



SINGLE PAIR ETHERNET (SPE)

In an industry that prides itself on efficiency, Single Pair Ethernet (SPE) has clear appeal. Compared to classic industrial Ethernet with four pairs of wires, SPE requires just one pair, which reduces cost, increases design flexibility, and improves reliability because there are fewer wires to take care of. Plus, with the advent of hybrid SPE, manufacturers can transmit data and power through a single cable and connector, driving even more optimization and saving space.

With the long-awaited announcement of an industrial SPE standard — the IEC 63171-7 cable using the M12 connector — manufacturers can confidently invest in transitioning their edge computing to SPE and joining the smart manufacturing trend.

Data architecture and foresight

Taking advantage of the full capabilities of SPE requires planning and thinking holistically. Manufacturers need to understand how to architect their data network within the plant, where to use standard Ethernet (or perhaps even glass fiber in the future), where SPE works best, and consider identifying low-risk spots to install wireless connectivity. Figuring out how to properly design this industrial data network will be a big opportunity on the horizon, one that many manufacturers are just now starting to realize. ►

MAKING INDUSTRY 4.0 POSSIBLE

The IEC 63171-7 provides an interface for hybrid SPE and power transmission in one cable, with high-speed data transmission up to 1 Gbps/600 MHz and power up to 11 kW/16 A. This allows engineers to optimize machine-to-machine communication in their applications without loss of data, to decentralize computing power and get data to the edge of the network.

Adopting the IEC 63171-7 as the industrial SPE standard has several additional advantages for manufacturers:

- It provides simple plug-and-play connectivity capabilities.
- It uses a single cable + connector combo that is built to withstand harsh environments.
- It uses separate data and power contacts so it reduces electromagnetic interference.
- It provides the reliability, durability, and security that are required in industrial settings.

Plus, since it is one cable/one connector, it fits smoothly into compact spaces — important for the ongoing trend toward miniaturization.

Hybrid SPE offers two big benefits

For industrial robotics, hybrid SPE has two significant benefits. On a macro-level, installing SPE helps advance the IIoT goals of Industry 4.0, by providing the infrastructure to transmit data seamlessly between substantially all devices and sensors on the network to the cloud.

On a more micro-level, within the robots and cobots themselves, SPE makes it easier to pull increasing quantities of data and electricity from the base of the robot to the end of the arm and gripper with reduced loss of losing power, signal, or data.



Are you interested in learning more about TE Connectivity's expertise in industrial robotics connectivity?

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