Modicon OTB interface modules
Modicon TM2 expansion modules

Catalog

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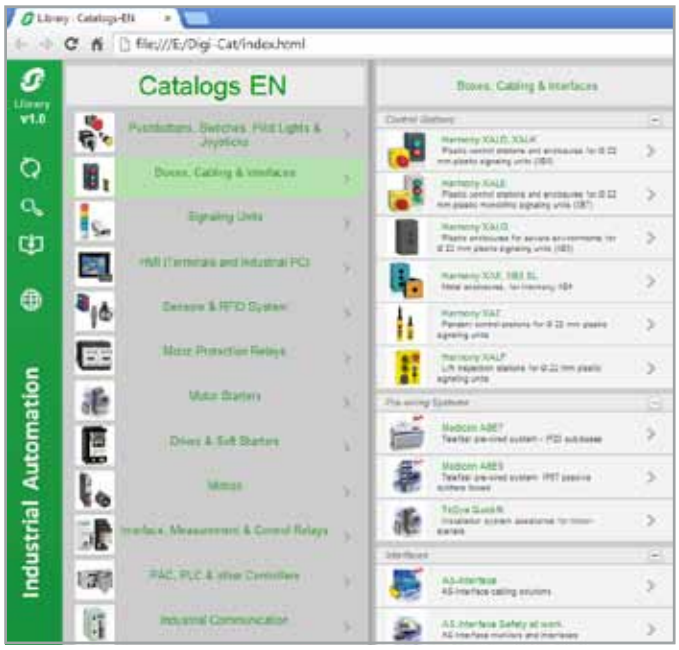

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General content

Modicon OTB interface modules

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

Applications		**Data exchange between a control source (PLC, variable speed drives, PC, etc.) and the inputs and outputs**	**Data exchange between a control source (PLC, variable speed drives, PC, etc.) and the inputs and outputs**
Compatibility		□ **Magelis HMI Controller XBTGC** □ **Drive controllers Altivar IMC (with Altivar 61 or Altivar 71 variable speed drives)** □ **Modicon TM2 I/O expansion modules**	□ **Magelis HMI Controller XBTGC** □ **Drive controllers Altivar IMC (with Altivar 61 or Altivar 71 variable speed drives)** □ **Modicon TM2 I/O expansion modules**
Type of bus or network		**Ethernet Modbus/TCP network**	**CANopen bus** / **Modbus Serial link**
			 
Nature of bus or network		Mixed local industrial network	CAN fieldbus / Local RS 485 network
Structure	Physical interface	10/100 BASE-T (RJ 45 connector)	ISO 11898 (SUB-D 9-pin connector) / RS 485 (2 x RJ 45 connectors in parallel)
	Access method	CSMA-CD	CSMA-MA, multimaster / Master-slave
	Transfer rate	10/100 Mbit/s	10…1000 Kbit/s depending on distance / 1.2…38.4 Kbit/s
Medium		Shielded dual twisted pair via Ethernet **ConneXium** cabling system	Shielded dual twisted pair / Dual twisted pair
Configuration	Number of devices	256 max. per network segment. Unlimited using switches.	127 slaves / 32 slaves per segment
	Maximum length (distance)	500 m *(1640 ft)* according to standard 802.3 1000 m *(3280 ft)* with **ConneXium** cabling system	From 30 m *(98.43 ft)* (1 Mbit/s) to 1000 m *(3280 ft)* (> 50 Kbit/s) / Up to 1000 m *(3280 ft)*
Digital inputs/outputs	Number of I/O	20 I/O	20 I/O
	Number of inputs	12 ⎓ 24 V sink/source (PNP or NPN) inputs	12 ⎓ 24 V sink/source (PNP or NPN) inputs
	Number of outputs	6 relay outputs and 2 ⎓ 24 V transistor, source (PNP) outputs	6 relay outputs and 2 ⎓ 24 V transistor, source (PNP) outputs
Type of connection		Removable screw terminal blocks	Removable screw terminal blocks
Input/output extension	Number of extension modules	7 digital or analogue input/output modules, or connection accessories	7 digital or analogue input/output modules, or connection accessories
	Maximum I/O configuration	With interface module: - 132 with screw terminal digital I/O extension module, - 164 with spring terminal digital I/O extension module, - 288 with type HE10 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)	With interface module: - 132 with screw terminal digital I/O extension module, - 164 with spring terminal digital I/O extension module, - 288 with type HE10 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	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 - up/down counting with preset value
	or Counting, 20 kHz	2 channels, 32 bits (0…4 294 967 295 points) - dedicated digital inputs/outputs - up/down counting, up counting, down counting, frequency meter	2 channels, 32 bits (0…4 294 967 295 points) - dedicated digital inputs/outputs - up/down counting, up counting, down counting, frequency meter
	Pulse generator, 7 kHz	2 PWM function channels (output with pulse width modulation) and PLS function (pulse generator output)	2 PWM function channels (output with pulse width modulation) and PLS function (pulse generator output)
Supply voltage		⎓ 24 V supply	⎓ 24 V supply
Type		**OTB1E0DM9LP**	**OTB1C0DM9LP** / **OTB1S0DM9LP**
Page		6	6 / 6

