# TM241CE40U
controller M241 40 IO transistor NPN Ethernet



## Main

| | |
|---|---|
| Range of product | Modicon M241 |
| Product or component type | Logic controller |
| [Us] rated supply voltage | 24 V DC |
| Discrete input number | 24 discrete input including 8 fast input conforming to IEC 61131-2 Type 1 |
| Discrete output type | Transistor |
| Discrete output number | 16 transistor including 4 fast output |
| Discrete output voltage | 24 V DC for transistor output |
| Discrete output current | 0.1 A with Q0...Q3 terminal(s) for fast output (PTO mode)<br>0.5 A with Q0...Q15 terminal(s) for transistor output |

## Complementary

| | |
|---|---|
| Discrete I/O number | 40 |
| 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 state1 guaranteed | >= 15 V for input |
| Current state 1 guaranteed | >= 2.5 mA for input<br>>= 5 mA for fast input |
| Voltage state 0 guaranteed | <= 5 V for input |
| Current state 0 guaranteed | <= 1 mA for input<br><= 1.5 mA for fast input |
| Discrete input current | 7 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 | <= 2 µs turn-on operation with I0...I7 terminal(s) for fast input<br><= 2 µs turn-off operation with I0...I7 terminal(s) for fast input<br><= 2 µs turn-on operation with Q0...Q3 terminal(s) for fast output<br><= 2 µs turn-off operation with Q0...Q3 terminal(s) for fast output<br>50 µs turn-on operation with I0...I15 terminal(s) for input<br>50 µs turn-off operation with I0...I15 terminal(s) for input<br><= 34 µs turn-on operation with Q0...Q15 terminal(s) for output<br><= 250 µs turn-off operation with Q0...Q15 terminal(s) for output |
| Configurable filtering time | 1 µs 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 | Negative logic (sink) |
| Output voltage limits | 30 V DC |
| Current per output common | 2 A |
| 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 20...100 Hz for fast output<br>+/- 1 % at 100 Hz...1 kHz for fast output |
| Leakage current | <= 5 µA for output |
| Voltage drop | <= 1 V |
| Tungsten load | <= 2.4 W |
| Protection type | Short-circuit and overload protection with automatic reset<br>Reverse polarity protection for fast output<br>Short-circuit protection |
| Reset time | 10 ms automatic reset output<br>12 s automatic reset fast output |
| Memory capacity | 8 MB for program<br>64 MB for system memory RAM |
| Data backed up | 128 MB built-in flash memory for backup of user programs |
| Data storage equipment | <= 32 GB SD card optional |
| Battery type | BR2032 lithium non-rechargeable, battery life: 4 yr |
| 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>4 cyclic master tasks<br>3 cyclic master tasks + 1 freewheeling task |
| Realtime clock | With |
| Clock drift | <= 60 s/month at 25 °C |
| Positioning functions | PWM/PTO function 4 channel(s) (positioning frequency: 100 kHz) |
| Counting input number | 4 fast input (HSC mode) |
| Control signal type | A/B signal at 100 kHz for fast input (HSC mode)<br>Pulse/Direction signal at 200 kHz for fast input (HSC mode)<br>Single phase signal at 200 kHz for fast input (HSC mode) |
| Integrated connection type | USB port with connector mini B USB 2.0<br>Ethernet with connector RJ45<br>Non isolated serial link "serial 1" with connector RJ45 and interface RS232/RS485<br>Non isolated serial link "serial 2" with connector removable screw terminal block and interface RS485 |
| Supply | Serial link supply "serial 1" at 5 V, 200 mA |
| Transmission rate | 1.2...115.2 kbit/s (115.2 kbit/s by default) for bus length of 15 m - communication protocol: RS485<br>1.2...115.2 kbit/s (115.2 kbit/s by default) for bus length of 3 m - communication protocol: RS232<br>480 Mbit/s for bus length of 3 m - communication protocol: USB<br>10/100 Mbit/s - communication protocol: Ethernet |
| Communication port protocol | Modbus non isolated serial link with master/slave method |
| Port Ethernet | 1 - 10BASE-T/100BASE-TX port with copper cable support |
| Communication service | FDR<br>Downloading<br>IEC VAR ACCESS |

