Machine Structure™

PacDrive 3 automation solution

Catalog

March 2015

Schneider Electric™

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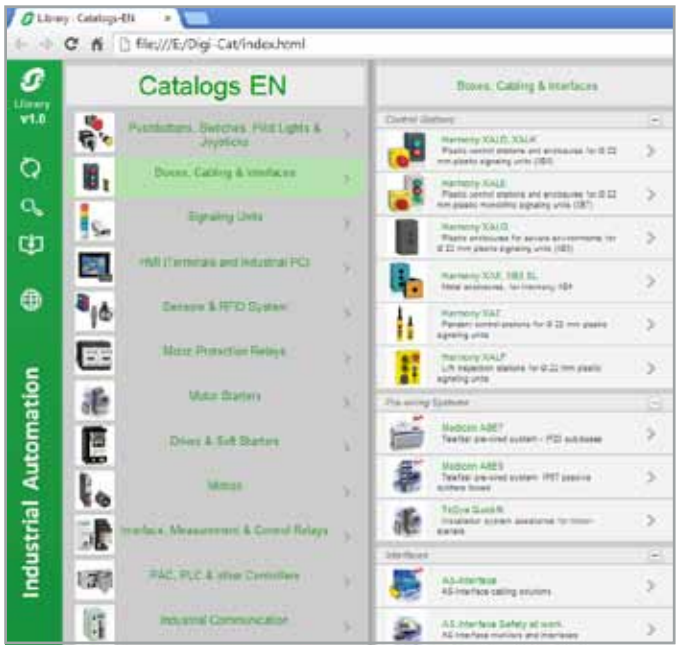

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PacDrive 3 automation solution

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General presentation

Technical information on all of the products listed in this catalog is available at: www.schneider-electric.com

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PacDrive 3 automation solution
General presentation

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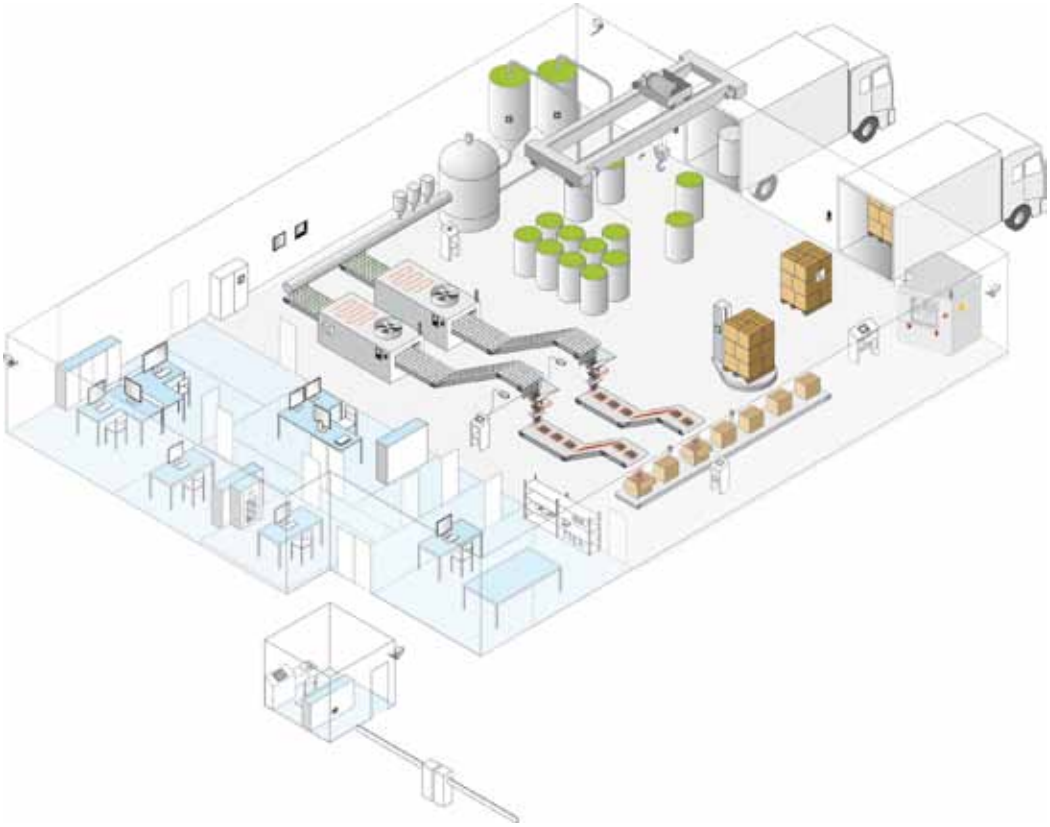
PacDrive 3 automation solution

One partner for complete solutions

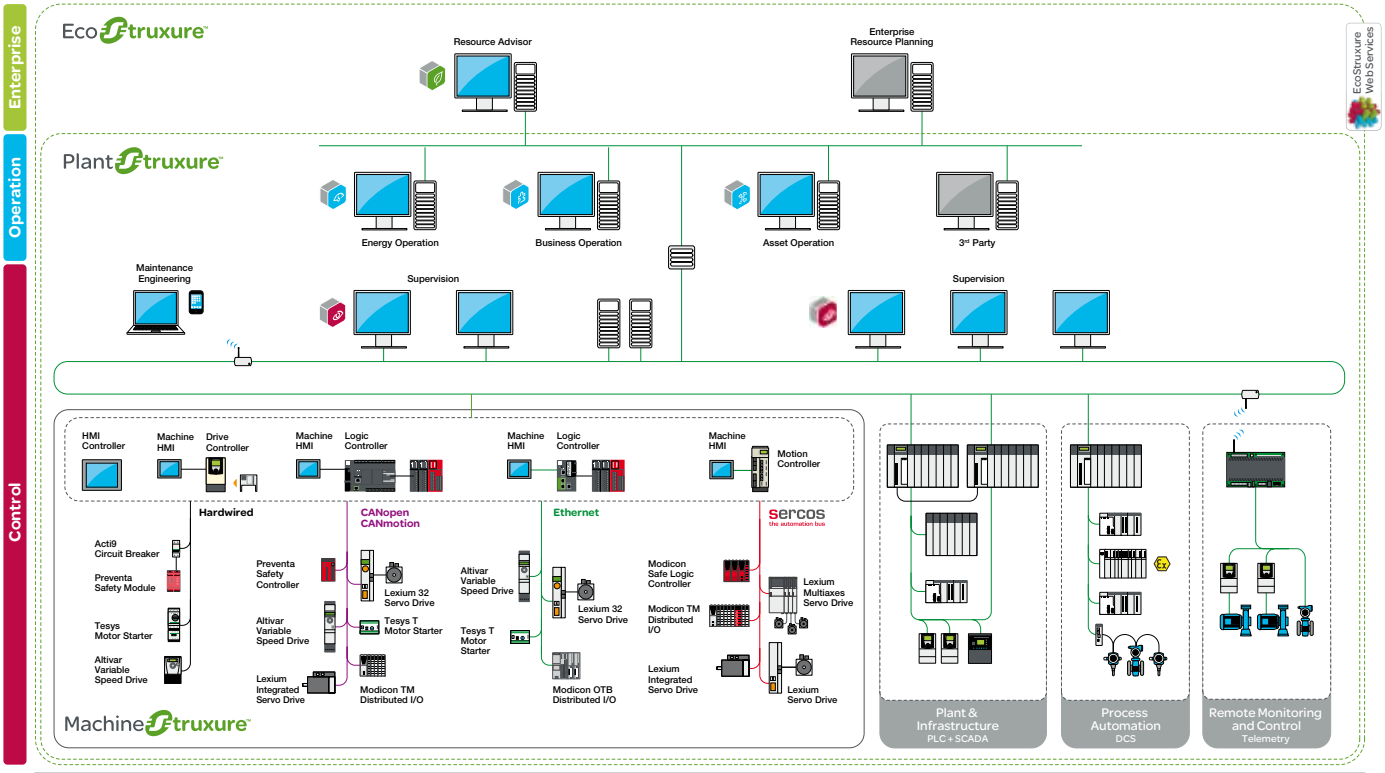
1

One partner for complete solutions

As a global specialist in energy management, Schneider Electric offers integrated solutions across multiple market segments, including leadership positions in Utilities & Infrastructures, Industry & Machine automation, Data Centers & Networks, and in Residential. Focused on making energy safe, reliable, efficient, productive and green, Schneider Electric delivers complete solutions for manufacturing and process industries.



A fully embedded portfolio of solutions:
PlantStruxure and MachineStruxure allow the scalable automation of processing systems, individual production machines, and entire production lines; EcoStruxure is an approach to creating an intelligent energy management system within your facility/ factory.



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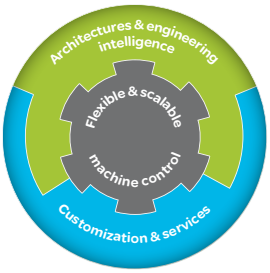
PacDrive 3 automation solution

Improve your profitability

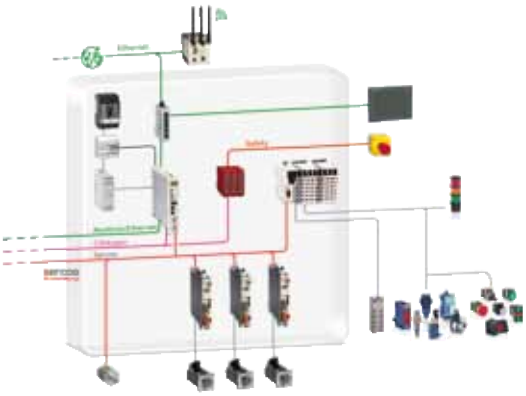
Technology and services for automating the entire machine

Machine Struxure helps you to design forward-looking machines and systems while reducing time to market and increasing profitability: Flexible and scalable hardware platforms, architectures, and engineering intelligence, together with a comprehensive package of services, all with the goal of ensuring that you always get the best possible solution – througout the entire lifecycle of your machine!



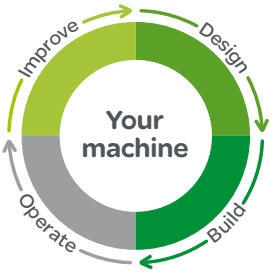
Flexible and scalable machine control

Flexible Machine Control is the technological core of MachineStruxure. The drive, HMI, and logic and motion controllers included in Flexible Machine Control can be used in a wide range of machines. They also provide specific functions for packaging and material handling – either with or without robotics – as well as material working, hoisting, HVAC&R, and pumping applications. Safety controllers for hardwired and embedded safety network solutions meet common safety standard requirements



Ready-to-use architectures and off-the-shelf software

Recommended automation architectures are available for mapping a wide range of machine designs. Combined with an extensive selection of preprogrammed software functions, these architectures put Schneider Electric's comprehensive application know-how at your fingertips. Specific benefits include shorter programming times, better software quality, and standardized programming. Off-the-shelf software templates can also enhance the reusability of machine programs.



Partnership throughout the entire machine lifecycle

As your partner, we provide support throughout the lifecycle of your machine. Our experts advise you at every step, from technical support to on-site assistance. If you are missing products from our portfolio or have a special product requirement, please discuss product customization options with our Solution Service. We offer standard support, a 24/7 hotline, and replacement parts centers in various locations around the world – so your machines are always available for your customers.

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PacDrive 3 automation solution
Motion-centric machine automation

An integrated system´s approach

One controller for the entire machine

PacDrive's digital system architecture is based upon the concept of a centralized controller. Using an IEC 61131-3-compliant machine program, a single controller performs all control functions, from cartesian and robotic motion to temperature regulation and machine logic. This is a central pillar in the process of creating modular machines.

- Single controller solution for motion, PLC logic, and communication
- Centralized calculation of all axis positions within the controller, allowing the controller to switch on the fly from real to virtual axes. Enables motion testing/simulation without connecting drives/motors
- Standard parameterization of each axis, configuration of individual drives requires only input of inertia for each load
- Electronic type plates for all servo drives/motors, detailed communication with each drive/motor for automatic parameterization and firmware replication (all data are centrally stored in the controller) and diagnosis
- Maximum scalability: Modular machines can be configured easily. The controller recognizes all connected drives/motors and can activate/deactivate them automatically based upon the modules connected to the machine

Scalable controller performance

PacDrive LMC Eco series

PacDrive LMC Pro series

Controllers for automating both simple and complex machines

The PacDrive LMC controllers cover a wide range of applications. Factors 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 will offer the optimum balance of price and performance.

The PacDrive controller series deliver full scalability, from small applications with a few servo axes to complex, high-performance systems:

- PacDrive LMC Eco series for 0 - 16 synchronized servo axes
- PacDrive LMC Pro series for 8 - 99 synchronized servo axes

Integrated robots can lower the number of axes depending upon kinematics and complexity of operation.

In addition, the controller can synchronize up to 255 virtual axes. The network update rate for all axes is 1msec. All controllers are software-compatible, since all have identical Schneider Electric Logic Motion Runtime software.

Each PacDrive LMC controller is equipped with integrated, digital and analog I/Os. The controllers include both standard and high-speed I/Os (touch probes) for significantly faster response to events recorded by sensors (such as motion-relevant signals). External I/Os can also be added with a Sercos bus coupler for the modular Modicon TM5/TM7 I/O solution.

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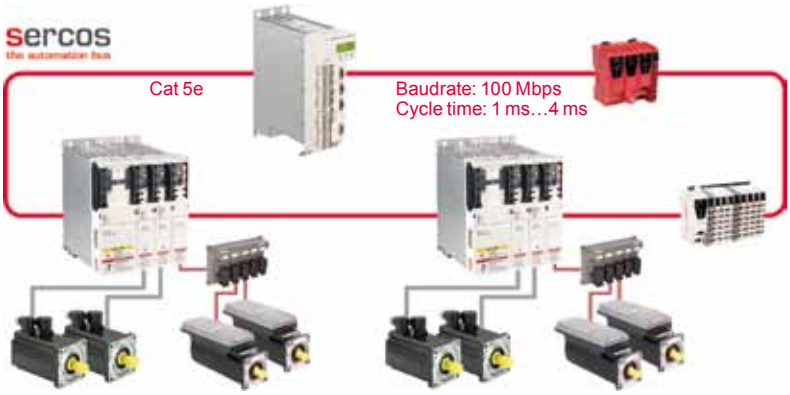
PacDrive 3 automation solution
Open communication standards

A powerful automation bus

sercos
the automation bus

Sercos – an Ethernet-based automation bus

Sercos is the preferred automation bus for all LMC Pro and LMC Eco controllers. Sercos drive communication allows the implementation of I/O communication and safe communication using a single, Ethernet-based fieldbus.



Open communication standards

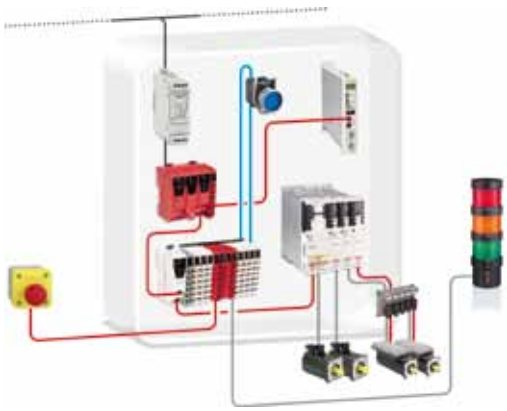
PROFIBUS®
PROFINET®
Ethernet
EtherNet/IP
CANopen

Fieldbus standards and web protocols

PacDrive is an open technology, which includes open communication standards. In addition to the default integrated interfaces, PacDrive controllers can communicate using the most common fieldbus and RT Ethernet standards.

- Sercos is the preferred automation bus for PacDrive solutions, while CANopen is an alternative for I/O communication for simple machines. Each PacDrive controller has a CANopen interface as well as a standard Ethernet interface
- In addition to communication via Sercos and Ethernet, LMC Pro series controllers can communicate simultaneously via two fieldbus protocols and real-time Ethernet, e.g. CAN and Profinet
- Optional expansion cards are also available for all controllers to implement additional fieldbus interfaces such as EtherNet/IP. The LMC Pro series controllers also have a PROFIBUS interface (master and slave)
- All current web protocols for vertical integration/remote control have been integrated, e.g. OPC UA, HTTP, FTP, SMS, or SMTP
- Web visualization is available for remote access

Embedded Safety



Example: Safety chain solution with safe logic controllers Modicon SLC, Modicon TM5 and Modicon TM7 safe I/Os for a safe communication over Sercos automation bus

Safety chain solutions

Safety Chain solutions allow implementation of safety functionalities in automation solutions in less time and with less engineering effort. Each Safety Chain solution is a recommended architecture for implementing and certifying one or more corresponding safe functions.
Two types of Safety Chain solutions are available for PacDrive:

- Safety chain solutions with Sercos communication (recommended for most applications)
- Safety chain solutions with hardwired architecture

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PacDrive 3 automation solution
Flexible servo drive design

Flexible servo drive design

Lexium SH3 servo motors

Lexium MH3 servo motors

Lexium SHS servo motors

Increasing control cabinet space requirements and rising costs for mounting and cabling are key factors driving the design of new servo solutions. At the same time, there is still a need for classic single-axis servo solutions. No single solution can fully satisfy both of these needs. This is why the Lexium servo system for PacDrive offers a Lexium 52 stand-alone-axis solution as well as a Lexium 62 multi-axis servo solution. All servo drives are fully software-compatible and can work side by side in mixed configurations.

Standard and stainless servo motors

Dynamic, highly efficient servo motors form the basis for every modern servo solution. The Lexium SH3, MH3, and SHS stainless steel servo motors cover a wide range of performance and flange sizes. All motors are equipped with electronic type plates and are optimized for use with Lexium 52 and Lexium 62 cabinet servo drives.

Lexium 52 – stand-alone servo drives

Lexium 52 – stand-alone servo drive

In a conventional stand-alone design with integrated 3-phase power supply, Lexium 52 series servo drives are particularly well suited for economical configuration of servo drive solutions with self-contained single axes. They communicate via Sercos and offer embedded digital I/O. The servo drives are available in five different power levels, ranging from 1.5 to 24 A continuous current and 6 to 72 A peak current.

Lexium 52 is ideal for solutions with a small number of axes and is fully compatible with the ´smaller´ PacDrive Eco controllers.

Lexium 62 – multi-axis servo drives

Lexium 62 – multi-axis servo drive system

The Lexium 62 series servo drives consist of single drives (1 axis) and double drives (2 axes) of the same size. All of the single and double drives within a group share a single power supply. No backplane connections are required, and the modules can be coupled to the adjacent module in less than two minutes through a quick front connection with locking screws. All are compatible for use with Lexium SH3, SHS (stainless) and MH3 series servo motors, and can also be used for third-party DC motors.

The multi-axis cabinet-based Lexium 62 requires up to 50% less cabinet space compared to other solutions on the market.

Lexium 62 ILM integrated servo modules

Lexium 62 ILM – integrated servo drive

Lexium 62 ILM servo modules with integrated drive electronics incorporate a flexible approach to cabling, with prefabricated hybrid cables and distribution boxes. The only elements remaining in the cabinet are the shared power supply for the Lexium 62 series and a CM (connection module). The drive and network solution together form a true plug-and-play solution. The range of network topologies available includes line, tree, and daisy chain, all topologies either alone or mixed.

Lexium 62 ILM integrated servo modules are the key element in consistent modular machine design. The Lexium 62 ILM requires up to 90% less cabinet space when compared to stand-alone drives, and wiring/installation times in the cabinet can be reduced by up to 90%.

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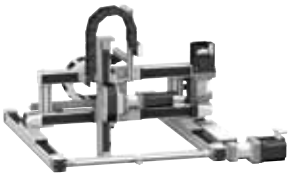
PacDrive 3 automation solution
Embedded robots

Embedded robotics solutions

Delta 2 picker mechanisms

Delta 3 picker mechanisms



Portal robots

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 Lexium SH3 servo motors, they can be fully integrated into the PacDrive 3 automation solution. Standard Lexium servo drives or integrated servo drives can be used, and thanks to library functions, the robot(s) can be integrated into the IEC 61131-3-compliant machine program structures.

Ready-to-use robotics packages

With the availability of complete robot arm mechanisms, there is no longer any need to develop customer-specific kinematics or integrate third-party products. This allows even faster creation of robot-enabled machine designs. The portfolio consists of Delta 2 and Delta 3 picker mechanisms, and the cartesian system provides individual solutions for portal and gantry robots.
All PacDrive Delta robots and Lexium Cartesian robots are developed and produced by Schneider Electric.

Universal use of PacDrive Robotics software library

Appropriate transformation modules incorporate all typical kinematics into the controller software, whether it involves PacDrive robotics or customized kinematics. In addition to transformation modules mapped to the PacDrive Delta 3 and Lexium cartesian kinematics, a universal transformation module is also available for custom-designed or third-party kinematics, and allows various robots to be controlled with PacDrive controllers.

Integration of vision systems with library functions

Vision systems are typically a fundamental element in robotics solutions. An open vision library allows many of the vision systems available on the market to be quickly integrated into a solution. Cognex vision solutions in particular are fully supported.

Related products

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

Schneider Electric offers a full range of products & solutions for energy distribution & management and for industrial automation.
From actuators to control systems, we have the products to complete your PacDrive 3 automation solution. Please contact your local sales office or visit our web site, www.schneider-electric.com, to find the following products and others:

- Motor control, positioning: variable frequency drives, step motor drives, EC motor drives, motor starters

- HMI, control and dialogue devices: operator interfaces with display panels, pushbuttons, emergency switches, dialog and signaling devices (also for safety solutions)

- Measuring, recording, switching: optoelectronic / inductive / ultrasound switches and sensors, recording systems (also for safety solutions)

- Power supplies, power distribution, metering and monitoring: power supplies, contactors, measuring equipment, panel instruments

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PacDrive 3 automation solution
Reduce your time to market

Reduce your time to market

SoMachine Motion Software

SoMachine – an integrated enviroment for software engineering, commissioning, and diagnostics

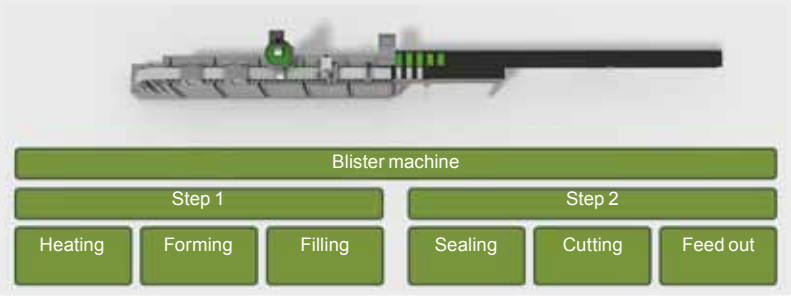
SoMachine Motion is an integrated software environment for all aspects of your machine engineering process with PacDrive.

SoMachine Motion guides you in every phase of your project: planning, sizing and selection, programming, commissioning, diagnosis, and maintenance. Functionalities such as diagnostics, fast device replacement, and motion design are deeply embedded in the tools, making them highly efficient. PacDrive LMC controllers are programmed in compliance with the IEC-61131-3 standard, with object-oriented extensions. Devices are configured using a powerful parameter concept.

Library functions and template-based programming

Shorten your engineering time with ready-to-use modular software solutions that have been extensively tested and successfully deployed in many machines. PacDrive libraries provide software functionality in the form of classic function blocks (AFBs = Application Function Blocks) and Equipment Modules (EMs). AFBs and EMs allow you to build scalable, modular project architectures, thus reducing engineering times even further.

AFBs are supplied for many basic common automation tasks and machine functionalities. AFBs can be parameterized to perform a variety of common tasks in a motion-centric machine – with no programming required.



Equipment Modules add a standardized interface and behavior for command processing, operation modes, exception handling, and logging – on top of the functionality provided by AFBs. EMs consist of one or more combined AFBs. Equipment Modules for typical machine parts include: Axis Module (combining AFBs for homing, jogging, endless, positioning, and cam functions), Crank, Multibelt, Robotic, Smart Infeed, Unwinder, and Intelligent Line Shaft.

Equipment Modules were developed to pave the way for programming with the PacDrive Template, a standardized project architecture. This template is available in SoMachine Motion, along with sample projects adapted to individual applications for an even easier design process. The PacDrive Template architecture includes communication with the HMI, machine level command processing, operation mode management (optionally compliant with PackML ISA-TR.00.02), exception handling, and logging.

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PacDrive 3 automation solution

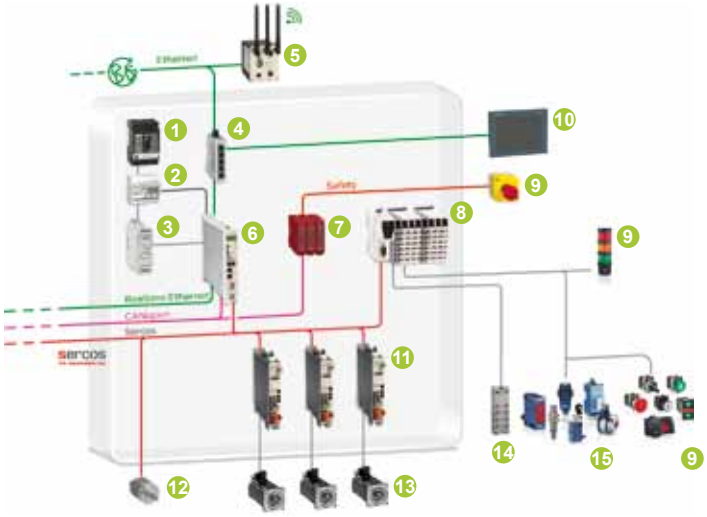
Reduce your time to market

Examples of automation architectures

Compact architecture with hardwired safety solution, suitable for machines with small number of servo axes

For machine/motion control solutions with 0-4 servo axes

Synchronized axes / Sercos/ Motion controller PacDrive LMC101



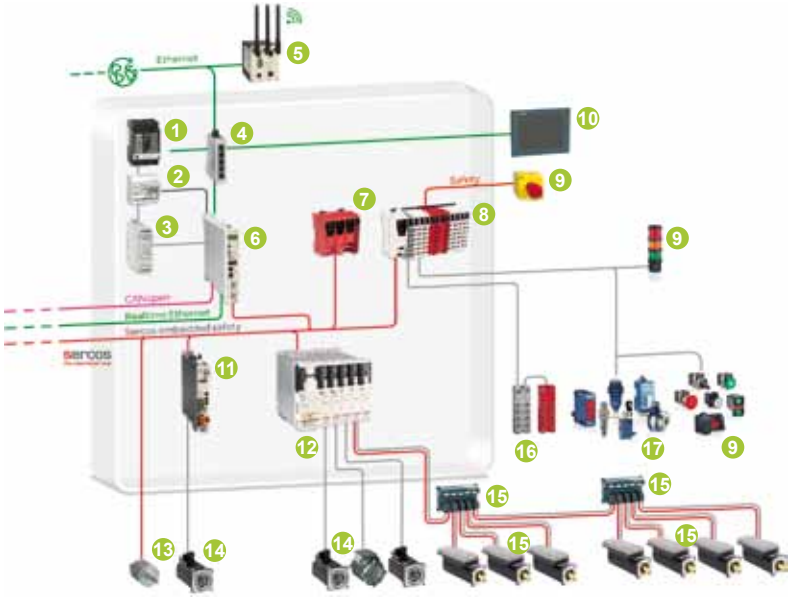
Solution breakdown

1 **Compact NSX** circuit breaker
2 **IEM32** energy meter
3 **Phaseo** switch mode power supply
4 **ConneXium** switch Ethernet
5 **ConneXium** wireless Ethernet access
6 **PacDrive LMC101** motion controller
7 **Preventa XPSMCM** safety modular controller
8 **Modicon TM5** *(IP 20)* Sercos interface module, expansion module
9 **Harmony** Control & Signaling units
10 **Magelis** HMI
11 **Lexium 52** single axis servo drive
12 3rd party product: encoder
13 **Lexium SH/MH** servo motors series
14 **Modicon TM7** *(IP 67)* expansion module
15 **OsiSense** proximity, photoelectric sensors, limit switch, encoder

Scalable solution, suitable for automating a wide range of packaging machines and handling solutions

For machine/motion control solutions with up to 16 servo axes

Synchronized axes / Sercos/ Motion controller PacDrive LMC216



Solution breakdown

1 **Compact NSX** circuit breaker
2 **IEM32** energy meter
3 **Phaseo** switch mode power supply
4 **ConneXium** switch Ethernet
5 **ConneXium** wireless Ethernet access
6 **PacDrive LMC216** motion controller
7 **Modicon TM5CSLC** Safe logic controller
8 **Modicon TM5** *(IP 20)*: Sercos interface module, safe expansion module, expansion module
9 **Harmony** Control & Signaling units
10 **Magelis** HMI
11 **Lexium 52** single axis servo drive
12 **Lexium 62** multi-axis servo solution cabinet based: power supply, servo drives
13 3rd party product: encoder
14 **Lexium SH/MH** servo motors series
15 **Lexium 62 ILM** integrated servo modules: connection modules, distribution boxes, integrated servo drives
16 **Modicon TM7** *(IP 67)*: expansion module, safe expansion module
17 **OsiSense** proximity, photoelectric sensors, limit switch, encoder

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PacDrive 3 automation solution
Reduce your time to market

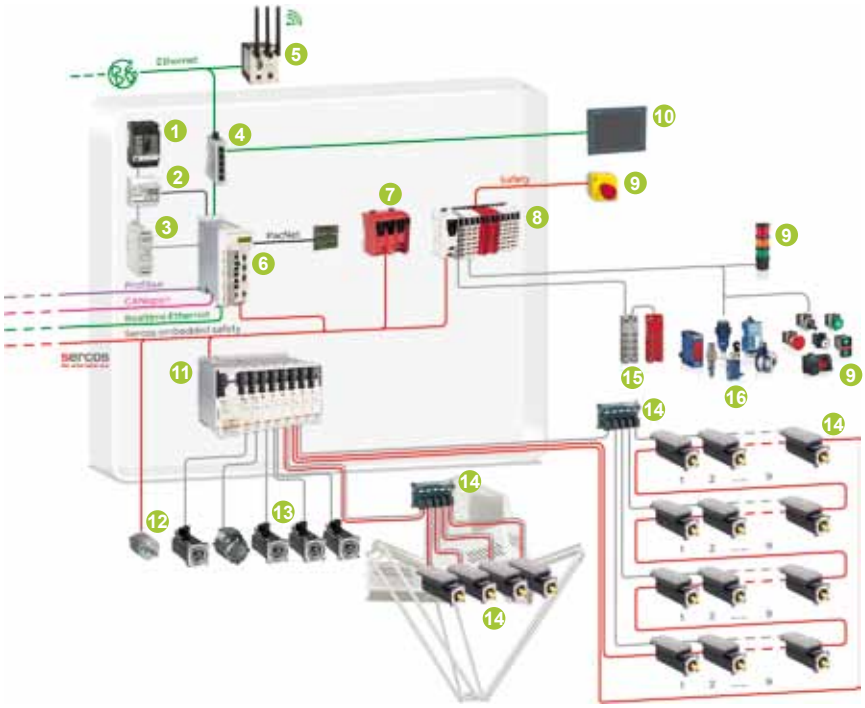
1

Examples of automation architectures

For machines/motion control solutions with up to 99 servo axes and/or robots

Scalable automation architecture, suitable for even the most demanding packaging machines, picker lines, and other challenging servo applications

Synchronized axes & robots / Sercos/ Motion controller PacDrive LMC600



Solution breakdown

1 **Compact NSX** circuit breaker
2 **IEM32** energy meter
3 **Phaseo** switch mode power supply
4 **ConneXium** switch Ethernet
5 **ConneXium** wireless Ethernet access
6 **PacDrive LMC600** motion controller, **PacNet** fast I/O module
7 **Modicon TM5CSLC** Safe logic controller
8 **Modicon TM5** *(IP 20)* Sercos interface module, safe expansion module, expansion module
9 **Harmony** Control & Signaling units
10 **Magelis** HMI
11 **Lexium 62** multi-axis servo solution: power supply, communication module, servo drives
12 3rd party product: encoder
13 **Lexium SH/MH** servo motors series
14 **Lexium 62 ILM** integrated servo modules: connection modules, distribution boxes, integrated servo drives – **Lexium P4** robot
15 **Modicon TM7** *(IP 67)* expansion module, safe expansion module
16 **OsiSense** proximity, photoelectric sensors, limit switch, encoder

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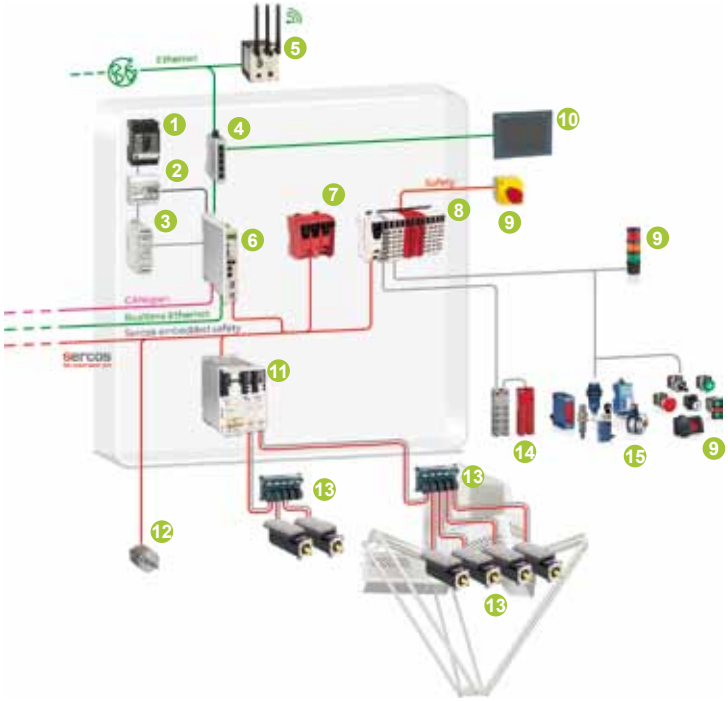
PacDrive 3 automation solution
Reduce your time to market

Examples of automation architectures

Flexible, adaptable automation architecture for designing typical standardized robot cells: robot (delta 3, cartesian …), feed-in, feed-out

For robot cells/portal robots: 1 robot, feed-in, feed-out

Robots / Sercos/ Motion controller PacDrive LMC106



Solution breakdown

1 **Compact NSX** circuit breaker
2 **IEM32** energy meter
3 **Phaseo** switch mode power supply
4 **ConneXium** switch Ethernet
5 **ConneXium** wireless Ethernet access
6 **PacDrive LMC106** motion controller
7 **Modicon TM5CSLC** Safe logic controller
8 **Modicon TM5** *(IP 20)* Sercos interface module, safe expansion module, expansion module
9 **Harmony** Control & Signaling units
10 **Magelis** HMI
11 **Lexium 62** multi-axis servo solution: power supply, servo drives
12 3rd party product: encoder
13 **Lexium 62 ILM** integrated servo modules: connection module, distribution boxes, integrated servo drives – **Lexium P4** robot
14 **Modicon TM7** *(IP 67)* expansion module, safe expansion module
15 **OsiSense** proximity, photoelectric sensors, limit switch, encoder

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PacDrive 3 automation solution
Focus on packaging and handling processes

Focus on packaging and handling processes

Expertise across the entire packaging process

Schneider Electric is one of the leading companies in packaging automation worldwide.

- As a pioneering member of OMAC, Schneider Electric has been active for many years in the OMAC Packaging Workgroup. Schneider Electric has also implemented the guidelines of the Weihenstephan Standard, which is becoming increasingly important for the vertical integration of data streams generated from packaging lines. Today, more than 80,000 machines worldwide are automated using the PacDrive platform. Everything is possible, from simple positioning applications up to 99 synchronous driven servo axes or integrated robots.
- To save time and enhance quality, machines can be automated with matching, ready-to-use library software modules such as Multibelt, Winder/Unwinder, Printmark Detection, Sealing, and so on. The template-based software strategy was developed for more complex applications, and supports the trend towards the use of modular machines in packaging automation by offering standardized, reusable machine programs.

Material handling – solution packages including mechatronics

In material handling, Schneider Electric has taken its solutions far beyond basic technologies. PacDrive can serve as the hardware basis for a large number of conveying and handling requirements. The PacDrive software libraries offer ready-to-use software modules for many typical tasks such as conveying, feeding, separation, or infeed.

Example of architectures and library functions also simplify implementation for demanding applications. Linear motion axes, cartesian robots, and Delta 2 and Delta 3 picker robots are of particular interest. These functions can even be used for stainless steel robots in hygienic designs, Schneider Electric offers complete solutions: hardware, software, and mechatronics – and of course services.

These robots can be used for material handling solutions such as buffers for small load carriers or sorting systems in the beverage industry.

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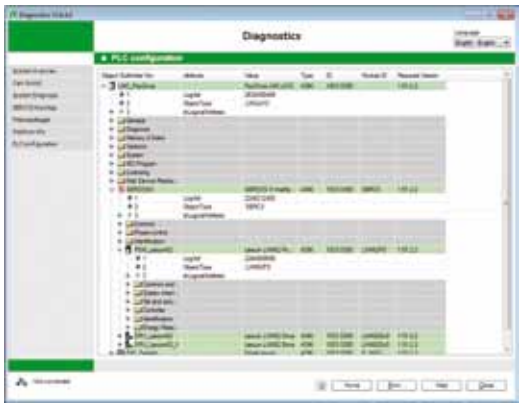
PacDrive 3 automation solution

Simplify integration & maintenance

Simplify integration and maintenance

PacDrive's digital system architecture is based upon the concept of a centralized controller. All system functions run through the centralized controller, from the human-machine interface to motion and device bus communication, line synchronization, and vertical integration. This approach creates far-reaching possibilities for diagnostics, easy firmware handling, and automatic parameterization of replacement components.



Maintenance tools

The Logic Builder in SoMachine Motion offers extensive diagnostic funtionalities throughout a PacDrive-based automation system. Sercos scan can be used to detect all core components and maintain firmware version compatibility in drives or motors. An integrated software oscilloscope permits simultaneous plotting of PLC and motion variables (including mixed variables). During commissioning, the tool's message logger makes it easy to track down the source of system and user diagnostics messages.

