

L-force

Controller-based Automation



Open and closed loop control, visualisation



Lenze

L-force – Your future is our drive

In order to cut your costs, save you time and increase your efficiency, through L-force we have made a unique product philosophy reality. This generation of drive and automation technology perfectly combines innovation, flexibility, usability and a systematic approach.

L-force is innovation

Every day we are working on better solutions to offer you more options and (added) value.

L-force is flexibility

Performance, functional range, software and service – we deliver just the right combination.

L-force is usability

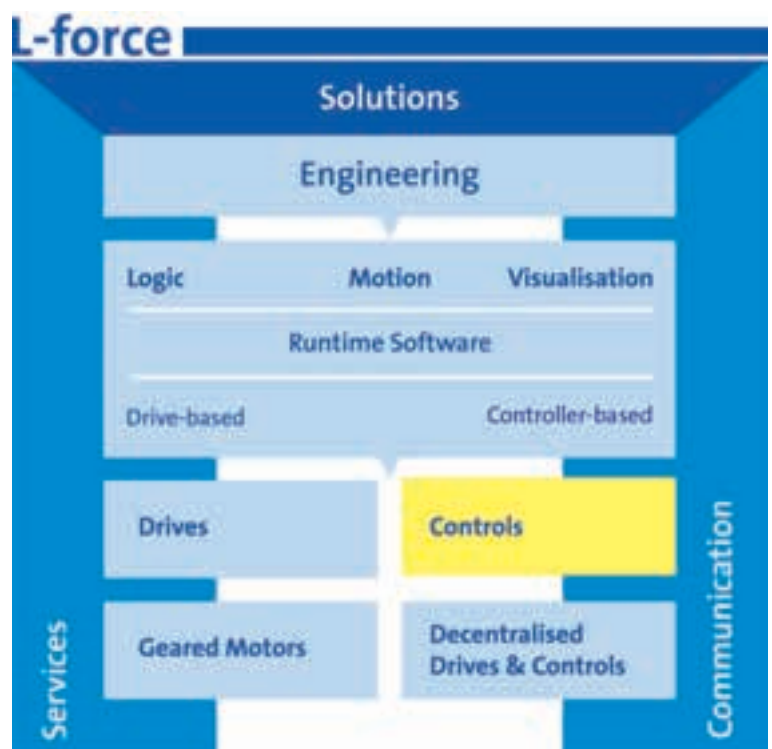
Prepared solutions and simple and function-focused engineering simplify commissioning for you.

L-force is systematic

Everything about L-force is perfectly coordinated.

Let's shape the future together.

L-force is an integrated program of components, solutions, systems and services. This overview shows our full range with individual product and solution segments.



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Open and closed loop control,
visualisation

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Automation system with central motion control

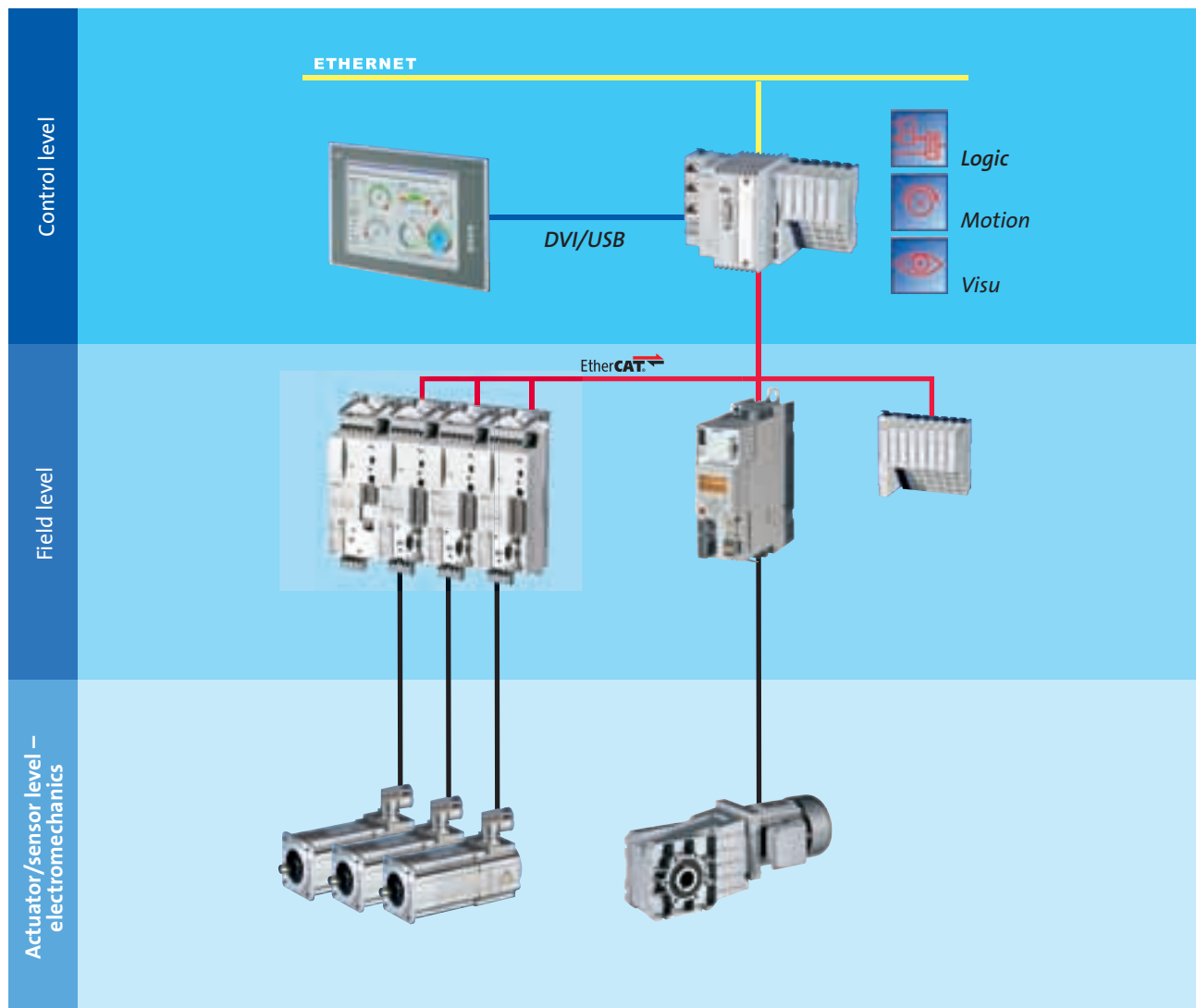
Complex machines such as robots, packaging machines and handling systems require a powerful and consistent automation system with a central control system. This permits the coordinated movement of large numbers of axes and is also able to take on the control functions of a line process. The central architecture offers project planners the advantage that they only have to develop and manage one control program. We call this Controller-based Automation for central motion control.

In order to efficiently and cost-effectively manage the increasing complexity of your automation work, you expect your automation supplier to offer not just a consistent automation system but also advanced engineering tools and if necessary assistance from a qualified support team. Lenze can provide experts experienced in sales and support

to assist you in project planning, design, selection of the appropriate components and programming your mechatronic solution.

In Europe alone, our customers have access to a network of more than 100 highly qualified applications engineers. An all-around service, training and a global helpline round things off perfectly.

The Lenze controller-based automation system consists of the new Controller 3200 C range of devices, a wide selection of servo and frequency inverters with matched standard three-phase AC motors, synchronous and asynchronous servo motors, each of which can be combined with gearboxes of various designs, and even decentralised I/O systems.





Controller



I/O system



Engineering software



Monitor panel



Runtime software



Frequency and servo inverters



Standard three-phase AC motors, synchronous and asynchronous servo motors



Gearboxes and geared motors

Automation with EtherCAT



EtherCAT, the modern Ethernet-based bus system, is integrated in the L-force Controller 3200 C as standard and opens up a multitude of different possible uses:

- ▶ all on one bus (logic, motion)
- ▶ virtually unlimited number of devices
- ▶ 1 ms cycle time
- ▶ can be combined with other bus systems (using option cards)

Functional principle of EtherCAT

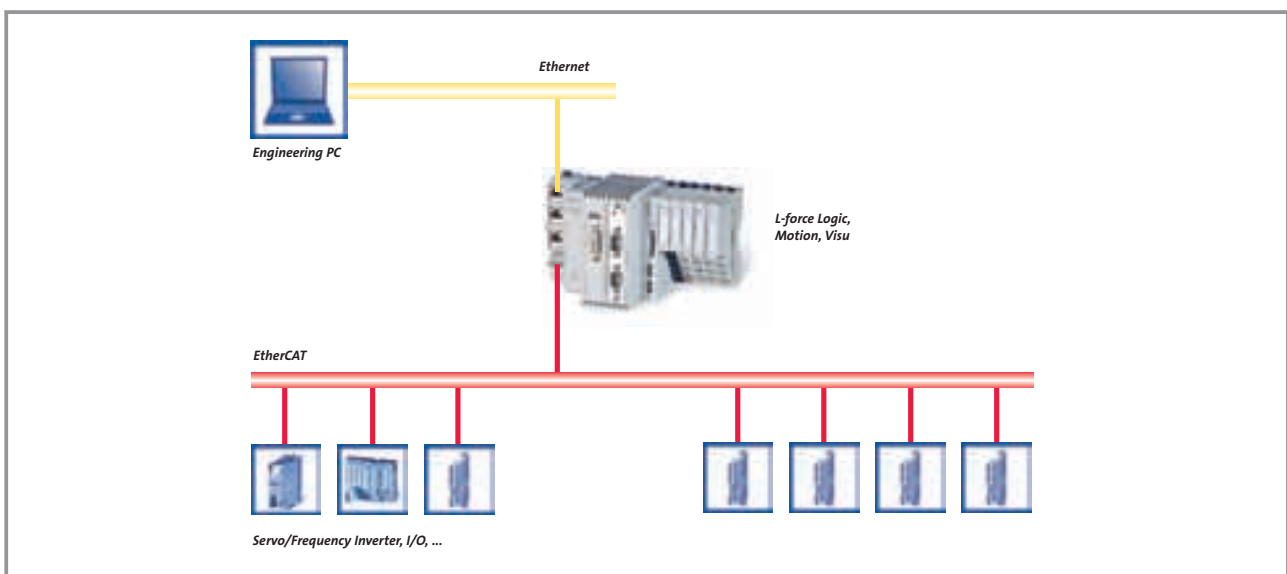
Data is taken from and/or added to the Ethernet telegram in a cycle. This procedure was first used with Interbus under the name "one-total-frame protocol". The basic idea is the same, but there are major differences between the details of Interbus and EtherCAT. Standard Ethernet telegrams are not used.

Topology

In principle any topology can be used for an EtherCAT system. A line topology is usually used. This actually involves a ring. Standard switches cannot be used to create a star.

| Controller 3200 C range of devices | | | Controller | | Field devices | | | | | | |
|---|----------------|------------------------|------------|--------|---------------|-----------------|---------------|-------------|-------------|--------------------|---------------------|
| | | | 3200 C | | I/O systems | Servo inverter | | | | Frequency inverter | Other field devices |
| | | | 3221 C | 3231 C | 1000 | 9400 with DS402 | 9400 HighLine | ECS-M | ECS | 8400 | XML file |
| Runtime Software | L-force Logic | LPC 1000 | X | X | X | | X | | X | X | X |
| | L-force Motion | MPC 1200 | X | X | | X | | X* | | | |
| | L-force Visu | VisiWinNET® Compact CE | | X | | | | | | | |
| Communication | EtherCAT | Interface | integrated | | Bus coupler | Module | Module | Mo- dule | Mo- dule | Module | |
| | | No. of bus lines | 1 | | | | | | | | |
| | | Baud rate | 100 Mbps | | | | | | | | |

* in preparation



Automation with CANopen

CANopen

The tried-and-tested CAN bus is used by default in many field devices. If only a small number of axes is used, this may be an interesting alternative to EtherCAT.

- ▶ We would recommend separating the motion and logic bus
- ▶ Up to 2 synchronised motion buses possible
- ▶ Cost-effective for average performance with a small number of axes
- ▶ 1 ms cycle time
- ▶ Can be combined with EtherCAT

Up to 2 CAN buses

When using a 1 Mbps baud rate on a CAN bus, a maximum of 3-4 drive controllers can be operated with a cycle time of 1 ms. Several CAN buses, suited to motion, are therefore available and are synchronised with one another.