Modicon OTB interface modules

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

Modicon OTB islands on CANopen bus

OTB1E0DM9LP
interface module for Ethernet Modbus/TCP network

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

OTB9ZZ61JP
common module

Presentation

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●0DM9LP** 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 ⎓ 24 V inputs,
- 6 relay outputs,
- 2 ⎓ 24 V solid-state outputs.

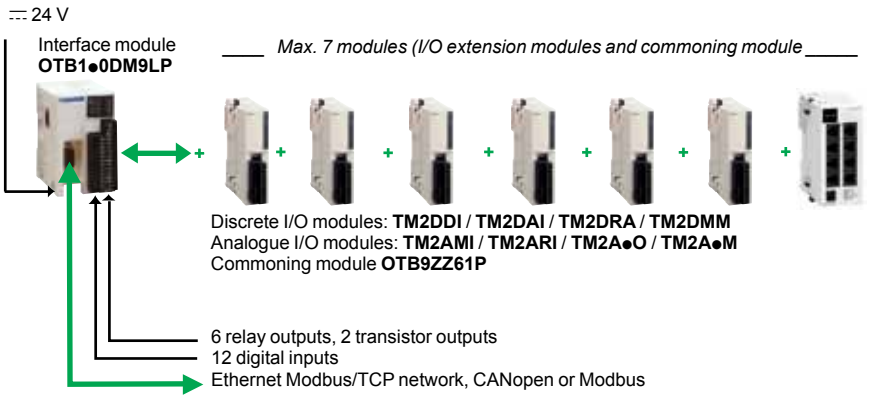
All the bases use a ⎓ 24 V supply. Of monobloc design, each Modicon OTB interface module can be fitted with extension modules of Twido programmable controller range.
With its range of I/O extensions, the Modicon OTB offer provides a modularity that allows all requirements to be met, commencing with a 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.

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.

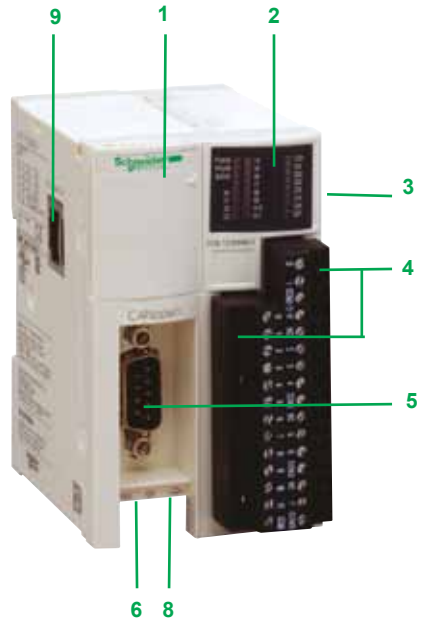
7 Two RJ45 connectors in parallel for connection to the Modbus serial link with **OTB1S0DM9LP** interface.