Backup data, system data and, firmware updates for the controller can be managed with the Controller Assistant. The Drive Assistant is an easy-to-use tool for direct updates of firmware in Sercos slaves.

Diagnostics was developed for local use during normal operations. This stand-alone tool can be run as a single program on a PC, without the need for an additional SoMachine Motion workbench. Diagnostics provides a snapshot of a machine's current status, including loggers, device parameters, I/O status, graphical architecture view of the Sercos network, and more. Diagnostics contains almost the same functionalities as the programming and commissioning tool for engineering, without the risk of unintended changes to the machine program.

Fast device replacement

The ability to easily replace the electronic components responsible for improper operation is just as important as a rapid diagnosis of the improper operation itself. PacDrive users can quickly change out servo drives or servo motors with plug-and-play technology. Parameterization of the replacement components via laptop or software installation is no longer required. The centralized PacDrive controller detects the replacement components or motors based upon their electronic type plates and configures them automatically. There is also no need to activate switches for the Sercos or IP address. The controller performs a firmware check and retrieves updates when the equipment is replaced.

Remote maintenance

PacDrive provides the interfaces and/or protocols needed for remote maintenance via the Internet, modem, and mobile telecommunications. Schneider Electric provides advice and support to machine users and machine builders for integration of the most practical options – worldwide.

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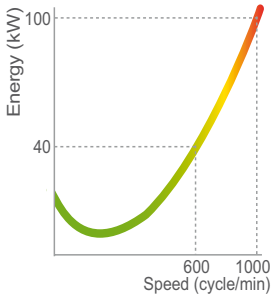
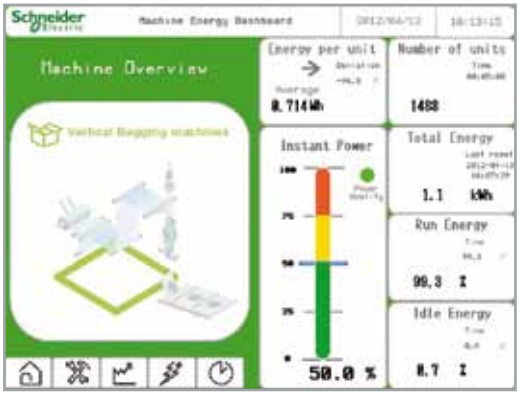
Energy efficiency



Measure the energy consumption of a running machine compared to the output and calculate the optimal ratio

Lexium 62 multi-axis servo systems require no additional installation for a DC bus coupling

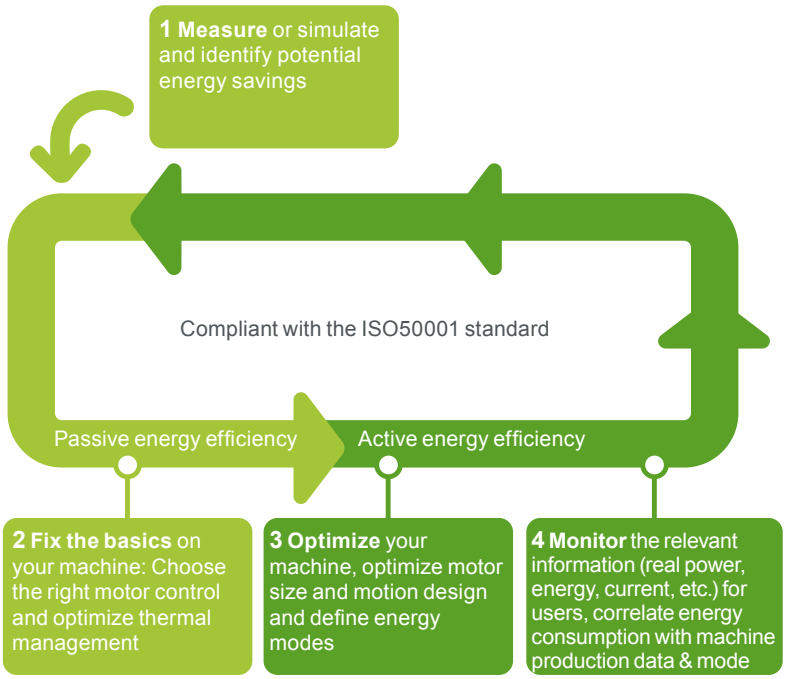


An energy dashboard integrated into the machine's HMI design provides the user with constant, up-to-date information on all energy-relevant parameters

Grow your business with energy-efficient solutions

Energy efficiency is an increasing concern for your customers' global strategic planning. By offering them machines that save energy, you can stand out in the market and gain a competitive advantage. Follow the four principles of energy efficiency adapted to your machine's lifecycle, and help your customers comply with the ISO 50001 standard.

Energy optimization in four sustainability steps



How can PacDrive help you?

- **Simulate** your individual program in virtual mode and **calculate** your machine's **energy footprint**
  Measure real energy consumption
  Request Schneider Electric **consulting/engineering** for comprehensive support
- Use Lexium SH3 series **high efficiency servo motors**
  Share DC-bus using Lexium 62 multi-axis solution / Lexium 62 ILM
  Save energy used to cool the cabinet by shifting servo drives to the machine frame with Lexium 62 ILM 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-related figures **in real time**

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PacDrive 3 automation solution
Service & Support

Service and support that are behind you all the way

Design

Build

Operate

Improve

Stage in the product life cycle: "Design"
What we can bring you at this stage...

We find the best solution for your needs
- Based on your needs, our Solution Application Experts and Application Design Experts (SAE/ADE) work out innovative technical solutions including
  - Co-engineering
  - Tests
  - Validation

We understand your challenges
- Consulting
- Audits

We execute the solution with a full service agreement
- Our solution design and delivery centers (Flex-Centres) are committed to quality and results and provide tests, validation, and commissioning

We improve your team's competencies
- In class training and On site training

Stage in the product life cycle: "Build"
What we can bring you at this stage...

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, your solutions will include:
  - Project management and responsibility
  - Engineered systems
  - Third-party components management
  - Customizations and adaptations

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
- Supply chain optimization

Stage in the product life cycle: "Operate"
What we can bring you at this stage...

We provide international sales and after-sales services for you and your customers
- Maintenance contracts
- Spares parts and repairs
- Just-in-time delivery
- Return of goods
- Service expertise:
- Error diagnosis and repair
- Environmental measurements (EMC, fieldbus, thermography, power quality analyses, etc.)
- Customer International Support (CIS) as a single point of contact:
- A network of dedicated local country experts
- Web-based collaborative platform for efficient communication

We improve your customers' competencies
- In-class customer training and On-site training
- Customer service and commissioning training

Stage in the product life cycle: "Improve"
What we can bring you at this stage...

We improve your machine ranges
- Consulting

We improve your customer's machines in their production line
- Audits
- Training
- Migration and upgrade
- Services Expertises:
  - Consultancy
  - Retrofitting

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Programming software

Technical information on all of the products listed in this catalog is available at: www.schneider-electric.com

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PacDrive 3 automation solution
SoMachine Motion programming software

■ **Presentation** . . . . . *page 2/2*

■ **General characteristics**

- ☐ **Logic Builder** ..... *page 2/2*
- ☐ **Motion centric machine application development** ..... *page 2/3*
- ☐ **Motion Builder** ..... *page 2/5*

■ **References**

- ☐ **Product offer** ..... *page 2/6*
- ☐ **SoMachine Motion software** ..... *page 2/6*
- ☐ **License update from previous version** ..... *page 2/6*
- ☐ **Runtime licensed features and license points** ..... *page 2/7*
- ☐ **License points without flash card** ..... *page 2/7*
- ☐ **Flash card with license points included, for use with PacDrive LMC controllers for non-robotic applications** ..... *page 2/7*
- ☐ **Flash cards with license points (spare parts for robot controllers)** ..... *page 2/7*

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PacDrive 3 automation solution

SoMachine Motion programming software

Software solution, Logic Builder

Presentation

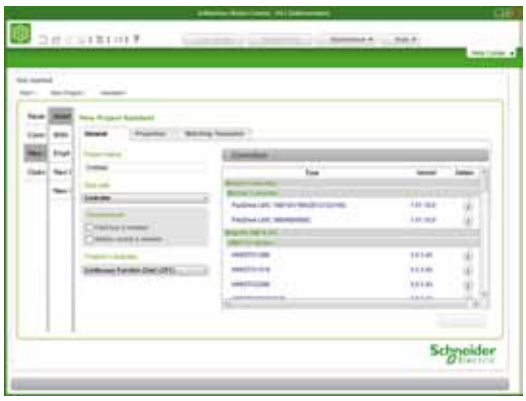
Software solution

SoMachine Motion programming software

SoMachine Motion programming software is compliant with IEC 61131-3. It can be used to develop, configure, and commission entire PacDrive systems.

■ SoMachine Motion proposes one project file, managed through the Central (new project) and is aligned with SoMachine V4.1 (same look and feel).
■ SoMachine Motion engineering tools can be accessed through this single project file:
- **Logic Builder**: a programming environment for PacDrive controllers
- **Motion Builder**: motion design and sizing software for drives, motors, gearboxes, power supplies
- SoSafe Programmable: a programming environment for Modicon SLC safe logic controllers *(see page 7/2, Embedded safety PLC chapter ; separate purchase required*)
- **Vijeo Designe**r: the HMI programming software for Magelis panels *(1)* is integrated in SoMachine Motion. Vijeo Designer can be used without the need for a separate license.

■ SoMachine Motion maintenance tools, which can be started from the Central or stand-alone, provide the following functions:
- **Diagnostics**: obtain a snapshot of the current machine status, including loggers, device parameters, I/O status, and a graphical architecture view of the Sercos ring. Additional user-defined data can be provided by the machine application.
- **Controller assistant**: backup and image management; firmware update for controllers; Fast Device Replacement can also update the firmware of Sercos devices
- **Drives Assistant**: for direct updates of Sercos device firmware



Create a new project through the central

General characteristics

Feature	Description
Logic Builder	
IEC 61131-3 programming languages	■ IL (Instruction List) ■ LD (Ladder Diagram) ■ SFC (Sequential Function Chart) ■ ST (Structured Text) ■ FBD (Function Block Diagram) ■ + CFC (Continous Function Chart)
Programming services	■ Multi-tasking: Cyclic, Fast, Event ■ Functions (Func) and Function Blocks (FBs) ■ Data Unit Types (DUTs) ■ On-line changes ■ Watch windows ■ Graphical monitoring of variables (trace) ■ Breakpoints, step-by-step execution ■ Visualization for application and machine set-up
Motion services	■ Embedded device configuration and commissioning ■ CAM profile editor ■ Sample application trace ■ Visualization screens ■ Logical encoder
Global services	■ User access and profile ■ Project documentation printing ■ Project comparison (control) ■ Variable sharing based on publish/subscribe mechanism ■ Library version management
Advanced software development	■ Source Code Management with Subversion (SVN) ■ ETEST Unit Testing Framework ■ Scripting with Python ■ Import/Export in PLC Open format

(1) Please consult our web site, www.schneider-electric.com

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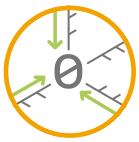
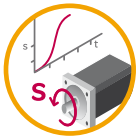
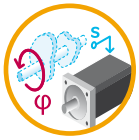
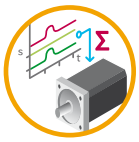
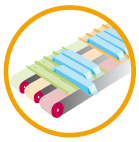
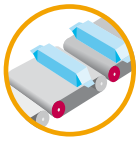
General characteristics

Feature	Description
Motion centric machine application development	
Homing 	■ Supported homing modes: - Touchprobe input - Digital signal - Hardware limit switch - Torque - Move to absolute position - Set axis position - Set encoder position - Set axis and encoder position - Restore axis position from retain - Restore axis position from axis encoder - Write axis encoder and set axis position *Available as AFB (Application Function Block) and included in the Axis Module.*
Positioning 	■ Endless feed, jogging, positioning ■ Motion profile with defined velocity, acceleration, deceleration, and jerk limit ■ Positioning modes: endless, relative, absolute *Available as AFB (Application Function Block) and included in the Axis Module.*
Cam motion 	■ Graphical cam diagram editor and direct access to cam segment data through data structures ■ An axis in cam mode can follow any position source as its master, including other axes and encoders ■ Cam segment types: - straight - general 5th degree polynomial - simple sinus - inclined sinus - modified sinus - modified acceleration trapezoid - standard 5th degree polynomial - quadratic parabola - general modified sinusoid - general modified acceleration trapezoid - harmonic combination - sinus-straight combination - user-defined cam profile ■ Different cold start and warm start modes ■ Active cam diagram can be changed on the fly *Available as AFB (Application Function Block) and included in the Axis Module.*
Intelligent line shaft	■ Dynamically reduce the speed of the master axis according to the speed and acceleration limitations of the slave axes - achieve higher overall machine speed - increase machine lifetime - limit forces that act on the product ■ Multiple independent intelligent line shafts in one machine are possible *Available as AFB (Application Function Block) and included in the Axis Module.*
Software motion generator (SMG) 	■ Overlay motion profiles of different types and with different masters (up to 3 position channels, resulting position profile is the sum of the component channels) ■ Additional motion laws (e.g. 7th degree polynomial) ■ Custom motion laws, implemented by the user (e.g. 11th degree polynomial) *Available as AFB (Application Function Block) that can be connected to the Axis Module.*
Multi-belt 	■ For dual-belt and multi-belt applications, e.g. for grouping or infeed: - up to 8 belts - up to 8 stations - multiple trains per belt - up to 127 compartments per train - almost all parameters can be adjusted while the system is running - sensor signal filtering - collision prevention - warm start *Available as AFB (Application Function Block) and EM (Equipment Module), usage requires runtime license points, see page 2/7 for details.*
Smart infeed 	■ Basis for rapid development of various product feed applications with 1 to 10 belts in series *Available as AFB (Application Function Block) and EM (Equipment Module), usage requires runtime license points, see page 2/7 for details.*

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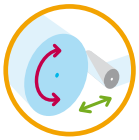
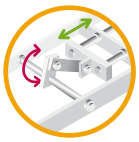
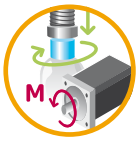
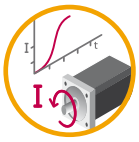
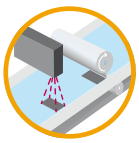
2

General characteristics

Feature		Description
Motion centric machine application development ***(continued)***		
Unwinder		■ For winding and unwinding foils, with or without a dancer roll *Available as AFB (Application Function Block) and EM (Equipment Module), currently available only as "obsolete" library conforming to the PacDrive M programming conventions. PacDrive 3 version planned.*
Crank		■ Motion can be stated as the linear motion of the crank slide. This linear motion profile is transformed into a rotary motion profile of the crank shaft *Available as AFB (Application Function Block) and EM (Equipment Module).*
Robotics		■ Supported kinematics: - Portal/Cartesian robots - 2-axis delta robots - 3-axis delta robots - Articulated robots - SCARA robots - Custom transformation for non-standard robots - Additional axes possible (e.g. rotary axis) - Additional wrist transformation possible ■ Different interpolations: linear, circular, spline. Blending of segments possible ■ Monitoring of work envelope (including obstacles) ■ Synchronous belt tracking (synchronizing to a linear or rotary motion, in any spatial orientation) ■ Acceleration limitation *Available as AFB (Application Function Block) and EM (Equipment Module), usage requires runtime license points, see page 2/7 for details.* *AFB currently available only as "obsolete" library conforming to the PacDrive M programming conventions. PacDrive 3 version planned.*
Torque control		■ Move axes with torque control instead of position control *Available as AFB (Application Function Block).*
Current control		■ Directly send acceleration reference values to the drive in every Sercos cycle, for applications in which direct control of drive current is desired *Available as a firmware feature.*
Print mark control		■ Absolute correction for each individual product, or tendential correction of small deviations e.g. on a continuous foil feed ■ Indexed mode or synchronized operation *Available as AFB (Application Function Block).*
PackML		■ Optionally represent the machine state in conformance with the PackML standard (ISA-TR88.00.02-2008) *Currently available only as "obsolete" library conforming to the PacDrive M programming conventions. PacDrive 3 version planned.*
PLCopen MC		■ As an alternative to PacDrive style motion control, FBs conforming to PLCopen MC are also available: □ Multi-axis - MC_CamIn - MC_CamOut - MC_Cam_Id - MC_Cam_Ref - MC_GearIn - MC_GearOut - MC_PhasingAbsolute - MC_StartMode □ Single-axis - MC_Direction - MC_Home - MC_MoveAbsolute - MC_MoveAdditive - MC_MoveRelative - MC_MoveVelocity - MC_Stop

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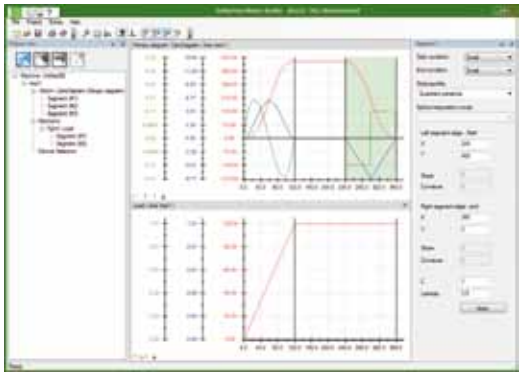
General characteristics

Feature	Description
Motion Builder	
Mechanical modeling	■ Load cases: - Rotary table - Roll feed - Conveyor belt - Spindle drive - Rack and pinion gear - Crank - General load case ■ Additional transformations: - Additional gearbox - Belt drive - Coupling ■ In Logic Builder, mechanical drive parameters can be generated from the mechanical parameters: - FeedConstant - GearIn, GearOut - J_Gear - StaticFriction - ViscousFriction - J_Load (mechatronic data exchange)
Motion profile 	■ Cam diagram, with the following motion laws: - straight line - quadratic parabola - 5th degree polynomial - simple sinus - modified sinus - modified acceleration trapezoid - general 5th degree polynomial - user defined motion profile ■ Positioning (planned) ■ Multiple motion profiles per axis possible ■ Synchronization of motion profiles with Logic Builder (mechatronic data exchange) ■ Import (*.asc, *.trace, *.txt) and export (*.asc, *.dat) of motion profiles ■ Dynamic load: M(phi) or F(phi) as a separate profile
Mechanical sizing	■ Product database: - Drives - Motors (user-defined motors possible) - Gearboxes (user-defined gearboxes possible) - Reserve settings - Sizing results: - Velocity, acceleration, torque, inertia in different parts of the machine - $J_{load} : J_{motor}$ - Torque over time - Torque over speed - Analysis of peak torque for different gearbox factors
Electrical sizing	■ Power circuit calculation: - Calculation of current and power, depending upon actual motion profiles - Multiple power circuits possible, each with or without shared DC bus

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2

Presentation

Product offer

SoMachine Motion software is delivered on a DVD as a fully-functional 21-day trial version. After the 21-day trial period, a license is required for continued use.

- ■ SoMachine Motion is available in two languages: English, German
- □ Processor: Intel® Pentium® 4 - 1.8 GHz or higher, Intel® Pentium® M 1.0 GHz or equivalent, Intel® Core™ i7 – 2.7 GHz
- □ RAM Memory: 2 GB (recommended: 8 GB)
- □ Hard Disk: 3.5 GB (recommended: 10 GB)
- □ OS: Windows XP Professional, Windows 7 Professional 32-bit or 64-bit
- □ Drive: DVD reader
- □ Display: 1680 × 1050 pixel resolution or higher
- □ Peripherals: mouse or compatible pointing device
- □ Peripherals: USB interface
- □ Web Access: Web registration requires Internet access

The documentation is supplied in electronic format: complete on-line help plus complementary documentation in pdf format.

References

SoMachine Motion software

Description	Reference	
	DVD *(1)*	**License** *(2)* / number & type
A license is required to use the engineering tools (Central, Logic Builder, Motion Builder, Vijeo). Without a license, the engineering tools can be used as a trial version for 21 days. Maintenance tools (Diagnostics, Controller Assistant, Drives Assistant) and other tools (Gateway, OPC server, etc.) included on the DVD do not require a separate license, and can be installed and used indefinitely even without a license.	**VSWETSQMM000410** + Trial V4.1 license (21 days)	**SOMMACCZXSPAZZ** / 1 (Single)
		SOMMACCZXTPAZZ / 10 (Team)
		SOMMACCZXEPAZZ / 100 (Entity)

License update from previous version

Software version type	Reference to update SoMachine Motion V4.1	
SoMachine Motion V4 Single update (1)	**SOMMADCZXSPAZZ**	Single license
SoMachine Motion V4 Entity update (100)	**SOMMADCZXEPAZZ**	Entity license

(1) The DVD is mandatory and delivered with a trial license.
(2) One of the 3 types of license is mandatory.

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Presentation

Runtime licensed features and license points

Some features require license points in order to function fully. License points are checked when such features are run. The controller works normally as long as sufficient license points are available. If the features in use exceed the available license points, the features can be used in demo mode for only 6 hours.
The following features require licenses:

Feature	License point cost
Smart Infeed	25 license points per instance
Multi-belt	60 license points per instance
Robotics (base functionality)	30 license points per instance *(1)*
Robotics (transformation)	25 license points per instance *(1)*
Robotics (wrist transformation)	25 license points per instance *(1)*
Robotics (acceleration limitation)	25 license points per instance *(1)*
Use of 3rd party drives on Sercos 3 (SercDrive)	15 license points per drive

(1) To control a robot and qualify for free robotic support, the purchase of a robotic controller is required. The robotic controller comes pre-loaded with license points that can be used for robotic and other features.

Separate memory cards with pre-loaded license points are also available. These are intended as spare parts or replacement parts for robotic controllers. License points are linked to a controller's memory card. License points cannot be returned or transferred. Additional license points can be purchased separately and added to existing memory cards (either robotics or regular). License points purchased separately are linked to a specific memory card during the purchasing process.

References

License points without flash card

Delivered as activation code only. These can be added to a flash card without license points, or can be used to add more license points to a flash card that already contains license points (see below).

Number of license points	License points without flash card
1 license point	**VSWRTPT00100000**
160 license points	**VSWRTPT16000000**
240 license points	**VSWRTPT24000000**
320 license points	**VSWRTPT32000000**

Flash card with license points included (for use with PacDrive LMC controllers for non-robotic applications)

These flash cards come pre-loaded with a number of license points and replace the flash card that comes with the controller, thus eliminating the need to activate license points.

Number of license points	Reference			
	SD-card with license points for LMC Eco controller	Capacity	Compact flash card with license points for LMC Pro controller	Capacity
Flash card without license points *(1)*	**VW3E70360AA00**	512 MB	**VW3E70340AA00**	128 MB
			VW3E70350AA00	512 MB
30 license points	–		**VW3E70351AA00**	512 MB
40 license points	–		**VW3E70352AA00**	512 MB
55 license points	–		**VW3E70353AA00**	512 MB
60 license points	–		**VW3E70354AA00**	512 MB
80 license points	–		**VW3E70355AA00**	512 MB
105 license points	–		**VW3E70356AA00**	512 MB
160 license points	–		**VW3E70357AA00**	512 MB
240 license points	–		**VW3E70358AA00**	512 MB
320 license points	–		**VW3E70359AA00**	512 MB
330 license points	–		**VW3E7035AAA00**	512 MB
420 license points	–		**VW3E7035BAA00**	512 MB
465 license points	–		**VW3E7035CAA00**	512 MB
999 license points	–		**VW3E7035DAA00**	512 MB

(1) spare part for the flash card included with the controller.

Flash cards with license points (spare parts for robot controllers)

Number of license points	Reference		Reference	
	SD-card with license points: spare part for LMC Eco Robot controller *(1)*	Capacity	Compact flash card with license points: spare part for LMC Pro Robot controller *(1)*	Capacity
80 license points	**VW3E70365AARC**	512 MB	**VW3E70355AARC**	512 MB
160 license points	**VW3E70367AARC**	512 MB	**VW3E70357AARC**	512 MB
240 license points	–		**VW3E70358AARC**	512 MB
320 license points	–		**VW3E70359AARC**	512 MB
999 license points	–		**VW3E7035DAARC**	512 MB

(1) See page 6/2, "Robotic solutions": robot controllers already come with a memory card with the necessary license points included.

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Motion controllers

Technical information on all of the products listed in this catalog is available at: www.schneider-electric.com

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PacDrive 3 automation solution
PacDrive LMC motion controllers

Presentation

- Controls
  - Scalable performance for high-performance industrial machines ..... page 3/2
  - Ethernet-based communication with Sercos ..... page 3/3
- PacDrive LMC Eco controllers ..... pages 3/4 and 3/6
- PacDrive LMC Pro controllers ..... pages 3/5 and 3/6

Description

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References

- Robot controllers ..... page 3/8
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PacDrive 3 automation solution
PacDrive LMC motion controllers

Software-compatible PacDrive LMC motion controllers

Memory card

Controls

Scalable performance for high-performance industrial machines

PacDrive LMC motion controllers cover a wide range of applications.

> Full software compatibility

PacDrive LMC motion controllers are a broad family of nine different controllers, with a powerful CPU for applications requiring 0 to 99 synchronized axes (at 1 msec network update rate)

- up to 99 servo axes, and up to 255 virtual axes
- with multiple fieldbuses used in parallel to Sercos: CANopen, Profibus, etc.

All controllers are software-compatible, since each has identical Schneider Electric Logic Motion Runtime software:

- same runtime
- same libraries
- same engineering tool
- same diagnostic tools
- same support of drives, IOs, etc.

Up to 4096 dynamic electronic cam disks can be programmed to operate in parallel. The program can switch between electronic cam disks during operation. All controllers have an integrated PLC (5 µsec for 1000-bit instructions).

> Benefits for you and your customers

- **Diagnostics functionalities included**: integrated software oscilloscope and message logger
- **Outstanding performance**: powerful motion engine
- **Connectivity**: broad support of fieldbuses and IT communication protocols
- **Service-oriented**: memory card for storing/transferring programming and configuration data
- **Easy to service**: no PC required, integrated plaintext display in five languages for system messages and diagnostics

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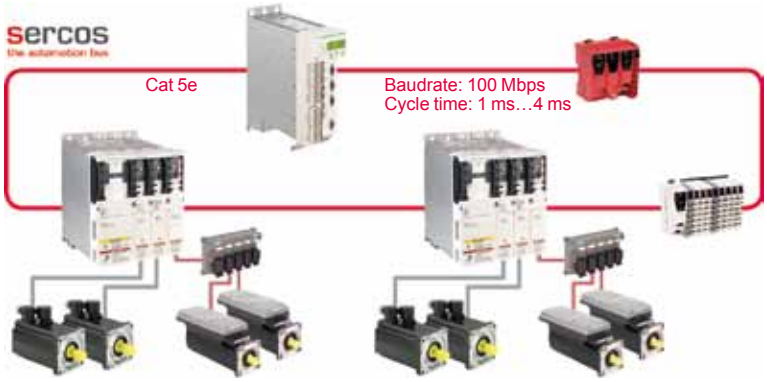
Controls

Ethernet-based communication with Sercos

Sercos is the preferred automation bus for PacDrive:
- Drive communication
- I/O communication
- Safe communication and non realtime IP communication
- All embedded in one cable



> Key benefits of Sercos for PacDrive

- **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. Less than 100 ns jitter
- **Cost-effective:** simple, no hub or switches, Cat 5e cable is generally sufficient
- **High availability:** Sercos supports all PacDrive functions for automating the setup of servo drives/motors, including assignment of bus address
- **Vendor-neutral:** supported by more than 50 controller manufacturers and 30 drive manufacturers
- **Green:** Sercos energy profile defines rules for creating standardized energy modes

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

The modular Schneider Electric Modicon TM5 and Modicon TM7 systems for Sercos provide 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.

Modicon TM5 Safety I/O expansion modules (IP20), Modicon TM7 Safety I/O expansion modules (IP 67), see page 7/7.

> Connectivity

In addition to the Sercos automation bus, PacDrive LMC motion controllers support the following communication standards:

- Fieldbuses:
  - Profinet
  - Profibus
  - CAN
  - Ethernet/IP
  - EtherCat
  - Modbus TCP
- IT protocols
  - TCP/IP
  - UDP/IP
  - OPC UA
  - FTP
  - HTTP (embedded web vizualization)
- Serial communication
  - USB / serial interface

Optional expansion cards are also available for all controllers to implement additional fieldbus interfaces such as EtherNet/IP. USB and serial interfaces are also standard in all controllers. ThePacDrive LMC controllers also have a PROFIBUS interface (master and slave).

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PacDrive LMC Eco controllers

Type		LMC100	LMC101	LMC106	LMC201	LMC212	LMC216
Processor		Intel Atom 1.6 GHz					
		512 KB L2 Cache					
RAM		512 MB DDR2 RAM					
NV RAM		128 KB					
Power supply	Supply voltage	24 VDC					
	Supply consumption	30 W					
Battery		Yes					
Memory card		At least 512 MB (SD Card)					
Cooling		Passive					
Real-Time Clock (RTC)		Yes					
Real-Time Operating System		VxWorks and SEAAutomation Kernel					
Input	Digital input	8					
	Touchprobe input	4					
	Interrupt input	-					
	Analog input	-					
Output	Digital output	8					
	Analog output	-					
Number of drives		**0 servo axes**	**4 servo axes**	**6 servo axes**	**8 servo axes**	**12 servo axes**	**16 servo axes**
Integrated communication	CAN	1 (9 pin SUB-D plug x1)					
	RS232	1 (RJ45 x1)					
	RS422/RS485	1 (RJ45 x1)					
	USB-A	1 (USB x1)					
	USB-B	-					
	Profibus-DP	-					
	Master encoder	1 (RJ45 x1)					
	Ethernet	1 (RJ45 x1)					
	Realtime Ethernet	-					
	Sercos	1 (RJ45 x2)					
	PacNet	-					

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PacDrive LMC Pro controllers

Type		LMC300	LMC400	LMC600
Processor		Intel Celeron M 1.5 GHz	Intel Celeron M 1.5 GHz	Intel Pentium M 2 GHz
		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	36 W		
Battery		Yes		
Memory card		At least 128 MB (CF Card)		
Cooling		Fan		
Real-Time Clock (RTC)		Yes		
Real-Time Operating System		VxWorks and SEAAutomation Kernel		
Input	Digital input	20		
	Touchprobe input	16		
	Interrupt input	4		
	Analog input	2		
Output	Digital output	16		
	Analog output	2		
Number of drives		**8 servo axes**	**16 servo axes**	**99 servo axes**
Integrated communication	CAN	1 (9 pin SUB-D plug x1)		
	RS232	1 (9 pin SUB-D plug x1)		
	RS422/RS485	1 (9 pin SUB-D plug x1)		
	USB-A	1 (USBx1)		
	USB-B	1 (mini USBx1)		
	Profibus-DP	1 (9 pin SUB-D socket x1)		
	Master encoder	1 (9 pin SUB-D socket x1)		
	Ethernet	1 (RJ45 x1)		
	Realtime Ethernet	1 (RJ45 x2)		
	Sercos	1 (RJ45 x2)		
	PacNet	1 (RJ45 x1)		

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Type		PacDrive LMC Eco controller LMC100, LMC101, LMC106, LMC201, LMC212, LMC216	PacDrive LMC Pro controller LMC300, LMC400, LMC600
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 bus	Sercos	Sercos
	Integrated additional fieldbus connection (configuration 1)	CANopen (Master/Slave)	PROFIBUS DP master/slave and CANopen (2.0B)
	Integrated additional fieldbus 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	–	Up to 4x Hiperface® encoders or 1x incremental master encoder
	Master encoder output via PacNet interface	–	Up to 4x Hiperface®
	Integrated OPC interface	OPC-UA Server	OPC-UA Server
	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	Up to 2x Option module:
		■ RT Ethernet □ Profinet IO-RT (Controller) □ Ethernet/IP (Scanner / Adapter) □ EtherCAT IO (Master/Slave) ■ Profibus DP (Master/Slave)	■ RT Ethernet x2 □ Profinet IO-RT (Controller) □ Ethernet/IP (Scanner / Adapter) □ EtherCAT IO (Master/Slave) ■ RT Ethernet and CANopen ■ RT Ethernet and Profibus ■ CANopen and Profibus

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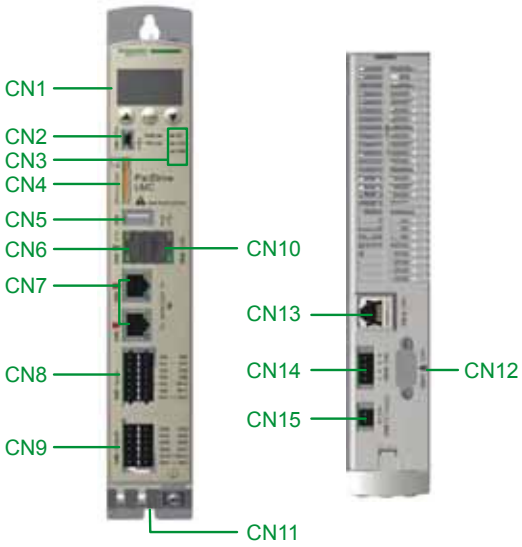
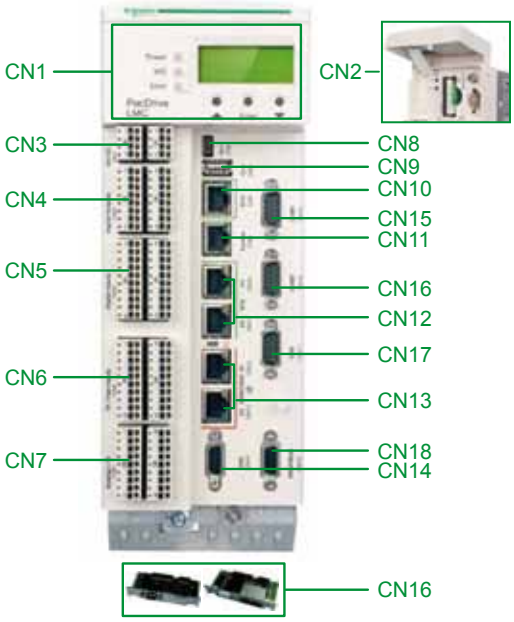
PacDrive 3 automation solution

PacDrive LMC motion controllers

PacDrive LMC Eco and LMC Pro controllers



PacDrive LMC Eco controller – description	
LMC100, LMC101, LMC106, LMC201, LMC212, LMC216	
Item	**Function**
CN1	LCD and LED
CN2	USB client (not active)
CN3	LED connector
CN4	SD card
CN5	USB Host
CN6	Ethernet
CN7	Sercos
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



PacDrive LMC Pro controller – description	
LMC300, LMC400, LMC600	
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
CN14	Master encoder
CN15	COM1: RS232
CN16	COM2: RS422/RS485
CN17	CANopen
CN18	Profibus DP
CN19	Optional module slots

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PacDrive LMC Eco and LMC Pro controllers – type code

LMC	300	C	CA	1	0000

Internal
0000= Standard

Hardware
1

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

Type
C= Controller base

Size
100= Max. 0 servo axes *(1)*
101= Max. 4 servo axes *(1)*
106 = Max. 6 servo axes *(1)*
201= Max. 8 servo axes *(1)*
212= Max. 12 servo axes *(1)*
216= Max. 16 servo axes *(1)*
300= Max. 8 servo axes *(2)*
400= Max. 16 servo axes *(2)*
600= Max. 99 servo axes *(2)*

Family
LMC= PacDrive LMC controller

(1) For PacDrive LMC Eco controllers.
(2) For PacDrive LMC Pro controllers.

Robot controllers – references

Controller type	PacDrive LMC Eco		PacDrive LMC Pro		
Number of synchronized servo axes	up to 4	up to 8	up to 8	up to 16	up to 99
Standard reference	LMC101C●●●	LMC201C●●●	LMC300C●●●	LMC400C●●●	LMC600C●●●
Robot controller (includes a number of license points and free support for robotics, see page 2/7 for details)					
with 80 license points included	LMC101CAA150RC	LMC201CAA150RC	LMC300CAA150RC	LMC400CAA150RC	LMC600CAA150RC
with 160 license points included	–	LMC201CAA170RC	LMC300CAA170RC	LMC400CAA170RC	LMC600CAA170RC
with 240 license points included	–	–	LMC300CAA180RC	LMC400CAA180RC	LMC600CAA180RC
with 320 license points included	–	–	LMC300CAA190RC	LMC400CAA190RC	LMC600CAA190RC
with 999 license points included	–	–	–	–	LMC600CAA1D0RC

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PacDrive 3 automation solution

PacDrive LMC Motion controller

PacDrive LMC Eco and LMC Pro controllers

PacDrive LMC Eco controller

PacDrive LMC Pro controller

PacDrive LMC controllers – references

Size	Max. number of controlled servo axes	Options	Reference	Weight kg / *lb*
PacDrive LMC Eco controllers *(1)*				
LMC100C	**0**	– (basic)	**LMC100CAA10000**	2.200/ *4.85*
LMC101C	**4**	– (basic)	**LMC101CAA10000**	
LMC106C	**6**	– (basic)	**LMC106CAA10000**	
LMC201C	**8**	– (basic)	**LMC201CAA10000**	
LMC212C	**12**	– (basic)	**LMC212CAA10000**	
LMC216C	**16**	– (basic)	**LMC216CAA10000**	
PacDrive LMC Pro controllers *(1)*				
LMC300C	**8**	– (basic)	**LMC300CAA10000**	3.500/ *7.72*
		CANopen option module	**LMC300CBB10000**	
		Profibus option module	**LMC300CBC10000**	
		RT Ethernet option module	**LMC300CBD10000**	
		2x RT Ethernet option modules	**LMC300CBG10000**	
		1x CANopen option module + 1x RT Ethernet option module	**LMC300CBI10000**	
		1x Profibus option module + 1x RT Ethernet option module	**LMC300CBL10000**	
		Uninterruptible power supply	**LMC300CCA10000**	
		CANopen option module + Uninterruptible power supply	**LMC300CCB10000**	
		Profibus option module + Uninterruptible power supply	**LMC300CCC10000**	
		RT Ethernet option module + Uninterruptible power supply	**LMC300CCD10000**	
		2x RT Ethernet option modules + Uninterruptible power supply	**LMC300CCG10000**	
		1x CANopen option module + 1x RT Ethernet option module + Uninterruptible power supply	**LMC300CCI10000**	
		1x Profibus option module + 1x RT Ethernet option module + Uninterruptible power supply	**LMC300CCL10000**	
LMC400C	**16**	– (basic)	**LMC400CAA10000**	3.500/ *7.72*
		CANopen option module	**LMC400CBB10000**	
		Profibus option module	**LMC400CBC10000**	
		RT Ethernet option module	**LMC400CBD10000**	
		2x RT Ethernet option modules	**LMC400CBG10000**	
		1x CANopen option module + 1x RT Ethernet option module	**LMC400CBI10000**	
		1x Profibus option module + 1x RT Ethernet option module	**LMC400CBL10000**	
		Uninterruptible power supply	**LMC400CCA10000**	
		CANopen option module + Uninterruptible power supply	**LMC400CCB10000**	
		Profibus option module + Uninterruptible power supply	**LMC400CCC10000**	
		RT Ethernet option module + Uninterruptible power supply	**LMC400CCD10000**	
		2x RT Ethernet option modules + Uninterruptible power supply	**LMC400CCG10000**	
		1x CANopen option module + 1x RT Ethernet option module + Uninterruptible power supply	**LMC400CCI10000**	
		1x Profibus option module + 1x RT Ethernet option module + Uninterruptible power supply	**LMC400CCL10000**	
LMC600C	**99**	Basic	**LMC600CAA10000**	3.500/ *7.72*
		CANopen option module	**LMC600CBB10000**	
		Profibus option module	**LMC600CBC10000**	
		RT Ethernet option module	**LMC600CBD10000**	
		2x RT Ethernet option modules	**LMC600CBG10000**	
		1x CANopen option module + 1x RT Ethernet option module	**LMC600CBI10000**	
		1x Profibus option module + 1x RT Ethernet option module	**LMC600CBL10000**	
		Uninterruptible power supply	**LMC600CCA10000**	
		CANopen option module + Uninterruptible power supply	**LMC600CCB10000**	
		Profibus option module + Uninterruptible power supply	**LMC600CCC10000**	
		RT Ethernet option module + Uninterruptible power supply	**LMC600CCD10000**	
		2x RT Ethernet option modules + Uninterruptible power supply	**LMC600CCG10000**	
		1x CANopen option module + 1x RT Ethernet option module + Uninterruptible power supply	**LMC600CCI10000**	
		1x Profibus option module + 1x RT Ethernet option module + Uninterruptible power supply	**LMC600CCL10000**	

(1) Accessory kit included in controller packaging: terminals, 0.1 m connection cable, termination resistors, and other accessories.

