

Modicon OTB interface modules

Modicon TM2 expansion modules

Catalog

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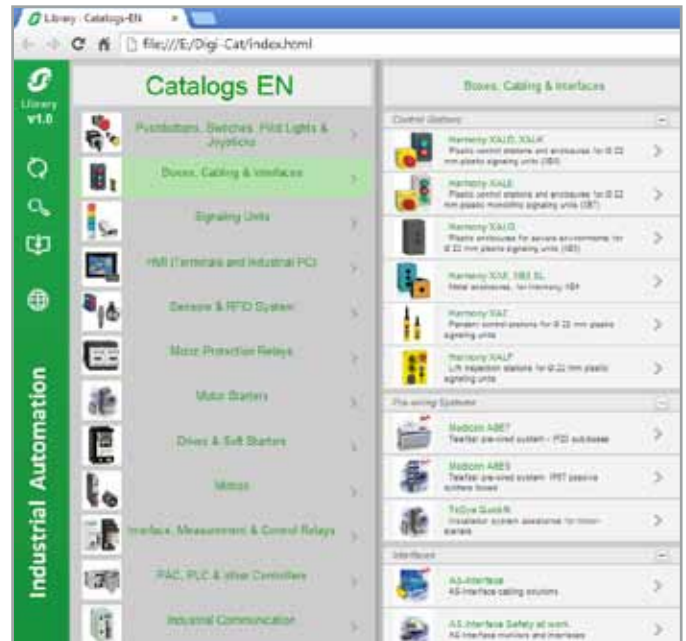
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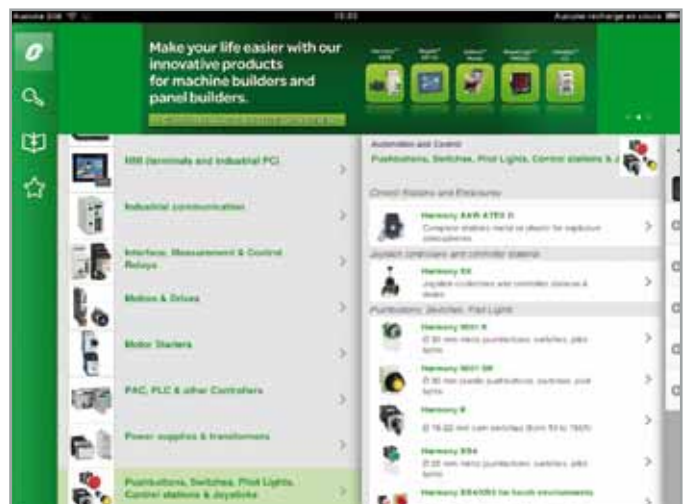
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General content

Modicon OTB interface modules

IP20 optimum modular I/O system, for simple machines (up to 248 I/Os)

Selection guide page 2

■ **Presentation**..... page 4

■ **Configuration**..... page 5

■ **Description**..... page 5

■ **References**

□ Interface modules with integrated digital I/O page 6

□ Separate components page 7

□ Connections page 7

Modicon TM2 Expansion modules

■ **Modicon TM2 Digital modules**

Selection guide pages 8 to 11

□ Presentation page 12

□ Description page 13

□ References pages 14 to 15

■ **Modicon TM2 Analog modules**

Selection guide pages 16 to 17

□ Presentation page 18

□ Description page 18

□ References page 19

■ **Modicon TM2 Expert modules**

□ Presentation page 20

□ Description page 20

□ References page 21

■ **Product reference index**..... page 22

Modicon OTB interface modules

IP20 optimum modular I/O system, for simple machines (up to 248 I/Os)

Applications	Data exchange between a control source (PLC, variable speed drives, PC, etc.) and the inputs and outputs
Compatibility	<input type="checkbox"/> Magelis HMI Controller XBTGC <input type="checkbox"/> Drive controllers Altivar IMC (with Altivar 61 or Altivar 71 variable speed drives) <input type="checkbox"/> Modicon TM2 I/O expansion modules
Type of bus or network	Ethernet Modbus/TCP network



Nature of bus or network	Mixed local industrial network
Structure	Physical interface Access method Transfer rate
	10/100 BASE-T (RJ 45 connector) CSMA-CD 10/100 Mbit/s
Medium	Shielded dual twisted pair via Ethernet ConneXium cabling system
Configuration	Number of devices Maximum length (distance)
	256 max. per network segment. Unlimited using switches. 500 m (1640 ft) according to standard 802.3 1000 m (3280 ft) with ConneXium cabling system
Digital inputs/outputs	Number of I/O Number of inputs Number of outputs
	20 I/O 12 \rightarrow 24 V sink/source (PNP or NPN) inputs 6 relay outputs and 2 \rightarrow 24 V transistor, source (PNP) outputs
Type of connection	Removable screw terminal blocks
Input/output extension	Number of extension modules Maximum I/O configuration
	7 digital or analogue input/output modules, or connection accessories With interface module: - 132 with screw terminal digital I/O extension module, - 164 with spring terminal digital I/O extension module, - 288 with type HE-10 connector digital I/O extension module, - screw terminal analog I/O: up to 7 x 8 I, or 7 x 2 O, or 7 x (4 I/2 O)
Integrated I/O functions	Counting, 5 kHz or Counting, 20 kHz Pulse generator, 7 kHz
	2 channels, 32 bits (0...4 294 967 295 points) - dedicated digital inputs - up/down counting with preset value 2 channels, 32 bits (0...4 294 967 295 points) - dedicated digital inputs/outputs - up/down counting, up counting, down counting, frequency meter 2 PWM function channels (output with pulse width modulation) and PLS function (pulse generator output)
Supply voltage	\rightarrow 24 V supply
Type	OTB1E0DM9LP
Page	6

Data exchange between a control source (PLC, variable speed drives, PC, etc.) and the inputs and outputs	
<input type="checkbox"/> Magelis HMI Controller XBTGC <input type="checkbox"/> Drive controllers Altivar IMC (with Altivar 61 or Altivar 71 variable speed drives) <input type="checkbox"/> Modicon TM2 I/O expansion modules	
CANopen bus	Modbus Serial link

