

TR-Electronic Miniature Multi Turn Rotary Encoder Product Information CMV 22 M

22 mm



TR-Electronic – Your Partner in Automation




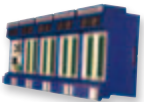





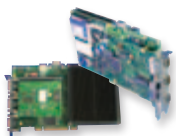








TR-Electronic can look back on more than 25 years of success, and is represented worldwide with an export share of more than 40 %. The core business comprises the development and manufacture of industrial angular and position measuring technology, as well as compact drive technology with integrated position control and measurement. The company is divided into three Business Units (BU) and is thus well positioned for further growth in the future.

Products in the **Rotary Encoder Business Unit** with optical or magnetic scanning precisely acquire position in steel production, wind power plants, cranes and ships as well as in explosion-proof versions in painting lines. Miniature versions ensure the correct position in medical technology. SIL3 approved absolute rotary encoders ensure the necessary safety.

In the **Linear Encoders Business Unit** magnetostrictive position sensors position injection molding machines, for example, or are directly integrated into hydraulic cylinders. Cascadable distance measurement sensors position parting units. With their high precision, glass scales on machine tools ensure precise position. Laser sensors based on phase difference measuring techniques position aisle stackers in warehousing and materials handling technology.

In the **Drives Business Unit** angle sensors are combined with compact drives: no external electronics are required, position, speed and torque controllers, power electronics and absolute rotary encoders are compactly integrated into the drive and thus bring intelligence directly to the drive shaft via the field bus. Compact drives are used for diverse applications in the printing and packaging industry and on palletizers.



| Rotary Encoder | Linear Encoder | Drives | Components | Engineering | Unidor |
|--|--|--|---|---|---|
|  Incremental Encoder |  Magnetostriction |  Actuator |  I/O Module | Automation Solutions  | Punching and forming Measurement and control systems  |
|  Absolute Encoder |  Glass scale |  Positioning Drive |  Controls | Retrofit  | Sensors  |
|  Draw Wire Encoder |  TOF laser |  Processing Drive |  Industrial-PC | | Process monitoring tools  |
| |  Barcode Positioning | | | | |

The portfolio is supplemented by the affiliated TRsystems with customized controls, industrial PCs, hydraulic controls as well as control units and sensors for punching and forming.

An essential factor for the success of TR-Electronic are the now more than 300 employees who actively help to shape the product portfolio with innovations and successfully implement customer projects. Through its commitment to the regional colleges, TR-Electronic supports the high quality training of young employees and thus guarantees the highest level of innovation and quality at its Trossingen location.

A high degree of vertical integration allows customer-specific requirements to be responded to very quickly. The constantly new requirements on the mechanical design of sensors, on innovative new operating interfaces and new plug connectors result in a rapidly increasing product diversity. With TR-Electronic you have a partner who can fulfil these requirements.

Content

General

| | |
|--|----|
| Absolute miniature rotary encoder – Application and technology | 3 |
| Product overview – TR-Electronic – Your partner for automation | 8 |
| Addresses – Distribution Germany and International | 10 |

Miniature rotary encoder CMV 22 M

| | |
|---|---|
| With analog interface – CMV 22 M analog | 4 |
| With SSI – CMV 22 M SSI | 6 |

Absolute Miniature Rotary Encoder

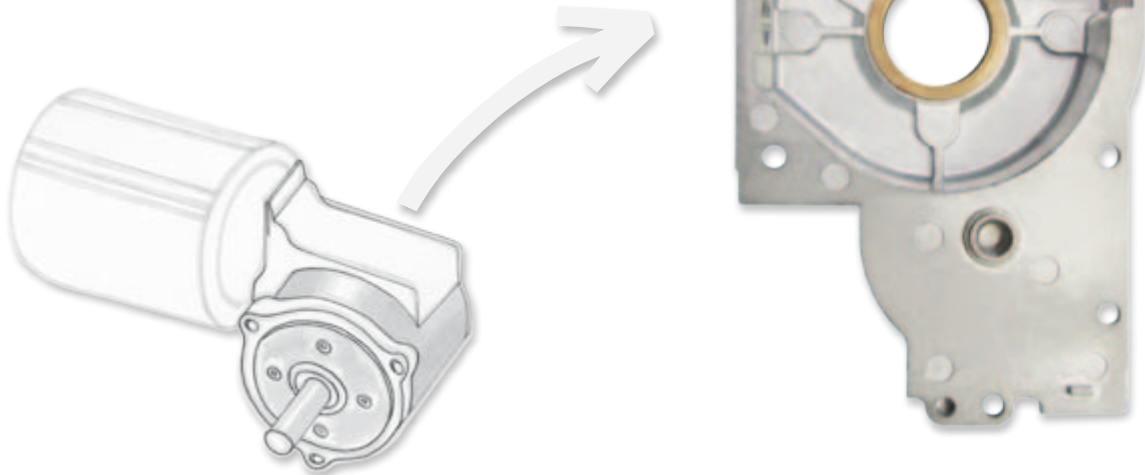
Within the CMV 22 M we have combined our innovative ideas of rotary encoder technology and the experience gained over the years and placed it into a miniature rotary encoder. With a 22 mm diameter, it is the smallest absolute multi turn rotary encoder of its kind. Amazingly compact, it can be easily mounted in the most confined machine spaces. The contact-free detection guarantees shock and vibration resistance which combined with its low mass make it perfect