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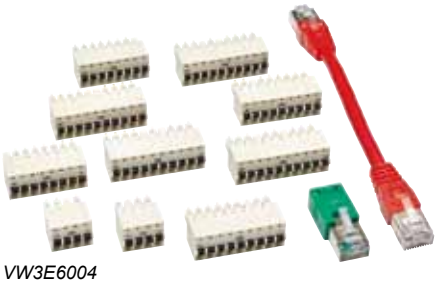
PacDrive 3 automation solution

PacDrive LMC Motion controller

Spare parts, Communication modules, Programming software



VW3E6004

Spare parts – references

PacDrive LMC Pro controller – spare parts

Designation	Description	Reference	Weight kg/*lb*
Accessory kit	Complete connector set for PacDrive LMC Pro controller (300C, 400C, 600C) and Sercos cable (0.13 m/ 0.43ft)	**VW3E6004**	0.100/ *0.22*
Compact flash memory card	512 MB	**VW3E70350AA00**	0.025/ *0.06*
Battery	Lithium battery front, 3 V	**VW3E6020**	0.060/ *0.13*

VW3E704000000

VW3E704100000

PacDrive LMC Eco controller – communication modules

Designation	Description	Reference	Weight kg/*lb*
Communication module Profibus DP	1x 9 pin SUB-D	**VW3E704000000**	0.080/ *0.18*
Communication module Ethernet real time (RT)	2x RJ45 ports	**VW3E704100000**	0.080/ *0.18*

VW3E6019

PacDrive LMC Eco controller – spare parts

Designation	Description	Reference	Weight kg/*lb*
Accessory kit	Complete connector set for PacDrive LMC Eco controllers (100C...216C) and Sercos cable (0.13 m / 0.43*ft*)	**VW3E6019**	0.100/ *0.22*
SD card	512 MB	**VW3E70360AA00**	0.025/ *0.06*

VW3E70360AA00

Programming software

SoMachine Motion software for PacDrive system	See page 2/2

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PacDrive 3 automation solution

PacDrive LMC Motion controller

Cables, terminals

VW3E5001R●●●

Cables, terminals – references

Sercos cables

Designation	Length m	ft	Reference	Weight kg/lb
Sercos cables for redundant Sercos ring Equiped with two RJ45 connectors	0.5	*1.640*	**VW3E5001R005**	0.045 / *0.10*
	1	*3.281*	**VW3E5001R010**	0.065 / *0.14*
	1.5	*4.921*	**VW3E5001R015**	0.068 / *0.15*
	2	*6.562*	**VW3E5001R020**	0.081 / *0.18*
	3	*9.843*	**VW3E5001R030**	0.124 / *0.27*
	5	*16.404*	**VW3E5001R050**	0.199 / *0.44*
	10	*32.808*	**VW3E5001R100**	0.325 / *0.72*
	15	*49.213*	**VW3E5001R150**	0.610 / *1.34*
	20	*65.617*	**VW3E5001R200**	0.810 / *1.79*
	25	*82.021*	**VW3E5001R250**	1.020 / *2.25*
	30	*98.425*	**VW3E5001R300**	1.220 / *2.69*
	40	*131.234*	**VW3E5001R400**	3.100 / *6.83*
	50	*164.042*	**VW3E5001R500**	2.020 / *4.45*

Encoder cables

Incremental master encoder cable (UL)	1.5	*4.921*	**VW3E2097R015**	0.196 /*1.43*
	5	*16.404*	**VW3E2097R050**	0.415 / *0.91*
	10	*32.808*	**VW3E2097R100**	0.757 / *1.67*
	15	*49.213*	**VW3E2097R150**	1.087 / *2.40*
	20	*65.617*	**VW3E2097R200**	1.417 / *3.12*
	30	*98.425*	**VW3E2097R300**	2.077 / *4.58*
	40	*131.234*	**VW3E2097R400**	2.737 / *6.03*
	50	*164.042*	**VW3E2097R500**	3.397 / *7.49*

PacNet terminals

Designation	Description	Reference	Weight kg/lb
Bus terminal – 4/DIO1	PacNet bus terminal 16x digital inputs/16x digital outputs	**VBO04S00**	0.980 / *2.16*
Bus terminal– 4/Enc1	PacNet bus terminal 2x master encoder inputs (incremental or SinCos) / 1x incremental encoder input and output	**VBO05S00**	0.790 / *1.74*

VBO04S00

VBO05S00

PacNet and Patch cables (controller-Bus terminal-4) *(1)*

Designation	Length m	ft	Reference	Weight kg/lb
PacNet cables	0.5	*1.640*	**VW3E3001R005**	0.500 / *1.10*
	1	*3.281*	**VW3E3001R010**	1.000 / *2.20*
	2	*6.562*	**VW3E3001R020**	2.000 / *4.41*
	3	*9.843*	**VW3E3001R030**	3.000 / *6.61*
	5	*16.404*	**VW3E3001R050**	5.000 / *11.02*
Patch cables	10	*32.808*	**VW3E3001R100**	10.000 / *22.05*
	15	*49.213*	**VW3E3001R150**	15.000 / *33.07*
	20	*65.617*	**VW3E3001R200**	20.000 / *44.09*
	25	*82.021*	**VW3E3001R250**	25.000 / *55.12*
	30	*98.425*	**VW3E3001R300**	30.000 / *66.14*
	40	*131.234*	**VW3E3001R400**	40.000 / *88.18*
	50	*164.042*	**VW3E3001R500**	50.000 / *110.23*

(1) PacNet cables are available only in the given lengths.

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Servo drives

Technical information on all of the products listed in this catalog is available at: www.schneider-electric.com

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Lexium 52 stand-alone servo drive

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Lexium 62 ILM integrated drive

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PacDrive 3 automation solution
Lexium 52 stand-alone servo drive

Lexium 52 stand-alone servo drives

Lexium 52 stand-alone servo drive, controlling a pick-and-place robot

Presentation

> Lexium 52 stand-alone servo drive

In a conventional stand-alone design with an integrated 3-phase power supply, Lexium 52 series servo drives are particularly well suited for economical configuration of servo drive solutions with self-contained single axes. They communicate via Sercos and offer embedded digital I/O. Lexium 52 servo drives are available in five different power levels, ranging from 1.5 to 24 A continuous current and 6 to 72 A peak current. This corresponds to a power range of 0.4 to 7 kW (0.536 to 9.383 hp).

Lexium 52 is ideal for solutions with a small number of axes and is fully compatible with the ´smaller´ PacDrive Eco controllers.

The Lexium 52 servo drive series include five servo drive models associated with Lexium SH3 series servo motors, optimized to meet 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 is designed to simplify the machine lifecycles.

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 within a minimum space, enabling reduced machine dimensions and lower costs. Integrated safety functions reduce design times and facilitate compliance 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 significantly lower the costs of bringing the device into conformity to obtain the CE mark. Additional filters, available as an option, can be installed by the customer to reduce levels of conducted and radiated emissions.

> High performance

The Lexium 52 servo drive increases machine performance with the following features:

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

> Lexium SH3, MH3 and SHS servo motors: dynamics and power

Lexium 52 servo drives can operate synchronous 3-phase servo motors of the Lexium SH3, MH3, and SHS series.
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.

These servo drives cover a continuous stall torque range of 0.5 to 94.4 Nm (0.368 to 69.625 ft lbf) for nominal speeds between 2000 and 8000 rpm.
All servomotors in this Lexium series have an electronic type plate. Therefore they all follow to the principles of PacDrive´s system communication for automatic configuration via the controller.

Lexium SH3, MH3, and SHS servo motors, see pages 5/2 to 5/14

> Accessories and options

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

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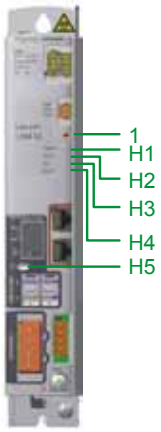
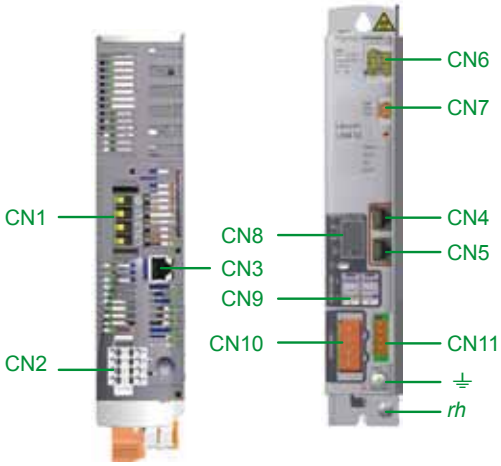
Lexium 52 servo drive

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 nominal 208 / 200 (-15%)...240 (+10%) 3-phase nominal 400 / 380 (-15%)...480 (+10%)				
Supply frequency Hz	48…62				
Control voltage VDC	24 (-20%…+25%)				
Motion bus	Sercos				
Encoder	Hiperface® or SinCos				
Digital input	2				
Touchprobe input	2				
Digital input or output	2				
Housing dimensions DxWxH	220x 48 x 270 mm *(8.661x 1.890x 10.630 in.)*			220x 68x 230 mm *(8.661x 2.677x 9.055 in.)*	220x 108x 230 mm *(8.661x 4.252 x 9.055 in.)*
Protection rating	IP20				
Certifications	CE, Ulus, and CSA				



Lexium 52 stand-alone 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 Inverter Enable 2-channel
CN3	Motor encoder
CN4 , CN5	Sercos communication ports
CN6	Digital input/output
CN7	Ready relay output
CN8	External braking resistor
CN9	DC bus connection for parallel operation
CN10	Motor phases
CN11	Holding brake/motor temperature
rh	Shielded connector

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Lexium 52 servo drives – type code

LXM	52	D	U60	C	4	1	0	00

Customer
00= Standard

Internal
0= Internal production

Hardware Release
1

Options
4= 3 phases 208/400/480 VAC

Variants
C= Single Drive HW-STO SIL 3 PLe

Current Output (Peak)
U60= 6 A
D12= 12 A
D18= 18 A
D30= 30 A
D72= 72 A

Type
D= Drive

Size
52= Lexium 52

Family
LXM= Lexium

LXM52DU60C41000, LXM52DD12C41000, LXM52DD18C41000

LXM52DD30C41000

LXM52DD72C41000

Lexium 52 servo drives – references *(1)*

Designation	Continuous output	Continuous current	Peak current	Reference	Weight kg/*lb*
Single drives	0.4 kW (*0.536 hp*)	1.5 A @ 8 kHz	6 A	**LXM52DU60C41000**	1.800/ *3.97*
	0.9 kW (*1.206 hp*)	3 A @ 8 kHz	12 A	**LXM52DD12C41000**	1.800/ *3.97*
	1.8 kW (*2.412 hp*)	6 A @ 8 kHz	18 A	**LXM52DD18C41000**	1.900/ *4.19*
	3 kW (*4.021 hp*)	10 A @ 8 kHz	30 A	**LXM52DD30C41000**	2.700/ *5.95*
	7 kW (*9.383 hp*)	24 A @ 8 kHz	72 A	**LXM52DD72C41000**	5.000/ *11.02*

VW3M7101R01

Accessories – references

Designation	Description	Reference	Weight kg/*lb*
Single drive connectors	Spare part	**VW3E6018**	0.055 *0.12*
Daisy chain DC bus cordset	Length 0.1 m (0.3 ft.) Equipped with 2 connectors	**VW3M7101R01**	0.144/ *0.32*

(1) The Lexium 52 stand-alone servo drive includes a Sercos cable for connection on Sercos bus.

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PacDrive 3 automation solution

Lexium 52 stand-alone servo drive

Option: Braking resistors

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 recovered energy is converted into heat by the braking resistor. This 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 such a case, the internal braking resistor should be 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 provided by 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 within the same installation can be connected in parallel.

> Applications

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

Braking resistor – references

VW3A770●●

VW3A760●R●●

Designation	Ohmic value	Continuous power PPr	Peak energy EPK				Length of connection cable		Reference	Weight	
			115 V	230 V	380 V	480 V					
	Ω	W	Ws	Ws	Ws	Ws	m	*ft*		kg	*lb*
Braking resistor for Lexium 52 servo drives – IP20	10	1000	36500	36500	22500	22500	-	-	**VW3A7705**	11.000	*24.251*
	15	1000	43100	43100	26500	26500	-	-	**VW3A7704**	11.000	*24.251*
Braking resistor for Lexium 52 servo drives – IP65	10	400	18800	13300	7300	7700	0.75	*2.461*	**VW3A7601R07**	1.420	*3.131*
	10	400	18800	13300	7300	7700	2	*6.562*	**VW3A7601R20**	1.470	*3.241*
	10	400	18800	13300	7300	7700	3	*9.843*	**VW3A7601R30**	1.620	*3.571*
	27	100	4200	3800	1900	1700	0.75	*2.461*	**VW3A7602R07**	0.630	*1.389*
	27	100	4200	3800	1900	1700	2	*6.562*	**VW3A7602R20**	0.780	*1.720*
	27	100	4200	3800	1900	1700	3	*9.843*	**VW3A7602R30**	0.900	*1.984*
	27	200	9700	7400	4900	4300	0.75	*2.461*	**VW3A7603R07**	0.930	*2.050*
	27	200	9700	7400	4900	4300	2	*6.562*	**VW3A7603R20**	1.080	*2.381*
	27	200	9700	7400	4900	4300	3	*9.843*	**VW3A7603R30**	1.200	*2.646*
	27	400	25500	18100	11400	10500	0.75	*2.461*	**VW3A7604R07**	1.420	*3.131*
	27	400	25500	18100	11400	10500	2	*6.562*	**VW3A7604R20**	1.470	*3.241*
	27	400	25500	18100	11400	10500	3	*9.843*	**VW3A7604R30**	1.620	*3.571*
	72	100	5500	3700	2500	2300	0.75	*2.461*	**VW3A7605R07**	0.620	*1.367*
	72	100	5500	3700	2500	2300	2	*6.562*	**VW3A7605R20**	0.750	*1.653*
	72	100	5500	3700	2500	2300	3	*9.843*	**VW3A7605R30**	0.850	*1.874*
	72	200	14600	9600	6600	6000	0.75	*2.461*	**VW3A7606R07**	0.930	*2.050*
	72	200	14600	9600	6600	6000	2	*6.562*	**VW3A7606R20**	1.080	*2.381*
	72	200	14600	9600	6600	6000	3	*9.843*	**VW3A7606R30**	1.200	*2.646*
	72	400	36600	24700	16200	15500	0.75	*2.461*	**VW3A7607R07**	1.420	*3.131*
	72	400	36600	24700	16200	15500	2	*6.562*	**VW3A7607R20**	1.470	*3.146*
	72	400	36600	24700	16200	15500	3	*9.843*	**VW3A7607R30**	1.620	*3.571*
	100	100	4400	4400	2900	2900	0.75	*2.461*	**VW3A7608R07**	0.410	*0.904*
	100	100	4400	4400	2900	2900	2	*6.562*	**VW3A7608R20**	0.560	*1.235*
	100	100	4400	4400	2900	2900	3	*9.843*	**VW3A7608R30**	0.760	*1.676*

Recommendation: The total continuous power dissipated in the external braking resistor(s) should be less than or equal to the nominal power of the Lexium 52 servo drive.
Note: The size of the braking resistor must be calculated based upon the application.

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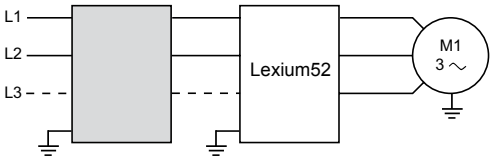
PacDrive 3 automation solution

Lexium 52 stand-alone servo drive

Option: Line chokes



Lexium52 servo drive with line choke

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 IEC 61800-5-1 (VDE 0160 level 1 high-energy overvoltages on the line supply). The inductance values are defined for a voltage drop of between 3% and 5% of the nominal line voltage. Values higher than this will cause loss of torque. It is recommended that these chokes be 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 particularly recommended 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 imbalance between phases greater 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

VW3A455●

Line chokes – references

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

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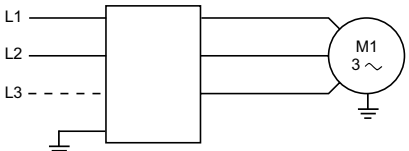
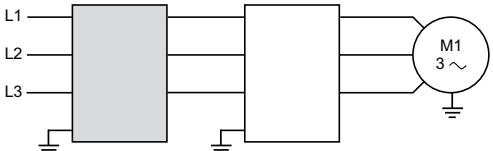
PacDrive 3 automation solution

Lexium 52 stand-alone servo drive

Option: EMC filters



Lexium 52 with EMC filter



Additional EMC input filter

Lexium 52

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

Additional EMC input filters can be used with Lexium 52 servo drives to meet more stringent requirements, and are designed to reduce conducted emissions on the line supply below the limits of 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 within an enclosure.

Use according to the type of line supply

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

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

EMC filters – references

Designation	Rated current	For use with servo drives	Maximum servo motor shielded cable length (m) conforming to		Reference	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
3-phase supply voltage						
EMC filters	15 A	LXM52DU60C41000 LXM52DD12C41000 LXM52DD18C41000 LXM52DD30C41000	50	100	**VW3A4422**	0.90 / *1.984*
	25 A	LXM52DD72C41000	50	100	**VW3A4423**	1.35 / *2.976*

VW3A442●

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PacDrive 3 automation solution
Lexium 62 multi-axis drive system

Lexium 62 multi-axis servo drive system

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-connect front-side 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-side 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: this leaves room at the front of the device for rapid assembly/disassembly of Lexium 62 components.

> Connection of the Sercos ring via Sercos interface module

The Sercos ring can be connected quickly via the Sercos 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 in less than two minutes, using a quick front-side connection with locking screws. 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 Lexium SH3, MH3, and SHS servo motors.
The servo drives have an electronic type 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 type plates.

To connect to the 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 errors
- > Inverter Enable safety input (according to IEC 61508, EN/ISO13849-1) for each axis
- > Automatic motor detection
- > Software-compatible with Lexium 62 ILM integrated servo modules and stand-alone servo drives

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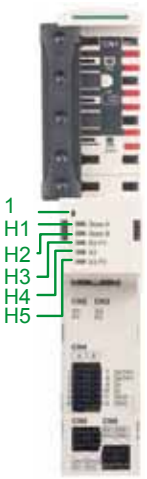
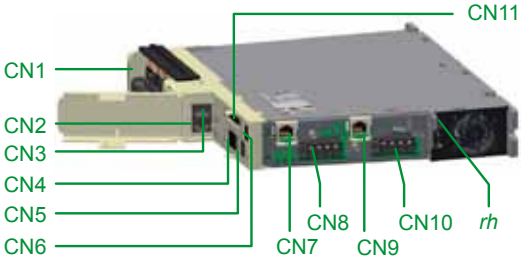
Lexium 62 servo drive

Servo drive type	Single servo drive					Double servo drive		
	LXM62D U60X21000	LXM62D D15X21000	LXM62D D27X21000	LXM62D D45X21000	LXM62D C13C21000	LXM62D U60X21000	LXM62D D15X21000	LXM62D D27X21000
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*
DC bus voltage VDC	250…700							
Supply frequency Hz	48…62							
Control voltage VDC	24 (-20%…+25%)							
Motion bus	Sercos							
Encoder	Hiperface® or SinCos							
Inverter Enable	1 input (two channels)					2 inputs (two channels for each input)		
Digital input	2					2 x 2		
Touchprobe input	2					2 x 2		
Digital input or output	2					2 x 2		
Housing dimensions (D x W x H)	270 x 44 x 310 mm *(10.630 x 1.732 x 12.205 in.)*				270 x 89 x 310 mm *(10.630 x 3.504 x 12.205 in.)*	270 x 44 x 310 mm *(10.630 x 1.732 x 12.205 in.)*		
Protection rating	IP20							
Certifications	CE, ULus and CSA							

4





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 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

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Lexium 62 servo drives – type code

LXM	62	D	U60	C	2	1	000

Internal
000= Standard

Hardware Release
1

Options
2= 250…700 VDC

Variants
C= Single servo drive HW-STO SIL 3 PLe
D= Double servo drive HW-STO SIL 3 PLe

Peak current
U60= 6 A
D15= 15 A
D27= 27 A
D45= 45 A
C13= 130 A

Type
D= Drive

Size
62= Lexium 62

Family
LXM= Lexium

Lexium 62 servo drives – references *(1)*

Designation	Continuous output	Continuous current	Peak current	Reference	Weight kg/*lb*
Single servo drives	0.95 kW (1.273 hp)	2 A @ 4 kHz	6 A	**LXM62DU60C21000**	3.000/ *6.61*
	2.4 kW (3.217 hp)	5 A @ 4 kHz	15 A	**LXM62DD15C21000**	3.000/ *6.61*
	4.3 kW (5.764 hp)	9 A @ 4 kHz	27 A	**LXM62DD27C21000**	3.000/ *6.61*
	9.6 kW (12.868 hp)	20 A @ 4 kHz	45 A	**LXM62DD45C21000**	3.000/ *6.61*
	24 kW (32.171 hp)	50 A @ 4 kHz	130 A	**LXM62DC13C21000**	6.800 *14.99*
Double servo drives	2x 0.95 kW (2x 1.273 hp)	2x 2 A @ 4 kHz	2x6 A	**LXM62DU60D21000**	3.000/ *6.61*
	2x 2.4 kW (2x 3.217 hp)	2x5 A @ 4 kHz	2x15 A	**LXM62DD15D21000**	3.000/ *6.61*
	2x 4.3 kW (2x 5.764 hp)	2x 9 A @ 4 kHz	2x27 A	**LXM62DD27D21000**	3.000/ *6.61*

(1) The Lexium 62 servo drive includes a Sercos cable for connection on Sercos bus.

LXM62D●●●C21000

LXM62D●●●D21000

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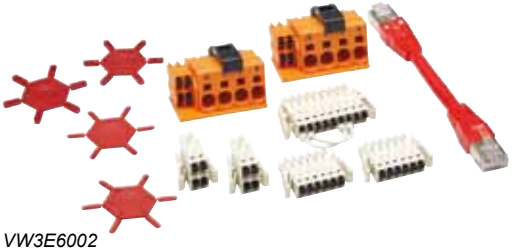
PacDrive 3 automation solution

Lexium 62 multi-axis drive system

Accessories

VW3E6001



VW3E6002

VW3E6005

Accessories for Lexium 62 servo drive – references

Designation	Description	Reference	Weight kg / *lb*
Single drive connectors	Connectors and Sercos cable 0.09 m *(0.30 ft)*	**VW3E6001**	0.027/ *0.06*
Double drive connectors	Connectors and Sercos cable 0.09 m *(0.30 ft)*	**VW3E6002**	0.033/ *0.07*
Torque indicator	Limited torque 2.5 N.m (*1.843 ft-lbf)*	**VW3E6016**	0.160/ *0.35*
Single drive connectors	Connectors for one LXM62DC13C21000 servo drive and Sercos cable 0.09 m (*0.30 ft*)	**VW3E6052**	0.250/ *0.55*
Accessory kit **for external shield connection**	For single and double drive	**VW3E6005**	0.090/ *0.20*
	For LXM62DC13C21000	**VW3E6053**	0.027/ *0.06*
5 V encoder adapter	For connection of third-party engines (e.g. linear, torque, asynchronous) Note: third-party engines must meet requirements of overvoltage category 3 (according to IEC 61800-5-1)	**VW3E6027**	0.200/ *0.44*
Bleeder module	Optional intelligent external braking resistor	**VPM030000000**	3.140/ *6.92*

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PacDrive 3 automation solution

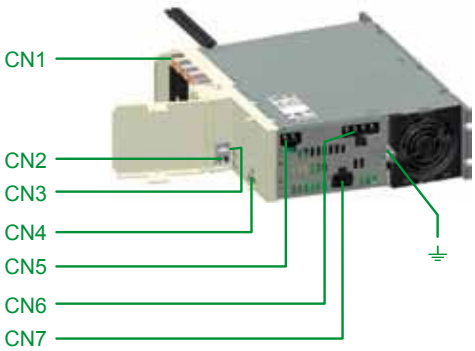
Lexium 62 multi-axis drive system

Power supply

Power supply modules

Power supply module type	LXM62PD84A11000	LXM62PD20A11000
Rated voltage VAC	1-phase nominal 230 / 208 (-10%)...270 (+10%)	
	3-phase nominal 230 / 208 (-10%)...360 (+10%)	
	3-phase nominal 400 / 380 (-10%)...480 (+10%)	
Rated supply current (A)	Max. 40	Max. 10
Power frequency	48...63 Hz	
Control voltage VDC	24 (-20%…+25%)	
Control current A	Max. 50 (no overload permissible)	
DC Bus voltage VDC	270…700	
Rated current A	21 (1-phase)	10 (1-phase)
	42 (3-phase)	10 (3-phase)
Peak current A	42 (1-phase)	20 (1-phase)
	84 (3-phase)	20 (3-phase)
Continuous output kW (*hp*)	22.1 *(0.03 hp)* at 3-phase 400 V AC	5.2 *(0.007 hp)* at 3-phase 400 V AC
Peak output kW/*hp*	44.2 *(0.06hp)* at 3-phase 400 V AC	10.4 *(0.014 hp)* at 3-phase 400 V AC
Sercos interface	Integrated	
Bleeder	Integrated	
EMC filter	Integrated	
Housing dimensions (D x W x H)	270 x 89 x 310 mm (*10.630 x 3.504 x 12.205 in.)*	
Protection rating	IP20	
Certifications	CE, ULus, and CSA	

(1) an external mains filter is required when total motor cable lengths > 150 m (492.13 ft).



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 communication
CN4	Ready relay output
CN5	24 VDC
CN6	Mains connection
CN7	DC bus output

Performance for parallel connection

Number of power supply modules	Intermediate circuit		Allowed DC bus capacitance
	Continuous current	Peak current	
1	42 A	84 A	12.5 mF
2	73.9 A	147 A	21.9 mF
3	110.9 A	189 A	31.3 mF

LXM62PD●●A11000

Power supply and accessory – references

Designation	Description	Reference	Weight kg/*lb*
Power supply modules for Lexium 62 servo drives and Lexium 62 ILM servo modules	■ 22.1/44.2 kW *(0.03 / 0.06 hp)* @ 400 VAC ■ Continuous current 42 A / 84 A ■ Pulse energy 4000 Ws	**LXM62PD84A11000**	6.300/ *13.89*
	■ 5.2 /10.4 kW *(0.007 / 0.014 hp)* @ 400 VAC ■ Continuous current 10 A / 20 A ■ Pulse energy 4000 Ws	**LXM62PD20A11000**	6.300/ *13.89*
Power supply connectors	Spare part	**VW3E6003**	0.090/ *0.20*

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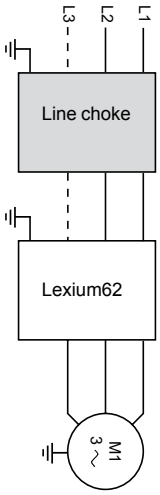

Lexium62 servo drive with line choke

Option: 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.

VW3A455●

Designation	Line Current		Certification		Reference	Weight kg/*lb*
	Single-phase supply voltage	Three-phase supply voltage	CE	UL us/CSA		
Line choke for Lexium 62 servo drive	16 A	–	☑	☑	**VW3SKLN016H003E**	0.398/ *0.88*
	–	4 A	☑	☑	**VW3A4551**	1.500/ *3.31*
	–	10 A	☑	☑	**VW3A4552**	3.000/ *6.61*
	–	16 A	☑	☑	**VW3A4553**	3.500/ *7.72*
	–	30 A	☑	☑	**VW3A4554**	6.000/ *13.23*
	–	60 A	☑	☑	**VW3A4555**	11.000/ *24.25*

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PacDrive 3 automation solution
Lexium 62 ILM integrated drive

Lexium 62 ILM integrated drive range

1 Lexium 62 connection module (CM)
2 Lexium 62 distribution box (DB)
3 Lexium 62 ILM integrated drive
4 Hybrid cable

- Various dimensions with peak torques of up to 55 Nm (more than *40.57 ft-lbf*)
- Can be combined with single and double drives using a shared power supply
- 70% shorter cable lengths
- 90% less wiring time required in the control cabinet
- 50% less cable installation required in the machine
- Inverter Enable safety input (according to IEC 61508, EN/ISO13849-1) for each axis

Presentation

The Lexium ILM 62 integrated drive and motor bundle is more than just compact:
- Quick interconnects and hybrid cables for signal and power level
- Automatic network configuration
- Diagnostic functions

Servo modules move servo drives out of the control cabinet and into the field. 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 LMC motion controller,
  - the shared power supply,
  - the connection module (CM) with the possibility of connecting up to 45 servo modules.
- The CM feeds power, 24 V for controls and brakes, Inverter Enable and Sercos to the Lexium 62 ILM integrated drive from the same DC bus power supplies as the Lexium 62.

Lexium 62 ILM integrated drives use a flexible approach to cabling, consisting of pre-terminated hybrid cables and Lexium 62 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 62 ILM integrated drives are the key element in modular machine design. They permit modular design of mechanics, software, and even electronics. This makes Lexium 62 ILM integrated drive an ideal solution for machines with a variety of optional mechatronic modules. Except for additional power supply units that may be required, any later addition of modules to a machine requires no changes in the control cabinet.

> Lexium 62 ILM integrated drive benefits

- Quick interconnects and hybrid cables for signal and power level
- Plug & Play technology
- Up to 90% less cabinet space
- Up to 90% less wiring time
- Up to 70% less cabling

> Peak torques of 3.5 to 55 Nm *(2.58 to 40.57 ft lbf)*

Lexium 62 ILM integrated drives are available in flange sizes of 70, 100, and 140 mm (*2.76, 3.94, and 5.52 in.*).
Thus they will fully cover a holding torque range of 1.1 to 12.5 Nm (*0.81 to 9.22 ft lbf)* and/or a peak torque of 3.5 to 55 Nm *(2.58 to 40.57 ft lbf)*.
The models are software-compatible with one another and with Lexium 62 and Lexium 52 series servo drives. Additional options include an integrated holding brake, a feathered key groove, and a multi-turn encoder.
The addition of a shaft seal can increase the protection rating from IP54 to IP65.

> Lexium 62 ILM integrated drive main characteristics

- Supply voltage: 250…700 VDC
- 560 VDC Nominal / rated
- Control voltage: 24 VDC (-20%… +25%)
- Brake supply voltage: 24 VDC (-20%… +25%)
- Cooling: passive
- Protection: IP65

> 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 inside the control cabinet.

