# Product datasheet

Specifications



## Logic controller, Modicon M241, 24 IO transistor PNP Ethernet

TM241CE24T

## Main

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|---|---|
| **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)<br>0.1 A for fast output (PTO mode) (Q0...Q3) |

## Complementary

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|---|---|
| **Discrete I/O number** | 24 |
| **Maximum number of I/O expansion module** | 7 (local I/O-Architecture)<br>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** | >= 15 V for input |
| **Voltage state 0 guaranteed** | <= 5 V for input |
| **Discrete input current** | 5 mA for input<br>10.7 mA for fast input |
| **Input impedance** | 4.7 kOhm for input<br>2.81 kOhm for fast input |
| **Response time** | 50 µs turn-on, I0...I13 terminal(s) for input<br>50 µs turn-off, I0...I13 terminal(s) for input<br><= 2 µs turn-on, I0...I7 terminal(s) for fast input<br><= 2 µs turn-off, I0...I7 terminal(s) for fast input<br><= 34 µs turn-on, Q0...Q9 terminal(s) for output<br><= 250 µs turn-off, Q0...Q9 terminal(s) for output<br><= 2 µs turn-on, Q0...Q3 terminal(s) for fast output<br><= 2 µs turn-off, Q0...Q3 terminal(s) for fast output |

Excluding VAT, FCA Jabal Ali & are subject to change – check with your local distributor.

Disclaimer: This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications

| | |
|---|---|
| **Configurable filtering time** | 1 s for fast input<br>12 ms for fast input<br>0 ms for input<br>1 ms for input<br>4 ms for input<br>12 ms for input |
| **Discrete output logic** | Positive logic (source) |
| **Output voltage limits** | 30 V DC |
| **Maximum current per output common** | 2 A with Q0...Q3 for fast output<br>2 A with Q4...Q7 for output<br>1 A with Q8...Q9 for output |
| **Maximum output frequency** | 20 kHz for fast output (PWM mode)<br>100 kHz for fast output (PLS mode)<br>1 kHz for output |
| **Accuracy** | +/- 0.1 % at 0.02…0.1 kHz for fast output<br>+/- 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<br>Short-circuit and overload protection with automatic reset<br>Reverse polarity protection for fast output |
| **Reset time** | 10 ms automatic reset output<br>12 s automatic reset fast output |
| **Memory capacity** | 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<br>0.7 ms for other instruction |
| **Application structure** | 8 external event tasks<br>8 event tasks<br>3 cyclic master tasks + 1 freewheeling task<br>4 cyclic master tasks |
| **Realtime clock** | With |
| **Clock drift** | <= 60 s/month at 25 °C |
| **Positioning functions** | PTO function 4 channel(s) (positioning frequency: 100 kHz)<br>PTO function 4 channel(s) for transistor output (positioning frequency: 1 kHz) |
| **Counting input number** | 4 fast input (HSC mode) at 200 kHz<br>14 standard input at 1 kHz |
| **Control signal type** | A/B at 100 kHz for fast input (HSC mode)<br>Pulse/direction at 200 kHz for fast input (HSC mode)<br>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<br>Non isolated serial link serial 2 with removable screw terminal block connector and RS485 interface<br>USB port with mini B USB 2.0 connector<br>Ethernet with RJ45 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<br>1.2...115.2 kbit/s (115.2 kbit/s by default) for bus length of 3 m for RS232<br>480 Mbit/s for bus length of 3 m for USB<br>10/100 Mbit/s for Ethernet |

