks are included with M172 /M171 EEVD .
(3) in 2 DIN: controller width is 36 mm (1.41 in) in 4 DIN: controller width is 72 mm /2.83 in).

Modicon M171/M172/M173

Logic controllers for HVAC and Pumping applications

Measurement accessories: Temperature and Humidity control

Temperature and Humidity control

Designation	Use ■ Applications	Description	Cable length m (ft)	Unit reference	Sold in lots of *(1)*	Weight kg/*lb*
NTC probes	Multi-purpose ■ Temperature control: - 50…+110 °C *(-122…230 °F)*	- IP 68 - Grey - Equipped with 2 conductor cables for controller side	1.5 *(4.92)*	TM1STNTCRN52015	8	0.144/*0.320*
				TM1STNTCRN5201P	100	0.144/*0.320*
			3 *(9.84)*	TM1STNTCRN52030	5	0.180/*0.400*
				TM1STNTCRN5203P	50	0.180/*0.400*
			5 *(16.40)*	TM1STNTCRN52050	4	0.228/*0.500*
	Multi-purpose ■ Temperature control: - 50…+110 °C *(-122…230 °F)*	- IP 67 - Black - Equipped with 2 conductor cables for controller side	1.5 *(4.92)*	TM1STNTCRN61515	8	0.104/*0.230*
				TM1STNTCRN6151P	100	0.104/*0.230*
			3 *(9.84)*	TM1STNTCRN61530	5	0.125/*0.280*
				TM1STNTCRN6153P	50	0.125/*0.280*
			5 *(16.40)*	TM1STNTCRN61550	4	0.164/*0.360*
				TM1STNTCRN6155P	25	0.164/*0.360*
	Multi-purpose ■ Temperature control: - 50…+110 °C *(-122…230 °F)*	- FAST - IP 67 - Grey - Equipped with 2 conductor cables for controller side	1.5 *(4.92)*	TM1STNTCSF44015	8	0.144/*0.320*
			3 *(9.84)*	TM1STNTCSF44030	5	0.175/*0.390*
				TM1STNTCSF4403P	50	0.175/*0.390*
	Multi-purpose ■ Temperature control: - 50…+110 °C *(-122…230 °F)*	- IP 68 - Grey - Equipped with 2 conductor cables for controller side	1.5 *(4.92)*	TM1STNTCSN62015	8	0.144/*0.320*
				TM1STNTCSN6201P	100	0.144/*0.320*
			3 *(9.84)*	TM1STNTCSN62030	5	0.175/*0.390*
				TM1STNTCSN6203P	50	0.175/*0.390*
			5 *(16.40)*	TM1STNTCSN62050	4	0.232/*0.510*
NTC probes with a strap	Pipe ■ Temperature control: - 50…+110 °C *(-122…230 °F)*	- IP 68 - Grey - Equipped with 2 conductor cables for controller side	1.5 *(4.92)*	TM1STNTCTN62015	8	0.152/*0.340*
				TM1STNTCTN6201P	100	0.152/*0.340*
			3 *(9.84)*	TM1STNTCTN62030	5	0.180/*0.400*
PT1000 probes	Multi-purpose ■ Temperature control: - 50…+110 °C *(-122…230 °F)*	- IP 68 - Green - Equipped with 2 conductor cables for controller side	1.5 *(4.92)*	TM1STPTTSN62015	8	0.144/*0.320*
				TM1STPTTSN6201P	100	0.144/*0.320*
			3 *(9.84)*	TM1STPTTSN62030	5	0.175/*0.390*
				TM1STPTTSN6203P	50	0.175/*0.390*
			5 *(16.40)*	TM1STPTTSN62050	4	0.232/*0.510*
				TM1STPTTSN6205P	25	0.232/*0.510*
	Multi-purpose ■ Temperature control: - 50…+110 °C *(-122…230 °F)*	- IP 68 - Green - Equipped with 2 conductor cables for controller side	1.5 *(4.92)*	TM1STPTTSN52015	8	0.136/*0.300*
				TM1STPTTSN5201P	100	0.136/*0.300*
			3 *(9.84)*	TM1STPTTSN52030	5	0.175/*0.390*
				TM1STPTTSN5203P	50	0.175/*0.390*
			5 *(16.40)*	TM1STPTTSN52050	4	0.232/*0.510*
				TM1STPTTSN5205P	25	0.232/*0.510*
NTC probe	Outside air ■ Temperature control: -50…100 °C *(-58...212 °F)*	- IP 65 - Wall mounting - NTC 10kOhm /25°C		TM1STNTCW69755		0.050/*0.110*
	Inside air (room) ■ Temperature control: -25…40 °C *(-13…104 °F)*	- IP 30 - Indoor wall mounting - NTC 10kOhm /25°C		TM1STNTCWN75750		0.050/*0.110*
Humidity probe	Multi-purpose ■ Humidity control: 0…100%	- IP 65 - Wall mounting - 4-20 mA		TM1SHC4		0.140/*0.308*
Humidity & temperature probes	Multi-purpose ■ Humidity control: 0…100% ■ Temperature control: -40…60 °C *(-40...140 °F)*	- IP 65 - Wall mounting - 4-20 mA, NTC 10kOhm /25°C		TM1SHTCN4		0.140/*0.308*
		- IP 65 - Wall mounting - 2x 4-20 mA		TM1SHTCC4		0.140/*0.308*
		- IP 65 - Wall mounting - 2x Modbus ports embedded (RS-485 / Modbus RTU)		TM1SHTM4		0.140/*0.308*

