

Product data sheet

Specifications



Logic controller, Modicon M241, 24 IO transistor PNP Ethernet CAN master

TM241CEC24T

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) 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) 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 10.7 mA for fast input |
| Input impedance | 4.7 kOhm for input 2.81 kOhm for fast input |
| Response time | 50 μ s turn-on, I0...I13 terminal(s) for input 50 μ s turn-off, I0...I13 terminal(s) for input ≤ 2 μ s turn-on, I0...I7 terminal(s) for fast input ≤ 2 μ s turn-off, I0...I7 terminal(s) for fast input ≤ 34 μ s turn-on, Q0...Q9 terminal(s) for output ≤ 250 μ s turn-off, Q0...Q9 terminal(s) for output ≤ 2 μ s turn-on, Q0...Q3 terminal(s) for fast output ≤ 2 μ s turn-off, Q0...Q3 terminal(s) for fast output |
| Configurable filtering time | 1 μ s for fast input 12 ms for fast input |

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| | 0 ms for input 1 ms for input 4 ms for input 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 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 external event tasks 4 cyclic master tasks 3 cyclic master tasks + 1 freewheeling task 8 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 |

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| 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 | 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 |
| Electrical connection | removable screw terminal block for inputs and outputs (pitch 5.08 mm) removable screw terminal block for connecting the 24 V DC power supply (pitch 5.08 mm) |
| Maximum cable distance between devices | Unshielded cable: <50 m for input Shielded cable: <10 m for fast input Unshielded cable: <50 m for output Shielded cable: <3 m for fast output |
| Insulation | 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 |
| Marking | CE |
| Surge withstand | 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 |
| Web services | Web server |
| Maximum number of connections | 16 Ethernet/IP device 8 Modbus server |
| CANopen feature profile | DS 301 V4.02 DR 303-1 |
| Number of slave | 63 CANopen: |
| Mounting support | 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 |
| Height | 90 mm |
| Depth | 95 mm |
| Width | 150 mm |
| Net weight | 0.53 kg |
| Environment | |
| Standards | 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 |
| Product certifications | IACS E10 RCM cULus |

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| Resistance to electrostatic discharge | 8 kV in air conforming to EN/IEC 61000-4-2 4 kV on contact conforming to EN/IEC 61000-4-2 |
| Resistance to electromagnetic fields | 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 |
| Resistance to fast transients | 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 |
| 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 μ V/m QP (power lines) at 10...150 kHz conforming to EN/IEC 55011 Conducted emissions - test level: 63 dB μ V/m QP (power lines) at 1.5...30 MHz conforming to EN/IEC 55011 Radiated emissions - test level: 40 dB μ V/m QP class A at 30...230 MHz conforming to EN/IEC 55011 Conducted emissions - test level: 79...63 dB μ V/m QP (power lines) at 150...1500 kHz conforming to EN/IEC 55011 Radiated emissions - test level: 47 dB μ 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

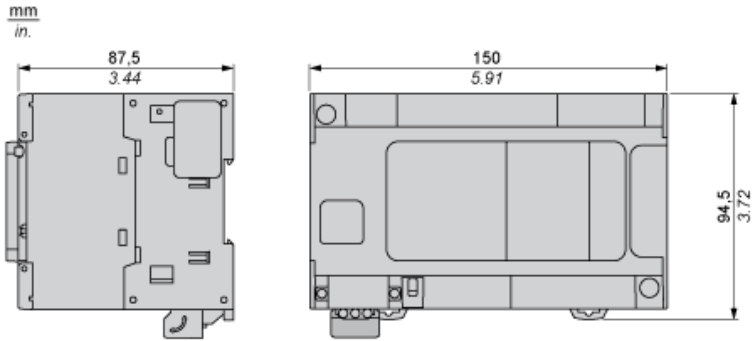
| | |
|-------------------------------------|-----------|
| Unit Type of Package 1 | PCE |
| Number of Units in Package 1 | 1 |
| Package 1 Height | 11.3 cm |
| Package 1 Width | 13.115 cm |
| Package 1 Length | 18.729 cm |
| Package 1 Weight | 661.0 g |
| Unit Type of Package 2 | S03 |
| Number of Units in Package 2 | 8 |
| Package 2 Height | 30.0 cm |
| Package 2 Width | 30.0 cm |
| Package 2 Length | 40.0 cm |
| Package 2 Weight | 6.16 kg |

Offer Sustainability

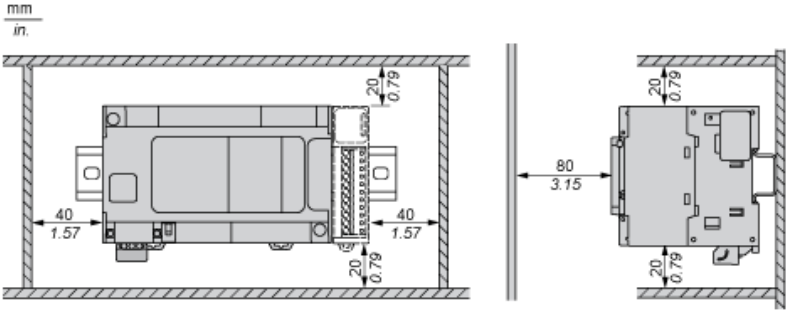
| | |
|---------------------------------|-----------------------|
| Sustainable offer status | Green Premium product |
|---------------------------------|-----------------------|

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|-----------------------------------|---|
| REACH Regulation | REACH Declaration |
| EU RoHS Directive | Pro-active compliance (Product out of EU RoHS legal scope) EU RoHS Declaration |
| Mercury free | Yes |
| RoHS exemption information | Yes |
| China RoHS Regulation | China RoHS declaration |
| Environmental Disclosure | Product Environmental Profile |
| Circularity Profile | End of Life Information |
| 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 www.P65Warnings.ca.gov |

