

# Motion controller Modicon LMC058

Catalogue  
September 2010



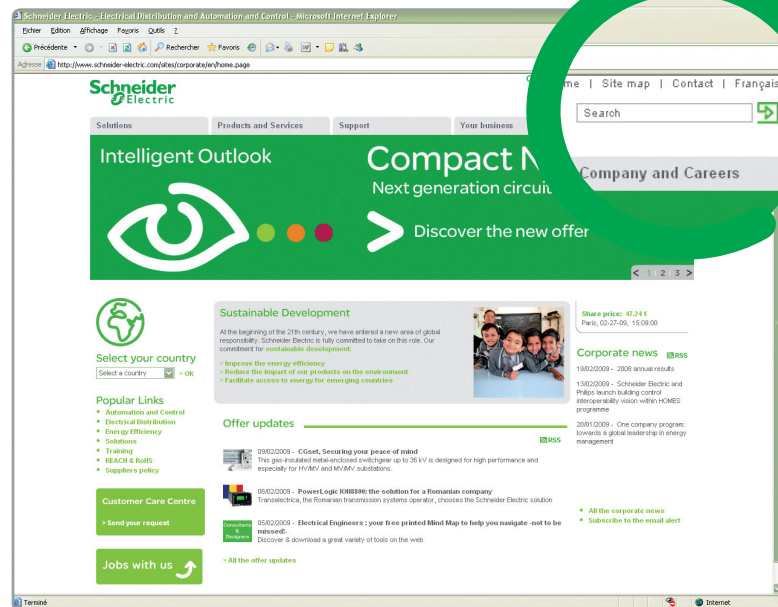


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Browse the “product data sheet” to check out :

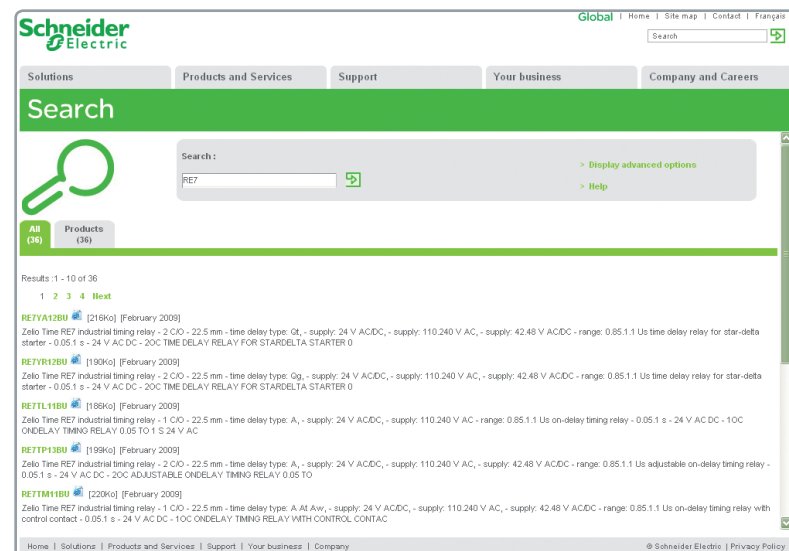
- characteristics,
- dimensions,
- curves, ...
- and also the links to the user guides and the CAD files.

**1** From the home page, type the model number\* into the “Search” box.



\* type the model number without any blank, replace “●” by “\*”

**2** Under “All” tab, click the model number that interests you.



### 3 The product data sheet displays.

Example : Zelio Time data sheet

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**Zelio Time-RE 7 / RE 8 / RE 9**  
Timer relays that are simply ingenious

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**RE7YA12BU**

Zelio Time RE7 industrial timing relay - 2 C/O - 22.5 mm - time delay type: Ot. - supply: 110...240 V AC, - supply: 42...48 V AC/DC - range: 0.85...1.1 Us

**Main**

range of product	Zelio Time
product or component type	industrial timing relay
discrete output type	relay
width pitch dimension	22.5 mm
contacts type and composition	2 C/O
component name	RE7
contacts material	90/10 silver nickel contacts
time delay type	On
time delay range	0.05 s - 300 h
[Us] rated supply voltage	24 V AC/DC 50/60 Hz
	110...240 V AC 50/60 Hz
	42...48 V AC/DC 50/60 Hz
product weight	0.15 kg
voltage range	0.85...1.1 Us
tightening torque	0.8...1.1 N.m
CAD overall width	22.5 mm
CAD overall height	78 mm
CAD overall depth	80 mm

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<b>Flexible modular system</b>	
■ General presentation .....	4
<b>Compact bases</b>	
■ Selection guide .....	8
■ Presentation .....	10
■ Description .....	13
■ References .....	14
<b>Accessories, connection cables, USB memory stick</b>	
■ References .....	15
<b>Built-in CANopen bus port</b>	
■ Presentation .....	16
■ Architecture, references .....	18
<b>CANopen bus</b>	
■ Cabling system .....	18
■ References .....	19
<b>Modbus and Character mode serial link</b>	
■ Cabling system .....	20
■ Connections, references .....	21
<b>Ethernet Modbus/TCP network</b>	
■ Cabling system .....	22
■ References .....	23
<b>Communication modules</b>	
■ Presentation, description .....	24
■ References .....	23
<b>Discrete slice I/O extension modules</b>	
■ Selection guide .....	26
■ Presentation, description .....	28
■ References .....	29
■ Presentation, description .....	30
■ References .....	31
<b>Slice common distribution modules</b>	
■ Presentation .....	32
■ References .....	33
<b>Analog slice I/O extension modules</b>	
■ Selection guide .....	34
■ Presentation, description .....	36
■ References .....	37
<b>Slice counter modules</b>	
■ Selection guide .....	38
■ Presentation, description .....	40
■ References .....	41
<b>Slice power distribution modules</b>	
■ Presentation .....	42
■ References .....	43
<b>Slice remote I/O modules</b>	
■ Presentation .....	44
■ References .....	45
<b>SoMachine</b>	
■ Presentation .....	46
■ Characteristics .....	48
■ References .....	49
<b>Altivar 32 variable speed drives and Lexium 32 motion control</b>	
■ Offer for complex machines .....	50
<b>TeSys motor starters - open version</b>	
■ Selection guide .....	52
<b>Power supplies for DC control circuits</b>	
■ Selection guide .....	54
<b>Operator dialogue terminals: Magelis XBT GT/GK/GH/GTW Advanced Panels</b>	
■ Selection guide .....	56
<b>Compatibility: inputs/outputs modules</b>	
■ and OsiSense® XU photo-electric sensors .....	60
■ and OsiSense® XS inductive proximity sensors .....	62
■ and OsiSense® XCC rotary encoders .....	64
<b>Product reference index</b> .....	66



Motion controller Modicon LMC058

The Motion controller Modicon LMC058 is the optimum solution for axis control and positioning, including automation functions. Part of Schneider Electric's "Flexible Machine Control" concept, it meets the needs of a wide range of applications in all business sectors.

This motion controller is designed for machine manufacturers (OEMs) who require synchronized axes, focusing on applications such as packaging, conveying and storage machines, metal and wood working machines, etc. and offers high-performance solutions for velocity control, counting, axis control and communication functions.

To this end, the LMC058 master motion controller includes as standard:

- A CANopen master
- A CANmotion master dedicated to control of up to 8 synchronized axes, with a performance of 2 ms for 4 axes

With Motion controllers Modicon LMC058, Lexium 32 and Lexium SD3 drives, and BSH and BDH servo motors, Schneider Electric offers a complete, high-performance and cost-effective solution.

### Applications

The motion controller Modicon LMC058 performs axis synchronization and coordination, via a fieldbus, for applications requiring control of up to 8 synchronized axes.

It integrates the standard motion control functions:

- Velocity control and torque control
- Relative or absolute positioning
- Cam profiles for slave axes and control of programmable cam switches
- Virtual axes
- Electronic gearing function for velocity and position, linear and circular interpolations (2½D)
- Master axis using an external encoder
- Distance measurement and position capture on high-speed (30 µs) discrete input

This is specifically designed for applications such as:

- Material handling machines (conveyors, palletizers, storage and retrieval systems, etc.) and transfer machines (cranes, etc.)
- Assembly machines (tool fixing, clamping, etc.)
- Inspection and quality control machines
- Packaging machines working "on the fly" (flying shear, printing, marking, etc.)
- Wood and metal working machines

### Performance

In terms of performance, the motion controller Modicon LMC058 has a Dual-Core processor:

- Core 1 is dedicated exclusively to managing program tasks and offers the maximum resources for real-time execution of synchronized axis control and the application code.
- Core 2 is dedicated to executing communication tasks, which then have no further impact on the application execution performance.

Execution of the Motion task is synchronized with the CANmotion bus cycle time.

This task calculates the position of the synchronized axes and is programmed with SoMachine V2.0 software, which offers six IEC 61131-3 programming languages:

- ☐ Instruction List (IL)
- ☐ Ladder (LD)
- ☐ Function Block Diagram (FBD)
- ☐ Grafcet (SFC)
- ☐ Structured Text (ST)
- ☐ Continuous Function Chart (CFC)

The ease of use of PLCopen function blocks significantly reduces the time taken to program motion control and control independent and synchronized axes on machines.

The ability to combine motion functions with standard automation functions offers both maximum flexibility and a high level of performance. The LMC058 master motion controller is able to control synchronization of real, remote and virtual axes.



### Performance (continued)

To improve the performance and reliability of your machines, the LMC058 motion controller has a 15-way SUB-D connection for a master encoder (incremental or SSI).

With an execution speed of **22 ns** for a Boolean instruction i.e. more than **45,000 Boolean instructions** per ms, the capacity to manage up to **2400 I/O**, a **64 MB** RAM that can store data and programs as well as a **128 MB** Flash memory for application and data backup, the motion controller Modicon LMC058 eliminates any doubts about the machine's capabilities.

In developing the motion controller Modicon LMC058, the cost aspect was taken into account, and the CPUs are equipped as standard with:

- 42 discrete I/O
- Embedded serial link and Ethernet port
- 4 analog inputs (reference LMC058 LF424)
- A CANopen master
- A CANmotion master

### Development and technology

In all its characteristics, the motion controller Modicon LMC058 has been developed to minimize the costs of assembly, cabling, commissioning and maintenance.

To this end:

- All the modules have removable terminals.
- All the electrical connections are made on spring terminals, speeding up the wiring process and also avoiding the need for periodic retightening. In addition, each terminal has a test point for a voltage sensing device.
- The embedded serial link and Ethernet port on the motion controller Modicon LMC058 have an RJ45 connection at 45° for quick visible connection of the communication channels.
- The modularity of the various bases and extension modules has been optimized in order to significantly reduce the number of references to be ordered and assembled, while ensuring the minimum investment in your configuration is necessary, thanks to a capacity of between 2 and 42 channels per extension module.
- Mechanical assembly of the various parts has been designed to save a considerable amount of time during assembly.

### Software configuration

Configuration and programming of all motion controller Modicon LMC058s and equipment in Schneider Electric's "Flexible Machine Control" concept are both designed to cut costs and optimize machine performance, using SoMachine V2.0.

To reduce the configuration time of device, a selection of function blocks is available in the "Motion Library":

- Library for ATV on CANopen
- Lexium library for Lexium 32 and Lexium SD3 on CANopen and CANmotion
- Lexium library for the whole ILx range on CANopen

This PLCopen-compliant library consists of administrative function blocks (read/write parameters, states, etc.) and single-axis and multi-axis function blocks.

The main functions are as follows:

- Power On, stop, reset
- Relative, absolute or additional positioning
- Continuous positioning (reaching a position at a predefined speed)
- Velocity control
- Velocity profile
- Position profile
- Cam profile
- Electronic gearing
- Phasing
- Programmable cam switch
- Linear or circular interpolation

### User library

With SoMachine V2.0 software, it is very easy to create your own function blocks (user library) to reduce programming times. Creating a user library simplifies the standardization and reuse of programs and also allows you to protect your know-how.



SoMachine V2.0 software platform

### Application function blocks (AFB)

This is a library of functions developed specifically by Schneider Electric. It contains application functions currently encountered in applications in the fields of assembly, material handling and cutting to length. Each function block has a large number of mechanical and application variants.

The use of function blocks:

- Saves programming time
- Saves setup time
- Simplifies reading

The function blocks available in the library are:

- Flying shear
- Rotary knife
- Grouping/ungrouping
- Clamping with torque control
- Etc.

*Nota: AFB are available only on the type S motion controllers: LMC058...S0 with SoMachine extension. See page 49.*

### Functions

#### Analog functions

For machines that require functions to process data issued by analog sensors/actuators (voltage or current), temperature sensors or PID control sensors, a complete range of extension modules (compact or "slice") as well as advanced programming functions are included in the motion controller Modicon LMC058 offer.

In order to minimize the number of machine product references, optimize assembly time and cut costs, the LMC058 LF424 motion controller includes 4 voltage or current analog inputs with 12-bit resolution as standard.

The different extension modules are available in 2, 4 or 6-channel versions and with either 12 or 16-bit resolution.

The powerful performance of the LMC058 motion controller enables up to 200 analog I/O and/or temperature modules to be connected, thus extending the limits of machine requirements.

#### High-speed counter function (HSC)

In order to meet requirements for machine productivity, the LMC058 motion controller has 8 embedded high-speed counters with a counting frequency of 200 kHz for each channel and 4 reflex outputs.

These embedded counters, together with the CANopen master link, make it quick and easy to create cost-effective, high-performance multi-axis functions to suit the machines' limitations.

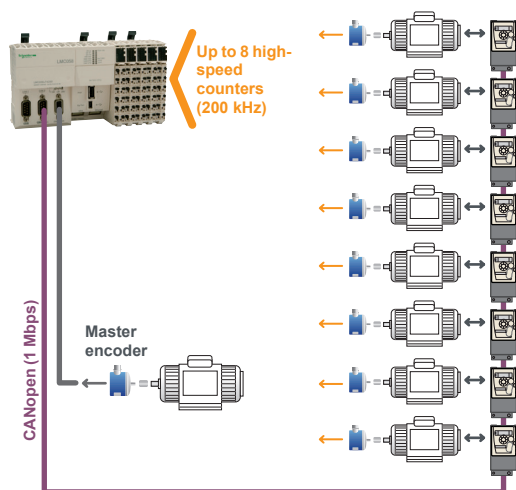
With the availability of PLCopen function blocks specific to the motion control functions in the SoMachine V2.0 software, you can be sure that developing your applications will be quick and reliable.

Moreover, a complete range of high-speed counter modules is available so you can adapt your configuration to your machine's specific requirements.

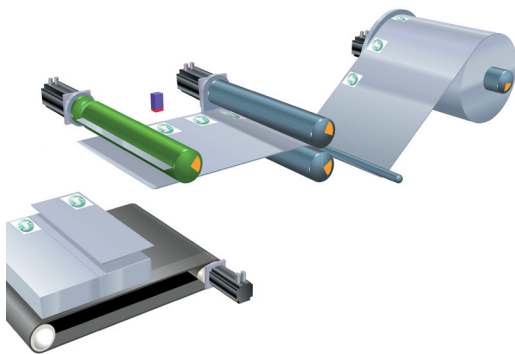
#### Position control function

Several options are offered in terms of position control:

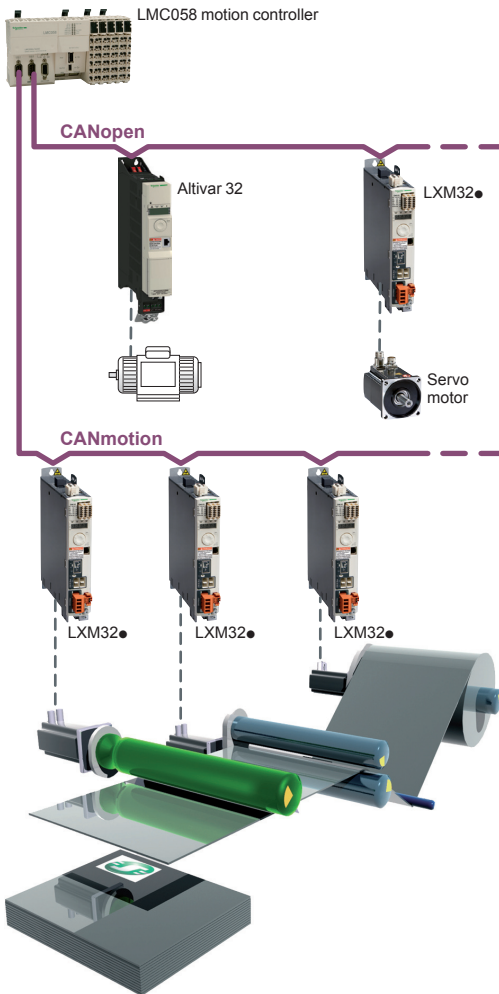
- Creating a sequence in Lexium 32 servo drives, with communication with the LMC058 motion controller achieved by the use of discrete I/O
- Creating an application in the LMC058 motion controller and controlling Lexium 32 drives and servo drives and/or Lexium SD3 stepper drives via the integrated CANopen master link available on LMC058 motion controllers (in this case the Motion tasks are independent axis Motion tasks)
- Creating an application in the LMC058 motion controller and controlling the Lexium 32 drives and servo drives and/or Lexium SD3 stepper drives via the integrated CANmotion master link available on all LMC058 motion controllers (in this case the Motion tasks are independent and/or synchronized axis Motion tasks - cam profiles, electronic gearing, interpolation)



High-speed counter function (one-phase or two-phase)



Lexium 32 servo drives: monitoring cutting to length



### Ethernet communication

All motion controller Modicon LMC058 references have an embedded RJ45 Ethernet port (10/100 Mbps, MDI/MDIX) with Ethernet TCP Modbus, Ethernet IP Device, SoMachine V2.0 on Ethernet, UDP, TCP and SNMP protocols.

In addition, all the LMC058 motion controllers have an embedded Web Server and FTP Server. As well as the default address based on the MAC address, it is possible to assign a motion controller IP address via a DHCP server or BOOTP server.

### CANmotion/CANopen communication

The CANopen machine bus is now very widely used in industry because of its high performance. In accordance with international standard ISO 11898 promoted by the CAN in Automation association of users and manufacturers, it offers a high level of openness and interoperability thanks to its standardized communication and equipment profiles.

CANmotion and CANopen buses use a double shielded twisted pair. Each end of the bus must be equipped with a line terminator.

A staged CANmotion and CANopen connectivity solution reduces costs and optimizes your architecture, thanks to:

- Reduced cabling time
- Greater reliability of the cabling
- Flexibility should you need to add or remove a device

#### CANmotion

All motion controller Modicon LMC058 references have an embedded CANmotion master.

This bus is dedicated to synchronizing the drives (conforming to standard CiA DSP 402, the Device Profile for Drives & Motion Control).

This CANmotion link can be configured between 250 kbps and 1 Mbps, and offers the option of configuring and controlling up to 8 Lexium 32 servo drives and/or Lexium SD3 stepper drives.

The CANmotion bus cycle time ensures that the axis positions will be refreshed.

To ensure maximum performance on the motion bus, we recommend using a daisy chain cabling architecture.

#### CANopen

All motion controller Modicon LMC058 references have an embedded CANopen master.

This bus is dedicated to expansion of the automation capabilities, such as the I/O, drives, encoders, etc.

The link can be configured between 125 kbps and 1 Mbps and supports up to 32 slaves. Architectures based on CANopen can be used to distribute I/O modules as close to the sensors and actuators as possible, thus reducing wiring costs and times, and to communicate with different devices such as variable speed drives, servo drives, etc.

The CANopen configurator is integrated in the SoMachine V2.0 software and can also be used to import standard description files in EDS format.

### Modbus communication

All motion controllers Modicon LMC058 have a serial link as standard that can be configured as either RS232 or RS485 and incorporates the two most commonly used protocols on the market:

- ☐ Modbus ASCII/RTU Master or Slave
- ☐ Character string (ASCII)

### Integration in the Schneider Electric product offer

Combined with other products dedicated to machine manufacturers in the Schneider Electric offer, such as ATV variable speed drives, Lexium servo drives, Magelis HMI terminals, TeSys motor starters and contactors, the motion controller Modicon LMC058 is now a must-have element in machine architectures, with hitherto unrivalled ease and speed of installation.

### Applications

Industrial machines: packaging, conveying, material handling, assembly, wood and metal working, ceramics, etc.

42 discrete I/O



### User memory

RAM

Flash

64 MB (program + data)

128 MB

### Typical Boolean instruction time

22 ns

### User program size

128 program Kinstructions

### Power supply

24 V ---

### Channel connection

Via removable spring terminal blocks (supplied)

### Inputs

Discrete

Analog

26 x 24 V --- inputs including 8 counter inputs (200 kHz)

—

### Discrete outputs

Transistor

Relay

16 outputs (0.5 A) including 4 reflex outputs

—

### Built-in communication ports

USB-B mini-port

USB-A port

RJ45 port (MBS)

SUB-D connector (9-way male) (CAN0)

SUB-D connector (9-way male) (CAN1)

SUB-D connector (15-way female) (Encoder)

RJ45 port (Ethernet)

Programming port for SoMachine V2.0 software

Connection of a USB memory stick for transferring programs, data files, firmware updates

RS232 serial link

RS485 serial link (supplies 250 mA, 5 V for HMI power supply)

Protocols: Modbus ASCII/RTU Master/Slave, ASCII (character string)

CANopen bus master (32 slaves)

CANmotion bus master (32 slaves)

Encoder input (incremental or SSI)

Ethernet TCP/IP, Web Server, FTP, Ethernet Modbus TCP

### Optional communication ports

—

### Motion controller

LMC058 LF42

### Page

14



Industrial machines: packaging, conveying, material handling, assembly, wood and metal working, ceramics, etc.

42 discrete I/O  
+ 4 analog inputs



64 MB (program + data)

128 MB

22 ns

128 program Kinstructions

24 V ---

Via removable spring terminal blocks (supplied)

26 x 24 V --- inputs including 8 counter inputs (200 kHz)

4 inputs  
+ 10 V/- 10 V, 4-20 mA/0-20 mA  
12-bit resolution

16 outputs (0.5 A) including 4 reflex outputs

—

Programming port for SoMachine V2.0 software

Connection of a USB memory stick for transferring programs, data files, firmware updates

RS232 serial link,  
RS485 serial link (supplies 250 mA, 5 V for HMI power supply)  
Protocols: Modbus ASCII/RTU Master/Slave, ASCII (character string)

CANopen bus master (32 slaves)

CANmotion bus master (32 slaves)

Encoder input (incremental or SSI)

Ethernet TCP IP Modbus slave, Web Server, FTP

2 PCI slots available on controller for optional communication modules (1)

**LMC058 LF424**

14

(1) To be ordered separately



More technical information on [www.schneider-electric.com](http://www.schneider-electric.com)





LMC058 LF42 motion controller



LMC058 LF424 motion controller

TM5 PC communication modules



TM5 C compact discrete or analog I/O extension module ▲



TM5 SD slice discrete I/O module



TM5 SA slice analog I/O module



TM5 SE slice counter module



TM5 SPD slice common distribution module



TM5 SPS slice power distribution modules



TM5 SBET1 slice bus extension module (transmitter)



TM5 SBER2 slice bus extension module (receiver)

### Presentation

#### Range

The LMC058 motion controller range is divided into two sizes:

- The LMC058 LF42 motion controller is 177 mm wide.
- The LMC058 LF424 motion controller is 237.5 mm wide as it has two free PCI slots for optional communication modules (serial link or Profibus DP).