(1) The given value is the number of products delivered for one ordered reference.

Application	Type of machine controlled	Compressor			
	Number of phases	3			
	Type of motor	Asynchronous	Asynchronous and Synchronous		Asynchronous and Synchronous for scroll
Compressor size	0.18 kW *(0.25 HP)*	**Altivar 12** Consult catalog Ref. DIA2ED2130101EN			
	0.37 kW *(0.5 HP)*		**Altivar 320** Consult catalog Ref. DIA2ED2160311EN		
	0.75 kW *(1 HP)*			**Altivar Process ATV600** Consult catalog Ref. DIA2ED2140502EN	**Altivar 212** Consult catalog Ref. DIA2ED2101102EN
	2.2 kW *(0.25 HP)*				
	4.0 kW *(5 HP)*				
	7.5 kW *(10 HP)*				
	15 kW *(20 HP)*				
	18.5 kW *(25 HP)*				
	22 kW *(30 HP)*				
	30 kW *(40 HP)*				
	37 kW *(50 HP)*				
	45 kW *(60 HP)*				
	55 kW *(67 HP)*				
	75 kW *(100 HP)*				
	90 kW *(120 HP)*				
	110 kW *(150 HP)*				
	315 kW *(422 HP)*				
	355 kW *(480 HP)*				
	400 kW *(540 HP)*				
	450 kW *(603 HP)*				
	500 kW *(670 HP)*				
	560 kW *(750 HP)*				
	630 kW *(850 HP)*				
	710 kW *(950 HP)*				
	800 kW *(1100 HP)*				

Application	Type of machine controlled	Fan		
	Number of phases	3		
Fan size	0.18 kW *(0.25 HP)*	**Altivar 12** Consult catalog Ref. DIA2ED2130101EN		
	0.37 kW *(0.5 HP)*			
	0.75 kW *(1 HP)*		**Altivar 212** Consult catalog Ref. DIA2ED2101102EN	**Altivar Process Drive ATV600** Consult catalog Ref. DIA2ED2140502EN
	2.2 kW *(0.25 HP)*			
	4.0 kW *(5 HP)*			
	7.5 kW *(10 HP)*			
	15 kW *(20 HP)*			
	75 kW *(100 HP)*			
	> 75 kW *(> 100 HP)*			

