

Modicon TM5

High-Performance and Safe IP20 Modular I/O System

Analog modules

Applications	
Compatibility	Local and remote I/O
	Distributed I/O with bus coupler

1 to 6 analog input channels	2 to 4 analog output channels
■ Modicon M258 logic controller ■ Modicon LMC058 motion controller	
■ Ethernet network interface module ■ CANopen bus interface module ■ Sercos bus interface module	



Channel connection	
Analog inputs	Number
	Type
	Range
	Resolution
	Sampling period
	Without filtering
With filtering	

Via removable spring terminal blocks (to be ordered separately)					
2	2	4	4	2	4
Voltage/current				Pt100/Pt1000 temperature probe	
-10...+10 V DC 0...20 mA/ 4...20 mA				-200...+850 °C/ -328...+1,562 °F	
12 bits + sign	15 bits + sign	12 bits + sign	15 bits + sign	16 bits	
300 µs	–	400 µs	–	–	
1 ms	50 µs	1 ms	50 µs	–	

Via removable spring terminal blocks (to be ordered separately)	
2	6
Thermocouple (J, K, S, N)	
Full bridge strain gage	
Type J: -210...+1,200 °C (-346...2,192 °F) Type K: -270...+1,372 °C (-454...+2,502 °F) Type S: -50...+1,768 °C (-50...+3,214 °F) Type N: -270...+1,300 °C (-454...+2,372 °F)	
Differential: 85...5,000 Ω	
16 bits	
24 bits	
–	
–	

Analog outputs	Number
	Type
	Range
	Resolution
	Response time

2	2	4	4
Voltage/current			
-10...+10 V DC, 0...20 mA			
12 bits + sign	15 bits + sign	12 bits + sign	15 bits + sign
1 ms max.			

Digital inputs	Number and type
	Nominal input voltage
	IEC/EN 61131-2 conformity
	Type of signal (1)
	Type of wiring
	Limit values
	Nominal input current
	Input impedance
	State 0
	State 1

Digital outputs	Number
	Nominal output voltage
	Output current per channel
	Output current per group of channels
	Type of signal (1)
	Type of wiring
	Limit values
	Short-circuit and overload protection

Power supply	
Isolation	Channel-to-channel
	Between groups of channels
	Between channels and bus

Internal					
Non-isolated					
–					
500 V ~ RMS					

Electronic modules

TM5SAI2L	TM5SAI2H	TM5SAI4L	TM5SAI4H	TM5SAI2PH	TM5SAI4PH
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Compatible bus bases (2)

TM5ACBM11, TM5ACBM15					
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Compatible removable terminal block (2)

TM5ACTB06, TM5ACTB12		TM5ACTB12		TM5ACTB06, TM5ACTB12	
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Page

21

(1) Source output: PNP output; Sink output: NPN output
(2) To be ordered separately

Internal	Internal	Internal
Non-isolated	Non-isolated	Non-isolated
–	–	–
500 V ~ RMS	500 V ~ RMS	500 V ~ RMS

TM5SAI2TH	TM5SAI6TH	TM5SEAI5G	TM5SAO2L	TM5SAO2H	TM5SAO4L	TM5SAO4H
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TM5ACBM11, TM5ACBM15						
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TM5ACTB06, TM5ACTB12		TM5ACTB12	TM5ACTB06, TM5ACTB12		TM5ACTB12	
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21



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High-Performance and Safe IP20 Modular I/O System Analog modules

Presentation

TM5SAI●● and **TM5SEIAISG** analog input modules are used to acquire various analog values encountered in industrial applications.

TM5SAO●●● 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. The output current or voltage is proportional to the numerical value defined by the user program.

When the controller stops, the outputs can be configured to fall back (set to the low scale value or held at their value). This function, when set to 'hold', is useful when debugging the application or when a fault occurs, so as not to disturb the process being controlled.

Depending on the application requirements, these modules are available with 12-, 16-, or 24-bit resolution.

Each analog module comprises three parts to be ordered separately (1):

- An input or output electronic module
- A bus base
- A terminal block

These modules can be mechanically assembled before mounting on a symmetrical rail.

