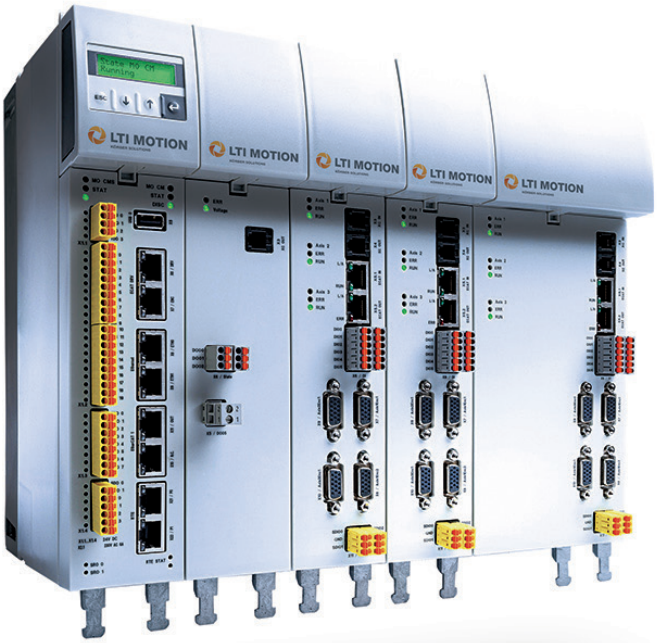
LTI MOTION
KÖRBER SOLUTIONS



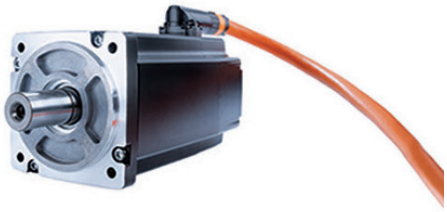
SystemOne Order Catalogue

SystemOne CM
Controls
I/O modules
Control units
Software

SystemOne
Order Catalogue

ID no.: 1400.205B.4-01 • Date: 04/2016
You will find the latest version of this document at
www.lti-motion.com.


MotionCenter
LTI MOTION



Product overview

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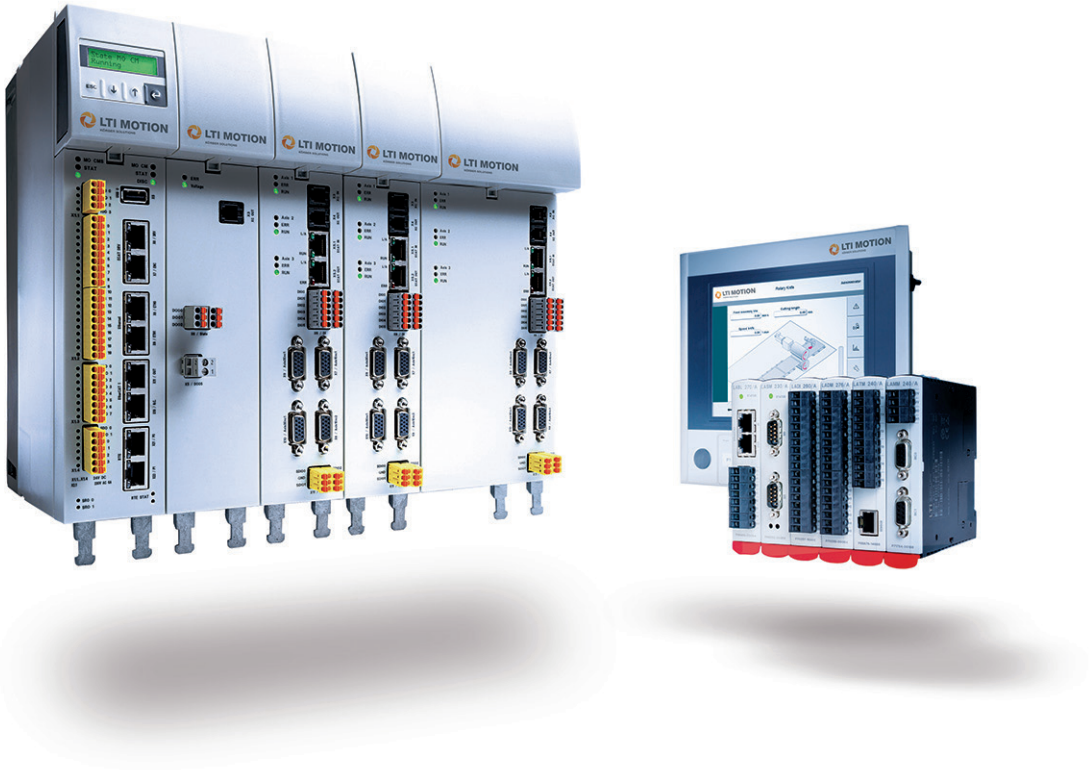
1 SystemOne CM - general



1.1 Advanced automation system

The advanced automation system provides superior solutions for complex automation tasks. A matched range of components permits efficient design in different applications.

This solution portfolio offers high-performance drive technology, scaleable safety technology and control technology from a single source.
Rounded off by the competence of the LTI Group in the areas of MotionControl, Motion Safety, CNC, magnetic bearings, motors and the broad performance range of the drive technology, the optimal solution competence for your applications is available.

Alongside top product quality, we offer you sound, specifically targeted advice, expert commissioning support, a sophisticated, needs-oriented ordering and shipment logistics system, as well as outstanding service and diagnostic capabilities.

1.2 Automation components

Control platform
with scaleable spectrum.

Displays
with diagonals from 4.2“ to 15“ for usage in an industrial environment.

I/O system
for modular expansion using standard, technology and communication assemblies.

Safe Monitoring Control in SIL3
modular safety control.

Toolset
for all tasks in the automation system, based on established CODESYS standard.

1.3 Drive components in this catalogue

ServoOne CM from 1.5-32 A as DC system for 4, 5, 6 or more axes: Centrally supplied with power and with auxiliary voltage.

Functional Safety in SIL3
modular safety designs with various encoder interfaces and scaleable I/O.

1.4 Additional drive components

Servo drives from 2-450 A for AC-supplied single-axis movements
with AC mains connection from 1/3 x 230 V - 3 x 480 V.

Servo drives from 4-170 A as DC-supplied multi-axis system
with sinusoidal regenerative power supply units.

ServoOne with integrated safety control in SIL3
servo drives from 4 to 72 A with AC or DC supply.

1.5 Functionality

High-speed communication
based on a wide variety of profile-compliant field bus interfaces (EtherCAT, sercos II & III, PROFINET IRT, CANopen, ...).

High-performance motor control
for the precise, dynamic movement of a wide variety of linear and rotary motor systems.

Compact size
for optimal switch cabinet utilisation.

Flexible cooling concepts
featuring air or liquid cooling.

Future-proof
thanks to a flexible expansion concept.

Comprehensive PC software
for planning, commissioning and programming multi-axis drive systems.

1.6 SystemOne CM certification

1.6.1 CE marking

The SystemOne CM devices are components intended for stationary electrical systems and machines in the industrial and commercial sector.

The ServoOne CM axis controllers conform to the Machinery Directive 2006/42/EC and are tested and certified according to applicable standards. The devices meet the requirements of the harmonised product standard EN 61800-5-1.

The ServoOne CMP supply unit conforms to the Low Voltage Directive 2006/95/EC and is tested and certified according to applicable standards. The devices meet the requirements of the harmonised product standard EN 61800-5-1.

You will find the EC declarations of conformity in the operation manuals for the ServoOne CM axis controller and ServoOne CMP supply unit in chapter 2 Safety in each case.

1.6.2 UL/UR certification

All sizes of the ServoOne CMP supply unit have UL certification (UL 61800-5-1).
All sizes of the ServoOne CM axis controller have UL certification (UL 61800-5-1).

1.6.3 EMC certification

All ServoOne CM devices are by design resilient to interference in accordance with EN 61800-3, environment classes 1 and 2.

To limit conducted interference emissions to the permissible level, external EMC mains filters are available (chapter “2.6.7 Mains filters”). These mains filters comply with the EMC directive 2004/108/EC.

For the interference level achievable (C2/C3) please refer to the operation manual.

NOTE:

The ServoOne CM devices have been developed for usage in an industrial environment and can cause RF interference on usage in residential environments.

1.6.4 STO certification

You will find information on the STO certification in the operation manual.

1.7 EC declaration of conformity, control module

LTI MOTION
KÖRBER SOLUTIONS

EG-Konformitätserklärung
EC Declaration of Conformity

Der Hersteller / *The manufacturer:*

LTI Motion GmbH
Gewerbestraße 5-9
35633, Lahnau

erklärt hiermit, dass die folgenden Produkte /
declares that the following products:

Produktbezeichnung / *Product designation*: Steuerungsmodul / *Control Modul*

Produkttypen / *Product types:*

MO CM-3.0001.0000
MO CM-3.0101.0000
MO CM-6.0021.0000
MO CM-6.0121.0000

---

den Sicherheitsbestimmungen der nachstehenden EG-Richtlinie entsprechen:
comply with the essential requirements of the following EC Directive:

2004/108/EG / *2004/108/EC* EMV Richtlinie / *EMC Directive*

---

und dass folgende angeführte harmonisierte Norm angewandt wurde /
and that the following harmonised standard has been applied:

EN 61131-2:2007
Speicherprogrammierbare Steuerungen – Teil 2: Betriebsmittelanforderungen und Prüfungen /
Programmable controllers – Part 2: Equipment requirements and tests

EN 61800-3:2004
Drehzahlveränderbare elektrische Antriebe – Teil 3: EMV-Anforderungen einschließlich spezieller Prüfverfahren / *Adjustable speed electrical power drive systems – Part 3: EMC requirements and specific test methods*

Jahr der CE-Kennzeichnung / *Year of CE-marking:* 2013

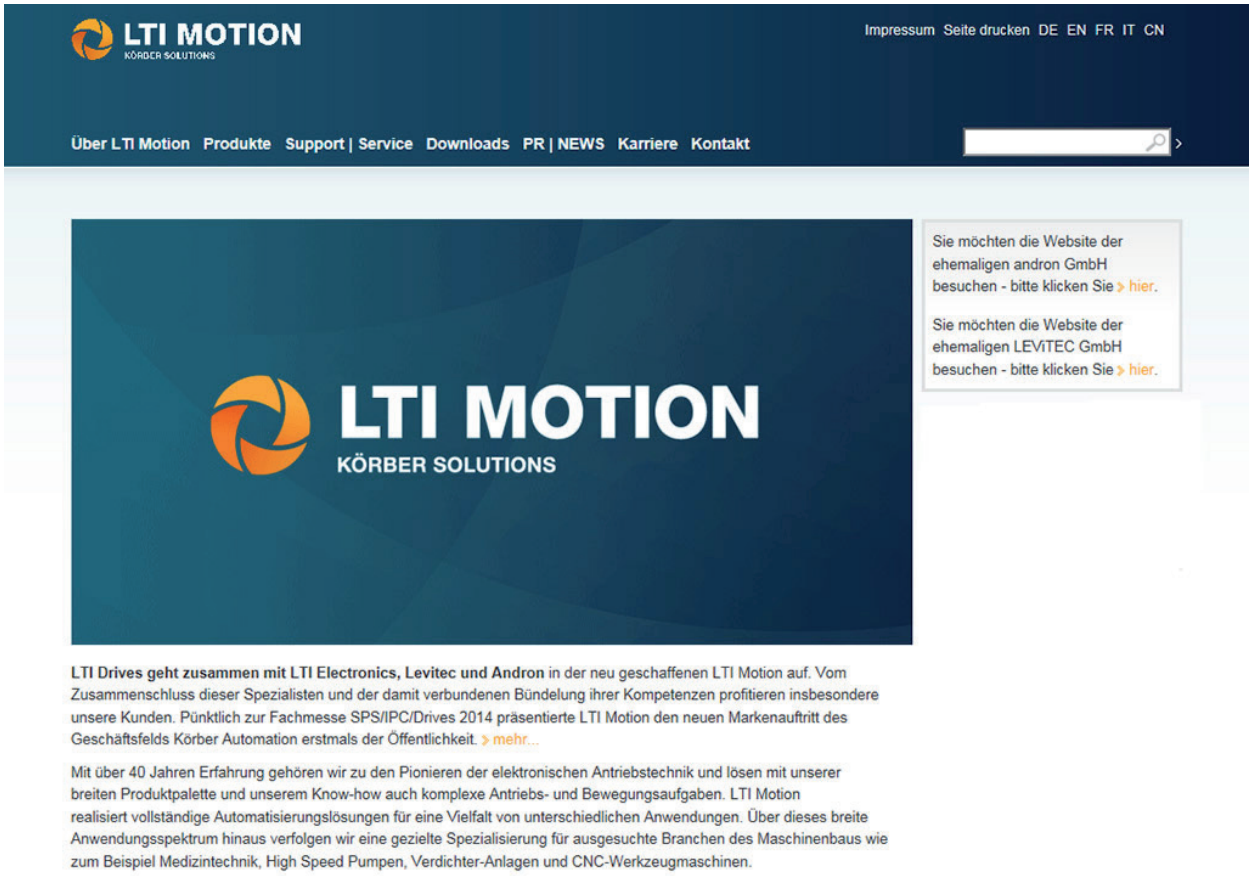
Unterschrift / *signature*
Name / *name*: Dr. Josef Wiesing
Stellung / *position*: Geschäftsführer / *Managing Director*
Datum / *date*: 09.04.2015

Dokument: 1553.0DK.1-00

FB P087 EG-Konformitätserklärung 2015/02 B Seite / Page 1 / 1

Space for notes

1.8 Services



LTI MOTION offers a wide range of information on the Internet. Whether you are looking for more detailed technical information on our products or on project planning and design, or want to contact our nearest representative - just visit our website: **www.lti-motion.com.**

Or call us on +49 6441 966-0 to obtain detailed information material on our broad range of services, available in printed form as a convenient reference source.

Design-in

Professional project management that keeps you to deadlines and budgets is an important element of our joint success.
The sooner you get to market with your new solution the better.
That is why we can support you in:

- Analysing requirements for
- Planning and drive design
- Creating the functional specification
- Total cost analysis
- Project management

Logistics

To make ordering a routine exercise and reduce or even eliminate unnecessary formalities, the entire process is co-ordinated, from planning through ordering to spare parts supplies.

Software update service

As part of our product maintenance function we are continuously improving the quality of the drive system. Our software update service provides you with information on new releases and enhancements to the various firmware versions.

After-sales

You can call on our service and support wherever and whenever you need assistance. With our flexibility, fast response times, superior technical know-how and extensive user experience, we can offer a wide range of services, including:

- On-site commissioning.
- Advice and training.
- Repairs / service concept.

Helpline

Our Helpline can assist you with:

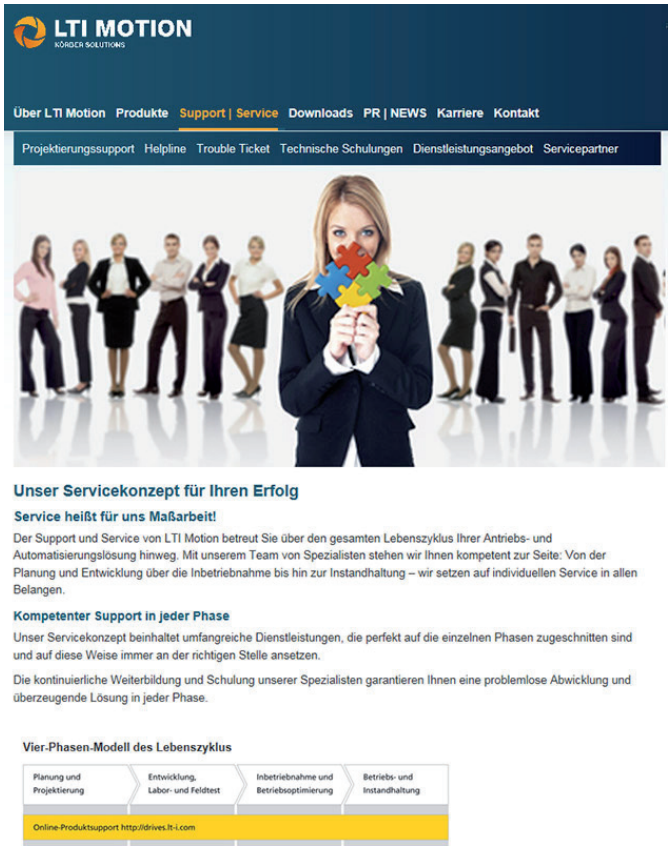
- Telephone commissioning of standard products and systems.
- Evaluating error and diagnostic displays.
- Locating and dealing with reproducible faults.
- Software updates.

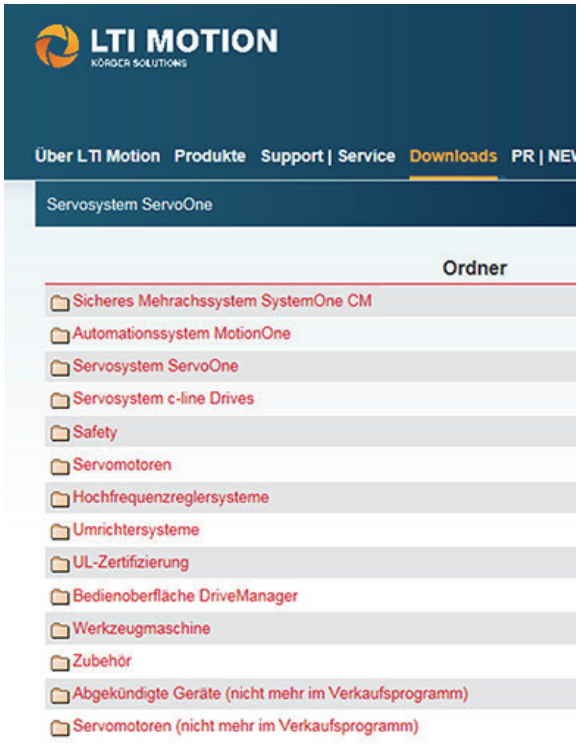
To contact the Helpline:

Address:	LTI MOTION GmbH Gewerbestrasse 5-9 35633 Lahnau
Mo.-Fr.:	8 a.m. - 5 p.m. (CET)
Telephone:	+49 (0) 6441 966-180
E-Mail:	helpline@lti-motion.com
Internet:	► www.lti-motion.com ► Support & Service ► Trouble Ticket

Downloads

You will find the latest comprehensive information on our products on our website www.lti-motion.com in “Downloads”.





1.9 Ambient conditions for the SystemOne CM devices

General conditions	SystemOne CM - devices
Protection	IP20 except terminals (IP00)
Accident prevention regulations	As per local regulations (in Germany e.g. BGV A3)
Installation altitude	Up to 1000 m above MSL, higher with power reduction (1 % per 100 m, max. 2000 m above MSL), overvoltage category III > 2000 m: overvoltage category II
Pollution degree	2
Type of installation	Built-in unit, only for vertical installation in a switch cabinet with min. IP4x protection, on using safety function STO min. IP54

Ambient conditions, SystemOne CM

Climatic conditions	SystemOne CM - devices	
In transit	As per EN 61800-2, IEC 60721-3-2 class 2K31	
	Temperature	-25 °C to +70 °C
	Relative atmospheric humidity	95 % at max. +40 °C
In storage	As per EN 61800-2, IEC 60721-3-1 class 1K3 and 1K42	
	Temperature	-25 °C to +55 °C
	Relative atmospheric humidity	5 % to 95 %
In operation	As per EN 61800-2, IEC 60721-3-3 class 3K33	
	Temperature	5 °C to +40 °C (4, 8, 16 kHz) to 50 °C with power reduction (5 %/°C)
	Relative atmospheric humidity	5 % to 85 % without condensation

1) The absolute humidity is limited to max. 60 g/m³. This means that at 70 °C for example, the relative atmospheric humidity may only be max. 40 %.
2) The absolute humidity is limited to max. 29 g/m³. So the maximum values for temperature and relative atmospheric humidity stipulated in the table must not occur simultaneously.
3) The absolute humidity is limited to max. 25 g/m³. So the maximum values for temperature and relative atmospheric humidity stipulated in the table must not occur simultaneously.

Climatic conditions, SystemOne CM

Mechanical conditions	SystemOne CM - devices		
Vibration limit In transit	As per EN 61800-2, IEC 60721-3-2 class 2M1		
	Frequency [Hz]	Amplitude [mm]	Acceleration [m/s²]
	2 ≤ f < 9	3.5	Not applicable
	9 ≤ f < 200	Not applicable	10
	200 ≤ f < 500	Not applicable	15
Shock limit In transit	As per EN 61800-2, IEC 60721-3-2 class 2M1		
	Drop height of packed device max. 0.25 m		
Vibration limits for the system	As per EN 61800-2, IEC 60721-3-3 class 3M1		
	Frequency [Hz]	Amplitude [mm]	Acceleration [m/s²]
	2 ≤ f < 9	0.3	Not applicable
	9 ≤ f < 200	Not applicable	1

NOTE:

- Only use ServoOne CM devices in a stationary installation and do not subject to continuous vibration.
- If the safety function STO (Safe Torque Off) is used, as per EN ISO 13849-2 the switch cabinet must have IP54 protection or higher.

Mechanical conditions, SystemOne CM

1.10 Reference documentation on the automation system SystemOne CM

Documentation on the installation and operation of the automation system SystemOne CM

Document	Contents	ID no.	File formats
MotionOne CM	Operation manual and system manual.	1400.203B.x	PDF
ServoOne CM - Axis Controller Operation Manual	Safety, mechanical installation, electrical installation, commissioning, diagnostics, specification, certification and standards, technical data.	1400.200B.x	PDF
ServoOne CMP - Supply Unit Operation Manual	Safety, mechanical installation, electrical installation, commissioning, diagnostics, specifications, certification and applicable standards, technical data.	1400.201B.x	PDF
ServoOne CM - online device help	Description of the software functionality ServoOne CM, firmware version: V1.10-xx.	1400.209B.x	PDF and HTML5
ServoOne CM - online program help DriveManager 5	Graphic PC user software for initial commissioning and serial commissioning, operation, diagnostics and project management.	0842.25B.x	PDF and context-sensitive help

Documentation on the automation system SystemOne CM

Document	Contents	ID no.	File formats
SystemOne - Order Catalogue	Information, notes on ordering, specifications and technical data on: • SystemOne CM - control systems and safety control (MotionOne CMS), axis controllers (ServoOne CM), supply units (ServoOne CMP). • Scope of supply SystemOne CM. • Accessories SystemOne CM (PC user software DriveManager 5, connector sets, data cables, mains chokes, braking resistors, mains filters). • MotionOne CP (controls) and COsoftware (control software). • COconnect (I/O modules). • VOpanel (display and control units). • MotionCenter (tools for planning, programming and diagnostics). • Other LTI products (drive technology, safety control, motors, motor and encoder cables).	1400.205B.x	PDF
SystemOne CM - brochure	Brochure with main functional features of the automation system SystemOne CM.	0920.2066.2	PDF
All in SystemOne CM - leaflet	Leaflet with main functional features of the automation system SystemOne CM.	Leaflet	PDF
LSP Servomotors - Order Catalogue	Basic information, notes on ordering, specifications, technical data.	0814.28B.x	PDF
LSN/LST/LSH Servomotors - Order Catalogue	Basic information, notes on ordering, specifications, technical data.	0814.25B.x	PDF
LSMx Servomotors - Order Catalogue	Basic information, notes on ordering, specifications, technical data.	0814.27B.x	PDF

1.11 Other documentation on LTI devices

Documentation on the servo system ServoOne (ServoOne junior, ServoOne single-axis system, ServoOne multi-axis system)

Document	Contents	ID no.	File formats
ServoOne - brochure	Brochure with main functional features of the automation system ServoOne.	0920.2045.4	PDF
ServoOne System - System Catalogue	Information, notes on ordering, specifications and technical data on: ServoOne junior, single and multi-axis system, supply units, safety systems, communication, technology, function packages, accessories and motors.	1100.24B.x	PDF
ServoOne CM - online device help	Description of the software functionality ServoOne, firmware versions: • SO single-axis system from V3.25-xx. • SO multi-axis system from V3.25-xx. • SO junior from V1.30-xx.	0842.26B.x	PDF and HTML
ServoOne CM - online program help DriveManager 5	Graphic PC user software for initial commissioning and serial commissioning, operation, diagnostics and project management.	0842.25B.x	PDF and context-sensitive help
ServoOne junior - Operation Manual	Safety, mechanical installation, electrical installation, commissioning, diagnostics, specifications, certification and applicable standards, technical data.	1300.20B.x	PDF
ServoOne Single-Axis System - Operation Manual	Safety, mechanical installation, electrical installation, commissioning, diagnostics, specifications, certification and applicable standards, technical data.	1100.20B.x	PDF
ServoOne Multi-Axis System - Operation Manual	Safety, mechanical installation, electrical installation, commissioning, diagnostics, STO, operation with servocontroller as supply, planning, application example, specifications, certification and applicable standards, technical data.	1101.20B.x	PDF
ServoOne Multi-Axis System Supply Unit - Operation Manual	Safety, mechanical installation, electrical installation, commissioning, diagnostics, specifications, certification and applicable standards, technical data.	1101.21B.x	PDF
ServoOne Safety Function STO - Description	This documentation replaces the description of the STO functionality in the operation manuals.	Description in 24 languages	PDF
ServoOne CANopen/EtherCAT - User Manual	Safety, installation and connection, commissioning, setting parameters, functionality, operation modes, emergency objects, technology functions, parameter lists.	1108.28B.x	PDF
ServoOne One-Cable Interface - Model Description	Description, technical data, connection system, encoder evaluation, specifications.	1106.26B.x	PDF
ServoOne 2nd SinCos Encoder - Specification	Operation modes, technical data, connection system, configuration, reference marks.	1308.21B.x	PDF
ServoOne TTL Encoder Simulation/ TTL Master Encoder - Specification	Operation modes, technical data, terminal assignment, configuration.	1306.21B.x	PDF
ServoOne TWINsync - Specification	Technology options, installation, parameter description, control via TWINsync, TWINsync operation modes, monitoring functions/error messages.	1106.23B.x	PDF
ServoOne SSI Encoder Simulation - Specification	Performance features, pin assignments, setting parameters, technical data, specifications.	1106.22B.x	PDF
ServoOne TTL Encoder with Commutation Signal - Specification	Operation modes, technical data, terminal assignment, configuration.	1306.24B.x	PDF
ServoOne Digital Input/Output Expansion - Specification	Application area, article designation, technical data, configuration.	1106.24B.x	PDF
ServoOne HF Function Package - User Manual	Safety, power stage, motor, rotary encoder, control, inputs and outputs, parameter lists.	1107.22B.x	PDF
Quick Start Guide iPLc - Installation EN	Characteristics, functions, system requirements, setting parameters, parameter description file, installation, user logon, program start/stop.	1107.21B.x	PDF
Basic Motion - library EN	DIN EN 61131, CODESYS basics, library, functions.	1107.23B.x	PDF and HTML

Documentation for accessories for the automation systems

Document	Contents	ID no.	File formats
Mains Filters - Installation Manual	Safety, installation, dimensions, connection, technical data.	0925.21B.x	PDF
Line Chokes - Installation Manual	Safety, installation, dimensions, connection, technical data.	0925.20B.x	PDF
Braking Resistor - Installation Manual	Safety, installation, dimensions, connection, technical data.	0923.20B.x	PDF
Motor Chokes/Filters	Safety, pre-conditions, installation, dimensions, connections, technical data.	0926.20B.x	PDF
• Bus systems • Terminal expansions • Operation	Miscellaneous documentation. See Download area at LTI MOTION in Accessories.	-	Various

NOTE:

Subject to technical change without notice. Information and specifications may be subject to change at any time. You will find our latest documentation at www.lti-motion.com in the “Downloads” section.

