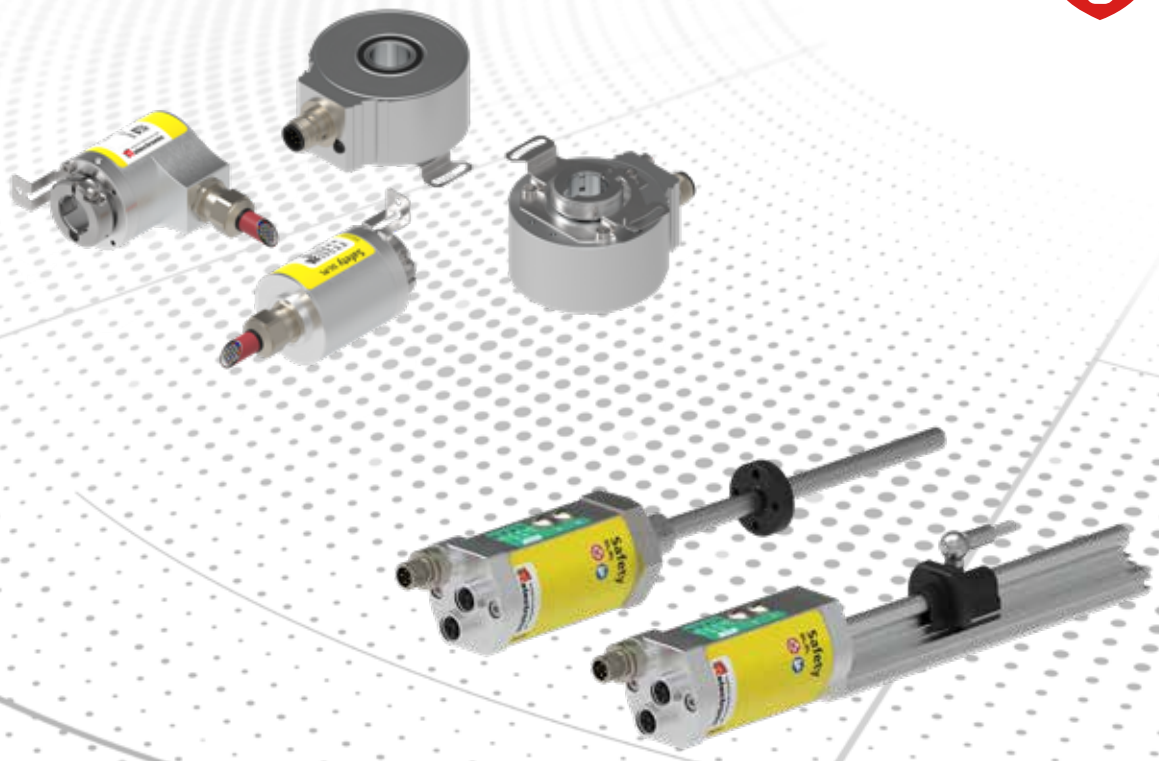
Sensors – Highlights 2027

New solutions, first shown here!

