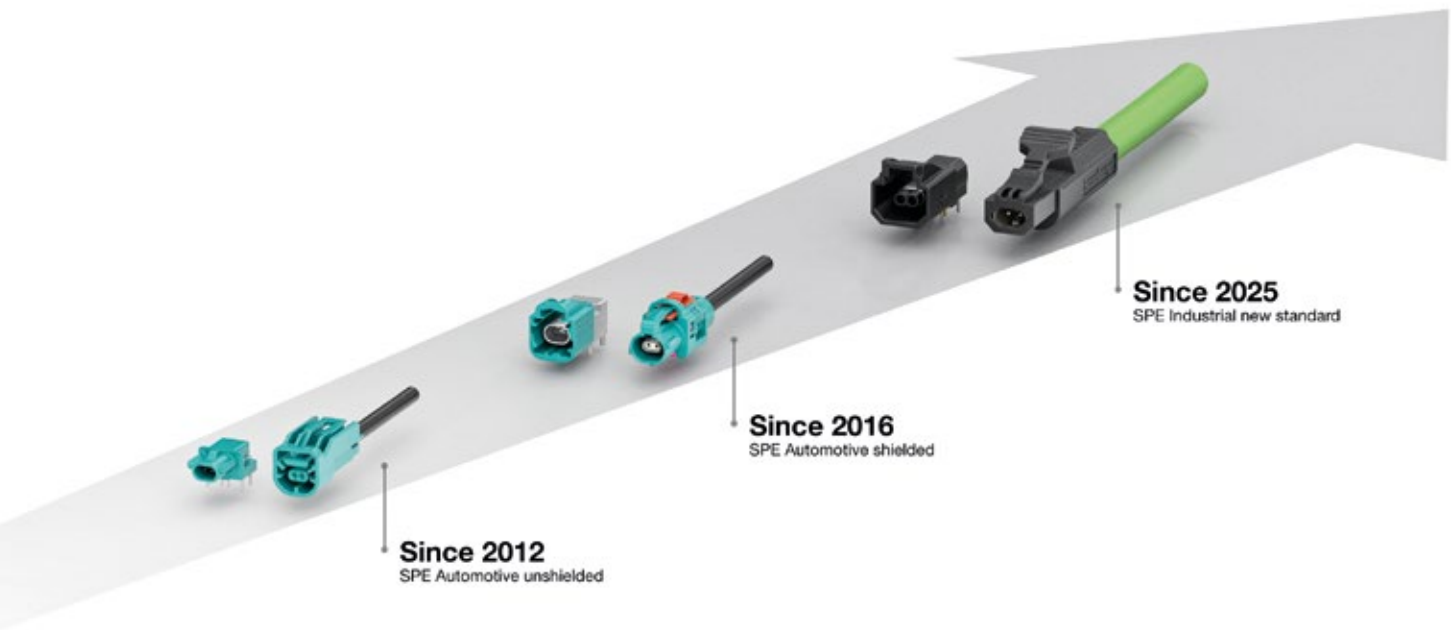


Connectivity Solutions for Industrial Applications

Single Pair Ethernet (SPE) Connectors

INTERCONNECT





SPE – One Pair of Wires for an Infinite Number of Applications

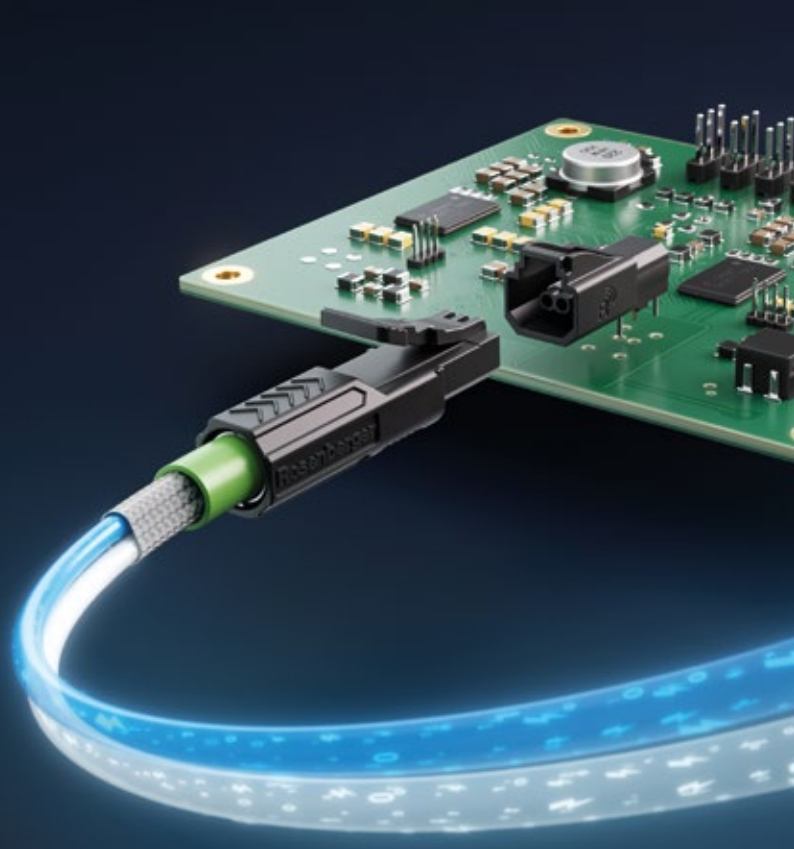
Single Pair Ethernet (SPE) reduces data transmission to a single twisted pair of wires, enabling data rates of up to 1 Gbit/s at distances of up to 1,000 meters. It supports multidrop networks, Power over Data Line (PoDL), and hybrid installations over a single cable. SPE creates unified, Ethernet-based communication from the sensor to the cloud.

Trends shaped by Rosenberger from Automotive to Industry

The development of Single Pair Ethernet systems has been driven significantly by the automotive industry. Autonomous driving and modern mobility concepts require reliable, high-speed data transmission in confined spaces. In industry, too, the demand for powerful solutions is increasing, especially for IoT applications in harsh environments. Rosenberger has developed space-saving, lightweight, and robust differential connectors with the MTD® and H-MTD® connector series, which meet the highest mechanical and environmental requirements. Based on this proven technology, the SPE Industrial series has been adapted for industrial applications.

Standardization for the Future

A crucial step towards the standardization of industrial SPE applications is the further development of the IEC 63171-7 standard to Edition 2 (ED2). This extension, which was initiated by the PROFIBUS User Organization (PNO), defines a uniform connector face for SPE connections. The goal is to create cross-manufacturer interoperability, which significantly facilitates integration and scalability in industrial automation.



New: IEC 63171-7 ED2 PNO Interface for SPE

This standard extends the existing IEC 63171-7 and defines IP20 and IP67 SPE connectors in rectangular, M8, and M12 styles (both hybrid and non-hybrid). It is the basis for the PNO standard.

