Schneider Service Manual

TM241CEC24R

1. Description

Schneider Electric TM241CEC24R

3. Product Information

Schneider Electric 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

100...240 V AC

Discrete input number 14, discrete input 8 fast input conforming to IEC

61131-2 Type 1

Discrete output type Transistor

Relay

Discrete output number 6 relay

4 transistor 4 fast output

Discrete output voltage 5...125 V DC for relay output

5...250 V AC for relay output

24 V DC for transistor output

Discrete output current 2 A for relay output (Q4...Q9)

0.1 A for fast output (PTO mode) (TR0...TR3)

0.5 A for transistor output (TR0...TR3)

Complementary

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 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 5 mA for input

Input impedance 4.7 kOhm for input

Response time 50 µs turn-on, I0...I13 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

Maximum 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 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 4 cyclic master tasks

8 external event tasks

8 event tasks

3 cyclic master tasks + 1 freewheeling task

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 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

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 blockfor inputs and outputs (pitch 5.08 mm)

Removable screw terminal blockfor 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

Marking CE

Sensor power supply 24 V DC at 400 mA supplied by the controller

Surge withstand 2 KV power lines (AC) common mode conforming to EN/IEC 61000-4-5

2 KV relay output common mode conforming to EN/IEC 61000-4-5

1 KV shielded cable common mode conforming to EN/IEC 61000-4-5

1 KV power lines (AC) 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 DR 303-1

DS 301 V4.02

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 508

Product certifications RCM

CULus

CE

UKCA

DNV-GL

ABS

LR

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

2 KV (relay output) 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

Conducted emissions - test level: 79 dBµV/m QP/66 dBµV/m AV (power lines) at

0.15...0.5 MHz conforming to EN/IEC 55011

Conducted emissions - test level: 73 dBµV/m QP/60 dBµV/m AV (power lines) at

0.5...300 MHz conforming to EN/IEC 55011

Radiated emissions - test level: 40 dBµV/m QP class A (10 m) 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 (10 m) 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 11.335 cm

Package 1 Width 13.188 cm

Package 1 Length 18.727 cm

Package 1 Weight 780.0 g