

Product Information Note

PlantCruise by Experion Fault Tolerant Ethernet



Fault Tolerant Ethernet (FTE) is the control network of PlantCruise. FTE is dedicated to providing not only fault tolerance, but also the performance and security required for industrial control applications.

Industrial Network Robustness

FTE unites Honeywell's expertise in designing robust control networks with Ethernet technology in a patented advanced networking solution. FTE leverages commercial Ethernet technology found in IT networks to lower the costs of the FTE network infrastructure, connections to IT networks, connections to third-party Ethernet devices and ongoing maintenance and support.

Features and Benefits

- Four communication paths between FTE nodes
- Tolerates multiple failures in cables and electronics
- Rapid fault detection and recovery
- Transparent to PC applications
- Allows normal (non-FTE) Ethernet nodes
- Online addition/removal of nodes
- No proprietary hardware
- Minimal overhead—no duplicate messages
- Fully distributed—no master node
- Easy configuration
- Fiber optic or shielded copper cable for noise protection
- CE-Mark compliant



Fault Tolerant Ethernet components

Single Network Provides Rapid Response

Conventional Ethernet redundancy schemes commonly employ two separate Ethernet networks with each node (server or station) connected to both networks. If a communication failure occurs, the elapsed time for a particular node to switch to the other network can be over 30 seconds, depending upon the network complexity and the equipment used.

Honeywell's FTE solution employs a single network and does not require a server or station to re-establish its network connection. As a result, the switchover time is typically under one second.

Full Hardware Redundancy in a Single Network

FTE's single network offers significant advantages. Two independent networks will inevitably have some differences in configuration and performance. A single network is simpler to manage because its configuration and performance are consistent. Analytical, diagnostic and security tools can access all equipment in the network from a single connection and can readily provide a perspective of the entire communication system. Nodes can switch much faster between ports on the same network than between ports on different networks.

FTE's hardware redundancy provides multiple-path capability through its unique topology: two parallel trees of switches and cabling are linked at the top in order to form one fault-tolerant network. In this way, switches and cables are fully redundant within a single network. The separate identity of each tree is maintained by color coding and tagging cables, switches and FTE node ports.

Multiple Communication Paths

With twice as many communication paths between nodes as dual LANs, FTE tolerates more faults—all single faults, as well as many multiple faults. Nodes in an FTE community continually check the status of each path.

Connectivity	FTE	dual
Number of networks	1	2
Number of communication paths between:		
- FTE nodes	4	2
- FTE and Ethernet nodes	2	1
- Ethernet nodes on same tree/network	1	1
- Ethernet nodes on different trees/networks	1	0

FTE provides more communication paths with one network than conventional dual LAN redundancy

FTE is also transparent to higher level application programs in FTE nodes. Without requiring additional software configuration, those applications also benefit from the high network availability that FTE provides.

Designed for Determinism and Security

A PlantCruise system may include loop controllers and I/O modules, operator stations, supervisory controllers and engineering stations. To deliver control determinism, the FTE network ensures that each device only sends and receives message traffic appropriate for its type, so that all devices can have the required bandwidth.

FTE Equipment Summary

Network Interface Card (NIC)

- COTS dual port NIC in PCIe form factor

Network Switchgear

- COTS switches supported
- Tested switch models available from variety of manufacturers

Media Converters

- Convert between copper and fiber optic media
- Provide flexibility for varied application requirements
- Ability to support geographically diverse applications

For More Information

To learn more about how Honeywell's Fault Tolerant Ethernet can improve plant performance, visit our website www.honeywellprocess.com or contact your Honeywell account manager.

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