molex

AVNET ABACUS

INDUSTRIAL ETHERNET INNOVATIONS TAKE CONNECTED MANUFACTURING INTO THE IIOT FUTURE

The world is more connected than ever before. While a typical consumer might consider connected things — the internet of things (IoT) — to be smart appliances, houses or even vehicles, such connected concepts have been at play in industrial automation for many years. Here, the so-called industrial internet of things (IIoT) allows machinery to communicate with engineers, technicians and other factory personnel in real time.

IIoT data collection has only ramped up in recent years, allowing for advanced performance, scheduling and maintenance optimization using big data, digital twins, machine learning techniques and more. Getting this data from machines — and even individual sensor and actuator endpoints — to where it can be properly processed means greater data throughput requirements, as well as more, and smaller, collection endpoints.

With a long history of reliable, high-speed data transmission, Ethernet is often the preferred physical layer for general computing and IIoT applications. For general usage, standard RJ45 plugs and receptacles keep cables connected, but in a challenging industrial setting, robust screw-in style connectors may instead be chosen to ensure they stay in place.

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CASE STUDY: INDUSTRIAL ETHERNET DATA TRANSMISSION ENHANCES MANUFACTURING OPERATIONS

An internationally recognized manufacturer of automated sheet metal processing equipment needed a new method to connect machinery to their data processing infrastructure. Any chosen solution would need to be reliable, with bandwidth to accommodate present and future needs, and robust enough to endure the rigors of a factory setting. Molex, with its broad portfolio of industrial communication products and extensive experience working together with customers, was able to provide an industrial Ethernet solution that met these demanding requirements.

Thanks to its collaboration with Molex, the manufacturer implemented machine communication standards that are flexible enough to be applied to a range of production configurations in different manufacturing facilities. This facilitates performance now while accommodating potential growth of their IIoT/Industry 4.0 (and whatever may come next) setup well into the future.endpoints — to where it can be properly processed means greater data throughput requirements, as well as more, and smaller, collection endpoints.

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MOLEX ETHERNET IIOT INNOVATION

A competitive advantage for Molex is its extensive portfolio of products, suitable for a wide range of scenarios and applications. Molex collaborates with Avnet Abacus to multiply these possibilities, both from a product offering and engineering resources standpoint. With their help, customers quickly identify and solve communication challenges in the most advantageous way possible, and even pursue customized IIoT communication solutions as needed.

Advances in connectivity via industrial Ethernet has been proven over many years and iterations, and is one of the most exciting communication technologies available in the IIoT space. With innovations in single-pair Ethernet (SPE) allowing this technology to be applied in even more situations thanks to a reduced physical size, this technology is poised to become even more useful in the future. Molex is an innovator in this space, featuring a wide range of cordsets, switches and modules. Their products are hardened for industrial use with high performance connector options and miniaturized SPE components that can reliably transmit data now, while looking toward future innovations.

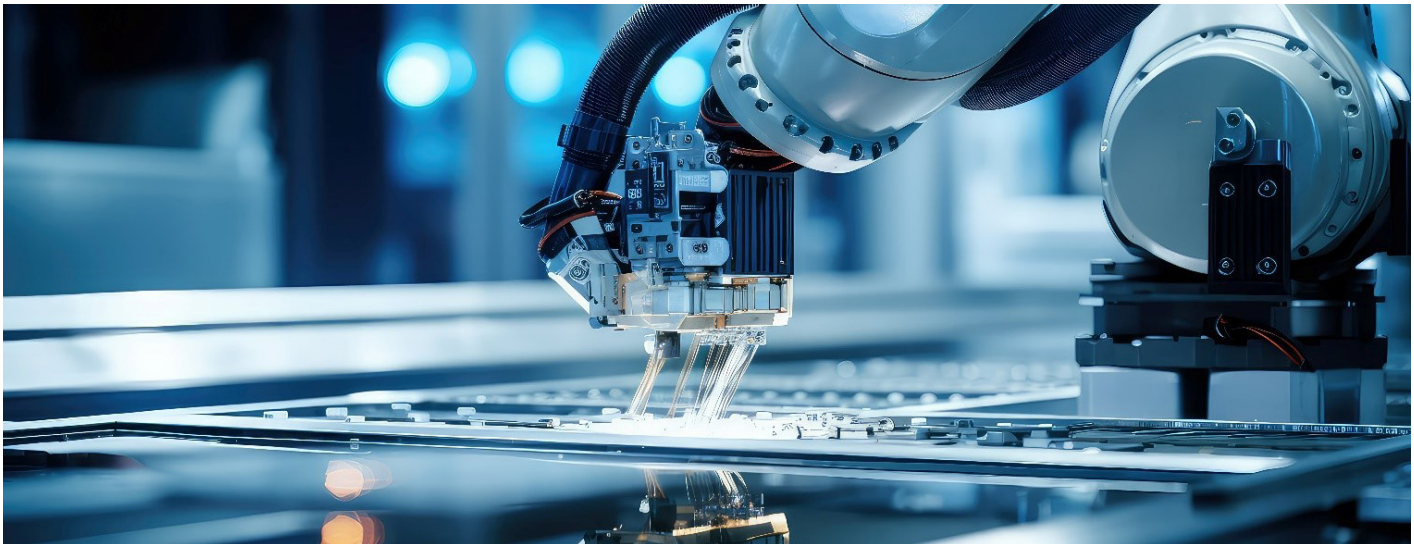
In addition to data transmission, sensor endpoints need power. Since its standardization in 2003, power over Ethernet (PoE) provides an option to use Ethernet cable to power devices. This does away with the then-ubiquitous (and still extremely common) wall wart supply at the endpoint. PoE use also does away with the need to have an AC outlet reasonably close. This requirement can be especially inconvenient in remote installations where a qualified electrician would otherwise need to run AC lines. In 2018, power over data line technology (PoDL) was standardized for use in SPE, making this tech even more useful.