This range is completed by an extensive extension module offer:

- Discrete/analog compact I/O extension modules (available second quarter 2011)
- Slice discrete I/O extension modules
- Slice analog I/O extension modules
- Slice counter modules
- Slice common distribution modules
- Slice power distribution modules
- Slice bus extension modules

#### Functions

The main component in a system is the motion controller: two LMC058 motion controller models are offered to cover different control requirements (pressure, temperature, counting, velocity, positioning, motion, etc.).

LMC058 motion controllers and I/O modules are programmed using SoMachine V2.0 software.

Reference	Embedded functions
LMC058 LF42	<ul style="list-style-type: none"> <li>■ 42 discrete I/O including 8 high-speed counters (200 kHz)</li> <li>■ CANopen master</li> <li>■ CANmotion master</li> </ul>
LMC058 LF424	<ul style="list-style-type: none"> <li>■ 42 discrete I/O including 8 high-speed counters (200 kHz)</li> <li>■ 4 voltage/current analog inputs</li> <li>■ CANopen master</li> <li>■ CANmotion master</li> </ul>

All LMC058 motion controllers have two groups of high-speed I/O with, for each group:

- Four sink type high-speed inputs (up to 200 kHz), 2 standard inputs and 2 source type high-speed outputs (up to 100 kHz) dedicated to HSC or PWM functions
- A high-speed input which can be used as an "Encoder capture input"
- Two commons for the inputs
- One common for the outputs
- A power supply (24 V ---) consisting of 3 units:
  - One for the CPU
  - One for the high-speed I/O modules
  - One for other modules (internal I/O Bus).

### Conformity to standards

Type	Performance	
Surge immunity 24 VDC circuit	EN/IEC 61000-4-5	1 kV in common mode 0.5 kV in differential mode
Surge immunity 230 VAC circuit	EN/IEC 61000-4-5	2 kV in common mode 1 kV in differential mode
Induced electromagnetic field	EN/IEC 61000-4-6	10 Veff (0.15...80 MHz)
Conducted emission	EN 55011 (IEC/CISPR11)	150...500 kHz, quasi peak 79 dBμV 500 kHz...30 MHz, quasi peak 73 dBμV
Radiated emission	EN 55011 (IEC/CISPR11)	30...230 MHz, 10 m @ 40 dBμV/m 230 MHz...1 GHz, 10 m @ 47 dBμV/m



### Assembly and mounting

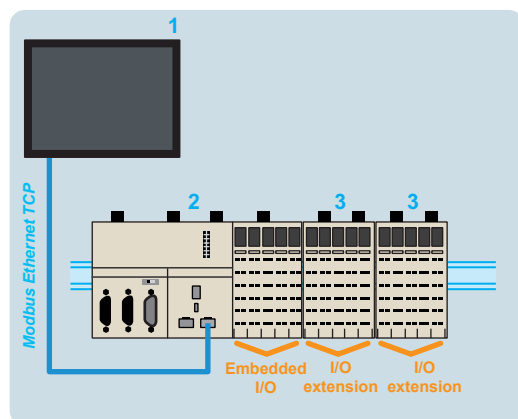
The components of this system have been designed for simple interlocking mechanical assembly.

An 8-way bus extension connection (2 for the power supply, 2 for the bus and 4 for the data) is used to distribute data and the power supply when assembling the components: the LMC058 motion controller with compact I/O extension modules and slice modules (I/O extension, counting, common distribution, power distribution, bus extension).

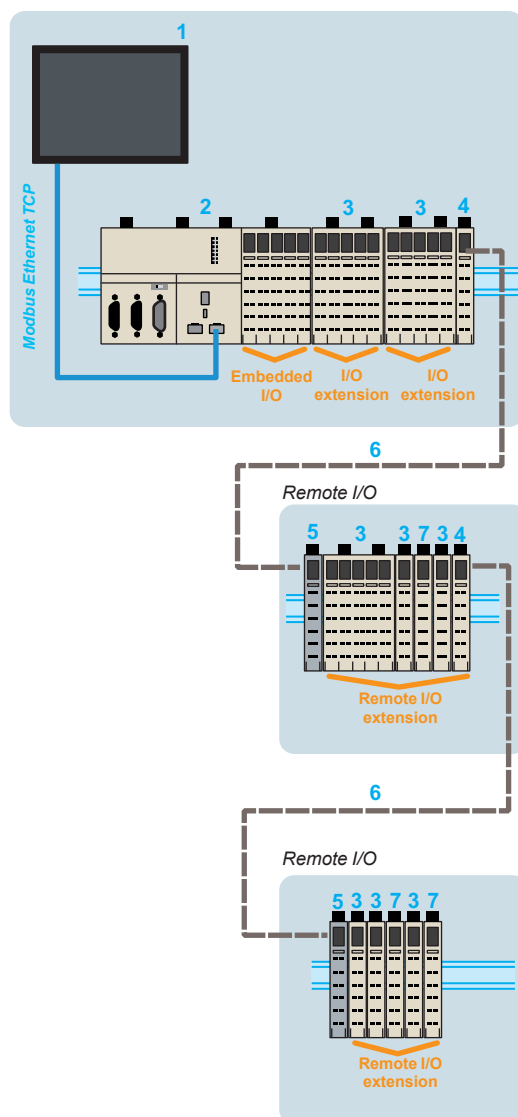
All the elements which make up the system are mounted on a symmetrical rail using the locking clips located on top of each device.

Wiring and maintenance of devices is simplified by the use of removable spring terminals. The spring terminals are undone by pressing a locking tab.

The system is integrated into communication networks: all connectors (RJ45, USB, mini-USB and SUB-D type) are accessible, as they are located on the motion controller front panels.



Local I/O



### Local or remote architecture

#### Local I/O

A PLC configuration can be local or remote. It consists of an LMC058 motion controller with its embedded input and output channels, used in conjunction with compact or slice I/O extension modules which are used to increase the number of channels and/or application-specific functions.

Compact modules represent a way of adding a large number of I/O with a single component, and thus only a single product reference.

Slice I/O extension modules (combination of a bus base, an electronic module and a terminal block) complete this configuration and, being modular with between 2 and 12 channels, make it possible to adjust the number of channels to exactly that required. The addition of slice discrete or analog I/O extension modules, temperature or high-speed counter modules increases the processing capabilities of applications.

#### Local I/O configuration

- 1 XBT GT supervisory graphic touch screen terminal
- 2 LMC058 motion controller
- 3 Compact or slice I/O extension modules

#### Remote I/O

Because of its backplane bus management, the TM5 system can be used to control I/O modules remotely.

The same modules can be used in either a local and/or remote configuration, linked together with bus extension cables.

The maximum distance between two remote islands is 100 m and the maximum number of islands is 25, i.e. a total distance of up to 2500 m.

This function ensures a high level of flexibility, while retaining **synchronization of all data acquisition**, since all the extension modules are on the same backplane bus.

#### Remote I/O configuration

- 1 XBT GT supervisory graphic touch screen terminal
- 2 LMC058 motion controller
- 3 Compact or slice I/O extension modules
- 4 Slice bus transmitter extension modules
- 5 Slice bus receiver extension modules
- 6 TM5 bus extension cables
- 7 Slice common distribution modules

### Communication

LMC058 motion controllers have the following built-in communication ports:

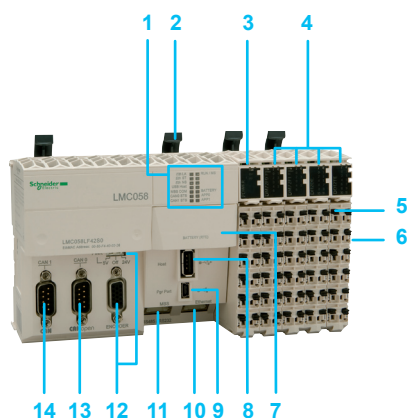
References	Communication ports	Use
LMC058LF42	RJ45 Configurable as RS232 or RS485	ASCII or RTU exchange with Modbus communication protocol
	1 x RJ45 (MDI/MDIX port)	<input type="checkbox"/> FTP server <input type="checkbox"/> Web server <input type="checkbox"/> Modbus TCP server <input type="checkbox"/> Modbus TCP client <input type="checkbox"/> SoMachine V2.0 Manager <input type="checkbox"/> SNMP <input type="checkbox"/> Ethernet IP device <input type="checkbox"/> Modbus device
	1 x USB-A	Connection of a USB memory stick for transferring (uploading/downloading) programs, data and/or firmware
	1 x mini-USB	Programming port (480 Mbps)
	1 x 9-way male SUB-D	CANopen master connection
	1 x 9-way male SUB-D	CANmotion master connection
	1 x 15-way female SUB-D	Master encoder
LMC058LF424	1 x RJ45 Configurable as RS232 or RS485	ASCII or RTU exchange with Modbus communication protocol
	1 x RJ45 (MDI/MDIX port)	<input type="checkbox"/> FTP server <input type="checkbox"/> Web server <input type="checkbox"/> Modbus TCP server <input type="checkbox"/> Modbus TCP client <input type="checkbox"/> SoMachine V2.0 Manager <input type="checkbox"/> SNMP <input type="checkbox"/> Ethernet IP device <input type="checkbox"/> Modbus device
	1 x USB-A	Connection of a USB memory stick for transferring (uploading/downloading) programs, data and/or firmware
	1 x mini-USB	Programming port (480 Mbps)
	1 x 9-way male SUB-D	CANopen master connection
	1 x 9-way male SUB-D	CANmotion master connection
	1 x 15-way female SUB-D	Master encoder
	2 PCI slots for communication modules = 2 x 9-way male SUB-D	Optional addition of communication modules for a serial link or Profibus DP

### Embedded Ethernet

LMC058 motion controllers have an embedded Ethernet link via a direct connection to their RJ45 port.

- ☐ Speed: "10 BaseT" and "100 BaseTX" with auto-negotiation
- ☐ RJ45 port (MDI/MDIX): automatic adaptation to a straight or crossed cable

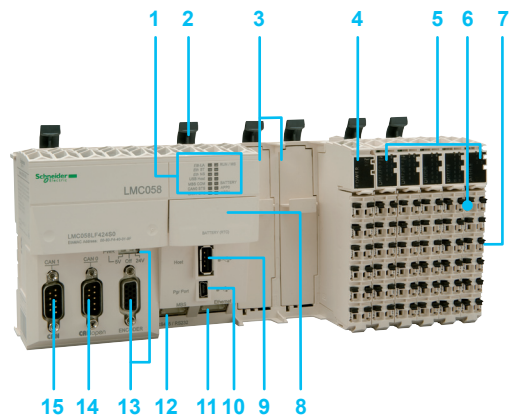
References	Protocols	Number of connections
LMC058LF42	Modbus server	8
LMC058LF424	Modbus device	2
	Ethernet IP device	16
	FTP server	4
	Web server	10



### Description

The LMC058LF42 motion controller comprises:

- 1 A display block with:
  - 4 motion controller status LEDs (RUN/MS, BATTERY, APP0 and APP1)
  - 7 built-in communication port status LEDs (*Eth* LA, *Eth* ST, *Eth* NS, USB Host, MBS COM, CAN 0 STS, CAN 1 STS)
- 2 Locking clip for mounting/dismounting on  $\sqcap$  symmetrical rail
- 3 A 24 V  $\square$  power supply module with removable terminal block and locking clip, display block and slot for a label
- 4 I/O modules, each one with a removable terminal block with locking clip, a display block showing the I/O states and a slot for a label-holder
- 5 Removable terminal block with locking clip for locking/unlocking
- 6 On the side, a bus extension connector for connecting to the next module
- 7 A slot for the RTC (Real Time Clock) battery
- 8 A USB-A connector (marked Host) for connecting a USB memory stick for transferring programs, data or firmware updates
- 9 A USB-B mini-connector (marked Pgr Port) for connecting to the programming PC
- 10 An RJ45 connector (marked Ethernet) for connecting to the Ethernet network and/or Magelis XBT GT graphic terminal
- 11 An RJ45 connector (marked MBS) for the RS232 or RS485 serial link
- 12 A 15-way female SUB-D connector, marked ENCODER, for connecting the master encoder and a selector switch for the 3 encoder supply voltage states (5 V, Off, 24 V)
- 13 A 9-way male SUB-D connector, marked CAN0, for connecting to the CANopen bus
- 14 A 9-way male SUB-D connector, marked CAN1, for connecting to the CANmotion bus



The LMC058LF424 motion controller comprises:

- 1 A display block with:
  - 4 motion controller status LEDs (RUN/MS, BATTERY, APP0 and APP1)
  - 7 built-in communication port status LEDs (*Eth* LA, *Eth* ST, *Eth* NS, USB Host, MBS COM, CAN 0 STS, CAN 1 STS)
- 2 Locking clip for mounting/dismounting on  $\sqcap$  symmetrical rail
- 3 Two free PCI slots for the communication modules
- 4 A 24 V  $\square$  power supply module with removable terminal block and locking clip, display block and slot for a label
- 5 I/O modules, each one with a removable terminal block with locking clip, a display block showing the I/O states and a slot for a label-holder
- 6 Removable terminal block with locking clip for locking/unlocking
- 7 On the side, a bus extension connection for the link with the next module
- 8 A slot for the RTC (Real Time Clock) battery
- 9 A USB-A connector (marked Host) for connecting a USB memory stick for transferring programs, data or firmware updates
- 10 A USB-B mini-connector (marked Pgr Port) for connecting to the programming PC
- 11 An RJ45 connector (marked Ethernet) for connecting to the Ethernet network and/or Magelis XBT GT graphic terminal
- 12 An RJ45 connector (marked MBS) for the RS232 or RS485 serial link
- 13 A 15-way female SUB-D connector, marked ENCODER, for connecting the master encoder and a selector switch for the 3 encoder supply voltage states (5 V, Off, 24 V)
- 14 A 9-way male SUB-D connector, marked CAN0, for connecting to the CANopen bus
- 15 A 9-way male SUB-D connector, marked CAN1, for connecting to the CANmotion bus



LMC058LF42



LMC058LF424

### References

#### LMC058 motion controllers, 24 V $\overline{\text{V}}$ power supply (1)

No. of I/O	Inputs	Outputs	Built-in communication ports	Reference	Weight (kg)
42 I/O	<ul style="list-style-type: none"> <li>26 x 24 V <math>\overline{\text{V}}</math> discrete inputs including 8 counter inputs (200 kHz)</li> </ul>	<ul style="list-style-type: none"> <li>16 discrete transistor outputs (0.5 A) including 4 reflex outputs</li> </ul>	<ul style="list-style-type: none"> <li>1 RJ45 port: Ethernet</li> <li>1 SUB-D port (9-way male): CANopen master</li> <li>1 SUB-D port (9-way male): CANmotion master</li> <li>1 SUB-D port (15-way female): master encoder</li> <li>1 USB-A port: program transfer</li> <li>1 USB-B mini-port: software programming</li> <li>1 RJ45 port: RS232/RS485 serial link</li> </ul>	LMC058LF42	0.550
42 + 4 I/O	<ul style="list-style-type: none"> <li>26 x 24 V <math>\overline{\text{V}}</math> discrete inputs including 8 counter inputs (200 kHz)</li> <li>4 analog inputs 10 V/- 10 V, 4-20 mA/ 0-20 mA, 12-bit resolution</li> </ul>	<ul style="list-style-type: none"> <li>16 discrete transistor outputs (0.5 A) including 4 reflex outputs</li> </ul>	<ul style="list-style-type: none"> <li>1 RJ45 port: Ethernet</li> <li>1 SUB-D port (9-way male): CANopen master</li> <li>1 SUB-D port (9-way male): CANmotion master</li> <li>1 SUB-D port (15-way female): master encoder</li> <li>1 USB-A port: program transfer</li> <li>1 USB-B mini-port: software programming</li> <li>1 RJ45 port: RS232/RS485 serial link</li> <li>+ 2 free PCI slots for optional communication modules (2): RS232/RS485 serial link and Profibus DP</li> </ul>	LMC058LF424	0.770

(1) The motion controllers Modicon LMC058 require a power supply with a nominal voltage of 24 V  $\overline{\text{V}}$ . The 24 V  $\overline{\text{V}}$  power supply must be rated Separated Extra Low Voltage (SELV-rated) according to IEC 61140. The SELV-rating means that SELV isolation is provided between the electrical input and output of the power supply.

(2) To be ordered separately



TM5 ACTLC100



TM5 ACTCH100



TM5 ACLITW1



TM5 ACLT1

## References

## Accessories

Designation	Used for	Colour	Sold in lots of	Unit reference	Weight kg
<b>Terminal block shield (label-holder)</b>	Labelling the terminal blocks on the I/O channels	Transparent	100	TM5 ACTCH100	0.002
<b>Terminal block shield locking clip</b> (Order with terminal shield TM5 ACTCH100)	Locking terminal block shield TM5 ACTCH100	Transparent	100	TM5 ACTLC100	0.001
<b>Sheet of 92 precut paper labels</b>	Terminal block shield TM5 ACTCH100	White	100	TM5 ACTLS100	0.001
<b>Coloured plastic markers</b>	Labelling 16 connection channel terminals	White	1	TM5 ACLITW1	0.015
		Red	1	TM5 ACLITR1	0.015
		Blue	1	TM5 ACLITB1	0.015
<b>Metal tool</b>	Inserting/removing TM5 ACLIT●1	Black	1	TM5 ACLT1	0.030

## Connection cables

Designation	Used from	to	Length	Reference	Weight kg
<b>Software programming cable</b> Baud rate: 480 Mbps max. Protocol: Modbus, HTTP, FTP, Codesys or virtual, non-isolated	PC USB port	USB mini-port on LMC058 motion controllers, the ATV-IMC card or XBT GT graphic touch screen terminals	3 m	TCS XCN AM UM3P	0.065
<b>Programming cable</b>	PC USB port	USB-B mini-port on LMC058 motion controllers	1.8 m	BMX XCA USB H018	0.230
<b>RS485 serial link cables</b> Modbus protocol	SUB-D port (25-way) on Small Panels: XBT N401, XBT N410, XBT R410, XBT R411, XBT GT2... GT7	RJ45 port on LMC058 motion controllers	1.8 m	XBT Z938	0.230
	RJ45 port on XBT GT graphic touch screen terminals	RJ45 port on LMC058 motion controllers	2.5 m	XBT 9980	0.230
<b>RS232 serial link cables</b> Character mode	SUB-D port (9-way female) on DTE (1): printer, hand-held bar code reader, etc.	RJ45 port on LMC058 motion controllers	3 m	TCS MCN 3M4F3C2	0.150
	SUB-D port (9-way female) on DCE (2): GSM modem	RJ45 port on LMC058 motion controllers	3 m	TCS MCN 3M4M3S2	0.150
<b>Cable for master encoder input</b>	Incremental encoders or SSI serial absolute encoders (1 stripped end)	15-way female SUB-D port on LMC058 motion controllers (1 High Density 15-way male SUB-D connector)	1 m	VW3 M4 701	—

(1) DTE: Data Terminal Equipment

(2) DCE: Data Communication Equipment

### Presentation

Schneider Electric has selected CANopen for its machines and installations because of its wealth of functions and its resulting benefits in the automation world. This decision was based on the general acceptance of CANopen, and the fact that CANopen products are increasingly used in control system architectures. CANopen is an open network supported by more than 400 companies worldwide, and promoted by CAN in Automation (CiA). CANopen conforms to standards EN 50325-4 and ISO 15745-2.

### CANmotion and CANopen characteristics

CANmotion and CANopen buses are multi-master buses ensuring reliable, deterministic access to real-time data in control system equipment. The CSMA/CA protocol is based on broadcast exchanges, sent cyclically or on an event, to ensure optimum use of the bandwidth.

A message handling channel can also be used to define slave parameters.

CANmotion and CANopen buses are a set of profiles on CAN systems with the following characteristics:

- Open bus system
- Data exchanges in real time without overloading the protocol
- Modular design allowing modification of size
- Interconnection and interchangeability of devices
- Standardized network configuration
- Access to all device parameters
- Synchronization and circulation of cyclical and/or event-controlled process data (short system response time)

### Connectable Schneider Electric devices

The following Schneider Electric devices can be connected to the CANopen bus:

- Ø 58 mm OsiSense XCC multi-turn absolute encoders: **XCC 3510P**, **XCC 3515CS84CB**
- TeSys U starter-controllers with communication module: **LUL C08**
- TeSys T motor management system with controller: **LTM R●●C●●**
- Modicon OTB IP 20 distributed I/O with I/O extension modules with interface module: **OTB 1C0 DM9LP**
- Modicon FTB monobloc IP 67 I/O splitter boxes: **FTB 1CN●●●●●**
- Preventa configurable safety controllers: **XPS MC16ZC**, **XPS MC32ZC**
- Altivar 312 variable speed drives for asynchronous motors (0.18...15 kW): **ATV 312H ●●●●●**
- Altivar 61/71 variable speed drives for asynchronous motors (0.75...630 kW): **ATV 61H /71H ●●●●●**
- Lexium 05/Lexium 32 servo drives (0.15...7 kW) for BSH/BSM servo motors: **LXM 05A●D●●●●●**, **LXM 32A●D●●●●●**
- Lexium **SD3** stepper drives
- Lexium integrated drives: **ILA1B**, **ILE1B** and **ILS1B**



TeSys U with LUL C08 communication module



Lexium 32A

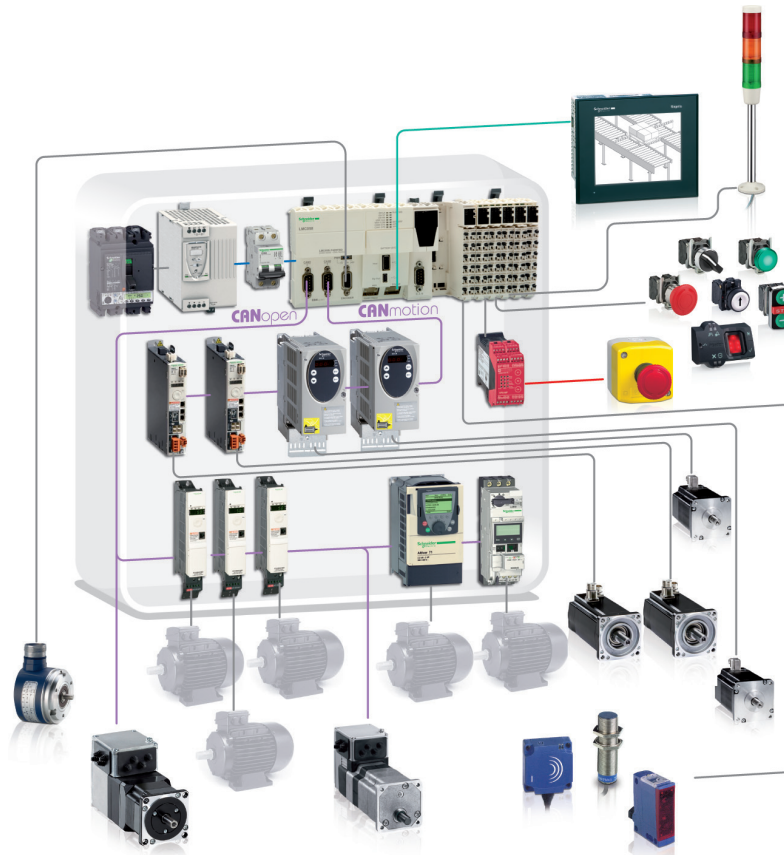


Altivar 312



Lexium ILA1B

#### Architecture



#### CANopen port on LMC058 motion controllers

LMC058 motion controllers include a 9-way male SUB-D CANopen port and act as the CANopen master.