Space for notes

2 SystemOne CM

Safe multiple axis automation system

The automation system SystemOne CM contains all the components of an automation system.
The major advantage of the system is in the space-saving integration of motion control, safety control, supply unit with auxiliary power supply and servo axis controllers in one scaleable unit.

The system offers axis controllers as single-axis, double-axis and triple-axis controllers in a power range from 1.5 A to 32 A for optimal system design.
The number of axes is almost unlimited.
A central supply, a DC group for power and 24 V via a busbar system on the front ensure straightforward installation and the lowest possible wiring effort.
The axis controllers are equipped with a scaleable safety option: From STO as per PLe, cat 4, or SIL3 or single-axis monitoring up to multiple axis motion monitoring, everything is possible.

The integration of the safety control in the motion control yields not only cost savings due to common usage of function modules such as memory and interfaces, it is also offers the advantage of the common usage of data and hardware. The two controls communicate via a common data pool and in this way significantly expand not only the functionality and flexibility, but also permit very short system-internal response times.

One tool

The system is operated straightforwardly via the CODESYS 3-based central development tool MotionCenter. Along with features for configuring the drive systems and system-wide diagnostics, MotionCenter also provides the integrated tool "VIeditor" for preparing simple and complex data display solutions for simple monitors and active panels. And Safetymanager (in preparation) for preparing safety projects for machine safety.

The user connects to a point in the system from the central control via Ethernet and has access to all components. Scaleable computing power, combined with the various technology functions in the motion control, provides the user with an optimal spectrum for cost-effective system solutions.

2.1 MotionOne CM - integrated control systems

MotionOne CMS - MotionControl and safety control

Linux operating system with

CODESYS 3 development environment
Article designation: see order code

2.1.1 CPU module MO CM 3.x - Atom CPU

CPU performance

The control module MO CM 3.x is an intelligent master assembly designed for the medium power range and is used in the SystemOne automation system.
The MO CM 3.x housing can also accommodate an optional safety control CMS (model: MO CM-6.Sxx).

Reliable data storage

The firmware and application data are saved on a CFast memory card.
In this way the data are stored reliably and are available at any time.

Communicative hardware

The field bus interface EtherCAT based on real-time Ethernet provides almost unlimited design freedom. The integrated data display provides cost savings, because as a result expensive intelligent panels are unnecessary. In addition, diagnostics functions are available via an integrated Human Machine Interface (HMI) with 2-line text display. Two USB ports permit the connection of accessories such as printers, modems etc.

More flexibility due to straightforward expansion

A PCI expansion slot provides comprehensive protection of investment and powerful expansion options. In this way individually designed solutions can be integrated into the control and further used.
For even more flexibility COconnect expansion modules can be operated remotely using an EtherCAT bus coupler. It is also possible to integrate modules from other manufacturers in the same way.

Technical data

General	
Supply voltage	24 V DC (19.2 V to 30 V, as per EN 61131-2)
Protection class	III in accordance with EN 61131-2:2007, connection via busbars
Fan	Yes, unregulated, monitored
Ambient conditions	
Operating temperature	+5 °C to +55 °C
Storage temperature	-25 °C to +70 °C
Relative atmospheric humidity	10 % to 95 % (without condensation)
Shock and vibration resistance	As per EN 61131-2
Computer core	
Processor	Intel Atom 1.3 GHz
Chip set	Intel Atom E660
Memory	1 GB DDR2 RAM
Buffered SRAM	1 MB
Interfaces	
EtherCAT master	1x master interface on-board
Ethernet slave	1x (configuration for EtherCAT, PROFINET, Ethernet IP)
Graphic interface, cable length	Up to 20 m (XGA) with cable LAXW 044-050 (see page 104)
Ethernet (LAN) / cable length	100/1000 Mbit, 1x Gbit, max. 50 m with standard Ethernet cable CAT5
USB	3x USB 2.0 high speed.
CFast	Type 1 (supplied without memory card)
PCIe interface	Only on MO CM 6.x
Graphic interface	DVI
Dimensions	
Dimensions (H x W x D)	310 mm x 55 mm x 240 mm
Protection	IP20
EC directives met	
Directive 2004/108/EC	EC directive on electromagnetic compatibility
Directive 2011/65/EU	RoHS directive
Standards applied	
EN 61131-1:2003	Programmable controllers - Part 1
EN 61131-2:2007	Programmable controllers - Part 2
UL 508, 2005	Industrial Control Equipment

2.1.2 CPU module MO CM 6.x - DualCore CPU

CPU performance

The control module is an intelligent master assembly designed for the upper power range, and is used in the SystemOne automation system.
The MO CM 6.x housing can also accommodate an optional safety control CMS (model: MO CM-6.Sxx).

Reliable data storage

The firmware and application data are saved on a CFast memory card.
In this way the data are stored reliably and are available at any time.

Communicative hardware

The field bus interface EtherCAT based on real-time Ethernet provides almost unlimited design freedom. The integrated graphics provide cost savings, because as a result expensive intelligent panels are unnecessary. In addition, diagnostics functions are available via an integrated HMI with 2-line text display. Two USB ports permit the connection of accessories such as printers, modems etc.

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A PCI expansion slot provides comprehensive protection of investment and powerful expansion options. In this way individually designed solutions can be integrated into the control and further used.
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Technical data

General	
Supply voltage	24 V DC (19.2 V to 30 V, as per EN 61131-2)
Protection class	III in accordance with EN 61131-2:2007, connection via busbars
Fan	Yes, unregulated, monitored
Ambient conditions	
Operating temperature	+5 °C to +55 °C
Storage temperature	-25 °C to +70 °C
Relative humidity	10 % to 95 % (without condensation)
Shock and vibration resistance	As per EN 61131-2
Computer core	
Processor	Intel 2 x 2.1 GHz
Chip set	Intel i3 2310
Memory	1 GB DDR3 RAM
Buffered SRAM	1 MB
Interfaces	
EtherCAT master	1x master interface on-board
Graphic interface, cable length	Up to 20 m (XGA) with cable LAXW 044-050 (see p. 5-6)
Second EtherCAT master	1x (on-board, only on Mo CM-6)
Ethernet (LAN) / cable length	100/1000 MBit, 1x Gbit, max. 50 m with standard Ethernet cable CAT5
USB	3x USB 2.0 high speed
CFast	Type 1 (supplied without memory card)
PCIe interface	Only on MO CM 6.x
Graphic interface	Graphic interface
Dimensions	
Dimensions (H x W x D)	310 mm x 55 mm x 240 mm
Protection	IP20
Weight	2900 g
EC directives met	
Directive 2004/108/EC	EC directive on electromagnetic compatibility
Directive 2011/65/EU	RoHS directive
Standards applied	
EN 61131-1:2003	Programmable controllers - Part 1
EN 61131-2:2007	Programmable controllers - Part 2
UL 508, 2005	Industrial Control Equipment

2.1.3 Order code - control module MotionOne CM (Safety)

Name	MO	CM	-	3	.	0	1	0	1	.	0	0	0	0	.	0

MotionOne CM

Processor	S:	Safety monitoring control (stand alone)
	3:	Atom 1.3 GHz
	6:	Intel i3 2.1 GHz
Safety control	0:	None
	S:	Safe Control Onboard Safe-IO: 20 DI, 10 DO, 2 RDO **)
Cooling method	0:	Wall mounting (heat sink, air-cooled)
	1:	Cold plate
Second master interface only MO CM 6.x	0:	None
	2:	EtherCAT master
Slave interface	0:	None
	1:	RT Ethernet slave
Safety Function	0:	Not included
	2:	Safe Motion Control programmable (only in conjunction with Safe Control Onboard)
Reserve		
Extras		
Model	0:	Standard
Version index		

** ... Configurable protocols: PROFINET and EtherCAT*

***) In preparation*

2.1.4 Models available

Article number	Order code	Model	Date
1553.5001	MO CM-3.0001.0000.0	Atom 1.3 GHz processor, wall mounting	02/2016
1553.5002	MO CM-6.0021.0000.0	Intel i3 2.1 GHz processor, wall mounting, 2nd EtherCAT master	02/2016
1553.5011	MO CM-3.0101.0000.0	Atom 1.3 GHz processor, cold plate	02/2016
1553.5012	MO CM-6.0121.0000.0	Intel i3 2.1 GHz processor, cold plate, 2nd EtherCAT master	02/2016

2.1.5 TTechnical specification

This chapter provides a functional overview of the performance of the available Control units.

	MO CM-3.x	MO CM-6.x	LACP 265/X
Technical specification			
M in_ cy cle time	1 ms	1 ms	1 ms
Min_ cycle time motion task	8 ms	1 ms	4 ms
M ax .number of PLC-tasks			32
Size of program memory PLC			8 MB
Size of reta n data memory	100 kB	100 kB	16 kB
RAM	1 GB	1 GB	1 GB
Axes			
Handling axis (per cinematic) Robotic technology withlibraries: EasyMotion / Motion	6	6	6
Robotic technologies: Auxiliary axis	6	6	6
PLCopen axis: Single axis with library MFB	64	64	64
Robot features			
Workzone	with preview limited to 30 workspaces	with preview limited to 30 workspaces	with preview limited to 30 workspaces
Trigger Points	with preview	with preview	with preview
Multikinematik: possible number of robots Example application: delta robot, EtherCAT IO's, without dynamic torque model, with conveyor tracking			
MotionTask 8 ms	1	8	2
MotionTask 6 ms	-	8	2
MotionTask 4 ms	-	8	1
MotionTask 2 ms	-	4	-
MotionTask 1 ms	-	2	-

2.1.6 MotionOne CM software - runtime licences

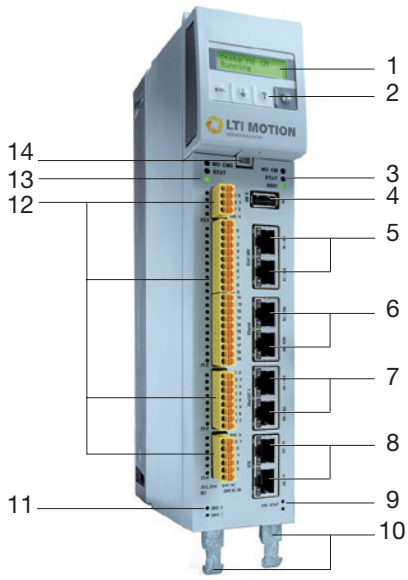
This chapter describes the software licences available for control and data display solutions.
At least one licence must be used per control, depending on the functionality of the application. All control licences automatically include the functionality: Linux real-time extension and CODESYS 3.x programming system.
A licence is also to be used per data display solution in an application.

Control licence	To be used for	Functionality	Art. no.
Runtime licences for basic control MO CM-x –ST without sector package			
Licence G3 MFB		MotionControl as per PLCopen: CODESYS 3.x programming system Motion Control according to PLCOpen (Part 1 and 2) – interpolated single-axis movements and electronic gearing cam plate editor	1557.1010
Licence G3 EasyMotion		Motion Control runtime licence for trajectory control: • As for “MFB” and in addition: – IEC interface for controlling co-ordinated movements (trajectories) – KAIRO programming language for trajectory control – Trajectory standard functions: synchronous point-to-point movement, linear and circular path movement, geometric blending – Per control – Supports following kinematics: Cartesian handling, H-portal, Scara, articulated arm	1557.1011
• Licence G3 MultiKin	Per control, for each kinematic additional to EasyMotion	• Does not include runtime or Motion licences • One licence for each additional kinematic with EasyMotion package on the same control	1557.1012
• Licence G3 Trigger Points	Additional licence for path control with licences G3 EasyMotion or G3 Motion	Additional functions: • Switching points with prediction on the trajectory	1557.1020
• Licence G3 Workzone	Additional licence for path control with licences G3 EasyMotion or G3 Motion	Additional functions: • Working area monitoring	1557.1021
Licence G3 Motion	Per control, with one robotic kinematic	Runtime licence Motion • As for "MFB" and in addition: – KAIRO interpreter and robot management according to PLCOpen – Standard functions for robotics: synchronous point-to-point movement, linear and circular path movement, absolute blending – Robotics expanded functions: path-true restriction of the axis speeds and accelerations, axis/rail/6D tracking – Per control – Supports following kinematics: cartesian handling, H-portal, Scara, articulated arm, delta	1557.1013
• Licence G3 Motion MultiKin	Per control, for each kinematic feature additional to G3 Motion	Does not include runtime or Motion licences One licence for each additional kinematic feature with G3 Motion package on the same control	1557.1014
Runtime licences for sector-specific control MO CM-x –XT in the machine tool sector			
		In preparation	

1) Runtime licences are required per control used. Higher runtime licences include the functions of the subordinate licences.

Runtime licence for data display solutions			
Data display licence	To be used for	Functionality	
Licence G3 ViewTrend	Per control or active data display solution	Data display runtime licence - Linux operating system Java graphics library LTI Data display framework This licence is required for the following applications: a) Control using stationary passive monitor via DVI --> per control b) Active panel stationary on a control or mobile panel for several controllers --> per panel	1557.1016
Licence G3TeachView	Per control and teach data display solution on mobile control units (LAOP Txx-Teach)	As for “View Trend” and in addition: Runtime licence EasyMotion Teach-In data display system for trajectory control - Linux operating system - Java graphics library LTI **Note**: Can only be used on model “OPMxx-Teach” mobile control units (in preparation).	1557.1018

2.1.7 MotionOne CM - arrangement of the connections



MotionOne CM - control module - overview of the connections			
1	MMI Display	8	Slave field bus
2	Control panel	9	Slave field bus status LEDs
3	Status LEDs (CM, STAT, DISK)	10	Strain relief / cable shielding connection
4	USB port (USB 0)	11	MO CM S safety relay status LEDs (optional)
5	EtherCAT interface	12	MO CM S on-board safety I/O (optional)
6	2x Ethernet interface	13	MO CM S status LEDs, safety control (optional)
7	Second EtherCAT master only MO CM 6.x	14	Catch for “busbar” cover

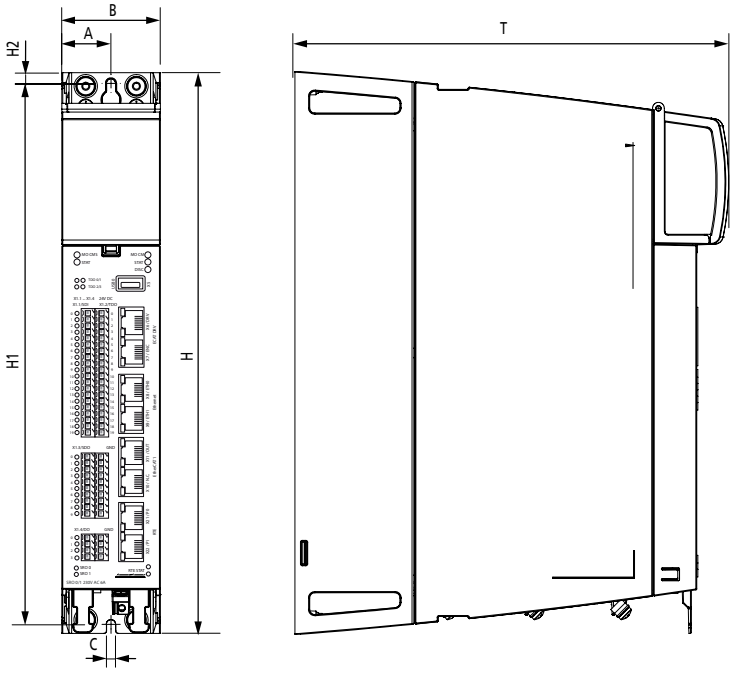
On the underside of the MotionOne CM control module there are 2 further USB ports (USB1, USB2), the graphic interface (DVI) and the PCI external connection (optional). For more detailed information see the operation manual.

2.1.8 MotionOne CM - installation and dimensions

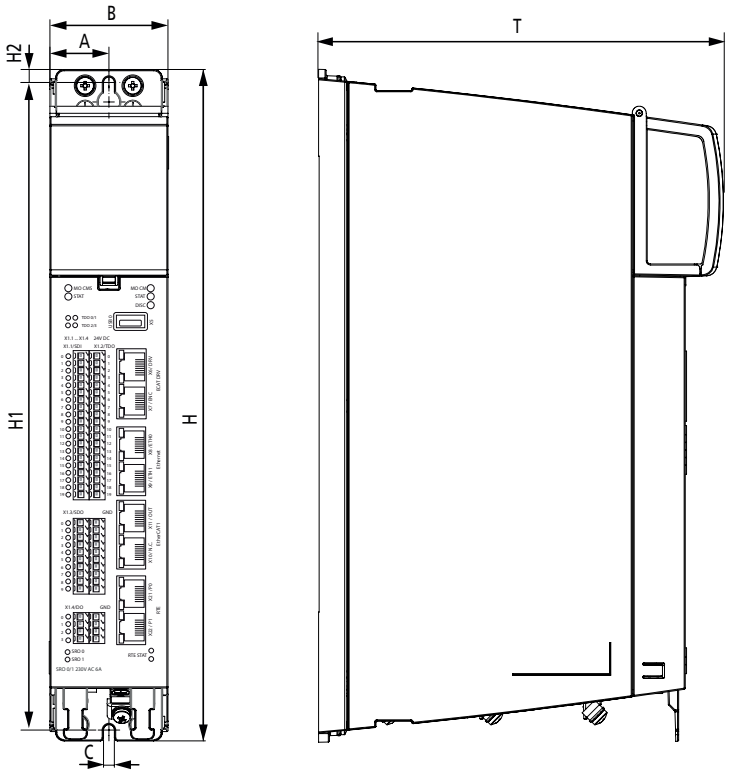
MotionOne CM		
Device type	MOCM-x.x**0**xx,xxxx.x	MOCM-x.x**1**xx,xxxx.x
Cooling method	With heat sink (air-cooled)	Cold plate
Weight	2.9 kg	2.4 kg
Mounting method	Vertical mounting with unhindered air flow	Vertical mounting on thermally conductive film
Side clearance	0 mm	0 mm
B (width)	55 mm	55 mm
H (height)	310 mm	310 mm
D (depth) [1)]	241 mm	188.5 mm
H1	299 mm	299 mm
H2	6 mm	6 mm
A	27.5 mm	27.5 mm
A1	-	-
C	5 mm	5 mm
Screws	2x M4	2x M4

1) *Without terminals/connections*

Dimensional sketch with heat sink, air-cooled



Dimensional sketch, cold plate



NOTE:
You will find more information on mounting in the Operation Manual MotionOne CM Control (V0.01, in preparation).

2.2 MotionOne CM - accessories

2.2.1 Memory card LAXC 320/A

Suitable for central assemblies
MO CM 3.x, MO CM 6.x

- Type: CFast
- Memory capacity: 2 GB
- Data carrier for application, device description and operating system

Article designation: LAXC 320/A
Article number: 1553.4001

2.2.2 Connector sets

- EtherCAT connection:
  8-pin RJ-45 connector required.
- ·· Connector with terminal connections:

Article designation	Number	Description	Comment	Article number
LAXT 215/A	2	FMC 1.5/4-ST-3.5	For on-board safety IO MO CM x.**S**xxx.**2**xxx.x	1553.2001
	2	FMC 1.5/10-ST-3.5		
	2	FMC 1.5/20-ST-3.5		
	1	BLZ 7.62HP/04/180 SN BK BX		
	1	BLZ 7.62 ZE03 BK BX		

NOTE:
- Connectors with terminal connections are not included in the scope of supply! Please order separately from LTI.
- You will find technical data on the connectors in the data sheet from the manufacturer.

2.3 ServoOne CM - axis controller

Single, double and triple-axis controllers

Article designation: see order code

Comprehensive performance scaling

The automation system SystemOne offers axis controllers as single-axis, double-axis and triple-axis controllers in a power range up to 32 A for optimal system design.
Cost-effective drive systems for 4 axes (3 + 1), 5 axes (3 + 2), 6 axes (3 + 3) or more can therefore be combined without problems and that not only for a specific sector, as the control technology meets the highest requirements, applications in the machine tool industry are possible. Due to the innovative usage of technology, the control performance also remains independent of the number of drive controller axes. Thanks to the development of a special drive ASIC, consistent performance from single-axis to triple-axis controllers is realised. There are also no restrictions on the usage of different encoder technologies, as proven interfaces such as resolver, sine/cosine, HIPERFACE® or EnDAT
are available along with the latest one-cable solutions to the servomotor.

Central supply

ServoOne CM axis controllers are supplied with power and auxiliary power via a central supply unit ServoOne CMP.
The number of axis controllers that can be arranged beside a supply unit is dependent on the power (power supply and auxiliary power supply) required for the application and must be taken into account during the planning of the multi-axis system. A maximum of 9 axis controllers (corresponding to a maximum of 27 axes) can be operated on a supply unit.

Safety systems

The axis controller provides scaleable integrated safety technology. In the standard model the functions STO (Safe Torque Off) and SBC (Safe Brake Control) are available.
The expanded, optional “functional safety” forms, together with the central safety control CMS, a system for axis and path monitoring connected via EtherCAT. This can include safe and non-safe encoders and encoder combinations (HIPERFACE DSL®, SinCos, TTL and HTL) that are evaluated directly on the axis controller.

Field bus

The ServoOne CM axis controllers are designed for operation on the EtherCAT CoE field bus system. Bus cycle times of a minimum of 125 µs can be configured.
In operation, service and diagnostics access is by tunnelling via the central control (EtherCAT EoE). For this purpose the control must support the routing function for TCP/IP communication via EoE (Ethernet over EtherCAT). Digital inputs are available for axis-related functions, such as limit switch or reference mark evaluation.

Technical information

Axis controller ServoOne CM			Single-axis controller	Double-axis controller	Triple-axis controller
	Rated current	Maximum current [1]			
Size 1	1.5 A	4.5 A	x	x	x
	3 A	9 A	x	x	x
	6 A	18 A	x	x	x
	12 A	36 A	x	-	-
	16 A	48 A	x	-	-
Size 2	12 A	36 A	-	x	x
	16 A	40 A	-	x	-
	24 A	72 A	x	-	-
	32 A	80 A	x	-	-
Dimensions (air-cooled) H x W x D	Size 1		310 mm x 55 mm x 241 mm		
	Size 2		310 mm x 110 mm x 241 mm		
Multi-encoder interface (Resolver, SinCos, SinCos + HIPERFACE®, EnDAT 2.1, EnDAT 2.2)			1	2	3
Single encoder interface SinCos, TTL			1	2	1 (axis 1)
Field bus			EtherCAT CoE		
Standard inputs			9 standard inputs (1 ms) 3 touchprobes (2x 2 µs, 1x 10 µs)		
Safety inputs			4 inputs (1 ms)		
Motor holding brake			Max. 24 VC, 2 A, (SBC as per SIL2)		
Standard safety technology			STO (SIL3, PLe, Cat 4) + SBC (SIL3, PLe, Cat 4)		
Functional safety technology			In preparation		
Type of cooling			Wall mounting (heat sink air-cooled), cold plate		
Mains filter			Ext. combined mains filter for supply unit		
Interfaces			ECAT EtherCAT CoE		

1) ... Overload for 500 ms (@4 kHz, 400 VAC)

2

2.3.1 ServoOne CM axis controller - Order code

Name			SO	CM	-	3	.	0	0	0	6	.	1	1	0	0	.	0
ServoOne CM																		
Axes	1:	Single-axis controller																
	2:	Double-axis controller																
	3:	Triple-axis controller																
Supply	0:	DC voltage (from SO CMP supply unit)																
Cooling method	0:	Wall mounting (heat sink, air-cooled)																
	1:	Cold plate																
Rated current	01:	1.5 A																
	03:	3 A																
	06:	6 A																
	12:	12 A																
	18:	18 A																
	24:	24 A																
	32:	32 A																
Encoder interface	0:	None																
	1:	Standard encoder interface																
	2:	Standard encoder interface and HIPERFACE DSL® (one-cable solution)																
	3:	HIPERFACE DSL® (one-cable solution)																
Safety functionality	1:	Standard SD0 (STO + SBC)																
	2:	SDC (encoder version SinCos - HDSL(R))*																
	3:	SDC (encoder version SinCos + EnDAT2.2)*																
	4:	SDC (encoder version resolver + HDSL(R))*																
	5:	SDC (encoder version resolver + EnDAT2.2)*																
Extras	0:	None																
	1:	Coated																
Model	0:	Standard																
Version index																		

** In preparation*

Scope of supply:

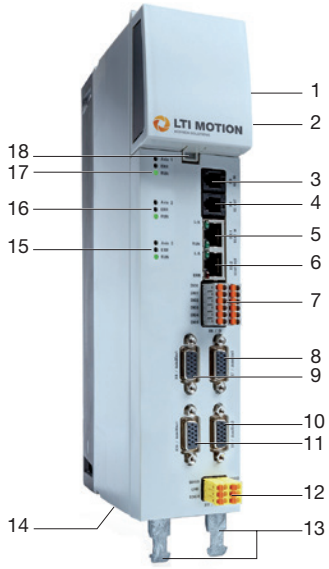
- Axis controller
- Communication cable set (XCom and EtherCAT connection cable, description from page 51).
- Product DVD incl. safety instructions (description from page 52).

Order as accessory:

Connector set - axis controller (description from page page 55).

Space for notes

2.3.2 ServoOne CM axis controller - arrangement of the connections



Types			
SO CM-1.xxxx.x	ServoOne CM single-axis controller		
SO CM-2.xxxx.x	ServoOne CM double-axis controller		
SO CM-3.xxxx.x	ServoOne CM triple-axis controller		
Item	**Designation**	**Function**	**Details**
1	X1	Control supply 24 V DC	Via copper busbar, under the cover
2	X2	DC link +/- power supply	Via copper busbar, under the cover
3	X3	Cross-communication input	Connection, only for system-internal cross-communication
4	X4	Cross-communication output	Connection, only for system-internal cross-communication
5	X5.1	EtherCAT IN, input field bus	Optional: EtherNet interface for PC with DriveManager 5
6	X5.2	EtherCAT OUT, output field bus	
7	X6	Digital inputs	Programmable
8	X7	Encoder interface	For usage and assignment see operation manual ServoOne CM - axis controller
9	X9[1)]	Encoder interface	
10	X8	Encoder interface	
11	X10[1)]	Encoder interface	
12	X11	Safe digital inputs	Safety function
13	-	Strain relief / cable shielding connection	
14[3)]	X12	Power connection motor 1	With integrated connections for motor brake and motor temperature monitoring, or connection of one-cable solution with HIPERFACE DSL® encoder (LSP-04-x to LSP-13-x motors)
	X13[1)]	Power connection motor 2	
	X14[2)]	Power connection motor 3	
	S-ADR	DIL switch	Configuration STO/SBC or setting address FSoE
15	-	Status LEDs (axis 3)	
16	-	Status LEDs (axis 2)	
17	-	Status LEDs (axis 1)	
18	-	Catch for "busbar" cover	

Key for the figure "Arrangement of the connections on the ServoOne CM axis controller".