| | |
|---|---|
| **Communication port protocol** | Non isolated serial link: Modbus master/slave |
| **Port Ethernet** | 10BASE-T/100BASE-TX - 1 port(s) copper cable |
| **ethernet services** | FDR<br>DHCP server via TM4 Ethernet switch network module<br>DHCP client embedded Ethernet port<br>SMS notifications<br>Updating firmware<br>SNMP client/server<br>Programming<br>NGVL<br>Monitoring<br>IEC VAR ACCESS<br>FTP client/server<br>Downloading<br>SQL client<br>Modbus TCP client I/O scanner<br>Ethernet/IP originator I/O scanner embedded Ethernet port<br>Ethernet/IP target, Modbus TCP server and Modbus TCP slave<br>Send and receive email from the controller based on TCP/UDP library<br>Web server (WebVisu & XWeb system)<br>OPC UA server<br>DNS client |
| **Local signalling** | 1 LED (green) for PWR<br>1 LED (green) for RUN<br>1 LED (red) for module error (ERR)<br>1 LED (red) for I/O error (I/O)<br>1 LED (green) for SD card access (SD)<br>1 LED (red) for BAT<br>1 LED (green) for SL1<br>1 LED (green) for SL2<br>1 LED (red) for bus fault on TM4 (TM4)<br>1 LED per channel (green) for I/O state<br>1 LED (green) for Ethernet port activity |
| **Electrical connection** | removable screw terminal blockfor inputs and outputs (pitch 5.08 mm)<br>removable screw terminal blockfor connecting the 24 V DC power supply (pitch 5.08 mm) |
| **Maximum cable distance between devices** | Unshielded cable: <50 m for input<br>Shielded cable: <10 m for fast input<br>Unshielded cable: <50 m for output<br>Shielded cable: <3 m for fast output |
| **Insulation** | Between supply and internal logic at 500 V AC<br>Non-insulated between supply and ground<br>Between input and internal logic at 500 V AC<br>Non-insulated between inputs<br>Between fast input and internal logic at 500 V AC<br>Between output and internal logic at 500 V AC<br>Non-insulated between outputs<br>Between fast output and internal logic at 500 V AC<br>Between output groups at 500 V AC |
| **Marking** | CE |
| **Surge withstand** | 1 kV power lines (DC) common mode conforming to IEC 61000-4-5<br>1 kV shielded cable common mode conforming to IEC 61000-4-5<br>0.5 kV power lines (DC) differential mode conforming to IEC 61000-4-5<br>1 kV relay output differential mode conforming to IEC 61000-4-5<br>1 kV input common mode conforming to IEC 61000-4-5<br>1 kV transistor output common mode conforming to IEC 61000-4-5 |
| **Web services** | Web server |
| **Maximum number of connections** | 8 Modbus server<br>8 SoMachine protocol<br>10 web server<br>4 FTP server<br>16 Ethernet/IP target<br>8 Modbus client |
| **Number of server device(s)** | 64 Modbus TCP:<br>16 EtherNet/IP: |
| **Cycle time** | 10 ms 16 EtherNet/IP<br>64 ms 64 Modbus TCP |

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|---|---|
| **Mounting support** | Top hat type TH35-15 rail conforming to IEC 60715<br>Top hat type TH35-7.5 rail conforming to IEC 60715<br>plate or panel with fixing kit |
| **Height** | 90 mm |
| **Depth** | 95 mm |
| **Width** | 150 mm |
| **Net weight** | 0.53 kg |

## Environment

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|---|---|
| **Standards** | ANSI/ISA 12-12-01<br>CSA C22.2 No 142<br>CSA C22.2 No 213<br>IEC 61131-2:2007<br>Marine specification (LR, ABS, DNV, GL)<br>UL 508 |
| **Product certifications** | RCM<br>cULus<br>CE<br>UKCA<br>DNV-GL<br>ABS<br>LR |
| **Resistance to electrostatic discharge** | 8 kV in air conforming to IEC 61000-4-2<br>4 kV on contact conforming to IEC 61000-4-2 |
| **Resistance to electromagnetic fields** | 10 V/m 80 MHz...1 GHz conforming to IEC 61000-4-3<br>3 V/m 1.4 GHz...2 GHz conforming to IEC 61000-4-3<br>1 V/m 2 GHz...3 GHz conforming to IEC 61000-4-3 |
| **Resistance to fast transients** | 2 kV (power lines) conforming to IEC 61000-4-4<br>1 kV (Ethernet line) conforming to IEC 61000-4-4<br>1 kV (serial link) conforming to IEC 61000-4-4<br>1 kV (input) conforming to IEC 61000-4-4<br>1 kV (transistor output) conforming to IEC 61000-4-4 |
| **Resistance to conducted disturbances** | 10 V 0.15...80 MHz conforming to IEC 61000-4-6<br>3 V 0.1...80 MHz conforming to Marine specification (LR, ABS, DNV, GL)<br>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 dBµV/m QP ( power lines) at 10…150 kHz conforming to IEC 55011<br>Conducted emissions - test level: 63 dBµV/m QP ( power lines) at 1.5…30 MHz conforming to IEC 55011<br>Radiated emissions - test level: 40 dBµV/m QP class A at 30…230 MHz conforming to IEC 55011<br>Conducted emissions - test level: 79...63 dBµV/m QP ( power lines) at 150…1500 kHz conforming to IEC 55011<br>Radiated emissions - test level: 47 dBµV/m QP class A at 230…1000 MHz conforming to IEC 55011 |
| **Immunity to microbreaks** | 10 ms |
| **Ambient air temperature for operation** | -10…50 °C (vertical installation)<br>-10…55 °C (horizontal installation) |
| **Ambient air temperature for storage** | -25…70 °C |
| **Relative humidity** | 10…95 %, without condensation (in operation)<br>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<br>3 gn at 8.4…150 Hz on symmetrical rail<br>3.5 mm at 5…8.4 Hz on panel mounting<br>3 gn at 8.4…150 Hz on panel mounting |
| **Shock resistance** | 15 gn for 11 ms |

