

TM238LDA24DR

Compact base, Modicon M238 logic controller,
24 I/O, 100...240 V AC supply, internal RAM
500 kB



Main

Range of Product	Modicon M238 logic controller
Product or Component Type	Compact base
Product specific application	-
Discrete I/O number	24
Discrete input number	6 input EN/IEC 61131-2 type 1 8 fast input EN/IEC 61131-2 type 1
Discrete input voltage	24 V
Discrete input voltage type	DC
Discrete output number	4 solid state output 6 relay output
Discrete output voltage	24 V DC relay output 24 V DC solid state output 240 V AC relay output
Maximum number of I/O expansion module	7
[Us] rated supply voltage	100...240 V AC
Memory description	Internal RAM 500 kB
Data backed up	Variables of type retain and retain persistent internal battery, 3 days 22 h 10 year(s) Variables of type retain and retain persistent optional battery lithium thionyl chloride (TSXPLP01), 1 year
Mounting Support	Panel 35 mm symmetrical DIN rail

Complementary

Discrete input logic	Positive logic (sink) fast input Sink or source (positive/negative) input
Number of common point	1 input 1 solid state output 4 fast input 4 relay output
Sensor power supply	19.2...30 V DC
Voltage state 1 guaranteed	>= 15 V input/fast input
Voltage state 0 guaranteed	<= 5 V input/fast input
Discrete input current	10.4 mA input 8 mA fast input
Input impedance	2.3 kOhm input 3 kOhm fast input
Response time	0.25 ms solid state output 3 ms input 300 ns fast input
Configurable filtering time	0.004 ms fast input 0.4 ms fast input 1 ms fast input 2 ms fast input 4 ms fast input

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Anti bounce filtering	0 ms configurable input/fast input 1.5 ms configurable input/fast input 12 ms configurable input/fast input 4 ms configurable input/fast input
Network frequency	<= 100 kHz fast input (counter mode) <= 100 kHz fast input (normal mode) <= 100 kHz input
Maximum cable distance between devices	Shielded cable <32.81 ft (10 m) fast input (counter mode) <98.43 Ft (30 m) fast input (normal mode) <98.43 Ft (30 m) input <98.43 Ft (30 m) relay output <98.43 ft (30 m) solid state output
Isolation between channels and internal logic	500 V AC relay output 500 V DC solid state output
Isolation between channels	500 V for group of 2 fast inputs 500 V solid state output None input
Discrete output logic	Positive logic (source)
Output voltage limits	Solid state output 19.2...30 V Relay output 250 V Relay output 30 V
Discrete output current	2 A relay output Q4...Q8) 5 A relay output Q9) 20...500 mA solid state output
Maximum output frequency	100 kHz solid state output
Maximum leakage current	2 mA solid state output
[Ures] residual voltage	2 V solid state output
Maximum tungsten load	<3 W solid state output
Short-circuit protection	With solid state output
Overvoltage protection	With solid state output
Overload protection	With solid state output
Minimum load	10 mA 5 V DC relay output
Contact resistance	50 µOhm
Load current	2 A 240 V AC, resistive 600 cyc/mn, Q4...Q8 relay output 2 A 30 V DC, resistive 600 cyc/mn, Q4...Q8 relay output 5 A 240 V AC, inductive 1800 cyc/mn, Q9 relay output 5 A 30 V DC, inductive 1800 cyc/mn, Q9 relay output
Mechanical durability	20000000 cycles relay output
Electrical durability	100000 Cycles relay output Q4...Q8 500000 cycles relay output Q9
Maximum input/output number	136 removable screw terminal block with I/O expansion module 192 spring terminal block with I/O expansion module 248 HE-10 connector with I/O expansion module
Supply voltage limits	85...264 V
Inrush current	35 A
Maximum power consumption in W	25 W 100 V 42 W 264 V
Insulation resistance	> 10 MOhm at 500 V, between I/O and earth terminals > 10 MOhm at 500 V, between supply and earth terminals
Exact time for 1 Kinstruction	0.3 ms 70 % Boolean + 30 % fixed arithmetic)
Execution time per instruction	0.42 µs arithmetic INT word LD and ST 0.439 µs arithmetic INT word +, -, x operations 0.459 µs arithmetic DINT double-word LD and ST 0.506 µs arithmetic DINT double-word +, -, x operations 0.648 µs arithmetic REAL floating LD and ST 5111 µs arithmetic REAL floating +, -, x operations 7.25 µs arithmetic REAL floating by operation 0.971 µs Boolean
Exct time for event task	<= 1.75 ms arithmetic REAL floating >= 0.75 ms arithmetic INT word 0.95 ms arithmetic DINT double-word
System overhead	0.15 Ms master task (PWM, frequency meter) 0.15 Ms master task (simple counting) 0.2 Ms master task (PTO) 0.35 Ms master task (advanced counting) 0.9 ms master task (I/O)
Input output assignment	Reading/Writing I/O on base Reading/writing I/O on extension modules