1) ... Only on ServoOne CM double and triple-axis controllers.

2) ... Only on ServoOne CM triple-axis controllers.

3) ... Arranged on the underside of the ServoOne CM axis controller.

NOTE:
You will find more detailed descriptions and specifications on the above stated connections in the operation manual for the ServoOne CM axis controller (ID. no.: 1400.200B.x-xx).

2.3.3 ServoOne CM axis controller - technical data

ServoOne CM axis controller	Unit	SOCM-1.xx01	SOCM-2.xx01	SOCM-3.xx01	SOCM-1.xx03	SOCM-2.xx03	SOCM-3.xx03
Control section							
Control voltage	V DC	24 ± 10 %					
Control voltage on usage of a motor holding brake with cable length < 50 m	V DC	24 -5 % / +10 %					
Max. switch-on current on 24 V supply, per device	A	1.8 A @ 24 V / 1 s and 2.2 A @ 18 V / 1 s					
Power consumption, typical	W	48	54	60	48	54	60
Power output brake driver	W	48 max.	2 x 48 max.	3 x 48 max.	48 max.	2 x 48 max.	3 x 48 max.
DC link							
Capacitance in the DC link	µF	165	165	165	165	165	165
DC resistance in the DC link (DC+ to DC-)	kΩ	146	146	146	146	146	146
Rated power @ 3 x 230 V	kW	0.6	0.6	0.6	0.6	0.6	0.6
Rated power @ 3 x 400/480 V	kW	1.1	1.1	1.1	1.1	1.1	1.1
Power section							
Permissible switching frequencies	kHz	2 / 4 / 8 / 12 / 16 kHz					
Rate of rise of voltage on the output with 10 m motor cable (10 %-90 %)	kV / µs	3 ...8 kV / µs					
Output frequency range @ 2/4 kHz	Hz	0 … 400 Hz					
Output frequency range @ 8 kHz	Hz	0 … 800 Hz					
Output frequency range @ 16 kHz	Hz	0 … 1600 Hz					
Ambient temperature	°C	5…40, up to 50 with derating					
Axis controller							
Power dissipation @ (400 V/ 4 kHz/ I_{rated}) in the interior	W	60.5	69	77.5	64	76	88
Power dissipation @ (400 V/ 4 kHz/ P_{rated}) via heat sink	W	12	24	26	24	48	72

Table 2.1 Technical data, 1.5 A to 3 A controller

ServoOne CM axis controller	Unit	SOCM-1. xx06	SOCM-2. xx06	SOCM-3. xx06	SOCM-1. xx12	SOCM-2. xx12	SOCM-3. xx12	SOCM-1. xx18	SOCM-2. xx16	SOCM-1. xx24	SOCM-1. xx32
Control section											
Control voltage	V DC	24 ± 10 %									
Control voltage on usage of a motor holding brake with cable length < 50 m	V DC	24 -5 % / +10 %									
Max. switch-on current at 1 s switch-on time per device	A	1.8 A at 24 V and 2.2 A at 18 V									
Power consumption with power stage (without motor holding brake)	W	48	54	60	43	54	60	48	54	48	48
Max. power output, motor holding brake output	W	48 max.	2 x 48 max.	3 x 48 max.	48 max.	2 x 48 max.	3 x 48 max.	48 max.	2 x 48 max.	48 max.	48 max.
DC link											
Capacitance in the DC link	µF	165	165	165	225	405	405	225	405	675	675
DC resistance in the DC link (DC+ to DC-)	kOhm	146	146	146	146	146	146	146	146	146	146
Rated power @ 3 x 230 V	kW	0.6	0.6	0.6	0.9	1.8	1.8	0.9	1.8	3.0	3.0
Rated power @ 3 x 400/480 V	kW	1.1	1.1	1.1	1.5	3.1	3.1	1.5	3.1	5.2	5.2

Table 2.2 Technical data, 6 A to 32 A controller

ServoOne CM axis controller	Unit	SOCM-1. xx06	SOCM-2. xx06	SOCM-3. xx06	SOCM-1. xx12	SOCM-2. xx12	SOCM-3. xx12	SOCM-1. xx18	SOCM-2. xx16	SOCM-1. xx24	SOCM-1. xx32
Power section											
Permissible switching frequencies	kHz	2 / 4 / 8 / 12 / 16 kHz									
Rate of rise of voltage on the output with 10 m motor cable (10 %-90 %)	kV / µs	3 ...8 kV / µs									
Output frequency range F_M @ 2/4 kHz	Hz	0 … 400 Hz									
Output frequency range F_M @ 8 kHz	Hz	0 … 800 Hz									
Output frequency range F_M @ 16 kHz	Hz	0 … 1600 Hz									
Ambient temperature	°C	5…40, up to 50 with derating									
Axis controller											
Power dissipation @ (400 V/ 4 kHz/ I_{rated}) in the interior	W	67.6	83.2	98.8	95	118	141	101.4	128.7	103	112.2
Power dissipation @ (400 V/ 4 kHz/ P_{rated}) via heat sink	W	40	80	119	87.3	174.7	262	120	233	176	240

Table 2.2 Technical data, 6 A to 32 A controller

Space for notes

ServoOne CM axis controller	Unit	SOCM-1.XX06	SOCM-2.XX06	SOCM-3.XX06
Control section				
Control voltage	V_{DC}	24 ± 10 %		
Power consumption with power stage (without motor holding brake)	W	48	54	60
Power consumption per encoder	W	Max. 1.4	Max. 1.4	Max. 1.4
Brake 24 V DC	W	Max. 48	Max. 2 x 48	Max. 3 x 48
Max. switch-on current on 24 V supply, per device	-	1.8 A at 24 V and 2.2 A at 18 V		
Max. switch-on current pulse duration	s	1		
DC link				
Capacitance in the DC link	µF	165	165	165
DC resistance in the DC link (DC+ to DC-)	kΩ	146	146	146
Rated power DC link circuit	kW	1.1	1.1	1.1
Power section				
Permissible switching frequencies	kHz	2 / 4 / 8 / 12 / 16		
Rate of rise of voltage on the output with 10 m motor cable (10 %-90 %)	kV / µs	3 … 8		
Output frequency range @ 4 kHz	Hz	0 … 400		
Output frequency range @ 8 kHz	Hz	0 … 800		
Output frequency range @ 16 kHz	Hz	0 … 1600		
Rated current @ 4 kHz, 400 V AC	A eff	1 x 6	2 x 6	3 x 6
Maximum current @ 4 kHz, 400 V AC	A eff	12 A per axis for 10 s		
Maximum current @ 4 kHz, 400 V AC	A eff	18 A per axis for 500 ms		
Ambient temperature	°C	5…40, up to 50 with derating		

- *Comments: The data on the current per axis in the axis controller 400/480 V AC relate to the feed voltage from the supply unit.*
- *Attention: Until the type test has been completed all technical data are only theoretical values and not assured characteristics.*

ServoOne CM axis controller	Unit	SOCM-1.XX12	SOCM-2.XX12	SOCM-3.XX12
Control section				
Control voltage	V_{DC}	24 ± 10 %		
Power consumption with power stage (without motor holding brake)	W	48	54	60
Power consumption per encoder	W	Max. 1.4	Max. 1.4	Max. 1.4
Brake 24 V DC	W	Max. 48	Max. 2 x 48	Max. 3 x 48
Max. switch-on current on 24 V supply, per device	-	1.8 A at 24 V and 2.2 A at 18 V		
Max. switch-on current pulse duration	s	1		
DC link				
Capacitance in the DC link	µF	405	405	405
DC resistance in the DC link (DC+ to DC-)	kΩ	146	146	146
Rated power DC link circuit	kW	3.1	3.1	3.1
Power section				
Permissible switching frequencies	kHz	2 / 4 / 8 / 12 / 16		
Rate of rise of voltage on the output with 10 m motor cable (10 %-90 %)	kV / µs	3 … 8		
Output frequency range @ 4 kHz	Hz	0 … 400		
Output frequency range @ 8 kHz	Hz	0 … 800		
Output frequency range @ 16 kHz	Hz	0 … 1600		
Rated current @ 4 kHz, 400 V AC	A eff	1 x 12	2 x 12	3 x 12
Maximum current @ 4 kHz, 400 V AC	A eff	24 A per axis for 10 s		
Maximum current @ 4 kHz, 400 V AC	A eff	36 A per axis for 500 ms		
Ambient temperature	°C	5…40, up to 50 with derating		

- *Comments: The data on the current per axis in the axis controller 400/480 V AC relate to the feed voltage from the supply unit.*
- *Attention: Until the type test has been completed all technical data are only theoretical values and not assured characteristics.*

ServoOne CM axis controller	Unit	SOCM-1.XX18 [1)]	SOCM-2.XX16 [1)]	SOCM-1.XX24	SOCM-1.XX32 [1)]
Control section					
Control voltage	V_{DC}	24 ± 10 %			
Power consumption with power stage (without motor holding brake)	W	48	54	48	48
Power consumption per encoder	W	Max. 1.4	Max. 1.4	Max. 1.4	Max. 1.4
Brake 24 V DC	W	Max. 48	Max. 2 x 48	Max. 48	Max. 48
Max. switch-on current on 24 V supply, per device	-	1.8 A at 24 V and 2.2 A at 18 V			
Max. switch-on current pulse duration	s	1			
DC link					
Capacitance in the DC link	µF	225	405	675	675
DC resistance in the DC link (DC+ to DC-)	kΩ	350	146	146	146
Rated power DC link circuit	kW	1.5	3.1	5.2	5.2
Power section					
Permissible switching frequencies	kHz	2 / 4 / 8 / 12 / 16			
Rate of rise of voltage on the output with 10 m motor cable (10 %-90 %)	kV / µs	3 … 8			
Output frequency range @ 4 kHz	Hz	0 … 400			
Output frequency range @ 8 kHz	Hz	0 … 800			
Output frequency range @ 16 kHz	Hz	0 … 1600			
Rated current @ 4 kHz, 400 V AC	A eff	1 x 18	2 x 16	1 x 24	1 x 32
Maximum current @ 4 kHz, 400 V AC	A eff	36 A per axis for 2 s	32 A per axis for 2 s	48 A per axis for 10 s	64 A per axis for 2 s
Maximum current @ 4 kHz, 400 V AC	A eff	48 A per axis for 500 ms	40 A per axis for 500 ms	66.8 A 500 ms	80 A for 500 ms
Ambient temperature	°C	5…40, up to 50 with derating			

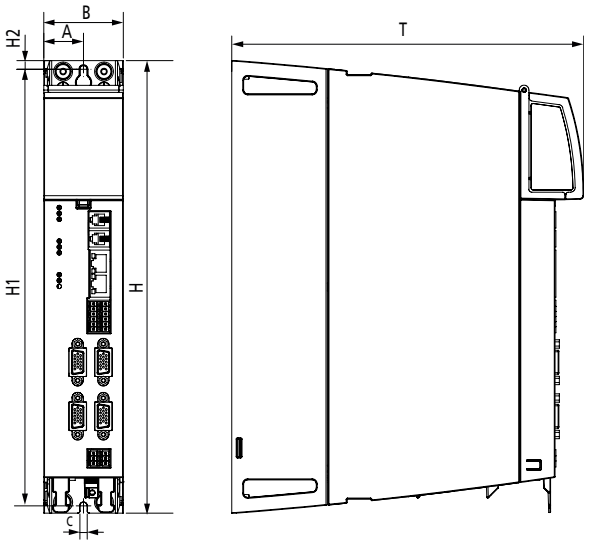
- *Comments: The data on the current per axis in the axis controller 400/480 V AC relate to the feed voltage from the supply unit.*
- *Attention: Until the type test has been completed all technical data are only theoretical values and not assured characteristics.*

NOTE:
You will find further technical data on the ServoOne CM axis controller in the operation manual.

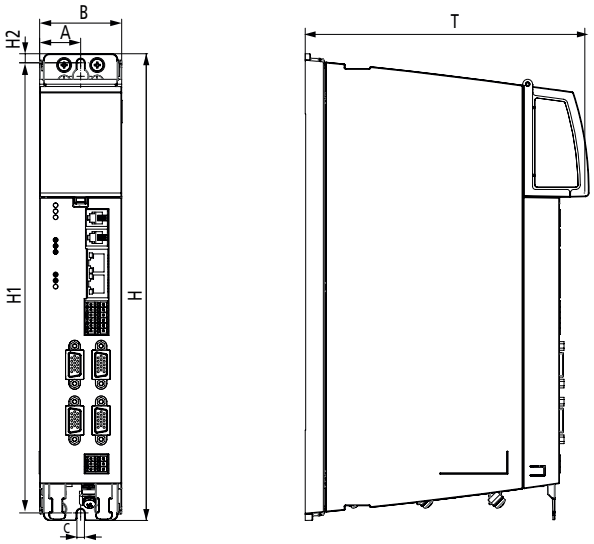
2

2.3.4 ServoOne CM axis controller - installation and dimensions (BG1)

ServoOne CM	BG1 (see table on page 42)	
Device type	SOCM-x.x**0**xx.xxxx.x	SOCM-x.x**1**xx.xxxx.x
Cooling method	Heat sink (air-cooled)	Cold plate
Weight	2.7 kg	2.3 kg
Mounting method	Vertical mounting with unhindered air flow	Vertical mounting on thermally conductive film
Side clearance	0 mm	0 mm
B (width)	55 mm	55 mm
H (height)	310 mm	310 mm
D (depth) [1)]	241 mm	188.5 mm
H1	299 mm	299 mm
H2	6 mm	6 mm
A	27.5 mm	27.5 mm
A1	-	-
C	5 mm	5 mm
Screws	2x M4	2x M4



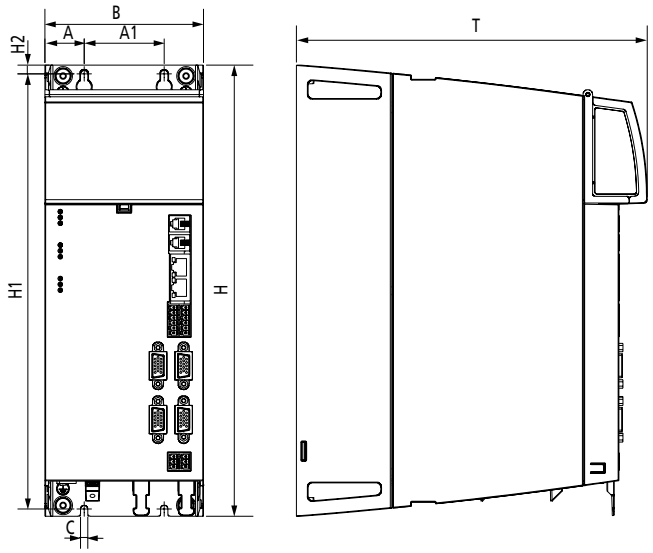
Dimensional sketch with heat sink (air-cooled) (BG1)



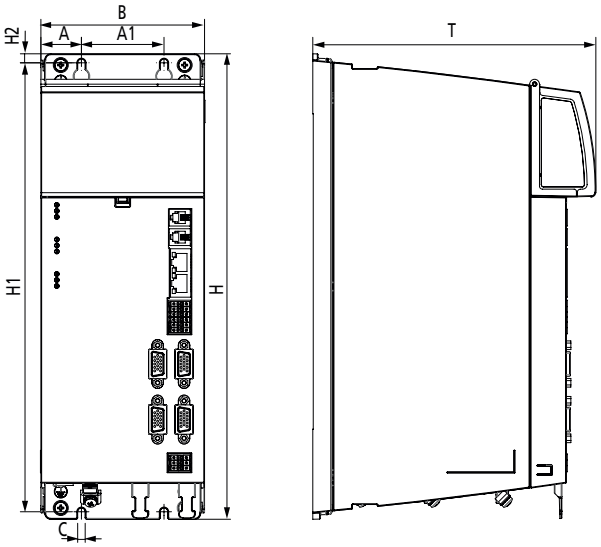
Dimensional sketch, cold plate (BG1)

2.3.5 ServoOne CM axis controller - installation and dimensions (BG2)

ServoOne CM	BG2 (see table on page 44)	
Device type	SOCM-x.x**0**xx.xxxx.x	SOCM-x.x**1**xx.xxxx.x
Cooling method	Heat sink (air-cooled)	Cold plate
Weight	4.5 kg	3.7 kg
Mounting method	Vertical mounting with unhindered air flow	Vertical mounting on thermally conductive film
Side clearance	0 mm	0 mm
B (width)	110 mm	109 mm
H (height)	310 mm	310 mm
D (depth) [1)]	241 mm	188.5 mm
H1	299 mm	299 mm
H2	6 mm	6 mm
A	27.5 mm	27.5 mm
A1	55 mm	55 mm
C	5 mm	5 mm
Screws	4x M4	4x M4



Dimensional sketch with heat sink (air-cooled) (BG2)



Dimensional sketch, cold plate (BG2)

NOTE:
You will find more information on mounting in the Operation Manual ServoOne CM Axis Controller (ID no.: 1400.200B.x-xx).

2.3.6 ServoOne drive systems - function overview comparison

Function	ServoOne Junior	ServoOne single-axis system	ServoOne multi-axis system	ServoOne CM
Commissioning				
Automatic motor identification	●	•	•	•
Automatic encoder offset definition	•	•	•	•
Autotuning	•	•	•	•
Electronic motor rating plate	-	Customer-spec. with HIPERFACE®	-	Specification in preparation
Electronic motor rating plate via EtherCAT	-	-	-	• 2)
Motor systems				
Rotary asynchronous motors	•	•	•	•
Rotary synchronous motors	•	•	•	•
Linear synchronous motors	•	•	•	•
Encoder types				
Multi-encoder interface: Resolver, EnDAT 2.1, EnDAT 2.2, HIPERFACE®	•	•	•	•
HIPERFACE DSL® one-cable solution	•	-	-	•
Single encoder interface (SinCos, TTL without absolute information)	-	-	-	•
Distance-coded encoder systems	•	•	•	-
Control modes				
Torque/force control	16 kHz	16 kHz	16 kHz	16 kHz
Speed control	8 kHz	8 kHz	8 kHz	8 kHz
Position control	8 kHz	8 kHz	8 kHz	8 kHz
Open-loop motor control VFC	-	o	o	-
Sensorless control of synchronous motors	1)	1)	1)	-
Control functions				
Field-weakening for asynchronous motors	•	•	•	• 2)
Field-weakening for synchronous motors	•	•	•	• 2)
Autocommutation for synchronous motors	•	•	•	• 2)
Predictive acceleration feed forward control	•	•	•	•
Predictive speed feed forward control	•	•	•	•
Freely configurable filters (PT1-PT4, band elimination filter etc.)	•	•	•	• 2)
Active vibration damping	•	•	•	• 2)
Quick stop without sensor	-	-	-	•
Reduction of the speed controller gain at low speeds	•	•	•	•
Correction methods				
GPOC (encoder correction)	•	•	•	• 2)
Friction torque compensation	•	•	•	• 2)
Detent torque compensation	•	•	•	• 2)
Axis/spindle error correction	•	•	•	• 2)
Motion profiles				
Point-to-point positioning	•	•	•	• 2)
Jerk limitation in the profile mode	•	•	•	• 2)
Override in the profile mode	•	•	•	• 2)
Interpolating positioning	Linear, spline	Linear, spline	Linear, spline	Linear, spline

• ... Standard, o ... Optional, – ... Not available, 1) ... On request, 2) ... In preparation

Function	ServoOne Junior	ServoOne single-axis system	ServoOne multi-axis system	ServoOne CM
Synchronous motion / electronic gearing	•	•	•	• 2) Gantry function in the multi-axis controller
Modulo/rotary axis	•	•	•	• 2)
Cam plates	o	o	o	–
Axis-guided homing runs	• As per CiA 402 (type 12 - 35)	• As per CiA 402 (type 12 - 35)	• As per CiA 402 (type 12 - 35)	• 2) As per CiA 402 (type 0 - 37)
Homing to block	•	• (Type 7 - 10)	•	• 2)
Non-volatile storage of the absolute position for the usage of singleturn encoders as multiturn (encoder window comparison)	–	–	–	• 2)
Virtual master	•	•	•	–
Standards-compliant motion profiles	CANopen CiA 402 (V2.0) sercos EtherCAT CoE PROFIdrive	CANopen CiA 402 (V2.0) sercos EtherCAT CoE PROFIdrive	CANopen CiA 402 (V2.0) sercos EtherCAT CoE PROFIdrive	EtherCAT CoE
Scaling in user units (°, µm, …), scaling as DriveManager support	•	•	•	• (Only CiA 402)
IO function				
Functions of the digital inputs	•	•	•	• Subset of ServoOne
Warning thresholds for overload monitoring	•	•	•	•
Cam group	–	–	–	–
Technology				
Programmable in IEC61131	o	o	o	–
Safety systems				
Support for EtherCAT FSoE	–	• 2)	• 2)	• 2)
Support for safety system SystemOne CMS	–	• 2)	• 2)	• 2)
Support for controls from other manufacturers	–	–	–	• 2)
EtherCAT field bus operation				
Interfacing to master, as per EtherCAT CoE (CAN over EtherCAT) CiA 402 V2.x	•	•	•	
Interfacing to master, as per EtherCAT CoE (CAN over EtherCAT) CiA 402 V3.x (multiple device profile)				•
DriveManager 5				
DriveManager from V5.5.x	•	•	•	• Subset of ServoOne
Point-to-point connection Ethernet control interface	•	•	•	
Point-to-point connection EtherCAT field bus interface	–	–	–	•

• ... Standard, o ... Optional, – ... Not available, 1) ... On request, 2) ... In preparation

2.4 ServoOne CMP - supply unit

ServoOne CMP - supply unit

Article designation: see order code

The power supply

The power for the multi-axis system comes in steps of 10 kW and 22 kW from a central supply unit with integrated 24 V/480 W auxiliary supply.

Axis controllers are arranged on the right of the supply unit on a rail system. The control modules MO CM or MO CM are mounted on the left. The connection of the axis controllers to the DC link supply and the 24 V DC auxiliary voltage is realised without wiring effort using the integrated busbar system. Only the 24 V DC auxiliary voltage is transmitted to the control. Digital outputs indicate the actual status.
The supply unit supplies the energy for the axis controller. Configuration, diagnostics and status information are realised via the first axis on the first axis controller in the drive group. A maximum of 9 axis controllers (maximum 27 axes) are allowed to be operated on one supply unit.

Safety systems

Test outputs provide OSSD output signals. The OSSD output signals are used for short circuit and cross-circuit testing on the wiring for the safe, digital inputs on the axis side.

Device protection/mains contactor

A relay output is provided with which it is possible to control an external mains contactor via the MotionOne CM control integrated in the system.

Technical information (for further details see operation manual)

Supply unit	10 kW (BG1)	22 kW (BG2)
Supply unit (air-cooled) dimensions H x W x D	310 x 55 x 241 mm	310 x 110 x 241 mm
Supply voltage	3 x 400 V AC	
Rated current I_n	18 A	35 A
Overload (1 s)	36 A	70 A
Brake chopper *	Yes, internal resistor optional	
External braking resistor min.	33 Ω	15 Ω
External braking resistor max.	90 Ω	90 Ω
Internal braking resistor R_B	56 Ω	28 Ω
Continuous braking power	BG1 = 75 W BG2 = 200 W	
Precharging	With charging current limiting	
Power supply unit 24 V DC, 20 A	Integrated (standard) **	
Mains contactor	Operation of an external mains contactor via integrated relay contact	
Mains filter	External combined mains filter	
Test outputs	2 (OSSD output signals are used to control the safe, digital inputs and test the drive controller wiring for short circuit and cross-circuit.)	
Interfaces	Internal cross-communication	

** ... Note: Only operate supply unit with braking resistor! Take into account for model with external braking resistor!*

*** ... Optionally without switched-mode power supply (external)*

2.4.1 ServoOne CMP central supply unit - order code

Name			SO CM	-	P	.	0	0	2	2	.	1	0	0	0	.	0
ServoOne CM																	
Model	P:	Passive															
Power supply	0:	3x 230-480 V AC															
Cooling method	0:	Wall mounting (heat sink, air-cooled)															
	1:	Cold plate															
Power	10:	10 kW (BG1)															
	22:	22 kW (BG2)															
24 V control voltage supply	0:	Without 24 V switched-mode power supply															
	1:	With 24 V switched-mode power supply, 480 W															
	2:	With 24 V switched-mode power supply, 480 W, with 24 V back-up (power failure)															
Braking resistor *	0:	External															
	1:	Internal															
Extras	0:	None															
	1:	Coated															
Model	0:	Standard															
Version index																	

*** ... Note:** *Only operate supply unit with braking resistor. Take into account for model with external braking resistor!*

NOTE:
A maximum of 9 axis controllers (maximum 27 axes) can be operated on one supply unit.

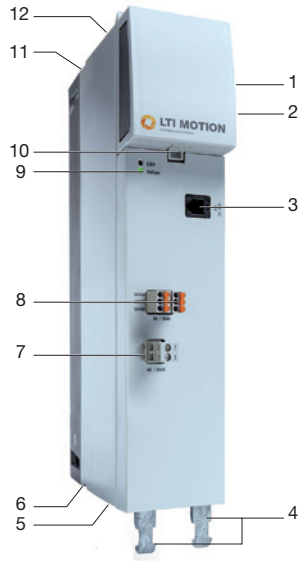
Scope of supply

- Supply unit
- Product DVD incl. safety instructions (description from page 51)

Order as accessory

- Connector set - supply unit (description from page 52)

2.4.2 ServoOne CMP central supply unit - arrangement of the connections



Types		
SO CMP.xx10.x		
SO CMP.xx22.x		
Item	**Designation**	**Function**
1	U_{St}	Control supply 24 V DC output via busbar (as per EN 61131-2)
2	U_{ZK}	DC link +/- power supply output
3	X3	Cross-communication output (XC out)
4	-	Strain relief / cable shielding connection
5[1)]	X7	Switched-mode power supply mains input (L1, L2 / 1 x 400 V AC)
6[1)]	X8	Mains input (L1, L2, L3 / 3 x 400 V AC)
7	X5	Relay contact (R002) programmable
8	X6	Relay contact (R001) digital outputs (TP02)
9	-	Status LEDs
10	-	Busbar cover catch
11[2)]	X1	Connection for braking resistor
12[2)]	X2	24 V control supply output via terminals

** Note: Only operate supply unit with braking resistor. Take into account for model with external braking resistor!*

1) ... Arranged on the underside of the ServoOne CM axis controller.