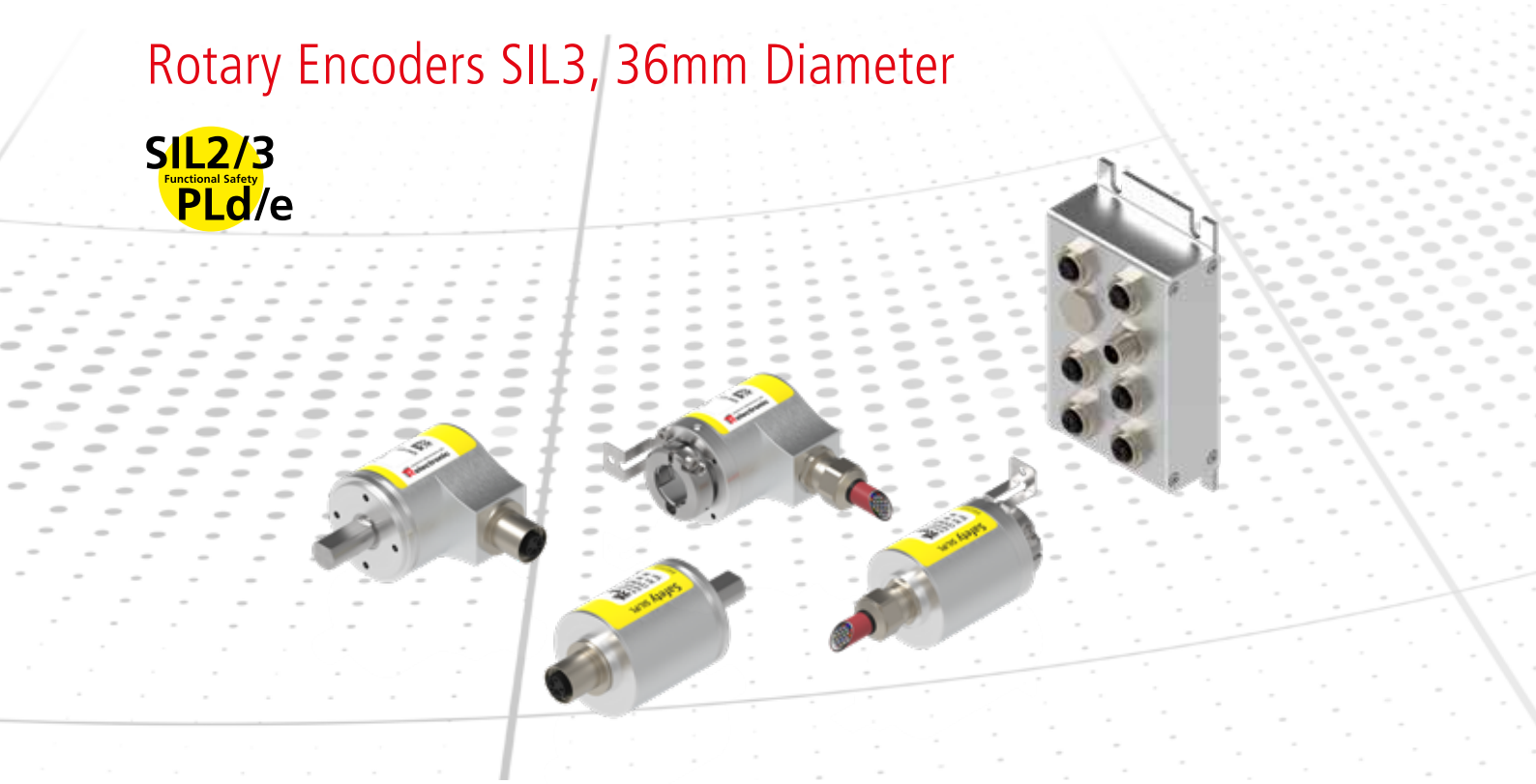
SIL2/3 Functional Safety PLd/e

CRA READY



www.tr-electronic.com

Rotary Encoders SIL3, 36mm Diameter



NEW: Functional Safety Encoder CD_362+FS

Just 36 mm and fully safe

The CD_362+FS from TR Electronic is currently the smallest safe absolute encoder on the market that meets the high requirements of SIL3 or PLe with Category 3. With a diameter of 36 mm, TR Electronic delivers a redundant encoder system that includes two multiturn gearboxes and two sets of sensors. Even in this small encoder, TR's well-known safe bus protocols can be implemented.

Safe bus protocols without overhead

The safe encoders of the 362 series implement the safe bus protocol in compliance with standards and are certified for CANopen Safety and IO-Link Safety.
The safe bus protocols PROFIsafe, CIP Safety™, openSAFETY, and FSoE are generated securely directly within the encoder.. They are then transmitted via an RS-485-based serial interface. If a standard interface for communication with a higher-level system is required, the appropriate CIB2X+FS converter module can be used to convert the serial signals from up to 4 CD_362+FS encoders to the standard Ethernet interface.

Applications

Autonomous guided vehicles (AGVs)
Medical devices and equipment

The CD_362+FS family at a glance:

Mechanical specifications:
_ Encoder diameter: 36 mm
_ Typical overall length: 42 mm
_ Available as a solid shaft and blind shaft / slip-on hollow shaft
_ Blind shaft,: Form fit with a keyway in the clamping ring; shaft diameters 6, 8, 10, 12, 15 mm
_ Solid shaft: 6 mm D-Cut, 8, 10 mm: Keyway

Interfaces:
_ CANopen Safety, IO-Link Safety, SSI+SSI, SSI + Incremental
via M12 connectors or cable glands
Secure interface protocol, standardized and tested via a serial connection:
_ PROFIsafe, CIP Safety™, OpenSAFETY, FSoE
This can be loaded directly into a controller by the customer.

