Motion centric machine automation with PacDrive 3

Catalogue
2013

Schneider Electric

Motion centric machine automation with PacDrive 3

Contents

Motion centric machine automation with PacDrive 3

chapter 1

Solution Overview

Contents

Motion centric machine automation with PacDrive 3
Solution overview

Motion centric machine automation with PacDrive 3

Solution overview

Complete automation solutions

1

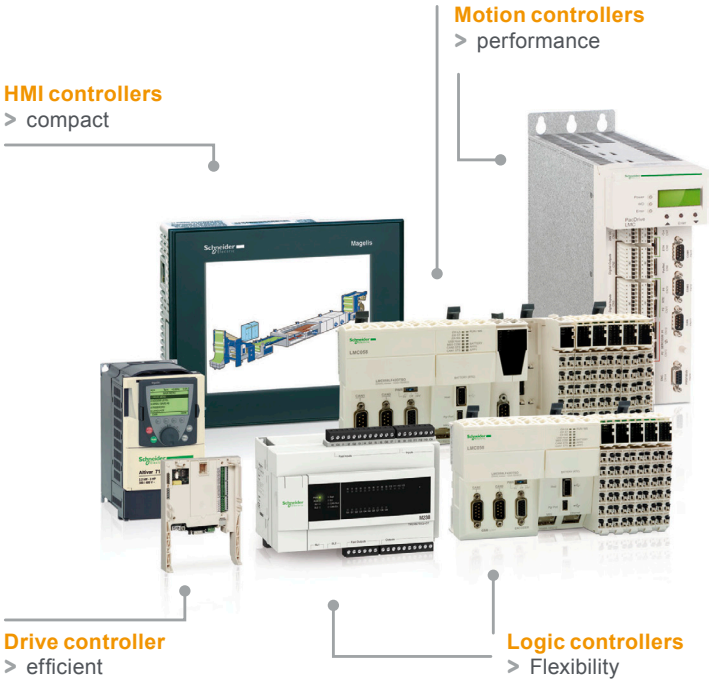
Complete automation solutions

Scalable motion control solutions for machines with up to 99 servo axes

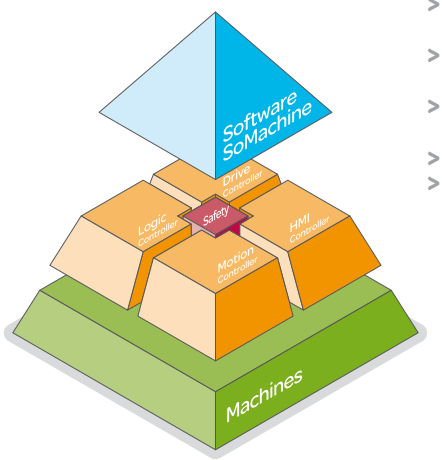
PacDrive 3 is Schneider Electric's technology for automating complete machines with logic, synchronized servo axes and/or robotics on a single hardware platform. PacDrive 3 is ideal for designing modern machines in a wide range of industrial machine applications, for example in areas such as processing, packaging, conveying, production and assembly.

PacDrive 3 – an integral part of MachineStruxure

PacDrive3 is part of the MachineStruxure™ multi-controller platform, Schneider Electric´s comprehensive approach for automating a broad range of machines.



MachineStruxure offers you maximum flexibility and optimized control of your machines:



- > In performance and functionality scalable control hardware
- > Standards for communication from machine level to factory level
- > Engineering workbench for the entire life cycle
- > Solution concepts for engineering
- > Engineering services, support, training – worldwide

> Schneider Electric is a worldwide leader in automation and machine control with an excellent reputation in motion control technology

Motion centric machine automation with PacDrive 3

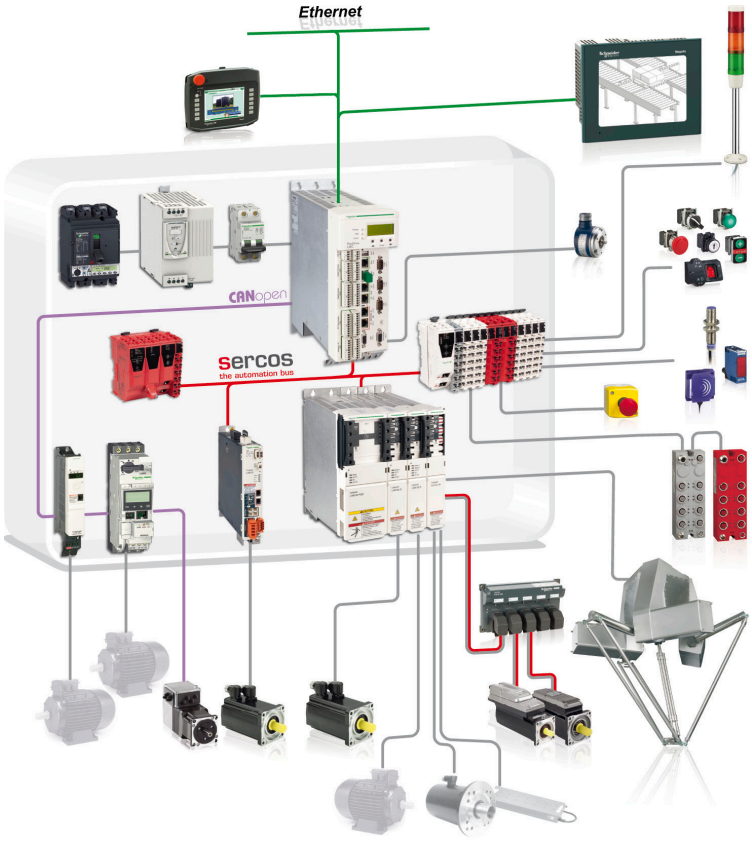
Solution overview

Controls

Controls

Logic motion control – the basis for standardized solutions

The integration of motion, PLC and IT functionality in a single hardware platform is a central element of PacDrive 3. This allows the creation of fully integrated software structures, that enable modular machine designs and help to reduce engineering time. PacDrive 3's scalable controller performance allows economical automation of applications ranging from small systems with only a few servo axes to high-performance solutions with up to 99 servo axes or 30 robots.



A single controller platform for all machine functions

The central PacDrive controller performs all control functions, from Cartesian and robotic motion to temperature regulation and machine logic. It also stores system data and equipment-specific parameters.
All of the system functions run through the centralized controller, from the human machine interface to motion and device bus communication, line synchronization, and vertical integration.

Design fully modular machines taking less engineering time and less commissioning time!

- **Universal:** one controller for logic, motion and robotics
- **Minimal training:** one tool for programming the whole machine, including robots, and one programming language
- **Enabling modular machine designs:** one program for the whole machine
- **Plug & play with auto-configuration:** system data and equipment-specific parameters are stored centrally, motion components are equipped with electronic plates

Reduce your engineering time and improve your business performance

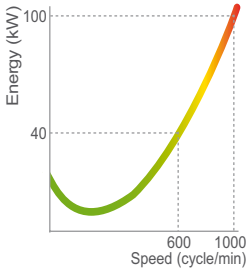
Motion centric machine automation with PacDrive 3

Solution overview

Energy efficiency

Energy efficiency

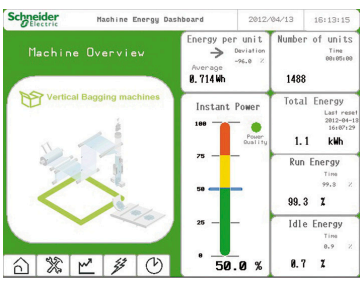
up to 30% energy saving



Energy footprint of a machine

PacDrive SH series servo motors

Library functions: consumption of synchronous servo axes

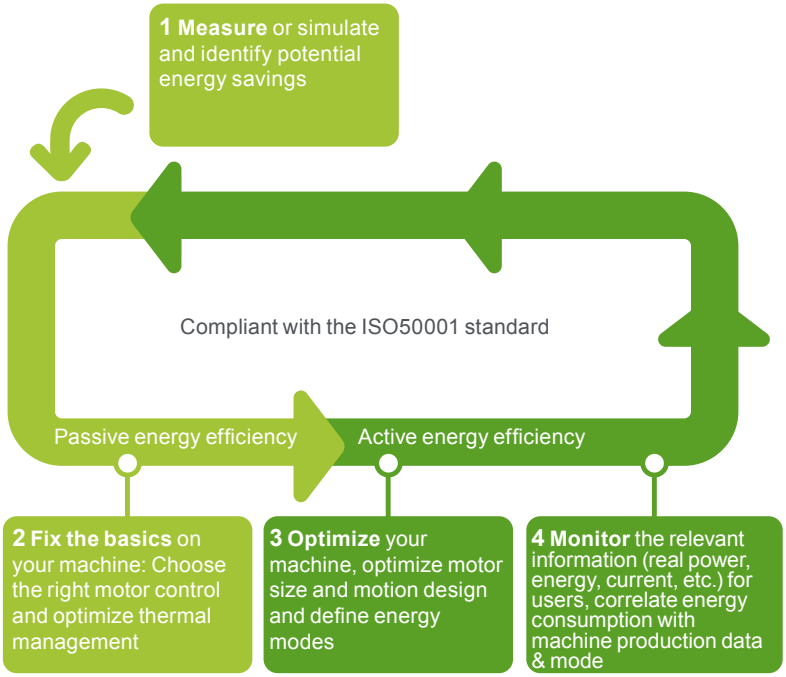


Library functions: Machine energy dashboard

Grow your business with energy-efficient solutions

Energy efficiency is an increasing concern in the global strategy of your customers. By offering them machines that save energy you will differentiate yourself in the market and gain a competitive advantage. Follow the four principles of energy efficiency adapted to life cycle of your machine and enable your customers to be compliant with the ISO 50001 standard.

Energy optimization in four sustainability steps



How can PacDrive 3 help you?

> **Simulate** your individual program in virtual mode and **calculate** your machine **energy footprint**
> **Measure** real energy consumption
> Request Schneider Electric **consulting/engineering** for comprehensive support

> Use PacDrive SH series **high efficiency servo motors**
> **Share DC-bus** using Lexium LXM 62/ILM 62 multi-axis solution
> **Save energy used to cool the cabinet** by shifting servo drives to the machine frame with Lexium ILM 62 series integrated servo drives

> Use SoMachine Motion tools for **energy efficient motion design/robotic path design**
> Use sophisticated library functions for **optimized consumption of synchronous servo axes**
> Use PackML-compliant operating modes of the PacDrive programming concept and **create standardized energy modes** for machines/lines

> Create your individual **energy dashboard** with library functions, **monitor and calculate** energy relevant figures **in real time**

> At Schneider Electric, energy efficiency starts at the machine design phase

Motion centric machine automation with PacDrive 3

Solution overview

Controls

Controls

Scalable performance for high performance industrial machines

The PacDrive LMC 101C, 201C, 300C, 400C and 600C automation controllers cover a wide range of applications.
Aspects such as the number of axes to be synchronized, data transmission volumes and the range of robotic elements to be integrated all determine which controller offers the optimum balance of price and performance.

Software-compatible PacDrive automation controllers

Full software compatibility

Starting with controllers for synchronizing up to four servo axes, PacDrive 3 provides scalable performance for synchronizing up to 99 servo axes (at 1 msec network update rate), and for up to 255 virtual axes. All controllers are software-compatible, since each of them has identical Schneider Electric Logic Motion Runtime software. You can program up to 4096 dynamic electronic cam disks operating in parallel. The program can switch between electronic cam disks during operation. All controllers have an integrated PLC (5 µsec for 1000 bit instructions).

Memory card

Benefits for you and your customers

- **Diagnostics functionalities** included: integrated software oscilloscope and message logger
- **Practice-oriented:** memory card for storing/transferring programming and configuration data
- **Easy to service:** no PC required, integrated plaintext display for system messages and diagnostics in five languages

> Proven technology: more than 60,000 machines worldwide have already been automated with PacDrive

Motion centric machine automation with PacDrive 3

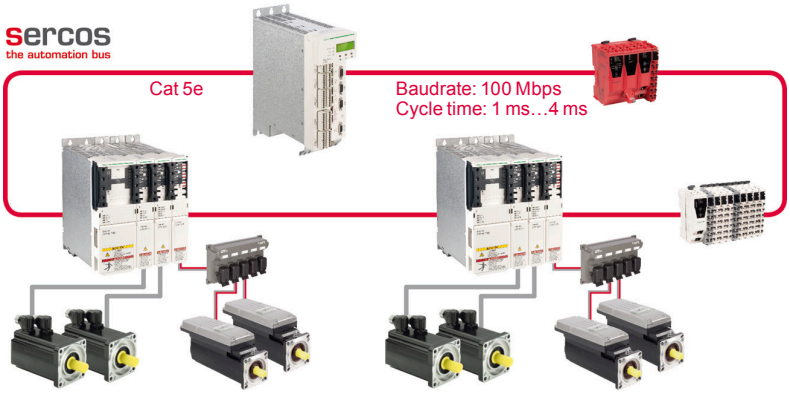
Solution overview

Controls

Controls

Ethernet-based communication with sercos III

sercos III is the preferred automation bus for PacDrive 3: drive communication, I/O communication and safe communication can be implemented using the same medium.



Key benefits for PacDrive 3

- **Universal:** fully integrated Ethernet-based solution for drive, fieldbus and safety communication
- **Reliable:** media redundancy to reduce probability of failure
- **Powerful:** network update rate of 1…4 ms for 99 servo axes. A new synchronization procedure makes it even more precise
- **Cost-effective:** simple, no hub or switches, Cat 5e cable is generally sufficient
- **High availability:** sercos III supports all PacDrive functions for automating the setup for servo drives/motors, including assignment of bus address. sercos III also supports hot swapping
- **Vendor-neutral:** supported by more than 50 controller manufacturers and 30 drive manufacturers
- **Green:** sercos energy profile defines rules for creating standardized energy modes

Openness to international accepted standards

- sercos III is the preferred automation bus for PacDrive 3 solutions. For simple machines CANopen is an alternative for I/O communication. All PacDrive controllers have a CANopen interface. A standard Ethernet interface is also integrated in all controllers
- In addition to communication via sercos III and Ethernet, LMC x00C controllers can also simultaneously communicate via two field bus protocols and real-time Ethernet, e.g. CAN and Profinet
- Optional expansion cards are also available for all controllers to implement additional field bus interfaces, such as EtherNet/IP. USB and serial interfaces are also standard in all controllers. The LMC x00C controllers also have a PROFIBUS interface (master and slave)

sercos the automation bus

Ethernet

EtherNet/IP

CANopen

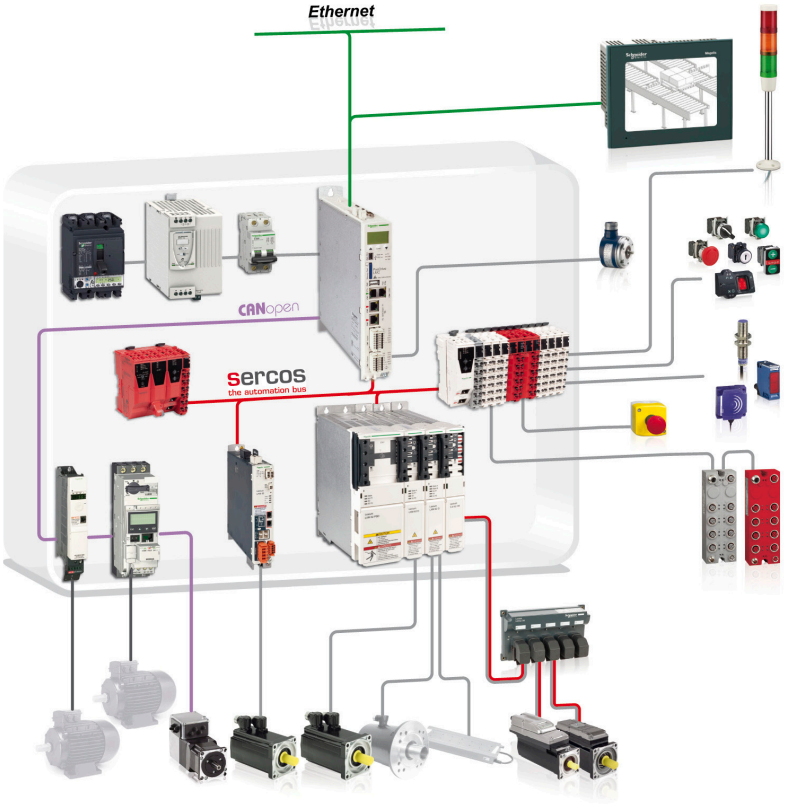
With sercos III you are choosing one of most powerful Ethernet-based communication solutions on the market

Motion centric machine automation with PacDrive 3

Solution overview
Controls

Fully integrated safe communication

In PacDrive 3, safety communication for motion and I/O is fully integrated in standard communication. An IEC 61131-3 compliant programmable safe logic controller communicates with a safety protocol over sercos III with the relevant drives and the I/O system.



SLC 100/SLC 200:
Scalable logic performance for your safety solution

TM5 safety modules: IP 20 safe I/O

TM7 safety modules: IP 67 safe I/O

Meeting your requirements

- **Fully integrated safe logic controller:** sercos III slave, can be programmed directly via the PacDrive Controller
- **Scalable performance:** up to 20 safety nodes for small applications, up to 80 safety nodes for complex applications
- **High availability:** safe logic controller comes with removable memory key for configuration and data
- **Programming solution included:** one tool, integrated in SoMachine Motion, fits all safety lifetime phases from development through commissioning to maintenance and diagnostics
- **Cost effective:** less work to implement safety solutions in the machine, reduced installation costs, no more dedicated cabling
- **Open standards:** communication based on sercos III, IEC 61131-3 compliant programming
- **Certified:** safety solutions up to SIL 3 according to IEC 61508 and PLe according to ISO 13849-1 are possible

Flexible I/O design with standard and safe I/O

- The modular Schneider Electric TM5/TM7 system for sercos III provides I/O technology with IP 20 and IP 67 protection. Safe communication versions of both TM5 and TM7 safety modules are available, color-coded to clearly differentiate them from standard technology. Standard and safe I/O modules can be mixed

Save time during design, installation and implementation of your safety solution

Motion centric machine automation with PacDrive 3

Solution overview

Application Software

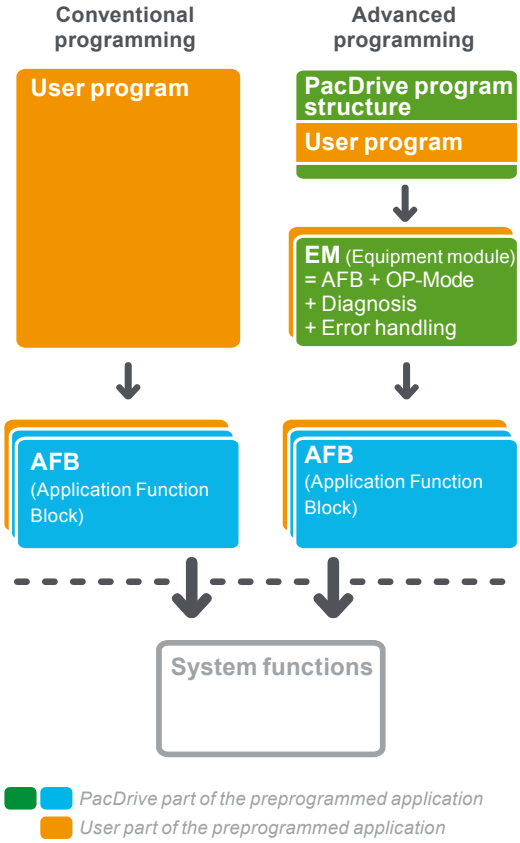
1

Application software

Software solution to counter rising engineering costs

The PacDrive software concept offers two ways to counter rising engineering costs: programs can be programmed either in the conventional way, using Application Function Blocks (AFBs), or by using PacDrive's predefined program structure and Equipment Modules (EMs): the latter option further reduces programming work and creates standardized modular software to improve the reusability of machine modules.

Two possible routes to a single destination:



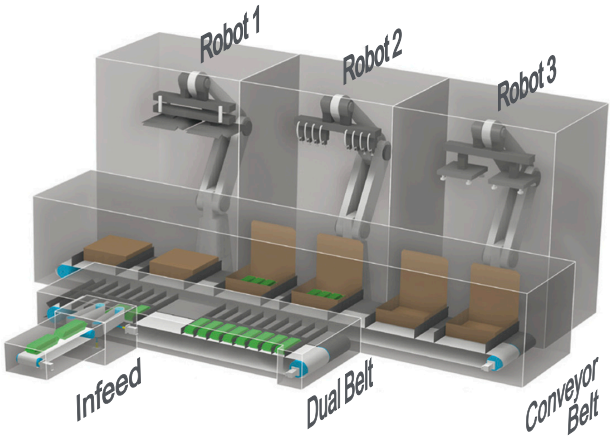
Application Function Block (AFB) integrated in Equipment Modules (EMs)

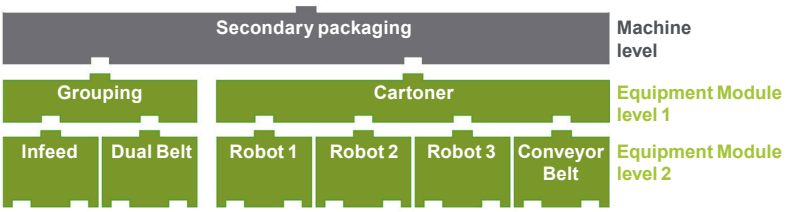
Key element for modular machines

PacDrive's predefined programming template is a universal, basic machine program into which users can integrate their own software components. The program's basic functionalities are already in place, including OMAC-compliant operating modes, diagnostics mechanisms, error handling and response. These can be adapted to the individual application by configuring them as needed.

In this template, Equipment Modules (EMs) are connected in order to map the modular structure of a machine to the software structure. EMs are tested and documented software library functions. They are based on IEC 61131-3-compliant Application Function Blocks (AFBs), supplemented with functions for operating modes, diagnostics, exception handling, and a standardized module interface.

- **Less programming time:** by subdividing the program into modules entire machine functions can be reused
- **Top quality software:** tested, validated and documented off-the-shelf software
- **Individual:** Equipment Modules can be customized by users
- **Comprehensive:** the PacDrive libraries contain most of the functions needed for packaging machines. They also offer a variety of mechatronic functions typically used in production machinery and in handling, assembly and sorting machines





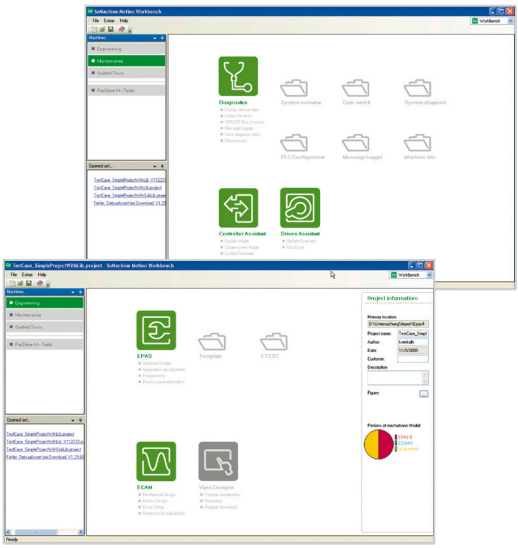
Don't reinvent the wheel, create reusable, standardized software

Motion centric machine automation with PacDrive 3

Solution overview

Tools

Tools



SoMachine Motion: ONE workbench to manage all the tools in a single environment

Engineering workbench for the entire lifecycle

SoMachine Motion is the single entry point for PacDrive 3: the workbench contains all the tools needed for the whole engineering process, including commissioning and diagnostics. No need for folders full of CDs or optional add-ons, all the necessary tools are embedded in ONE software: SoMachine Motion.

Actively shaping the modern engineering process

Machinery is becoming increasingly complex, leading to a similar increase in the amount of software and data. To keep pace with this trend, engineers will have to rethink their project processes and adopt new approaches.
With SoMachine Motion, you can help actively shape the current changes in engineering. SoMachine Motion is ideal for managing mechatronic and motion centric design projects that incorporate mechanical, hardware and electronics development in an interdisciplinary process.

One of the most modern and powerful tool concepts

- **Multi-user design:** all project data is stored in a central database
- **Open standards:** CoDeSys V3 based programming tool, thus offering the option of object-oriented programming. Plug-ins for additional functionalities
- **Individual:** editors and debuggers for all six standard IEC 61131-3 languages available
- **Optional graphic programming:** sophisticated new approach for programming using drag-and-drop functions, program code is generated automatically
- **Powerful motion/drive train design:** single tool for designing a complete system, from mechanics and motion design to calculation of system power requirements
- **Safety included:** safety editor for creating IEC 61131-3 compliant programs included, as well as a configurator to parameterize the hardware components of the safety solution
- **Easy to use:** support tools are provided to handle program and firmware data and to perform program version management
- **Diagnostics functionalities for your customer:** the diagnostics tool with comprehensive functionalities can be used on its own, without any programming knowledge and at an early stage in the project
- **Customized HMI design**: ONE tool to cover your Magelis HMI application design needs

SoMachine Motion makes your engineering processes efficient and cost-effective

Motion centric machine automation with PacDrive 3

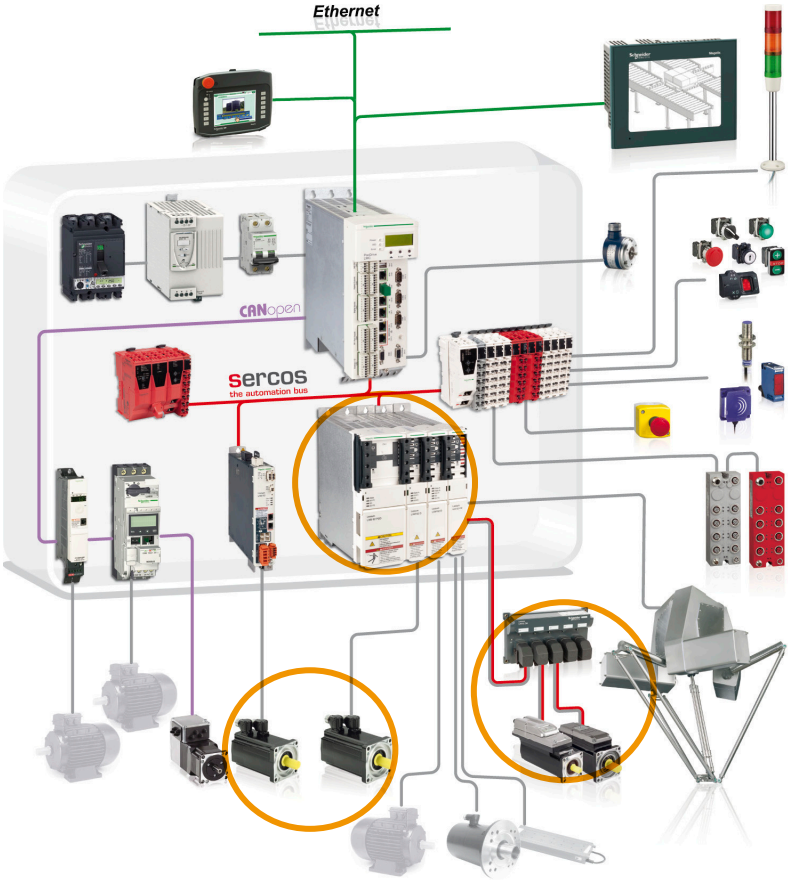
Solution overview

Servo drives

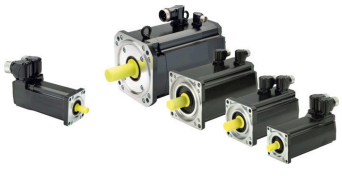
Servo drives

Flexible configuration of drive architectures

Increasing control cabinet space requirements and increased mounting and cabling costs are factors that demand new ideas. The modular servo drives of the LXM 62 Series and the integrated ILM 62 drives provide new ways to reduce space requirements in the control cabinet and lower costs.
Stand-alone drives are ideal for servo drive solutions with self-contained single axes. All drives are software compatible and interchangeable, all drives have an electronic name plate for automatic parameterizing.



Lexium LXM 52 series servo drives



PacDrive SH series AC servo motors

Lexium LXM 52 stand-alone servo drives

In a conventional stand-alone design, Lexium LXM 52 series servo drives are particularly well suited for economical configuration of servo drive solutions with self-contained single axes. They communicate via sercos III and offer integrated digital I/O, an option made possible by the universal sercos III communication profile. The servo drives are available in five different power ranges, ranging between 1.5 and 24 A continuous current and between 6 and 72 A peak current.

Highly dynamic AC servo motors

The highly dynamic, precise AC servo motors of the PacDrive SH series can be operated by Lexium LXM 52 and LXM 62 servo drives. SH motors are available in five flange sizes with peak torques from 1.5 to 330 Nm. SH motors have a triple overload capacity. All of the motors are equipped with high-resolution, single turn or multi-turn absolute value encoders.

> Reduce your hardware costs with economical solutions for multi and single axis configurations

Motion centric machine automation with PacDrive 3

Solution overview

Servo drives

Lexium LXM 62 series servo drives

Lexium ILM 62 servo modules

Flexible configuration of drive architectures *(continued)*

Universal servo drives for multi-axis solutions

The fully digital servo drives of the Lexium LXM 62 series are modular, consisting of single drives (1 axis) and double drives (2 axes) of the same size. All of the single and double drives in a group use a shared power supply. No backplane connections are required, and the modules can be coupled to the adjacent module with a quick front connection with locking screws in less than two minutes.
Lexium LXM 62 lets users implement cost-effective compact multi-axis solutions, which require up to 50% less space in the cabinet, compared with traditional servo solutions!

Integrated servo drives

Lexium ILM 62 servo modules with integrated drive electronics use a flexible approach to cabling, consisting of pre-terminated hybrid cables and distribution boxes. All that remains in the cabinet is the shared power supply of the LXM 62 series and a CM (Connection Module). The drive and network solution together form a true plug-and-play solution for modularity in mechanics, electronics and software.

Check your application and pursue your objectives

- **Single axis solution:** LXM 52 is ideal for solutions with few axes and works perfectly with the small PacDrive LMC x01C controllers
- **Multi-axis solution/cabinet:** LXM 62 needs **up to 50%** less cabinet space in comparison with others on the market. With tool-free motor connection and quick front connection the assembly or installation time can be reduced. LXM 62 can be used for the whole SH motor range, from the smallest to the largest
- **Multi-axis solution/integrated servo drives:** ILM 62 integrated servo modules are the key element for consistent modular machine design. ILM 62 needs **up to 90%** less cabinet space in comparison with stand-alone drives! The wiring/installation times in the cabinet can be reduced by **up to 90%** in comparison with others on the market (standard drives). Compared to conventional servo solutions, the network solution reduces the required cabling by **up to 70%**, and the labor required for installing the servo solution in the machine frame is reduced by **up to 50%**

Minimize required cabinet space and installation times

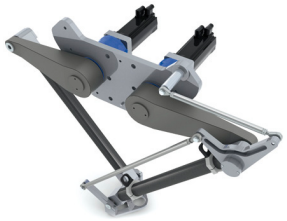
Motion centric machine automation with PacDrive 3

Solution overview

Robotics solutions

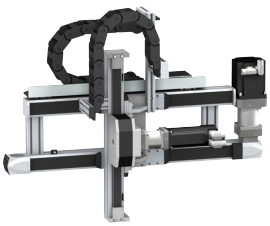
1

Robotics solutions

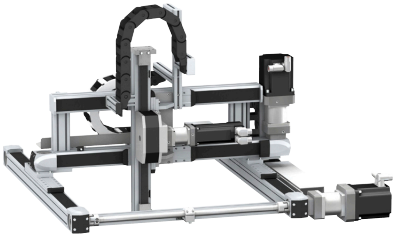


Delta 2 picker mechanisms

Delta 3 picker mechanisms



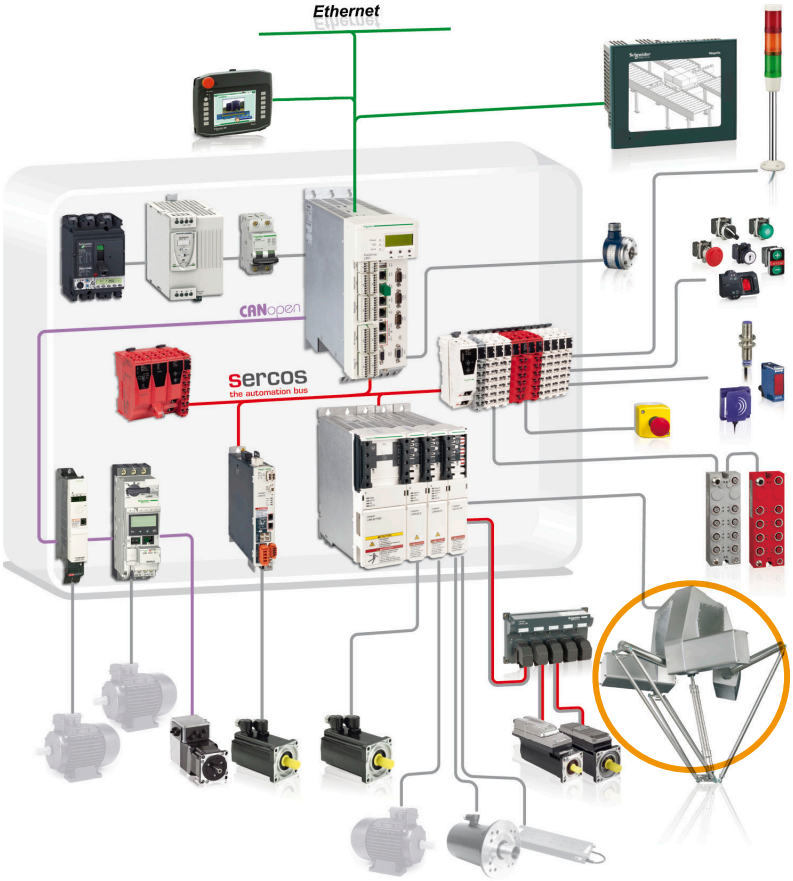
Linear positioner



Portal robots

Integrated robotics

The integration of robotics into the machine control solution is one of the outstanding features of PacDrive: if robot kinematics with up to 6 axes are equipped with PacDrive SH servo motors, they can be fully integrated into the PacDrive automation solution. Standard Lexium servo drives or integrated servo drives can be used and thanks to library functions the robot(s) can be integrated in the IEC 61131-3-compliant machine program structures.



Ready-to-use robotics packages are cutting engineering times

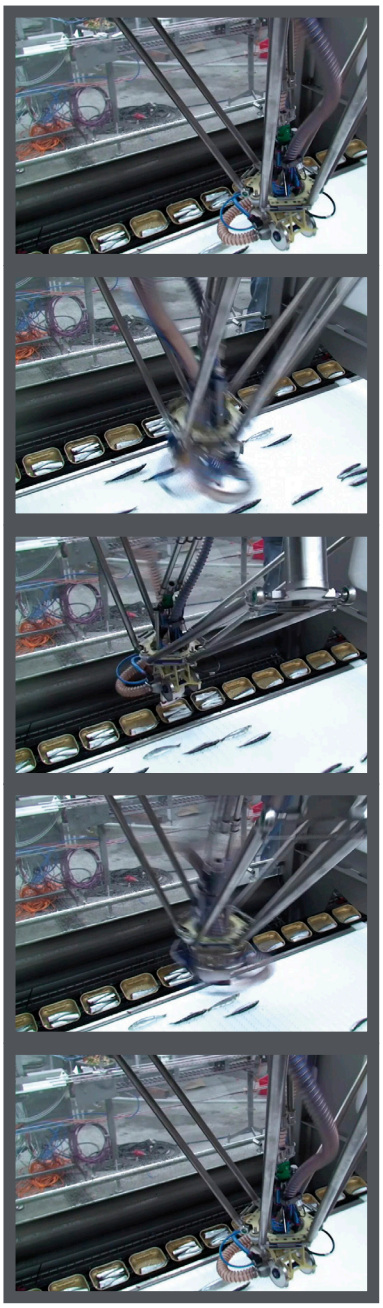
Thanks to the availability of complete robot arm mechanisms, development of customer-specific kinematics or integration of third-party products is no longer necessary. This permits even faster creation of robot-enabled machine designs. The portfolio consists of Delta 2 and Delta 3 picker mechanisms, and the linear motion system provides individual solutions for portal and gantry robots.

