



### Main

Range of product	Modicon M241
Product or component type	Logic controller
[Us] rated supply voltage	24 V DC
Discrete input number	14, discrete input 8 fast input conforming to IEC 61131-2 Type 1
Discrete output type	Transistor
Discrete output number	10 transistor 4 fast output
Discrete output voltage	24 V DC for transistor output
Discrete output current	0.5 A for transistor output (Q0...Q9) 0.1 A for fast output (PTO mode) (Q0...Q3)

### Complementary

Discrete I/O number	24
Maximum number of I/O expansion module	7 (local I/O-Architecture) 14 (remote I/O-Architecture)
Supply voltage limits	20.4...28.8 V
Inrush current	50 A
Power consumption in W	32.6...40.4 W (with max number of I/O expansion module)
Discrete input logic	Sink or source
Discrete input voltage	24 V
Discrete input voltage type	DC
Voltage state 1 guaranteed	$\geq 15$ V for input
Voltage state 0 guaranteed	$\leq 5$ V for input
Discrete input current	5 MA for input 10.7 mA for fast input
Input impedance	4.7 kOhm for input 2.81 kOhm for fast input
Response time	50 $\mu$ s turn-on, I0...I13 terminal(s) for input 50 $\mu$ s turn-off, I0...I13 terminal(s) for input $\leq 2$ $\mu$ s turn-on, I0...I7 terminal(s) for fast input $\leq 2$ $\mu$ s turn-off, I0...I7 terminal(s) for fast input $\leq 34$ $\mu$ s turn-on, Q0...Q9 terminal(s) for output $\leq 250$ $\mu$ s turn-off, Q0...Q9 terminal(s) for output $\leq 2$ $\mu$ s turn-on, Q0...Q3 terminal(s) for fast output $\leq 2$ $\mu$ s turn-off, Q0...Q3 terminal(s) for fast output
Configurable filtering time	1 $\mu$ s for fast input 12 ms for fast input 0 ms for input 1 ms for input 4 ms for input 12 ms for input
Discrete output logic	Negative logic (sink)
Output voltage limits	30 V DC
Maximum current per output common	2 A with Q0...Q3 for fast output 2 A with Q4...Q7 for output 1 A with Q8...Q9 for output
Maximum output frequency	20 KHz for fast output (PWM mode) 100 KHz for fast output (PLS mode) 1 kHz for output
Accuracy	+/- 0.1 % at 0.02...0.1 kHz for fast output +/- 1 % at 0.1...1 kHz for fast output

Maximum leakage current	5 µA for output
Maximum voltage drop	<1 V
Maximum tungsten load	<2.4 W
Protection type	Short-circuit protection Short-circuit and overload protection with automatic reset Reverse polarity protection for fast output
Reset time	10 Ms automatic reset output 12 s automatic reset fast output
Memory capacity	8 MB for program 64 MB for system memory RAM
Data backed up	128 MB built-in flash memory for backup of user programs
Data storage equipment	<= 16 GB SD card (optional)
Battery type	BR2032 lithium non-rechargeable, battery life: 4 year(s)
Backup time	2 years at 25 °C
Execution time for 1 KInstruction	0.3 Ms for event and periodic task 0.7 ms for other instruction
Application structure	8 event tasks 4 cyclic master tasks 3 cyclic master tasks + 1 freewheeling task 8 external event tasks
Realtime clock	With
Clock drift	<= 60 s/month at 25 °C
Positioning functions	PTO function 4 channel(s) (positioning frequency: 100 kHz) PTO function 4 channel(s) for transistor output (positioning frequency: 1 kHz)
Counting input number	4 fast input (HSC mode) at 200 kHz 14 standard input at 1 kHz
Control signal type	A/B at 100 kHz for fast input (HSC mode) Pulse/Direction at 200 kHz for fast input (HSC mode) Single phase at 200 kHz for fast input (HSC mode)
Integrated connection type	Non isolated serial link serial 1 with RJ45 connector and RS232/RS485 interface Non isolated serial link serial 2 with removable screw terminal block connector and RS485 interface USB port with mini B USB 2.0 connector Ethernet with RJ45 connector CANopen J1939 with male SUB-D 9 connector
Supply	(serial 1)serial link supply: 5 V, <200 mA
Transmission rate	1.2...115.2 kbit/s (115.2 kbit/s by default) for bus length of 15 m for RS485 1.2...115.2 kbit/s (115.2 kbit/s by default) for bus length of 3 m for RS232 480 Mbit/s for bus length of 3 m for USB 10/100 Mbit/s for Ethernet 1000 kbit/s for bus length of 20 m for CANopen 800 kbit/s for bus length of 40 m for CANopen 500 kbit/s for bus length of 100 m for CANopen 250 kbit/s for bus length of 250 m for CANopen 125 kbit/s for bus length of 500 m for CANopen 50 kbit/s for bus length of 1000 m for CANopen 20 kbit/s for bus length of 2500 m for CANopen
Communication port protocol	Non isolated serial link: Modbus master/slave
Port Ethernet	10BASE-T/100BASE-TX - 1 port(s) copper cable
Ethernet services	SNMP client/server Modbus TCP slave device Modbus TCP server Modbus TCP client IEC VAR ACCESS FTP client/server SQL client DHCP client Ethernet/IP adapter Send and receive email from the controller based on TCP/UDP library Web server (WebVisu & XWeb system) OPC UA server DNS client

