## Main

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

## Complementary

<table>
<thead>
<tr>
<th>Feature</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discrete I/O number</td>
<td>24</td>
</tr>
<tr>
<td>Maximum number of I/O expansion module</td>
<td>7 (local)</td>
</tr>
<tr>
<td></td>
<td>14 (remote)</td>
</tr>
<tr>
<td>Supply voltage limits</td>
<td>20.4…28.8 V</td>
</tr>
<tr>
<td>Inrush current</td>
<td>50 A</td>
</tr>
<tr>
<td>Power consumption in W</td>
<td>32.6…40.4 W (with max number of I/O expansion module)</td>
</tr>
<tr>
<td>Discrete input logic</td>
<td>Sink or source</td>
</tr>
<tr>
<td>Discrete input voltage</td>
<td>24 V</td>
</tr>
<tr>
<td>Discrete input voltage type</td>
<td>DC</td>
</tr>
<tr>
<td>Voltage state 1 guaranteed</td>
<td>&gt;= 15 V for input</td>
</tr>
<tr>
<td>Voltage state 0 guaranteed</td>
<td>&lt;= 5 V for input</td>
</tr>
<tr>
<td>Discrete input current</td>
<td>5 mA for input</td>
</tr>
<tr>
<td></td>
<td>10.7 mA for fast input</td>
</tr>
<tr>
<td>Input impedance</td>
<td>4.7 kOhm for input</td>
</tr>
<tr>
<td></td>
<td>2.81 kOhm for fast input</td>
</tr>
<tr>
<td>Response time</td>
<td>50 µs turn-on, I0...I13 terminal(s) for input</td>
</tr>
<tr>
<td></td>
<td>50 µs turn-off, I0...I13 terminal(s) for input</td>
</tr>
<tr>
<td></td>
<td>&lt;= 2 µs turn-on, I0...I7 terminal(s) for fast input</td>
</tr>
<tr>
<td></td>
<td>&lt;= 2 µs turn-off, I0...I7 terminal(s) for fast input</td>
</tr>
<tr>
<td></td>
<td>&lt;= 34 µs turn-on, Q0...Q9 terminal(s) for output</td>
</tr>
</tbody>
</table>

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.

Jun 13, 2020
| **Configurable filtering time** | 1 µs for fast input  
12 ms for fast input  
0 ms for input  
1 ms for input  
4 ms for input  
12 ms for input |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Discrete output logic</strong></td>
<td>Positive logic (source)</td>
</tr>
<tr>
<td><strong>Output voltage limits</strong></td>
<td>30 V DC</td>
</tr>
</tbody>
</table>
| **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  
8 event tasks  
3 cyclic master tasks + 1 freewheeling task  
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)  
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 |
| **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 |
| **Communication port protocol** | Non isolated serial link: Modbus master/slave |
| **Port Ethernet**             | 10BASE-T/100BASE-TX - 1 port(s) copper cable    |
| **Ethernet services**         | FDR  
DHCP server via TM4 Ethernet switch network module  
DHCP client embedded Ethernet port  
SMS notifications |
### Updating firmware
- SNMP client/server
- Programming
- NGVL
- Monitoring
- IEC VAR ACCESS
- FTP client/server
- Downloading
- 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) PWR:
- 1 LED (green) RUN:
- 1 LED (red) module error (ERR):
- 1 LED (red) I/O error (I/O):
- 1 LED (green) SD card access (SD):
- 1 LED (red) BAT:
- 1 LED (green) SL1:
- 1 LED (green) SL2:
- 1 LED (red) bus fault on TM4 (TM4):
- 1 LED per channel (green) I/O state:
- 1 LED (green) Ethernet port activity:

### 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
- Between output groups 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
- 8 Modbus server
- 8 SoMachine protocol
- 10 web server
- 4 FTP server
- 16 Ethernet/IP target
- 8 Modbus client

### Number of slave
- 64 Modbus TCP:
- 16 Ethernet/IP:

### 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
- 150 mm

### Net weight
- 0.53 kg
### Environment

**Standards**
- ANSI/ISA 12-12-01
- CSA C22.2 No 142
- CSA C22.2 No 213
- Marine specification (LR, ABS, DNV, GL)
- UL 1604
- UL 508

**Product certifications**
- CULus
- IACS E10
- RCM
- CSA

**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 dBµV/m QP (power lines) at 10...150 kHz conforming to EN/IEC 55011
- Conducted emissions - test level: 63 dBµV/m QP (power lines) at 1.5...30 MHz conforming to EN/IEC 55011
- Radiated emissions - test level: 40 dBµV/m QP class A at 30...230 MHz conforming to EN/IEC 55011
- Conducted emissions - test level: 79...63 dBµV/m QP (power lines) at 150...1500 kHz conforming to EN/IEC 55011
- Radiated emissions - test level: 47 dBµV/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

### Offer Sustainability

**Sustainable offer status**
- Green Premium product

**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
<table>
<thead>
<tr>
<th>WEEE</th>
<th>The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVC free</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Clearance
Mounting and Clearance

NOTE: Expansion modules must be mounted above the logic controller.
Direct Mounting On a Panel Surface

Mounting Hole Layout

- M4 x 0.8 mm
- D 0.37 in
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

<table>
<thead>
<tr>
<th>(1)</th>
<th>(2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>V1+</td>
<td>V1–</td>
</tr>
<tr>
<td>Q4</td>
<td>Q5</td>
</tr>
<tr>
<td>Q6</td>
<td>Q7</td>
</tr>
<tr>
<td>3.2 A</td>
<td>L</td>
</tr>
<tr>
<td>1.75 A</td>
<td>L</td>
</tr>
</tbody>
</table>

(*) : 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