Molex has a wide range of products suitable for PoE usage, and as an innovator in SPE technology they will continue to drive PoDL usage in this reduced-wiring implementation. Avnet Abacus, who specializes in turning good ideas into great products, can help specify just the right off-the-shelf device for an application and can guide customers through the design process for new solutions when needed.

A SLIM, SINGLE-PAIR ETHERNET IIOT FUTURE

Consider Ethernet cable in its standard form: eight individual wires in four twisted pairs, with an RJ45 plug on either end. This has served personal, commercial and industrial communication needs remarkably well over numerous decades and iterations — including advances in speed as well as PoE capacity. While once unthinkable, as the demands of more and smaller connected devices increase, the size of these cables and connectors can be an impediment to full IIoT implementation. SPE provides an answer to this limitation by cutting the number of wires down from eight to two for a nominal 75% savings. Correspondingly, connector sizes can also be reduced to facilitate the implementation of Ethernet in places where it was impossible before (e.g., at the individual actuators or sensors themselves). Add SPE power delivery via PoDL and this technology can take care of sensor power requirements at the same time.

As a premium member of the SPE Industrial Partner Network, Molex is an early adopter in this space and is committed to this technology's advancement and interoperability. Combined with their traditional Ethernet and communications expertise and collaboration with Avnet Abacus, they are positioned as a leader in this space now, and a key innovator for the SPE IIoT future.



COMMUNICATION DRIVES INDUSTRIAL INNOVATION

With faster and more reliable communication capabilities, machines are able to communicate with operators, technicians and engineers. This allows for enhanced performance and production planning, as well as data-driven predictive maintenance techniques. Immediate problems can be reported to a previously unseen level, allowing engineers and technicians to solve problems and make improvements faster than ever before.

At the same time, ubiquitous high-speed communication standards like Ethernet and its next evolution in SPE mean that manufacturing systems can be made more intuitive, both from the engineer, technician and operator standpoint, and even allow management to get a more complete picture of manufacturing capabilities and challenges. Spare part inventories can thus be kept lower, training times can be reduced and production planning can be facilitated to a more precise level.

These factors contribute to machines that run better, and operators who are able to integrate faster and more easily with their electro-mechanical counterparts. From a manufacturing perspective, this ultimately means more uptime, more production and better profits.

MOLEX AND AVNET ABACUS: COLLABORATING FOR THE FUTURE OF INDUSTRIAL AUTOMATION

Avnet Abacus is a leading European distributor specialising in interconnect, passive, electromechanical, power supply, energy storage, wireless, and sensor products. With a strong presence in the market, we have established ourselves as a reliable and trusted partner for manufacturers, designers, and engineers across various industries. We understand the challenges of the constantly changing technology landscape, as well as the vital role that electronic components play in fostering innovation. As a result, we provide a diverse array of high-quality products from leading manufacturers, guaranteeing that you have access to the most up-to-date technology and solutions to match your individual needs.

Together, Avnet Abacus and Molex can help customers get their product to market quickly in a cost-effective manner, retrofit existing lines with new IIoT upgrades, or simply find that perfect replacement or upgraded part that has been difficult to source.

Our technical professionals are committed to providing great service and support throughout the lifecycle of your product. We are with you every step of the way, from initial design and prototype to manufacturing and supply chain management, providing experienced support and personalised solutions to help you reach your goals. When you connect with Avnet Abacus for electronic components, you receive access to a world-class workforce as well as a huge ecosystem of resources. We are committed to assisting you in overcoming obstacles, accelerating time-to-market, and achieving your business objectives.

Get in touch to start an advanced IIoT journey today: Contact Us

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