Local signalling	<p>1 LED (green) for PWR  1 LED (green) for RUN  1 LED (red) for module error (ERR)  1 LED (red) for I/O error (I/O)  1 LED (green) for SD card access (SD)  1 LED (red) for BAT  1 LED (green) for SL1  1 LED (green) for SL2  1 LED (red) for bus fault on TM4 (TM4)  1 LED per channel (green) for I/O state  1 LED (green) for Ethernet port activity  1 LED (green) for CANopen run  1 LED (green) for CANopen error</p>
Electrical connection	<p>Removable screw terminal blockfor inputs and outputs (pitch 5.08 mm)  Removable screw terminal blockfor connecting the 24 V DC power supply (pitch 5.08 mm)</p>
Maximum cable distance between devices	<p>Unshielded cable: &lt;50 m for input  Shielded cable: &lt;10 m for fast input  Unshielded cable: &lt;50 m for output  Shielded cable: &lt;3 m for fast output</p>
Insulation	<p>Between supply and internal logic at 500 V AC  Non-insulated between supply and ground  Between input and internal logic at 500 V AC  Non-insulated between inputs  Between fast input and internal logic at 500 V AC  Between output and internal logic at 500 V AC  Non-insulated between outputs  Between fast output and internal logic at 500 V AC</p>
Marking	CE
Surge withstand	<p>1 KV power lines (DC) common mode conforming to EN/IEC 61000-4-5  1 KV shielded cable common mode conforming to EN/IEC 61000-4-5  0.5 KV power lines (DC) differential mode conforming to EN/IEC 61000-4-5  1 KV relay output differential mode conforming to EN/IEC 61000-4-5  1 KV input common mode conforming to EN/IEC 61000-4-5  1 kV transistor output common mode conforming to EN/IEC 61000-4-5</p>
Web services	Web server
Maximum number of connections	<p>16 Ethernet/IP device  8 Modbus server</p>
CANopen feature profile	<p>DR 303-1  DS 301 V4.02</p>
Number of slave	63 CANopen:
Mounting support	<p>Top hat type TH35-15 rail conforming to IEC 60715  Top hat type TH35-7.5 rail conforming to IEC 60715  Plate or panel with fixing kit</p>
Height	90 mm
Depth	95 mm
Width	150 mm
Net weight	0.53 kg

