# TM241CEC24R

# controller M241 24 IO relay Ethernet CAN master





#### Main

Range of product	Modicon M241
Product or component type	Logic controller
[Us] rated supply voltage	100240 V AC
Discrete input number	14 discrete input including 8 fast input conforming to IEC 61131-2 Type 1
Discrete output type	Relay Transistor
Discrete output number	4 transistor including 4 fast output 6 relay
Discrete output voltage	24 V DC for transistor output 5250 V AC for relay output 5125 V DC for relay output
Discrete output current	0.5 A with TR0TR3 terminal(s) for transistor output 0.1 A with TR0TR3 terminal(s) for fast output (PTO mode) 2 A with Q4Q9 terminal(s) for relay output

#### Complementary

Complementary			
Discrete I/O number	24		
Number of I/O expansion module	14 (remote I/O architecture) 7 (local I/O architecture)		
Supply voltage limits	85264 V		
Network frequency	50/60 Hz		
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	>= 5 mA for fast input >= 2.5 mA for input		
Voltage state 0 guaranteed	<= 5 V for input		
Current state 0 guaranteed	<= 1.5 mA for fast input <= 1 mA for input		
Discrete input current	5 mA for input		
Input impedance	4.7 kOhm for input		
Response time	50 μs turn-on operation with I0I13 terminal(s) for input		
Configurable filtering time	1 μs for fast input		
Discrete output logic	Positive logic (source)		
Output voltage limits	277 V AC relay output 30 V DC transistor output 125 V DC relay output		
Output frequency	<= 100 kHz for fast output (PLS mode) <= 20 kHz for fast output (PWM mode) <= 1 kHz for transistor output		
Accuracy	+/- 1 % at 100 Hz1 kHz for fast output +/- 0.1 % at 20100 Hz for fast output		
Protection type	Without protection for relay output Reverse polarity protection for transistor output Short-circuit and overload protection with automatic reset for transistor output Short-circuit protection for transistor output		

Reset time	12 s automatic reset fast output 10 ms automatic reset output	
Memory capacity	64 MB for system memory RAM 8 MB for program	
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	0.7 ms for other instruction     0.3 ms for event and periodic task	
Application structure	8 event tasks 4 cyclic master tasks 3 cyclic master tasks + 1 freewheeling task 8 external event tasks	
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	Single phase signal at 200 kHz for fast input (HSC mode) Pulse/Direction signal at 200 kHz for fast input (HSC mode) A/B signal at 100 kHz for fast input (HSC mode)	
Integrated connection type	CANopen with connector male SUB-D 9 Ethernet with connector RJ45 USB port with connector mini B USB 2.0 Non isolated serial link "serial 2" with connector removable screw terminal block and interface RS485 Non isolated serial link "serial 1" with connector RJ45 and interface RS232/RS485	
Supply	Serial link supply "serial 1" at 5 V, 200 mA	
Transmission rate	20 kbit/s for bus length of 2500 m - communication protocol: CANopen 50 kbit/s for bus length of 1000 m - communication protocol: CANopen 125 kbit/s for bus length of 500 m - communication protocol: CANopen 250 kbit/s for bus length of 250 m - communication protocol: CANopen 500 kbit/s for bus length of 100 m - communication protocol: CANopen 800 kbit/s for bus length of 40 m - communication protocol: CANopen 1000 kbit/s for bus length of 20 m - communication protocol: CANopen 10/100 Mbit/s - communication protocol: Ethernet 480 Mbit/s for bus length of 3 m - communication protocol: USB 1.2115.2 kbit/s (115.2 kbit/s by default) for bus length of 3 m - communication protocol: RS232 1.2115.2 kbit/s (115.2 kbit/s by default) for bus length of 15 m - communication protocol: RS485	
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	FTP server SNMP DHCP client Ethernet/IP adapter Modbus TCP server Modbus TCP client IEC VAR ACCESS Modbus TCP slave device	
Local signalling	1 LED green for CANopen error 1 LED green for CANopen run 1 LED green for Ethernet port activity 1 LED per channel green for I/O state 1 LED red for bus fault on TM4 (TM4) 1 LED green for SL2 1 LED green for SL1 1 LED red for BAT 1 LED green for SD card access (SD) 1 LED red for I/O error (I/O) 1 LED red for module error (ERR) 1 LED green for RUN 1 LED green for PWR	
Electrical connection	Removable screw terminal block for connecting the 24 V DC power supply (pitch 5.08 mm) Removable screw terminal block for inputs and outputs (pitch 5.08 mm)	



