Product datasheet
Characteristics

TM238LDA24DR

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 conforming to EN/IEC 61131-2 type 1 8 fast input conforming to 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
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 optional battery lithium thionyl chloride (TSXPLP01) 1 year Variables of type retain and retain persistent internal battery 3 days 22 h 10 yr
Mounting support	35 mm symmetrical DIN rail Panel

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
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
Cable distance between devices	Shielded cable: 10 m for fast input (counter mode) 30 m for fast input (normal mode)

	30 m for input 30 m for relay output 30 m for 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	19.2...30 V solid state output 250 V relay output 30 V relay output
Discrete output current	2 A relay output Q4...Q8 5 A relay output Q9 20...500 mA solid state output
Output frequency	<= 100 kHz solid state output
Leakage current	< 2 mA solid state output
[Ures] residual voltage	< 2 V solid state output
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 relay output Q4...Q8 2 A 30 V DC resistive <= 600 cyc/mn relay output Q4...Q8 5 A 240 V AC inductive <= 1800 cyc/mn relay output Q9 5 A 30 V DC inductive <= 1800 cyc/mn relay output Q9
Mechanical durability	>= 20000000 cycles relay output
Electrical durability	>= 100000 cycles relay output Q4...Q8 >= 500000 cycles relay output Q9
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
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 2 configurable freewheeling/cyclic/event auxiliary tasks 32 levels of priority between tasks 4 interrupt tasks
Realtime clock	With 10 s/monthat 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	1 LED RUN 1 LED Batt 1 LED module error (ERR) 1 LED per channel I/O state 1 LED PWR 1 LED SL1
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
Product 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	CSA CTick GOST UL
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...9842.52 ft (0...3000 m)
vibration resistance	1 gn 3.5 mm (f= 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)

Offer Sustainability

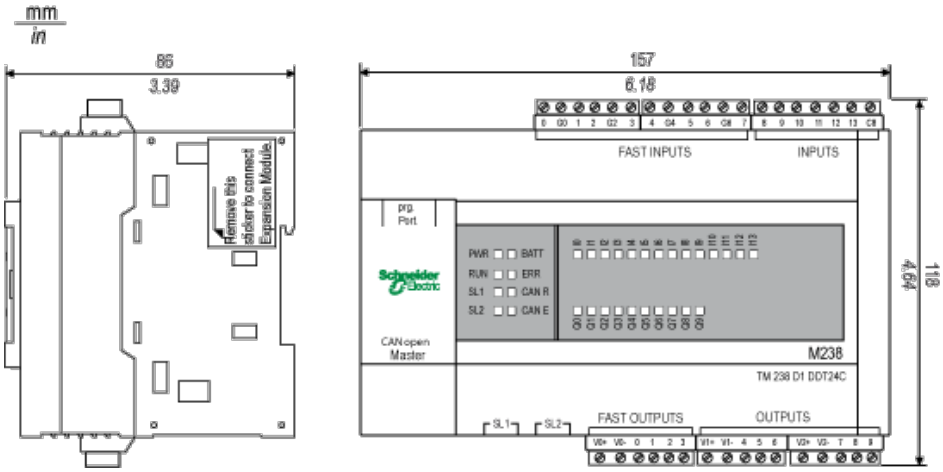
Green Premium product	Green Premium product
Compliant - since 1017 - Schneider Electric declaration of conformity	Compliant - since 1017 - Schneider Electric declaration of conformity
Reference not containing SVHC above the threshold	Reference not containing SVHC above the threshold
Available	Available
Available	Available

