

Scheinder Electric TM221CE40T

TM221CE40T

controller M221 40 IO transistor PNP Ethernet

Main

Range of product Modicon M221

Product or component

type

Logic controller

[Us] rated supply voltage

24 V DC

Discrete input number 24 discrete input conforming to IEC 61131-2 Type 1 including 4 fast input

Analogue input number 2 at input range: 0...10 V

Discrete output type Transistor

Discrete output number 16 transistor including 2 fast output

Discrete output voltage 24 V DC

Discrete output current 0.5 A

Complementary

Discrete I/O number 40

Number of I/O expansion module ≤ 7 with ≤ 60 discrete output(s) for relay output

Supply voltage limits 19.2...28.8 V

Inrush current ≤ 35 A

Power consumption in W ≤ 17 W at 24 V

Discrete input logic Sink or source (positive/negative)

Discrete input voltage 24 V

Discrete input voltage type DC

Analogue input resolution 10 bits

LSB value 10 mV

Conversion time 1 ms per channel + 1 controller cycle time for analog input

Permitted overload on inputs ± 15 V DC for analog input permanent

± 30 V DC for analog input with 5 min maximum

Voltage state 1 guaranteed ≥ 15 V for input

Current state 1 guaranteed ≥ 2.5 mA for input

Voltage state 0 guaranteed ≤ 5 V for input

Current state 0 guaranteed ≤ 1 mA for input

Discrete input current 7 mA for input

Input impedance 100 kOhm for analog input

3.4 kOhm for discrete input

Response time 10 ms turn-off operation for output

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10 ms turn-on operation for output
5 μ s turn-off operation for fast input
5 μ s turn-on operation for fast input
100 μ s turn-off operation for input; I8...I15 terminal
100 μ s turn-on operation for input; I8...I15 terminal
35 μ s turn-off operation for input; I2...I5 terminal
35 μ s turn-on operation for input; I2...I5 terminal
Configurable filtering time 12 ms for input
3 ms for input
0 ms for input
Discrete output logic Positive logic (source)
Output frequency 0.1 kHz at Q2...Q15 terminal
100 kHz for fast output (PWM/PLS mode) at Q0...Q1 terminal
Absolute accuracy error +/- 1 % of full scale for analog input
Leakage current 0.1 mA for transistor output
Voltage drop $\leq$ 1 V
Mechanical durability $\geq$ 20000000 cycles for transistor output

Tungsten load $\leq$ 12 W for output and fast output
Protection type Overload and short-circuit protection at 1.3 A
Reset time 1 s automatic reset
Memory capacity 256 kB for program with 10000 instructions
Data backed up 256 kB built-in flash memory for backup of programs
Data storage equipment 2 GB SD card optional
Battery type BR2032 lithium non-rechargeable, battery life: 4 yr
Backup time 1 year at 25 ° C by interruption of power supply
Execution time for 1 KInstruction 0.3 ms for event and periodic task
Execution time per instruction 0.2 μ s Boolean
Exct time for event task 60 μ s response time
Clock drift $\leq$ 30 s/month at 25 ° C
Regulation loop Adjustable PID regulator up to 14 simultaneous loops
Positioning functions PWM/PLS function 2 channel(s) (positioning frequency: 100 kHz)
Control signal type Single phase signal at 100 kHz for fast input (HSC mode)
Pulse/Direction signal at 100 kHz for fast input (HSC mode)
A/B signal at 50 kHz for fast input (HSC mode)
Counting input number 4 fast input (HSC mode) (counting frequency: 100 kHz), counting capacity:
32
bits
Integrated connection type Ethernet with connector RJ45
Non isolated serial link "serial 1" with connector RJ45 and interface RS232/
RS485