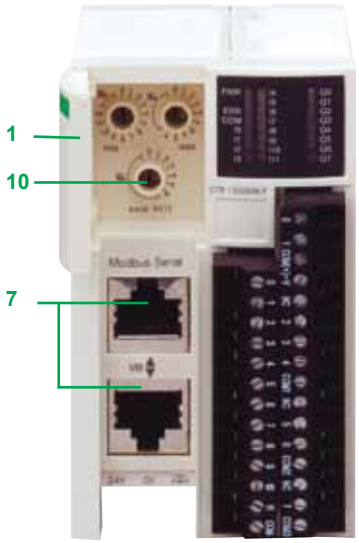
8 A screw terminal block for connecting the 24 V ⎓ power supply.

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

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OTB1E0DM9LP

OTB1C0DM9LP

OTB1S0DM9LP

Interface modules with integrated digital I/O

Supply voltage	Number and type of inputs	Number and type of solid-state outputs	Number and type of relay outputs	Connection by	Fieldbus or network	Reference	Weight kg/ *lb*
⎓ **24 V**	12 I ⎓ 24 V IEC type 1 (1 common)	2 O ⎓ 24 V 0.3 A (1 common)	6 O ⎓ 30 V/ ∿ 240 V 2 A (3 commons)	Removable screw terminal block	Ethernet Modbus/TCP	**OTB1E0DM9LP**	0.185 *0.407*
					CANopen bus	**OTB1C0DM9LP**	0.195 *0.429*
					Modbus RS 485 Serial link	**OTB1S0DM9LP**	0.190 *0.418*

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

Modicon TM2 Expansion modules
Modicon TM2 Digital modules

Applications	Type of expansion modules	**Digital inputs with removable screw terminal block**			**Digital inputs with HE10 connector**		**Digital I/O with removable screw terminal block**	**Digital I/O with non-removable spring terminal block**
	Compatibility	**- 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**			**- 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 ⎓ 24 V inputs	8 ∿ 120 V inputs	16 ⎓ 24 V inputs	16 ⎓ 24 V inputs	32 ⎓ 24 V inputs	4 ⎓ 24 V inputs/4 relay outputs	16 ⎓ 24 V inputs/8 relay outputs
Connection		By removable screw terminal block			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	⎓ 20.4...28.8 V	∿ 85...132 V	⎓ 20.4...28.8 V	⎓ 20.4...28.8 V		⎓ 20.4...28.8 V	
	Input current	7 mA per channel	7.5 mA per channel	7 mA per channel	5 mA per channel		7 mA per channel	
	Input logic	Sink/source *(1)*	–	Sink/source *(1)*	Sink/source *(1)*		Sink/source *(1)*	
	Commons	1 x 8 channels	1 x 8 channels	1 x 16 channels	1 x 16 channels	2 x 16 channels	1 x 4 channels	1 x 16 channels
	Response time □ Off-on	4 ms	25 ms	4 ms	4 ms		4 ms	
	□ On-off	4 ms	30 ms	4 ms	4 ms		4 ms	
Outputs	Output types	–			–		1 N/O contact	
	Voltage range	–			–		∿ 240 V, ⎓ 30V	
	Commons	–			–		1 x 4 channels	2 x 4 channels
	Output current □ Per output	–			–		2 A (Ith)	
	□ Per group of channels	–			–		7 A (Ith)	
Isolation	Between channels	None			None		None between input channels, none between output channels Between input group and output groups: 1500 V rms ∿ for 1 min Between output groups: 1500 V rms ∿ for 1 min	
	Between channels and internal logic	500 V rms ∿ for 1 min	1500 V rms ∿ for 1 min	500 V rms ∿ for 1 min	500 V rms ∿ for 1 min		Between input channels and internal logic: 500 V rms ∿ for 1 min Between output channels and internal logic: 2300 V rms ∿ for 1 min	
I/O module type		**TM2DDI8DT**	**TM2DAI8DT**	**TM2DDI16DT**	**TM2DDI16DK**	**TM2DDI32DK**	**TM2DMM8DRT**	**TM2DMM24DRF**
Pages		14			14			