for use in demanding environments.

Within many axis positioning systems there are often control parameters located very close to the main position, multi-ganged potentiometers are vulnerable to early failures at those positions; whereas the contact-free CMV 22 M does not share this weakness and can provide short-sharp motion control signals reliably throughout the systems life time.

Direct installation into servo drives for wear-free, absolute position detection over several revolutions.

The small size of 22 mm enables a real multi-turn position measuring without battery back-up at places like apparatus construction and medical engineering, where up till now only incremental rotary encoders or multiple-ganged potentiometers were used.



Technology

The use of a CMV 22 M ensures a real multi turn position measuring without the need of a mechanical stop reference position.

The axial position is sampled over several revolutions using contact-free magnetic sensors. Immediately when switched on, the absolute position value is available without the need of an internal back-up battery or an external counter.

Due to its compact size, the CMV 22 M is only available with pre-cabled connectivity.



Miniature Rotary Encoder CMV22 M With Analog Interface

- + analog interface
- + power and voltage
- + endless potentiometers
- + contact-free measurement procedure
- + roller bearing for a long operating life at a high speed
- + special parameters on request
- + alternative shaft / flange combination possible



Supply

| | |
|----------------------------|----------------|
| Power supply | 14 ... 30 V DC |
| Power input without demand | < 50 mA |

Measured value acquisition

| | |
|----------------------------------|----------|
| Capacitance ¹⁾ | ≤ 20 bit |
| Steps / revolution ¹⁾ | ≤ 4.096 |
| Revolution ¹⁾ | ≤ 256 |
| Accuracy | ±1 ° |

Interface

| | |
|------------------------|--|
| Voltage | 0 ... 10 V |
| - Load resistance | ≥ 20 kΩ |
| - Maximum cable length | 10 m (electrical shielding) |
| Current | 0 ... 20 mA |
| - Load resistance | < 500 Ω |
| Resolution | 15 bit |
| Cycle time | 500 μs |
| Parallel input bit | Counting direction, Preset |
| Input bit level | „0“ < +2 V DC, „1“ = Supply voltage |

Mechanical features

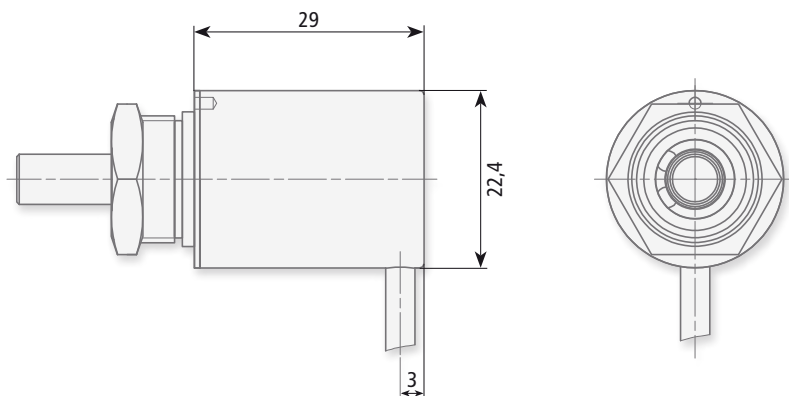
| | |
|--------------------------------|--|
| Mechanically permissible speed | ≤ 3.000 min ⁻¹ |
| Shaft load (shaft end) | ≤ 10 N axial, ≤ 5 N radial |
| Bearing life time | ≥ 30 × 10 ⁹ revolution at ≤ 3.000 min ⁻¹ ≤ 25°C Shaft load ≤ 5 N axial, ≤ 0 N radial |
| Mass (typ., without cable) | 60 g |