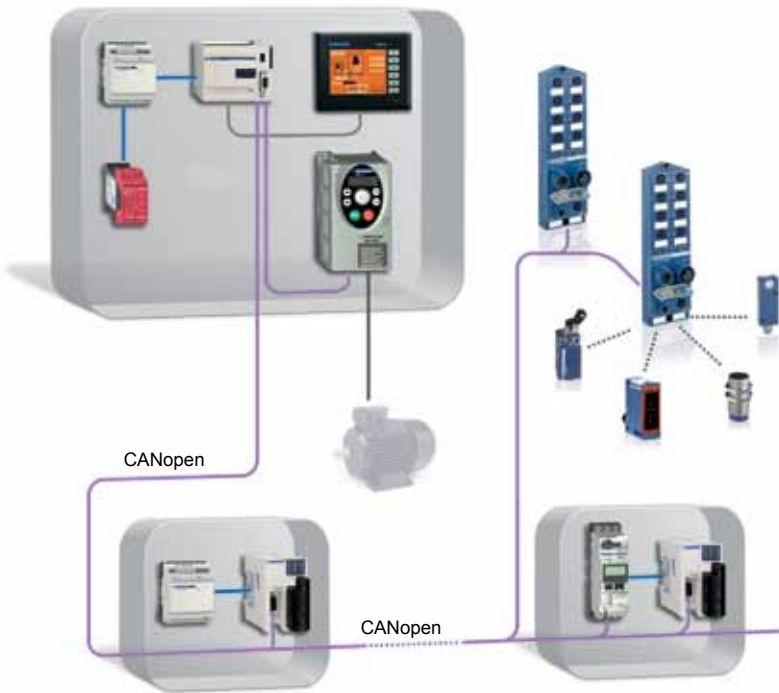


CAN fieldbus	Local RS 485 network
ISO 11898 (SUB-D 9-pin connector) CSMA-MA, multimaster 10...1000 Kbit/s depending on distance	RS 485 (2 x RJ 45 connectors in parallel) Master-slave 1.2...38.4 Kbit/s
Shielded dual twisted pair 127 slaves From 30 m (98.43 ft) (1 Mbit/s) to 1000 m (3280 ft) (> 50 Kbit/s)	Dual twisted pair 32 slaves per segment Up to 1000 m (3280 ft)
20 I/O 12 \rightarrow 24 V sink/source (PNP or NPN) inputs 6 relay outputs and 2 \rightarrow 24 V transistor, source (PNP) outputs	
Removable screw terminal blocks	
7 digital or analogue input/output modules, or connection accessories	
With interface module: - 132 with screw terminal digital I/O extension module, - 164 with spring terminal digital I/O extension module, - 288 with type HE-10 connector digital I/O extension module, - screw terminal analog I/O: up to 7 x 8 I, or 7 x 2 O, or 7 x (4 I/2 O)	
2 channels, 32 bits (0...4 294 967 295 points) - dedicated digital inputs - up/down counting with preset value	
2 channels, 32 bits (0...4 294 967 295 points) - dedicated digital inputs/outputs - up/down counting, up counting, down counting, frequency meter	
2 PWM function channels (output with pulse width modulation) and PLS function (pulse generator output)	
\rightarrow 24 V supply	
OTB1C0DM9LP	OTB1S0DM9LP
6	6

Modicon OTB interface modules

IP20 optimum modular I/O system, for simple machines (up to 248 I/Os)

Presentation



Modicon OTB islands on CANopen bus

There is an increasing tendency for machine manufacturers to design their automation systems using modular architectures. The use of distributed inputs/outputs (I/Os) is becoming more and more common. The Modicon OTB offer is an ideal solution for “optimised” type distributed input/output requirements. This offer, complementing the Modicon interface family, has been designed to provide the right technical-economical balance: it meets the needs of machine manufacturers and users seeking the best compromise between size, ease of cabling, setting-up and costs. Open and modular, the Modicon OTB solution enables the creation of industrial I/O islands managed by a master controller (PLC, PC or variable speed drive) via a fieldbus or communication network.

With its expandable block type architecture, the Modicon OTB solution adapts to all configurations of automation system islands. The Modicon OTB offer is particularly economical for small and medium size islands. In addition, the optimised sizes of this offer are ideally suited to the size of enclosures for distributed I/Os, that are located as near to the machine as possible. This solution reduces cabling time and costs and at the same time takes into account the modular architecture of the machine.

Furthermore, the Modicon OTB offer proposes fewer references relating to spare parts and accessories that are required for creating an island.

The Modicon OTB offer has also been designed to be as simple as possible. This offer includes 3 **OTB1●ODM9LP** communication bases (interface modules) for the various types of communication medium:

- Ethernet Modbus/TCP network,
- CANopen bus,
- Modbus Serial Link.

Inputs and outputs are directly integrated in the interface modules. Each base incorporates 20 I/O:

- 12 $\bar{\text{---}}$ 24 V inputs,
- 6 relay outputs,
- 2 $\bar{\text{---}}$ 24 V solid-state outputs.

All the bases use a $\bar{\text{---}}$ 24 V supply. Of monobloc design, each Modicon OTB interface module can be fitted with extension modules of Twido programmable controller range.

With its range of I/O extensions, the Modicon OTB offer provides a modularity that allows all requirements to be met, commencing with a base that can be fitted with up to 7 **TM2D●●** digital I/O or **TM2A●●** analogue I/O modules.

The extension modules, like the interface modules, simply clip-on to 35 mm (1.37 in.) symmetrical rail and enable configurations of up to 228 digital I/O and up to 42 analogue I/O channels, or a mixture of both types (within the limit of 7 extension modules), to be obtained.

Sensors and actuators are connected to the interface modules and I/O extension modules using removable screw terminal blocks. All Modicon OTB modules provide an IP 20 degree of protection.

To simplify sensor and actuator connections, as well as linking commons, the Modicon OTB offer also includes an **OTB9ZZ61JP** commoning module. This module, as with all the other modules of the Modicon OTB range, allows the through connection of the internal bus or network (passively in this case) and enables connection of the commons in two isolated groups for each commoning module (2 removable 10 screw terminal connectors).



OTB1E0DM9LP interface module for Ethernet Modbus/TCP network



TM2D●● / TM2A●● Digital or analogue I/O modules

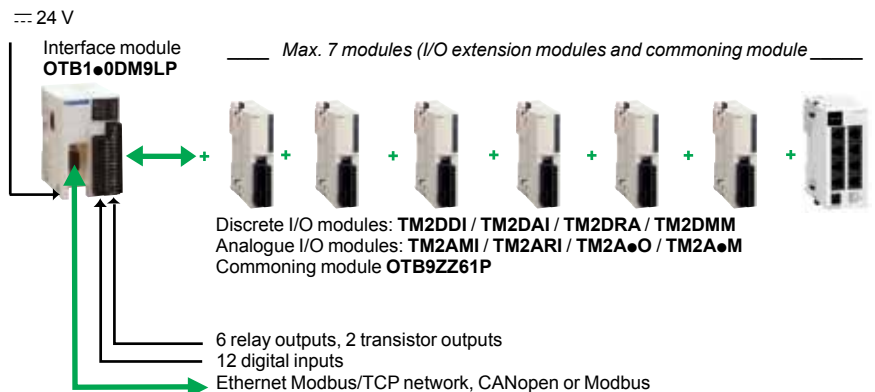


OTB9ZZ61JP common module

Modicon OTB interface modules

IP20 optimum modular I/O system, for simple machines (up to 248 I/Os)

Configuration



Description

The Modicon **OTB1●0DM9LP** (1) interface modules comprise :

- 1 A hinged access door.
- 2 A display unit showing:
 - the interface module status and communication status (PWR, RUN, ERR, COM, STA, 10T, 100T depending on model),
 - the I/O states (IN● ant OUT●).
- 3 A connector for extension modules (right-hand side).
- 4 Two removable screw terminal connectors for connecting the sensors and the preactuators.

