Product data sheet

TM241CE40R
controller M241 40 IO relay Ethernet

Main

Range of product Modicon M241
Product or component type Logic controller
[Us] rated supply voltage 100...240 V AC
Discrete input number 24 discrete input including 8 fast input conforming to IEC 61131-2 Type 1
Discrete output type Relay
Transistor
Discrete output number 12 relay
4 transistor including 4 fast output
Discrete output voltage 24 V DC for transistor output
5...125 V DC for relay output
5...250 V AC for relay output
Discrete output current
0.1 A with TR0...TR3 terminal(s) for fast output (PTO mode)
2 A with Q4...Q15 terminal(s) for relay output
0.5 A with TR0...TR3 terminal(s) for transistor output

Complementary

Discrete I/O number 40
Number of I/O expansion module 7 (local I/O architecture)
14 (remote I/O architecture)
Supply voltage limits 85...264 V
Network frequency 50/60 Hz
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 7 mA for input
Input impedance 4.7 kOhm for input
Response time 50 µs turn-on operation with I0...I15 terminal(s) for input
Configurable filtering time 1 µs for fast input
Discrete output logic Positive logic (source)
### Output voltage limits
- 125 V DC relay output
- 30 V DC transistor output
- 277 V AC relay output

### Output frequency
- <= 1 kHz for transistor output
- <= 20 kHz for fast output (PWM mode)
- <= 100 kHz for fast output (PLS mode)

### Accuracy
- +/- 0.1 % at 0.02...0.1 kHz for fast output
- +/- 1 % at 0.1...1 kHz for fast output

### Protection type
- Short-circuit protection for transistor output
- Short-circuit and overload protection with automatic reset for transistor output
- Reverse polarity protection for transistor output
- Without protection for relay output

### Reset time
- 10 ms automatic reset output
- 12 s automatic reset fast output

### Memory capacity
- 8 MB for program
- 128 MB for system memory RAM
- 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 yr

### 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
- 4 cyclic master tasks
- 3 cyclic master tasks + 1 freewheeling task
- 8 event tasks
- 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)

### Counting input number
- 4 fast input (HSC mode) at 200 kHz
- 14 standard input at 1 kHz

### Control signal type
- A/B signal at 100 kHz for fast input (HSC mode)
- Pulse/direction signal at 200 kHz for fast input (HSC mode)
- Single phase signal at 200 kHz for fast input (HSC mode)

### Integrated connection type
- USB port with connector mini B USB 2.0
- Ethernet with connector RJ45
- Non isolated serial link "serial 1" with connector RJ45 and interface RS232/RS485
- 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
- 1.2...115.2 kbit/s (115.2 kbit/s by default) for bus length of 3 m - communication protocol: RS232
- 480 Mbit/s for bus length of 3 m - communication protocol: USB
- 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

### Ethernet services
- FDR
- Downloading
- IEC VAR ACCESS
- Monitoring
- NGVL
- Programming
- Updating firmware
- SMS notifications
- DHCP server (via TM4 Ethernet switch network module)
- DHCP client (embedded Ethernet port)
- SNMP client/server
- FTP client/server
- SQL client
- Modbus TCP client I/O scanner
- Ethernet/IP originator I/O scanner (embedded Ethernet port)
- Ethernet/IP target, Modbus TCP server and Modbus TCP slave
- 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 SD card access (SD)
1 LED red for BAT
1 LED green for SL1
1 LED green for SL2
1 LED per channel green for I/O state
1 LED red for I/O error (I/O)
1 LED red for bus fault on TM4 (TM4)
1 LED green for Ethernet port activity
1 LED red for module error (ERR)
1 LED green for PWR
1 LED green for RUN

**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)

**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**

500 V AC between supply and internal logic
Non-insulated between supply and ground

**Marking**

CE

**Sensor power supply**

24 V DC at 400 mA supplied by the controller

**Surge withstand**

2 kV for power lines (AC) in common mode conforming to EN/IEC 61000-4-5
2 kV for relay output in common mode conforming to EN/IEC 61000-4-5
1 kV for shielded cable in common mode conforming to EN/IEC 61000-4-5
1 kV for power lines (AC) in differential mode conforming to EN/IEC 61000-4-5
1 kV for relay output in differential mode conforming to EN/IEC 61000-4-5
1 kV for input in common mode conforming to EN/IEC 61000-4-5
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
8 connection(s) for SoMachine protocol
10 connection(s) for web server
4 connection(s) for FTP server
16 connection(s) for Ethernet/IP target
8 connection(s) for Modbus client