|  | Monitoring<br>NGVL<br>Programming<br>Updating firmware<br>SMS notifications<br>DHCP server (via TM4 Ethernet switch network module)<br>DHCP client (embedded Ethernet port)<br>SNMP client/server<br>FTP client/server<br>SQL client<br>Send email from the controller based on TCP/UDP library<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 |
| --- | --- |
| Local signalling | 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 per channel green for I/O state<br>1 LED red for I/O error (I/O)<br>1 LED red for bus fault on TM4 (TM4)<br>1 LED green for Ethernet port activity<br>1 LED red for module error (ERR)<br>1 LED green for PWR<br>1 LED green for RUN |
| Electrical connection | Removable screw terminal block for inputs and outputs (pitch 5.08 mm)<br>Removable screw terminal block for connecting the 24 V DC power supply (pitch 5.08 mm) |
| Cable length | <= 50 m unshielded cable for input<br><= 10 m shielded cable for fast input<br><= 3 m shielded cable for fast output<br><= 50 m unshielded cable for output |
| Insulation | 500 V AC between fast input and internal logic<br>Non-insulated between inputs<br>500 V AC between output and internal logic<br>500 V AC between fast output and internal logic<br>Non-insulated between outputs<br>500 V AC between input and internal logic<br>500 V AC between output groups<br>500 V AC between supply and internal logic<br>Non-insulated between supply and ground |
| Marking | CE |
| Surge withstand | 1 kV for power lines (DC) in common mode conforming to EN/IEC 61000-4-5<br>1 kV for shielded cable in common mode conforming to EN/IEC 61000-4-5<br>0.5 kV for power lines (DC) in differential mode conforming to EN/IEC 61000-4-5<br>1 kV for relay output in differential mode conforming to EN/IEC 61000-4-5<br>1 kV for input in common mode conforming to EN/IEC 61000-4-5<br>1 kV for transistor output in common mode conforming to EN/IEC 61000-4-5 |
| Web services | Web server |
| Maximum number of connections | 8 connection(s) for Modbus server<br>8 connection(s) for SoMachine protocol<br>10 connection(s) for web server<br>4 connection(s) for FTP server<br>16 connection(s) for Ethernet/IP target<br>8 connection(s) for Modbus client |
| Number of slave | 16 Ethernet/IP<br>64 Modbus TCP |
| Cycle time | 10 ms 16 Ethernet/IP<br>64 ms 64 Modbus TCP |
| 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 | 190 mm |
| Product weight | 0.62 kg |

## Environment

| Standards | CSA C22.2 No 142 |
| --- | --- |

| | |
|---|---|
| | ANSI/ISA 12-12-01<br>UL 1604<br>CSA C22.2 No 213<br>EN/IEC 61131-2 : 2007<br>Marine specification (LR, ABS, DNV, GL)<br>UL 508 |
| Product certifications | CULus<br>IACS E10<br>CSA<br>RCM |
| Resistance to electrostatic discharge | 4 kV on contact conforming to EN/IEC 61000-4-2<br>8 kV in air 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<br>3 V/m (1.4 GHz...2 GHz) conforming to EN/IEC 61000-4-3<br>1 V/m (2 GHz...3 GHz) conforming to EN/IEC 61000-4-3 |
| Resistance to fast transients | 2 kV for power lines conforming to EN/IEC 61000-4-4<br>1 kV for Ethernet line conforming to EN/IEC 61000-4-4<br>1 kV for serial link conforming to EN/IEC 61000-4-4<br>1 kV for input conforming to EN/IEC 61000-4-4<br>1 kV for transistor output conforming to EN/IEC 61000-4-4 |
| Resistance to conducted disturbances, induced by radio frequency fields | 10 V (0.15...80 MHz) conforming to EN/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, condition of test: power lines (radio frequency: 10...150 kHz) conforming to EN/IEC 55011<br>Conducted emissions, test level: 79...63 dBµV/m QP, condition of test: power lines (radio frequency: 150 kHz...1.5 MHz) conforming to EN/IEC 55011<br>Conducted emissions, test level: 63 dBµV/m QP, condition of test: power lines (radio frequency: 1.5...30 MHz) conforming to EN/IEC 55011<br>Radiated emissions, test level: 40 dBµV/m QP with class A (radio frequency: 30...230 MHz) conforming to EN/IEC 55011<br>Radiated emissions, test level: 47 dBµV/m QP with class A (radio frequency: 230 MHz...1 GHz) conforming to EN/IEC 55011 |
| Immunity to microbreaks | 10 ms |
| Ambient air temperature for operation | -10...55 °C for horizontal installation<br>-10...50 °C for vertical 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 (vibration frequency: 5...8.4 Hz) on symmetrical rail<br>3 gn (vibration frequency: 8.4...150 Hz) on symmetrical rail<br>3.5 mm (vibration frequency: 5...8.4 Hz) on panel mounting<br>3 gn (vibration frequency: 8.4...150 Hz) on panel mounting |
| Shock resistance | 15 gn for 11 ms |