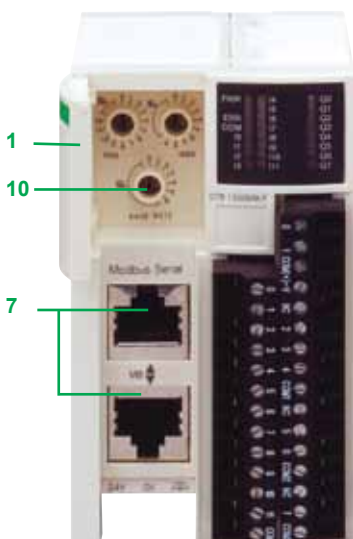
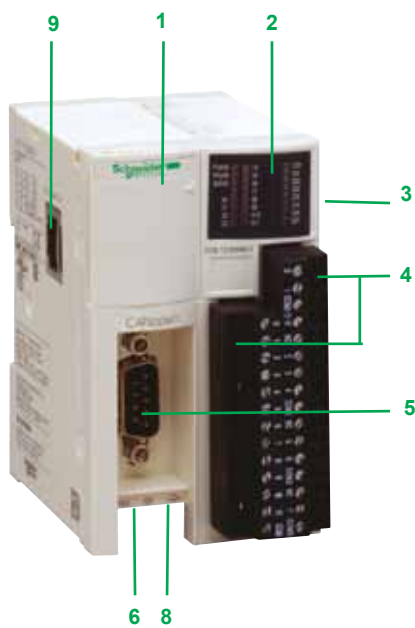
Depending on model:

- 5 A 15-way SUB-D connector for connection to the CANopen bus with **OTB1C0DM9LP** interface.
- 6 A RJ45 connector for connection to the Ethernet Modbus/TCP network with **OTB1E0DM9LP** interface.
- 7 Two RJ45 connectors in parallel for connection to the Modbus serial link with **OTB1S0DM9LP** interface.
- 8 A screw terminal block for connecting the 24 V ⎓ power supply.
- 9 One RJ45 connector dedicated to update the operating system of interface module.

With access to hinged door 1

- 10 Two or three coding wheels (depending on model) for OTB island address and bus or network communication speed adjustment.

Mounting: the interface modules are mounted on a symmetrical 35 mm (1.37 in.) rail. Fixing kit **TWDXMT5** (supplied in lots of 5) allows plate or panel mounting (2 holes of Ø 4,3 mm; 0,16 in.).



(1) Only the communication parts 5, 6 and 9 are dedicated to each fieldbus or network and can differ, the general description remains the same.

Modicon OTB interface modules

IP20 optimum modular I/O system, for simple machines (up to 248 I/Os)

Interface modules with integrated digital I/O

Supply voltage	Number and type of			Connection by	Fieldbus or network	Reference	Weight kg/lb
	inputs	solid-state outputs	relay outputs				
= 24 V	12 I	2 O	6 O	Removable screw terminal block	Ethernet Modbus/TCP	OTB1E0DM9LP	0.185
	= 24 V	= 24 V	= 30 V/ ~ 240 V				0.407
	IEC type 1 (1 common)	0.3 A (1 common)	2 A (3 commons)				



OTB1E0DM9LP

CANopen bus	OTB1C0DM9LP	0.195 0.429
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OTB1C0DM9LP

Modbus RS 485 Serial link	OTB1S0DM9LP	0.190 0.418
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OTB1S0DM9LP

Modicon OTB interface modules

IP20 optimum modular I/O system, for simple machines (up to 248 I/Os)



OTB9ZZ61JP

Separate components

Description	Usage	Number of commons	Connection by	Capacity wires	Reference	Weight kg / lb
Commoning module	For grouping input or output commons, 8 A maximum; inter-module	2 isolated groups	Removable screw terminal block	2 x 10	OTB9ZZ61JP	0.100 0.220
Fixing kit Sold in lots of 5	For plate or panel mounting of modular base controllers or extensions	–	–	–	TWDXMT5	–
Software and documentation	Configuration software “Modicon Configuration Tool-Lite” and hardware user guides	–	–	–	FTXES01	0.050 0.110

Connections

Description	Usage	Reference
Ethernet Modbus/TCP network	Cabling system: ConneXium Hub and switches, cordsets, cables and connectors	Please consult on our web site www.schneider-electric.com
CANopen Bus	Cabling system: Tap links, cables, cordsets, IP 20 and IP 67 accessories	Please consult on our web site www.schneider-electric.com
Modbus serial link	Cabling system : Tap links, Hub, cables, cordsets, line end adapters	Please consult on our web site www.schneider-electric.com

Applications	Type of expansion modules	Digital inputs with removable screw terminal block		
	Compatibility	<ul style="list-style-type: none"> - Modicon OTB interface modules - Magelis HMI Controller XBTGC - Modicon M221 logic controllers - Modicon M241 logic controllers - Modicon M251 logic controllers - Modicon M238 logic controllers - Twido controllers 		
				
Number and type		8 $\overline{\text{---}}$ 24 V inputs	8 \sim 120 V inputs	16 $\overline{\text{---}}$ 24 V inputs
Connection		By removable screw terminal block		
Inputs	Voltage range	$\overline{\text{---}}$ 20.4...28.8 V	\sim 85...132 V	$\overline{\text{---}}$ 20.4...28.8 V
	Input current	7 mA per channel	7.5 mA per channel	7 mA per channel
	Input logic	Sink/source (1)	–	Sink/source (1)
	Commons	1 x 8 channels	1 x 8 channels	1 x 16 channels
	Response time	4 ms	25 ms	4 ms
	<input type="checkbox"/> Off-on <input type="checkbox"/> On-off	4 ms	30 ms	4 ms
Outputs	Output types	–		
	Voltage range	–		
	Commons	–		
	Output current	–		
	<input type="checkbox"/> Per output <input type="checkbox"/> Per group of channels	–		
Isolation	Between channels	None		
	Between channels and internal logic	500 V rms \sim for 1 min	1500 V rms \sim for 1 min	500 V rms \sim for 1 min
I/O module type		TM2DDI8DT	TM2DAI8DT	TM2DDI16DT
Pages		14		

(1) Sink input: positive logic, source input: negative logic.