Environmental conditions

| | |
|--|--|
| Vibration DIN EN 60068-2-6 | ≤ 100 m/s ² , sine 50–2.000 Hz |
| Shock DIN EN 60068-2-27 | ≤ 1.000 m/s ² , half-sine, 11 ms |
| EMV | Transient emissions DIN EN 61000-6-3 Immunity to disturbance DIN EN 61000-6-2 |
| Working temperature | 0 °C ... +60 °C |
| Storage temperature | 0 °C ... +85 °C, dry |
| Relative humidity, DIN EN 60068-3-4 | 95 %, no condensation |
| Protection class DIN EN 60529 ²⁾ | IP 64 |

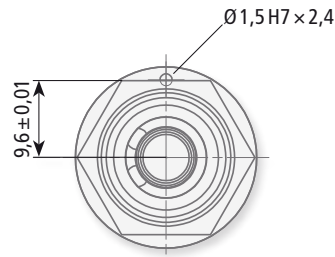
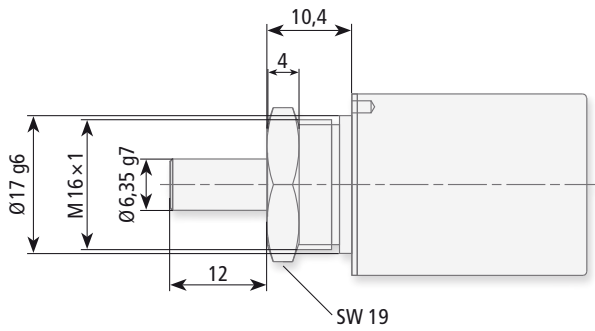
¹⁾programmable parameter

²⁾valid with screwed on mating connector and / or screwed together cable gland



Please ask your project manager for detailed drawings.

Our recommendation



Order information analog voltage 0 ... 10 V

| | |
|--|----------------|
| Order number | CMV 22 M-00008 |
| <ul style="list-style-type: none"> + Shaft: 6,35 mm (1/4"), glatt x 12 mm + Cable gland: radial + 0,5 m cable with open end, not finished + measurement range programmable + input for switching counting direction | |

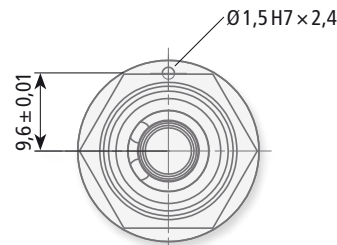
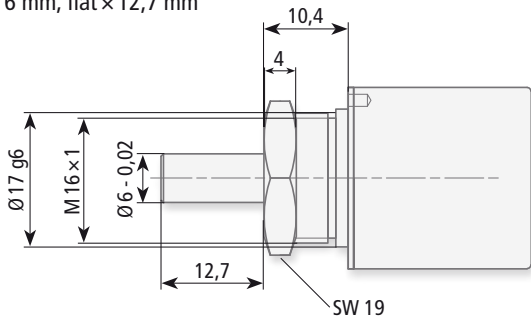
Order information analog current 0 ... 20 mA

| | |
|---|----------------|
| Order number | CMV 22 M-00024 |
| <ul style="list-style-type: none"> + Shaft: 6,35 mm (1/4"), glatt x 12 mm + Cable gland: radial + 0,5 m cable with open end, not finished + measurement range programmable + set an input preset value | |

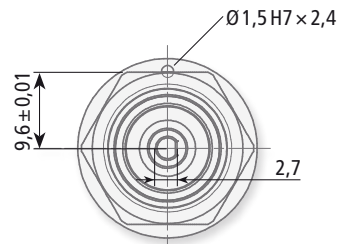
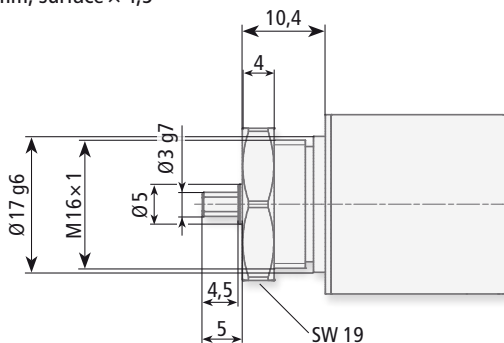
Further options