Safety-oriented design
_ Two-channel detection
_ Multiturn detection via two gearboxes and separate detections
_ Monitored power supply
_ Internal hardware diagnostics and consolidation into a secure transmission protocol

Linear Encoder with Functional Safety

SIL2/3 Functional Safety PLd/e



Uncompromising Safety for Linear Motion – SIL 3 Linear Encoders

A functionally safe linear measurement system that meets the stringent requirements of SIL3 or PLe (as well as SIL2/PLd). With this system, TR Electronic fills the gap in applications where linear movements must be monitored directly and with absolute safety. The system is based on highly reliable, redundant sensing, in which two independent measurement systems are housed securely within a tube or profile.

Truly absolute, non-contact, and wear-free

This new development combines maximum safety with the proven mechanical advantages of TR Electronic's linear measurement systems. Scanning is truly absolute, non-contact, and completely wear-free.

Secure Communication and Smart Diagnostics

Secure data is transmitted directly via PROFINET and PROFIsafe (PROFIsafe address type 2). Integrated features such as the Media Redundancy Protocol (MRP) ensure maximum network availability. System startup is significantly accelerated by Fast Start-Up (FSU). In addition, the system is perfectly suited for modern control environments thanks to the standardized PNO encoder profile (Class 3/4) and S2 system redundancy. A high-speed measurement channel for high-precision control and a secure preset interface are directly integrated. Commissioning and service are conveniently handled via the TCI Device Tool.

Prepared for Cybersecurity and the New Machinery Regulation

With an eye toward the future, the SIL3 linear measurement system is designed ex works to comply with the Cyber Resilience Act (CRA) and the new Machinery Regulation (MVO 2027), and meets the criteria of PROFINET Security Class 1.

Applications

The new SIL3 linear measurement system is indispensable wherever humans and machines work closely together and extremely heavy loads must be moved safely. Typical applications include:

- Railway construction machinery and tunnel boring machines
- Construction machinery in harsh outdoor environments
- Modern entertainment and event technology, where loads are transported over people or people are moved.

By complying with the new Machinery Directive, TR Electronic already provides machine builders with the legal certainty that will be mandatory for future generations of equipment.

Safety Highlights:

- Certified safety: Full support for applications according to SIL3/PLe and SIL2/PLd
- Redundant design: Two completely independent detection systems in a single tube (2-in-1)
- Future-proof: Compliant with the Cyber Resilience Act (CRA) and the new Machinery Regulation (MD 2027)

General product features:

- Detection: Non-contact, wear-free, truly absolute, and with no system-imposed speed limit
- Precision: High-precision resolution of 0.01 mm
- Design: Available as a robust tubular version or a profile version
- PROFIsafe via PROFINET
- Fast Start-Up (FSU), Media Redundancy (MRP)
- Profile & Security: PNO Encoder Profile (KL 3/4) and PROFINET Security Class 1, System Redundancy S2
- Separate, high-speed measurement channel for dynamic control
- Secure preset interface
- Configuration via TCI Device Tool

encoTRive – EtherCAT with NC function



Decentralized compact drives – compact & integrated

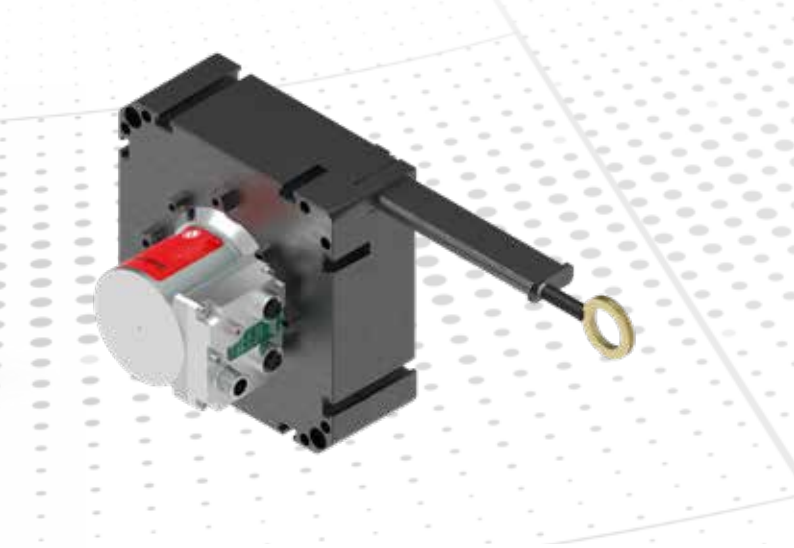
_Motor, power electronics, control, and position detection in one system
_Supply voltage: 24–48 V
_Safety functions: STO and SS1
_battery-free multiturn technology
_Bus systems: EtherCAT, PROFINET, PROFIBUS, CANopen

EtherCAT NC – new possibilities

_Integration into EtherCAT NC functions
_Manufacturer-neutral integration of a wide variety of drives
_Central position control via controller
_Integration via standard technology functions

The encoTRive series combines motor, electronics, and position detection in a single housing – ideal for space-saving applications with a 24–48 V supply. With support for modern fieldbus systems such as EtherCAT, Profinet, and CANopen, positioning tasks can be carried out efficiently. The new EtherCAT NC extension enables manufacturer-neutral integration and standardized control integration: The drive takes care of speed control, while position control is handled by the controller. This simplifies project planning and commissioning.