Cable length	<= 3 m shielded cable for fast output <= 50 m unshielded cable for output <= 10 m shielded cable for fast input	
Insulation	<= 50 m unshielded cable for input  Non-insulated between supply and ground 500 V AC between supply and internal logic	
Marking	CE	
Sensor power supply	24 V DC at 400 mA supplied by the controller	
Surge withstand	1 kV for transistor output in common 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 relay output in differential 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 shielded cable 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 2 kV for power lines (AC) in common mode conforming to EN/IEC 61000-4-5	
Web services	Web server	
Maximum number of connections	8 connection(s) for Modbus server 16 connection(s) for Ethernet/IP device	
CANopen feature profile	DR 303-1 DS 301 V4.02	
Number of slave	<= 63 CANopen	
Mounting support	Plate or panel with fixing kit Top hat type TH35-7.5 rail conforming to IEC 60715 Top hat type TH35-15 rail conforming to IEC 60715	
Height	90 mm	
Depth	95 mm	
Width	150 mm	
Product weight	0.53 kg	
Environment		
Standards	UL 508 UL 1604 Marine specification (LR, ABS, DNV, GL) EN/IEC 61131-2: 2007 CSA C22.2 No 213 CSA C22.2 No 142 ANSI/ISA 12-12-01	
Product certifications	CSA CULus IACS E10 RCM	
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	1 V/m (2 GHz3 GHz) conforming to EN/IEC 61000-4-3 3 V/m (1.4 GHz2 GHz) conforming to EN/IEC 61000-4-3 10 V/m (80 MHz1 GHz) conforming to EN/IEC 61000-4-3	
Resistance to fast transients	1 kV for transistor output conforming to EN/IEC 61000-4-4 1 kV for input conforming to EN/IEC 61000-4-4 1 kV for serial link conforming to EN/IEC 61000-4-4 1 kV for Ethernet line conforming to EN/IEC 61000-4-4 2 kV for relay output conforming to EN/IEC 61000-4-4 2 kV for power lines conforming to EN/IEC 61000-4-4	
Resistance to conducted disturbances, induced by radio frequency fields	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) 3 V (0.180 MHz) conforming to Marine specification (LR, ABS, DNV, GL) 10 V (0.1580 MHz) conforming to EN/IEC 61000-4-6	
Electromagnetic emission	Radiated emissions, test level: 47 dBμV/m QP with class A, condition of test: 10 m (radio frequency: 230 MHz1 GHz) conforming to EN/IEC 55011 Radiated emissions, test level: 40 dBμV/m QP with class A, condition of test: 10 m (radio frequency: 30230 MHz) conforming to EN/IEC 55011 Conducted emissions, test level: 73 dBμV/m QP/60 dBμV/m AV, condition of test: power lines (radio frequency: 0.5300 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: 0.150.5 MHz) conforming to EN/IEC 55011 Conducted emissions, test level: 63 dBμV/m QP, condition of test: power lines (radio frequency: 1.530 MHz) conforming to EN/IEC 55011 Conducted emissions, test level: 7963 dBμV/m QP, condition of test: power lines (radio frequency: 150 kHz1.5 MHz) conforming to EN/IEC 55011 Conducted emissions, test level: 12069 dBμV/m QP, condition of test: power lines (radio frequency: 10150 kHz) conforming to EN/IEC 55011	



