

Scheinder Electric TM221ME16R

TM221ME16R

controller M221 16 IO relay Ethernet

Main

Range of product Modicon M221

Product or component type Logic controller

[Us] rated supply voltage 24 V DC

Discrete input number 8 discrete input conforming to IEC 61131-2 Type 1

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

Discrete output type Relay normally open

Discrete output number 8 relay

Discrete output voltage 5...125 V DC

5...250 V AC

Discrete output current 2 A

Complementary

Discrete I/O number 16

Number of I/O expansion module ≤ 7 for relay output

Supply voltage limits 20.4...28.8 V

Inrush current ≤ 35 A

Power consumption in W ≤ 23.3 W at 24 V with max number of I/O expansion module

≤ 4.3 W at 24 V without I/O expansion module

Power supply output current 0.52 A at 5 V for expansion bus

0.46 A at 24 V for expansion bus

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 ± 30 V DC for analog input with 5 min maximum

± 13 V DC for analog input permanent

Voltage state 1 guaranteed ≥ 15 V for input

Voltage state 0 guaranteed ≤ 5 V for input

Discrete input current 7 mA for discrete input

5 mA for fast input

Input impedance 3.4 kOhm for input

4.9 kOhm for fast input

100 kOhm for analog input

Response time 35 μ s turn-off operation for input; I2...I5 terminal

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5 μ s turn-on operation for fast input; I0, I1, I6, I7 terminal
35 μ s turn-on operation for input; other terminals terminal
5 μ s turn-off operation for fast input; I0, I1, I6, I7 terminal
100 μ s turn-off operation for input; other terminals terminal
5 μ s turn-on, turn-off operation for output; Q0...Q1 terminal
50 μ s turn-on, turn-off operation for output; Q2...Q3 terminal
300 μ s turn-on, turn-off operation for output; other terminals terminal
Configurable filtering time 0 ms for input
12 ms for input
3 ms for input
Output voltage limits 125 V DC
277 V AC
Current per output common 7 A
Absolute accuracy error +/- 1 % of full scale for analog input
Electrical durability Inductive AC-15, (cos phi = 0.35) 240 V / 120 VA : 100000 cycles
Resistive DC-12, 24 V / 48 W : 100000 cycles

Resistive AC-12, 120 V / 240 VA : 100000 cycles
Inductive AC-15, (cos phi = 0.35) 240 V / 36 VA : 300000 cycles
Resistive AC-12, 120 V / 80 VA : 300000 cycles
Inductive (L/R = 7 ms) DC-13, 24 V / 24 W : 100000 cycles
Resistive DC-12, 24 V / 16 W : 300000 cycles
Inductive (L/R = 7 ms) DC-13, 24 V / 7.2 W : 300000 cycles
Inductive AC-14, (cos phi = 0.7) 240 V / 240 VA : 100000 cycles
Inductive AC-15, (cos phi = 0.35) 120 V / 60 VA : 100000 cycles
Inductive AC-14, (cos phi = 0.7) 240 V / 72 VA : 300000 cycles
Inductive AC-15, (cos phi = 0.35) 120 V / 18 VA : 300000 cycles
Resistive AC-12, 240 V / 480 VA : 100000 cycles
Inductive AC-14, (cos phi = 0.7) 120 V / 120 VA : 100000 cycles
Resistive AC-12, 240 V / 160 VA : 300000 cycles
Inductive AC-14, (cos phi = 0.7) 120 V / 36 VA : 300000 cycles
Switching frequency 20 switching operations/minute with maximum load
Mechanical durability $\geq$ 20000000 cycles for relay output
Minimum load 1 mA at 5 V DC for relay output
Protection type Without protection at 5 A
Reset time 1 s
Memory capacity 256 kB for user application and data RAM with 10000 instructions
256 kB for internal variables RAM
Data backed up 256 kB built-in flash memory for backup of application and data
Data storage equipment 2 GB SD card optional
Battery type BR2032 lithium non-rechargeable, battery life: 4 yr