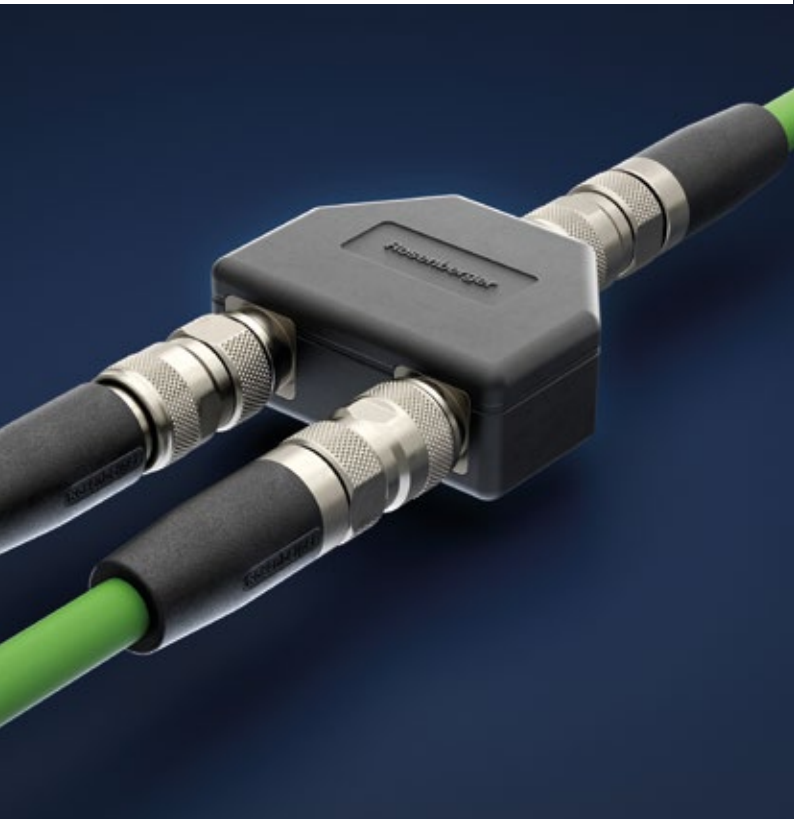
- **Future-proof:** The standardized interface provides long-term clarity and security for your application
- **Optimized compatibility:** Standardized solutions enable easy integration into existing systems
- **Long-term efficiency:** Improved interoperability and standardized processes lead to cost savings and increased productivity

As an innovative partner in connection technology, we are already working intensively on the development of connectors based on the new standard. Rosenberger is convinced that these future-proof products, will meet the high requirements of modern industrial applications.

IEC 63171-7 SPE Hybrid Connectors

In contrast to traditional SPE technology, which uses only one pair of wires for data and power transmission (PoDL), the hybrid version employs additional conductors for even higher power supply.

- **Data and Power Transmission:** One cable does it all – up to 1 Gbps data transmission and significantly higher power supply
- **Efficient Wiring:** Fewer cables, less space required and less installation effort
- **High Power Levels:** Ideal for devices with higher power requirements



SPE-Adaptors for Multidrop

The Single Pair Ethernet adaptors enable classic multidrop applications according to the IEEE standard for 10BASE-T1S (10BASE-T1M) standard and meet the industry standard IP 20 and IP 67 requirements. Miniaturization is achieved by using of a patented ferrite core. Multidrop technology allows multiple components to be connected with a single cable, reducing space requirements, simplifying cabling and optimizing resource utilization.

- **Scalability & Flexibility:** Ideal for applications requiring distributed sensors, actuators or control units
- **Reliability:** Reduces potential points of failure compared to traditional multi-wire setups
- **Optimized for Industrial Applications:** Ideal for sensor networks and factory automation, where multiple devices need to communicate efficiently over a shared medium



Single Pair Ethernet: Streamlining Industrial Communication for the Field Level

The SPE system simplifies data transmission by using only a single wire pair for communication. Classic Ethernet, which has long been established in the upper levels of automation, often reaches its limits at the field level: It is too complicated to install, has too little range, and is not designed for harsh conditions on the factory floor. This is where Single Pair Ethernet (SPE) comes in, improving Ethernet where it previously had its shortcomings.