Immunity to microbreaks	10 ms	
Ambient air temperature for operation	-1055 °C for horizontal installation -1050 °C for vertical installation	
Ambient air temperature for storage	-2570 °C	
Relative humidity	1095 % without condensation in storage 1095 % without condensation in operation	
IP degree of protection	IP20 with protective cover in place	
Pollution degree	2	
Operating altitude	02000 m	
Storage altitude	03000 m	
Vibration resistance	3 gn (vibration frequency: 8.4150 Hz) on panel mounting 3.5 mm (vibration frequency: 58.4 Hz) on panel mounting 3 gn (vibration frequency: 8.4150 Hz) on symmetrical rail 3.5 mm (vibration frequency: 58.4 Hz) on symmetrical rail	
Shock resistance	esistance 15 gn for 11 ms	

# Offer Sustainability

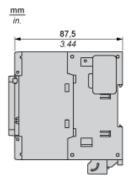
Sustainable offer status	Green Premium product
RoHS (date code: YYWW)	Compliant - since 1350 - Schneider Electric declaration of conformity
REACh	Reference not containing SVHC above the threshold
Product environmental profile	Available
Product end of life instructions	Available

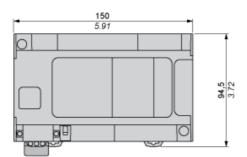


# Product data sheet Dimensions Drawings

# TM241CEC24R

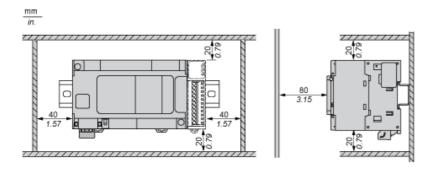
#### **Dimensions**



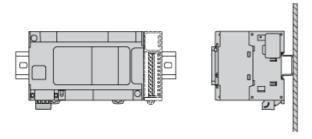


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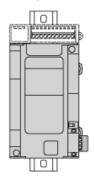
#### Clearance



## Mounting Position

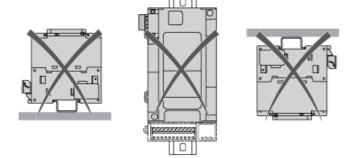


#### Acceptable Mounting



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

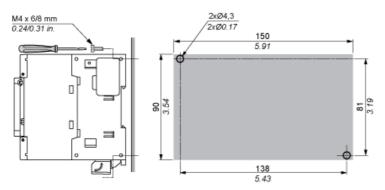
#### **Incorrect Mounting**



## Direct Mounting On a Panel Surface

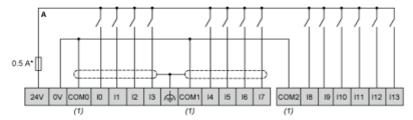
# Mounting Hole Layout





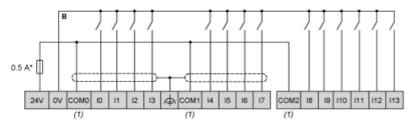
#### **Digital Inputs**

#### Wiring Diagram (Positive Logic)



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

#### Wiring Diagram (Negative Logic)

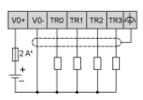


(\*): Type T fuse

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

### **Fast Transistor Outputs**

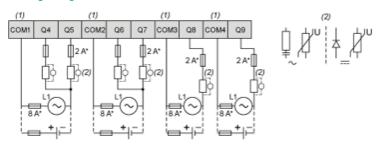
#### Wiring Diagram



(\*): 2 A fast-blow fuse

#### **Relay Outputs**

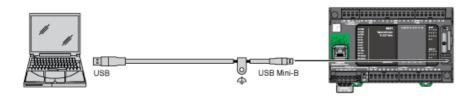
#### Wiring Diagram



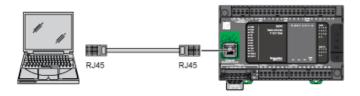
(\*): Type T fuse

(1): The terminals COM1 to COM4 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 DC load or an RC snubber in parallel of each inductive AC load

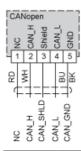


## Ethernet Connection to a PC



## **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