Mechanic

Shaft 6 mm, flat x 12,7 mm



Shaft 3 mm, surface x 4,5



Interface

| | |
|---------------|-----------------------------------|
| Cable length | 0,3 ... 5 m |
| Termination | open end, connector |
| Programming | customer specific pre-programming |
| Control input | forward/backward, preset |

Miniature Rotary Encoder CMV22 M SSI

- + synchronous-serial interface
- + programmable
- + contact-free measurement procedure
- + roller bearing for a long operating life at a high speed
- + special parameters on request
- + alternative shaft / flange combination possible



Supply

| | |
|----------------------------|----------------|
| Power supply | 14 ... 30 V DC |
| Power input without demand | < 50 mA |

Measured value acquisition

| | |
|--------------------|----------|
| Capacitance | ≤ 24 bit |
| Steps / revolution | ≤ 4.096 |
| Revolution | ≤ 256 |
| Accuracy | ±1 ° |

Interface

| | |
|-------------------------------|---|
| SSI | synchronous-serial interface |
| Clock input | Optocoupler |
| Data output | RS-422, 2-wire |
| Clock frequency | 80 kHz – 1 MHz |
| Mono time t_M | $16 \mu s \leq t_M \leq 25 \mu s$, typical 20 μs |
| Output code ¹ | Binary, gray |
| Output | Position or speed |
| Cycle time | 500 μs |
| Displaying negative values | Prefix + value, 2's-complement |
| SSI- or parallel special bits | End switch, over speed, direction signal, motion signal, error signal, parity |
| Parallel input bit | Counting direction, Preset |
| Input bit level | „0“ < +2 V DC, „1“ = Supply voltage |

¹programmable parameter

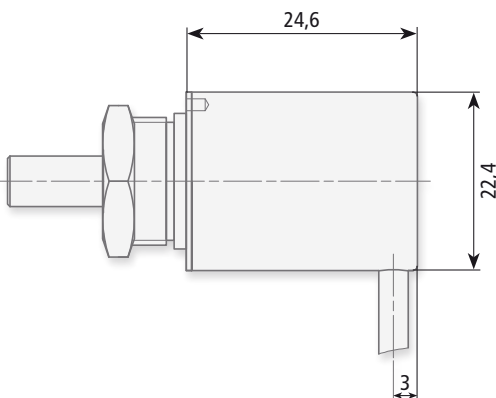
²valid with screwed on mating connector and / or screwed together cable gland

Mechanical features

| | |
|--------------------------------|---|
| Mechanically permissible speed | ≤ 10.000 min ⁻¹ |
| Shaft load (shaft end) | ≤ 10 N axial, ≤ 5 N radial |
| Bearing life time | ≥ 30 × 10 ⁹ revolution at ≤ 3.000 min ⁻¹ ≤ 25 °C Shaft load ≤ 5 N axial, ≤ 0 N radial |
| Mass (typ., without cable) | 60 g |

Environmental conditions

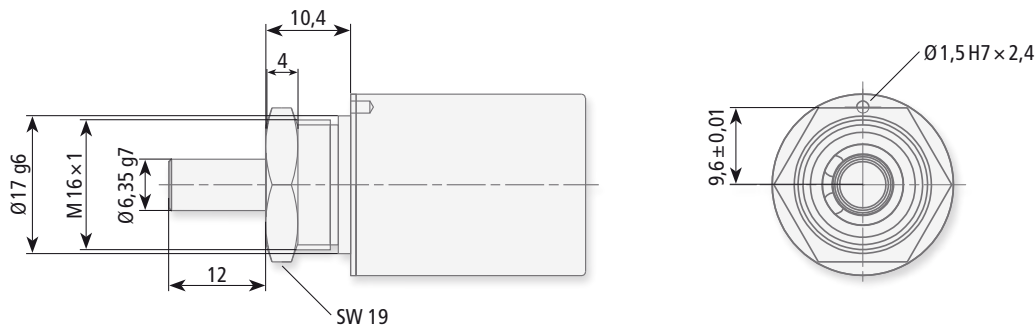
| | |
|---|--|
| Vibration DIN EN 60068-2-6 | ≤ 100 m/s ² , sine 50–2.000 Hz |
| Shock DIN EN 60068-2-27 | ≤ 1.000 m/s ² , Half-sine, 11 ms |
| EMV | Transient emissions DIN EN 61000-6-3 Immunity to disturbance DIN EN 61000-6-2 |
| Working temperature | 0 °C ... +60 °C |
| Storage temperature | 0 °C ... +85 °C, dry |
| Relative humidity, DIN EN 60068-3-4 | 95 %, no condensation |
| Protection class DIN EN 60529 ² | IP 64 |



Please ask your project manager for detailed drawings.