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

Modicon TM2 Expansion modules
Modicon TM2 Digital modules

Applications	Type of expansion modules	**8/16 outputs with removable screw terminal block**				**16/32 outputs with HE 10 connectors**			
	Compatibility	**- 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**				**- 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		16 ⎓ 24 V transistor outputs	16 ⎓ 24 V transistor outputs	32 ⎓ 24 V transistor outputs	32 ⎓ 24 V transistor outputs
Connection		By removable screw terminal block				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
Outputs	Output types	Transistor		Relay with 1 N/O contact		Transistors			
	Voltage range	⎓ 20.4..28.8 V		∿ 240 V, ⎓ 30 V		⎓ 20.4...28.8 V			
	Logic *(1)*	Sink	Source	–		Sink	Source	Sink	Source
	Commons	1 x 8 channels		2 x 4 channels	2 x 8 channels	1 x 16 channels		2 x 16 channels	
	Output current □ Per output	0.3 A max.	0.5 A max.	2 A max.		0.1 A max.	0.4 A max.	0.1 A max.	0.4 A max.
	□ Per group of channels	3 A at 28.8 V	4 A at 28.8 V	7 A max.	8 A max.	1 A at 28.8 V	2 A at 28.8 V	1 A at 28.8 V	2 A at 28.8 V
	Protection against overload and short-circuit	–	Yes, with automatic reactivation	–		–	Yes, with automatic reactivation	–	Yes, with automatic reactivation
Isolation	Between channels	None		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		500 V rms ∿ for 1 min			
Output module type		**TM2DDO8UT**	**TM2DDO8TT**	**TM2DRA8RT**	**TM2DRA16RT**	**TM2DDO16UK**	**TM2DDO16TK**	**TM2DDO32UK**	**TM2DDO32TK**
Pages		14				14			

(1) Source output: positive logic, sink output: negative logic.

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.

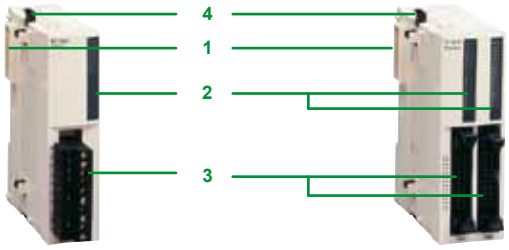
The narrow width of these I/O modules (17.5 mm/*0.69 in.*, 23.5 mm/*0.93 in.*, 29.7 mm/*1.17 in.* or 39.1 mm/*1.54 in.*) makes it possible to build Modicon M238, Twido or Modicon OTB configurations of up to 248 I/O with a minimal overall size of L 364.9 mm/*14.37 in.* x H 90 mm/*3.54 in.* x D 81.3 mm/*3.20 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**
	TWDLC●A 10DRF, TWDLC●A 16DRF	**TWD LC●A 24DRF**	**TWD LC●● 40DRF**	**TWD LMDA 20D●K**	**TWD LMDA 20DRT**	**TWD LMDA 40D●K**	**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.

Modicon TM2 Expansion modules
Modicon TM2 Digital modules



Module with removable screw terminal block

Module with HE 10 connector

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 ⊔ 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 (Ith) **∼ 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 (Ith)	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 (Ith)	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	**TWDFCN2K20**	–
	26	**TWDFCN2K26**	–

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

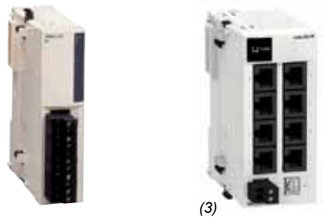
Description	For use with Twido	Gauge C.s.a.	Cable length	Reference	Weight kg *lb*
Pre-formed cables 1 pre-formed cable: one end fitted with HE 10 connector, one end with free wires	I/O expansions TM2 DDI 16DK/32DK TM2 DDO 16●K/32●K	AWG 22 0.035 mm^2	3 m	**TWDFCW30K**	0.405 *0.892*
		AWG 22 0.035 mm^2	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 16DK/32DK	AWG 28 0.080 mm^2	1 m	**ABFTE20EP100**	0.080 *0.176*
		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 16TK/32TK	AWG 28 0.080 mm^2	1 m	**ABFTE20SP100**	0.080 *0.176*
		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.