**Number of slave**

16 Ethernet/IP
64 Modbus TCP

**Cycle time**

10 ms 16 Ethernet/IP
64 ms 64 Modbus TCP

**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**

190 mm

**Product weight**

0.62 kg

**Environment**

**Standards**

CSA C22.2 No 142
ANSI/ISA 12-12-01
UL 1604
CSA C22.2 No 213
EN/IEC 61131-2 : 2007
Marine specification (LR, ABS, DNV, GL)
UL 508

**Product certifications**

IACS E10
RCM
CSA
cULus

**Resistance to electrostatic discharge**

4 kV on contact conforming to EN/IEC 61000-4-2
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
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 for power lines conforming to EN/IEC 61000-4-4
2 kV for relay output conforming to EN/IEC 61000-4-4
1 kV for Ethernet line 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 dBµV/m QP, condition of test: power lines (radio frequency: 10...150 kHz) conforming to EN/IEC 55011  
Conducted emissions, test level: 63 dBµV/m QP, condition of test: power lines (radio frequency: 1.5...30 MHz) conforming to EN/IEC 55011  
Conducted emissions, test level: 79 dBµV/m QP/66 dBµV/m AV, condition of test: power lines (radio frequency: 30...230 MHz) conforming to EN/IEC 55011  
Radiated emissions, test level: 40 dBµV/m QP with class A, condition of test: 10 m (radio frequency: 230...1000 MHz) conforming to EN/IEC 55011  
Radiated emissions, test level: 47 dBµV/m QP with class A, condition of test: 10 m (radio frequency: 150...1500 kHz) conforming to EN/IEC 55011 |
|**Immunity to microbreaks** | 10 ms |
|**Ambient air temperature for operation** | -10...55 °C for horizontal installation  
-10...50 °C for vertical 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 (vibration frequency: 5...8.4 Hz) on symmetrical rail  
3 gn (vibration frequency: 8.4...150 Hz) on symmetrical rail  
3.5 mm (vibration frequency: 5...8.4 Hz) on panel mounting  
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
  - Schneider Electric declaration of conformity
- **REACH**: Reference contains SVHC above the threshold
  - Go to CaP for more details
- **Product environmental profile**: Available
  - Product Environmental Profile
- **Product end of life instructions**: Available
  - End of Life Information
Dimensions

![Diagram of TM241CE40R dimensions in mm]

- Width: 190 mm
- Height: 94.6 mm
- Depth: 87.5 mm
- Height: 94.6 mm
Clearance

[Diagram showing mounting and clearance dimensions in millimeters and inches]
Mounting and Clearance

Acceptable Mounting

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

Incorrect Mounting
Direct Mounting On a Panel Surface

Mounting Hole Layout

- M4 x 6/8 mm
- 0.240\( \times \)0.37 in.

Dimensions:
- 180 mm (7.09 in.)
- 178 mm (7.01 in.)
- 90 mm (3.54 in.)
- 35 mm (1.38 in.)
Digital Inputs

Wiring Diagram (Positive Logic)

(*) : Type T fuse
(1) : The COM0, COM1 and COM2 terminals are not connected internally.

Wiring Diagram (Negative Logic)

(*) : Type T fuse
(1) : The COM0, COM1 and COM2 terminals are not connected internally.
Fast Transistor Outputs

Wiring Diagram

(*) :  2 A fast-blow fuse
**Relay Outputs**

**Wiring Diagram**

- **(*)**: Type T fuse
- **(1)**: The terminals COM1 to COM6 are not connected internally.
- **(2)**: To improve the life time of the contacts, and to protect from potential inductive load damage, you must connect a free wheeling diode in parallel to each inductive AC load.
USB Mini-B Connection
Ethernet Connection to a PC