

Scheinder Electric TM221CE16T

TM221CE16T - controller M221 16 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 9 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 7 transistor including 2 fast output

Discrete output voltage 24 V DC

Discrete output current 0.5 A

Complementary

Discrete I/O number 16

Number of I/O expansion module ≤ 4 for transistor output
 ≤ 4 for relay output

Supply voltage limits 20.4...28.8 V

Inrush current ≤ 35 A

Power consumption in W ≤ 11 W at 24 V with max number of I/O expansion module
 ≤ 4.6 W at 24 V without I/O expansion module

Power supply output current 0.325 A at 5 V for expansion bus

0.15 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 4.9 kOhm for fast input

3.4 kOhm for discrete input

100 kOhm for analog input

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Response time 35 μ s turn-off operation for input; I2...I5 terminal
 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
 Discrete output logic Positive logic (source)
 Current per output common 3.5 A
 Output frequency 100 kHz for fast output (PWM/PLS mode) at Q0...Q1 terminal
 5 kHz for output at Q2...Q3 terminal
 0.1 kHz for output at Q4...Q6 terminal
 Absolute accuracy error +/- 1 % of full scale for analog input
 Leakage current 0.1 mA for transistor output
 Voltage drop ≤ 1 V
 Mechanical durability ≥ 20000000 cycles for transistor output
 Tungsten load ≤ 12 W for output and fast output
 Protection type Overload and short-circuit protection at 1 A
 Reset time 1 s automatic reset
 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
 Backup time 1 year at 25 $^{\circ}$ 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
 Maximum size of object areas 512 %M memory bits
 512 %KW constant words
 255 %TM timers
 8000 %MW memory words
 255 %C counters
 Realtime clock With
 Clock drift ≤ 30 s/month at 25 $^{\circ}$ C
 Regulation loop Adjustable PID regulator up to 14 simultaneous loops
 Positioning functions Position PTO 2 axe(s) pulse/direction mode (100 kHz)

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Position PTO 1 axe(s) CW/CCW mode (100 kHz)
Function available PLS
Frequency generator
PWM
Counting input number 4 fast input (HSC mode) (counting frequency: 100 kHz), counting capacity: 32 bits
Control signal type Pulse/Direction
Single phase
A/B
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 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 SoMachine-Network
: Ethernet protocol
Port Ethernet 10BASE-T/100BASE-TX 1 port with 100 m copper cable
Communication service DHCP client
Modbus TCP slave device
Modbus TCP client
Modbus TCP server
Ethernet/IP adapter
Local signalling 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)
1 LED red for module error (ERR)
1 LED green for PWR
1 LED green for RUN
Electrical connection Mini B USB 2.0 connector for a programming terminal
Terminal block, 3 terminal(s) for connecting the 24 V DC power supply
Connector, 4 terminal(s) for analogue inputs
Removable screw terminal block for inputs
Removable screw terminal block for outputs

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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
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 95 mm
Product weight 0.346 kg
Environment
Standards EN/IEC 61010-2-201
EN/IEC 60664-1
EN/IEC 61131-2
Product certifications DNV-GL
CSA
cULus
IACS E10
ABS
RCM
LR
EAC
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

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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

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

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Shock resistance 147 m/s² (test wave duration:11 ms)



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