Advantages

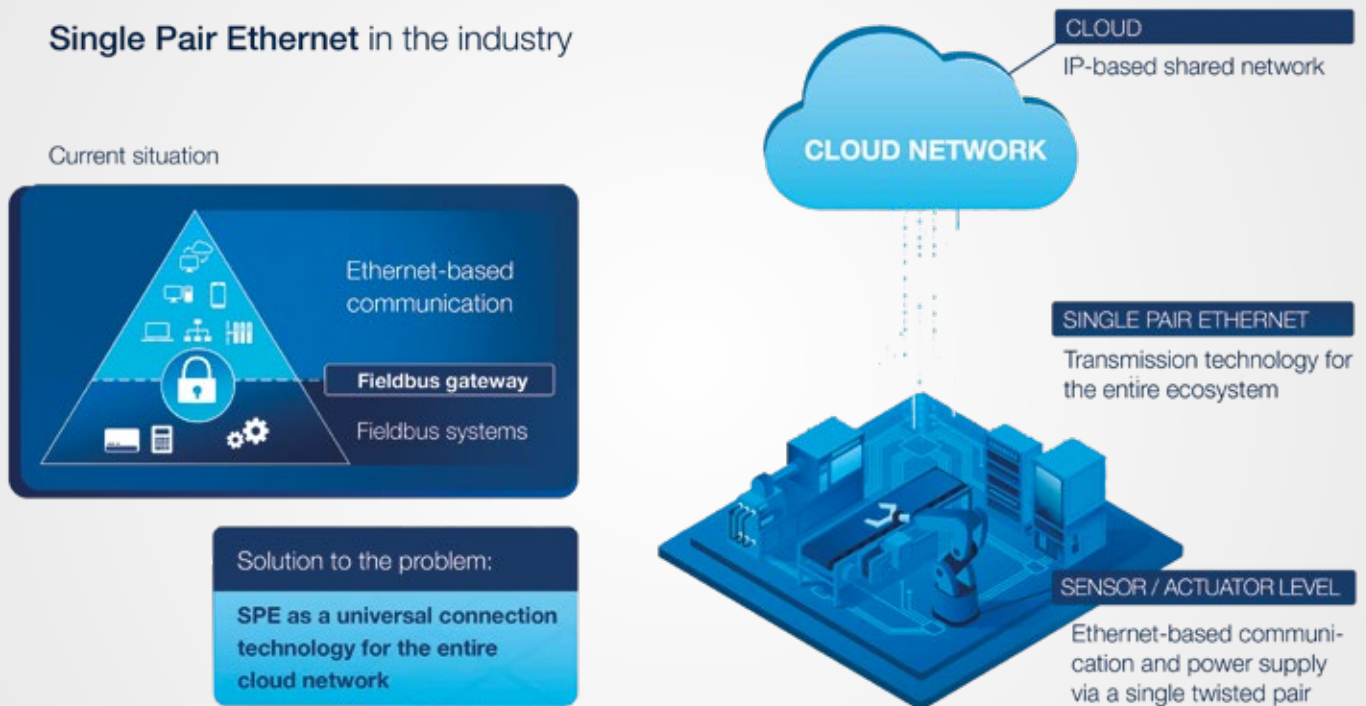
- **Standardized communication:** Enables consistent Ethernet-based communication from sensor to cloud
- **Key technology:** Paves the way for Industry 4.0 and IIoT
- **Efficient infrastructure:** Low cabling costs by leveraging existing infrastructure
- **Long range:** Transmission distances of up to 1,000 m and more
- **High performance:** Transmission speeds of 1 Gbps and more
- **Resource-efficient:** Minimizes weight, space and installation requirements

SPE significantly simplifies infrastructure and paves the way for future-proof industrial automation applications.

Applications

- Factory Automation
- Robotics
- Sensors and Actuators
- Controls and Switches

Single Pair Ethernet in the industry



From the Sensor to the Cloud

Traditional Ethernet solutions are rapidly evolving due to the increasing automation and digitization of industrial plants, necessitating connections that are both fit-for-purpose and future-proof. Single Pair Ethernet (SPE) ensures that your cabling deployments will remain reliable and efficient for years to come.

From sensors to the cloud, SPE provides a continuous and reliable connection across various applications, including factory automation, robotics, logistics, sensors and actuators, controls and switches.

As a member of the Single Pair Ethernet System Alliance, an association of leading technology companies from various industries and application areas, Rosenberger collaborates to promote SPE technology for the Industrial Internet of Things (IIoT) and other applications. The alliance aims to combine and strategically exchange expertise in the field of SPE.

For more information on the Single Pair Ethernet System Alliance, please visit www.singlepairethernet.com



**Single Pair Ethernet
System Alliance**



Website

For more information refer to our website:
www.rosenberger.com/spe

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