



HIGH-SPEED DATA TRANSMISSION

A key component of the increasing trend in industry automation? Data.

Like other technology trends, the advances of Industry 4.0 are built on the ability to glean insights and intelligence from huge swaths of data. Every sensor, every connection, every relay — all communicating in real time, all requiring a tremendous amount of smooth, reliable networking speed to ensure data flows in a constant, well coordinated stream.

For industrial robotics, the increase in data volume as well as speed is growing exponentially, leaving manufacturers to **identify the best way to increase data transmission capabilities on the factory floor without adding bulk or inefficiencies to the system.**

How do you share more data?

Manufacturers and robotics OEMs have had two choices for transmitting data: wireless or wired.

While technological advancements in Wi-Fi and 5G have made progress in recent years, there are challenges with implementing wireless technology in industrial robots, including latency effects, issues with ruggedness and reliability, plus problems with electromagnetic and radio interference. So far, that has led many manufacturers to opt for wired connections, with Ethernet delivered through rugged RJ45 industrial connectors or hybrid single pair Ethernet (SPE) that allows manufacturers to transmit high-speed data and more power via a single cable and connection.

Real-time communication

Beyond ruggedness and reliability, a key benefit of using wired technology for data transmission in robotics is the ability for secure, real-time communication. Analyzing data in real time is required for adapting robots' processes as part of machine learning. ▶

GOVERNANCE DATA MODELS



Market research company IDC predicts that by 2022, organizations will increase their investments in data governance, digital engineering, and digital operations technologies by 40% in order to support autonomous operations. And industrial organizations that do not implement an enterprise governance data model by 2021 will see their profitability underperform by 10%.

MORE DATA, MORE SPEED

Looking to boost data capabilities? Industrial Ethernet is the go-to choice for many manufacturers and robotics OEMs. Here are two options that have proven their value in the industrial space:

Single Pair Ethernet (SPE)

- Broadband connectivity for industrial applications
- Data transmission and power supply at the same time
- 1 Gbps max data transmission speed, 10 Mbps speed across 1,000 m cable
- 16 A max power supply (48 V, 400 W max)
- Compact, space-saving technology



Industrial RJ45 Connector

- Installs on site without tools
- Fast communication speeds up to Cat5e and Cat6a
- Remarkable seismic resistance
- Choose from straight-line direction or 45-degree direction



Consider manufacturing applications with continuous touchpoints on a work piece — polishing a smartphone on the assembly line, for example — where you can dramatically improve the cycle times of the process and increase the output of the manufacturing line, and also impact the quality of the end product. This is the moment where real-time data is critical. Under- or over-polishing a smartphone will wreck it; having a highly responsive robot adapting to real-time data about what the level of polishing that particular smartphone needs when it hits that robot's work station is a great benefit to the manufacturer. In order to optimize production, the robot needs to immediately respond and react when it senses it is time to stop polishing. That is exactly the point where wired solutions are necessary — there is less risk of disrupting the flow of data with a wired connection.

In the future, there will be situations that call for wireless, areas of the factory where wired is necessary, and applications where manufacturers will depend on a combination of the two.

Serving your industrial robotics needs

As a global leader in connectivity technology, TE Connectivity has helped customers around the world engineer secure, high-speed connections to drive industrial automation.

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

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