Motion centric machine automation with PacDrive 3

Solution overview

Robotics solutions

Integrated robotics *(continued)*



Pave the way to better robotics solutions

- **No additional hardware:** one controller can control machines and multiple robots
- **No additional programming tools:** SoMachine Motion tools are suitable
- **One HMI concept:** robots are fully integrated in the user interface of the machine
- **Flexible:** one program for machine and robotics, therefore easy and more flexible synchronization of machine and robots
- **Easy to use:** PacDrive robotics library for motion programming and transformation. The library functions can be adapted by parameterizing for both PacDrive kinematics and individual kinematics. The option to specify blending parameters provides optimized paths
- **Optional automatic generation of paths:** the path generator can calculate paths by defining the start and arrival point, even three-dimensional obstacles can be dealt with by entering the coordinates
- **Solutions for the food industry:** the P4 pick & place robot features a stainless steel construction. Thanks to its IP 65 rated washdown configuration the robot is suitable for hygienic environments
- **Single source:** all drives and motors used for robotics are PacDrive components, whether they are PacDrive mechanisms or individual robotics mechanisms. So you can get support and service for the entire automation solution (including the robotics kinematics by using Schneider Electric kinematics)

Optimize your machines with robotics solutions

Motion centric machine automation with PacDrive 3

Solution overview

Develop your business

Develop your business

Service and support that are there with you all the way

Design

We find the best solution for your needs

> Based on your needs, our Solution Application Experts and Application Design Experts (SAE/ADE) devise innovative technical solutions including
  > Co-engineering
  > Tests
  > Validation

We understand your concerns

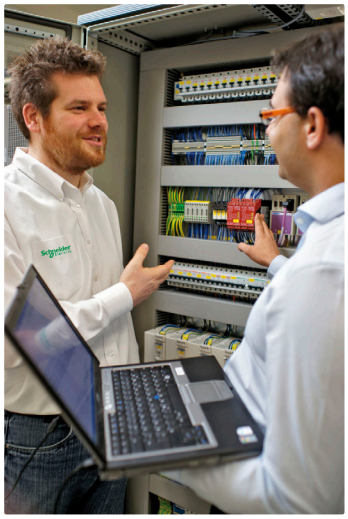
> Consulting

We implement the solution with a full service agreement

> Our solution design and delivery centers (Flex-Centers) are committed to quality and results, and provide:
  > Project and program management
  > Software and hardware engineering
  > Tests, validation, and commissioning

We improve your team's competencies

> Classroom and on-site training



Build

We ensure the delivery of your solution

> Availability of components through a large worldwide network of distributors

> Collaboration, management, and delivery through local partners

> With Schneider Electric as your turnkey solution partner we include in our solutions:
  > Project management and control
  > Engineered systems
  > Third-party component management

We provide on-site services and support

> Secondment of qualified personnel to deliver on-site engineering and technical services

We improve your service team's competencies

> Service and commissioning training

> Make your machines stand out from the beginning and benefit from worldwide support

Motion centric machine automation with PacDrive 3

Solution overview

Develop your business

Service and support that are there with you all the way
(continued)

Operate

We provide international sales and after-sales services for you and your customers

- Maintenance contracts
- Spare parts
- Repairs
- Standard and express deliveries
- Return of goods
- Service expertise:
  - Error diagnosis and repair
  - Environmental measurements (EMC, field bus, thermography, power quality analyses, etc.)
- Customer International Support (CIS) as a single point of contact:
  - A network of 190 dedicated local country experts
  - A web-based collaborative platform for efficient communication

We improve your customers' competencies

- Classroom and on-site customer training
- Customer service and commissioning training

Improve

Improve your machine ranges

- Consulting

We improve your customers' machines on their production lines

- Audits
- Service expertise:
  - Consultancy
  - Retrofitting
- Migration and upgrading
- Training

Contact your machine solutions experts:
www.schneider-electric.com/general machine control

Motion centric machine automation with PacDrive 3

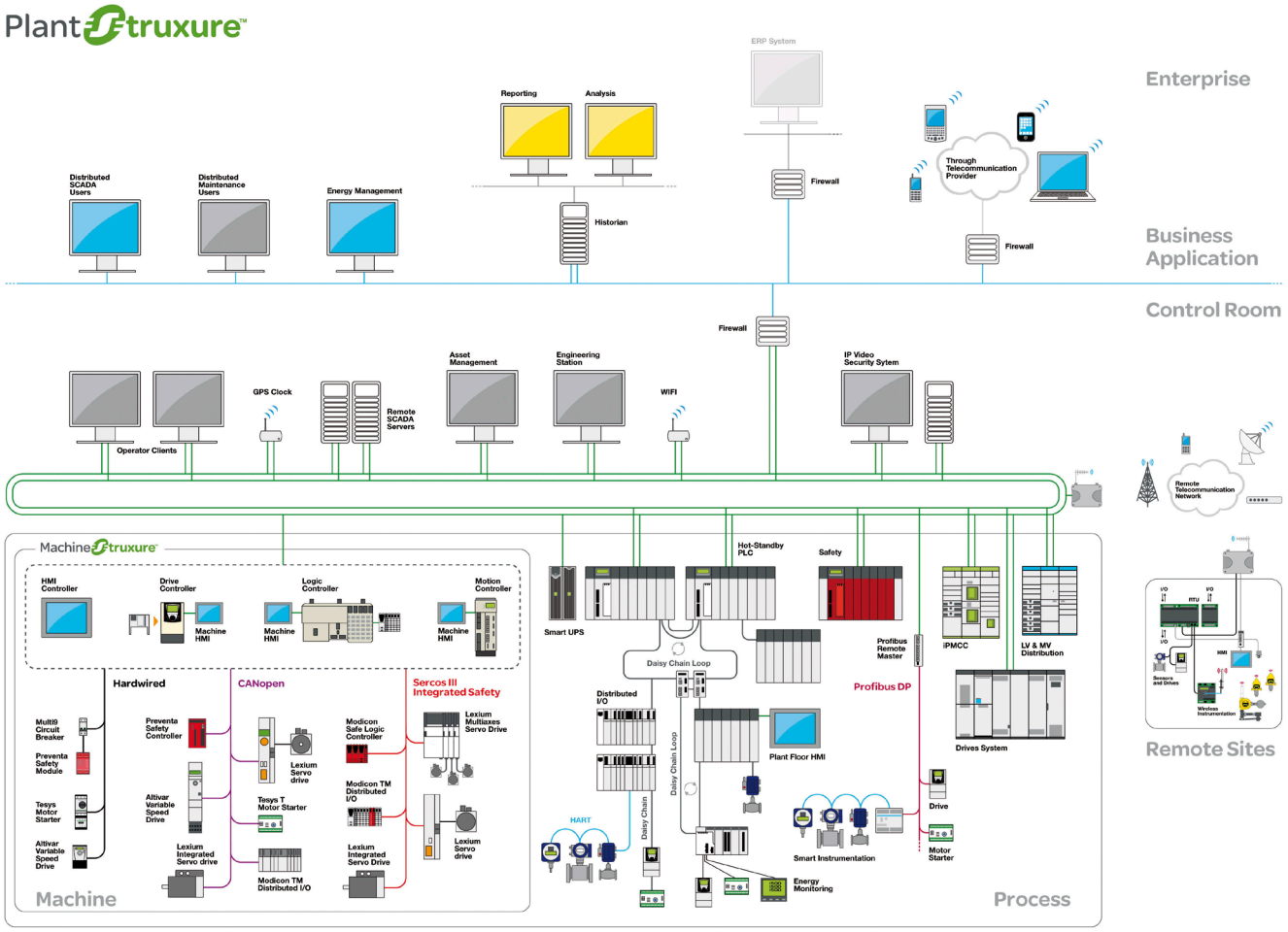
Solution overview

Develop your business

Develop your business

From machine to plant, Schneider Electric provides a single, open and fully coherent system

PlantStruxure™ architecture is Schneider Electric's comprehensive solution for industrial process control, while MachineStruxure™ architecture is dedicated to machine control.
Because both architectures are based on open standards and designed to be fully compatible, your machines can easily be integrated into your customers' factory processes. In addition, open standards allow your machines to evolve with your customers' changing requirements.



MachineStruxure™ architecture, one of the mainstays of EcoStruxure architecture

EcoStruxure™ system architecture enables the convergence of five key domains of our expertise: management of Power, Processes and Machines, the IT Room, Buildings, and Security.
EcoStruxure™ architecture takes multiple, siloed systems and adapts them to an integrated solution, reducing redundancy of equipment, software, and personnel.

From machine to plant, Schneider Electric provides a single, fully coherent system

Motion centric machine automation with PacDrive 3

Solution overview

Complete automation solutions

Complete automation solutions

- Wide range
- Simple to use
- Network openness
- Worldwide availability

Innovation dedicated to reduction of:

- Enclosure size
- Wiring time
- Installation time

Your one-stop shop from simple control systems to global automation solutions

Schneider Electric is a world leader in automation. We help you benefit from the latest technologies that can turn your machines into a commercial success. From actuators to control systems, we have the solution that is suited to your specific needs

Motor control, positioning

- Variable frequency drives
- Step motor drives
- EC motor drives
- Motor starters

all easy to integrate in PacDrive

HMI, control and dialog devices

- Operator interfaces with display panels
- Pushbuttons
- Emergency switches
- Dialog and signaling devices (as well for safety solutions)

Measuring, recording, switching

- Optoelectronic/inductive/ultrasound switches and sensors
- Recording systems (as well for safety solutions)

Power supplies, power distribution, metering and monitoring

- Power supplies
- Contactors
- Measuring equipment
- Panel instruments

Alliance Partners

Building on our open automation platforms and strategies, we work with strategic partners who complement our capabilities in order to provide you with solutions that fully meet your business objectives. Within this collaboration partnerships are created that can deliver the most complete and effective solution for your applications.

Schneider Electric offers a full range of products & solutions for energy distribution and management and industrial automation

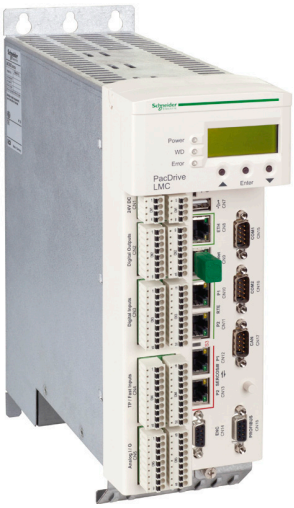
chapter 2

PacDrive 3 System Motion Solutions

PacDrive 3 System Motion Solutions

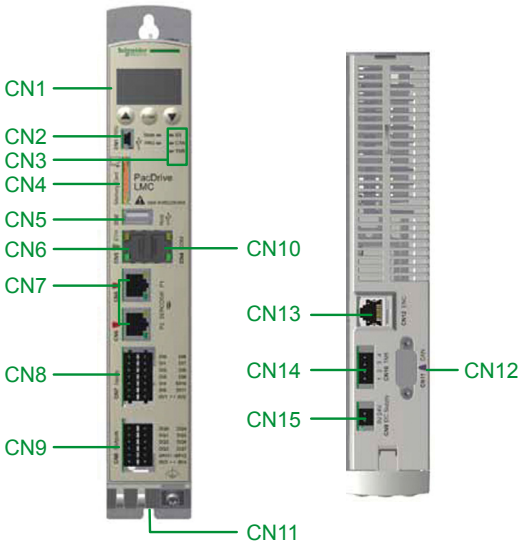
LMC controllers

LMC ●01C, LMC ●00C: Overview

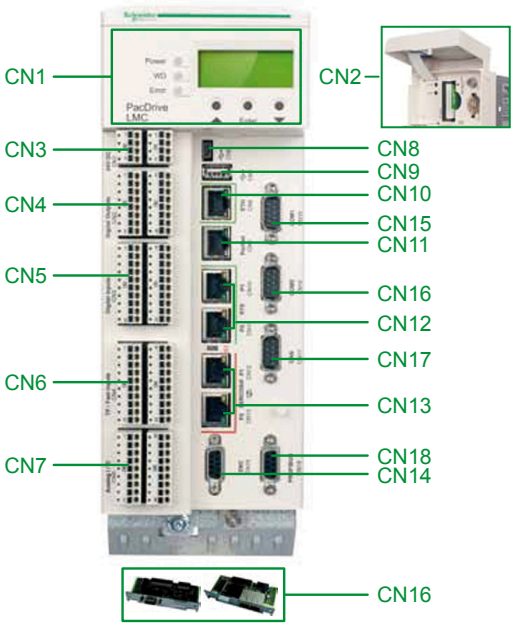
Type		LMC101C	LMC201C	LMC300C	LMC400C	LMC600C
						
Processor		Intel Atom 1.6 GHz		Intel Celeron M 600 MHz	Intel Celeron M 1.5 GHz	Intel Pentium M 2 GHz
		512 KB L2 Cache		512 KB L2 Cache	1 MB L2 Cache	2 MB L2 Cache
RAM		512 MB DDR2 RAM				
NV RAM		128 KB				
Power supply	Supply voltage	24 VDC				
	Supply consumption	30 W		24 W	36 W	
Battery		Yes				
Memory card		At least 512 MB (SD Card)		At least 128 MB (CF Card)		
Cooling		Passive		Fan		
Real Time Clock (RTC)		Yes				
Real-Time Operating System		VxWorks and SEAAutomation Kernel				
Input	Digital input	8		20		
	Touchprobe input	4		16		
	Interrupt input	-		4		
	Analog input	-		2		
Output	Digital output	8		16		
	Analog output	-		2		
Number of drives		**4 servo axes**	**8 servo axes**	**8 servo axes**	**16 servo axes**	**99 servo axes**
Integrated communication	CAN	1 (9 pin SUB-D plug x1)		1 (9 pin SUB-D plug x1)		
	RS232	1 (RJ45 x1)		1 (9 pin SUB-D plug x1)		
	RS422/RS485	1 (RJ45 x1)		1 (9 pin SUB-D plug x1)		
	USB-A	1 (USB x1)		1 (USBx1)		
	USB-B	-		1 (mini USBx1)		
	Profibus-DP	-		1 (9 pin SUB-D socket x1)		
	Master encoder	1 (RJ45 x1)		1 (9 pin SUB-D socket x1)		
	Ethernet	1 (RJ45 x1)		1 (RJ45 x1)		
	Ethernet TCP/IP or Profinet IO	-		1 (RJ45 x2)		
	sercos III	1 (RJ45 x2)		1 (RJ45 x2)		
	PacNet	-		1 (RJ45 x1)		

Type		LMC101C, LMC201C	LMC300C, LMC400C, LMC600C
Integrated I/O			
Touchprobe input	Number	4	16
	Nominal input voltage	24 VDC	24 VDC
	Input filter	100 µs	100 µs
	TP0 to TP15	10 µs	10 µs
Digital input	Number	8	20
	Nominal input voltage	24 VDC	24 VDC
	Input filter	–	1 or 5 ms (can be parameterized)
Interrupt input	Number	–	16
	Nominal input voltage	–	24 VDC
	Input filter	–	0.1 or 1 ms (can be parameterized)
Analog input	Number	–	2
	Type	–	Voltage/current
	Range	–	- 10…10 V (resistor 100 kOhm) - 20…20 mA
	Resolution	–	12 bits
Digital output	Number	8	16
	Output voltage	24 VDC	24 VDC
	Nominal current (Ie)	100 mA per output	250 mA per output
	Transmission time	100 µs	100 µs
	Short circuit protection	Yes	Yes
Analog output	Number	–	2
	Type	–	Voltage
	Range	–	-10…10 V
	Resolution	–	12 bits
Communication			
Bus connections	Integrated motion and field buses	sercos III	sercos III
	Integrated additional field bus connection (configuration 1)	CANopen (Master/Slave)	PROFIBUS DP master/slave and CANopen (2.0B)
	Integrated additional field bus connection (configuration 2)	–	RT-Ethernet (2 ports) and Profibus DP (master/slave) or 1x CANopen (2.0B)
	PacNet interface	–	1
Communication/interface	Serial interfaces	COM1: RS232 COM2: RS422/RS485	COM1: RS232 COM2: RS422/RS485
	Network connection	1x Ethernet 10/100 BASE-T	1x Ethernet 10/100 BASE-T
	USB connection	1x USB-A-2.0 1x USB-B	1x USB-A-2.0 1x USB -B
	Master encoder interface	1x Hiperface® master encoder or 1x incremental master encoder	1x Hiperface® master encoder or 1x incremental master encoder
	Programming interface	Ethernet	Ethernet
	Additional encoder input via PacNet interface	–	1x Hiperface® encoder or 1x incremental master encoder
	Master encoder output via PacNet interface	–	incremental
	Integrated OPC interface	Yes	Yes
	Diagnostic interface for remote maintenance	Ethernet or Modem	Ethernet or Modem
	Communication protocols	HTTP (Hypertext Transfer Protocol) FTP (File Transfer Protocol) SMTP (Simple Mail Transfer Protocol)	HTTP (Hypertext Transfer Protocol) FTP (File Transfer Protocol) SMTP (Simple Mail Transfer Protocol)
	Communication modules	1x Option module □ Profinet IO-RT controller/device □ Ethernet/IP scanner/adapter □ Profibus DP master/Slave	Up to 2x Option module: □ Ethernet RT x 2 □ Ethernet RT and CANopen □ Ethernet RT and Profibus □ CANopen and Profibus

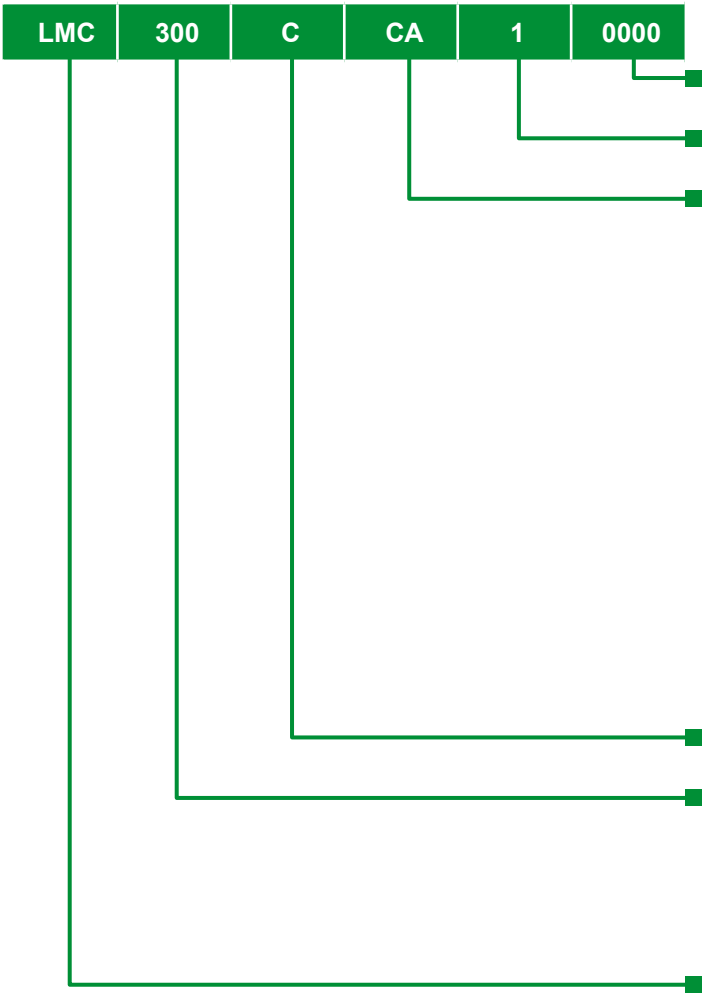
PacDrive 3 System Motion Solutions
LMC controllers
LMC ●01C, LMC ●00C: Controller interfaces



LMC●01C controller interfaces	
Item	**Function**
CN1	LCD and LED
CN2	USB client (not active)
CN3	LED connector
CN4	SD card
CN5	USB Host
CN6	Ethernet
CN7	sercos III
CN8	12 digital input points and 4 touchprobe input points
CN9	8 digital output points
CN10	COM: RS232/RS485
CN11	Optional module slots
CN12	CAN/CANopen
CN13	Master encoder
CN14	Not used
CN15	24 VDC power supply



LMC●00C controller interfaces	
Item	**Function**
CN1	LCD and LED
CN2	CF card and battery
CN3	24 VDC power supply and Watchdog
CN4	16 digital output points
CN5	20 digital input points
CN6	16 touchprobe input points and 4 fast input points
CN7	2 analog input points and 2 analog output points
CN8	USB client
CN9	USB host
CN10	Ethernet
CN11	PacNet
CN12	RT-Ethernet
CN13	sercos III
CN14	Master encoder
CN15	COM1: RS232
CN16	COM2: RS422/RS485
CN17	CANopen
CN18	Profibus DP
CN19	Optional module slots



Internal
0000= Standard

Hardware
1

Module
AA= None (1) (2)
BB= CANopen option module (2)
BC= Profibus option module (2)
BD= Ethernet RT option module (2)
BG= CANopen option modulex2 (2)
BI= CANopen option module + Ethernet RT option module (2)
BL= Profibus option module + Ethernet RT option module (2)
CA= Uninterruptible power supply (2)
CB= Uninterruptible power supply + CANopen option module (2)
CC= Uninterruptible power supply + Profibus option module (2)
CD= Uninterruptible power supply + Ethernet RT option module (2)
CG= Uninterruptible power supply + CANopen option module x2 (2)
CI= Uninterruptible power supply + CANopen option module + Ethernet RT option module (2)
CL= Uninterruptible power supply + Profibus option module + Ethernet RT option module (2)

Type
C= Controller base

Size
101= Max. 4 servo axes
201= Max. 8 servo axes
300= Max. 8 servo axes
400= Max. 16 servo axes
600= Max. 99 servo axes

Family
LMC= LMC controller

(1) For LMC●01C controllers
(2) For LMC●00C controllers

2

LMC controllers		
Size	Reference	Description
LMC101C	**LMC101CAA10000**	Controller (4 axes), Accessory kit included, Basic
LMC201C	**LMC201CAA10000**	Controller (8 axes), Accessory kit included, Basic
LMC300C	**LMC300CAA10000**	Controller (8 axes), Accessory kit included, Basic
	LMC300CBB10000	Controller (8 axes), Accessory kit included, CANopen option module
	LMC300CBC10000	Controller (8 axes), Accessory kit included, Profibus option module
	LMC300CBD10000	Controller (8 axes), Accessory kit included, Ethernet RT option module
	LMC300CBG10000	Controller (8 axes), Accessory kit included, 2x Ethernet RT option modules
	LMC300CBI10000	Controller (8 axes), Accessory kit included, 1x CANopen option module + 1x Ethernet RT option module
	LMC300CBL10000	Controller (8 axes), Accessory kit included, 1x Profibus option module + 1x Ethernet RT option module
	LMC300CCA10000	Controller (8 axes), Accessory kit included, Uninterruptible power supply
	LMC300CCB10000	Controller (8 axes), Accessory kit included, CANopen option module + Uninterruptible power supply
	LMC300CCC10000	Controller (8 axes), Accessory kit included, Profibus option module + Uninterruptible power supply
	LMC300CCD10000	Controller (8 axes), Accessory kit included, Ethernet RT option module + Uninterruptible power supply
	LMC300CCG10000	Controller (8 axes), Accessory kit included, 2x Ethernet RT option modules + Uninterruptible power supply
	LMC300CCI10000	Controller (8 axes), Accessory kit included, 1x CANopen option module + 1x Ethernet RT option module + Uninterruptible power supply
	LMC300CCL10000	Controller (8 axes), Accessory kit included, 1x Profibus option module + 1x Ethernet RT option module + Uninterruptible power supply
LMC400C	**LMC400CAA10000**	Controller (16 axes), Accessory kit included, Basic
	LMC400CBB10000	Controller (16 axes), Accessory kit included, CANopen option module
	LMC400CBC10000	Controller (16 axes), Accessory kit included, Profibus option module
	LMC400CBD10000	Controller (16 axes), Accessory kit included, Ethernet RT option module
	LMC400CBG10000	Controller (16 axes), Accessory kit included, 2x Ethernet RT option modules
	LMC400CBI10000	Controller (16 axes), Accessory kit included, 1x CANopen option module + 1x Ethernet RT option module
	LMC400CBL10000	Controller (16 axes), Accessory kit included, 1x Profibus option module + 1x Ethernet RT option module
	LMC400CCA10000	Controller (16 axes), Accessory kit included, Uninterruptible power supply
	LMC400CCB10000	Controller (16 axes), Accessory kit included, CANopen option module + Uninterruptible power supply
	LMC400CCC10000	Controller (16 axes), Accessory kit included, Profibus option module + Uninterruptible power supply
	LMC400CCD10000	Controller (16 axes), Accessory kit included, Ethernet RT option module + Uninterruptible power supply
	LMC400CCG10000	Controller (16 axes), Accessory kit included, 2x Ethernet RT option modules + Uninterruptible power supply
	LMC400CCI10000	Controller (16 axes), Accessory kit included, 1x CANopen option module + 1x Ethernet RT option module + Uninterruptible power supply
	LMC400CCL10000	Controller (16 axes), Accessory kit included, 1x Profibus option module + 1x Ethernet RT option module + Uninterruptible power supply
LMC600C	**LMC600CAA10000**	Controller (99 axes), Accessory kit included, Basic
	LMC600CBB10000	Controller (99 axes), Accessory kit included, CANopen option module
	LMC600CBC10000	Controller (99 axes), Accessory kit included, Profibus option module
	LMC600CBD10000	Controller (99 axes), Accessory kit included, Ethernet RT option module
	LMC600CBG10000	Controller (99 axes), Accessory kit included, 2x Ethernet RT option modules
	LMC600CBI10000	Controller (99 axes), Accessory kit included, 1x CANopen option module + 1x Ethernet RT option module
	LMC600CBL10000	Controller (99 axes), Accessory kit included, 1x Profibus option module + 1x Ethernet RT option module
	LMC600CCA10000	Controller (99 axes), Accessory kit included, Uninterruptible power supply
	LMC600CCB10000	Controller (99 axes), Accessory kit included, CANopen option module + Uninterruptible power supply
	LMC600CCC10000	Controller (99 axes), Accessory kit included, Profibus option module + Uninterruptible power supply
	LMC600CCD10000	Controller (99 axes), Accessory kit included, Ethernet RT option module + Uninterruptible power supply
	LMC600CCG10000	Controller (99 axes), Accessory kit included, 2x Ethernet RT option modules + Uninterruptible power supply
	LMC600CCI10000	Controller (99 axes), Accessory kit included, 1x CANopen option module + 1x Ethernet RT option module + Uninterruptible power supply
	LMC600CCL10000	Controller (99 axes), Accessory kit included, 1x Profibus option module + 1x Ethernet RT option module + Uninterruptible power supply

Note: Controller packaging contains terminals, 0.1 m connection cable, termination resistors and other accessories

Sercos cables			
Designation	**Reference**	**Length**	
sercos III cables for redundant sercos ring	VW3E5001R005	0.5 m	*1.640 ft*
	VW3E5001R010	1 m	*3.281 ft*
	VW3E5001R015	1.5 m	*4.921 ft*
	VW3E5001R020	2 m	*6.562 ft*
	VW3E5001R030	3 m	*9.843 ft*
	VW3E5001R050	5 m	*16.404 ft*
	VW3E5001R100	10 m	*32.808 ft*
	VW3E5001R150	15 m	*49.213 ft*
	VW3E5001R200	20 m	*65.617 ft*
	VW3E5001R250	25 m	*82.021 ft*
	VW3E5001R300	30 m	*98.425 ft*
	VW3E5001R400	40 m	*131.234 ft*
	VW3E5001R500	50 m	*164.042 ft*

LMC ●00C controller spare parts		
Designation	**Reference**	**Description**
Accessory kit	VW3E6004	Spare part for LMC ●00C controller
Compact flash memory card	VW3E70350AA00	512 MB
Battery	VW3E6020	Lithium battery front, 3 V

LMC ●01C controller communication modules		
Designation	**Reference**	**Description**
Communication module Profibus DP	VW3E704000000	1x 9 pin SUB-D
Communication module Ethernet real time	VW3E704100000	2x RJ45 ports

LMC ●01C controller spare parts		
Designation	**Reference**	**Description**
Accessory kit	VW3E6019	Spare part for LMC ●01C controller
Secure digital memory card	VW3E70360AA00	512 MB

PacNet terminals		
Bus terminal-4/DIO1	VBO04S00	I/O-Module bus terminal - 4/DIO1, PacNet bus terminal 16E/16A
Bus terminal-4/Enc1	VBO05S00	Bus terminal-4/Enc1 module

PacNet and Patch cables (Controller-Bus terminal-4)			
Designation	**Reference**	**Length**	
PacNet cables	VW3E3001R005	0.5 m	*1.640 ft*
	VW3E3001R010	1 m	*3.281 ft*
	VW3E3001R020	2 m	*6.562 ft*
	VW3E3001R030	3 m	*9.843 ft*
	VW3E3001R050	5 m	*16.404 ft*
Patch cables	VW3E3001R100	10 m	*32.808 ft*
	VW3E3001R150	15 m	*49.213 ft*
	VW3E3001R200	20 m	*65.617 ft*
	VW3E3001R250	25 m	*82.021 ft*
	VW3E3001R300	30 m	*98.425 ft*
	VW3E3001R400	40 m	*131.234 ft*
	VW3E3001R500	50 m	*164.042 ft*

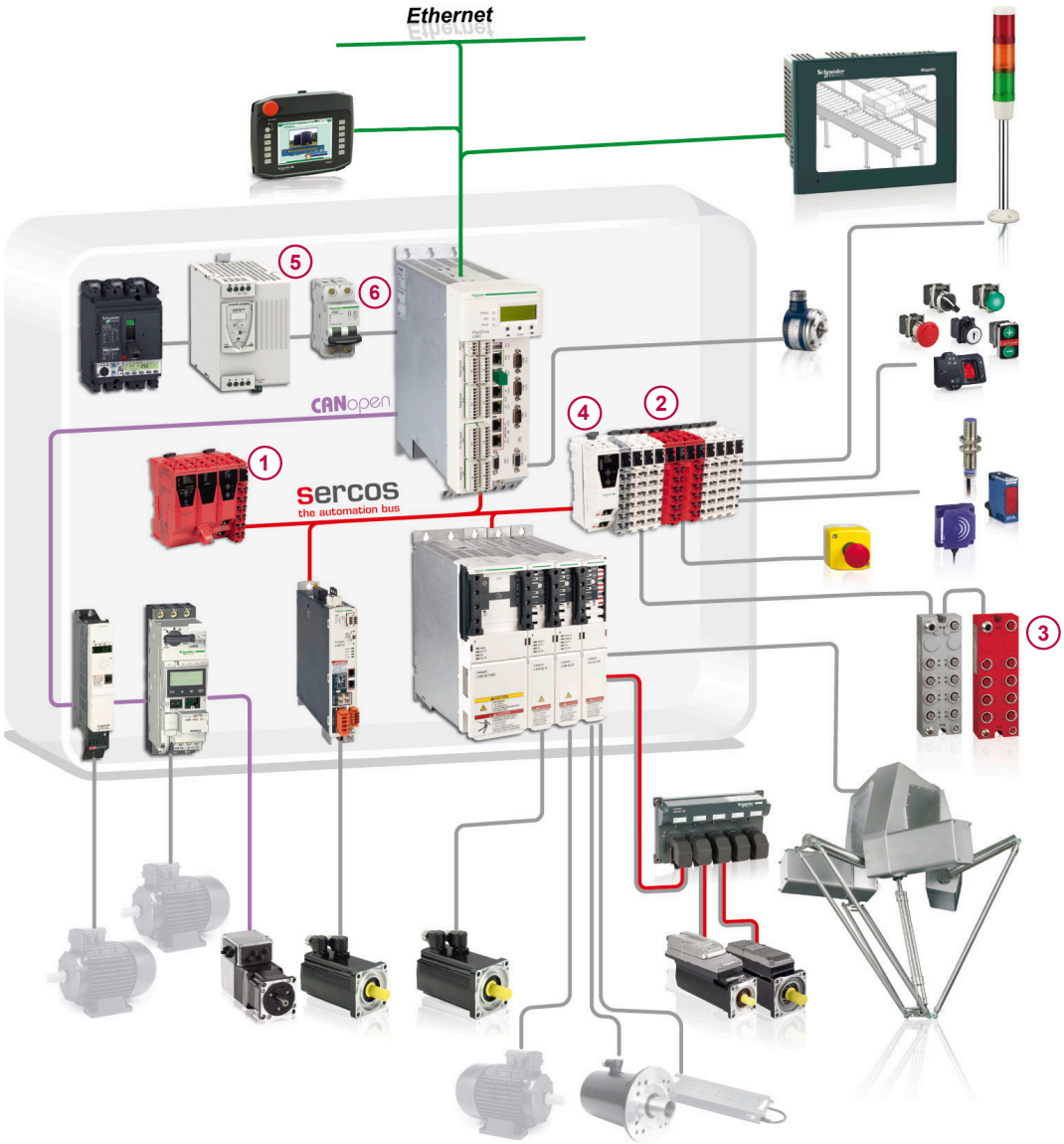
Note PacNet cables are only available in the given lengths

Programming software		
Designation	**Reference**	**Description**
SoMachine Motion software	VSWETSQMM0CL000	Corporate license
	VSWETSQMM0SL000	Single license
	VSWETSQMM0UG000	Upgrade license
Software for specific functions	VSWRTPT00100000	1x license
	VSWRTPT16000000	160x licenses
	VSWRTPT24000000	240x licenses
	VSWRTPT32000000	320x licenses

PacDrive 3 System Motion Solutions

sercos III bus

Software, Safe logic controllers, Safety I/O modules, sercos III interface module



Software for safe logic controller

Designation	Reference	Description
SoSafe Software	MSDPN0SL0UV10	SoSafe single license
	MSDPN0SL0TV10	SoSafe team license (10x)

① Safe logic controllers

TM5CSLC100FS and TM5CSLC200FS Safe Logic Controllers are Safety-Related Systems certified according to IEC 61508 by TÜV Rheinland Group. They are based on the family of programmable logic controllers (PLCs)

TM5CSLC●●	TM5CSLC100FS	SLC 100 sercos III 20 nodes	◻ sercos III slave interface ◻ 2x shielded RJ45 ports, 100 Mbps ◻ 20 safety devices ◻ IEC 61131-3 programmable ◻ Function block diagram, Ladder diagram ◻ 24 VDC power supply ◻ Memory key interface
	TM5CSLC200FS	SLC 200 sercos III 100 nodes	◻ sercos III slave interface ◻ 2x shielded RJ45 ports, 100 Mbps ◻ 100 safety devices ◻ 32 machine options ◻ IEC 61131-3 programmable ◻ Function block diagram, Ladder diagram ◻ 24 VDC power supply ◻ Memory key interface

Safe logic controller accessories

Memory key	TM5ACSLCM2FS	2 MB memory key with locking
	TM5ACSLCM8FS	8 MB memory key with locking

PacDrive 3 System Motion Solutions

sercos III bus

Software, Safe logic controllers, Safety I/O modules, sercos III interface module

② IP20 Safety digital input modules, 24 VDC power supply

The TM5 digital safety modules are Safety-Related Systems certified according to IEC 61508 by TÜV Rheinland Group.

TM5SDI●●

Reference	Description	
TM5SDI2DFS	2x Safety digital input 24 VDC Sink	□ 2x clock outputs □ Configurable input filter □ 0.1 A rated output current, 0.2 A total current
TM5SDI4DFS	4x Safety digital input 24 VDC Sink	□ 4x clock outputs □ Configurable input filter □ 0.1 A rated output current, 0.4 A total current

② IP20 Safety digital mixed I/O modules, 24 VDC power supply

TM5SDM●●

Reference	Description	
TM5SDM4DTRFS	2x N/O safety relay 5-250V, 5 mA-6 A switching capacity 2x Safety digital input 24 VDC sink	□ 2 clock outputs □ Software and hardware input filters □ 0.05 A rated output current, 0.1 A total current

② IP20 Safety digital output modules, 24 VDC power supply

TM5SDO●●

Reference	Description	
TM5SDO2TFS	2x Safety digital output 24 VDC Tr 0.5 A	□ 1 A total current, 0.5 A rated output current □ Open circuit detection □ Integrated output detection
TM5SDO2TAFS	2x Safety digital output 24 VDC Tr 2 A	□ 4 A total current, 2 A rated output current □ Open circuit detection □ Integrated output detection
TM5SDO4TFS	4x Safety digital output 24 VDC Tr 0.5 A	□ 2 A total current, 0.5 A rated output current □ Open circuit detection □ Integrated output detection
TM5SDO4TAFS	4x Safety digital output 24 VDC Tr 2 A	□ 5 A total current, 2 A rated output current □ Open circuit detection □ Integrated output detection

Safety digital input module accessories

	Reference	Description	
Safety bus base	**TM5ACBM3FS**	24 VDC connected	□ Color: red □ Safety coded □ Internal I/O supply interconnected □ 0.13 W power consumption
Safety terminal block	**TM5ACTB52FS**	12 pins 24 VDC	□ Colour: red □ 12 pin spring clamp □ Safety coded □ 10 A rated current per contact

③ IP67 Safety mixed I/O modules, 24 VDC power supply

The TM7 digital safety modules are Safety-Related Systems certified according to IEC 61508 by TÜV Rheinland Group.

TM7SDM●●

Reference	Description	
TM7SDM12DTFS	IP 67 Expansion block 8x safety digital input 24 VDC sink 4x safety digital output 24 VDC, Tr 2A	□ Color: red □ 8x clock outputs □ Configurable input filters □ 5 A total current, 2 A rated output current

④ sercos III interface module for distributed IO modules (see also page 4/2 to 4/5)

	Reference	Description	
 **Electronic interface module**	**TM5NS31**	sercos III communication module	□ Color: white
 **Bus base**	**TM5ACBN1**	Use as a base for TM5NS31 and TM5SPS3 electronic modules	□ Color: white □ Power supply 24 VDC
 **Power distribution electronic module**	**TM5SPS3**	Power supply for the sercos III bus, interface and I/O expansion modules	□ Color: grey □ Power supply 24 VDC
 **Terminal block**	**TM5ACTB12PS**	12 spring terminals	□ Color: grey □ Use for TM5SPS3

Recommanded power supply

Phaseo ABL8TEQ24xxx: ⑤

- Unregulated filtered rectified power supplies from 0.5 to 60 A
- Power supplies for 400 V 3-phase networks
- Output voltage: 24 V / 240-1440 W
- Primary voltage adaptation +/- 20 V
- Use of rated power up to +55°C without derating
- LED display of primary voltage presence

Recommanded protection

Mains current	DC bus current (with mains choke)	Protection
12 A	⩽ 12.5 A	⑥ TeSys U LUB12 with LUCA12BL
18 A	⩽ 19 A	TeSys U LUB32 with LUCA18BL
32 A	⩽ 33.5 A	TeSys U LUB32 with LUCA32BL
40 A	⩽ 42 A	Mains contactor LC1D40ABD motor protection switch GV3P40

Note : Limit the 24 VDC supply of the power supply with adequate means to 50 A.

PacDrive 3 System Motion Solutions
Servo drives
Lexium 62 Servo drives

Flexible Drive Design

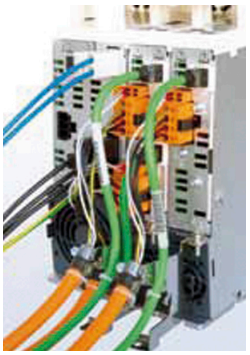
An innovative drive design allows flexible drive architectures: a multi-axis system, in which single and dual-axis servo drives are connected to a shared power supply, reduces costs and space requirements in systems with more than four servo axes. Pluggable interconnects and a quick front connection bus also reduce installation costs.

The fully digital servo drives of the Lexium 62 series are modular, consisting of single drives (1 axis) and double drives (2 axes) of equal size, as well as power supplies. The single and double drives in a group use a shared power supply. Multiple groups are possible, with the number of axes being limited by the type of controller used.

Fast Connection

The Lexium 62 components offer easy handling and installation, startup and replacement: the quick front connection to the power supply automatically includes integration into the DC bus as well.

> Motor and encoder connection



Motor/encoder cables exit at the bottom of the unit: leaves room at the front of the device for rapid assembly/disassembly of Lexium 62 components.

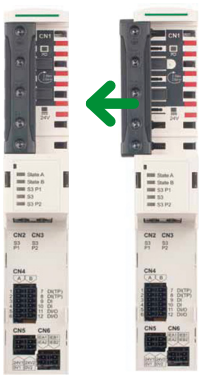
> Connection of the sercos ring via sercos III interface module

The sercos ring can be connected quickly via the sercos III interface on the power module and the drive modules. Single and double drives are integrated into the sercos ring with short cable bridges.

> Connection to DC bus

The servo drives are coupled to the DC bus and to the power supply: no backplane connections are required, and the modules can be coupled to the adjacent module with a quick front connection with locking screws in less than two minutes. When the connection is made, LEDs indicate the correct power supply with the 24 V control voltage. The design operates without any additional work required, even when drives are removed and reinstalled from a continuously connected series of devices. The DC bus can provide a 120 A continuous current (maximum).

Lexium 62 series servo drives can be used with all PacDrive system motors. The servo drives have an electronic name plate. Upon first use or exchange of the device, it is identified by the centralized controller and configured based upon the specified parameters. The servo drives themselves in turn detect connected motors by their name plates.