## Packing Units

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|---|---|
| **Unit Type of Package 1** | PCE |
| **Number of Units in Package 1** | 1 |
| **Package 1 Height** | 11.33 cm |
| **Package 1 Width** | 13.095 cm |
| **Package 1 Length** | 18.689 cm |
| **Package 1 Weight** | 640.0 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** | 5.801 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** | 58.4 kg |

## Contractual warranty

| | |
|---|---|
| **Warranty (in months)** | 18 |

## Environmental Data

Schneider Electric aims to achieve Net Zero status by 2050 through supply chain partnerships, lower impact materials, and circularity via our ongoing “Use Better, Use Longer, Use Again” campaign to extend product lifetimes and recyclability.

Environmental Data explained >

How we assess product sustainability >

### Environmental footprint

| | |
|---|---|
| Total lifecycle Carbon footprint | **912 kg CO2 eq.** |
| Carbon footprint of the manufacturing phase [A1 to A3] | **45 kg CO2 eq.** |
| Carbon footprint of the distribution phase [A4] | **3 kg CO2 eq.** |
| Carbon footprint of the installation phase [A5] | **0 kg CO2 eq.** |
| Carbon footprint of the use phase [B2, B3, B4, B6] | **862 kg CO2 eq.** |
| Carbon footprint of the end-of-life phase [C1 to C4] | **2 kg CO2 eq.** |
| Environmental Disclosure | **Product Environmental Profile** |

## Use Better

### Materials and Substances

| | |
|---|---|
| Packaging made with recycled cardboard | **Yes** |
| Packaging without single use plastic | **Yes** |
| SCIP Number | **3d1fb974-648d-4978-8c59-b7dcc486f5a5** |
| EU RoHS Directive | **Compliant By Exemption** |
| REACh Regulation | **Reference contains Substances of Very High Concern above the threshold** |
| PVC free | **Yes** |

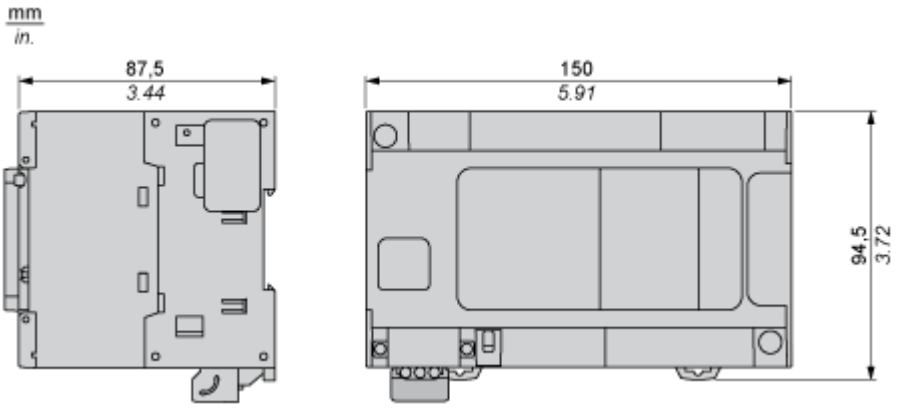
## Use Again

### Repack and remanufacture

| | |
|---|---|
| Recyclability potential, in % | **0** |
| End of life manual availability | **End of Life Information** |
| Take-back | **No** |
| WEEE Label | **The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins** |