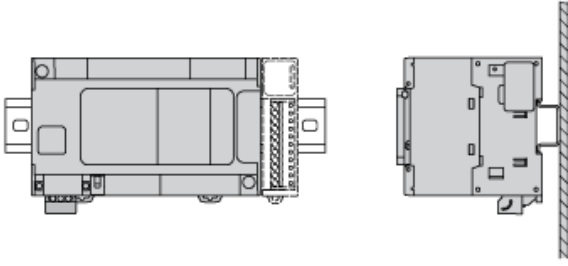
Dimensions



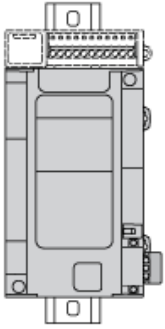
Clearance



Mounting Position

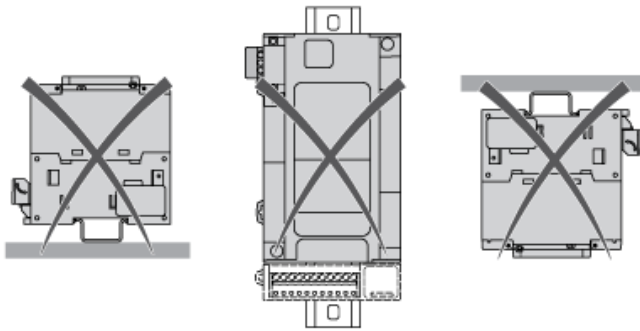


Acceptable Mounting



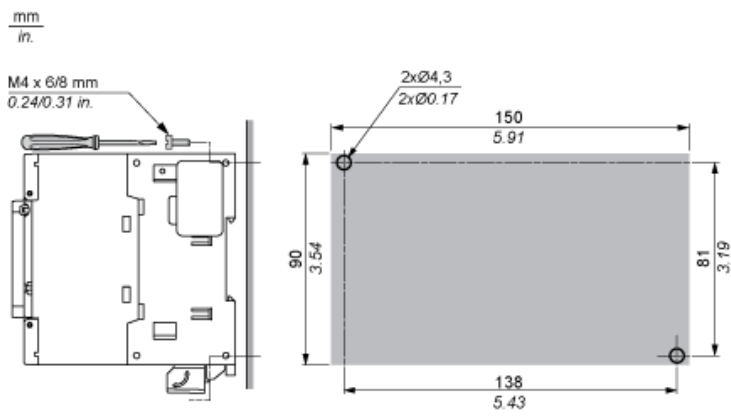
NOTE: Expansion modules must be mounted above the logic controller.

Incorrect Mounting



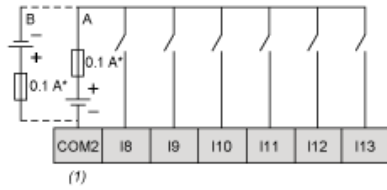
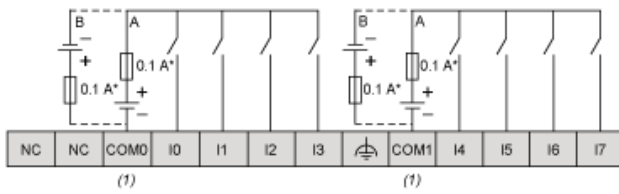
Direct Mounting On a Panel Surface

Mounting Hole Layout



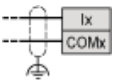
Digital Inputs

Wiring Diagram



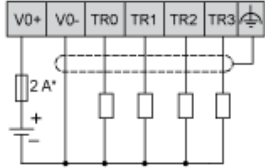
- (*) : Type T fuse
- (1) : The COM0, COM1 and COM2 terminals are not connected internally
- (A) : Sink wiring (positive logic)
- (B) : Source wiring (negative logic)

Fast Input Wiring (I0...I7)



Fast Transistor Outputs

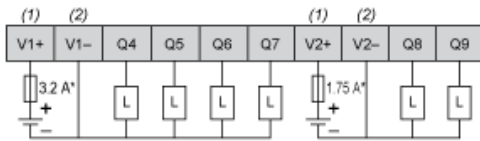
Wiring Diagram



(*) : 2 A fast-blow fuse

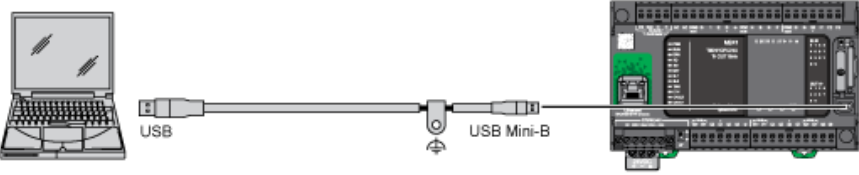
Transistor Outputs

Wiring Diagram

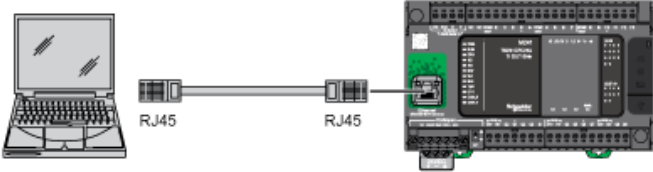


- (*) : Type T fuse
- (1) : The V1+ and V2+ terminals are not connected internally.
- (2) : The V1- and V2- terminals are not connected internally.

USB Mini-B Connection

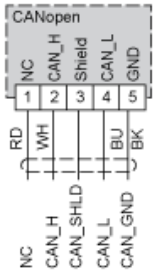


Ethernet Connection to a PC



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 |

Recommended replacement(s)