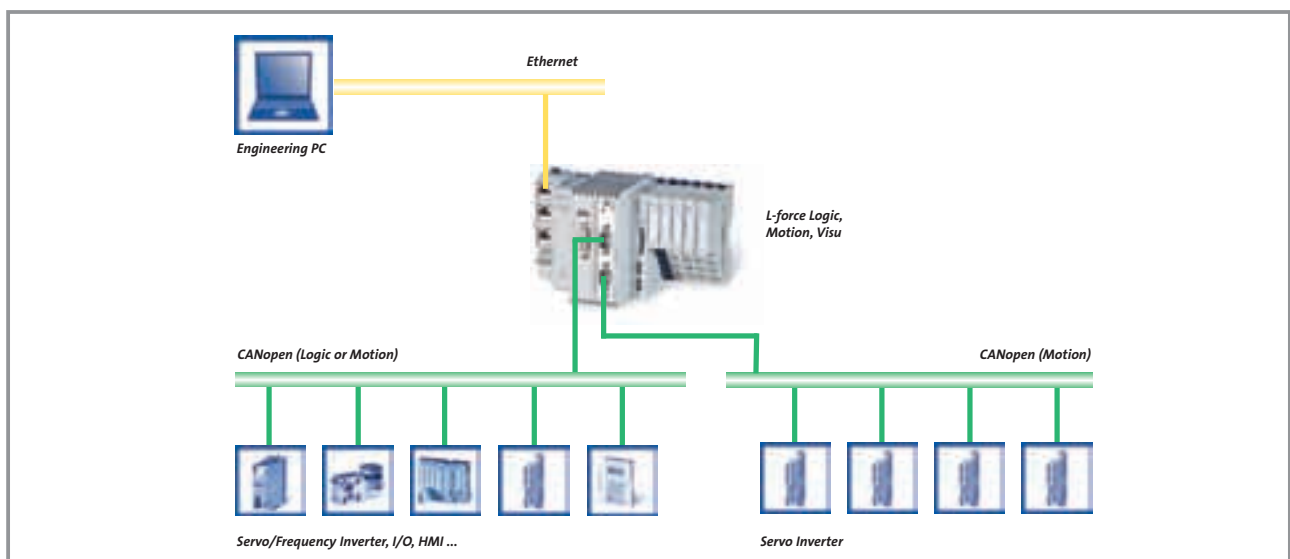
The number of drive controllers which can be contacted therefore increases with the number of bus lines.

We would always recommend using a separate CAN bus for pure logic control as this will ensure that any interference to the drive controller by another CANopen device (e.g. a HMI) is reliably prevented.

CANopen versus system bus (CAN)

Lenze's ECS range of devices features an on-board system bus (CAN) connection. The protocol used here is a subset of CANopen and can also be operated on a CANopen compatible L-force Controller in conjunction with other CANopen compatible devices.

| Controller 3200 C range of devices | | | Controller | | Field devices | | | | | | |
|------------------------------------|----------------|------------------------|-------------|--------|---------------|-----------------|---------------|-------------|-------------|--------------------|---------------------|
| | | | 3200 C | | I/O systems | Servo inverter | | | | Frequency inverter | Other field devices |
| | | | 3221 C | 3231 C | 1000 | 9400 with DS402 | 9400 HighLine | ECS-M | ECS | 8400 | EDS file |
| Runtime Software | L-force Logic | LPC 1000 | X | X | X | | X | | X | X | X |
| | L-force Motion | MPC 1200 | X | X | | X | | X | | | |
| | L-force Visu | VisiWinNET® Compact CE | | X | | | | | | | |
| Communication | CANopen | Interface | MC-CAN2 | | Bus coupler | Inte-grated | Inte-grated | Inte-grated | Inte-grated | Integrated | |
| | | No. of bus lines | 2 | | | | | | | | |
| | | Baud rate | max. 1 Mbps | | | | | | | | |



Automation with PROFIBUS



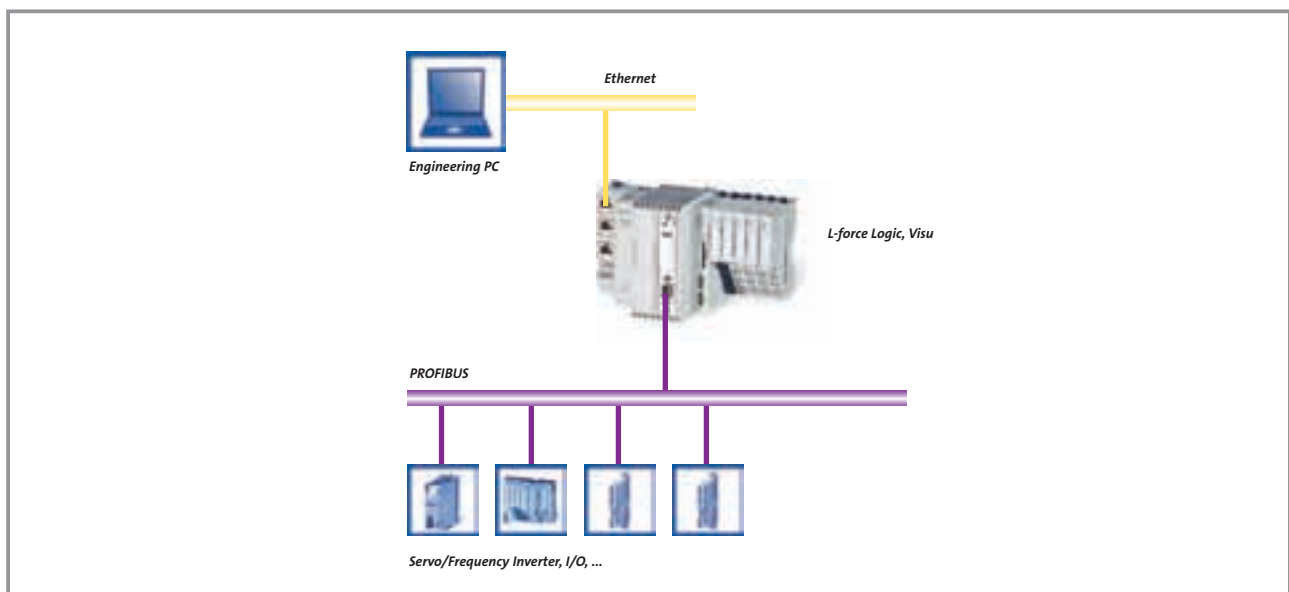
Nowadays PROFIBUS is by far the most common fieldbus used in automation technology. The choice of field devices available is huge. By extending control technology to PROFIBUS, this diverse range is now also available within L-force Logic.

- ▶ Soft PLC with functional range of L-force Logic (LPC 1000)
- ▶ Can be combined with motion buses
- ▶ Integration of devices using DDF (device description file)

Possible combinations

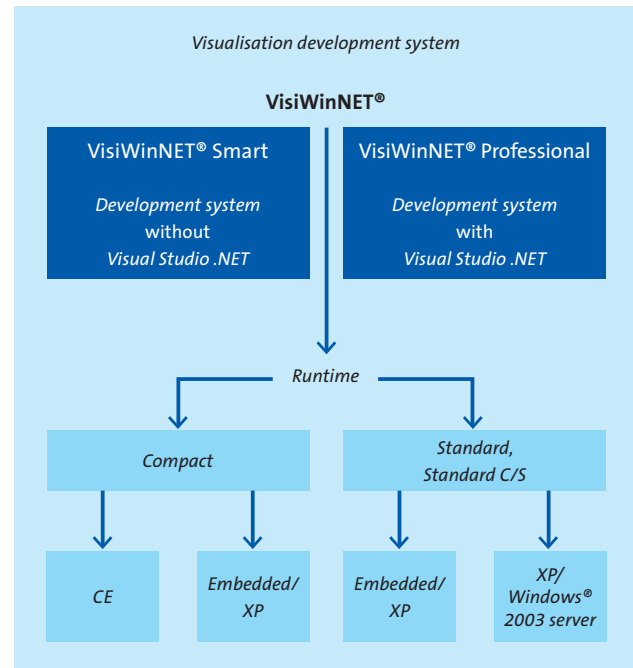
Lenze supplies the relevant combinations to allow you to both integrate tried-and-tested system parts automated with PROFIBUS into the Lenze world of control and to tap into the advantages of L-force control technology. For example, logic field devices are contacted using PROFIBUS while EtherCAT is operated in parallel as the motion bus. This also allows for a smooth transition when moving from PROFIBUS to other bus systems.

| Controller 3200 C range of devices | | | Controller | | Field devices | | | | |
|------------------------------------|---------------|------------------------|--------------|--------|---------------|----------------|--------|--------------------|---------------------|
| | | | 3200 C | | I/O systems | | | Frequency inverter | Other field devices |
| | | | 3221 C | 3231 C | 1000 | 9400 High-Line | ECS | 8400 | DDF file |
| Runtime Software | L-force Logic | LPC 1000 | X | X | X | X | X | X | X |
| | L-force Visu | VisiWinNET® Compact CE | | X | | | | | |
| Communication | PROFIBUS | Interface | MC-PBM | | Bus coupler | Module | Module | Module | |
| | | No. of bus lines | 1 | | | | | | |
| | | Baud rate | max. 10 Mbps | | | | | | |






Runtime software

The control functionalities are described via the runtime software. Alongside the various classes, scaling also exists within the runtime environments such that you only need to pay for those functionalities you actually need. The performance data for the respective software results from interaction with the chosen hardware platform.



1

| Runtime software | Versions available |
|---|--|
|  L-force Logic | LPC 1000 <ul style="list-style-type: none"> ► PLC functionality in accordance with IEC 61131-3 ► 6 languages: <ul style="list-style-type: none"> – instruction list (IL) – ladder diagram (LP) – function diagram (FD) – structured text (ST) – sequential function chart (SFC) – free graphics function diagram editor (CFC) ► Multitasking ► Based on the tried-and-tested CoDeSys ► Object-focused programming |
|  L-force Motion | MPC 1200 <ul style="list-style-type: none"> ► Motion in accordance with PLCopen Part 1 + 2 ► NC functionality with 3 interpolated axes (3 D) ► NC transformations: gantry, tripod and SCARA using libraries ► G-code interpreter module (DIN 66025) ► Electronic cam ► Electronic cam group <p>The software is always delivered with L-force Logic</p> |
|  L-force Visu | VisiWinNET® <ul style="list-style-type: none"> ► VisiWinNET® Compact CE ► Operating system-dependent runtime software, installed on the destination hardware ► Scaling via the number of power tags ► Visualisation of control variables |

PLC Designer 3

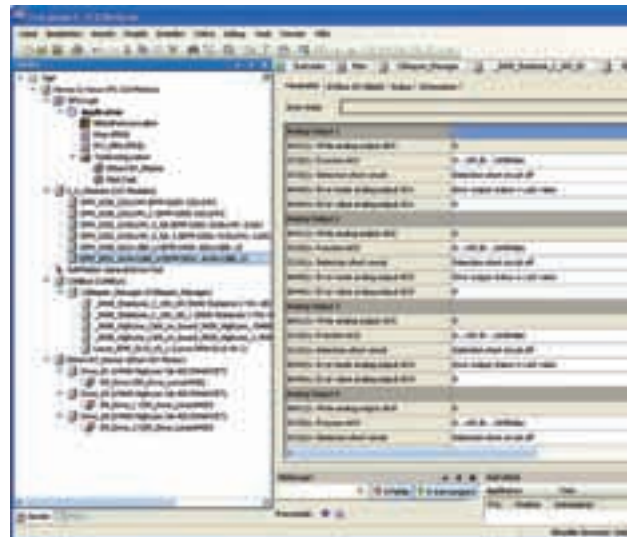
Controlling in accordance with industrial standard IEC 61131-3

The control system is based on the modern CoDeSys 3 control system. Lenze has qualified this basic system for continuous operation in automation systems and extended and modified it to suit its requirements. It is marketed under the name PLC Designer 3. Compared with the pure CoDeSys, the timing has for example been optimised and adapted to the specific hardware such that an optimised packing density is ensured on the bus for the best possible bus performance utilisation. A gateway function has also been added which allows drive parameter setting programs such as L-force Engineer to access the connected field devices via the controller – this system extension is especially beneficial for EtherCAT. However, the key addition is the integration of I/O system 1000 into the control configuration.

The PLC Designer is available at 4 different licence levels. All licence levels have one thing in common:

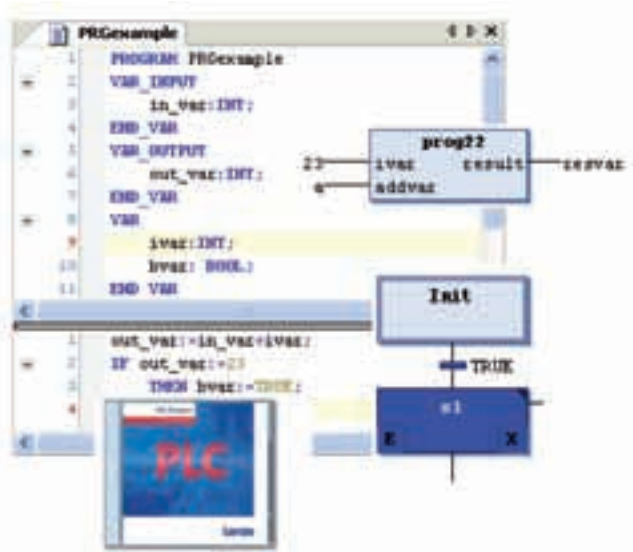
The L-force Engineer and PLC Designer share one licence. Once you have bought one of the products, you automatically receive a licence for the other. The licence key, required during installation, applies to both products.