2) ... Arranged on the top of the ServoOne CM axis controller.

NOTE:
You will find descriptions and specifications on the above stated connections in the Operation Manual ServoOne CMP Supply Unit (ID. no.: 1400.201B.x-xx).

NOTE:
- If the ServoOne CMP supply unit BG2 is installed in your SystemOne CM system, you will need an EtherCAT connection cable with a length of 500 mm (standard) or 300 mm (with angled connectors).
See “EtherCAT topology” on page 79.
- An EtherCAT connection cable of length 500 mm (standard, page 73) is included with the ServoOne CMP supply unit BG2.

2.4.3 ServoOne CMP supply unit - technical data (BG1)

Technical data, ServoOne CMP - 10 kW supply unit

Device	SOCM-P.0010 / SOCM-P.0110		
Input, mains side			
Mains voltage U_N ± 10 %, 3 times	230 V AC	400 V AC	480 V AC
Continuous current [$A_{AC\ eff}$] typical	21.4 A_{eff}	21.4 A_{eff}	18 A_{eff}
Peak current [A_{AC}] typical	43 A_{eff}	43 A_{eff}	36 A_{eff}
Continuous power typical (dependent of the mains impedance)	8 kVA	14 kVA	
Rectifier power dissipation typical	50 W		
Asymmetry of mains voltage	±3 % max.		
Frequency	50 -60 Hz ± 10 %		
Max. cable cross-section X12	1.5 ... 6 mm^2 (fine-stranded cable with/without ferrules) mm^2		
DC link output			
DC link voltage	325 V DC	565 V DC	678 V DC
Continuous current	18 A DC	18 A DC	15 ADC
Peak current 2 x I_N for 1 s mains choke not required	36 A DC	36 A DC	30 ADC
Continuous power P_N	5.75 kW	10 kW	10 kW
Peak power 2 x P_N for 1 s	11.5 kW	20 kW	20 kW
DC link capacitance CMP only	330 µF		
Max. permissible DC link capacitance SOCM + CMP [1)]	2000 µF (1670 + 330) max.		
Power dissipation P_{rated} in the interior	85 W		

NOTE:
Observe maximum permissible DC link capacitance!
You will find more detailed information in the Operation Manual ServoOne CMP Supply Unit (ID. no.: 1400.201B.x-xx).

Technical data, brake chopper - 10 kW supply unit

Device	SOCM-P.0010 / SOCM-P.0110		
Mains voltage	230 V AC	400 V AC	480 V AC
Brake chopper power electronics			
Brake chopper switching threshold	411 V	652 V	765 V
Overvoltage protection	446 V	687 V	800 V
Continuous braking power [kW]	1.8 kW	3 kW	3 kW
Peak braking power for maximum 0.5 s *)	8 kW	13 kW	16 kW
Maximum ohmic resistance of an externally installed braking resistor	60 Ω	90 Ω	90 Ω
Minimum ohmic resistance of an externally installed braking resistor	21 Ω	33 Ω	38 Ω
Supply unit with integrated braking resistor: (model SO CM-P.xxxx.11xx.x)			
Continuous braking power	75 W		
Peak braking power for maximum 0.5 s *)	3 kW		
Ohmic resistance of the integrated braking resistor	56 Ω		

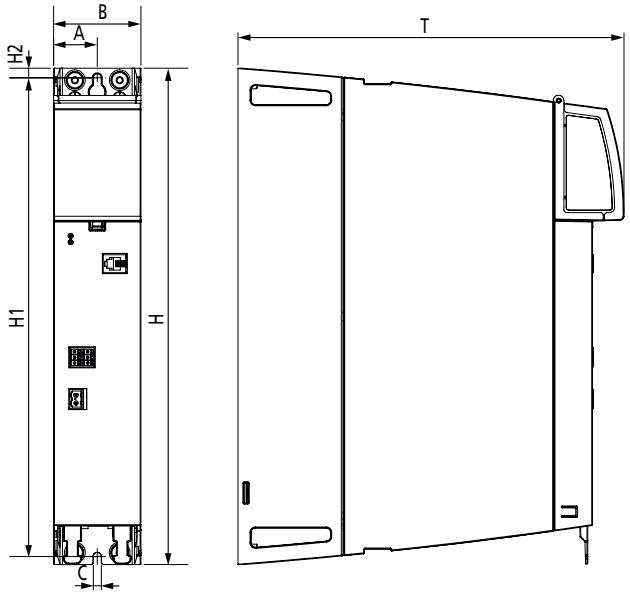
*) After this time shutdown is initiated based on I^2 x t

2.4.4 ServoOne CMP supply unit - installation and dimensions (BG1)

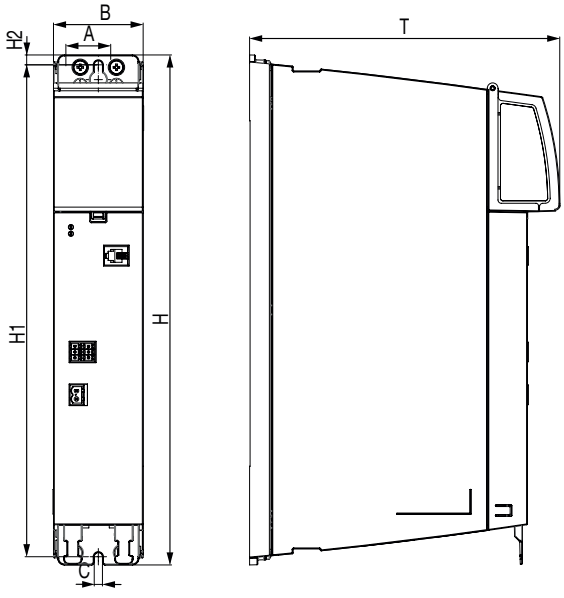
Device type	SOCM-P.0010.x	SOCM-P.0110.x
Cooling method	Heat sink (air-cooled)	Cold plate
Weight	2.65 kg	2.2 kg
Mounting method	Vertical mounting with unhindered air flow	Vertical mounting on thermally conductive film
Side clearance	0 mm	0 mm
B (width)	55 mm	54.5 mm
H (height)	310 mm	310 mm
D (depth) [1)]	241 mm	188.5 mm
H1	299 mm	299 mm
H2	6 mm	6 mm
A	27.5 mm	27.5 mm
A1	-	-
C	5 mm	5 mm
Screws	2x M4	2x M4

1) ... Without terminals/connectors

NOTE:
- The supply unit is fitted to the left of the axis controllers.
- Fit the axis controller with the highest power next to the supply unit (for double-axis and triple-axis controllers it is the total power that counts).



Dimensional sketch with heat sink (air-cooled, BG1)



Dimensional sketch, cold plate (BG1)

NOTE:
You will find more detailed information on mounting in the Operation Manual ServoOne CMP Supply Unit (ID. no.: 1400.201B.x-xx).

2.4.5 ServoOne CMP supply unit - technical data (BG2)

Technical data, ServoOne CMP - 22 kW supply unit

Device	SOCM-P.0022 / SOCM-P.0122		
Input, mains side			
Mains voltage U_N ± 10 %, 3 times	230 V AC	400 V AC	480 V AC
Continuous current [$A_{AC\ eff}$] typical	45 A	45 A	38 A
Peak current [A_{AC}] typical	90 A	90 A	76 A
Continuous power typical (dependent of the mains impedance)	18.5 kVA	32 kVA	
Rectifier power dissipation	110 W		
Asymmetry of mains voltage	±3 % max.		
Frequency	50 -60 Hz ± 10 %		
Max. cable cross-section of the terminals X12	1.5 ... 16 mm^2 (fine-stranded cable with/without ferrules)		
DC link output			
DC link voltage	310 V DC	565 V DC	678 V DC
Continuous current	35 ADC	35 ADC	29 ADC
Peak current 2 x I_N for 1 s mains choke not required	70 ADC	70 ADC	58 ADC
Continuous power P_N	12 kW	22 kW	
Peak power 2 x P_N for 1 s	24 kW	44 kW	
DC link capacitance CMP only	840 µF		
Permissible DC link capacitance SOCM + CMP [1)]	4000 µF (3160 + 840) max.		
Power dissipation P_{rated} in the interior	130 W		

Technical data, brake chopper - 22 kW supply unit

Device	SOCM-P.0022 / SOCM-P.0122		
Mains voltage	230 V AC	400 V AC	480 V AC
Brake chopper power electronics			
Brake chopper switching threshold	411 V	652 V	765 V
Overvoltage protection	446 V	687 V	800 V
Continuous braking power [kW]	3.5 kW	6 kW	**)
Peak braking power for maximum 0.5 s *)	20 kW	32 kW	**)
Maximum ohmic resistance of an externally connected braking resistor	50 Ω	90 Ω	**)
Minimum ohmic resistance of an externally installed braking resistor	8 Ω	15 Ω	**)
Supply unit "with integrated braking resistor" (model SO CM-P.xxxx.11xx.x)			
Continuous braking power [kW]	200 W		
Peak braking power for maximum 0.5 s *)	6 kW		
Ohmic resistance of the integrated braking resistor	28 Ω		

*) After this time shutdown is initiated based on I^2 x t

**) Was not available at the time of going to press.

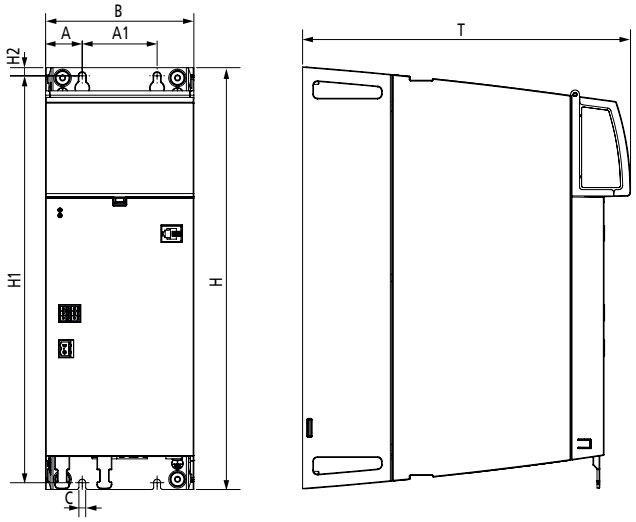
NOTE:
Please only the operate supply unit with braking resistor! You will find further information on this aspect and on safety-related aspects in the Operation Manual ServoOne CMP Supply Unit (ID no.: 1400.201B.x-xx).

2.4.6 ServoOne CMP supply unit - installation and dimensions (BG2)

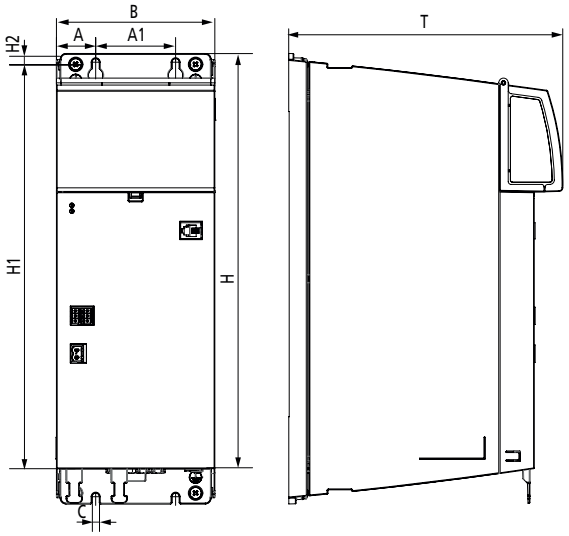
Device type	SOCM-P.0022.x	SOCM-P.0122.x
Cooling method	Heat sink (air-cooled)	Cold plate
Weight	5.1 kg	4.2 kg
Mounting method	Vertical mounting with unhindered air flow	Vertical mounting on thermally conductive film
Side clearance	0 mm	0 mm
B (width)	110 mm	109 mm
H (height)	310 mm	310 mm
D (depth) [1)]	241 mm	188.5 mm
H1	299 mm	299 mm
H2	6 mm	6 mm
A	27.5 mm	27.5 mm
A1	55 mm	55 mm
C	5 mm	5 mm
Screws	4x M4	4x M4

1) ... Without terminals/connectors

NOTE:
- The supply unit is fitted to the left of the axis controllers.
- Fit the axis controller with the highest power next to the supply unit (for double-axis and triple-axis controllers it is the total power that counts).



Dimensional sketch with heat sink (air-cooled, BG2)



Dimensional sketch, cold plate (BG2)

NOTE:
You will find more detailed information on mounting in the Operation Manual ServoOne CMP Supply Unit (ID. no.: 1400.201B.x-xx).

2.5 Scope of supply SystemOne CM

2.5.1 XCom connection cable - internal cross-communication

Technical data

Article designation	XCom connection cable
Article number	1 400.601.0
Description	System-internal communication
Cable length	240 mm
Connections	2x RJ10 connector

2.5.2 ECAT - EtherCAT connection cable (standard)

Technical data

Article designation	EtherCAT connection cable
Description	EtherCAT connection cable between axis controllers
Cable length	250 mm (art. no. 112 675) 500 mm (art. no. 113 025)
Cable type	Patch cable SF/UTP Cat.5e
Connections	2x RJ45 connector

NOTE:
EtherCAT connection cable of length 500 mm (standard):
- You will need this cable if the ServoOne CMP supply unit BG2 is fitted in your SystemOne CM system.
- It is included with the ServoOne CMP supply unit BG2.

Please also note the “EtherCAT connection cables with angled connectors” available as accessories and the explanations on the EtherCAT topology on page 62.

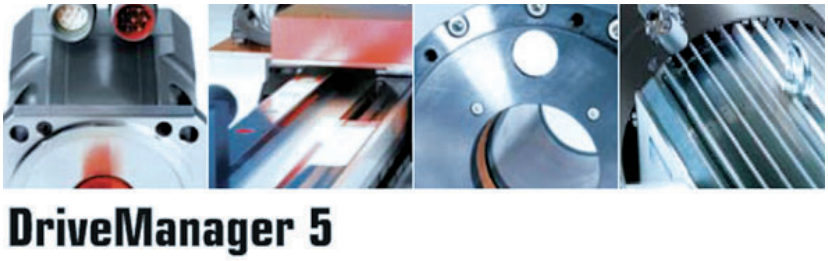
2.5.3 Product DVD with safety instructions

Article designation	Product DVD with safety instructions
Article number	1 020.850.0

2.6 SystemOne CM - accessories (additional components)

Contents	Comment	Page
PC user software DriveManager 5	Full version	page 54
Connector sets	Axis controller and supply unit	page 55
Data cables	Ethernet, USB, EtherCAT with angled connectors	page 57
Mains chokes	LR-	page 60
Braking resistors	BR-	page 62
Mains filter ServoOne CM	EMC	page 64
EMC cable clamps	Packing unit 100 pcs.	page 66
PE connection plate	Packing unit 50 pcs.	page 67
Selection of motor cables	Chapter 7	page 118
Selection of encoder cables	Chapter 7	page 118

2.6.1 PC user software DriveManager 5



DriveManager 5

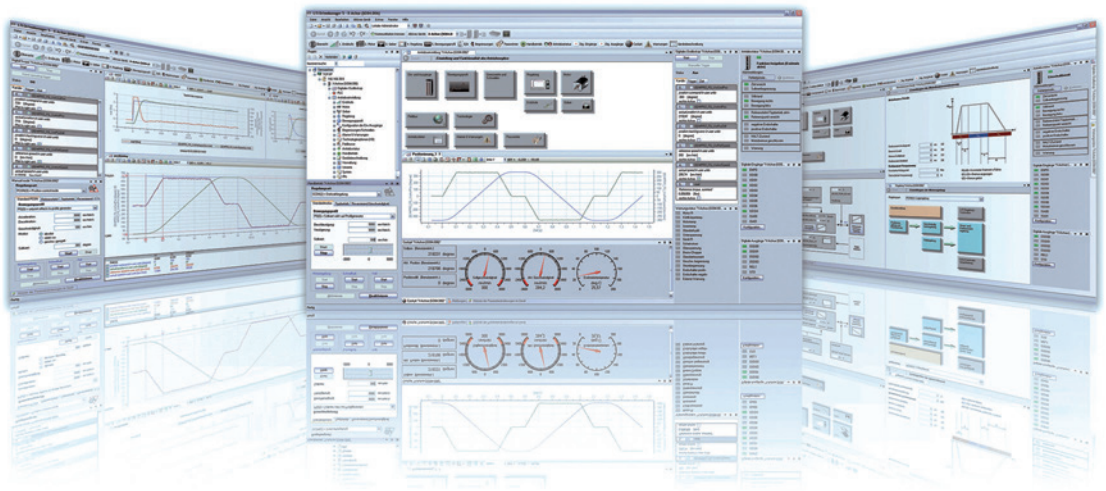
DriveManager 5	Article designation

Description

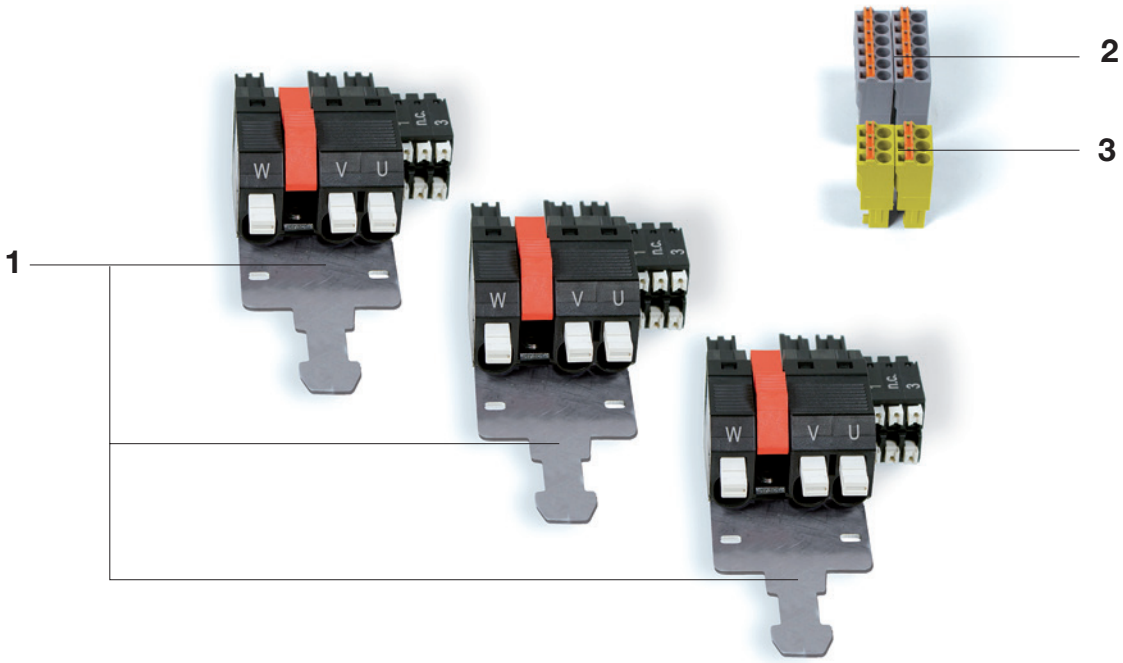
- The PC user software DriveManager 5 with integrated help ("Program help" and "Device help") and autotuning cuts commissioning times.
- DriveManager 5 has network support and is able to manage multiple axis controllers simultaneously in a project.
- For ServoOne CM a DriveManager version from V5.5.27 is recommended (basic support from V5.4.124).

Technical data	DriveManager 5
Support for the following functions	• Initial commissioning of one or more servocontrollers
	• Fast serial commissioning with a configurable commissioning file (containing firmware, parameters, iPLC program)
	• Operation and diagnostics, including using Cockpit and 6-channel oscilloscope – Firmware update for the axis controllers and supply units – Testing and commissioning of individual axes via manual mode function
	• Project management

User interface



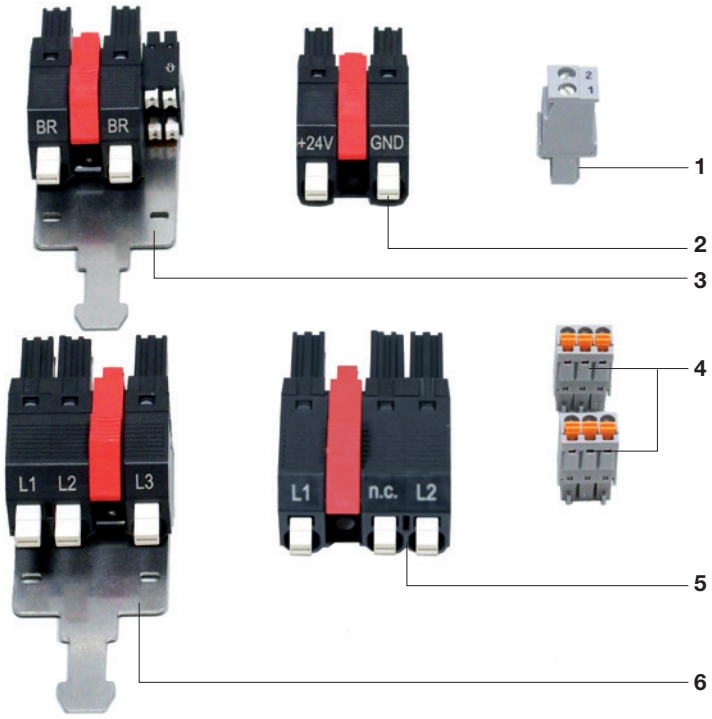
2.6.2 Connector set - axis controller



ServoOne CM - axis controller	Article number
Single-axis controller	1411.600.0
Double-axis controller	1412.600.0
Triple-axis controller	1413.600.0

Technical data		
Description		Connector sets, suitable for ServoOne CM axis controller
Connections	1	X12, X13, X14 - Motor power connections (with integrated connections for motor brake and motor temperature monitoring)
	2	X6 - Digital inputs (programmable)
	3	X11 - Digital inputs (safety function)

2.6.3 Connector set - supply unit



ServoOne CM - supply unit	Article number
Size 1 (10 kW)	1451.600.0
Size 2 (22 kW)	1452.600.0
Connector for switched-mode power supply (10 kW and 22 kW), see item 5.	1455.600.0

Technical data		
Description		Connector sets suitable for ServoOne CMP supply unit
Connections	1	X5 - Digital output (DO05) - relay output for control of main contactor (terminal)
	2	X1 - Connection for braking resistor incl. thermal contact (via terminals)
	3	X2 - Control supply 24 V DC output (via terminals)
	4	X6 - Digital outputs
	5	X7 - Switched-mode power supply mains input (L1, L2 / 2 x 400 V AC) - for 24 V control supply for the axis controllers and the MotionOne CM control
	6*	X8 - Mains input (L1, L2, L3 / 3 x 400 V AC) - for DC link power supply to the axis controllers

** ... Figure shows the connector for BG1. Connector for BG2 is larger.*

2.6.4 Data cables

CC-ECL03
Cable length (m)

Ethernet connection cable type CC-ECL03 (Ethernet) | Article designation

Technical data	CC-ECL03
Description	Connection cable between Ethernet connection on the servocontroller and PC with DriveManager
Cable length	3 m
Cable type	Crosslink Ethernet cable, CAT 5
Connections	2 x RJ45 connectors

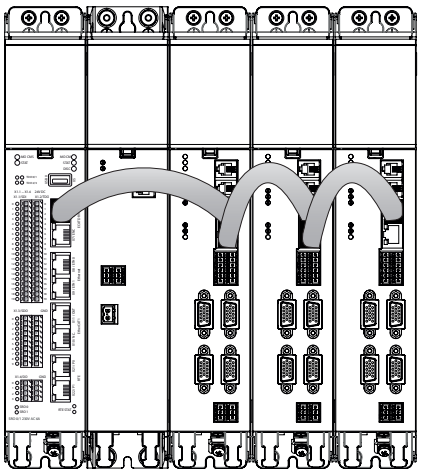
Ethernet connection cable type CC-ECL03 (Ethernet)

CC-ECATx.x-90°
Cable length (m)
0.2=0.2 m
0.3=0.3 m

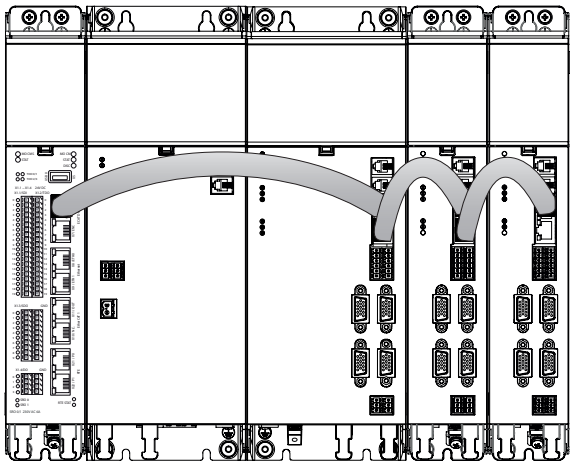
Article designation

Technical data	CC-ECL03
Description	Connection cable between Ethernet connection on the servocontroller and PC with DriveManager
Cable length	3 m
Cable type	Crosslink Ethernet cable, CAT 5
Connections	2 x RJ45 connectors
Article number	1400.602.0

NOTE:
On ordering EtherCAT connection cable with angled connectors please note:
·· Depending on the constellation of sizes (BG1, BG2) in your SystemOne CM system, you will require different cable lengths for the EtherCAT connection cables.
See the following example EtherCAT topologies with individual SystemOne CM modules to determine the cable length:



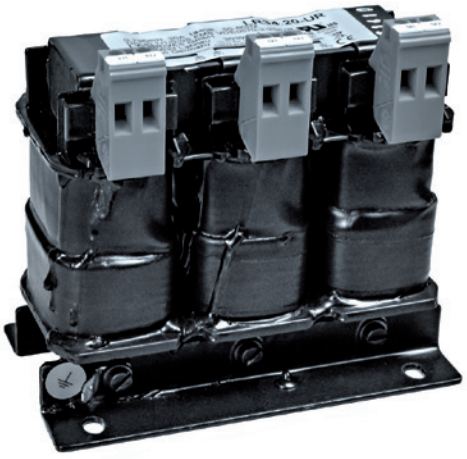
SystemOne CM system with
3x 20 cm EtherCAT connection cables
(angled connectors)



SystemOne CM system with
1x 30 cm and 2x 20 cm EtherCAT connection cables
(angled connectors)

Space for notes

2.6.5 Mains chokes



LR34.20-UR

LR34.xx-UR

Product range and voltage | Rated current

Article designation

Our recommendation:

- Use LR34.20-UR for ServoOne CMP - BG1 (10 kW)
- ·· Use LR34.44-UR for ServoOne CMP - BG2 (22 kW)