The bus consists of a master station, the LMC058 motion controller and slave stations. The master is in charge of configuration, exchanges and diagnostics to the slaves.

The CANopen bus is a communication bus and is used to manage a variety of slaves, such as:

- Discrete slaves
- Analog slaves
- Variable speed drives
- Motor starters
- Etc.

#### CANopen port

Standards		DS 301 V4.02, DR 303-1							
Class		Conformity class M10, limited to 32 slaves							
Data rate	Max. length (m)	20	40	100	250	500	1000	2500	5000
	Data rate (kbps)	1000	800	500	250	125	50	20	10
Number of slaves		32 max. with max. limit of: 64 TDPOs/64 RPDOs							
Connection		On 9-way male SUB-D port							

#### CANmotion port on LMC058 motion controllers

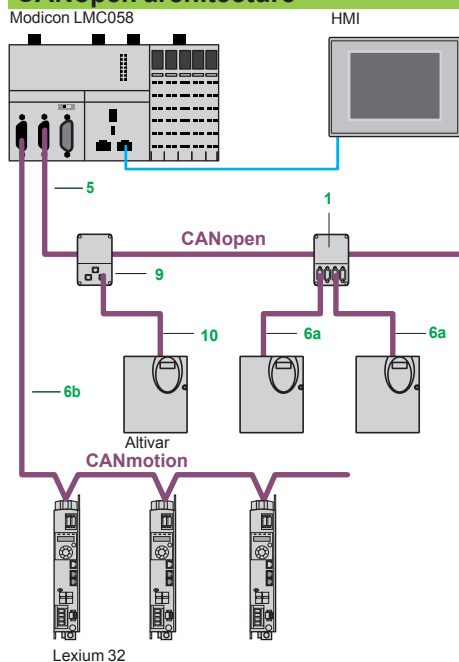
LMC058 motion controllers include a 9-way male SUB-D CANmotion port and act as the CANmotion master.

This CANmotion connection offers the option of configuring and controlling up to 8 Lexium 32 drives and/or Lexium SD3 stepper drives.

The CANmotion bus cycle time ensures that the axis positions will be refreshed.

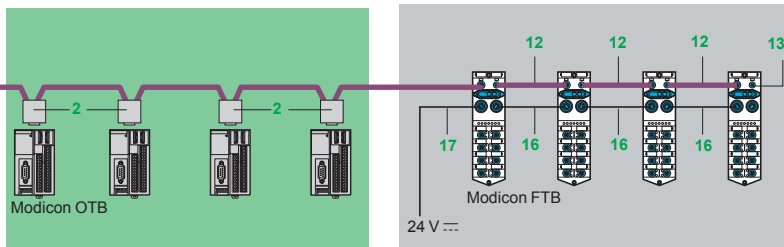


## CANopen architecture



Example of connection of the “Distributed CANopen Optimized” architecture dedicated to machines and modular installations.

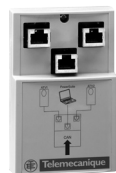
For other CANopen architectures, please refer to the “Industrial communication networks in machines and installations” catalogue.



## References



TSX CAN TDM4



VW3 CAN TAP2



TSX CAN  
KCD F90T

TSX CAN  
KCD F180T



TSX CAN KCD F90TP

Standard tap junctions and connectors						
Designation	Description	No.	Length	Reference	Weight kg	
IP 20 CANmotion/CANopen tap junction	4 SUB-D ports. Screw terminal block for connection of trunk cables Line termination	1	–	TSX CAN TDM4	0.196	
IP 20 CANmotion/CANopen connectors 9-way female SUB-D Switch for line termination	90° angled	2	–	TSX CAN KCDF 90T	0.04	
	Straight (1)	–	–	TSX CAN KCDF 180T	0.049	
	90° angled with 9-way SUB-D for connecting a PC or diagnostic tool	–	–	TSX CAN KCDF 90TP	0.051	
IP 67 M12 connectors	Male	–	–	FTX CN 12M5	0.050	
	Female	–	–	FTX CN 12F5	0.050	
IP 20 CANmotion/CANopen tap junction for Altivar and Lexium	2 RJ45 ports	9	–	VW3 CAN TAP2	–	
IP 20 standard cables and formed cordsets						
Designation	Description	No.	Length	Reference	Weight kg	
CANmotion/CANopen cables (2 x AWG 22 2 x AWG 24)	For standard environments (2) CE marking: low smoke zero halogen Flame-retardant (IEC 60332-1)	5	50 m	TSX CAN CA50	4.930	
			100 m	TSX CAN CA100	8.800	
			300 m	TSX CAN CA300	24.560	
	For standard environments (2) UL certification CE marking: flame-retardant (IEC 60332-2)	5	50 m	TSX CAN CB50	3.580	
			100 m	TSX CAN CB100	7.840	
			300 m	TSX CAN CB300	21.870	
	For harsh environments (2) or mobile installation CE marking: low smoke zero halogen Flame-retardant (IEC 60332-1) Oil-resistant	5	50 m	TSX CAN CD50	3.510	
			100 m	TSX CAN CD100	7.770	
			300 m	TSX CAN CD300	21.700	
	CANmotion/CANopen formed cordsets One 9-way female SUB-D connector at each end.	For standard environments (2) CE marking: low smoke zero halogen Flame-retardant (IEC 60332-1)	–	0.3 m	TSX CAN CADD03	0.091
				1 m	TSX CAN CADD1	0.143
				3 m	TSX CAN CADD3	0.295
5 m				TSX CAN CADD5	0.440	
For standard environments (2), UL certification, CE marking: flame-retardant (IEC 60332-2)		–	0.3 m	TSX CAN CBDD03	0.086	
			1 m	TSX CAN CBDD1	0.131	
			3 m	TSX CAN CBDD3	0.268	
			5 m	TSX CAN CBDD5	0.400	

(1) For connection to integrated controller card Altivar IMC.

(2) **Standard environment:** No particular environmental constraints, operating temperature between + 5°C and + 60°C, and in fixed installations.

**Harsh environment:** Resistance to hydrocarbons, industrial oils, detergents, solder splashes, relative humidity up to 100%, saline atmosphere, significant temperature variations, operating temperature between - 10°C and + 70°C, or in mobile installations.



## References (continued)

## IP 20 standard cables and formed cordsets (continued)

Designation	Description	No.	Length	Reference	Weight kg
CANmotion/CANopen formed cordsets	Cordsets with one 9-way female SUB-D connector and one RJ45 connector	6a	0.5 m	TCS CCN 4F3 M05T	—
			1 m	TCS CCN 4F3 M1T	—
			3 m	TCS CCN 4F3 M3T	—
	Cordset with one 9-way female SUB-D connector and one RJ45 connector with built-in line termination	6b	1 m	VW3 M38 05 R010	—
			3 m	VW3 M38 05 R030	—
	Cordsets with two 9-way SUB-D connectors, one female and one male	—	0.5 m	TLA CD CBA 005	—
			1.5 m	TLA CD CBA 015	—
			3 m	TLA CD CBA 030	—
			5 m	TLA CD CBA 050	—

## IP 67 standard formed cordsets

CANmotion/CANopen formed cordsets	Cordsets with two 5-way M12 A-coded angled connectors (one male, one female)	12	0.3 m	FTX CN 3203	0.40
			0.6 m	FTX CN 3206	0.70
			1 m	FTX CN 3210	0.100
			2 m	FTX CN 3220	0.160
			3 m	FTX CN 3230	0.220
			5 m	FTX CN 3250	0.430

## IP 20 connection accessories

CANmotion/CANopen connector for Altivar 71 (1)	9-way female SUB-D. Switch for line termination. Cables exit at 180°	—	—	VW3 CAN KCDF 180T	—
Adaptor for Altivar 71 drive	CANopen adaptor SUB-D to RJ45	—	—	VW3 CAN A71	—
CANmotion/CANopen formed cordsets	One RJ45 connector at each end	10	0.3 m	VW3 CAN CARR03	—
			1 m	VW3 CAN CARR1	—
CANmotion/CANopen bus adaptor for Lexium 17D	Hardware interface for a CANopen-compliant link + one connector for a PC terminal	—	—	AM0 2CA 001V000	0.110
Y-connector	CANopen/Modbus	—	—	TCS CTN011M11F	—

## IP 67 connection accessories for Modicon FTB/FTM monobloc and modular splitter boxes

Designation	Composition	No.	Length	Reference	Weight kg
IP 67 line terminator	Equipped with one M12 connector (for end of bus)	13	—	FTX CNTL12	0.010
24 V $\square$ power supply connection cables	Equipped with two 5-way 7/8 connectors	16	0.6 m	FTX DP2206	0.150
			1 m	FTX DP2210	0.190
			2 m	FTX DP2220	0.310
			5 m	FTX DP2250	0.750
	Equipped with one 5-way 7/8 connector at one end and flying leads at the other end	17	1.5 m	FTX DP2115	0.240
			3 m	FTX DP2130	0.430
			5 m	FTX DP2150	0.700
			—	—	—
T-connector for power supply	Equipped with two 5-way 7/8 connectors	—	—	FTX CNCT1	0.100

(1) For ATV 71H●●M3, ATV 71HD11M3X, HD15M3X, ATV 71H075N4... HD18N4 drives, this connector can be replaced by the TSX CAN KCDF 180T connector.



VW3 CAN A71



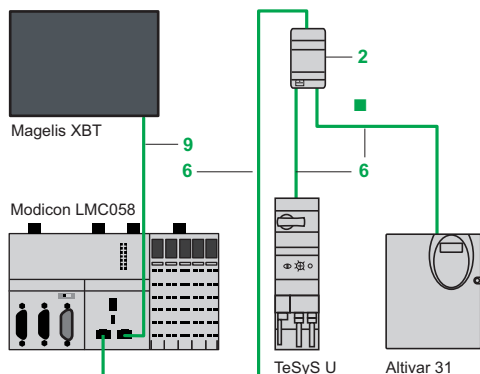
AM0 2CA 001V000



FTX DP21●●

### Modbus cabling system

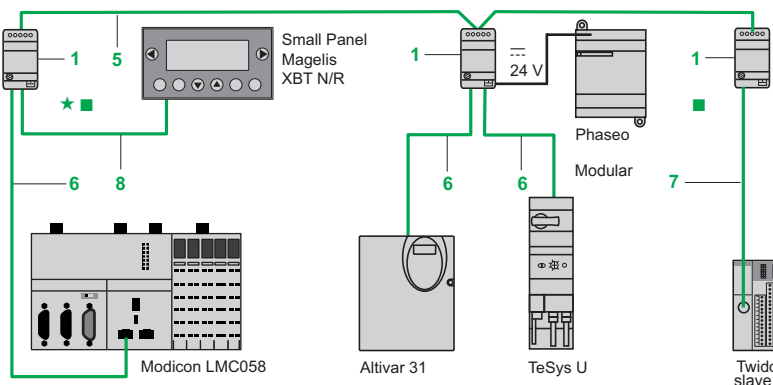
#### Non-isolated link (Modicon LMC058 master)



- Length of cables between Modicon LMC058 and Altivar:  
≤ 30 m max.

★ Line polarization active  
■ Line termination

#### Isolated link (Modicon LMC058 master)



- Total length of cables between isolation boxes 1: ≤ 1000 m  
- Length of tap cables 6, 7 or 8: ≤ 10 m

### References

#### Extension and adaptation elements for RS 485 serial link

Designation	Description	No.	Length	Reference	Weight kg
<b>Isolation box</b> Screw terminal block for trunk cable 2 x RJ45 for tap-off	- Isolation of the RS 485 link (1) - Line termination (RC 120 Ω, 1 nF) - Line pre-polarization (2 R 620 Ω) 24 V ⎓ (screw terminal block) or 5 V ⎓ (via RJ45) power supply, Mounting on 35 mm rail	1	—	TWD XCA ISO	0.100
<b>Tap junction</b> 1 x RJ45 for trunk cable 2 x RJ45 for tap-off	- Line termination (RC 120 Ω, 1 nF) - Line pre-polarization (2 R 620 Ω), Mounting on 35 mm rail	2	—	TWD XCA T3RJ	0.080
<b>Modbus splitter box</b> Screw terminal block for trunk cable 10 x RJ45 for tap-off	Mounting on 35 mm rail on plate or panel (2 x Ø 4 mm screws)	—	—	LU9 GC3	0.500
<b>T-junction boxes</b> 2 x RJ45 for trunk cable	1 integrated cable with RJ45 connector for tap-off dedicated to Altivar variable speed drive	—	0.3 m	VW3 A8 306 TF03	—
			1 m	VW3 A8 306 TF10	—
<b>Passive T-junction box</b>	- 1-channel line extension and tap-off on screw terminal block - Line termination	—	—	TSX SCA 50	0.520
<b>RS 232C/RS 485 line converter</b>	- Max. data rate 19.2 kbps - No modem signals 24 V ⎓/20 mA power supply, Mounting on 35 mm rail	—	—	XGS Z24	0.100

(1) Line isolation recommended for line distances > 10 m.



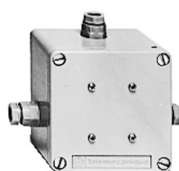
TWD XCA ISO



TWD XCA T3RJ



LU9 GC3



TSX SCA 50



XGS Z24

## References (continued)

Cables and cordsets for RS 485 serial link					
Designation	Description	No.	Length	Unit reference	Weight kg
<b>RS 485 double shielded twisted pair trunk cables</b>	Modbus serial link, supplied without connector	<b>5</b>	100 m	<b>TSX CSA 100</b>	5.680
			200 m	<b>TSX CSA 200</b>	10.920
			500 m	<b>TSX CSA 500</b>	30.000
<b>Modbus RS 485 cordsets</b>	2 x RJ45 connectors	<b>6</b>	0.3 m	<b>VW3 A8 306 R03</b>	0.030
			1 m	<b>VW3 A8 306 R10</b>	0.050
			3 m	<b>VW3 A8 306 R30</b>	0.150
	1 x RJ45 connector and 1 end with flying leads	—	1 m	<b>TWD XCA FJ010</b>	0.060
			3 m	<b>VW3 A8 306 D30</b>	0.150
	1 x mini-DIN connector for Twido controller and 1 x RJ45 connector	—	0.3 m	<b>TWD XCA RJ003</b>	0.040
			1 m	<b>TWD XCA RJ010</b>	0.090
			3 m	<b>TWD XCA RJ030</b>	0.160
	1 x mini-DIN connector for Twido controller and 1 x RJ45 connector (1) (2)	<b>7</b>	0.3 m	<b>TWD XCA RJP03</b>	0.027
	1 x mini-DIN connector for Twido controller and 1 x RJ45 connector Dedicated to Programming protocol (2) (3)	—	0.3 m	<b>TWD XCA RJP03P</b>	0.027
	1 mini-DIN connector for Twido controller and 1 end with flying leads	—	1 m	<b>TWD XCA FD010</b>	0.062
			10 m	<b>TSX CX 100</b>	0.517
<b>Cordsets for Modicon LMC058 (SL1, SL2) to Magelis display units and panels</b>	2 x RJ45 connectors XBT N200/R400 XBT RT500/511 XBT GT11●●/1335	<b>9</b>	2.5 m	<b>XBT Z9980</b>	0.150
	1 x RJ45 connector and 1 x 25-way SUB-D connector Small Panel XBT N401/410 XBT R410/411	<b>8, 9</b>	2.5 m	<b>XBT Z938</b>	0.210
	1 x RJ45 connector and 1 x 9-way SUB-D connector Advanced Panel XBT GT2●●0...7340 XBT GK●●●0	<b>9</b>	2.5 m	<b>XBT Z9008</b>	0.150
<b>Cordset for Magelis Small Panels</b>	2 x RJ45 connectors Small Panel XBT N200/R400 XBT RT500/511	<b>8</b>	3 m	<b>VW3 A8 306 R30</b>	0.150
<b>Line terminator</b>	For RJ45 connector R = 120 Ω, C = 1 nf Sold in packs of 2	—	—	<b>VW3 A8 306 RC</b>	0.200

Cordsets for RS 232 serial link				
Designation	Description	Length	Reference	Weight kg
<b>Cordset for Data Terminal Equipment (DTE) (printer) (4)</b>	Serial link for DTE (2) 1 x RJ45 connector and 1 x 9-way female SUB-D connector	3 m	<b>TCS MCN 3M4F3C2</b>	0.150
<b>Cordset for Data Connection Equipment (DCE) (modem, converter)</b>	Serial link for DCE 1 x RJ45 connector and 1 x 9-way male SUB-D connector	3 m	<b>TCS MCN 3M4M3S2</b>	0.150

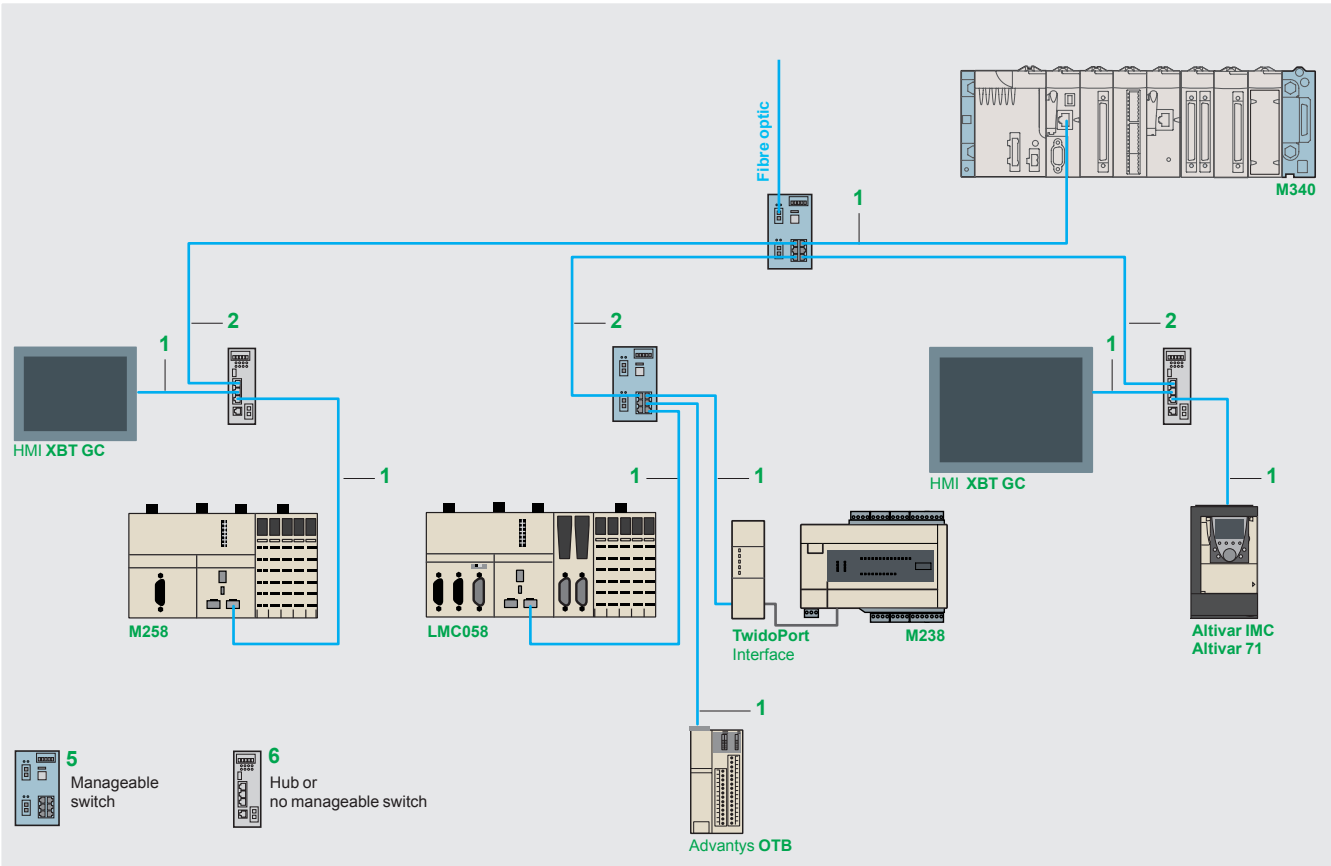
(1) Forces configuration of the Twido controller's built-in RS 485 port with the TwidoSuite programming protocol parameters.

(2) Carries the 5 V ⎓ voltage (supplied via the Twido controller's built-in RS 485 port) required by the TWD XCA ISO isolation box, thus avoiding the need for an external 24 V ⎓ power supply.

(3) Allows the Twido controller's built-in RS 485 port to be used with the parameters described in the configuration.

(4) If the terminal is equipped with a 25-way SUB-D connector, you will also need to order the 25-way female/9-way male SUB-D adaptor **TSX CTC 07**.

Ethernet Modbus/TCP or Ethernet IP network architecture



References (1)

Shielded copper connection cables

ConneXium shielded copper connection cables are available in two versions to comply with the different standards and approvals in force:

■ Shielded twisted pair copper cables to standard EIA/TIA 568

These cables conform to:

- standard EIA/TIA 568, category CAT 5E,
- standard IEC 11801/EN 50173, class D.

Their flame resistance conforms to:

- NFC 32070# classification C2
- standards IEC 322/1,
- Low Smoke Zero Halogen (LSZH).

■ Shielded twisted pair copper cables, UL and CSA 22.1 approved

These cables conform to:

- standards UL and CSA 22.1.

Their flame resistance conforms to NFPA 70.

“Do It Yourself” cable and connectors

The ConneXium “Do It Yourself” range allows the user to make up Ethernet copper cables on site and to the required length. They are designed for cabling Ethernet 10/100 Mbit/s networks. The maximum length of cables made up in this way is 80 m. They can be assembled quickly using a knife and cutting pliers (no special tools are required).