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Lexium 62 ILM integrated servo drive – type code

ILM	070	1	P	0	1	A	0	000

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 seal
1= Parallel key, without shaft seal
2= Smooth shaft, with shaft seal, IP65
3= Parallel key, with shaft seal, IP65

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

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

Flange size
070= 70 mm/*2.756 in.*
100= 100 mm/*3.937in.*
140= 140 mm/*5.512 in.*

Family
ILM= integrated Lexium servo modules

Lexium 62 ILM integrated drive – references

Designation	Rated servo motor output power Pn		Continuous stall torque Mo		Rated torque Mn	Peak stall torque Mmax	Continuous current Io	Rated current In	Peak current Imax	Rotor moment of inertia Jm	Holding brake moment of inertia Jbr	Rated speed Nn	Reference	Weight (without options)	
	kW	hp	Nm	ft-lbf			Arms			kg cm²	kg cm²	rpm		kg	*lb*
Motor	0.31	*0.415*	1.1	*0.811*	0.5	3.5	1.55	0.6	5.7	0.25	0.1	6000	**ILM0701P**	2.7	*5.952*
	0.72	*0.965*	1.7	*1.253*	1.15	7.6	2.5	1.5	11.8	0.41	0.1	6000	**ILM0702P**	3.4	*7.496*
	0.72	*0.965*	2.2	*1.622*	1.15	8.7	3	1.5	12	0.58	0.3	6000	**ILM0703P**	4.2	*9.259*
	0.6	*0.804*	2.5	*1.843*	1.9	9.6	1.8	1.4	7.4	1.4	0.7	3000	**ILM1001P**	4.9	*10.803*
	0.91	*1.219*	4.4	*3.245*	2.9	18.3	2.9	2	13.1	2.31	0.7	3000	**ILM1002P**	6.4	*14.110*
	1.1	*1.474*	5.8	*4.277*	3.5	28.3	3.6	2.4	21.2	3.22	0.7	3000	**ILM1003P**	8.1	*17.857*
	1.45	*1.943*	7.5	*5.531*	4.6	27	4.7	2.9	18.8	7.41	1.3	3000	**ILM1401P**	12.5	*27.558*
	1.3	*1.742*	8.5	*6.269*	8.3	27	3.2	3.15	14.6	7.41	1.3	1500	**ILM1401M**	12.5	*27.558*
	1.91	*2.560*	12.5	*9.219*	9.1	55	4.8	3.7	24	12.68	1.3	2000	**ILM1402P**	17.2	*37.920*

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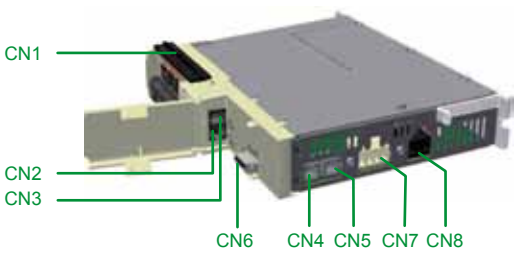
PacDrive 3 automation solution

Lexium 62 ILM integrated drive
Lexium 62 connection module
Lexium 62 distribution box

Lexium 62 connection module (CM) – presentation

type	ILM62CMD20A000
Input current A	20
Output current A	20
Continuous output kW/*hp*	0.95 /1.273
DC bus input voltage VDC	250…700
DC bus output voltage VDC	250…700
Control voltage VDC	24 VDC (-20%… +25%)
Inverter Enable input voltage VDC	24 (-20%… +25%)
Inverter Enable output voltage VAC	40
Inverter Enable output current A	2
Cooling	Passive
Housing dimensions (D x W x H)	270 x 44.5 x 310 mm (*10.630 x 1.752 x 12.205 in.*)
Protection rating	IP 20



Lexium 62 connection module – decription

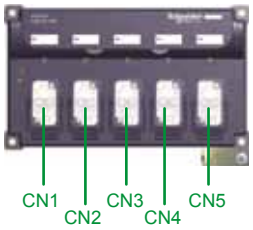
Connector	Function
CN1	Busbar module
CN2/CN3	Sercos communication to power supply and additional connection modules
CN4	Inverter Enable 24 VDC
CN5, CN6	Sercos communication to Lexium 62 ILM and Lexium 62 distribution boxes
CN7	Inverter Enable signal output/24 VDC output
CN8	DC bus output

Lexium 62 connection module – reference

Designation	Use	Reference	Weight kg/*lb*
Lexium 62 connection module	To connect the Lexium 62 ILM with Sercos and DC bus	**ILM62CMD20A000**	3.000 *6.61*

Lexium 62 distribution box (DB) – Presentation

type	ILM62DB4A000
Input current A	20
Output current A	20
DC bus input voltage VDC	250…700 VDC
DC bus output voltage VDC	250…700 VDC
Control voltage VDC	24 VDC (-20%… +25%)/Max. 20 A
Inverter Enable input voltage VDC	24 (-20%… +25%)
Inverter Enable output voltage VAC	40
Inverter Enable output current A	2
Housing dimensions (D x W x H)	151.4 x 230 x 94 mm (*5.961 x 9.055 x 3.701 in.*)
Protection rating	IP 65
Sercos speed rate	100 Mbps



ILM62DB4A000 with 5 x VW3E6023

Lexium 62 distribution box (DB) – decription

Connector	Function
CN1	Input (Lexium 62 connection module ILM62CM or Lexium 62 distribution box ILM62DB)
CN2, CN3, CN4, CN5	Output (Lexium 62 distribution box ILM62DB or Lexium 62 ILM integrated drive)

Lexium 62 distribution box (DB) – references

Designation	Use	Reference	Weight kg/*lb*
Lexium 62 distribution box	To connect several Lexium 62 ILM with Sercos and DC bus	**ILM62DB4A000**	0.850/ *1.88*
Sercos bridge plug	For distribution box (to be ordered separately: not included in ILM62DB4A000)	**VW3E6023**	0.784/ *1.73*

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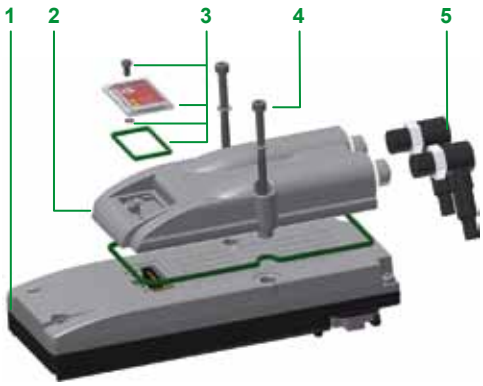
PacDrive 3 automation solution

Lexium 62 ILM integrated drive

Lexium 62 digital I/O module (option module)

Lexium 62 digital I/O module: option module for Lexium 62 ILM integrated drive – presentation

type	VW3E702100000
Digital inputs/outputs	8 digital inputs or outputs (IEC 61131-2 type I) □ 2 inputs configurable as touch probe □ 4 outputs configurable as digital output
Input voltage VDC	□ Range UIN 0 Voltage -3…5 VDC □ Range UIN 1 Voltage 15…30 VDC
Output voltage VDC	$(+U_L - 3V) < U_{OUT} < +U_L$
Control voltage VDC	24 VDC (-15%/+20%) □ with internal I/O supply: max. 300 mA, □ with external I/O supply: max. 80 mA
Overall module current across the 8 inputs/outputs A	■ with internal I/O supply: 0.1 A ■ with external I/O supply: 2.0 A
Certifications	CE, cULus
Protection rating	IP 65



Lexium 62 digital I/O module – description

Connector	Function
1	Lexium 62 ILM integrated drive
2	Lexium 62 digital I/O 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)

Lexium 62 digital I/O module – reference

Designation	Description	Reference	Weight kg/*lb*
Lexium 62 digital I/O module	■ 8 digital inputs or outputs (IEC 61131-2 type I) □ 2 inputs configurable as touch probe □ 4 outputs configurable as digital output	**VW3E702100000**	0.480/ *1.06*

Accessories for Lexium 62 digital I/O module – reference

Designation	Description	Reference	Weight kg/*lb*
I/O cable	■ with M12 connector, angled ■ Length: 3 m *(9.843 ft)*	**VW3E4001R030**	0.215/ *0.47*
Terminal block connector	For ABE9 splitter box	**ABE9CM12C**	0.040/ *0.09*
IP67 passive splitter box	With 4 channels, M12 connector type	**ABE9C1240M**	0.060/ 0.13

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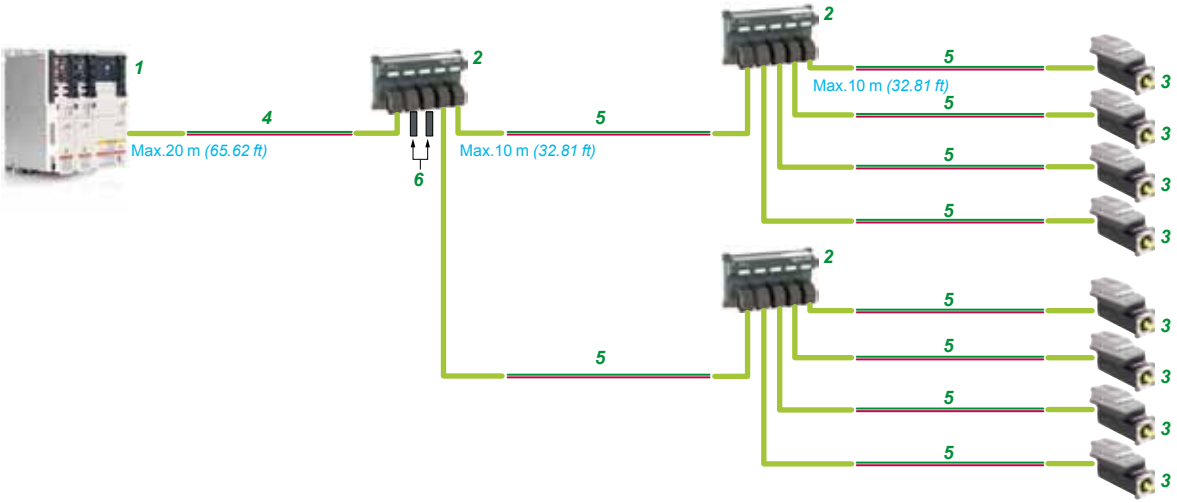
PacDrive 3 automation solution

Lexium 62 ILM integrated drive

Sercos installation

Hybrid cabling examples

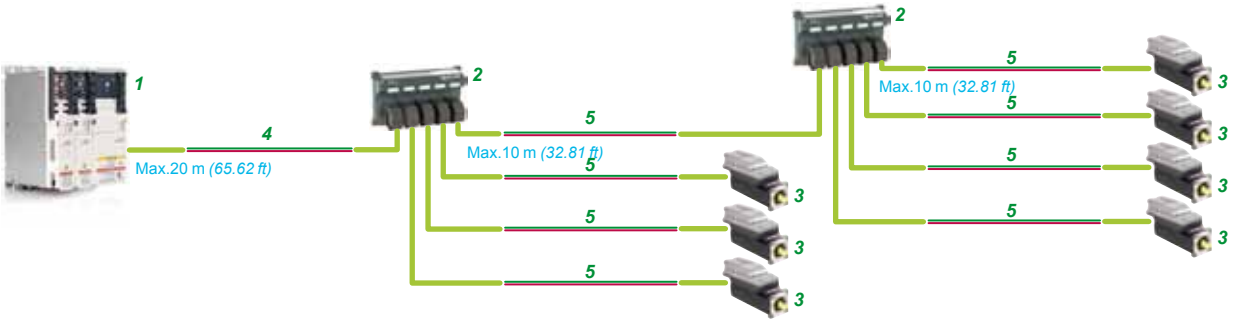
Example 1



1 Lexium 62 connection module ILM62CM
2 Lexium 62 distribution box ILM62DB
3 Lexium 62 ILM integrated drive
4 Hybrid cable ILM62CM – ILM62DB4 *(1)*
5 Hybrid cable ILM62DB4 – ILM or ILM62DB4 – ILM62DB4 *(1)*

(1) Various connector directions available (left, right, straight).
(2) Any unused Lexium 62 distribution box ILM62DB connection must be terminated with a Sercos bridge.

Example 2



1 Lexium 62 connection module ILM62CM
2 Lexium 62 distribution box ILM62DB
3 Lexium 62 ILM integrated drive
4 Hybrid cable ILM62CM – ILM62DB4 *(1)*
5 Hybrid cable ILM62DB4 – ILM or ILM62DB4 – ILM62DB4 *(1)*

(1) Various connector directions available (left, right, straight).

Lexium 62 hybrid cable – references

Lexium 62 hybrid cables includes cables for: DC bus, Sercos, 24 V, Inverter Enable signal.

Cable between (1)	and (2)	item no	Connector (1)	Connector (2)	Standard length m / *ft*	Reference (●●● x 0.1 m)	Weight kg/*lb*
Connection module	Distribution box	*4*	–	D0	5 / *16.40*	**VW3E1147R●●●**	–
		4	–	D1	5 / *16.40*	**VW3E1141R●●●**	–
		4	–	D2	5 / *16.40*	**VW3E1146R●●●**	–
Distribution box	Distribution box or ILM integrated drive	*5*	D1	D0	2 / *32.81*	**VW3E1149R●●●**	–
		5	D1	D1	2 / *32.81*	**VW3E1142R●●●**	–
		5	D1	D2	2 / *32.81*	**VW3E1148R●●●**	–
		5	D0	D2	2 / *32.81*	**VW3E1150R●●●**	–
		5	D0	D0	2 / *32.81*	**VW3E1151R●●●**	–
		5	D2	D2	2 / *32.81*	**VW3E1152R●●●**	–

Note
Item no 4: available in the following lengths: 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, and 20 m (16.40, 19.69, 22.97, 26.25, 29.53, 32.81, 36.09, 39.37, 42.65, 45.93, 49.21, 52.49, 55.77, 59.06, 62.34, and 65.62 ft).
Item no 5: available in the following lengths: 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10 m (3.28, 6.56, 9.84, 13.12, 16.40, 19.69, 22.97, 26.25, 29.53, and 32.81 ft).

Cable outlet	
on distribution box ILM62DB	on ILM integrated drive

Specifications ILM system	Max. distance (m / *ft*)
Between ILM62CM and ILM62DB4	20 / *65.62*
Between ILM62DB4 and ILM62DB4	10 / *32.81*
Between ILM62DB4 and Lexium 62 ILM integrated drive	10 / *32.81*
Between two active Sercos slaves *(1)*	50 / *164.04*
Total of cable lengths	200 / *656.17*

(1) Lexium 62 connection module ILM62CM and distribution module ILM62DB are not active Sercos slaves.

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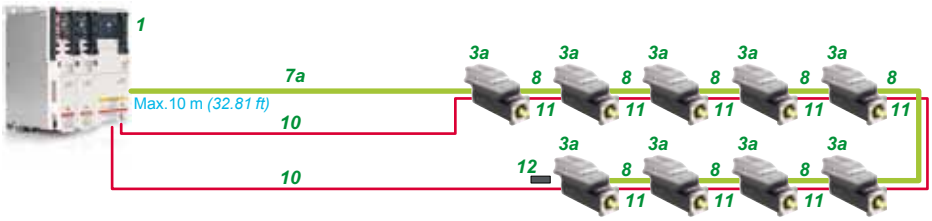
Daisy chain cabling examples

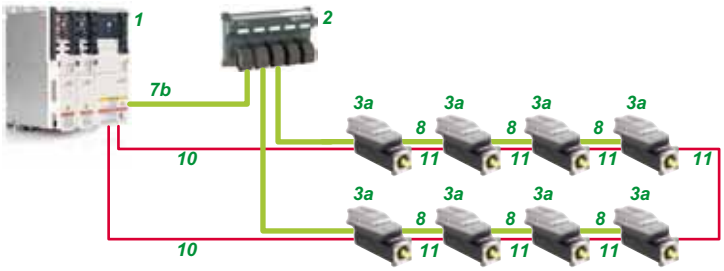
Example 3



1 Lexium 62 connection module ILM62CM
3a Lexium 62 ILM integrated drive with daisy chain connection box Type A, B or C
7a Power cable ILM62CM – ILM (terminals – M23)
8 Power cable ILM – ILM (M23 – M23)
10 Sercos cable ILM62CM – ILM (RJ45 – M12)
11 Sercos cable ILM – ILM or ILM62DB4 – ILM (M12 – M12)
12 Protective cap for power cable connection *(1)*

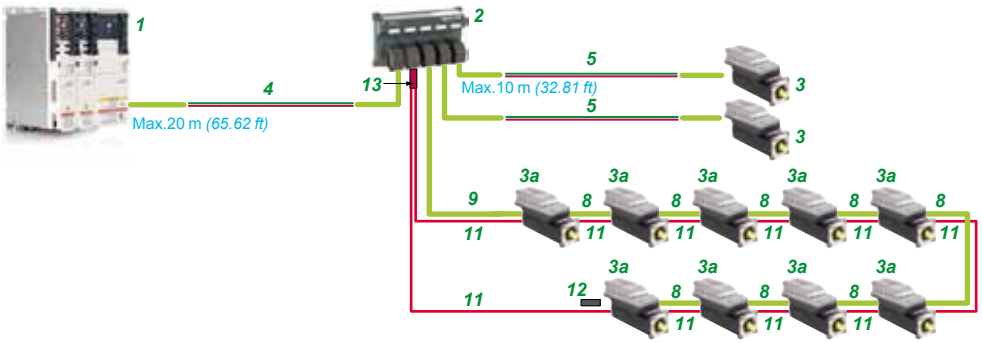
Max. 9 ILM servo drives can be linked in one daisy chain line.
(1) Each ILM daisy chain line must be terminated with a protective cap for the power cable connection.

Example 4



1 Lexium 62 connection module ILM62CM
2 Lexium 62 distribution box ILM62DB
3a Lexium 62 ILM integrated drive with daisy chain connection box Type A, B or C
7b Power cable ILM62CM – ILM62DB4
8 Power cable ILM – ILM (M23 – M23)
10 Sercos cable ILM62CM – ILM (RJ45 – M12)
11 Sercos cable ILM – ILM or ILM62DB4 – ILM (M12 – M12)

Example 5



1 Lexium 62 connection module ILM62CM
2 Lexium 62 distribution box ILM62DB
3 Lexium 62 ILM integrated drive
3a Lexium 62 ILM integrated drive with daisy chain connection box Type A, B or C
4 Hybrid cable ILM62CM – ILM62DB4 *(1)*
5 Hybrid cable ILM62DB4 – ILM or ILM62DB4 – ILM62DB4 *(1)*
8 Power cable ILM – ILM (M23 – M23)
9 Power cable ILM62DB4 – ILM (DB-connector – M23)
11 Sercos cable ILM – ILM or ILM62DB4 – ILM (M12 – M12)
12 Protective cap for power cable connection *(2)*
13 Sercos distribution connector on ILM62DB4

Max. 36 Lexium 62 ILM integrated drives can be connected on one distribution box and four daisy chain lines.
(1) Various connector directions available (left, right, straight).
(2) Each ILM daisy chain line must be terminated with a protective cap for the power cable connection.

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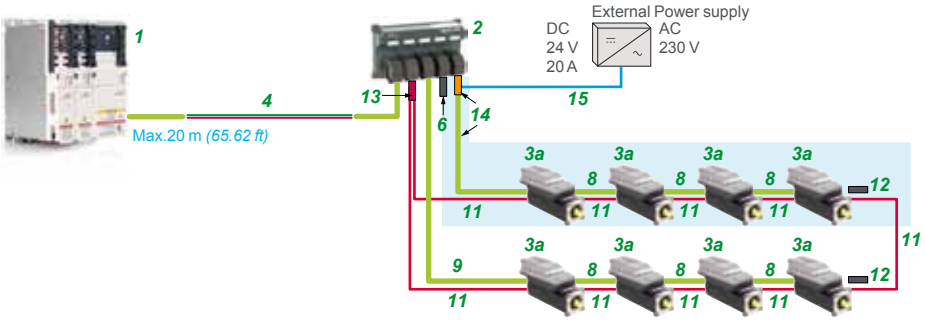
PacDrive 3 automation solution

Lexium 62 ILM integrated drive

Sercos installation, Connectors

Daisy chain cabling examples

Example 6: 24 V IN to ILM62DB4 distribution module

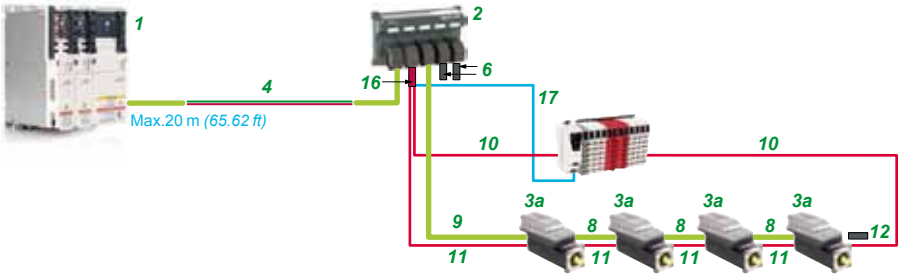


1 Lexium 62 connection module ILM62CM
2 Lexium 62 distribution box ILM62DB
3a Lexium 62 ILM integrated drive with daisy chain connection box Type A, B or C
4 Hybrid cable ILM62CM – ILM62DB4 *(1)*
6 Sercos bridge *(2)*
8 Power cable ILM – ILM (M23 – M23)
9 Power cable ILM62DB4 – ILM (DB-connector – M23)
11 Sercos cable ILM – ILM or ILM62DB4 – ILM (M12 – M12)
12 Protective cap for power cable connection *(3)*
13 Sercos distribution connector on ILM62DB4
14 Connector, including power cable and 24 V IN on ILM62DB4 *(4)*
15 24 V-IN cable

Max. 36 Lexium 62 ILM integrated drives can be connected on one distribution box and four daisy chain lines.
(1) Various connector directions available (left, right, straight).
(2) Any unused Lexium 62 distribution box ILM62DB connection must be terminated with a Sercos bridge.
(3) Each ILM daisy chain line must be terminated with a protective cap for the power cable connection.
(4) Separate 24V-supply – only for daisy chain line on this connector.

4

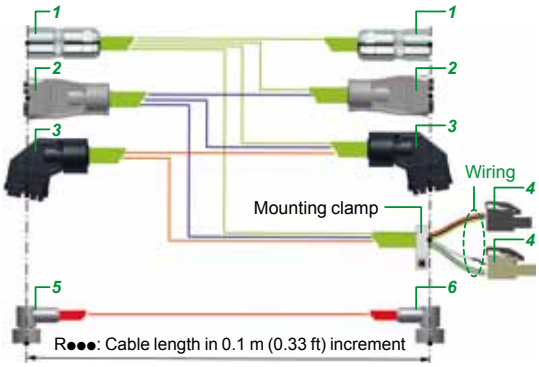
Example 7: Sercos and 24 V OUT on ILM62DB4 distribution module



1 Lexium 62 connection module ILM62CM
2 Lexium 62 distribution box ILM62DB
3a Lexium 62 ILM integrated drive with daisy chain connection box Type A, B or C
4 Hybrid cable ILM62CM – ILM62DB4 *(1)*
6 Sercos bridge *(2)*
8 Power cable ILM – ILM (M23 – M23)
9 Power cable ILM62DB4 – ILM (DB-connector – M23)
11 Sercos cable ILM – ILM or ILM62DB4 – ILM (M12 – M12)
12 Protective cap for power cable connection *(3)*
16 Sercos distribution connector & 24 V-Out on ILM62DB4
17 24 V-Out cable

(1) Various connector directions available (left, right, straight).
(2) Any unused Lexium 62 distribution box ILM62DB must be terminated with a Sercos bridge.
(3) Each ILM daisy chain line must be terminated with a protective cap for the power cable connection.

Connectors – description



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

Cable outlet

on distribution box ILM62DB — on ILM integrated drive

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PacDrive 3 automation solution

Lexium 62 ILM integrated drive

Connection box , Daisy chain cables

ILM62DCA000 (type A)

ILM62DCB000 (type B)

ILM62DCC000 (type C)

Connection box – references

Designation	item no	Description	Lexium 62 ILM-Servo module compatibility	Reference	Weight kg/*lb*
Daisy chain connection box assembly	*3a*	Type A	ILM070, ILM100, ILM140	**ILM62DCA000**	0.535 / *1.18*
	3a	Type B	ILM070, ILM100	**ILM62DCB000**	0.535 / *1.18*
	3a	Type C	ILM140	**ILM62DCC000**	0.535 / *1.18*

Cable length	Max. (m / *ft*)
Between ILM62CM and ILM62DB4	20 / *65.62*
Between ILM62DB4 and ILM62DB4	10 / *32.81*
Between ILM62DB4 and Lexium 62 ILM integrated drive	10 / *32.81*
Between two Lexium 62 ILM integrated drives	10 / *32.81*
Between two active Sercos slaves *(1)*	50 / *164.04*
Total of cable lengths	200 / *656.17*
For daisy chain cable: between ILM62DB4 and last Lexium 62 ILM integrated drive	10 / *32.81*

(1) Connection module ILM62CM and distribution module box ILM62DB are not active Sercos slaves.

Daisy chain cable – references

Designation	Between	and	item no	Connector type	Length m / *ft*	Reference	Weight kg/*lb*
Power cable	Connection module	ILM integrated drive	*7a*	Terminals / M23	3 / *9.84*	**VW3E1155R030**	1.367 / *3.01*
					5 / *16.40*	**VW3E1155R050**	0.203 / *0.45*
					10 / *32.81*	**VW3E1155R100**	1.367 / *3.01*
	Connection module	Distribution box	*7b*	Terminals / DB connector (D1)	3 / *9.84*	**VW3E1158R030**	1.367 / *3.01*
					5 / *16.40*	**VW3E1158R050**	1.367 / *3.01*
					10 / *32.81*	**VW3E1158R100**	2.370 / *5.22*
	ILM integrated drive	ILM integrated drive	*8*	M23 / M23	0.3 / *0.98*	**VW3E1157R003**	1.367 / *3.01*
					0.7 / *2.30*	**VW3E1157R007**	0.294 / *0.65*
					1 / *3.28*	**VW3E1157R010**	0.356 / *0.78*
					2 / *6.56*	**VW3E1157R020**	0.562 / *1.24*
					3 / *9.84*	**VW3E1157R030**	0.680 / *1.50*
					4 / *13.12*	**VW3E1157R040**	0.974 / *2.15*
					5 / *16.40*	**VW3E1157R050**	1.180 / *2.60*
	Distribution box	ILM integrated drive	*9*	DB connector (D1) / M23	1 / *3.28*	**VW3E1164R010**	0.381 / *0.84*
					2 / *6.56*	**VW3E1164R020**	0.587 / *1.29*
					3 / *9.84*	**VW3E1164R030**	0.793 / *1.75*
Sercos cable	Connection module	ILM integrated drive	*10*	RJ45 / M12 angled	3 / *9.84*	**VW3E3065R030**	1.367 / *3.01*
					5 / *16.40*	**VW3E3065R050**	0.557 / *1.23*
					10 / *32.81*	**VW3E3065R100**	1.075 / *2.37*
	ILM integrated drive or Distribution box	ILM integrated drive	*11*	M12 angled / M12 angled	0.3 / *0.98*	**VW3E3064R003**	0.140 / *0.31*
					0.7 / *2.30*	**VW3E3064R007**	0.180 / *0.40*
					1 / *3.28*	**VW3E3064R010**	0.210 / *0.46*
					2 / *6.56*	**VW3E3064R020**	0.310 / *0.68*
					3 / *9.84*	**VW3E3064R030**	0.410 / *0.90*
					4 / *13.12*	**VW3E3064R040**	1.367 / *3.01*
					5 / *16.40*	**VW3E3064R050**	0.610 / *1.34*

Daisy chain accessory – references

Designation	item no	Connector type	Length m / *ft*	Reference	Weight kg/*lb*
Protective cap for power cable connection	*12*	–	–	**ILM62DCZ000**	0.235 / *0.52*
Sercos connector distributor in ILM62DB4	*13*	–	–	**VW3E6029**	0.700 / *1.54*
Sercos cable *(1)*	–	Straight M12 / M12 angled	1 / *3.28*	**VW3E3066R010**	0.081 / *0.18*
			3 / *9.84*	**VW3E3066R030**	0.221 / *0.49*
			5 / *16.40*	**VW3E3066R050**	0.361 / *0.80*
Connector including Power cable and 24 V IN on Lexium 62 distribution box ILM62DB	*14*	–	1 / *3.28*	**VW3E1163R010**	0.381 / *0.84*
	14	–	2 / *6.56*	**VW3E1163R020**	0.587 / *1.29*
	14	–	3 / *9.84*	**VW3E1163R030**	0.793 / *1.75*
24 V IN cable	*15*	–	1 / *3.28*	**VW3E8001R010**	0.081 / *0.18*
			3 / *9.84*	**VW3E8001R030**	0.221 / *0.49*
			5 / *16.40*	**VW3E8001R050**	0.361 / *0.80*
Daisy Chain M23 Housing Connector Set	–	–	–	**VW3E6046**	0.220 / *0.49*
Sercos connector distributor & 24 V-Out on Lexium 62 distribution box ILM62DB *(2)*	*16*	–	–	**VW3E6047**	0.720 / *1.59*
HCN-2 adapter *(3)*	–	–	–	**VW3E6026**	0.125 / *0.28*
Hybrid Cable	–	CM / HCN-2	2 / *6.56*	**VW3E1159R020**	0.758 / *1.67*
		HCN-2 / D0	2 / *6.56*	**VW3E1160R020**	0.768 / *1.69*
		HCN-2 / D1	2 / *6.56*	**VW3E1161R020**	0.768 / *1.69*
		HCN-2 / D2	2 / *6.56*	**VW3E1162R020**	0.768 / *1.69*

(1) For connecting additional Sercos devices.
*(2) For 24V-Out cable, see **MachineStruXure** catalog – 2014 (n° MKTED2140202EN).*
(3) Allows routing of cables through tubes or cable penetrations.

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Servo motors

Technical information on all of the products listed in this catalog is available at: www.schneider-electric.com

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PacDrive 3 automation solution
Lexium SH3 servo motors

Lexium SH3 servo motors range

Presentation

Lexium SH3 servo motors are an excellent solution to the need for dynamic performance. Five flange sizes and a variety of lengths, this offer is a suitable solution for many applications, covering a continuous stall torque range from 0.5 to 33.4 Nm (0.4 to 24.6 lbf ft) for speeds up to 8,000 rpm.
Thanks to their new winding technology based on salient poles, Lexium SH3 servo motors are far more compact and offer a higher power density than conventional servo motors.
Lexium SH3 servo motors are UL Recognized and conform to UL1004 as well as European directives (CE marking).
They are available with the following variants:

- 5 flange sizes: 55, 70, 100, 140, and 205 mm (*2.28, 2.76, 3.94, 5.51, and 8.071 in.)*
- 2 degrees of protection for the shaft end:
  - IP 54 or IP 65 in accordance with IEC/EN 60529
  - The degree of protection provided by the casing is IP 65 (IP 67 with the conformity kit, which is available as an option).
- With or without holding brake
- Straight or elbow connectors for power and encoder connection
- Integrated single-turn or multi-turn SinCos Hiperface® encoder (medium or high resolution)
- Smooth or keyed shaft end

Special features

Lexium SH3 servo motors have been developed to comply with the following main specifications:

- The ambient operating temperature is - 20...+ 40 °C /- *4...+ 104 °F* without derating, in accordance with IEC 60721-3-3, category 3K3, and up to 55 °C/*131 °F* with derating of 1% of the nominal output power per additional °C above 40 °C/*104 °F*.
- The maximum operating altitude is 1,000 m/*3,280 ft* without derating, 2,000 m/ *6,561 ft* with k = 0.86, and 3,000 m/*9,842 ft* with k = 0.8 *(1)*.
- The relative humidity that the servo motor can withstand is in line with IEC 60721-3-3, categories 3K3, 3Z12, and 3Z2.
- The windings are insulation class F (maximum temperature for windings 155 °C/ *311 °F*, in accordance with IEC 60034-1.
- All mounting positions are permitted (horizontal mounting (IMB5) or vertical mounting (IMV1 with shaft end at the top and IMV3 with shaft end at the bottom) in accordance with IEC 60034-7.

Holding brake

Lexium SH3 servo motors can be equipped with an electromagnetic holding brake.

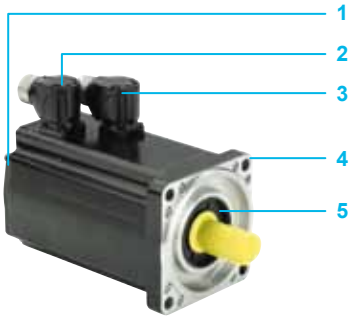
⚠ *Do not use the holding brake as a dynamic brake for deceleration, as this will quickly damage the brake.*

Integrated encoder

Lexium SH3 servo motors are equipped with a single-turn (131,072 points/turn) *(2)* or multi-turn (131,072 points/turn x 4,096 turns) *(1)* SinCos Hiperface® high-resolution absolute encoder, giving an angular shaft position that is precise to less than ± 1.3 arc minutes.
This encoder performs the following functions:

- Gives the absolute position of the motor to allow flow synchronization
- Measures the servo motor speed via the associated Lexium 52 / 62 servo drive (this information is used by the servo drive's speed controller)
- Measures the position information for the servo drive's position controller
- Sends data from the servo motor to the servo drive, which provides automatic identification of the motor when the servo drive starts

Description



Lexium SH3 servo motors, with a 3-phase stator and a 6 to 10-pole rotor (depending on model) with Neodymium-Iron-Borium (NdFeB) magnets, consist of:

1 Casing with RAL 9005 opaque black paint protective coating
2 Threaded sealed male ellbow connector for the power cable *(3)*
5 Threaded sealed male ellbow connector for the control cable (encoder) *(3)*
4 4-point axial mounting flange
3 Smooth or keyed shaft end (depending on the model)

Cables and connectors to be ordered separately, for connection to Lexium 52 / 62 servo drives.Schneider Electric has taken particular care with the compatibility of Lexium SH3 servo motors and Lexium 52 / 62 servo drives. This compatibility is possible only when using cables and connectors sold by Schneider Electric.See page 5/11.

(1) k: derating factor
(2) Encoder resolution given for use with Lexium 52 / 62 servo drives.
(3) For other model with rotatable elbow connector, see page 5/3.

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Lexium SH3 servo motors – references

The Lexium SH3 servo motors shown below are supplied without a gearbox. For GBX and GBY gearboxes, see page 5/16.

Technical datas

Nominal servo motor output power		Continuous stall torque		Peak stall torque		Rated torque		Rated speed		Rotor moment of inertia (without holding brake)	Reference	Weight without holding brake (with holding brake)	
Pn		M0		Mmax		Mn		Nn	Nmax	Jm			
kW	/hp	Nm	/ft-lbf	Nm	/ft-lbf	Nm	/ft-lbf	rpm	rpm	kgcm²		kg	lb
0.4	0.5	0.5	0.4	1.5	1.1	0.5	0.4	8000	9000	0.057 (0.079)	**SH30551P●**	1.200 (1.300)	2.65 (2.83)
0.6	0.8	0.8	0.6	2.5	1.8	0.7	0.3	8000	9000	0.093 (0.115)	**SH30552P●**	1.500 (1.600)	3.31 (3.49)
0.9	1.2	1.2	0.9	3.5	2.6	1.0	0.7	8000	9000	0.130 (0.152)	**SH30553P●**	1.700 (1.800)	3.75 (4.15)
0.8	1.0	1.4	1.0	3.5	2.6	1.3	1.0	6000	8000	0.205 (0.318)	**SH30701P●**	1.900 (2.100)	4.19 (4.63)
1.2	1.6	2.2	1.6	7.6	5.6	1.9	1.4	6000	8000	0.351 (0.464)	**SH30702P●**	2.800 (3.000)	6.12 (6.66)
1.5	2.0	3.1	2.3	11.3	8.3	2.3	1.7	6000	8000	0.503 (0.616)	**SH30703P●**	3.400 (3.500)	7.50 (7.72)
1.4	1.9	3.3	2.4	9.6	7.1	2.7	2.0	5000	6000	1.100 (1.613)	**SH31001P●**	4.400 (4.900)	9.70 (10.80)
1.9	2.5	5.8	4.3	18.3	13.5	4.6	3.4	4000	6000	1.909 (2.422)	**SH31002P●**	6.000 (6.500)	13.23 (14.33)
2.4	3.2	8.0	5.9	28.3	20.8	5.7	4.2	4000	6000	2.718 (3.521)	**SH31003P●**	7.700 (8.400)	16.98 (18.52)
2.5	3.4	10.0	7.4	40.5	29.9	7.9	5.8	3000	6000	3.613 (4.416)	**SH31004P●**	9.400 (10.300)	20.72 (22.71)
2.9	3.9	11.1	8.2	27	1.5	9.2	6.8	3000	4000	6.941 (8.542)	**SH31401P●**	11.500 (12.900)	25.35 (28.44)
3.9	5.2	19.5	14.4	60.1	44.3	12.3	9.1	3000	4000	12.162 (14.824)	**SH31402P●**	16.500 (18.100)	36.38 (39.90)
4.1	5.4	27.8	20.5	90.2	66.5	12.9	9.5	3000	4000	17.383 (21.559)	**SH31403P●**	21.900 (24.000)	48.28 (52.91)
5.06	6.8	33.4	24.6	131.9	97.3	16.1	11.2	3000	4000	22.604 (26.794)	**SH31404P●**	27.000 (29.300)	59.52 (64.60)
5.5	7.4	36.9	27.2	110	81.1	17.5	12.9	3000	3800	71.40 (87.40)	**SH32051P●**	35.000 (38.600)	77.17 (85.1)
7.9	10.7	64.9	47.9	220	162.3	38.1	28.1	2000	3800	129 (145)	**SH32052P●**	50.000 (53.600)	110.23 (118.2)
10.6	14.2	94.4	69.6	330	243.4	50.7	37.4	2000	3800	190 (206)	**SH32053P●**	67.000 (70.600)	147.71 (155.65)
0.7	0.9	2.2	1.6	7.6	5.6	2.1	1.6	3000	8000	0.351 (0.464)	**SH30702M●**	2.800 (3.000)	6.17 (6.61)
0.9	1.2	3.1	2.3	11.3	8.3	2.8	2.1	3000	8000	0.503 (0.616)	**SH30703M●**	3.400 (3.500)	7.50 (7.72)
0.8	1.1	3.3	2.4	9.6	7.1	3	2.2	2500	6000	1.100 (1.613)	**SH31001M●**	4.400 (4.900)	9.70 (10.80)
1.9	2.6	5.8	4.3	18.3	13.5	5.2	3.4	2000	6000	1.909 (2.422)	**SH31002M●**	7.700 (8.400)	16.98 (18.52)
1.5	2.0	8	5.9	28.3	20.9	7	5.2	2000	6000	2.718 (3.521)	**SH31003M●**	11.500 (12.900)	25.35 (28.44)
1.7	2.2	11.1	8.2	27	19.9	10.6	7.8	1500	4000	6.941 (8.542)	**SH31401M●**	11.900 (13.000)	26.24 (28.67)

To order a Lexium SH3 servo motor, complete each reference with:

		SH3	●	●	●	●	●	●	●	●	●●
Flange size	55 mm /2.165 in.		**055**								
	70 mm /2.756 in.		**070**								
	100 mm /3.937 in.		**100**								
	140 mm /5.512 in.		**140**								
	205 mm /8.071 in.		**205**								
Length	1 stack			**1**							
	2 stacks			**2**							
	3 stacks			**3**							
	4 stacks			**4**							
Winding	Optimized in terms of torque and speed of rotation				**P**						
	Optimized in terms of current (available only on specific models)				**M**						
Shaft end	Smooth					**0**					
	Keyed					**1**					
Integrated sensor High resolution, optical	Single-turn, SinCos Hiperface® 131,072 points/turn *(1)*						**1**				
	Multi-turn, SinCos Hiperface® 131,072 points/turn x 4,096 turns *(1)*						**2**				
Holding brake	Without							**A**			
	With							**F**			
Connections	Straight connector								**1**		
	Angular connector 90°, can be rotated								**2**		
Degree of protection	IP54/IP65 (shaft/housing)									**0**	
	IP65/IP65 (shaft/housing)									**1**	
	IP65/IP67 (shaft/housing)									**2**	
Motor type	Standard										**00**

(1) Sensor resolution given for use with a Lexium 52/ 62 servo drive.