Technical data	LR34.20-UR	LR34.44-UR
Mains voltage	3 x 460 V -25 % +10 %, 50/60 Hz [1)]	
Overload factor	2.0 x I_N for 3 s	2.0 x I_N for 30 s
Ambient temperature	-25 °C to +40 °C, with power reduction up to 60 °C (1.3 % per °C)	
Installation altitude	1000 m, with power reduction up to 2000 m (6 % per 1000 m)	
Relative atmospheric humidity	15 ... 95 %, condensation not permitted	
Storage temperature	-25 °C to +70 °C	
Protection	IP00	
Short-circuit voltage	UK 2 % (corresponds to 4.6 V at 400 V)	
Permissible pollution degree	P2 as per EN 61558-1	
Thermal configuration	$I_{eff} \leq I_N$	
UL recognition	UL recognition for the USA and Canadian markets	

[1)] At mains frequency 60 Hz the power dissipation increases by approx. 5 - 10 %

NOTE:
You will find descriptions and specifications on the mains chokes in the following documents:
·· Line Chokes - Installation Manual (ID no.: 0925.20B.x-xx)
·· ServoOne CMP Supply Unit - Operation Manual (ID no.: 1400.201B.x-xx)

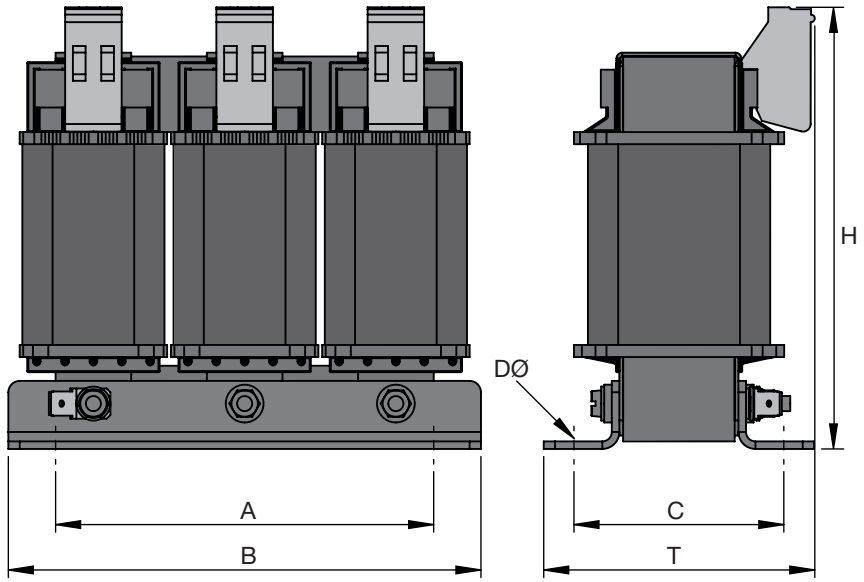
Three-phases mains chokes for ServoOne CMP

Article designation	Rated current [A]	U_K [%]	Power dissip. tot. [W]	Inductance [mH]	Total height [kg]	CU weight [kg]	Connection
LR34.20-UR	20	2	34	0.735	2.5	0.6	4 mm²
LR34.44-UR	45	2	51	0.33	5.0	2.0	10 mm²

Dimensions of three-phases mains chokes for ServoOne CMP

Article designation	B (width)	H (height)	T (depth)	A	C	D Ø
LR34.20-UR	125	120	75	100	55	5x8
LR34.44-UR	155	156	115	130	72	8x12

Dimensional drawing

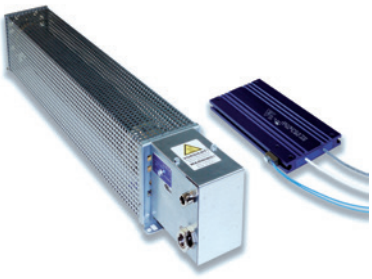


Dimensional drawing, three-phase mains choke for ServoOne CMP

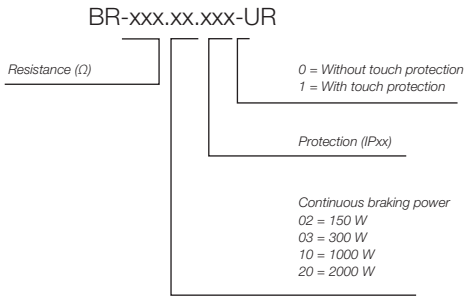
2.6.6 Braking resistors

NOTE:
Please note for ServoOne CMP device variant with internal resistance:
- Do not connect an additional braking resistor! Please note for ServoOne CMP device variant with external resistor:
- Only operate supply unit **with** braking resistor (internal or ext.).

You will find further information in the Operation Manual ServoOne CMP Supply Unit (ID no.: 1400.201B.x-xx).



BR-XXX.XX.201-UR BR-XXX.XX.540-UR



Article designation

Technical data	As per Fig. 1	As per Fig. 2	As per Fig. 3	As per Fig. 4	As per Fig. 5
Surface temperature	>250 °C				
Touch protection	No			Yes	
Voltage max.	848 V DC		970 V DC	848 V DC	
Test voltage	4200 V DC		4000 V DC	2500 V AC	
Temperature monitoring	Yes, with bimetallic protector				
Breaking capacity	6.3 A / 230 V		0.5 A / 230 V	2.0 A / 230 V	
Certificates	CE-compliant; UL recognition				
Connection	1 m long insulated litz wire			Terminal box with PG gland	

Our recommendation for device variants with external braking resistor:

- Use BR-039.xx.xxx-UR for ServoOne CMP - BG1 (10 kW).
- Use BR-020.xx.xxx-UR for ServoOne CMP - BG2 (22 kW).

Article designation	Resistance [Ω ±10 %]	Continuous braking power [W]	Peak braking power [W]	Protection	Connection		Fig.
					Resistance	Bimetallic protector	
BR-039.02.540-UR	39	150	16 k [1)]	IP54	AWG 14/19	AWG 22	1
BR-020.02.540-UR	20	150	32 k [1)]	IP54	AWG 14/19	AWG 22	1
BR-039.03.540-UR	39	300	16 k [1)]	IP54	AWG 14/19	AWG 22	2
BR-020.03.540-UR	20	300[2)]	32 k [1)]	IP54	AWG 14	AWG 18	3
BR-039.10.201-UR	39	1000	16 k [1)]	IP20 [3)]	Terminal G10/2 for AWG 20-6	Terminal G5/2 for AWG 24-12	4
BR-020.10.201-UR	20	1000	32 k [1)]	IP20 [3)]	Terminal G10/2 for AWG 20-6	Terminal G5/2 for AWG 24-12	4
BR-039.20.201-UR	39	2000	16 k [1)]	IP20 [3)]	Terminal G10/2 for AWG 20-6	Terminal G5/2 for AWG 24-12	5
BR-020.20.201-UR	20	2000	32 k [1)]	IP20 [3)]	Terminal G10/2 for AWG 20-6	Terminal G5/2 for AWG 24-12	6

1) *Once for max. 0.5 sec., then pause of at least 10 minutes for cooling.*
2) *At cycle times of max. 150 s the required rated continuous braking power is calculated according to the following formula: Rated continuous braking power (W) = max. pulse duration (s) x peak power (W) / cycle time (s).*
3) *On mounting on suitable surface.*

Dimensions, braking resistors [mm]

Figure 1

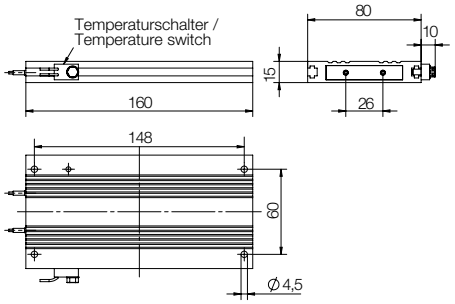


Figure 2

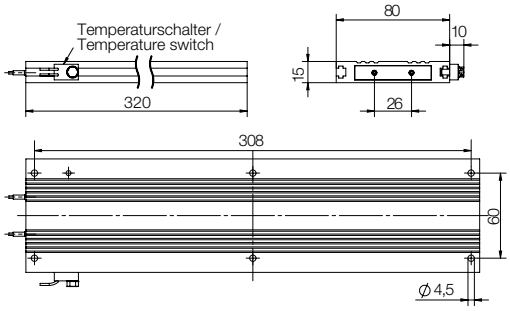


Figure 3

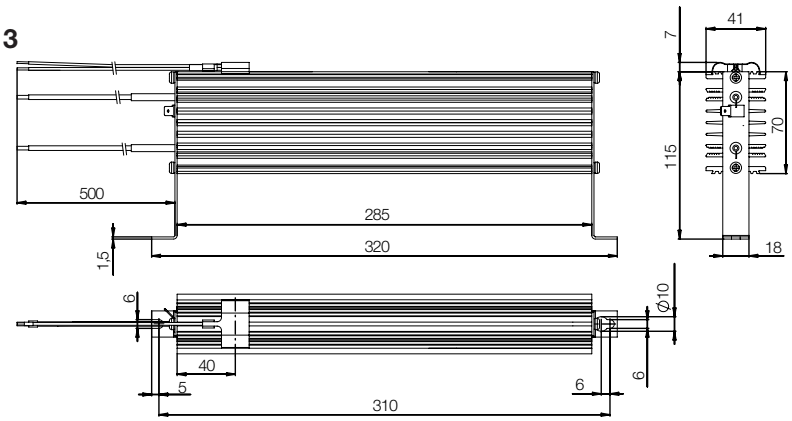


Figure 4

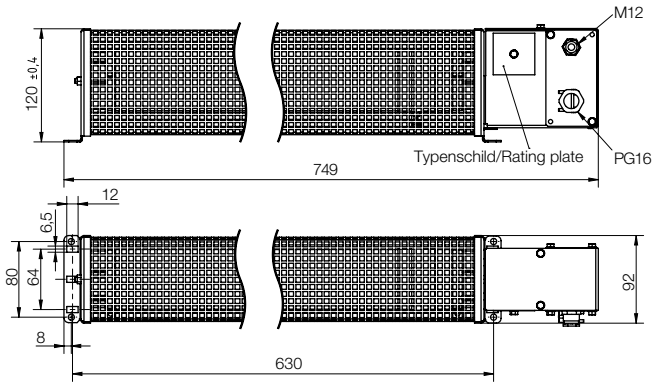
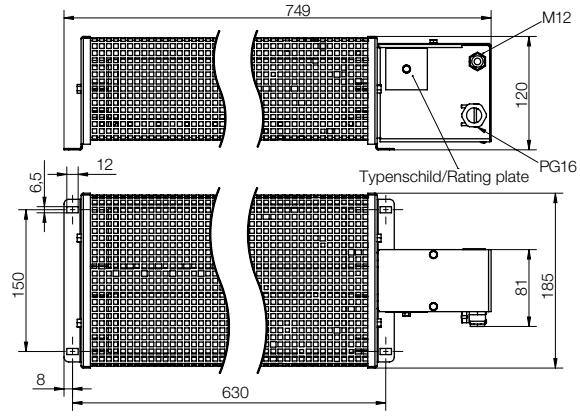


Figure 5



2

2.6.7 Mains filters

EMC25.240-UR

EMCxx.240-UR

Rated current

Model/motor cable length:
120 ... Perm. motor cable length up to 120 m
240 ... Perm. motor cable length up to 240 m
600 ... Perm. motor cable length up to 600 m

Article designation

Technical data	EMCxx.xxx-UR
Rated voltage/frequency	3 x 480 V AC +10 % at 50/60 Hz
Ambient temperature	+45 °C, with power reduction up to 55 °C (1.0 % per °C)
Installation altitude	1000 m, with power reduction up to 2000 m (1 % per 100 m)
Relative atmospheric humidity	≤75 % annual average, ≤95 % for max. 30 days, condensation not permitted
Storage/transportation temperature	-25 °C to +45 °C / -40 °C to +85 °C
Climate category	25/105/21
Protection	IP20
Connections	Touch-protected screw terminals IP20, shield contact area
Standards/certificates	IEC 60939-2, RoHS-compliant, UL certification outstanding
RFI suppression to EN61800-3 (category C3 - industrial -)	EMCxx.120-UR: permitted motor cable length up to 120 m EMCxx.240-UR: permitted motor cable length up to 240 m EMCxx.600-UR: permitted motor cable length up to 600 m

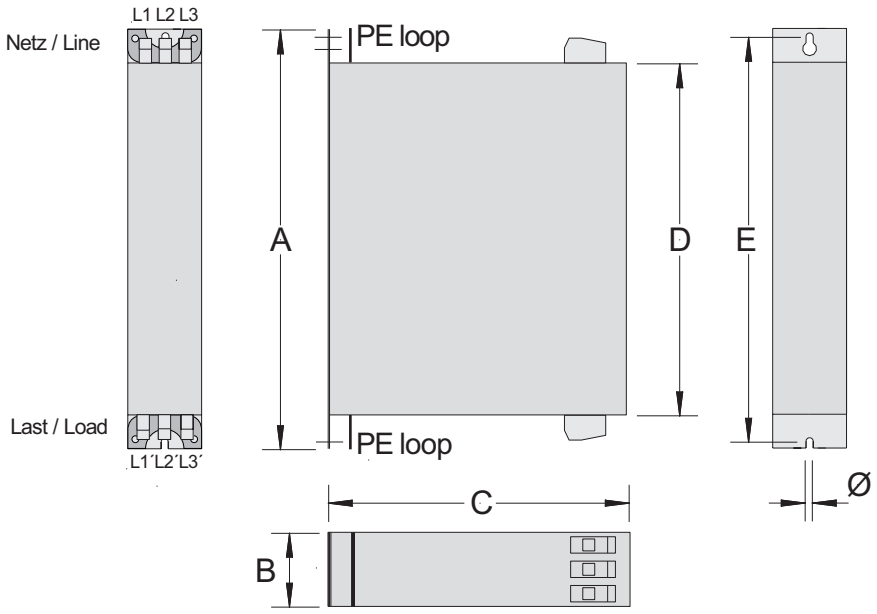
Three-phase mains filters

Article designation	Rated current [A]	Overload [1] [A]	Power dissipation [W]	Leakage current [2] [mA]	Touch current [3] [mA] N
EMC25.120-UR	25	50	3	5.5	5.4
EMC53.120-UR	53	106	16	5.7	5.9
EMC25.240-UR	25	50	4.8	24.5	7.2
EMC53.240-UR	53	106	13.6	24.5	7.2
EMC25.600-UR	25	50	11	61.5	9.2
EMC53.600-UR	53	106	18	61.5	9.2

1) For 10 s, repeatable after 6 minutes; precondition: mains filter mounting vertically on bare metal base plate.
2) Effective value of leakage current to EN 60939 (2009) at 50 Hz and rated voltage with 2 % asymmetry. The device on which the interference is to be suppressed can increase the leakage current.
3) Peak value measurement with measurement circuit to EN 60990 at 50 Hz and rated voltage with 2 % asymmetry.

Article designation	Dimensions [mm]						PE	Input/output	
	A	B	C	D	E	Ø		Clamping area (mm²)	Tightening torque (Nm)
EMC25.120-UR	310	55	220	260	300	5.3	M5	0.2 - 6	1.5 - 1.8
EMC53.120-UR	310	55	220	260	300	5.3	M5	0.5 - 16	2.0 - 2.3
EMC25.240-UR	310	55	220	260	300	5.3	M5	0.2 - 6	1.5 - 1.8
EMC53.240-UR	310	55	220	260	300	5.3	M5	0.5 - 16	2.0 - 2.3
EMC25.600-UR	310	55	220	260	300	5.3	M5	0.2 - 6	1.5 - 1.8
EMC53.600-UR	310	55	220	260	300	5.3	M5	0.5 - 16	2.0 - 2.3

Dimensional drawing



2.6.8 EMC cable clamp

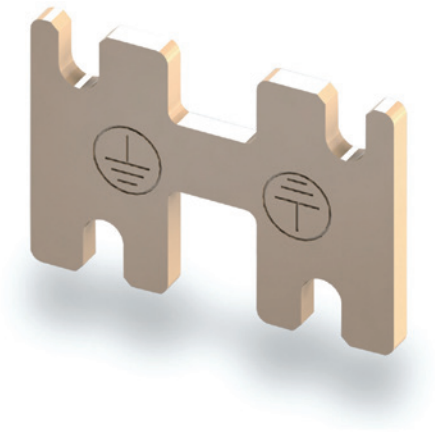
EMC cable clamp EKS 1222

EKS1222 Article designation

Designation	Article number	Description
EMC cable clamp EKS1222	113388	Fastening clamp for cable shield – ··Packing unit: 100 pcs. – ··Strap width: 9 mm – ··Diameter 12-22 mm

NOTE:
You will find information on the usage of the cable clamps in the following operation manuals:
·· ServoOne CM Axis Controller (ID no.: 1400.200B.x-xx).
·· ServoOne CMP Supply Unit (ID no.: 1400.201B.x-xx).

2.6.9 PE connector for ServoOne CM



PE plate ServoOne CM
Packing unit 50 pcs.

Article designation

Designation	Article number	Description
PE connector Packing unit 50 pcs.	1400.0004.0	PE connection plate for ServoOne CM – ··Packing unit: 50 pcs. – ··Material: Copper (nickel-plated)

NOTE:
You will find information on the usage of the PC connection plates in the following operation manuals:
·· ServoOne CM Axis Controller (ID no.: 1400.200B.x-xx).
·· ServoOne CMP Supply Unit (ID no.: 1400.201B.x-xx).

Space for notes

3 MotionOne CP

Central assemblies

Linux operating system,
CODESYS programmable

Runtime licences

Scalable runtime licences for single-axis, coupled and path-controlled movements for various applications

3.1 Central assembly LACP 265/X

Article designation: LACP 265/X

Power class

The LACP 265/X features the optimised and therefore very efficient Atom platform and a compact design.
Equipped with a performance spectrum of 1.8 GHz and the Linux operating system with real-time support, the assembly provides exactly the right computing performance for demanding control tasks.

Reliable data storage

The firmware and application data are saved on a CompactFlash memory card, which is conveniently accessible from the front.
In this way the data are stored safely and are available at any time.

Communicative hardware

The field bus interface EtherCAT provides almost unlimited design freedom. The integrated data display solution with DVI provides cost savings, because as a result expensive intelligent panels are unnecessary. In addition, diagnostics functions are available via an integrated 7-segment display. Two USB ports permit the connection of accessories such as printers, modems etc.

More flexibility due to straightforward expansion options

For even more flexibility COconnect modules can be operated either directly or remotely using a CAN or EtherCAT interface. Modules from other manufacturers can also be integrated straightforwardly.

Technical data

General	
Supply voltage	24 V DC (19.2 V to 30 V, as per EN 61131-2)
Protection class	III in accordance with EN 61131-2:2007
Fan	Can be replaced from the exterior
Ambient conditions	
Operating temperature	+5 °C to +55 °C
Storage temperature	-40 °C to +70 °C
Relative atmospheric humidity	5 % to 95 % (without condensation)
Shock and vibration resistance	As per EN 61131-2
Computer core	
Processor	Intel Atom 1.8 GHz
Chip set	Intel US15W (Atom)
Memory	1 GB DDR3 SDRAM
Buffered SRAM	1 MB
Interfaces	
CAN interface	Onboard
CAN bus baud rates	Adjustable (max. 1 MBaud).
Graphic interface, cable length	Up to 20 m (XGA) with cable LAXW 041-050
Ethernet (LAN) / cable length	100/1000 Mbit / max. 50 m with standard Ethernet cable CAT5
USB	USB 2.0 high speed
Memory card	CompactFlash, type 1 (supplied without memory card)
PCI interface	For Ethernet option module (LANX 252/A)
K bus	On side, for attaching modules
EtherCAT	Real-time Ethernet field bus
Dimensions	
Dimensions (H x W x D)	120 mm x 270 mm x 100 mm
Protection	IP20
Weight	1266 g
EC directives met	
Directive 2004/108/EC	EC directive on electromagnetic compatibility
Directive 2002/95/EC	RoHS directive
Standards applied	
EN 61131-1:2003	Programmable controllers - Part 1
EN 61131-2:2007	Programmable controllers - Part 2
UL 508, 2005	Industrial Control Equipment

Accessories

Connector set		
LASX 210/A	RS 232	Page 90
LASX 230/A	RS 485/422	TBD
LAFX 200/A	CAN	Page 90
LANX 252/A	Ethernet	Page 89
Connector set		
LAXT 006/A		Page 92
Memory card		
In preparation		TBD

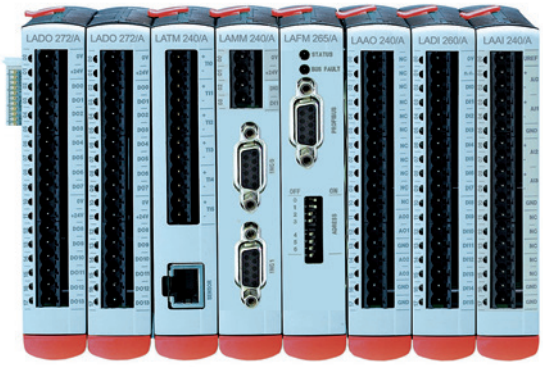
NOTE:
The central assembly LACP 265/X will be available from Nov. 2015.

3.2 Memory card LAXC 330/A V3 system

Article designation: LAXC330/A

- Suitable for central assembly LACP 265/X
- Type: CompactFlash
- Memory capacity: 2 GB

4 COconnect



Bus integration

EtherCAT, CANopen and PROFIBUS

Input and output

Digital and analogue

Incremental encoder interface

Temperature measurement

Accessories

Connectors and cables

4.1 Bus coupler assembly LABL 270/A

Article designation: LABL 270/A

The LABL 270/A is an assembly in the MotionOne control system and is used as a bus coupler between EtherCAT and K bus.
In this way system assemblies can be operated as decentral I/O islands.
The LABL 270/A can be connected via EtherCAT to a control and is therefore an EtherCAT slave.
Up to 12 I/O modules can be supplied and operated.
4 digital inputs of type 1 (as per IEC 61131-2) are available for processing external digital signals. They have a common ground potential.
The “high” switching state is indicated on the left of the connector strip by green LEDs. The digital inputs can also be used as interrupt inputs for the exact processing of external digital signals.
The EtherCAT slave address is automatically assigned by the EtherCAT configuration tool.
A maximum of 4 modules can be operated with interrupts on the K bus. For this reason the modules LADI 260/A, LADM 272/A, LADM 276/A and LADM 276/A that support interrupts are also offered in the configuration tool in two versions.

Technical data

General		
Supply voltage		+24 V DC from front (19.2 V to 30 V, as per IEC 61131-2)
Max. switch-on current		14 A
Overvoltage category		II
Protection class		III in accordance with EN 61131-2:2007
Max. total power consumption		58 W
Max. internal power consumption		4.5 W
Power available K bus +5 V		8.5 W
Power available K bus +24 V		45 W
Protection measures		Against reverse polarity, overload, power feedback, short circuit
Supply connection terminals		Open, spacing 5.08 mm
Ambient conditions		
Operating temperature		+5 °C to +55 °C
Storage temperature		-40 °C to +70 °C
Relative atmospheric humidity		10 % to 95 % (without condensation)
Shock and vibration resistance		As per EN 61131-2:2007
Digital inputs		
Number of inputs		4
Input type		Type 1 (as per EN 61131-2)
Voltage range for “1”		15 V ≤ UH ≤ 30 V
Voltage range for “0”		-3 V ≤ UH ≤ 5 V
Bounce		1 ms, 100 ms can be configured
Sampling time		1 ms
Can be used as interrupt inputs		Yes
Response time of the K bus interrupt		100 µs with 5 kHz input filter
Electrical isolation		No
State indication		Green LED
EtherCAT interface		
EtherCAT slave baud rate		100 Mbit/s
Dimensions		
Dimensions (H x W x D)		120 mm x 22.5 mm x 100 mm
Weight		121 g
Connectors and connector strip required		
EtherCAT connection		8-pin RJ-45 connector
Power supply input signals		Standard pin connector strip with 5.08 mm spacing
Connector set LAXT 022/A for LABL 27x/A		
Number	1x	1x
Socket connector strips	2-pin	4-pin
Colour	bw	bw
Order number Weidmüller	BLZF 5.08/2 SN SW - 170769	BLZF 5.08/4 SN SW - 170771

4.2 Bus coupler assembly LABL 272/A

Article designation: LABL 272/A

The LABL 272/A is an assembly in the MotionOne control system and is used as a bus coupler between EtherCAT and K bus. In this way system assemblies can be operated as decentral I/O islands. The LABL 272/A can be connected via EtherCAT to a control and is therefore an EtherCAT slave. Up to 12 I/O modules can be supplied and operated.
4 digital inputs of type 1 (as per IEC 61131-2) are available for processing external digital signals. They have a common ground potential. The "high" switching state is indicated on the left of the connector strip by green LEDs. The digital inputs can also be used as interrupt inputs for the exact processing of external digital signals. The EtherCAT slave address is automatically assigned by the EtherCAT configuration tool.
A maximum of 4 modules can be operated with interrupts on the K bus. For this reason the modules LADI 260/A, LADM 272/A, LADM 276/A and LADM 276/A that support interrupts are also offered in the configuration tool in two versions.

Unlike the LABL 270/A, the LABL 272/A also supports the following bus modules on the K bus:

Max. modules in a row	Bus	Max. baud rate
2x LAFM 200/A	2x CAN	Either 2 x 512 kbit/s or 1 x 1 Mbit/s
4x LASM 230/A	2x RS-485/422	2 x 115200 bit/s

Depending on the type of modules attached, a maximum of 4 bus modules can be attached to the LABL 272/A.

Technical data

General		
Supply voltage		+24 V DC from front (19.2 V to 30 V, as per IEC 61131-2)
Max. switch-on current		14 A
Overvoltage category		II
Protection class		III in accordance with EN 61131-2:2007
Max. total power consumption		58 W
Max. internal power consumption		4.5 W
Power available K bus +5 V		8.5 W
Power available K bus +24 V		45 W
Protection measures		Against reverse polarity, overload, power feedback, short circuit
Supply connection terminals		Open, spacing 5.08 mm
Ambient conditions		
Operating temperature		+5 °C to +55 °C
Storage temperature		-40 °C to +70 °C
Relative atmospheric humidity		10 % to 95 % (without condensation)
Shock and vibration resistance		As per EN 61131-2:2007
Digital inputs		
Number of inputs		4
Input type		Type 1 (as per EN 61131-2)
Voltage range for “1”		15 V ≤ UH ≤ 30 V
Voltage range for “0”		-3 V ≤ UH ≤ 5 V
Bounce		1 ms, 100 ms can be configured
Sampling time		1 ms
Can be used as interrupt inputs		Yes
Response time of the K bus interrupt		100 µs with 5 kHz input filter
Electrical isolation		No
State indication		Green LED
EtherCAT interface		
EtherCAT slave baud rate		100 Mbit/s
Dimensions		
Dimensions (H x W x D)		120 mm x 22.5 mm x 100 mm
Weight		121 g
Connectors and connector strip required		
EtherCAT connection		8-pin RJ-45 connector
Power supply input signals		Standard pin connector strip with 5.08 mm spacing
Connector set LAXT 022/A for LABL 27x/A		
Number	1x	1x
Socket connector strips	2-pin	4-pin
Colour	bw	bw
Order number Weidmüller	BLZF 5.08/2 SN SW - 170769	BLZF 5.08/4 SN SW - 170771

4.3 Bus coupler assembly LABL 210/B

Article designation: LABL 210/B

The LABL 210/B is a CANopen bus coupler assembly that makes possible the decentralisation and remote operation of assembly islands. These assembly islands can be connected to all central assemblies from the automation system product lines that have a CAN interface. The bus coupler operates based on CANopen and supports all the communication types of this protocol.
It connects the CAN bus system to the modularly expandable automation system assemblies.
A 24 V supply terminal supplies the bus coupler and all attached modules.
There are two address switches on the front for setting the CAN node address.
The actual transfer rate is set using a baud rate switch that can also be accessed from the front. Depending on the cable length, a baud rate up to maximum 1 Mbit/s (25 m) can be set.
The CAN connection is made via a 9-pin D-Sub connector. The state of the assembly is indicated via a status LED.