Description	Characteristics	Length	Reference	Weight kg
<b>Ethernet copper cable</b> 2 shielded twisted pairs 24 AWG	Conforming to the above-mentioned standards and approvals	300 m	<b>TCS ECN 300R2</b>	–
<b>RJ 45 connector</b>	Conforming to EIA/TIA-568-D	–	<b>TCS EK3 MDS</b>	–
<b>M12 connector</b>	Conforming to IEC 60176-2-101	–	<b>TCS EK1 MDRS</b>	–

(1) For other versions (fibre optic, switches, ...): please consult our “Machines and Installations with Industrial Communications” catalogue.



490 NT●000●●



TCS ESU 043F1N0



TCS ESM 043F2C●0



499 NMS/NSS 251 02



TCS ESM 083F2C●0



TCS ESU 051 F0

**References (continued)****Shielded twisted pair cables to standard EIA/TIA568**

Description	Pre-formed at both ends	Item	Length	Reference	Weight kg
Straight cables	2 x RJ45 connectors For connection to terminal equipment (DTE)	1	2 m	490 NTW 000 02	—
			5 m	490 NTW 000 05	—
			12 m	490 NTW 000 12	—
			40 m	490 NTW 000 40	—
			80 m	490 NTW 000 80	—
Crossover cables	2 x RJ45 connectors For connection between hubs, switches and transceivers	2	5 m	490 NTC 000 05	—
			15 m	490 NTC 000 15	—
			40 m	490 NTC 000 40	—
			80 m	490 NTC 000 80	—

**Shielded twisted pair cables, UL and CSA 22.1 approved**

Description	Pre-formed at both ends	Item	Length	Reference	Weight kg
Straight cables	2 x RJ45 connectors For connection to terminal equipment (DTE)	1	2 m	490 NTW 000 02U	—
			5 m	490 NTW 000 05U	—
			12 m	490 NTW 000 12U	—
			40 m	490 NTW 000 40U	—
			80 m	490 NTW 000 80U	—
Crossover cables	2 x RJ45 connectors For connection between hubs, switches and transceivers	2	5 m	490 NTC 000 05U	—
			40 m	490 NTC 000 40U	—
			80 m	490 NTC 000 80U	—

**Shielded twisted pair cable for IP 67 switch**

Description	Pre-formed at both ends	Item	Length	Reference	Weight kg
Straight cables	1 x IP 67 4-way M12 connector and 1 x RJ45 connector	8	1 m	TCS ECL 1M3M 1S2	—
			3 m	TCS ECL 1M3M 3S2	—
			5 m	TCS ECL 1M3M 5S2	—
			10 m	TCS ECL 1M3M 10S2	—
			25 m	TCS ECL 1M3M 25S2	—
			40 m	TCS ECL 1M3M 40S2	—

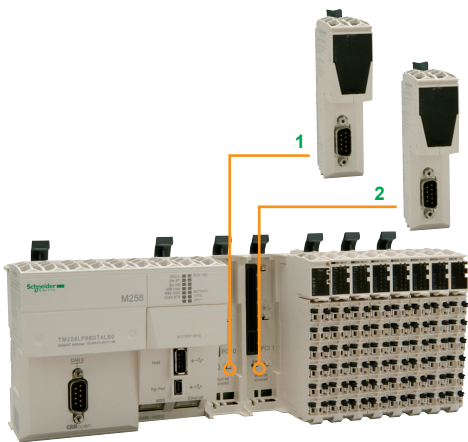
**ConneXium hub**

Description	Number of ports		Item	Reference	Weight kg
	Copper cable	Fibre optic			
Twisted pair hub 10BASE-T copper ports, RJ45 shielded connectors	4	—	6	499 NEH 104 10	0.530

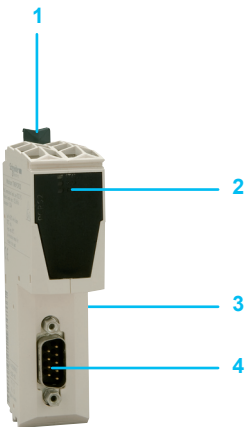
**ConneXium switches**

Description	Number of ports		Item	Manag-eable	Reference	Weight kg
	Copper cable	Fibre optic				
Optimised twisted pair switch 10BASE-T/100BASE-TX copper ports, RJ45 shielded connectors	3	—	6	No	TCS ESU 033FN0	0.113
	4	1	6	No	TCS ESU 043FN0	0.120
	5	—	6	No	TCS ESU 053FN0	0.113
Twisted pair switches 10BASE-T/100BASE-TX copper ports, RJ45 shielded connectors	8	—	6	No	499 NES 181 00	0.230
	8	—	5	Yes	TCS ESM083F23F0	0.410
Twisted pair and fibre optic switches 10BASE-T/100BASE-TX copper ports, RJ45 shielded connectors. 100BASE-FX optic ports, SC connectors	3	1, multimode	5	Yes	TCS ESM043F1CU0	0.400
	2	2, multimode	5	Yes	TCS ESM043F2CU0	0.400
	3	1, single-mode	5	Yes	TCS ESM043F1CS0	0.400
	2	2, single-mode	5	Yes	TCS ESM043F2CS0	0.400
	4	1, multimode	6	No	499 NMS 251 01	0.330
	3	2, multimode	6	No	499 NMS 251 02	0.335
	4	1, single-mode	6	No	499 NSS 251 01	0.330
	3	2, single-mode	6	No	499 NSS 251 02	0.335
	7	1, multimode	5	Yes	TCS ESM083F1CU0	0.410
	6	2, multimode	5	Yes	TCS ESM083F2CU0	0.410
IP 67 twisted pair switch (1) 10BASE-T/100BASE-TX copper ports, shielded M12 connectors (type D)	7	1, single-mode	5	Yes	TCS ESM083F1CS0	0.410
	6	2, single-mode	5	Yes	TCS ESM083F2CS0	0.410
	5	—	—	No	TCS ESU 051 F0	0.210

(1) Require special cables with M12 connectors for their --- 24 V supply: XZC P1●64L●.



1 TM5 PCRS● communication module: Modbus/ASCII serial link  
2 TM5 PCDPS communication module: Profibus DP Slave link  
For mounting on the two free PCI slots in the M258 logic controller or LMC058 motion controller



Presentation

TM5 PC●●● communication modules are designed for TM258 LD42DT4L, TM258 LF42DT4L, TM258 LF42DR, TM258 LF66DT4L logic controllers and LMC 058LF424● motion controllers and are installed in the two free PCI slots in.

- TM5 PC●●● communication modules can be used to configure:
- An additional Modbus or ASCII serial link as RS232 or RS485
  - The connection as a slave to the Profibus DP bus

The maximum number of communication modules is 2 with just 1 TM5 PCRS● serial communication module.

Description

- TM5 PC●●● communication modules comprise:
- 1 A locking clip for mounting/dismounting on the controller
  - 2 A channel and module diagnostics LED display block
  - 3 A connector for linking to the controller
  - 4 A SUB-D connector (male 9-way) for connection:
    - to the serial link on TM5 PCRS●
    - to the Profibus bus on TM5 PCDPS

Serial link		
LED	Colour	Status: on
Status	Green	Operation in progress
	Red	Controller starting
RXD	Yellow	Reception on interface: □ RS232 with TM258 PCRS2 □ RS485 with TM258 PCRS4
TXD	Yellow	Transmission on interface: □ RS232 with TM258 PCRS2 □ RS485 with TM258 PCRS4



TM5 PCRS●



TM5 PCDPS

### References

Description	Used for	Physical layer/ protocol	Built-in port	Reference	Weight kg
Serial link communication modules	<input type="checkbox"/> Logic controllers: TM258 LD42DT4L, TM258 LF42DT4L, TM258 LF42DR, TM258 LF66DT4L <input type="checkbox"/> Motion controllers: LMC 058LF424●	RS232/ Modbus/ASCII	SUB-D connector (male 9-way)	<b>TM5 PCRS2</b>	
		RS485 or RS422/ Modbus/ASCII	SUB-D connector (male 9-way)	<b>TM5 PCRS4</b>	

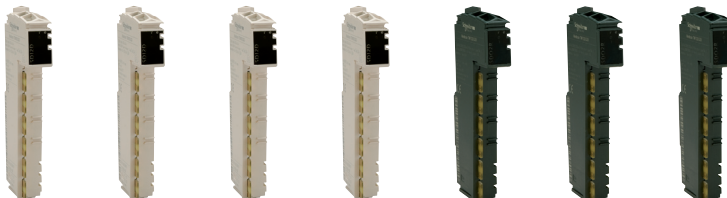
Description	Used for	Profile	Built-in port	Reference	Weight kg
Profibus DP communication modules	<input type="checkbox"/> Logic controllers: TM258 LD42DT4L, TM258 LF42DT4L, TM258 LF42DR, TM258 LF66DT4L <input type="checkbox"/> Motion controllers: LMC 058LF424●	V1 slave	SUB-D connector (male 9-way)	<b>TM5 PCDPS ▲</b>	

▲ Available second quarter 2011.

Applications	Type of extension module
	Compatibility

## 2 to 12 discrete input channels

Logic controller Modicon M258, Motion controller Modicon LMC058



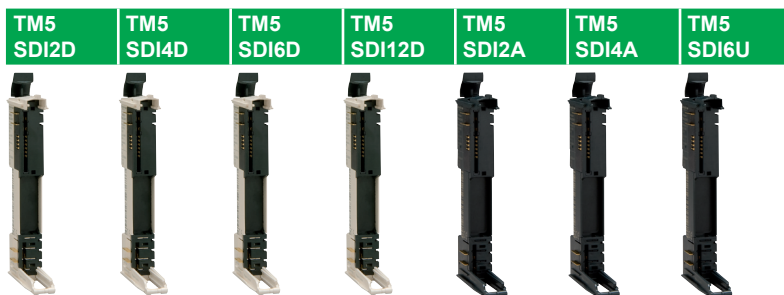
Channel connection	
Inputs	Number
	Nominal input voltage
	IEC/EN 61131-2 conformity
	Type of signal (1)
	Type of wiring
	Limit values
	Nominal input current
	Input impedance
	State 0
	State 1

With removable spring terminal blocks (to be ordered separately)

2	4	6	12	2	4	6
24 V $\overline{\text{DC}}$	24 V $\overline{\text{DC}}$	24 V $\overline{\text{DC}}$	24 V $\overline{\text{DC}}$	100/240 V $\sim$	100/240 V $\sim$	100/240 V $\sim$
Type 1	Type 1	Type 1	Type 1	Type 1	Type 1	Type 1
Sink	Sink	Sink	Sink	–	–	–
1-, 2- or 3-wire	1-, 2- or 3-wire	1 or 2-wire	1-wire	1-, 2- or 3-wire	1 or 2-wire	1 or 2-wire
$\overline{\text{DC}}$ 20.4... 28.8 V	$\overline{\text{DC}}$ 20.4... 28.8 V	$\overline{\text{DC}}$ 20.4... 28.8 V	$\overline{\text{DC}}$ 20.4... 28.8 V	$\sim$ 100... 240 V	$\sim$ 100... 240 V	$\sim$ 100... 120V
3.75 mA	3.75 mA	3.75 mA	3.75 mA	5 mA at $\sim$ 100 V 11 mA at $\sim$ 240 V	5 mA at $\sim$ 100 V 11 mA at $\sim$ 240 V	10 mA at $\sim$ 120 V
6.4 k $\Omega$	6.4 k $\Omega$	6.4 k $\Omega$	6.4 k $\Omega$	–	–	–
$\overline{\text{DC}}$ 5 V max.	$\overline{\text{DC}}$ 5 V max.	$\overline{\text{DC}}$ 5 V max.	$\overline{\text{DC}}$ 5 V max.	–	–	–
$\overline{\text{DC}}$ 15 V min.	$\overline{\text{DC}}$ 15 V min.	$\overline{\text{DC}}$ 15 V min.	$\overline{\text{DC}}$ 15 V min.	–	–	–

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

Type of electronic extension module
-------------------------------------



Associated bus base (to be ordered separately)	TM5 ACBM11
	TM5 ACBM15
	TM5 ACBM12

TM5 SDI2D	TM5 SDI4D	TM5 SDI6D	TM5 SDI12D	TM5 SDI2A	TM5 SDI4A	TM5 SDI6U
Yes	Yes	Yes	Yes	No	No	No
Yes	Yes	Yes	Yes	No	No	No
No	No	No	No	Yes	Yes	Yes



Associated terminal block (to be ordered separately)	TM5 ACTB06
	TM5 ACTB12
	TM5 ACTB32

TM5 SDI2D	TM5 SDI4D	TM5 SDI6D	TM5 SDI12D	TM5 SDI2A	TM5 SDI4A	TM5 SDI6U
Yes	Yes	Yes	No	No	No	No
Yes	Yes	Yes	Yes	No	No	No
No	No	No	No	Yes	Yes	Yes

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29

31

(1) Source output: PNP output, sink output: NPN output.

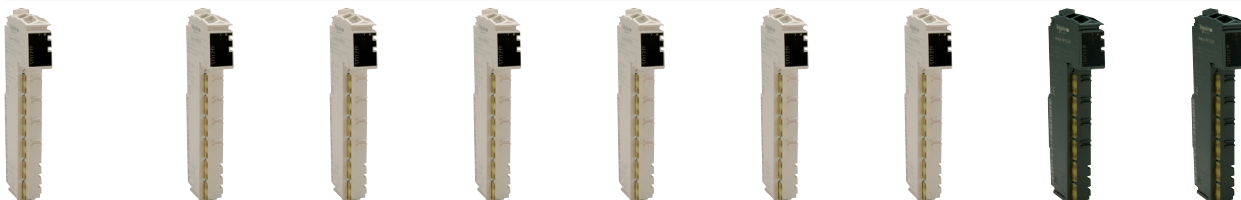


More technical information on [www.schneider-electric.com](http://www.schneider-electric.com)



8 discrete input channels 4 transistor output channels	2 to 12 transistor output channels	2 to 4 relay output channels
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Logic controller Modicon M258, Motion controller Modicon LMC058



With removable spring terminal blocks (to be ordered separately)

8								
24 V ---								
Type 1								
Sink								
1-wire								
--- 20.4... 28.8 V								
3.75 mA								
6.4 kΩ								
--- 5 V max.								
--- 15 V min.								
4	2	4	4	6	8	12	2	4
24 V ---	24 V ---	24 V ---	24 V ---	24 V ---	24 V ---	24 V ---	--- 30/~ 230 V	--- 30/~ 230 V
0.5 A	0.5 A	0.5 A	2 A	0.5 A	2 A	0.5 A	5 A	5 A
2 A max.	1 A max.	2 A max.	4 A max.	3 A max.	8 A max.	6 A max.	10 A max.	10 A max.
Source	Source	Source	Source	Source	Source	Source	Relay	Relay
1-wire	1-, 2- or 3-wire	1-, 2- or 3-wire	1-, 2- or 3-wire	1 or 2-wire	1-wire	1-wire	NO/NC contact	NO/NC contact
--- 20.4...28.8 V	--- 20.4...28.8 V	--- 20.4...28.8 V	--- 20.4...28.8 V	--- 20.4...28.8 V	--- 20.4...28.8 V	--- 20.4...28.8 V	--- 24...36 V ~ 184...276 V	--- 24...36 V ~ 184...276 V
Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No

TM5 SDM12DT	TM5 SDO2T	TM5 SDO4T	TM5 SDO4TA	TM5 SDO6T	TM5 SDO8TA	TM5 SDO12T	TM5 SDO2R	TM5 SDO4R
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Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
No	No	No	No	No	No	No	Yes	Yes



No	Yes	Yes	Yes	Yes	No	No	No	No
Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No
No	No	No	No	No	No	No	Yes	Yes

29

31



More technical information on [www.schneider-electric.com](http://www.schneider-electric.com)

### Presentation

The TM5 SD●●●● discrete slice I/O extension module offer consists of 11 input, mixed I/O and output electronic modules (sensor and preactuator 24 V  $\pm$  power supply).

They complement the embedded I/O in the various M258 controllers and LMC058 motion controllers. They are used to adapt to the application requirements as closely as possible to reduce the installation and wiring costs.

Each discrete slice I/O extension module consists of three parts to be ordered separately:

- ☐ An I/O electronic module
- ☐ A bus base
- ☐ A terminal block

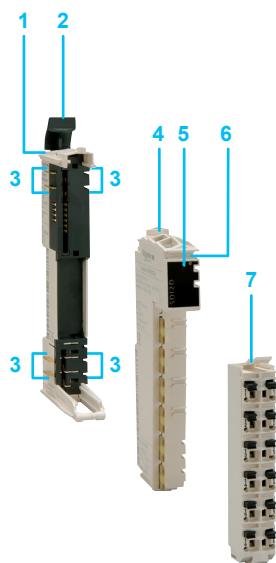
These modules can be mechanically assembled before mounting on a symmetrical rail.

These modules offer the following advantages:

- ☐ Removable terminals
- ☐ Spring terminals which can be used for quick, tool-free connection of the sensors and preactuators in addition, the quality of the spring terminals avoids the need for periodic retightening
- ☐ Hot swapping

The discrete slice I/O extension modules offer includes:

- Four 24 V  $\pm$  discrete input electronic modules with 2, 4, 6 or 12 sink inputs
- One 24 V  $\pm$  discrete mixed I/O electronic module, with 8 sink inputs and 4 source transistor outputs
- Six discrete output electronic modules with 2, 4, 6, 8 or 12 source transistor outputs



### Description

TM5 S●●●● discrete slice I/O extension modules comprise:

- 1 A bus base
- 2 A mechanical locking clip for mounting/dismounting on a symmetrical rail
- 3 On each side of the base, a bus extension connection for the link with the previous controller or module
- 4 A discrete input, I/O or output electronic module
- 5 A channel and module diagnostics LED display block
- 6 A slot for the terminal shield (label-holder)
- 7 A removable spring terminal block with locking clip and slots for coloured identifiers

Device colour: White



TM5 SD●●●



TM5 ACBM●●



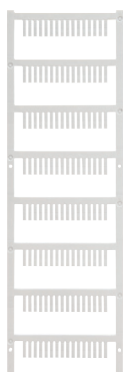
TM5 ACTB●●



TM5 ACTLC100



TM5 ACTCH100



TM5 ACLITW1



TM5 ACLT1



TM5 ACLPL10



TM5 ACLPR10

### References

#### Discrete input electronic modules

Voltage	Number and type of channels (1)	Reference	Weight kg
24 V $\overline{\text{V}}$ inputs	2 sink inputs	TM5 SDI2D	0.025
	4 sink inputs	TM5 SDI4D	0.025
	6 sink inputs	TM5 SDI6D	0.025
	12 sink inputs	TM5 SDI12D	0.025

#### Discrete mixed I/O electronic modules

24 V $\overline{\text{V}}$ I/O	8 sink inputs 4 source transistor outputs	TM5 SDM12DT	0.025
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#### Discrete output electronic modules

24 V $\overline{\text{V}}$ outputs	2 source transistor outputs	0.5 A per channel	TM5 SDO2T	0.025
	4 source transistor outputs	0.5 A per channel	TM5 SDO4T	0.025
	4 source transistor outputs	2 A per channel, 4 A per module	TM5 SDO4TA	0.025
	6 source transistor outputs	0.5 A per channel	TM5 SDO6T	0.025
	8 source transistor outputs	2 A per channel	TM5 SDO8TA	0.025
	12 source transistor outputs	0.5 A per channel	TM5 SDO12T	0.025

#### Bus bases

Power supply	Characteristics	Sold in lots of	Unit reference	Weight kg
24 V $\overline{\text{V}}$	—	1	TM5 ACBM11	0.020
		10	TM5 ACBM1110	0.020
	Address setting	1	TM5 ACBM15	0.020
		10	TM5 ACBM1510	0.020

#### Terminal blocks

Use	Description	Sold in lots of	Unit reference	Weight kg
For discrete I/O electronic modules, 24 V $\overline{\text{V}}$ power supply	6 contacts	1	TM5 ACTB06	0.016
	12 contacts	10	TM5 ACTB0610	0.016
		1	TM5 ACTB12	0.020
		10	TM5 ACTB1210	0.020

#### Accessories

Description	Used for	Colour	Sold in lots of	Unit reference	Weight kg
Terminal block shield (label- holder)	Marking the terminal blocks on the I/O channels	Transparent	100	TM5 ACTCH100	0.002
Terminal block shield locking clip (Order with terminal shield TM5 ACTCH100)	Locking terminal block shield TM5 ACTCH100	Transparent	100	TM5 ACTLC100	0.001
Precut sheet of labels	Terminal block shield TM5 ACTCH100	White	100	TM5 ACTLS100	0.001
Coloured plastic identifiers	Labelling 16 connection channel terminals	White	1	TM5 ACLITW1	0.015
		Red	1	TM5 ACLITR1	0.015
		Blue	1	TM5 ACLITB1	0.015
Metal tool	Inserting/removing TM5 ACLIT●1 identifiers	Black	1	TM5 ACLT1	0.030
Retaining plates for bus bases	Held on the left side	White	10	TM5 ACLPL10	0.004
	Held on the right side	White	10	TM5 ACLPR10	0.004
Locking clips	For slice modules	Black	100	TM5 ACADL100	0.001

(1) Source output: PNP output, sink output: NPN output.

### Presentation

The **TM5 SD●●●** discrete slice I/O extension module offer consists of five input and output electronic modules (sensor and preactuator 100/240 V ~ power supply). They complement the embedded I/O in the various M258 controllers and LMC058 motion controllers. They are used to adapt to the application requirements as closely as possible to reduce the installation and wiring costs.