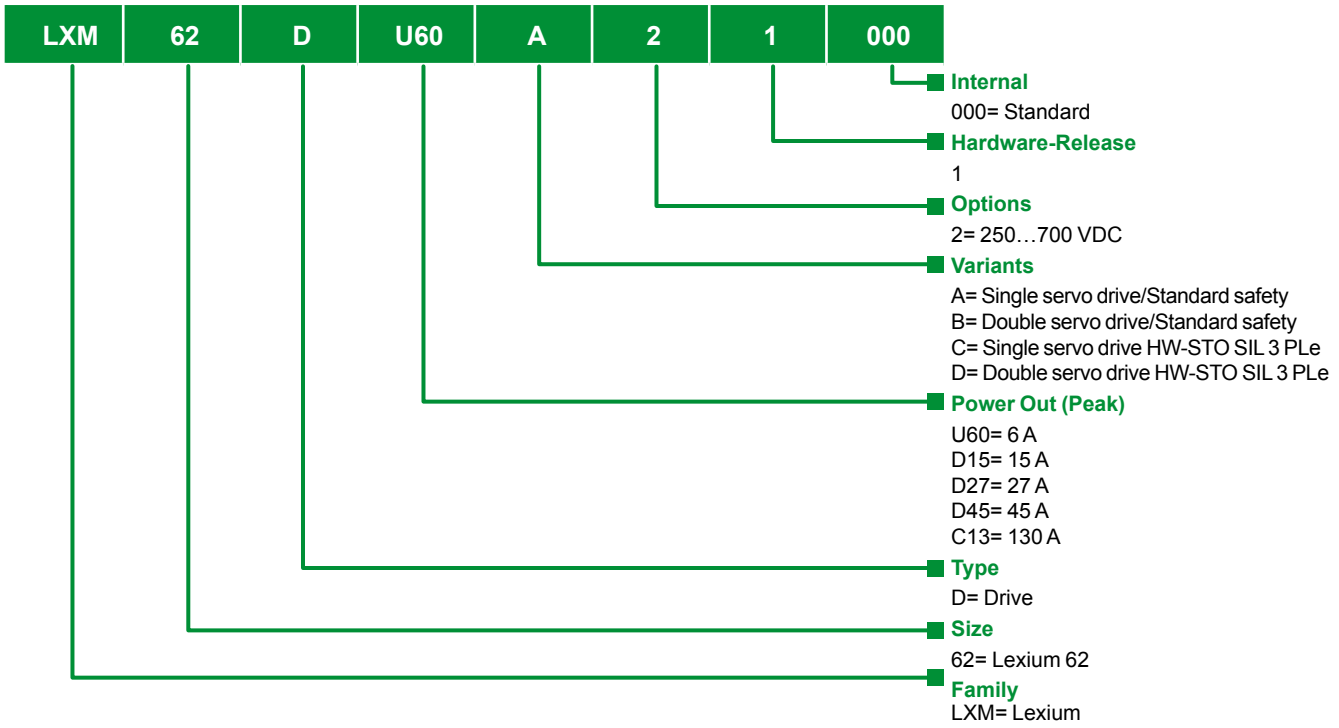
To connect to DC bus, 24 V power supply, and ground wire: move the slide to the left and tighten the screws

- > Less space required in the control cabinet
- > Minimal assembly/installation time
- > Tool-free motor connection
- > Optimized feedback loops minimize contouring diagnosed errors
- > Inverter Enable safety input (according to IEC 61508, EN/ISO13849-1) for each axis
- > Automatic motor detection
- > Software-compatible with ILM62 servo modules and with stand-alone servo drives

PacDrive 3 System Motion Solutions

Servo drives

Lexium 62 Servo drives, Power supply module, Accessories



Servo drives		
Designation	**Reference**	**Description**
Single servo drives	**LXM62DU60X21000**	□ Continuous output 0.95 kW (*1.273 hp*) □ Continuous current 2 A @ 4 kHz □ Peak current 6 A
	LXM62DD15X21000	□ Continuous output 2.4 kW (3.217 *hp*) □ Continuous current 5 A @ 4 kHz □ Peak current 15 A
	LXM62DD27X21000	□ Continuous output 4.3 kW (5.764 *hp*) □ Continuous current 9 A @ 4 kHz □ Peak current 27 A
	LXM62DD45X21000	□ Continuous output 9.6 kW (12.868 *hp*) □ Continuous current 20 A @ 4 kHz □ Peak current 45 A
	LXM62DC13C21000	□ Continuous output 24 kW *(32.171 hp)* □ Continuous current 50 A @ 4 kHz □ Peak current 130 A
Double servo drives	**LXM62DU60X21000**	□ Continuous output 2x 0.95 kW (2x *1.273 hp*) □ Continuous current 2x2 A @ 4 kHz □ Peak current 2x6 A
	LXM62DD15X21000	□ Continuous output 2x 2.4 kW (2x 3.217 *hp*) □ Continuous current 2x5 A @ 4 kHz □ Peak current 2x15 A
	LXM62DD27X21000	□ Continuous output 2x 4.3 kW (2x 5.764 *hp*) □ Continuous current 2x 9 A @ 4 kHz □ Peak current 2x27 A

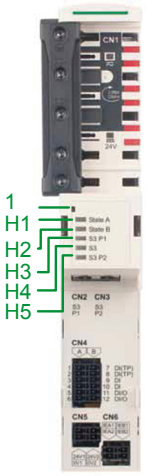
Power supply		
Designation	**Reference**	**Description**
Power supply module	**LXM62PD84A11000**	□ For single and double Lexium 62 servo drives and ILM62 servo modules □ Continuous output 23.7/47.4 kW (31.769/63.538 *hp*) @ 400 VAC □ Continuous current 42 A □ Peak current 84 A

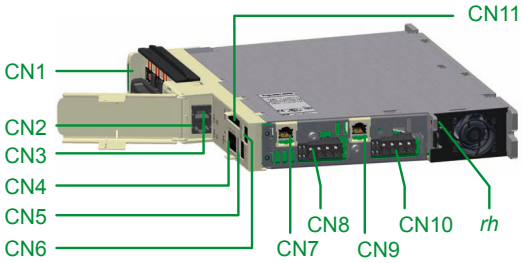
Accessories		
Designation	**Reference**	**Description**
Single drive connectors	**VW3E6001**	Spare part
Double drive connectors	**VW3E6002**	Spare part
Power supply connectors	**VW3E6003**	Spare part
Torque indicator	**VW3E6016**	2.5 N.m (*1.843 ft lbf*)
Single drive connectors	**VW3E6052**	Spare part for 130 A drive

PacDrive 3 System Motion Solutions

Servo drives

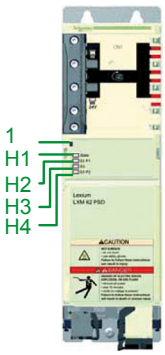
Lexium 62 Servo drive interfaces, Power supply module interfaces

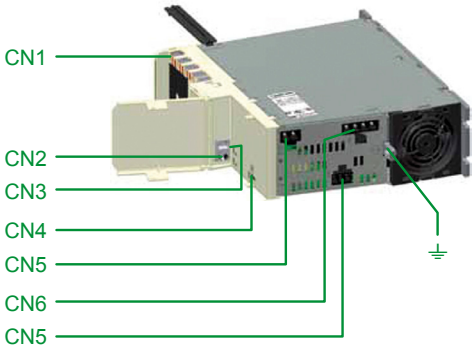




Lexium 62 servo drive interfaces

Item	Function
1	Reset button
H1	Status LED for axis A
H2	Status LED for axis B (only for D2S)
H3	S3 Port 1 LED
H4	S3 LED
H5	S3 Port 2 LED
Connector	**Function**
CN1	Busbar module
CN2, CN3	sercos III communication
CN4	Digital input/output
CN5	24 V supply for digital input/output
CN6	Inverter Enable
CN7, CN9	Encoder connector CN7 - axis A CN9 - axis B (only for double drive)
CN8, CN10	Motor phases CN8 - axis A CN10 - axis B (only for double drive)
CN11	Inverter Enable 2-channel
rh	Shielded connector





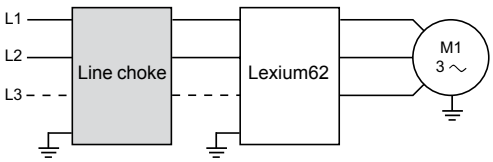
Power supply module interfaces

Item	Function
1	Reset button
H1	Status LED
H2	S3 Port 1 LED
H3	S3 LED
H4	S3 Port 2 LED
Connector	**Function**
CN1	Busbar Module
CN2, CN3	sercos III communication
CN4	Ready relay output
CN5	24 VDC
CN6	Mains connection
CN7	DC bus output

Power supply module type	LXM62PD84A11000
Rated voltage VAC	1 phase min. 208 (-10%)/Nom. 230/max. 270 (+10%)
	3 phase min. 208 (-10%)/Nom. 230/max. 360 (+10%)
	3 phase min. 380 (-10%)/Nom. 400/max. 480 (+10%)
Control voltage VDC	4 (-20%…+25%)
Control current A	Max. 50 (no overload permissible)
DC Bus voltage VDC	270…700
Rated current A	21 (1 phase)
	42 (3 phase)
Peak current A	42 (1 phase)
	84 (3 phase)
Continuous output kW/*hp*	12.5/*16.756*
Peak output kW/*hp*	25/*33.512*
sercos III interface	Integrated
Bleeder	Integrated
EMC-filter	Integrated
Housing dimensions DxWxH (mm/*in.*)	270x89x310/*10.630x3.504x12.205*
Protection rating	IP20
Certifications	CE, ULus and CSA

Servo drive type	LXM62D U60X21000	LXM62D D15X21000	LXM62D D27X21000	LXM62D D45X21000	LXM62D C13C21000	LXM62D U60X21000	LXM62D D15X21000	LXM62D D27X21000
Type	**Single servo drive**					**Double servo drive**		
Rated current (4 kHz) A	2	5	9	20	50	2x 2	2x 5	2x 9
Peak current (4 kHz) A	6	15	27	45	130	2x 6	2x 15	2x 27
Continuous output kW/*hp*	0.95/*1.273*	2.4/*3.217*	4.3/*5.764*	9.6/*12.868*	*24/32.171*	2x 0.95/ *2x 1.273*	2x 2.4/ *2x 3.217*	2x 4.3/ *2x 5.764*
Supply voltage VDC	250…700							
Supply frequency Hz	48…62							
Control voltage VDC	24 (-20%…+25%)							
Motion bus	sercos III							
Encoder	Hiperface® or SinCos							
Inverter Enable	1 input					2 inputs		
Digital input	2					2 x 2		
Touchprobe input	2					2 x 2		
Digital input or output	2					2 x 2		
Housing dimensions DxWxH (mm/*in.*)	270x44x310 */10.630x1.732x12.205*				270x89x310 */10.630x3.504 x12.205*	270x44 x310 */10.630x1.732x12.205*		
Protection rating	IP20							
Certifications	CE, ULus and CSA							

Option: Line choke



Lexium62 servo drive with line choke

A line choke can be used to provide improved protection against overvoltages on the line supply and to reduce harmonic distortion of the current produced by the servo drive. The recommended chokes limit the line current. One line choke can be connected to a number of servo drives. In such cases, the current consumption of the group of servo drives at nominal voltage is ≥ the nominal current of the line choke.

Designation	Reference	Description	
		Line Current	
		Single-phase supply voltage	Three-phase supply voltage
Line chokes	**VW3SKLN016H003E**	16 A	–
	VW3A4551	–	4 A
	VW3A4552	–	10 A
	VW3A4553	–	16 A
	VW3A4554	–	30 A
	VW3A4555	–	60 A

PacDrive 3 System Motion Solutions
Servo drives
Lexium 52 Servo drives

Presentation

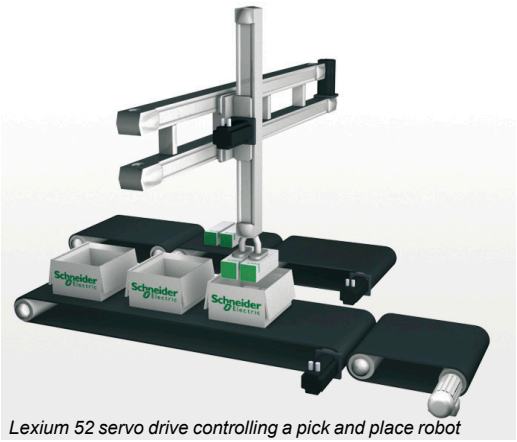
The Lexium 52 range of servo drives includes five servo drive models associated with SH3 series servo motor ranges for optimum use, which can adapt to demands for high performance, power and simplicity of use in motion control applications. It covers power ratings between 0.4 and 7 kW (*0.536 and 9.383 hp*). The Lexium 52 servo drive offer is designed to simplify the life cycle of machines.

The SoMachine Motion setup software, side-by-side mounting and color-coded plug-in connectors, easily accessible on the front panel or on top of the servo drives all make installation, setup and maintenance easier. Maintenance is also quicker and less expensive thanks to the new duplication and backup tools.

The compact size of the servo drives and servo motors provides maximum power in the minimum space, enabling the machine dimensions and costs to be reduced. Integrated safety functions reduce design times and make it easier to comply with safety standards.

Compliance with electromagnetic compatibility (EMC) requirements

The integration of a category C3 EMC filter in Lexium 52 servo drives and compliance with EMC requirements simplify installation and make it very inexpensive to bring the device into conformity to obtain the CE mark. Additional filters, available as an option, can be installed by the customer to reduce the levels of conducted and radiated emissions.



Lexium 52 servo drive controlling a pick and place robot

High performance

The Lexium 52 servo drive offer increases machine performance due to the following characteristics:

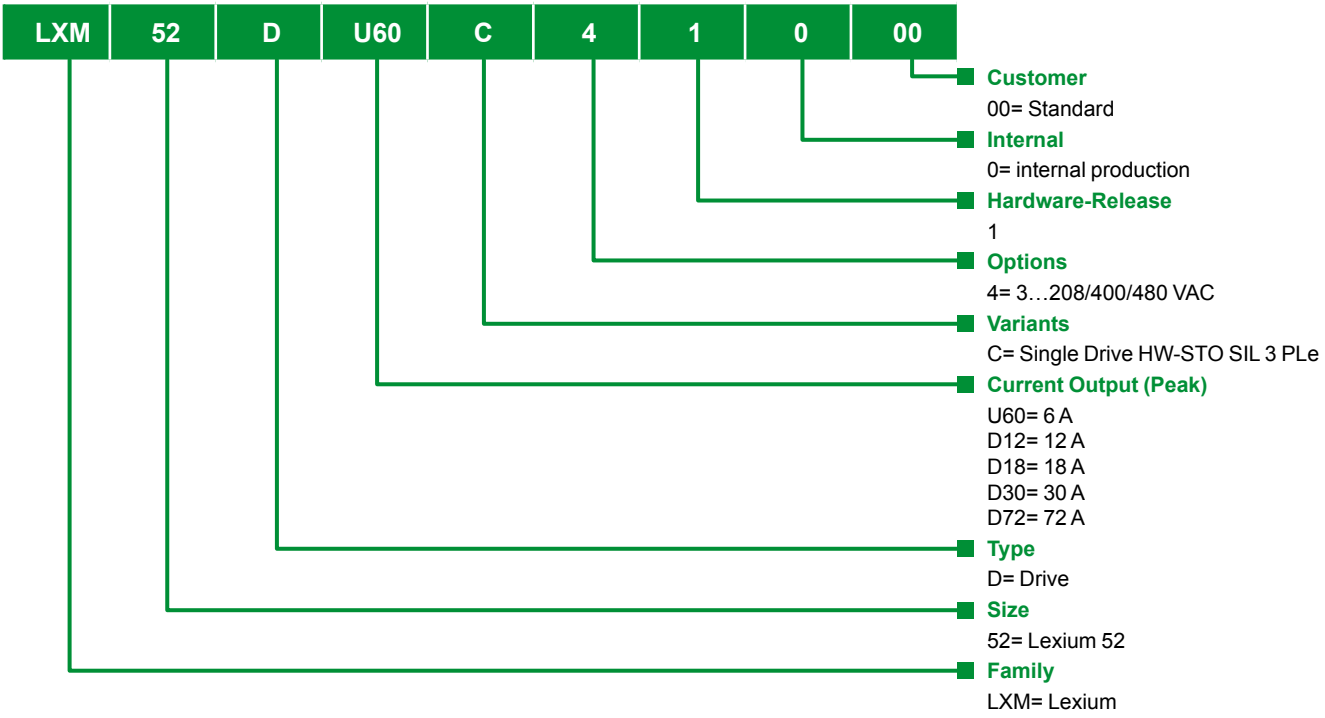
- Overload capacity: high peak current (up to 4 times the direct current)
- Increases the range of movement
- Power density: the compact size of the servo drives offers maximum efficiency in a small space

SH3 servo motors: dynamics and power

SH3 servo motors are synchronous three-phase motors. They feature a SinCos Hiperface® encoder for sending data from the servo motor to the servo drive automatically, and are available with or without a holding brake.
SH3 servo motors satisfy requirements for precision and high dynamic performance, due to the low rotor inertia. They are compact, and offer a high power density.
This product offer covers a continuous stall torque range between 0.5 Nm and 94.4 Nm (*0.368 and 69.625 ft lbf*) for nominal speeds between 2000 and 8000 rpm.

Accessories and options

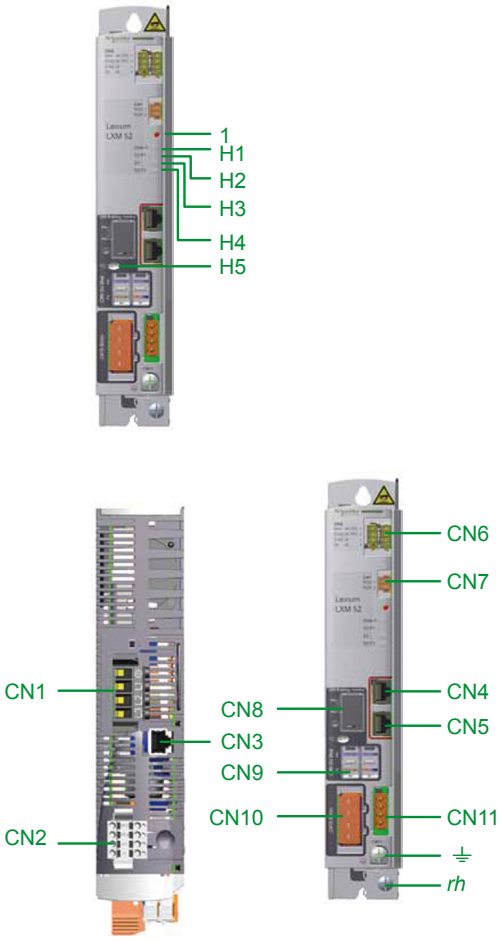
- External accessories
- Options: braking resistors, line chokes, etc.



Servo drives		
Designation	**Reference**	**Description**
Single drives	**LXM52DU60C41000**	□ Continuous output 0.4 kW (*0.536 hp*) □ Continuous current 1.5 A @ 8 kHz □ Peak current 6 A
	LXM52DD12C41000	□ Continuous output 0.9 kW (*1.206 hp*) □ Continuous current 3 A @ 8 kHz □ Peak current 12 A
	LXM52DD18C41000	□ Continuous output 1.8 kW (*2.412 hp*) □ Continuous current 6 A @ 8 kHz □ Peak current 18 A
	LXM52DD30C41000	□ Continuous output 3 kW (*4.021 hp*) □ Continuous current 10 A @ 8 kHz □ Peak current 30 A
	LXM52DD72C41000	□ Continuous output 7 kW (*9.383 hp*) □ Continuous current 24 A @ 8 kHz □ Peak current 72 A

Accessories		
Designation	**Reference**	**Description**
Single drive connectors	**VW3E6018**	Spare part
Cordset	**VW3M7101R01**	Daisy chain connection of the DC bus Equipped with 2 connectors

2



Lexium 52 servo drive interfaces	
Item	**Function**
1	Reset button
H1	Status LED A
H2	S3 Port 1 LED
H3	S3 LED
H4	S3 Port 2 LED
H5	DC bus LED
Connector	**Function**
CN1	Mains connection
CN2	24 VDC control supply and STO safety function
CN3	Motor encoder
CN4	sercos III Port 1
CN5	sercos III Port 2
CN6	Digital input/output
CN7	Ready
CN8	External braking resistor
CN9	DC bus connection for parallel operation
CN10	Motor phases
CN11	Holding brake/motor temperature

Servo drive type	LXM52DU60C41000	LXM52DD12C41000	LXM52DD18C41000	LXM52DD30C41000	LXM52DD72C41000
Rated current (8 kHz)	1.5	3	6	10	24
Peak current (8 kHz) A	6	12	18	30	72
Continuous output kW/*hp*	0.4/*0.536*	0.9/*1.206*	1.8/*2.412*	3/*4.021*	7/*9.383*
Supply voltage VAC	3-phase 208…480				
Supply frequency Hz	48…62				
Control voltage VDC	24 V (-20%…+25%)				
Motion bus	sercos III				
Encoder	Hiperface® or SinCos				
Digital input	2				
Touchprobe input	2				
Digital input or output	2				
Housing dimensions DxWxH (mm/*in.*)	220x48x230 */8.661x1.890x9.055*			220x68x230 */8.661x2.677 x9.055*	220x108x230 */8.661x4.252 x9.055*
Protection rating	IP20				
Certifications	CE, Ulus and CSA				

PacDrive 3 System Motion Solutions
Servo drives
Lexium 52 Servo drive option: Braking resistors

VW3A770●●

VW3A760●R●●

Presentation

> Internal braking resistor
A braking resistor is built into the servo drive to absorb the braking energy. If the DC bus voltage in the servo drive exceeds a specified value, this braking resistor is activated. The restored energy is converted into heat by the braking resistor.
It enables maximum transient braking torque.

> External braking resistor
When the servo motor has to be braked frequently, use of an external braking resistor is recommended to dissipate the excess braking energy. In this case, it is recommended that the internal braking resistor is deactivated. Several external braking resistors can be connected in parallel. The servo drive monitors the power dissipated in the braking resistor.
The degree of protection of the casing is
- IP65 for VW3A7601R●● to VW3A7608●● braking resistors
- IP20 for VW3A770●●braking resistors

The operating temperature around the unit can be between 0 and + 50°C.
To optimize the size of the braking resistor, the DC buses on Lexium 52 servo drives in the same installation can be connected in parallel.

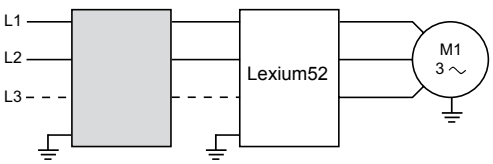
Applications

> Machines with high inertia
> Driving loads
> Machines with fast cycles

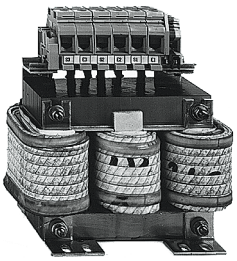
Options: Braking resistor

Designation	Reference	Description									
		Ohmic value (Ω)	Continuous power PPr (W)	Peak energy EPK 115 V Ws	230 V Ws	380 V Ws	480 V Ws	Length of connection cable (m)	(ft)	Weight (kg)	lb
Braking resistor for temperature controller switch	**VW3A7705**	10	1000	36500	36500	22500	22500	-	-	11.000	24.251
	VW3A7704	15	1000	43100	43100	26500	26500	-	-	11.000	24.251
Braking resistor for Lexium 52 servo drives	**VW3A7601R07**	10	400	18800	13300	7300	7700	0.75	2.461	1.420	3.131
	VW3A7601R20	10	400	18800	13300	7300	7700	2	6.562	1.470	3.241
	VW3A7601R30	10	400	18800	13300	7300	7700	3	9.843	1.620	3.571
	VW3A7602R07	27	100	4200	3800	1900	1700	0.75	2.461	0.630	1.389
	VW3A7602R20	27	100	4200	3800	1900	1700	2	6.562	0.780	1.720
	VW3A7602R30	27	100	4200	3800	1900	1700	3	9.843	0.900	1.984
	VW3A7603R07	27	200	9700	7400	4900	4300	0.75	2.461	0.930	2.050
	VW3A7603R20	27	200	9700	7400	4900	4300	2	6.562	1.080	2.381
	VW3A7603R30	27	200	9700	7400	4900	4300	3	9.843	1.200	2.646
	VW3A7604R07	27	400	25500	18100	11400	10500	0.75	2.461	1.420	3.131
	VW3A7604R20	27	400	25500	18100	11400	10500	2	6.562	1.470	3.241
	VW3A7604R30	27	400	25500	18100	11400	10500	3	9.843	1.620	3.571
	VW3A7605R07	72	100	5500	3700	2500	2300	0.75	2.461	0.620	1.367
	VW3A7605R20	72	100	5500	3700	2500	2300	2	6.562	0.750	1.653
	VW3A7605R30	72	100	5500	3700	2500	2300	3	9.843	0.850	1.874
	VW3A7606R07	72	200	14600	9600	6600	6000	0.75	2.461	0.930	2.050
	VW3A7606R20	72	200	14600	9600	6600	6000	2	6.562	1.080	2.381
	VW3A7606R30	72	200	14600	9600	6600	6000	3	9.843	1.200	2.646
	VW3A7607R07	72	400	36600	24700	16200	15500	0.75	2.461	1.420	3.131
	VW3A7607R20	72	400	36600	24700	16200	15500	2	6.562	1.470	3.146
	VW3A7607R30	72	400	36600	24700	16200	15500	3	9.843	1.620	3.571
	VW3A7608R07	100	100	4400	4400	2900	2900	0.75	2.461	0.410	0.904
	VW3A7608R20	100	100	4400	4400	2900	2900	2	6.562	0.560	1.235
	VW3A7608R30	100	100	4400	4400	2900	2900	3	9.843	0.760	1.676

Recommendation: The total continuous power dissipated in the external braking resistor(s) is less than or equal to the nominal power of the Lexium 52 servo drive.



Lexium52 servo drive with line choke



VW3A455●

Presentation

A line choke can be used to provide improved protection against overvoltages on the line supply and to reduce harmonic distortion of the current produced by the servo drive.
The recommended chokes limit the line current.
They have been developed in line with standard IEC 61800-5-1 (VDE 0160 level 1 high-energy overvoltages on the line supply). The inductance values are defined for a voltage drop between 3% and 5% of the nominal line voltage. Values higher than this will cause loss of torque. It is recommanded that these chokes are installed upstream of the servo drive.
One line choke can be connected to a number of servo drives. In such cases, the current consumption of the servo drives at nominal voltage is greater than or equal to the nominal current of the line choke.

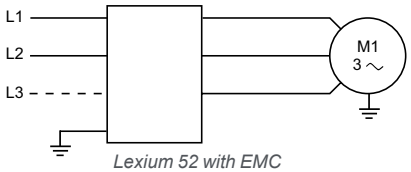
Applications

The use of line chokes is recommended in particular under the following circumstances:

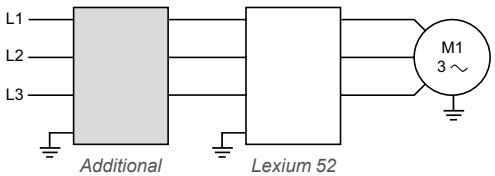
- Close connection of several servo drives in parallel
- Line supply with significant disturbance from other equipment (interference, overvoltages)
- Line supply with voltage unbalance between phases that is more than 1.8% of the nominal voltage
- Servo drive supplied by a line with very low impedance (in the vicinity of a power transformer 10 times more powerful than the servo drive rating)
- Installation of a large number of servo drives on the same line
- Reduction of overloads on the cosφ correction capacitors, if the installation includes a power factor correction unit

Options: Line chokes

Designation	Reference	Description						
		For use with servo drives	Line current and THD				Weight	
			Without choke		With choke			
			A	%	A	%	(kg)	*(lb)*
Line chokes	Three-phase supply voltage: 380 V 50/60 Hz							
	VW3A4553	LXM52DU60C41000	1.4	187	1.9	106	3.5	*7.716*
		LXM52DD12C41000	3	174	3.5	88		
	VW3A4554	LXM52DD18C41000	5.5	159	7.2	88	6	*13.228*
		LXM52DD30C41000	8.7	146	11.6	74		
		LXM52DD72C41000	18.1	124	23.5	43		
	Three-phase supply voltage: 480 V 50/60 Hz							
	VW3A4553	LXM52DU60C41000	1.2	201	1.6	116	3.5	*7.716*
		LXM52DD12C41000	2.4	182	2.9	98		
	VW3A4554	LXM52DD18C41000	4.5	165	6	98	6	*13.228*
		LXM52DD30C41000	7	152	9.6	85		
		LXM52DD72C41000	14.6	129	19.5	55		



Lexium 52 with EMC filter



Additional EMC input filter

Lexium 52

VW3A422

VW3A4423

Presentation

> Integrated EMC filter

Lexium 52 servo drives have integrated radio interference input filters to comply with the EMC standard for variable speed electrical power drive "products" IEC/EN 61800-3, edition 2, category C3 in environment 2, and to comply with the European directive on EMC (electromagnetic compatibility).

> Additional EMC input filters

Used with Lexium 52 servo drives, additional EMC input filters can be used to meet more stringent requirements and are designed to reduce conducted emissions on the line supply below the limits of standard IEC/EN 61800-3 edition 2, category C2 or C3. Additional EMC filters are mounted on the side of the device. They have tapped holes for mounting in an enclosure.

Use according to the type of line supply

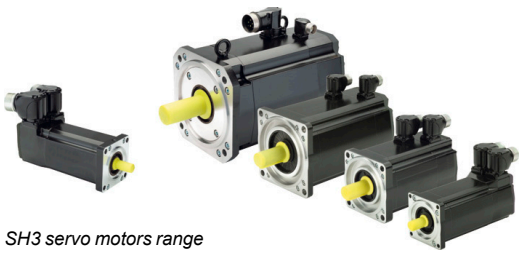
Integrated or additional EMC filters can only be used on TN (neutral connection) or TT (neutral to ground) systems. Lexium 52 servo drives cannot be used on IT (impedance earthed or isolated neutral) systems. Standard IEC/EN 61800-3, appendix D2.1, states that on IT systems, filters can cause permanent insulation monitors to operate in a random manner.

If a machine has to be installed on an IT system, it is recommended that an isolation transformer is inserted in order to re-create a TT system on the secondary side.

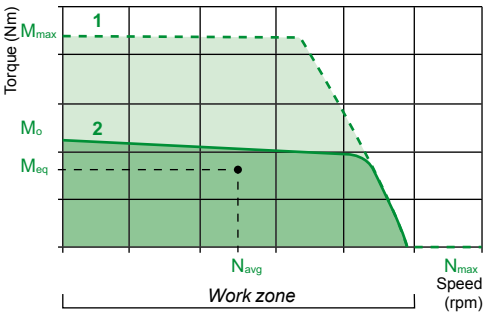
Options: EMC filters

Designation	Reference	Description				
		EMC filters for servo drives	Maximum servo motor shielded cable length (m) conforming to		Weight	
			EN55011, class A Gr1 IEC/EN 61800-3 cat. C2 in environment 1 Switching frequency: 8 kHz	EN55011, class A Gr2 IEC/EN 61800-3 cat. C3 in environment 2 Switching frequency: 8 kHz	(kg)	*(lb)*
EMC filters	Three-phase supply voltage					
	VW3A422	LXM52DU60C41000 LXM52DD12C41000 LXM52DD18C41000 LXM52DD30C41000	50	100	0.90	*1.984*
	VW3A4423	LXM52DD72C41000	50	100	1.35	*2.976*

PacDrive 3 System Motion Solutions
Servo Motors
SH3 Servo motor range



SH3 servo motors range



Presentation

SH3 servo motors are the ideal choice to meet requirements for dynamics and precision. With five flange sizes and a variety of lengths, there is a suitable solution for most applications, covering a continuous stall torque range from 0.5 to 94.4 Nm (0.368 and 69.625 ft lbf) for speeds up to 8000 rpm.

SH3 servo motors are available in five flange sizes: 55, 70, 100,140 and 205 mm *(2.165, 2.756, 3.937, 5.512 and 8.071 in.)*

> Torque/speed characteristics

SH3 servo motors provide torque/speed curve profiles similar to the example shown on the left with:

- Peak torque, depending on the servo drive model
- Continuous torque, depending on the servo drive model where:
  - N_{max} (in rpm) corresponds to the maximum speed of the servo motor
  - M_{max} (in Nm) represents the peak stall torque value
  - M_0 (in Nm) represents the continuous stall torque value

> Principle for determining servo motor size according to the application

The torque/speed curves can be used to determine the correct servo motor size.

- Locate the work zone of the application in terms of speed
- Verify, using the servo motor cycle timing diagram, that the torques required by the application during the various phases of the cycle are located within the area bounded by curve **1** in the work zone
- Calculate the average speed Navg and the equivalent thermal torque M_{eq}
- It is recommended that the point defined by N_{avg} and M_{eq} is located below curve **2** in the work zone

Functions

> General functions

SH3 servo motors have been developed to meet the following requirements:

- Functional characteristics, ruggedness, safety, etc. in accordance with IEC/EN 60034-1
- Ambient operating temperature:
  - - 20...40°C according to DIN 50019R14.
  - Maximum 60°C with derating from 40°C by 1% of the nominal output power per additional °C
- Relative humidity: IEC 60721-3-3 category 3K3
- Maximum operating altitude: 1000 m without derating, 2000 m with k = 0.86, 3000 m with k = 0.8
- Storage and transport temperature: - 40...70°C
- Winding insulation class: F (threshold temperature for windings 155°C) in accordance with DIN VDE 0530
- Power and encoder connection via straight or angled connectors
- Built-in PTC thermistor probe
- Out-of-round, concentricity and perpendicularity between flange and shaft in accordance with DIN 42955, class N
- Permitted mounting positions: no mounting restrictions for IMB5 - IMV1 and IMV3 in accordance with DIN 42950
- Polyester resin-based paint: opaque black RAL 9005
- Degree of protection:
  - Casing: IP 54 in accordance with IEC/EN 60529
  - Shaft end: IP 50 (1) or IP 65 in accordance with IEC/EN 60529. Increased IP 67 case protection available
- Integrated feedback: SinCos Hiperface® single turn or multi-turn high-resolution encoder
- Smooth or keyed shaft end

> Holding brake

SH3 servo motors can be fitted with a failsafe electro-magnetic holding brake.
The holding brake should not be used as a dynamic brake for deceleration, as this would quickly damage the brake.