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Lexium SH3 servo motor and Lexium 52 servo drive – combination

Lexium 52 Servo drives	Servo motors				Motor			Servo drive	
Reference	Reference							Standard	
		Size	Winding		Io	Inom	Ipeak	Inom	Ipeak
					A	A	A	A @ 8 kHz	A
LXM52DU60C41000	SH3	0551	P		0.73	0.62	2.9	1.5	6
		0552	P		1.2	1.1	4.8	1.5	6
		0702	M		1.5	1.5	6	1.5	6
LXM52DD12C41000	SH3	0553	P		1.7	1.35	6.5	3	12
		0701	P		1.8	1.6	5.7	3	12
		0702	P		2.9	2.6	11.8	3	12
		0703	M		2.1	1.9	8.7	3	12
		1001	M		1.8	1.6	6.3	3	12
		1002	M		2.5	2.3	9	3	12
LXM52DD18C41000	SH3	0703	P		4.1	3	17	6	18
		1001	P		3.5	2.8	12	6	18
		1002	P		4.8	3.8	17.1	6	18
		1003	M		3.4	3.1	14.7	6	18
		1401	M		4	4	10.8	6	18
LXM52DD30C41000	SH3	1003	P		6.6	4.9	28.3	10	30
		1004	P	*(1)*	6.2	5.3	32.3	10	30
		1401	P		7.8	6.8	20.8	10	30
LXM52DD72C41000	SH3	1004	P		6.2	5.3	32.3	24	72
		1402	P		13.2	8.9	44.1	24	72
		1403	P		17.6	8.7	61	24	72
		1404	P	*(1)*	21.3	11	95.6	24	72
		2051	P	*(1)*	21	11.5	87.2	24	72
		2052	P	*(1)+(2)*	25.7	17.8	96.8	24	72
		2053	P	*(1)+(2)*	33.2	20.4	136.1	24	72

Lexium SH3 servo motor and Lexium 62 servo drive – combination

Lexium 62 Servo Drives	Servo motors				Motor			Servo drive			
Reference x = C: Single drive x = D: Double drive	Reference								Standard		
		Size	Winding		Io	Inom	Ipeak	Inom			Ipeak
					A	A	A	A @ 4 kHz	A @ 8 kHz	A @ 16 kHz	A
LXM62DU60x21000	SH3	0551	P		0.73	0.62	2.9	2	2	1.2	6
		0552	P		1.2	1.1	4.8	2	2	1.2	6
		0702	M		1.5	1.5	6	2	2	1.2	6
		0553	P	*(1)*	1.7	1.35	6.5	2	2	1.2	6
		0701	P		1.8	1.6	5.7	2	2	1.2	6
LXM62DD15x21000	SH3	0702	P		2.9	2.6	11.8	5	5	3.5	15
LXM62DU60x21000	SH3	0703	M	*(1)+(2)*	2.1	1.9	8.7	2	2	1.2	6
		1001	M	*(1)*	1.8	1.6	6.3	2	2	1.2	6
LXM62DD15x21000	SH3	1002	M		2.5	2.3	9	5	5	3.5	15
		0703	P	*(1)*	4.1	3	17	5	5	3.5	15
		1001	P		3.5	2.8	12	5	5	3.5	15
		1002	P	*(1)*	4.8	3.8	17.1	5	5	3.5	15
		1003	M		3.4	3.1	14.7	5	5	3.5	15
		1401	M		4	4	10.8	5	5	3.5	15
LXM62DD27x21000	SH3	1003	P	*(1)*	6.6	4.9	28.3	9	7	4	27
		1401	P		6.8	7.8	20.8	9	7	4	27
		1004	P	*(1)*	6.2	5.3	32.3	9	7	4	27
LXM62DD45C21000	SH3	1402	P		13.2	8.9	44.1	20	15	8	45
		1403	P	*(1)*	17.6	8.7	61	20	15	8	45
LXM62DC13C21000 or LXM62DD45C21000 *(1)*	SH3	1404	P		21.3	11	95.6	50	50	30	130
		2051	P		21	11.5	87.2	50	50	30	130
LXM62DC13C21000	SH3	2052	P		25.7	17.8	96.8	50	50	30	130
		2053	P	*(1)*	33.2	20.4	136.1	50	50	30	130

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

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Lexium SH3 servo motors – dimensions

Dimensions (overall)

Servo motors	Flange		W x H x D *(1)*			
			Without holding brake		With holding brake	
	mm	*in.*	mm	*in.*	mm	*in.*
SH30551●	55 x 55	*2.16 x 2.16*	55 x 94.5 x 132.5	*2.16 x 3.72 x 5.22*	55 x 94.5 x 159	*2.16 x 3.72 x 6.26*
SH30552●	55 x 55	*2.16 x 2.16*	55 x 94.5 x 154.5	*2.16 x 3.72 x 6 .08*	55 x 94.5 x 181	*2.16 x 3.72 x 7.13*
SH30553●	55 x 55	*2.16 x 2.16*	55 x 94.5 x 176.5	*2.16 x 3.72 x 6.95*	55 x 94.5 x 203	*2.16 x 3.72 x 7.99*
SH30701●	70 x 70	*2.76 x 2.76*	70 x 111.5 x 154	*2.76 x 4.39 x 6.06*	70 x 111.5 x 180	*2.76 x 4.39 x 7.09*
SH30702●	70 x 70	*2.76 x 2.76*	70 x 111.5 x 187	*2.76 x 4.39 x 7.36*	70 x 111.5 x 213	*2.76 x 4.39 x 8.39*
SH30703●	70 x 70	*2.76 x 2.76*	70 x 111.5 x 220	*2.76 x 4.39 x 8.66*	70 x 111.5 x 254	*2.76 x 4.39 x 10.00*
SH31001●	100 x 100	*3.94 x 3.94*	100 x 138.5 x 169	*3.94 x 5.45 x 6.65*	100 x 138.5 x 200	*3.94 x 5.45 x 7.87*
SH31002●	100 x 100	*3.94 x 3.94*	100 x 138.5 x 205	*3.94 x 5.45 x 8.07*	100 x 138.5 x 236	*3.94 x 5.45 x 9.29*
SH31003●	100 x 100	*3.94 x 3.94*	100 x 138.5 x 241	*3.94 x 5.45 x 9.49*	100 x 138.5 x 272	*3.94 x 5.45 x 10.71*
SH31004●	100 x 100	*3.94 x 3.94*	100 x 138.5 x 277	*3.94 x 5.45 x 10.91*	100 x 138.5 x 308	*3.94 x 5.45 x 12.13*
SH31401●	140 x 140	*5.51 x 5.51*	140 x 178 x 218	5.51 x 7.01 x 8.58	140 x 178 x 256	*5.51 x 7.01 x 10.08*
SH31402●	140 x 140	*5.51 x 5.51*	140 x 192.5 *(2)* x 273	*5.51 x 7.58 (2) x 10.75*	140 x 192.5 *(2)* x 311	*5.51 x 7.58 (2) x 12.24*
SH31403●	140 x 140	*5.51 x 5.51*	140 x 192.5 *(2)* x 328	*5.51 x 7.58 (2) x 12.91*	140 x 192.5 *(2)* x 366	*5.51 x 7.58 (2) x 14.41*
SH31404●	140 x 140	*5.51 x 5.51*	140 x 192.5 *(2)* x 383	*5.51 x 7.58 (2) x 15.08*	140 x 192.5 *(2)* x 421	*5.51 x 7.58 (2) x 16.58*
SH32051●	205 x 205	*8.07 x 8.07*	205 x 259 x 321	*8.07 x 10.20 x 12.64*	205 x 259 x 370.5	*8.07 x 10.20 x 14.59*
SH32052●	205 x 205	*8.07 x 8.07*	205 x 259 x 405	*8.07 x 10.20 x 15.94*	205 x 259 x 454.5	*8.07 x 10.20 x 17.89*
SH32053●	205 x 205	*8.07 x 8.07*	205 x 259 x 489	*8.07 x 10.20 x 19.25*	205 x 259 x 538.5	*8.07 x 10.20 x 21.20*

(1) D = motor length (excluding shaft end).
(2) 192.5 mm / 7.58 in. with straight connector, 198.5 mm / 7.82 in. with rotatable elbow connector.

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Lexium MH3 servo motor with rotatable elbow connectors

Presentation

Lexium MH3 servo motors provide excellent power density values to meet the requirements of compact machines. With four flange sizes and three different lengths for each flange size, they are suitable for many applications, covering a continuous stall range from 1.4 to 65 Nm (1.0 to 47.9 lbf ft) for speeds up to 6,000 rpm.
The Lexium MH3 servo motors have a medium inertia motor, which means they are particularly suitable for high-load applications.
They help to simplify installation and adjustment by providing robust adjustment of the movement.
Lexium MH3 servo motors are UL Recognized and conform to UL1004 as well as European directives (CE marking).
They are available with the following variants:

- 4 flange sizes: 70, 100, 140, and 190 mm (*2.76, 3.94, 5.51, and 7.48 in.)*
- Degree of protection:
  - IP 65 for the shaft end in accordance with IEC/EN 60529 (IP 67 with the conformity kit, which is available as an option)
  - IP 65 for the casing (IP 67 with the conformity kit, which is available as an option)
- With or without holding brake
- Elbow connectors for power and encoder connection
- Integrated single-turn or multi-turn SinCos Hiperface® encoder (medium or high resolution)
- Smooth or keyed shaft end

Special features

Lexium MH3 servo motors have been developed to comply with the following main specifications:

- The ambient operating temperature is - 20...+ 40 °C /*- 4...+ 104 °F* without derating, in accordance with IEC 60721-3-3, category 3K3, and up to 55 °C /*131 °F* with derating of 1% of the nominal output power per additional °C above 40 °C /*104 °F*.
- The maximum operating altitude is 1,000 m /*3,280 ft* without derating, 2,000 m /*6,561 ft* with k = 0.86, and 3,000 m /*9,842 ft* with k = 0.8 *(1)*.
- The relative humidity that the servo motor can withstand is in line with IEC 60721-3-3, categories 3K3, 3Z12, and 3Z2.
- The windings are insulation class F (maximum temperature for windings 155 °C/ *311 °F*) in accordance with IEC 60034-1.
- All mounting positions are permitted (horizontal mounting (IMB5) or vertical mounting (IMV1 with shaft end at the top and IMV3 with shaft end at the bottom) in accordance with IEC 60034-7.

Holding brake

Lexium MH3 servo motors can be equipped with an electromagnetic holding brake.
⚠ **Do not use the holding brake as a dynamic brake for deceleration, as this will quickly damage the brake.**

Integrated encoder

Lexium MH3 servo motors include an absolute encoder as standard equipment.
This encoder performs the following functions:

- Gives the absolute position of the motor to allow flow synchronization
- Measures the servo motor speed via the associated Lexium 52 / 62 servo drive (this information is used by the servo drive's speed controller)
- Measures the position information for the servo drive's position controller
- Sends data from the servo motor to the servo drive, which provides automatic identification of the motor when the servo drive starts

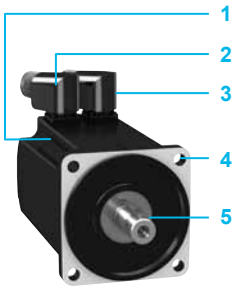
Four types of encoder are available:

- High resolution SinCos Hiperface® encoder:
  - Single-turn (131,072 points/turn) *(2)*
  - Multi-turn (131,072 points/turn x 4,096 turns) *(2)*

  These encoders give an angular shaft position that is precise to less than ± 1.3 arc minutes.
- Medium resolution SinCos Hiperface® encoder:
  - Single-turn (32,768 points/turn) *(2)*
  - Multi-turn (32,768 points/turn x 4,096 turns) *(2)*

  These encoders give an angular shaft position that is precise to less than ± 4.8 arc minutes.

Description



Lexium MH3 servo motors, with a 3-phase stator and a 10-pole rotor with Neodymium-Iron-Boron (NdFeB) magnets, consist of:

1 Casing with RAL 9005 opaque black paint protective coating
2 Threaded sealed male ellbow connector for the power cable
3 Threaded sealed male ellbow connector for the control cable (encoder)
4 4-point axial mounting flange
5 Smooth or keyed shaft end (depending on the model)

Cables and connectors to be ordered separately, for connection to Lexium 52 / 62 servo drives. Schneider Electric has taken particular care with the compatibility of Lexium MH3 servo motors and Lexium 52 / 62 servo drives. This compatibility is possible only when using cables and connectors sold by Schneider Electric, See page 5/11.

(1) k: derating factor
(2) Encoder resolution given for use with a Lexium 52 / 62 servo drive.

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Lexium MH3 servo motors – references

The MH3 servo motors shown below are supplied without a gearbox. For GBX and GBY gearboxes, see page 5/16.

Technical datas

Nominal servo motor output power		Continuous stall torque		Peak stall torque		Rated torque		Rated speed		Rotor moment of inertia (without holding brake)	Reference	Weight without holding brake (with holding brake)	
Pn		M0		Mmax		Mn		Nn	Nmax	Jm			
kW	/hp	Nm	/ft-lbf	Nm	/ft-lbf	Nm	/ft-lbf	rpm	rpm	kgcm²		kg	lb
0.750	1.0	1.4	1.0	4.2	3.1	1.3	0.9	5500	6000	0.59	**MH30701P●**	1.600 (2.6000)	3.53 (5.73)
1.2	1.6	2.5	1.9	7.4	5.5	1.9	1.4	5500	6000	1.13	**MH30702P●**	2.300 (3.300)	5.07 (7.28)
1.3	1.8	3.4	2.5	10.2	7.5	2.3	1.7	5000	6000	1.67	**MH30703P●**	3.000 (4.000)	6.61 (8.82)
1.3	1.7	3.4	2.5	10.2	7.5	2.9	2.1	4000	6000	3.19	**MH31001P●**	3.340 (4.800)	7.36 (10.58)
1.2	2.7	6	4.4	18	13.3	4.2	3.1	4000	6000	6.28	**MH31002P●**	4.920 (6.400)	4.920 (14.11)
2.9	3.9	9	6.6	27	19.9	6.2	4.6	4000	6000	10.3	**MH31003P●**	6.500 (8.150)	14.33 (17.97)
2.6	3.6	10.3	7.6	39.9	29.4	7.2	5.3	3500	4000	16.46	**MH31401P●**	8.000 (10.300)	17.64 (22.71)
3.7	5.1	18.5	13.6	55.5	40.9	10.2	7.5	3500	4000	32	**MH31402P●**	12.000 (14.300)	26.46 (31.53)
4.8	6.5	24	17.7	75	55.3	13.1	9.7	3500	4000	47.5	**MH31403P●**	16.000 (18.500)	35.27 (40.79)
5.2	7.0	30	22.1	90	66.38	17.9	13.2	3000	4000	71.4	**MH31901P●**	33.000 (37.900)	72.75 (83.56)
6.1	8.3	48	35.4	144	106.2	24.9	18.4	2000	4000	129	**MH31902P●**	44.000 (48.900)	97.00 (107.81)
7.2	10.5	65	47.9	195	143.8	50.7	37.4	2000	3500	190	**MH31903P●**	67.000 (71.900)	147.71 (158.51)

To order a Lexium MH3 servo motor, complete each reference with:

	MH3	●	●	●	●	●	●	●	●	●●
Flange size	70 mm /2.756 in.	**070**								
	100 mm /3.937 in.	**100**								
	140 mm /5.512 in.	**140**								
	190 mm /8.071 in.	**190**								
Length	1 stack		**1**							
	2 stacks		**2**							
	3 stacks		**3**							
Winding	Optimized in terms of torque and speed of rotation			**P**						
Shaft end	Smooth				**0**					
	Parallel key				**1**					
Integrated sensor High resolution, optical	Single-turn, SinCos Hiperface® □ 131.072 increments/revolution □ 128 Sin/Cos periods per revolution					**1**				
	Multi-turn, SinCos Hiperface® □ 131.072 increments/revolution x 4096 revolutions □ 128 Sin/Cos periods per revolution *(1)*					**2**				
Integrated sensor Medium resolution, optical	Single-turn, SinCos Hiperface® □ 32.768 increments/revolution □ 16 Sin/Cos periods per revolution *(1)*					**6**				
	Multi-turn, SinCos Hiperface® □ 32.768 increments/revolution x 4096 revolutions □ 16 Sin/Cos periods per revolution *(1)*					**7**				
Holding brake	Without						**A**			
	With						**F**			
Connection	Angular connector 90°, can be rotated							**2**		
Degree of protection	IP65 (shaft/housing) *(2)*								**2**	
Motor type	Standard									**00**

(1) Sensor resolution given for use with a Lexium 52/ 62 servo drive.
(2) IP 67 with the VW3M230● conformity kit, supplied as an option.

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Lexium MH3 servo motor and Lexium 52 servo drive – combination

Lexium 52 servo drive	Servo motors			Motor			Servo drive	
Reference	Reference							
		Size	Winding	Io	Inom	Ipeak	Inom	Ipeak
				A	A	A	A @ 8 kHz	A
LXM52DU60C41000	MH3	0701	P (1)	1.78	1.72	5.97	1.5	6
LXM52DD12C41000	MH3	0702	P	2.94	2.49	9.68	3	12
		0703	P (2)	3.91	3.02	12.57	3	12
		1001	P	3.15	2.82	11.20	3	12
LXM52DD18C41000	MH3	1002	P	5.04	4.10	17.50	6	18
LXM52DD30C41000	MH3	1003	P	7.69	6.07	26.71	10	30
		1401	P	8.58	6.35	29.80	10	30
LXM52DD72C41000	MH3	1402	P	16.83	9.76	57.42	24	72
		1403	P	18.00	10.42	62.32	24	72
		1901	P (2)	23.2	14.00	89.6	24	72
		1902	P (2)	30.8	19.30	114	24	72
		1903	P (2)	36.1	21.30	124.5	24	72

Lexium MH3 servo motor and Lexium 62 servo drive – combination

Lexium 62 servo drive	Servo motors			Motor			Servo drive			
Reference	Reference							Standard		
		Size	Winding	Io	Inom	Ipeak	Inom			Ipeak
				A	A	A	A @ 4 kHz	A @ 8 kHz	A @ 16 kHz	A
LXM62DU60x21000	MH3	0701	P	1.78	1.72	5.97	2	2	1.2	6
LXM62DD15x21000	MH3	0702	P	2.94	2.49	9.68	5	5	3.5	15
		0703	P	3.91	3.02	12.57	5	5	3.5	15
		1001	P	3.15	2.82	11.20	5	5	3.5	15
LXM62DD27x21000	MH3	1002	P	5.04	4.10	17.50	9	7	4	27
LXM62DD45C21000	MH3	1003	P	7.69	6.07	26.71	9	7	4	45
		1401	P	8.58	6.35	29.80	20	15	8	45
LXM62DC13C21000 or LXM62DD45C21000 *(1)*	MH3	1402	P	16.83	9.76	57.42	50	50	30	130
		1403	P	18.00	10.42	62.32	50	50	30	130
		1901	P	23.2	14.00	89.6	50	50	30	130
LXM62DC13C21000	MH3	1902	P	30.8	19.30	114	50	50	30	130
		1903	P	36.1	21.30	124.5	50	50	30	130

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

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Lexium MH3 servo motors – dimensions (overall)						
Servo motors	**Flange size**		**Width x Height x Depth** *(1)*			
			Without integrated holding brake		**With integrated holding brake**	
	mm	***in.***	**mm**	***in***	**mm**	***in***
MH30701P●	70 x 70	*2.76 x 2.76*	70 x 109.5 x 122	*2.76 x 4.31 x 4.80*	70 x 109.5 x 161	*2.76 x 4.31 x 6.34*
MH30702P●	70 x 70	*2.76 x 2.76*	70 x 109.5 x 154	*2.76 x 4.31 x 6.06*	70 x 109.5 x 193	*2.76 x 4.31 x 7.60*
MH30703P●	70 x 70	*2.76 x 2.76*	70 x 109.5 x 186	*2.76 x 4.31 x 7.32*	70 x 109.5 x 225	*2.76 x 4.31 x 8.86*
MH31001P●	100 x 100	*3.94 x 3.94*	100 x 139.5 x 128	*3.94 x 5.49 x 5.04*	100 x 139.5 x 170	*3.94 x 5.49 x 6.69*
MH31002P●	100 x 100	*3.94 x 3.94*	100 x 139.5 x 160	*3.94 x 5.49 x 6.30*	100 x 139.5 x 202	*3.94 x 5.49 x 7.95*
MH31003P●	100 x 100	*3.94 x 3.94*	100 x 139.5 x 192	*3.94 x 5.49 x 7.56*	100 x 139.5 x 234	*3.94 x 5.49 x 9.21*
MH31401P●	140 x 140	*5.51 x 5.51*	140 x 179.5 x 152	*5.51 x 7.07 x 5.98*	140 x 179.5 x 187	*5.51 x 7.07 x 7.36*
MH31402P●	140 x 140	*5.51 x 5.51*	140 x 179.5 x 192	*5.51 x 7.07 x 7.56*	140 x 179.5 x 227	*5.51 x 7.07 x 8.94*
MH31403P●	140 x 140	*5.51 x 5.51*	140 x 179.5 x 232	*5.51 x 7.07 x 9.13*	140 x 179.5 x 267	*5.51 x 7.07 x 10.51*
MH31901P●	190 x190	*5.51 x 5.51*	190 x 257 x 190	*7.48 x 10.12 x 7.48*	190 x 257 x 248	*7.48 x 10.12 x 9.76*
MH31902P●	190 x 190	*7.48 x 7.48*	190 x 257 x 250	*7.48 x 10.12 x 9.84*	190 x 257 x 308	*7.48 x 10.12 x 12.13*
MH31903P●	190 x 190	*7.48 x 7.48*	190 x 257 x 310	*7.48 x 10.12 x 12.21*	190 x 257 x 368	*7.48 x 10.12 x 14.49*

(1) D: Housing dimensions (without shaft).

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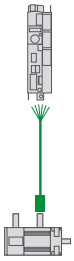
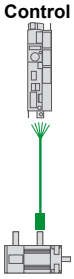
Connection elements for Lexium SH3 / MH3 servo motors and Lexium 52 / 62 servo drives

Designation	Description	From Lexium servo motor	To servo drive	Composition (mm² / inch²)	Length m	Length ft.	Reference	Weight kg	Weight lb
Power cordsets 	Cables equipped with an M23 industrial connector (servo motor end) and a free end (servo drive end)	SH3/MH3	Lexium 52 Lexium 62	1.5 / *0.002*	5	*16.404*	**VW3E1143R050**	1.367	*3.01*
					10	*32.808*	**VW3E1143R100**	2.602	*5.74*
					15	*49.213*	**VW3E1143R150**	3.837	*8.46*
					20	*65.617*	**VW3E1143R200**	5.072	*11.18*
					25	*82.021*	**VW3E1143R250**	6.307	*13.90*
					30	*98.425*	**VW3E1143R300**	7.542	*16.63*
					40	*131.234*	**VW3E1143R400**	10.012	*22.07*
					50	*164.042*	**VW3E1143R500**	12.482	*27.52*
	Cables equipped with an M23 industrial connector (servo motor end) and a free end (servo drive end)	SH3/MH3	Lexium 52 Lexium 62	2.5 / *0.004*	5	*16.404*	**VW3E1144R050**	1.712	*3.77*
					10	*32.808*	**VW3E1144R100**	3.292	*7.26*
					15	*49.213*	**VW3E1144R150**	4.872	*10.74*
					20	*65.617*	**VW3E1144R200**	6.452	*14.22*
					25	*82.021*	**VW3E1144R250**	8.032	*17.71*
					30	*98.425*	**VW3E1144R300**	9.612	*21.19*
					40	*131.234*	**VW3E1144R400**	12.772	*28.16*
					50	*164.042*	**VW3E1144R500**	15.932	*35.12*
	Cables equipped with an M40 industrial connector (servo motor end) and a free end (servo drive end)	SH3/MH3	Lexium 52 Lexium 62	2.5 / *0.004*	5	*16.404*	**VW3E1145R050**	1.995	*4.40*
					10	*32.808*	**VW3E1145R100**	3.575	*7.88*
					15	*49.213*	**VW3E1145R150**	5.155	*11.36*
					20	*65.617*	**VW3E1145R200**	6.735	*14.85*
					25	*82.021*	**VW3E1145R250**	8.315	*18.33*
					30	*98.425*	**VW3E1145R300**	9.895	*21.81*
					40	*131.234*	**VW3E1145R400**	13.055	*28.78*
					50	*164.042*	**VW3E1145R500**	16.215	*35.75*
		SH3/MH3	Lexium 52 Lexium 62	4 / *0.006*	5	*16.404*	**VW3E1153R050**	2.513	*5.54*
					10	*32.808*	**VW3E1153R100**	5.000	*11.02*
					15	*49.213*	**VW3E1153R150**	7.413	*16.34*
					20	*65.617*	**VW3E1153R200**	9.870	*21.76*
					25	*82.021*	**VW3E1153R250**	12.313	*27.15*
					30	*98.425*	**VW3E1153R300**	14.763	*32.55*
					40	*131.234*	**VW3E1153R400**	19.663	*43.35*
					50	*164.042*	**VW3E1153R500**	24.563	*54.15*
		SH3/MH3	Lexium 52 Lexium 62	10 / *0.016*	5	*16.404*	**VW3E1154R050**	4.832	*10.65*
					10	*32.808*	**VW3E1154R100**	9.232	*20.35*
					15	*49.213*	**VW3E1154R150**	13.632	*30.05*
					20	*65.617*	**VW3E1154R200**	18.032	*39.75*
					25	*82.021*	**VW3E1154R250**	22.432	*49.45*
					30	*98.425*	**VW3E1154R300**	26.832	*59.15*
					40	*131.234*	**VW3E1154R400**	35.632	*78.56*
					50	*164.042*	**VW3E1154R500**	44.432	*97.96*
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/MH3	Lexium 52 Lexium 62	–	5	*16.404*	**VW3E2094R050**	0.415	*0.91*
					10	*32.808*	**VW3E2094R100**	0.745	*1.64*
					15	*49.213*	**VW3E2094R150**	1.075	*2.37*
					20	*65.617*	**VW3E2094R200**	1.405	*3.10*
					25	*82.021*	**VW3E2094R250**	1.735	*3.83*
					30	*98.425*	**VW3E2094R300**	2.065	*4.55*
					40	*131.234*	**VW3E2094R400**	2.725	*6.01*
					50	*164.042*	**VW3E2094R500**	3.385	*7.46*

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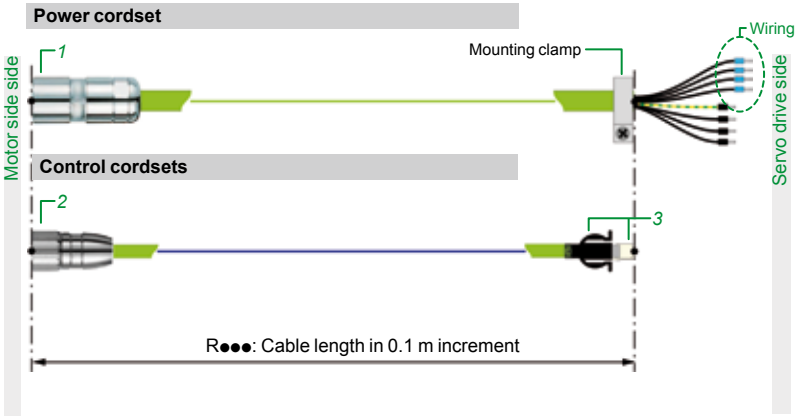
PacDrive 3 automation solution

Lexium SH3 / MH3 servo motors

Connection elements

IP 67 conformity kits

Connection description



1 M23/M40 connector
2 M23 signal connector
3 Y-Con + RJ45 connector

IP 67 conformity kits for Lexium MH3 servo motors

- This kit can be used to provide IP 67 degree of protection.
- It is mounted in place of the motor backplate.

PF080922

VW3M230●

Description	Use with	Reference	Weight kg/*lb*
IP 67 conformity kits (supplied as an option for Lexium MH3 servo motors)	■ MH3070●●	**VW3M2301**	0.100/ *0.220*
	■ MH3100●●	**VW3M2302**	0.150/ *0.331*
	■ MH3140●●	**VW3M2303**	0.300/ *0.661*
	■ MH3190●●	*(1)*	0.003/ *0.007*

(1) IP 67 conformity kit sold by Festo AG under reference QSML-B-M3-4-20.

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PacDrive 3 automation solution
Lexium SHS stainless steel servo motors

FCE200519B200

FCE200520B200

FCE200524B200

FCE200521B200

FCE200525B200

FCE200522B200

FCE200523B200

Presentation

Lexium SHS servo motors are stainless steel servo motors that are based on Lexium SH3 servo motors and designed for a high-torque output with relatively low current consumption in a stainless steel jacket.
Lexium SHS stainless steel servo motors and hybrid cable are the ideal choice to meet the requirements for dynamics, precision, and surroundings in the food and pharma industries.

Seven different types of Lexium SHS servo motors are available, in the following variants:
- 3 flange sizes: 055, 070, 100 mm
- Peak Torque: 3.2 to 28.3 Nm *(2.36 to 20.87 ft-lbf)*
- Available speed: up to 6000 rpm
- Equipped with multi-turn encoder and optionally with holding brake
- Laser marking of identification label

One cable solution

The range of stainless steel motors has been designed with a new type of hybrid cable to connect the drive to the motor based on a single-cable connection. This reduces the effort required for cabling and cleaning.

> Applications

Lexium SHS servo motors are suitable for machines used in the food industry, which may have special requirements for materials, surfaces, soiled edges, and cleaning all parts of the machine.

> General functions

Lexium SHS servo motors offer the following features:
- Overload protection with an integrated temperature sensor (external evaluation required)
- Low moment of inertia
- Excellent dynamics
- Stainless steel surface: fewer "soiled edges", easy cleaning (CIP), hygienic design
- Certification to CE, UL, and CSA
- Construction in accordance with EHEDG Guidelines
- Stainless steel motors are integrated in ECAM Database
- Degree of protection: IP 67 and IP 69k (shaft and housing)
- High overload capability
- Easy commissioning through electronic type plate and low maintenance
- Lexium SHS motors can be operated with Lexium 62, Lexium 52, and partly for Lexium 32. Suitable cables are available for every drive. Lexium SHS motors can also be operated with PacDrive M.

> Holding brake

The Lexium SHS servo motors (FCE200521B200, FCE200522B200 and FCE200523B200) are equipped with a failsafe electro-magnetic holding brake.
⚠ **Do not use the holding brake as a dynamic brake for deceleration, as this will quickly damage the brake.**

> Integrated encoder

Lexium SHS servo motors are fitted with a SinCos Hiperface® high-resolution multi-turn (131,072 points/turn x 4096 turns) encoder providing angular precision of the shaft position, accurate to less than ± 1.3 arc minute (*0.021°*).
This performs the following functions:
- Gives the absolute motor position to allow flow synchronization
- 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

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Lexium SHS servo motor – references

Technical datas

Nominal servo motor output power		Continuous stall torque		Rated torque		Peak stall torque		Rated speed		Rotor moment of inertia (without holding brake)	Reference	Weight	
Pn		M0		Mn		Mmax		Nn	Nmax	Jm			
kW	/hp	Nm	/ft-lbf	Nm	/ft-lbf	Nm	/ft-lbf	rpm	rpm	kgcm²		kg	lb
0.3	0.4	0.9	0.66	0.79	0.58	3.2	2.4	4000	9000	0.13	**FCE200519B200** (1)	2.200	4.85
0.9	1.2	2.0	1.47	1.4	1.03	7.6	5.6	6000	8000	0.41	**FCE200520B200** (1)	6.400	14.11
1.0	1.3	2.5	1.84	1.55	1.14	10.3	7.6	6000	8000	0.81	**FCE200521B200** (2)	7.200	18.87
0.8	1.1	4.65	3.42	3.85	2.83	18.3	13.5	2000	8000	2.93	**FCE200522B200** (2)	8.800	19.40
1.3	1.7	6.75	4.97	3.0	2.21	28.3	20.9	4000	6000	3.22	**FCE200523B200** (2)	10.000	22.05
1.0	1.3	2.5	1.84	1.55	1.14	10.3	7.6	6000	6000	0.58	**FCE200524B200** (1)	7.100	15.65
0.8	1.1	4.65	3.42	4.0	2.95	18.3	13.5	2000	6000	2.31	**FCE200525B200** (1)	8.700	19.18

(1) Motor without holding brake.
(2) Motor with holding brake.

Lexium SHS servo motor and Lexium 52 servo drive – combination

Lexium 52 Servo drives	Servo motors	Motor			Servo drive
Reference	Reference				Standard
		Io	Inom	Ipeak	Inom
		A	A	A	A @ 8 kHz
LXM52DD12C41000	**FCE200519B200**	0.8	1.35	3.4	3
	FCE200520B200	2.9	2.6	11.8	3
	FCE200521B200	3.6	1.9	15.2	3
	FCE200522B200	2.2	2.3	9.0	3
LXM52DD18C41000	**FCE200523B200**	5.7	3	28.3	6
	FCE200524B200	3.6	3.8	15.2	6
	FCE200525B200	2.2	3.1	9.0	6

Lexium SHS servo motor and Lexium 62 servo drive – combination

Lexium 62 Servo Drives	Servo motors	Motor				Servo drive			
Reference x = C: Single drive x = D: Double drive	Reference						Standard		
		Io	Inom	Ipeak		Inom			Ipeak
		A	A	A		A @ 4 kHz	A @ 8 kHz	A @ 16 kHz	A
LXM62DU60x21000	**FCE200519B200**	0.8	1.35	3.4	(1)	2	2	1.2	6
LXM62DD15x21000	**FCE200520B200**	2.9	2.6	11.8		5	5	1.2	15
LXM62DU60x21000	**FCE200521B200**	3.6	1.9	15.2	(1)+(2)	2	2	1.2	6
LXM62DD15x21000	**FCE200522B200**	2.2	2.3	9.0		5	5	3.5	15
LXM62DD15x21000	**FCE200523B200**	5.7	3	28.3	(1)	5	5	3.5	15
LXM62DD15x21000	**FCE200524B200**	3.6	3.8	15.2	(1)	5	5	3.5	15
LXM62DD15x21000	**FCE200525B200**	2.2	3.1	9.0		5	5	3.5	15

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

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Lexium SHS servo motors – dimensions

Dimensions (overall)

Servo motors	Flange		W x H x D *(1)*	
	mm	*in.*	mm	*in.*
FCE200519B200	58 x 58	*2.3 x 2.3*	58 x 64 x 225.1	*2.3 x 2.5 x 8.9*
FCE200520B200	71 x 71	*2.8 x 2.8*	71 x 112 x 216.7	*2.8 x 4.4 x 8.5*
FCE200524B200	71 x 71	*2.8 x 2.8*	71 x 112 x 284	*2.8 x 4.4 x 11.2*
FCE200521B200	71 x 71	*2.8 x 2.8*	71 x 112 x 284	*2.8 x 4.4 x 11.2*
FCE200525B200	100 x 100	*3.94 x 3.94*	100 x 138 x 270.7	*3.94 x 5.4 x 10.7*
FCE200522B200	100 x 100	*3.94 x 3.94*	100 x 138 x 270.7	*3.94 x 5.4 x 10.7*
FCE200523B200	100 x 100	*3.94 x 3.94*	100 x 138 x 306.7	*3.94 x 5.4 x 12.1*

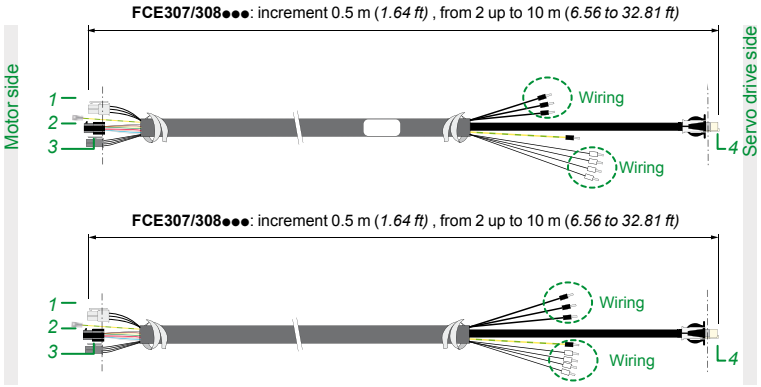
(1) D = motor length (excluding shaft end).

Connection elements

Designation	Composition	Connector		Length		Reference	Weight	
		Motor side	Servo drive side	m	*ft*		kg	*lb*
Motor cable for Lexium SHS stainless steel servo motors and Lexium 62 servo drives								
Hybrid cables (shielded motor and encoder cable)	(4 x 1.5 mm²/ *0.002 in²*) + 2 x (2 x 0.75 mm² / *0.001 in²*) + 2 x 0.34 mm² / *0.0005 in²*) + 3 x (2 x 0.15 mm² / *0.001 in²*)	Molex connectors	RJ45 (PD-3) connector for Encoder signal Wires for motor and holding brake connector	2	*6.56*	**FCE307020A200**	0.743	*1.64*
				2.5	*8.20*	**FCE307025A200**	0.909	*2.0*
				3	*9.84*	**FCE307030A200**	1.074	*2.37*
				3.5	*11.48*	**FCE307035A200**	1.240	*2.73*
				4	*13.12*	**FCE307040A200**	1.405	*3.10*
				4.5	*14.76*	**FCE307045A200**	1.571	*3.46*
				5	*16.40*	**FCE307050A200**	1.736	*3.83*
				5.5	*18.04*	**FCE307055A200**	1.902	*4.19*
				6	*19.69*	**FCE307060A200**	2.067	*4.56*
				6.5	*21.33*	**FCE307065A200**	2.233	*4.92*
				7	*22.97*	**FCE307070A200**	2.398	*5.29*
				7.5	*24.61*	**FCE307075A200**	2.564	*5.65*
				8	*26.25*	**FCE307080A200**	2.729	*6.02*
				8.5	*27.89*	**FCE307085A200**	2.895	*6.38*
				9	*29.53*	**FCE307090A200**	3.060	*6.75*
				9.5	*31.17*	**FCE307095A200**	3.226	*7.11*
				10.0	*32.81*	**FCE307100A200**	3.391	*7.48*
Motor cable for Lexium SHS stainless steel servo motors and Lexium 52 servo drives								
Hybrid cables (shielded motor and encoder cable)	(4 x 1.5 mm²/ *0.002 in²*) + 2 x (2 x 0.75 mm² / *0.001 in²*) + 2 x 0.34 mm² / *0.0005 in²*) + 3 x (2 x 0.15 mm² / *0.001 in²*)	Molex connectors	RJ45 (PD-3) connector for Encoder signal Wires for motor and holding brake connector	2	*6.56*	**FCE308020A200**	0.743	*1.64*
				2.5	*8.20*	**FCE308025A200**	0.909	*2.0*
				3	*9.84*	**FCE308030A200**	1.074	*2.37*
				3.5	*11.48*	**FCE308035A200**	1.240	*2.73*
				4	*13.12*	**FCE308040A200**	1.405	*3.10*
				4.5	*14.76*	**FCE308045A200**	1.571	*3.46*
				5	*16.40*	**FCE308050A200**	1.736	*3.83*
				5.5	*18.04*	**FCE308055A200**	1.902	*4.19*
				6	*19.69*	**FCE308060A200**	2.067	*4.56*
				6.5	*21.33*	**FCE308065A200**	2.233	*4.92*
				7	*22.97*	**FCE308070A200**	2.398	*5.29*
				7.5	*24.61*	**FCE308075A200**	2.564	*5.65*
				8	*26.25*	**FCE308080A200**	2.729	*6.02*
				8.5	*27.89*	**FCE308085A200**	2.895	*6.38*
				9	*29.53*	**FCE308090A200**	3.060	*6.75*
				9.5	*31.17*	**FCE308095A200**	3.226	*7.11*
				10.0	*32.81*	**FCE308100A200**	3.391	*7.48*

Connection description

Hybrid cables



1 *Socket strip MINIFIT JR 2x2 with clip*
2 *Molex plug MICROFIT 8-pin*
3 *Socket strip MINIFIT JR 2x2 with clip*
4 *RJ45 cable plug*

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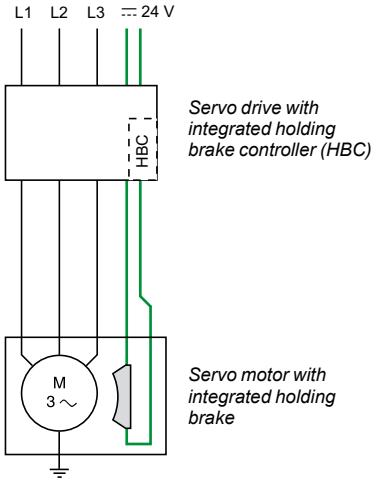
PacDrive 3 automation solution

Lexium servo motors

Options: Holding brake, Encoder, Planetary gearboxes

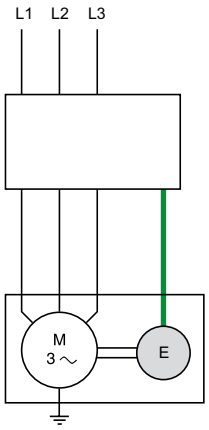


Holding Brake for Lexium servo motors

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 standard configuration of the servo drive integrates a holding brake controller, which amplifies the braking control signal to quickly deactivate the brake.

> Applications

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 the event of torque overload, such as vertical axis movement.



Encoder for Lexium servo motors

The standard measurement device is the SinCos Hiperface® single-turn or multi-turn encoder integrated in Lexium servo motors.
Depending on the model, single-turn and multi-turn SinCos encoders are available with medium resolution and capacitive sensing, or high resolution and optical sensing.
To select the type of SinCos Hiperface® encoder integrated in the Lexium servo motors (single-turn or multi-turn), see Servo motor references.
For additional information on integrated encoder characteristics, please contact your local sales office.

