# **Product data sheet**

Specification





# logic controller, Modicon M221, 16 IO, 8 DI, 8 DO, relay, Ethernet

TM221ME16R

Product availability: Stock - Normally stocked in distribution facility

Price\*: 309.00 USD

## 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 IEC 61131-2 Type 1	
Analogue Input Number	2 010 V	
Discrete Output Type	Relay normally open	
Discrete Output Number	8 relay	
Discrete Output Voltage	5125 V DC 5250 V AC	
Discrete Output Current	2 A	

## **Complementary**

Discrete I/O Number	16
Maximum Number Of I/O Expansion Module	7 (local I/O-Architecture) 14 (remote I/O-Architecture)
Supply Voltage Limits	20.428.8 V
Inrush Current	35 A
Maximum Power Consumption In W	23.3 W 24 V with max number of I/O expansion module) 4.3 W 24 V without I/O expansion module)
Power Supply Output Current	0.52 A 5 V expansion bus 0.46 A 24 V 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 analog input
Permitted Overload On Inputs	+/- 30 V DC 5 min maximum)analog input +/- 13 V DC permanent)analog input
Voltage State 1 Guaranteed	>= 15 V input
Voltage State 0 Guaranteed	<= 5 V input
Discrete Input Current	7 mA discrete input 5 mA fast input

Price is "List Price" and may be subject to a trade discount – check with your local distributor or retailer for actual price.

Input Impedance	100 kOhm analog input
	3.4 kOhm input 4.9 kOhm fast input
Response Time	35 μs turn-off, I2I5 input
Nespense Time	5 µs turn-on, 10, 11, 16, 17 fast input
	35 µs turn-on, other terminals input
	5 μs turn-off, 10, 11, 16, 17 fast input
	100 μs turn-off, other terminals input
	5 μs turn-on, turn-off, Q0Q1 output
	50 μs turn-on, turn-off, Q2Q3 output
	300 μs turn-on, turn-off, other terminals output
Configurable Filtering Time	0 ms input
	3 ms input
	12 ms input
Output Voltage Limits	125 V DC
	277 V AC
Maximum Current Per Output	7 A
Common  Absolute Acquirect Error	A 0/ of full code code size of
Absolute Accuracy Error	+/- 1 % of full scale analog input
Electrical Durability	100000 cycles AC-12, 120 V, 240 VA, resistive
	100000 cycles AC-12, 240 V, 480 VA, resistive
	300000 cycles AC-12, 120 V, 80 VA, resistive 300000 cycles AC-12, 240 V, 160 VA, resistive
	100000 cycles AC-12, 240 V, 160 VA, resistive 100000 cycles AC-15, cos phi = 0.35, 120 V, 60 VA, inductive
	100000 cycles AC-15, cos phi = 0.35, 120 V, 60 VA, inductive
	300000 cycles AC-15, cos phi = 0.35, 120 V, 18 VA, inductive
	300000 cycles AC-15, cos phi = 0.35, 240 V, 36 VA, inductive
	100000 cycles AC-14, cos phi = 0.7, 120 V, 120 VA, inductive
	100000 cycles AC-14, cos phi = 0.7, 240 V, 240 VA, inductive
	300000 cycles AC-14, cos phi = 0.7, 120 V, 36 VA, inductive
	300000 cycles AC-14, cos phi = 0.7, 240 V, 72 VA, inductive
	100000 cycles DC-12, 24 V, 48 W, resistive
	300000 cycles DC-12, 24 V, 16 W, resistive
	100000 cycles DC-13, 24 V, 24 W, inductive (L/R = 7 ms)
	300000 cycles DC-13, 24 V, 7.2 W, inductive (L/R = 7 ms)
Switching Frequency	20 switching operations/minute with maximum load
Mechanical Durability	20000000 cycles relay output
Minimum Load	1 mA 5 V DC relay output
Protection Type	Without protection 5 A
Reset Time	1 s
Memory Capacity	256 kB user application and data DAM 10000 instructions
memory capacity	256 kB user application and data RAM 10000 instructions 256 kB internal variables RAM
Data Backed Up	256 kB built-in flash memory backup of application and data
Data Storage Equipment	2 GB SD card optional)
Battery Type	BR2032 or CR2032X lithium non-rechargeable
Backup Time	1 year 77 °F (25 °C) by interruption of power supply)
Execution Time For 1 Kinstruction	
Execution Time For T Kinstruction	0.3 ms event and periodic task     0.7 ms 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 %KW constant words
	255 %C counters
	8000 %MW memory words
	255 %TM timers
	512 %M memory bits
Realtime Clock	With