## Offer Sustainability

| | |
|---|---|
| Sustainable offer status | Green Premium product |
| RoHS (date code: YYWW) | Compliant  - since  1330  -  Schneider Electric declaration of conformity<br>Schneider Electric declaration of conformity |
| REACh | Reference not containing SVHC above the threshold<br>Reference not containing SVHC above the threshold |
| Product environmental profile | Available<br>Product environmental |
| Product end of life instructions | Available<br>End of life manual |

# TM241CE40U

## Dimensions
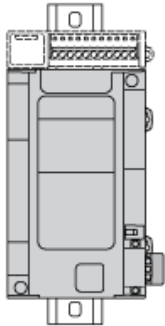
mm
in.

87,5
3.44

190
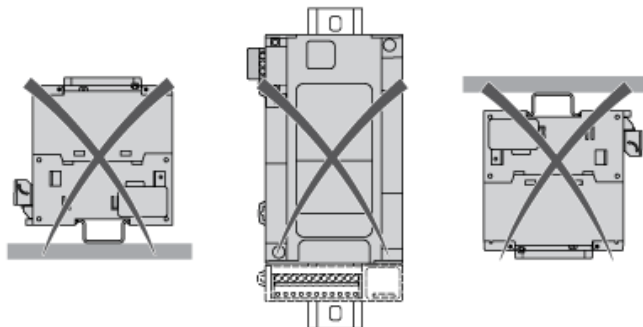7.48

94,5
3.72
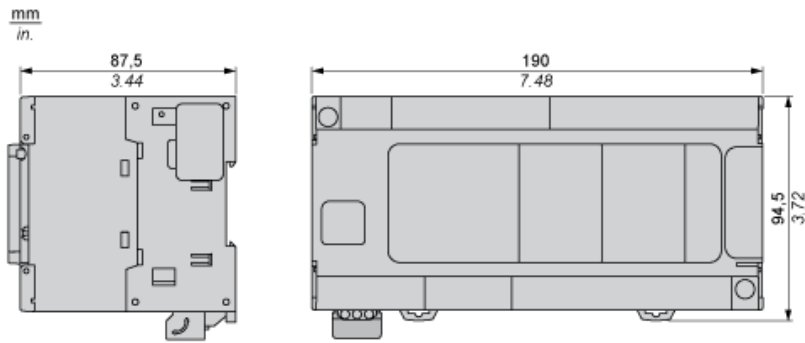
## Clearance
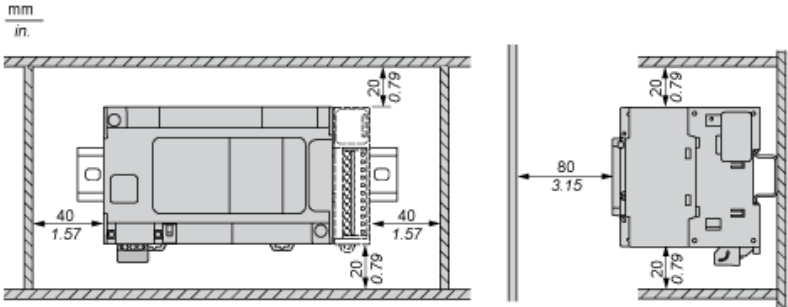
## Mounting Position
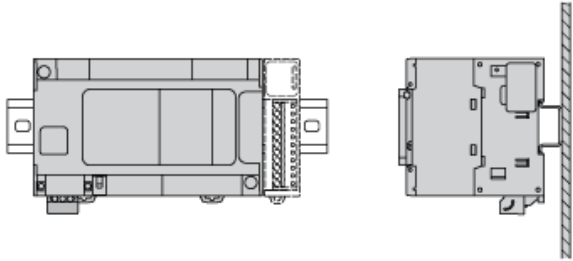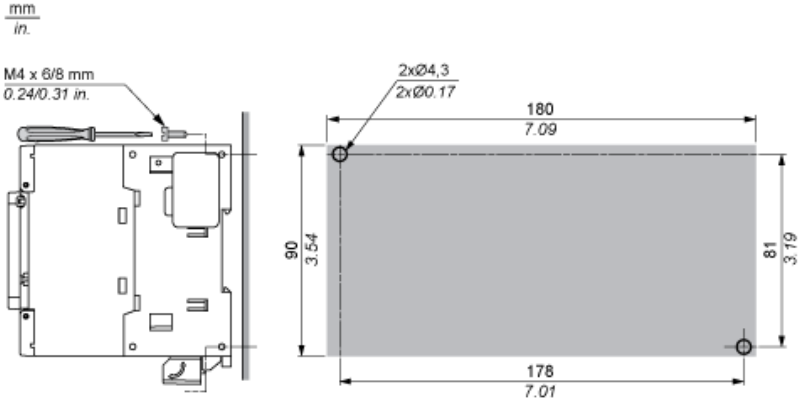
## Acceptable Mounting