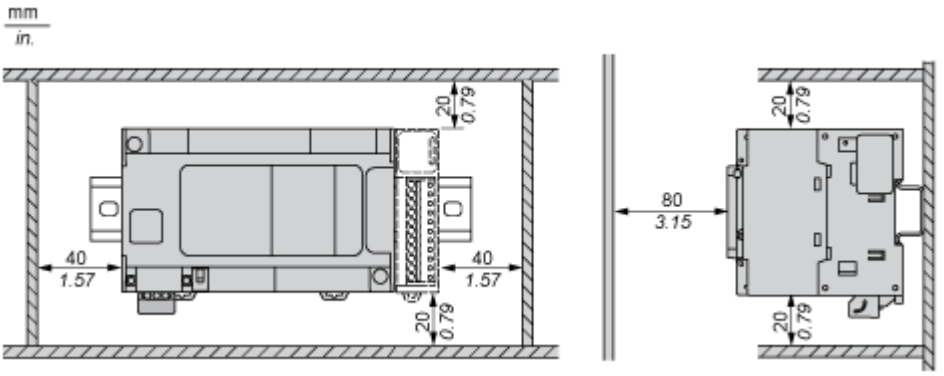
Dimensions Drawings

**Dimensions**

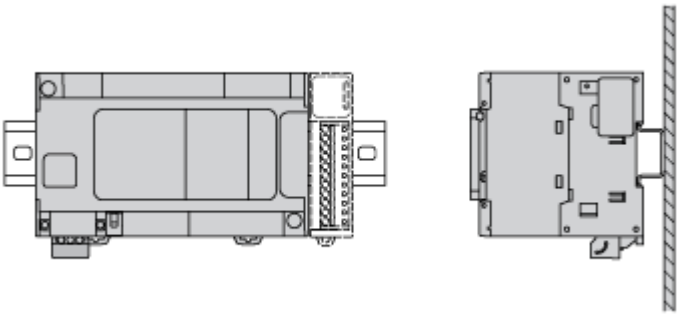


Mounting and Clearance

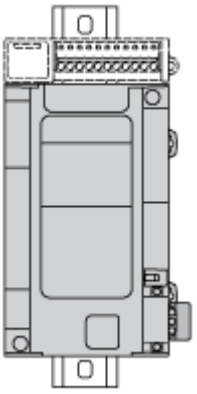
## Clearance



## Mounting Position

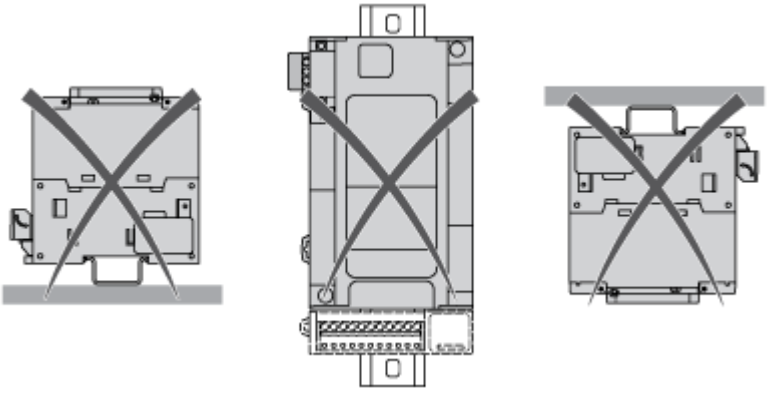


### Acceptable Mounting



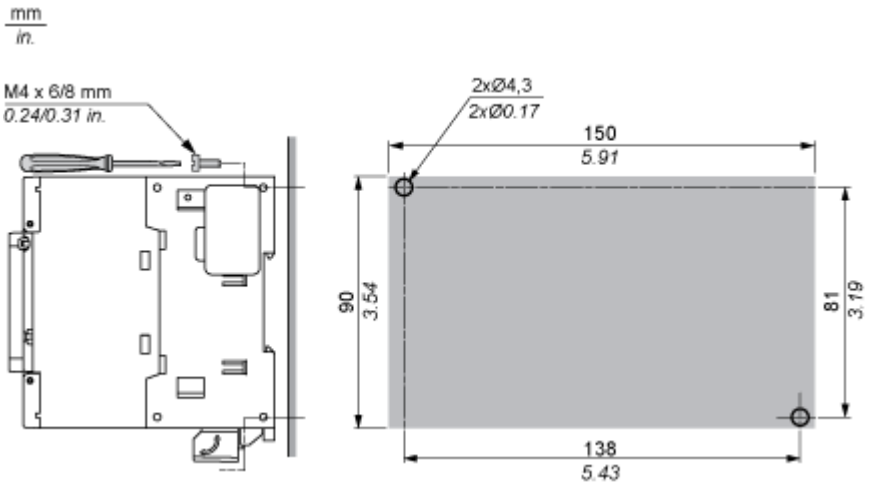
**NOTE:** Expansion modules must be mounted above the logic controller.

### Incorrect Mounting



## Direct Mounting On a Panel Surface

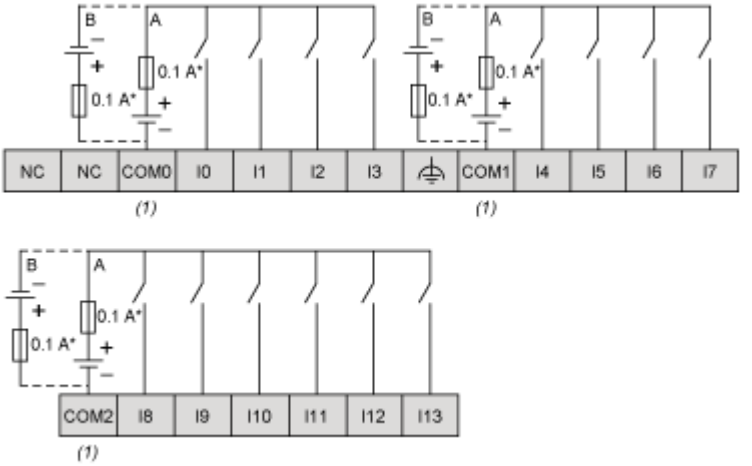
### Mounting Hole Layout



Connections and Schema