Applications	Type of expansion modules	Digital inputs with HE10 connector	Digital I/O with removable screw terminal block	Digital I/O with non-removable spring terminal block	
	Compatibility	<ul style="list-style-type: none"> - Modicon OTB interface modules - Magelis HMI Controller XBTGC - Modicon M221 logic controllers - Modicon M241 logic controllers - Modicon M251 logic controllers - Modicon M238 logic controllers - Twido controllers 			
					
Number and type		16 $\overline{\text{---}}$ 24 V inputs	32 $\overline{\text{---}}$ 24 V inputs	4 $\overline{\text{---}}$ 24 V inputs/4 relay outputs	16 $\overline{\text{---}}$ 24 V inputs/8 relay outputs
Connection		By HE10 connector Allows use of the Modicon Telefast ABE 7 pre-wired system		By removable screw terminal block	By non-removable spring terminal block
Inputs	Voltage range	$\overline{\text{---}}$ 20.4...28.8 V		$\overline{\text{---}}$ 20.4...28.8 V	
	Input current	5 mA per channel		7 mA per channel	
	Input logic	Sink/source (1)		Sink/source (1)	
	Commons	1 x 16 channels	2 x 16 channels	1 x 4 channels	1 x 16 channels
	Response time	4 ms		4 ms	
	<input type="checkbox"/> Off-on <input type="checkbox"/> On-off	4 ms		4 ms	
Outputs	Output types	–		1 N/O contact	
	Voltage range	–		\sim 240 V, $\overline{\text{---}}$ 30V	
	Commons	–		1 x 4 channels	2 x 4 channels
	Output current	–		2 A (lth)	
	<input type="checkbox"/> Per output <input type="checkbox"/> Per group of channels	–		7 A (lth)	
Isolation	Between channels	None		None between input channels, none between output channels	
	Between channels and internal logic	500 V rms \sim for 1 min		Between input group and output groups: 1500 V rms \sim for 1 min	
				Between output groups: 1500 V rms \sim for 1 min	
				Between input channels and internal logic: 500 V rms \sim for 1 min	
			Between output channels and internal logic: 2300 V rms \sim for 1 min		
I/O module type		TM2DDI16DK	TM2DDI32DK	TM2DMM8DRT	TM2DMM24DRF
Pages		14			

Modicon TM2 Expansion modules

Modicon TM2 Digital modules

Applications	Type of expansion modules	8/16 outputs with removable screw terminal block			
	Compatibility	<ul style="list-style-type: none"> - Modicon OTB interface modules - Magelis HMI Controller XBTGC - Modicon M221 logic controllers - Modicon M241 logic controllers - Modicon M251 logic controllers - Modicon M238 logic controllers - Twido controllers 			



Type	8 --- 24 V transistor outputs	8 relay outputs	16 relay outputs
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Connection	By removable screw terminal block		
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Outputs	Output types	Transistor		Relay with 1 N/O contact		
	Voltage range	--- 20.4...28.8 V		~ 240 V, --- 30 V		
	Logic (1)	Sink	Source	-		
	Commons	1 x 8 channels		2 x 4 channels	2 x 8 channels	
	Output current	0.3 A max.	0.5 A max.	2 A max.		
	Protection against overload and short-circuit	3 A at 28.8 V	4 A at 28.8 V	7 A max.	8 A max.	

Isolation	Between channels	None	None
	Between group of channels	-	1500 V rms for 1 min
	Between channels and internal logic	500 V rms ~ for 1 min	2300 V rms ~ for 1 min

Output module type	TM2DDO8UT	TM2DDO8TT	TM2DRA8RT	TM2DRA16RT
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Pages	14
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(1) Source output: positive logic, sink output: negative logic.

16/32 outputs with HE 10 connectors			
<ul style="list-style-type: none"> - Modicon OTB interface modules - Magelis HMI Controller XBTGC - Modicon M221 logic controllers - Modicon M241 logic controllers - Modicon M251 logic controllers - Modicon M238 logic controllers - Twido controllers 			



16 --- 24 V transistor outputs	16 --- 24 V transistor outputs	32 --- 24 V transistor outputs	32 --- 24 V transistor outputs
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By HE10 connector	By HE10 connector Allows use of the Modicon Telefast ABE 7 pre-wired system	By HE10 connector	By HE10 connector Allows use of the Modicon Telefast ABE 7 pre-wired system
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Outputs	Output types	Transistors		
	Voltage range	--- 20.4...28.8 V		
	Logic (1)	Sink	Source	Source
	Commons	1 x 16 channels		2 x 16 channels
	Output current	0.1 A max.	0.4 A max.	0.4 A max.
	Protection against overload and short-circuit	1 A at 28.8 V	2 A at 28.8 V	2 A at 28.8 V

Isolation	Between channels	None
	Between group of channels	-
	Between channels and internal logic	500 V rms ~ for 1 min

Output module type	TM2DDO16UK	TM2DDO16TK	TM2DDO32UK	TM2DDO32TK
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Pages	14
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Modicon TM2 Expansion modules

Modicon TM2 Digital modules

Presentation

The offer digital I/O expansion modules includes input modules, output modules and mixed input/output modules. With the 15 I/O modules offered, in addition to the I/O integrated in 24 and 40 I/O compact base controllers and modular base controllers, configurations can be adapted to suit application requirements, so optimising costs.

The following digital I/O modules are available:

- Four 24 V digital input modules comprising an 8, 16 and a 32-channel module, equipped with either removable screw terminal blocks or HE 10 connector, depending on the model. These modules can be either “sink or source” .
- One ~ 120 V digital input module, 8 channels, equipped with a removable screw terminal block.
- Eight digital output modules comprising two output modules with 8 and 16 relay outputs, output modules with 8, 16 or 32-channel “sink” or “source” transistor outputs, equipped with either removable screw terminal blocks or HE 10 connector, depending on the model.
- Two mixed digital input and output modules, comprising one 4-channel input/4-channel relay output module with removable screw terminal block and one 16-channel input/8-channel relay output module with non-removable spring terminal block.

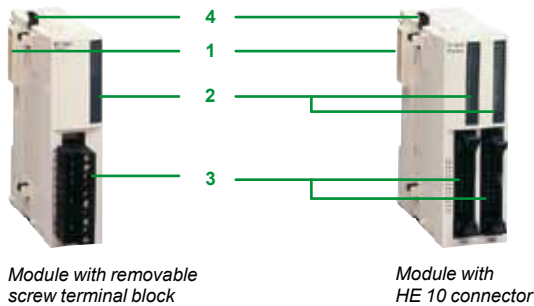
The narrow width of these I/O modules (17.5 mm/0.69 in., 23.5 mm/0.93 in., 29.7 mm/1.17 in. or 39.1 mm/1.54 in.) makes it possible to build Modicon M238, Twido or Modicon OTB configurations of up to 248 I/O with a minimal overall size of L 364.9 mm/14.37 in. x H 90 mm/3.54 in. x D 81.3 mm/3.20 in.