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USB port with connector mini B USB 2.0
Supply Serial serial link supply at 5 V 200 mA
Transmission rate 480 Mbit/s - communication protocol: USB
1.2...115.2 kbit/s (115.2 kbit/s by default) for bus length of 3 m - communication
protocol: RS232
1.2...115.2 kbit/s (115.2 kbit/s by default) for bus length of 15 m - communication
protocol: RS485
Communication port protocol Non isolated serial link : Modbus protocol master/slave - RTU/ASCII
or SoMachine-Network
USB port : USB protocol - SoMachine-Network
Port Ethernet 10BASE-T/100BASE-TX 1 port with 100 m copper cable
Communication service DHCP client
Modbus TCP server
Modbus TCP client
Modbus TCP slave device
Local signalling Ethernet network link yellow for Link (Link Status)
Ethernet network activity green for ACT
1 LED green for SL
1 LED per channel green for I/O state
1 LED red for BAT
1 LED green for SD card access (SD)
1 LED red for module error (ERR)
1 LED green for RUN
1 LED green for PWR
Electrical connection Mini B USB 2.0 connector for a programming terminal
Connector, 4 terminal(s) for analogue inputs
Terminal block, 3 terminal(s) for connecting the 24 V DC power supply
Removable screw terminal block for outputs
Removable screw terminal block for inputs
Cable length $\leq$ 3 m shielded cable for fast output
 $\leq$ 30 m unshielded cable for output
 $\leq$ 10 m shielded cable for fast input
 $\leq$ 30 m unshielded cable for input
Insulation Non-insulated between analogue inputs
Non-insulated between analogue input and internal logic
500 V AC between output and internal logic
Non-insulated between inputs
500 V AC between fast input and internal logic
500 V AC between input and internal logic
Marking CE
Mounting support Plate or panel with fixing kit

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Top hat type TH35-7.5 rail conforming to IEC 60715

Top hat type TH35-15 rail conforming to IEC 60715

Height 70 mm

Depth 70 mm

Width 160 mm

Product weight 0.456 kg

Environment

Standards EN/IEC 61131-2

EN/IEC 61010-2-201

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 GHz...3 GHz) conforming to EN/IEC 61000-4-3

3 V/m (1.4 GHz...2 GHz) conforming to EN/IEC 61000-4-3

10 V/m (80 MHz...1 GHz) conforming to EN/IEC 61000-4-3

Resistance to magnetic fields 30 A/m at 50...60 Hz conforming to EN/IEC 61000-4-8

Resistance to fast transients 1 kV for serial link conforming to EN/IEC 61000-4-4

1 kV for Ethernet line conforming to EN/IEC 61000-4-4

1 kV for I/O 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

Surge withstand 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

0.5 kV for power lines (DC) 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

1 kV for I/O 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

1 kV for power lines (DC) in common mode conforming to EN/IEC 61000-4-5

Resistance to conducted disturbances, induced by

radio frequency fields

10 Vrms (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 Vrms (0.1...80 MHz) conforming to Marine specification (LR, ABS, DNV, GL)

10 Vrms (0.15...80 MHz) conforming to EN/IEC 61000-4-6

Electromagnetic emission Radiated emissions conforming to EN/IEC 55011 class A 10 m, 230 MHz...1

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GHz : 47 dB μ V/m QP

Radiated emissions conforming to EN/IEC 55011 class A 10 m, 30...230 MHz :

40 dB μ V/m QP

Conducted emissions conforming to EN/IEC 55011 power lines, 1.5...30 MHz : 63

dB μ V/m QP

Conducted emissions conforming to EN/IEC 55011 power lines, 150 kHz...1.5

MHz : 79...63 dB μ V/m QP

Conducted emissions conforming to EN/IEC 55011 power lines, 10...150 kHz :

120...69 dB μ V/m QP

Conducted emissions conforming to EN/IEC 55011 power lines (AC), 0.5...300

MHz : 73 dB μ V/m QP/60 dB μ V/m AV

Conducted emissions conforming to EN/IEC 55011 power lines (AC), 0.15...0.5

MHz : 79 dB μ V/m QP/66 dB μ V/m AV

Immunity to microbreaks 10 ms

Ambient air temperature for operation -10...35 ° C for vertical installation

-10...55 ° C for horizontal installation

Ambient air temperature for storage -25...70 ° C

Relative humidity 10...95 % without condensation in storage

10...95 % without condensation in operation

IP degree of protection IP20 with protective cover in place

Pollution degree $\leq$ 2

Operating altitude 0...2000 m

Storage altitude 0...3000 m

Vibration resistance 3 gn (vibration frequency: 8.4...150 Hz) on panel mounting

3.5 mm (vibration frequency: 5...8.4 Hz) on panel mounting

3 gn (vibration frequency: 8.4...150 Hz) on symmetrical rail

3.5 mm (vibration frequency: 5...8.4 Hz) on symmetrical rail

Shock resistance 15 gn (test wave duration:11 ms)

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