Each discrete slice I/O extension module consists of three parts to be ordered separately:

- ☐ An I/O electronic module
- ☐ A bus base
- ☐ A terminal block

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

These modules offer the following advantages:

- ☐ Removable terminals
- ☐ Spring terminals which can be used for quick, tool-free connection of the sensors and preactuators in addition, the quality of the spring terminals avoids the need for periodic retightening
- ☐ Hot swapping

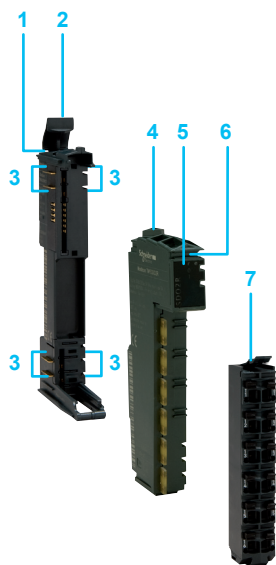
The discrete slice input extension modules offer includes:

- Two 100/240 V ~ discrete input electronic modules, with 2 or 4 inputs
- A 100/120 V ~ discrete input electronic module, with 6 inputs
- Two 30 V ~/230 V ~ discrete output electronic modules, with 2 or 4 relay outputs

### Description

**TM5 SD●●●** discrete slice I/O extension modules comprise:

- 1 A bus base
- 2 A mechanical locking clip for mounting/dismounting on a symmetrical rail
- 3 On each side of the base, a bus extension connection for the link with the previous controller or module
- 4 A discrete input or output electronic module
- 5 A channel and module diagnostics LED display block
- 6 A slot for the terminal shield (label-holder)
- 7 A removable spring terminal block with locking clip and slots for coloured identifiers



Device colour: black



TM5 SDI2A



TM5 SDO2R



TM5 ACBM12



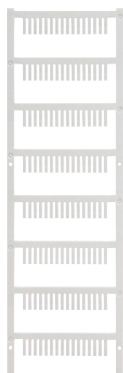
TM5 ACTB32



TM5 ACTLC100



TM5 ACTCH100



TM5 ACLITW1



TM5 ACLT1



TM5 ACLPL10



TM5 ACLPR10



TM5 ACADL100

### References

#### Multivoltage discrete input electronic modules

Voltage	Number and type of channels (1)	Reference	Weight kg
100/240 V ~ inputs	2 inputs	TM5 SDI2A	0.025
	4 inputs	TM5 SDI4A	0.025
100/120 V ~ inputs	6 inputs	TM5 SDI6U	0.025

#### Discrete output electronic modules

30 V ~ / 230 V ~ outputs	2 outputs, NO/NC contact	5 A relay	TM5 SDO2R	0.025
	4 outputs, NO/NC contact	5 A relay	TM5 SDO4R	0.025

#### Bus bases

Power supply	Characteristics	Sold in lots of	Unit reference	Weight kg
~ 240 V	—	1	TM5 ACBM12	0.020
		10	TM5 ACBM1210	0.020

#### Terminal blocks

Use	Description	Sold in lots of	Unit reference	Weight kg
For discrete I/O electronic module, 240 V ~ power supply	12 contacts	1	TM5 ACTB32	0.025
		10	TM5 ACTB3210	0.025

#### Accessories

Description	Used for	Colour	Sold in lots of	Unit reference	Weight kg
Terminal block shield (label- holder)	Marking the terminal blocks on the I/O channels	Transparent	100	TM5 ACTCH100	0.002
Terminal block shield locking clip (Order with terminal shield TM5 ACTCH100)	Locking terminal block shield TM5 ACTCH100	Transparent	100	TM5 ACTLC100	0.001
Precut sheet of labels	Terminal block shield TM5 ACTCH100	White	100	TM5 ACTLS100	0.001
Coloured plastic identifiers	Labelling 16 connection channel terminals	White	1	TM5 ACLITW1	0.015
		Red	1	TM5 ACLITR1	0.015
		Blue	1	TM5 ACLITB1	0.015
Metal tool	Inserting/removing TM5 ACLIT1 identifiers	Black	1	TM5 ACLT1	0.030
Retaining plates for bus bases	Held on the left side	White	10	TM5 ACLPL10	0.004
	Held on the right side	White	10	TM5 ACLPR10	0.004
Locking clips	For slice modules	Black	100	TM5 ACADL100	0.001

(1) Source output: PNP output, sink output: NPN output.

### Presentation

TM5 SP●●● slice common distribution modules make cabling more flexible by “branching” the various voltages needed to power the I/O extension modules used. Each slice common distribution module consists of three parts to be ordered separately:

- ☐ A common distribution electronic module
- ☐ A bus base
- ☐ A terminal block to be chosen according to the number of terminals

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

These modules offer the following advantages:

- ☐ Removable terminals
- ☐ Spring terminals which can be used for quick, tool-free connection of the sensors and preactuators in addition, the quality of the spring terminals avoids the need for periodic retightening
- ☐ Hot swapping

The slice power supply common modules offer includes four common distribution electronic modules which have a removable fuse.

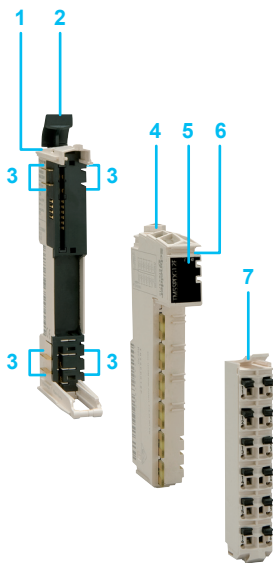
This offer is completed by a non-functioning dummy module TM5 SD0000 which can be used to:

- ☐ Increase the flexibility in managing the various options for an installation: machine with or without temperature sensors for example.
- ☐ Reserve a physical slot and a logical address on the backplane bus, for adding a functioning module at a later date: application-specific I/O extension for example.

### Description

Slice common distribution modules comprise:

- 1 A bus base
- 2 A mechanical locking clip for mounting/dismounting on a symmetrical rail
- 3 On each side of the base, a bus extension connection for the link with the previous controller or module
- 4 A common distribution electronic module
- 5 A channel and module diagnostics LED display block
- 6 A slot for the terminal shield (label-holder)
- 7 A removable spring terminal block with locking clip and slots for coloured identifiers



Device colour: white



TM5 SPDG●●●



TM5 ACBM●●



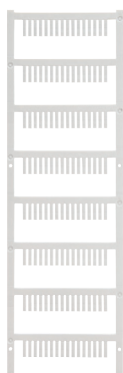
TM5 ACTB●●



TM5 ACTLC100



TM5 ACTCH100



TM5 ACLITW1



TM5 ACLT1



TM5 ACLPL10



TM5 ACLPR10

### References

#### Common distribution electronic modules (1)

Power supply type	Characteristics	Reference	Weight kg
24 V ~	12 common x 0 V DC with 1 fuse	TM5 SPDG12F	0.025
	12 common x 24 V DC with 1 fuse	TM5 SPDD12F	0.025
	5 common x 0 V DC 5 common x 24 V DC with 1 fuse	TM5 SPDG5D4F	0.025
	6 common x 0 V DC 6 common x 24 V DC with 1 fuse	TM5 SPDG6D6F	0.025

#### Dummy electronic module

Characteristics	Used for	Reference	Weight kg
Non-functioning	Reservation of slots and logical address	TM5 SD0000	0.015

#### Bus bases

Power supply	Characteristics	Sold in lots of	Unit reference	Weight kg
24 V ~	–	1	TM5 ACBM11	0.020
		10	TM5 ACBM1110	0.020
	Address setting	1	TM5 ACBM15	0.020
		10	TM5 ACBM1510	0.020

#### Terminal blocks

Use	Description	Sold in lots of	Unit reference	Weight kg
For common distribution electronic module, 24 V ~ power supply	6 contacts	1	TM5 ACTB06	0.016
		10	TM5 ACTB0610	0.016
	12 contacts	1	TM5 ACTB12	0.020
		10	TM5 ACTB1210	0.020

#### Accessories

Description	Used for	Colour	Sold in lots of	Unit reference	Weight kg
Terminal block shield (label-holder)	Marking the terminal blocks on the I/O channels	Transparent	100	TM5 ACTCH100	0.002
Terminal block shield locking clip (Order with terminal shield TM5 ACTCH100)	Locking terminal block shield	Transparent	100	TM5 ACTLC100	0.001
Precut sheet of labels	Terminal block shield TM5 ACTCH100	White	100	TM5 ACTLS100	0.001
Coloured plastic identifiers	Labelling 16 connection channel terminals	White	1	TM5 ACLITW1	0.015
		Red	1	TM5 ACLITR1	0.015
		Blue	1	TM5 ACLITB1	0.015
Metal tool	Inserting/removing TM5 ACLIT●1 identifiers	Black	1	TM5 ACLT1	0.030
Retaining plates for bus bases	Held on the left side	White	10	TM5 ACLPL10	0.004
	Held on the right side	White	10	TM5 ACLPR10	0.004
Locking clips	For slice modules	Black	100	TM5 ACADL100	0.001

(1) Equipped with 5 x 20 internal fuse, slow-blow 6.3 A

Applications	Type of extension module
	Compatibility

### 2 to 6 analog input channels

Logic controller Modicon M258, Motion controller Modicon LMC058



### Channel connection

Analog inputs	Number
	Type
	Range
	Resolution
	Sampling period without filtering with filtering

With removable spring terminal blocks (to be ordered separately)

2	2	4	4	2
Voltage/current	Voltage/current	Voltage/current	Voltage/current	Pt100/Pt1000 temperature probe
- 10...+ 10 V DC 0...20 mA/ 4...20 mA	- 10...+ 10 V DC 0...20 mA/ 4...20 mA	- 10...+ 10 V DC 0...20 mA/ 4...20 mA	- 10...+ 10 V DC 0...20 mA	- 200...+ 850°C
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	—

Analog outputs	Number
	Type
	Range
	Resolution
	Response time

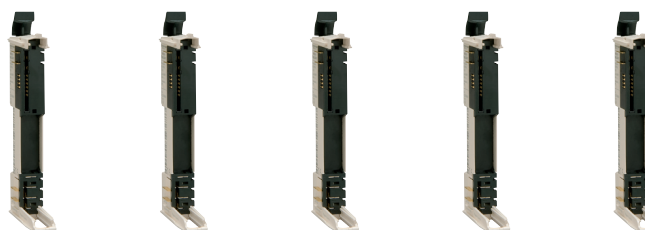
### Power supply

Isolation	Channel-to-channel
	Between channel groups
	Channel-to-bus

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

### Type of electronic extension module

TM5 SAI2L	TM5 SAI2H	TM5 SAI4L	TM5 SAI4H	TM5 SAI2PH
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Associated bus base (to be ordered separately)	TM5 ACBM11
	TM5 ACBM15

Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes

Associated terminal block (to be ordered separately)	TM5 ACTB06
	TM5 ACTB12



Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes

### Page

37



More technical information on [www.schneider-electric.com](http://www.schneider-electric.com)



## 2 to 4 analog output channels



With removable spring terminal blocks (to be ordered separately)

2	4	6
J, K, S, N thermocouple	Pt100/Pt1000 temperature probe	J, K, S, N thermocouple
Type J: - 210...+ 1200°C Type K: - 270...+ 1372°C Type S: - 50...+ 1768°C Type N: - 270...+ 1300°C	- 200...+ 850°C	Type J: - 210...+ 1200°C Type K: - 270...+ 1372°C Type S: - 50...+ 1768°C Type N: - 270...+ 1300°C
16 bits	16 bits	16 bits
—	—	—
—	—	—

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

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

<b>TM5 SAI2TH</b>	<b>TM5 SAI4PH</b>	<b>TM5 SAI6TH</b>	<b>TM5 SAO2L</b>	<b>TM5 SAO2H</b>	<b>TM5 SAO4L</b>	<b>TM5 SAO4H</b>
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Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes	Yes



Yes	Yes	Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes	Yes	Yes



### Presentation

TM5 SA●●● analog slice I/O extension modules are used to acquire various analog values encountered in industrial applications.

Analog slice 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.

On a controller "stop", the outputs can be configured with fallback (set to the bottom scale value or held at their value). This function, with holding the value, is used when debugging the application or on a fault so as not to disturb the controlled process.

Each analog slice I/O extension module consists of three parts to be ordered separately:

- An I/O electronic module
- A bus base
- A terminal block

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

These modules offer the following advantages:

- Removable terminals
- Spring terminals which can be used for quick, tool-free connection of the sensors and preactuators in addition, the quality of the spring terminals avoids the need for periodic retightening
- Hot swapping

The offer of 12 analog slice I/O modules includes:

- Four electronic modules with 2 or 4 voltage/current inputs
- Two electronic modules with 2 or 4 Pt100/Pt1000 temperature probes
- Two electronic modules with 2 or 6 J, K, S and N thermocouple inputs
- Four electronic modules with 2 or 4 voltage/current outputs

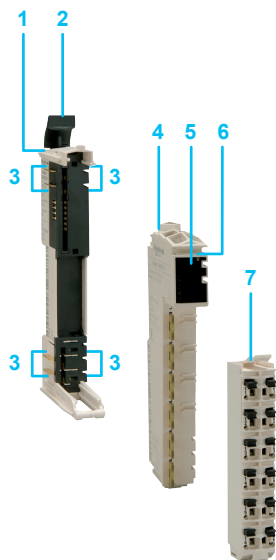
Depending on the application requirements, these electronic modules are available in 12 or 16 bit-resolution.

It is advisable to use the TM2XMTGB earthing plate which simplifies connection of the analog sensor and actuator cable shielding. This shielding must be connected to the device's functional earth.

### Description

Analog slice I/O modules comprise:

- 1 A bus base
- 2 A mechanical locking clip for mounting/dismounting on a symmetrical rail
- 3 On each side of the base, a bus extension connection for the link with the previous controller or module
- 4 An analog input or output electronic module
- 5 A channel and module diagnostics LED display block
- 6 A slot for the terminal shield (label-holder)
- 7 A removable spring terminal block with locking clip and slots for coloured identifiers



Device colour: white



TM5 SAI●●



TM5 SAO●●



TM5 ACBM●●



TM5 ACTB●●



TM5 ACTLC100



TM5 ACTCH100



TM5 ACLTW1



TM5 ACLT1



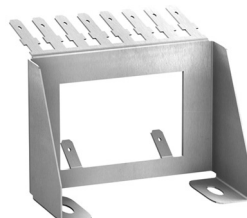
TM5 ACLPL10



TM5 ACLPR10



TM5 ACADL100



TM2 XMTGB



TM200 RSRCEMC

### References

#### Analog input electronic modules

Number and type of inputs	Input range	Resolution	Reference	Weight kg
2 voltage/current inputs	- 10...+ 10 V DC	12 bits + sign	TM5 SAI2L	0.025
	0...20 mA/4...20 mA	15 bits + sign	TM5 SAI2H	0.025
4 voltage/current inputs	- 10...+ 10 V DC	12 bits + sign	TM5 SAI4L	0.025
	0...20 mA/4...20 mA			
	- 10...+ 10 V DC, 0...20 mA	15 bits + sign	TM5 SAI4H	0.025
2 Pt100/Pt1000 temperature probe inputs	- 200...+ 850°C	16 bits	TM5 SAI2PH	0.025
2 J, K, S, N thermocouple inputs	Type J: - 210...+ 1200°C	16 bits	TM5 SAI2TH	0.025
	Type K: - 270...+ 1372°C			
	Type S: - 50...+ 1768°C			
	Type N: - 270...+ 1300°C			
4 Pt100/Pt1000 temperature probe inputs	- 200...+ 850°C	16 bits	TM5 SAI4PH	0.025
6 J, K, S, N thermocouple inputs	Type J: - 210...+ 1200°C	16 bits	TM5 SAI6TH	0.025
	Type K: - 270...+ 1372°C			
	Type S: - 50...+ 1768°C			
	Type N: - 270...+ 1300°C			

#### Analog output electronic modules

Number and type of outputs	Output range	Resolution	Reference	Weight kg
2 voltage/current outputs	- 10...+ 10 V DC, 0...20 mA	12 bits + sign	TM5 SAO2L	0.025
		15 bits + sign	TM5 SAO2H	0.025
4 voltage/current outputs	- 10...+ 10 V DC, 0...20 mA	12 bits + sign	TM5 SAO4L	0.025
		15 bits + sign	TM5 SAO4H	0.025

#### Bus bases

Power supply	Characteristics	Sold in lots of	Unit reference	Weight kg
24 V ☐	–	1	TM5 ACBM11	0.020
		10	TM5 ACBM1110	0.020
	Address setting	1	TM5 ACBM15	0.020
		10	TM5 ACBM1510	0.020

#### Terminal blocks

Use	Type	Sold in lots of	Unit reference	Weight kg
For analog I/O electronic module,	6 contacts	1	TM5 ACTB06	0.016
		10	TM5 ACTB0610	0.016
24 V ☐ power supply	12 contacts	1	TM5 ACTB12	0.020
		10	TM5 ACTB1210	0.020

#### Accessories

Designation	Used for	Colour	Sold in lots of	Unit reference	Weight kg
Terminal block shield (label-holder)	Marking the terminal blocks on the I/O channels	Transparent	100	TM5 ACTCH100	0.002
Terminal block shield locking clip (Order with terminal shield TM5 ACTCH100)	Locking terminal block shield TM5 ACTCH100	Transparent	100	TM5 ACTLC100	0.001
Precut sheet of labels	Terminal block shield TM5 ACTCH100	White	100	TM5 ACTLS100	0.001
Coloured plastic identifiers	Labelling 16 connection channel terminals	White	1	TM5 ACLITW1	0.015
		Red	1	TM5 ACLITR1	0.015
		Blue	1	TM5 ACLITB1	0.015
Metal tool	Inserting/removing TM5 ACLIT●1 identifiers	Black	1	TM5 ACLT1	0.030
Retaining plates for bus bases	Held on the left side	White	10	TM5 ACLPL10	0.004
	Held on the right side	White	10	TM5 ACLPR10	0.004
Locking clips	For slice modules	Black	100	TM5 ACADL100	0.001

#### Separate parts

Designation	Description	Unit reference	Weight kg
Earthing plate	Support equipped with 10 male Faston connectors for connecting the cable shielding (via 6.35 mm connectors, not supplied) and the functional earths (FE)	TM2 XMTGB	0.045
Shielding connection clamps	Attachment and earthing of the cable shielding. Pack of 25 clamps including 20 for Ø 4.8 mm cable and 5 for Ø 7.9 mm cable	TM200 RSRCEMC	–
Mounting kit	For mounting the analog modules on a plate or panel	TWD XMT 5	0.065

Applications	Upcounting, downcounting, period measurement, frequency meter, frequency generator, axis following with encoder
Compatibility	Logic controller Modicon M258, Motion controller Modicon LMC058



Channel connection	With removable spring terminal blocks (to be ordered separately)	
Number of counter channels	2	1
IEC/EN 61131-2 conformity	Type 1	Incremental
Type of signal (1)	Sink	RS422
Type of input	1-, 2- or 3-wire	–
Nominal input voltage	24 V $\overline{---}$	24 V $\overline{---}$ asymmetrical
Voltage limit values	$\overline{---}$ 20.4... 28.8 V	–
Frequency per channel	50 kHz	100 kHz
Resolution	–	16/32 bits
Functions	Event counting Interval measurement	2 x 24 V $\overline{---}$ auxiliary inputs 24 V $\overline{---}$ encoder power supply
Types of counter module	<b>TM5 SDI2DF</b>	<b>TM5 SE1IC01024</b>



Associated bus base (to be ordered separately)	TM5 ACBM11	Yes	Yes
	TM5 ACBM15	Yes	Yes



Associated terminal block (to be ordered separately)	TM5 ACTB12	Yes	Yes
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Page	41
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(1) Source output: PNP output, sink output: NPN output.



Upcounting, downcounting, period measurement, frequency meter, frequency generator, axis following with encoder

Logic controller Modicon M258, Motion controller Modicon LMC058



With removable spring terminal blocks (to be ordered separately)
2
Incremental
Sink
—
— 24 V asymmetrical
—
100 kHz
16/32 bits
2 x 24 V — auxiliary inputs 24 V — encoder power supply

TM5 SE2IC01024



Yes
Yes



Yes
41



Presentation

**TM5 SDI12DF** and **TM5 SE●●●●●●●●** slice counter modules for Modicon M258 logic controller and LMC058 motion controllers are used to count the pulses generated by a sensor or to process the signals from an incremental encoder, depending on the reference chosen.

The extent of the high-speed counter module offer makes it possible to adapt the configuration to the machine's precise requirements: the three counter modules differ in their frequency and their functions.

Counter electronic modules	No. of channels	Max. frequency	Integrated functions	Signal
TM5 SDI12DF	2	50 kHz	Event counting, interval measurement	Sink
TM5 SE1IC01024	1	100 kHz	2 x 24 V ∴ auxiliary inputs 24 V ∴ encoder power supply	RS422
TM5 SE2IC01024	2	100 kHz	2 x 24 V ∴ auxiliary inputs 24 V ∴ encoder power supply	Sink

The function parameters are set by configuration using SoMachine V2.0 software.

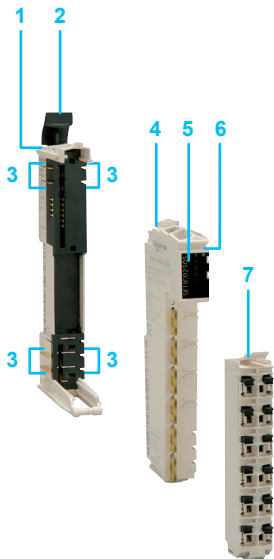
Each slice counter module consists of three parts to be ordered separately:

- An electronic counter module
- A bus base
- A terminal block

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

These modules offer the following advantages:

- Removable terminals
- Spring terminals which can be used for quick, tool-free connection of the sensors and preactuators in addition, the quality of the spring terminals avoids the need for periodic retightening
- Hot swapping



Description

Slice counter modules comprise:

- 1 A bus base
- 2 A mechanical locking clip for mounting/dismounting on a symmetrical rail
- 3 On each side of the base, a bus extension connection for the link with the previous controller or module
- 4 An electronic counter module
- 5 A channel and module diagnostics LED display block
- 6 A slot for the terminal shield (label-holder)
- 7 A removable spring terminal block with locking clip and slots for coloured identifiers

Device colour: white



TM5 SDI2DF



TM5 SE●●●●●●●●



TM5 ACBM●●



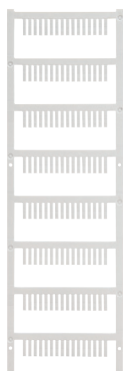
TM5 ACTB●●



TM5 ACTLC100



TM5 ACTCH100



TM5 ACLITW1



TM5 ACLT1



TM5 ACLPL10



TM5 ACLPR10



TM5 ACADL100

### References

#### Counter electronic modules

Counting frequency	Number of channels	Function	Reference	Weight kg
50 kHz	2	Event counting, interval measurement	TM5 SDI2DF	0.025
100 kHz	1	2 x 24 V $\overline{\text{---}}$ auxiliary inputs 24 V $\overline{\text{---}}$ encoder power supply	TM5 SE1IC01024	0.025
	2	2 x 24 V $\overline{\text{---}}$ auxiliary inputs 24 V $\overline{\text{---}}$ encoder power supply	TM5 SE2IC01024	0.025

#### Bus bases

Power supply	Characteristics	Sold in lots of	Unit reference	Weight kg
24 V $\overline{\text{---}}$	—	1	TM5 ACBM11	0.020
		10	TM5 ACBM1110	0.020
	Address setting	1	TM5 ACBM15	0.020
		10	TM5 ACBM1510	0.020

#### Terminal blocks

Use	Description	Sold in lots of	Unit reference	Weight kg
For electronic counter module powered with 24 V $\overline{\text{---}}$	12 contacts	1	TM5 ACTB12	0.020
		10	TM5 ACTB1210	0.020

#### Accessories

Designation	Used for	Colour	Sold in lots of	Unit reference	Weight kg
Terminal block shield (label-holder)	Marking the terminal blocks on the I/O channels	Transparent	100	TM5 ACTCH100	0.002
Terminal block shield locking clip (Order with terminal shield TM5 ACTCH100)	Locking terminal block shield TM5 ACTCH100	Transparent	100	TM5 ACTLC100	0.001
Precut sheet of labels	Terminal block shield TM5 ACTCH100	White	100	TM5 ACTLS100	0.001
Coloured plastic identifiers	Labelling 16 connection channel terminals	White	1	TM5 ACLITW1	0.015
		Red	1	TM5 ACLITR1	0.015
		Blue	1	TM5 ACLIB1	0.015
Metal tool	Inserting/removing TM5 ACLIT●1 identifiers	Black	1	TM5 ACLT1	0.030
Retaining plates for bus bases	Held on the left side	White	10	TM5 ACLPL10	0.004
	Held on the right side	White	10	TM5 ACLPR10	0.004
Locking clips	For slice modules	Black	100	TM5 ACADL100	0.001



### Presentation

TM5 SP●● slice power distribution modules are intended to supply power to the I/O modules and/or the TM5 bus.