Compatible range of variable speed drives

Software solution

EcoStruxure Machine Expert - HVAC programming software

EcoStruxure Machine Expert - HVAC programming software is compliant with IEC 61131-3. It can be used to develop, configure, and commission HVAC solution systems.
It includes:
- Programming M171, M172 and M173 logic controllers, remote display units and Secure Interfaces
- Setting up expansion buses and networks
- Creating the screen of the displays (built-in and displays of M171, M172 and M173 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
  - a library of Tested, Validated, and Documented Applications (TVDA)
- Full simulation mode

General characteristics

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 M171, M172 Performance, and M173 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), MQTT, SNMP
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

Modicon M171/M172/M173

Logic controllers for HVAC and pumping applications

EcoStruxure Machine Expert - HVAC programming software

EcoStruxure Machine Expert - HVAC programming software

Programming software

EcoStruxure Machine Expert - HVAC software is supplied by downloading from our website

The product version concerned offers the EcoStruxure Machine Expert - HVAC functions associated with logic controllers.

Operating system

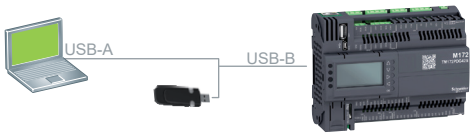
- Windows 10, 64 bit, Windows 11, 64 bit
- Architecture x64
- RAM: 2 GB (4 GB preferred)
- CPU: Intel Core i3 1,6 GHz or later
- Hard Disk: 1 GB free space
- Peripherals: USB, Monitor (1563x864 min/ 1920x1080 recommended), Mouse and Keyboard

Designation	Application	Reference
EcoStruxure Machine Expert - HVAC programming software	Logic controllers, remote display units and Secure Interfaces	Only available as a download from our website

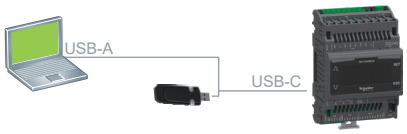
Programming accessories

The USB cable is recommended for local programming.
An Ethernet port is recommended for remote download or remote programming.

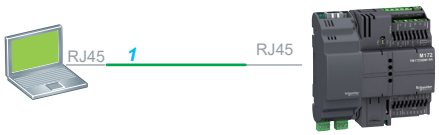
Description	Characteristics and use	Length	Reference	Weight kg/*lb*
Ethernet connection cable (1)	Shielded twisted pair straight cord Equipped with 1 RJ45 connector at each end From the PC RJ45 port to the RJ45 port on TM171AETH Communication module and M172 logic controller CE compatible	2 m/*6.56 ft*	490NTW00002	–
		5 m/*16.40 ft*	490NTW00005	–
		12 m/*39.37 ft*	490NTW00012	–
		40 m/*131.23 ft*	490NTW00040	–
Programming cable (2)	Between a PC and the TTL programming port of M171 Optimized logic controllers		TM171ADMI	0.157/ *0.350*
Programming stick (3)	To transfer parameters from one M171 Optimized or M173 Optimized logic controller to another, or to download the program		TM171AMFK	0.010/ *0.020*



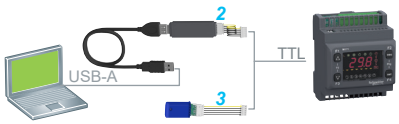
Local programming, download via USB-B port on M171 Performance or M172 logic controllers: any USB-A/USB-B cable can be used



Local programming, download via USB-C port on M173 Optimized logic controllers: any smart-phone cable can be used



Remote programming via USB port on TM171AETH Communication module + M172 Performance logic controller



Local programming, download via TTL port on M171 Optimized logic controllers

Modicon M171/M172/M173

Logic controllers for HVAC and Pumping applications

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Schneider Electric Industries SAS
Head Office
35, rue Joseph Monier - CS 30323
F-92500 Rueil-Malmaison Cedex
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