Technical data

General	
Supply voltage	+24 V DC from front (19.2 V to 30 V, as per IEC 61131-2)
Max. switch-on current at 25 °C	5 A
Max. switch-on current at 50 °C	7 A
Max. power consumption +5 V	4.5 W
Power available K bus +5 V	8.5 W
Power available K bus +24 V	45 W
Protection measures	Against reverse polarity, overload, power feedback, short circuit
Supply connection terminals	Open, spacing 5.08 mm
CAN addressing on the K bus	16-digit address switch, front
Displays on the front panel	2-colour status LED for module status, transmit and receive LED on the CAN interface
Ambient conditions	
Operating temperature	+5 °C to +55 °C
Storage temperature	-40 °C to +70 °C
Relative atmospheric humidity	10 % to 95 % (without condensation)
Shock and vibration resistance	As per EN 61131-2
CAN interface	
Connection	D-SUB connector 9-pin
Baud rate	Can be set using rotary switch: 1 Mbit/s, 800 kbit/s, 500 kbit/s, 250 kbit/s, 125 kbit/s
Electrical isolation	No
Number	1
Transmit/receive indication	Transmit LED, receive LED
Bus termination	Switched via jumpers
Dimensions	
Dimensions (H x W x D)	120 mm x 22.5 mm x 100 mm
Weight	121 g
Accessories	
Connector set	LAXT 005/A
CAN connection cable	LAXW 010-x

4.4 Interface assembly LAFM 200/A

Article designation: LAFM 200/A

The LAFM 200/A is a CANopen interface assembly (CAN master and CAN slave).
The assembly can attached directly to a central assembly or also to the bus coupler assembly LABL 272/A. The connection is made via a 9-pin D-Sub connector.
States on the bus are indicated via two status LEDs (TX, RX).

Technical data

General	
Supply voltage	+24 V DC from the K bus, 5 V from the K bus
Protection class	III in accordance with EN 61131-2:2007
Displays on the front panel:	LEDs for transmit, receive and for status indication
Max. number of LAFM 200/A that can be operated on a CP assembly	2
Power available K bus +5 V	0.8 W
Power available K bus +24 V	0 W
Ambient conditions	
Operating temperature	+5 °C to +55 °C
Storage temperature	-40 °C to +70 °C
Relative atmospheric humidity	10 % to 95 % (without condensation)
Shock and vibration resistance	As per EN 61131-2 :2007
CAN interface	
Transfer medium	Cable, shielded
Electrical isolation	No
Baud rate upper limit	1 Mbit/s
Baud rate lower limit	125 kbit/s
Setting for the actual transfer rate	Using software on the CPU assembly
Bus terminating resistor	Yes, jumper in the connector
Connection system	DSUB 9-pin connector
Indication	2 LEDs: yellow = Transmit, green = Receive
Dimensions	
Dimensions (H x W x D)	120 mm x 22.5 mm x 100 mm
Assembly width (incl. K bus connector)	32.5 mm
Weight	140 g

4.5 Interface assembly LASM 230/A

Article designation: LASM 230/A

The LASM 230/A is a serial interface assembly that provides two interfaces that can be configured as RS-485-A or RS-422-A with up to 115200 Baud.
The two communication channels operate independently of each other with a maximum transfer rate of up to 115000 Baud. Depending on the maximum transfer rate, cable lengths up to 1200 m are possible.
The connection is made via a 9-pin D-Sub connector. The state of the assembly is indicated via a status LED.

Technical data

General	
Supply voltage logic	24 V DC from the K bus, 5 V DC from the K bus
Addressing on the K bus	Via 16-digit address switch, on side. Max. 4 modules possible (address switch setting 4 - F invalid)
Power consumption K bus 5 V	0.5 W
Power consumption K bus 24 V	0 W
Ambient conditions	
Operating temperature	+5 °C to +55 °C
Storage temperature	-40 °C to +70 °C
Relative atmospheric humidity	10 % to 95 % (without condensation)
Shock and vibration resistance	As per EN 61131-2:2007
Interface	
Type of interface	RS-485-A/RS-422-A, 9-pin connector
Transfer medium	Cable, screened, 120 Ω
Electrical isolation	No
Current loop baud rates	Can be set via software, perm. baud rates: 1200, 2400, 4800, 9600, 19200, 38400, 57600 and 115200 Baud
Switchover between RS-485-A and RS-422-A	Can be set via software
Dimensions	
Dimensions (H x W x D)	120 mm x 22.5 mm x 100 mm
Assembly width (incl. K bus connector)	32.5 mm
Weight	132 g

4.6 Interface assembly LASM 250/A

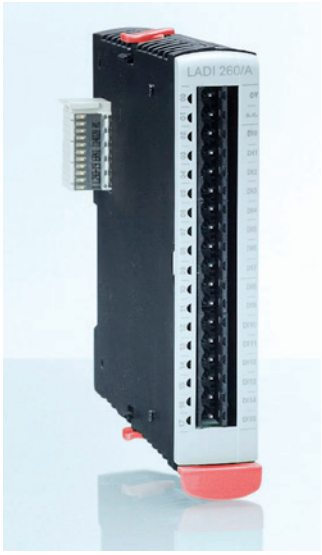
Article designation: LASM 250/A

The LASM 250/A is a serial interface assembly that provides four SSI interfaces.
The synchronous serial interface is an interface for absolute travel measuring systems.
The interfaces operate with a transmission speed of up to 1 Mbit/s. The connection is via RJ45 connector with sensor break detection. The state of the assembly is indicated via a status LED.

Technical data

General	
Supply voltage	24 V DC from front (19.2 V to 30 V, as per IEC 61131-2) 24 V DC from the K bus, 5 V DC from the K bus
Overvoltage category	II
Protection class	III in accordance with EN 61131-2:2007
Addressing on the K bus	Via 16-digit address switch, on side
Max. power consumption	24 W, if all 4 SSI interfaces are operated with 250 mA full load (supply 24 V DC from front)
Power consumption K bus 24 V	0 W
Power consumption K bus 5 V	0.65 W
Ambient conditions	
Operating temperature	+5 °C to +55 °C
Storage temperature	-40 °C to +70 °C
Relative atmospheric humidity	10 % to 95 % (without condensation)
Shock and vibration resistance	As per EN 61131-2:2007
SSI interface	
Number of interfaces	4
Output voltage for encoder supply	+ 24 V DC
Max. current for encoder supply	250 mA per channel
Baud rate	125 kbit/s, 250 kbit/s, 500 kbit/s, 1 Mbit/s,
Electrical isolation	No
Sensor break detection	Yes
Dimensions	
Dimensions (H x W x D)	120 mm x 22.5 mm x 100 mm
Assembly width (incl. K bus connector)	32.5 mm
Weight	140 g

4.7 Digital input assembly LADI 260/A



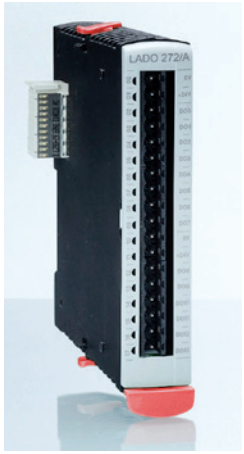
Article designation: LADI 260/A

The LADI 260/A is a digital input assembly that can be attached directly to a central assembly or that can be operated using a bus coupler. This digital input assembly makes it possible to connect 16 digital inputs. 24 V DC control signals are acquired by the digital inputs and forwarded, electrically isolated, to the higher level automation device. In addition 2 of the 16 digital inputs can be used as interrupt inputs. These interrupt inputs permit a response time of 50 µs.
The input filters can be individually configured to 1 ms or 100 ms. Green LEDs indicate the states of the digital inputs.

Technical data

General	
Supply voltage	From the K bus
Addressing on the K bus	Via 16-digit address switch, on side
Terminals	Open, spacing 5.08 mm
Max. power consumption K bus	+5 V: 0.4 W +24 V: 1 W
Ambient conditions	
Operating temperature	+5 °C to +55 °C
Storage temperature	-40 °C to +70 °C
Relative atmospheric humidity	10 % to 95 % (without condensation)
Shock and vibration resistance	As per IEC 61131-2
Digital inputs	
Number of inputs	16
Input type	Type 1 (as per IEC 61131-2)
Voltage range for “1”	15 V ≤ UH ≤ 30 V
Voltage range for “0”	-3 V ≤ UH ≤ 5 V
Filter	Adjustable: 500 Hz, 50 Hz
Sampling time	1 ms
Electrical isolation	Yes
State indication	Green LED
Interrupt inputs	
Number of inputs	2 (DI0, DI1) of the digital inputs
Input type	Type 1 (as per IEC 61131-2)
Voltage range for “1”	15 V ≤ UH ≤ 30 V
Voltage range for “0”	-3 V ≤ UH ≤ 5 V
Filter	Adjustable: 5 kHz, 500 Hz, 50 Hz
Response time of the K bus interrupt	100 µs with 5 kHz input filter
Electrical isolation	Yes
State indication	Green LED
Interfaces	
System bus interface	Parallel bus interfaces can be connected to the side
Dimensions	
Dimensions (H x W x D)	120 mm x 22.5 mm x 100 mm
Weight	130 g
Accessories (see chap. 4.18 on Page 93)	
Connector set	LAXT 030/A

4.8 Digital output assembly LADO 272/A



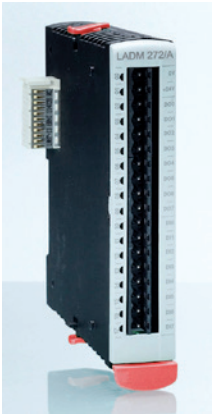
Article designation: LADO 272/A

The LADO 272/A is a digital output assembly that can be attached directly to a central assembly or that can be operated using a bus coupler. This digital output assembly makes it possible to connect 14 digital outputs. The digital outputs switch the 24 V DC control signals from a central assembly to the actuators connected with electrical isolation. The digital outputs are designed for a load of up to 2 A with 50 % simultaneity.
Reliability is ensured by short-circuit detection and continuous short-circuit protection. The high power consumption of the outputs makes it possible to shut down inductive loads quickly. The outputs are divided into two groups with a dedicated power supply.
Orange LEDs indicate the states of the digital outputs.

Technical data

General	
Supply voltage	From the K bus and +24 V DC from front (19.2 V to 30 V, as per IEC 61131-2)
Addressing on the K bus	Via 16-digit address switch, on side
Terminals	Open, spacing 5.08 mm
Max. power consumption K bus	+5 V: 0.4 W +24 V: 2.1 W
Ambient conditions	
Operating temperature	+5 °C to +55 °C
Storage temperature	-40 °C to +70 °C
Relative atmospheric humidity	10 % to 95 % (without condensation)
Shock and vibration resistance	As per IEC 61131-2
Digital outputs	
Number of outputs	14
Rated voltage	+24 V DC
Processing time	1 ms
Rated current	2 A with 50 % simultaneity
Protection	Short-circuit protection
Max. inductive load	1 J at max. 0.2 Hz
State indication	Orange LED
Electrical isolation	
Interfaces	
System bus interface	Parallel bus interfaces can be connected to the side
Dimensions	
Dimensions (H x W x D)	120 mm x 22.5 mm x 100 mm
Weight	135 g
Accessories (see chap. 4.18 on Page 93)	
Connector set	LAXT 030/A

4.9 Digital input and output assemblies LADM 276/A and LADM 272/A



Article designation: LADM 276/A
Article designation: LADM 272/A

The LADM 276/A and LADM 272/A are digital input/output assemblies that can be attached directly to a central assembly or that can be operated via a bus coupler. These mixed digital assemblies make it possible to connect 6 (LADM 276/A) or 8 (LADM 272/A) digital inputs and 8 digital outputs.
24 V DC control signals are acquired by the digital inputs and forwarded, electrically isolated, to the higher level automation device.
In addition 2 of the digital inputs can be used as interrupt inputs. These interrupt inputs permit a response time of 50 µs. The input filters can be individually configured to 1 ms or 100 ms.

The digital outputs switch the 24 V DC control signals from a central assembly to the actuators connected with electrical isolation.
Reliability is ensured by short-circuit detection and continuous short-circuit protection.
The digital outputs are designed for a load of up to 2 A with 50 % simultaneity.

Technical data

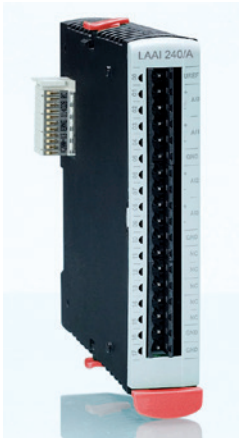
General	
Supply voltage	From the K bus and +24 V DC from front (19.2 V to 30 V, as per IEC 61131-2)
Addressing on the K bus	Via 16-digit address switch, on side
Terminals	Open, spacing 5.08 mm
Max. power consumption K bus	+5 V: 0.4 W +24 V: 2.1 W

Ambient conditions	
Operating temperature	+5 °C to +55 °C
Storage temperature	-40 °C to +70 °C
Relative atmospheric humidity	10 % to 95 % (without condensation)
Shock and vibration resistance	As per IEC 61131-2
Digital inputs	
Number of inputs	6 (LADM 276/A) 8 (LADM 272/A)
Input type	Type 1 (as per IEC 61131-2)
Voltage range for “1”	15 V ≤ UH ≤ 30 V
Voltage range for “0”	-3 V ≤ UH ≤ 5 V
Filter	Adjustable: 500 Hz, 10 Hz
Sampling time	1 ms
Electrical isolation	Yes
Configuration	Source
State indication	Green LED
Interrupt inputs	
Number of inputs	2 (DI0, DI1) of the 6 digital inputs
Input type	Type 1 (as per IEC 61131-2)
Voltage range for “1”	15 V ≤ UH ≤ 30 V
Voltage range for “0”	-3 V ≤ UH ≤ 5 V
Filter	12 kHz
Response time of the K bus interrupt	50 µs
Electrical isolation	Yes
State indication	Green LED
Digital outputs	
Number of outputs	8
Rated voltage	+24 V DC
Processing time	1 ms
Rated current	2 A with 50 % simultaneity
Protection	Short-circuit protection
Max. inductive load	1 J at max. 0.2 Hz
State indication	Orange LED
Electrical isolation	Yes
Configuration	Sink, open collector (LADM 272/A) Source (LADM 276/A)

Unlike the LADM 272/A (operation of the digital input with 24 V DC) the digital input on the LADM 276/A is operated using 0 V (ground).

Interfaces	
System bus interface	Parallel bus interfaces can be connected to the side
Dimensions	
Dimensions (H x W x D)	120 mm x 22.5 mm x 100 mm
Weight	135 g
Accessories (see chap. 4.18 on Page 93)	
Connector set	LAXT 030/A

4.10 Analogue input assembly LAAI 240/A



Article designation: LAAI 240/A

The LAAI 240/A is an analogue input assembly that can be attached directly to a central assembly or that can be operated using a bus coupler.
This assembly makes it possible to connect 4 analogue inputs (calibrated from the factory).
The analogue inputs process differential or potentiometer input signals in the range of ±10 V or 0-10 V with a resolution of 14 bits. A sensor break is signalled to the higher level central assembly.
A microcontroller converts the measured values on the analogue inputs using the calibration data and forwards the corrected values to the higher level automation unit.

Technical data

General	
Supply voltage	From the K bus and +24 V DC from front (19.2 V to 30 V, as per IEC 61131-2)
Addressing on the K bus	Via 16-digit address switch, on side
Terminals	Open, spacing 5.08 mm
Max. power consumption K bus	+5 V: 0.4 W +24 V: 2.1 W

Analogue voltage inputs	
Number of inputs	4
Input range	±10 V or 0 V - U_{ref}
Input type	Differential or single-ended
Conversion cycle	1 ms
Resolution	14 bits
Electrical isolation	No
Reference voltage output	10 V ±2.5 %, max. 20 mA
Sampling repetition time	1 ms
Input impedance in the signal range	10 MΩ
Input filter characteristic - order	First order
Input filter characteristic - crossover frequency	250 Hz
Converter method	Successive approximation
Monotony without error codes	Yes
Common mode control	±13.5 V
Common mode rejection	>80 dB
Value of the least significant bit (LSB)	1.3 mV
Maximum permissible continuous overload (without damage)	±30 V
Typ. measuring error temp. coefficient	±5 ppm of the scale end value / °C
Max. measuring error temp. coefficient	±20 ppm of the scale end value / °C
Largest error at 25 °C	±0.01 % of the scale end value
Interfaces	
System bus interface	Parallel bus interfaces can be connected to the side
Dimensions	
Dimensions (H x W x D)	120 mm x 22.5 mm x 100 mm
Weight	132 g
EC directives	
Directive 2004/108/EC	
Directive 2002/95/EC	
Standards/certification	
IEC 61131-1:2003	
IEC 61131-2:2003	
UL 508, 2005	
Accessories (see chap. 4.18 on Page 93)	
Connector set	LAXT 030/A

4.11 Analogue output assembly LAAO 240/A

Article designation: LAAO 240/A

The LAAO 240/A is an analogue output assembly that can be attached directly to a central assembly or that can be operated using a bus coupler. This assembly makes it possible to connect 4 analogue outputs (calibrated from the factory). The analogue outputs generate signals in the range of ±10 V with a resolution of 12 bits.

Technical data

General	
Supply voltage	From the K bus
Supply for the IO	From front
Addressing on the K bus	Via 16-digit address switch, on side
Type of terminals	Open, spacing 5.08 mm
Analogue voltage outputs	
Number of outputs	4
Output range	±10 V
Conversion cycle	1 ms
Resolution	12 bits
Electrical isolation	No
Value of the least significant bit (LSB)	5.32 mV
Monotony	Yes
Load resistance	≥1000 Ω
Largest capacitive load	≤10 nF
Differential non-linearity	≤±1 LSB
Settling time on change over full range (ohmic load)	≤50 µs
Typ. analogue output error temp. coefficient	±20 ppm of the scale end value / °C
Max. analogue output error temp. coefficient	±30 ppm of the scale end value / °C
Largest error at 25 °C	±0.15 % of the scale end value
Interfaces	
System bus interface	Parallel bus interfaces can be connected to the side
Dimensions	
Dimensions (H x W x D)	120 mm x 22.5 mm x 100 mm
Weight	132 g
EC directives	
Directive 2004/108/EC	EC directive on electromagnetic compatibility
Directive 2002/95/EC	RoHS directive
Standards/certification	
IEC 61131-1:2003	Programmable controllers - Part 1 (general)
IEC 61131-2:2003	Programmable controllers - Part 2 (hardware)
UL 508, 2005	Industrial Control Equipment
Accessories (see chap. 4.18 on Page 93)	
Connector set	LAXT 030/A

4.12 Analogue input and output assembly LAAM 280/A

Article designation: LAAM 280/A

The LAAM 280/A is an analogue input/output assembly that can be attached directly to a central assembly or that can be operated using a bus coupler. This mixed assembly makes it possible to connect 4 analogue inputs/outputs (calibrated from the factory).
The analogue inputs process differential or potentiometer input signals in the range of ±10 V or 0-10 V with a resolution of 14 bits. A sensor break is signalled to the higher level central assembly.
The analogue outputs generate signals in the range of ±10 V with a resolution of 12 bits.

Technical data

General	
Supply voltage	From the K bus
Supply for the IO	From front
Addressing on the K bus	Via 16-digit address switch, on side
Type of terminals	Open, spacing 5.08 mm
Analogue voltage outputs	
Number of inputs	4
Input range	±10 V or 0 V - U_{ref}
Input type	Differential or single-ended
Conversion cycle	1 ms
Resolution	14 bits
Electrical isolation	No
Reference voltage output	10 V ±2.5 %, max. 20 mA
Sampling repetition time	1 ms
Input impedance in the signal range	10 MΩ
Input filter characteristic	First order
Input filter characteristic - crossover frequency	250 Hz
Converter method	Successive approximation

Analogue voltage inputs	
Monotony without error codes	Yes
Common mode control	±13.5 V
Common mode rejection	>80 dB
Value of the least significant bit (LSB)	1.3 mV
Maximum permissible continuous overload (without damage)	±30 V
Typ. measuring error temp. coefficient	±5 ppm of the scale end value / °C
Max. measuring error temp. coefficient	±20 ppm of the scale end value / °C
Largest error at 25 °C	±0.01 % of the scale end value
Analogue voltage outputs	
Number of outputs	4
Output range	±10 V
Conversion cycle	1 ms
Resolution	12 bits
Electrical isolation	No
Value of the least significant bit (LSB)	5.32 mV
Monotony	Yes
Load resistance	≥1000 Ω
Largest capacitive load	≤10 nF
Differential non-linearity	≤±1 LSB
Settling time on change over full range (ohmic load)	≤50 µs
Typ. analogue output error temp. coefficient	±20 ppm of the scale end value / °C
Max. temp. coefficient output error temp. coefficient	±30 ppm of the scale end value / °C
Largest error at 25 °C	±0.15 % of the scale end value
Interfaces	
System bus interface	Parallel bus interfaces can be connected to the side
Dimensions	
Dimensions (H x W x D)	120 mm x 22.5 mm x 100 mm
Weight	135 g
EC directives	
Directive 2004/108/EC	EC directive on electromagnetic compatibility
Directive 2002/95/EC	RoHS directive
Standards/certification	
IEC 61131-1:2003	Programmable controllers - Part 1 (general)
IEC 61131-2:2003	Programmable controllers - Part 2 (hardware)
UL 508, 2005	Industrial Control Equipment
Accessories (see chap. 4.18 on Page 93)	
Connector set	LAXT 030/A

4.13 Incremental encoder interface assembly LAMM 240/A

Article designation: LAAM 280/A

The LAMM 240/A is an incremental encoder interface assembly that can be attached to a central assembly or that can be used with a bus coupler.

Technical data

General	
Supply voltage	From the K bus
Addressing on the K bus	Via 16-digit address switch, on side
Terminals	Open, spacing 5.08 mm
Max. power consumption K bus	0.6 W
Incremental encoder inputs	
Number of inputs	2
Connection	D-Sub sockets 9-pin
Input range	5 V differential and 24 V (configurable)
Max. input frequency	250 kHz (differential)
Max. pulse rate	1000 kHz (4-times evaluation, differential)
Evaluation	Single, double, quadruple (configurable), counting function with and without direction evaluation
Resolution	32 bits
Electrical isolation	No
Speed measurement	
Measuring method	Gate measurement with internal 50 MHz clock
Counter width	24 bits
Minimum speed that can be acquired	Pulse length greater than 0.33 s = speed 0
Distance counter	
Counter width	32 bits
Encoder supply	
Supply +24 V	Looped through from +24 V input terminal
Load capacity	500 mA total
Protection	Overload and short circuit
Supply 5 V	Generated by 24 V input terminal
Rated voltage	5.05 V ±4 %
Load capacity	100 mA per encoder
Latch inputs	
Number of inputs	2
Response time latch input	20 µs
Input type	Sink input in accordance with IEC 61131 or source input can be configured
Electrical isolation	No
Time stamp for latch event	
Resolution	1 µs
Maximum sampling time	16 bit counter (unambiguous up to 65 ms sampling time)
Interfaces	
System bus interface	Parallel bus interfaces can be connected to the side
Diagnostic features	
Sensor break and sensor short circuit with 5 V differential input configuration	
Zero pulse monitoring	
Counter overflow	
Tracking error: signal frequency at the inputs outside specification (max. 250 kHz)	
Dimensions	
Dimensions (H x W x D)	120 mm x 22.5 mm x 100 mm
Weight	135 g
Standards/certification	
IEC 61131-1:2003	Programmable controllers - Part 1 (general)
IEC 61131-2:2003	Programmable controllers - Part 2 (hardware)
UL 508	In preparation
Accessories (see chap. 4.18 on Page 92)	
Connector set	LAXT 006/A

4.14 Temperature measuring assembly LATM 240/A

Article designation: LATM 240/A

The LATM 240/A is a temperature measuring module that can be attached directly to a central assembly or that can be operated using a bus coupler.
This analogue input assembly permits the connection of thermocouples. With 2-wire technology up to 6 thermocouples can be operated. The calibration and linearisation of the temperature values is realised via a microcontroller. The inputs are electrically isolated from each other and from the control electronics. Two operating modes on the LATM 240/A are supported.
In the standard mode the actual measured temperature is output. In a second mode the measured voltage in µV can be indicated. A sensor break is signalled to the higher level central assembly and can be evaluated in the application.
The cold junction compensation is undertaken in 2 ways:

1. Internal temperature measurement on the assembly's terminals.
2. External terminal temperature compensation.

Measuring accuracies of up to ±0.5 °C can be achieved over the entire temperature range with external terminal temperature compensation. The relocation of the terminal for the thermocouple to the exterior reduces costs due to the reduction in the length of the expensive thermocouple wires.

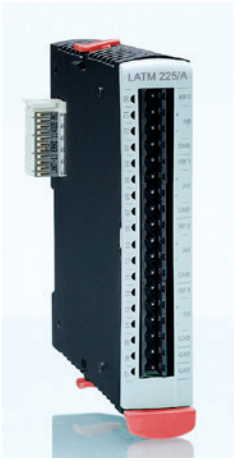
Technical data

General	
Supply voltage	From the K bus
Addressing on the K bus	Via 16-digit address switch, on side
Thermocouple inputs	
Number of inputs	
Thermocouple type	
Temperature range	
Resolution	
Electrical isolation	
Calibration	
Settling time	
Measurement duration	
Measurement period	
Input resistance	
Cut-off frequency input filter	
Sensor break detection	
Type of terminals	
Terminal temperature compensation	

Supplied without connector

Sensor interface (for the connection of the external temperature sensor LATE 220/A)	
Type of interface	SPI
Connection	RJ45 socket
Sensor supply for external sensor	Protected against sustained short circuit, current limited
Connection	From front
Detection of connection of an external reference junction	Automatic
Dimensions	
Dimensions (H x W x D)	120 mm x 22.5 mm x 100 mm
Standards/certification	
IEC 61131-1:2003	Programmable controllers - Part 1 (general)
IEC 61131-2:2003	Programmable controllers - Part 2 (hardware)
UL 508	UL - planned
Accessories (see chap. 4.18 on Page 93)	
Connector set	LAXT 025/A

4.15 Temperature measuring assembly LATM 225/A



Article designation: LATM 225/A

The LATM 225/A is a temperature measuring module that can be attached directly to a central assembly or that can be operated using a bus coupler.
This analogue input assembly permits the connection of resistance sensors PT100.
With 2-wire or 4-wire technology up to 4 temperature sensors can be operated.
With 4-wire technology the effects of the cable lengths are compensated and in this way the measuring accuracy increased. The calibration and linearisation of the temperature values is realised via a microcontroller.
A sensor break is signalled to the higher level central assembly and can be evaluated in the application.