Each slice power distribution module consists of three parts to be ordered separately:

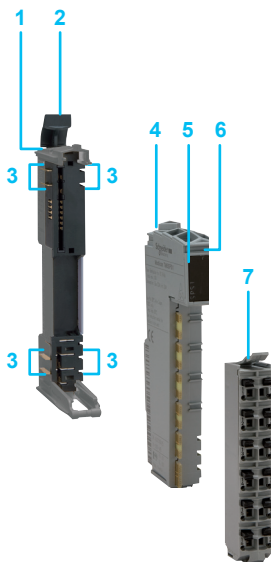
- A power distribution electronic module
- A bus base
- A terminal block

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

These modules offer the following advantages:

- Removable terminals
- Spring terminals which can be used for quick, tool-free connection of the sensors and preactuators in addition, the quality of the spring terminals avoids the need for periodic retightening

Four slice power distribution modules are available



### Description

Power distribution modules comprise:

- 1 A bus base
- 2 A mechanical locking clip for mounting/dismounting on a symmetrical rail
- 3 On each side of the base, a bus extension connection for the link with the previous controller or module
- 4 A power distribution electronic module
- 5 A channel and module diagnostics LED display block
- 6 A slot for the terminal shield (label-holder)
- 7 A removable spring terminal block with locking clip and slots for coloured identifiers

Device colour: grey



TM5 SP●●



TM5 ACBM●●



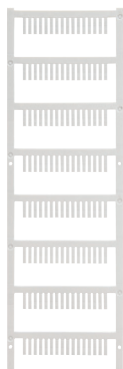
TM5 ACTB●●



TM5 ACTLC100



TM5 ACTCH100



TM5 ACLITW1



TM5 ACLT1



TM5 ACLPL10



TM5 ACLPR10



TM5 ACADL100

### References

#### Power distribution electronic modules

Input power supply	Used for	Fuse	Reference	Weight kg
24 V $\overline{\text{---}}$	Supplying power to the I/O modules in 24 V $\overline{\text{---}}$ Total I max: 10 A	–	<b>TM5 SPS1</b>	0.030
		6.3 A internal fuse	<b>TM5 SPS1F</b>	0.030
	Supplying power □ to the I/O modules in 24 V $\overline{\text{---}}$ □ and the TM5 bus (Bus power supply: 7 W)	–	<b>TM5 SPS2</b>	0.030
		6.3 A internal fuse	<b>TM5 SPS2F</b>	0.030

#### Bus bases

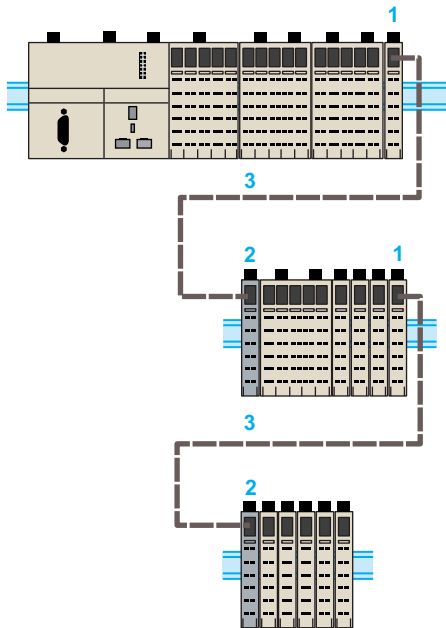
Power supply	Characteristics	Sold in lots of	Unit reference	Weight kg
24 V $\overline{\text{---}}$	Isolated on the left on the power supply to the I/O modules in 24 V $\overline{\text{---}}$	<b>1</b>	<b>TM5 ACBM01R</b>	0.020
		<b>10</b>	<b>TM5 ACBM01R10</b>	0.020
	Isolated on the left on the power supply to the I/O modules in 24 V $\overline{\text{---}}$ Address setting	<b>1</b>	<b>TM5 ACBM05R</b>	0.020
		<b>10</b>	<b>TM5 ACBM05R10</b>	0.020

#### Terminal block

Use	Characteristics	Reference	Weight kg
For power distribution electronic module 24 V $\overline{\text{---}}$	12 contacts	<b>TM5 ACTB12PS</b>	0.020

#### Accessories

Description	Used for	Colour	Sold in lots of	Unit reference	Weight kg
<b>Terminal block shield (label-holder)</b>	Marking the terminal blocks on the I/O channels	Transparent	<b>100</b>	<b>TM5 ACTCH100</b>	0.002
<b>Terminal block shield locking clip</b> (Order with terminal shield TM5 ACTCH100)	Locking terminal block shield TM5 ACTCH100	Transparent	<b>100</b>	<b>TM5 ACTLC100</b>	0.001
<b>Precut sheet of labels</b>	Terminal block shield TM5 ACTCH100	White	<b>100</b>	<b>TM5 ACTLS100</b>	0.001
<b>Coloured plastic identifiers</b>	Labelling 16 connection channel terminals	White	<b>1</b>	<b>TM5 ACLITW1</b>	0.015
		Red	<b>1</b>	<b>TM5 ACLITR1</b>	0.015
		Blue	<b>1</b>	<b>TM5 ACLITB1</b>	0.015
<b>Metal tool</b>	Inserting/removing TM5 ACLIT●1 identifiers	Black	<b>1</b>	<b>TM5 ACLT1</b>	0.030
<b>Retaining plates for bus bases</b>	Held on the left side	White	<b>10</b>	<b>TM5 ACLPL10</b>	0.004
	Held on the right side	White	<b>10</b>	<b>TM5 ACLPR10</b>	0.004
<b>Locking clips</b>	For slice modules	Black	<b>100</b>	<b>TM5 ACADL100</b>	0.001



### Presentation

M258 controllers and LMC058 motion controllers offer the possibility of creating islands of remote I/O via the **TCS XCNNXNX100** extension bus.

This makes it possible to:

- Adapt the architecture as closely as possible to the machine topology
- Reduce the wiring costs by minimizing the distance between the I/O modules and the sensors/preactuators
- Take full advantage of the **TCS XCNNXNX100** extension bus exchange performance
- Save the cost of a fieldbus connection

In addition, irrespective of the extension module local or remote slot, the modules remain synchronized due to use of the same extension bus. Slice remote I/O modules are needed to:

- Increase the number of remote I/O on a M258 controller and an LMC058 motion controller beyond 100 m
- Exchange incoming and outgoing data produced by the I/O extension modules
- Guarantee the performance of data exchanges

Two slice remote I/O modules are available:

- **TM5 SBET1** electronic modules: transmitter (1), white
- **TM5 SBER2** electronic modules: receiver (2), grey like all the power distribution modules
- They are physically linked by the remote I/O connection cable (3)

### TCS XCNNXNX100

- The maximum distance between islands is 100 m and it is possible to connect up to 25 remote islands.

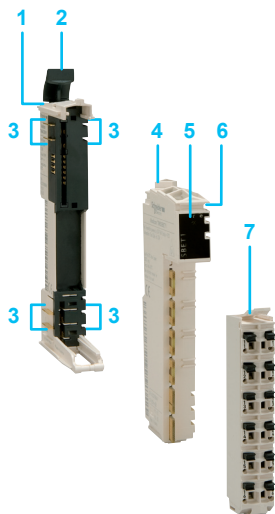
Each slice remote I/O module consists of three parts to be ordered separately:

- A remote I/O electronic module, either transmitter or receiver
- A bus base
- A terminal block

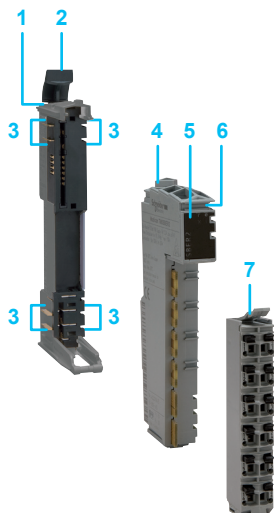
These modules can be mechanically assembled before mounting on a symmetrical rail.

These modules offer the following advantages:

- Removable terminals,
- Spring terminals which can be used for quick, tool-free connection of the sensors and preactuators in addition, the quality of the spring terminals avoids the need for periodic retightening.



Transmitter slice remote I/O module



Receiver slice remote I/O module

### Description

Transmitter and receiver slice remote I/O modules comprise:

- 1 A bus base
- 2 A mechanical locking clip for mounting/dismounting on a symmetrical rail
- 3 On each side of the base, a bus extension connection for the link with the previous controller or module
- 4 A remote I/O electronic module, either transmitter or receiver
- 5 A channel and module diagnostics LED display block
- 6 A slot for the terminal shield (label-holder)
- 7 A removable spring terminal block with locking clip and slots for coloured identifiers



TM5 SBET1



TM5 SBER2



TM5 ACBM1●



TM5 ACBM0●R



TM5 ACTB●●



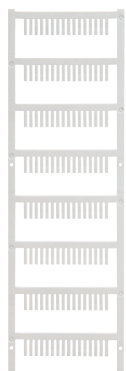
TM5 ACTB12PS



TM5 ACTLC100



TM5 ACTCH100



TM5 ACLITW1



TM5 ACLT1



TM5 ACLPL10



TM5 ACLPR10



TM5 ACADL100

### References

#### Remote I/O electronic modules

Description	Characteristics	Reference	Weight kg
<b>Transmitter module</b>	Data transmission electronic module Module colour: white	<b>TM5 SBET1</b>	0.025
<b>Receiver module</b>	Data reception electronic module Power distribution module for electronic modules and TM5 bus, 24 V $\pm$ power supply Module colour: grey	<b>TM5 SBER2</b>	0.025

#### Extension bus

Description	Use	Length	Reference	Weight kg
<b>Remote I/O connection cable</b>	Bus extension by linking transmitter and receiver modules	100 m	<b>TCS XCNNXNX100</b>	8.800

#### Bus bases

Power supply	Used for	Sold in lots of	Unit reference	Weight kg
—	TM5 SBET1 transmitter module	1	<b>TM5 ACBM11</b>	0.020
		10	<b>TM5 ACBM1110</b>	0.020
	TM5 SBET1 transmitter module, with address setting	1	<b>TM5 ACBM15</b>	0.020
		10	<b>TM5 ACBM1510</b>	0.020
24 V $\pm$	TM5 SBER2 receiver module	1	<b>TM5 ACBM01R</b>	0.020
		10	<b>TM5 ACBM01R10</b>	0.020
	TM5 SBER2 receiver module, with address setting	1	<b>TM5 ACBM05R</b>	0.020
		10	<b>TM5 ACBM05R10</b>	0.020

#### Terminal blocks

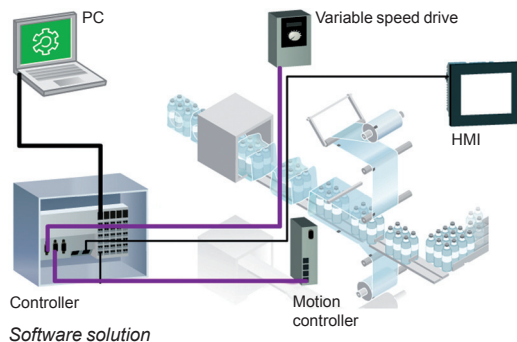
Used for	Characteristics	Sold in lots of	Unit reference	Weight kg
<b>TM5 BET1 transmitter module</b>	6 contacts	1	<b>TM5 ACTB06</b>	0.016
		10	<b>TM5 ACTB0610</b>	0.016
	12 contacts	1	<b>TM5 ACTB12</b>	0.020
		10	<b>TM5 ACTB1210</b>	0.020
<b>TM5 BER2 receiver module</b>	12 contacts	1	<b>TM5 ACTB12PS</b>	0.020

#### Accessories

Description	Used for	Colour	Sold in lots of	Unit reference	Weight kg
<b>Terminal block shield (label-holder)</b>	Marking the terminal blocks on the I/O channels	Transparent	100	<b>TM5 ACTCH100</b>	0.002
<b>Terminal block shield locking clip</b> (Order with terminal shield TM5 ACTCH100)	Locking terminal block shield	Transparent	100	<b>TM5 ACTLC100</b>	0.001
<b>Precut sheet of labels</b>	Terminal block shield TM5 ACTCH100	White	100	<b>TM5 ACTLS100</b>	0.001
<b>Coloured plastic identifiers</b>	Labelling 16 connection channel terminals	White	1	<b>TM5 ACLITW1</b>	0.015
		Red	1	<b>TM5 ACLITR1</b>	0.015
		Blue	1	<b>TM5 ACLITB1</b>	0.015
<b>Metal tool</b>	Inserting/removing TM5 ACLIT●1 identifiers	Black	1	<b>TM5 ACLT1</b>	0.030
<b>Retaining plates for bus bases</b>	Held on the left side	White	10	<b>TM5 ACLPL10</b>	0.004
	Held on the right side	White	10	<b>TM5 ACLPR10</b>	0.004
<b>Locking clips</b>	For slice modules	Black	100	<b>TM5 ACADL100</b>	0.001



SoMachine software platform



Project management

## Presentation

SoMachine is the OEM solution software for developing, configuring and commissioning the entire machine in a single software environment, including logic, motion control, HMI and related network automation functions.

SoMachine allows you to program and commission all the elements in Schneider Electric's Flexible and Scalable Control platform, the comprehensive solution-oriented offer for OEMs, which helps you achieve the most optimized control solution for each machine's requirements.

Flexible and Scalable Control platforms include:

### Controllers:

- HMI controllers:
  - XBT GC,
  - XBT GT/GK CANopen,
- Logic controllers:
  - Modicon M238,
  - Modicon M258,
- Motion Controller
  - Modicon LMC 058,
- Integrated Controller Card:
  - Altivar IMC,

### HMI:

- HMI Magelis graphic panels:
  - XBT GT,
  - XBT GK.

SoMachine is a professional, efficient, and open software solution integrating Vijeo-Designer.

It integrates also the configuring and commissioning tool for motion control devices. It features all IEC 61131-3 languages, integrated field bus configurators, expert diagnostics and debugging, as well as outstanding capabilities for maintenance and visualisation.

SoMachine integrates tested, validated, documented and supported expert application libraries dedicated to applications in Packaging, Hoisting and Conveying.

SoMachine provides you:

- One software package,
- One project file,
- One cable connection,
- One download operation.

## Visual graphic user interface

Navigation within SoMachine is intuitive and highly visual. Presentation is optimized in such a way that selecting the development stage of the desired project makes the appropriate tools available. The user interface ensures nothing is overlooked, and suggests the tasks to be performed throughout the project development cycle. The workspace has been streamlined, so that only that which is necessary and relevant to the current task is featured, without any superfluous information.

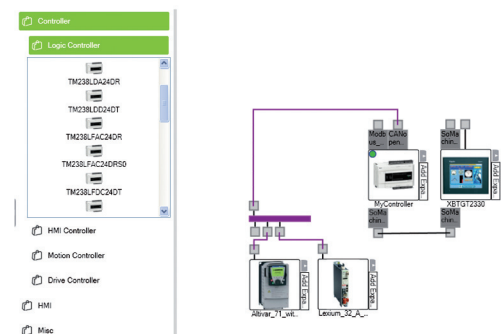
## Learning centre

From the home menu, the learning centre provides several tools to get started with SoMachine. An animated file explains briefly the SoMachine interface and concept. An e-learning allows to run a self-training about SoMachine. A third section gives access to several documented examples of simple coding with SoMachine.

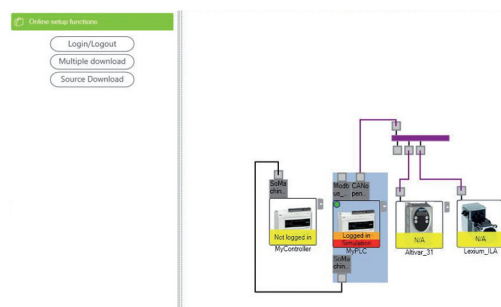
## Projects management

The implemented project management principle allows to browse quickly the existing projects getting the relevant information without the need to open them before selection.

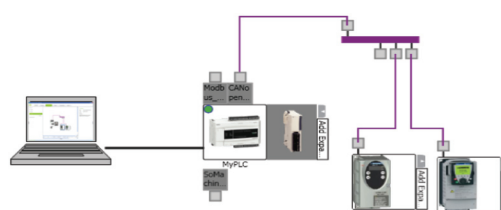
The user can create a new project, starting from several means: using Tested Validated and Documented Architectures, using the provided examples, using an existing project or from scratch. There is quick access to the most recently-used projects.



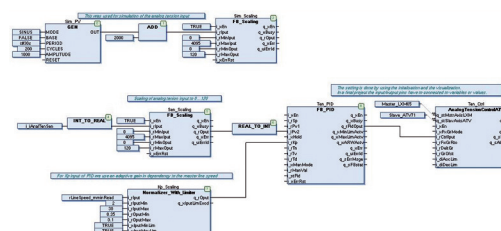
Configuration



Commissioning



Transparency



Application Function Blocks

### Project properties

For each project, the user has the option to define additional information, through friendly forms. It's also possible to attach documents, a customer picture and a configuration picture.

### Configuration

From the graphic user interface, the user can easily build his architecture and configure the devices of this architecture.

### Description of the architecture

A graphic editor can be used to assemble the various elements easily by a simple drag & drop. A devices catalogue is displayed on the left of the screen. It is split into several sections: controllers, HMI, Miscellaneous and search.

### Configuration of the device

Directly from the topologic view of the user interface, a simple click drives the user to the configuration screen of the selected device.

### Programming and debug

Programming is an essential step, and the user has to carefully design it to be as efficient as possible. Advanced control and HMI functions cover all the needs of an OEM engineer in terms of creating the control and visualisation system. Powerful tools allow debug and functional tests such as simulation, step by step execution, break points, trace.

### Commissioning

For an easy and fast diagnostic, the menu commissioning allows the user to check the online state of his architecture. Through the topologic view of the configuration, the devices display if you are logged in or not, as well as if they are in run or stop mode.

### Documentation

Because a printed file of the project is an important element, it is possible to build and customize the project report:

- select the items to be included in the report,
- organize the sections,
- define the page layout
- and then launch the printing.

### Transparency (1)

SoMachine supports Device Type manager (DTM) because it is a field device tool (FDT) container.

With DTM's representing field device in SoMachine, direct communications are possible to every single device via SoMachine, the controller and the field bus CANopen, thus avoiding the lead for individual cable connections.

From the SoMachine unique environment, the remote devices can be set-up off-line and tuned on-line.

### Dedicated OEM application libraries (AFB libraries)

SoMachine can be extended through its solution extension DVD. It integrates tested, validated, documented and supported expert application libraries dedicated to many OEM applications. Their simple configuration speeds up design, commissioning, installation and troubleshooting.

These libraries cover the following applications:

- Packaging,
- Hoisting,
- Conveying.

### Tested Validated Documented Architectures (TVDA)

SoMachine provides a variety of preset projects with ready-to-use architectures you can adapt to individual requirements. Some of them are generic TVDA, they are based on controllers configuration. The solution extension DVD brings solutions oriented TVDA's to SoMachine.

(1) Available: second quarter 2011.



#### SoMachine characteristics

##### Overview

IEC 61131-3 programming languages	<ul style="list-style-type: none"> <li>■ IL (Instruction List)</li> <li>■ LD (Ladder Diagram)</li> <li>■ SFC (Sequential Function Chart)</li> <li>■ ST (Structured Text)</li> <li>■ FBD (Function Block Diagram)</li> <li>■ CFC (Continuous Function Chart)</li> </ul>
Controller programming services	<ul style="list-style-type: none"> <li>■ Multi-tasking: Mast, Fast, Event</li> <li>■ Functions (Func) and Function Blocks (FBs)</li> <li>■ Data Unit Type (DUTs)</li> <li>■ On-line changes</li> <li>■ Watch windows</li> <li>■ Graphical monitoring of variables (trace)</li> <li>■ Breakpoints, step-by-step execution</li> <li>■ Simulation</li> <li>■ Visualization for application and machine set-up</li> </ul>
HMI-based services	<ul style="list-style-type: none"> <li>■ Graphics libraries containing more than 4000 2D and 3D objects.</li> <li>■ Simple drawing objects (points, line, rectangles, ellipses, etc ...)</li> <li>■ Preconfigured objects (button, switch, bar graph, etc ...)</li> <li>■ Recipes (32 groups of 256 recipes with max. 1024 ingredients)</li> <li>■ Action tables</li> <li>■ Alarms</li> <li>■ Printing</li> <li>■ Java scripts</li> <li>■ Multimedia file support: wav, png, jpg, emf, bmp</li> <li>■ Variable trending</li> </ul>
Motion services	<ul style="list-style-type: none"> <li>■ Embedded devices configuration and commissioning</li> <li>■ CAM profile editor</li> <li>■ Sample application trace</li> <li>■ Motion and drive function blocks libraries for inverters, servos and steppers</li> <li>■ Visualization screens</li> </ul>
Global services	<ul style="list-style-type: none"> <li>■ User access and profile</li> <li>■ Project documentation printing</li> <li>■ Project comparison (control)</li> <li>■ Variable sharing based on publish/subscribe mechanism</li> <li>■ Library version management</li> </ul>
Integrated fieldbus configurators	<ul style="list-style-type: none"> <li>■ Control network: <ul style="list-style-type: none"> <li>□ Modbus Serial Line</li> <li>□ Modbus TCP</li> </ul> </li> <li>■ Field bus: <ul style="list-style-type: none"> <li>□ CANopen</li> <li>□ CANmotion</li> <li>□ AS-interface</li> </ul> </li> <li>■ Connectivity: <ul style="list-style-type: none"> <li>□ Profibus-DP</li> <li>□ Ethernet IP</li> </ul> </li> </ul>
Expert and solutions libraries	<ul style="list-style-type: none"> <li>■ PLCOpen function blocks for Motion control <ul style="list-style-type: none"> <li>□ Exemple: MC_MoveAbsolute, MC_CamIn, ServoDrive, ...</li> </ul> </li> <li>■ Packaging function blocks <ul style="list-style-type: none"> <li>□ Exemple: Analog film tension control, rotary knife, lateral film position control, ...</li> </ul> </li> <li>■ Conveying function blocks <ul style="list-style-type: none"> <li>□ Exemple: tracking, turntable, conveyor, ...</li> </ul> </li> <li>■ Hoisting function blocks <ul style="list-style-type: none"> <li>□ Exemple: anti-sway, anti-crab, hoisting position synchronisation, ...</li> </ul> </li> </ul>



#### Product offer

SoMachine software is delivered on a DVD, it is a product oriented version that includes all SoMachine features related to generic hardware (M238, M258, LMC058, XBT GC), as well as generic TVDA

The solution features are added to SoMachine by installing its solution extension DVD. It includes all SoMachine solutions hardware, plus all the dedicated application libraries and TVDA.