Modicon TM2 Expansion modules
Modicon TM2 Analog modules

Applications	Type of expansion modules	Analog inputs				Analog inputs (continued)		Analog outputs		Analog I/O		
	Compatibility	- 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				- 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						
						 (3)						
Type		2 inputs		4 inputs	8 inputs	8 inputs		1 output	2 outputs	2 inputs/1 output		4 inputs/2 outputs
Nature		Voltage/current	Thermocouple inputs	Voltage/current Temperature probe	Voltage/current	Temperature probe inputs		Voltage/current	Voltage	Voltage/current	Thermocouple/ temperature probe inputs Voltage/current output	Voltage/current
Connection		Removable screw terminal block				Removable screw terminal block	Removable screw terminal block and RJ11 connectors	Removable screw terminal block				
Inputs	Range	0...10 V 4...20 mA (non differential)	Thermocouple type J, K and T (differential) *(1)*	□ 0...10 V or 0...20 mA *(Transfer time: 160 ms per channel)* □ 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)	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)
	Resolution	12 bits (4096 points)	12 bits (4096 points)	12 bits (4096 points)	10 bits (1024 points)	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)
	Acquisition period	10 ms per channel + 1 controller cycle time	200 ms per channel + 1 controller cycle time	□ 160 ms per channel □ 320 ms per channel + 1 controller cycle time	160 ms per channel + 1 controller cycle time	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
Outputs	Range	–				–		0...10 V 4...20 mA	± 10 V	0...10 V 4...20 mA		
	Resolution	–				–		12 bits (4096 points)	11 bits (2048 points) + sign	12 bits (4096 points)		
	Transfer time	–				–		10 ms + 1 controller cycle time	2 ms + 1 controller cycle time	20 ms + 1 controller cycle time		
External suplly	Nominal voltage	⎓ 24 V				⎓ 24 V		⎓ 24 V				
	Limit values	⎓ 20.4…28.8 V				⎓ 20.4…28.8 V	⎓ 19.2…30 V	⎓ 19.2…30 V				
Isolation	Between channels	Non isolated				Non isolated						
	Between channels and sensor supply	∿ 500 V rms		Non isolated		Non isolated	∿ 500 V rms	∿ 500 V rms	Non isolated	∿ 500 V rms		∿ 800 V rms
	Between channels and internal logic	∿ 500 V rms	∿ 2500 V rms	∿ 2500 V rms		∿ 2500 V rms		∿ 500 V rms	∿ 2500 V rms	∿ 500 V rms		∿ 1500 V rms
Analog I/O module type		**TM2AMI2HT**	**TM2AMI2LT**	**TM2AMI4LT**	**TM2AMI8HT**	**TM2ARI8HT**	**TM2ARI8LT** *(2)* **TM2ARI8LRJ** *(3)*	**TM2AMO1HT**	**TM2AVO2HT**	**TM2AMM3HT**	**TM2ALM3LT**	**TM2AMM6HT**
Pages		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.