## Environment

Standards	<p>ANSI/ISA 12-12-01  CSA C22.2 No 142  CSA C22.2 No 213  EN/IEC 61131-2:2007  Marine specification (LR, ABS, DNV, GL)  UL 1604  UL 508</p>
Product certifications	<p>RCM  IACS E10  CSA  cULus</p>
Resistance to electrostatic discharge	<p>8 KV in air conforming to EN/IEC 61000-4-2  4 kV on contact conforming to EN/IEC 61000-4-2</p>
Resistance to electromagnetic fields	<p>10 V/M 80 MHz...1 GHz conforming to EN/IEC 61000-4-3  3 V/M 1.4 GHz...2 GHz conforming to EN/IEC 61000-4-3  1 V/m 2 GHz...3 GHz conforming to EN/IEC 61000-4-3</p>
Resistance to fast transients	<p>2 KV (power lines) conforming to EN/IEC 61000-4-4  1 KV (Ethernet line) conforming to EN/IEC 61000-4-4  1 KV (serial link) conforming to EN/IEC 61000-4-4  1 KV (input) conforming to EN/IEC 61000-4-4  1 kV (transistor output) conforming to EN/IEC 61000-4-4</p>

Resistance to conducted disturbances	10 V 0.15...80 MHz conforming to EN/IEC 61000-4-6 3 V 0.1...80 MHz conforming to Marine specification (LR, ABS, DNV, GL) 10 V spot frequency (2, 3, 4, 6.2, 8.2, 12.6, 16.5, 18.8, 22, 25 MHz) conforming to Marine specification (LR, ABS, DNV, GL)
Electromagnetic emission	Conducted emissions - test level: 120...69 dB $\mu$ V/m QP ( power lines) at 10...150 kHz conforming to EN/IEC 55011 Conducted emissions - test level: 63 dB $\mu$ V/m QP ( power lines) at 1.5...30 MHz conforming to EN/IEC 55011 Radiated emissions - test level: 40 dB $\mu$ V/m QP class A at 30...230 MHz conforming to EN/IEC 55011 Conducted emissions - test level: 79...63 dB $\mu$ V/m QP ( power lines) at 150...1500 kHz conforming to EN/IEC 55011 Radiated emissions - test level: 47 dB $\mu$ V/m QP class A at 230...1000 MHz conforming to EN/IEC 55011
Immunity to microbreaks	10 ms
Ambient air temperature for operation	-10...50 °C (vertical installation) -10...55 °C (horizontal installation)
Ambient air temperature for storage	-25...70 °C
Relative humidity	10...95 %, without condensation (in operation) 10...95 %, without condensation (in storage)
IP degree of protection	IP20 with protective cover in place
Pollution degree	2
Operating altitude	0...2000 m
Storage altitude	0...3000 m
Vibration resistance	3.5 mm at 5...8.4 Hz on symmetrical rail 3 gn at 8.4...150 Hz on symmetrical rail 3.5 mm at 5...8.4 Hz on panel mounting 3 gn at 8.4...150 Hz on panel mounting
Shock resistance	15 gn for 11 ms

## Packing Units

Unit Type of Package 1	PCE
Number of Units in Package 1	1
Package 1 Height	11.39 cm
Package 1 Width	13.214 cm
Package 1 Length	18.704 cm
Package 1 Weight	661.0 g
Unit Type of Package 2	S03
Number of Units in Package 2	8
Package 2 Height	30 cm
Package 2 Width	30 cm
Package 2 Length	40 cm
Package 2 Weight	6.14 kg
Unit Type of Package 3	P06
Number of Units in Package 3	64
Package 3 Height	75.0 cm
Package 3 Width	40.0 cm
Package 3 Length	80.0 cm
Package 3 Weight	54.48 kg

## Offer Sustainability

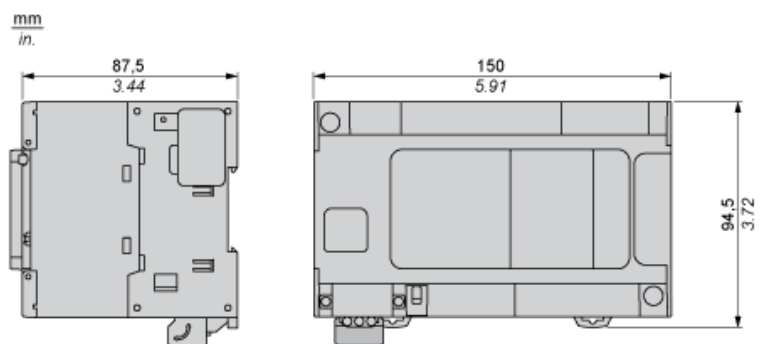
Sustainable offer status	Green Premium product
REACH Regulation	 <a href="#">REACH Declaration</a>
EU RoHS Directive	Pro-active compliance (Product out of EU RoHS legal scope)  <a href="#">EU RoHS Declaration</a>
Mercury free	Yes
China RoHS Regulation	 <a href="#">China RoHS Declaration</a>
RoHS exemption information	 Yes
Environmental Disclosure	 <a href="#">Product Environmental Profile</a>