Application structure	1 configurable freewheeling/cyclic master task 4 interrupt tasks 2 configurable freewheeling/cyclic/event auxiliary tasks 32 levels of priority between tasks
Realtime clock	With 10 s/month 77 °F (25 °C)
Integrated connection type	1 isolated serial link female RJ45 Modbus master/slave RTU/ASCII, character mode or SoMachine-Network RS232/RS485 1.2...115.2 kbit/s (115.2 kbit/s by default)
Supply	Serial link supply 5 V, <200 mA
Positioning functions	HSC reflex 4 100 Hz
Counting input number	8 100 kHz 32 bits
Complementary function	Event processing PID
Marking	CE
Local signalling	For RUN 1 LED For Batt 1 LED For module error (ERR) 1 LED For I/O state 1 LED per channel For PWR 1 LED For SL1 1 LED
Electrical connection	1 connector mini B USB 2.0 for a programming terminal 1 removable screw terminal block (10 terminals) for connecting the 6 preactuators (output) 1 removable screw terminal block (12 terminals) for connecting the sensors (fast inputs) 1 removable screw terminal block (6 terminals) for connecting the 4 preactuators (output) 1 removable screw terminal block (7 terminals) for connecting the sensors (inputs) 1 removable screw terminal block for connecting the 100-240 V AC power supply
Net Weight	1.23 lb(US) (0.56 kg)

Environment

Immunity to microbreaks	10 ms
Dielectric strength	1500 V for 1 minute, between I/O and earth terminals 1500 V for 1 minute, between supply and earth terminals
Product certifications	UL CSA CTick GOST
Ambient Air Temperature for Operation	14...131 °F (-10...55 °C)
Ambient Air Temperature for Storage	-40...158 °F (-40...70 °C)
Relative humidity	95 % without condensation
IP Degree of Protection	IP20
Pollution degree	<= 2
Operating altitude	0...6561.68 ft (0...2000 m)
Storage altitude	0.00...9842.52 ft (0...3000 m)
Vibration resistance	1 gn 3.5 mm 5...150 Hz)
Shock resistance	15 gn 11 ms
Height	4.65 in (118 mm)
Depth	3.39 in (86 mm)
Width	6.18 in (157 mm)

Ordering and shipping details

Category	22530-M238 PLC & SOMACHINE SOFTWARE
Discount Schedule	PC12
GTIN	3606480060571
Nbr. of units in pkg.	1
Package weight(Lbs)	25.54 oz (724.0 g)
Returnability	No
Country of origin	ID

Packing Units

Unit Type of Package 1	PCE
Package 1 Height	4.02 in (10.2 cm)
Package 1 width	5.20 in (13.2 cm)
Package 1 Length	8.74 in (22.2 cm)
Unit Type of Package 2	S03
Number of Units in Package 2	14
Package 2 Weight	23.48 lb(US) (10.651 kg)
Package 2 Height	11.81 in (30 cm)
Package 2 width	11.81 in (30 cm)
Package 2 Length	15.75 in (40 cm)