## Digital Inputs

### Wiring Diagram



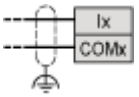

(*) : Type T fuse

(1) : The COM0, COM1 and COM2 terminals are not connected internally

(A) : Sink wiring (positive logic)

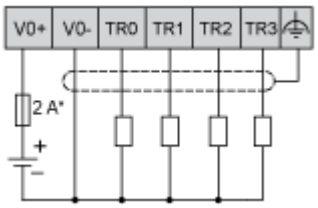
(B) : Source wiring (negative logic)

### Fast Input Wiring (I0...I7)



## Fast Transistor Outputs

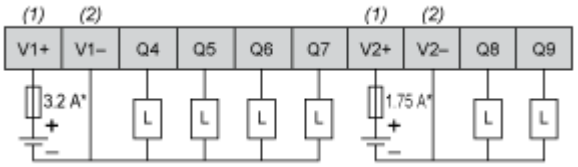
### Wiring Diagram




(*) : 2 A fast-blow fuse

## Transistor Outputs

### Wiring Diagram

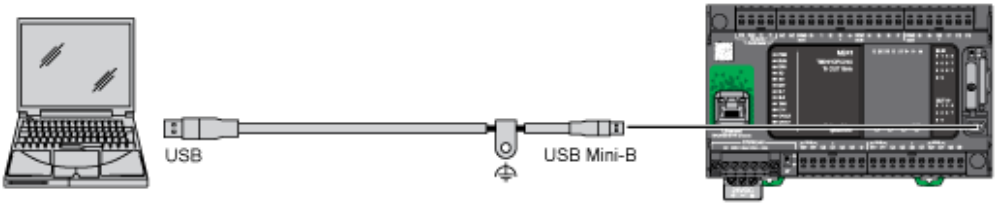



(*) : Type T fuse

(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