> Applications

This interface can be used for:

- Automatic identification of Lexium servo motor data by the servo drive
- Automatic initialization of the servo drive's control loops, to simplify installation of the motion control device

Planetary gearboxes

GBX and GBY optionnal planetary gearboxes for Lexium SH3 and MH3 servo motors: see page 5/16.
Schneider electric can supply stainless steel gearboxes for Lexium SHS servo motors: please contact your local sales office.

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PacDrive 3 automation solution

Lexium SH3 and MH3 servo motors

Option: GBX and GBY planetary gearboxes

PF080936

GBX planetary gearboxes

PF080937

GBY angular planetary gearbox

PF080938

GBK adapter kit

PF105616

GBX160 planetary gearbox

Presentation

Motion control often requires the use of gearboxes to adapt speeds and torques, while providing the precision demanded by the application.

Schneider Electric has chosen to use GBX planetary gearboxes and GBY angular planetary gearboxes for their Lexium servo motors.
The combination of Lexium servo motors with the most suitable planetary gearboxes makes them very easy to mount and set up.

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

Available in 4 sizes (GBX60...GBX160), planetary gearboxes are offered with 15 reduction ratios (3:1...100:1).
GBY angular planetary gearboxes are available in 3 sizes (GBY60…GBY120) with 7 reduction ratios (3:1...40:1).

The tables on the following pages show the most suitable combinations of servo motor and GBX or GBY planetary gearbox.
For other combinations or additional information on planetary gearbox characteristics, please refer to the servo motor data sheets on our web site, www.schneider-electric.com or contact your local sales office.

A GBK adapter kit is available for mounting the Lexium servo motors with GBX60…GBX120 or GBY60…GBY120 planetary gearboxes.
The GBX160 planetary gearbox includes an integrated adapter kit as standard equipment.

The adapter kit includes:
- An adapter plate
- A shaft end adapter, depending on the servo motor/planetary gearbox combination
- Accessories for mounting the plate on the planetary gearbox
- Accessories for mounting the servo motor

References

Size	Reduction ratio	Reference	Weight kg/*lb*
GBX60	3:1, 4:1, 5:1, 8:1, and 10:1	**GBX060●●●K**	0.900/ *1.984*
	9:1, 12:1, 15:1, 16:1, 20:1, 25:1, 32:1, and 40:1	**GBX060●●●K**	1.000/ *2.205*
	60:1	**GBX060●●●K**	1.300/ *2.866*
GBX80	3:1, 4:1, 5:1, 8:1, and 10:1	**GBX080●●●K**	2.100/ *4.630*
	9:1, 12:1, 15:1, 16:1, 20:1, 25:1, 32:1, and 40:1	**GBX080●●●K**	2.600/ *5.732*
GBX120	3:1, 4:1, 5:1, 8:1, and 10:1	**GBX120●●●K**	6.000/ *13.228*
	9:1, 12:1, 15:1, 16:1, 20:1, 25:1, 32:1, and 40:1	**GBX120●●●K**	8.000/ *17.637*
	60:1, 80:1, and 100:1	**GBX120●●●K**	10.000/ *22.046*
GBX160	8:1	**GBX160●●●●●●●F**	18.000/ *39.683*
	12:1, 15:1, 16:1, 20:1, 25:1, 32:1, and 40:1	**GBX160●●●●●●●F**	22.000/ *48.502*

Customization: Please contact your local sales office to obtain a special motor / gearbox combination to meet any specific needs.

SH3 motor + mounted gearbox

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PacDrive 3 automation solution

Lexium SH3 and MH3 servo motors

Option: GBX planetary gearboxes

References

To order a GBX060…GBX120 planetary gearbox, complete each reference as follows:

			GBX	●●●	●●●	K
Size	Casing diameter	60 mm/ *2.36 in.*		**060**		
		80 mm/ *3.15 in.*		**080**		
		120 mm/ *4.72 in.*		**120**		
Reduction ratio		3:1			**003**	
		4:1			**004**	
		5:1			**005**	
		8:1			**008**	
		9:1			**009**	
		10:1			**010**	
		12:1			**012**	
		15:1			**015**	
		16:1			**016**	
		20:1			**020**	
		25:1			**025**	
		32:1			**032**	
		40:1			**040**	
		60:1			**060**	
		80:1			**080**	
		100:1			**100**	
Mounting with GBK adapter kit						**K**

To order a GBX160 planetary gearbox, complete each reference above as follows:

			GBX	●●●	●●●	●●●	●	F
Size	Casing diameter	160 mm/ *6.30 in.*		**160**				
Reduction ratio		8:1 and 12:1…40:1			**008…040** (as in the table above)			
Associated Lexium servo motors	Type					**100**		
						140		
	Motor						**1**	
							2	
							3	
							4	
Integrated servo motor adapter								**F**

Lexium servo motor/GBX gearbox combinations

Reduction ratios from 3:1 to 100:1

	Reduction ratio													
Servo motor	**3:1, 4:1**	**5:1**	**8:1**	**9:1**	**10:1**	**12:1**	**15:1, 16:1**	**20:1**	**25:1**	**32:1**	**40:1**	**60:1**	**80:1**	**100:1**
SH30551	GBX060	GBX060	GBX060	GBX060	GBX060	GBX060	GBX060	GBX060	GBX060	GBX060	GBX060	GBX060	–	–
SH30552	GBX060	GBX060	GBX060	GBX060	GBX060	GBX060	GBX060	GBX060	GBX060	GBX060	–	–	–	–
SH30553	GBX060	GBX060	GBX060	GBX060	GBX060	GBX060	GBX060	GBX060	–	–	–	–	–	–
SH30701	GBX060	GBX060	GBX060	GBX060	GBX060	GBX060	GBX060	GBX080	GBX080	GBX080	GBX080	GBX120	GBX120	GBX120
SH30702	GBX060	GBX060	GBX080	GBX060	GBX080	GBX060	GBX080	GBX080	GBX080	GBX120	GBX120	GBX120	GBX120	GBX120
SH30703	GBX060	GBX060	GBX080	GBX060	GBX080	GBX080	GBX080	GBX080	GBX120	GBX120	GBX120	GBX120	GBX120	GBX120
SH31001	GBX080	GBX080	GBX080	GBX080	GBX120	GBX080	GBX080	GBX080	GBX120	GBX120	GBX120	–	–	–
SH31002	GBX080	GBX080	GBX120	GBX080	GBX120	GBX080	GBX120	GBX120	GBX160	GBX160	GBX160	–	–	–
SH31003	GBX080	GBX080	GBX120	GBX080	GBX120	GBX120	GBX120	GBX120	GBX160	GBX160	GBX160	–	–	–
SH31004	GBX120	GBX120	GBX120	GBX120	–	GBX120	GBX160	GBX160	GBX160	GBX160	GBX160	–	–	–
SH31401	GBX120	GBX120	GBX120	GBX120	–	GBX120	GBX160	GBX160	GBX160	GBX160	GBX160	–	–	–
SH31402	GBX120	GBX120	GBX160	–	–	GBX160	GBX160	GBX160	GBX160	GBX160	GBX160	–	–	–
SH31403	GBX120	GBX120	GBX160	–	–	GBX160	GBX160	GBX160	GBX160	GBX160	GBX160	–	–	–
SH31404	GBX120	GBX120	GBX160	–	–	GBX160	GBX160	GBX160	–	–	–	–	–	–
MH3/ILM 0701	GBX060	GBX060	GBX060	GBX060	GBX060	GBX060	GBX060	GBX080	GBX080	GBX080	GBX080	GBX120	GBX120	GBX120
MH3/ILM 0702	GBX060	GBX060	GBX080	GBX060	GBX060	GBX060	GBX080	GBX080	GBX080	GBX120	GBX120	GBX120	GBX120	GBX120
MH3/ILM 0703	GBX060	GBX060	GBX080	GBX060	GBX080	GBX080	GBX080	GBX080	GBX120	GBX120	GBX120	GBX120	GBX120	GBX120
MH3/ILM 1001	GBX080	GBX080	GBX080	GBX080	GBX080	GBX080	GBX080	GBX080	GBX120	GBX120	GBX120	–	–	–
MH3/ILM 1002	GBX080	GBX080	GBX120	GBX080	GBX080	GBX080	GBX120	GBX120	GBX160	GBX160	GBX160	–	–	–
MH3/ILM 1003	GBX080	GBX080	GBX120	GBX080	GBX120	GBX120	GBX120	GBX120	GBX160	GBX160	GBX160	–	–	–
MH3/ILM 1401	GBX120	GBX120	GBX120	GBX120	–	GBX120	GBX160	GBX160	GBX160	GBX160	GBX160	–	–	–
MH3/ILM 1402	GBX120	GBX120	GBX160	–	–	GBX160	GBX160	GBX160	GBX160	GBX160	GBX160	–	–	–
MH3/ILM 1403	GBX120	GBX120	GBX160	–	–	GBX160	GBX160	GBX160	GBX160	GBX160	GBX160	–	–	–

GBX060

For these combinations, please verify that the application will not exceed the maximum gearbox output torque; contact your local sales office.

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PacDrive 3 automation solution

Lexium SH3 and MH3 servo motors

Option: GBY angular planetary gearboxes

References

PF080937

GBY●●●●●●K angular planetary gearbox

Size	Reduction ratio	Reference	Weight kg/*lb*
GBY60	3:1, 4:1, 5:1, and 8:1	**GBY060●●●K**	1.700/ *3.748*
	12:1, 20:1, and 40:1	**GBY060●●●K**	1.900/ *4.189*
GBY80	3:1, 4:1, 5:1, and 8:1	**GBY080●●●K**	4.400/ *9.700*
	12:1, 20:1, 25:1, and 40:1	**GBY080●●●K**	5.000/ *11.023*
GBY120	3:1, 4:1, 5:1, and 8:1	**GBY120●●●K**	12.000/ *26.455*
	12:1, 20:1, and 40:1	**GBY120●●●K**	14.000/ *30.865*

To order a GBY angular planetary gearbox, complete each reference above as follows:

			GBY	●●●	●●●	K
Size	Casing diameter	60 mm / *2.36 in.*		**060**		
		80 mm / *3.15 in.*		**080**		
		120 mm / *4.72 in.*		**120**		
Reduction ratio		3:1			**003**	
		4:1			**004**	
		5:1			**005**	
		8:1			**008**	
		12:1			**012**	
		20:1			**020**	
		25:1			**025**	
		40:1			**040**	
Mounting with GBK adapter kit						**K**

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Lexium servo motor/GBY gearbox combinations

Reduction ratios from 3:1 to 40:1

Servo motor	Reduction ratio 3:1	4:1	5:1	8:1	12:1	20:1	25:1	40:1
SH30551	GBY060	GBY060	GBY060	GBY060	GBY060	GBY060	–	GBY060
SH30552	GBY060	GBY060	GBY060	GBY060	GBY060	GBY060	–	–
SH30553	GBY060	GBY060	GBY060	GBY060	GBY060	GBY060	–	–
SH30701	GBY060	GBY060	GBY060	GBY060	GBY060	GBY080	GBY080	GBY080
SH30702	GBY060	GBY060	GBY060	GBY080	GBY080	GBY080	GBY080	GBY120
SH30703	GBY080	GBY080	GBY080	GBY080	GBY080	GBY080	GBY080	GBY120
SH31001	GBY080	GBY080	GBY080	GBY080	GBY080	GBY080	–	GBY120
SH31002	GBY080	GBY080	GBY080	GBY120	GBY080	GBY120	–	–
SH31003	GBY120	GBY120	GBY120	GBY120	GBY120	GBY120	–	–
SH31004	GBY120	GBY120	GBY120	–	GBY120	–	–	–
SH31401	GBY120	GBY120	GBY120	GBY120	GBY120	–	–	–
MH3/ILM 0701	GBY060	GBY060	GBY060	GBY060	GBY060	GBY080	GBY080	GBY080
MH3/ILM 0702	GBY060	GBY060	GBY060	GBY080	GBY080	GBY080	GBY080	GBY120
MH3/ILM 0703	GBY080	GBY080	GBY080	GBY080	GBY080	GBY080	GBY080	GBY120
MH3/ILM 1001	GBY080	GBY080	GBY080	GBY080	GBY080	GBY080	–	GBY120
MH3/ILM 1002	GBY080	GBY080	GBY080	GBY120	GBY080	GBY120	–	–
MH3/ILM 1003	GBY120	GBY120	GBY120	GBY120	GBY120	GBY120	–	–
MH3/ILM 1401	GBY120	GBY120	GBY120	GBY120	GBY120	–	–	–

GBY060

For these combinations, please verify that the application will not exceed the maximum gearbox output torque; contact your local sales office.

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PacDrive 3 automation solution

Lexium SH3 and MH3 servo motors

Option: GBX or GBY planetary gearboxes Adapter kit for GB● planetary gearboxes

References

To order a GBK adapter kit, complete each reference as follows:

			GBK	●●●	●●●	●	F
Size of GBX or GBY planetary gearbox	Casing diameter	60 mm/ *2.36 in.*		**060**			
		80 mm/ *3.15 in.*		**080**			
		120 mm/ *4.72 in.*		**120**			
Associated SH3, MH3, Lexium 62 ILM servo motors		SH3055			**055**		
		SH3070/MH3070/ILM070			**070**		
		SH3100/MH3100/ILM100			**100**		
		SH3140/MH3140/ILM140			**140**		
Compatibility		All types of motor				**0**	
		1 or 2-stack motors				**2**	
		1, 2, or 3-stack motors				**3**	
		4-stack motor				**4**	
Servo motor adapter							**F**

GBK adapter kit/ Lexium servo motor combination

GBK references	Lexium SH3 servo motor													
	0551●	**0552●**	**0553●**	**0701●**	**0702●**	**0703●**	**1001●**	**1002●**	**1003●**	**1004●**	**1401●**	**1402●**	**1403●**	**1404●**
GBK0600550F	■	■	■											
GBK0600702F				■	■									
GBK0600703F						■								
GBK0800702F				■	■									
GBK0800703F						■								
GBK0801003F							■	■	■					
GBK1200702F				■	■									
GBK1200703F						■								
GBK1201003F							■	■	■					
GBK1201004F										■				
GBK1201400F											■	■	■	■
GBK references	**Lexium MH3/ILM servo motor**													
GBK0600702F				■	■									
GBK0600703F						■								
GBK0800702F				■	■									
GBK0800703F						■								
GBK0801003F							■	■	■					
GBK1200702F				■	■									
GBK1200703F						■								
GBK1201003F							■	■	■					
GBK1201400F											■	■	■	

■ Compatible
□ Not compatible

(1) Weight of adapter kit:
- *GBK060●●●F: 0.200 kg/0.441 lb*
- *GBK080●●●F: 0.450 kg/0.992 lb*
- *GBK120●●●F: 0.650 kg/1.433 lb*

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Robotic solutions

Technical information on all of the products listed in this catalog is available at: www.schneider-electric.com

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PacDrive Delta robots

Presentation

- PacDrive Delta 2 robots ..... page 6/2
- PacDrive Delta 3 robots ..... page 6/3
- Selection guide ..... page 6/4

Product reference structure ..... page 6/6

References

- PacDrive Delta 2 robots ..... page 6/7
- Spare parts for PacDrive Delta 2 robots ..... page 6/7
- PacDrive Delta 3 robots ..... page 6/8
- Spare parts for PacDrive Delta 3 robots ..... pages 6/9 to 6/11

Lexium Cartesian robots

Presentation

- Lexium PAS Portal Axes and Lexium TAS Linear Tables: Single-axis systems for loads of up to 150 kg ..... page 6/12
- Lexium CAS Cantilever and Lexium CAS Telescopic Axes: Single-axis systems with stationary motor and moving axis body ..... page 6/12
- Lexium MAX Double Portal Axes: Dual-axis systems for large loads and high speeds ..... page 6/13
- Lexium Max Portal Robots and Linear Positioners: Lexium dual-axis and triple-axis systems for multi-dimensional applications ..... page 6/13

Selection guides

- Lexium Cartesian robots: Linear axes ..... page 6/14
- Lexium Cartesian robots: Multi-axis systems ..... page 6/16

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PacDrive 3 automation solution

Robotics solutions

PacDrive Delta robots

PacDrive Delta 2 robot

Presentation

These robotics solutions were developed as an add-on to PacDrive. They were designed to satisfy rapidly growing customer demand for robots as an integral part of machine design, for example in packaging machinery.

The robotics hardware consists of PacDrive Delta 2, PacDrive Delta 3, and Cartesian robots.

In addition to the standard product offerings, customized versions are also available upon request.

PacDrive Delta 2 robots

- The PacDrive Delta 2 robot is quick, quiet, and reliable. It has a maximum load capacity of 25 kg (55 lbs).
- The D2S types use conventional Lexium SH3 servo motors with cabinet-mounted servo drives.
- The ready-to-use D2 robots are also available with an optional rotational axis.
- Flexible integration into the automation system is possible using the Lexium 62 ILM servo modules with integrated servo drive. Though mechanically identical, the D2I types offer the benefits of the Lexium 62 ILM integrated drives technology.
- The Lexium 62 ILM integrated drives significantly reduce cabinet space and cabling, leaving only a shared power supply inside the cabinet. The Lexium 62 ILM integrated drives are connected via a single cable from the cabinet to machine-mounted distribution boxes and single, quick-connect cables to each drive.

Advantages of PacDrive Delta 2 robots

> High payload capacity
> Large work envelope
> High precision
> Highly 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
> Degree of protection up to IP55
> Easy-clean design

References

> See page 6/7

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PacDrive Delta 3 robot type P4

PacDrive Delta3 robot type P4 Flat

PacDrive Delta 3 robot type P2, P4, P6 Compact

Presentation *(continued)*

PacDrive Delta 3 robots

- PacDrive Delta 3 robots are designed for fast pick-and-place operations. They stand out with their short cycle times and an exceptional payload capacity of up to 15 kg (33.1 lb).
- Combined with a vision system, PacDrive Delta 3 robots can also be used for random and/or mixed product flow picking.
- The robot's mounting fixtures located on the top (P4 Standard version), which reduces the risk of the robot arms colliding with the frame, even at extreme deflection.
- The PacDrive Delta 3 robots can be equipped with Lexium SH3 servo motors, or with Lexium 62 ILM integrated drives.
- The PacDrive Delta 3 robots are also available with an optional rotational axis.
- Lexium 62 ILM integrated drives are connected via a single cable from the cabinet to machine-mounted distribution boxes and single, quick-connect cables to each servo.

Advantages of PacDrive Delta 3 robots

- 3 types available for optimum footprint
- Highly dynamic response
- IP65 rated, sealed stainless steel design for pharmaceutical and food applications (IP69k for all robots on the moving parts, Version with cleanroom up to class 6 available)
- High precision
- Optimized tube/cable mounting through the parallel plate reduces risk of collision with products and machine parts
- Suitable for washdown applications (P4 only)
- Available with Lexium 62 ILM integrated drives 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
- Choice between Lexium SH3 servo motors and Lexium 62 ILM integrated drives
- Patented, completely welded stainless steel lower arms, no gluing, no issues with cleaning fluids
- Re-referencing without additional tool ("Homing")

References

- See pages 6/10 to 6/12

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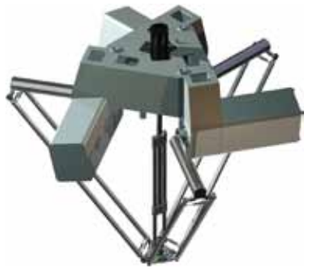
PacDrive 3 automation solution

Robotics solutions

PacDrive Delta robots

Robot type	PacDrive Delta 2 robots	PacDrive Delta 3 robots				
	D2 (1000 mm / *39.4 in.*)	**P2 Compact (800 mm** / *31.5 in.*)	**P4 Standard (1200 mm** / *47.2 in.*)	**P4 Flat (1200 mm** / *47.2 in.*)	**P4 Compact (1200 mm** / *47.2 in.*)	**P6 Compact (1600 mm** / *62.9 in.*) **P6 Extended (1600 mm** / *62.9 in.*)
Number of axes	2-3-axis	3-4 axis	3-4 axis	3-4 axis	3-4 axis	
						
Work envelope	□ Width 360 mm *(14.17 in.)* □ Height 1000 mm *(39.37 in.)* □ Unlimited rotation	□ Diameter 800 mm *(31.5 in.)* □ Height 230 mm *(9.06 in.)* □ Unlimited rotation	□ Diameter 1200 mm *(47.24in.)* □ Height 225 mm *(8.86 in.)* □ Unlimited rotation	□ Diameter 1200 mm *(47.2 in.)* □ Height 225 mm *(8.86 in.)* □ Unlimited rotation	□ Diameter 1200 mm *(47.2 in.)* □ Height 225 mm *(8.86 in.)* □ Unlimited rotation	□ P6 compact, P6 Extended: diameter 1600 mm *(62.9 in.)* □ P6 compact: height 275 mm *(10.83 in.)* □ P6 Extended: height 400 mm in Z stroke *(15.74 in.)* □ Unlimited rotation
Rotational axis	□ Fixed (no rotational axis installed) □ Optional rotational axis	□ Fixed (no rotational axis installed) □ Optional rotational axis	□ Fixed (no rotational axis installed) □ Optional rotational axis	□ Fixed (no rotational axis installed) □ Optional rotational axis	□ Fixed (no rotational axis installed) □ Optional rotational axis	
Repetitive accuracy	< 0.3 mm *(< 0.01 in.)*	+/- 0.1 mm *(+/-0.004 in.)*	+/- 0.1 mm *(+/-0.004 in.)*	+/- 0.1 mm *(+/-0.004 in.)*	+/- 0.1 mm *(+/-0.004 in.)*	
Maximum cycle	50 cycle/minute *(1)*	301 cycle/minute *(1)*	230 cycle/minute *(1)*	230 cycle/minute *(1)*	230 cycle/minute *(1)*	160 cycle/minute *(1)*
Maximum speed	4 m/sec	10 m/sec	10 m/sec	10 m/sec	10 m/sec	
Maximum acceleration	□ 18 m/sec² max	□ 120 m/sec² at 1kg *(at 2.20 lb)* □ 90 m/sec² at 1.5 kg *(at 3.31 lb)*	□ 100 m/sec² at 1kg *(at 2.20 lb)* □ 75 m/sec² at 1.5 kg *(at 3.31 lb)*	□ 100 m/sec² at 1kg *(at 2.20 lb)* □ 75 m/sec² at 1.5 kg *(at 3.31 lb)*	□ 100 m/sec² at 1kg *(at 2.20 lb)* □ 75 m/sec² at 1.5 kg *(at 3.31 lb)*	□ 80 m/sec² at 1kg *(at 2.20 lb)* □ 60 m/sec² at 1.5 kg *(at 3.31 lb)*
Maximum payload capability	Up to 30 kg *(66.14 lb)*	Up to 15 kg *(33.1 lb)*	Up to 15 kg (33.1 lb)	Up to 15 kg (33.1 lb)	Up to 15 kg (33.1 lb)	
Variants	□ Normal – non-washdown (IP55)	□ Normal – washdown, non-hygienic (IP65, IP69K moving parts)	□ Washdown (IP65, IP69K moving parts) □ Normal – non-washdown (IP65, IP69K moving parts) □ Cleanroom Class 6	□ Washdown (IP65, IP69K moving parts) □ Normal – non-washdown (IP65, IP69K moving parts)	□ Normal – washdown, non-hygienic (IP65, IP69K moving parts)	
Combined motor type	□ Lexium SH3 motors □ Lexium 62 ILM □ Without motor	□ Lexium SH3 motors □ Lexium 62 ILM	□ Lexium SH3 motors □ Lexium 62 ILM integrated drive □ Motor and drive	□ Lexium SH3 motors □ Lexium 62 ILM integrated drive □ Without motor	□ Lexium SH3 motors □ Lexium 62 ILM integrated drive	□ Lexium SH3 motors □ Lexium 62 ILM integrated drive on request
Reference	**VRKD2●●●●●00000**	**VRKP2●●●NC00000**	**VRKP4●●●●●00000**	**VRKP4●●●●F00000**	**VRKP4●●●NC00000**	**VRKP6●●●NC00●00**
See page	6/7	6/8	6/8	6/8	6/8	6/8

(1) Depending on the application, and on payload.

(1) Depending on the application, and on payload.

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PacDrive Delta 2 and PacDrive Delta 3 robots: Product reference structure

	Type (root)			Model					Options						
	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 Type/Product Type

P2	3-4 axis Delta 3 robot 800 mm *(31.5 in.)*
P4	3-4 axis Delta 3 robot 1200 mm *(47.2 in.)*
P6	3-4 axis Delta 3 robot 1600 mm *(62.9 in.)*
D2	2-3-axis Delta 2 robot
CP	Customer Project

Subtype

S0	SH motor
L0	ILM motor
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 IP 65 (P4)
NF	Normal, non-washdown, flat (P4)
NO	Normal, non-washdown (P4)
WF	Washdown, flat (P4)
CW	Cleanroom, class 6 conforming to ISO14644-1 (P4)
NC	Normal, Compact (P2, P4 and P6 with SH motors; with Lexium 62 ILM motors on request)
01	Customized version 01 (=> Option=C)
YY	Spare part
P4	Customized bundle for P4 robot scope

Version
to identify mechanism version

00	S00 (P4; D2)

Miscellaneous
for options; e.g. spare part number

000	Customized hardware bundle subtype/enumeration

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PacDrive 3 automation solution

Robotics solutions

PacDrive Delta 2 robots, Spare parts

PacDrive Delta 2 robot

PacDrive Delta 2 robots		
D2 robots		
Designation	**Reference**	**Weight kg / *lb***
PacDrive robot D2-1000	**VRKD2S0FEC00000**	137.000 *302.03*
PacDrive robot D2R-1000	**VRKD2S0REC00000**	137.000 *302.03*
PacDrive robot D2L-1000	**VRKD2L0FEC00000**	137.000 *302.03*
PacDrive robot D2LR-1000	**VRKD2L0REC00000**	137.000 *302.03*
PacDrive Robot D2WMR-1000	**VRKD2WMREC00000**	137.000 *302.03*

Spare parts for PacDrive Delta 2 robots			
Designation	**Description**	**Reference**	**Weight kg / *lb***
Maintenance tool kit	Calibration tool for calibration of the robot after replacement of a motor or gear box 1x gauge	**VRKD2YYYYY00001**	–
Cable clamp set	2x cable clamps	**VRKD2YYYYY00002**	–
Secondary arm assembly	1x secondary arm 6x bearings	**VRKD2YYYYY00003**	–

VRKD2YYYYY00001

VRKD2YYYYY00002

VRKD2YYYYY00003

6

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PacDrive 3 automation solution

Robotics solutions

PacDrive Delta 3 robots, Spare parts

PacDrive Delta 3 robot P2 Compact

PacDrive Delta 3 robot P4 Standard

PacDrive Delta 3 robot P4 Flat

PacDrive Delta 3 robot P4/P6 Compact

PacDrive Delta 3 robots

P2 Compact robots (800 mm work envelop / *31.50 in. work envelop*)

Designation	Reference	Weight kg / *lb*
PacDrive robot P2s-F-NC-15-800 *P2 Compact, fixed axis, non-washdown, SH3 motor*	**VRKP2S0FNC00000**	47.000 *103.62*
PacDrive robot P2s-R-NC-15-800 *P2 Compact, rotational axis, non-washdown, SH3 motor*	**VRKP2S0RNC00000**	52.000 *114.64*
PacDrive robot P2L-F-NC-15-800 *P2 Compact, fixed axis, non-washdown, ILM motor*	**VRKP2L0FNC00000**	55.000 *121.25*
PacDrive robot P2L-R-NC-15-800 *P2 Compact, rotational axis, non-washdown, ILM motor*	**VRKP2L0RNC00000**	65.000 *143.30*

P4 Standard robots (1200 mm work envelop / *47.24 in.work envelop*)

Designation	Reference	Weight kg / *lb*
PacDrive robot P4s-F-WD-15-1200 *P4, fixed axis, washdown, SH3 motor*	**VRKP4S0FWD00000**	105.000 *231.49*
PacDrive robot P4s-R-WD-15-1200 *P4, rotational axis, washdown, SH3 motor*	**VRKP4S0RWD00000**	110.000 *242.51*
PacDrive robot P4s-F-CW-15-1200 *P4, fixed axis, washdown, cleanroom, SH3 motor*	**VRKP4S0FCW00000**	105.000 *231.49*
PacDrive robot P4s-R-CW-15-1200 *P4, rotational axis, washdown, cleanroom, SH3 motor*	**VRKP4S0RCW00000**	110.000 *242.51*
PacDrive robot P4L-F-NO-15-1200 *P4, fixed axis, non-washdown, ILM motor*	**VRKP4L0FNO00000**	107.000 *235.89*
PacDrive robot P4L-R-NO-15-1200 *P4, rotational axis, non-washdown, ILM motor*	**VRKP4L0RNO00000**	113.000 *249.12*

P4 Flat robots (1200 mm work envelop / *47.24 in.work envelop*)

Designation	Reference	Weight kg / *lb*
PacDrive robot P4s-F-WF-15-1200 *P4 Flat, fixed axis, washdown, SH3 motor*	**VRKP4S0FWF00000**	89.000 *196.21*
PacDrive robot P4s-R-WF-15-1200 *P4 Flat, rotational axis, washdown, SH3 motor*	**VRKP4S0RWF00000**	94.000 *207.23*
PacDrive robot P4L-F-NF-15-1200 *P4 Flat, fixed axis, non-washdown, ILM motor*	**VRKP4L0FNF00000**	116.000 *255.74*
PacDrive robot P4L-R-NF-15-1200 *P4 Flat, rotational axis, non-washdown, ILM motor*	**VRKP4L0RNF00000**	125.000 *275.58*
PacDrive robot P4-R-NF-15-1200 *P4 Flat, rotational axis, non-washdown, without motor*	**VRKP4WMRNF00000**	100.000 *220.46*

P4 Compact robots (1200 mm work envelop / *47.24 in. work envelop*)

Designation	Reference	Weight kg / *lb*
PacDrive robot P4s-F-NC-15-1200 *P4 Compact, fixed axis, non-washdown, SH3 motor*	**VRKP4S0FNC00000**	51.000 *112.44*
PacDrive robot P4s-R-NC-15-1200 *P4 Compact, rotational axis, non-washdown, SH3 motor*	**VRKP4S0RNC00000**	56.000 *123.46*
PacDrive robot P4L-F-NC-15-1200 *P4 Compact, fixed axis, non-washdown, ILM motor*	**VRKP4L0FNC00000**	55.000 *121.25*
PacDrive robot P4L-R-NC-15-1200 *P4 Compact, rotational axis, non-washdown, ILM motor*	**VRKP4L0RNC00000**	60.000 *132.28*

P6 Compact robots (1600 mm work envelop / *62.99 in. work envelop*)

Designation	Reference	Weight kg / *lb*
PacDrive robot P6s-F-NC-15-1600 *P6 Compact, fixed axis, non-washdown, SH3 motor*	**VRKP6S0FNC00000**	60.000 *132.28*
PacDrive robot P6s-R-NC-15-1600 *P6 Compact, rotational axis, non-washdown, SH3 motor*	**VRKP6S0RNC00000**	65.000 *143.30*

P6 Extended robots (1600 mm work envelop / *62.99 in. work envelop*)

Designation	Reference	Weight kg / *lb*
PacDrive robot P6EXs-F-NC-15-1600 *P6 Extended, fixed axis, non-washdown, SH3 motor*	**VRKP6S0FNC00EX0**	60.000 *132.28*
PacDrive robot P6EXs-R-NC-15-1600 *P6 Extended, rotational axis, non-washdown, SH3 motor*	**VRKP6S0RNC00EX0**	65.000 *143.30*

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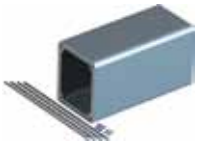
PacDrive 3 automation solution

Robotics solutions

PacDrive Delta 3 robots, Spare parts



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VRKP2YYYYY00002
VRKP4YYYYY00002

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VRKP4YYYYY00010

VRKP4YYYYY00011

VRKP4YYYYY00012

VRKP4YYYYY00013

PacDrive Delta 3 robots

Spare parts for PacDrive Delta 3 robots

Designation	Use with	Description	Reference	Weight kg / *lb*
Primary arm with ball pins and indexing bolt	P2	1x primary arm, complete 1x indexing bolt gearing	**VRKP2YYYYY00002**	–
2 secondary arms with rolls, sockets, and 4 springs	P2	2x lower arm, complete 4x spring	**VRKP2YYYYY00004**	–
Telescopic axis mounted with universal joints	P2	1x telescopic axis	**VRKP2YYYYY00007**	–
Set of 3 tubes for telescopic axis	P2	2x lower tube 16 1x upper tube 20	**VRKP2YYYYY00010**	–
Motor cover with fasteners – without seal	P4	1x motor cover P4x-WD 4x screw-threaded rod 4x sealing rings screw-threaded rod 4x loss washer	**VRKP4YYYYY00001**	–
Primary arm with ball pins and indexing bolt	P4	1x primary arm, complete 1x indexing bolt for gearing	**VRKP4YYYYY00002**	–
Gearbox with fasteners and indexing bolt	P2, P4, P6	1x gearbox main axis 12x screw-drive motor 4x screw-drive motor 12x washer drive motor 1x indexing bolt gearbox 1x X-Ring drive motor 1x PE caps for motors	**VRKP4YYYYY00003**	–
2 secondary arms with rolls, sockets and 4 springs	P4	2x lower arm, complete 4x spring	**VRKP4YYYYY00004**	–
Parallel plate with bearing and ball pins	P2, P4, P6	1x parallel plate with bearing and ball pins	**VRKP4YYYYY00005**	–
Parallel plate with ball pins	P2, P4, P6	1x parallel plate with ball pins	**VRKP4YYYYY00006**	–
Telescopic axis mounted with universal joints	P4	1x telescopic axis	**VRKP4YYYYY00007**	–
Upper universal joint with fasteners	P2, P4, P6	1x upper universal joint 1x clamping screw for upper universal joint	**VRKP4YYYYY00008**	–
Lower universal joint with fasteners and indexing bolt	P2, P4, P6	1x lower universal joint 6x countersunk screw for universal joint 1x straight pin for universal joint	**VRKP4YYYYY00009**	–
Set of 3 tubes for telescopic axis	P4	2x lower tube 16 1x upper tube 20	**VRKP4YYYYY00010**	–
Various fasteners	P2, P4, P6	1x clamping cone, large 1x clamping sleeve, large 1x washer, large 4x washer, small 4x clamping cone, small 4x clamping sleeve, small 1x cover for universal joint 5x clamping screw 1x screw for universal joint, large 1x screw for universal joint, small 6x countersunk screw for universal joint 2x straight pin for universal joint	**VRKP4YYYYY00011**	–
3 sets of sliding films	P2, P4, P6	3x sliding lms 20 6x sliding lms 16	**VRKP4YYYYY00012**	–
3 sets of sliding film FDA	P2, P4, P6	3x sliding film 20 FDA 6x sliding film 16 FDA	**VRKP4YYYYY00013**	–

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PacDrive 3 automation solution

Robotics solutions

PacDrive Delta 3 robots, Spare parts

VRKP4YYYYY00014

VRKP4YYYYY00015

VRKP4YYYYY00016

VRKP4YYYYY00017

VRKP4YYYYY00018

VRKP4YYYYY00019

VRKP4YYYYY00020

VRKP4YYYYY00021

VRKP4YYYYY00022

VRKP4YYYYY00023

PacDrive Delta 3 robots

Spare parts for PacDrive Delta 3 robots *(continued)*

Designation	Use with	Description	Reference	Weight kg / *lb*
Gearbox rotation axis with fasteners and seals	P2, P4, P6	1x gearbox rotational axis 1x O-ring central motor 4x sealing ring for central motor 4x screw for central motor above 4x gearbox screw	**VRKP4YYYYY00014**	–
Maintenance lid with fasteners	P4	1x maintenance lid 14x maintenance lid screw 14x sealing ring for maintenance lid	**VRKP4YYYYY00015**	–
Cable bushing with lids and fasteners	P4	1x cable bushing M16 PVDF 1x counter nut M16 MS-vern 1x sealing ring PE M16 2x gland body M50 PVDF 2x counter nut M50 MS-vern 2x sealing ring PE M50 1x sealing insert 4x13 1x sealing insert 7x9 1x lock bolt 13 4x lock bolt 9 1x media lid 50 1x media lid 50/16 10x screw for media lid 10x sealing ring for screw media lid	**VRKP4YYYYY00016**	–
Motor cover with fasteners – without seals	P4	1x motor cover P4x-NO 4x screw-threaded rod 4x sealing ring for screw-threaded rod 4x loss washer	**VRKP4YYYYY00017**	–
2 covers with fasteners – without seals	P4	2x media lid blank 10x screw media lid 10x sealing ring for screw media lid	**VRKP4YYYYY00018**	–
Closing 4th-axis lid with fasteners and seals	P4	1x blind cap central axis 1x o-ring central motor 4x sealing ring for central motor 4x screw for central motor below	**VRKP4YYYYY00019**	–
1 set of seals for maintenance lid, motor cover, media lid	P4	1x seal for maintenance lid 1x seal for motor cover 1x seal for media lid	**VRKP4YYYYY00020**	–
2 sets of seals for all gearboxes	P2, P4, P6	6x X-ring drive motor 2x o-ring central motor	**VRKP4YYYYY00021**	–
Screw set for 1 primary arm	P2, P4, P6	7x screw for primary arm	**VRKP4YYYYY00022**	–
12 Helical extensions with rolls and fasteners – set for 1 robot	P2, P4, P6	12x helical extension 24x roll 24x screw	**VRKP4YYYYY00023**	–

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PacDrive 3 automation solution

Robotics solutions

PacDrive Delta 3 robots, Spare parts

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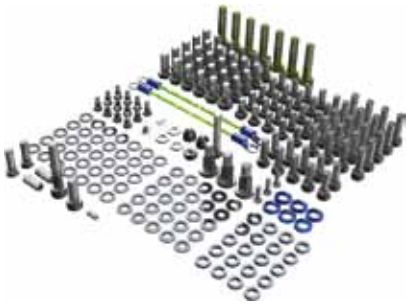
VRKP4YYYYY00025