Technical data

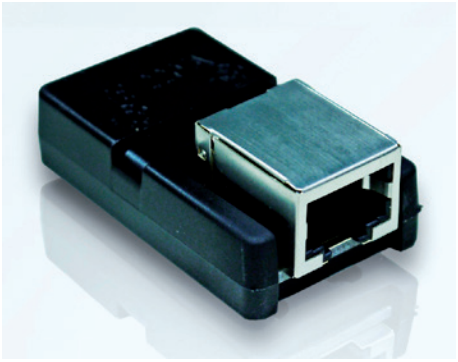
General	
Supply voltage	From the K bus
Addressing on the K bus	Via 16-digit address switch, on side
Terminals	Open, spacing 5.08 mm
Power consumption K bus	+5 V: max. 2.5 W +24 V: max. 0.3 W

Supplied without connector

PT100 inputs	
Number of inputs	4
Input type	4-wire measurement and 2-wire measurement (isolated sensor)
Resolution	14 bits
Measuring range	-100 °C to +850 °C
Linearisation method	Internal

PT100 inputs	
Electrical isolation	No
Calibration	Yes
Sensor break detection	YES
Constant current output	600 µA
Sampling repetition time	2 ms
Input impedance in the signal range	10 MΩ
Input filter characteristic - order	First order
Input filter characteristic - crossover frequency	15 Hz
Conversion method	Successive approximation
Monotony without error codes	Yes
Common mode control	≤13.5 V
Common mode rejection	>80 dB
Value of the least significant bit (LSB)	0.058 °C
Maximum permissible continuous overload (without damage)	≤30 V
Typ. measuring error temp. coefficient	≤10 ppm of the scale end value / °C
Max. measuring error temp. coefficient	≤40 ppm of the scale end value / °C
Largest error at 25 °C	≤0.02 % of the scale end value / °C
Averaging	Moving average formed over 100 ms
Interface	
System bus interface	Parallel bus interfaces can be connected to the side
Dimensions	
Dimensions (H x W x D)	120 mm x 22.5 mm x 100 mm
Weight	134 g
EC directives	
Directive 2004/108/EC	EC directive on electromagnetic compatibility
Directive 2002/95/EC	RoHS directive
Standards/certification	
EN 61131-1:2003	Programmable controllers - Part 1 (general)
EN 61131-2:2003	Programmable controllers - Part 2 (hardware)
UL 508, 2005	Industrial Control Equipment
Accessories (see chap. 4.18 on Page 93)	
Connector set	LAXT 110/A

4.16 Temperature compensation LATE 220/A



Article designation: LATE 220/A

The terminal temperature sensor LATE 220/A is used for external terminal temperature compensation.
It is used if the thermocouple wires are extended using Cu wires.

Technical data

General	
Connection system	RJ45 socket
Mounting	Fasten using adhesive (on adhesive surface) or cable tie
Dimensions (H x W x D)	17 mm x 26 mm x 45 mm
Weight	17 g

Supplied without connector or cable

4.17 Ethernet interface module LANX 252/A

Article designation: LATE 220/A

The LANX 252/A is an Ethernet PCI option module that is inserted into the central assemblies LACP 240/A, LACP 242/A or LACP 265/A. This assembly is used to connect an Ethernet bus user.

Technical data

General	
Type of interface	MII interface (interface to MPC5200 PowerPC) SPI for serial EEPROM
Connection system	Edge connector 60-pin
Supply	+3.3 V DC
Module detection	Yes
Ethernet interface	
Type of interface	Ethernet 100base TX
Transfer medium	Cable, shielded
Electrical isolation	Yes
Transfer rate	100 Mbit/s, 10 Mbit/s
Setting for the actual transfer rate	Automatic
Connection	RJ45 socket
Maximum cable length	50 m
Indication	LED green = Activity, LED yellow = Line

Supplied without connector

Mechanism	
Structure	No housing; front panel mounted on printed circuit board
Protection	IP20 (protection of the central assembly in which the module is mounted)
Standards	
EN 50081-2	Electromagnetic compatibility. Generic emission standard. Industrial environment
EN 50082-2	Electromagnetic compatibility. Generic immunity standard. Industrial environment
IEC 61131-1	Programmable controllers - Part 1 (general)
IEC 61131-2	Programmable controllers - Part 2 (hardware)

4.18 Serial interface module LASX 210/A

Article designation: LASX 210/A

The LASX 210/A is a serial option module that is inserted in the central assembly LACP 265/A. This assembly is used as an RS232 serial interface and operates in the full duplex mode. Depending on the transfer rate, cable lengths up to 15 m are possible.

Technical data

Interface to the central assembly	
Type of interface	5 V TTL output on the UART
Connection system	CHAMP connector 30-pin
Supply	+5 V DC
Module detection	YES (module fitted YES/NO; no type detection)
Type of module detection	2 pins that represent the 4 logical states
RS232 interface	
Transfer medium	Cable, shielded
Elec. isolation	No
Baud rate upper limit	115 kBaud
Baud rate lower limit	1200 Baud
Setting for the actual transfer rate	Using software, default setting 9600 bd
Connection system	D-Sub connector, 9-pin

Supplied without connector

Mechanism	
Structure	No housing; front panel mounted on printed circuit board
Protection	IP20 (protection of the central assembly in which the module is mounted)
Standards	
EN 50081-2	Electromagnetic compatibility. Generic emission standard. Industrial environment
EN 50082-2	Electromagnetic compatibility. Generic immunity standard. Industrial environment
IEC 61131-1	Programmable controllers - Part 1 (general)
IEC 61131-2	Programmable controllers - Part 2 (hardware)

4.19 CAN interface module LAFX 200/A

Article designation: LAFX 200/A

The LAFX 200/A is an option module for the field bus connection to CANopen. This option module is inserted in the central assembly LACP 265/A.

Technical data

Interface to the central assembly	
Type of interface	5 V TTL output on the CAN controller
Connection system	CHAMP connector 30-pin
Supply	+5 V DC
Module detection	YES (module fitted YES/NO; no type detection)
CAN interface	
Transfer medium	Cable, shielded
Elec. isolation	No
Baud rate upper limit	1 MBaud
Baud rate lower limit	125 kBaud
Setting for the actual transfer rate	Using software on the CPU
Terminating resistor	Yes (jumper in the connector)
Connection system	D-Sub connector, 9-pin
Indication	LED green = Transmit LED yellow = Receive

Supplied without connector

Mechanism	
Structure	No housing; front panel mounted on printed circuit board
Protection	IP20 (protection of the central assembly in which the module is mounted)
Standards	
EN 50081-2	Electromagnetic compatibility. Generic emission standard. Industrial environment
EN 50082-2	Electromagnetic compatibility. Generic immunity standard. Industrial environment
IEC 61131-1	Programmable controllers - Part 1 (general)
IEC 61131-2	Programmable controllers - Part 2 (hardware)

Space for notes

4.20 COconnect accessories

CAN connection cable LAXW 010-008 and LAXW 010-050

Article designation: LAXW 010-008 (0.8 m)
Article designation: LAXW 010-050 (5.0 m)

- Suitable for LABL 210/B.
- Length: 0.8 m or 5.0 m.
- D-Sub connector (both ends).

Connector set LAXT 005/A

Article designation: LAXT 005/A

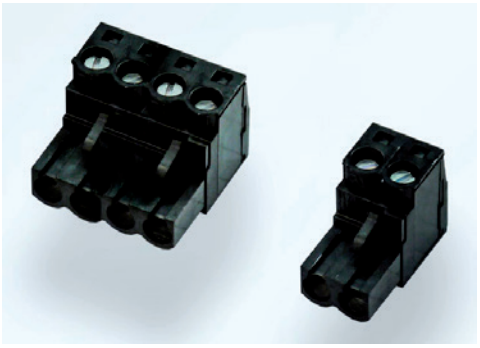
- Suitable for LABL 210/B, LACP 232/Z, LACP 24x/A.
- Comprising 1 piece BLZ 5.08/2 SN SW.
- Available as single set and 50 pcs./packing unit.

Connector set LAXT 006/A

Article designation: LAXT 006/A

- Suitable for LAMM 240/A.
- Comprising 2 pieces BLZ 5.08/6 SN SW.
- Available as single set and 50 pcs./packing unit.

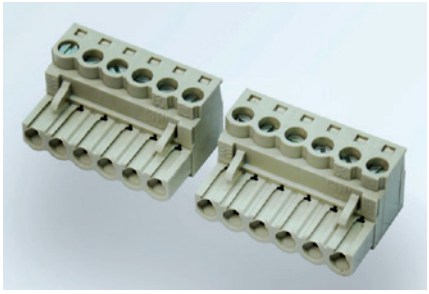
Connector set LAXT 022/A



Article designation: LAXT 022/A

- Suitable for LABL 27x/A.
- Comprising 1 piece BLZ 5.08/2 SN SW and 1 piece BLZ 5.08/4 SN SW
- Available as single set and 50 pcs./packing unit each.

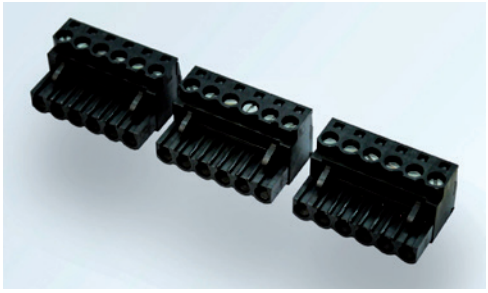
Connector set LAXT 025/A



Article designation: LAXT 025/A

- Suitable for LATM 240/A.
- Comprising 2 pieces BLZ 5.08/6 AU SW.
- Available as single set and 50 pcs./packing unit.

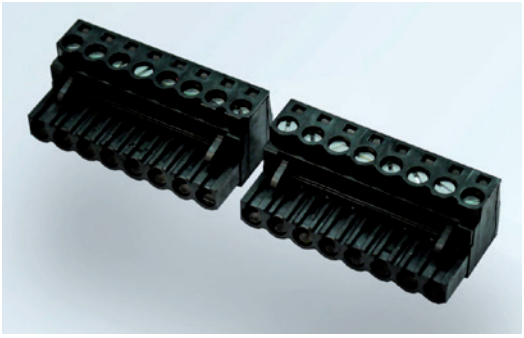
Connector set LAXT 030/A



Article designation: LAXT 030/A

- Suitable for LADI 260/A, LADM 272/A, LADM 276/A, LADO 272/A, LAAI 240/A, LAAO 240/A, LAAM 280/A.
- Comprising 3 pieces BLZ 5.08/6 SN SW.
- Available as single set and 50 pcs./packing unit.

Connector set LAXT 110/A



Article designation: LAXT 110/A

- Suitable for LATM 225/A.
- Comprising 2 pieces BLZ 5.08/8 SN SW.
- Available as single set and 50 pcs./packing unit.

Space for notes

5 VOpanel

Stationary control units VOpanel-S

Stationary control units with industrial quality touchscreen for convenient machine operation.

Mobile control units VOpanel-M

Mobile control units with display for

- Flexible controlling,
- Practical “teaching-in” processes and
- For data display.

Accessories

Cables, junction boxes and wall brackets.

The membranes on the front of the control units are resistant to: acetone, antifreeze, ethanol, petrol (lead-free), diesel, gearbox oil, heptane, isopropanol, methylethyl ketone, oil SAE, hydrochloric acid, turpentine, toluene.

5.1 Stationary control unit LAOP 460-LD/A-0000

Article designation: LAOP 460-LD/A-0000

The LAOP 460-LD/A-0000 is a control unit developed for usage in an industrial environment. Due to its flexible design the unit can be expanded with additional modules with little effort and in this way adapted to your system.

The control unit is designed as a monitor solution, i.e. the software for the display of data runs centrally in the control CPU. This feature permits straightforward, low-cost interfacing to the control. Only one cable is required for video data and operating data. After starting the control, diagnostic features are immediately available, as information such as boot data is output directly on the display.

Additional software for the operation of the control unit is unnecessary. This configuration reduces the overall complexity of the system and results in less maintenance and service effort.

The standard model of the control units has 16 digital inputs that make it possible to wire additional switches and lights to the control unit. If these inputs are insufficient, the control unit can be expanded with additional inputs and outputs using modules.

Due to the newly developed mounting feature the control unit can be mounted straightforwardly, securely and at low cost. No special tool is necessary for operation. Ease of use and the assurance of protection class IP65 for industrial applications underline the installation concept.

Technical data

General	
Supply voltage	+24 V DC (voltage limits as per IEC 61131-2)
Max. switch-on current	10 A
Max. power consumption	29 W
Internal power consumption	12 W
Max. power consumption (digital inputs)	3 W at 12 V DC (optional)
Display	15“ TFT, 1024 x 768 pixels, 16 million colours
Touchscreen	Analogue resistive
Membrane keypad	10 membrane keys with tactile feedback and LED, 1 power LED
Ambient conditions	
Operating temperature	+5 °C to +55 °C
Storage temperature	-40 °C to +70 °C
Relative atmospheric humidity	5 % to 95 % (without condensation)
Vibration and shock resistance	As per IEC 61131-2
Protection class	III (as per IEC 61131-2)
Protection	IP65 on the front (with correct installation), IP20 on the rear
Digital inputs	
Number of inputs	16 (DI0 - DI15, not IEC 61131-2 compliant)
Rated voltage	+24 V DC
Applied contact current	5 mA (supply exclusively via V_{out})
Electrical isolation	No
State indication	None
Min. update cycle	60 ms
Interfaces	
Serial interface	RS-485-A, 115 kbit/s
Graphic interface	PL (Panel Link), control unit can be positioned up to 20 m from the control
Mechanical characteristics	
External dimensions (W x H x D)	432 mm x 390 mm x 64.6 mm
Installation dimensions (W x H)	420 mm x 378 mm
Housing material	Metal
Front panel material	Aluminium
Decorative film material	Polyester
Sealing	Round cord all round
Weight	6.1 kg

5.2 Stationary control units LAOP 450-LD/A-0000 and LAOP 430-LD/A-0000

Article designation: LAOP 450-LD/A-0000
Article designation: LAOP 430-LD/A-0000

The LAOP 450-LD/A-0000 and LAOP 430-LD/A-0000 are control units that were developed for usage in an industrial environment. Due to their flexible design the units can be expanded with additional modules with little effort and in this way adapted to your system.

The control units are designed as a monitor solution, i.e. the software for the display of data runs centrally in the control CPU. This feature permits straightforward, low-cost interfacing to the control.

Only one cable is required for video data and operating data. After starting the control, diagnostic features are immediately available.

Information such as boot data is output directly on the display. Additional software for the operation of the control unit is unnecessary. This configuration reduces the overall complexity of the system and results in less maintenance and service effort.

The standard model of the control units has 16 digital inputs that make it possible to wire additional switches and lights to the control unit. If these inputs are insufficient, the control units can be expanded with additional inputs and outputs using modules.

Due to the newly developed mounting feature the control unit can be mounted straightforwardly, securely and at low cost. No special tool is necessary for operation. Ease of use and the assurance of protection class IP65 for industrial applications underline the installation concept.

Technical data

General	
Supply voltage	+24 V DC (voltage limits as per IEC 61131-2)
Max. switch-on current	10 A
Max. power consumption	29 W
Internal power consumption	12 W
Max. power consumption (digital inputs)	3 W at 12 V DC (optional)
Display	12.1“ TFT (LAOP 450-LD/A-0000) 8.4“ TFT (LAOP 430-LD/A-0000) each 800 x 600 pixels, 256,000 colours
Touchscreen	Analogue resistive
Membrane keypad	10 membrane keys with tactile feedback and LED, 1 power LED
Ambient conditions	
Operating temperature	+5 °C to +55 °C
Storage temperature	-40 °C to +70 °C
Relative atmospheric humidity	5 % to 95 % (without condensation)
Vibration and shock resistance	As per IEC 61131-2
Protection class	III (as per IEC 61131-2)
Protection	IP65 on the front (with correct installation), IP20 on the rear
Digital inputs	
Number of inputs	16 (DI0 - DI15, not IEC 61131-2 compliant)
Rated voltage	+24 V DC
Applied contact current	5 mA (supply exclusively via V_{out})
Electrical isolation	No
State indication	None
Min. update cycle	60 ms
Interfaces	
Serial interface	RS-485-A, 115 kbit/s
Graphic interface	PL (Panel Link), control unit can be positioned up to 30 m from the control
Mechanical characteristics	
External dimensions (W x H x D)	372 mm x 336 mm x 63.2 mm (LAOP 450-LD/A-0000), 298 mm x 269 mm x 62.4 mm (LAOP 430-LD/A-0000)
Installation dimensions (W x H)	360 mm x 324 mm (LAOP 450-LD/A) 286 mm x 257 mm (LAOP 430-LD/A)
Housing material	Metal
Front panel material	Aluminium
Decorative film material	Polyester
Sealing	Round cord all round
Weight	4.0 kg (LAOP 450-LD/A-0000) 2.8 kg (LAOP 430-LD/A-0000)

5.3 Mobile control unit LAOPM 55/A

Article designation: LAOPM 55/A

Latest technologies

With the latest ARM processor OMAP3503 from Texas Instruments the LAOPM 55/A is a particularly powerful embedded platform with low power consumption. Either Windows CE 6.0 or Linux are available as the operating system. Data can be conveniently transferred to removable media via the USB port provided.

Open communication

The LAOPM 55/A is equipped with a 100 Mbit Ethernet interface as standard. As a result maximum data transmission is ensured on the very cost-effective device so complex data display tasks can be realised.

Tough performer

To increase the reliability of the devices, the latest FE computer simulation is used during design.
The result of this research work is the round shape and the double-wall housing. The LAOPM 55/A can withstand a fall from a height of 1.5 metres without loss of function.

The convenience of a consumer solution

The LAOPM 55/A was designed for right or left-hand usage. All gripping and holding positions can be used as required and aid convenient, fatigue-free operation.

Technical data

Display	
Height	6.5“ TFT with LED backlight
Resolution, colour depth	640 x 480 pixels, 65536 colours
Touchscreen	Analogue resistive
Controls	
Membrane keypad	With tactile feedback, 3 x up to 16 keys (left/right/bottom), 2 x up to 4 LEDs (left/right)
Control devices (optional)	Handwheel, override potentiometer, 2 and 3-axis joystick
Controls (optional)	Key switch (three-position), I/O buttons (latching)
Safety elements	Enable button (three-position, two circuits), emergency stop button
Processor, memory, interfaces	
Processor	OMAP3503 600 MHz
Memory	64 MB Flash, 64 MB DRAM
Removable storage	Via USB
Interfaces	USB 2.0 full speed compatible, Ethernet 100 Mbit/sec, RS232/422/485
Software	
Operating system	Windows CE 6.0 or Linux
Data display system	Windows: Visual Studio.NET emb., C++ or C# Linux: ViEditor / Java
Dimensions	
Dimensions (H x W x L)	Diameter 250 mm, Total height 125 mm
Weight	Approx. 1300 g (without options)
Supply of power	
Power supply	+24 V DC (as per IEC 61131)
Ambient conditions	
Operating temperature	0 °C to +50 °C
Storage temperature	-20 °C to +70 °C
Relative atmospheric humidity	5 % to 95 % (without condensation)
Vibration resistance	10 Hz ≤ f ≤ 57 Hz with 0.075 mm, 57 Hz ≤ f ≤ 150 Hz with 1 g (EN 61131-2)
Shock resistance	15 g / 11 ms (EN 61131-2)
Protection	IP65

5.4 Mobile control unit LAOPM 20e/A

Article designation: LAOPM 20e/A

Best legibility due to OLED technology

The control unit has a powerful OLED display, optionally also with touchscreen. It is extremely energy-efficient and ensures the best legibility with its high contrast. The high brilliance permits the highest resolutions, as a result a large amount of information can be displayed on the compact display.

Application-optimised design

The LAOPM 20e/A is a very compact, light one-hand control unit. One hand always remains free for process-related activities. The device can be equipped with different optional controls and in this way can be optimally adapted to any application.

Convenient, fatigue-free left or right-hand operation

The low weight and the compact, ergonomic design permit fatigue-free work. The device is suitable for left or right-hand operation and can be optimally adjusted to the operator's hand using the adjustable belt.

Flexibility in the software

There are almost no limits for the programmer on writing applications. Alternatively, teach-in or commissioning applications can be realised in Visual Studio or ViEditor (Java-based). It is also possible to create remote solutions.

Perfect, quick integration

The control unit supports the serial interfaces RS-232-C or RS-422-A as well as Ethernet.

Safety as standard

All safety-related circuits are designed as double-circuits. The 3-position enable button that can be operated without the need to apply force detects operator cramp and panic reactions and then immediately places machines in a safe state.

Technical data

Display	
Type	Graphic OLED display
Height	3.4“ (75 x 42 mm)
Resolution, colour depth	480 x 272 pixels, 65536 colours
Touchscreen	Analogue resistive (optional)
Controls	
Membrane keypad	36 keys with tactile feedback (16 keys per version with handwheel)
Optional controls (up to 2 can be selected as required)	Override rotary switch / axis selection switch / key switch / pushbutton
Control device (optional)	Handwheel (magnetic detent, 100 pulses/revolution)
Safety elements (wired to the exterior)	2 enable buttons (3-position, 2-circuit), emergency stop button (2-circuit)
Processor, memory, interfaces	
Processor	OMAP3503 600 MHz
Memory	128 MB Flash, 128 MB SDRAM
Removable storage	Micro-SD card (optional)
Interfaces	USB 2.0 (optional), Ethernet 10/100 Mbit/sec, RS-422-A or RS-232-C
Housing	
Dimensions (H x W x L)	55 mm x 82 mm (162 mm) x 226 mm
Weight	Approx. 470 g (without options)
Supply of power	
Power supply	+24 V DC (as per IEC 61131)
Current consumption	200 mA at 24 V DC
Ambient conditions	
Operating temperature	0 °C to +45 °C
Storage temperature	-20 °C to +70 °C
Relative atmospheric humidity	5 % to 95 % (without condensation)
Vibration resistance	10 Hz ≤ f ≤ 57 Hz with 0.075 mm, 57 Hz ≤ f ≤ 150 Hz with 1 g (EN 61131)
Shock resistance	15 g / 11 ms (EN 61131)
Protection	IP65

5.5 Accessories

Connection cable for mobile control unit LATT 050 MV1 and LATT 100 MV1

Article designation: LATT 050 MV1 (5 m)
Article designation: LATT 100 MV1 (10 m)

- Suitable for mobile control unit LAOPM 55/A.
- Length: 5 m or 10 m

Connection cable for mobile control unit LATT 050-eaa and LATT 100-eaa

Article designation: LATT 050-eaa (5 m)
Article designation: LATT 100-eaa (10 m)

- Suitable for mobile control unit LAOPM 20e/A.
- Length: 5 m or 10 m

Video cable for stationary control unit LAXW 041-050

Article designation: LAXW 041-050

- Connection to control type LACP 24x/A and LACP 265/A.
- Suitable for all stationary control units. (LAOP 430-LD/A-0000, LAOP 450-LD/A-0000, LAOP 460-LD/A-0000).
- Length: 5 m.
- Cable for data display (RS-485)

Video cable for stationary control unit LAXW 044-050

Article designation: LAXW 044-050

- Connection to MO CM x.
- Suitable for all stationary control units (LAOP 430-LD/A-0000, LAOP 450-LD/A-0000, LAOP 460-LD/A-0000).
- Control-end DVI connector.
- Length: 5 m.
- Cable for data display (DVI to RS-485)

Wall bracket for mobile control unit LAWB 020

Article designation: LAWB 020)

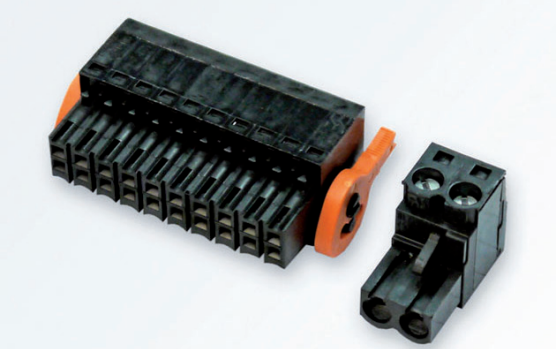
- Suitable for mobile control unit LAOPM 20e/A.
- Without cable holder.
- Without height adjustment

Wall bracket for mobile control unit LAWB 090

Article designation: LAWB 090

- Suitable for mobile control unit LAOPM 55/A.
- Without cable holder.
- Without height adjustment

Connector set for stationary control unit LAXT 120/A



Article designation: LAXT 120/A

- Suitable for all stationary control units (LAOP 430-LD/A-0000, LAOP 450-LD/A-0000, LAOP 460-LD/A-0000).

Junction box for mobile control unit LAJB 001/A set

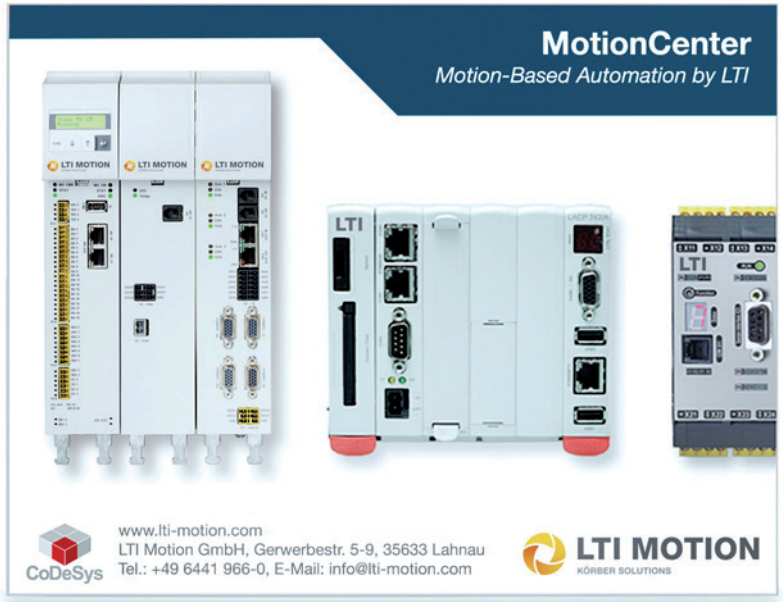
Article designation: LAXT 120/A

- Suitable for the connection of LATT 050 MV1, LATT 100 MV1, LATT 050-eaa and LATT 100-eaa an LACP 240/A, LACP 242/A and MotionOne CMx.
- On the usage of a mobile control unit is used as a connecting element between cabling inside and outside the switch cabinet.