-		
Clock Drift	<= 30 s/month 77 °F (25 °C)	
Regulation Loop	Adjustable PID regulator up to 14 simultaneous loops	
Function Available	Frequency generator PWM PLS	
Counting Input Number	4 fast input (HSC mode) 100 kHz 32 bits	
Counter Function	Single phase A/B Pulse/direction	
Integrated Connection Type	USB port mini B USB 2.0 Non isolated serial link serial 1 RJ45 RS232/RS485 Ethernet RJ45	
Supply	Serial 1)serial link supply 5 V, <200 mA	
Transmission Rate	1.2115.2 kbit/s (115.2 kbit/s by default) 49.21 ft (15 m) RS485 1.2115.2 kbit/s (115.2 kbit/s by default) 9.84 ft (3 m) RS232 480 Mbit/s USB	
Communication Port Protocol	USB port USB - SoMachine-Network Non isolated serial link Modbus master/slave - RTU/ASCII or SoMachine-Network Ethernet	
Port Ethernet	10BASE-T/100BASE-TX 1 328.08 ft (100 m) copper cable	
Communication Service	DHCP client Modbus TCP slave device Ethernet/IP adapter Modbus TCP client Modbus TCP server	
Local Signalling	for PWR 1 LED (green) for RUN 1 LED (green) for module error (ERR) 1 LED (red) for SD card access (SD) 1 LED (green) for BAT 1 LED (red) for I/O state 1 LED per channel (green) for SL 1 LED (green) for ACT Ethernet network activity (green) for Link (Link Status) Ethernet network link (yellow)	
Electrical Connection	terminal block, 3 for connecting the 24 V DC power supply connector, 4 for analogue inputs Mini B USB 2.0 connector for a programming terminal removable screw terminal block, 10 for inputs removable screw terminal block, 11 for outputs	
Maximum Cable Distance Between Devices	Shielded cable <32.81 ft (10 m) fast input Unshielded cable <98.43 ft (30 m) output Unshielded cable <98.43 ft (30 m) digital input Unshielded cable <3.28 ft (1 m) analog input Shielded cable <9.84 ft (3 m) fast output	
Insulation	Between input and internal logic 500 V AC Between fast input and internal logic 500 V AC Non-insulated between inputs Between output and internal logic 500 V AC Between output groups 500 V AC Non-insulated between analogue input and internal logic Non-insulated between analogue inputs	
Marking	CE	
Mounting Support	Top hat type TH35-15 rail IEC 60715 Top hat type TH35-7.5 rail IEC 60715 plate or panel with fixing kit	
Height	3.54 in (90 mm)	
Depth	2.76 in (70 mm)	
Width	2.76 in (70 mm)	
Net Weight	0.58 lb(US) (0.264 kg)	