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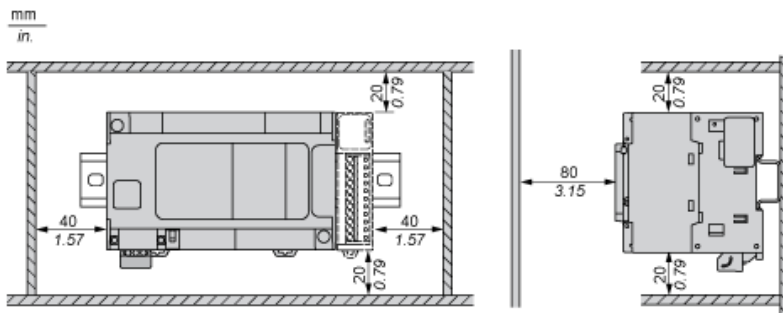
Circularity Profile	<a href="#">End Of Life Information</a>
WEEE	The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins
PVC free	Yes
California proposition 65	WARNING: This product can expose you to chemicals including: Lead and lead compounds, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to <a href="http://www.P65Warnings.ca.gov">www.P65Warnings.ca.gov</a>

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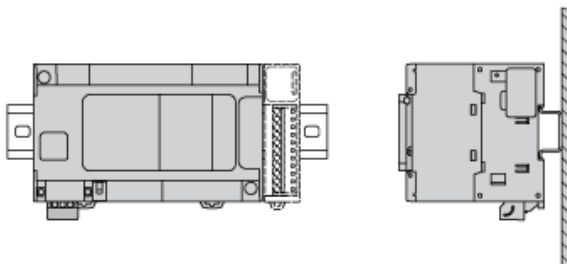
## Dimensions



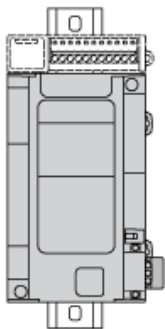
Clearance



Mounting Position

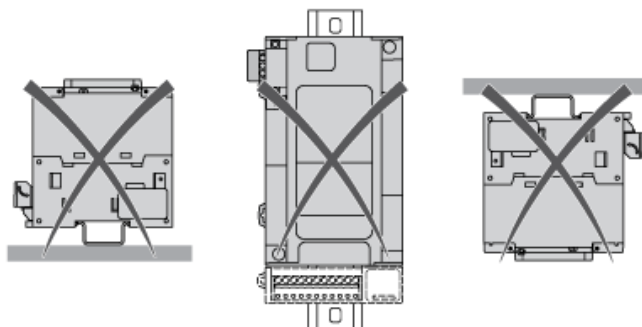


Acceptable Mounting



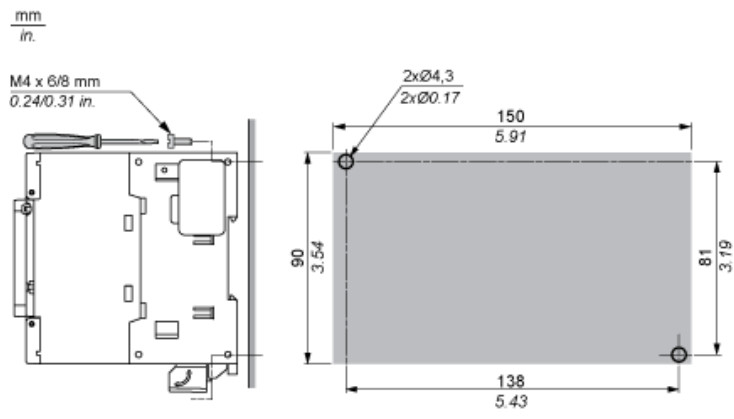
NOTE: Expansion modules must be mounted above the logic controller.