A CD containing the PLC Designer is supplied with every L-force Controller. This is valid for 30 days as a demo version and can be upgraded to the full version using an engineer key. More recent versions of the PLC Designer and updates can be downloaded from the website.



| Version | Features | Product code |
|---|---|---------------|
| PLC Designer 3.x, single user licence | <ul style="list-style-type: none"> ▶ CD-ROM in scope of supply ▶ Installation on a PC ▶ Language German/English | ESPEVPDXA0EC1 |
| PLC Designer 3.x, multiple user licence | <ul style="list-style-type: none"> ▶ No CD-ROM in scope of supply ▶ Multiple installation depending on the number of licences bought ▶ Based on the single user licence | ESPEVPDNNML1 |
| PLC Designer 3.x, corporate licence | <ul style="list-style-type: none"> ▶ No CD-ROM in scope of supply ▶ Multiple installation within a company at one site ▶ Based on the single user licence | ESPEVPDNNFL1 |
| PLC Designer 3.x, buyout licence | <ul style="list-style-type: none"> ▶ No CD-ROM in scope of supply ▶ Sub-licences are provided with Lenze devices which are installed in a machine ▶ Based on the single user licence | ESPEVPDNNBL1 |

Engineering



PLC Designer

Lenze uses PLC Designer as its central engineering software for control technology. This is based on the familiar CoDeSys and offers the following features:

- ▶ programming logic & motion in accordance with IEC 61131-3 (IL, LP, FD, ST, SFC and CFC editor)
- ▶ function blocks certified according to PLCopen Part 1 + 2
- ▶ NC module library
- ▶ graphic DIN 66025 editor (G-code) with DXF import
- ▶ cam editor
- ▶ Object-focused programming

Version 3 of the PLC Designer is needed to program L-force Controller 3200 C.

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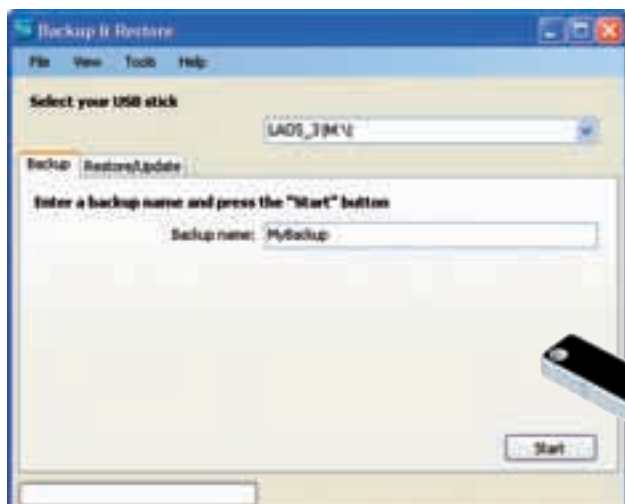


Web-based parameter setting

All L-force Controllers have an integrated web server with pages prepared for the following actions:

- ▶ controller configuration and diagnostics
- ▶ access to all logbook parameters
- ▶ access to integrated controller logbook

All major commissioning and diagnostics work can therefore be undertaken without a separate PC program; all that is required is a web browser.



Backup & Restore

Backup & Restore is a free of charge piece of software which allows you to easily back up your controller data:

- ▶ perform backup processes
- ▶ perform restore processes
- ▶ perform update processes

Backup & Restore is on the CD supplied with every L-force Controller. Suitable USB sticks can be found under accessories on page 2-10.



VisiWinNET® visualisation software

VisiWinNET® is available in two independent versions so that various tasks can be handled individually and to optimum effect.



VisiWinNET® Smart

VisiWinNET® Smart is a user-friendly visualisation system which displays the interface in a simple way. It is a flexible tool suited to producing simple applications or use as a service tool. VisiWinNET® Smart has its own full-graphics integrated development environment and provides users with ready-made templates.

But the system's greatest strength lies in the fact that it can be combined with VisiWinNET® Professional.

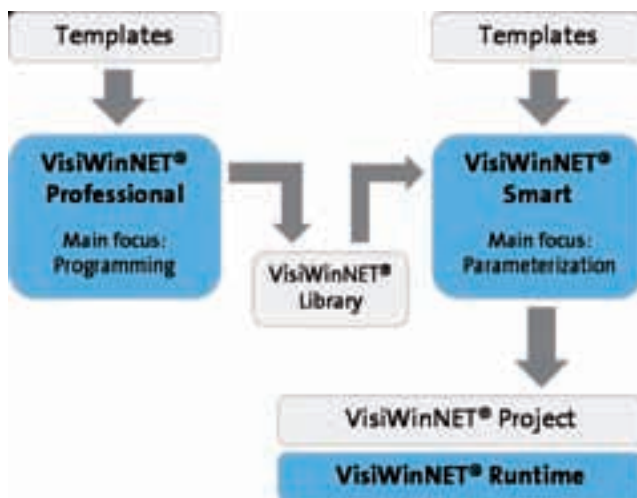
VisiWinNET® Smart is used in applications in the machine-oriented field and simple B&B applications.

VisiWinNET® Professional

The VisiWinNET® Professional system is fully integrated in the Microsoft® Visual Studio .NET development environment.

The efficiency of L-force Visu VisiWinNET® is enhanced when combined with VisiWinNET® Smart and Professional. VisiWinNET® Professional can be used to develop specific machine modules and control elements which are then integrated in Smart with the aid of the VisiWinNET® configurator where they are put to further use.

The user can use this convenient function to produce recurring functions to suit his or her needs.



| Version | Features | Runtime Windows® CE | Order code | | | |
|--------------------------|--|-------------------------------------|------------|-----|----|--------------------------|
| VisiWinNET® Smart | ► Single user licence | <input checked="" type="checkbox"/> | 7710 | 100 | 06 | <input type="checkbox"/> |
| VisiWinNET® Professional | ► Single user licence Windows® XP development "MS Visual Studio .NET" 2005 is also required! | <input checked="" type="checkbox"/> | on request | | | <input type="checkbox"/> |
| Licencing | USB dongle | | | | | 5 |
| Order code | Your solution: | | □□□□ | □□□ | □□ | □ |

For more information about VisiWinNET®, please consult the "PC-based automation" catalogue.

Controllers

A compact combination of control and visualisation

L-force Controller 3200 C _____ 2-2
Variants
Order data

L-force Controller 3200 C series

L-force Controller 3200 C is the ideal platform for automation systems in the control cabinet. It is based on the modern Intel® processor Atom™. A powerful PC architecture can therefore be produced in the smallest of spaces without forced cooling or other moving components. But the real gem is that I/O system 1000 can be connected directly without having to first pass via fieldbuses.

Variants

The L-force Controller 3200 C series includes two versions. When combined with our L-force control system, these two variants, 3221 C and 3231 C, form the basis for a powerful motion controller – with and without integrated visualisation!

Controller version 3231 C has an integrated DVI interface, to which external monitors / monitor panels (see chapter 4) can be connected.

Integrated Ethernet switch

The integrated switch allows line topologies with Ethernet to be established without the need for a separate switch as part of the infrastructure. A free interface also provides the option of attaching a diagnostic device, such as a service technician's laptop, without intervention in the existing bus layout.



I/O system 1000 as local I/Os

Extremely fast communication (48 Mbps) between the L-force Controller 3200 C and I/O modules takes place via a proprietary, but extremely efficient backplane bus. It allows for individual and group access to inputs and outputs, and also enables precise synchronisation of the input modules which give the input signals a time stamp with a resolution of 1µs and therefore high-precision recording.

Logic (PLC), motion and visualisation in one

- ▶ Optimised for machines/modules with central motion control
- ▶ Simple engineering thanks to central data storage

➤ Saves space in the control cabinet



High-precision control system for optimum production results

- ▶ Touch probe capable inputs
- ▶ High precision output control
- ▶ Highly deterministic backplane bus with precise time stamp 1 µs

➤ Don't react, instead act with precision!



Easy to use

- ▶ Automated standard set-up and data backup via USB flash drive
- ▶ Simple device replacement via pluggable memory card
- ▶ Diagnostics via integrated web server

➤ Minimises the time required for commissioning and maintenance



Maintenance-free

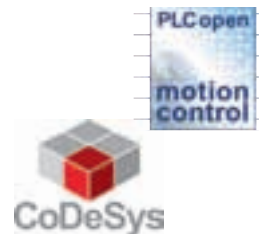
- ▶ Operation without fan
- ▶ Operation without battery using integrated UPS
- ▶ High degree of safety thanks to integrated backup process

Future-proof thanks to industrial standards

- ▶ Programming to IEC61131-3
- ▶ Motion in accordance with PLCopen
- ▶ PLC Designer based on CoDeSys 3

➤ Security for your investment

IEC 61131-3

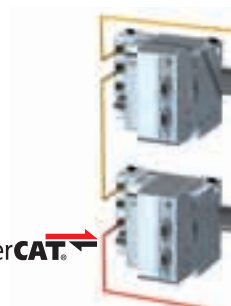


Communicative

- ▶ Daisy-chain cabling using integrated Ethernet switch
- ▶ EtherCAT implemented as fast bus system directly on board
- ▶ Precisely tailored thanks to modular extension option

➤ No external components are required

EtherCAT



I/O system 1000 for local signals

- ▶ Permanent wiring thanks to separation of the electronic and base module
- ▶ Fast diagnostics achieved using wellstructured labelling and LEDs clearly assigned to each channel
- ▶ Easy to connect thanks to printed circuit diagram
- ▶ Fully integrated shield connection without the need for special shield terminals



➤ Compact and clever



Standards and fields of application

| Area | Values | | |
|------------------------------|---|--------------|--|
| Vibration resistance | 1G / 15G, as per IEC 60068-2-6 / 60068-2-27 | | |
| Admissible temperature range | During transport: –25 °C ... +70 °C During storage: –25 °C ... +70 °C During operation: ► 3221 C 0 °C ... +55 °C ► 3231 C 0 °C ... +50 °C | | |
| Noise immunity | Requirements | Standard | Severity |
| | ESD | EN 61000-4-2 | Severity 3, 8 kV in the case of air discharge, 4 kV in the case of contact discharge |
| | Conducted radio frequency | EN 61000-4-6 | 150 kHz ... 80 MHz, 10 V/m 80% AM (1 kHz) |
| | RF interference (housing) | EN 61000-4-3 | 80 kHz ... 1000 MHz, 10 V/m 80% AM (1 kHz) |
| | Burst | EN 61000-4-4 | Severity 3 |
| | Surge | EN 61000-4-5 | Severity 3 |
| Enclosure | IP20 | | |
| Marking | EC: Fulfilment of EC Low Voltage Directive cULus: Approval in accordance with UL 508 in preparation | | |





Controller 3200 C

Controller 3200 C is available in two variants:

Controller 3221 C is the ideal basis for a powerful PLC or a motion controller, which is to be located in the control cabinet and is to have local I/Os.