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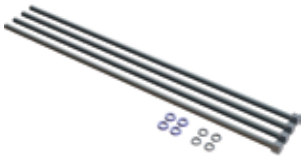

VRKP4YYYYY00027

VRKP4YYYYY00028

VRKP4YYYYY00029

PacDrive Delta 3 robots

Spare parts for PacDrive Delta 3 robots *(continued)*

Designation	Use with	Description	Reference	Weight kg / *lb*
12 ball pins – set for 1 robot	P2, P4, P6	12x ball pin	**VRKP4YYYYY00024**	–
12 ball sockets – set for 1 robot	P2, P4, P6	12x ball socket	**VRKP4YYYYY00025**	–
Set of small parts e.g. fasteners, washers, etc. without expendable parts	P2, P4, P6	12x screw 2x PE sticker 1x ground wire 0.5, 650 mm *(25.6 in.)* 1x ground wire 0.5, 400 mm *(15.7 in.)* 25x sealing ring for central motor sealing ring for covering screw 35x sealing ring for maintenance lid sealing ring for media lid 2x washer PE 2x screw for central motor below 20x washer drive motor 10x screw for central motor above for screw drive motor screw for universal joint, small 7x screw for primary arm 1x straight pin for universal joint 1x clamping screw for universal joint 1x screw for universal joint, large 3x countersunk screw for universal joint 20x screw for drive motor 25x covering screw 2x indexing bolt for gearbox 1x nut PE 1x spring ring PE 1x screw PE 30x screw for maintenance lid screw for media lid clamping screw 3x flat head screw for motor cover 6x loss washer 2x PE cap for motors	**VRKP4YYYYY00026**	–
Fasteners for motor cover	P4	4x screw for threaded rod 4x sealing ring screw for threaded rod 4x loss washer	**VRKP4YYYYY00027**	–
Fan with clamping fixtures	P4	12x clamping fixture 3x fan 80x25 24 V 6x wire end ferrules	**VRKP4YYYYY00028**	–
Parallel plate with bearing and ball pins	P2, P4, P6	1x titanium parallel plate with bearing and ball pins	**VRKP4YYYYY00029**	–

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PacDrive 3 automation solution
Robotics solutions
Lexium Cartesian robots

Presentation

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

Because of their modular structure, the elements can be configured as needed. 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 *(330.6 lb)*

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

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

□ The Lexium PAS 4●S with ballscrew is 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
> Includes metal cover strip for use in harsh environments

■ **Lexium TAS linear tables**

□ With its integrated ballscrew-drive, the Lexium TAS is 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 has two recirculating ball bearing guides and an integrated ball chain
> Aluminum profiles with extremely high torsion and bending resistance

Selection guide

> See pages 6/14 and 6/15

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 that moves into the working area

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

□ The 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 in a 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, which consist 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 6/14 and 6/15

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MAX H

MAX S

Presentation *(continued)*

Lexium MAX double portal axes: Dual-axis systems for large loads and high speeds

■ Lexium MAX H and Lexium MAX S double portal axes

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

□ The 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 the Lexium MAX S, the support axis is driven by a transmission shaft

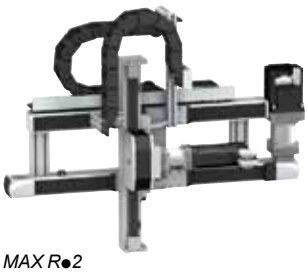
Advantages

> 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 ranges from 100 mm *(3.93 in.)* to 2800 mm *(110.23 in.)*

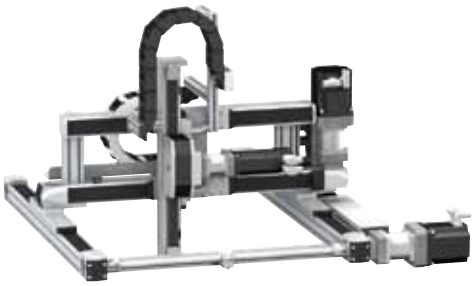
Selection guide

> See pages 6/16 and 6/17

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

□ The Lexium MAX P is used for dynamic X/Z applications above or below the work envelope

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

□ For loads up to 50 kg *(110.23 lb)* 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 work envelope

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

□ The 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 *(286.6 lb)* (MAX R●2)/50 kg *(110.2 lb)* (MAX R●3)

Selection guide

> See pages 6/16 and 6/17

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PacDrive 3 automation solution

Robotics solutions

Lexium Cartesian robots: Linear axes

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

Main characteristics	◻ Highly 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 / *220.5 lb*	100 kg / *220.5 lb*
Maximum driving force	2600 N	4520 N
Maximum load movement speed	8 m/s	1.25 m/s
Maximum working stroke	5500 mm / *216.5 in.*	3000 mm / *118.1 in.*
Repeatability	± 0.05 mm / *0.002 in.*	± 0.02 mm / *0.001 in.*
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 Cartesian robots 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	

Main characteristics	◻ 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 ◻ Highly dynamic response
Dynamic response	★★	★★★★	★★★★	★★★★
Precision	★★★★★★	★★★	★★★	★★
Maximum payload	150 kg / *330.7 lb*	50 kg / *110.2 lb*	18 kg / *39.7 lb*	35 kg / *77.2 lb*
Maximum driving force	2580 N	2150 N	705 N	1500 N
Maximum load movement speed	1 m/s	3 m/s	3 m/s	3 m/s
Maximum working stroke	1500 mm / *59 in.*	1200 mm / *47.2 in.*	500 mm / *19.7 in.*	2400 mm / *94.5 in.*
Repeatability	± 0.02 mm / *0.001 in.*	± 0.05 mm / *0.002 in.*	± 0.05 mm / *0.002 in.*	± 0.1 mm ± 0.05 mm / *0.004 in.*
Options	◻ 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
Reference	**TAS 4**	**CAS 4**	**CAS 3**	**CAS 2**
More information	*Please consult our Lexium Cartesian robots catalog (DIA7ED02090805EN) or visit our web site: www.schneider-electric.com*			

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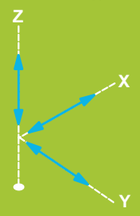
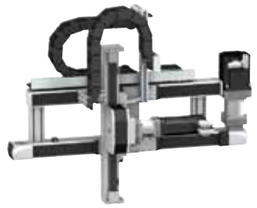
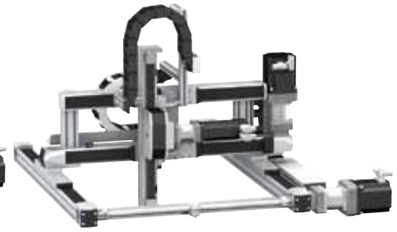
PacDrive 3 automation solution

Robotics solutions

Lexium Cartesian robots: Multi-axis systems

Axis type		Double portal axes	
Movement	Number of directions	1	
	Movement type 	Horizontal: combination of two parallel axes X and X	
	Load position	On two parallel carriages	
Multi-axis system type		PAS 4●B axes + PAS 4●H support axis (load driven)	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 □ Highly dynamic response □ High-precision movement (positioning, guiding)	□ High-precision movement (positioning, guiding) □ High feed forces
Maximum payload		250 kg / *551 lb*	300 kg / *661.4 lb*
Maximum working stroke	On the X axis	5500 mm / *216.5 in.*	
	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 Cartesian robots 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 / *110.2 lb*	130 kg / *286.6 lb*	50 kg / *110.2 lb*
5500 mm / *216.5 in.*	5500 mm / *216.5 in.*	5500 mm / *216.5 in.*
–	1500 mm / *59 in.*	1500 mm / *59 in.*
1200 mm / *47.2 in.*	–	1200 mm / *47.2 in.*
□ 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 equipment: □ Protective metal strip □ Anti-corrosion version □ Anti-static belt		
MAX P	MAX R●2	MAX R●3
Please consult our Lexium Cartesian robots catalog (DIA7ED02090805EN) or visit our web site: www.schneider-electric.com		

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Technical information on all of the products listed in this catalog is available at: www.schneider-electric.com

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PacDrive 3 automation solution
Embedded safety

■ **General presentation**

- Maximize your business and machine performance with MachineStruxure ..... page 7/2
- Improve efficiency ..... page 7/2
- Increase your profitability ..... page 7/3

■ **Modicon TM5CSLC safe logic controller**

- Presentation, References ..... page 7/4
- Safety characteristics and Certification ..... page 7/5

■ **Modicon TM5 safety I/O modules**

- Presentation ..... page 7/6
- References ..... page 7/6

■ **Modicon TM7 safety I/O modules**

- Presentation ..... page 7/7
- References ..... page 7/7

■ **Modicon TM5 Sercos interface module**

- Presentation ..... page 7/7
- References ..... page 7/7

■ **SoSafe Programmable programming software**

- Presentation ..... pages 7/8 and 7/9
- Application function blocks ..... page 7/10
- References ..... page 7/11

■ **Preventa modular safety controller Type XPSMCM**

- Presentation ..... pages 7/12 and 7/13
- References ..... pages 7/14 and 7/15

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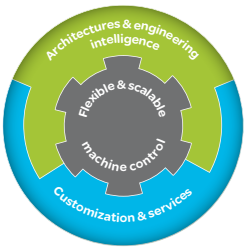
PacDrive 3 automation solution

Embedded safety

Maximize your business and machine performance with MachineStruxure
Improve efficiency

Maximize your business and machine performance with MachineStruxure



Machine builders like you are constantly looking for new ways to design and build more innovative machines in less time and at lower cost. MachineStruxure™ can help.

The NEXT generation of MachineStruxure is a complete machine automation solution that provides flexible and scalable machine control, ready-to-use architectures, efficient engineering solutions, and comprehensive customization and engineering support services. It can help you meet your challenges for improved efficiency and greater productivity, allowing you to deliver higher added value to your customers throughout the entire machine life cycle.

Improve efficiency

Flexible and scalable safety

Performance

Multi-function distributed

Preventa XPSMCM modular safety controller

Modicon TM5 Embedded safety PLC

Multi-function

Embedded safety for Altivar drives and Lexium 32 motion controllers

Preventa XPSMC safety controller

Single function

Traditional Preventa XPS safety module

Embedded Modicon TM3 safety functional module

Standalone → Embedded Safety Network

Selecting the right safety offer for your application

Selecting the appropriate safety management system for your application is dependent on size of application, scalability and flexibility of architecture, requirements of diagnostics and software needs.

Typically;

- Safety modules (Preventa XPS) are used to manage stop operations for small machines with a limited number of safety functions.
- Safety modular controllers (Preventa XPSMCM) are used for speed monitoring applications as well as for distributed architectures with up to 128 Inputs and 16 outputs.
- Embedded safety PLCs (Modicon TM5CSLC), are used for large distributed architectures with high diagnostic needs and software flexibility.

More details can be found regarding other safety offers:

- within our “Preventa solutions for efficient machine” catalog, (N° MKTED2140201EN)
- on our website: www.schneider-electric.com/machinesafety

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PacDrive 3 automation solution

Embedded safety

Increase your profitability

Increase your profitability

Up to Cat. 4, PI e, SIL3

PacDrive LMC motion controller

Lexium 62 servo drive

Everything you need is embedded

- Find the exact match for your specifications
- Optimize your configuration
- Save space in the cabinet by using fewer components

Modicon TM5CSLC safe logic controller

Modicon TM5 Sercos interface module

Modicon TM5 safety I/O module (IP 20)

Modicon TM7 safety I/O module (IP 67)

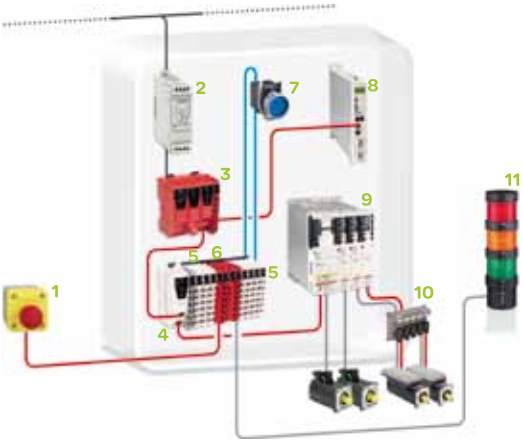
Overview

The Embedded safety PLC offer for PacDrive 3 is suitable for safety applications requiring distributed safety connected to physical input/output devices over Sercos common network and certified to EN ISO 13849-1 PL e Category 4, and EN/IEC 62061 SIL3.

Architecture

The PacDrive 3 architecture is comprised of a Master controller which is the PacDrive Motion controller (LMC). The Modicon TM5CSLC●00FS safe logic controller can be added to this architecture to manage the safety related parts of the architecture over Sercos network. Sercos network can be created as a line, tree or ring topology.

- Input/outputs are connected to Sercos network with the use of Modicon TM5 Sercos Interface modules. The ethernet cable between each of Sercos interface module can be extended up to 100 meters (328.08 ft.).
- Up to 20 Modicon TM5 safety I/O modules can be connected within the network when a safe logic controller (TM5CSLC100FS), is used, and up to 100 Modicon TM5 safety I/O modules can be connected within the network when a safe logic controller (TM5CSLC200FS), is used.
- The Modicon TM5 Sercos interface module (bus coupler) can manage up to 50 Modicon TM5/Modicon TM7 safety and non-safety I/O modules. The safety IOs can be distributed over up to 50 Modicon TM5 Sercos interface modules.



Solution Breakdown

1 **Harmony XALK** emergency stop
2 **Phaseo** power supply 24 V ⎓
3 **Modicon TM5CSLC** safe logic controller
4 **Modicon TM5** Sercos interface module
5 **Modicon TM5** I/O module
6 **Modicon TM5** safety I/O module
7 **Harmony XB4** pushbutton
8 **PacDrive LMC101** motion controller
9 **Lexium 62** multi-axis servo solution: power supply, communication module, servo drives
10 **Lexium 62 ILM** integrated servo drive: connection module, distribution box, integrated servo module
11 **Harmony XVB** signaling unit

Programming

The safety system is programmed using SoSafe Programmable software. On installation of SoSafe Programmable, the software editor is embedded into SoMachine Motion programming environment. Each hardware component is defined within the SoMachine Motion environment such as the PLC, and the Modicon TM5/ Modicon TM7 safety I/O modules. The application program and configuration of the safety hardware is managed within the SoSafe programmable safety editor.

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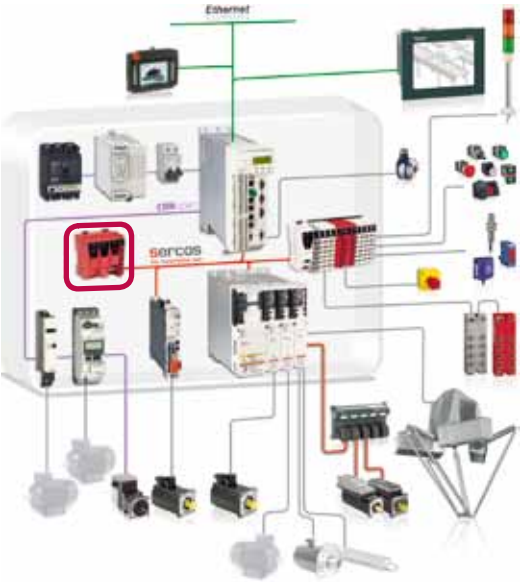

Modicon TM5CSLC safe logic controllers

Presentation

The Modicon TM5CSLC safe logic controllers are Sercos slave interface, supplied with a 24 VDC power supply.

- They have two embedded shielded RJ45 ports, 100 Mbps, and a memory key interface.
- The Modicon TM5CSLC safe logic controllers are programmed with the with **SoSafe Programmable** sotware using IEC 61131-3 programming languages: Ladder Diagram (LD), Function Block Diagram (FBD), and Structured Text (ST).
- The Modicon TM5CSLC safe logic controllers manage the safety-related application and provide the following functionalities:
  - configuration management
  - parameter management
  - safety-related execution of the application program

The safety I/O modules (Modicon TM5 and Modicon TM7) are connected to Modicon TM5CSLC safe logic controllers by means of the Modicon TM5 Sercos interface modules.

TM5CSLC●00FS

References

Designation	Description	Reference	Weight kg / *lb*
Safe logic controllers	■ 20 safety nodes	**TM5CSLC100FS**	0.290/ *0.64*
	■ 100 safety nodes ■ 32 machine options *(1)*	**TM5CSLC200FS**	0.290/ *0.64*

(1) The machine option is a mechanism, which can be used to make parts of the configuration "optional" therefore it makes it possible to create one application program to manage a variety of machines.
Safety inputs can be used to select which configuration is available in the machine and disables the safety functions which are not available, or this can be managed also virtually by connecting this option to an internal signal.

Accessories for Modicon TM5CSLC safe logic controller

Presentation

TM5 safety system memory keys

Each safe logic controller requires a memory key to operate. The memory key is required to save the program, the parameters, and the system configuration.
The memory key is designed with a mechanical locking mechanism to prevent unintended removal.

TM5ACSLCM●FS

References

Designation	Description	Reference	Weight kg / *lb*
Memory key with lock	2 MB	**TM5ACSLCM2FS**	0.003/ *0.007*
	8 MB	**TM5ACSLCM8FS**	0.003/ *0.007*

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Safety characteristics for Modicon TM5CSLC safe logic controllers

Criteria	Characteristic value
Category according to EN ISO 13849	Cat 4
Maximum performance level according to EN ISO 13849	PL e
Maximum safety integrity level according to IEC 62061	SIL 3
Maximum safety integrity level according to IEC 61508	SIL 3
PFH	< 1* 10^{-9}
PFD	◻ < 1* 10^{-5} at a proof test interval of 10 years ◻ < 2* 10^{-5} at a proof test interval of 20 years
PT	Max. 20 years
DC	> 90%
MTTFd	> 100 years

Certification

The Modicon TM5 embedded safety offer is certified by TÜV Rheinland Group up to performance level e EN ISO 13849-1, and SILcl 3 according to IEC 61508 and IEC 62061.
In addition, the following is a table of the offer certification:

- IEC 61508: 2000 Functional safety of electrical, electronic and programmable electronic safety-related systems Parts 1 to 4, SIL 3
- IEC 61511: 2003 Functional safety
- IEC 61131-2: Programmable controllers part 2: Equipment requirements and tests
- IEC 62061: 2005 Safety of machinery – Functional safety of safety related electrical, electronic and programmable electronic control systems, SILcl 3
- EN ISO 13849-1: 2008 Safety of machinery: Safety-related parts of control systems – Part 1: General principles for design, PL e Category 4
- EN 60204-1: 2006 Safety of machinery. Electrical equipment of machines. General requirements
- EN 61496-1: 2004 Safety of machinery: Electro-Sensitive Protection Equipment, Part 1: General requirements and tests
- EN 50178: 1997 Electronic equipment for use in power installations
- NFPA-79: Electrical Standard for Industrial Machinery

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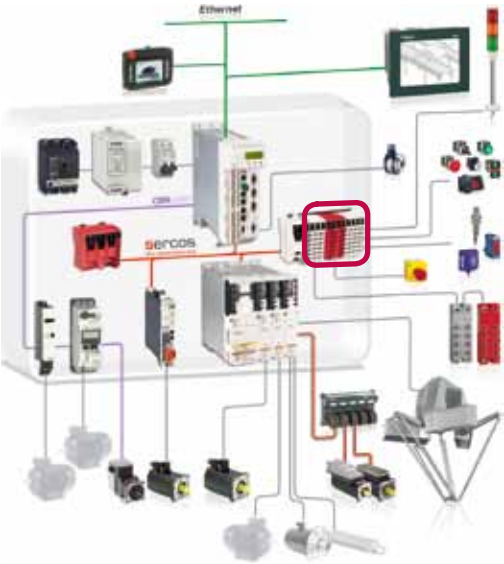


Modicon TM5 safety I/O expansion modules (IP 20)

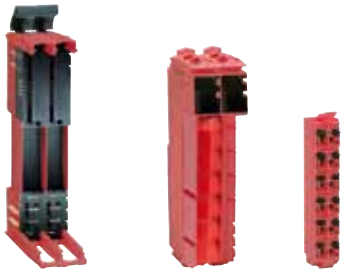
Presentation

Each safety I/O expansion module consists of three parts to be ordered separately:
- A safety I/O electronic module
- A bus base, with a mechanical locking lever for mounting/dismounting on a symmetrical rail. On each side of the base, a bus expansion connection for the link with the previous controller or module
- A removable spring terminal block with locking lever and slots for coloured identifiers

Note: When ordering the I/O module the three components must be ordered separately.

The range of safety digital I/O expansion modules is composed of:
- safety digital input modules
- safety digital output modules
- safety digital input/output modules

TM5ACBM3FS + TM5SD●●●●● + TM5ACTB52FS



TM5ACBM3FS *TM5SD●●●●●* *TM5ACTB52FS*

References

Safety I/O electronic module

Designation	Description		Reference	Weight kg / *lb*
IP 20 safety digital input modules	2x safety digital input, 24 VDC, sink	□ 2x clock outputs □ Configurable input filter □ 0.1 A rated output current, 0.2 A total current	**TM5SDI2DFS**	0.025/ *0.055*
	4x safety digital input, 24 VDC, sink	□ 4x clock outputs □ Configurable input filter □ 0.1 A rated output current, 0.4 A total current	**TM5SDI4DFS**	0.025/ *0.055*
IP 20 safety digital mixed I/O modules	2x safety digital input, 24 VDC, sink 2x N/O safety relay outputs 5-250 V, 5 mA-6 A switching capacity	□ 2 clock outputs □ Software and hardware input filters □ 0.05 A rated output current, 0.1 A total current	**TM5SDM4DTRFS**	0.025/ *0.055*
IP 20 safety digital output modules	2x safety digital output, 24 VDC, 0.5 A transistor	□ 1 A total current, 0.5 A rated output current □ Open circuit detection □ Integrated output detection	**TM5SDO2TFS**	0.025/ *0.055*
	2x safety digital output, 24 VDC, 2 A transistor	□ 4 A total current, 2 A rated output current □ Open circuit detection □ Integrated output detection	**TM5SDO2TAFS**	0.025/ *0.055*
	4x safety digital output, 24 VDC, 0.5 A transistor	□ 2 A total current, 0.5 A rated output current □ Open circuit detection □ Integrated output detection	**TM5SDO4TFS**	0.025/ *0.055*
	4x safety digital output, 24 VDC, 2 A transistor	□ 5 A total current, 2 A rated output current □ Open circuit detection □ Integrated output detection	**TM5SDO4TAFS**	0.025/ *0.055*
	6x safety digital output, 24 VDC, B Type, 0.2 A transistor	□ 1.2 A total current, 0.2 A rated output current □ Integrated output detection	**TM5SDO6TBFS**	0.025/ *0.055*

Safety bus base

Safety bus base	□ Internal I/O supply interconnected □ 0.13 W power consumption		**TM5ACBM3FS**	0.020/ *0.044*

Safety terminal block

Safety terminal block	□ 24 VDC connected □ 12-pin spring clamp □ 10 A rated current per contact		**TM5ACTB52FS**	0.020/ *0.044*

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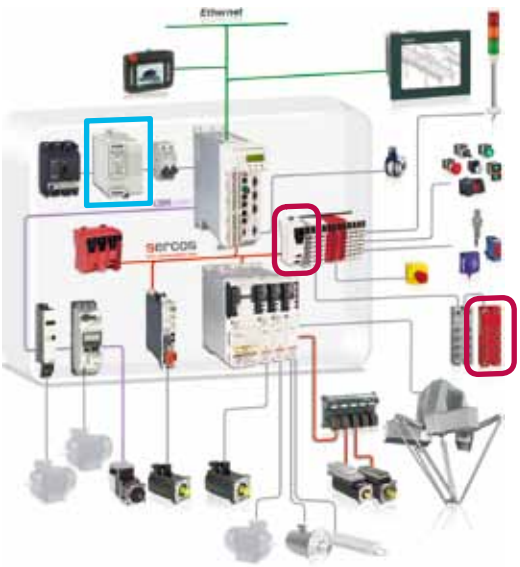
Modicon TM7 safety I/O expansion module (IP 67)
Modicon TM5 Sercos interface module, for distributed I/O modules



Modicon TM7 safety I/O expansion module (IP 67)

Presentation

Modicon TM7 safety I/O expansion module is an I/O block dedicated to safety-related applications with eight safety digital input – sink, and four safety digital output – transistor.
It is used for mounting outside electrical cabinets, directly on the installation. Its IP 67 protection enables it to be used within processes or machines in harsh environments (splashing water, oil, dust, etc.).
TM7 safety I/O module makes use of two power buses and a data bus to perform its functions. These buses are organized as follows:

- ■ TM7 bus: this bus includes one data bus and one power bus, named as follows:
  - □ TM7 power bus: distributes power to supply the electronics of the TM7 Safety I/O modules. This bus receives its power from a Modicon TM5SBET7 transmitter module *(1)*.
  - □ TM7 data bus: passes data between the Sercos bus interface and the TM7 expansion modules.
- ■ 24 VDC I/O power segment: distributes power to the inputs, outputs and the connected sensors and actuators of the TM7 safety system I/O blocks. Each Modicon TM5 / TM7 safety modules can have multiple 24 VDC I/O power segments, depending on considerations such as power consumption and separation of I/O types.

TM7SDM12DTFS

References

Designation	Description		Reference	Weight kg / *lb*
IP 67 safety mixed I/O module	8x safety digital input 24 VDC, sink 4x safety digital output 24 VDC, 2A transistor	□ 8x clock outputs □ Configurable input filters □ 5 A total current, 2 A rated output current	**TM7SDM12DTFS**	0.320/ *0.705*

(1) Please refer to "Modicon TM5, expansion modules" – catalog DIA3ED2131204EN, or on our web site, www.schneider-electric.com

Modicon TM5 Sercos interface module, for distributed I/O modules

Presentation

The Modicon TM5 Sercos interface module is a combination of four products to be ordered separately: TM5ACBN1 bus base, TM5NS31 electronic interface module, TM5SPS3 power distribution electronic module, and TM5ACTB12PS removable terminal block. More information, see page 8/4.

TM5ACBN1 *TM5NS31* *TM5SPS3* *TM5ACTB12PS*

References

Electronic interface module	Sercos communication module	**TM5NS31**	0.025/ *0.055*
Bus base (24 VDC power supply)	Use as a base for TM5NS31 and TM5SPS3 electronic modules	**TM5ACBN1**	0.020/ *0.044*
Power distribution electronic module	24 VDC power supply for the Sercos bus, interface and I/O expansion modules	**TM5SPS3**	0.025/ *0.055*
Terminal block	12 spring terminals, for use with TM5SPS3	**TM5ACTB12PS**	0.016/ *0.035*

Recommended power supply and protection

Phaseo switch mode power supply: type ABL8TEQ24●●●

- □ 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

For more information, Please refer to "Phaseo Power supplies & Transformers" catalog – DIA3ED2131105EN, or on our web site, www.schneider-electric.com

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

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

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SoSafe Programmable programming software

Reduce your time to market

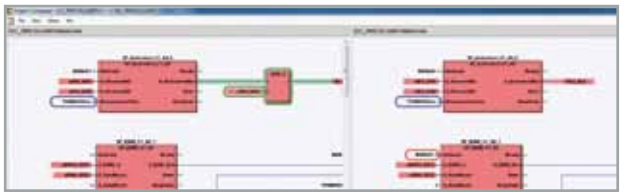
SoSafe Programmable, programming software

Easy automation with SoSafe Programmable: intuitive programming software

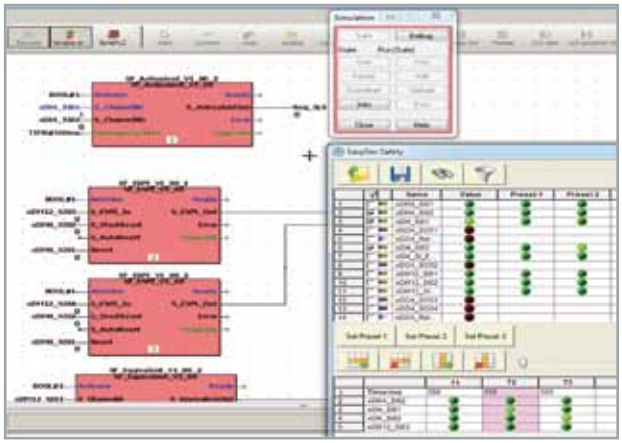
Configuration

- Define hardware module configuration
- Create project configuration using drag-and-drop to position function blocks and assign inputs and outputs.

Online simulation & testing

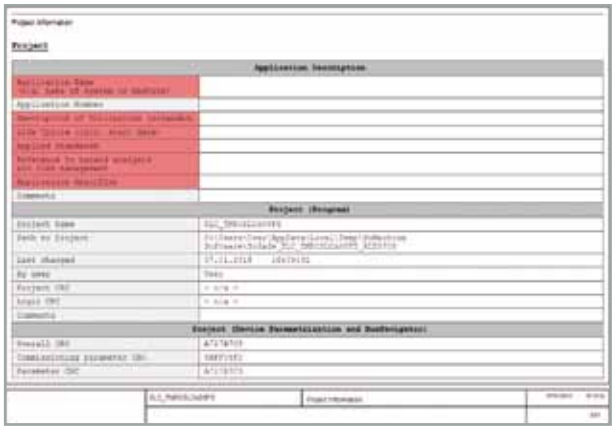


- Validate software configuration



- View configuration behavior through online simulation in graphic or text views.

Commissioning



- Use project documentation to support wiring and safety calculations and complete the commissioning process.

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Programming software: SoSafe Programmable

The Modicon TM5/TM7 safety system is programmed and setup using **SoSafe Programmable** software.
SoSafe Programmable is used to create complex logical conditions using logical functions and safety functions, such as muting, timer, counters, Emergency stop, light curtain etc. via a graphic configuration interface.
The software editor is an add-on software for SoMachine Motion.

- Programming possible with the combination of 3 languages:
  - Function Block Diagram (FBD)
  - The graphical language FBD is composed of functions and function blocks which are connected to each other or to variables using lines.
  - Ladder Diagram (LD); Code programmed in the graphic language LD is composed of contacts and coils.
  - Structured Text (ST); Code programmed in the textual language ST consists of statements and expressions.
- Online monitoring and diagnostics of I/O status
- Project compare functionality to view changes between programs
- Configuration validation
- Hardware device scanner
- Printable schematics and documentation

The application program is downloaded from the PC to the Modicon TM5CSLC safe logic controller via an Ethernet connection. The application transferred to the TM5CSLC safe logic controller is saved on the memory stick.

Password

SoSafe Programmable software is protected with two levels of alphanumerical password for the application program (Development and Commissioning levels) and one additional level on the safe logic controller for hardware access protection.
The project password protects the project from unauthorized changes. The following hierarchical project levels are available:

- Development : enable all software functions
- Commissioning: enables up to modify parameter settings of devices
- Maintenance (No password): diagnostics and maintenance functions, NO modification allowed

LOG file

SoSafe Programmable records user's actions in two event log files:

- The project event log records project-related user actions like inserting, deleting or changing a POU. Error messages received from the TM5CSLC safe logic controllers error stack are included in this error log file.
- The system event log records events that are not project-related, such as changes in the user manager.

Every event log entry contains the following information:

- Date and time of the modification
- Type of modification
- Name of the logged on user

System requirements

Device	Value	
	Minimum	Recommanded
IBM compatible PC with Pentium processor	1 GHz x 86 architecture	2 GHz x 86 architecture
System RAM	Windows 7: 1 GB Windows 8: 1 GB	Windows 7: 2 GB Windows 8: 2 GB
HArd disk	500 MB free memory space	1 GB free memory space
CD ROM drive	Required	

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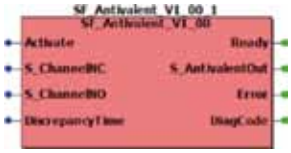
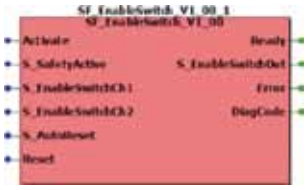
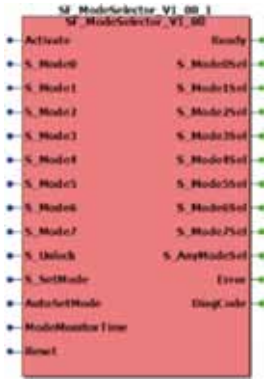
PacDrive 3 automation solution

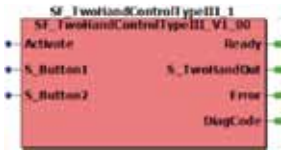
Embedded safety

SoSafe Programmable programming software









Safe PLCopen application function blocks

Function block	Description
SF_Antivalent	The safe SF_Antivalent function block monitors the signals of two safe input terminals for different signal states.
SF_EDM (External Device Monitoring	The safe SF_EDM (External Device Monitoring) function block monitors the defined initial state and the switching behavior of contactors connected to the safety module.
SF_EmergencyStop	The safe SF_EmergencyStop function block monitors the switching states of an emergency-stop control device.
SF_EnableSwitch	The safe SF_EnableSwitch function block evaluates the signals of a manually actuated three-stage enable switch (in accordance with EN 60204) in order to identify its switching stage and direction.
SF_Equivalent	The safe SF_Equivalent function block monitors the signals of two safe input terminals for the same signal states.
SF_ESPE safe	The SF_ESPE (Electro-Sensitive Protective Equipment) safe function block monitors the switching states of electro-sensitive protective equipment (e.g. light curtains).
SF_GuardLocking	The safe SF_GuardLocking function block supports the monitoring of a guard with guard locking (safety door monitoring with a four-stage interlocking according to EN 1088).
SF_ModeSelector	The safe SF_ModeSelector function block evaluates the states of a mode selector switch with up to eight positions.
SF_MutingPar_2Sensor	The safe SF_MutingPar_2Sensor function block evaluates the signals of two muting sensors and one item of optoelectronic safety equipment (e.g. light curtain).
SF_MutingPar	The safe SF_MutingPar function block evaluates the signals of four muting sensors and one item of optoelectronic safety equipment (e.g. light curtains).
SF_MutingSeq	The safe SF_MutingSeq function block evaluates the signals of four muting sensors and one item of optoelectronic safety equipment (e.g. light curtains).
SF_OutControl	The safe SF_OutControl function block controls the output of a safe device. The safe output is controlled depending on a signal from the standard control (operation start/stop) and a safe signal monitoring of a safe function (e.g., emergency-stop).
SF_SafetyRequest	The safe SF_SafetyRequest function block supports the function “Request of a safety function” in an application (e.g. safe stop).
SF_TestableSafetySensor	The safe SF_TestableSafetySensor function block evaluates the status of connected optoelectronic safety equipment (e.g. light curtains).
SF_TwoHandControlTypeII	The safe SF_TwoHandControlTypeII function block evaluates the switching behavior of a type II two-hand control device connected to the safety module.
SF_TwoHandControlTypeIII	The safe SF_TwoHandControlTypeIII function block evaluates the switching behavior of a type III two-hand control device connected to the safety module.

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SOMSAACZZ●PA20

Programming software for Modicon TM5CSLC safe logic controller

Presentation

SoSafe Programable is available on DVD format, and in two languages: English and German.
It runs on PC with the following operating systems:
- Windows 7 Professional 32/64 bit
- Windows 8.1 Professional 32/64 bit

References

Designation	Description	Reference	Weight kg / *lb*
SoSafe Programmable	Demo license (30 days trial)	**SOMSAAS20**	–
	Single license	**SOMSAACZZSPA20**	
	Team license (10x)	**SOMSAACZZTPA20**	
	Entity license (100x)	**SOMSAACZZEPA20**	

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PacDrive 3 automation solution

Embedded safety

Preventa modular safety controller Type XPSMCM

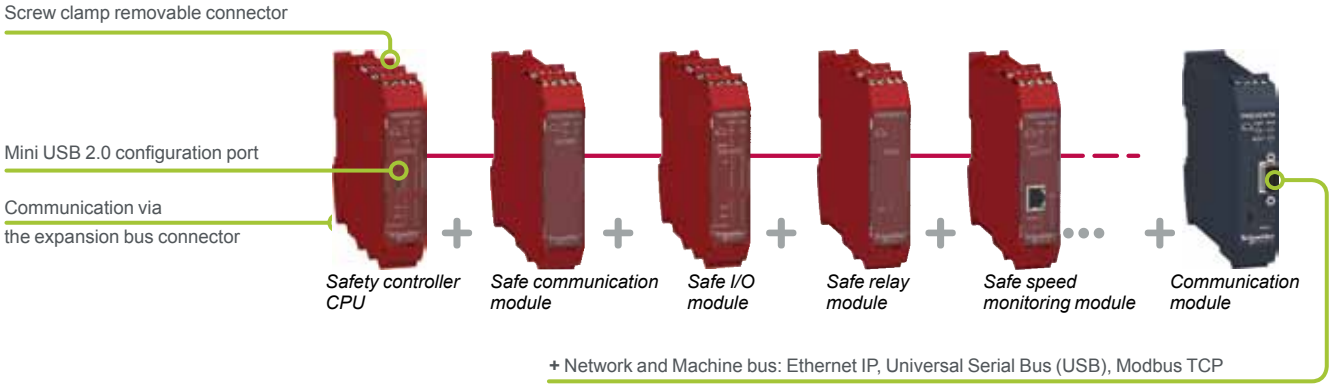
Alternative offers are available to connect to the PacDrive 3 system such as Preventa safety modules or Preventa safety controllers. Which offer simple to use standalone safety configurations to manage the safety around the machine. The Preventa modular safety controller offer (XPSMCM) is a flexible system able to have between 8 to 128 inputs and between 2 to 16 outputs within the configuration. In addition some key functions to monitor speed using SIN/COS embedded encoders from the servo motor systems

Increase profitability

Up to Cat. 4, PI e, SIL3

Everything you need is embedded

- Find your exact match to your specifications
- Optimize your configuration
- Save space in a cabinet with less components
- Expand from small to large configuration by a wide range of expansion and communication modules
- Build up to 6 island architectures via safe communication up to 50 m(*164.04 ft*) between each island



More details can be found regarding XPSMCM offer:
- within our “Preventa modular safety controller” catalog, (N° DIA3ED2140901EN)
- on our website: or on our website: www.schneider-electric.com/machinesafety

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PacDrive 3 automation solution

Embedded safety

Preventa modular safety controller Type XPSMCM

General presentation

The Preventa modular safety controller type XPSMCM is a modular configurable safety controller able to monitor multiple safety functions on and around a machine to minimise the risk of people accessing the dangerous moving parts of the machine.