These digital I/O modules are mounted as standard on symmetrical rails to the right of the controller.

The maximum number of digital and/or analogue I/O modules which may be mounted depends on the type of base controller:

Base controller type	Twido compact and modular						Modicon M238	Modicon M221 and M221 Book		Modicon M241 Modicon M251	Magelis HMI controller		Modicon OTB interface
	TWDLCA 10DRF, TWDLCA 16DRF	TWDLCA 24DRF	TWDLCA 40DRF	TWDLCA 20DK	TWDLCA 20DRT	TWDLCA 40DK	TM238 L.....	TM221C16●, TM221CE16●	TM221M16●, TM221ME16●, TM221●24●, TM221M●32TK, TM221●40●	TM241C●●●●● TM251MES●	XBT GC1100●	XBT GC2●●0●	OTB1●0 DM9LP
Number of modules	0	4	7	4	7	7	7	7	7	7	2	3	7

The digital I/O modules are electrically isolated with the use of a photocoupler between the internal electronic circuit and the input/output channels.



Description

Digital I/O expansion modules comprise:

- 1 An extension connector for electrical connection to the previous module (1).
- 2 One or two blocks for displaying the channels and module diagnostics.
- 3 One or two connection components of varying type, depending on the model:
 - removable screw terminal block (1 or 2) for modules whose reference ends in **T**,
 - HE 10 connector (1 or 2) for modules whose reference ends in **K**,
 - non-removable spring terminal block for module **TM2DMM24DRF**.
- 4 Latching mechanism for attachment to the previous module.

These modules are mounted on a symmetrical \perp rail. The **TWDXMT5** mounting kit can be used for plate or panel mounting. For modules with removable screw terminal block, the terminal blocks are supplied with the module.

The **OTB9ZZ61JP** supply common distribution module (2 isolated groups of 10 terminals) simplifies the wiring of supply commons of sensors or actuators via 2 removable screw terminal blocks.

(1) A connector on the right-hand side makes continuity of the electrical link with the next I/O module.

Modicon TM2 Expansion modules

Modicon TM2 Digital modules



TM2DDI8DT



TM2DDI32DK



TM2DDO8●T/DRA8RT



TM2DDO16●K



TM2DDO32●K



TM2DRA16RT



TM2DMM8DRT



TM2DMM24DRF

References

Digital input modules

Input voltage	Nb of channels	Nb of common points	Connection	Reference	Weight kg lb
☐ 24 V sink/source	8	1	Removable screw terminal block (supplied)	TM2DDI8DT	0.085 0.187
	16	1	Removable screw terminal block (supplied)	TM2DDI16DT	0.100 0.220
			HE 10 connector	TM2DDI16DK (1)	0.065 0.143
	32	2	HE 10 connector	TM2DDI32DK (1)	0.100 0.220
~ 120 V	8	1	Removable screw terminal block (supplied)	TM2DAI8DT	0.081 0.179

Digital output modules

Type de sortie	Nb of channels	Nb of common points	Connection	Reference	Weight kg lb
Transistors ☐ 24 V	8, sink 0.3 A	1	Removable screw terminal block (supplied)	TM2DDO8UT	0.085 0.187
	8, source 0.5 A	1	Removable screw terminal block (supplied)	TM2DDO8TT	0.085 0.187
Transistors ☐ 24 V	16, sink 0.1 A	1	HE 10 connector	TM2DDO16UK	0.070 0.154
	16, source 0.4 A	1	HE 10 connector	TM2DDO16TK (1)	0.070 0.154
	32, sink 0.1 A	2	HE 10 connector	TM2DDO32UK	0.105 0.231
	32, source 0.4 A	2	HE 10 connector	TM2DDO32TK (1)	0.105 0.231
Relay 2 A (lth) ~ 230 V/☐ 30 V	8 (N/O contact)	2	Removable screw terminal block (supplied)	TM2DRA8RT	0.110 0.243
	16 (N/O contact)	2	Removable screw terminal block (supplied)	TM2DRA16RT	0.145 0.320

Digital mixed input/output modules

Nb of I/O	Nb, type of input	Nb, type of output	Nb of common points	Connection	Reference	Weight kg lb
8	4 I, ☐ 24 V sink/source	4 O, relay (N/O contact) 2 A (lth)	Inputs: 1 common Outputs: 1 common	Removable screw terminal block (supplied)	TM2DMM8DRT	0.095 0.209
24	16 I, ☐ 24 V sink/source	8 O, relay (N/O contact) 2 A (lth)	Inputs: 1 common Outputs: 2 commons	Non-removable spring terminal block	TM2DMM24DRF	0.140 0.309

(1) Module that allows use of the Modicon Telefast ABE 7 pre-wired system.



OTB9ZZ61JP

References

Separate components

Description	Application	Reference	Weight kg lb
Mounting kit Sold in lots of 5	For plate or panel mounting of the digital modules.	TWDXMT5	0.065 0.143
Commun distribution module	For distribution of supply commons. 8 A max. Connection on 2 removable screw terminal blocks	OTB9ZZ61JP	0.100 0.220

Description	Number of ways	Reference	Weight kg lb
HE 10 female connectors Sold in lots of 5	20 26	TWDFCN2K20 TWDFCN2K26	– –

Pre-formed cables for digital I/O modules with HE 10 connectors

Description	For use with Twido	Gauge C.s.a.	Cable length	Reference	Weight kg lb
Pre-formed cables 1 pre-formed cable: one end fitted with HE 10 connector, one end with free wires	I/O expansions TM2 DDI	AWG 22 0.035 mm ²	3 m	TWDFCW30K	0.405 0.892
	16DK/32DK TM2 DDO 16●K/32●K	AWG 22 0.035 mm ²	5 m	TWDFCW50K	0.670 1.477

Pre-formed connecting cables (1)

Description	Association	Jauge Section	Longueur cordon	Reference	Weight kg lb
Digital input pre-formed cables, 1 pre-formed cable: one end with 20-way HE 10 connector on TM2 side, one end with 20-way HE 10 connector on sensor side	Inputs TM2 DDI	AWG 28 0.080 mm ²	1 m	ABFTE20EP100	0.080 0.176
	16DK/32DK	AWG 28 0.080 mm ²	2 m	ABFTE20EP200	0.140 0.309
		AWG 28 0.080 mm ²	3 m	ABFTE20EP300	0.210 0.463
Digital output pre-formed cables 1 pre-formed cable: one end with 20-way HE 10 connector on TM2 side, one end with 20-way HE 10 connector on preactuator side	Outputs TM2 DDO	AWG 28 0.080 mm ²	1 m	ABFTE20SP100	0.080 0.176
	16TK/32TK	AWG 28 0.080 mm ²	2 m	ABFTE20SP200	0.140 0.309
		AWG 28 0.080 mm ²	3 m	ABFTE20SP300	0.210 0.463

(1) Cables for applications with Twido controllers.