Like its little brother, Controller 3231 C can also be used as a powerful PLC or motion controller. It also has a DVI interface which allows a visualisation system to run on the controller in parallel to the control system and to be displayed via an external monitor.

| | | | |
|------------------------|--|---|---|
| | |  |  |
| Product | | 3221 C | 3231 C |
| Technical data | | | |
| | Processor | Intel® Atom™ 1.1 GHz | Intel® Atom™ 1.6 GHz |
| | External memory card | 1 x SD card (included in the scope of supply) | |
| | Dimensions (height x width x depth) | 112 x 136 x 105 | |
| Features / connections | | | |
| | 100 Mbps Ethernet with integrated switch | 2 x | 2 x |
| | EtherCAT as high-speed motion bus | 1 x | 1 x |
| | 24 V voltage supply | 1 x | 1 x |
| | USB, e.g. to connect USB sticks to back up data | 2 x | 3 x |
| | DVI-D to connect a monitor panel | | 1 x |
| Software | Windows® CE6.0 | ● | ● |
| | Runtime software L-force Logic (LPC 1000) | ● | ● |
| | Runtime software L-force Motion (MPC 1200) | Optional | Optional |
| | Runtime software VisiWinNET® Compact CE | | Optional 500 power tags |
| Option interface MC | | | |
| | Interface connection for CANopen (MC-CAN2) | Optional | Optional |
| | Interface connection for PROFIBUS (MC-PBM) | Optional | Optional |

Product: L-force Controller 3221 C

Product code

E32GAC 00000B4F□XXX-02S13□00 000

Option interface MC 1

- 0 – none
- 5 – MC-PBM (PROFIBUS)
- 9 – MC-CAN2 (CANopen)

Control technology runtime software

- 3 – L-force Logic: LPC 1000
- 4 – L-force Motion: MPC 1200



Product: L-force Controller 3231 C

Product code

E 3 2 G A C 1 0 0 0 0 C 4 G □ XXX - 0 2 S 1 3 □ □ □ 0 0 0

Option interface MC 1

- 0 – none
- 5 – MC-PBM (PROFIBUS)
- 9 – MC-CAN2 (CANopen)

Control technology runtime software

- 3 – L-force Logic: LPC 1000
- 4 – L-force Motion: MPC 1200

Visualisation runtime software

- 00 – L-force Visu: without runtime
- 14 – L-force Visu: VisiWinNET® Compact CE, 500 power tags



USB 3

- ▶ Touch screen connection, (3231 C only)

LAN 1a

- ▶ Ethernet 10/100 Mbps with integrated switch

LAN 1b

- ▶ Ethernet 10/100 Mbps with integrated switch

EtherCAT

DVI-D

- ▶ Connection for an external monitor (3231 C only)

Supply voltage

- ▶ 24 V DC





Option interface

- ▶ Extension to include bus systems

4 LEDs

- ▶ Status displays

Power supply module

- ▶ Supply for attached I/O modules

I/O system 1000

- ▶ Up to 64 modules
- ▶ Analog and digital inputs and outputs
- ▶ Other peripheral interfaces

SD card

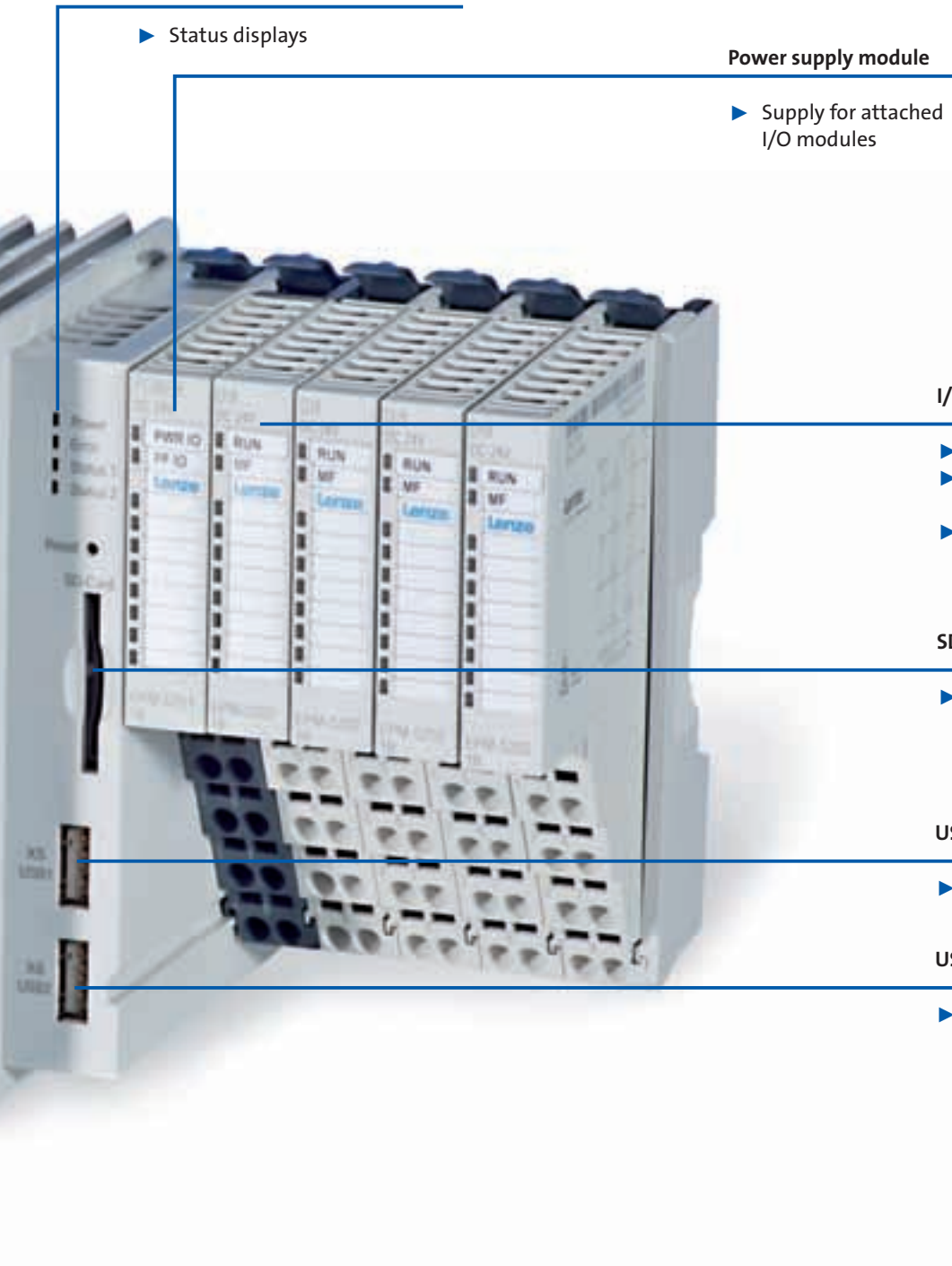
- ▶ Data memory for project data

USB 1

- ▶ Optional keyboard connection







USB 2

- ▶ Optional connection for USB stick to back up data



Accessories

Order data

| Item / description: | | Order code | |
|---|-------------------|---|----------------------------|
|  | SD card | SD-Card 512 MB | Secure Digital Memory Card |
| | | | EPCZEMSD3 |
|  | USB stick | 1 GB 4 GB | EPCZEMUS4 EPCZEMUS6 |
| | Power supply unit | Power supply unit 100-240 V AC / 24 V DC / 10 A | EZV2400-000 |
|  | CAN bus plugs | "Node" CAN bus plug - Sub-D, 90° screw terminals | EPM-T950 |
|  | | "Termination" CAN bus plug - Sub-D, 90° - Screw terminals - Integrated terminating resistor | EPM-T951 |
|  | | "Straight" CAN bus plug CAN - Sub-D, 180° - Screw terminals - Switchable terminating resistor | EPM-T952 |
|  | | "Switch" CAN bus plug - Sub-D, 90° - Tension spring terminal - Switchable terminating resistor | EWZ0046 |



I/O System

I/O system for optimum performance

I/O system 1000

| | |
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I/O system 1000

Fulfils the strictest of requirements

The availability of Ethernet-based bus systems is forming the basis for new automation concepts in mechanical and systems engineering - the power limits of established bus systems that were available until now have been surpassed.

The L-force I/O system 1000 represents a highly deterministic method of controlling input and output modules and even encompasses the ability to read in the kinds of touch probe inputs that are required for synchronised movements within the context of clocked production processes. The minimal internal cycle time combined with the use of a time stamp ensures that the I/O system 1000 can meet even the toughest requirements in terms of speed. As such, it is also suitable for use within real-time-based architectures.

At the very first glance, the system impresses with its slimline design and clearly structured diagnostics and labelling concepts. The I/O modules, which offer space for 8 connection points, are provided with a space of 12.5 mm on conventional DIN rails.

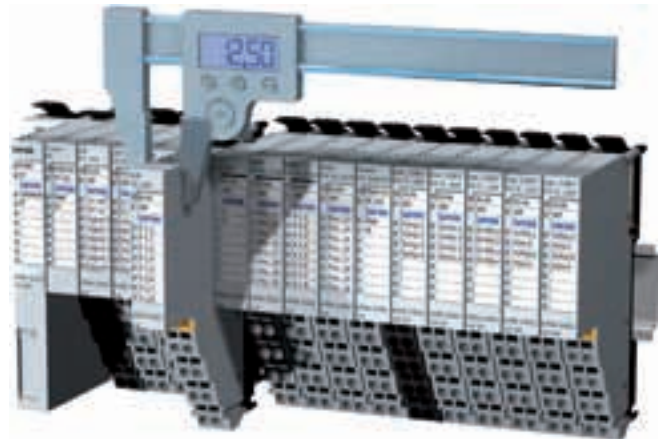
User-oriented connection system

The "inner life" of the I/O system is also user-friendly down to the finest detail: the I/O compound module, which has a modular structure, consisting of a terminal block with rear panel bus connection, as well as electronics designed to protect against polarity reversal. This enables defective electronic modules to be replaced if maintenance work is required, without loosening the wiring from the base module. As those with plenty of practical experience will know, this eliminates a frequent error cause - incorrect wiring. Also of considerable benefit is the staircase shape of the connection level including tension spring technology and permanent wiring, which has proven highly effective for standard terminals over the years. All that is needed for the wiring itself is a simple screwdriver. The labelling and wiring of the new system is just as simple as combining the modules with complete stations. Up to 64 modules can be assembled via the integrated backplane bus through simple insertion, without any wiring requirements.

Permanent wiring

- ▶ 2-part concept: base module and electronic module
- ▶ In the event of maintenance work, the electronics can be replaced without contact with the wiring
- ▶ Item designation remains on the base module
- ▶ Codes protect against the assignment of an incorrect module type

➤ **Wiring faults in the event of service are completely eliminated**



Compact design

- ▶ Slimline design
- ▶ 8 connection points at a width of just 12.5 mm
- ▶ Tried and tested tension spring technology
- ▶ Wiring level generated in a ladder shaped space-saving manner
- ▶ Consistent separation of electronic and wiring levels
- ▶ Up to 64 modules can be mounted
- ▶ Automatic connection via the backplane bus

Performance and robustness

- ▶ Gilded contacts ensure safe connection between the modules
- ▶ Fault-tolerant protocols ensure maximum availability – even in the case of individual frame errors
- ▶ The high bandwidth of 48 Mbps allows for extremely fast response times without telegram overheads





Fast diagnostics

- ▶ Clear labelling concept and diagnostic concept
- ▶ Brightly lit LEDs can be easily identified even in a poorly lit control cabinet
- ▶ An LED and inscription field are clearly assigned to each channel

➤ **Optimum combination of readability and labelling in the smallest of spaces**



Integrated shield support

- ▶ Holders for shield buses are available as accessories
- ▶ Direct installation of standard 10 x 3 bus bars on the I/O station
- ▶ Shield support with standard cable fastenings and shield clamps possible

➤ **Fully integrated shield concept, and yet no special terminals necessary**



Scalable supply concept

- ▶ The main supply is a fixed component of the bus coupler and supplies both electronics and the I/O level
- ▶ Optional additional I/O supply, in the event that more than 10 A output current is required
- ▶ Optional additional I/O supply and electronic supply for extremely large station structures
- ▶ Each new I/O supply forms a separate potential area



Simple connection

- ▶ Circuit diagram and connection plan printed on the module itself
- ▶ To the sides: detailed view
- ▶ On the front: brief view, can also be seen when the modules are fitted

➤ **The manual is thus virtually redundant!**



Tool-free mounting

- ▶ Direct snap-in mounting on the DIN rail
- ▶ Individual module or entire station can be mounted
- ▶ Complete blocks can subsequently be added to the DIN rail
- ▶ Unlocking levers remain open such that complete stations can be fitted and removed

➤ **Simply slide in and lock – no need for any tools**








Standards and fields of application

| Area | Values | | |
|--|---|--------------|--|
| Vibration resistance | 1G / 15G, as per IEC 60068-2-6 / 60068-2-27 | | |
| Climatic conditions | RH1 as per EN 61131-2 (without condensation, relative humidity of 10 ... 95 %) | | |
| Admissible temperature range | During transport: —25 °C ... +70 °C During storage: —25 °C ... +70 °C During operation: ▶ Horizontal installation 0 ... +60 °C ▶ Vertical installation 0 ... +60 °C | | |
| Mounting positions | horizontal and vertical | | |
| Degree of pollution | Degree of pollution 2 in accordance with EN 61131-2 | | |
| Noise emission | Compliance with limit class A in accordance with EN 61000-6-4 | | |
| Noise immunity | Requirements | Standard | Severity |
| | ESD | EN 61000-4-2 | Severity 3, 8 kV in the case of air discharge, 4 kV in the case of contact discharge |
| | Conducted radio frequency | EN 61000-4-6 | 150 kHz ... 80 MHz, 10V/m 80 % AM (1 kHz) |
| | RF interference (housing) | EN 61000-4-3 | 80 ... 1000 MHz, 10 V/m 80 % AM (1 kHz) |
| | Burst | EN 61000-4-4 | Severity 3 |
| Insulation resistance | In accordance with IEC 61131-2 | | |
| Insulation voltage against reference earth | 500 V | | |
| Electrical isolation to the system bus (CAN) | Galvanically decoupled | | |
| Electrical isolation to the process level | Galvanically decoupled | | |
| Terminals | Tension spring 1.5 mm ² (AWG15) | | |
| Enclosure | IP20 | | |
| Marking | EC: Fulfilment of EC Low Voltage Directive cULus: Approvals according to UL 508 | | |