> Integrated encoder

SH3 servo motors are fitted with a SinCos Hiperface® high-resolution single turn (131,072 points/turn) or multi-turn (131,072 points/turn x 4096 turns) encoder providing angular precision of the shaft position, accurate to less than ± 1.3 arcminute (*0.021°*).
This performs the following functions:

- Gives the absolute motor position so that flows can be synchronized
- Measures the position information for the servo drive controller
- Sends data from the servo motor to the servo drive, which allows automatic identification of the motor when the servo drive starts

SH3 Servo motor type code

SH3	055	3	P	0	1	A	1	0	00

Internal
00= Standard

Degree of protection
0= IP54/IP65 (shaft/housing)
1= IP65/IP65 (shaft/housing)
2= IP65/IP67 (shaft/housing)

Connection version
1= Straight connector
2= Angular connector 90°, can be rotated

Holding brake
A= Without holding brake
F= With holding brake

Encoder system
1= Absolute single turn 128 Sin/Cos periods per revolution
2= Absolute multi-turn 128 Sin/Cos periods per revolution

Shaft
0= Smooth shaft
1= Parallel key

Winding
P = Optimized in terms of torque and speed of rotation
M = Optimized in terms of current (only available on specific models. See table on page 2/22)

Length
1= 1 stack
2= 2 stacks
3= 3 stacks
4= 4 stacks

Size
055= 55 mm/*2.165 in.*
070= 70 mm/*2.756 in.*
100= 100 mm/*3.937 in.*
140= 140 mm/*5.512 in.*
205= 205 mm/*8.071 in.*

Family
SH3= Synchronous motor - low inertia

Hybrid cable type code

VW3	E	1	141	R	050

Length
xxx= Length (x 0.1 m)

Fixed separator R

Drawing reference
141= between ILM62CM & ILM62DB4 or ILM62 servo module, Cable outlet: **D1**
142= between ILM62DB4 & ILM62DB4 or between 2 ILM62 servo modules, Cable outlet: **D1** on both ends
146= between ILM62CM & ILM62DB4 or ILM62 servo module, Cable outlet: **D2**
147= between ILM62CM & ILM62DB4 or ILM62 servo module, Cable outlet: **D0**
148= between ILM62DB4 & ILM62DB4 or ILM62 servo module, Cable outlet: **D1** & **D0**
149= between ILM62DB4 & ILM62DB4 or ILM62 servo module, Cable outlet: **D1** & **D2**
150= between ILM62DB4 & ILM62DB4 or ILM62 servo module, Cable outlet: **D0** & **D2**
151= between ILM62DB4 & ILM62DB4 or ILM62 servo module, Cable outlet: **D0** on both ends
152= between ILM62DB4 & ILM62DB4 or ILM62 servo module, Cable outlet: **D2** on both ends

Type
1= Motor/Hybrid cables

Family
E= PacDrive 3

Note: Power cable length: 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 and 20 m. Servo drive cable length: 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10 m

2

SH3 Servo motor Performance

Reference	Description: Nominal servo motor output power Pn		Continuous stall torque M0		Rated torque Mn		Peak stall torque Mmax		Rated speed Nn	Maximum mechanical speed Nmax	Rotor moment of inertia (without holding brake) Jm
	kW	*/hp*	Nm	*/ft lbf*	Nm	*/ft lbf*	Nm	*/ft lbf*	rpm	rpm	kgcm²
SH30551P	0.4	*0.536*	0.5	*0.368*	0.48	*0.354*	1.5	*1.106*	8000	9000	0.059 (0.08)
SH30552P	0.6	*0.804*	0.8	*0.590*	0.72	*0.31*	2.5	*1.843*	8000	9000	0.096 (0.117)
SH30553P	0.88	*1.179*	1.2	*0.885*	1.05	*0.74*	3.5	*2.581*	8000	9000	0.134 (0.155)
SH30701P	0.8	*1.02*	1.4	*1.032*	1.3	*0.958*	3.5	*2.581*	6000	8000	0.25 (0.322)
SH30702P	1.2	*1.608*	2.2	*1.622*	1.9	*1.401*	7.6	*5.605*	6000	8000	0.41 (0.482)
SH30703P	1.5	*2.010*	3.1	*2.286*	2.3	*1.696*	11.3	*8.334*	6000	8000	0.58 (0.81)
SH31001P	1.4	*1.876*	3.3	*2.433*	2.7	*1.991*	9.6	*7.080*	5000	6000	1.4 (2.02)
SH31002P	1.9	*2.546*	5.8	*4.277*	4.6	*3.392*	18.3	*13.497*	4000	6000	2.31 (2.93)
SH31003P	2.4	*3.217*	8.0	*5.900*	5.7	*4.204*	28.3	*20.873*	4000	6000	3.22 (3.84)
SH31004P	2.5	*3.351*	10.0	*7.375*	7.9	*5.826*	40.5	*29.871*	3000	6000	4.22 (5.25)
SH31401P	2.89	*3.873*	11.1	*8.186*	9.2	*6.785*	27	*1.475*	3000	4000	7.41 (9.21)
SH31402P	3.86	*5.174*	19.5	*14.382*	12.3	*9.072*	60.1	*44.327*	3000	4000	12.68 (14.48)
SH31403P	4.05	*5.428*	27.8	*20.504*	12.9	*9.514*	90.2	*66.528*	3000	4000	17.94 (23.44)
SH31404P	5.06	*6.782*	33.4	*24.634*	16.1	*11.874*	131.9	*97.284*	3000	4000	23.7 (29.2)
SH32051P	5.5	*7.372*	36.9	*27.216*	17.5	*12.907*	110	*81.131*	3000	3800	71.4 (87.4)
SH32052P	7.98	*10.697*	64.9	*47.867*	38.1	*28.101*	220	*162.263*	2000	3800	129 (145)
SH32053P	10.62	*14.235*	94.4	*69.625*	50.7	*37.394*	330	*243.395*	2000	3800	190 (206)
SH30702M	0.66	*0.884*	2.2	*1.622*	2.2	*1.622*	7.6	*5.605*	3000	8000	0.41 (0.482)
SH30703M	0.88	*1.179*	3.1	*2.286*	3.05	*2.249*	11.3	*8.334*	3000	8000	0.58 (0.81)
SH31001M	0.79	*1.058*	3.3	*2.433*	3	*2.212*	9.6	*7.080*	2500	6000	1.4 (2.02)
SH31002M	1.9	*2.546*	5.8	*4.277*	5.2	*3.835*	18.3	*13.497*	2000	6000	2.31 (2.93)
SH31003M	1.47	*1.970*	8	*5.900*	7	*5.162*	28.3	*20.873*	2000	6000	3.22 (3.84)
SH31401M	1.67	*2.238*	11.1	*8.186*	10.6	*7.818*	27	*19.914*	1500	4000	7.41 (9.21)

Standstill current	Rated current	Peak current	Winding resistance Ph – Ph	Winding inductance Ph – Ph	Torque constant (120°C)	Weight (with holding brake)	
I0	In	Imax	Ru-v	Lu-v	Kt	M	
A	A	A	Ω	mH	Nm/Arms	kg	*lb*
0.73	0.62	2.9	41.8	71.5	0.68	1.2 (1.28)	*2.646 (2.822)*
1.2	1.1	4.8	17.4	35.3	0.7	1.5 (1.58)	*3.307 (3.483)*
1.7	1.35	6.5	10.4	25	0.7	1.8 (1.88)	*3.968 (4.145)*
1.8	1.6	5.7	10.4	38.8	0.8	2.1 (2.32)	*4.145 (5.115)*
2.9	2.6	11.8	4.2	19	0.77	2.8 (3.02)	*6.173 (6.658)*
4.1	3	17	2.7	13	0.78	3.6 (3.82)	*7.937 (8.422)*
3.5	2.8	12	3.8	17.6	0.89	4.3 (4.92)	*9.480 (10.847)*
4.8	3.8	17.1	2.4	12.7	1.21	5.8 (6.42)	*12.787 (14.154)*
6.6	4.9	28.3	1.43	8.8	1.227	5 (8.12)	*11.023 (17.902)*
6.2	5.3	32.3	1.81	11.8	1.62	9.2 (10.23)	*20.283 (22.553)*
7.8	6.8	20.8	1.41	15.6	1.43	11.9 (13)	*26.235 (28.660)*
13.2	8.9	44.1	0.6	7.4	1.47	16.6 (17.7)	*36.597 (39.022)*
17.6	8.7	61	0.4	5.1	1.58	21.3 (23.1)	*46.958 (50.927)*
21.3	11.0	95.6	0.28	3.9	1.57	26 (27.8)	*57.320 (61.289)*
21	11.5	87.2	0.3	5.7	1.75	35 (38.6)	*77.162 (85.098)*
25.7	17.8	96.8	0.3	5.8	2.52	50 (53.6)	*110.231 (118.168)*
33.2	20.4	136.1	0.2	4	2.84	67 (70.6)	*147.710 (155.646)*
1.5	1.5	6	16.4	74.1	1.47	2.8 (3.02)	*6.173 (155.646)*
2.1	1.9	8.7	10.2	49.2	1.48	3.6 (3.82)	*7.937 (8.422)*
1.8	1.6	6.3	13.9	64.3	1.83	4.3 (4.92)	*9.480 (10.847)*
2.5	2.3	9	8.6	45.7	2.32	5.8 (6.42)	*12.787 (14.154)*
3.4	3.1	14.7	5.3	32.5	2.35	5 (8.12)	*11.023 (17.902)*
4	4	10.8	5.3	58.1	2.78	11.9 (13)	*26.235 (28.660)*

2

SH3 servo motor and Lexium 52 servo drive combination

Lexium 52 Servo drives	Servo motors				Motor			
Reference	Reference							Standard
		Size	Winding		Io	Inom	Ipeak	Inom @ 8 kHz
LXM52DU60C41000	**SH3**	**0551**	**P**		0.73	0.62	2.9	1.5
		0552	**P**		1.2	1.1	4.8	1.5
		0702	**M**		1.5	1.5	6	1.5
LXM52DD12C41000	**SH3**	**0553**	**P**		1.7	1.35	6.5	3
		0701	**P**		1.8	1.6	5.7	3
		0702	**P**		2.9	2.6	11.8	3
		0703	**M**		2.1	1.9	8.7	3
		1001	**M**		1.8	1.6	6.3	3
		1002	**M**		2.5	2.3	9	3
LXM52DD18C41000	**SH3**	**0703**	**P**		4.1	3	17	6
		1001	**P**		3.5	2.8	12	6
		1002	**P**		4.8	3.8	17.1	6
		1003	**M**		3.4	3.1	14.7	6
		1401	**M**		4	4	10.8	6
LXM52DD30C41000	**SH3**	**1003**	**P**		6.6	4.9	28.3	10
		1004	**P**	(1)	6.2	5.3	32.3	10
		1401	**P**		6.8	7.8	20.8	10
LXM52DD72C41000	**SH3**	**1004**	**P**		6.2	5.3	32.3	24
		1402	**P**		13.2	8.9	44.1	24
		1403	**P**		17.6	8.7	61	24
		1404	**P**	(1)	21.3	11	95.6	24
		2051	**P**	(1)	21	11.5	87.2	24
		2052	**P**	(1)+(2)	25.7	17.8	96.8	24
		2053	**P**	(1)+(2)	33.2	20.4	136.1	24

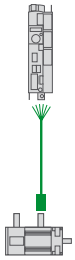
SH3 servo motor and Lexium 62 servo drive combination

Lexium 62 Servo Drives	Servo motors				Motor						
Reference (x = A = Single drive, x = B = Double drive)	Reference									Standard	
		Size	Winding		Io	Inom	Ipeak		Inom @ 4 kHz	Inom @ 8 kHz	Inom @ 16 kHz	Ipeak
LXM62DU60x21000	**SH3**	**0551**	**P**		0.73	0.62	2.9		2	2	1.2	6
LXM62DU60x21000		**0552**	**P**		1.2	1.1	4.8		2	2	1.2	6
LXM62DU60x21000		**0702**	**M**		1.5	1.5	6		2	2	1.2	6
LXM62DU60x21000	**SH3**	**0553**	**P**		1.7	1.35	6.5	(1)	2	2	1.2	6
LXM62DU60x21000		**0701**	**P**		1.8	1.6	5.7		2	2	1.2	6
LXM62DD15x21000		**0702**	**P**		2.9	2.6	11.8		5	5	1.2	15
LXM62DU60x21000		**0703**	**M**		2.1	1.9	8.7	(1)+(2)	2	2	1.2	6
LXM62DU60x21000		**1001**	**M**		1.8	1.6	6.3	(1)	2	2	1.2	6
LXM62DD15x21000		**1002**	**M**		2.5	2.3	9		5	5	3.5	15
LXM62DD15x21000	**SH3**	**0703**	**P**		4.1	3	17	(1)	5	5	3.5	15
LXM62DD15x21000		**1001**	**P**		3.5	2.8	12		5	5	3.5	15
LXM62DD15x21000		**1002**	**P**		4.8	3.8	17.1	(1)	5	5	3.5	15
LXM62DD15x21000		**1003**	**M**		3.4	3.1	14.7		5	5	3.5	15
LXM62DD15x21000		**1401**	**M**		4	4	10.8		5	5	3.5	15
LXM62DD27x21000	**SH3**	**1003**	**P**		6.6	4.9	28.3	(1)	9	7	4	27
LXM62DD27x21000		**1004**	**P**		6.2	5.3	32.3	(1)	9	7	4	27
LXM62DD27x21000		**1401**	**P**		6.8	7.8	20.8		9	7	4	27
LXM62DD27x21000	**SH3**	**1004**	**P**		6.2	5.3	32.3	(1)	9	7	4	27
LXM62DD45x21000		**1402**	**P**		13.2	8.9	44.1		20	15	8	45
LXM62DD45x21000		**1403**	**P**		17.6	8.7	61	(1)	20	15	8	45
LXM62DC13C21000 or **LXM62DD45x21000** (1)		**1404**	**P**		21.3	11	95.6		50	50	30	130
LXM62DC13C21000 or **LXM62DD45x21000** (1)		**2051**	**P**		21	11.5	87.2		50	50	30	130
LXM62DC13C21000		**2052**	**P**		25.7	17.8	96.8		50	50	30	130
LXM62DC13C21000		**2053**	**P**		33.2	20.4	136.1	(1)	50	50	30	130

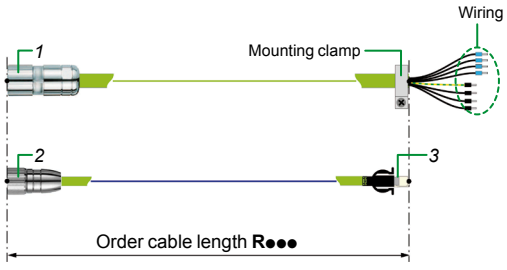
(1) Drive peak current lower than motor peak current
(2) Continuous torque limited by nominal drive current

PacDrive 3 System Motion Solutions
Servo motors
SH3 Servo motor range: Connection elements

Connection elements

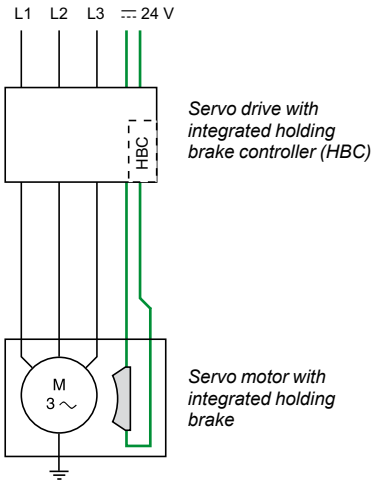
Designation	Description	From servo motor	To servo drive	Composition (mm²/inch²)	Length (m)	(ft)	Reference
Power cordsets 	Cables equipped with an M23 industrial connector (servo motor end) and a free end (servo drive end)	SH3055●P, SH3070●P/M, SH3100●P/M, SH31401M	Lexium 62 Lexium 52	1.5/*0.002*	5	*16.404*	**VW3E1143R050**
					10	*32.808*	**VW3E1143R100**
					15	*49.213*	**VW3E1143R150**
					20	*65.617*	**VW3E1143R200**
					25	*82.021*	**VW3E1143R250**
					30	*98.425*	**VW3E1143R300**
					40	*131.234*	**VW3E1143R400**
					50	*164.042*	**VW3E1143R500**
	Cables equipped with an M23 industrial connector (servo motor end) and a free end (servo drive end)	SH31401P, SH31402P	Lexium 62 Lexium 52	2.5/*0.004*	5	*16.404*	**VW3E1144R050**
					10	*32.808*	**VW3E1144R100**
					15	*49.213*	**VW3E1144R150**
					20	*65.617*	**VW3E1144R200**
					25	*82.021*	**VW3E1144R250**
					30	*98.425*	**VW3E1144R300**
					40	*131.234*	**VW3E1144R400**
					50	*164.042*	**VW3E1144R500**
	Cables equipped with an M40 industrial connector (servo motor end) and a free end (servo drive end)	SH31403P, SH31404P, SH32051P	Lexium 62 Lexium 52	2.5/*0.004*	5	*16.404*	**VW3E1145R050**
					10	*32.808*	**VW3E1145R100**
					15	*49.213*	**VW3E1145R150**
					20	*65.617*	**VW3E1145R200**
					25	*82.021*	**VW3E1145R250**
					30	*98.425*	**VW3E1145R300**
					40	*131.234*	**VW3E1145R400**
					50	*164.042*	**VW3E1145R500**
		SH32052P, SH32053P	Lexium 62 Lexium 52	4/*0.006*	5	*16.404*	**VW3E1153R050**
					10	*32.808*	**VW3E1153R100**
					15	*49.213*	**VW3E1153R150**
					20	*65.617*	**VW3E1153R200**
					25	*82.021*	**VW3E1153R250**
					30	*98.425*	**VW3E1153R300**
					40	*131.234*	**VW3E1153R400**
					50	*164.042*	**VW3E1153R500**
		SH32052P, SH32053P	Lexium 62 Lexium 52	10/*0.016*	5	*16.404*	**VW3E1154R050**
					10	*32.808*	**VW3E1154R100**
					15	*49.213*	**VW3E1154R150**
					20	*65.617*	**VW3E1154R200**
					25	*82.021*	**VW3E1154R250**
					30	*98.425*	**VW3E1154R300**
					40	*131.234*	**VW3E1154R400**
					50	*164.042*	**VW3E1154R500**
Control cordsets (feedback) 	SinCos Hiperface® encoder cables equipped with an M23 industrial connector (servo motor end) and an RJ45 connector with 8+2 contacts (servo drive end)	SH3●●●●P	Lexium 62 Lexium 52	–	5	*16.404*	**VW3E2094R050**
					10	*32.808*	**VW3E2094R100**
					15	*49.213*	**VW3E2094R150**
					20	*65.617*	**VW3E2094R200**
					25	*82.021*	**VW3E2094R250**
					30	*98.425*	**VW3E2094R300**
					40	*131.234*	**VW3E2094R400**
					50	*164.042*	**VW3E2094R500**

Connection description



1 M23/M40 connector
2 M23 signal connector
3 Y-Con connector

PacDrive 3 System Motion Solutions
Servo motors
SH3 Servo motor option: Holding Brake



Servo drive with integrated holding brake controller (HBC)

Servo motor with integrated holding brake

Presentation

The holding brake integrated in the servo motor is an electromagnetic pressure spring brake that blocks the servo motor axis once the output current has been switched off.

The servo drive integrates as standard a holding brake controller which amplifies the braking control signal, so that the brake is deactivated quickly.

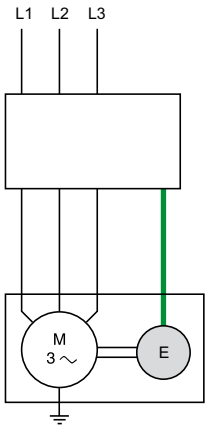
Application

In the event of an emergency, such as a power outage or operation of an emergency stop button, the drive is immobilized, thus significantly increasing safety.
The servo motor axis must also be blocked in case of torque overload, such as in the event of vertical axis movement.

Characteristics

Please consult your customer care center.

PacDrive 3 System Motion Solutions
Servo motors
SH3 Servo motor option: Encoder



Servo motor with SinCos Hiperface® encoder

Presentation

The standard measurement device is the SinCos Hiperface® single turn or multi-turn encoder integrated in servo motors.

Use of this interface enables:

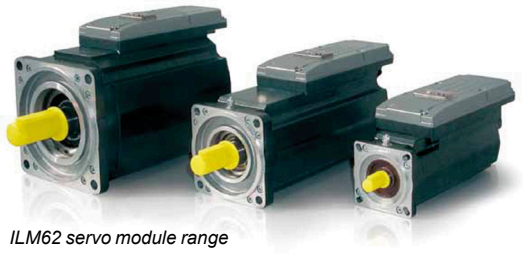
- Automatic identification of SH3 servo motor data by the servo drive
- Automatic initialization of the servo drive's control loops, thus simplifying installation of the motion control device

Characteristics

Type of encoder	Single turn SinCos	Multi-turn SinCos
Sine/cosine periods per turn	128	128
Number of points (1)	131,072	131,072 x 4096 turns
Encoder precision	±1.3 arc min (*0.021°*)	
Measurement method	Optical, high resolution	
Interface	Hiperface®	
Operating temperature	- 20...+ 110 °C	

(1) Encoder resolution is given for use with equipped Lexium 52/62 servo drives.

PacDrive 3 System Motion Solutions
Lexium integrated servo modules
Lexium ILM62 servo module



ILM62 servo module range

Presentation

> Lexium ILM62 servo modules benefits:
- Quick interconnections and hybrid cables for signal and power level
- Automatic network configuration
- Diagnostic functions

The Lexium ILM62 servo modules with integrated drive electronics are the technological successors to the iSH servo modules, and offer more than just compact drives. The drive and network solution together form a true plug-and-play solution for modularity in mechanics, electronics and software.

Servo modules move servo drives out of the control cabinet and into the field. Based on experience with iSH technology, this reduces wiring and cabling requirements in the control cabinet by up to 90%. The only components that remain in the control cabinet are the PacDrive controller, the shared power supply and the CM (connection module) with the possibility of connecting up to 45 servo modules. The CM feeds power to the Lexium ILM62 servo module from the same power supplies as the Lexium 62.

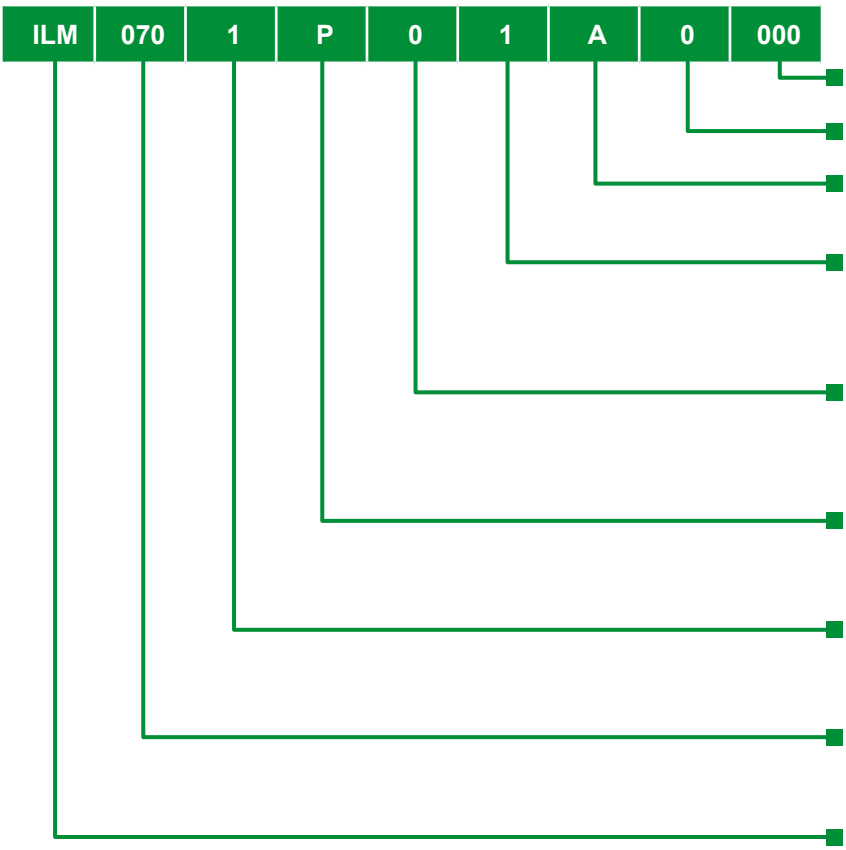
Lexium ILM62 servo modules use a flexible approach to cabling, consisting of pre-terminated hybrid cables and distribution boxes. The network itself is configured as a plug-and-play solution. Compared to conventional servo solutions, this reduces the required cabling by up to 70%, and the labor required for installing the servo solution in the machine frame is reduced by approximately 50%.
Lexium ILM62 servo modules are the key element in modular machine design. They permit modular design of mechanics, software and even electronics. This makes Lexium ILM62 servo modules an ideal solution for machines with a variety of optional mechatronic modules. Apart from any additional power supply units required, any later addition of modules to a machine requires no changes in the control cabinet.

> Peak torques of 3.5 to 55 Nm *(2.581 to 40.565 ft lbf)*
Lexium ILM62 servo modules are available in flange sizes of 70, 100, and 140 mm (*2.756, 3.937 and 5.512 in.*).
They will therefore fully cover a holding torque range of 1.1 to 12.5 Nm (*0.811 to 9.219 ft lbf)* and/or a peak torque of 3.5 to 55 Nm *(2.581 to 40.565 ft lbf)*.
The models are software-compatible with one another and with Lexium 62 and Lexium 52 series servo drives. Additional options include the integration of a holding brake, a feathered key groove and a multi-turn encoder with electronic name plate. The addition of a shaft seal can increase the protection rating from IP54 to IP65.

> Lexium ILM62 servo module main characteristics
- Supply voltage: 250…700 VDC
- Control voltage: 24 VDC (-20%… +25%)
- Rated current: 250 mA
- Brake supply voltage: 24 VDC (-20%… +25%)
- Cooling: passive
- Protection: IP65

- > Multi-axis design requires up to 90% less control cabinet space
- > Various dimensions with peak torques of up to 55 Nm (*40.565 ft lbf*)
- > Can be combined with single and double drives using a shared power supply
- > 70% shorter cable lengths
- > 90% less wiring required in the control cabinet
- > 50% less cable installation required on the machine frame
- > Inverter Enable safety input (according to IEC 61508, EN/ISO13849-1) for each axis

> Smaller control cabinets:
With intelligent servo modules, the servo drives are mounted on the machine frame, leaving only the controller and the shared power supply in the control cabinet.



Internal
000= Standard

Variant
0= Standard

Holding brake
A= Without holding brake
F= With holding brake

Encoder
1= Absolute single turn 128 Sin/Cos periods per revolution
2= Absolute multi-turn 128 Sin/Cos periods per revolution

Shaft
0= Smooth shaft, without shaft sealing
1= Parallel key, without shaft sealing
2= Smooth shaft, with shaft sealing, IP65
3= Parallel key, with shaft sealing, IP65

Winding type
P= Standard
M= Optimized in terms of torque (only available with ILM1401)

Length (number of stacks)
1= 1 stack
2= 2 stacks
3= 3 stacks

Size (flange)
070= 70 mm/*2.756 in.*
100= 100 mm/*3.937in.*
140= 140 mm/*5.512 in.*

Family
ILM= integrated Lexium servo modules

Lexium ILM62 servo modules

Designation	Reference	Description													
		Nominal servo motor output power Pn		Continuous stall torque Mo		Rated torque Mn	Peak stall torque Mmax	Standstill current Io	Rated current In	Peak current Imax	Rotor moment of inertia Jm	Holding brake moment of inertia Jbr	Rated speed Nn	Weight (without options)	
		kW	*hp*	Nm	*ft lbf*			Arms			kg cm²	kg cm²	rpm	kg	*lb*
Motor	**ILM0701P**	0.31	*0.415*	1.1	*0.811*	0.5	3.5	1.55	0.6	5.7	0.25	0.11	6000	2.7	*5.952*
	ILM0702P	0.72	*0.965*	1.7	*1.253*	1.15	7.6	2.5	1.5	11.8	0.41	0.11	6000	3.4	*7.496*
	ILM0703P	0.72	*0.965*	2.2	*1.622*	1.15	8.7	3	1.5	12	0.58	0.11	6000	4.2	*9.259*
	ILM1001P	0.6	*0.804*	2.5	*1.843*	1.9	9.6	1.8	1.4	7.4	1.4	0.49	3000	4.9	*10.803*
	ILM1002P	0.91	*1.219*	4.4	*3.245*	2.9	18.3	2.9	2	13.1	2.31	0.49	3000	6.4	*14.110*
	ILM1003P	1.1	*1.474*	5.8	*4.277*	3.5	28.3	3.6	2.4	21.2	3.22	0.78	3000	8.1	*17.857*
	ILM1401P	1.45	*1.943*	7.5	*5.531*	4.6	27	4.7	2.9	18.8	7.41	1.5	3000	12.5	*27.558*
	ILM1401M	1.3	*1.742*	8.5	*6.269*	8.3	27	3.2	3.15	14.6	7.41	1.5	1500	12.5	*27.558*
	ILM1402P	1.91	*2.560*	12.5	*9.219*	9.1	55	4.8	3.7	24	12.68	2.55	2000	17.2	*37.920*

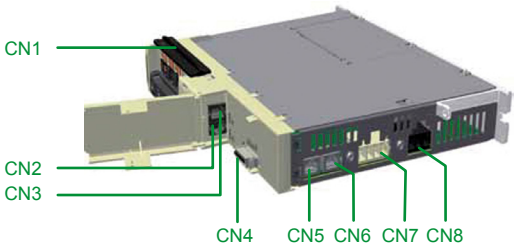
PacDrive 3 System Motion Solutions

Lexium integrated servo modules

Lexium ILM62 servo module: Connection module, Distribution box

ILM62CMD20A000

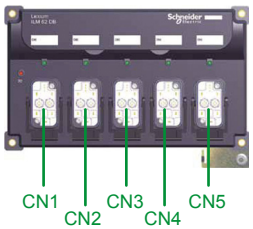
Connection module	
Reference	**Description**
ILM62CMD20A000	□ DC bus input voltage: 250…700 VDC □ Control voltage: 24 VDC (-20%… +25%) □ Input current: 20 A □ DC bus output voltage: 250…700 VDC □ Output current : 20 A □ Inverter Enable input voltage: 24 VDC (-20%… +25%) □ Inverter Enable output voltage: 40 VAC □ Inverter Enable output current: 2 A □ Cooling: passive □ Protection: IP20 □ Dimensions (D x W x H): 270 x 44.5 x 310 mm */10.630 x1.752 x 12.205 in.* □ Weight (with packaging): 3 (4) kg/*6.614 (8.818) lb*



Connection module interface	
Connector	**Function**
CN1	Busbar module
CN2/CN3	sercos III communication
CN4	Inverter Enable 24 VDC
CN5	sercos III communication
CN6	sercos III communication
CN7	Inverter Enable signal output/24 VDC output
CN8	DC bus output

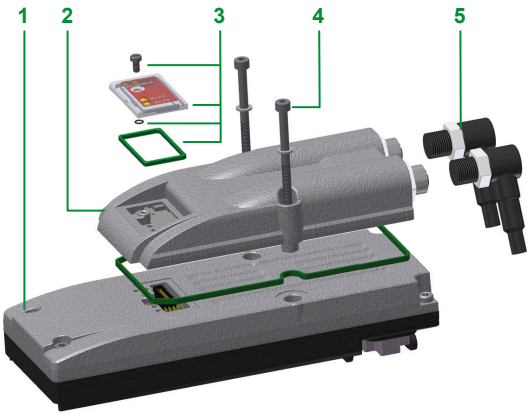
ILM62DB4A000

Distribution box	
Reference	**Description**
ILM62DB4A000	□ DC bus input voltage: 250…700 VDC □ Control voltage: 24 VDC (-20%… +25%)/Max. 20 A □ Input current: 20 A □ DC bus output voltage: 250…700 VDC □ Output current: 20 A □ Inverter Enable output voltage: 40 VAC □ Inverter Enable output current: 2 A □ Cooling: passive □ sercos III 100 Mbps □ Protection: IP65 □ Dimensions (D x W x H): 151.4 x 230x 94 mm */5.961 x 9.055 x 3.701 in.)* □ Weight: 0.85 kg/*1.874 lb*
VW3E6023	□ sercos III bridge



Distribution box interface	
Connector	**function**
CN1	Input (ILM62CM connection module or ILM62DB distribution box)
CN2	Output (ILM62DB distribution box or ILM62 servo module)
CN3	Output (ILM62DB distribution box or ILM62 servo module)
CN4	Output (ILM62DB distribution box or ILM62 servo module)
CN5	Output (ILM62DB distribution box or ILM62 servo module)

PacDrive 3 System Motion Solutions
Lexium integrated servo modules
Lexium ILM62 servo module: Digital I/O module



1 Lexium ILM62 servo module
2 VW3E702100000 I/O option module
3 M3x6 screw, connector cover, sealing connector cover and O-ring seal
4 Screw M4x50 and lock washer
5 M12 connector (VW3E4001R030 I/O cable)

Digital I/O option module for Lexium ILM62 servo module

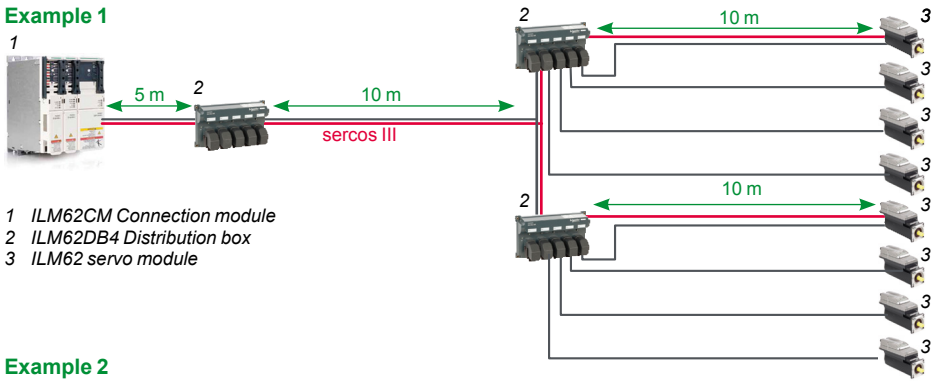
Reference	Description
VW3E702100000	□ Control voltage: 24 VDC (-15%/+20%) - with internal I/O supply: max. 300 mA, - with external I/O supply: max. 80 mA □ 8 Digital inputs (IEC 61131-2 type I) - Range UIN 0 Voltage -3…5 VDC - Range UIN 1 Voltage 15…30 VDC □ 8 Digital outputs (IEC 61131-2 type I) □ Output voltage: $(+U_L - 3V) < U_{OUT} < +U_L$ □ Overall module current across the 8 inputs/outputs - with internal I/O supply: 0.1 A - with external I/O supply: 2.0 A □ Weight: 0.022 kg □ Protection: IP65 □ Approval: CE, cULus

Accessories for Digital I/O option module

Reference	Description
VW3E4001R030	□ I/O cable DIO8 to DIO4 □ With M12 connector, angled □ Length:3 m (9.843 ft)
ABE9CM12C	Terminal block connector
ABE9C1240M	IP67 passive splitter box

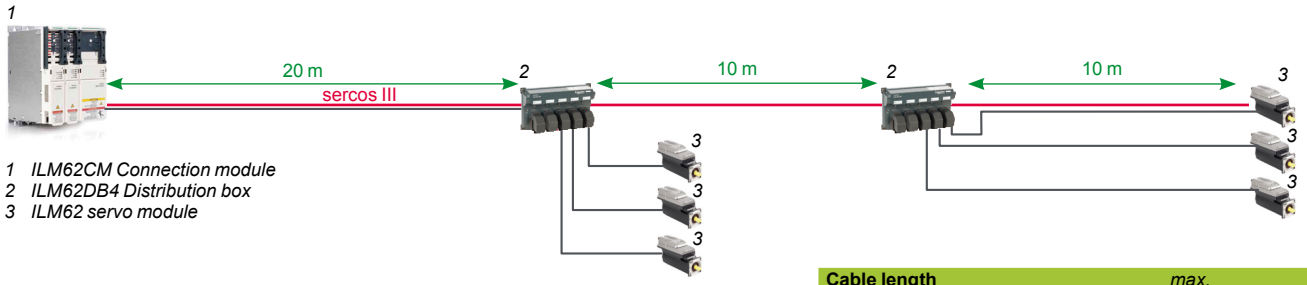
PacDrive 3 System Motion Solutions
Lexium integrated servo modules
Lexium ILM62 servo module: sercos III installation

Example 1



1 ILM62CM Connection module
2 ILM62DB4 Distribution box
3 ILM62 servo module

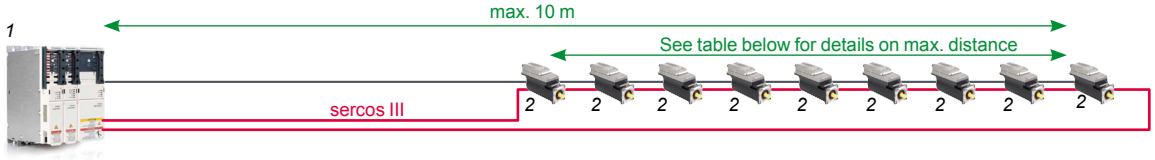
Example 2



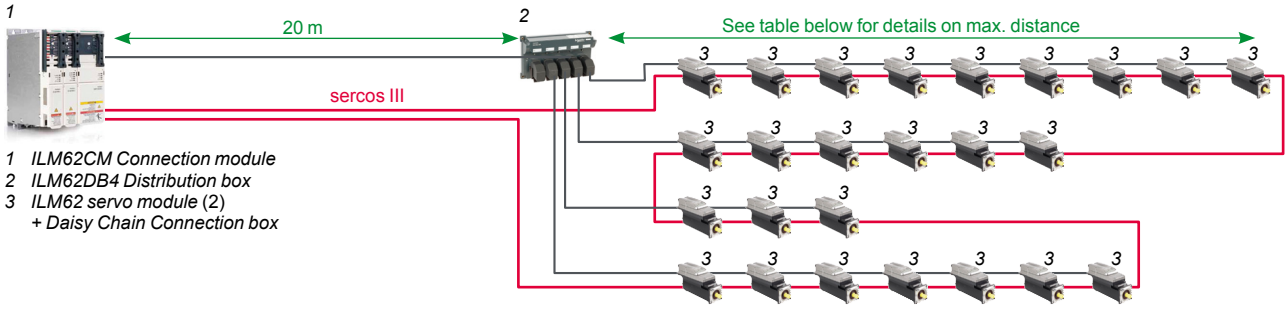
1 ILM62CM Connection module
2 ILM62DB4 Distribution box
3 ILM62 servo module

Cable length	max.
From ILM62CM to ILM62DB4	20 m
From ILM62DB4 to ILM62DB4	10 m
From ILM62DB4 to ILM62 servo module	10 m
Between 2 active sercos slaves	50 m

Example 3 & 4: "Daisy Chain" connection of ILM62 servo modules in the PacDrive3 context (1)



1 ILM62CM Connection module
2 ILM62 servo module (2)
+ Daisy Chain Connection box



1 ILM62CM Connection module
2 ILM62DB4 Distribution box
3 ILM62 servo module (2)
+ Daisy Chain Connection box

Principal scheme of the daisy chain wiring

- ILM62 servo modules in daisy chain configuration are connected to the Lexium 62 system using the ILM62CM Connection module and the ILM62DB4 Distribution box
- Up to 4 daisy chains can be connected to the LXM62DB4 using its output connectors
- Power (DC-Link voltage/24V/Inverter Enable signals) and SERCOS signals are distributed by means of separate cables
- Each of the ILM62 servo modules has to be enhanced with a Daisy Chain connection box
- The connection between the ILM62 servo modules is made using:
  - Power cables for power distribution (DC link voltage/24V) with M23 connectors and Inverter Enable,
  - Ethernet cables for distribution of SERCOS signals with M12 connectors
- Daisy Chain Connection box assembly for daisy chain wiring

ILM62DCA000: type A **ILM62DCB000:** type B **ILM62DCC000:** type C

ILM limits	Max.	Max. no. of drives
ILM62CM (Inverter Enable Generator)	2 A	45
DC link current	20 A	–
24 V supply current	20 A	45
Cable length	*max.*	
Between two active sercos devices	50 m	
Total length of Inverter Enable connections	200 m	
Total length of 24 V power supply transmission	50 m	
Between ILM62CM and ILM62DB4	20 m	
Between ILM62DB4 and ILM62	10 m	
Daisy chain limits	*max.*	
No. of servo modules in a daisy chain	9 (2)	
Total cable length in a daisy chain	10 m	

(1) Available Q2/2013.
(2) 9 servo modules max. If more than 9 servo modules on a row are required, please contact your Customer Care Center.

PacDrive 3 System Motion Solutions

Lexium integrated servo modules

Lexium ILM62 servo module: Connection box and connection cable

Hybrid cable type code

VW3	E	1	141	R	050

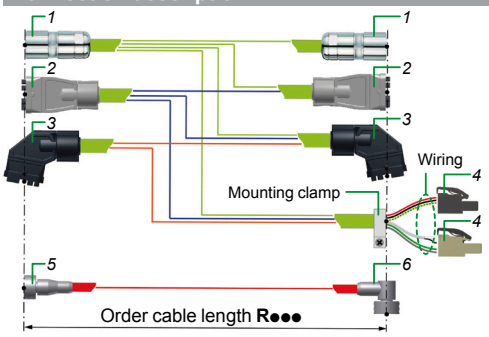
Length
xxx= Length (x0.1m)
Fixed separator R
Drawing reference
141= between ILM62CM & ILM62DB4 or ILM62 servo module, Cable outlet: **D1**
142= between ILM62DB4 & ILM62DB4 or between 2 ILM62 servo modules, Cable outlet: **D1** on both ends
146= between ILM62CM & ILM62DB4 or ILM62 servo module, Cable outlet: **D2**
147= between ILM62CM & ILM62DB4 or ILM62 servo module, Cable outlet: **D0**
148= between ILM62DB4 & ILM62DB4 or ILM62 servo module, Cable outlet: **D1** & **D0**
149= between ILM62DB4 & ILM62DB4 or ILM62 servo module, Cable outlet: **D1** & **D2**
150= between ILM62DB4 & ILM62DB4 or ILM62 servo module, Cable outlet: **D0** & **D2**
151= between ILM62DB4 & ILM62DB4 or ILM62 servo module, Cable outlet: **D0** on both ends
152= between ILM62DB4 & ILM62DB4 or ILM62 servo module, Cable outlet: **D2** on both ends
Type
1= Motor/Hybrid cables
Family
E= PacDrive 3

Note: Power cable length: 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19 and 20 m. Servo drive cable length: 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10 m

Connection boxes and cables

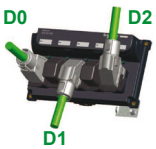
Designation	Description	Detail	Reference
Daisy Chain Connection box assembly	Type A	Standard	**ILM62DCA000**
	Type B	For ILM070 servo modules	**ILM62DCB000**
	Type C	For ILM100 servo modules	**ILM62DCC000**
Protection Cap	–		**ILM62DCZ000**
Designation	**Description**	**Length**	**Reference**
Power Cable	M23/M23	0.3 m/*0.984 ft*	**VW3E1157R003**
		0.7 m/*2.297 ft*	**VW3E1157R007**
		1 m/*3.281 ft*	**VW3E1157R010**
		2 m/*6.562 ft*	**VW3E1157R020**
		3 m/*9.843 ft*	**VW3E1157R030**
		4 m/*13.123 ft*	**VW3E1157R040**
		5 m/*16.404 ft*	**VW3E1157R050**
	D1/M23	1 m/*3.281 ft*	**VW3E1156R010**
		2 m/*6.562 ft*	**VW3E1156R020**
		3 m/*9.843 ft*	**VW3E1156R030**
	CM/M23	3 m/*9.843 ft*	**VW3E1155R010**
		5 m/*16.404 ft*	**VW3E1155R050**
		10 m/*32.808 ft*	**VW3E1155R100**
	CM/D1	3 m/*9.843 ft*	**VW3E1158R030**
		5 m/*16.404 ft*	**VW3E1158R050**
		10 m/*32.808 ft*	**VW3E1158R100**
Sercos III Cable	M12 angled	0.3 m/*0.984 ft*	**VW3E3064R003**
		0.7 m/*2.297 ft*	**VW3E3064R007**
		1 m/*3.281 ft*	**VW3E3064R010**
		2 m/*6.562 ft*	**VW3E3064R020**
		3 m/*9.843 ft*	**VW3E3064R030**
		4 m/*13.123 ft*	**VW3E3064R040**
		5 m/*16.404 ft*	**VW3E3064R050**
	RJ45/M12 angled	3 m/*9.843 ft*	**VW3E3065R030**
		5 m/*16.404 ft*	**VW3E3065R050**
		10 m/*32.808 ft*	**VW3E3065R100**

Connection description



1 M23/M23 connector
2 HyCon3 D0 connector
3 HyCon3 D1/D2 connector
4 RJ45 connector
5 M12 straight connector
6 M12 angled connector

Cable outlet:
on ILM62DB4 Distribution box

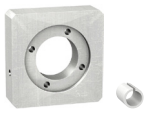


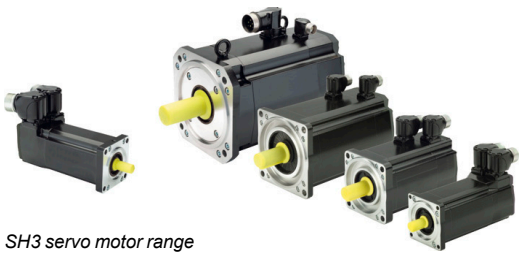
on ILM62 servo modules

PacDrive 3 System Motion Solutions
Servo motors and Gearboxes
Standard and Customized offers


GBX gearboxes


GBY angular gearboxes


GBK adaptor kit


SH3 servo motor range


ILM62 servo module range

Servo motors and Gearboxes

Standard offer

Presentation

In many cases, motion control requires the use of gearboxes to adapt speeds and torques, while ensuring the precision demanded by the application.