Incorrect Mounting



Direct Mounting On a Panel Surface

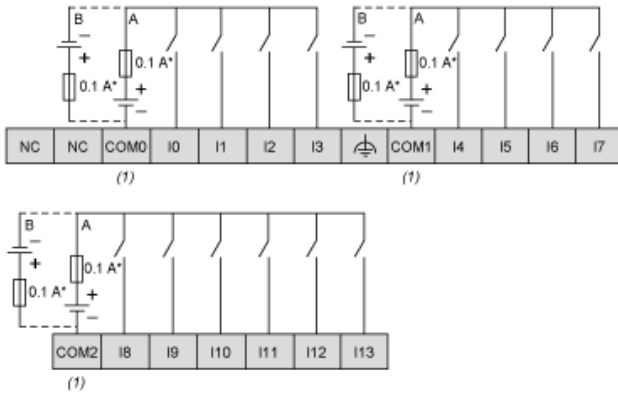
## Mounting Hole Layout





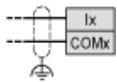
Digital Inputs

Wiring Diagram



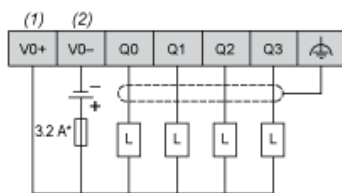
- (\*) : Type T fuse
- (1) : The COM0, COM1 and COM2 terminals are not connected internally
- (A) : Sink wiring (positive logic)
- (B) : Source wiring (negative logic)

Fast Input Wiring (I0...I7)



Fast Transistor Outputs

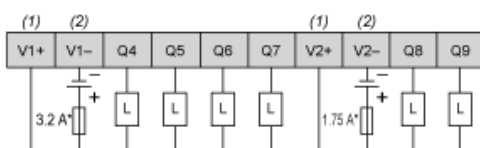
Wiring Diagram



- (\*) : Type T fuse
- (1) The VO+, V1+, V2+ and V3+ terminals are not connected internally.
- (2) The VO-, V1-, V2- and V3- terminals are not connected internally.

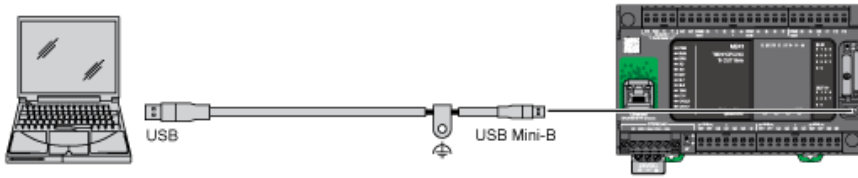
Transistor Outputs

Wiring Diagram

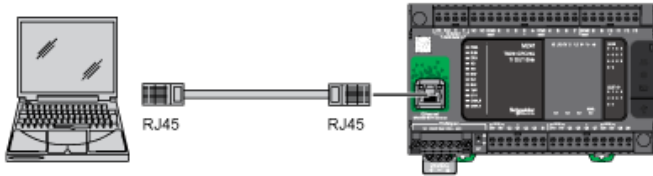


- (\*) : Type T fuse
- (1) : The V1+ and V2+ terminals are not connected internally.
- (2) : The V1- and V2- terminals are not connected internally.

USB Mini-B Connection

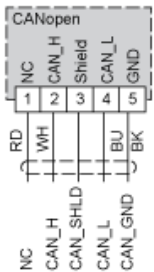


## Ethernet Connection to a PC



## CANopen Connection

### Wiring Diagram



Pin	Signal	Description	Marking	Color of Cable
1	Not used	Reserved	NC	red
2	CAN_H	CAN_H bus line (dominant high)	CAN_H	white
3	CAN_SHLD	Optional CAN shield	Shield	-
4	CAN_L	CAN_L bus line (dominant low)	CAN_L	blue
5	CAN_GND	CAN Ground	GND	black