Bus coupler

Rated data

| | | | |
|-------------------------------------|---|--|---|
| |  |  |  |
| Version | CANopen | PROFIBUS | EtherCAT |
| Order designation | EPM-S110 | EPM-S120 | EPM-S130 |
| Function | CANopen bus coupler with integrated power supply module | PROFIBUS bus coupler with integrated power supply module | EtherCAT bus coupler with integrated power supply module |
| Current supply | | | |
| Electronics supply voltage | 24 V DC (20.4 ... 28.8 V) | 24 V DC (20.4 ... 28.8 V) | 24 V DC (20.4 ... 28.8 V) |
| Current consumption | 1.9 A | 1.9 A | 1.9 A |
| Backplane bus current output | 3 A | 3 A | 3 A |
| Fusing | via power supply module | via power supply module | via power supply module |
| I/O supply output voltage | 24 V | 24 V | 24 V |
| I/O supply output current | 10 A | 10 A | 10 A |
| Electrical isolation | 500 V between I/O supply, electronic supply and fieldbus | 500 V between I/O supply, electronic supply and fieldbus | 500 V between I/O supply, electronic supply and fieldbus |
| Communication | | | |
| Bus system | CANopen (DS 301) | PROFIBUS (DP-V0/V1) | EtherCAT (CoE) |
| Bus devices | Slave | Slave | Slave |
| Baud rate | 10 kbps to 1 Mbps | 9.6 kbps to 12 Mbps | 100 Mbps |
| Connections | 9-pole Sub-D | 9-pole Sub-D | RJ45, double |
| Process data | 16 Rx / 16 Tx | 244 bytes | 256 bytes |
| Max. number of devices for fieldbus | 127 | 125 (without repeater max. 32) | 65535 |
| Device description file | EDS | DDF | XML (Modular Device Profile MDP) |
| Status display | | | |
| Voltage supply | Supply ok / fuse defective | Supply ok / fuse defective | Supply ok / fuse defective |
| Bus diagnostics | RUN-LED in accordance with CANopen -ready for operation -system error | -ready for operation -system error | -ready for operation -system error |
| General | | | |
| Number of I/O modules | max. 64 | max. 64 | max. 64 |
| Scope of supply | Bus coupler module incl. power supply module | Bus coupler module incl. power supply module | Bus coupler module incl. power supply module |
| Packaging unit | 1 | 1 | 1 |
| Enclosure | IP20 | IP20 | IP20 |
| Dimensions (height x width x depth) | 100 x 48 x 76 | 100 x 48 x 76 | 100 x 48 x 76 |
| Weight | 0.16 kg | 0.16 kg | 0.16 kg |

Bus coupler

Rated data

| | | | |
|-------------------------------------|---|--|---|
| |  |  |  |
| Version | PROFINET | DeviceNet | Modbus TCP/IP |
| Order designation | EPM-S140* | EPM-S150* | EPM-S160* |
| Function | PROFINET bus coupler with integrated power supply module | DeviceNet bus coupler with integrated power supply module | Modbus TCP/IP bus coupler with integrated power supply module |
| Current supply | | | |
| Electronics supply voltage | 24 V DC (20.4 ... 28.8 V) | 24 V DC (20.4 ... 28.8 V) | 24 V DC (20.4 ... 28.8 V) |
| Current consumption | 1.9 A | 1.9 A | 1.9 A |
| Backplane bus current output | 3 A | 3 A | 3 A |
| Fusing | via power supply module | via power supply module | via power supply module |
| I/O supply output voltage | 24 V | 24 V | 24 V |
| I/O supply output current | 10 A | 10 A | 10 A |
| Electrical isolation | 500 V between I/O supply, electronic supply and fieldbus | 500 V between I/O supply, electronic supply and fieldbus | 500 V between I/O supply, electronic supply and fieldbus |
| Communication | | | |
| Bus system | PROFINET (RT/IRT) | DeviceNet | Modbus TCP/IP |
| Bus devices | Device | Slave | Slave |
| Baud rate | 100 Mbps | 500 kbps | 100 Mbps |
| Connections | RJ45, double | 5-pole pluggable terminal | RJ45 |
| Process data | 1 kByte | 256 bytes | 256 bytes |
| Max. number of devices for fieldbus | | | |
| Device description file | GSDML | EDS | - |
| Status display | | | |
| Voltage supply | Supply ok / fuse defective | Supply ok / fuse defective | Supply ok / fuse defective |
| Bus diagnostics | -ready for operation -system error | -ready for operation -system error | -ready for operation -system error |
| General | | | |
| Number of I/O modules | max. 64 | max. 64 | max. 64 |
| Scope of supply | Bus coupler module incl. power supply module | Bus coupler module incl. power supply module | Bus coupler module incl. power supply module |
| Packaging unit | 1 | 1 | 1 |
| Enclosure | IP20 | IP20 | IP20 |
| Dimensions (height x width x depth) | 100 x 48 x 76 | 100 x 48 x 76 | 100 x 48 x 76 |
| Weight | 0.16 kg | 0.16 kg | 0.16 kg |


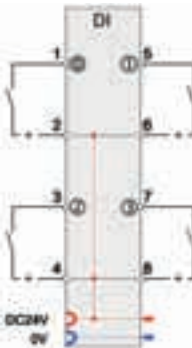
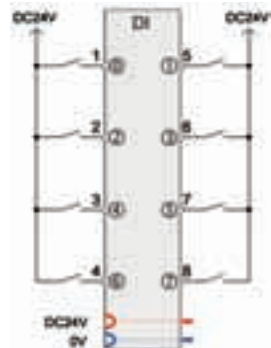
* in preparation



Digital I/O

Inputs, positive switching Rated data



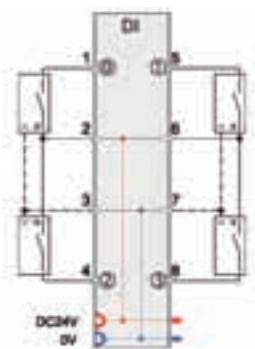
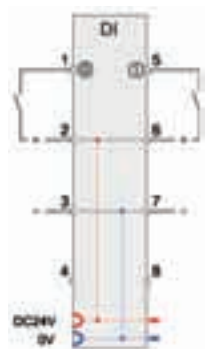
| | | | |
|-------------------------------------|---|--|---|
| | | | |
| Version | DI 2, 24 V DC | DI 4, 24 V DC | DI 8, 24 V DC |
| Order designation | EPM-S200 | EPM-S201 | EPM-S202 |
| Function | 2 digital inputs | 4 digital inputs | 8 digital inputs |
| Current supply | | | |
| Backplane bus current consumption | 55 mA | 55 mA | 60 mA |
| Electrical isolation | 500 V between backplane bus and I/O signal | 500 V between backplane bus and I/O signal | 500 V between backplane bus and I/O signal |
| Signal | | | |
| Number of inputs/outputs | 2/- | 4/- | 8/- |
| Rated voltage | 24 V DC | 24 V DC | 24 V DC |
| Input level | Type 1 in acc. with IEC 61131-2 "0": 0 ... 5 V "1": 15 ... 28.8 V | Type 1 in acc. IEC 61131-2 "0": 0 ... 5 V "1": 15 ... 28.8 V | Type 1 in acc. with IEC 61131-2 "0": 0 ... 5 V "1": 15 ... 28.8 V |
| Filter | 3 ms | 3 ms | 3 ms |
| Connection system | 1-/2-/3-wire conductor technology | 1-/2-wire conductor technology | single-wire conductor technology |
| I/O wiring | PNP | PNP | PNP |
| Communication | | | |
| Width in the input process image | 2 bits | 4 bits | 8 bits |
| Status display | | | |
| Module status | Ready for operation / error | Ready for operation / error | Ready for operation / error |
| Signal status | 1 LED per channel | 1 LED per channel | 1 LED per channel |
| General | | | |
| Scope of supply | I/O compound module (base module + electronic module) | I/O compound module (base module + electronic module) | I/O compound module (base module + electronic module) |
| Packaging unit | 1 | 1 | 1 |
| Enclosure | IP20 | IP20 | IP20 |
| Dimensions (height x width x depth) | 100 x 12.5 x 76 | 100 x 12.5 x 76 | 100 x 12.5 x 76 |
| Weight | 0.06 kg | 0.06 kg | 0.06 kg |
| Wiring diagram |  |  |  |

Digital I/O

Inputs, positive switching

Rated data





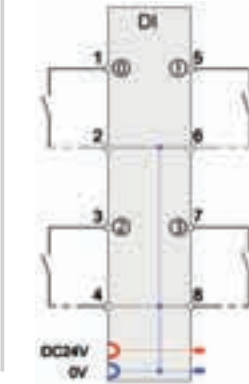
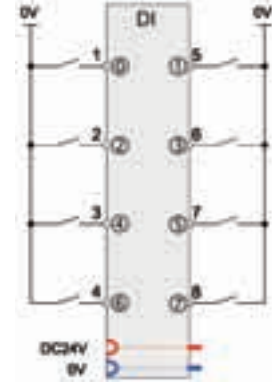
| | | |
|-------------------------------------|---|---|
| Version | DI 4 , DC 24 V | DI 2, 2μs, DC 24 V |
| Order designation | EPM-S203 | EPM-S207* |
| Function | 4 digital inputs, three-wire conductor connection system | 2 high-speed digital inputs with time stamp |
| Current supply | | |
| Backplane bus current consumption | 55 mA | |
| Electrical isolation | 500 V between backplane bus and I/O signal | 500 V between backplane bus and I/O signal |
| Signal | | |
| Number of inputs/outputs | 4/- | 2/- |
| Rated voltage | 24 V DC | 24 V DC |
| Input level | Type 1 according to IEC 61131-2 "0": 0 ... 5 V "1": 15 ... 28.8 V | Type 1 according to IEC 61131-2 "0": 15 ... 28.8 V "1": 0 ... 5 V |
| Filter | 3 ms | 2 μs - 3 ms |
| Time stamp | | yes |
| Connection system | 1-/2-/3-wire conductor technology | 1-/2-/3-wire conductor technology |
| I/O wiring | PNP | PNP |
| Communication | | |
| Width in the input process image | 4 bits | 4-60 bits |
| Parameter data (PROFIBUS/PROFINET) | | 4 bytes |
| Status display | | |
| Module status | Ready for operation / error | Ready for operation / error |
| Signal status | 1 LED per channel | 1 LED per channel |
| General | | |
| Scope of supply | I/O compound module (base module + electronic module) | I/O compound module (base module + electronic module) |
| Packaging unit | 1 | 1 |
| Enclosure | IP20 | IP20 |
| Dimensions (height x width x depth) | 100 x 12.5 x 76 | 100 x 12.5 x 76 |
| Weight | 0.06 kg | 0.06 kg |
| Wiring diagram |  |  |

* in preparation



Digital I/O

Inputs, negative switching Rated data

| | | | |
|-------------------------------------|---|--|---|
| |  | | |
| Version | DI 2, NPN, DC 24 V | DI 4, NPN, DC 24 V | DI 8, NPN, DC 24 V |
| Order designation | EPM-S204 | EPM-S205 | EPM-S206 |
| Function | 2 digital inputs, negative switching | 4 digital inputs, negative switching | 8 digital inputs, negative switching |
| Current supply | | | |
| Backplane bus current consumption | 60 mA | 60 mA | 65 mA |
| Electrical isolation | 500 V between backplane bus and I/O signal | 500 V between backplane bus and I/O signal | 500 V between backplane bus and I/O signal |
| Signal | | | |
| Number of inputs/outputs | 2/- | 4/- | 8/- |
| Rated voltage | 24 V DC | 24 V DC | 24 V DC |
| Input level | Type 1 in acc. with IEC 61131-2 "0": 15 ... 28.8 V "1": 0 ... 5 V | Type 1 in acc. with IEC 61131-2 "0": 15 ... 28.8 V "1": 0 ... 5 V | Type 1 in acc. with IEC 61131-2 "0": 15 ... 28.8 V "1": 0 ... 5 V |
| Filter | 3 ms | 3 ms | 3 ms |
| Connection system | 1-/2-/3-wire conductor technology | 1-/2-wire conductor technology | single-wire conductor technology |
| I/O wiring | NPN | NPN | NPN |
| Communication | | | |
| Width in the input process image | 2 bits | 4 bits | 8 bits |
| Status display | | | |
| Module status | Ready for operation / error | Ready for operation / error | Ready for operation / error |
| Signal status | 1 LED per channel | 1 LED per channel | 1 LED per channel |
| General | | | |
| Scope of supply | I/O compound module (base module + electronic module) | I/O compound module (base module + electronic module) | I/O compound module (base module + electronic module) |
| Packaging unit | 1 | 1 | 1 |
| Enclosure | IP20 | IP20 | IP20 |
| Dimensions (height x width x depth) | 100 x 12.5 x 76 | 100 x 12.5 x 76 | 100 x 12.5 x 76 |
| Weight | 0.06 kg | 0.06 kg | 0.06 kg |
| Wiring diagram |  |  |  |