Applications	Type of expansion modules Compatibility					
	<ul style="list-style-type: none"> - Modicon OTB interface modules - Magelis HMI Controller XBTGC - Modicon M221 logic controllers - Modicon M241 logic controllers - Modicon M251 logic controllers - Modicon M238 logic controllers - Twido controllers 					
						
Type	2 inputs		4 inputs		8 inputs	
Nature	Voltage/current		Thermocouple inputs	Voltage/current		Voltage/current
Connection	Removable screw terminal block					
Inputs	Range	0...10 V 4...20 mA (non differential)	Thermocouple type J, K and T (differential) (1)	<input type="checkbox"/> 0...10 V or 0...20 mA (Transfer time: 160 ms per channel) <input type="checkbox"/> Temperature probe 2, 3 or 4-wire: - Pt 100/1000: -200...600 °C, - Ni 100/1000: -50...150 °C (non differential) (Transfer time: 320 ms per channel + 1 controller cycle time)	0...10 V 0...20 mA (non differential)	
Resolution	12 bits (4096 points)	12 bits (4096 points)	12 bits (4096 points)	10 bits (1024 points)		
Acquisition period	10 ms per channel + 1 controller cycle time	200 ms per channel + 1 controller cycle time	<input type="checkbox"/> 160 ms per channel <input type="checkbox"/> 320 ms per channel + 1 controller cycle time	160 ms per channel + 1 controller cycle time		
Outputs	Range	-				
Resolution	-					
Transfer time	-					
External supply	Nominal voltage	≡ 24 V				
Limit values	≡ 20.4...28.8 V					
Isolation	Between channels	Non isolated				Non isolated
Between channels and sensor supply	~ 500 V rms		~ 2500 V rms		~ 2500 V rms	
Between channels and internal logic	~ 500 V rms		~ 2500 V rms		~ 2500 V rms	
Analog I/O module type	TM2AMI2HT	TM2AMI2LT	TM2AMI4LT	TM2AMI8HT		
Pages	19					

(1) ⚠ Analog inputs module TM2AMI2LT do not detect the absence/presence of PC R3 5984 cable.
 (2) Connection by a removable screw terminal block.
 (3) Connection by a RJ11 connector.
 (4) ⚠ When cable is disconnected, analog value is max.

Analog inputs (continued)			Analog outputs		Analog I/O						
<ul style="list-style-type: none"> - Modicon OTB interface modules - Magelis HMI Controller XBTGC - Modicon M221 logic controllers - Modicon M241 logic controllers - Modicon M251 logic controllers - Modicon M238 logic controllers - Twido controllers 											
											
8 inputs		1 output		2 outputs		2 inputs/1 output		4 inputs/2 outputs			
Temperature probe inputs		Voltage/current		Voltage		Voltage/current		Thermocouple/temperature probe inputs Voltage/current output			
Removable screw terminal block		Removable screw terminal block and RJ11 connectors		Removable screw terminal block							
NTC probe (non differential)	PTC probe ⚠ Threshold detection (high and low) (non dif.)	Temperature probe 2 or 3-wire Pt100: -200...600 °C Pt1000: -50...200 °C (non differential)		-		0...10 V 4...20 mA (non differential)		Thermocouple type J, K and T Temperature probe 2 or 3-wire Pt100: -100...500 °C (differential) (4)		0...10 V 4...20 mA (non differential)	
10 bits (1024 pts)	1 < range 2 = range 4 > range	12 bits (4096 points)		-		12 bits or 11 bits + sign (4096 points)		12 bits (4096 points)			
160 ms per channel + 1 controller cycle time	320 ms per channel (1280 ms maxi.) + 1 controller cycle time	-		-		10 ms per channel + 1 controller cycle time		50 ms per channel + 1 controller cycle time		16 ms (fast) / 64 ms (normal) per channel + 1 controller cycle time	
-		0...10 V 4...20 mA		± 10 V		0...10 V 4...20 mA		-		-	
-		12 bits (4096 points)		11 bits (2048 points) + sign		12 bits (4096 points)		-		-	
-		10 ms + 1 controller cycle time		2 ms + 1 controller cycle time		20 ms + 1 controller cycle time		-		-	
≡ 24 V		≡ 20.4...28.8 V		≡ 19.2...30 V		≡ 24 V		≡ 19.2...30 V		-	
Non isolated		Non isolated		~ 500 V rms		~ 500 V rms		Non isolated		~ 500 V rms	
~ 500 V rms		~ 500 V rms		~ 500 V rms		~ 500 V rms		~ 2500 V rms		~ 800 V rms	
~ 2500 V rms		~ 2500 V rms		~ 2500 V rms		~ 2500 V rms		~ 500 V rms		~ 1500 V rms	
TM2ARI8HT	TM2ARI8LT (2) TM2ARI8LRJ (3)	TM2AMO1HT	TM2AVO2HT	TM2AMM3HT	TM2ALM3LT	TM2AMM6HT					
19		19		19		19		19		19	

(1) ⚠ Analog inputs module TM2AMI2LT do not detect the absence/presence of PC R3 5984 cable.
 (2) Connection by a removable screw terminal block.
 (3) Connection by a RJ11 connector.
 (4) ⚠ When cable is disconnected, analog value is max.

Presentation

Analog I/O expansion modules enable the acquisition of various analog values encountered in industrial applications. Analog output modules are used to control the preactuators in devices such as variable speed drives, valves and applications that require process control. 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 with fallback (reset to the lowest scale value or hold the last value received). This function, when set to 'hold', is useful when debugging the application.