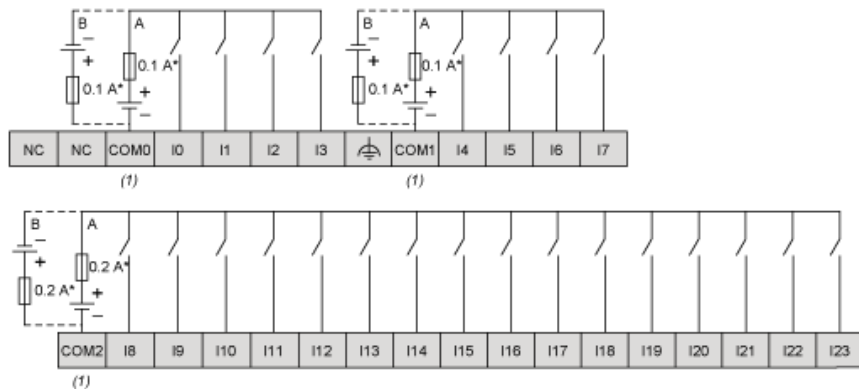NOTE: Expansion modules must be mounted above the logic controller.

## Incorrect Mounting

## Direct Mounting On a Panel Surface

### Mounting Hole Layout

$\frac{mm}{in.}$

M4 x 6/8 mm
0.24/0.31 in.

2xØ4,3
2xØ0.17

180
7.09

90
3.54

81
3.19

178
7.01

Life Is On | Schneider Electric

## Digital Inputs

### Wiring Diagram



| NC | NC | COM0 | I0 | I1 | I2 | I3 | ⏚ | COM1 | I4 | I5 | I6 | I7 |
|----|----|------|----|----|----|----|----|------|----|----|----|----|
| | | (1) | | | | | | (1) | | | | |

| COM2 | I8 | I9 | I10 | I11 | I12 | I13 | I14 | I15 | I16 | I17 | I18 | I19 | I20 | I21 | I22 | I23 |
|------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| (1) | | | | | | | | | | | | | | | | |

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

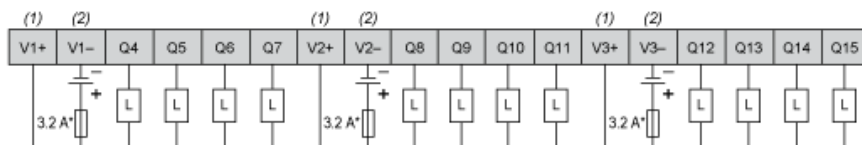### Fast Input Wiring (I0...I7)
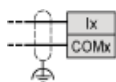
## Fast Transistor Outputs
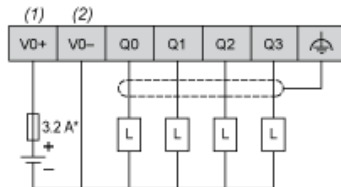
### Wiring Diagram



(*) : Type T fuse
(1)   The V0+, V1+, V2+ and V3+ terminals are not connected internally.
(2)   The V0-, V1-, V2- and V3- terminals are not connected internally.

## Transistor Outputs
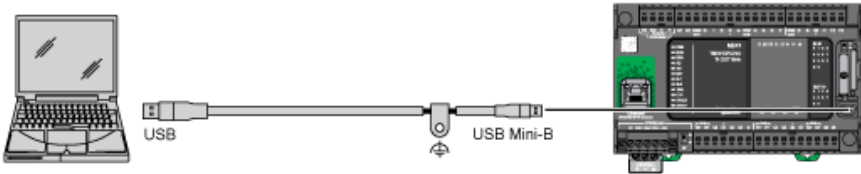
### Wiring Diagram



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

# TM241CE40U

## USB Mini-B Connection

# TM241CE40U

## Ethernet Connection to a PC