Digital I/O

Outputs, positive switching

Rated data



| Version | DO 2, 24 V DC, 0.5 A | DO 4, 24 V DC, 0.5 A | DO 8, 24 V DC, 0.5 A |
|---------------------------------------|---|---|---|
| Order designation | EPM-S300 | EPM-S301 | EPM-S302 |
| Function | 2 digital outputs | 4 digital outputs | 8 digital outputs |
| Current supply | | | |
| Backplane bus current consumption | 55 mA | 55 mA | 65 mA |
| I/O supply current consumption | 5 mA | 10 mA | 15 mA |
| Electrical isolation | 500 V between backplane bus and I/O signal | 500 V between backplane bus and I/O signal | 500 V between backplane bus and I/O signal |
| Signal | | | |
| Number of inputs/outputs | -/2 | -/4 | -/8 |
| Rated voltage | 24 V DC | 24 V DC | 24 V DC |
| Output current per channel | 0.5 A | 0.5 A | 0.5 A |
| Output delay | 30 µs - 175 µs | 30 µs - 175 µs | 30 µs - 175 µs |
| Short-circuit strength | Yes, electronic | Yes, electronic | Yes, electronic |
| Switching frequency at ohmic load | 1 kHz | 1 kHz | 1 kHz |
| Switching frequency at inductive load | 0.5 Hz | 0.5 Hz | 0.5 Hz |
| Switching frequency at lamp load | 10 Hz | 10 Hz | 10 Hz |
| Contact | | | |
| Connection system | 1-/2-/3-wire conductor technology | 1-/2-wire conductor technology | single-wire conductor technology |
| I/O wiring | PNP | PNP | PNP |
| Communication | | | |
| Width in the output process image | 2 bits | 4 bits | 8 bits |
| Status display | | | |
| Module status | Ready for operation/error/overload | Ready for operation/error/overload | Ready for operation/error/overload |
| Signal status | 1 LED per channel | 1 LED per channel | 1 LED per channel |
| General | | | |
| Scope of supply | I/O compound module (base module + electronic module) | I/O compound module (base module + electronic module) | I/O compound module (base module + electronic module) |
| Packaging unit | 1 | 1 | 1 |
| Enclosure | IP20 | IP20 | IP20 |
| Dimensions (height x width x depth) | 100 x 12.5 x 76 | 100 x 12.5 x 76 | 100 x 12.5 x 76 |
| Weight | 0.06 kg | 0.06 kg | 0.06 kg |
| Wiring diagram | | | |



Digital I/O

Outputs, positive switching

Rated data



| | | | |
|---------------------------------------|---|---|---|
| | | | |
| Version | DO 2, 24 V DC, 2 A | DO 4, 24 V DC, 2 A | DO2, DC 24 V, 1 µs |
| Order designation | EPM-S306 | EPM-S309 | EPM-S310* |
| Function | 2 digital outputs, 2 A | 4 digital outputs, 2 A | 2 high-speed digital outputs with time stamp |
| Current supply | | | |
| Backplane bus current consumption | 55 mA | 55 mA | |
| I/O supply current consumption | 5 mA | 10 mA | |
| Electrical isolation | 500 V between backplane bus and I/O signal | 500 V between backplane bus and I/O signal | 500 V between backplane bus and I/O signal |
| Signal | | | |
| Number of inputs/outputs | -/2 | -/4 | -/2 |
| Rated voltage | 24 V DC | 24 V DC | 24 V DC |
| Output current per channel | 2 A | 2 A (total current max. 4 A) | 0.5 A |
| Output delay | 30 µs - 175 µs | 30 µs - 175 µs | 1 µs |
| Short-circuit strength | Yes, electronic | Yes, electronic | Yes, electronic |
| Switching frequency at ohmic load | 1 kHz | 1 kHz | |
| Switching frequency at inductive load | 0.5 Hz | 0.5 Hz | |
| Switching frequency at lamp load | 10 Hz | 10 Hz | |
| Contact | | | |
| Connection system | 1-/2-/3-wire conductor technology | 1-/2-wire conductor technology | 1-/2-wire conductor technology |
| I/O wiring | PNP | PNP | PNP |
| Communication | | | |
| Width in the output process image | 2 bits | 4 bits | 24 -60 bytes |
| Status display | | | |
| Module status | Ready for operation/error/overload | Ready for operation/error/overload | Ready for operation/error/overload |
| Signal status | 1 LED per channel | 1 LED per channel | 1 LED per channel |
| General | | | |
| Scope of supply | I/O compound module (base module + electronic module) | I/O compound module (base module + electronic module) | I/O compound module (base module + electronic module) |
| Packaging unit | 1 | 1 | 1 |
| Enclosure | IP20 | IP20 | IP20 |
| Dimensions (height x width x depth) | 100 x 12.5 x 76 | 100 x 12.5 x 76 | 100 x 12.5 x 76 |
| Weight | 0.06 kg | 0.06 kg | 0.06 kg |
| Wiring diagram | | | |

* in preparation

Digital I/O

Outputs, negative switching

Rated data




| Version | DO 2, NPN, 24 V DC, 0.5 A | DO 4, NPN, 24 V DC, 0.5 A | DO 8, NPN, 24 V DC, 0.5 A |
|---------------------------------------|--|--|--|
| Order designation | EPM-S303 | EPM-S304 | EPM-S305 |
| Function | 2 digital outputs negative switching | 4 digital outputs negative switching | 8 digital outputs negative switching |
| Current supply | | | |
| Backplane bus current consumption | 60 mA | 65 mA | 70 mA |
| I/O supply current consumption | 3 mA | 5 mA | 10 mA |
| Electrical isolation | 500 V between backplane bus and I/O signal | 500 V between backplane bus and I/O signal | 500 V between backplane bus and I/O signal |
| Signal | | | |
| Number of inputs/outputs | -/2 | -/4 | -/8 |
| Rated voltage | 24 V DC | 24 V DC | 24 V DC |
| Output current per channel | 0.5 A | 0.5 A | 0.5 A |
| Output delay | 30 µs - 175 µs | 30 µs - 175 µs | 30 µs - 175 µs |
| Short-circuit strength | Yes, electronic | Yes, electronic | Yes, electronic |
| Switching frequency at ohmic load | 1 kHz | 1 kHz | 1 kHz |
| Switching frequency at inductive load | 0.5 Hz | 0.5 Hz | 0.5 Hz |
| Switching frequency at lamp load | 10 Hz | 10 Hz | 10 Hz |
| Contact | | | |
| Connection system | 1-/2-/3-wire conductor technology | 1-/2-wire conductor technology | single-wire conductor technology |
| I/O wiring | NPN | NPN | NPN |
| Communication | | | |
| Width in the output process image | 4 bits | 4 bits | 8 bits |
| Status display | | | |
| Module status | Ready for operation/error/overload | Ready for operation/error/overload | Ready for operation/error/overload |
| Signal status | 1 LED per channel | 1 LED per channel | 1 LED per channel |
| General | | | |
| Scope of supply | I/O compound module (base module + electronic module) | I/O compound module (base module + electronic module) | I/O compound module (base module + electronic module) |
| Packaging unit | 1 | 1 | 1 |
| Enclosure | IP20 | IP20 | IP20 |
| Dimensions (height x width x depth) | 100 x 12.5 x 76 | 100 x 12.5 x 76 | 100 x 12.5 x 76 |
| Weight | 0.06 kg | 0.06 kg | 0.06 kg |
| Wiring diagram | | | |



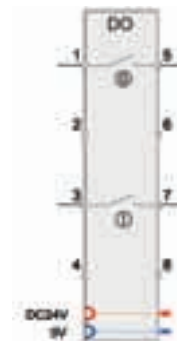
Digital I/O

Relay

Rated data

| | |
|--|---|
|  | |
| Version | Relay 2, AC 230 V, 3 A |
| Order designation | EPM-S308 |
| Function | 2 relay outputs, 230 V |
| Current supply | |
| Backplane bus current consumption | 55 mA |
| Signal | |
| Number of inputs/outputs | -/2 |
| Rated voltage | 30 V DC / 230 V AC |
| Output current per channel | 3 A / 3 A |
| Switching frequency at ohmic load | 100 Hz |
| Contact | NO contact |
| Communication | |
| Width in the output process image | 2 bits |
| Status display | |
| Module status | Ready for operation / error |
| Signal status | 1 LED per channel |
| General | |
| Scope of supply | I/O compound module (base module + electronic module) |
| Packaging unit | 1 |
| Enclosure | IP20 |
| Dimensions (height x width x depth) | 100 x 12.5 x 76 |
| Weight | 0.06 kg |

Wiring diagram



Analog I/O

Inputs

Rated data




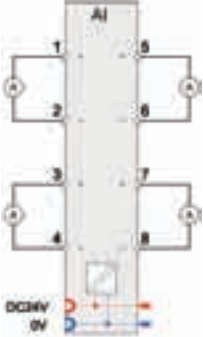
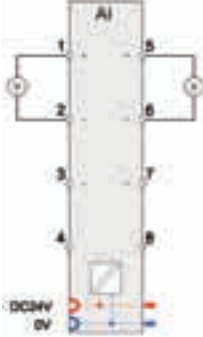

| | | | |
|-------------------------------------|---|---|---|
| | | | |
| Version | AI 2, 12 bits, 0 ... 10 V | AI 4, 12 bits, 0 ... 10 V | AI 2, 12 bits, 0/4 ... 20 mA |
| Order designation | EPM-S400 | EPM-S401 | EPM-S402 |
| Function | 2 analog inputs, voltage measurement | 4 analog inputs, voltage measurement | 2 analog inputs, current measurement |
| Current supply | | | |
| Backplane bus current consumption | 70 mA | 70 mA | 70 mA |
| I/O supply current consumption | 15 mA | 15 mA | 15 mA |
| Electrical isolation | 500 V between backplane bus and I/O signal | 500 V between backplane bus and I/O signal | 500 V between backplane bus and I/O signal |
| Signal | | | |
| Number of inputs/outputs | 2/- | 4/- | 2/- |
| Signal | 0 ... 10 V DC | 0 ... 10 V DC | 0/4 ... 20mA |
| Filter | 1 kHz | 1 kHz | 1 kHz |
| Sensor | | | |
| Resolution | 12 bits | 12 bits | 12 bits |
| Usage error margin | +/- 0.3 % | +/- 0.3 % | +/-0.3 % at 0 ... 20 mA, +/-0.5 % at 4 ... 20 mA |
| Basic error margin (at 25 °C) | +/- 0.2 % | +/- 0.2 % | +/-0.2 % at 0 ... 20 mA, +/-0.3 % at 4 ... 20 mA |
| A/D conversion time | 4 ms (all channels) | 8 ms (all channels) | 4 ms (all channels) |
| Communication | | | |
| Width in the input process image | 4 bytes | 8 bytes | 4 bytes |
| Parameter data (PROFIBUS/PROFINET) | 6 bytes | 8 bytes | 6 bytes |
| Status display | | | |
| Module status | Ready for operation / error | Ready for operation / error | Ready for operation / error |
| Signal status | 1 LED per channel | 1 LED per channel | 1 LED per channel |
| General | | | |
| Scope of supply | I/O compound module (base module + electronic module) | I/O compound module (base module + electronic module) | I/O compound module (base module + electronic module) |
| Packaging unit | 1 | 1 | 1 |
| Enclosure | IP20 | IP20 | IP20 |
| Dimensions (height x width x depth) | 100 x 12.5 x 76 | 100 x 12.5 x 76 | 100 x 12.5 x 76 |
| Weight | 0.06 kg | 0.06 kg | 0.06 kg |
| Wiring diagram | | | |



