

Modicon TM3 I/O expansion modules for Modicon controllers Analog I/O modules

Applications	Analog inputs		Analog outputs		Analog I/O	
Compatibility	Modicon M221/M221 Block/M241/M251 logic controllers Modicon M262 logic controller Modicon TM3BC bus coupler modules					
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Inputs	2 inputs		4 inputs		4 inputs	
	Voltage/current	Temperature	Voltage/current	Temperature	Voltage/current	Temperature
Range	-10...+10 VDC; 0...+10 VDC/ 0...20 mA; 4...20 mA	Thermocouples (J, K, R, S, B, T, N, E, C), non-isolated	-10...+10 VDC; 0...+10 VDC/ 0...20 mA; 4...20 mA	Thermocouples (J, K, R, S, B, T, N, E, C)	Thermocouples (J, K, R, S, B, T, N, E, C), non-isolated	Thermocouples (J, K, R, S, B, T, N, E, C)
Resolution	16 bits or 15 bits + sign	16 bits or 15 bits + sign	12 bits or 11 bits + sign	16 bits or 15 bits + sign	16 bits or 15 bits + sign	16 bits or 15 bits + sign
Transfer time	1 or 10 ms (configurable)	100 ms per channel for temperature signals, 1 or 10 ms (configurable) for voltage/current signals	1 or 10 ms (configurable)	100 ms per channel for temperature signals, 1 or 10 ms (configurable) for voltage/current signals	1 or 10 ms (configurable)	100 ms per channel for temperature signals, 1 or 10 ms (configurable) for voltage/current signals

Outputs	2 outputs		4 outputs		4 outputs	
	Voltage/current	Temperature	Voltage/current	Temperature	Voltage/current	Temperature
Range	-10...+10 VDC; 0...+10 VDC/ 0...20 mA; 4...20 mA	Thermocouples (J, K, R, S, B, T, N, E, C), non-isolated	-10...+10 VDC; 0...+10 VDC/ 0...20 mA; 4...20 mA	Thermocouples (J, K, R, S, B, T, N, E, C)	-10...+10 VDC; 0...+10 VDC/ 0...20 mA; 4...20 mA	Thermocouples (J, K, R, S, B, T, N, E, C)
Resolution	16 bits or 15 bits + sign	16 bits or 15 bits + sign	12 bits or 11 bits + sign	16 bits or 15 bits + sign	12 bits or 11 bits + sign	16 bits or 15 bits + sign
Transfer time	1 or 10 ms (configurable)	100 ms per channel for temperature signals, 1 or 10 ms (configurable) for voltage/current signals	1 or 10 ms (configurable)	100 ms per channel for temperature signals, 1 or 10 ms (configurable) for voltage/current signals	1 or 10 ms (configurable)	100 ms per channel for temperature signals, 1 or 10 ms (configurable) for voltage/current signals

Via 24 V --- external power supply
23.6 x 90 x 70 (0.93 x 3.54 x 2.76)
Mounting on symmetrical DIN rail L or panel using special mounting kit TMAM2

Module	2 outputs		4 outputs		4 outputs	
	Voltage/current	Temperature	Voltage/current	Temperature	Voltage/current	Temperature
Range	-10...+10 VDC; 0...+10 VDC/ 0...20 mA; 4...20 mA	Thermocouples (J, K, R, S, B, T, N, E, C), non-isolated	-10...+10 VDC; 0...+10 VDC/ 0...20 mA; 4...20 mA	Thermocouples (J, K, R, S, B, T, N, E, C)	-10...+10 VDC; 0...+10 VDC/ 0...20 mA; 4...20 mA	Thermocouples (J, K, R, S, B, T, N, E, C)
Resolution	16 bits or 15 bits + sign	16 bits or 15 bits + sign	12 bits or 11 bits + sign	16 bits or 15 bits + sign	12 bits or 11 bits + sign	16 bits or 15 bits + sign
Transfer time	1 or 10 ms (configurable)	100 ms per channel for temperature signals, 1 or 10 ms (configurable) for voltage/current signals	1 or 10 ms (configurable)	100 ms per channel for temperature signals, 1 or 10 ms (configurable) for voltage/current signals	1 or 10 ms (configurable)	100 ms per channel for temperature signals, 1 or 10 ms (configurable) for voltage/current signals