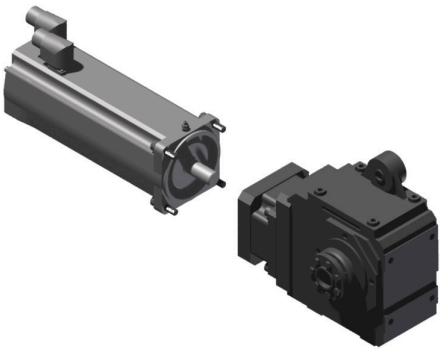
Schneider Electric has chosen to use GBX gearboxes and GBY angular gearboxes with SH3 servo motors and ILM62 servo modules.
Combining SH3 servo motors and ILM62 servo modules with the most suitable gearboxes ensures simple, risk-free operation.

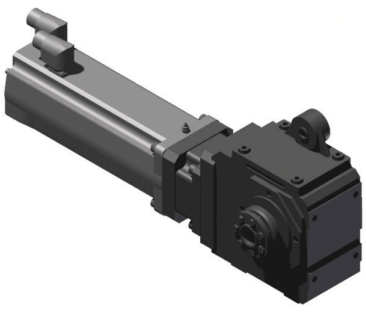
The gearboxes are designed for applications which are not susceptible to mechanical backlash. They have a keyed shaft, are lubricated for life and conform to IP 54 degree of protection.

Combination

The combinations can be:

> **SH3 servo motors and GBX or GBY gearboxes**
> **ILM62 servo modules and GBX or GBY gearboxes**


SH3 motor + gearbox (separate)


SH3 motor + mounted gearbox

Customized offer

Presentation

Motors and gearboxes are additional products in our portfolio and necessary to complete the hardware equipment for OEM machines. The aim is to provide a service to define the optimum choice of motor and the most suitable gearbox for customers' needs.
When a motor and gearbox combination is requested, our specialists will check the feasibility. Then we can make you an offer that includes the motor and gearbox combination as one ready-to-use unit under one product reference.

Customer advantages

- Ease of ordering and time to market
- Combinations are tested, validated and documented
- Customized solutions are possible (color and stainless steel combinations)
- Time saving (already mounted)
- Relevance and feasibility of combination will be checked
- Only one product reference for motor and gearbox
- Reduction of total cost of research, development and purchase of spare parts
- Warranty from a single supplier

Combination

The combinations can be:

> **SH3 servo motors and any referenced gearbox**
> **ILM62 servo modules and any referenced gearbox**

GBM combinations

Customized offer *(continued)*

Example for the referencing system

	GBM combinations			GB-Type		GB-Ratio			GB-Options	GB-Mounting	Motor Type	Motor Flange	Motor Stack	Counter	
	root									body					
	1	2	3	1	2	3	4	5	6	7	8	9	10	11	12
	G	B	M	A	A	0	0	5	A	R	A	1	0	0	0

GBM Combinations
GBM = Gearbox and motor combinations

GB-Type
AA = TP 004 *(1)*
AB = TP 010 *(1)*
AC = TP 025 *(1)*
...

GB-Ratio
003 = 3:1
004 = 4:1
005 = 5:1
...

GB-Options

	red. tolerance	keyed shaft	washdown
A =	-	-	-
B =	x	-	-
C =	-	x	-
...	...	...	...

GB-Mounting (motor to gearbox)
Mounting position of the complete GBM-units
T = 0°
B = 180° clockwise
R = 90° clockwise
L = 90° counterclockwise

Motor-Type:
...
B = ILM 62
C = SH3
...

Motor-Flange
1 = 055 mm
2 = 070 mm
3 = 100 mm
4 = 140 mm
5 = 205 mm

Motor-Stack
1 = one stack
2 = two stacks
3 = three stacks
4 = four stacks

Counter
motor variant or further options

(1) Example given for Wittenstein. Please note that GBM combinations can also be provided with Neugart, Apex or Stöber.

PacDrive 3 System Motion Solutions

Servo motors and Gearboxes
Customized offer
Extract for existing references with SH3 servo motors

Extract for existing references with SH3 servo motors

Combination Number (Motor + Gearbox)	Servo motor designation	Gearbox designation
GBMAA005CTC1226	SH055/80009/0/1/00/00/10/10/00	SK060S-MF1-005-1C1/SH055-D09
GBMKU040ATC1318	SH055/80013/0/0/00/00/00/00/00	AF060-040-S1-P2/SH055-D09
GBMBF050CTC2137	SH070/60010/0/0/00/00/00/01/00	LP+070-MO2-050-111/SH070-D11
GBMBF007CTC2115	SH070/60010/0/0/00/00/00/10/00	LP070-MO1-007-111/SH070
GBMDW010CTC2213	SH070/60020/0/0/00/00/00/01/00	WPLN090-010/SH070-D11/OP7+OP14
GBMEA005CTC2213	SH070/60020/0/0/00/00/00/01/00	PLE60-005/SH070-D11/OP2
GBMBK010CTC2231	SH070/60020/0/0/00/00/00/10/00	LPB070-MO1-010-111/SH070-D11
GBMTG075AMC2231	SH070/60020/0/0/00/00/00/10/00	S002SNF0750ME10-EL1/SH070-D11 S01
GBMTH361AMC2231	SH070/60020/0/0/00/00/00/10/00	S102SGD3610ME10-EL1/SH070-D11 S01
GBMTJ075AMC2231	SH070/60020/0/0/00/00/00/10/00	S002SNF0750ME10-EL1/SH070-D11 S02
GBMTE004MUC2231	SH070/60020/0/0/00/00/00/10/00	KL102GG0040MQ-EL5/SH070-D11 SO1
GBMAB035ATC2228	SH070/60020/0/0/00/00/00/11/00	TP010S-MF2-035-0B1/SH070-D11
GBMBF010CTC2228	SH070/60020/0/0/00/00/00/11/00	LP+070-MO1-010-111/SH070
GBMCH040ETC2220	SH070/60020/0/0/00/00/10/11/00	SPK075S-MF2-040-1C1/SH070-D11_SO1
GBMRY020CTC2220	SH070/60020/0/0/00/00/10/11/00	P322SPR0200ME/SH070-D11
GBMKU010ATC2319	SH070/60030/0/0/00/00/00/00/00	AF060-010-S1-P2/SH070-D14
GBMKW010ATC2319	SH070/60030/0/0/00/00/00/00/00	AF075-010-S1-P2/SH070-D14
GBMAB020BTC2317	SH070/60030/0/0/00/00/00/10/00	TP010S-MF2-020-0C0/SH07060030
GBMAJ039FTC2332	SH070/60030/0/0/00/00/00/11/00	TP010X-MA2-38.5-4C1/SH70-60030
GBMBG010CTC2330	SH070/60030/0/1/00/00/00/00/00	LP+090-MO1-010-111/SH070-60030
GBMRF056ABC3423	SH100/30100/0/0/00/00/00/11/00	K402SG0560ME20-EL5/SH100D24 S01
GBMDT040ATC3441	SH100/30100/0/0/00/00/10/11/00	PLN142-040/SH100-D24/OP2
GBMCH012ETC3222	SH100/40060/0/0/00/00/00/01/00	SPK075S-MF2-012-0E1/SH100-D19_SO1
GBMCG012ATC3222	SH100/40060/0/0/00/00/00/01/00	SPK075S-MF2-012-0E1/SH100-D19
GBMDH028JLC3235	SH100/40060/0/0/00/00/00/10/00	VDHe063-MF1-028-041-0D1/SH100-D19
GBMEM040CTC3235	SH100/40060/0/0/00/00/00/10/00	PLE120-040/SH100-D19/OP2
GBMEM020CTC3235	SH100/40060/0/0/00/00/00/10/00	PLE120-020/SH100-D19/OP2
GBMKY005ATC3321	SH100/40080/0/0/00/00/00/01/00	AF100-005-S1-P2/SH100-D19
GBMRB046ABC3125	SH100/50030/0/0/00/00/00/11/00	K202SG0460ME10-EL5/SH100D19 S01
GBMCD012ETC3136	SH100/50030/0/0/00/00/10/11/00	SK100S-MF2-012-0E1/SH100-D19 SO1
GBMRD018AMC4142	SH140/30120/0/0/00/00/00/11/00	K302AG0175ME20-EL1/SH140D24 S01
GBMRA020ABC4224	SH140/30200/0/0/00/00/00/10/00	K102SG0200ME20-EL5/SH140D24 S01
GBMDT005ATC4240	SH140/30200/0/3/00/00/10/11/00	PLN142-005/SH140-D24/OP2
GBMAE021BTC4316	SH140/30270/0/0/00/00/00/11/00	TP110S-MF2-021-0G0/SH140
GBMDT025CTC4316	SH140/30270/0/0/00/00/00/11/00	PLN142-025/SH140 D24/OP7

How you can request a GBM?
For any combination you need, please contact your local sales force or complete the full GBM Request form on our website and send it to the European Flex-Center (european-flex-center@schneider-electric.com).
This form will provide us with all the information we need to give you an accurate quotation.

Schneider Electric

GBM Request

Name _____

Date _____

Customer _____ Application/Machine _____

Project _____ Quantity _____ ☐ once ☐ per year

1.Motor

Art No _____

or Type Key _____

or detailed description

☐ ILM62 ☐ 055
☐ SH3 ☐ 070
☐ 100
☐ 140

Speed _____ rpm

Torque _____ Nm

☐ Holding brake
☐ Sincos multi-turn
☐ Shaft key
☐ Stainless steel shaft
☐ Shaft sealing IP65
☐ Ext. fan 24 VDC
☐ Barrier pressure
☐ Water cooling flange

Please note that some options are not available for every motor or gearbox

2.Gearbox

Art No _____

or TypeKey _____

or detailed description

Supplier
☐ Neugart
☐ Wittenstein
☐ Apex
☐ Stöber

Type/Design _____

Size _____

Ratio _____

Mounting position EL (1…6) _____

☐ Reduced backlash
☐ Foodgrade lubricant
☐ Plain output shaft
☐ Output shaft with key

Please give clear details of any non-standard specifications (flange, shrink rings, foot mounting, torque arm, etc.) below:

_____

_____

3.Combination Mounting direction of motor according to gearbox *(1)*

(1) The full request form can be also found on the Schneider-Electric home page (ready to complete).

chapter 3

Robotics Solutions

Robotics Solutions

Robotics solutions
Delta 2 robots, Delta 3 robots

Delta 2 robot

The robotics solution offer is developed as an add-on to the PacDrive 3 offer to satisfy the fast increasing customer requirement for a robot to be an integral part of the machine design, e.g. packaging machine.

The robotics hardware offer consists of Delta 2, Delta 3 kinematics and Cartesian robots as well as Lexium linear motion (see page 3/4 and 3/5).
In addition to the referenced offer, customized versions are also possible on request.

Delta 2 robot

- D2 robot is quick, quiet and reliable. Its maximum load capacity is 25 kg (55 lbs).
- The D2s-F and D2s-R model uses conventional SH servo motors with cabinet-mounted servo drives. The ready-to-use D2 robots are also available with an optional rotary axis.
- Flexible integration into the automation system is possible using the iSH or ILM servo modules with integrated servo drive. Though mechanically identical, the D2i-F and D2i-R models and the D2l-F and D2l-R models offer the benefits of iSH/ILM servo module technology.
- Servo modules integrate the drives on the motors, significantly reducing cabinet space and cabling with only a shared power supply inside the cabinet for up to 25 machine-mounted servo modules. Servo modules are connected via a single cable from the cabinet to machine-mounted distribution boxes and single, quick connect cables to each servo.

Advantages of D2 robots:

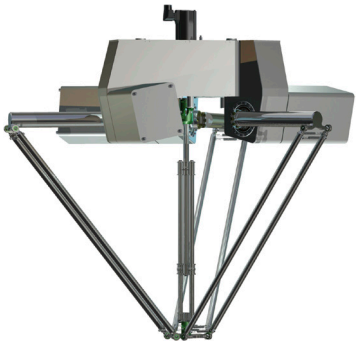
> High payloads
> Large work envelope
> High precision
> High dynamic response
> Low noise level
> Standard components for mechanisms and drives
> Pre-assembled and ready to connect
> Referenced ex-factory
> Low-maintenance while at the same time offering high load capacity
> Compact angled gearboxes are also available
> Protection class up to IP55
> Easy-clean design

References

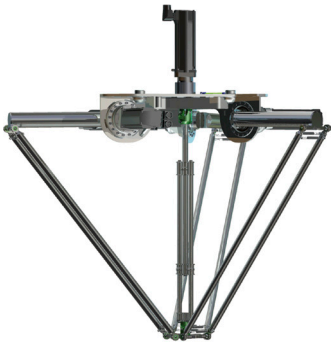
> See pages 3/6 to 3/8

Robotics solutions
Delta 2 robots, Delta 3 robots

Delta 3 robot type P4



Delta3 robot type P4 Flat



Delta 3 robot type P4 Compact

Delta 3 robot

■ The P4 is a delta 3 robot designed for fast pick & place operations. It stands out with its short cycle times and an exceptional payload capacity of up to 10 kg (15 kg on request with PacDrive 3).

■ Combined with a vision system, the P4 can also be used for random and/or mixed product flow picking.

■ The robot's mounting fixtures are at the top (P4 version), reducing the risk of the robot arms colliding with the frame, even at extreme deflection. The P4s-F and P4s-R models use conventional SH servo motors with cabinet-mounted servo drives. It is IP65 rated for use in washdown environments.

■ The P4i-F and P4i-R or P4l-F and P4l-R models use iSH or ILM servo modules. Servo modules integrate the drives on the motors, significantly reducing cabinet space and cabling.

■ Servo modules are connected via a single cable from the cabinet to machine-mounted distribution boxes and single, quick connect cables to each servo.

Advantages of P4 robots:

> 3 types for optimum footprint
> High dynamic response
> IP65 rated, sealed stainless steel design for pharmaceutical and food applications (optional clean room class 6 for SH-Version)
> High precision
> Optimized tube/cable mounting through the parallel plate reduces risk of collision with products and machine parts
> Suitable for washdown application (P4s only)
> Available with iSH or ILM servo modules for non-washdown applications
> Low noise level
> Standard components for mechanisms and drives
> Pre-assembled and ready to connect
> Referenced ex-factory
> Low-maintenance while at the same time offering high load capacity
> Compact design for ceiling mounting
> Three or four degrees of freedom
> Free choice between SH and iSH and ILM motor/servo module variants
> Welded stainless-steel arms, no gluing, no issues with cleaning fluids
> Re-referencing without additional tool ("Homing")

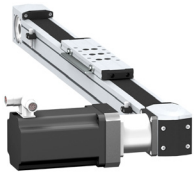
References

> See pages 3/6 to 3/13

Robotics solutions
Lexium Linear motion

Schneider Electric provides modular Lexium linear motion systems that consist of standardized elements, complete solutions and customized solutions for a variety of 1, 2, and 3 dimensional motion tasks.

As a result of their modular structure, the elements can be configured as required. The length and stroke of each axis system is individually determined.



PAS 4●B

PAS 4●S

TAS 4

Lexium PAS Portal Axes and Lexium TAS Linear Tables: Single axis systems for loads of up to 150 kg

■ **Lexium PAS4●B and Lexium PAS 4●S portal axes**

□ Lexium PAS 4●B with toothed belt are designed for precise, dynamic positioning of heavy loads over long distances

□ Lexium PAS 4●S with ballscrew are designed for high-precision positioning of heavy loads at low to medium speeds with high feed forces

Advantages

> Large selection of sizes, adapted to customer requirements
> Flexible interface for simple and rapid mounting, modification and servicing
> With metal cover strip for application in rough environments

■ **Lexium TAS linear tables**

□ With their integrated ballscrew drive, Lexium TAS are ideal for high-precision linear positioning of heavy loads at high feed forces with minimum mechanical backlash

Advantages

> Superior system rigidity and compact dimensions
> Each guide rail with two recirculating ball bearing guides and integrated ball chain
> Aluminum profiles with extremely high torsion and bending resistance

Selection guide

> See pages 3/14 and 3/15

CAS 4

CAS 3

CAS 2

Lexium CAS Cantilever and Lexium CAS Telescopic Axes: Single axis systems with stationary motor and moving axis body

■ **Lexium CAS 3 and Lexium CAS 4 cantilever axes**

□ Cantilever axes consist of a stationary motor unit and a mobile axis body which moves into the working area

□ Lexium CAS 4 with extruded profile axis body and toothed belt drive is designed for high speeds (with roller guides) and heavy loads and long strokes (with recirculating ball bearing guides)

□ Lexium CAS 3 with round bar axis body, toothed belt or toothed rack drive and recirculating ball bearing guide is used for light and medium loads and strokes

Advantages

> Available with metal cover strip (Lexium CAS 4 only), anti-static toothed belt and as corrosion-resistant version for harsh environments
> Mechanical interface or end plate for suction, gripper and assembly tools

■ **Lexium CAS 2 telescopic axis**

□ Lexium **CAS 2** telescopic axes are extremely compact units consisting of a moving axis body, a moving carriage and a stationary motor. Their stroke is considerably greater than their length

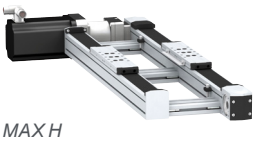
Advantages

> The carriage can move in positive and negative directions with the same stroke
> Recirculating ball bearing guide for high forces and torques or roller guide as a cost-effective alternative

Selection guide

> See pages 3/14 and 3/15

Robotics solutions
Lexium Linear motion



MAX H

MAX S

Lexium MAX Dual Portal Axes: Dual-axis systems for large loads and high speeds

■ **Lexium MAX H and Lexium MAX S dual portal axes**

□ Dual portal axes are designed for high-precision, dynamic movements of large, heavy loads over long distances in a single plane

□ Lexium MAX H consists of a driven toothed belt axis and a non-driven support axis. The carriages of the support axis are moved by the load which is driven via the main axis

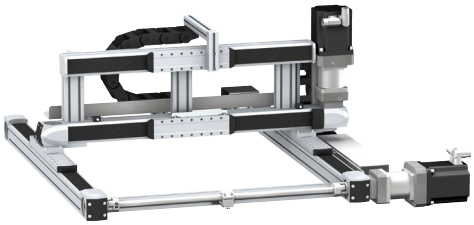
□ In the case of Lexium MAX S, the support axis is driven by a transmission shaft

Advantages

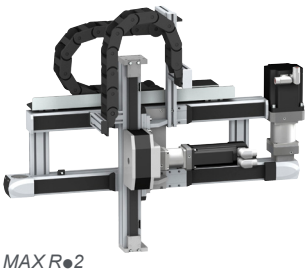
> Up to three carriages for large loads
> Available with metal cover strip, anti-static toothed belt and in a corrosion-resistant version for harsh environments
> Distance between the two axes from 100 mm up to 2800 mm

Selection guide

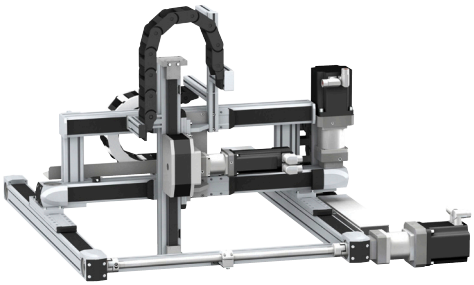
> See pages 3/16 and 3/17



MAX P



MAX R●2



MAX R●3

Lexium Max Portal Robots and Linear Positioners: Lexium dual-axis and triple-axis systems for multi-dimensional applications

■ **Lexium MAX P linear positioners**

□ Lexium MAX P are used for dynamic X/Z applications above or below the working area

□ The linear positioner consists of a Lexium MAX H dual portal axis (X direction) and a Lexium CAS cantilever axis (Z direction)

□ For loads up to 50 kg with long X and medium Z movements

■ **Lexium MAX R●2 and Lexium MAX R●3 portal robots**

□ Portal robots are used for X/Y or XYZ applications above the working area

□ Lexium MAX R●2 consists of a Lexium MAX S dual portal axis (X direction) and a Lexium MAX H or a Lexium PAS B portal axis (Y direction)

□ Lexium MAX R●3 features an additional Lexium CAS 4 or Lexium CAS 3 cantilever axis (Z direction)

Advantages

> An additional rotational axis can be mounted on the Z axis
> Loads of up to 130 kg (MAX R●2)/50 kg (MAX R●3)

Selection guide

> See pages 3/16 and 3/17

Robotics solutions
Delta 2 robots, Delta 3 robots

D2 and D3 robots: Product reference structure

	Type			Model					Options						
	root														
	1	2	3	1	2	3	4	5	6	7	8	9	10	11	12
	V	R	K	P	4	S	0	R	N	O	0	0	0	0	0

Robot Kinematics
VRK

Robot Model/Product Type
P4 3-4 axis Picker 1200 mm
D2 2-3 axis Delta
CP Customer Project

Sub Type
S0 SH motor (P4; D2)
I0 iSH motor (P4; D2)
L0 ILM motor (P4; D2)
WM Without motor (P4)
YY Spare part set
HB Hardware Bundle

Option
R Rotational axis installed
F Fixed, no rotational axis installed
C Customized version or customized hardware bundle
Y Spare part

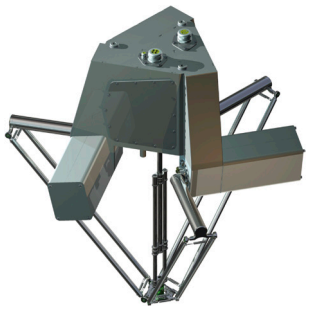
Variant
WD Washdown (P4)
NF Normal, not washdown, flat (P4)
NO Normal, not washdown (P4)
WF Washdown, flat (P4)
CW Cleanroom (P4)
NC Normal, Compact (P4)
01 Customized version 01 (=> Option=C) (P4; D2)
YY Spare part
P4 Customized bundle for P4 robot scope

Revision
to identify revisions of mechanisms
00 S00 (P4; D2)

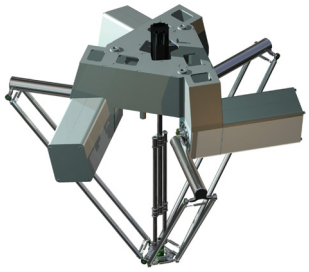
Miscellaneous
for options; e.g. spare part number
000 Customized hardware bundle subtype/enumeration

Robotics solutions
Delta 2 robots, Delta 3 robots

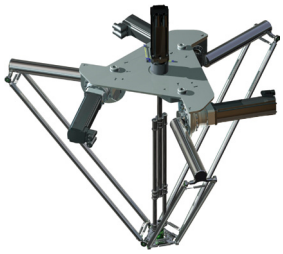
Delta 2 robot D2



Delta 3 robot P4



Delta3 robot P4 Flat



Delta 3 robot P4 Compact

Delta 2 Robots

D2

Designation	Reference
PacDrive Robot D2-1000	**VRKD2S0FEC00000**
PacDrive Robot D2R-1000	**VRKD2S0REC00000**
PacDrive Robot D2iR-1000	**VRKD2I0REC00000**
PacDrive Robot D2i-1000	**VRKD2I0FEC00000**
PacDrive Robot D2i-C01-1000	**VRKD2I0C0100000**
PacDrive Robot D2l-1000	**VRKD2L0FEC00000**
PacDrive Robot D2lR-1000	**VRKD2L0REC00000**

Delta 3 Robots

- WD: Washdown (P4)
- NF: Normal, not washdown, flat (P4)
- NO: Normal, not washdown (P4)
- WF: Washdown, flat (P4)
- CW: Cleanroom (P4)
- NC: Normal, Compact (P4)

P4

Designation	Reference
ROBOT P4s-F-WD-15-1200	**VRKP4S0FWD00000**
ROBOT P4s-R-WD-15-1200	**VRKP4S0RWD00000**
ROBOT P4s-F-CW-15-1200	**VRKP4S0FCW00000**
ROBOT P4s-R-CW-15-1200	**VRKP4S0RCW00000**
ROBOT P4i-F-NO-15-1200	**VRKP4I0FNO00000**
ROBOT P4i-R-NO-15-1200	**VRKP4I0RNO00000**
ROBOT P4l-F-NO-15-1200	**VRKP4L0FNO00000**
ROBOT P4l-R-NO-15-1200	**VRKP4L0RNO00000**

P4 Flat

Designation	Reference
ROBOT P4s-F-WF-15-1200	**VRKP4S0FWF00000**
ROBOT P4s-R-WF-15-1200	**VRKP4S0RWF00000**
ROBOT P4i-F-NF-15-1200	**VRKP4I0FNF00000**
ROBOT P4i-R-NF-15-1200	**VRKP4I0RNF00000**
ROBOT P4l-F-NF-15-1200	**VRKP4L0FNF00000**
ROBOT P4l-R-NF-15-1200	**VRKP4L0RNF00000**

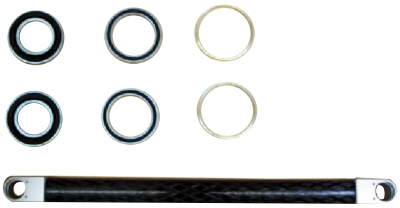
P4 Compact

Designation	Reference
ROBOT P4s-F-NC-15-1200	**VRKP4S0FNC00000**
ROBOT P4s-R-NC-15-1200	**VRKP4S0RNC00000**

Robotics solutions
Delta 2 robots
Spare parts

VRKD2YYYYY00001

VRKD2YYYYY00002



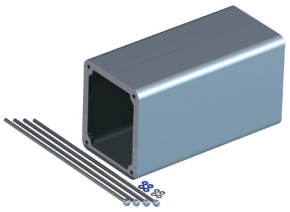
VRKD2YYYYY00003

Spare parts

Spare parts for D2

Designation	Description	Reference
Maintenance tool kit	Calibration Tool for calibration of the robot after replacement of a motor or gearbox 1x gauge	**VRKD2YYYYY00001**
Cable clamp set	2x cable clamps	**VRKD2YYYYY00002**
Secondary arm assembly	1x secondary arm 6x bearings	**VRKD2YYYYY00003**

Robotics solutions
Delta 3 robots
Spare parts



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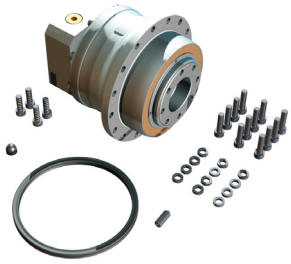
VRKP4YYYYY00002



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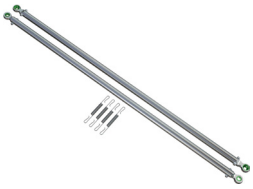

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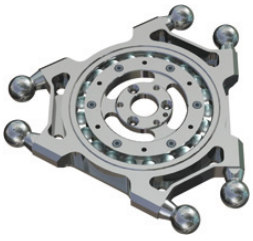

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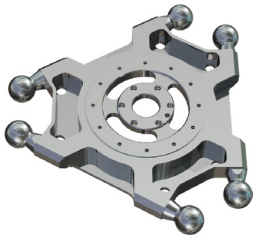


VRKP4YYYYY00006

Spare parts

Spare parts for D3

Designation	Description	Reference
Motor cover with fasteners - without sealing	1x motor cover P4x-WD 4x screw threaded rod 4x sealing rings for screw threaded rod 4x washer	**VRKP4YYYYY00001**
Primary arm with ball pins and indexing bolt	1x complete primary arm 1x indexing bolt gearing	**VRKP4YYYYY00002**
Gearbox with fasteners and indexing bolt	1x gearbox main axis 12x drive motor screw 4x drive motor screw 12x drive motor washer 1x gearbox indexing bolt 1x drive motor X-ring 1x PE-caps for motors	**VRKP4YYYYY00003**
2 Secondary arms with rolls, sockets & 4 springs	2x complete lower arm 4x helical extension	**VRKP4YYYYY00004**
Parallel plate with bearing and ball pins	1x parallel plate with bearing and ball pins	**VRKP4YYYYY00005**
Parallel plate with ball pins	1x parallel plate with ball pins	**VRKP4YYYYY00006**

Robotics solutions
Delta 3 robots
Spare parts

VRKP4YYYYY00007

VRKP4YYYYY00008

VRKP4YYYYY00009

VRKP4YYYYY00010

VRKP4YYYYY00011

VRKP4YYYYY00012

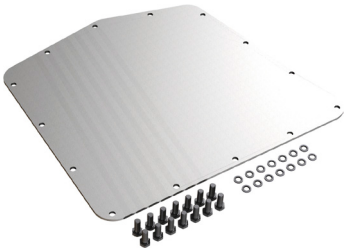
3

Spare parts		
Spare parts for D3 *(continued)*		
Designation	**Description**	**Reference**
Telescopic axis mounted with universal joints	1x telescopic axis	**VRKP4YYYYY00007**
Upper universal joint with fasteners	1x upper universal joint 1x upper universal joint clamping screw	**VRKP4YYYYY00008**
Lower universal joint with fasteners & indexing bolt	1x lower universal joint 6x universal joint countersunk screw 1x universal joint straight pin	**VRKP4YYYYY00009**
Set of 3 tubes for telescopic axis	2x lower tube 16 1x upper tube 20	**VRKP4YYYYY00010**
Miscellaneous fasteners	1x clamping cone large 1x clamping sleeve large 1x washer large 4x washer small 4x clamping cone small 4x clamping sleeve small 1x universal joint cover 5x clamping screw 1x universal joint screw large 1x universal joint screw small 6x universal joint countersunk screw 2x universal joint straight pin	**VRKP4YYYYY00011**
3 sets of standard sleeve bearings	3x sleeve bearings 20 6x sleeve bearings 16	**VRKP4YYYYY00012**

Robotics solutions
Delta 3 robots
Spare parts

VRKP4YYYYY00013

VRKP4YYYYY00014



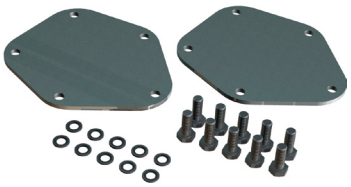
VRKP4YYYYY00015

VRKP4YYYYY00016

VRKP4YYYYY00017

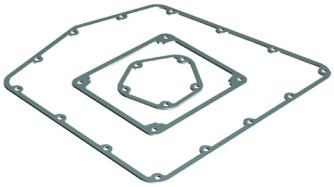
Spare parts		
Spare parts for D3 *(continued)*		
Designation	**Description**	**Reference**
3 sets of FDA sleeve bearings	3x FDA 20 sleeve bearings 6x FDA 16 sleeve bearings	**VRKP4YYYYY00013**
Gearbox rotation axis with fasteners & seals	1x gearbox rotation axis 1x central motor O-ring 4x central motor sealing ring 4x central motor top screw 4x central motor bottom screw	**VRKP4YYYYY00014**
Maintenance lid with fasteners	1x maintenance lid 14x maintenance lid screws 14x maintenance lid sealing rings	**VRKP4YYYYY00015**
Cable bushing with lids & fasteners	1x PVDF M16 cable bushing 1x MS-vern M16 counter nut 1x PE M16 sealing ring 2x PVDF M50 gland body 2x MS-vern M50 counter nut 2x PE M50 sealing ring 1x sealing insert 4x13 1x sealing insert 7x9 1x lock bolt 13 4x lock bolt 9 1x cover 50 1x cover 50/16 10x cover screw 10x sealing ring for cover screw	**VRKP4YYYYY00016**
Motor cover with fasteners - without seals	1x motor cover P4x-NO 4x screw threaded rod 4x screw threaded rod sealing ring 4x washer	**VRKP4YYYYY00017**

Robotics solutions
Delta 3 robots
Spare parts



VRKP4YYYYY00018

VRKP4YYYYY00019



VRKP4YYYYY00020

VRKP4YYYYY00021

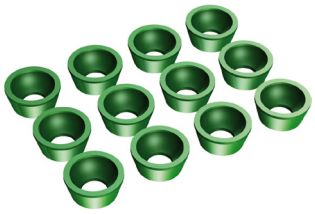
VRKP4YYYYY00022

VRKP4YYYYY00023

Spare parts		
Spare parts for D3 *(continued)*		
Designation	**Description**	**Reference**
2 covers with fasteners - without seals	2x blank cover 10x cover screw 10x sealing rings for cover screw	**VRKP4YYYYY00018**
Closing 4-axis lid with fasteners and seals	1x central axis blind cap 1x central motor O-ring 4x central motor sealing ring 4x central motor bottom screw	**VRKP4YYYYY00019**
1 set of seals for maintenance lid, motor cover, cover	1x maintenance lid seal 1x motor cover seal 1x cover seal	**VRKP4YYYYY00020**
2 sets of seals for all gearboxes	6x drive motor X-ring 2x central motor O-ring	**VRKP4YYYYY00021**
Set of screws for 1 primary arm	7x primary arm screw	**VRKP4YYYYY00022**
12 Helical extensions with rolls and fasteners - set for 1 robot	12x helical extension 24x roll 24x screw	**VRKP4YYYYY00023**

Robotics solutions
Delta 3 robots
Spare parts

VRKP4YYYYY00024



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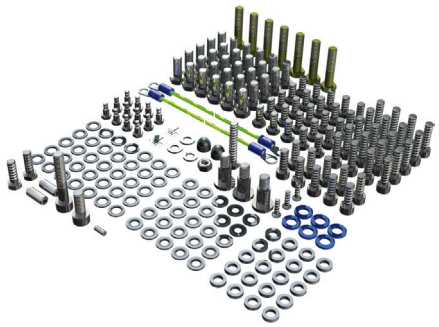

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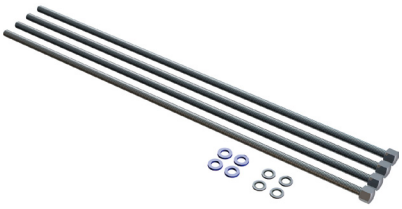


VRKP4YYYYY00027

VRKP4YYYYY00028

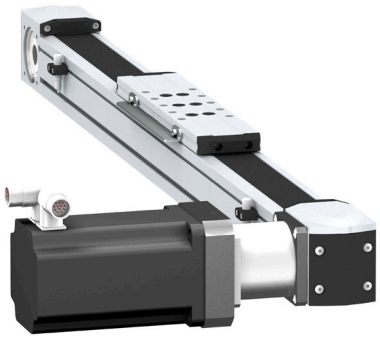
Spare parts

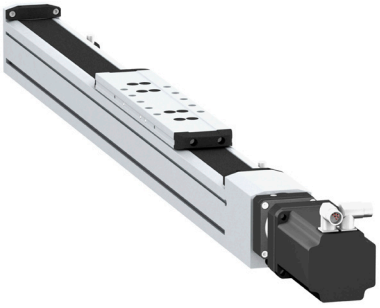
Spare parts for D3 ***(continued)***

Designation	Description	Reference
12 ball pins - set for 1 robot	12x ball pin	**VRKP4YYYYY00024**
12 ball socket - set for 1 robot	12x ball socket	**VRKP4YYYYY00025**
Set of small parts, e.g. fasteners, washers, etc. Without consumables	12x screw 2x PE sticker 1x ground wire 0.5, 650 mm 1x ground wire 0.5, 400 mm 25x central motor sealing ring cover screw sealing ring 35x maintenance lid sealing ring cover sealing ring 2x PE washer 2x central motor bottom screw 20x drive motor washer 10x central motor top screw drive motor screw universal joint screw, small 7x primary arm screw 1x universal joint straight pin 1x universal joint clamping screw 1x universal joint screw, large 3x universal joint countersunk screw 20x drive motor screw 25x screw cover 2x gearbox indexing bolt 1x PE nut 1x PE spring ring 1x PE screw 30x maintenance lid screw cover screw clamping screw 3x motor cover flat head screw 6x washer 2x PE cap for motors	**VRKP4YYYYY00026**
Fasteners for motor cover	4x screw threaded rod 4x screw threaded rod sealing ring 4x washer	**VRKP4YYYYY00027**
Fan with clamping fixtures	12x clamping fixtures 3x fan 80x25 24 V 6x wire end ferrules	**VRKP4YYYYY00028**

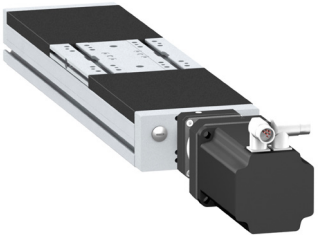
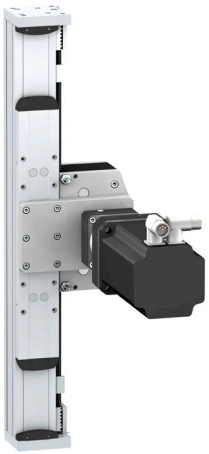
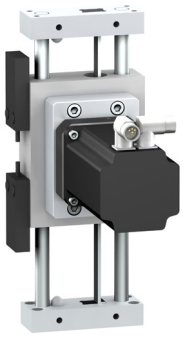
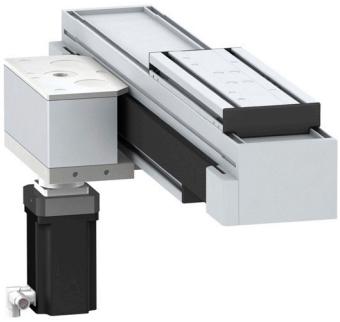
Robotics solutions
Lexium Linear motion
Linear axes