New series Cable length sensor



WPS cable pull mechanism for CMW582 rotary encoder - NEW range: 10 m

Precise measurement over long distances – compact, robust, versatile

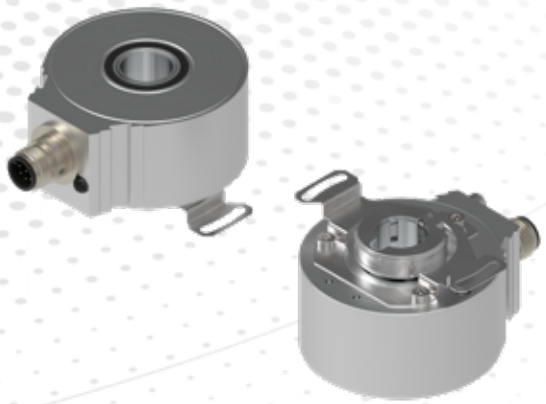
_Resolution of more than 17 bits over measuring lengths of 10 m with compact design
_Integrated multiturn encoder, protection class IP67

Full integration

_Wide range of interfaces: PROFINET, EtherCAT, CANopen, SSI, IO-Link, and many more.
_Radial connector arrangement, flexible mounting options
_Seamlessly integrated into the CMW582-encoder

The new WPS cable pull mechanism from TR Electronic enables high accuracy with low linearity deviation across the entire measuring range of 5 m and new up to 10 m – even in confined spaces and challenging installation situations. The multiturn encoder is directly integrated, significantly reducing the installation space required. Thanks to its IP67 protection rating, the mechanism is also suitable for harsh industrial environments. Installation is made easy by versatile mounting options – with T-slots and additional holes. Fully integrated into the CMW582 series, the WPS offers all common interfaces for modern automation – including Industrial Ethernet, IO-Link, and fieldbus options. Ideal for mechanical engineering, conveyor technology, and Industry 4.0 concepts.

Low Profile Absolute Encoder



Hollow-through-shaft Encoder with low integration depth CEL582

When it comes to precise position determination in extremely limited space, the new low-profile absolute encoder from TR Electronic sets new standards. Wherever conventional hollow-shaft encoders in the standard industrial 58-mm size reach their limits due to their housing depth, this new development shines as a true problem-solver. With a standard diameter of 58 mm and an exceptionally low profile of less than 40 mm, the system integrates seamlessly into compact machine environments. A space-saving cable exit via a grommet saves valuable millimeters during installation.

_Ultra-compact: Standard diameter of 58 mm with a mounting depth of less than 40 mm.
_Optimized installation: Space-saving cable gland and flexible mounting—either via a spring-loaded torque support or a pin-and-slot design.
_Mechanisch variabel: Durchgehende Hohlwelle bis 15 mm sowie flansch- oder haubenseitige Fixierung der Drehmomentstütze.
_Mechanically versatile: Through-hole shaft up to 15 mm, as well as flange- or housing-side mounting of the torque support.
_Robust design: Maximum stability thanks to dual-sided mounting on the housing.
_Extensive interface support: Direct CANopen, IO-Link, and SSI; PROFINET, EtherCAT and other interfaces from Family C__582 available via the CIB2X interface box.

CANopen as a New Secondary Interface



Flexible Secondary Interface for Standard and Safety Encoders C__582, CD_582+FS

Two Interfaces in One Sensor

TR Electronic specializes in customer-specific customizations and integrates a wide range of industrial interfaces directly into its sensors. Whereas SSI and incremental signals (INK) were previously the primary options for output to a secondary interface, the company is now expanding its offerings: CANopen is now available as a full-featured secondary interface.
This interface is routed directly from the encoder via an additional connector. It is available for both the standard encoders of the C__582 family and the safety encoders of the CD_582 family (here as a non-safety secondary interface).

