

Can EtherCAT be connected to a switch



Overview

Ethernet switches cannot be used with EtherCAT. Specialized EtherCAT junctions may be used instead, as described in EtherCAT Network Topologies. EtherCAT technology is not only fully Ethernet-compatible, but is also characterized by its conceptual openness: the protocol is compatible with other Ethernet-based services and protocols on the same physical network – usually with only a minimal loss of performance: In EtherCAT DirectMode. EIP is standard TCP/IP stuff (the full 7 layers of OSI) while EtherCAT is not that at all (it diverges after the 2nd or 3rd layer). A switch is actually detrimental to EtherCAT as it adds unnecessary latency and jitter, but a good switch with full PTP (IEEE-1588) support can reduce the detriment it. EtherCAT (Ethernet for Control Automation Technology) is an Ethernet -based fieldbus system developed by Beckhoff Automation. The protocol is standardized in IEC 61158 and is suitable for both hard and soft real-time computing requirements in automation technology. EtherCAT networks are usually built with junction devices or industrial EtherCAT switches that support frame forwarding. The XBF-PN04B and XBF-PN08B modules must be installed in the slot (s) directly adjacent to the XEM CPU.

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The connection line of EtherCAT communication cannot be shared with other network, such as Ethernet or EtherNet/IP. The switching hub for Ethernet cannot be used for EtherCAT.



By reviewing the table below, you can clearly understand the fundamental differences between EtherCAT and Ethernet, as well as their respective advantages and disadvantages.



There is no restriction when it comes down to the type of Ethernet devices that can connect within an EtherCAT strand via a switch port. Also, devices with Fieldbus interfaces can be ...



The XBF-PN08B and XBF-PN04B don't support EtherCAT connections through a generic Ethernet switch. EtherCAT nodes for XBF-PN0xB modules only support line topology.



Any Ethernet device can be connected within the EtherCAT segment via switch ports. The Ethernet frames are tunneled via the EtherCAT protocol, as is normal for internet protocols (e.g., TCP/IP, ...



Overview Features Implementation Organization Standardization Further reading External links



EoE is typically used for devices with TCP/IP stack, such as a web server, or for infrastructure devices such as switch ports, to which peripheral devices can be connected.



Generally speaking (or perhaps always?) there are no switches in EtherCAT networks. Although there are multi-port junctions that play a similar role in the cabling topology. And there are tunneling ...



Do not use Ethernet switches! EtherCAT is not compatible with normal Ethernet (although EtherCAT does use Ethernet cables). Ethernet switches cannot be used with EtherCAT. Specialized EtherCAT ...



Up to 65,535 devices can be connected to one EtherCAT segment, so network expansion is virtually unlimited. Because of the practically unlimited number of nodes, modular devices such as “sliced” I/O ...



There is no restriction on the type of Ethernet device that can be connected within the EtherCAT segment via a switch port. EtherCAT devices can also have a TCP/IP stack and therefore behave ...

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