Axis type		Portal axes	
Movement	Number of directions	1	
	Movement type	Generally horizontal	
	Position of the load	On carriage	
Drive		Toothed belt	Ballscrew
Type of guide		Ball or roller	Ball





Main characteristics	□ High dynamic response □ Long stroke length □ High positioning speed	□ High precision movement (positioning, repeatability, guiding) □ High feed forces □ High rigidity
Dynamic response	★★★★★	★★★
Precision	★★★	★★★★★
Maximum payload	100 kg	100 kg
Maximum driving force	2600 N	4520 N
Maximum speed of movement of the load	8 m/s	1.25 m/s
Maximum working stroke	5500 mm	3000 mm
Repeatability	± 0.05 mm	± 0.02 mm
Options	□ Choice of guide type: ball (for applications requiring high forces and torques) or roller (simple, cost-effective solution) □ Wide range of sensors for the limit switch function □ Choice of carriage type for adapting to the load □ Option to add carriages □ Anti-corrosion version □ Anti-static belt	□ Choice of pitch □ Protective metal strip □ Wide range of sensors for the limit switch function □ Choice of carriage type for adapting to the load □ Option to add carriages □ Option to add ballscrew supports for longer axes
Reference	**PAS 4●B**	**PAS 4●S**
More information	*Please consult our Lexium Linear motion catalog (DIA7ED02090805EN) or visit our web site: www.schneider-electric.com*	

Linear tables	Cantilever axes with mobile structure on profile	Cantilever axes with mobile structure on parallel rods	Telescopic axes
1			
Generally horizontal	Generally vertical		Generally horizontal
On carriage	On the side of the profile or on the 2 end blocks	On the 2 end blocks	On carriage
Ballscrew	Toothed belt	Toothed belt or rack	Toothed belt
Double, ball	Ball or roller	Ball	
			
□ High precision movement (positioning, repeatability, guiding) □ High feed forces □ High rigidity □ Feed movement without mechanical backlash	□ Long stroke length □ High feed forces □ Option to mount the load on the side of the profile or on the end blocks □ High rigidity	□ Compact □ Mobile structure with light travel weight	□ Long stroke length from a compact unit □ High rigidity □ High dynamic response
★★	★★★★	★★★★	★★★★
★★★★★★	★★★	★★★	★★
150 kg	50 kg	18 kg	35 kg
2580 N	2150 N	705 N	1500 N
1 m/s	3 m/s	3 m/s	3 m/s
1500 mm	1200 mm	500 mm	2400 mm
± 0.02 mm	± 0.05 mm	± 0.05 mm	± 0.1 mm
□ Choice of pitch □ Several different motor mounting options	□ Choice of guide type: ball (for applications requiring high forces and torques) or roller (simple, cost-effective solution) □ Protective metal strip □ Anti-corrosion version □ Wide range of sensors for the limit switch function □ Anti-static belt	□ Anti-corrosion version □ Anti-static belt	□ Choice of guide type: ball (for applications requiring high forces and torques) or roller (simple, cost-effective solution) □ Choice of carriage type for adapting to the load
TAS 4	**CAS 4**	**CAS 3**	**CAS 2**

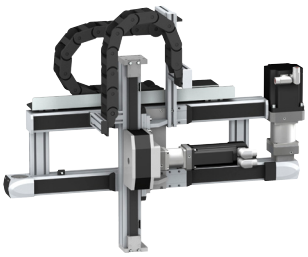
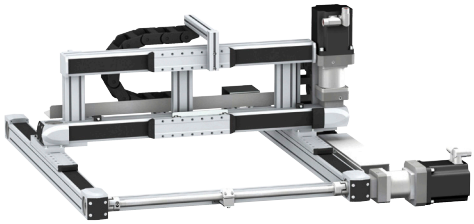
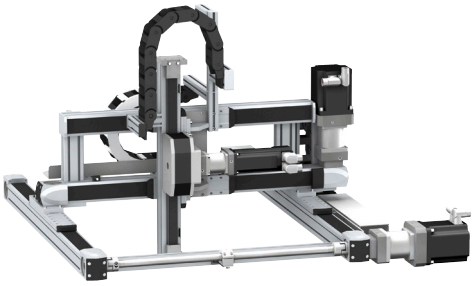
Please consult our Lexium Linear motion catalog (DIA7ED02090805EN) or visit our web site: www.schneider-electric.com

Robotics solutions

Lexium Linear motion

Multi-axis systems

Axis type		**Double portal axes**	
Movement	Number of directions	**1**	
	Movement type	**Horizontal: combination of two parallel axes X and X**	
	Position of the load	**On two parallel carriages**	
Multi-axis system type		**PAS 4●B axes + PAS 4●H support axis (driven by the load)**	**PAS 4●B + PAS 4●B axes (shaft-driven)**
Drive		**Toothed belt on one axis**	**Toothed belt on both axes**
Type of guide		**Ball or roller**	**Ball or roller**
			
Main characteristics		◻ Long stroke length ◻ High dynamic response ◻ High precision movement (positioning, guiding)	◻ High precision movement (positioning, guiding) ◻ High feed forces
Maximum payload		250 kg	300 kg
Maximum working stroke	**On the X axis**	5500 mm	
	On the Y axis	–	
	On the Z axis	–	
Options		◻ Choice of guide type: ball (for applications requiring high forces and torques) or roller (simple, cost-effective solution) ◻ Protective metal strip ◻ Anti-corrosion version ◻ Anti-static belt ◻ Wide range of sensors for the limit switch function ◻ Several different motor mounting options ◻ Variable distance between the two axes	
Reference		**MAX H**	**MAX S**
More information		*Please consult our Lexium Linear motion catalog (DIA7ED02090805EN) or visit our web site: www.schneider-electric.com*	

Linear positioners	Portal robots	
2		**3**
Horizontal and vertical: combination of one X axis and one Z axis	**Horizontal: combination of two perpendicular axes X and Y**	**Horizontal and vertical: combination of two perpendicular axes X and Y and one Z axis**
On the side or on the end blocks of the Z axis profile	**On the Y axis carriage**	**On the side or on the end blocks of the Z axis profile**
□ **MAX S + CAS 4 axes** □ **MAX S + CAS 3 axes**	□ **MAX S + MAX H axes** □ **MAX S + PAS 4●B axes**	□ **MAX S + MAX H + CAS 4 axes** □ **MAX S + MAX H + CAS 3 axes**
Toothed belt on each axis		
Ball or roller		
		
□ Dynamic load positioning	□ Long stroke length on both axes	□ Long stroke length on three axes
50 kg	130 kg	50 kg
5500 mm	5500 mm	5500 mm
–	1500 mm	1500 mm
1200 mm	–	1200 mm
□ Choice of guide type: ball (for applications requiring high forces and torques) or roller (simple, cost-effective solution) □ Wide range of sensors for the limit switch function		
Supplied as standard: □ Protective metal strip □ Anti-corrosion version □ Anti-static belt		
MAX P	**MAX R●2**	**MAX R●3**
Please consult our Lexium Linear motion catalog (DIA7ED02090805EN) or visit our web site: www.schneider-electric.com		

chapter 4

Distributed I/O

Distributed I/O

Distributed I/Os

Modicon TM5 interface module for distributed I/O modules on sercos III bus

sercos III

Fully integrated real time Ethernet based communication

With the addition of sercos III, Schneider Electric has created the first fully Ethernet-based communication solution for PacDrive applications, enabling communication with both drives and field devices.
sercos III also smoothes the way for the integration of safety automation.
sercos III is a true standard, it does not rely upon a specific manufacturer, and it is one of the most powerful Ethernet-based communication solutions currently on the market.

Modicon TM5 interface module for sercos III bus

To enhance its “Flexible machine Control” concept, a key component of MachineStruxure™, and the PacDrive 3 motion controller offer, Schneider Electric offers an interface module providing sercos III access to distributed I/O.

- The PacDrive 3 motion controllers offer the possibility of creating distributed I/O islands via the TM5 interface bus, which enables the architecture to be adapted to match the topology of the machine as closely as possible and reduces wiring costs.
- The Modicon TM5 interface module allows the connection of distributed I/O islands (sensors and actuators) that are distributed over machines via the sercos III bus. These islands communicate on the sercos III bus.

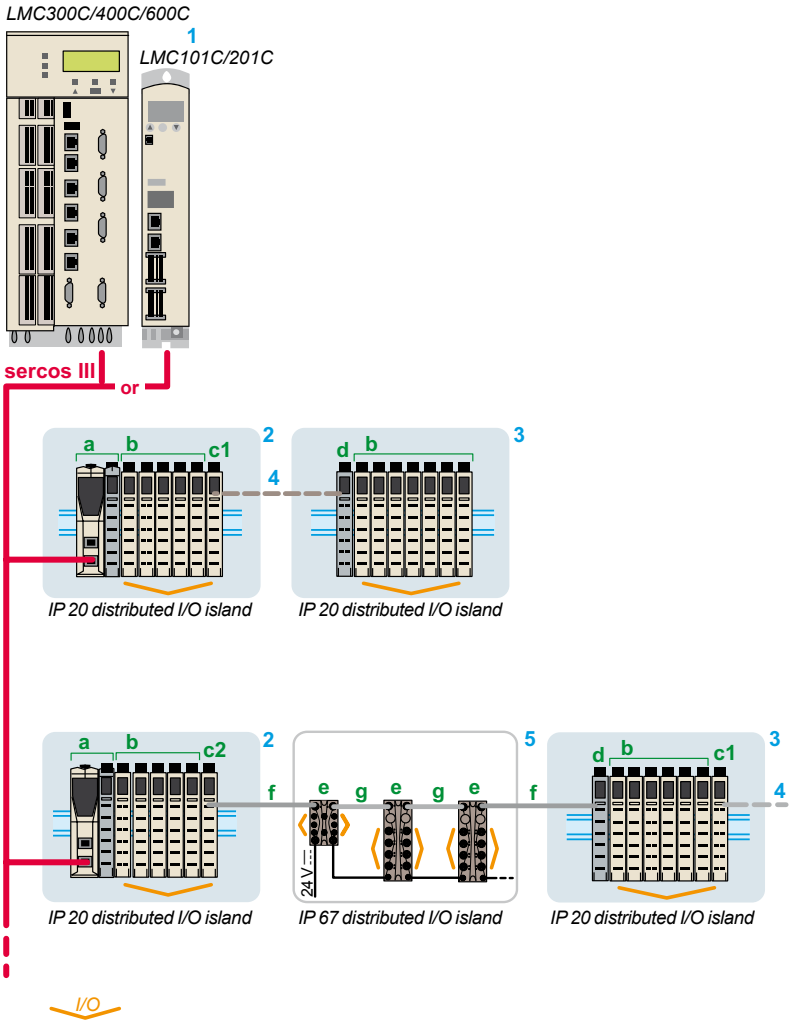
TM5 interface module for sercos III bus

Applications	■ Performance distributed I/O (IP 20)
Compatibility	■ PacDrive 3 motion controllers: LMC101C, LMC201C, LMC 300C, LMC400C, LMC600C
Available bus	■ sercos III bus
Configuration with I/O expansion modules	■ Module type: □ Modicon TM5 modules and/or Modicon TM7 blocks: □ Digital I/O modules □ Analog I/O modules □ Common distribution modules (TM5 only) ■ Capacity: For 1 TM5 interface module: 64 TM5/TM7 modules max. including: □ Digital I/O: 768 I/O max. □ Analog I/O: 364 I/O max. ■ Maximum distances □ from the expansion bus (TM5 or TM7): 2500 m. □ between 2 islands of TM5 modules: 100 m. □ between 2 TM7 blocks: 100 m. □ between 1 island of TM5 modules and 1 TM7 block: 100 m.
Integrated I/O	None
Type of distributed I/O expansion module	TM5 interface module for sercos III bus

Distributed I/O

Modicon TM5 interface module for distributed I/O modules on sercos III bus

Distributed I/O on sercos III bus architecture



1 PacDrive 3 motion controllers: masters on sercos III bus

2 IP 20 distributed I/O islands. Composition: TM5 interface module (**a**) + TM5 compact block *(1)* or I/O modules (**b**) *(2)* + transmitter modules TM5SBET1 (**c1**)/ TM5SBET7 (**c2**) *(3)*.

3 IP 20 distributed I/O island. Composition: receiver module TM5SBER2 (**d**) + TM5 compact block *(1)* or TM5 I/O modules (**b**) *(2)*.

4 TM5 expansion bus. Composition : remote I/O connection cable TCSXCNNXNX100.

5 IP 67 distributed I/O island. Composition: TM7 IP 67 I/O blocks (digital or analog) (**e**) *(4)* + expansion bus cable TM7 TCSXCN●●●E *(5)* (**f**) + TM7 bus daisy chain cables **TCSXCN●M●F●●E***(5)* (**g**) .

(1) Modicon TM5 compact block: see page 4/8.
(2) Modicon TM5 digital modules: see page 4/12 ; Modicon TM5 analog modules: see page 4/20.
(3) Modicon TM5 transmitter modules and TM5 expansion bus: see page 4/30.
(4) Modicon TM7 I/O blocks: see page 4/32.
(5) TM7 expansion bus cables: see page 4/42.

Distributed I/O

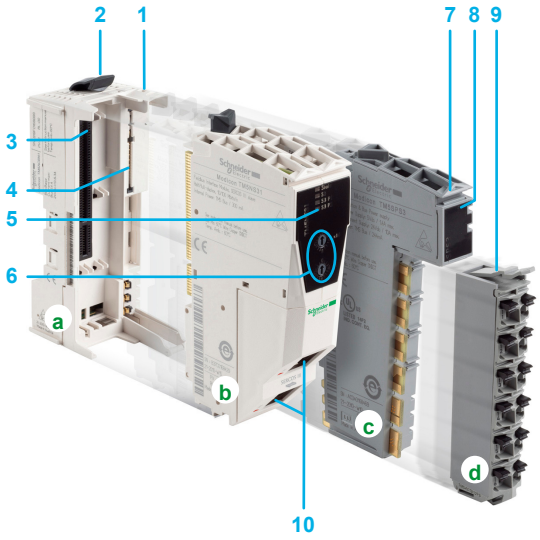
Modicon TM5 interface module for distributed I/O on sercos III bus

Presentation

The TM5 interface module is dedicated to applications as Optimum distributed I/O (IP 20) on sercos III bus and is compatible with the PacDrive 3 motion controllers: LMC101C, LMC201C, LMC300C, LMC400C and LMC600C.

The TM5 interface module is a combination of 4 products to be ordered separately:
- TM5ACBN1 bus base (**a**)
- + TM5NS31 electronic interface module (**b**)
- + TM5SPS3 power distribution electronic module (**c**) (1)
- + TM5ACTB12PS removable terminal block (**d**).

The modules can be mechanically assembled on the bus base before mounting on a symmetrical rail and offer the following advantages:
- Removable terminal block
- Spring terminals for connecting the power supply of the interface module and the I/O expansion modules quickly, with no tools required. In addition, the quality of the spring terminals avoids the need for periodic retightening.



Description

This assembly comprises:

1 On the side of the base, an expansion bus connection for the link with the next module
2 A mechanical locking lever for mounting/dismounting on a symmetrical rail
3 A slot for the power distribution module with connector
4 A slot for the sercos III interface module with connector
5 A channel and interface module diagnostics LED display block
6 Two rotary selector switches for addresses on the bus
7 A slot for labelling (label-holder)
8 A channel and power distribution module diagnostics LED display block
9 A removable spring terminal block with locking clip and slots for coloured identifiers
10 Two RJ45 connectors for connecting to the sercos III bus (bus in / bus out)

(1) Supplied with 2 protective plates, TM5 ACPL10 and TM5ACPR10.

Distributed I/O

Modicon TM5 interface module for distributed I/O on sercos III bus

TM5NS31

TM5SPS3

TM5ACBN1

TM5ACTB12PS

TM5ACTLC100

TM5ACTCH100

TM5ACLPL10

TM5ACLPR10

TM5 interface module for sercos III bus

Electronic interface module

Description	Characteristics	Reference	Weight kg
Electronic interface module	sercos III communication module with sercos III protocol Module colour: white	**TM5NS31**	0.025

Power distribution electronic module

Input power supply	Characteristics	Reference	Weight kg
24 V ⎓	Power supply for the sercos III bus, interface and I/O expansion modules Module colour: grey	**TM5SPS3**	0.025

Bus base

Power supply	Characteristics	Unit reference	Weight kg
24 V ⎓	Use for TM5 NS31 and TM5SPS3 electronic module Supplied with 2 protective plates TM5ACPL10 and TM5ACPR10 Colour of the base: white	**TM5ACBN1**	0.020

Terminal block

Used for	Characteristics	Unit reference	Weight kg
Power distribution electronic module TM5SPS3	12 spring terminals Terminal block colour: grey	**TM5ACTB12PS**	0.016

Accessories

Description	Use for	Colour	Sold in lots of	Unit reference	Weight kg
Plain text cover holder (label-holder)	Labelling the I/O channel terminal blocks	Transparent	100	**TM5ACTCH100**	0.200
Terminal block shield locking clip (Order with plain text cover holder TM5ACTCH100)	Locking plain text cover holder TM5ACTCH100	Transparent	100	**TM5ACTLC100**	0.100
Precut sheet of paper labels	Plain text cover holder TM5ACTCH100	White	100	**TM5ACTLS100**	0.100
Coloured plastic identifiers	Labelling 16 connection channel terminals	White	1	**TM5ACLITW1**	0.015
		Red	1	**TM5ACLITR1**	0.015
		Blue	1	**TM5ACLITB1**	0.015
Metal tool	Inserting/removing TM5ACLIT●1 identifiers	Black	1	**TM5ACLT1**	0.030
Retaining plates for bus bases	Held on the left side	White	10	**TM5ACLPL10**	0.004
	Held on the right side	White	10	**TM5ACLPR10**	0.004
Locking clips	For electronic modules	Black	100	**TM5ACADL100**	0.001

Configuration software

- SoMachine software, please consult our website www.schneider-electric.com
- Performance distributed I/O configuration software, please consult our website www.schneider-electric.com

(1) Modicon TM5 Transmitter/Receiver modules (see page 4/30)

Distributed I/O
Modicon TM5 communication module for RS232 serial link

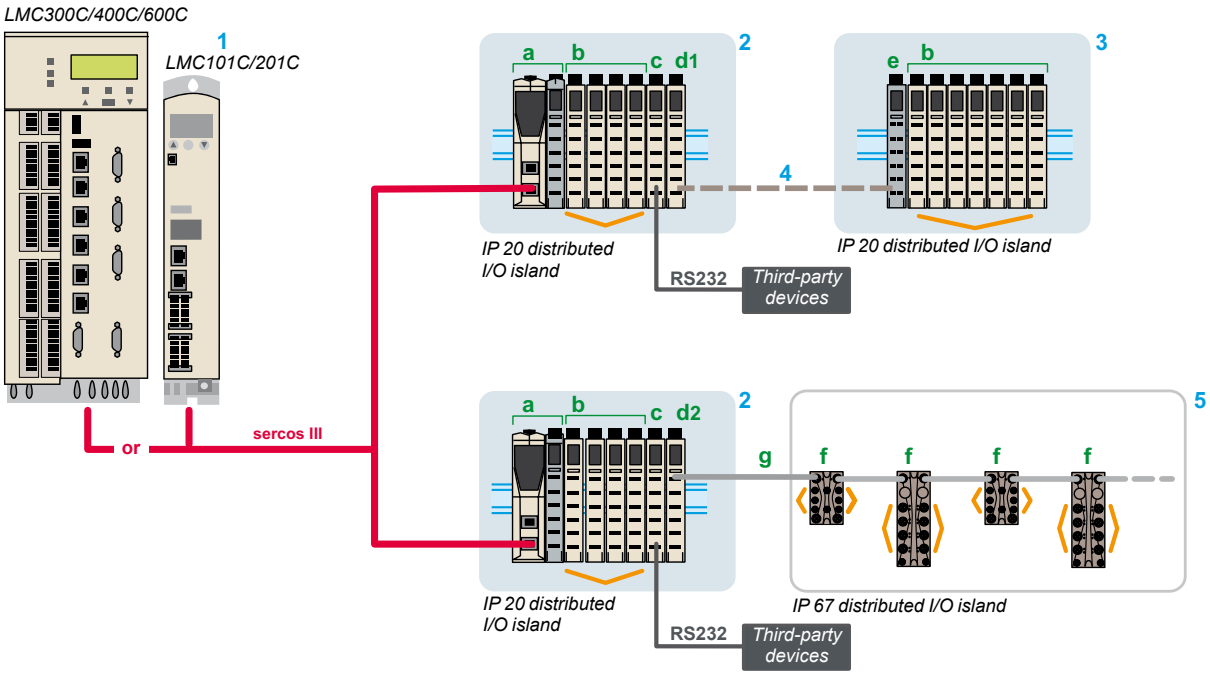
Presentation

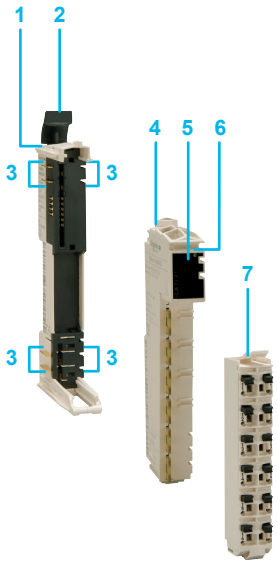
Communication module

The **TM5SE1RS2** communication module is designed for PacDrive 3 motion controllers: LMC101C, LMC201C, LMC300C, LMC400C and LMC600C. It brings a multiple RS232 ports to connect third party devices to PacDrive 3 motion controllers.

The TM5SE1RS2 communication module can be integrated in PacDrive3 distributed and remote architectures.

SoMachine Motion software provides configuration, read and write functionality.





1 PacDrive 3 motion controllers: Masters on sercos III bus

2 IP 20 distributed I/O islands. Composition: TM5 interface module (**a**) + TM5 compact block *(1)* or I/O modules (**b**) *(2)* + TM5 communication module (**c**) transmitter modules TM5SBET1 (**d1**)/TM5SBET7 (**d2**) *(3)*.

3 IP 20 distributed I/O island. Composition: receiver module TM5SBER2 (**e**) + TM5 compact block *(1)* or TM5 I/O modules (**b**) *(2)*.

4 TM5 expansion bus. Composition: remote I/O connection cable TCSXCNNXNX100.

5 IP 67 distributed I/O island. Composition: TM7 IP 67 I/O blocks (digital or analog) (**e**) *(4)* + expansion bus cable TM7 TCSXCN●●●E *(5)* (**g**).

Description

The **TM5SE1RS2** communication module features:

1 A bus base
2 A mechanical locking lever for mounting/dismounting on a symmetrical rail
3 On each side of the base, a bus expansion connection for the link with the previous controller or module
4 A RS232 electronic interface module
5 A channel and module diagnostics LED display block
6 A slot for labelling (label-holder)
7 A removable spring terminal block with locking lever and slots for coloured identifiers

(1) Modicon TM5 compact block: see page 4/8.
(2) Modicon TM5 digital modules: see page 4/12 ; Modicon TM5 analog modules: see page 4/20.
(3) Modicon TM5 transmitter modules and TM5 expansion bus: see page 4/30.
(4) Modicon TM7 I/O blocks: see page 4/32.
(5) TM7 expansion bus cables: see page 4/42.

Distributed I/O

Modicon TM5 communication module for RS232 serial link

Device colour: white

TM5SE1RS2

TM5ACTB●●

TM5ACBM●●

TM5ACTLC100

TM5ACTCH100

TM5ACLPL10

TM5ACLPR10

References

RS232 electronic interface module

Designation	Description	Reference	Weight kg
RS232 electronic interface module	□ SoMachine Motion Protocol □ Physical layer: RS232 □ Speed (Baud rates): 1200 to 115200 Kbits/s □ Capacity: 7 or 8 data bits □ Services: Low/High/Even, None, Odd parity Bit	**TM5SE1RS2**	0.064

Bus bases

Power supply	Characteristics	Sold in lots of	Unit reference	Weight kg
24 V ⎓	–	1	**TM5ACBM11**	0.020
		10	**TM5ACBM1110**	0.020

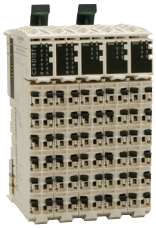
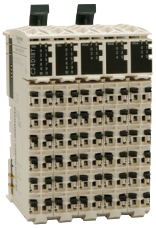
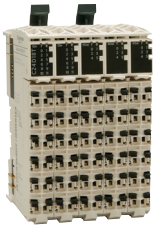
Terminal blocks

Use	Type	Sold in lots of	Unit reference	Weight kg
For RS232 electronic interface module, 24 V ⎓ power supply	6 contacts	1	**TM5ACTB06**	0.016
		10	**TM5ACTB0610**	0.016
	12 contacts	1	**TM5ACTB12**	0.020
		10	**TM5ACTB1210**	0.020

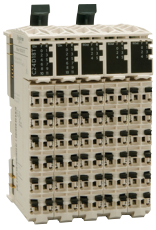
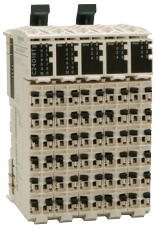
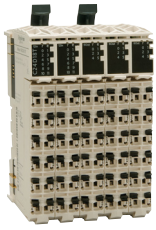
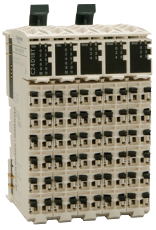
Accessories

Designation	Used for	Colour	Sold in lots of	Unit reference	Weight kg
Plain text cover holder (label-holder)	Marking the terminal blocks on the I/O channels	Trans-parent	100	**TM5ACTCH100**	0.002
Plain text cover holder locking clip *(Order with plain text cover holder TM5ACTCH100)*	Locking plain text cover holder TM5ACTCH100	Trans-parent	100	**TM5ACTLC100**	0.001
Precut legend strips of paper	Plain text cover holder TM5ACTCH100	White	100	**TM5ACTLS100**	0.001
Coloured plastic identifiers	Labelling 16 connection channel terminals	White	1	**TM5ACLITW1**	0.015
		Red	1	**TM5ACLITR1**	0.015
		Blue	1	**TM5ACLITB1**	0.015
Metal tool	Inserting/removing TM5ACLIT●1 identifiers	Black	1	**TM5ACLT1**	0.030
Retaining plates for bus bases	Held on the left side	White	10	**TM5ACLPL10**	0.004
	Held on the right side	White	10	**TM5ACLPR10**	0.004
Locking clips	For modules	Black	100	**TM5ACADL100**	0.001

Distributed I/O
I/O expansion modules
Modicon TM5 compact blocks

Applications	Modicon TM5 compact block	**20 I/O**	**36 I/O**	**42 I/O**
	Compatibility	**PacDrive 3 motion controllers**		
				
Channel connection		With removable spring terminal blocks (supplied)		
Digital inputs	Number	**12**	**24**	**24**
	Nominal input voltage	24 V ⎓	24 V ⎓	24 V ⎓
	IEC/EN 61131-2 conformity	Type 1	Type 1	Type 1
	Type of signal *(1)*	Sink	Sink	Sink
	Type of wiring	3-wire	1-wire	1-wire
	Limit values	20.4... 28.8 V ⎓	20.4... 28.8 V ⎓	20.4... 28.8 V ⎓
	Nominal input current	3.75 mA	3.75 mA	3.75 mA
	Input impedance	6.4 kΩ	6.4 kΩ	6.4 kΩ
	State 0	5 V max. ⎓	5 V max. ⎓	5 V max. ⎓
	State 1	15 V min. ⎓	15 V min. ⎓	15 V min. ⎓
Digital outputs	Number	**8**, transistor	**12**, relays with NO contact	**18**, transistor
	Nominal output voltage	24 V ⎓	24 V ⎓	24 V ⎓
	Output current per channel	0.5 A	0.5 A	0.5 A
	Output current per group of channels	1 A max.	5 A max.	2 A max.
	Type of signal *(1)*	Source	Source	Source
	Type of wiring	3-wire	1-, 2- or 3-wire	2-wire
	Limit values	20.4...28.8 V ⎓	20.4...28.8 V ⎓	20.4...28.8 V ⎓
	Short-circuit and overload protection	Yes	Yes	Yes
Analog inputs	Number			
	Type			
	Range			
	Resolution			
	Sampling period without filtering			
	Sampling period with filtering			
Analog outputs	Number			
	Type			
	Range			
	Resolution			
	Response time			
Power supply				
Isolation	Channel-to-channel			
	Between channel groups			
	Channel-to-bus			
Type of Modicon TM5 compact block		**TM5C12D8T**	**TM5C24D12R**	**TM5C24D18T**
Pages		4/11	4/11	4/11

(1) Source output: PNP output. Sink output: NPN output.

24 I/O	16 I/O		
PacDrive 3 motion controllers			
			
With removable spring terminal blocks (supplied)			
12			
24 V ⎓			
Type 1			
Sink			
2-wire			
20.4... 28.8 V ⎓			
3.75 mA			
6.4 kΩ			
5 V max. ⎓			
15 V min. ⎓			
6, transistor			
24 V ⎓			
0.5 A			
2 A max.			
Source			
2-wire			
20.4...28.8 V ⎓			
Yes			
4	**8**	**8**	**8**
Voltage/current	Voltage	Current	**4** Voltage + **4** current
- 10…+ 10 Vdc 0…20 mA/4…20 mA	- 10…+ 10 Vdc	0….20 mA/4…20 mA	Voltage : - 10…+ 10 Vdc Current : 0…20 mA/4…20 mA
12 bits	11 bits + sign	12 bits	Voltage: 11 bits + sign Current: 12 bits
300 µs	–	–	–
1 ms	50 ms	50 ms	50 ms
2	**8**	**8**	**8**
Voltage/current	Voltage	Current	**4** Voltage + **4** current
- 10…+ 10 Vdc 0…20 mA	- 10…+ 10 Vdc	0…20 mA	Voltage : - 10…+ 10 Vdc Current : 0…20 mA
12 bits	11 bits + sign	12 bits	Voltage: 11 bits + sign Current: 12 bits
1 ms max.	20 ms max. 5 ms per channel	20 ms max. 5 ms per channel	20 ms max. 5 ms per channel
Internal	Internal	Internal	Internal
Non-isolated	Non-isolated	Non-isolated	Non-isolated
–	–	–	–
500 V ∼ RMS	500 V ∼ RMS	500 V ∼ RMS	500 V ∼ RMS
TM5C12D6T6L	**TM5CAI8O8VL**	**TM5CAI8O8CL**	**TM5CAI8O8CVL**
4/11	4/11	4/11	4/11

Distributed I/O
I/O expansion modules
Modicon TM5 compact blocks

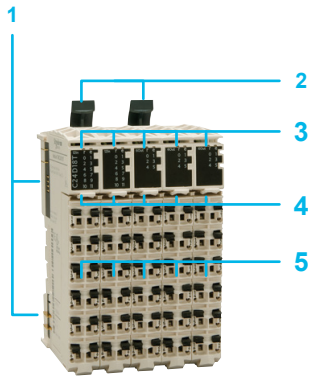
Presentation

Modicon TM5 compact blocks offer a low-cost solution for expanding digital and/or analogue I/O control system configurations.
They consist of a block containing the circuit boards, the bus bases, and the TM5ACTB12 removable terminal blocks.

They complement the embedded I/O in the various PacDrive 3 motion controllers and represent a cost-effective way to create configurations requiring a large number of digital or analogue channels.

The TM5C●●●●●●● I/O compact block offer consists of:
- A 24 V ⎓ digital I/O compact block, with 12 sink inputs and 8 transistor outputs
- A 24 V ⎓ digital I/O compact block, with 24 sink inputs and 12 relay outputs
- A 24 V ⎓ digital I/O compact block, with 24 sine inputs and 18 transistor outputs
- A 24 V ⎓ mixed I/O compact block, with 12 sink digital inputs and 4 analogue inputs, and 6 transistor digital outputs and 2 analogue outputs
- 3 x 24 V ⎓ analogue I/O compact block:
  - a block with 8 voltage I/O
  - a block with 8 current I/O
  - a block with 4 voltage I/O + 4 current I/O.

Regardless of which compact block is chosen, the format is the same and corresponds to five I/O expansion modules.
TM5 compact blocks are connected to the TM5 expansion bus via the TM5 interface module.
The advantage of these blocks is their compact size, ease of wiring and, depending on the reference, the option of combining different types of channel.

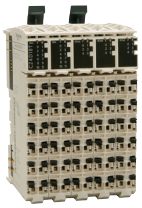


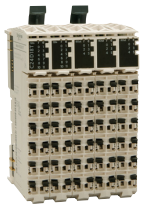
Description

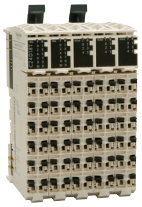
TM5 compact blocks comprise:
1. On each side of the base, a bus expansion connection for the link with the previous controller or block
2. Two mechanical locking clips for mounting/dismounting on a symmetrical rail
3. Five LED display blocks for the channels and compact block diagnostics
4. Five slots for the plain text cover holder (label-holder)
5. Five removable spring terminal blocks, each with locking clip and slots for coloured identifiers

Distributed I/O
I/O expansion modules
Modicon TM5 compact blocks

Device colour: white


TM5C12D8T


TM5C24D12R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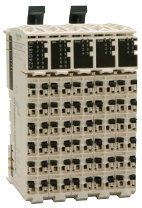
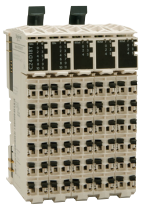
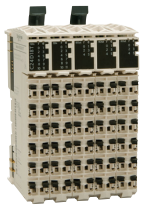
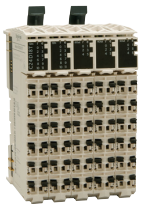

TM5C12D6T6L


TM5CAI8O8VL


TM5CAI8O8CL

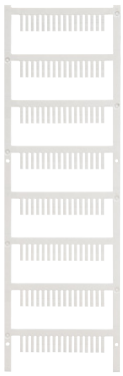

TM5CAI8O8CVL


TM5ACTB●●


TM5ACTLC100


TM5ACTCH100


TM5ACLT1


TM5ACLITW1

References

Number of I/O	Inputs	Outputs (1)	Reference	Weight kg
TM5 I/O digital compact blocks				
20 I/O	12 digital inputs, 24 V ⎓, Sink, 3-wire	8 transistor digital outputs, 3-wire, 24 V ⎓, Source, 0.5 A	**TM5C12D8T**	0.037
36 I/O	24 digital inputs, 24 V ⎓, Sink, 1-wire, 0.5 A max	12 digital outputs, 5 A relay, with NO contact, 30 V ⎓/230 V ∿	**TM5C24D12R**	0.037
42 I/O	24 digital inputs, 24 V ⎓, Sink, 1-wire	18 transistor digital outputs, 24 V ⎓, Source, 0.5 A, 2-wire	**TM5C24D18T**	0.037
TM5 I/O digital/analogue compact blocks				
24 I/O	12 digital inputs, 24 V ⎓, Sink, 2-wire 4 analogue inputs - 10…+ 10 V, 0…20 mA, 4…20 mA, resolution 12 bits	6 transistor digital outputs, 2-wire, 24 V ⎓, Source, 0.5 A 2 analogue outputs, - 10…+ 10 V, 0…20 mA, resolution 12 bits	**TM5C12D6T6L**	0.037
TM5 I/O analogue compact blocks				
16 I/O	8 analogue voltage inputs - 10…+ 10 Vdc Resolution 11 bits + sign	8 analogue voltage ouputs - 10…+ 10 Vdc Resolution 11 bits + sign	**TM5CAI8O8VL**	0.037
	8 analogue current inputs 0…20 mA/4…20 mA Resolution 12 bits	8 analogue current ouputs 0…20 mA Resolution 12 bits	**TM5CAI8O8CL**	0.037
	8 analogue inputs: □ 4 voltage inputs - 10…+ 10 Vdc □ 4 current inputs 0…20 mA/4…20 mA Resolution □ voltage: 11 bits + sign □ current : 12 bits	8 analogue outputs: □ 4 voltage outputs - 10…+ 10 Vdc □ + 4 current outputs 0…20 mA Resolution □ voltage: 11 bits + sign □ current : 12 bits	**TM5CAI8O8CVL**	0.037

Terminal blocks

Use	Description	Sold in lots of	Unit reference	Weight kg
For I/O compact blocks, 24 V ⎓ power supply	12 spring terminals	1	**TM5ACTB12**	0.020
		10	**TM5ACTB1210**	0.200

Accessories

Description	Used for	Colour	Sold in lots of	Unit reference	Weight kg
Plain text cover holder (label-holder)	Marking the terminal blocks on the I/O channels	Transparent	100	**TM5ACTCH100**	0.200
Plain text cover holder locking clip *(Order with plain text cover holder TM5ACTCH100)*	Locking plain text cover holder TM5ACTCH100	Transparent	100	**TM5ACTLC100**	0.100
Precut legend strips of paper	Plain text cover holder TM5ACTCH100	White	100	**TM5ACTLS100**	0.100
Coloured plastic identifiers	Labelling 16 connection channel terminals	White	1	**TM5ACLITW1**	0.015
		Red	1	**TM5ACLITR1**	0.015
		Blue	1	**TM5ACLITB1**	0.015
Metal tool	Inserting/removing TM5ACLIT●1 identifiers	Black	1	**TM5ACLT1**	0.030

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

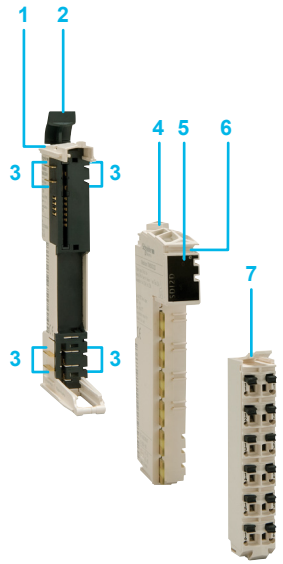
Distributed I/O
I/O expansion modules
Modicon TM5 digital modules and Modicon TM5 digital/analog module

Applications	Type of expansion module	**2 to 12 digital input channels**					
	Compatibility	**PacDrive 3 motion controllers**					
							
Channel connection		With removable spring terminal blocks (to be ordered separately)					
Digital inputs	Number	**2**	**4**	**6**	**12**	**2**	**4**	**6**
	Nominal input voltage	24 V ⎓				100/240 V ∿		
	IEC/EN 61131-2 conformity	Type 1				Type 1		
	Type of signal *(1)*	Sink				–		
	Type of wiring	1-, 2- or 3-wire		1 or 2-wire	1-wire	1-, 2- or 3-wire	1 or 2-wire	
	Limit values	⎓ 20.4... 28.8 V				∿ 100... 240 V		
	Nominal input current	3.75 mA				5 mA at ∿ 100 V 11 mA at ∿ 240 V		10 mA at ∿ 120 V
	Input impedance	6.4 kΩ				–		
	State 0	⎓ 5 V max.				–		
	State 1	⎓ 15 V min.				–		
Digital outputs	Number							
	Nominal output voltage							
	Output current per channel							
	Output current per group of channels							
	Type of signal *(1)*							
	Type of wiring							
	Limit values							
	Short-circuit and overload protection							
Analog inputs	Number							
	Type							
	Range							
	Resolution							
	Sampling period without filtering							
	Sampling period with filtering							
Analog outputs	Number							
	Type							
	Range							
	Resolution							
	Response time							
Type of electronic expansion module		**TM5SDI2D**	**TM5SDI4D**	**TM5SDI6D**	**TM5SDI12D**	**TM5SDI2A**	**TM5SDI4A**	**TM5SDI6U**
Associated bus base *(2)*		**TM5ACBM11, TM5ACBM15**				**TM5ACBM12**		
Associated terminal block *(2)*		**TM5ACTB06, TM5ACTB12**			**TM5ACTB12**	**TM5ACTB32**		
Pages		4/15				4/17		

(1) Source output: PNP output, sink output: NPN output.
(2) to be ordered separately.

