



## SINGLE PAIR ETHERNET (SPE) TECHNOLOGY

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REDUCE COMPLEXITY, COSTS AND ENABLE YOURSELF TO GO BEYOND EXISTING BORDERS

- ✔ **Enables IIoT**  
It brings Ethernet down to the sensor/actuator level in a cost effective way. This connectivity allows real-time data collection, and transparent communication, which enables the analysis and exchange of the collected data to accelerate the optimization of productivity, efficiency and process controls.
- ✔ **Facilitates an open ecosystem**  
The standardization of the Single Pair Ethernet technology enables an ecosystem of multiple suppliers to decrease the risk of production downtime due to supply issues because of the dependency on a single manufacturer.

- ✔ **Reduces Wire Complexity**  
Single Pair Ethernet enables Ethernet transmission with two wires, rather than four or eight. This provides movement freedom in robotics/machinery applications as it need less wire (2 vs 4 or 8) The reduced number of wires enables a small form factor and make the cabling cost-effective.  
Less weight on the wire leads to less copper so the application is able to move faster and uses less energy.
- ✔ **Allows high speed communication**  
Higher bandwidth in a smaller package; connections up to 1 Gb/s and cable length up to 1000 meter for 10 MB/s.
- ✔ **PODL – Power over data line**  
Data and power up to 50W over the single twisted pair used for data transmission
- ✔ **Hybrid power data solution**  
The separate power pins of the hybrid data/power connector as defined in IEC 63171-6 enable power levels beyond PODL up to 192W for 24 V and up to 392W for 48 V (8 A)

### What is Single Pair Ethernet?

Single Pair Ethernet, or SPE, enables Ethernet transmission with two wires, rather than four or eight. For years, TE Connectivity has been driving innovation in the automotive industry with this smaller, lighter, smarter technology. TE is now bringing SPE's powerful advantages to the infrastructure of manufacturing facilities. This slim, lightweight yet powerful connectivity solution enables the industry to digitize at the field level and is seen as the infrastructure for the Industrial Internet of Things.

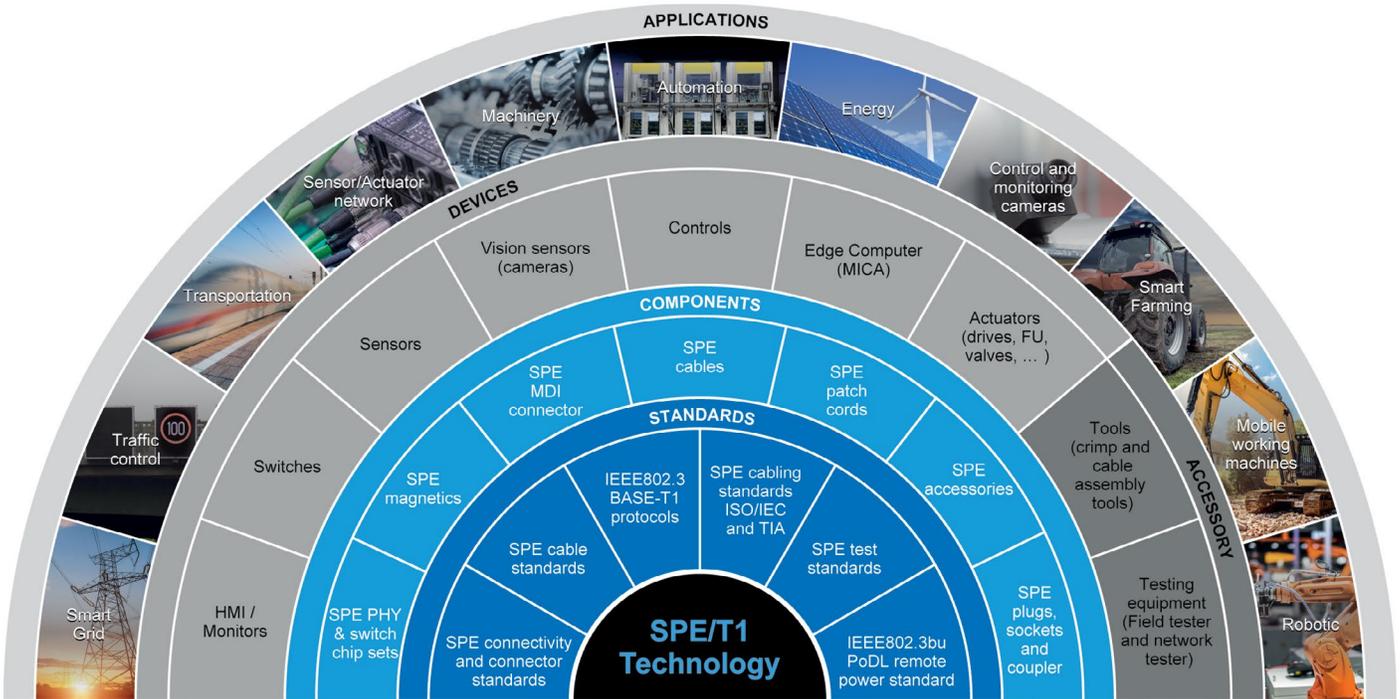
### Why Single Pair Ethernet (SPE)?

With IIoT, the industry is placing ever tougher demands on network technology. The need for a more cost-efficient and simple infrastructure at the field level has grown significantly. In the future, even small devices should be connected to the company network in a transparent manner. Process control, communication for value-added services and safety functions are going to run uniformly on Ethernet in the future.

The legacy bus systems will be gradually substituted by Ethernet to avoid media discontinuities. At the same time, the 2-pair and 4-pair Ethernet infrastructure is too expensive, too large and oversized for most sensors and actuators. This applies to infrastructure components such as cables and connectors and components intended to be integrated with devices. The trend towards miniaturisation leads to the fact that ever smaller space is available inside a device, e.g. for passive network components, and on the device, e.g. for a connector socket. Finally, the demands on the possible data transmission rates of sensors are increasing which can be satisfied by the light, small, cheap and powerful infrastructure SPE is providing.

**SPE Industrial Partner Network**

TE Connectivity is proud to be a founding partner of the SPE Industrial Partner Network. Together with all members we are driving this technology to get widely adopted by the industry and promoting IEC 63171-6 as the relevant connector standard for industrial applications. The SPE/T1 Partner Program brings together strong brands for the purpose of jointly communicating and positioning the technology of Single Pair Ethernet on the industrial market. The Single Pair Ethernet market is being developed to open up new business opportunities. For users, this means a simple picture of IIoT in conjunction with Single Pair Ethernet, with clarity and transparency across the board - from standardization to the components and devices and through to the applications.



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