Contractual warranty

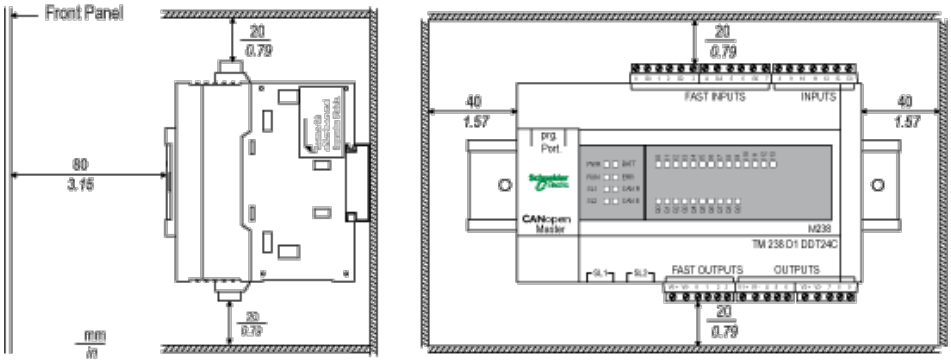
Warranty period	18 months

Modicon M238 Logic Controller

Dimensions

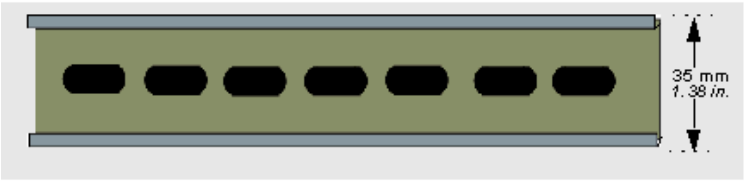


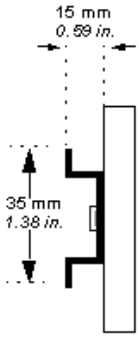
Clearance



Mounting on a DIN Rail

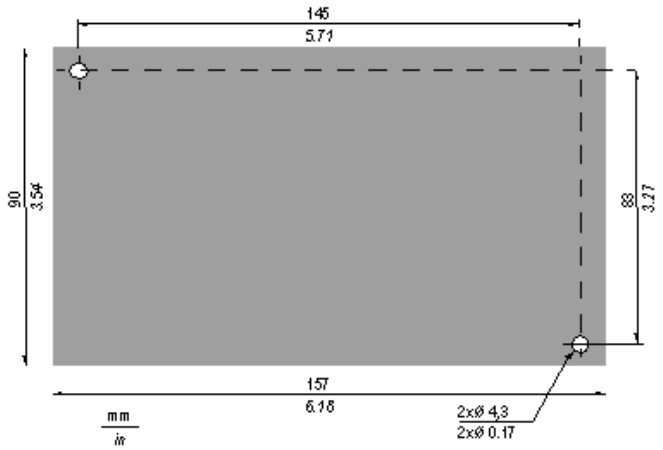
Dimensions of the DIN Rail



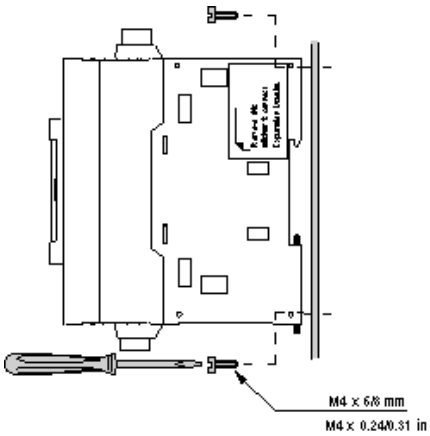


Mounting on a Metallic Panel

Mounting Holes



Mounting the Modicon M238 Logic Controller on a Metallic Panel



Wiring Requirements

Rules for Removable Screw Terminal Block

6 0.23 mm in						
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*)	c	N.m	0,6
		lb-in	*5.3*

Use copper conductors only.

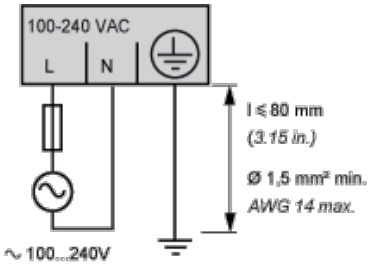
Rules for Removable Spring Terminal Block