#### References

- SoMachine is available in 6 languages:
  - ☐ English
  - ☐ French
  - ☐ German
  - ☐ Italian
  - ☐ Spanish
  - ☐ Simplified Chinese.
- System Requirements:
  - ☐ Processor: Pentium 3 - 1.2 GHz or higher
  - ☐ RAM Memory: 2 GByte; recommended: 3 GByte
  - ☐ Hard Disk: 3.5 GB, recommended: 4 GB
  - ☐ OS: Windows XP Professional, Windows Vista 32 Bit
  - ☐ Drive: DVD reader
  - ☐ Display: 1024 × 786 pixel resolution or higher
  - ☐ Peripherals: a Mouse or compatible pointing device
  - ☐ Peripherals: USB interface
  - ☐ Web Access: Web registration requires Internet access
- The documentation is supplied in electronic format: complete on-line help plus pdf version.

#### SoMachine software

Supported controllers	TVDA	Reference	Weight kg
M238 M258 LMC058 XBT GC XBT GT/GK with control function	Optimized HW XBT GC, Optimized HW M238, Optimized CANopen M238, Optimized AS-Interface M238, Optimized CANopen XBT GC/GT/GK, Performance HW M258, Performance CANopen M258 Performance CANmotion LMC058	MSD CHNSFUV20	—

#### SoMachine solution extension

Added controllers	Added TVDA	Added libraries	Reference	Weight kg
M238S M258S LMC058S XBT GCS XBT GT/GK with control function type S Altivar IMC	Optimized CANopen Altivar IMC, Performance CANmotion LMC058, Hoisting Optimized CANopen M238, Conveying Performance CANmotion LMC058	Hoisting Conveying Packaging	MSD CHNSFUS0V20 (1)	—

(1) For this version, please contact Schneider electric.

Application areas	Commons
	Specific
Technology type	

Printing, material handling, conveying, transfer machines, packaging, textiles, etc.  
Hoisting, wood-working or metal processing machines, etc.

Altivar 32 variable speed drives without sensor (velocity control)



Power range for 50...60 Hz (kW) line supply	
	Single-phase 100...120 V (kW)
	Single-phase 200...240 V (kW)
	Three-phase 380...480 V (kW)
	Three-phase 380...500 V (kW)

0.18...15

—

0.18...2.2

—

0.37...15

Drive	Motor speed	
	Type of control	Asynchronous motor
		Synchronous motor
	Motor sensor	Integrated
		Available as an option
	Transient overtorque	
	Peak current	

0.1...599 Hz

Voltage/frequency ratios: U/f and 5-point U/f  
Sensorless flux vector control ratio  
Kn<sup>2</sup> quadratic ratio (pump/fan)  
Energy saving ratio

Ratio for synchronous motor without sensor

—

—

170...200% of the nominal motor torque

—

Number of functions	
Safety functions	Integrated
	Available as an option

150

1: STO (Safe Torque Off)

3: SLS (Safe Limited Speed), SDI (Safe Direction Information), SS1 (Safe Stop 1)

Number of I/O	Inputs	Analog
		Logic
	Outputs	Analog
		Logic
	Relay outputs	

3

6

1: configurable as voltage (0-10 V) or current (0-20 mA)

1

2

Communication	Integrated
	Available as an option
	Bluetooth link®

Modbus, CANopen

DeviceNet, PROFIBUS DP V1, EtherNet/IP, Modbus TCP, EtherCAT (▲)

Integrated

Options	
---------	--

SoMove setup software  
Multi-Loader configuration tool  
Graphic display terminal  
Filters, braking resistors, line chokes

Standards and certifications	
------------------------------	--

IEC 61800-5-1, IEC 61800-3 (environments 1 and 2, category C2), UL 508C,  
EN 954-1 category 3, ISO/EN 13849-1/- 2 category 3 (PL d),  
IEC 61508 (parts 1 & 2) SIL 2 level, draft standard EN 50495E

CE, UL, CSA, C-Tick, NOM, GOST

References	
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ATV 32

Pages	
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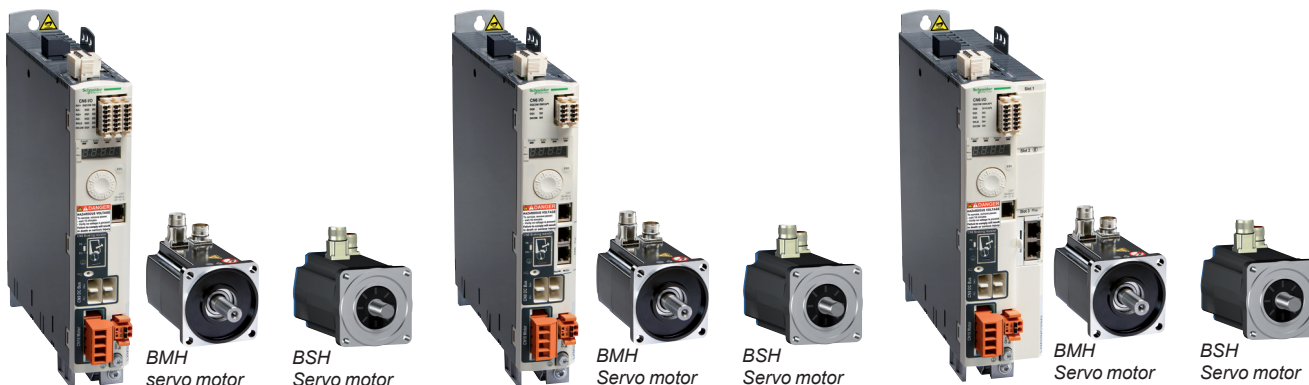
Please, consult our catalogue "Variable speed drives Altivar 32"

▲ Available 3rd quarter 2010

Printing, material handling, conveying, transfer machines, packaging, textiles, etc.

Clamping, cutting, cutting to length, flying shear, rotary knife, Pick & Place, winding, marking, etc.

#### Lexium 32 servo drives with sensor feedback (position control)



0.15...7

0.15...0.8

0.3...1.6

0.4...7

—

Nominal speed:

■ BMH servo motors: continuous stall torque range between 1.2...84 Nm for nominal speeds between 1200 and 6000 rpm

■ BSH servo motors: continuous stall torque range between 0.5...33.4 Nm for nominal speeds between 2500 and 6000 rpm

—

Synchronous motor with sensor feedback for BMH and BSH servo motors

SinCos Hiperface® sensor

—

Resolver encoder  
Analog encoder (motor and machine)  
Digital encoder (machine only)

—

Peak current, up to 4 times the drive direct current for 1 second

—

1: STO (Safe Torque Off)

4: SLS (Safe Limited Speed), SS1 (Safe Stop 1), SS2 (Safe Stop 2), SOS (Safe Operating Stop)

2

6

—

5

—

—

4 (1 of which can be used as a capture input)

—

2

—

—

6 (2 of which can be used as a capture input)

—

3

—

Modbus

—

Modbus, CANopen, CANmotion

—

Modbus

CANopen, CANmotion, DeviceNet, EtherNet/IP,  
PROFIBUS DP V1, EtherCAT (▲)

Available as an option

Available as an option

Available as an option

SoMove setup software

Multi-Loader configuration tool

Graphic display terminal

Filters, braking resistors, line chokes

IEC 61800-5-1, IEC 61800-3 (environments 1 and 2, categories C2 and C3), IEC 61000-4-2/4-3/4-4/4-5, ISO/EN 13849-1 (PL e), IEC 61508 SIL 3 level

CE, UL, CSA, TÜV


**LXM 32C**

**LXM 32A**

**LXM 32M**

Please, consult our catalogue "Variable speed drives Altivar 32"

▲ Available 3rd quarter 2010

Applications	Pre-assembled starters			
	Small machines starting under full load: D.O.L. starters		Machines starting under no-load: star-delta starters	
Starter type	D.O.L. or reversing starters with circuit-breaker		D.O.L. starters with fuse protection	Soft start units or star-delta starters to be used in association with a circuit-breaker or fuses
				
Level of service	Type 1 coordination		Type 2 coordination	–
Power at 400 V	Up to 5.5 kW	Up to 37 kW	Up to 37 kW	Up to 132 kW
Type of components	Combination automatic motor starter with overload protection built into the circuit-breaker		Fuse carrier + plate-mounted contactor	3 contactors (line, star and delta, mounted on plate, rail or chassis)
Pages	Please, consult our catalogue "Control and protection components"			

## Starters for customer assembly

Small machines starting under full load: D.O.L. starters  
Machines starting under no-load: star-delta starters

D.O.L. or reversing starters

D.O.L., reversing or star-delta starters with circuit-breakers

D.O.L., reversing or star-delta starters with fuses



Total coordination

Type 1 and type 2 coordination

—

—

Up to 15 kW

Up to 110 kW

Up to 315 kW

Up to 355 kW

Starter-controller

Thermal magnetic  
circuit-breaker  
+ contactor(s)

Magnetic circuit-breaker  
+ contactor(s)  
+ thermal overload relay

Fuse carrier  
+ contactor(s)  
+ thermal overload relay

Switch-disconnector-fuse  
+ contactor(s)  
+ thermal overload relay

Please, consult our catalogue "Control and protection components"

#### Power supplies

#### Regulated switch mode

Phaseo Modular range and Optimum range industrial power supplies



#### Input voltage

Connection to world-wide line supplies	United States
	- 120 V (in phase-to-neutral)
	- 240 V (in phase-to-phase)
Europe	- 230 V (in phase-to-neutral)
	- 400 V (in phase-to-phase)
	United States
	- 277 V (in phase-to-neutral)
	- 480 V (in phase-to-phase)

100...240 V ~  
120...250 V ---

Single-phase (N-L1) or 2-phase (L1-L2) connection

Single-phase (N-L1) connection

—

#### IEC 61000-3-2 conformity

Yes for ABL 7RP, not for ABL 8REM and not applicable for ABL 8MEM and ABL 7RM

#### Protection against undervoltage

Yes

#### Protection against overloads and short-circuits

Yes, voltage detection. Automatic restart on elimination on the fault

#### Diagnostic relay

—

#### Compatibility with function modules

—

#### Power reserve (Boost)

1,25 to 1,4 In during 1 minute, depending on model (with ABL 8MEM) No

#### Output voltage

Output current	0.3 A
	0.6 A
	1.2 A
	2 A
	2.5 A
	3 A
	4 A
	4.8 A
	5 A
	6 A
	10 A
	20 A
	40 A

5 V ---	12 V ---	24 V ---	48 V ---
		ABL 8MEM24003 (Modular)	
		ABL 8MEM24006 (Modular)	
		ABL 8MEM24012 (Modular)	
	ABL 8MEM12020 (Modular)		
		ABL 7RM24025 (Modular)	ABL 7RP4803 (Optimum)
		ABL 8REM24030 (Optimum)	
ABL 8MEM05040 (Modular)			
	ABL 7RP1205 (Optimum)	ABL 8REM24050 (Optimum)	

#### Pages

Please, consult our catalogue "Phaseo, Power supplies & transformers"

## Regulated switch mode

### Phaseo Universal range industrial power supplies



100...120 V ~ and 200...500 V ~ (1)	380...500 V ~	24 V ---	100...240 V		
Single-phase (N-L1) or 2-phase (L1-L2) connection	—	—	Single-phase (N-L1) connection		
	3-phase (L1-L2-L3) connection	—	Single-phase (N-L1) connection		
	3-phase (L1-L2-L3) connection	—	—		
Yes	—	—	No	Yes	
Yes	—	—	—	Yes	
Yes, current limitation or undervoltage detection	Yes, current limitation	—	Yes	—	
Yes, depending on model	—	—	—	—	
Yes with buffer module, battery and battery control modules, redundancy module and discriminating downstream protection module	—	—	—	—	
1,5 In during 4 secondes	No	—	No	—	
24 V ---	5 V ---	7...12 V ---	30 V ---	24 V ---	
		ABL 8DCC12020 (2)			
			ASI ABLB3002 ASI ABLD3002 (3) ASI ABLM3024 (4)		
ABL 8RPS24030				ASI ABLM3024 (4)	
			ASI ABLB3004 ASI ABLD3004 (3)		
ABL 8RPS24050					
		ABL 8DCC05060 (2)			
ABL 8RPS24100					
ABL 8RPM24200	ABL 8WPS24200				
	ABL 8WPS24400				

Please, consult our catalogue "Phaseo, Power supplies & transformers"


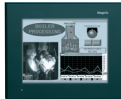

(1) Except **ABL 8RPM24200**. ~ 100...120 V and ~ 200...240 V.

(2) ---/--- converter module, requires to be associated with the Phaseo Universal range power supply.

(3) With earth fault detection.

(4) One output 30 V --- and one output 24 V --- ± 5 %.



Applications		Display of text messages, graphic objects and synoptic views Control and configuration of data		
Type of terminal		Touch screen Advanced Panels		
Display	Type			
	Capacity	Backlit monochrome (amber or red mode) STN LCD (320 x 240 pixels) or TFT LCD 3.8" (monochrome or colour)	Backlit monochrome or colour STN LCD or backlit colour TFT LCD (320 x 240 pixels or 640 x 480 pixels) (3) 5.7" (monochrome or colour)	Backlit colour STN LCD or TFT LCD (640 x 480 pixels) 7.5" (colour)
Data entry		Via touch screen		
		Static function keys		
		Dynamic function keys		
		Service keys		
		Alphanumeric keys		
Memory capacity	Application	32 MB Flash EPROM	16 MB Flash EPROM (3)	32 MB Flash EPROM
	Expansion	–	By means of 128, 256, 512 MB, 1, 2 or 4 GB CF card (except XBT GT2110)	
Functions	Maximum number of pages	Limited by internal Flash EPROM memory capacity	Limited by capacity of internal Flash EPROM memory or CF card memory	
	Variables per page	Unlimited (8000 variables max.)		
	Representation of variables	Alphanumeric, bitmap, bargraph, gauge, tank, tank level indicator, curves, polygon, button, LED		
	Recipes	32 groups of 64 recipes comprising 1024 ingredients max.		
	Curves	Yes, with log		
	Alarm logs	Yes		
	Real-time clock	Built-in		
	Discrete I/O	–		1 input (reset) and 3 outputs (alarm, buzzer, run)
	Multimedia I/O	–	(3)	1 audio input (microphone), 1 composite video input (digital or analog video camera), 1 audio output (loudspeaker) (1)
	Communication	Downloadable protocols	Uni-TE (2), Modbus, Modbus TCP/IP (1) and for PLC brands: Mitsubishi, Omron, Allen-Bradley and Siemens	
Asynchronous serial link		RS 232C/485 (COM1)	RS 232C/RS 422/485 (COM1) and RS 485 (COM2)	
USB ports		1	1 (3)	2
Buses and networks		–	Modbus Plus and Fipway with USB gateway, Profibus DP and Device Net with optional card	
Printer link		Ethernet TCP/IP (10BASE-T/100BASE-TX) (1)	USB port for parallel printer	
Development software		Vijeo Designer (36349/11) (on Windows XP, Windows Vista and Windows 7)		
Operating system		Magelis (200 MHz RISC CPU)	Magelis (133 MHz RISC CPU) (3)	Magelis (266 MHz RISC CPU)
Type of terminal		XBT GT11/13	XBT GT21/22/23/24/29	XBT GT42/43
Pages		Please, consult our catalogue "Human/Machine interfaces"		

(1) Depending on model.

(2) Uni-TE version V2 for Twido controller and TSX Micro/Premium platform.

(3) For XBTGT 2430, 32 MB Flash EPROM, 1 sound output, 2 USB ports, 266 MHz RISC CPU

(4) For XBT GT 5430

Display of text messages, graphic objects and synoptic views  
Control and configuration of data

#### Touch screen Advanced Panels



Backlit colour STN LCD or TFT LCD  
(640 x 480 pixels or 800 x 600 pixels) (4)

10.4" (colour)



Backlit colour TFT LCD (800 x 600 pixels)

12.1" (colour)



Backlit colour TFT LCD (1024 x 768 pixels)

15" (colour)

Via touch screen

—  
—  
—  
—

32 MB Flash EPROM

By means of 128, 256, 512 MB, 1, 2 or 4 GB CF card

Limited by capacity of internal Flash EPROM memory or CF card memory

Unlimited (8000 variables max.)

Alphanumeric, bitmap, bargraph, gauge, tank, tank level indicator, curves, polygon, button, LED

32 groups of 64 recipes comprising 1024 ingredients max.

Yes, with log

Yes

Built-in

1 input (reset) and 3 outputs (alarm, buzzer, run)

1 audio input (microphone), 1 composite video input (digital or analog video camera), 1 audio output (loudspeaker) (1)

Uni-TE (2), Modbus, Modbus TCP/IP (1) and for PLC brands: Mitsubishi, Omron, Allen-Bradley and Siemens

RS 232C/RS 422/485 (COM1) and RS 485 (COM2)

2

Modbus Plus with USB gateway

Ethernet TCP/IP (10BASE-T/100BASE-TX)

RS 232C (COM1) serial link, USB port for parallel printer

Vijeo Designer (36349/11) (on Windows XP, Windows Vista and Windows 7)

Magelis  
(266 MHz RISC CPU)

**XBT GT52/53/54**

**XBT GT63**

**XBT GT73**

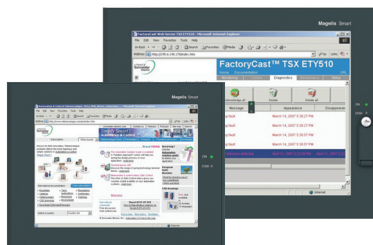
Please, consult our catalogue "Human/Machine interfaces"

<b>Applications</b>		Display of text messages, graphic objects and synoptic views Control and configuration of data	
<b>Type of terminal</b>		Advanced Panels with keypad	
			
<b>Display</b>	Type	Colour TFT LCD (320 x 240 pixels) or monochrome STN	
	Capacity	5.7" (monochrome or colour)	
<b>Data entry</b>		Colour TFT LCD (640 x 480 pixels)	
		10.4" (colour)	
<b>Data entry</b>		Via keypad and/or touch screen (configurable) and/or by industrial pointer	
		10	12
		14	18
		8	
		12	
<b>Memory capacity</b>	Application	16 MB Flash EPROM	
	Expansion	32 MB Flash EPROM	
		By means of 128, 256, 512 MB, 1, 2 or 4 GB CF card	
<b>Functions</b>	Maximum number of pages	Limited by capacity of internal Flash EPROM memory or CF card memory	
	Variables per page	Unlimited (8000 variables max.)	
	Representation of variables	Alphanumeric, bitmap, bargraph, gauge, tank, tank level indicator, curves, polygon, button, LED	
	Recipes	32 groups of 64 recipes comprising 1024 ingredients max.	
	Curves	Yes, with log	
	Alarm logs	Yes	
	Real-time clock	Built-in	
	Discrete I/O	–	1 input - 3 outputs
	Multimedia I/O	–	–
<b>Communication</b>	Downloadable protocols	Uni-TE (2), Modbus, Modbus TCP/IP (1) and for PLC brands: Mitsubishi, Omron, Allen-Bradley and Siemens	
	Asynchronous serial link	RS 232C/RS 422/485 (COM1) RS 485 (COM2)	
	USB ports	1	2
	Buses and networks	Modbus Plus, Fipway with USB gateway, Profibus DP and Device Net with optional card	
		Ethernet TCP/IP (10BASE-T/100BASE-TX)	
	Printer link	RS 232C (COM1) serial link, USB port for parallel printer	
<b>Development software</b>		Vijeo Designer (36349/11) (on Windows XP, Windows Vista and Windows 7)	
<b>Operating system</b>		Magelis (266 MHz RISC CPU)	
<b>Type of terminal</b>		<b>XBT GK 21/23</b>	<b>XBT GK 53</b>
<b>Pages</b>		Please, consult our catalogue "Human/Machine interfaces"	
		(1) Depending on model.	
		(2) Uni-TE version V2 for Twido controller and TSX Micro/Premium platform.	

**Display of text messages, graphic objects and synoptic views**  
**Control and configuration of data**

**Portable Advanced Panels**

**Open touch screen Advanced Panels**



Colour TFT LCD (640 x 480 pixels)	Colour TFT LCD (800 x 600 pixels)	Colour TFT LCD (800 x 600 pixels)	Colour TFT LCD (1024 x 768 pixels)
5.7" (colour)	8.4" (colour)	12" (colour)	15" (colour)
Via touch screen	Via touch screen		
11	–		
–	–		
–	–		
–	–		
32 MB Flash EPROM	1 GB CF system card included with terminal, expandable to 4 GB	2 GB CF system card included with terminal, expandable to 4 GB	
By means of 128, 256, 512 MB, 1, 2 or 4 GB CF card			
Limited by capacity of internal Flash EPROM memory or CF card memory			
Unlimited (8000 variables max.)			
Alphanumeric, bitmap, bargraph, gauge, tank, tank level indicator, curves, polygon, button, LED			
32 groups of 64 recipes comprising 1024 ingredients max.			
Yes, with log			
Yes			
Built-in			
–			
1 audio output			
Uni-TE (2), Modbus, Modbus TCP/IP and for PLC brands: Mitsubishi, Omron, Rockwell Automation and Siemens	Uni-TE (2), Modbus, Modbus TCP/IP (1) and for PLC brands: Mitsubishi, Omron, Allen-Bradley and Siemens		
RS 232C/RS 422-485 (COM1)	RS 232C (COM1) RS 232C (COM2)	RS 232C (COM1)	RS 232C (COM1) RS 232C (COM2 )
1	4	4 + 1 front-mounted	
–	Modbus Plus with USB gateway		
1 Ethernet port (10BASE-T/100BASE-TX)	1 TCP/IP Ethernet port (10BASE-T/100BASE-TX) and 1 Ethernet port (10BASE-T/100BASE-TX/1 GB)		
–	RS 232C (COM1 or COM2) serial link, USB port for parallel printer		
Vijeo Designer (36349/11) (on Windows XP, Windows Vista and Windows 7)			
Magelis (266 MHz RISC CPU)	Windows XP Embedded		

**XBT GH 2460**

**XBT GTW 450**

**XBT GTW 652**

**HMI GTW 7353**

Please, consult our catalogue "Human/Machine interfaces"

(1) Depending on model.

