Scheinder Electric TM221CE40R

TM221CE40R
controller M221 40 IO relay Ethernet
Main
Range of product Modicon M221
Product or component
type
Logic controller
[Us] rated supply voltage
100...240 V AC
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 Relay normally open
Discrete output number 16 relay
Discrete output voltage 5...250 V AC
5...125 V DC
Discrete output current 2 A
Complementary
Discrete I/O number 40
Number of I/O expansion module <= 7 with <= 48 discrete output(s) for relay output
Supply voltage limits 85...264 V
Network frequency 50/60 Hz
Inrush current <= 40 A
Power consumption in VA <= 70 VA at 100...240 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 state1 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
10 ms turn-on operation for output
5 µs turn-off operation for fast input
5 µs turn-on operation for fast input
100 µs turn-off operation for input; I8...I15 terminal
100 µs turn-on operation for input; I8...I15 terminal
35 µs turn-off operation for input; I2...I5 terminal
35 µs turn-on operation for input; I2...I5 terminal
Configurable filtering time 12 ms for input
3 ms for input
0 ms for input
Output voltage limits 277 V AC
125 V DC
Current per output common 8 A
Absolute accuracy error +/- 1 % of full scale for analog input

Electrical durability Inductive (L/R = 7 ms) DC-13, 24 V/ 7.2 W : 300000 cycles
Inductive (L/R = 7 ms) DC-13, 24 V/ 24 W : 100000 cycles
Resistive DC-12, 24 V/ 16 W : 300000 cycles
Resistive DC-12, 24 V / 48 W : 100000 cycles
Inductive AC-14, (cos phi = 0.7) 240 V/ 72 VA : 300000 cycles
Inductive AC-14, (cos phi = 0.7) 120 V/ 36 VA : 300000 cycles
Inductive AC-14, (cos phi = 0.7) 240 V/ 240 VA : 100000 cycles
Inductive AC-14, (cos phi = 0.7) 120 V/ 120 VA : 100000 cycles
Inductive AC-15, (cos phi = 0.35) 240 V / 36 VA : 300000 cycles
Inductive AC-15, (cos phi = 0.35) 120 V/ 18 VA : 300000 cycles
Inductive AC-15, (cos phi = 0.35) 240 V / 120 VA : 100000 cycles
Inductive AC-15, (cos phi = 0.35) 120 V/ 60 VA : 100000 cycles
Resistive AC-12, 240 V/ 160 VA : 300000 cycles
Resistive AC-12, 120 V / 80 VA : 300000 cycles
Resistive AC-12, 240 V/ 480 VA : 100000 cycles
Resistive AC-12, 120 V / 240 VA : 100000 cycles
Switching frequency 20 switching operations/minute with maximum load
Mechanical durability >= 20000000 cycles for relay output
Minimum load 10 mA at 5 V DC for relay output
Reset time 1 s
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 µs Boolean
Exct time for event task 60 µs response time
Clock drift <= 30 s/month at 25 ° C
Regulation loop Adjustable PID regulator up to 14 simultaneous loops
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
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 <= 30 m unshielded cable for output
<= 10 m shielded cable for fast input
<= 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 groups
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
Sensor power supply 24 V DC at 250 mA supplied by the controller
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 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
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 dBµV/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 <= 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 10 gn (test wave duration:11 ms)