This modular safety controller is designed for monitoring safety functions such as:
- Emergency Stop
- Guard Monitoring
- Perimeter Guarding
- Position Monitoring
- Speed Monitoring
- Enabling Movement

with input devices such as emergency stop pushbuttons, safety guard and limit switches, safety foot switches, safety light curtains and laser scanners, safety mats, safety encoders and proximity sensors, two-hand control stations and enabling switches.

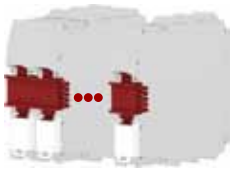
6 types of modules for 6 types of functionnality

XPSMCM system applications

The XPSMCM system offers numerous advantages compared to traditional safety modules, such as:
- The hardware architecture of expansion modules and layout can be designed according to the machine specification and thus reduces the number of components and the footprint and wiring
- Simplify input and output wiring by software configuration combining multiple functions together
- Allowing machine scalability from 8 inputs and 2 outputs and up to 128 inputs and 16 outputs with all expansion modules connected directly to the controller or distributed among 6 islands
- Connected everywhere with wide range of communication expansion modules
- Provided with intuitive software for logical configuration, Online simulation and testing, and commissioning
- Simplification of machine maintenance through removable memory card, which can be used to transfer the configuration to a new controller without software.

XPSMCM system components

The XPSMCM system is composed of:
- A safety controller CPU (can be used as standalone or together with expansion modules)
- Safe expansion modules (digital input modules, solid state and relay output modules, or mixed input/output modules)
- Safe speed monitoring modules for proximity sensors and safety encoders (Sin/Cos, HTL, TTL)
- Safe communication expansion modules for safe island creation
- Non-safe communication modules: interfaces to Modbus TCP, Ethernet IP
- A configuration software: SoSafe Configurable
- A memory card, available for saving configuration data for ease of maintenance and controller setup
- Expansion bus connectors, for connecting safe modules to the safety controller CPU.



Expansion bus connectors

Removable memory card

SoSafe Configurable software

Configuration software

The modular safety controller XPSMCM is supported by a completely intuitive software: SoSafe Configurable.

The software follows a simple drag and drop function block approach to configuration and is completed with a library of configurable safety functions and logical functions as well as easy to use tools for:
- online configuration monitoring
- configuration validator
- hardware device scanner
- printable schematics and documentation

SoSafe Configurable supports a quick and easy setup of the machine.

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PacDrive 3 automation solution

Embedded safety

Preventa modular safety controller Type XPSMCM

XPSMCMCP0802

XPSMCMMX0802

XPSMCMDI0800

XPSMCMDI1600

XPSMCMDI1200MT

XPSMCMDO0002

XPSMCMDO0004

XPSMCMER0002

XPSMCMER0004

XPSMCMRO0004

XPSMCMRO0004DA

XPSMCMEN0100SC

XPSMCMEN0200SC

XPSMCMEN0200

Safety controller

Description	Inputs (number & type)	Outputs (number & type)	Connector type	Reference	Weight kg/lb
Safety controller CPU	8 digital inputs + 2 for Start/Restart interlock	2 OSSD pairs + 4 test outputs + 2 status outputs	Screw	**XPSMCMCP0802**	0.250 0.55

Safe expansion modules

Safe expansion modules

Description	Inputs (number & type)	Outputs (number & type)	Connector type	Reference	Weight kg/lb
Safe mixed I/O expansion modules	8 digital inputs + 2 for Start/Restart interlock	2 OSSD pairs + 4 test outputs + 2 status outputs	Screw	**XPSMCMMX0802**	0.250 *0.55*
Safe input expansion modules	8 digital inputs	4 test outputs	Screw	**XPSMCMDI0800**	0.230 *0.51*
	16 digital inputs	4 test outputs	Screw	**XPSMCMDI1600**	0.250 *0.55*
	12 digital inputs	8 test ouputs for 4 wires safety Mats	Screw	**XPSMCMDI1200MT**	0.250 *0.55*
Safe output expansion modules	2 for Start/Restart interlock	2 OSSD pairs + 2 status outputs	Screw	**XPSMCMDO0002**	0.230 *0.51*
	4 for Start/Restart interlock	4 OSSD pairs + 4 status outputs	Screw	**XPSMCMDO0004**	0.250 *0.55*

Safe relay output modules

Safe relay output modules (without backplane expansion connection)	1 for Start/ Restart interlock	2 relays (2 NO +1 NC)	Screw	**XPSMCMER0002**	0.250 *0.55*
	2 for Start/ Restart interlock	4 relays (4 NO + 2 NC)	Screw	**XPSMCMER0004**	0.300 *0.66*
Safe relay output modules (Wiring with the expansion bus connector)	4 for Start/ Restart interlock	4 relays	Screw	**XPSMCMRO0004**	0.300 *0.66*
	4 for Start/ Restart interlock	4 relays with 8 status outputs	Screw	**XPSMCMRO0004DA**	0.330 *0.73*

Safe speed monitoring modules

Description	■ Inputs (number & type) ■ Connector type	Connector type	Reference	Weight kg/lb
Safe speed monitoring modules	□ 1 Sin/Cos encoder and 2 proximity sensor inputs □ 1x RJ 45 (ENC1) □ Proximity sensor connection via terminal blocks	Screw	**XPSMCMEN0100SC**	0.280 *0.62*
	□ Up to 2 Sin/Cos encoders and 2 proximity sensor inputs □ 2x RJ 45 (ENC1/ENC2) □ Proximity sensor connection via terminal blocks	Screw	**XPSMCMEN0200SC**	0.300 *0.66*
	□ 2 inputs for proximity switches □ Proximity sensor connection via terminal blocks	Screw	**XPSMCMEN0200**	0.230 *0.51*

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PacDrive 3 automation solution

Embedded safety

Preventa modular safety controller Type XPSMCM

XPSMCMCO0000S1 XPSMCMCO0000S2

Safe expansion modules (continued)

Safe communication expansion modules

Description	Characteristics	Connector type	Reference	Weight kg/*lb*
Safe RS 485 bus expansion module for remote extension	1 connection interface: 1 input or 1 output network connection	Screw	**XPSMCMCO0000S1**	0.300 *0.66*
	2 connections interface: 1 input and 1 output network connection	Screw	**XPSMCMCO0000S2**	0.300 *0.66*

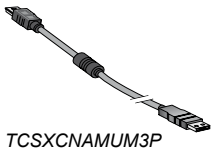
XPSMCMCO0000EI XPSMCMCO0000UB XPSMCMCO0000EM

Non-safe fieldbus communication modules

Description	■ Field bus / network type ■ Connector	Connector type	Reference	Weight kg/*lb*
Non-safe communication modules	□ Ethernet IP □ 1x RJ 45 (in/out)	Screw	**XPSMCMCO0000EI**	0.300 *0.66*
	□ Universal Serial Bus □ Mini USB	Screw	**XPSMCMCO0000UB**	0.300 *0.66*
	□ Modbus TCP □ 1x RJ 45 (in/out)	Screw	**XPSMCMCO0000EM**	0.300 *0.66*

Accessories

XPSMCMME0000



TCSXCNAMUM3P

XPSMCMCN0000SG

Description	Application	Lenght m / ft.	Reference	Weight kg/*lb*
Memory card	For saving configuration data for subsequent transfer to a new device without using a PC	–	**XPSMCMME0000**	0.004 *0.009*
Configuration cable	□ Configuration cable to be used for software configuration between a PC and the safety controller CPU □ Equipped with 2x USB connectors: USB A and USB mini B	3 / *9.84*	**TCSXCNAMUM3P**	0.065 *0.143*
RS 485 shielded cable	For use between two safe communication expansion modules	10 / *32.81*	**TSXSCMCN010**	0.920 *2.03*
		25 / *82.02*	**TSXSCMCN025**	2.300 *5.07*
		50 / *164.04*	**TSXSCMCN050**	4.600 *10.14*
Encoder splitter cable	For use between safe speed monitoring modules and PacDrive M	1 / *3.3*	**TSXESPPM001**	0.110 *0.24*
		3 / *9.84*	**TSXESPPM003**	0.310 *0.68*
		5 / *16.40*	**TSXESPPM005**	0.510 *1.12*
Expansion bus connector *(1)*	For connecting the various expansion modules to the safety controller CPU		**XPSMCMCN0000SG**	0.001 *0.002*

Configuration software for XPSMCM system

Description	Characteristics	Reference	Weight kg / *lb*
SoSafe Configurable	□ Version 1.0 □ Downloadable from Schneider website □ User manual included □ Available languages: English, French, Italian, German, Spanish, Chinese and Japanese □ Microsoft Windows® XP SP3 / Vista, Microsoft Windows® 7, Microsoft Windows® 8.1 □ Minimum PC requirement: 256 MB RAM, 300 MB mini. free space on Hard drive □ Mini USB connector 1.1 or 2.0	**XPSMCMSW0000V10**	–

SoSafe Configurable software

(1) This reference only needs to be ordered for the XPSMCMCP0802 reference when it is connected to expansion modules.

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Distributed I/O

Technical information on all of the products listed in this catalog is available at: www.schneider-electric.com

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Modicon TM5 Interface module for distributed I/O on Sercos bus

- Presentation ..... page 8/2
- Architecture ..... page 8/3
- Description ..... page 8/4
- References ..... page 8/5

Modicon TM5 expansion I/O blocks and I/O modules

- Selection guides
  - Modicon TM5 compact blocks ..... page 8/6
  - Modicon TM5 digital modules and digital/analog module ..... page 8/8
  - Modicon TM5 analog modules and digital/analog module ..... page 8/10
  - Modicon TM5 expert modules ..... page 8/12

Modicon TM7 - IP 67 modular I/O blocks

- Selection guides
  - Modicon TM7 digital I/O blocks ..... page 8/14
  - Modicon TM7 analog I/O blocks ..... page 8/16

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PacDrive 3 automation solution

Distributed I/O

Modicon TM5 Interface module for distributed I/O on Sercos bus

sercos
the automation bus

Sercos Bus

Fully integrated real time Ethernet based communication
With the addition of Sercos, Schneider Electric has created the first fully Ethernet-based communication solution for PacDrive and Modicon applications, enabling communication with both drives and field devices.
Sercos also smoothes the way for the integration of safety automation.
Sercos 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 bus

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

- The PacDrive LMC (Eco and Pro) motion controllers and the Modicon LMC078 motion controller 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 that are distributed over machines via the Sercos bus. These islands communicate on the Sercos bus.

Applications	■ Performance distributed I/O (IP 20)
Compatibility	■ PacDrive LMC motion controllers: LMC Eco and LMC Pro motion controllers ■ Modicon LMC078 motion controller
Available bus	■ Sercos 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 *(8202.1 ft.)* □ between two islands of TM5 modules: 100 m *(328.1 ft.)* □ between two TM7 blocks: 100 m *(328.1 ft.)* □ between one island of TM5 modules and TM7 blocks: 100 m *(328.1 ft.)*
Integrated I/O	None

Modicon TM5 interface module for Sercos bus

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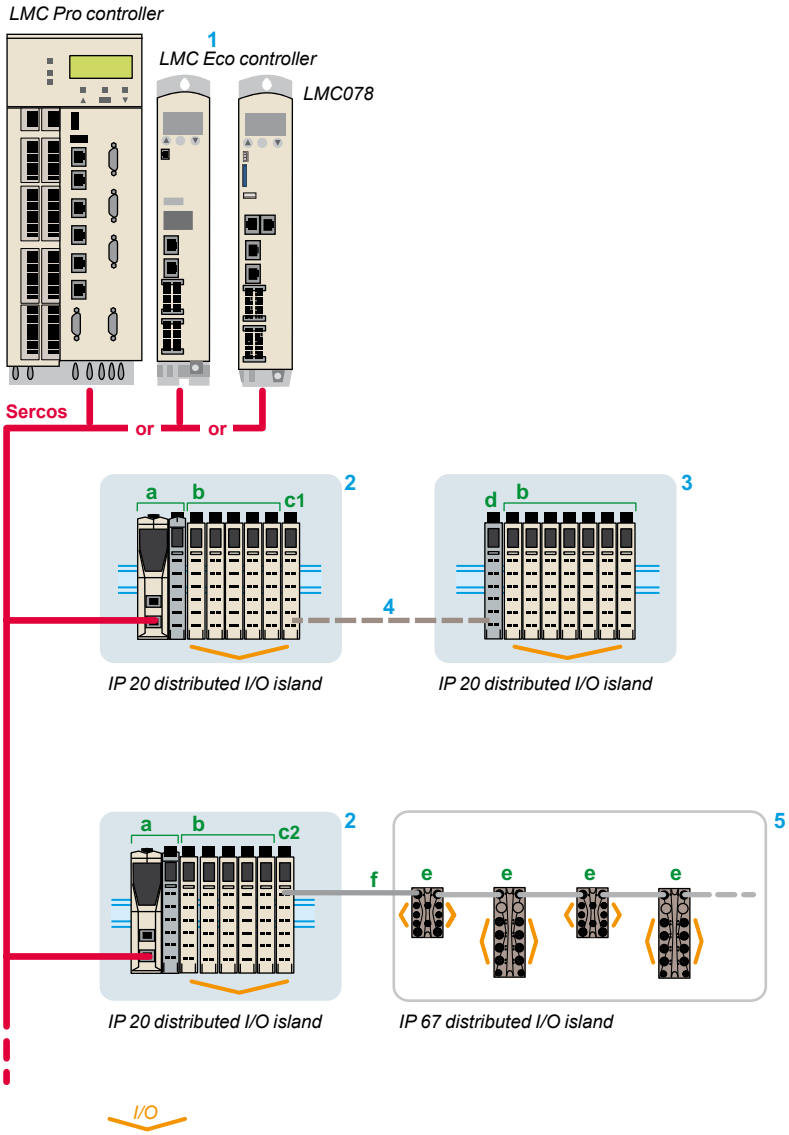
PacDrive 3 automation solution

Distributed I/O

Modicon TM5 Interface module for distributed I/O on Sercos bus

Distributed I/O on Sercos bus architecture



1 PacDrive LMC / Modicon LMC078 motion controllers: Masters on Sercos bus

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

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

4 TM5 expansion bus *(1)*.
Composition: remote I/O connection cable TCSXCNNXNX100.

5 IP 67 distributed I/O island *(2)*.
Composition: TM7 IP 67 I/O blocks (digital or analog) (**e**) + expansion bus cable TCSXCN●●●E (**f**).

(1) Modicon TM5 extension modules: see page 8/6.
(2) Modicon TM7 I/O blocks: see page 8/14.

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PacDrive 3 automation solution

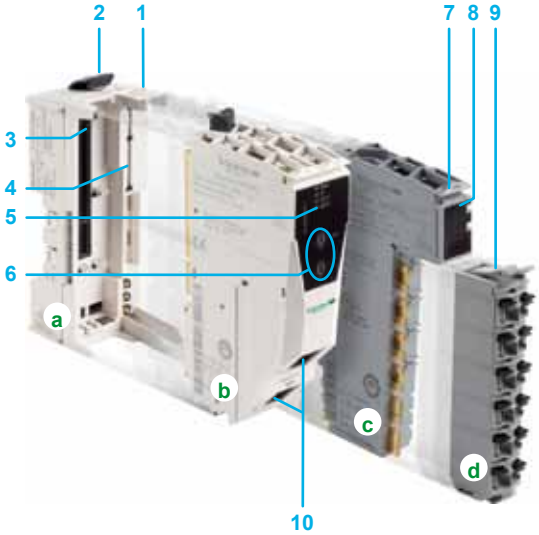
Distributed I/O

Modicon TM5 Interface module for distributed I/O on Sercos bus

Presentation

The TM5 interface module is dedicated to applications as Optimum distributed I/O (IP 20) on Sercos bus and is compatible with the PacDrive LMC motion controllers: LMC101C, LMC201C, LMC300C, LMC400C and LMC600C and the Modicon LMC078 motion controller.
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 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 bus (bus in / bus out)

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

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PacDrive 3 automation solution

Distributed I/O

Modicon TM5 Interface module for distributed I/O on Sercos bus

TM5NS31

TM5SPS3

TM5ACBN1

TM5ACTB12PS

TM5ACTLC100

TM5ACTCH100

TM5ACLPL10

TM5ACLPR10

TM5 interface module for Sercosbus

Electronic interface module

Description	Characteristics	Reference	Weight kg/ lb
Electronic interface module	Sercos communication module with Sercos protocol Module colour: white	**TM5NS31**	0.025 *0.055*

Power distribution electronic module

Input power supply	Characteristics	Reference	Weight kg/ lb
24 V ⎓	Power supply for the Sercos bus, interface and I/O expansion modules Module colour: grey	**TM5SPS3**	0.025 *0.055*

Bus base

Power supply	Characteristics	Unit reference	Weight kg/ lb
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 *0.044*

Terminal block

Used for	Characteristics	Unit reference	Weight kg/ lb
Power distribution electronic module TM5SPS3	12 spring terminals Terminal block colour: grey	**TM5ACTB12PS**	0.016 *0.035*

Accessories

Description	Use for	Colour	Sold in lots of	Unit reference	Weight kg/ lb
Plain text cover holder (label-holder)	Labelling the I/O channel terminal blocks	Transparent	100	**TM5ACTCH100**	0.200 *0.441*
Terminal block shield locking clip (Order with plain text cover holder TM5ACTCH100)	Locking plain text cover holder TM5ACTCH100	Transparent	100	**TM5ACTLC100**	0.100 *0.220*
Precut sheet of paper labels	Plain text cover holder TM5ACTCH100	White	100	**TM5ACTLS100**	0.100 *0.220*
Coloured plastic identifiers	Labelling 16 connection channel terminals	White	1	**TM5ACLITW1**	0.015 *0.033*
		Red	1	**TM5ACLITR1**	
		Blue	1	**TM5ACLITB1**	
Metal tool	Inserting/removing TM5ACLIT●1 identifiers	Black	1	**TM5ACLT1**	0.030 *0.066*
Retaining plates for bus bases	Held on the left side	White	10	**TM5ACLPL10**	0.004 *0.009*
	Held on the right side	White	10	**TM5ACLPR10**	
Locking clips	For electronic modules	Black	100	**TM5ACADL100**	0.001 *0.002*

Configuration software

- SoMachine software, please consult our web site: www.schneider-electric.com
- **Performance distributed I/O configuration** software, please consult our web site: www.schneider-electric.com

(1) Modicon TM5 Transmitter/Receiver modules: Please refer to "Modicon TM5, expansion modules" – catalog DIA3ED2131204EN, or on our web site, www.schneider-electric.com

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PacDrive 3 automation solution

Distributed I/O

Modicon TM5 compact blocks

Applications	Modicon TM5 compact block	**20 I/O**	**36 I/O**	**42 I/O**
	Compatibility	**Modicon M258 logic controller** **Modicon LMC058 motion controller**		
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			
TM5 compact blocks – reference		**TM5C12D8T**	**TM5C24D12R**	**TM5C24D18T**
More information		Please refer to **"Modicon TM5, expansion modules" – catalog DIA3ED2131204EN**, or on our web site, **www.schneider-electric.com**		

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

Applications	Modicon TM5 compact block	**24 I/O**	**16 I/O**		
	Compatibility	**Modicon M258 logic controller** **Modicon LMC058 motion controller**			
Channel connection		With removable spring terminal blocks (supplied)			
Digital inputs	Number	**12**			
	Nominal input voltage	24 V ⎓			
	IEC/EN 61131-2 conformity	Type 1			
	Type of signal *(1)*	Sink			
	Type of wiring	2-wire			
	Limit values	20.4... 28.8 V ⎓			
	Nominal input current	3.75 mA			
	Input impedance	6.4 kΩ			
	State 0	5 V max. ⎓			
	State 1	15 V min. ⎓			
Digital outputs	Number	**6**, transistor			
	Nominal output voltage	24 V ⎓			
	Output current per channel	0.5 A			
	Output current per group of channels	2 A max.			
	Type of signal *(1)*	Source			
	Type of wiring	2-wire			
	Limit values	20.4...28.8 V ⎓			
	Short-circuit and overload protection	Yes			
Analog inputs	Number	**4**	**8**	**8**	**8**
	Type	Voltage/current	Voltage	Current	**4** Voltage + **4** current
	Range	- 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
	Resolution	12 bits	11 bits + sign	12 bits	Voltage: 11 bits + sign Current: 12 bits
	Sampling period without filtering	300 µs	–	–	–
	Sampling period with filtering	1 ms	50 ms	50 ms	50 ms
Analog outputs	Number	**2**	**8**	**8**	**8**
	Type	Voltage/current	Voltage	Current	**4** Voltage + **4** current
	Range	- 10…+ 10 Vdc 0…20 mA	- 10…+ 10 Vdc	0…20 mA	Voltage : - 10…+ 10 Vdc Current : 0…20 mA
	Resolution	12 bits	11 bits + sign	12 bits	Voltage: 11 bits + sign Current: 12 bits
	Response time	1 ms max.	20 ms max. 5 ms per channel	20 ms max. 5 ms per channel	20 ms max. 5 ms per channel
Power supply		Internal	Internal	Internal	Internal
Isolation	Channel-to-channel	Non-isolated	Non-isolated	Non-isolated	Non-isolated
	Between channel groups	–	–	–	–
	Channel-to-bus	500 V ∿ RMS	500 V ∿ RMS	500 V ∿ RMS	500 V ∿ RMS
TM5 compact blocks – reference		**TM5C12D6T6L**	**TM5CAI8O8VL**	**TM5CAI8O8CL**	**TM5CAI8O8CVL**
More information		Please refer to **"Modicon TM5, expansion modules" – catalog DIA3ED2131204EN**, or on our web site, **www.schneider-electric.com**			

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Modicon TM5 Digital modules and Digital/Analog module

Applications	Type of expansion module	**2 to 16 digital input channels**							
	Compatibility	**Modicon M258 logic controller, Modicon LMC058 motion controller**							
Channel connection		With removable spring terminal blocks (to be ordered separately)							
Digital inputs	Number	**2**	**4**	**6**	**12**	**16**	**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				2.68 mA	5 mA at ∿ 100 V 11 mA at ∿ 240 V		10 mA at ∿ 120 V
	Input impedance	6.4 kΩ				8.9 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								
Electronic expansion module – reference		**TM5SDI2D**	**TM5SDI4D**	**TM5SDI6D**	**TM5 SDI12D**	**TM5 SDI16D**	**TM5SDI2A**	**TM5SDI4A**	**TM5SDI6U**
Compatible bus base – reference *2)*		**TM5ACBM11, TM5ACBM15**					**TM5ACBM12**		
Compatible terminal block – reference *(2)*		**TM5ACTB06, TM5ACTB12**			**TM5 ACTB12**	**TM5 ACTB16**	**TM5ACTB32**		
More information		Please refer to **"Modicon TM5, expansion modules" – catalog DIA3ED2131204EN**, or on our web site, **www.schneider-electric.com**							

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

Applications	Type of expansion module	**4 digital input channels and 1 analog input channel 2 digital output channels and 1 analog output channel**	**8 digital input channels 4 transistor output channels**	**2 to 16 transistor output channels**						**2 transistor output channels**	**2 to 4 relay output channels**	
	Compatibility	**Modicon M258 logic controller, Modicon LMC058 motion controller**										
Channel connection		With removable spring terminal blocks (to be ordered separately)										
Digital inputs	Number	**4**	**8**									
	Nominal input voltage	24 V ⎓	24 V ⎓									
	IEC/EN 61131-2 conformity	Type 1	Type 1									
	Type of signal *(1)*	Sink	Sink									
	Type of wiring	1-wire	1-wire									
	Limit values	⎓ 20.4...28.8 V	⎓ 20.4...28.8 V									
	Nominal input current	3.3 mA	3.75 mA									
	Input impedance	7.2 kΩ	6.4 kΩ									
	State 0	⎓ 5 V max.	⎓ 5 V max.									
	State 1	⎓ 15 V min.	⎓ 15 V min.									
Digital outputs	Number	**2**	**4**	**2**	**4**	**4**	**6**	**8**	**12**	**16**	**2**	**2**	**4**
	Nominal output voltage	24 V ⎓	24 V ⎓	24 V ⎓							100/240 V ∿	⎓ 30/∿ 230 V	
	Output current per channel	0.5 A	0.5 A	0.5 A	0.5 A	2 A	0.5 A	2 A	0.5 A		1 A	5 A	
	Output current per group of channels	1 A max.	2 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.	
	Type of signal *(1)*	Source	Source	Source							Solid state relay	Relay	
	Type of wiring	1-wire	1-wire	1-, 2- or 3-wire			1 or 2-wire	1-wire			3-wire	NO/NC contact	
	Limit values	⎓ 20,.4...28.8 V	⎓ 20.4...28.8 V	⎓ 20.4...28.8 V							∿ 80…264 V	⎓ 24...36 V ∿ 184...276 V	
	Short-circuit and overload protection	Yes	Yes	Yes							Yes	No	
Analog inputs	Number	**1**											
	Type	Voltage/current											
	Range	- 10…+ 10 Vdc 0…20 mA/4…20 mA											
	Resolution	12 bits + sign											
	Sampling period without filtering	400 ms											
	Sampling period with filtering	1 ms max.											
Analog outputs	Number	**1**											
	Type	Voltage/current											
	Range	- 10…+ 10 Vdc 0…20 mA											
	Resolution	12 bits											
	Response time	1 ms max.											
Electronic expansion module – reference		**TM5SMM6D2L**	**TM5SDM12DT**	**TM5 SDO2T**	**TM5S DO4T**	**TM5 SDO4TA**	**TM5 SDO6T**	**TM5 SDO8TA**	**TM5 SDO12T**	**TM5 SDO16T**	**TM5 SDO2S**	**TM5 SDO2R**	**TM5SDO4R TM5 SDO4R4**
Compatible bus base – reference *2)*		**TM5ACBM11, TM5ACBM15**									**TM5ACBM12**		
Compatible terminal block – reference *(2)*		**TM5ACTB12**		**TM5ACTB06, TM5ACTB12**				**TM5ACTB12**		**TM5 ACTB16**	**TM5ACTB32**		
More information		Please refer to **"Modicon TM5, expansion modules" – catalog DIA3ED2131204EN**, or on our web site, **www.schneider-electric.com**											

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Modicon TM5 Analog modules and Digital/Analog module

Applications	Type of expansion module	**1 to 6 analog input channels**						**1 analog input channel and 4 digital input channels** **1 analog input channel and 2 digital output channels**	**2 to 4 analog output channels**			
	Compatibility	**Modicon M258 logic controller, Modicon LMC058 motion controller**										
Channel connection		With removable spring terminal blocks (to be ordered separately)						With removable spring terminal blocks (to be ordered separately)				
Analog inputs	Number	**2**	**2**	**4**	**4**	**2**	**4**	**2**	**6**	**1**	**1**	
	Type	Voltage/current				Pt100/Pt1000 temperature probe		J, K, S, N thermocouple		Full bridge Strain Gauge	Voltage/current	
	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		Type J: - 210…+ 1200°C Type K: - 270…+ 1372°C Type S: - 50…+ 1768°C Type N: - 270…+ 1300°C		Differential: 85…5000 Ω	- 10...+ 10 Vdc 0…20 mA/4…20 mA	
	Resolution	12 bits + sign	15 bits + sign	12 bits + sign	15 bits + sign	16 bits		16 bits		24 bits	12 bits + sign	
	Sampling period without filtering	300 µs	–	400 µs	–	–		–		–	400 ms	
	Sampling period with filtering	1 ms	50 µs	1 ms	50 µs	–		–		–	1 ms max.	
Analog outputs	Number										**1**	**2**	**2**	**4**	**4**
	Type										Voltage/current	Voltage/current			
	Range										- 10…+ 10 Vdc 0…20 mA	- 10…+ 10 Vdc 0…20 mA			
	Resolution										12 bits	12 bits + sign	15 bits + sign	12 bits + sign	15 bits + sign
	Response time										1 ms maxi	1 ms max.			
Digital inputs	Number										**4**				
	Nominal input voltage										24 V ⎓				
	IEC/EN 61131-2 conformity										Type 1				
	Type of signal *(1)*										Sink				
	Type of wiring										1-wire				
	Limit values										⎓ 20.4... 28.8 V				
	Nominal input current										3.3 mA				
	Input impedance										7.2 kΩ				
	State 0										⎓ 5 V max.				
	State 1										⎓ 15 V min.				
Digital outputs	Number										**2**				
	Nominal output voltage										24 V ⎓				
	Output current per channel										0.5 A				
	Output current per group of channels										1 A max.				
	Type of signal *(1)*										Source				
	Type of wiring										1-wire				
	Limit values										⎓ 20.4...28.8 V				
	Short-circuit and overload protection										Yes				
Power supply		Internal						Internal		Internal	Internal	Internal
Isolation	Channel-to-channel	Non-isolated						Non-isolated		Non-isolated	Non-isolated	Non-isolated
	Between channel groups	–						–		–	–	–
	Channel-to-bus	∼ 500 V RMS						∼ 500 V RMS		∼ 500 V RMS	∼ 500 V RMS	∼ 500 V RMS
Electronic expansion module – reference		**TM5SAI2L**	**TM5SAI2H**	**TM5SAI4L**	**TM5SAI4H**	**TM5SAI2PH**	**TM5SAI4PH**	**TM5SAI2TH**	**TM5SAI6TH**	**TM5SEAISG**	**TM5SMM6D2L**	**TM5SAO2L**	**TM5SAO2H**	**TM5SAO4L**	**TM5SAO4H**
Compatible bus base – reference *2)*		**TM5ACBM11, TM5ACBM15**						**TM5ACBM11, TM5ACBM15**				
Compatible terminal block – reference *(2)*		**TM5ACTB06, TM5ACTB12**		**TM5ACTB12**		**TM5ACTB06, TM5ACTB12**	**TM5ACTB12**	**TM5ACTB06, TM5ACTB12**		**TM5ACTB12**		**TM5ACTB06, TM5ACTB12**		**TM5ACTB12**	
More information		Please refer to **"Modicon TM5, expansion modules" – catalog DIA3ED2131204EN**, or on our web site, **www.schneider-electric.com**						Please refer to **"Modicon TM5, expansion modules" – catalog DIA3ED2131204EN**, or on our web site, **www.schneider-electric.com**				

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

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Distributed I/O

Modicon TM5 Expert modules

Applications	**Upcounting, downcounting, period measurement, frequency meter, frequency generator, axis following with encoder**		**Upcounting, downcounting, period measurement, frequency meter, frequency generator, axis following with encoder**		
Compatibility	**Modicon M258 logic controller, Modicon LMC058 motion controller**		**Modicon M258 logic controller, Modicon LMC058 motion controller**		
Channel connection	With removable spring terminal blocks (to be ordered separately)		With removable spring terminal blocks (to be ordered separately)		
Number of counter channels	2	1	2	1	1
IEC/EN 61131-2 conformity	Type 1	Incremental	Incremental	Incremental	SSI absolute
Type of signal *(1)*	Sink	Sink	Sink	RS422, Sink	Sink
Type of input	1-, 2- or 3-wire	–	–	–	–
Nominal input voltage	24 V ⎓	24 V ⎓ asymmetrical	24 V ⎓ asymmetrical	5 V ⎓ symetrical	5 V ⎓ symetrical
Voltage limit values	20.4... 28.8 V ⎓	–	–	20.4... 28.8 V ⎓	20.4... 28.8 V ⎓
Frequency per channel	50 kHz	100 kHz	100 kHz	250 kHz	1 MHz
Resolution	–	16/32 bits	16/32 bits	16/32 bits	32 bits
Functions	Event counting Interval measurement	2 x 24 V ⎓ auxiliary inputs 24 V ⎓ encoder power supply	2 x 24 V ⎓ auxiliary inputs 24 V ⎓ encoder power supply	2 x 24 V ⎓ auxiliary inputs	2 x 24 V ⎓ auxiliary inputs
Electronic expansion module – reference	**TM5SDI2DF**	**TM5SE1IC01024**	**TM5SE2IC01024**	**TM5SE1IC02505**	**TM5SE1SC10005**
Compatible bus base – reference *(2)*	**TM5ACBM11, TM5ACBM15**		**TM5ACBM11, TM5ACBM15**		
Compatible terminal block – reference *(2)*	**TM5ACTB12**		**TM5ACTB12**		
More information	Please refer to **"Modicon TM5, expansion modules" – catalog DIA3ED2131204EN**, or on our web site, **www.schneider-electric.com**		Please refer to **"Modicon TM5, expansion modules" – catalog DIA3ED2131204EN**, or on our web site, **www.schneider-electric.com**		

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

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PacDrive 3 automation solution

Distributed I/O

Modicon TM7 – IP 67 modular I/O system:
Digital I/O blocks IP 67

Applications			Digital I/O expansion blocks						
Degree of protection			IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
Type of housing			Plastic	Plastic	Plastic	Plastic	Plastic	Plastic	Plastic
Modularity (number of channels)	Max. number of digital channels		8	16	16	8	8	16	16
	Digital inputs		8	16	16	–	0…8 software-configurable	0…16 software-configurable	0…16 software-configurable
	Digital outputs		–	–	–	8	0…8 software-configurable	0…16 software-configurable	0…16 software-configurable
Digital inputs	Voltage/current		24 V ⎓/7 mA	24 V ⎓/7 mA	24 V ⎓/7 mA	–	24 V ⎓/4.4 mA	24 V ⎓/4.4 mA	24 V ⎓/4.4 A max.
	Type		Sink *(1)*	Sink *(1)*	Sink *(1)*	–	Sink *(1)*	Sink *(1)*	Sink *(1)*
	IEC 61131-2 conformity		Type 1	Type 1	Type 1	–	Type 1	Type 1	Type 1
Digital outputs	Voltage		–	–	–	24 V ⎓	24 V ⎓	24 V ⎓	24 V ⎓
	Type		–	–	–	Transistor/Source *(2)*	Transistor/Source *(2)*	Transistor/Source *(2)*	Transistor/Source *(2)*
	Current per output		–	–	–	2 A max.	0.5 A max.	0.5 A max.	0.5 A max.
	Current per expansion block		–	–	–	8 A max.	4 A max.	8 A max.	8 A max.
Sensor/actuator power supply	Voltage		24 ➡ ⎓	24 V ⎓	24 V ⎓	24 V ⎓	24 V ⎓	24 V ⎓	24 V ⎓
	Max. current		500 mA for all channels	500 mA for all channels	500 mA for all channels	500 mA for all channels	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	Overloads, short-circuits and reverse polarity	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	B-coded 4-way male M12	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	B-coded 4-way female M12	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	–	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
		Actuator 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
	Expansion block power supply	Input connector	4-way male M8	4-way male M8	4-way male M8	4-way male M8	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	4-way female M8	4-way female M8	4-way female M8	4-way female M8
Diagnostics	By expansion block		Yes	Yes	Yes	Yes	Yes	Yes	Yes
	By channel		Yes	Yes	Yes	Yes	Yes	Yes	Yes
	By communication on TM7 bus		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Digital I/O blocks – reference			**TM7BDI8B**	**TM7BDI16B**	**TM7BDI16A**	**TM7BDO8TAB**	**TM7BDM8B**	**TM7BDM16A**	**TM7BDM16B**
More information			Please refer to **"Modicon TM7, IP67 modular I/O system" – catalog DIA3ED2140405EN**, or on our web site, **www.schneider-electric.com**			Please refer to **"Modicon TM7, IP67 modular I/O system" – catalog DIA3ED2140405EN**, or on our web site, **www.schneider-electric.com**			

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

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Distributed I/O

Modicon TM7 – IP 67 modular I/O system: Analog I/O blocks

Applications		Analog I/O expansion blocks							
Degree of protection		IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67	IP 67
Type of housing		Plastic	Plastic	Plastic	Plastic	Plastic	Plastic	Plastic	Plastic
Modularity (number of channels)	Max. number of analog channels	4	4	4	4	4	4	4	4
	Analog inputs	4	4	–	–	–	–	2	2
	Temperature inputs	–	–	4	4	–	–	–	–
	Analog outputs	–	–	–	–	4	4	2	2
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	J, K, S thermocouple Voltage 0...65536 µV	–	–	Voltage - 10…+ 10 V ⎓	Current 0…20 mA
	Resolution	11 bits + sign	12 bits	16 bits	16 bits	–	–	11 bits + sign	12 bits
Analog outputs	Type	–	–	–	–	Voltage - 10…+ 10 V ⎓	Current 0…20 mA	Voltage - 10…+ 10 V ⎓	Current 0…20 mA
	Resolution	–	–	–	–	11 bits + sign	12 bits	11 bits + sign	12 bits
	Current per expansion block	–	–	–	–	–	–	–	–
Sensor/actuator power supply	Voltage	24 V ⎓	24 V ⎓	–	–	24 V ⎓	24 V ⎓	24 V ⎓	24 V ⎓
	Max. current	500 mA for all channels	500 mA for all channels	–	–	500 mA for all channels	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	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	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 male M12 B-coded	4-way male M12 B-coded	4-way male M12 B-coded
	TM7 expansion bus – Bus output connector	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	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	A-coded 5-way female M12	–	–	A-coded 5-way female M12	A-coded 5-way female M12
	Analog I/O channels – Actuator connector	–	–	–	–	A-coded 5-way female M12	A-coded 5-way female M12	A-coded 5-way female M12	A-coded 5-way female M12
	Expansion block power supply – Input connector	4-way male M8	4-way male M8	4-way male M8	4-way male M8	4-way male M8	4-way male M8	4-way male M8	4-way male M8
	Expansion block power supply – Output connector	4-way female M8	4-way female M8	4-way female M8	4-way female M8	4-way female M8	4-way female M8	4-way female M8	4-way female M8
Diagnostics	By expansion block	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	By channel	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	By communication on TM7 bus	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Analog I/O blocks – reference		**TM7BAI4VLA**	**TM7BAI4CLA**	**TM7BAI4TLA**	**TM7BAI4PLA**	**TM7BAO4VLA**	**TM7BAO4CLA**	**TM7BAM4VLA**	**TM7BAM4CLA**
More information		Please refer to **"Modicon TM7, IP67 modular I/O system" – catalog DIA3ED2140405EN**, or on our web site, **www.schneider-electric.com**			Please refer to **"Modicon TM7, IP67 modular I/O system" – catalog DIA3ED2140405EN**, or on our web site, **www.schneider-electric.com**				

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MKTED2120601EN

March 2015- V3.0

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