General/Definition
CMV 22 M
With Analog Interface
With SSI

Our recommendation



Order information synchronous-serial interface

| | |
|--|----------------|
| Order number | CMV 22 M-00010 |
| <ul style="list-style-type: none"> + 24 data bit + shaft: 6,35 mm (1/4"), glatt $\times 12\text{ mm}$ + cable gland: radial + 0,5 m cable with open end, not finished + measurement range programmable + input for switching counting direction | |

Further options

Mechanic

Shaft 6 mm, flat $\times 12,7\text{ mm}$



Shaft 3 mm, surface $\times 4,5$



Interface

| | |
|---------------|-----------------------------------|
| Cable length | 0,3 ... 5 m |
| Termination | open end, connector |
| Programming | customer specific pre-programming |
| Control input | forward/backward, preset |

TR-Electronic – Your Partner in Automation

General/Definition

CMV 22 M

With Analog Interface

With SSI



Programmable rotary encoder

The standard of automation technology, available with all current fieldbus systems: PROFIBUS, Interbus, CANopen, DeviceNet and Industrial Ethernet. Including TR-Electronic's variety of mechanics, interfaces and functions.

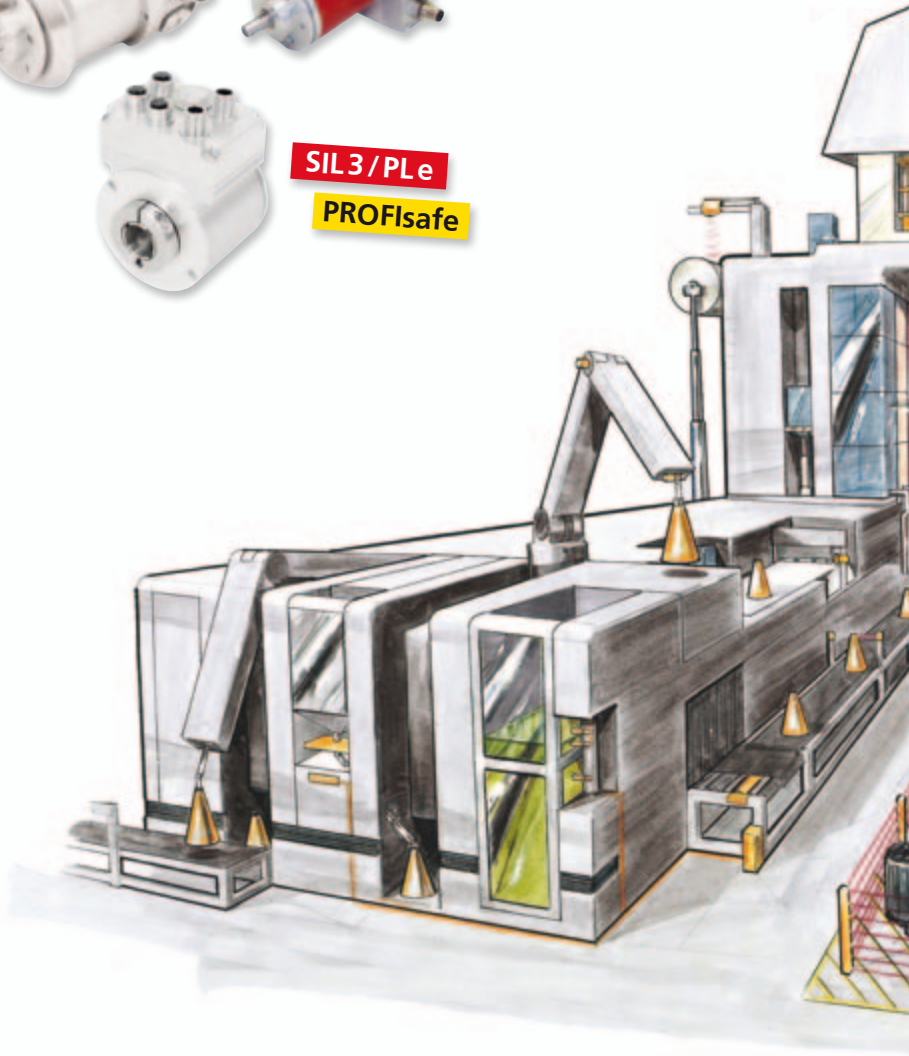


SIL3/PLe

PROFIsafe

Incremental rotary encoder

From 24 mm external diameter up to 55 mm hollow shaft – we always have a solution!