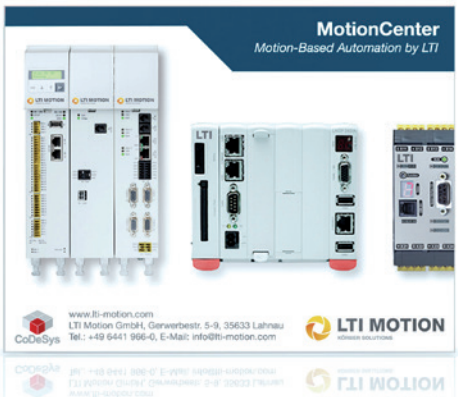
5

Space for notes

6 MotionCenter



6.1 MotionCenter software package



Article designation:
MotionCenter software package

The MotionCenter software package provides PLC programming based on CODESYS as well as modern data display tools. It impresses with openness due to OPC interface and with the ability to manage several drives in one project. The software package includes MotionCenter and ViEditor.

MotionCenter

CODESYS is programming software with which controllers can be programmed in accordance with international standards (IEC 61131-3).

The IP address set on a control is not always known. The integrated network scan finds all controls in the network. The network settings can be changed conveniently.

The configuration of the control and the IO assemblies used is fully integrated into CODESYS.

Motion functionality is integrated as an option.
With the aid of the PLCopen Motion function blocks single and multiple axis movements can be realised independent of the bus system used. A graphic editor is available for cam plates (CAM).

Data can be exchanged between a control with CODESYS runtime system and data display devices via a straightforward mechanism using network variables.

With the OPC standard, data display systems and host systems based on Windows can access variables on the control via a standardised interface.
Furthermore, straightforward data display can be realised quickly using Visual Basic, C++, C# or Excel.

ViEditor

A modern, intuitive graphic designer is available for planning dialog boxes. The elements provided are optimised for touch operation.
To design the data display dialog boxes, elements can be selected from a comprehensive library.

The existing widget palette can be expanded with custom elements. These elements can either be programmed or produced from a combination of existing elements (e.g. combination of data entry field and unit for the variables). Due to the central definition of attributes for variables (e.g. units, short/long text), each data display element to which the same variable is assigned is shown with the same attributes.

Due to the optimal combination of graphic planning and programming in Java, there are almost no limits on the design of the data display application.

With the aid of the central basic layout, data display applications can be prepared or changed very quickly. All elements that are to appear the same in every dialog box are placed once in the basic layout (e.g. date/time, logo, user name, buttons for changing dialog box, …). These elements then appear automatically in every dialog box.

Due to the use of commonplace Java technology, work can be re-used and the investment protected.

Technical data

General	
Contents	MotionCenter, ViEditor, control software and documentation
Form of delivery	DVD
System requirements	
Operating system	Windows XP, Windows Vista, Windows 7
Processor at least	Intel Pentium or compatible, 1.6 GHz
Memory at least	1 GB
Processor recommended	2.4 GHz
Memory recommended	2 GB
Hard disk space required	1.3 GB

Name	Licence	Functionality	Art. no.
MotionCenter LX Std	Workstation licence	Workstation licence - MotionCenter LX Standard Software Package – Form of delivery: DVD – Contents: MotionCenter, Vleditor, Scope, control software, demonstration examples and documentation – Preparation of PLCopen based IEC projects, drive parameter configuration and preparation of HMI projects (Vleditor) – Single user licence	1556.1030
MotionCenter LX FS		Workstation licence - MotionCenter LX Safety – As for Standard and in addition: – Programming (Safety) – Demonstration examples and documentation	1556.1032 in preparation
MotionCenter LX Adv		Workstation licence - MotionCenter LX Advanced – As for Safety and in addition: – Preparation of IEC, handling and robot configurations for standard kinematics – Programming (IEC and Kairo) – 3D Model Viewer/Scope – Templates and examples for robotics – Documentation	1556.1034 in preparation

7 Other LTI products

ID no.: 1400.205B.4-01 Date: 04/2016

7.1 ServoOne family

Servocontroller

ServoOne family

The modularity of the ServoOne family guarantees you optimum integration into the machine process at all times. A co-ordinated single-axis and energy-efficient multi-axis system meet the needs of any application across a wide power range.

Whether in high-speed field bus communication with the central multi-axis machine controller or with distributed Motion Control intelligence in the drive controller – the ServoOne is a master of both.

So enjoy the surprising diversity of functionality of the ServoOne, and make use of its future-proof specification for your application!

ServoOne junior

Optimised for the lower power range, the ServoOne junior comes with all the technological genes present in the rest of the family. Full functional compatibility and uniform handling within the ServoOne family is guaranteed at all times.

- **3 - 8 A rated current at 1/3 x 230 V AC**
- **2 - 16 A rated current at 3 x 400 - 480 V AC**
- **Up to 300 % overload capacity**

ServoOne single-axis system

The ServoOne servocontroller is suitable for a broad spread of applications thanks to its very wide power range. From handling systems to complex test rigs, there are no limits to the diversity of the applications covered.

- **4 - 450 A rated current at 3 x 230 - 480 V AC**
- **8 sizes for optimum performance tailoring**
- **Air or liquid cooled systems**
- **Safety control can be integrated**

ServoOne multi-axis system

Comprising DC-powered axis controllers and co-ordinated supply units with sinusoidal regenerative power supply, the multi-axis system offers a high degree of solutions expertise and flexibility. A constantly controlled DC link voltage ensures independence from varying mains voltages in different parts of the world. Surplus kinetic braking energy is converted into electric power and fed back into the supply system in sinusoidal form, thereby helping to preserve the environment as well as delivering financial benefits.

- **Axis controllers 4 - 450 A rated current**
- **DC link fuses integrated**
- **Supply units with 26 kW - 360 kW DC input power**

For operation with the control platform MotionOne, the CANopen option (article designation SOxx.xxx.xx4.x.xxxx.x) or EtherCAT option (article description SOxx.xxx.xx3.x.xxxx.x) is required for the ServoOne.

You will find further details in the system catalogue for the ServoOne (ID no. 1100.24B.x), which is available in the Download area of our homepage (www.lti-motion.com).

7.2 c-line

Servocontroller and frequency inverter

c-line devices

CDE/CDB3000 - the positioning wizard in the economy class

The drive controllers CDE/CDB are available in the power classes from 375 W or 2 A up to 90 kW or 132 A.

- **Safe standstill in accordance with category 3 EN 954-1**
- **CANopen**
- **Evaluation of two encoders and absolute value encoders**
- **Chained motion block positioning**
- **PLCmotion**
- **Cam group**
- **Inline position profile generator**

You will find further details in the Order Catalogue CDE/CDB3000 (ID. no. 1001.24B.x), which is available in the Download area of our homepage (www.lti-motion.com).

CDF3000 - the little one with the genes of its big brothers

We have given the CDF3000 all the characteristics to make it suitable for the DC supply concept with 24 V or 48 V for usage in the demanding automation world.

- **Supply voltage 24 V to 48 V, for operation at the protective extra low voltage level**
- **Features otherwise as for CDE/CDB3000**

You will find further details in the brochure for the CF3000 (ID no. 0920.0036), which is available in the Download area of our homepage (www.lti-motion.com).

7.3 Safety systems

Safe Motion from LTI

Devices with safety functions

The scaleable LTI Safe Motion architecture makes possible the optimal design of machine safety solutions. Independent of whether you favour a drive or control-based machine safety solution - our Safe Motion architecture is a master of both. The operation, usage and programming of the safety control are absolutely identical here, irrespective of where it is physically arranged.

The ServoOne with integrated SIL3 safety control offers a very wide range of safety functions. Very special solutions are possible with the drive controllers CDE/CDB/CDF3000 and the external “Safe Monitoring Control”.

FUNCTIONAL SAFETY

SERVOONE WITH INTEGRATED SAFETY CONTROL IN SIL3
servo drives from 4 to 72 A with AC or DC supply

SAFE MONITORING CONTROL IN SIL3
modular safety control with various encoder interfaces and scaleable I/O

With the following safety functions:

SSX **SAFE STOP SS1/2**
with monitoring of the speed curve

STO **SAFE TORQUE OFF**
shutdown in category 4/HFT 2

SOS **SAFE OPERATING STOP**
monitors the speed or the position at standstill

SLT **SAFELY LIMITED TORQUE**
monitors if a maximum torque or a maximum force is exceeded

SOS **SAFELY LIMITED SPEED**
monitors if a maximum permissible speed is exceeded

SLI **SAFELY LIMITED INCREMENT**
monitors if a pre-defined increment is exceeded

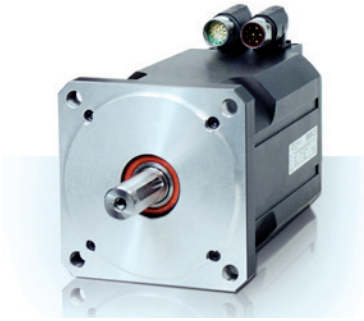
SLP **SAFELY LIMITED POSITION**
monitors if a pre-defined position is exceeded

SDI **SAFE DIRECTION**
monitors the inhibition of a direction of rotation

The bus coupler module SMC-B10 is required to integrate the control platform MotionOne via CANopen. Please note that it is only possible to send status messages.

You will find further details in the ServoOne safety brochure (ID. no. 0920.0044.x), which is available in the Download area of our homepage (www.lti-motion.com).

7.4 Servomotors

Contents	Types
 LSH servomotor – the power pack	LSH-050-x to SH-127-x
 LST servomotor – the versatile one	LST-037-x to LST-220-x
 LSN servomotor – compact and low-cost	LSN-050-x to LSN-090-x
 LSP servomotor with optional planetary gearbox – slim and cost-effective	 LSP-04-x to LSP-13-x motors with HIPERFACE DSL® cable (one-cable solution)

ID no.: 1400.205B.4-01 Date: 04/2016

7.4.1 The LSH motor - the power pack

Using a completely new winding technology known as concentrated winding, the new LSH generation of motors improves power density by between 30 % and 70 % compared with conventional technologies.

For the user this means up to 100 % improvement in dynamic performance and significantly reduced space requirements combined with good running behaviour.

Technical data

Motor type	DC link voltage [V]	Stall torque M_0 [Nm]	Rated torque M_n [Nm]	Rated current at 560 V I_n [A]	Rated current at 320 V I_n [A]	Rated speed n_n [min^{-1}]
LSH-050-1	320	0.26	0.24	-	0.68	4500
LSH-050-2	320	0.53	0.45	-	1.11	4500
LSH-050-3	320	0.74	0.67	-	1.55	4500
LSH-050-4	320	0.95	0.84	-	1.90	4500
LSH-074-1	320/560	0.95	0.86	1.28	1.43	3000
LSH-074-2	320/560	1.90	1.60	1.46	2.40	3000
LSH-074-3	320/560	3.30	2.90	2.30	4.00	3000
LSH-074-4	320/560	4.20	3.10	2.30	3.70	3000
LSH-097-1	320/560	4.10	3.20	2.80	5.00	3000
LSH-097-2	320/560	6.30	4.60	3.60	7.00	3000
LSH-097-3	320/560	8.60	6.10	4.80	8.3	3000
LSH-127-1	560	11.60	8.40	7.90	-	3000
LSH-127-2	560	14.90	10.90	9.60	-	3000
LSH-127-3	560	18.70	14.30	13.10	-	3000
LSH-127-4	560	27.30	21.00	14.90	-	3000

NOTE:
You will find detailed electrical data and accessories, such as system cables, in the Order Catalogue Servomotors (ID no.: 0814.25B.x).

7.4.2 The LST motor - the versatile one

Featuring conventional winding technology, the LST motor combines all the advantages of a 6-pole synchronous servomotor. Well suited to speeds up to 9000 min^{-1}.

- Well suited to speeds up to 9000 min^{-1}.
- Special windings are possible on request.
- High overload capacity even at standstill based on efficient heat distribution in the stator core.
- Increased rotor moment of inertia for torque adaptation.

Technical data

Motor type	DC link voltage [V]	Stall torque M_0 [Nm]	Rated torque M_n [Nm]	Rated current at 560 V I_n [A]	Rated current at 320 V I_n [A]	Rated speed n_n [min^{-1}]
LST-037	LST-037-1	0.10	0.09	-	0.56	6000
	LST-037-2	0.20	0.18	-	0.92	6000
	LST-037-3	0.30	0.27	-	0.89	6000
LST-050	LST-050-1	0.20	0.19	-	0.60	4500
	LST-050-2	0.40	0.36	-	0.88	4500
	LST-050-3	0.60	0.55	-	1.18	4500
	LST-050-4	0.80	0.72	-	1.47	4500
	LST-050-5	0.95	0.85	-	1.71	4500
LST-074	LST-074-1	0.65	0.60	0.64	1.04	3000
	LST-074-2	1.30	1.15	0.95	1.58	3000
	LST-074-3	1.90	1.60	1.26	2.20	3000
	LST-074-4	2.50	2.20	1.62	2.70	3000
	LST-074-5	3.00	2.50	1.82	3.00	3000
LST-097	LST-097-1	2.60	2.30	1.85	3.00	3000
	LST-097-2	3.90	3.30	2.60	4.30	3000
	LST-097-3	5.30	4.60	3.80	5.90	3000
	LST-097-4	7.50	6.40	4.40	8.10	3000
	LST-097-5	9.50	8.50	6.20	10.5	3000
LST-127	LST-127-1	6.60	5.70	4.00	-	3000
	LST-127-2	10.5	8.80	6.30	-	3000
	LST-127-3	13.5	11.0	9.50	-	3000
	LST-127-4	17.0	14.5	10.0	-	3000
	LST-127-5	22.0	17.0	13.0	-	3000
LST-158	LST-158-1	13.5	13.0	8.20	-	3000
	LST-158-2	19.0	17.0	10.6	-	3000
	LST-158-3	22.0	19.0	12.3	-	3000
	LST-158-4	29.0	24.0	14.7	-	3000
	LST-158-5	35.0	26.0	18.2	-	3000
LST-190	LST-190-1	27.0	21.0	13.5	-	3000
	LST-190-2	32.0	23.0	15.0	-	3000
	LST-190-3	40.0	26.0	17.9	-	3000

7.4.3 The LSN motor – compact and low-cost

The LSN product range featuring stall torques (M_0) from 0.28 Nm to 60 Nm (externally cooled up to 78 Nm) is an enhancement of the LSH range incorporating the Q 158 and Q 190 space envelopes. The winding construction is a compound-die pole winding. An optimised thermal design has increased the power density by a further approximately 30 % compared to the LSH product range. So the power density and dynamic performance of the LSN servomotors are in the "high-end segment".

Technical data

Motor type	Motor type/ Rating plate	DC link voltage [V]	Stall torque M_0 [Nm]	Rated torque M_n [Nm]	Rated current I_n [A]	Rated speed n_n [min^{-1}]
LSN-050	LSN-050-0028-45-320	320	0.28	0.25	0.96	4500
	LSN-050-0054-45-320		0.54	0.48	1.12	4500
	LSN-050-0075-45-320		0.75	0.68	1.48	4500
	LSN-050-0095-45-320		0.95	0.85	1.70	4500
	LSN-050-0028-45-560	560	0.28	0.25	0.96	4500
	LSN-050-0054-45-560		0.54	0.48	0.90	4500
	LSN-050-0075-45-560		0.75	0.68	0.83	4500
	LSN-050-0095-45-560		0.95	0.85	1.07	4500
LSN-074	LSN-074-0115-30-320	320	1.15	1.13	2.30	3000
	LSN-074-0205-30-320		2.05	1.90	3.10	3000
	LSN-074-0350-30-320		3.50	3.00	4.30	3000
	LSN-074-0480-30-320		4.80	3.70	4.50	3000
	LSN-074-0115-30-560	560	1.15	1.13	1.30	3000
	LSN-074-0205-30-560		2.05	1.90	1.70	3000
	LSN-074-0350-30-560		3.50	3.00	2.40	3000
	LSN-074-0480-30-560		4.80	3.70	2.60	3000
LSN-097	LSN-097-0510-30-320	320	5.10	4.20	7.00	3000
	LSN-097-0750-30-320		7.50	6.10	8.80	3000
	LSN-097-0960-30-320		9.60	7.70	10.80	3000
	LSN-097-1130-30-320		11.30	8.80	10.70	3000
	LSN-097-0510-30-560	560	5.10	4.20	3.90	3000
	LSN-097-0750-30-560		7.50	6.10	5.10	3000
	LSN-097-0960-30-560		9.60	7.70	6.00	3000
	LSN-097-1130-30-560		11.30	8.80	6.90	3000
LSN-127	LSN-127-1200-30-560	560	12.00	10.50	8.30	3000
	LSN-127-1600-30-560		16.00	13.80	9.90	3000
	LSN-127-2000-30-560		20.00	16.00	11.50	3000
	LSN-127-2400-30-560		24.00	20.00	14.10	3000
LSN-158	LSN-158-1800-20-560	560	18.00	14.80	8.60	2000
	LSN-158-2400-20-560		24.00	20.00	10.70	2000
	LSN-158-3000-20-560		30.00	25.30	12.90	2000
	LSN-158-3800-20-560		38.00	29.00	15.00	2000
	LSN-158-4400-20-560		44.00	36.50	17.30	2000
	LSN-158-1800-30-560	560	18.00	13.00	11.00	3000
	LSN-158-2400-30-560		24.00	17.00	13.80	3000
	LSN-158-3000-30-560		30.00	21.00	16.20	3000
	LSN-158-3800-30-560		38.00	25.00	19.70	3000
	LSN-158-4400-30-560		44.00	30.00	24.40	3000

Motor type	Motor type/ Rating plate	DC link voltage [V]	Stall torque M_0 [Nm]	Rated torque M_n [Nm]	Rated current I_n [A]	Rated speed n_n [min^{-1}]
LSN-190	LSN-190-3000-20-560	560	30.00	26.10	13.20	2000
	LSN-190-4000-20-560		40.00	32.80	15.40	2000
	LSN-190-5000-20-560		50.00	40.40	21.80	2000
	LSN-190-6000-10-560		60.00	54.00	14.60	2000
	LSN-190-3000-30-560	560	30.00	23.00	15.50	3000
	LSN-190-4000-30-560		40.00	25.00	20.10	3000
	LSN-190-5000-30-560		50.00	30.00	24.40	3000
	LSN-190-6000-25-560		60.00	36.20	20.70	3000

NOTE:
You will find detailed electrical data and accessories, such as system cables, in the Order Catalogue Servomotors (ID no.: 0814.25B.x).

7.4.4 The LSP servomotor with optional planetary gearbox – slim and cost-effective

The LSN product range featuring stall torques (M0) from 0.18 Nm to 18.5 Nm meets the highest demands in terms of synchronism and accuracy.

Its advantages are highlighted particularly in conjunction with the ServoOne junior drive controller. Users can choose from a total of 32 variants, enabling them to make a cost-effective drive controller combination.

In contrast to its Asian counterpart, the European model features a homogeneous inertia characteristic all across the product range. This means the motor in IP65 can always be adapted to specific needs. The further enhancement of the classic winding technology in these units makes it possible to produce compact designs and cuts production costs.

Technical data

Motor type	Motor type/ Rating plate	DC link voltage [V]	Stall torque M_0 [Nm]	Rated torque M_n [Nm]	Rated current I_n [A]	Rated speed n_n [min^{-1}]
LSP04	LSP04-002	320	0.18	0.12	0.6	9000
	LSP04-004	320	0.35	0.21	1.1	9000
LSP06	LSP06-007	320	0.7	0.6	0.8	3000
		320	0.7	0.5	1.3	6000
	LSP06-015	320	1.5	1.2	1.6	3000
		320	1.5	0.9	2.1	6000
LSP08	LSP08-028	320	2.8	2.4	3.0	3000
		320	2.8	1.7	3.8	5500
		560	2.8	2.3	1.7	3000
		560	2.8	1.7	2.2	5500
	LSP08-035	320	3.5	3.2	3.9	3000
		320	3.5	2.1	4.7	5500
		560	3.5	3.2	2.2	3000
		560	3.5	2.1	2.6	5500
LSP10	LSP10-056	560	5.6	4.8	3.3	3000
		560	5.6	3.4	3.9	5000
	LSP10-075	560	7.5	6.4	4.4	3000
		560	7.5	4.8	5.3	5000
LSP13	LSP13-055	320	5.5	4.8	4.1	2000
		320	5.5	4.0	6.0	3600
		560	5.5	4.8	2.3	2000
		560	5.5	4.0	3.4	3600
	LSP13-091	560	9.1	7.2	3.4	2000
		560	9.1	6.0	5.0	3600
	LSP13-123	560	12.3	9.6	4.5	2000
		560	12.3	8.0	6.7	3600
	LSP13-185	560	18.5	14.4	6.5	2000
		560	18.5	10.0	8.0	3600

NOTE:
You will find detailed electrical data and accessories, such as system cables, in the Order Catalogue Servomotors (ID no.: 0814.28B.x).

Space for notes

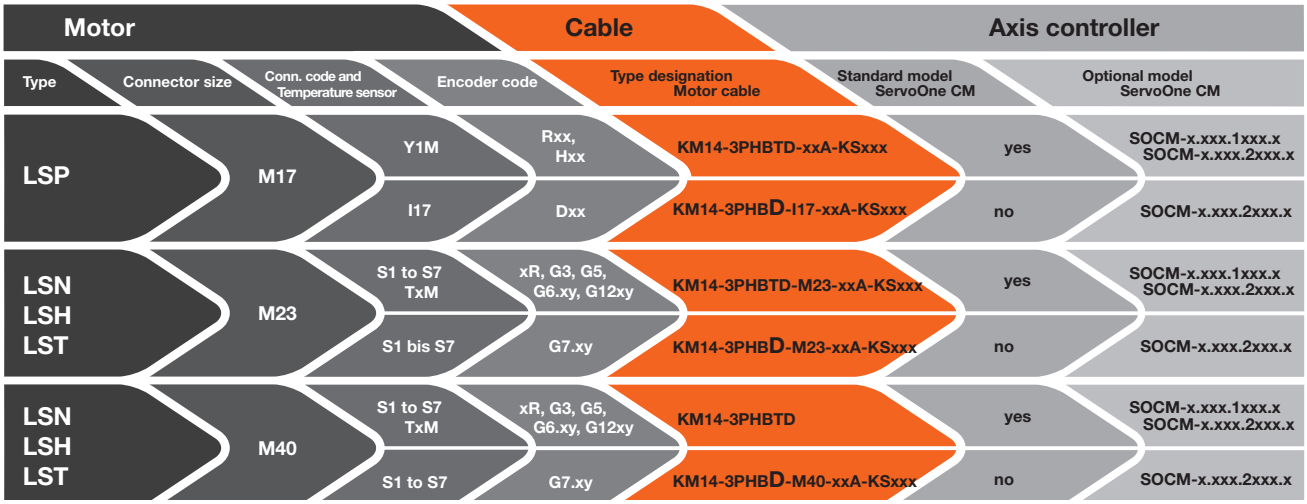
7.5 Ready made motor cables for ServoOne CM

Ready made motor cable - order code

	KM14	-	3PHBD	-	I17	-	10A	-	KS	001
Ready made motor cable										
Cable layout	**3PHBTD →**		3-phases + earth + brake + thermo + HIPERFACE DSL®							
Connector	**M23 →**		M23 connector							
	I17 →		I17 connector (HIPERFACE DSL®)							
	M40 →		M40 connector							
Rated current	**5A →**		Cable cross-section 0.5 mm^2							
	10A →		Cable cross-section 1 mm^2							
	16A →		Cable cross-section 1.5 mm^2							
	24A →		Cable cross-section 2.5 mm^2							
	35A →		Cable cross-section 4 mm^2							
Additional option	**KS →**		Capable for energy chains							
Cable length	**001 →**		1 m							
	010 →		10 m							
	030 →		30 m							
			Cable lengths available: 1 m, 2 m, 3 m, 4 m, 5 m, 6 m, 7 m, 8 m, 9 m, 10 m, 15 m, 20 m, 25 m, 30 m							

NOTE:
You will find descriptions and specifications for the ready made motor cables in the LSx servomotor catalogues and in the operation manual for the ServoOne CM axis controller.

Selection procedure “Motor cables for the ServoOne CM”



7.6 Ready made encoder cables for the ServoOne CM

Example illustration

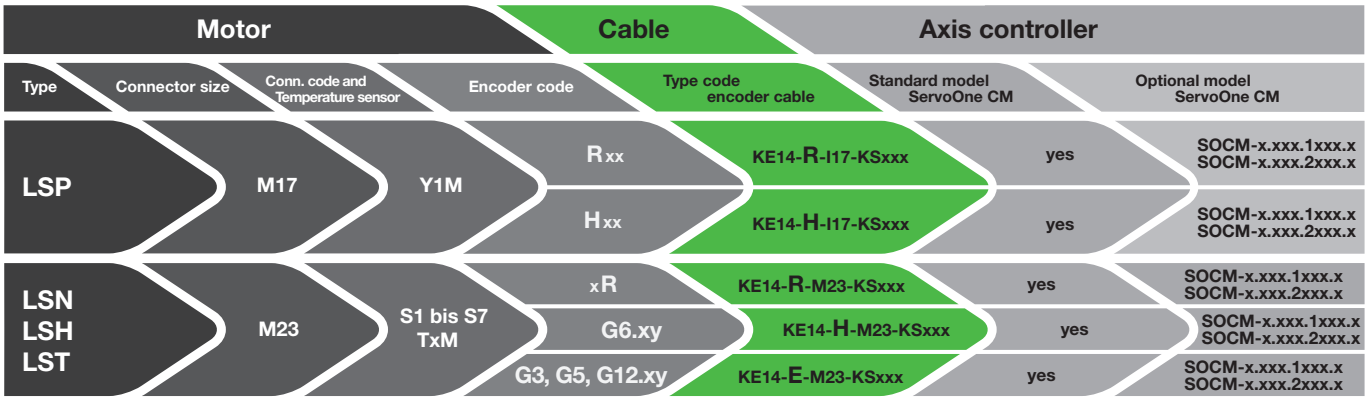
7.6.1 Ready made encoder cable - order code

	KE14	-	R	-	I17	-	KS	010

Ready made encoder cable			
Encoder type	**R →**		Resolver
	H →		HIPERFACE DSL®
	E →		EnDat/SSI
Connector		**M23 →**	M23 connector
		I17 →	I17 connector
Additional option		**KS →**	Capable for energy chains
Cable length		**001 →**	1 m
		010 →	10 m
		030 →	30 m
		Cable lengths available: 1 m, 2 m, 3 m, 4 m, 5 m, 6 m, 7 m, 8 m, 9 m, 10 m, 15 m, 20 m, 25 m, 30 m	

NOTE:
You will find descriptions and specifications for the ready made encoder cables in the LSx servomotor catalogues and in the operation manual for the ServoOne CM axis controller.

Selection procedure “Encoder cables for the ServoOne CM”



Space for notes

Subject to technical change without notice.

The content of our order catalogue was compiled with the greatest care and attention, and based on the latest information available to us.

We should nevertheless point out that this document cannot always be updated simultaneously with the on-going technical development of our products.

Information and specifications may be subject to change at any time. For information on the latest version please visit www.lti-motion.com.

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