They offer the following advantages:

- Removable terminal block
- Spring terminals that can be used for quick, tool-free connection of the sensors and preactuators (the quality of the spring terminals avoids the need for periodic retightening)
- Hot swapping capability

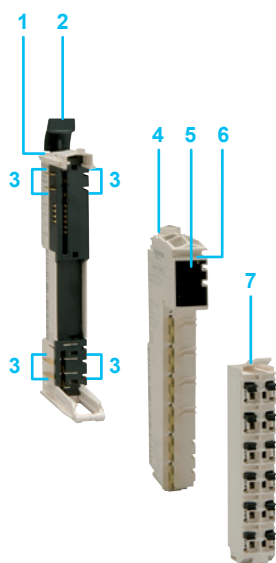
Use of the **TM2XMTGB** grounding plate is recommended. This simplifies connection of the cable shielding for the analog sensors and actuators (shielding must be connected to the device's functional ground).

Description

The analog modules comprise:

- 1 A bus base
- 2 A mechanical clip for locking onto a symmetrical rail
- 3 A bus expansion connection on each side of the base to provide the link with the adjacent controller or module
- 4 An analog input or output electronic module
- 5 An LED display block for the module channels and diagnostics
- 6 A slot for the plain text cover holder (label holder)
- 7 A removable spring terminal block with locking clip and slots for colored ID markers

(1) Also sold as a complete kit, see [page 21](#)





TM5SAI●●
TM5SAO●●
TM5SAO●●



TM5ACBM●●



TM5ACTB●●



TM5SA●4●K



TM2XMTGB

References

Description	Number and type of channels	Range	Resolution	Reference	Weight kg/lb
Analog input electronic modules	2 voltage/current inputs	-10...+10 V DC, 0...20 mA/4...20 mA	12 bits + sign	TM5SAI2L	0.025/ 0.055
		-10...+10 V DC, 0...20 mA	15 bits + sign	TM5SAI2H	
	4 voltage/current inputs	-0...+10 V DC, 0...20 mA/4...20 mA	12 bits + sign	TM5SAI4L	
		-10...+10 V DC, 0...20 mA	15 bits + sign	TM5SAI4H	
	2 Pt100/Pt1000 temperature probe inputs	-200...+850 °C (-328...+1,562 °F)	16 bits	TM5SAI2PH	
	4 Pt100/Pt1000 temperature probe inputs		16 bits	TM5SAI4PH	
	2 thermocouple inputs (J, K, S, N)	Type J: -210...+1,200 °C (-346...2,192 °F)	16 bits	TM5SAI2TH	
	6 thermocouple inputs (J, K, S, N)	Type K: -270...+1,372 °C (-454...+2,502 °F) Type S: -50...+1,768 °C (-50...+3,214 °F) Type N: -270...+1,300 °C (-454...+2,372 °F)	16 bits	TM5SAI6TH	
	1 full bridge strain gage input	Differential: 85...5,000 Ω	24 bits	TM5SEAISG	
Analog output electronic modules	2 voltage/current outputs	-10...+10 V DC, 0...20 mA	12 bits + sign	TM5SAO2L	0.025/ 0.055
			15 bits + sign	TM5SAO2H	
	4 voltage/current outputs	-10...+10 V DC, 0...20 mA	12 bits + sign	TM5SAO4L	
			15 bits + sign	TM5SAO4H	

Description	Characteristics	Reference	Weight kg/lb
Bus bases	24 V ⎓	TM5ACBM11	0.020/ 0.044
	24 V ⎓ With address setting	TM5ACBM15	0.020/ 0.044
Terminal blocks	For analog I/O electronic module 6 spring terminals	TM5ACTB06	0.016/ 0.035
	For analog I/O electronic module 12 spring terminals	TM5ACTB12	0.020/ 0.044

Separate parts

Description	Characteristics	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
Mounting kit <i>Sold in lots of 5</i>	For mounting analog modules on a plate or panel	TWDXMT5	0.065/ 0.143

Analog I/O expansion module kits

Description	Composition	Reference	Weight kg/lb
Kit comprising: - an analog input or output electronic module - a bus base - a terminal block	TM5SAI4L + TM5ACBM11 + TM5ACTB12	TM5SAI4LK	0.075/ 0.165
	TM5SAI4H + TM5ACBM11 + TM5ACTB12	TM5SAI4PHK	
	TM5SAO4L + TM5ACBM11 + TM5ACTB12	TM5SAO4LK	

Accessories

See [page 44](#)