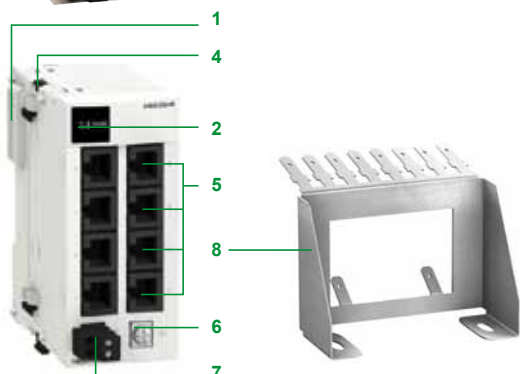
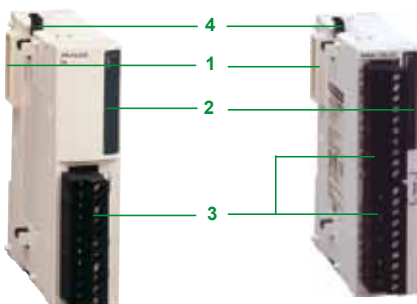
The following 10 analog I/O modules are available:

- One module with 2 inputs: 0...10 V, 4...20 mA
- One module with 2 inputs for type J, K and T thermocouples
- One module with 4 inputs: 0...10 V, 0...20 mA, Pt 100/1000 range - 200...600°C, Ni100/1000 range - 50...150°C
- Two modules with 8 temperature probe inputs: Pt100 range - 200...600°C and Pt1000 range - 50...200°C (with RJ11 connectors or removable screw terminal block)
- One module with 8 inputs: 0...10 V, 0...20 mA
- One module with 8 inputs: PTC/NTC (1)
- One module with 1 output: 0...10 V, 4...20 mA
- One module with 2 outputs: ± 10 V
- One mixed module with 2 inputs (0...10 V, 4...20 mA) and 1 output (0...10 V, 4...20 mA)
- One mixed module with 2 thermocouple (type J, K and T) or temperature probe inputs and 1 output 0...10 V, 4...20 mA
- One mixed module with 4 inputs (0...10 V, 4...20 mA) and 2 outputs (0...10 V, 4...20 mA)

Analog expansion modules offer a resolution of 10 bits, 11 bits + sign and 12 bits, with connection by removable screw terminal block. An external 24 V $\bar{\text{---}}$ power supply is required for each analog module.

These analog I/O expansion modules are mounted on symmetrical $\bar{\text{---}}$ rails to the right of base controller below. The maximum number of I/O and/or analog modules which may be mounted depends on the type of base controller:

Base controller type	Twido compact and modular						Modicon M238	Modicon M221 and M221 Book			Modicon M241 Modicon M251	Magelis HMI controller		Modicon OTB interface
	TWDLCA 10DRF, TWDLCA 16DRF	TWDLCA 24DRF	TWDLCA 40DRF	TWDLMA 20DK	TWDLMA 20DRT	TWDLMA 40DK	TM238 L.....	TM221C16, TM221CE16	TM221M16, TM221ME16, TM221M24, TM221M32TK, TM221M40	TM241C....., TM251MES	XBT GC1100	XBT GC2...0	OTB10 DM9LP	
Number of modules	0	4	7	4	7	7	7	7	7	7	2	3	7	



Analog I/O modules are electrically isolated with the use of a photocoupler between the internal electronic circuit and the input/output channels.

Description

Analog I/O modules comprise:

- 1 An extension connector for electrical connection to the adjacent module (2)
 - 2 A PWR display block
 - 3 One (or two, depending on model) removable screw terminal block(s) for connecting the 24 V $\bar{\text{---}}$ external power supply, the sensors and the preactuators
 - 4 A latching mechanism for attachment to the adjacent module
- For modules with 8 temperature probe inputs:
- 5 8 RJ11 connectors. A version of this module is available with 2 removable screw terminal blocks (2 x 13 terminals)
 - 6 A screw terminal for connecting the functional ground (FG)
 - 7 A removable screw terminal block for connecting the 24 V $\bar{\text{---}}$ power supply

The **TM2XMTGB** ground connection plate **8** simplifies connection of the analog sensor and actuator cable shielding. Connect this shielding to the device's functional ground (FG).

These modules are mounted on a symmetrical $\bar{\text{---}}$ rail. Mounting kit **TWDXMT5** can be used for plate or panel mounting.

(1) With PTC probe, threshold detection inputs (high and low).

(2) A connector on the right-hand side panel makes the continuity of the electrical link with the adjacent I/O module.



TM2AMI2HT



TM2AMI2LT



TM2ARI8LRJ



TM2ARI8LT



TM2ALMLT



TM2AMM6HT



TM2XMTGB



TM200 RSRCEMC

References

Analog input modules

Channel type	Input range	Output range	Resolution	Connection by	Reference	Weight kg lb
2 inputs	0...10 V 4...20 mA	–	12 bits	Removable screw terminal block (supplied)	TM2AMI2HT	0.085 0.187
	Thermocouple K, J, T	–	12 bits	Removable screw terminal block (supplied)	TM2AMI2LT	0.085 0.187
4 inputs	0...10 V 0...20 mA Temperature	–	12 bits	Removable screw terminal block (supplied)	TM2AMI4LT	0.085 0.187
8 inputs	0...10 V 0...20 mA	–	10 bits	Removable screw terminal block (supplied)	TM2AMI8HT	0.085 0.187
	Pt 100 Pt 1000	–	12 bits	RJ11 connector	TM2ARI8LRJ	0.190 0.419
				Removable screw terminal block (supplied)	TM2ARI8LT	0.190 0.419
	PTC/NTC	–	10 bits for NTC 2-threshold detection with PTC	Removable screw terminal block (supplied)	TM2ARI8HT	0.085 0.187

Analog output modules

1 output	–	0...10 V 4...20 mA	12 bits	Removable screw terminal block (supplied)	TM2AMO1HT	0.085 0.187
2 outputs	–	± 10 V	11 bits + sign	Removable screw terminal block (supplied)	TM2AVO2HT	0.085 0.187

Analog I/O modules

2 inputs and 1 output	0...10 V 4...20 mA	0...10 V 4...20 mA	12 bits	Removable screw terminal block (supplied)	TM2AMM3HT	0.085 0.187
	J, K, T thermocouple 3-wire Pt 100 temperature probe	0...10 V 4...20 mA	12 bits	Removable screw terminal block (supplied)	TM2ALM3LT	0.085 0.187
4 inputs and 2 outputs	0...10 V 4...20 mA	0...10 V 4...20 mA	12 bits	Removable screw terminal block (supplied)	TM2AMM6HT	0.085 0.187

Separate components

Description	Description	Reference	Weight kg lb
Ground connection plate	Plate equipped with male Faston connector for connecting cable shielding (via Faston clamp 6.35 mm/0.25 in., not supplied) and functional grounds (FG)	TM2XMTGB	0.045 0.099
Shielding connection clamps	Attach and ground the shielding of the cables <i>Sold in lots of 25 (20 for cable Ø 4.8 mm/Ø 0.19 in. and 5 for cable Ø 7.9 mm/Ø 0.31 in.)</i>	TM200RSRCEMC	–
Mounting kit	For plate or panel mounting of the analog modules. <i>Sold in lots of 5</i>	TWDXMT5	0.065 0.143

Presentation

TM200HSC206DT/DF Expert modules for Modicon M238 logic controllers and HMI controllers XBTGC are used to count the pulses generated by a sensor or to process the signals from an incremental encoder.