Motor feedback systems

Feedback encoder for modern positioning drives. Optional integrated or directly mounted on the drive shaft via hollow shaft.



Linear absolute displacement sensors

The compact class for linear absolute measurement. Directly bus-ready, suitable for harsh environmental conditions and for installation in hydraulic cylinders.



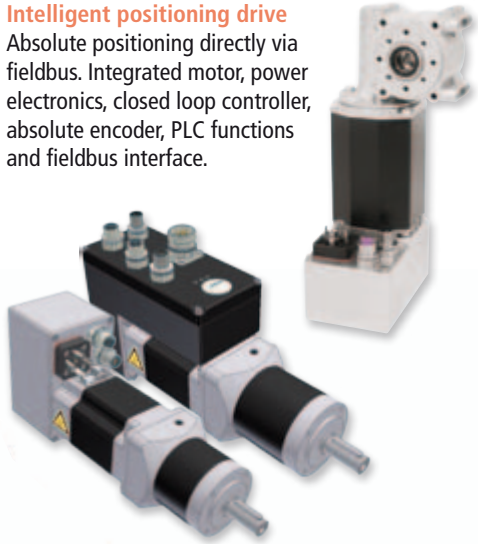
Absolute high resolution linear measurement systems

Linear measurement with absolute sub-micron resolution without referencing.



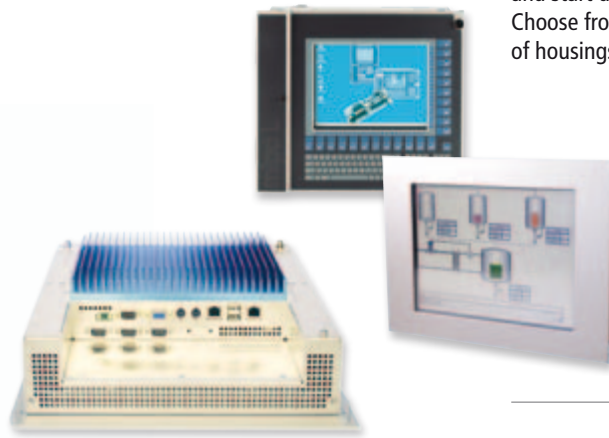
Intelligent positioning drive

Absolute positioning directly via fieldbus. Integrated motor, power electronics, closed loop controller, absolute encoder, PLC functions and fieldbus interface.



Heavy-duty industrial PC

Double shock proof mounted housing isolates the electronics from vibration, while front access (MIPC) simplifies configuration and start up. Choose from our wide selection of housings.



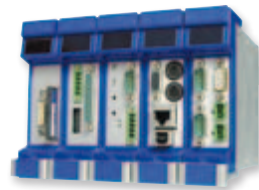
SPC – the PLC for PC

Turns every PC into an efficient PLC under S5/S7 or IEC 1131 protocols. Combines the comfort of PC control with the safety of a separate processor for PLC tasks.



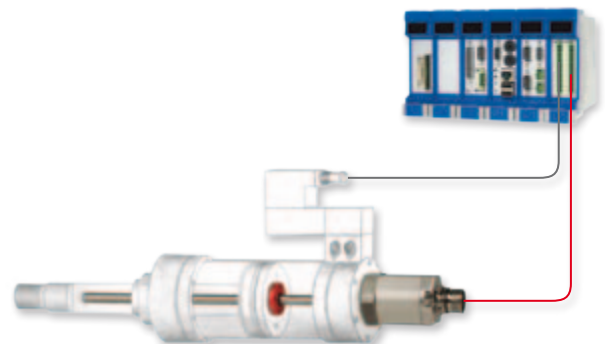
@ctivelO – more than fieldbus modules

Modular, rugged fieldbus node system I/O-node, small-scale PLC, decentralized axis controller, high performance cam controller, DIN-rail mounted industrial PC, servo controller for the hydraulic ... with commercial fieldbus systems, such as Profibus-DP, CANopen, DeviceNet, LightBus ... and ETH-ERNET as option!



Laser distance measuring systems

Absolute and wear-free measurement of distances up to 200 m via SSI, fieldbus and Ethernet.



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