Analog I/O

Inputs

Rated data

| | | | |
|-------------------------------------|---|--|---|
| |  | | |
| Version | AI 4, 12 bits, 0/4 ... 20 mA | AI 2, 16 bits, -10 V ... 10 V | AI 2, 16 bits, 0/4 ... 20 mA |
| Order designation | EPM-S403 | EPM-S406* | EPM-S408* |
| Function | 4 analog inputs, Current measurement | 2 analog inputs Voltage measurement bipolar, 16 bits | 2 analog inputs, Current measurement, 16 bits |
| Current supply | | | |
| Backplane bus current consumption | 70 mA | | |
| I/O supply current consumption | 15 mA | | |
| Electrical isolation | 500 V between backplane bus and I/O signal | 500 V between backplane bus and I/O signal | 500 V between backplane bus and I/O signal |
| Signal | | | |
| Number of inputs/outputs | 4/- | 2/- | 2/- |
| Signal | 0/4 ... 20 | -10 V DC+10 ... V DC | 0/4 ... 20mA |
| Filter | 1 kHz | | |
| Sensor | | | |
| Resolution | 12 bits | 16 bits | 16 bits |
| Usage error margin | +/-0.3 % at 0 ... 20 mA, +/-0.5 % at 4 ... 20 mA | | |
| Basic error margin (at 25 °C) | +/-0.2 % at 0 ... 20 mA, +/-0.3 % at 4 ... 20 mA | | |
| A/D conversion time | 8ms (all channels) | | |
| Communication | | | |
| Width in the input process image | 8 bytes | 4 bytes | 4 bytes |
| Parameter data (PROFIBUS/PROFINET) | 8 bytes | | |
| Status display | | | |
| Module status | Ready for operation / error | Ready for operation / error | Ready for operation / error |
| Signal status | 1 LED per channel | 1 LED per channel | 1 LED per channel |
| General | | | |
| Scope of supply | I/O compound module (base module + electronic module) | I/O compound module (base module + electronic module) | I/O compound module (base module + electronic module) |
| Packaging unit | 1 | 1 | 1 |
| Enclosure | IP20 | IP20 | IP20 |
| Dimensions (height x width x depth) | 100 x 12.5 x 76 | 100 x 12.5 x 76 | 100 x 12.5 x 76 |
| Weight | 0.06 kg | 0.06 kg | 0.06 kg |
| Wiring diagram |  |  |  |

* in preparation

Analog I/O

Outputs

Rated data


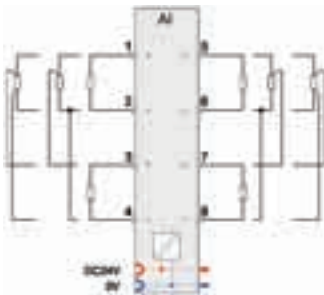



| Version | AO 2, 12 bits, 0 ... 10 V | AO 4, 12 bits, 0 ... 10 V | AO 2, 12 bits, 0/4 ... 20 mA | AO 4, 12 bits, 0/4 ... 20 mA |
|-------------------------------------|---|---|---|---|
| Order designation | EPM-S500 | EPM-S501 | EPM-S502 | EPM-S503 |
| Function | 2 analog outputs, voltage | 4 analog outputs, voltage | 2 analog outputs, current | 4 analog outputs, current |
| Current supply | | | | |
| Backplane bus current consumption | 80 mA | 80 mA | 80 mA | 80 mA |
| I/O supply current consumption | 35 mA | 35 mA | 55 mA | 95 mA |
| Electrical isolation | 500 V between backplane bus and I/O level | 500 V between backplane bus and I/O level | 500 V between backplane bus and I/O level | 500 V between backplane bus and I/O level |
| Signal | | | | |
| Number of inputs/outputs | -/2 | -/4 | -/2 | -/4 |
| Signal | 0 ... 10 V DC | 0 ... 10 V DC | 0/4 ... 20 mA | 0/4 ... 20 mA |
| Resolution | 12 bits | 12 bits | 12 bits | 12 bits |
| Usage error margin | +/- 0.3 % | +/- 0.3 % | +/-0.4 % at 0 ... 20 mA, +/-0.5 % at 4 ... 20 mA | +/-0.4 % at 0 ... 20 mA, +/-0.5 % at 4 ... 20 mA |
| Basic error margin (at 25 °C) | +/- 0.2 % | +/- 0.2 % | +/-0.2 % at 0 ... 20 mA, +/-0.3 % at 4 ... 20 mA | +/-0.2 % at 0 ... 20 mA, +/-0.3 % at 4 ... 20 mA |
| D/A conversion time | 2 ms (all channels) | 2 ms (all channels) | 2 ms (all channels) | 2 ms (all channels) |
| Communication | | | | |
| Width in the input process image | 4 bytes | 8 bytes | 4 bytes | 8 bytes |
| Parameter data (PROFIBUS/PROFINET) | 8 bytes | 10 bytes | 8 bytes | 10 bytes |
| Status display | | | | |
| Module status | Ready for operation/error | Ready for operation/error | Ready for operation/error | Ready for operation/error |
| Signal status | 1 LED per channel (overload, short circuit, parameterisation error) | 1 LED per channel (overload, short circuit, parameterisation error) | 1 LED per channel (overload, short circuit, parameterisation error) | 1 LED per channel (overload, short circuit, parameterisation error) |
| General | | | | |
| Scope of supply | I/O compound module (base module + electronic module) | I/O compound module (base module + electronic module) | I/O compound module (base module + electronic module) | I/O compound module (base module + electronic module) |
| Packaging unit | 1 | 1 | 1 | 1 |
| Enclosure | IP20 | IP20 | IP20 | IP20 |
| Dimensions (height x width x depth) | 100 x 12.5 x 76 | 100 x 12.5 x 76 | 100 x 12.5 x 76 | 100 x 12.5 x 76 |
| Weight | 0.06 kg | 0.06 kg | 0.06 kg | 0.06 kg |
| Wiring diagram | | | | |



Temperature measurement

Rated data

| | | |
|-------------------------------------|---|---|
| |  | |
| Version | AI 4, 16 bits, resistor | AI 2, 16 bits, thermo |
| Order designation | EPM-S404 | EPM-S405 |
| Function | 2 or 4 analog inputs, temperature measurement based on resistance tests | 2 analog inputs, temperature measurement with thermocouples, cold junction compensation through internal temperature measurement |
| Current supply | | |
| Backplane bus current consumption | 75 mA | 75 mA |
| I/O supply current consumption | 30 mA | 30 mA |
| Electrical isolation | 500 V between backplane bus and I/O signal | 500 V between backplane bus and I/O signal |
| Signal | | |
| Number of inputs/outputs | 4(2)/- | 2/- |
| Signal | | |
| Measuring range | Temperature detection: PT100: -200 °C ... +850 °C PT100: -200 °C ... +850 °C PT100: -60 °C ... +250 °C PT100: -60 °C ... +250 °C Resistance test: 60 Ω 600 Ω 3000 Ω 6000 Ω | type J, -210.0 °C ... +1200.0 °C type K, -270.0 °C ... +1372.0 °C type N, -270.0 °C ... +1300.0 °C type R, -50.0 °C ... +1769.0 °C type S, -50.0 °C ... +1769.0 °C type T, -270.0 °C ... +400.0 °C type B, 0.0 °C ... +1820.0 °C type C, 0.0 °C ... +2315.0 °C type E, -270.0 °C ... +1000.0 °C type L, -200.0 °C ... +900.0 °C -80 mV ... +80 mV |
| Sensor | PT100, PT1000, NI100, NI1000, resistor | J, K, N, R, S, T, B, C, E, L |
| Resolution | 16 bits | 16 bits |
| Usage error margin | +/- 0.4 % | >= +1.5 K, depending on sensor and spurious frequency suppressor |
| Basic error margin (at 25 °C) | +/- 0.2 % | >= +1 K, depending on sensor and spurious frequency suppressor |
| A/D conversion time | | Depending on configuration and filter setting 4 ms – 325 ms |
| Connection system | 2- (3-/4-wire conductor technology) | |
| Communication | | |
| Width in the input process image | 8 bytes | 4 bytes |
| Parameter data (PROFIBUS/PROFINET) | 34 bytes | 22 bytes |
| Status display | | |
| Module status | Ready for operation / error | Ready for operation / error |
| Signal status | 1 LED per channel | 1 LED per channel |
| General | | |
| Scope of supply | I/O compound module (base module + electronic module) | I/O compound module (base module + electronic module) |
| Packaging unit | 1 | 1 |
| Enclosure | IP20 | IP20 |
| Dimensions (height x width x depth) | 100 x 12.5 x 76 | 100 x 12.5 x 76 |
| Weight | 0.06 kg | 0.06 kg |
| Wiring diagram |  |  |

Counter

Rated data


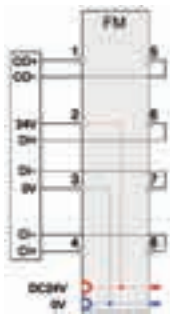


| Version | Counter 1, DC 24 V | Counter 2, DC 24 V | Counter 1, DC 5 V | Counter 2, DC 24 V |
|-------------------------------------|---|---|---|---|
| Order designation | EPM-S600 | EPM-S601 | EPM-S602 | EPM-S603 |
| Function | 1-slot counter 24 V with a high-speed digital output | 2-slot counter 24 V | 1-slot counter 5 V | 2-slot counter 24 V |
| Current supply | | | | |
| Backplane bus current consumption | 75 mA | 75 mA | 75 mA | 100 mA |
| I/O supply current consumption | 20 mA + current consumption of encoder | 15 mA + current consumption of encoder | 20 mA + current consumption of encoder | 15 mA + current consumption of encoder |
| Electrical isolation | 500 V between backplane bus and I/O signal | 500 V between backplane bus and I/O signal | 500 V between backplane bus and I/O signal | 500 V between backplane bus and I/O signal |
| Signal | | | | |
| Number of inputs/outputs | 1/1 | 2/- | 1/- | 2/- |
| Level | HTL | HTL | TTL | HTL |
| Filter | 1-100 kHz | 1-100 kHz | 1-500 kHz | 1-100 kHz |
| Filter | 400 kHz | 400 kHz | 2 | 400 kHz |
| Counter width | 32 bits | 32 bits | 32 bits | 32 bits |
| Counter function | Read, set, Latch function | Read, set | Read, set | Read |
| Alarm function | Yes | Yes | Yes | |
| Control inputs | Latch, reset, gate | | Reset | |
| Rated voltage | 24 V DC | | | |
| Output current per channel | 0.5 A | | | |
| Communication | | | | |
| Width in the input process image | 12 bytes | 12 bytes | 8 bytes | 12 bytes |
| Width in the output process image | 10 bytes | 12 bytes | 10 bytes | 4 bytes |
| Parameter data (PROFIBUS/PROFINET) | 21 bytes | 42 bytes | 22 bytes | 8 bytes |
| Status display | | | | |
| Module status | Ready for operation / error | Ready for operation / error | Ready for operation / error | Ready for operation / error |
| Signal status | 1 LED per counter input / control input / output | 1 LED per counter input | 1 LED per counter input | 1 LED per counter input |
| General | | | | |
| Scope of supply | I/O compound module (base module + electronic module) | I/O compound module (base module + electronic module) | I/O compound module (base module + electronic module) | I/O compound module (base module + electronic module) |
| Packaging unit | 1 | 1 | 1 | 1 |
| Enclosure | IP20 | IP20 | IP20 | IP20 |
| Dimensions (height x width x depth) | 100 x 12.5 x 76 | 100 x 12.5 x 76 | 100 x 12.5 x 76 | 100 x 12.5 x 76 |
| Weight | 0.06 kg | 0.06 kg | 0.06 kg | 0.06 kg |
| Wiring diagram | | | | |





Encoder evaluation

Rated data

| | |
|-------------------------------------|--|
| |  |
| Version | SSI |
| Order designation | EPM-S604 |
| Function | SSI interface for the evaluation of encoder signals |
| Current supply | |
| Backplane bus current consumption | 70 mA |
| I/O supply current consumption | 30 mA |
| Electrical isolation | 500 V between backplane bus and I/O signal |
| Signal | |
| Number of inputs/outputs | 1/- |
| Level | RS 422 |
| Encoder frequency | 12 kHz - 6 MHz |
| Rated voltage of encoder signal | 24 V DC |
| Evaluation function | 3 comparisons, 2 limit values |
| Communication | |
| Width in the input process image | 6 bytes |
| Parameter data (PROFIBUS/PROFINET) | 33 bytes |
| Status display | |
| Module status | Ready for operation / error |
| Signal status | 1 LED per encoder input signal |
| General | |
| Scope of supply | I/O compound module (base module + electronic module) |
| Packaging unit | 1 |
| Enclosure | IP20 |
| Dimensions (height x width x depth) | 100 x 12.5 x 76 |
| Weight | 0.06 kg |
| Wiring diagram |  |

Technology modules

Rated data




| | | |
|-------------------------------------|---|--|
| |  | |
| Version | PWM | RS232 |
| Order designation | EPM-S620 * | EPM-S640* |
| Function | Output of pulse width modulated signals | Activation of devices with RS232 interface |
| Current supply | | |
| Backplane bus current consumption | 100 mA | |
| I/O supply current consumption | | |
| Electrical isolation | 500 V between backplane bus and I/O signal | 500 V between backplane bus and I/O signal |
| Signal | | |
| Number of inputs/outputs | -/2 | |
| Rated voltage | 24 V DC | |
| Output current per channel | 0.5 A | |
| Output delay | 1 µs | |
| Short-circuit strength | Yes, electronic | |
| Level | | RS 232 |
| Max. cable length | | |
| Switching frequency at ohmic load | 20 Hz | |
| Communication | | |
| Max. baud rate | | 115.2 kbps |
| Hardware handshake | | RTS/CTS |
| Protocols | | ASCII, STX/ETX |
| Transmit/receive buffer | | |
| Width in the input process image | 2 bits | |
| Parameter data (PROFIBUS/PROFINET) | 8 bytes | |
| Status display | | |
| Module status | Ready for operation / error | Ready for operation / error |
| Signal status | 1 LED per channel | 1 TxD LED, 1 RxD LED |
| General | | |
| Scope of supply | I/O compound module (base module + electronic module) | I/O compound module (base module + electronic module) |
| Packaging unit | 1 | 1 |
| Enclosure | IP20 | IP20 |
| Dimensions (height x width x depth) | 100 x 12.5 x 76 | 100 x 12.5 x 76 |
| Weight | 0.06 kg | 0.06 kg |
| Wiring diagram |  | |