Offer Sustainability

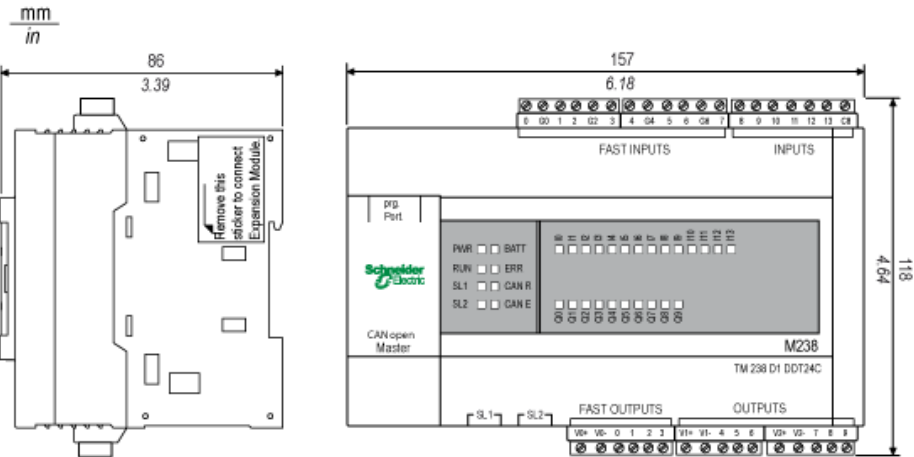
Sustainable offer status	Green Premium product
California proposition 65	WARNING: This product can expose you to chemicals including: Lead and lead compounds, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov
REACH Regulation	REACH Declaration
EU RoHS Directive	Pro-active compliance (Product out of EU RoHS legal scope) EU RoHS Declaration
Mercury free	Yes
RoHS exemption information	Yes
China RoHS Regulation	China RoHS Declaration
Environmental Disclosure	Product Environmental Profile
Circularity Profile	End Of Life Information
PVC free	Yes

Contractual warranty

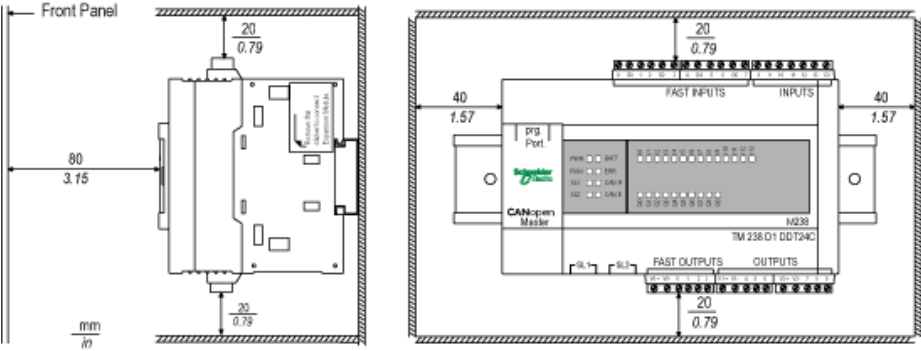
Warranty	18 months
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Modicon M238 Logic Controller