4 digital input channels and 1 analog input channel 2 digital output channels and 1 analog output channel	2 to 12 transistor output channels						2 transistor output channels	2 relay output channels
PacDrive 3 motion controllers								
								
With removable spring terminal blocks (to be ordered separately)								
4								
24 V ⎓								
Type 1								
Sink								
1-wire								
⎓ 20.4...28.8 V								
3.3 mA								
7.2 kΩ								
⎓ 5 V max.								
⎓ 15 V min.								
2	**2**	**4**	**4**	**6**	**8**	**12**	**2**	**2**
24 V ⎓	24 V ⎓						100/240 V ∿	⎓ 30/∿ 230 V
0.5 A	0.5 A	0.5 A	2 A	0.5 A	2 A	0.5 A	1 A	5 A
1 A max.	1 A max.	2 A max.	4 A max.	3 A max.	8 A max.	6 A max.	1 A	10 A max.
Source	Source						Solid state relay	Relay
1-wire	1-, 2- or 3-wire			1 or 2-wire	1-wire		3-wire	NO/NC contact
⎓ 20,.4...28.8 V	⎓ 20.4...28.8 V						∿ 80…264 V	⎓ 24...36 V ∿ 184...276 V
Yes	Yes						Yes	No
1								
Voltage/current								
- 10…+ 10 Vdc 0…20 mA/4…20 mA								
12 bits + sign								
400 ms								
1 ms max.								
1								
Voltage/current								
- 10…+ 10 Vdc 0…20 mA								
12 bits								
1 ms max.								
TM5SMM6D2L	**TM5SDO2T**	**TM5SDO4T**	**TM5SDO4TA**	**TM5SDO6T**	**TM5SDO8TA**	**TM5SDO12T**	**TM5SDO2S**	**TM5SDO2R**
TM5ACBM11, TM5ACBM15							**TM5ACBM12**	
TM5ACTB12	**TM5ACTB06, TM5ACTB12**				**TM5ACTB12**		**TM5ACTB32**	
4/15							4/17	

Distributed I/O
I/O expansion modules
Modicon TM5 digital modules and Modicon TM5 digital/analog module



Presentation

The TM5S●●●● digital module offer consists of:
- Ten input, mixed I/O and output electronic modules (sensor and preactuator 24 V ⎓ power supply): TM5SD●●●
- One Digital/Analog mixed I/O electronic module: **TM5SMM6D2L**.

They complement the embedded I/O in the various PacDrive 3 motion controllers. They are used to adapt to the application requirements as closely as possible to reduce the installation and wiring costs.
Each digital expansion module consists of three parts to be ordered separately *(1)*:
- 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 terminal
- 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 digital modules offer includes:
- Four 24 V ⎓ digital input modules with 2, 4, 6 or 12 sink inputs
- SIx digital output electronic modules with 2, 4, 6 or 12 source transistor outputs

The digital/analog module offer includes:
- one mixed I/O electronic module with four 24 V ⎓ digital inputs and one voltage/current analog input, two 24 V digital outputs and one voltage/current analog output.

Description

TM5SD●●●● digital modules and digital/analog **TM5SMM6D2L** module comprise:
1. A bus base
2. A mechanical locking lever for mounting/dismounting on a symmetrical rail
3. On each side of the base, a bus expansion connection for the link with the previous controller or module
4. A digital input, I/O or output electronic module
5. A channel and module diagnostics LED display block
6. A slot for labelling (label-holder)
7. A removable spring terminal block with locking lever and slots for coloured identifiers

(1) Also sold in kits, see page 4/15

Distributed I/O
I/O expansion modules
Modicon TM5 digital/analog module

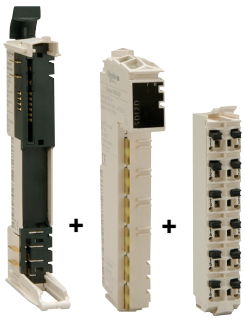
Device colour: White


TM5SD●●● *TM5SMM6D2L*


TM5ACBM●● *TM5ACTB●●*


TM5ACTLC100 *TM5ACTCH100*


TM5ACLPL10 *TM5ACLPR10*



TM5SD●12DK

References

Digital input electronic modules

Voltage	Number and type of channels (1)		Reference	Weight kg
24 V ⎓ inputs	2 sink inputs		**TM5SDI2D**	0.025
	4 sink inputs		**TM5SDI4D**	0.025
	6 sink inputs		**TM5SDI6D**	0.025
	12 sink inputs		**TM5SDI12D**	0.025

Digital output electronic modules

24 V ⎓ outputs	2 source transistor outputs	0.5 A per channel	**TM5SDO2T**	0.025
	4 source transistor outputs	0.5 A per channel	**TM5SDO4T**	0.025
	4 source transistor outputs	2 A per channel, 4 A per module	**TM5SDO4TA**	0.025
	6 source transistor outputs	0.5 A per channel	**TM5SDO6T**	0.025
	8 source transistor outputs	2 A per channel	**TM5SDO8TA**	0.025
	12 source transistor outputs	0.5 A per channel	**TM5SDO12T**	0.025

Digital/Analog mixed inputs/outputs electronic module

24 V ⎓ inputs/outputs	4 sink digital inputs	–	**TM5SMM6D2L**	0,025
	1 analog input	- 10...+ 10Vdc, 0…20 mA/4…20 mA		
	2 source transistor outputs	0.5 A per channel		
	1 analog output	0…20 mA		

Bus bases

Power supply	Characteristics	Sold in lots of	Unit reference	Weight kg
24 V ⎓	–	1	**TM5ACBM11**	0.020
		10	**TM5ACBM1110**	0.020
	Address setting	1	**TM5ACBM15**	0.020
		10	**TM5ACBM1510**	0.020

Terminal blocks

Use	Description	Sold in lots of	Unit reference	Weight kg
For electronic modules, 24 V ⎓ power supply	6 contacts	1	**TM5ACTB06**	0.016
		10	**TM5ACTB0610**	0.016
	12 contacts	1	**TM5ACTB12**	0.020
		10	**TM5ACTB1210**	0.020

Accessories

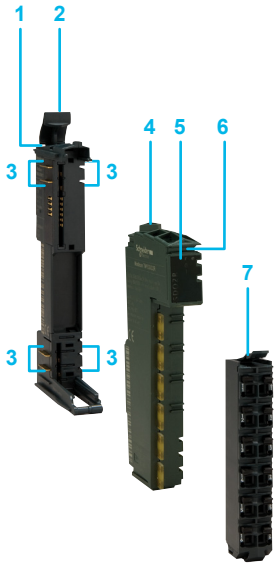
Description	Used for	Colour	Sold in lots of	Unit reference	Weight kg
Plain text cover holder (label-holder)	Marking the terminal blocks on the I/O channels	Transparent	100	**TM5ACTCH100**	0.002
Plain text cover holder locking clip *(Order with plain text cover holder TM5ACTCH100)*	Locking plain text cover holder TM5ACTCH100	Transparent	100	**TM5ACTLC100**	0.001
Precut legend strips of paper	Plain text cover holder TM5ACTCH100	White	100	**TM5ACTLS100**	0.001
Coloured plastic identifiers	Labelling 16 connection channel terminals	White	1	**TM5ACLITW1**	0.015
		Red	1	**TM5ACLITR1**	0.015
		Blue	1	**TM5ACLITB1**	0.015
Metal tool	Inserting/removing TM5ACLIT●1 identifiers	Black	1	**TM5ACLT1**	0.030
Retaining plates for bus bases	Held on the left side	White	10	**TM5ACLPL10**	0.004
	Held on the right side	White	10	**TM5ACLPR10**	0.004
Locking clips	For modules	Black	100	**TM5ACADL100**	0.001

Digital I/O expansion module kits

Description	Composition	Reference	Weight kg
Kit including a digital electronic module (input or output), a bus base and a terminal block	TM5SDI12D + TM5ACBM11 + TM5ACTB12	**TM5SDI12DK**	0.065
	TM5SDO12T + TM5ACBM11 + TM5ACTB12	**TM5SDO12TK**	0.065

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

Distributed I/O
I/O expansion modules
Modicon TM5 digital module



Presentation

The **TM5SD●●●** digital 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 PacDrive 3 motion controllers.
They are used to adapt to the application requirements as closely as possible to reduce the installation and wiring costs.
Each digital 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 terminal
- □ 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 digital modules offer includes:
- ■ Two 100/240 V ∿ digital input electronic modules, with 2 or 4 inputs
- ■ A 100/120 V ∿ digital input electronic module, with 6 inputs
- ■ A 100/240 V ∿ digital output electronic modules, with 2 outputs

Description

TM5SD●●● digital modules comprise:
1. A bus base
2. A mechanical locking lever for mounting/dismounting on a symmetrical rail
3. On each side of the base, a bus expansion connection for the link with the previous controller or module
4. A digital input or output electronic module
5. A channel and module diagnostics LED display block
6. A slot for labelling (label-holder)
7. A removable spring terminal block with locking lever and slots for coloured identifiers

Distributed I/O
I/O expansion modules
Modicon TM5 digital module

Device colour: black


TM5SDI●●


TM5SDO●●


TM5ACBM●●


TM5ACTB●●


TM5ACTLC100


TM5ACTCH100


TM5ACLPL10


TM5ACLPR10

References

Multivoltage digital input electronic modules

Voltage	Number and type of channels (1)	Sold in lots of	Unit reference	Weight kg
100/240 V ∼ inputs	2 inputs	1	**TM5SDI2A**	0.025
	4 inputs	1	**TM5SDI4A**	0.025
100/120 V ∼ inputs	6 inputs	1	**TM5SDI6U**	0.025

Digital output electronic modules

100/240 V ∼ outputs	2 x 1 A transistor outputs	1	**TM5SDO2S**	0.025
30 V ⎓/230 V ∼ outputs	2 x 5 A relay outputs, NO/NC contact	1	**TM5SDO2R**	0.025

Bus bases

Power supply	Characteristics	Sold in lots of	Unit reference	Weight kg
∼ 240 V	–	1	**TM5ACBM12**	0.020
		10	**TM5ACBM1210**	0.020

Terminal blocks

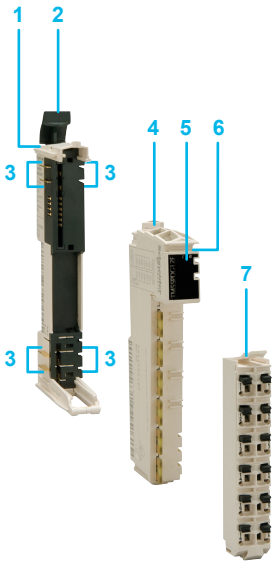
Use	Description	Sold in lots of	Unit reference	Weight kg
For digital I/O electronic module, 240 V ∼ power supply	12 contacts	1	**TM5ACTB32**	0.025
		10	**TM5ACTB3210**	0.025

Accessories

Description	Used for	Colour	Sold in lots of	Unit reference	Weight kg
Plain text cover holder (label-holder)	Marking the terminal blocks on the I/O channels	Transparent	100	**TM5ACTCH100**	0.002
Plain text cover holder locking clip *(Order with plain text cover holder TM5ACTCH100)*	Locking plain text cover holder TM5ACTCH100	Transparent	100	**TM5ACTLC100**	0.001
Precut legend strips of paper	Plain text cover holder TM5ACTCH100	White	100	**TM5ACTLS100**	0.001
Coloured plastic identifiers	Labelling 16 connection channel terminals	White	1	**TM5ACLITW1**	0.015
		Red	1	**TM5ACLITR1**	0.015
		Blue	1	**TM5ACLITB1**	0.015
Metal tool	Inserting/removing TM5ACLIT●1 identifiers	Black	1	**TM5ACLT1**	0.030
Retaining plates for bus bases	Held on the left side	White	10	**TM5ACLPL10**	0.004
	Held on the right side	White	10	**TM5ACLPR10**	0.004
Locking clips	For modules	Black	100	**TM5ACADL100**	0.001

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

Distributed I/O
I/O expansion modules
Modicon TM5 common distribution modules



Presentation

TM5SP●●● common distribution modules make cabling more flexible by “branching” the various voltages needed to power the I/O expansion modules used.
Each 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 terminal
- 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 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 TM5SD000 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 expansion for example.

Description

Common distribution modules comprise:
1. A bus base
2. A mechanical locking lever for mounting/dismounting on a symmetrical rail
3. On each side of the base, a bus expansion 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 labelling (label-holder)
7. A removable spring terminal block with locking lever and slots for coloured identifiers

Distributed I/O
I/O expansion modules
Modicon TM5 common distribution modules

Device colour: white

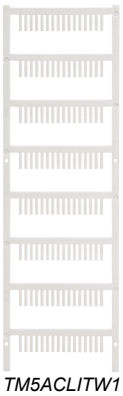
TM5SPDG●●●

TM5ACBM●●

TM5ACTB●●

TM5ACTLC100

TM5ACTCH100



TM5ACLITW1

TM5ACLT1

TM5ACLPL10

TM5ACLPR10

References

Common distribution electronic modules *(1)*

Power supply type	Characteristics	Reference	Weight kg
24 V ⎓	12 common x 0 Vdc with 1 fuse	**TM5SPDG12F**	0.025
	12 common x 24 Vdc with 1 fuse	**TM5SPDD12F**	0.025
	5 common x 0 Vdc 5 common x 24 Vdc with 1 fuse	**TM5SPDG5D4F**	0.025
	6 common x 0 Vdc 6 common x 24 Vdc with 1 fuse	**TM5SPDG6D6F**	0.025

Dummy electronic module

Characteristics	Used for	Reference	Weight kg
Non-functioning	Reservation of slots and logical address	**TM5SD000**	0.015

Bus bases

Power supply	Characteristics	Sold in lots of	Unit reference	Weight kg
24 V ⎓	–	1	**TM5ACBM11**	0.020
		10	**TM5ACBM1110**	0.020
	Address setting	1	**TM5ACBM15**	0.020
		10	**TM5ACBM1510**	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	**TM5ACTB06**	0.016
		10	**TM5ACTB0610**	0.016
	12 contacts	1	**TM5ACTB12**	0.020
		10	**TM5ACTB1210**	0.020

Accessories

Description	Used for	Colour	Sold in lots of	Unit reference	Weight kg
Plain text cover holder (label-holder)	Marking the terminal blocks on the I/O channels	Transparent	100	**TM5ACTCH100**	0.002
Plain text cover holder locking clip *(Order with plain text cover holder TM5ACTCH100)*	Locking plain text cover holder TM5ACTCH100	Transparent	100	**TM5ACTLC100**	0.001
Precut legend strips of paper	Plain text cover holder TM5ACTCH100	White	100	**TM5ACTLS100**	0.001
Coloured plastic identifiers	Labelling 16 connection channel terminals	White	1	**TM5ACLITW1**	0.015
		Red	1	**TM5ACLITR1**	0.015
		Blue	1	**TM5ACLITB1**	0.015
Metal tool	Inserting/removing TM5ACLIT●1 identifiers	Black	1	**TM5ACLT1**	0.030
Retaining plates for bus bases	Held on the left side	White	10	**TM5ACLPL10**	0.004
	Held on the right side	White	10	**TM5ACLPR10**	0.004
Locking clips	For modules	Black	100	**TM5ACADL100**	0.001

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

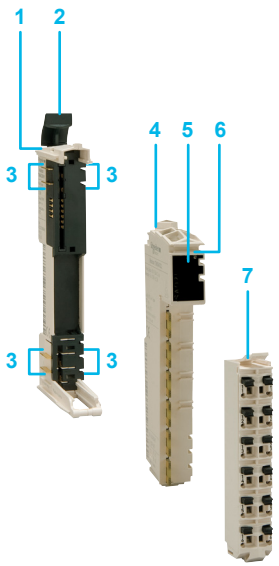
Distributed I/O
I/O expansion modules
Modicon TM5 analog modules and Modicon TM5 digital/analog module

Applications	Type of expansion module		**1 to 6 analog input channels**				
	Compatibility		**PacDrive 3 motion controllers**				
							
Channel connection			With removable spring terminal blocks (to be ordered separately)				
Analog inputs	Number		**2**	**2**	**4**	**4**	**2**	**4**
	Type		Voltage/current				Pt100/Pt1000 temperature probe	
	Range		- 10…+ 10 Vdc 0…20 mA/ 4…20 mA	- 10…+ 10 Vdc 0…20 mA	- 10…+ 10 Vdc 0…20 mA/ 4…20 mA	- 10…+ 10 Vdc 0…20 mA	- 200…+ 850°C	
	Resolution		12 bits + sign	15 bits + sign	12 bits + sign	15 bits + sign	16 bits	
	Sampling period	without filtering	300 µs	–	400 µs	–	–	
		with filtering	1 ms	50 µs	1 ms	50 µs	–	
Analog outputs	Number							
	Type							
	Range							
	Resolution							
	Response time							
Digital 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							
Digital outputs	Number							
	Nominal output voltage							
	Output current per channel							
	Output current per group of channels							
	Type of signal *(1)*							
	Type of wiring							
	Limit values							
	Short-circuit and overload protection							
Power supply			Internal					
Isolation	Channel-to-channel		Non-isolated					
	Between channel groups		–					
	Channel-to-bus		∿ 500 V RMS					
Type of electronic module			**TM5SAI2L**	**TM5SAI2H**	**TM5SAI4L**	**TM5SAI4H**	**TM5SAI2PH**	**TM5SAI4PH**
Associated bus base *(2)*			**TM5ACBM11, TM5ACBM15**					
Associated terminal block *(2)*			**TM5ACTB06, TM5ACTB12**		**TM5ACTB12**		**TM5ACTB06, TM5ACTB12**	**TM5ACTB12**
Pages			4/23					

(1) Source output: PNP output, sink output: NPN output.
(2) to be ordered separately.

		1 analog input channel and 4 digital input channels 1 analog input channel and 2 digital output channels		**2 to 4 analog output channels**			
							
With removable spring terminal blocks (to be ordered separately)							
2	**6**	**1**					
J, K, S, N thermocouple		Voltage/current					
Type J: - 210…+ 1200°C Type K: - 270…+ 1372°C Type S: - 50…+ 1768°C Type N: - 270…+ 1300°C		- 10...+ 10 Vdc 0…20 mA/4…20 mA					
16 bits		12 bits + sign					
–		400 ms					
–		1 ms max.					
		1	**2**	**2**	**4**	**4**	
		Voltage/current	Voltage/current				
		- 10…+ 10 Vdc 0…20 mA	- 10…+ 10 Vdc 0…20 mA				
		12 bits	12 bits + sign				
		1 ms max.	1 ms max.				
		4					
		24 V ⎓					
		Type 1					
		Sink					
		1-wire					
		⎓ 20.4... 28.8 V					
		3.3 mA					
		7.2 kΩ					
		⎓ 5 V max.					
		⎓ 15 V min.					
		2					
		24 V ⎓					
		0.5 A					
		1 A max.					
		Source					
		1-wire					
		⎓ 20.4...28.8 V					
		Yes					
Internal							
Non-isolated							
–							
∼ 500 V RMS							
TM5SAI2TH	**TM5SAI6TH**	**TM5SMM6D2L**	**TM5SAO2L**	**TM5SAO2H**	**TM5SAO4L**	**TM5SAO4H**	
TM5ACBM11, TM5ACBM15							
TM5ACTB06, TM5ACTB12		**TM5ACTB12**	**TM5ACTB06, TM5ACTB12**		**TM5ACTB12**		
4/23		4/15	4/23				

Distributed I/O
I/O expansion modules
Modicon TM5 analog modules



Presentation

TM5SAI●● analog modules are used to acquire various analog values encountered in industrial applications.
TM5SAO●●● Analog output modules are used to control preactuators in physical units, such as variable speed drives or valves and applications where process control is required. The output current or voltage is proportional to the numerical value defined by the user program.
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 module consists of three parts to be ordered separately *(1)*:
- 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 terminal
- 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 modules:
- 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 modules comprise:
1. A bus base
2. A mechanical locking lever for mounting/dismounting on a symmetrical rail
3. On each side of the base, a bus expansion 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 labelling (label-holder)
7. A removable spring terminal block with locking lever and slots for coloured identifiers

(1) Also sold in kits, see page 4/23.

Distributed I/O
I/O expansion modules
Modicon TM5 analog modules

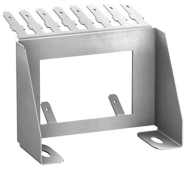
Device colour: white

TM5SAI●● TM5SAO●● TM5SAO●●

TM5ACBM●● TM5ACTB●●

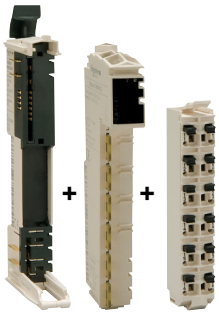
TM5ACTLC100 TM5ACTCH100

TM5ACLPL10 TM5ACLPR10



TM2XMTGB

TM200RSRCEMC



TM5SA●4●K

References

Analog input electronic modules

Number and type of inputs	Input range	Resolution	Reference	Weight kg
2 voltage/current inputs	- 10…+ 10 V DC, 0…20 mA/4…20 mA	12 bits + sign	**TM5SAI2L**	0.025
	- 10…+ 10 V DC, 0…20 mA	15 bits + sign	**TM5SAI2H**	0.025
4 voltage/current inputs	- 10…+ 10 Vdc, 0…20 mA/ 4…20 mA	12 bits + sign	**TM5SAI4L**	0.025
	- 10…+ 10 V DC, 0…20 mA	15 bits + sign	**TM5SAI4H**	0.025
2 Pt100/Pt1000 temperature probe inputs	- 200…+ 850°C	16 bits	**TM5SAI2PH**	0.025
4 Pt100/Pt1000 temperature probe inputs		16 bits	**TM5SAI4PH**	0.025
2 J, K, S, N thermocouple inputs	Type J: - 210…+ 1200°C Type K: - 270…+ 1372°C Type S: - 50…+ 1768°C Type N: - 270…+ 1300°C	16 bits	**TM5SAI2TH**	0.025
6 J, K, S, N thermocouple inputs		16 bits	**TM5SAI6TH**	0.025

Analog output electronic modules

Nber and type of O	Output range	Resolution	Reference	Weight kg
2 voltage/current outputs	- 10…+ 10 V DC, 0…20 mA	12 bits + sign	**TM5SAO2L**	0.025
		15 bits + sign	**TM5SAO2H**	0.025
4 voltage/current outputs	- 10…+ 10 V DC, 0…20 mA	12 bits + sign	**TM5SAO4L**	0.025
		15 bits + sign	**TM5SAO4H**	0.025

Bus bases

Power supply	Characteristics	Sold in lots of	Unit reference	Weight kg
24 V ⎓	–	1	**TM5ACBM11**	0.020
		10	**TM5ACBM1110**	0.020
	Address setting	1	**TM5ACBM15**	0.020
		10	**TM5ACBM1510**	0.020

Terminal blocks

Use	Type	Sold in lots of	Unit reference	Weight kg
For analog I/O electronic module, 24 V ⎓ power supply	6 contacts	1	**TM5ACTB06**	0.016
		10	**TM5ACTB0610**	0.016
	12 contacts	1	**TM5ACTB12**	0.020
		10	**TM5ACTB1210**	0.020

Accessories

Designation	Used for	Colour	Sold in lots of	Unit reference	Weight kg
Plain text cover holder (label-holder)	Marking the terminal blocks on the I/O channels	Transparent	100	**TM5ACTCH100**	0.002
Plain text cover holder locking clip *(Order with plain text cover holder TM5ACTCH100)*	Locking plain text cover holder TM5ACTCH100	Transparent	100	**TM5ACTLC100**	0.001
Precut legend strips of paper	Plain text cover holder TM5ACTCH100	White	100	**TM5ACTLS100**	0.001
Coloured plastic identifiers	Labelling 16 connection channel terminals	White	1	**TM5ACLITW1**	0.015
		Red	1	**TM5ACLITR1**	0.015
		Blue	1	**TM5ACLITB1**	0.015
Metal tool	Inserting/removing TM5ACLIT●1 identifiers	Black	1	**TM5ACLT1**	0.030
Retaining plates for bus bases	Held on the left side	White	10	**TM5ACLPL10**	0.004
	Held on the right side	White	10	**TM5ACLPR10**	0.004
Locking clips	For modules	Black	100	**TM5ACADL100**	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)	**TM2XMTGB**	0.045
Shielding connection clamps Sold in lots of 25	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	**TM200RSRCEMC**	–
Mounting kit (Sold in lots of 5)	For mounting the analog modules on a plate or panel	**TWDXMT5**	0.065

Analog I/O expansion module kits

Designation	Description	Reference	Weight kg
Kits including an analog input or output electronic module, a bus base and a terminal block	TM5SAI4L + TM5ACBM11 + TM5ACTB12	**TM5SAI4LK**	0.075
	TM5SAI4H + TM5ACBM11 + TM5ACTB12	**TM5SAI4HK**	0.075
	TM5SAO4L + TM5ACBM11 + TM5ACTB12	**TM5SAO4LK**	0.075

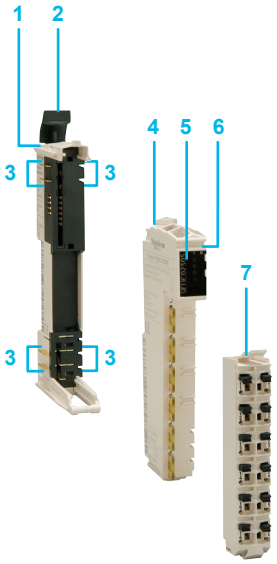
Distributed I/O
I/O expansion modules
Modicon TM5 expert modules

Applications	**Upcounting, downcounting, period measurement, frequency meter, frequency generator, axis following with encoder**	
Compatibility	**PacDrive 3 motion controllers**	
		
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	Sink
Type of input	1-, 2- or 3-wire	–
Nominal input voltage	24 V ⎓	24 V ⎓ asymmetrical
Voltage limit values	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 ⎓ auxiliary inputs 24 V ⎓ encoder power supply
Types of counter module	**TM5SDI2DF**	**TM5SE1IC01024**
Compatible bus base *(2)*	**TM5ACBM11, TM5ACBM15**	
Compatible terminal block *(2)*	**TM5ACTB12**	
Pages	4/27	

(1) Source output: PNP output, sink output: NPN output.
(2) To be ordered separately.

Upcounting, downcounting, period measurement, frequency meter, frequency generator, axis following with encoder		
PacDrive 3 motion controllers		
		
With removable spring terminal blocks (to be ordered separately)		
2	1	1
Incremental	Incremental	SSI absolute
Sink	RS422, Sink	Sink
–	–	–
24 V ⎓ asymmetrical	5 V ⎓ symetrical	5 V ⎓ symetrical
–	20.4... 28.8 V ⎓	20.4... 28.8 V ⎓
100 kHz	250 kHz	1 MHz
16/32 bits	16/32 bits	32 bits
2 x 24 V ⎓ auxiliary inputs 24 V ⎓ encoder power supply	2 x 24 V ⎓ auxiliary inputs	2 x 24 V ⎓ auxiliary inputs
TM5SE2IC01024	**TM5SE1IC02505**	**TM5SE1SC10005**
TM5ACBM11, TM5ACBM15		
TM5ACTB12		
4/27		

Distributed I/O
I/O expansion modules
Modicon TM5 Expert modules



Presentation

TM5SDI12DF and **TM5SE●●●●●●●** Expert modules for PacDrive 3 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 five counter modules differ in their frequency and their functions.

Expert electronic modules	No. of channels	Max. frequency	Integrated functions	Signal
TM5SDI12DF	2	50 kHz	Event counting, interval measurement	Sink
TM5SE1IC01024	1	100 kHz	2 x 24 V ⎓ auxiliary inputs 24 V ⎓ encoder power supply	Sink
TM5SE2IC01024	2	100 kHz	2 x 24 V ⎓ auxiliary inputs 24 V ⎓ encoder power supply	Sink
TM5SE1IC02505	1	250 kHz	2 x 24 V ⎓ auxiliary inputs ⎓ 5 V encoder power supply	Sink
TM5SE1SC10005	1	1 MHz	2 x 24 V ⎓ auxiliary inputs ⎓ 5 V SSI encoder power supply	Sink

The function parameters are set by configuration using SoMachine software.

Each Expert 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 terminal
- 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

TM5 Expert modules comprise:
1. A bus base
2. A mechanical locking lever for mounting/dismounting on a symmetrical rail
3. On each side of the base, a bus expansion 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 labelling (label-holder)
7. A removable spring terminal block with locking lever and slots for coloured identifiers

Distributed I/O
I/O expansion modules
Modicon TM5 Expert modules

Device colour: white


TM5SDI2DF

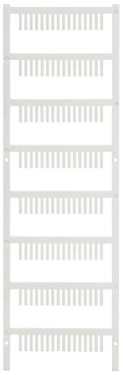

TM5SE●●●●●●●


TM5ACBM●●


TM5ACTB●●


TM5ACTLC100


TM5ACTCH100


TM5ACLITW1


TM5ACLT1


TM5ACLPL10


TM5ACLPR10


TM5ACADL100

References

Expert electronic modules

Counting frequency	Number of channels	Function	Reference	Weight kg
50 kHz	2	Event counting, interval measurement	**TM5SDI2DF**	0.025
100 kHz	1	2 x 24 V ⎓ auxiliary inputs 24 V ⎓ encoder power supply	**TM5SE1IC01024**	0.025
	2	2 x 24 V ⎓ auxiliary inputs 24 V ⎓ encoder power supply	**TM5SE2IC01024**	0.025
250 kHz	1	2 x 24 V ⎓ auxiliary inputs	**TM5SE1IC02505**	0,025
1 MHz	1	2 x 24 V ⎓ auxiliary inputs	**TM5SE1SC10005**	0,025

Bus bases

Power supply	Characteristics	Sold in lots of	Unit reference	Weight kg
24 V ⎓	–	1	**TM5ACBM11**	0.020
		10	**TM5ACBM1110**	0.020
	Address setting	1	**TM5ACBM15**	0.020
		10	**TM5ACBM1510**	0.020

Terminal blocks

Use	Description	Sold in lots of	Unit reference	Weight kg
For electronic counter module powered with 24 V ⎓	12 contacts	1	**TM5ACTB12**	0.020
		10	**TM5ACTB1210**	0.020

Accessories

Designation	Used for	Colour	Sold in lots of	Unit reference	Weight kg
Plain text cover holder (label-holder)	Marking the terminal blocks on the I/O channels	Transparent	100	**TM5ACTCH100**	0.002
Plain text cover holder locking clip *(Order with plain text cover holder TM5ACTCH100)*	Locking plain text cover holder TM5ACTCH100	Transparent	100	**TM5ACTLC100**	0.001
Precut legend strips of paper	Plain text cover holder TM5ACTCH100	White	100	**TM5ACTLS100**	0.001
Coloured plastic identifiers	Labelling 16 connection channel terminals	White	1	**TM5ACLITW1**	0.015
		Red	1	**TM5ACLITR1**	0.015
		Blue	1	**TM5ACLITB1**	0.015
Metal tool	Inserting/removing TM5ACLIT●1 identifiers	Black	1	**TM5ACLT1**	0.030
Retaining plates for bus bases	Held on the left side	White	10	**TM5ACLPL10**	0.004
	Held on the right side	White	10	**TM5ACLPR10**	0.004
Locking clips	For modules	Black	100	**TM5ACADL100**	0.001

Distributed I/O
I/O expansion modules
Modicon TM5 power distribution modules

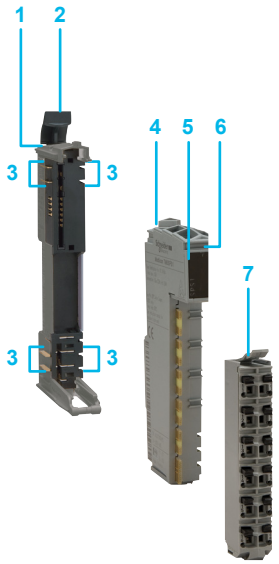
Presentation

TM5SP●● power distribution modules are intended to supply power to the I/O modules and/or the TM5 bus.

Four power distribution modules are available

Each 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 terminal
- 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



Description

Power distribution modules comprise:
1. A bus base
2. A mechanical locking lever for mounting/dismounting on a symmetrical rail
3. On each side of the base, a bus expansion 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 labelling (label-holder)
7. A removable spring terminal block with locking lever and slots for coloured identifiers

Distributed I/O
I/O expansion modules
Modicon TM5 power distribution modules

Device colour: grey

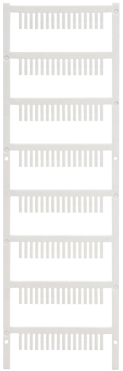

TM5SP●●


TM5ACBM●●


TM5ACTB●●


TM5ACTLC100


TM5ACTCH100


TM5ACLITW1


TM5ACLT1


TM5ACLPL10


TM5ACLPR10


TM5ACADL100

References

Power distribution electronic modules

Input power supply	Used for	Fuse	Reference	Weight kg
24 V ⎓	Supplying power to the I/O modules in 24 V ⎓ Total I max: 10 A	–	**TM5SPS1**	0.030
		6.3 A internal fuse	**TM5SPS1F**	0.030
	Supplying power □ to the I/O modules in 24 V ⎓ □ and the TM5 bus (Bus power supply: 7 W)	–	**TM5SPS2**	0.030
		6.3 A internal fuse	**TM5SPS2F**	0.030

Bus bases

Power supply	Characteristics	Sold in lots of	Unit reference	Weight kg
24 V ⎓	Isolated on the left on the power supply to the I/O modules in 24 V ⎓	1	**TM5ACBM01R**	0.020
		10	**TM5ACBM01R10**	0.020
	Isolated on the left on the power supply to the I/O modules in 24 V ⎓ Address setting	1	**TM5ACBM05R**	0.020
		10	**TM5ACBM05R10**	0.020

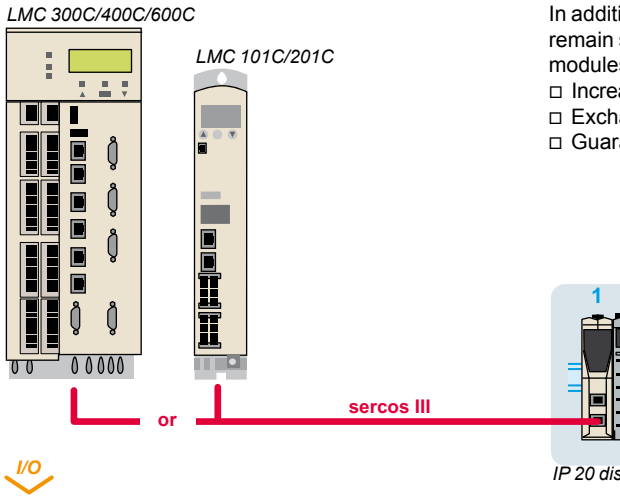
Terminal block

Use	Characteristics	Reference	Weight kg
For power distribution electronic module 24 V ⎓	12 contacts	**TM5ACTB12PS**	0.020

Accessories

Description	Used for	Colour	Sold in lots of	Unit reference	Weight kg
Plain text cover holder (label-holder)	Marking the terminal blocks on the I/O channels	Transparent	100	**TM5ACTCH100**	0.002
Plain text cover holder locking clip *(Order with plain text cover holder TM5ACTCH100)*	Locking plain text cover holder TM5ACTCH100	Transparent	100	**TM5ACTLC100**	0.001
Precut legend strips of paper	Plain text cover holder TM5ACTCH100	White	100	**TM5ACTLS100**	0.001
Coloured plastic identifiers	Labelling 16 connection channel terminals	White	1	**TM5ACLITW1**	0.015
		Red	1	**TM5ACLITR1**	0.015
		Blue	1	**TM5ACLITB1**	0.015
Metal tool	Inserting/removing TM5ACLIT●1 identifiers	Black	1	**TM5ACLT1**	0.030
Retaining plates for bus bases	Held on the left side	White	10	**TM5ACLPL10**	0.004
	Held on the right side	White	10	**TM5ACLPR10**	0.004
Locking clips	For modules	Black	100	**TM5ACADL100**	0.001

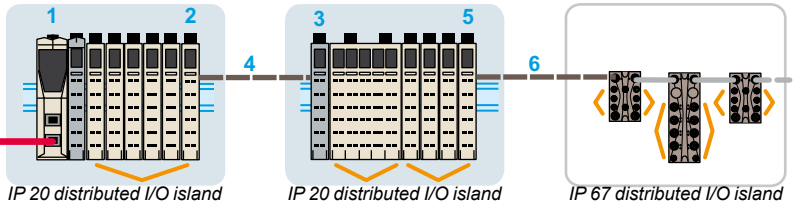
Distributed I/O
I/O expansion modules
Modicon TM5 transmitter and teceiver modules



Presentation

The PacDrive 3 motion controllers offer the possibility of creating IP 20 islands of distributed I/O via the TM5 interface module (see pages 2/9 & 4/2) and the TM5 expansion 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 modules and the sensors/preactuators
- Take full advantage of the TM5 expansion bus exchange performance
- Save the cost of a fieldbus connection

In addition, irrespective of the expansion module local or remote slot, the modules remain synchronized due to use of the same expansion bus. Modicon TM5 Remote modules are needed to:
- Increase the number of remote I/O on PacDrive 3 motion controllers beyond 100 m
- Exchange incoming and outgoing data produced by the I/O expansion modules
- Guarantee the performance of data exchanges

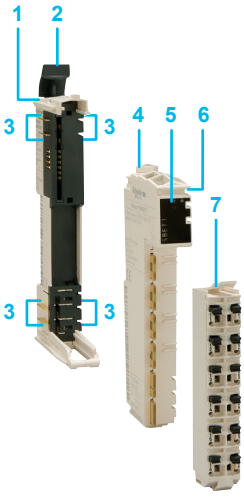


Four remote modules are available:
- The TM5 Interface module (1) for sercos III bus
- The **TM5SBET1** electronic module: transmitter (2), white, for data transmission between IP 20 islands
- The **TM5SBET7** electronic module: transmitter (5), white, for data transmission from an IP 20 island to an IP 67 island *(1)* via a TM7 expansion bus (6)
- The **TM5SBER2** electronic module: receiver (3), grey like the power distribution module.

