Making Data Acquisition Easy

EtherCAT Fiber Expansion

EtherCAT(Ethernet for Control Automation Technology) is an open, high-performance but low-cost Industrial Ethernet-based fieldbus system. It was introduced in 2003 and has been an international standard since 2007. The goal of EtherCAT was to apply Ethernet to automation applications which require short data update times with low communication jitter and low hardware costs.

EtherCAT is the fastest industrial ethernet technology, but it also synchronizes within nanosecond accuracy. The EtherCAT Master is the only node allowed to actively send an EtherCAT frame; all other slave nodes merely forward the data "on the fly" or fill data in the frame as the frame is moving. This concept guarantees real-time capabilities and the frame is delayed only by hardware propagation delay times. The rapid reaction times work to reduce the wait times during the transitions between process steps, so EtherCAT's excellent performance leads to improved accuracy, greater throughput, and thus lower costs.

EtherCAT supports almost all of topologies, and the combination of lines with branches is particularly beneficial. The connected ports can not only create branches but also directly integrate in various I/O modules, so no additional switches or active infrastructure components are required. Up to 65,535 devices can be connected to EtherCAT, so network expansion is virtually unlimited. EtherCAT offers a lot of flexibility regarding cable types, so inexpensive industrial Ethernet cable can be used between two nodes up to 100m apart in 100BASE-TX mode.


EtherCAT® Devices with Flexible Topology
- Line, Tree, Star, or Daisy-Chain
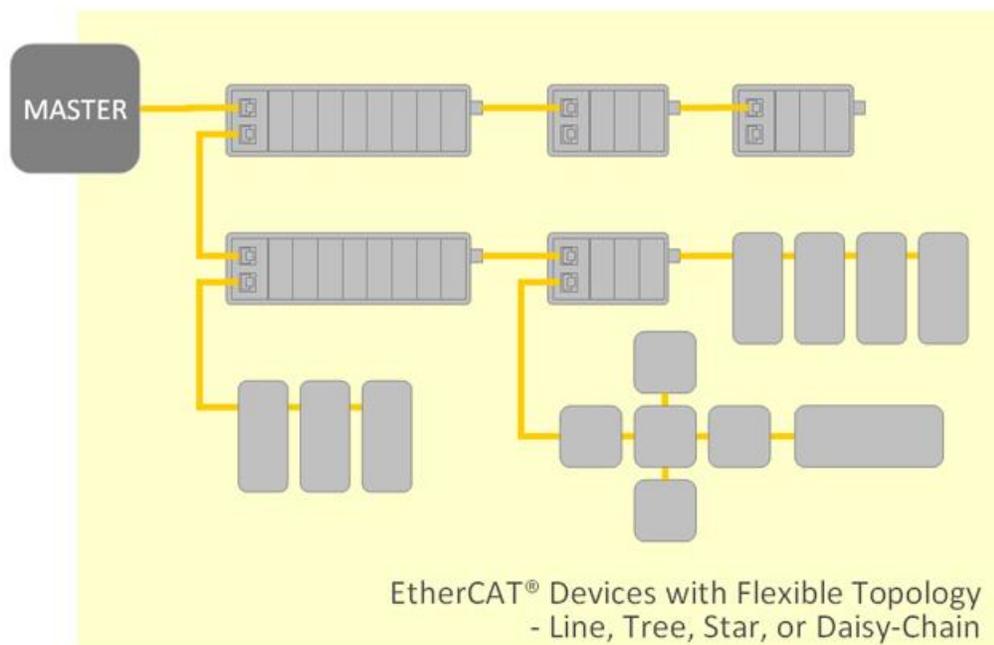
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Some applications require even more flexibility over greater distances. For these applications, ICP DAS offers an EtherCAT to Fiber converter. Using a pair of fiber converters, All have dual Ethernet ports to support flexible installations. Slave I/O modules also help to reduce wiring costs. Instead of having to wire each I/O device back to the master, each slave device can be situated at a convenient location near or central to several devices.   These are popular for connecting large manufacturing plants and factories using a single EtherCAT master. The ECAT-2511-A and mating ECAT-2511-B allow the user to extend the network up to 15 km away using single mode fibers between.
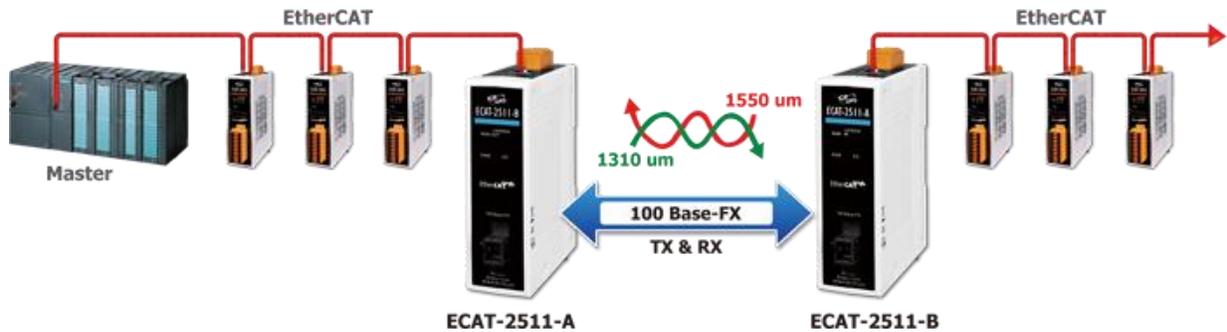
Each of the 2 modules transmit the EtherCAT signal using a different wavelength, so they can utilize a single Single Mode fiber instead of a pair resulting in half the cost.   The EtherCAT to fiber modules provide up to 4kV of ESD protection per port and support 100 Base TX data transfer.

If you have any questions, please feel free to contact us to discuss any applications you may have.