Dimensions

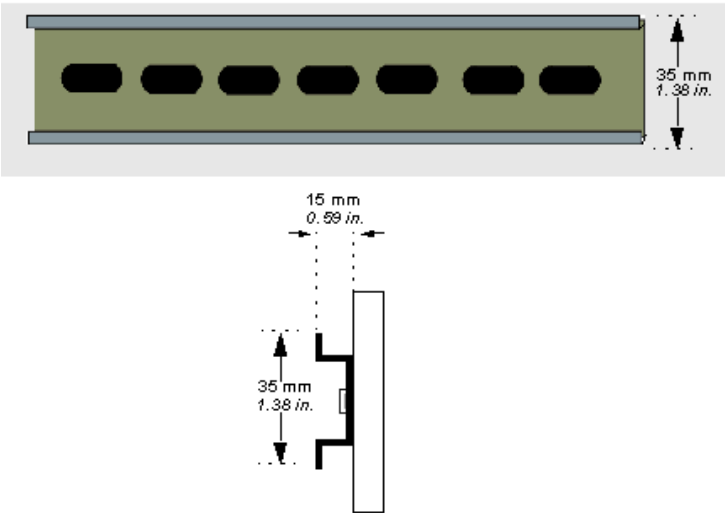


Clearance



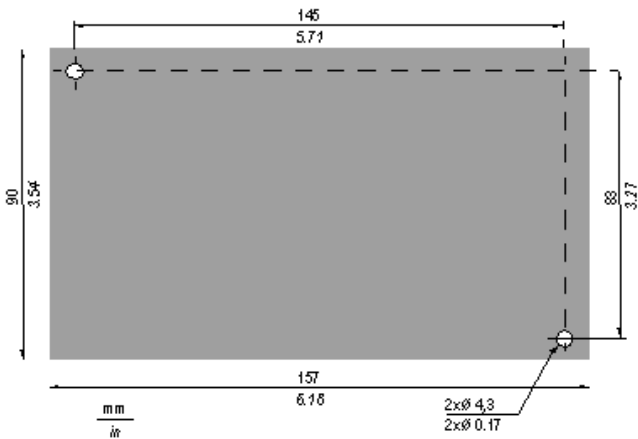
Mounting on a DIN Rail

Dimensions of the DIN Rail

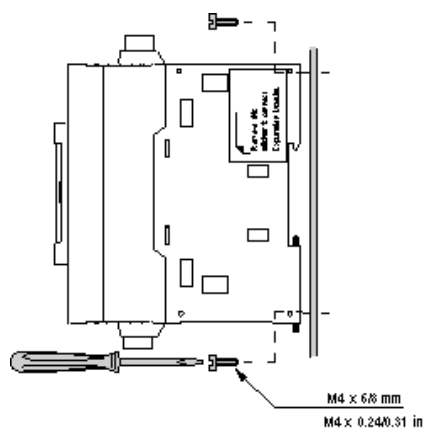


Mounting on a Metallic Panel

Mounting Holes

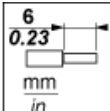
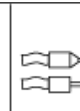
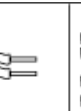
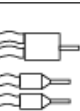


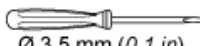
Mounting the Modicon M238 Logic Controller on a Metallic Panel



Wiring Requirements

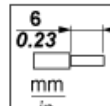
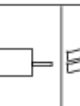
Rules for Removable Screw Terminal Block

						
mm ²	0,2... 1,5	0,25... 1,5	0,2... 1	0,2... 1,5	0,25... 1	0,5... 1,5
AWG	24... 14	24... 14	26... 16	24... 14	24... 16	20... 14

 Ø 3,5 mm (0.1 in)		N.m	0,6
		lb-in	5.3

Use copper conductors only.

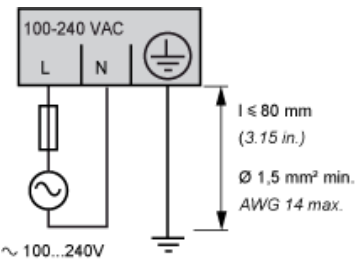
Rules for Removable Spring Terminal Block

				
mm ²	0,2... 1,5	0,25... 1,5	0,25... 1	0,5... 1,5
AWG	24... 14	24... 14	24... 16	20... 14

Use copper conductors only.

AC Power Supply

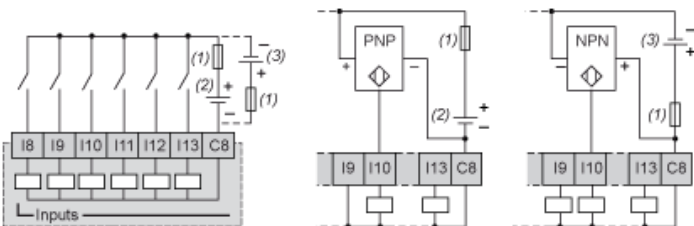
Wiring Diagram



Use an external fuse 2 A type T (UL recognized and CSA approved).