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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
0.7 ms for other instruction
Execution time per instruction 0.2 µs Boolean
Exct time for event task 60 µs response time
Application structure 1 configurable freewheeling/cyclic master task
1 cyclic auxiliary task
8 interrupt tasks
Maximum size of object areas 512 %M memory bits
8000 %MW memory words
512 %KW constant words
255 %TM timers
255 %C counters
Realtime clock With
Clock drift <= 30 s/month at 25 ° C
Regulation loop Adjustable PID regulator up to 14 simultaneous loops
Function available PWM
PLS
Frequency generator
Counting input number 4 fast input (HSC mode) (counting frequency: 100 kHz), counting capacity:
32 bits
Control signal type A/B
Pulse/direction
Single phase
Integrated connection type USB port with connector mini B USB 2.0
Ethernet with connector RJ45
Non isolated serial link "serial 1" with connector RJ45 and interface RS232/RS485
Supply Serial 1 serial link supply at 5 V 200 mA
Transmission rate 1.2...115.2 kbit/s (115.2 kbit/s by default) for bus length of 15 m -
communication
protocol: RS485
1.2...115.2 kbit/s (115.2 kbit/s by default) for bus length of 3 m - communication
protocol: RS232
480 Mbit/s - communication protocol: USB
Communication port protocol USB port : USB protocol - SoMachine-Network
Non isolated serial link : Modbus protocol master/slave - RTU/ASCII or SoMachineNetwork
: Ethernet protocol
Port Ethernet 10BASE-T/100BASE-TX 1 port with 100 m copper cable
Communication service DHCP client
Ethernet/IP adapter
Modbus TCP server

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Modbus TCP client
Modbus TCP slave device
Local signalling 1 LED red for module error (ERR)

1 LED green for PWR
1 LED green for RUN
1 LED green for SD card access (SD)
1 LED red for BAT
1 LED per channel green for I/O state
1 LED green for SL
Ethernet network activity green for ACT
Ethernet network link yellow for Link (Link Status)
Electrical connection Mini B USB 2.0 connector for a programming terminal
Removable screw terminal block, 10 terminal(s) for inputs
Removable screw terminal block, 11 terminal(s) for outputs
Terminal block, 3 terminal(s) for connecting the 24 V DC power supply
Connector, 4 terminal(s) for analogue inputs
Cable distance between devices Shielded cable: 10 m for fast input
Unshielded cable: 30 m for output
Unshielded cable: 30 m for digital input
Unshielded cable: 1 m for analog input
Shielded cable: 3 m for fast output
Insulation 500 V AC between fast input and internal logic
Non-insulated between inputs
Non-insulated between analogue inputs
500 V AC between output and internal logic
500 V AC between input and internal logic
Non-insulated between analogue input and internal logic
500 V AC between output groups
Marking CE
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 70 mm
Width 70 mm
Product weight 0.264 kg
Environment
standards EN/IEC 60664-1
EN/IEC 61131-2
EN/IEC 61010-2-201

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product certifications ABS

CSA

CULus

LR

IACS E10

RCM

EAC

DNV-GL

environmental characteristic Ordinary and hazardous location

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

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

resistance to fast transients 2 kV for power lines conforming to EN/IEC 61000-4-4

2 kV for relay output conforming to EN/IEC 61000-4-4

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

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

1 kV for I/O conforming to EN/IEC 61000-4-4

surge withstand 2 kV for power lines (AC) 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

1 kV for I/O in common mode conforming to EN/IEC 61000-4-5

1 kV for shielded cable in common 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 power lines (AC) in differential mode conforming to EN/IEC 61000-4-5

1 kV for relay output in differential mode conforming to EN/IEC 61000-4-5

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

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

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

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)

electromagnetic emission 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

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, 10...150 kHz :

120...69 dB μ V/m QP

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

dB μ V/m QP

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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, 150...1500 kHz : 79...63 dB μ V/m QP
Radiated emissions conforming to EN/IEC 55011 class A 10 m, 200...1000 MHz : 47 dB μ V/m QP
immunity to microbreaks 10 ms
ambient air temperature for operation -10...55 ° C for horizontal installation
-10...35 ° C for vertical 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 $\leq$ 2
operating altitude 0...2000 m
storage altitude 0...3000 m
vibration resistance 3.5 mm (vibration frequency: 5...8.4 Hz) on symmetrical rail
1 gn (vibration frequency: 8.4...150 Hz) on symmetrical rail
3.5 mm (vibration frequency: 5...8.4 Hz) on panel mounting
1 gn (vibration frequency: 8.4...150 Hz) on panel mounting
shock resistance 98 m/s² (test wave duration:11 ms)

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