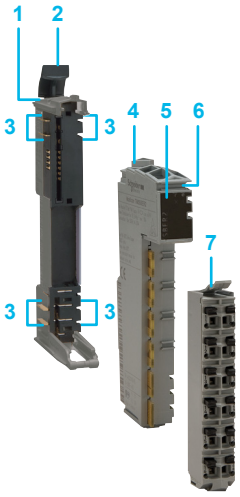
The transmitter (2) and receiver (3) modules are physically linked by the remote connection cable (4) **TCS XCNNXNX100**.
- The maximum distance between islands is 100 m and it is possible to connect up to 25 remote islands.
- Overall limitation is max 64 TM5 modules (slice type) or a mix of 64 TM5 modules (slice type) and TM7 blocks.

Each remote module consists of three parts to be ordered separately:
- An electronic module, either transmitter or receiver
- A bus base
- A connection block

These modules can be mechanically assembled before mounting on a symmetrical rail and offer the following advantages:
- Removable connector
- 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 module



Receiver module

Description

Transmitter and receiver modules comprise:
1. A bus base
2. A mechanical locking lever for mounting/dismounting on a symmetrical rail
3. On each side of the base, a bus expansion 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 labelling (label-holder)
7. A removable spring terminal block with locking lever and slots for coloured identifiers

(1) IP 67 islands. Composition: TM7 blocks and TM7 expansion bus. See page 4/32.

Distributed I/O
I/O expansion modules
Modicon TM5 transmitter and receiver modules



TM5SBET1 TM5SBET7


TM5SBER2


TM5ACBM1●

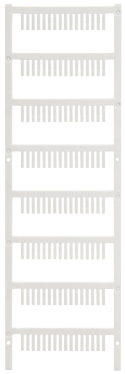

TM5ACBM0●R


TM5ACTB●●


TM5ACTB12PS


TM5ACTLC100


TM5ACTCH100


TM5ACLITW1


TM5ACLT1


TM5ACLPL10


TM5ACLPR10


TM5ACADL100

References

Remote I/O electronic modules

Description	Characteristics	Reference	Weight kg
Transmitter module	Electronic module for data transmission between IP 20 I/O islands Module colour: white	**TM5SBET1**	0.025
	Electronic module for data transmission between IP 20 I/O island and IP 67 I/O island Module colour: white Includes the power supply for the TM7 expansion modules	**TM5SBET7**	0.025
Receiver module	Data reception electronic module Power distribution module for electronic modules and the TM5 bus, 24 V ⎓ power supply Module colour: grey	**TM5SBER2**	0.025

Expansion bus

Description	Usage	Length	Reference	Weight kg
Remote connection cable	Bus extension by linking transmitter and receiver modules	100 m	**TCSXCNNXNX100**	8.800

Bus bases

Power supply	For use with	Sold in lots of	Unit reference	Weight kg
–	TM5SBET1 and TM5SBET7 transmitter modules	1	**TM5ACBM11**	0.020
		10	**TM5ACBM1110**	0.020
	TM5SBET1 and TM5SBET7 transmitter modules with address setting	1	**TM5ACBM15**	0.020
		10	**TM5ACBM1510**	0.020
24 V ⎓	TM5SBER2 receiver module	1	**TM5ACBM01R**	0.020
		10	**TM5ACBM01R10**	0.020
	TM5SBER2 receiver module, with address setting	1	**TM5ACBM05R**	0.020
		10	**TM5ACBM05R10**	0.020

Terminal blocks

For use with	Characteristics	Sold in lots of	Unit reference	Weight kg
Transmitter module TM5SBET1	6 contacts	1	**TM5ACTB06**	0.016
		10	**TM5ACTB0610**	0.016
Transmitter modules TM5SBET1 and TM5SBET7	12 contacts	1	**TM5ACTB12**	0.020
		10	**TM5ACTB1210**	0.020
Receiver module TM5SBER2	12 contacts	1	**TM5ACTB12PS**	0.020

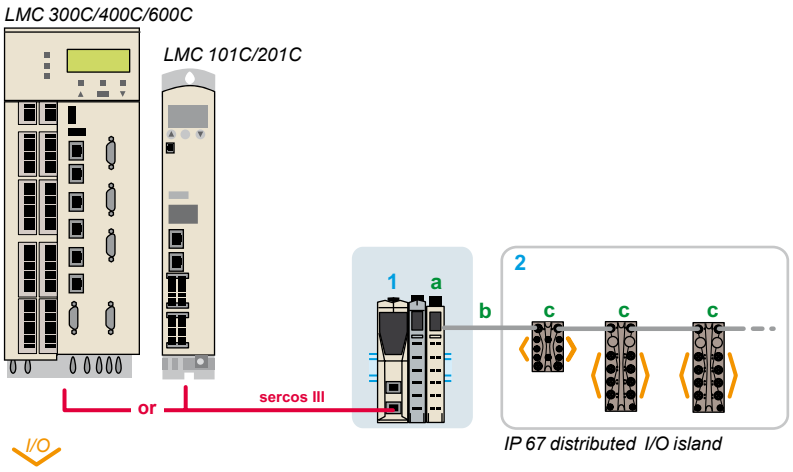
Accessories

Description	Used for	Colour	Sold in lots of	Unit reference	Weight kg
Plain text cover holder (label-holder)	Marking the connection blocks on the I/O channels	Transparent	100	**TM5ACTCH100**	0.002
Plain text cover holder locking clip *(Order with plain text cover holder TM5ACTCH100)*	Locking plain text cover holder TM5ACTCH100	Transparent	100	**TM5ACTLC100**	0.001
Precut legend strips of paper	Plain text cover holder TM5ACTCH100	White	100	**TM5ACTLS100**	0.001
Coloured plastic identifiers	Marking the 16 connection channel terminals	White	1	**TM5ACLITW1**	0.015
		Red	1	**TM5ACLITR1**	0.015
		Blue	1	**TM5ACLITB1**	0.015
Metal tool	Inserting/removing TM5ACLIT●1 identifiers	Black	1	**TM5ACLT1**	0.030
Retaining plates for bus bases	Held on the left side	White	10	**TM5ACLPL10**	0.004
	Held on the right side	White	10	**TM5ACLPR10**	0.004
Locking clips	For modules	Black	100	**TM5ACADL100**	0.001

Distributed I/O
I/O expansion modules
Modicon TM7 blocks

Presentation

To enhance its “Flexible machine Control” concept, Schneider Electric offers Modicon TM7 IP 67 blocks for mounting outside electrical cabinets, directly on the installation.
The IP 67 protection of these blocks enables them to be used within processes or machines in harsh environments (splashing water, oil, dust, etc.).
They have the following characteristics:
- Dust and damp proof
- Robust and compact
- Rapid wiring, economical to use



IP 67 distributed I/O island

1 TM5 interface module for sercos III bus + transmitter module TM5SBET7 (**a**) *(1)*.
2 IP 67 distributed I/O islands. Composition: TM7 expansion bus cable (**b**) + TM7 digital/analog I/O expansion blocks (**c**).

Modicon TM7 block offer

Modicon TM7 IP 67 blocks are available in various compositions and for different functions.

Digital blocks

The offer comprises:
- Three input blocks
- Three configurable I/O blocks
- One output block

Analog blocks

The offer comprises:
- Two expansion blocks with 4 inputs for connecting 4 sensors
- Two expansion blocks with 4 outputs for connecting 4 actuators
- Two mixed expansion blocks with 2 inputs and 2 outputs
- Two expansion blocks with 4 resistive temperature probe or thermocouple temperature measurement channels

Power distribution block

A power distribution block is available as an option to supply I/O expansion blocks on the TM7 expansion bus.
This power distribution block is necessary to avoid voltage drops in the following situation: with a TM5SBET7 transmitter module *(1)* followed by 6 *(2)* TM7 I/O expansion blocks (mounted vertically)
Note: These limit must be weighted according to the cable lengths.
Consult the SPIG (System Planning and Installation Guide) for the Modicon TM7 IP 67 block offer on www.schneider-electric.com

Connection accessories

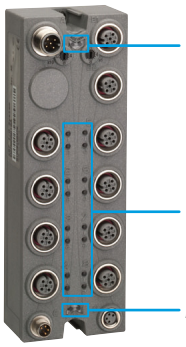
A range of cables and connectors is available for connecting the:
- TM7 expansion bus
- I/O
- 24 V ⎓ power supplies on TM7 expansion blocks

(1) TM5 transmitter (see page 4/30).
(2) Minimum number.


Digital I/O expansion block


Analog I/O expansion block


Power distribution block



Diagnostics functions

The diagnostic monitoring of faults is indicated by LEDs on expansion blocks and power distribution blocks and informs the control system (PacDrive 3 motion controllers) via the TM7 bus.
Each Modicon TM7 block has LEDs
- To display the status of the TM7 bus, the channel and the power supply
- For quick, precise location of a fault

There are several levels of diagnostics:
- Diagnostics per channel:
  - State of inputs
  - State of outputs
- Diagnostics per expansion block:
  - Sensor/actuator power supply present
  - Undervoltage fault on the I/O power supply
  - Analog input diagnostics
  - Short-circuit or overload on one or more digital outputs
- Communication bus diagnostics:
  - On TM7 expansion bus (I/O expansion blocks)
- Diagnostics of the power supply via the TM7 bus (I/O expansion block)

Specifications

Conformity with standards		IEC 61131-2
Product certifications		CE, cURus, GOST-R and c-Tick, ATEX (II 3g EEx nA II T5, IP 67, Ta = 0…60°C)
Temperature	Operation	- 10…+ 60°C (14...140°F)
	Storage	- 25…+ 85°C (- 13...185°F)
Relative humidity		5…95% (without condensation)
Degree of pollution conforming to IEC 60664		2
Degree of protection conforming to IEC 61131-2		IP 67
Altitude	Operation	0...2000 m (0...6560 ft.) *(1)*
	Storage	0...3000 m (0...9842 ft.)
Vibration resistance conforming to IEC 60721-3-5 Class 5M3	DIN rail mounted	7.5 mm (0.295 in.) 2...8 Hz fixed amplitude 20 m/s² (2 gn) 8...200 Hz fixed acceleration 40 m/s² (4 gn) 200...500 Hz fixed acceleration
Shock resistance conforming to IEC 60721-3-5 Class 5M3		300 m/s² (30 gn) for 11 ms, 1/2 sine wave, type 1 shock
Connectors	Type	M8 and/or M12
	Number of operations	50 min.

Electromagnetic compatibility

Electrostatic discharges conforming to IEC/EN 61000-4-2	± 8 kV, criterion B (air discharge) ± 4 kV, criterion B (direct discharge)
Electromagnetic fields conforming to IEC/EN 61000-4-3	10 V/m, amplitude modulation 80% at 1 kHz (80 MHz...2 GHz) 1 V/m (2...2.7 GHz)
Fast transients conforming to IEC/EN 61000-4-4	Supply: 2 kV, criterion B I/O: 1 kV, criterion B Shielded cable: 1 kV, criterion B Repetition frequency: 5 and 100 kHz
Immunity to overvoltages, 24 V ⎓ circuit conforming to IEC/EN 61000-4-5	Supply: □ 1 kV (12 Ω), criterion B in common mode □ 0.5 kV (2 Ω), criterion B in differential mode Unshielded links: □ 1 kV (42 Ω), criterion B in common mode □ 0.5 kV (42 Ω), criterion B in differential mode Shielded links: □ 1 kV (12 Ω), criterion B in common mode □ 0.5 kV (2 Ω), criterion B in differential mode
Induced magnetic fields conforming to IEC/EN 61000-4-6	Line supply, I/O signal connections > 10 m (32.8 ft.) Functional earth connection: 10 Vrms, criterion A, amplitude modulation 80% at 1 kHz (150...80 MHz)
Conducted emissions conforming to EN 55011 (IEC/CISPR11)	150...500 kHz, peak 79 dB µV 500 kHz...30 MHz, peak 73 dB µV
Radiated emissions conforming to EN 55011 (IEC/CISPR11)	30...230 MHz, 10 m (32.8 ft) at 40 dB (µV/m) 230 MHz...1 GHz, 10 m (32.8 ft) at 47 dB (µV/m)

(1) Temperature reduction of 0.5°C (32.9°F) for every additional 100 m (328 ft.) altitude above 2000 m (6560 ft.).
Refer to the instruction sheet for each product, downloadable from our website www.schneider-electric.com

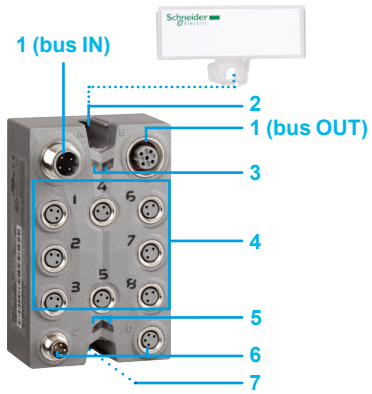
Distributed I/O
I/O expansion modules
Modicon TM7 blocks: digital blocks

Applications			Digital I/O expansion blocks		
					
Degree of protection			IP 67	IP 67	IP 67
Type of housing			Plastic	Plastic	Plastic
Modularity (number of channels)	Max. number of digital channels		8	16	16
	Digital inputs		8	16	16
	Digital outputs		–	–	–
Digital inputs	Voltage/current		24 V ⎓/7 mA	24 V ⎓/7 mA	24 V ⎓/7 mA
	Type		Sink *(1)*	Sink *(1)*	Sink *(1)*
	IEC 61131-2 conformity		Type 1	Type 1	Type 1
Digital outputs	Voltage		–	–	–
	Type		–	–	–
	Current per output		–	–	–
	Current per expansion block		–	–	–
Sensor/actuator power supply	Voltage		24 V ⎓	24 V ⎓	24 V ⎓
	Max. current		500 mA for all channels	500 mA for all channels	500 mA for all channels
	Protection against		Overloads, short-circuits and reverse polarity	Overloads, short-circuits and reverse polarity	Overloads, short-circuits and reverse polarity
Connection	TM7 expansion bus	Bus input connector	B-coded 4-way male M12	B-coded 4-way male M12	B-coded 4-way male M12
		Bus output connector	B-coded 4-way female M12	B-coded 4-way female M12	B-coded 4-way female M12
	Digital I/O channels	Sensor connector	3-way female M8, 1 channel per connector	3-way female M8, 1 channel per connector	A-coded 5-way female M12, 2 channels per connector
		Actuator connector	–	–	–
	Expansion block power supply	Input connector	4-way male M8	4-way male M8	4-way male M8
		Output connector	4-way female M8	4-way female M8	4-way female M8
Diagnostics	By expansion block		Yes	Yes	Yes
	By channel		Yes	Yes	Yes
	By communication on TM7 bus		Yes	Yes	Yes
Type of expansion block			**TM7BDI8B**	**TM7BDI16B**	**TM7BDI16A**
Pages			4/37	4/37	4/37

(1) Sink inputs: positive logic
(2) Source outputs: positive logic

			
IP 67	IP 67	IP 67	IP 67
Plastic	Plastic	Plastic	Plastic
8	8	16	16
–	0…8 software-configurable	0…16 software-configurable	0…16 software-configurable
8	0…8 software-configurable	0…16 software-configurable	0…16 software-configurable
–	24 V ⎓/4.4 mA	24 V ⎓/4.4 mA	24 V ⎓/4.4 A max.
–	Sink *(1)*	Sink *(1)*	Sink *(1)*
–	Type 1	Type 1	Type 1
24 V ⎓	24 V ⎓	24 V ⎓	24 V ⎓
Transistor/Source *(2)*	Transistor/Source *(2)*	Transistor/Source *(2)*	Transistor/Source *(2)*
2 A max.	0.5 A max.	0.5 A max.	0.5 A max.
8 A max.	4 A max.	8 A max.	8 A max.
24 V ⎓	24 V ⎓	24 V ⎓	24 V ⎓
500 mA for all channels	500 mA for all channels	500 mA for all channels	500 mA for all channels
Overloads, short-circuits and reverse polarity	Overloads, short-circuits and reverse polarity	Overloads, short-circuits and reverse polarity	Overloads, short-circuits and reverse polarity
B-coded 4-way male M12	B-coded 4-way male M12	B-coded 4-way male M12	B-coded 4-way male M12
B-coded 4-way female M12	B-coded 4-way female M12	B-coded 4-way female M12	B-coded 4-way female M12
–	3-way female M8, 1 channel per connector	A-coded 5-way female M12, 2 channels per connector	3-way female M8, 1 channel per connector
3-way female M8, 1 channel per connector	3-way female M8, 1 channel per connector	5-way female M12, 2 channels per connector	3-way female M8, 1 channel per connector
4-way male M8	4-way male M8	4-way male M8	4-way male M8
4-way female M8	4-way female M8	4-way female M8	4-way female M8
Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes
TM7BDO8TAB	**TM7BDM8B**	**TM7BDM16A**	**TM7BDM16B**
4/37	4/37	4/37	4/37

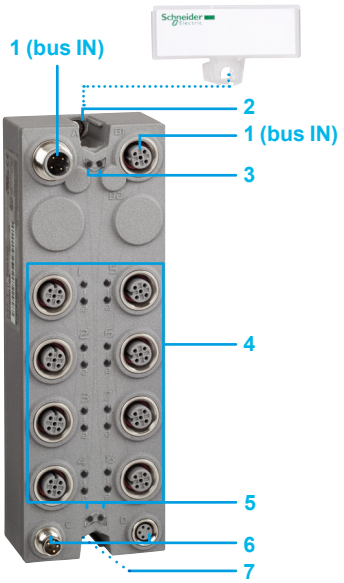
Distributed I/O
I/O expansion modules
Modicon TM7 blocks: digital blocks



Description

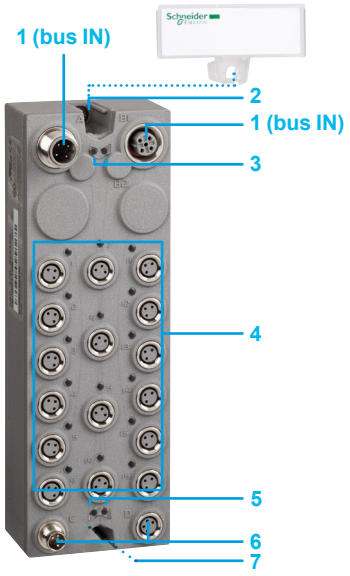
Digital I/O expansion blocks

8-channel digital I/O expansion blocks have the following on the front panel:
1. A male M12 connector (bus IN) and a female M12 connector (bus OUT) for connecting the TM7 expansion bus
2. A slot for the expansion block label *(1)*
3. Two bus diagnostic LEDs
4. Eight female M8 connectors for connecting sensors and actuators with LEDs for indicating channel status
5. Two LEDs indicating the status of the sensor and actuator 24 V ⎓ power supplies
6. Two M8 connectors for connecting the 24 V ⎓ sensor and actuator power supplies: male for PWR IN, female for PWR OUT
7. Fixing using two Ø 4 screws (not supplied) and connection of the functional earth when fixing the block on a metal support



16-channel digital I/O expansion blocks have the following on the front panel:
1. A male M12 connector (bus IN) and a female M12 connector (bus OUT) for connecting the TM7 expansion bus
2. A slot for the expansion block label *(1)*
3. Two bus diagnostic LEDs
4. Eight M12 connectors (2 channels per connector) or sixteen M8 connectors for connecting sensors and actuators with LEDs for indicating channel status
5. Two LEDs indicating the status of the sensor and actuator 24 V ⎓ power supplies
6. Two M8 connectors for connecting the 24 V ⎓ sensor and actuator power supplies: male for PWR IN, female for PWR OUT
7. Fixing using two Ø 4 screws (not supplied) and connection of the functional earth when fixing the block on a metal support

(1) Label-holder supplied with IP 67 block.



Distributed I/O
I/O expansion modules
Modicon TM7 blocks: digital blocks

TM7BDI8B, TM7BDO8TAB, TM7BDM8B

TM7BDM16B, TM7BDI16B

TM7BDI16A, TM7BDM16A

Digital I/O expansion blocks

Max. no. of channels	Number, type of inputs *(1)*	Number, type of outputs *(2)*	Sensor and actuator connection	Communication bus	Reference	Weight kg
8 input	8, sink *(3)*	–	8 x female M8 connectors	TM7 bus	**TM7BDI8B**	0.180
16 input	16, sink *(3)*	–	16 x female M8 connectors	TM7 bus	**TM7BDI16B**	0.320
	16, sink *(3)*	–	8 x female M12 connectors	TM7 bus	**TM7BDI16A**	0.320
8 output	–	8, transistor/ source *(4)*, 2 A max.	8 x female M8 connectors	TM7 bus	**TM7BDO8TAB**	0.185
8 configurable I/O	0...8, sink *(3)*	0...8, transistor/ source *(4)*, 0.5 A max.	8 x female M8 connectors	TM7 bus	**TM7BDM8B**	0.190
16 configurable I/O	0...16, sink *(3)*	0...16, transistor/ source *(4)*, 0.5 A max.	8 x female M12 connectors	TM7 bus	**TM7BDM16A**	0.320
			16 x female M8 connectors	TM7 bus	**TM7BDM16B**	0.320

(1) 24 V ⎓ IEC type 1
(2) 24 V ⎓
(3) Sink inputs: positive logic
(4) Source outputs: positive logic

Architecture, Connecting cables, Connection accessories, Separate parts

See pages 4/42 and 4/43

Configuration software

- SoMachine software, please consult our website www.schneider-electric.com
- Performance distributed I/O configuration software, please consult our website www.schneider-electric.com

Distributed I/O
I/O expansion modules
Modicon TM7 blocks: analog blocks

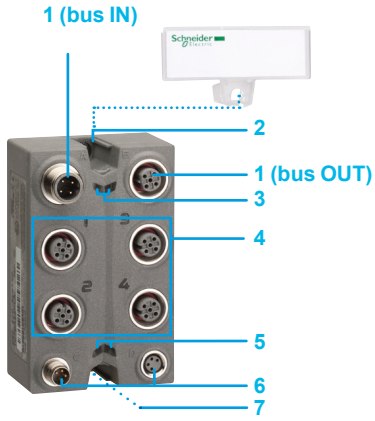
Applications			Analog I/O expansion blocks		
					
Degree of protection			IP 67	IP 67	IP 67
Type of housing			Plastic	Plastic	Plastic
Modularity (number of channels)	Max. number of analog channels		4	4	4
	Analog inputs		4	4	–
	Temperature inputs		–	–	4
	Analog outputs		–	–	–
Inputs	Type		Voltage - 10…+ 10 V ⎓	Current 0…20 mA	Pt 100 temperature probe, Pt 1000 temperature probe, KTY 10 silicon temperature probe, KTY 84 silicon temperature probe, Resistance 0...3276 Ohm
	Resolution		11 bits + sign	12 bits	16 bits
Analog outputs	Type		–	–	–
	Resolution		–	–	–
	Current per expansion block		–	–	–
Sensor/actuator power supply	Voltage		24 V ⎓	24 V ⎓	–
	Max. current		500 mA for all channels	500 mA for all channels	–
	Protection against		Overloads, short-circuits and reverse polarity	Overloads, short-circuits and reverse polarity	–
Connection	TM7 expansion bus	Bus input connector	4-way male M12 B-coded	4-way male M12 B-coded	4-way male M12 B-coded
		Bus output connector	4-way female M12 B-coded	4-way female M12 B-coded	4-way female M12 B-coded
	Analog I/O channels	Sensor connector	5-way female M12 A-coded	5-way female M12 A-coded	5-way female M12 A-coded
		Actuator connector	–	–	–
	Expansion block power supply	Input connector	4-way male M8	4-way male M8	4-way male M8
		Output connector	4-way female M8	4-way female M8	4-way female M8
Diagnostics	By expansion block		Yes	Yes	Yes
	By channel		Yes	Yes	Yes
	By communication on TM7 bus		Yes	Yes	Yes
Type of expansion block			**TM7BAI4VLA**	**TM7BAI4CLA**	**TM7BAI4TLA**
Pages			4/40		





IP 67	IP 67	IP 67	IP 67	IP 67
Plastic	Plastic	Plastic	Plastic	Plastic
4	4	4	4	4
–	–	–	2	2
4	–	–	–	–
–	4	4	2	2
J, K, S thermocouple Voltage 0...65536 µV	–	–	Voltage - 10…+ 10 V ⎓	Current 0…20 mA
16 bits	–	–	11 bits + sign	12 bits
–	Voltage - 10…+ 10 V ⎓	Current 0…20 mA	Voltage - 10…+ 10 V ⎓	Current 0…20 mA
–	11 bits + sign	12 bits	11 bits + sign	12 bits
–	–	–	–	–
–	24 V ⎓	24 V ⎓	24 V ⎓	24 V ⎓
–	500 mA for all channels	500 mA for all channels	500 mA for all channels	500 mA for all channels
–	Overloads, short-circuits and reverse polarity	Overloads, short-circuits and reverse polarity	Overloads, short-circuits and reverse polarity	Overloads, short-circuits and reverse polarity
4-way male M12 B-coded	4-way male M12 B-coded	4-way male M12 B-coded	4-way male M12 B-coded	4-way male M12 B-coded
4-way female M12 B-coded	4-way female M12 B-coded	4-way female M12 B-coded	4-way female M12 B-coded	4-way female M12 B-coded
A-coded 5-way female M12	–	–	A-coded 5-way female M12	A-coded 5-way female M12
–	A-coded 5-way female M12	A-coded 5-way female M12	A-coded 5-way female M12	A-coded 5-way female M12
4-way male M8	4-way male M8	4-way male M8	4-way male M8	4-way male M8
4-way female M8	4-way female M8	4-way female M8	4-way female M8	4-way female M8
Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes	Yes
TM7BAI4PLA	**TM7BAO4VLA**	**TM7BAO4CLA**	**TM7BAM4VLA**	**TM7BAM4CLA**

Distributed I/O
I/O expansion modules
Modicon TM7 blocks: analog blocks



Description

Analog I/O expansion blocks

Analog I/O expansion blocks have the following on the front panel:

1 A male M12 connector (bus IN) and a female M12 connector (bus OUT) for connecting the TM7 expansion bus
2 A slot for the expansion block label *(1)*
3 Two bus diagnostic LEDs
4 Four female M12 connectors for connecting sensors and/or actuators with LEDs for indicating channel status
5 Two LEDs indicating the status of the sensor and actuator 24 V ⎓ power supplies
6 Two M8 connectors for connecting the 24 V ⎓ sensor and actuator power supplies: male for PWR IN, female for PWR OUT
7 Fixing using two Ø 4 screws (not supplied) and connection of the functional earth when fixing the block on a metal support

(1) Label-holder supplied with IP 67 block.

TM7BAI4●LA, TM7BAO4●LA, TM7BAM4●LA

Analog I/O expansion blocks

Max. no. of channels	Input range	Output range	Resolution	Sensor and actuator connection	Communication bus	Reference	Weight kg
4 input	Voltage	–	11 bits + sign	4 female M12 connectors	TM7 bus	**TM7BAI4VLA**	0.200
	Current 0…20 mA	–	12 bits	4 female M12 connectors	TM7 bus	**TM7BAI4CLA**	0.200
	Pt 100, Pt 1000 temperature probe KTY 10, KTY 84 silicon temperature probe Resistance 0...3276 Ω	–	16 bits	4 female M12 connectors	TM7 bus	**TM7BAI4TLA**	0.200
	J, K, S thermocouple Voltage 0...65536 µV	–	16 bits	4 female M12 connectors	TM7 bus	**TM7BAI4PLA**	0.200
4 output	–	Voltage - 10…+ 10 V ⎓	11 bits + sign	4 female M12 connectors	TM7 bus	**TM7BAO4VLA**	0.200
	–	Current 0…20 mA	12 bits	4 female M12 connectors	TM7 bus	**TM7BAO4CLA**	0.200
2 input + 2 output	Voltage - 10…+ 10 V ⎓	Voltage - 10…+ 10 V ⎓	11 bits + sign	4 female M12 connectors	TM7 bus	**TM7BAM4VLA**	0.200
	Current 0…20 mA	Current 0…20 mA	12 bits	4 female M12 connectors	TM7 bus	**TM7BAM4CLA**	0.200

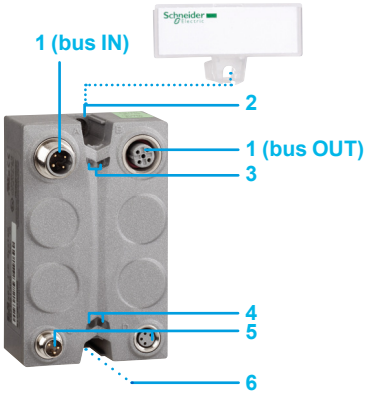
Architecture, Connecting cables, Connection accessories, Separate parts

See pages 4/42 and 4/43

Configuration software

- SoMachine software, please consult our website www.schneider-electric.com
- Performance distributed I/O configuration software, please consult our website www.schneider-electric.com

Distributed I/O
I/O expansion modules
Modicon TM7 blocks: power distribution block



Description

Power distribution block

The power distribution block has the following on the front panel:

1 A male M12 connector (bus IN) and a female M12 connector (bus OUT) for connecting the TM7 expansion bus
2 A slot for the power distribution block label *(1)*
3 Two TM7 bus diagnostic LEDs
4 Two LEDs indicating the status of the sensor and actuator 24 V ⎓ power supplies
5 Two M8 connectors for connecting the 24 V ⎓ sensor and actuator power supplies: male for PWR IN, female for PWR OUT
6 Fixing using two Ø 4 screws (not supplied) and connection of the functional earth when fixing the block on a metal support

(1) Label-holder supplied with IP 67 block.

TM7SPS1A

Power distribution block

Function	Connection	Communication bus	Reference	Weight kg
24 V ⎓/15 W power supply for I/O expansion blocks on the TM7 expansion bus	Supply: 2x M8 connectors, 1 male and 1 female TM7 bus: 2x M12 connectors, 1 male and 1 female	TM7 bus	**TM7SPS1A**	0.190

Architecture, Connecting cables, Connection accessories, Separate parts

See pages 4/42 and 4/43

Configuration software

- SoMachine software, please consult our website www.schneider-electric.com
- Performance distributed I/O configuration software, please consult our website www.schneider-electric.com

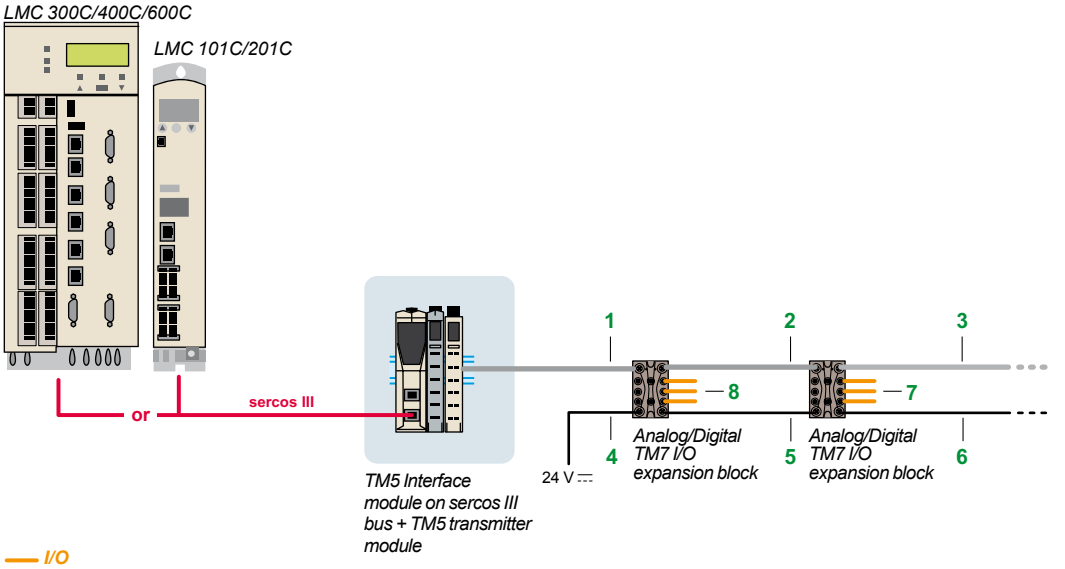
Associated offers

Modicon TM7 blocks

TM7 expansion bus

Cables, connection accessories, separate parts

TM7 expansion bus architecture



Connection accessories

Designation	Description	Item no.	Length (m)	Reference	Weight kg
TM7 expansion bus cables					
TM7 expansion bus cables (bus IN)	Equipped with one B-coded 4-way angled female M12 connector and 1 flying lead	1	1	**TCSXCN2FNX1E**	0.089
			3	**TCSXCN2FNX3E**	0.195
			10	**TCSXCN2FNX10E**	0.563
			25	**TCSXCN2FNX25E**	1.352
	Equipped with one B-coded 4-way straight femaleM12 connector and 1 flying lead	1	1	**TCSXCN1FNX1E**	0.089
			3	**TCSXCN1FNX3E**	0.195
			10	**TCSXCN1FNX10E**	0.563
			25	**TCSXCN1FNX25E**	1.352
TM7 bus daisy chain cables	Equipped with two B-coded 4-way angled M12 connectors, 1 male and 1 female, at each end	2	0.3	**TCSXCN2M2F03E**	0.090
			1	**TCSXCN2M2F1E**	0.127
			2	**TCSXCN2M2F2E**	0.179
			5	**TCSXCN2M2F5E**	0.337
			10	**TCSXCN2M2F10E**	0.600
			15	**TCSXCN2M2F15E**	0.863
	Equipped with two B-coded 4-way straight M12 connectors, 1 male and 1 female, at each end	2	0.3	**TCSXCN1M1F03E**	0.090
			1	**TCSXCN1M1F1E**	0.127
			2	**TCSXCN1M1F2E**	0.179
			5	**TCSXCN1M1F5E**	0.337
			10	**TCSXCN1M1F10E**	0.600
			15	**TCSXCN1M1F15E**	0.863
TM7 expansion bus cables (bus OUT)	Equipped with one B-coded 4-way angled male M12 connector and 1 flying lead	3	1		0.089
			3	**TCSXCN2MNX3E**	0.195
			10	**TCSXCN2MNX10E**	0.563
			25	**TCSXCN2MNX25E**	1.352
	Equipped with one B-coded 4-way straight male M12 connector and 1 flying lead	3	1	**TCSXCN1MNX1E**	0.089
			3	**TCSXCN1MNX3E**	0.195
			10	**TCSXCN1MNX10E**	0.563
			25	**TCSXCN1MNX25E**	1.352
Power distribution cables					
Power IN power distribution cables	Equipped with one 4-way angled female M8 connector and 1 flying lead	4	1	**TCSXCNEFNX1V**	0.041
			3	**TCSXCNEFNX3V**	0.105
			10	**TCSXCNEFNX10V**	0.329
			25	**TCSXCNEFNX25V**	0.809
	Equipped with one 4-way straight female M8 connector and 1 flying lead	4	1	**TCSXCNDFNX1V**	0.041
			3	**TCSXCNDFNX3V**	0.105
			10	**TCSXCNDFNX10V**	0.329
			25	**TCSXCNDFNX25V**	0.809

TCSXCN1M1F●●E

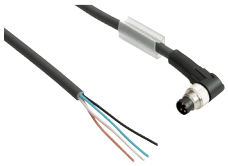
TCSXCN1MNX●●E

Associated offers

Modicon TM7 blocks
TM7 expansion bus
Cables, connection accessories, separate parts

TCSXCNDFNX●●V

TCSXCNDMDF●●V



TCSXCNEXNX●●V

TCSXCN1M●●SA

Connection accessories (continued)

Designation	Description	Item no.	Length (m)	Reference	Weight kg
Power distribution cables (continued)					
Power daisy chain cables	Equipped with two 4-way angled M8 connectors, 1 male and 1 female, at each end	5	0.3	**TCSXCNEMEF03V**	0.028
			1	**TCSXCNEMEF1V**	0.050
			2	**TCSXCNEMEF2V**	0.082
			5	**TCSXCNEMEF5V**	0.178
			10	**TCSXCNEMEF10V**	0.338
			15	**TCSXCNEMEF15V**	0.498
	Equipped with two 4-way straight M8 connectors, 1 male and 1 female, at each end	5	0.3	**TCSXCNDMDF03V**	0.105
			1	**TCSXCNDMDF1V**	0.329
			2	**TCSXCNDMDF2V**	0.809
			5	**TCSXCNDMDF5V**	0.105
			10	**TCSXCNDMDF10V**	0.329
			15	**TCSXCNDMDF15V**	0.809
Power OUT power distribution cables	Equipped with one 4-way angled male M8 connector and 1 flying lead	6	1	**TCSXCNEXNX1V**	0.041
			3	**TCSXCNEXNX3V**	0.105
			10	**TCSXCNEXNX10V**	0.329
			25	**TCSXCNEXNX25V**	0.809
	Equipped with one 4-way straight male M8 connector and 1 flying lead	6	1	**TCSXCNDMNX1V**	0.041
			3	**TCSXCNDMNX3V**	0.105
			10	**TCSXCNDMNX10V**	0.329
			25	**TCSXCNDMNX25V**	0.809
Cables for connecting analog sensors and actuators					
Cables for connecting sensors and actuators	Equipped with one A-coded 5-way angled male M12 connector and 1 flying lead	7	2	**TCSXCN2M2SA**	0.143
			5	**TCSXCN2M5SA**	0.258
			15	**TCSXCN2M15SA**	0.546
	Equipped with one A-coded 5-way straight male M12 connector and 1 flying lead	7	2	**TCSXCN1M2SA**	0.143
			5	**TCSXCN1M5SA**	0.258
			15	**TCSXCN1M15SA**	0.546
Cables for connecting digital sensors and actuators					
Please consult our "Cabling accessories OsiSense XZ" catalogue, available on tesensors.com website		8			

Connection accessories

Description	Composition	Reference	Weight kg
Connector with temperature probe for measurement by thermocouple	For use with the TM7 BAI4PLA expansion block for measurement with compensation of the temperature of the connector. Equipped with 1x5-way male M12 connector	**TM7ACTHA**	0.100

Separate parts

Description	Composition	Sold by lot of	Unit reference	Weight kg
Sealing plugs *(1)*	For M8 connector for Modicon TM7 IP 67 blocks	50	**TM7ACCB**	0.100
	For M12 connector for Modicon TM7 IP 67 blocks	50	**TM7ACCA**	0.100
Mounting plate on ⊔ symmetrical DIN rail	For Modicon TM7 IP 67 blocks	–	**TM7ACMP**	0.020
	For Modicon TM7 IP 67 blocks	10	**TM7ACMP10**	0.200
Set of two screwdrivers	For tightening the rings on M8 and M12 connectors to the correct torque		**TM7ACTW**	0.198

(1) The use of sealing plugs ensures that unused connectors on Modicon TM7 IP 67 blocks have IP 67 protection.

TM7ACMP

Schneider Electric Industries SAS

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

www.schneider-electric.com

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Photos: Schneider Electric

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