More technical information on www.schneider-electric.com

Modicon TM2 Expansion modules
Modicon TM2 Analog modules

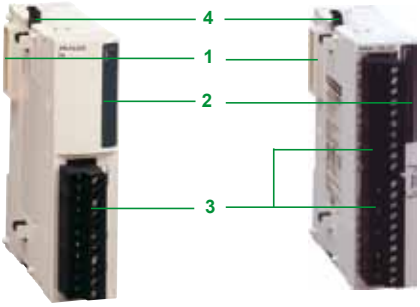
Presentation

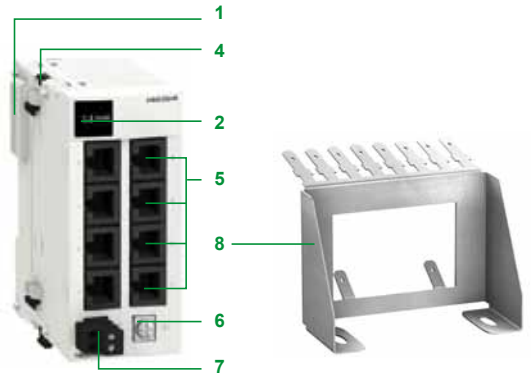
Analog I/O expansion modules enable the acquisition of various analog values encountered in industrial applications.
Analog output modules are used to control the preactuators in devices such as variable speed drives, valves and applications that require process control. The output current or voltage 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 ⎓ power supply is required for each analog module.
These analog I/O expansion modules are mounted on symmetrical ⊔ 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
	TWDLC●A 10DRF, TWDLC●A 16DRF	TWD LC●A 24DRF	TWD LC●● 40DRF	TWD LMDA 20D●K	TWD LMDA 20DRT	TWD LMDA 40D●K	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





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 ⎓ 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 ⎓ 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 ⊔ 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.

Modicon TM2 Expansion modules
Modicon TM2 Analog modules


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*

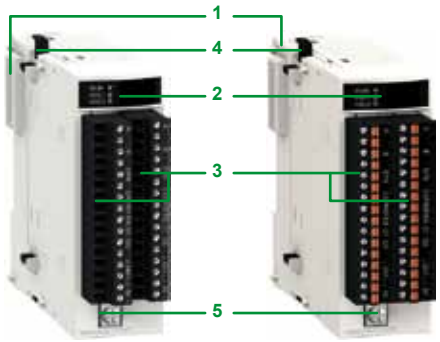
Analog I/O modules

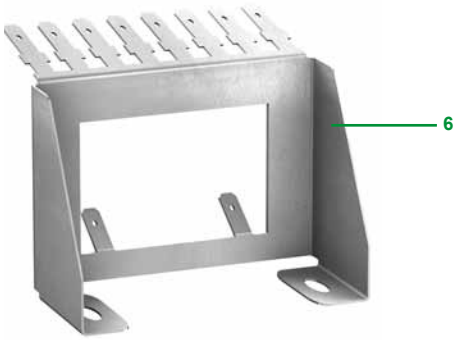
2 inputs and 1 output	0…10 V 4…20 mA	0…10 V 4…20 mA	12 bits	Removable screw terminal block (supplied)	**TM2AMM3HT**	0.085 *0.187*
	J, K, T thermocouple 3-wire Pt 100 temperature probe	0…10 V 4…20 mA	12 bits	Removable screw terminal block (supplied)	**TM2ALM3LT**	0.085 *0.187*
4 inputs and 2 outputs	0…10 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 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.*)	**TM200RSRCEMC**	–
Mounting kit	For plate or panel mounting of the analog modules. Sold in lots of 5	**TWDXMT5**	0.065 *0.143*

Modicon TM2 Expansion modules
Modicon TM2 Expert modules





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.

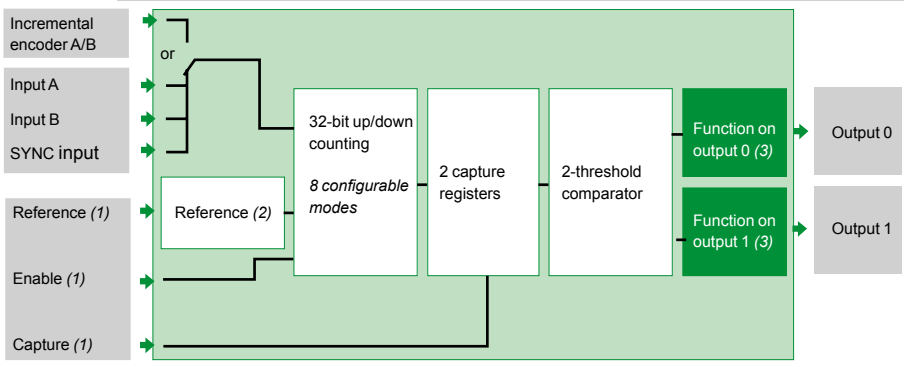
The **TM2XMTGB** ground connection plate **6** simplifies connection of the sensor and encoder cable shielding. Connect this shielding to the device's functional ground.

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.

Modicon TM2 Expansion modules
Modicon TM2 Expert modules

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 ⎓ 2 and 3-wire sensors - 15/30 V ⎓ 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*

The Next Generation

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