The two modules, both with two 60 KHz counter channels, differ in the way they are connected:

- Removable screw terminal block (2 x 16 contacts): **TM200HSC206DT**
- Removable spring terminals **TM200HSC206DF**

Expert modules	No. of channels	Maximum frequency	Integrated functions	Physical I/O per channel	
				Inputs	Outputs
TM200HSC206DT TM200HSC206DF (3 modules max. per controller.)	2	60 KHz	Upcounting Downcounting Period meter Frequency meter Frequency generator Axis following with encoder	6	2

The sensors used on each channel can be:

- 2-wire 24 V proximity sensors,
- 3-wire PNP 24 V proximity sensors,
- Limit switches (N/O or N/C contact),
- 15/30 V output signal incremental encoders and source outputs (positive logic).

TM200HSC206D Expert modules meet the requirements of such applications as:

- Message generation on empty unwinder status using the ratio,
- Sorting small parts using the period meter,
- Single electronic cam using the dynamic setting thresholds,
- Speed control using the period meter,
- Grouping/ungrouping for packaging machines,
- Event counting,
- Flow or speed measurement.

TM200HSC206D Expert modules are considered to be expansion modules and as such are connected to a controller by stacking them on a symmetrical rail, starting at the right-hand side panel of each controller.

The function parameters are set by configuration using SoMachine software.

Description

TM200HSC206D 60 KHz Expert modules comprise:

- 1 An extension connector for linking with the adjacent module (1).
- 2 A channel and module diagnostics display block.
- 3 2 removable screw or spring terminal blocks marked TB0 and TB1 for connecting the sensors and preactuators.
- 4 A mechanical device for locking to the adjacent module.
- 5 A screw terminal for the functional ground (FG) connection.

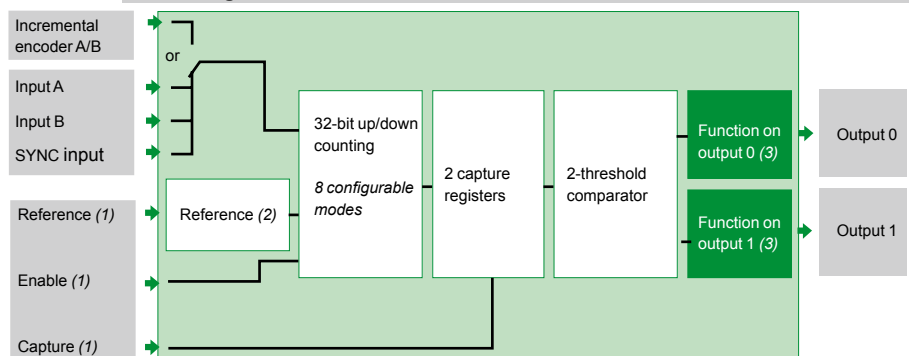
The **TM2XMTGB** ground connection plate 6 simplifies connection of the sensor and encoder cable shielding. Connect this shielding to the device's functional ground.

These modules are mounted as standard on a symmetrical rail. The **TWDXMT5** mounting kit can be used for plate or panel mounting.

(1) A connector on the right-hand side panel makes continuity of the link with the adjacent I/O module.

Operation

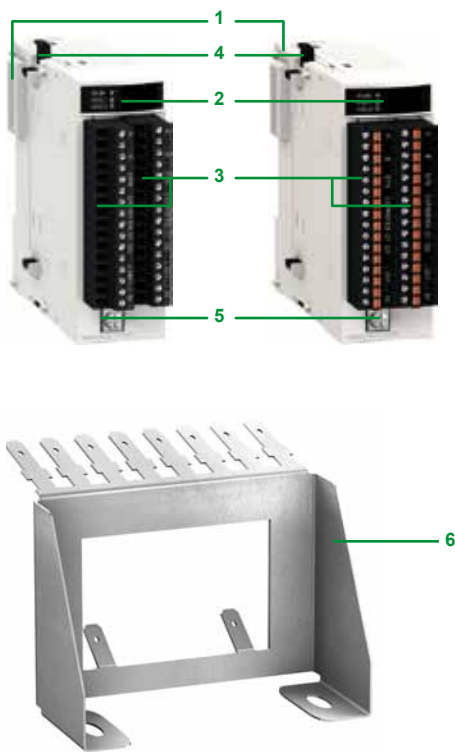
Block diagram of a TM200HSC206DT/DF module counter channel



(1) Optional inputs.

(2) Reference: 4 operating modes for "IN_SYNC" SYNC and "IN_REF" Reference inputs.

(3) Function on outputs: 11 possible types of behaviour.





TM200HSC206DT



TM200HSC206DF



TM2XMTGB

References

Expert modules (3 modules max. per controller)

Description	No. of channels	Characteristics	Connection	Reference	Weight kg /lb
Counter modules for: - 24 V $\overline{\text{DC}}$ 2 and 3-wire sensors - 15/30 V $\overline{\text{DC}}$ incremental encoders with source outputs (positive logic)	2	60 kHz counting	Screw terminals	TM200HSC206DT	0.150 0.331
			Spring terminals	TM200HSC206DF	0.150 0.331

Separate parts

Designation	Description	Reference	Weight kg /lb
Ground connection 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 Sold in lots of 5	For plate or panel mounting of the analog modules	TWDXMT5	0.065 0.143

A	
ABFTE20EP100	15
ABFTE20EP200	15
ABFTE20EP300	15
ABFTE20SP100	15
ABFTE20SP200	15
ABFTE20SP300	15

F	
FTXES01	7

O	
OTB1C0DM9LP	6
OTB1E0DM9LP	6
OTB1S0DM9LP	6
OTB9ZZ61JP	7

T	
TM2ALM3LT	19
TM2AMI2HT	19
TM2AMI2LT	19
TM2AMI4LT	19
TM2AMI8HT	19
TM2AMM3HT	19
TM2AMM6HT	19
TM2AMO1HT	19
TM2ARI8HT	19
TM2ARI8LRJ	19
TM2ARI8LT	19
TM2AVO2HT	19
TM2DAI8DT	14
TM2DDI8DT	14
TM2DDI16DK	14
TM2DDI16DT	14
TM2DDI32DK	14
TM2DDO8TT	14
TM2DDO8UT	14
TM2DDO16TK	14
TM2DDO16UK	14
TM2DDO32TK	14
TM2DDO32UK	14
TM2DMM8DRT	14
TM2DMM24DRF	14
TM2DRA8RT	14
TM2DRA16RT	14
TM2XMTGB	19
	21
TM200HSC206DF	21
TM200HSC206DT	21
TM200RSRCEMC	19
TWDFCN2K20	15
TWDFCN2K26	15
TWDFCW30K	15
TWDFCW50K	15
TWDXMT5	7
	15
	19
	21

The Next Generation



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