* in preparation

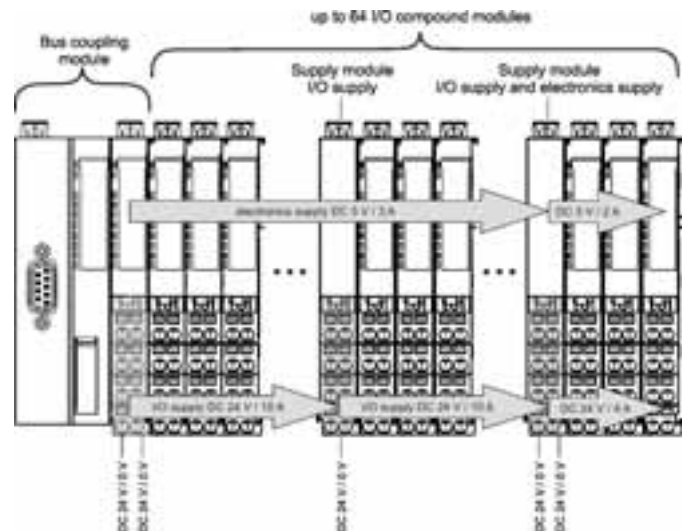


Power supply modules

Rated data






| | | | |
|-------------------------------------|---|--|---|
| |  |  |  |
| Version | Power BC | Power DC 24 V | Power DC 24 V / 24 V |
| Order designation | EPM-S700 | EPM-S701 | EPM-S702 |
| Function | Main supply (bus coupler) as a spare part | I/O supply | I/O supply and electronic supply |
| Current supply | | | |
| Electronics supply voltage | 24 V DC (20.4 ... 28.8 V) | | 24 V DC (20.4 ... 28.8 V) |
| Polarity reversal protection | Yes | Yes | Yes |
| Backplane bus current output | 3 A | | 2 A |
| Fusing | Internal | Internal | Internal |
| I/O supply output voltage | 24 V | 24 V | 24 V |
| I/O supply output current | 10 A | 10 A | 4 A |
| Electrical isolation | | No connection to the I/O supply voltage of the modules mounted at the side on the left | No connection to the I/O supply voltage of the modules mounted at the side on the left 500 V between I/O supply and electronic supply |
| Status display | | | |
| Voltage supply | Supply ok / fuse defective | Supply ok / fuse defective | Supply ok / fuse defective |
| General | | | |
| Scope of supply | Electronic module | I/O compound module | I/O compound module |
| Packaging unit | 1 | 1 | 1 |
| Enclosure | IP20 | IP20 | IP20 |
| Dimensions (height x width x depth) | 56 x 12.5 x 62 | 100 x 12.5 x 76 | 100 x 12.5 x 76 |
| Weight | 0.03 kg | 0.06 kg | 0.06 kg |

Wiring diagram



Accessories

Order data

| Item/ description: | | | Order code |
|---|----------------------------|--|------------|
|  | Holders for the shield bus | The holders enable installation of standard metal rails for the shield connection directly on the module (VPE 10 pieces) | EPM-S900 |
|  | CAN bus plugs | "Node" CAN bus plug - Sub-D, 90° - screw terminals | EPM-T950 |
|  | | "Termination" CAN bus plug - Sub-D, 90° - Screw terminals - Integrated terminating resistor | EPM-T951 |
|  | | "Straight" CAN bus plug CAN - Sub-D, 180° - Screw terminals - Switchable terminating resistor | EPM-T952 |
|  | | "Switch" CAN bus plug - Sub-D, 90° - Tension spring terminal - Switchable terminating resistor | EWZ0046 |



Monitor Panel

| | |
|-------------------------|-----|
| System properties _____ | 4-2 |
| Order data _____ | 4-3 |
| DVI/USB extender _____ | 4-4 |

Monitor Panel

Display unit as accessory for L-force Controller

Built-in variant



Stand-alone terminal

Monitor Panel





- ▶ Display or operator terminal as built-in variant or stand-alone terminal
- ▶ Touch screen or keyboard operation
- ▶ Digital DVI video interface

System properties





| Design | Built-in variant: Embedded line MP 1000-9000 DVI | Stand-alone terminal: Command Station CS 5000-9000 DVI |
|-------------------------|---|---|
| Industrial TFT displays | 26.4 cm (10.4") to 48.3 cm (19") with resistive touch | 38.1 cm (15") to 48.3 cm (19") with resistive touch |
| Interfaces | DVI-D video connection (only digital) USB up-link port (connection to controller) Integrated USB hub: 2 x USB down-Link Port (on rear) | DVI-D video connection (only digital) USB up-link port (connection to controller) Integrated USB hub: 2 x USB down-link Port (on rear) |
| Cable lengths | Standard: 2 m DVI/USB included in scope of supply Optional: 5 m DVI/USB passive, max. 35 m DVI/USB active with DVI/USB extender | Standard: 5 m DVI/USB passive, max. 35 m DVI/USB active with DVI/USB extender |
| Voltage supply | DC 24 V \pm 25 % | DC 24 V \pm 25 % |
| Gen. technical data | <ul style="list-style-type: none"> ▶ Approval: UL 508 (recognised), CSA C22.2 (recognised), CE, EN 61000 6-2(4), EN 55022, EN 55024 ▶ Enclosure: At front IP65, at rear IP20 ▶ Temperature range: 0° to 50°C operation, -10°C to 60° storage ▶ Relative humidity: 10 to 90 % non-condensing ▶ Maximum altitude: 3000 m above sea level | <ul style="list-style-type: none"> ▶ Approval: UL 508 (recognised), CSA C22.2 (recognised), CE, EN 61000 6-2(4), EN 55022, EN 55024 ▶ Enclosure: IP65 ▶ Temperature range : 0° to 45°C operation, -10°C to 60° storage ▶ Relative humidity: 10 to 90 % non-condensing ▶ Maximum altitude: 3000 above sea level |

Order data

Monitor panel as built-in variant *"Embedded Line DVI"*

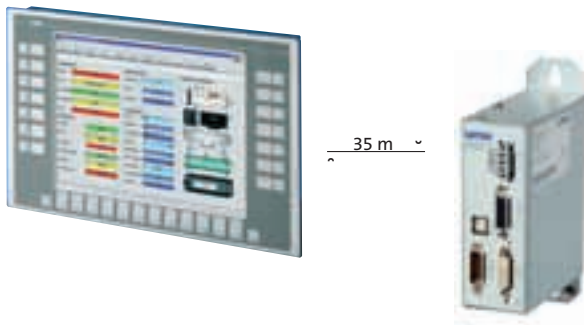
| | | | Order code | | | |
|---|--------------|--|----------------|--------|--|--------|
|  | MP 1000 DVI | <u>"Touch"</u> 26.4 cm (10.4") TFT display (640 x 480) | 5201- | 2 | <input type="checkbox"/> | 1 |
| | MP 1000s DVI | 26.4 cm (10.4") Display (800 x 600) | 5202- | 2 | <input type="checkbox"/> | 1 |
| | MP 2000 DVI | 30.7 cm (12.1") TFT display (800 x 600) | 5203- | 2 | <input type="checkbox"/> | 1 |
| | MP 5000 DVI | 38.1 cm (15.0") TFT display (1024 x 768) | 5204- | 2 | <input type="checkbox"/> | 1 |
| | MP 9000 DVI | 48.3 cm (19.0") TFT display (1280 x 1024) | 5205- | 2 | <input type="checkbox"/> | 1 |
|  | MP 5020 DVI | <u>"Touch plus F/S keys"</u> 38.1 cm (15.0") TFT display (1024 x 768) | 5206- | 2 | <input type="checkbox"/> | 1 |
|  | MP 1050 DVI | <u>"Touch plus num., alpha., F keys"</u> 26.4 cm (10.4") TFT display (640 x 480) | 5207- | 2 | <input type="checkbox"/> | 1 |
| | MP 1050s DVI | 26.4 cm (10.4") TFT display (800 x 600) | 5208- | 2 | <input type="checkbox"/> | 1 |
| | MP 2050 DVI | 30.7 cm (12.1") TFT display (800 x 600) | 5209- | 2 | <input type="checkbox"/> | 1 |
| | MP 5050 DVI | 38.1 cm (15") TFT display (1024 x 768) | 5210- | 2 | <input type="checkbox"/> | 1 |
|  | MP 5070 DVI | <u>"Touch plus num., special, F keys and MF2"</u> 38.1 cm (15") TFT display (1024 x 768) - German layout - English layout | 5211- 5212- | 2 2 | <input type="checkbox"/> <input type="checkbox"/> | 1 1 |
| | USB socket | No front USB socket Front USB socket (IP65) | | | | 0 1 |
| Order code | | Your solution: | □□□□- □ □ □ | | | |

Monitor panel as stand-alone terminal *"Command Station DVI"*

| | | | Order code | | | | |
|---|----------------------------|---|-----------------------|-------|----------------------------------|--------------------------|----------------------------------|
|  | CS 5000 DVI | "Touch" 38.1 cm (15.0") TFT display (1024 x 768) | 6300- | 2 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | CS 9000 DVI | 48.3 cm (19.0") TFT display (1280 x 1024) | 6301- | 2 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|  | CS 5010 DVI | <u>"Touch plus assembly field, 7 command elements and emergency off"</u> 38.1 cm (15.0") TFT display (1024 x 768) | 6302- | 2 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|  | CS 5050 DVI | <u>"Touch plus num., alpha., F keys"</u> 38.1 cm (15.0") TFT display (1024 x 768) | 6303- | 2 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|  | CS 5070 DVI | <u>"Touch plus num., special, F keys and MF2"</u> 38.1 cm (15.0") TFT display (1024 x 768) - German layout - English layout | 6304- | 2 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | | | 6305- | 2 | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | USB socket | No front USB socket Front USB socket (IP65) | | | 0 1 | | |
| | Mounting frame (at bottom) | No cable gland Double universal cable grommet (KDL-2) ¹⁾ USB connection in mounting frame IP65 | | | 0 1 3 | | |
| | Fastening adapter | VESA 100 VESA, closed Rittal CP-L | | | | | 0 1 2 |
| Order code | | | Your solution: | □□□□- | □ | □ | □ |

*)¹ Scope of supply includes 1 blind grommet

DVI/USB extender



Transfer

When using remote operating concepts, the DVI/USB extender allows the distance between the controller and operating panel to be extended up to 35 m. All signals (digital real time graphic information, USB peripherals, mouse and keyboard) are transferred via a TwinLAN cable (2 x CAT-7). The voltage supply for the panel (DC 24 V) also uses this cable connection.

- ▶ Transfer of DVI and USB (1.1) signals
- ▶ Transfer length: max. 35 m plus max. 5 m from controller to TX module
- ▶ Supply voltage transfer
- ▶ Simple installation: plug and play, software driver not needed
- ▶ Simple mounting: TX module on mounting plate, RX module is secured to rear of monitor panel.

Components

The system consists of a transmitter module which is fitted near the controller, and a receiver module which is attached directly to the rear of the monitor panel.


▶ Transmitter module TX:

Control cabinet assembly using key hole fastening
 Dimensions: 52 x 140 x 101.5 mm (W x H x D)
 Mounting area: 52 x 190 mm (W x H)
 Voltage supply: DC 24 V
 Connecting cable to PC supplied 2 m (max. 5 m)

▶ Receiver module RX:

Dimensions: 27.5 x 172.5 x 100 mm (W x H x D)
 Voltage supply: via transmitter module
 Supply: 24 V for monitor
 Connecting cable: 0.4 m

Order data

| Item / description: | | Order code |
|--|-------------------------------|--------------------|
|  DVI/USB extender Transmission cable | Transmitter and receiver unit | EPCZEBED |
| | TwinLAN 10 m | EYC0045A0100R05T05 |
| | TwinLAN 15 m | EYC0045A0100R05T05 |
| | TwinLAN 20 m | EYC0045A0100R05T05 |
| | TwinLAN 25 m | EYC0045A0100R05T05 |
| | TwinLAN 30 m | EYC0045A0100R05T05 |
| | TwinLAN 35 m | EYC0045A0100R05T05 |
| | DVI + USB cable 5 m | EYC0000A0350X00008 |



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