Module	2 outputs		4 outputs		4 outputs	
	Voltage/current	Temperature	Voltage/current	Temperature	Voltage/current	Temperature
Range	-10...+10 VDC; 0...+10 VDC/ 0...20 mA; 4...20 mA	Thermocouples (J, K, R, S, B, T, N, E, C), non-isolated	-10...+10 VDC; 0...+10 VDC/ 0...20 mA; 4...20 mA	Thermocouples (J, K, R, S, B, T, N, E, C)	-10...+10 VDC; 0...+10 VDC/ 0...20 mA; 4...20 mA	Thermocouples (J, K, R, S, B, T, N, E, C)
Resolution	16 bits or 15 bits + sign	16 bits or 15 bits + sign	12 bits or 11 bits + sign	16 bits or 15 bits + sign	12 bits or 11 bits + sign	16 bits or 15 bits + sign
Transfer time	1 or 10 ms (configurable)	100 ms per channel for temperature signals, 1 or 10 ms (configurable) for voltage/current signals	1 or 10 ms (configurable)	100 ms per channel for temperature signals, 1 or 10 ms (configurable) for voltage/current signals	1 or 10 ms (configurable)	100 ms per channel for temperature signals, 1 or 10 ms (configurable) for voltage/current signals

Presentation

- TM3AI●● and TM3TI●● analog input modules are used to acquire various analog values (voltage, current, or temperature) in industrial applications.
- TM3TI4D● analog input modules are used to acquire temperature values in industrial applications.
- TM3AQ●● analog output modules are used to control preactuators in physical units, such as variable speed drives or valves, and applications where process control is required.
- TM3TM●● and TM3AM●● mixed analog modules combine voltage/current or temperature inputs with one or two voltage/current outputs in the same unit.

When the controller stops, the outputs on each TM3 analog module can be configured to fall back (hold the last value or a specified value). This function, when set to 'hold', is useful when debugging the application or when a fault is detected, in order not to disturb the process being controlled.

Breakdown of the offer

- Analog I/O modules** Modules with 2 to 8 analog inputs/outputs:
- voltage/current or temperature inputs
 - temperature inputs
 - voltage/current outputs

Connections

- Screw-type or spring-type connectors at intervals of 5.08 mm (0.2 in.) for ease of wiring: identical to the connectors on Modicon M221 (TM221C●●●●) and Modicon M241 (TM241C●●●●) logic controllers
- Screw-type or spring-type connectors at intervals of 3.81 mm (0.15 in.) for compact dimensions: identical to the connectors on Modicon M221 Book (TM221M16●● and TM221ME16●●) logic controllers

Configuration

- Analog I/O modules connect to Modicon M221, M221 Book, M241, and M251 logic controllers and Modicon M262 logic/motion controller according to the general rules for the Modicon TM3 system: 7 local modules max. plus 7 remote modules.
- An external 24 V $\overline{\text{DC}}$ power supply is required for each Modicon TM3 analog module.
- The I/O modules are designed with isolation by an optocoupler between the internal electronics and the I/O channels.

Mounting

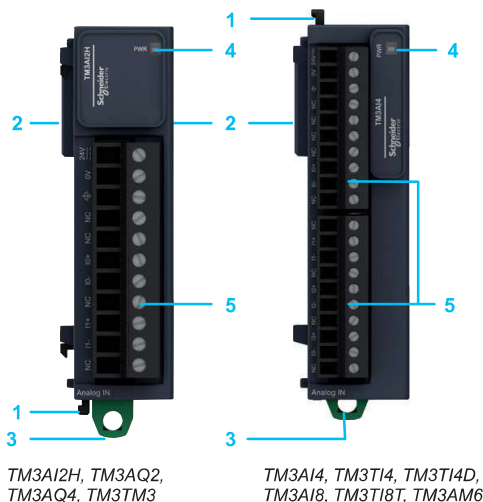
- Analog modules are mounted on a symmetrical DIN rail $\perp$.
- For plate or panel mounting, use the **TMAM2** kit.
- The **TM2XMTGB** grounding plate simplifies connection of the cable shielding (shielding must be connected to the device's functional ground).

Description

Modicon TM3 analog modules

- 1 Locking catch for the adjacent module
- 2 TM3 bus connectors (one on each side). These are designed to provide continuity of the link between connected modules.
- 3 Clip for locking on symmetrical DIN rail $\perp$
- 4 Module power status LED
- 5 Removable spring or screw terminal blocks (depending on the model) for connecting the analog channels and the 24 V power supply (1)

(1) Removable terminal blocks supplied with each module.