(2) Uni-TE version V2 for Twido controller and TSX Micro/Premium platform.

# Motion controller Modicon LMC058

Inputs/outputs modules and OsiSense® XU  
photo-electric sensors

Photo-electric sensors				Discrete input electronic modules 24 V DC: 2, 4, 6 or 12 inputs, type 1 Sink	Discrete input/output electronic modules 24 V DC: 8 inputs type 1 Sink and 4 transistor outputs	
Type	Reference			TM5 SDI2D, TM5 SDI4D, TM5 SDI6D, TM5 SDI12D	TM5 SDM12DT	
General purpose						
Design Ø 18	metal	3 wire, PNP 24 V	XUB 0/1/2/4/5/9 B●P●●●			
		3 wire, NPN 24 V	XUB 0/1/2/4/5/9 B●N●●●			
	Plastic	3 wire, PNP 24 V	XUB 0/1/2/4/5/9 A●P●●●			
		3 wire, NPN 24 V	XUB 0/1/2/4/5/9 A●N●●●			
Design	Miniature	3 wire, PNP 24 V	XUM 0/2/5/9 AP●●●●			
		3 wire, NPN 24 V	XUM 0/2/5/9 AN●●●●			
	Compact 50 x 50	3 wire, PNP 24 V	XUK 1/2/5/8/9 AP●●●			
		3 wire, NPN 24 V	XUK 1/2/5/8/9 AN●●●			
		3 wire, programmable PNP/NPN DC	XUK 0 AK●●●			
	Compact 92 x 71	5 wire, programmable AC/DC	XUK 0/1/2/5/8/9 AR			
		3 wire, programmable PNP/NPN DC	XUX 0/1/2/5/8/9 AK			
		5 wire, programmable AC/DC	XUX 0/1/2/5/8/9 AR			
Application						
Material Handling	Optical fork	3 wire, PNP 24 V	XUV R●●●●P●●			
		3 wire, NPN 24 V	XUV R●●●●N●●			
		3 wire, PNP 24 V	XUV A●●●●P●●			
		3 wire, NPN 24 V	XUV A●●●●N●●			
		4 wire, PNP or NPN 24 V	XUY F●●●●●			
		4 wire, PNP or NPN 24 V	XUV U06●●●			
		4 wire, PNP or NPN 24 V	XUV K ●●●			
		3 wire, PNP 24 V	XUV H●●●			
		3 wire, NPN 24 V	XUV J●●●			
Packaging	Fiber	4 wire, PNP or NPN 24 V	XUY DCF●●●			
		Compact	4 wire, PNP or NPN 24 V	XUR K		
	M18, threaded	3 wire, PNP 24 V	XU5M18U1D			
	Fiber	4 wire, PNP or NPN 24 V	XUY AFL●●●			
		M18, threaded	3 wire, PNP 24 V	XUB T●P●●●		
	3 wire, NPN 24 V		XUB T●N●●●			
	Compact	4 wire, PNP or NPN 24 V	XUK T●●●			
		3 wire, PNP 24 V	XUK C1N●●●			
		3 wire, NPN 24 V	XUK C1P●●●			
		3 wire, PNP 24 V	XUR C3P●●●			
	M18, threaded	3 wire, NPN 24 V	XUR C3N●●●			
		4 wire, PNP or NPN 24 V	XUM W●●●			
		3 wire, PNP 24 V	XUB 0SP●●●			
		3 wire, NPN 24 V	XUB 0SN●●●			
		3 wire, PNP 24 V	XU●N18P●●●			
		3 wire, NPN 24 V	XU●N18N●●●			
		M8, threaded	3 wire, PNP 24 V	XUA H●●●		
			3 wire, NPN 24 V	XUA J●●●		
	Miniature	3 wire, PNP 24 V	XUY P●●●●P●●			
		3 wire, NPN 24 V	XUY P●●●●N●●			
		3 wire, PNP 24 V	XUM 2/5/9 BP●●●			
		3 wire, NPN 24 V	XUM 2/5/9 BN●●●			
		3 wire, PNP 24 V	XUY●●●929●●			
		Hoisting	M 18, threaded	3 wire, PNP 24 V	XUB LBP●●●	
3 wire, NPN 24 V	XUB LBN●●●					
Compact	2 wire 4...20 mA ; 3 wire 0...10V		XUJ K803538			
	M18, threaded		2 wire 4...20 mA	XU5 M18AB20D		
PNP, 2 wire 4...20 mA			XU2 M18AB20D			
Compact	PNP, 2 wire 4...20 mA		XUY P●●●925			
	4 wire, PNP or NPN 24 V		XUY PS●●●			
Fiber	3 wire, PNP 24 V		XUD A●P●●●			
	3 wire, NPN 24 V		XUD A●N●●●			
	4 wire, PNP or NPN 24 V		XUY AF●●●			
other formats	3 wire, programmable PNP/NPN DC		XUC 2/8/9 AK●●●			
	5 wire, programmable AC/DC		XUC 2/8/9 ARC●●●			
	3 wire, PNP 24 V		XUL H●●●			
	3 wire, NPN 24 V		XUL J●●●			
	2 wire, AC		XUL A●●●			
	5 wire, programmable AC/DC		XUL M●●●			
	3 wire, programmable PNP/NPN DC		XUY B●●●S			
	5 wire, programmable AC/DC		XUY B●●●R			
M18, threaded	2 wire, AC DC		XU 5/8/9 M18MA●●●			

Compatible

Non compatible

[illegible]

# Motion controller Modicon LMC058

## Inputs/outputs modules and OsiSense® XS

### inductive proximity sensors

Proximity Sensors				Discrete input electronic modules 24 V DC: 2, 4, 6 or 12 inputs, type 1 Sink	
Type	Reference			TM5 SDI2D, TM5 SDI4D, TM5 SDI6D, TM5 SDI12D	
General purpose					
cylindrical, flush, sensing distance, standard, barrel short	Ø 6,5 plain short	3 wire, PNP 24V	XS5 06/08/12/18/30 B1P●●●		
	M8, M12, M18, M30	3 wire, NPN 24V	XS5 06/08/12/18/30 B1N●●●		
	Threaded short	2 wire, DC 24V	XS5 06/08/12/18/30 BS●●●●		
Cylindrical,flush, sensing distance standard, barrel long	M8, M12, M18, M30, Threaded long	3 wire, PNP 24V-48V	XS5 08/12/18/30 BLP●●●		
		3 wire, NPN 24V-48V	XS5 08/12/18/30 BLN●●●		
		2 wire, DC 24V-48V	XS5 08/12/18/30B1 D/C●●●		
Cylindrical, flush, sensing distance extending, barrel short	M12, M18, M30, threaded long	2 wire, AC DC	XS5 12/18/30 B1M●●●		
	Ø 6,5 plain short	3 wire, PNP 24V	XS1 06/08/12/18/30 B3P●●●		
	M8, M12, M18, M30	3 wire, NPN 24V	XS1 06/08/12/18/30 B3N●●●		
Cylindrical, flush, sensing distance extending, barrel long	Threaded short	2 wire, DC 24V	XS6 06/08/12/18/30 B3C●●●		
	M8, M12, M18, M30, Threaded long	3 wire, PNP 24V-48V	XS6 08/12/18/30 B1P●●●		
		3 wire, NPN 24V-48V	XS6 08/12/18/30 B1N●●●		
		2 wire, DC 24V-48V	XS6 08/12/18/30 B1D●●●		
	M12, M18, M30, threaded long	2 wire, AC DC	XS6 12/18/30 B1M●●●		
	M12, M18, M30, Threaded long	3 wire, PNP 24V-48V	XS6 12/18/30 B4P●●●		
		3 wire, NPN 24V-48V	XS6 12/18/30 B4N●●●		
	M12, M18, M30, threaded long	2 wire, AC DC	XS6 12/18/30 B4M●●●		
	Format flat, flush, sensing distance standard	Format J 8x22x8, F 15x22x8	3 wire, PNP 24V	XS7 J/F/C/D/E 1A1P●●●	
	Format E 26x26x13, C 40x40x15	3 wire, NPN 24V	XS7 J/F/C/D/E 1A1N●●●		
	Format D 80x80x26	2 wire, DC 24V	XS7 J/F/C/D/E 1A1D●●●		
	Format 40X40X117 plastic, with turret head: 5 positions	NO + NC	4 wire, PNP 24V-48V	XS7/XS8 C40PC44●	
		4 wire, NPN 24V-48V	XS7/XS8 C40NC44●		
	NO/NC programmable	2 wire, DC 24V-48V	XS7/XS8 C40D●●●●		
		2 wire, AC	XS7/XS8 C40F●●●●		
		2 wire, AC DC	XS7/XS8 C40M●●●●		
	Format flat, flush, sensing distance extending	Format E 26x26x13	3 wire, PNP 24V	XS8 E/C/D 1A1P●●●	
		Format C 40x40x15	3 wire, NPN 24V	XS8 E/C/D 1A1N●●●	
		Format D 80x80x26	2 wire, AC DC	XS8 E/C/D 1A1M●●●	
	Cylindrical multitension	M12, M18, M30, threaded	2 wire, AC DC	XS1/2 M12M●250	
	Cylindrical metal, 4 wire	Ø 6,5 plain short	4 wire, PNP 24V	XS1 L06/M08/M12/M18/M30 PC410	
		M8, M12, M18, M30 threaded	4 wire, NPN 24V	XS1 L06/M08/M12/M18/M30 NC410	
	Cylindrical metal 4 wire PNP+NPN	M12, M18, M30, threaded	4 wire, PNP+NPN, programmable 24V	XS1/2/4 M12/18/30 KP340●	
		Cylindrical plastic non flush, sensing distance standard	M8, M12, M18, M30, Threaded	3 wire, PNP 24V	XS4 P08/12/18/30 P●340●
			3 wire, PNP 24V-48V	XS4 P08/12/18/30 P●370●	
			3 wire, NPN 24V	XS4 P08/12/18/30 N●340●	
			3 wire, NPN 24V-48V	XS4 P08/12/18/30 N●370●	
			2 wire, AC DC	XS4 P08/12/18/30 M●230●●●	
	Cylindrical basic flush ; non flush	Ø 6,5 plain	3 wire, PNP 24V	XS1/206BLP●●●	
sensing distance standard, plastic ; metal			3 wire, NPN 24V	XS1/206BLN●●●	
	M8, M12, M18, M30 threaded	3 wire, PNP 24V	XS1/2 08/12/18/30 A/BLP●●●		
			3 wire, NPN 24V	XS1/2 08/12/18/30 A/BLN●●●	
Cylindrical, quasi flush, sensing distance extending	Ø 6,5 plain	3 wire, PNP 24V	XS1L06P●349●		
		3 wire, NPN 24V	XS1L06N●349●		
	M8, M12, M18, M30 threaded	3 wire, PNP 24V	XS1N 08/12/18/30 P●349●		
		3 wire, NPN 24V	XS1N 08/12/18/30 N●349●		
	Cylindrical, miniature	Ø 4 plain	3 wire, PNP 24V	XS1L04P●31●●	
			3 wire, NPN 24V	XS1L04N●31●●	
	M5, threaded	3 wire, PNP 24V	XS1N05P●31●●		
		3 wire, NPN 24V	XS1N05N●31●●		
	Ø 6,5 plain	3 wire, PNP 24V	XS2L06P●340●		
		3 wire, NPN 24V	XS2L06N●340●		
Applications					
Cylindrical, sensing distance adjustable, control rotation	M12, M18, M30, threaded	3 wire, PNP 24V	XS612B2P●●●		
		3 wire, NPN 24V	XS612B2N●●●		
	M18, threaded	3 wire, PNP 24V-48V	XSAV11/2373		
		2 wire, AC DC	XSAV11/2801		
	Format E 26x26x13	3 wire, PNP 24V	XS9●11RP●●●●		
	Format C 40x40x15	2 wire, AC DC	XS9●11RM●●●●		
Analog output	M12, M18, M30, threaded	2 wire 4...20mA ; 3 wire 0...10V	XS●12AB●●●●		
	Block format	2 wire 4...20mA ; 3 wire 0...10V	XS9●111A●●●●		
	Food and beverage	Cylindrical threaded metal	3 wire, PNP 24V	XS2●●SAP●●●	
		3 wire, NPN 24V	XS2●●SAN●●●		
		2 wire, AC DC	XS2●●SAMA●●●		
	Cylindrical threaded plastic	3 wire, PNP 24V-48V	XS2●●AAP●●●		
		3 wire, NPN 24V	XS2●●AAN●●●		
		2 wire, AC DC	XS2●●AAMA●●●		
	Factor 1	Cylindrical threaded metal	4 wire, PNP+NPN 24V	XS1M●●KPM40	
	Forme C, 40x117x41	4 wire, PNP+NPN 24V	XS7C40KPM40		
	Cylindrical threaded metal	3 wire, PNP 24V	XS1M18PAS●●		
	Packaging	Format 12x26x40	3 wire, PNP 24V	XS7G12P●140	
		3 wire, NPN 24V	XS7G12N●140		
		4 wire, PNP 24V-48V	XS7G12P●440		
		4 wire, NPN 24V-48V	XS7G12N●440		
		2 wire, AC DC	XS7G12M●230		
	Material handling	Format C 40x40x40	2 wire, DC 24V-48V	XS7T4DA●●●	
			4 wire, PNP 24V-48V	XS7T4PC●●●	
		4 wire, NPN 24V-48V	XS7T4NC●●●		
	Format D 80x80x26	2 wire, DC 24V-48V	XS7D1●●●●		
	Welding	Cylindrical metal	3 wire, PNP 24V	XS1M●●PAW●●	
		2 wire, DC 24V-48V	XSLC●●●		

Compatible

Non compatible



[illegible]

Rotary encoders			Counter electronic modules		
Type		Reference	50 Hz Type 1 sink	100 Hz 1 voie	100 Hz 2 voies
			TM5 SDI2DF	TM5 SE1ICO1024	TM5 SE2ICO1024
Incremental encoders	5V RS422, 4,5 V...5,5 V	XCC 14●●●●●R			
	Push-pull, 11...30 V	XCC 14●●●●●K			
	5V RS422, 4,5 V...5,5 V	XCC 19●●●●●RN			
	Push-pull, 11...30 V	XCC 19●●●●●KN			
	5V, RS422, 4,75...30 V	XCC 15●●●●●X			
	Push-pull, 5...30 V	XCC 15●●●●●Y			
	5V, RS422, 4,75...30 V	XCC 15●●●●●M●●●X			
	Push-pull, 5...30 V	XCC 15●●●●●M●●●Y			

Compatible

Non compatible

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490 NTC00005	23	TCS ECL1M3M3S2	23	TM5 ACLITB1	15, 29, 31, 33, 37, 41, 43 & 45	TM5 SDI2D	29	TWD XCAFJ010	21
490 NTC00005U	23	TCS ECL1M3M40S2	23			TM5 SDI2DF	41	TWD XCAISO	20
490 NTC00015	23	TCS ECL1M3M 5S2	23	TM5 ACLITR1	15, 29, 31, 33, 37, 41, 43 & 45	TM5 SDI4A	31	TWD XCAT3RJ	20
490 NTC00040	23	TCS ESU033FN0	23			TM5 SDI4D	29	<b>V</b>	
490 NTC00040U	23	TCS ESU043FN0	23			TM5 SDI6D	29	VW3 A8 306 D30	21
490 NTC00080	23	TCS ESU053FN0	23			TM5 SDI6U	31	VW3 A8 306 R03	21
490 NTC00080U	23	TCS MCN3M4F3C2	15	TM5 ACLITW1	15, 29, 31, 33, 37, 41, 43 & 45	TM5 SDM12DT	29	VW3 A8 306R10	21
490 NTW00002	23	TCS MCN3M4M3S2	15			TM5 SDO12T	29	VW3 A8 306R30	21
490 NTW00002U	23	TCS XCN AM UM3P	15	TM5 ACLPL10	29, 31, 33, 37, 41, 43 & 45	TM5 SDO2R	31	VW3 A8 306RC	21
490 NTW00005	23	TCS XCNNXNX100	45			TM5 SDO2T	29	VW3 A8 306TF03	20
490 NTW00005U	23	TCS ECN300R2	22	TM5 ACLPR10	29, 31, 33, 37, 41, 43 & 45	TM5 SDO4R	31	VW3 A8 306TF10	20
490 NTW00012	23	TCS EK1MDRS	22			TM5 SDO4T	29	VW3 CANA71	19
490 NTW00012U	23	TCS EK3MDS	22			TM5 SDO4TA	29	VW3 CANCEARR03	19
490 NTW00040	23	TCS ESM043F1CS0	23	TM5 ACLT1	15, 29, 31, 33, 37, 41, 43 & 45	TM5 SDO6T	29	VW3 CANCEARR1	19
490 NTW00040U	23	TCS ESM043F1CU0	23			TM5 SDO8TA	29	VW3 CANKCDF180T	19
490 NTW00080	23	TCS ESM043F2CS0	23	TM5 ACTB06	29, 33, 37 & 45	TM5 SE1IC01024	41	VW3 CANTAP2	18
490 NTW00080U	23	TCS ESM043F2CU0	23	TM5 ACTB0610	29, 33, 37 & 45	TM5 SE2IC01024	41	VW3 M3805R010	19
499 NEH10410	23	TCS ESM083F1CS0	23	TM5 ACTB12	29, 33, 37, 41 & 45	TM5 SPDD12F	33	VW3 M3805R030	19
499 NES18100	23	TCS ESM083F1CU0	23			TM5 SPDG12F	33	VW3 M4701	15
499 NMS25101	23	TCS ESM083F23F0	23	TM5 ACTB1210	29, 33, 37, 41 & 45	TM5 SPDG5D4F	33	<b>X</b>	
499 NMS25102	23	TCS ESM083F2CS0	23			TM5 SPDG6D6F	33	XBT 9980	15
499 NSS25101	23	TCS ESM083F2CU0	23	TM5 ACTB12PS	43 & 45	TM5 SPS1	43	XBT Z9008	21
499 NSS25102	23	TCS ESU051F0	23	TM5 ACTB32	31	TM5 SPS1F	43	XBT Z938	15 & 21
<b>A</b>		TCS MCN3M4F3C2	21	TM5 ACTB3210	31	TM5 SPS2	43	XBT Z9980	21
AM0 2CA001V000	19	TCS MCN3M4M3S2	21	TM5 ACTCH100	15, 29, 31, 33, 37, 41, 43 & 45,	TM5 SPS2F	43	XGS Z24	20
<b>B</b>		<b>TLA</b>		TM5 ACTLC100	15, 29, 31, 33, 37, 41, 43 & 45,	<b>TSX</b>			
BMX XCAUSBH018	15	TLA CDCBA 005	19	TM5 ACTLS100	15, 29, 31, 33, 37, 41, 43 & 45,	TSX CANCA100	18		
<b>F</b>		TLA CDCBA 015	19			TSX CANCA300	18		
FTX CN12F5	18	TLA CDCBA 030	19	TM5 ACTB3210	31	TSX CANCA50	18		
FTX CN12M5	18	TLA CDCBA 050	19	TM5 ACTCH100	15, 29, 31, 33, 37, 41, 43 & 45,	TSX CANCEADD03	18		
FTX CN3203	19	<b>TM2</b>				TSX CANCEADD1	18		
FTX CN3206	19	TM200RSRCMC	37	TM5 ACTLC100	15, 29, 31, 33, 37, 41, 43 & 45,	TSX CANCEADD3	18		
FTX CN3210	19	TM2XMTGB	37			TSX CANCEADD5	18		
FTX CN3220	19	<b>TM5</b>		TM5 ACTLS100	15, 29, 31, 33, 37, 41, 43 & 45,	TSX CANCEB100	18		
FTX CN3230	19	TM5 ACADL100	29, 31, 33, 37, 41, 43 & 45			TSX CANCEB300	18		
FTX CN3250	19			TM5 PCDPS	25	TSX CANCEB50	18		
FTX CNCT1	19	TM5 ACBM01R	43	TM5 PCRS2	25	TSX CAN CBDD03	18		
FTX CNTL12	19	TM5 ACBM01R	45	TM5 PCRS4	25	TSX CANCBDD1	18		
FTX DP2115	19	TM5 ACBM01R10	43	TM5 SAI2H	37	TSX CANCBDD3	18		
FTX DP2130	19	TM5 ACBM01R10	45	TM5 SAI2L	37	TSX CANCBDD5	18		
FTX DP2150	19	TM5 ACBM05R	43	TM5 SAI2PH	37	TSX CANCD100	18		
FTX DP2206	19	TM5 ACBM05R	45	TM5 SAI2TH	37	TSX CANCD300	18		
FTX DP2210	19	TM5 ACBM05R10	43	TM5 SAI4H	37	TSX CANCD50	18		
FTX DP2220	19	TM5 ACBM05R10	45	TM5 SAI4L	37	TSX CANKCDF180T	18		
FTX DP2250	19	TM5 ACBM11	29, 33, 37, 41 & 45	TM5 SAI4PH	37	TSX CANKCDF90T	18		
<b>L</b>		TM5 ACBM1110	29, 33, 37, 41 & 45	TM5 SAI6TH	37	TSX CANKCDF90TP	18		
LMC058LF42	14			TM5 SAO2H	37	TSX CANTDM4	18		
LMC058LF424	14			TM5 SAO2L	37	TSX CSA100	21		
LU9 GC3	20			TM5 SAO4H	37	TSX CSA200	21		
<b>M</b>				TM5 SAO4L	37	TSX CSA500	21		
MSD CHNSFUS0V20	49	TM5 ACBM12	31	TM5 SBER2	45	TSX CX100	21		
MSD CHNSFUV20	49	TM5 ACBM1210	31	TM5 SBET1	45	TSX SCA50	20		
<b>TCS</b>		TM5 ACBM15	29			<b>TWD</b>			
TCS CCN 4F3 M05T	19	TM5 ACBM15	33	TM5 SD0000	33	TWD XCARJ003	21		
TCS CCN 4F3 M1T	19	TM5 ACBM15	37	TM5 SDI12D	29	TWD XCARJ010	21		
TCS CCN 4F3 M3T	19	TM5 ACBM15	41	TM5 SDI2A	31	TWD XCARJ030	21		
TCS CTN011M11F	19	TM5 ACBM15	45			TWD XCARJP03	21		
TCS ECL1M3M10S2	23	TM5 ACBM1510	29, 33, 37, 41 & 45			TWD XCARJP03P	21		
TCS ECL1M3M1S2	23					TWD XMT5	37		
TCS ECL1M3M25S2	23					TWD XCAFD010	21		

**Schneider Electric Industries SAS**

[www.schneider-electric.com](http://www.schneider-electric.com)

Head Office  
35, rue Joseph Monier  
F-92500 Rueil-Malmaison  
France

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