The new CANopen secondary interface at a glance:

_Independent processing: Processes data directly at the detection.
_Flexible scaling: Resolution, gear ratio, offset, and direction of rotation can be set completely independently of the main interface.
_LSS support: Addressing and baud rate configurable via Layer Setting Service
_Full compatibility: Identical EDS files as the standard CANopen series from TR Electronic.
_Separate connector mounted directly on the housing..
_Also available with a through-shaft.
_Can be combined with the primary interfaces of families C__582 bzw. CD_582, e,g. PROFINET, PROFIBUS, EtherCAT, Ethernet/IP...

notion.S Comfort Panels



notion.ABC – Industrial HMI and automation systems of the highest standard

Customized, robust, and future-proof: With notion.ABC, TRsystems offers a powerful platform for demanding industrial applications. The systems are developed and manufactured entirely at the Trossingen site – for maximum quality, flexibility, and long-term availability.

Whether for extreme operating conditions such as shock, vibration, EMC, or classic machine control, notion.ABC impresses with its reliability and efficiency. With state-of-the-art CPU technology (ARM®, Intel® Atom®, Intel® Core™ Gen. 14) you are already equipped for tomorrow.

NEW: notion.S Comfort Panels from TRsystems

TP 700, TP 900, TP1200, TP1500, TP1900, TP2200

Highlights at a glance

_ Functionally and installation-compatible with SIMATIC* HMI Comfort Panels
_ Project planning directly in the TIA Portal
_ Supports WinCC Runtime Advanced & Unified PC Runtime
_ Scalable CPU performance – fanless and powerful
_ Long-term availability of touch panels (>10 years)
_ Seamless integration into SIMATIC*-environments: TIA Portal, WinCC Advanced & Unified

The notion.S Comfort Panels from TRsystems are the future-proof solution for industrial applications where compatibility, performance, and long-term availability are required. They can be fully integrated into the SIMATIC* world, both mechanically and in terms of software, including project planning in the TIA Portal. The panels support WinCC Runtime Advanced and Unified RT and are available in display sizes from 7" to 22" – with WVGA, WXGA, HD, or Full HD resolution. Thanks to fanless, scalable CPU technology, they offer high performance with reliable continuous operation. Robust design, optional glass protection, and over 10 years of availability make them the ideal choice for machine and plant manufacturers. Ethernet interfaces, MPI, or AS511 adapters enable connection to all generations of SIMATIC* S5 and S7 controllers. The capacitive touch haptics provide a modern operating feel – notion.S is more than a replacement: it is an upgrade for your HMI future.

*Registered trademarks of Siemens AG Munich

Well-Equipped for the Cyber Resilience Act



Fulfilment of CRA is logical and natural extension of the quality philosophy

For over 40 years, TR Electronic has established itself as a leading specialist in sensor technology and automation. The foundation of this long-standing success is a consistent focus on the customer, which is reflected in two core areas

_Focus on technical functionality: Customized interfaces, precise mechanical designs, and optimal adaptation to the most demanding environmental conditions ensure reliable operation in the field.

_Practical and risk-based compliance with regulatory requirements: Targeted adherence to all relevant product standards and compliance requirements guarantees customers legal and operational security.

Compliance with the new Cyber Resilience Act (CRA) is therefore a logical and natural extension of the Trossingen-based company's quality philosophy

Comprehensive Measures for Maximum Cyber Resilience

In light of the new legal requirements, TR Electronic has subjected its entire product portfolio to a thorough conformity assessment. Since protection against dangerous external interference has always been an integral part of the development process, the vast majority of products already fully comply with the guidelines. For the remaining components, necessary adjustments are being implemented on time and according to plan: The goal is to declare full compliance for the entire product range by the end of 2026. This status is confirmed continuously and transparently directly in the respective product-specific declarations of conformity. In its practical implementation, TR Electronic strictly adheres to the proven rules and recommendations of the Federal Office for Information Security (BSI).

Security in Action: PSIRT and ISO 27001

For TR Electronic, security is not a static state but a dynamic process. To complement product-level CRA compliance, the company has established its own Product Security Incident Response Team (PSIRT). This central reporting and disclosure platform enables security researchers, customers, and partners to responsibly report potential product security risks and vulnerabilities so that they can be addressed as quickly as possible. In this way, TR Electronic and its partners work together to maintain a consistently high level of security.

At the same time, the sensor technology specialist is fortifying itself against digital threats at the corporate level: The entire internal corporate infrastructure is currently undergoing intensive preparation for certification under the international security standard ISO 27001, for which far-reaching protective measures have already been successfully implemented.

With these proactive steps, TR Electronic is ensuring the future viability of its customers and once again demonstrating its role as a reliable pioneer of industrial transformation.

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