Modicon TM3

I/O expansion modules for Modicon controllers

Analog I/O modules



TM3AI2H TM3AI4



TM3TI4, TM3TI4D TM3AI8



TM3TI8T



TM3AQ2 TM3AQ4



TM3TM3 TM3AM6



TM200RSRCMC



TM2XMTGB

References

Modicon TM3 analog input modules

Number and type of channels	Input range	Output range	Resolution	Input terminal block (1) Interval (mm/in.)	Reference	Weight kg/ lb
2 voltage/current inputs	-10...+10 VDC, 0...+10 VDC/ 0...20 mA, 4...20 mA	—	16 bits or 15 bits + sign	Screw 5.08/0.2	TM3AI2H	0.115/ 0.254
				Spring 5.08/0.2	TM3AI2HG	0.100/ 0.220
4 voltage/current inputs	-10...+10 VDC, 0...+10 VDC/ 0...20 mA, 4...20 mA	—	12 bits or 11 bits + sign	Screw 3.81/0.15	TM3AI4	0.110/ 0.243
				Spring 3.81/0.15	TM3AI4G	0.100/ 0.220
4 voltage/current or temperature inputs (2)	Thermocouples (3) (J, K, R, S, B, T, N, E, C) Temperature probes (RTDs) (Ni100, Ni1000, PT100, PT1000) -0...+10 VDC, 0...+10 VDC/ 0...20 mA, 4...20 mA)	—	16 bits or 15 bits + sign	Screw 3.81/0.15	TM3TI4	0.110/ 0.243
				Spring 3.81/0.15	TM3TI4G	0.100/ 0.220
4 differential temperature inputs	Thermocouples (J, K, R, S, B, T, N, E, C), non-isolated	—	16 bits or 15 bits + sign	Screw 3.81/0.15	TM3TI4D	0.110/ 0.243
				Spring 3.81/0.15	TM3TI4DG	0.100/ 0.220
8 voltage/current inputs	-10...+10 VDC, 0...+10 VDC/ 0...20 mA, 4...20 mA	—	12 bits or 11 bits + sign	Screw 3.81/0.15	TM3AI8	0.110/ 0.243
				Spring 3.81/0.15	TM3AI8G	0.100/ 0.220
8 temperature inputs	Thermocouples (3) (J, K, R, S, B, T, N, E, C) NTC and PTC thermistors	—	16 bits or 15 bits + sign	Screw 3.81/0.15	TM3TI8T	0.110/ 0.243
				Spring 3.81/0.15	TM3TI8TG	0.100/ 0.220

Modicon TM3 analog output modules

2 voltage/current outputs	—	-10...+10 VDC, 0...+10 VDC/ 0...20 mA 4...20 mA	12 bits or 11 bits + sign	Screw 5.08/0.2	TM3AQ2	0.115/ 0.254
				Spring 5.08/0.2	TM3AQ2G	0.100/ 0.220
4 voltage/current outputs	—	-10...+10 VDC, 0...+10 VDC/ 0...20 mA 4...20 mA	12 bits or 11 bits + sign	Screw 5.08/0.2	TM3AQ4	0.115/ 0.254
				Spring 5.08/0.2	TM3AQ4G	0.100/ 0.220

Modicon TM3 mixed analog I/O modules

2 temperature or voltage/current inputs (2) and 1 voltage/current output	Thermocouples (3) (J, K, R, S, B, T, N, E, C) Temperature probes (RTDs) (Ni100, Ni1000, PT100, PT1000) -0...+10 VDC, 0...+10 VDC/ 0...20 mA, 4...20 mA	-10...+10 VDC, 0...+10 VDC/ 0...20 mA 4...20 mA	16 bits or 15 bits + sign (for inputs) 12 bits or 11 bits + sign (for output)	Screw 5.08/0.2	TM3TM3	0.115/ 0.254
				Spring 5.08/0.2	TM3TM3G	0.100/ 0.220
4 voltage/current inputs and 2 voltage/current outputs	-10...+10 VDC, 0...+10 VDC/ 0...20 mA, 4...20 mA	-10...+10 VDC, 0...+10 VDC/ 0...20 mA, 4...20 mA	12 bits or 11 bits + sign (for inputs and outputs)	Screw 3.81/0.15	TM3AM6	0.110/ 0.243
				Spring 3.81/0.15	TM3AM6G	0.100/ 0.220

Separate parts

Designation	Description	Unit reference	Weight kg/ lb
Grounding plate	Support equipped with 10 male Faston connectors for connecting the cable shielding (via 6.35 mm/0.25 in. connectors, not supplied) and the functional grounds (FG)	TM2XMTGB	0.045/ 0.099
Shielding connection clamps	Assembly and grounding of the cable shielding. Pack of 25 clamps including 20 for Ø 4.8 mm (0.189 in.) cable and 5 for Ø 7.9 mm (0.311 in.) cable	TM200RSRCMC	—
Mounting kit	For mounting analog I/O modules on a plate or panel	TMAM2	0.065/ 0.143
Set of I/O terminal blocks	4 x 10-way and 4 x 11-way removable screw terminal blocks for TM3AI4, TM3TI4, TM3AI8, TM3TI8, and TM3AM6 modules	TMAT2MSET	0.127/ 0.280
	4 x 10-way and 4 x 11-way removable spring terminal blocks for TM3AI4G, TM3TI4G, TM3AI8G, TM3TI8G, and TM3AM6G modules	TMAT2MSETG	0.127/ 0.280

(1) Removable terminal blocks supplied with each module.

(2) Each input can be configured independently for temperature or voltage/current.

(3) Use isolated thermocouples only.