6 0.23 mm in.				
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

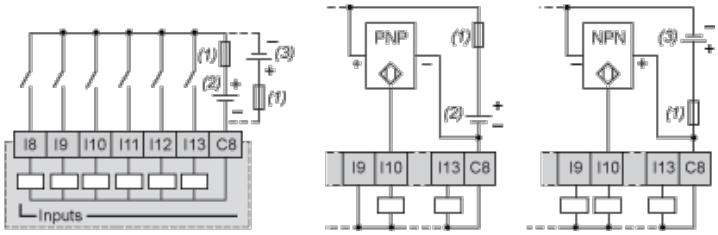
Wiring Diagram



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

Regular Inputs

Wiring Diagram



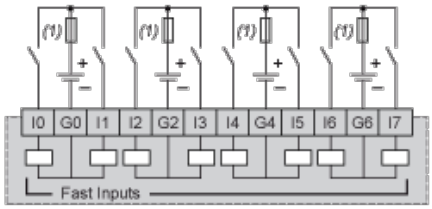
(1) Fast-blow fuse 0.5 A

(2) Sink input (positive logic)

(3) Source input (negative logic)

Fast Inputs

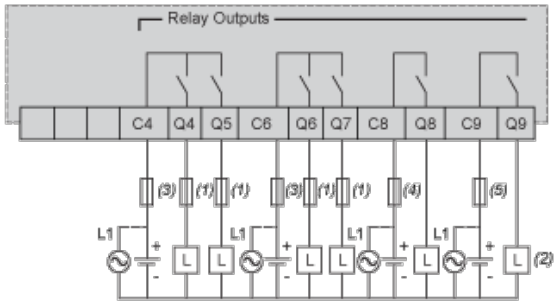
Wiring Diagram



(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

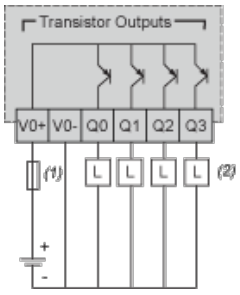
(4) 2 A slow-blow fuse

(5) 5 A slow-blow fuse

L1 All relays use the same phase across relay groups for alternate current connections

Transistor Outputs

Wiring Diagram

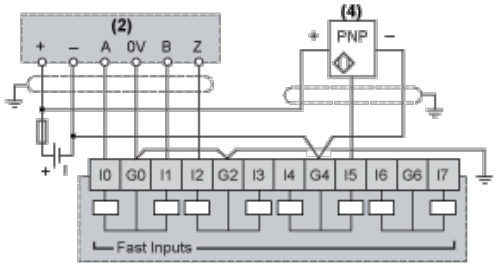


(1) 2 A fast-blow fuse

(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

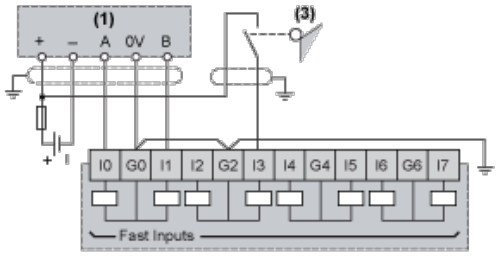


(2) Dual-phase encoder with index

(4) PNP sensor

Use a 0.5 A fast-blow fuse.

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



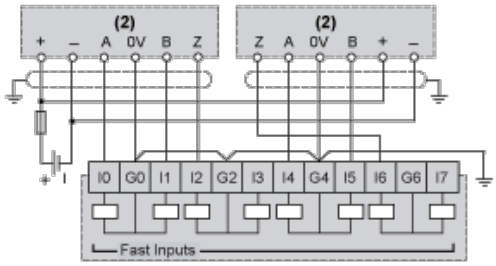
(1) Dual-phase encoder without index

(3) Limit switch

Use a 0.5 A fast-blow fuse.

Wiring Diagram Examples for 2 Encoders on Fast Inputs

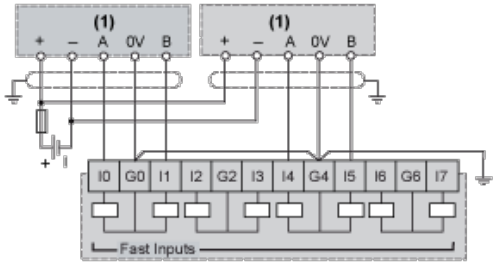
Incremental Encoders with Phase-Shifted Signals with TDC



(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.