## **Environment**

Standards	IEC 61131-2
	UL 508
	CAN/CSA C22.2 No. 213
	IACS E10 ANSI/ISA 12-12-01
	AUGINGA IZ IZ OT
Product Certifications	LR 
	cULus DNV-GL
	RCM
	EAC
	ABS
	CE
	UKCA cULus HazLoc
Environmental Characteristic	Ordinary and hazardous location
Resistance To Electrostatic	9 kV/ in air IEC 64000 4 2
Discharge	8 kV in air IEC 61000-4-2 4 kV on contact IEC 61000-4-2
Daniahawaa Ta Flankuumamakia	0.441// (/0.1// ).00.1// 4.0// 150.04000.4.0
Resistance To Electromagnetic Fields	9.14 V/m (10 V/m) 80 MHz1 GHz IEC 61000-4-3
·-	2.74 V/m (3 V/m) 1.4 GHz2 GHz IEC 61000-4-3 0.91 V/m (1 V/m) 22.7 GHz IEC 61000-4-3
Resistance To Magnetic Fields	98.43 A/m (30 A/m) 50/60 Hz IEC 61000-4-8
Resistance To Fast Transients	2 kV IEC 61000-4-4 power lines)
	2 kV IEC 61000-4-4 relay output) 1 kV IEC 61000-4-4 I/O)
	1 kV IEC 61000-4-4 line)
	1 kV IEC 61000-4-4 serial link)
Surge Withstand	2 kV power lines (AC) common mode IEC 61000-4-5
	2 kV relay output common mode IEC 61000-4-5
	1 kV I/O common mode IEC 61000-4-5
	1 kV shielded cable common mode IEC 61000-4-5
	0.5 kV power lines (DC) differential mode IEC 61000-4-5
	1 kV power lines (AC) differential mode IEC 61000-4-5
	1 kV relay output differential mode IEC 61000-4-5 0.5 kV power lines (DC) common mode IEC 61000-4-5
Resistance To Conducted	10 V 0.1580 MHz IEC 61000-4-6
Disturbances	3 V 0.180 MHz 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) Marine
	specification (LR, ABS, DNV, GL)
Electromagnetic Emission	Conducted emissions 79 dBµV/m QP/66 dBµV/m AV power lines (AC))0.150.5
	MHz IEC 55011
	Conducted emissions 73 dBμV/m QP/60 dBμV/m AV power lines (AC))0.5300 MHz IEC 55011
	Conducted emissions 12069 dBµV/m QP power lines)10150 kHz IEC 55011
	Conducted emissions 63 dBµV/m QP power lines)1.530 MHz IEC 55011
	Radiated emissions 40 dBµV/m QP class A 10 m)30230 MHz IEC 55011
	Conducted emissions 7963 dBµV/m QP power lines)1501500 kHz IEC 55011 Radiated emissions 47 dBµV/m QP class A 10 m)2001000 MHz IEC 55011
mmunity To Microbreaks	10 ms
Ambient Air Temperature For	14131 °F (-1055 °C) horizontal installation)
Operation	14131 F (-1035 °C) nonzontal installation)
Ambient Air Temperature For Storage	-13158 °F (-2570 °C)
Relative Humidity	10 95 % without condensation in operation)
Total vo Figurity	1095 %, without condensation in operation) 1095 %, without condensation in storage)
p Degree Of Protection	IP20 with protective cover in place
Pollution Degree	<= 2
i oliulion Degree	
Operating Altitude	06561.68 ft (02000 m)

Vibration Resistance	3.5 mm 58.4 Hz symmetrical rail 3.5 mm 58.4 Hz panel mounting 1 gn 8.4150 Hz symmetrical rail 1 gn 8.4150 Hz panel mounting
Shock Resistance	98 m/s² 11 ms

# Ordering and shipping details

	<u> </u>
Category	US10MSX22533
Discount Schedule	0MSX
Gtin	3606480611278
Returnability	Yes
Country Of Origin	MX

# **Packing Units**

Unit Type Of Package 1	PCE
Number Of Units In Package 1	1
Package 1 Height	4.21 in (10.7 cm)
Package 1 Width	5.04 in (12.8 cm)
Package 1 Length	3.82 in (9.7 cm)
Package 1 Weight	15.59 oz (442.0 g)
Unit Type Of Package 2	S04
Number Of Units In Package 2	24
Package 2 Height	11.81 in (30 cm)
Package 2 Width	15.75 in (40 cm)
Package 2 Length	23.62 in (60 cm)
Package 2 Weight	25.13 lb(US) (11.398 kg)
Unit Type Of Package 3	P12
Number Of Units In Package 3	288
Package 3 Height	41.34 in (105.0 cm)
Package 3 Width	47.24 in (120.0 cm)
Package 3 Length	31.50 in (80.0 cm)
Package 3 Weight	313.06 lb(US) (142 kg)

# Sustainability Screen Premium\*

**Green Premium<sup>TM</sup> label** is Schneider Electric's commitment to delivering products with best-inclass environmental performance. Green Premium promises compliance with the latest regulations, transparency on environmental impacts, as well as circular and low-CO<sub>2</sub> products.

**Guide to assessing product sustainability** is a white paper that clarifies global eco-label standards and how to interpret environmental declarations.

Learn more about Green Premium >

Guide to assess a product's sustainability >





Transparency RoHS/REACh

## Well-being performance

<b>Ø</b>	Mercury Free	
	Rohs Exemption Information	Yes
	Pvc Free	

## **Certifications & Standards**

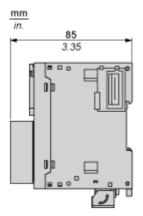
Reach Regulation	REACh Declaration	
Eu Rohs Directive	Pro-active compliance (Product out of EU RoHS legal scope)	
China Rohs Regulation	China RoHS declaration	
Environmental Disclosure	Product Environmental Profile	
Weee	The product must be disposed on European Union markets following specific waste collection and never end up in rubbish bins.	
Circularity Profile	End of Life Information	
California Proposition 65	WARNING: This product can expose you to chemicals including: Lead and lead compounds, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov	