Regular Inputs

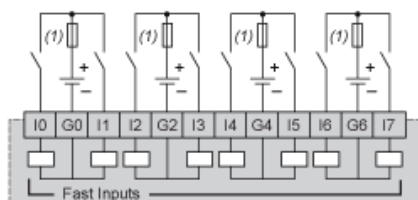
Wiring Diagram



- (1) Fast-blow fuse 0.5 A
- (2) Sink input (positive logic)
- (3) Source input (negative logic)

Fast Inputs

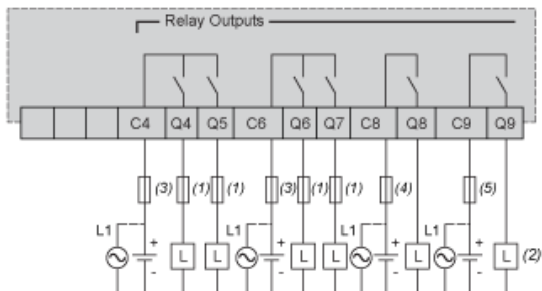
Wiring Diagram



- (1) Fast-blow fuse 0.5 A

Relay Outputs

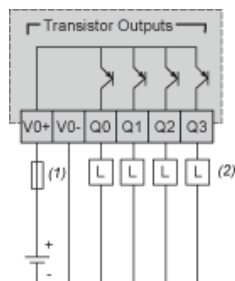
Wiring Diagram



- (1) 2 A fast-blow fuse
- (2) Load protected against inductive charge
- (3) 4 A slow-blow fuse
- (4) 2 A slow-blow fuse
- (5) 5 A slow-blow fuse
- L1 All relays use the same phase across relay groups for alternate current connections

Transistor Outputs

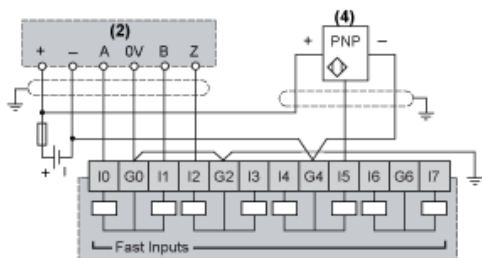
Wiring Diagram



- (1) 2 A fast-blow fuse
- (2) Protection for inductive load

Wiring Diagram Examples for 1 Encoder on Fast Inputs

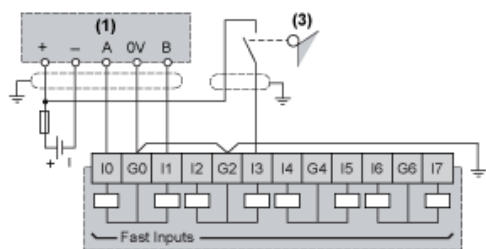
Incremental Encoder with Phase-Shifted Signals with TDC and 3-Wire PNP Detector



- (2) Dual-phase encoder with index
- (4) PNP sensor

Use a 0.5 A fast-blow fuse.

Incremental Encoder with Phase-Shifted Signals without TDC and Electromechanical Sensor

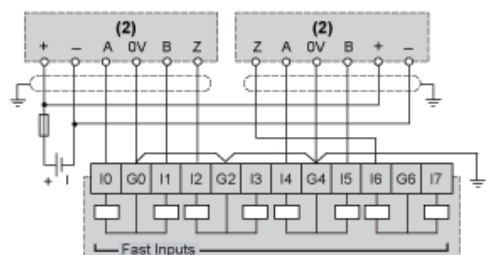


- (1) Dual-phase encoder without index
- (3) Limit switch

Use a 0.5 A fast-blow fuse.

Wiring Diagram Examples for 2 Encoders on Fast Inputs

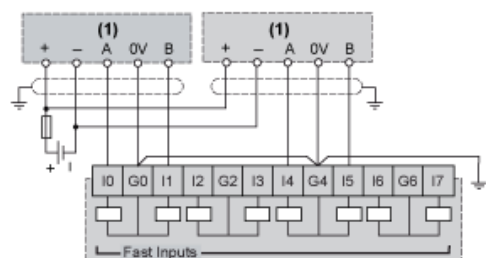
Incremental Encoders with Phase-Shifted Signals with TDC



- (2) Dual-phase encoder with index

Use a 0.5 A fast-blow fuse.

Incremental Encoders with Phase-Shifted Signals without TDC



- (1) Dual-phase encoder without index

Use a 0.5 A fast-blow fuse.

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