Amphenol ICC

Amphenol's Ethernet Solutions for Industry 4.0

Industry 4.0 focuses on intelligent machine-to-machine communication through faster and smarter networks. The Industrial Internet of Things (IIoT), which is a part of the fourth industrial revolution, opens various opportunities in intelligent manufacturing, automation, smart industry optimization, and the creation of new revenue models with a comprehensive goal of industrial digital transformation. This is made possible mainly with the innovations and developments happening in Industrial Ethernet, which has more or less become the de facto communication in modern digitalized manufacturing.

Industry 4.0 and IIoT is enabling a shift from a Hierarchical Automation model (with independent communication systems at the Device, Cell, Control and Enterprise Levels) to Automation in a Decentralized Network, where all devices have IP addresses, connected with Industrial Ethernet protocol.

What is Industrial Ethernet?

Industrial Ethernet can be simply defined as the Ethernet settings applied to an industrial infrastructure, which typically supports Industry 4.0 by establishing a stable and fast communication between automation sensors, actuators, and other machine controllers within harsh industry environments.

Compared to the conventional protocol, Ethernet offers amazing benefits, making it the undeniable factor in the implementation of Industry 4.0. Industrial Ethernet networks will be the backbone of industrial communications to connect different systems, machines ranging from nanosensors to enterprise-level machinery, as well as users irrespective of location. In the days to come, it will be essential to improve the network and system performance to catch up with the developments happening in the technology. Ever since the introduction of the 10BASE-T standard, Ethernet has virtually penetrated through various networking hardware from personal computers and consumer applications to large scale computing in business to the industrial sector.

From connectors and cable systems, the implementation of IIoT depends upon many factors. Only the most advanced Industrial Ethernet connectors and cable assemblies will be able to withstand the high performance demand in harsh conditions like vibration, liquids, dust and chemicals ingress, and electromagnetic interference. Amphenol ICC addresses a range of key Industrial markets where the proliferation of digital control is driving advanced interconnect needs. Amphenol has been a pioneer in introducing some of the highly efficient industrial Ethernet solutions with the capacity to adapt to the rising demands.

ix Industrial™ Connectors

ix Industrial™ connectors are Cat 6A connectors (10GBASE-T) that enable IoT connectivity for industrial protocols like Ethernet from sensors/actuators at the factory floor to the Enterprise/Cloud. The IEC 61076-3-124 compliant ix Industrial™ connectors are ideal for various applications in Factory and Process Automation, Machine to Machine communication, Robotics, Sensors, Human Interface devices, and all devices requiring Ethernet IIoT connectivity in a highly automated Industrial environment.

These are PoE-capable, provide data performance and superior EMI protection with 360° shielding through the mated pair. These connectors define a 10-way, shielded, free and fixed interface for data transmission up to 500MHz with a current capacity of 1.5A per pin, and support 4 pair Ethernet.

These connectors are just 25% of the size of an RJ45 connector, at the same time provides greater port density and mating security. With a high data rate performance for 10G Ethernet, this industrial Ethernet solution supports Ethernet/IP as well as common protocols including Profinet, DeviceNet, EtherCAT, Modbus, and others.

With 10mm connector pitch, strong 2-point metal latching, 360-degree shielding for EMI protection, it is poised to meet the needs of new higher density Industrial Ethernet communication designs.

Offered as PCB mount receptacles in right angle and vertical orientations, the ix Industrial™ comes with multiple keying options and mating field terminable plugs for easy on-site installation. The products are currently available in IP20 versions for MICE1 environments and IP67 versions for MICE2 and MICE3 harsh environments. These are designed to be intermatable with Hirose and Harting ix Industrial™ series of interconnect products.

Single Pair Ethernet (SPE) Connectors

Single Pair Ethernet from Amphenol narrows down the earlier two or four pairs of cables to just a single pair, saving space, and enabling a comprehensive and cost-effective array of standardized communication protocols. The SPE connectors also support next generation of automation technologies like IIoT and Industry 4.0 by providing direct Ethernet connectivity to peripheral devices like sensors, actuators, and vision system cameras that operate at speeds up to 1Gb/s. These connectors can extend up to 1000 meters with PoDL (Power over Data Link) capability, and rely on the existing architectures, guaranteeing enhanced flexibility.

These IEC63171-6 compliant industrial Ethernet connectors are mechanically robust and feature secure latching with 360° shielding for excellent performance in harsh environments. Amphenol's SPE connectors are compatible with other SPE Industrial partner network products and can provide innovative flexible solutions for unique applications.