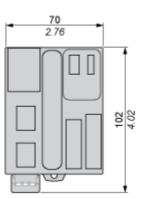
# **Product data sheet**

## **TM221ME16R**

## **Dimensions Drawings**

## **Dimensions**



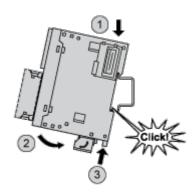


## **Product data sheet**

## **TM221ME16R**

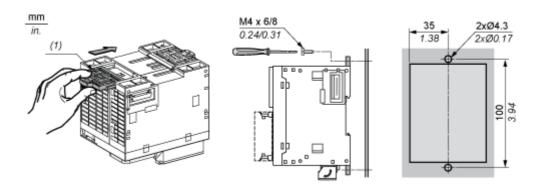
Mounting and Clearance

Mounting on a Rail



## **TM221ME16R**

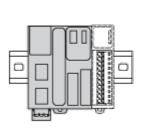
## **Direct Mounting on a Panel Surface**

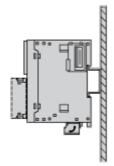


(1) Install a mounting strip

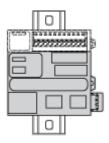
## Mounting

#### **Correct Mounting Position**

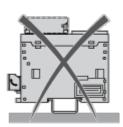


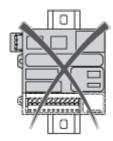


## **Acceptable Mounting Position**



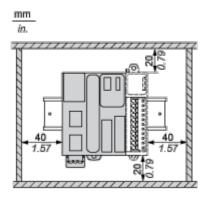
## **Incorrect Mounting Position**

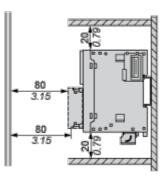






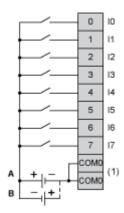
## Clearance





#### Connections and Schema

## **Digital Inputs**



(1) The COM0 terminals are connected internally.

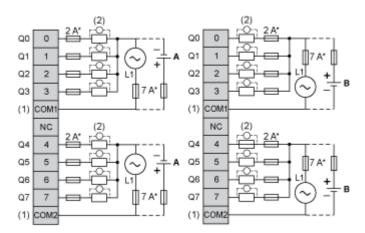
A: Sink wiring (positive logic).

B: Source wiring (negative logic).



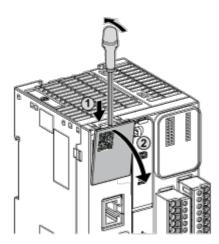
lx 10, 11, 16, 17

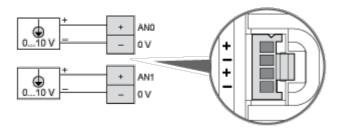
## **Digital Outputs**



- (\*) Type T fuse
- (1) The COM1 and COM2 terminals are not connected internally.
- (2) To improve the life time of the contacts, and to protect from potential inductive load damage, you must connect a free wheeling diode in parallel to each inductive DC load or an RC snubber in parallel of each inductive AC load
- A: Source wiring (negative logic).
- B: Sink wiring (positive logic).

## **Analog Inputs**

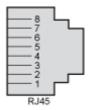




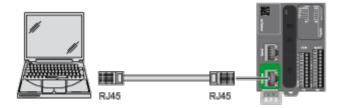
The (-) poles are connected internally.

Pin	Wire Color
AN0 / AN1	Red
0 V	Black

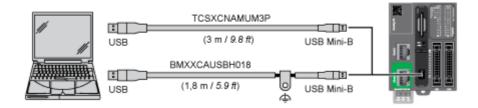
## **Ethernet Connection**



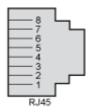
Pin N °	Signal
1	TD+
2	TD-
3	RD+
4	-
5	-
6	RD-
7	_
8	_



## **USB Mini-B Connection**



## **SL1 Connection**



SL1

Ν°	RS 232	RS 485
1	RxD	N.C.
2	TxD	N.C.
3	RTS	N.C.
4	N.C.	D1
5	N.C.	D0
6	стѕ	N.C.
7	N.C.*	5 Vdc
8	Common	Common

N.C.: not connected

 $<sup>\</sup>ensuremath{^*}$  : 5 Vdc delivered by the controller. Do not connect.

