TC COMMUNICATIONS®

Migrating from TDM to Ethernet for Legacy & Teleprotection Devices

Application Note

Overview

With the rapid convergence of data, voice and video, more Power Utilities are migrating from TDM systems and serial communications to Ethernet for simplicity, scalability, and better interoperability between Control Rooms and different types of substation IEDs.

An important part of this migration is integrating utility legacy and Teleprotection devices onto an Ethernet backbone network.

The application diagram (fig. 1) illustrates how the JumboSwitch® Industrial Gigabit Ethernet Modular Switch can be used to bridge legacy devices, support teleprotection relays, and provide connectivity between a Control Room and IEDs/RTUs/PLCs.

It is important to point out that in addition to all popular features and capabilities of standard Industrial Switches, the JumboSwitch also functions as an Ethernet backbone

that supports TDM over IP/Ethernet and VoIP. The JumboSwitch is compliant with IEC61850-3 and IEEE1613 standards while providing increased reliability and network modernization of Smart Grid communications technologies.

About JumboSwitch

Maximum data reliability and an unsurpassed capability to support real-time critical communications on a modern IP platform make the JumboSwitch a complete solution for Utility, SCADA & AMR network applications.

Because the JumboSwitch offers comprehensive interface connectivity, including support for most TDM over IP/Ethernet interfaces, it is a highly cost effective solution for upgrading legacy SCADA networks.

It offers Ethernet, T1/E1 and two types of Serial interface cards (standard and Turbo high speed) to handle all popular SCADA applications including connecting Central Control rooms with various devices such as Remote Terminal Units (RTUs), Programmable Logic Controllers (PLCs) and Intelligent Electronic Devices (IEDs).
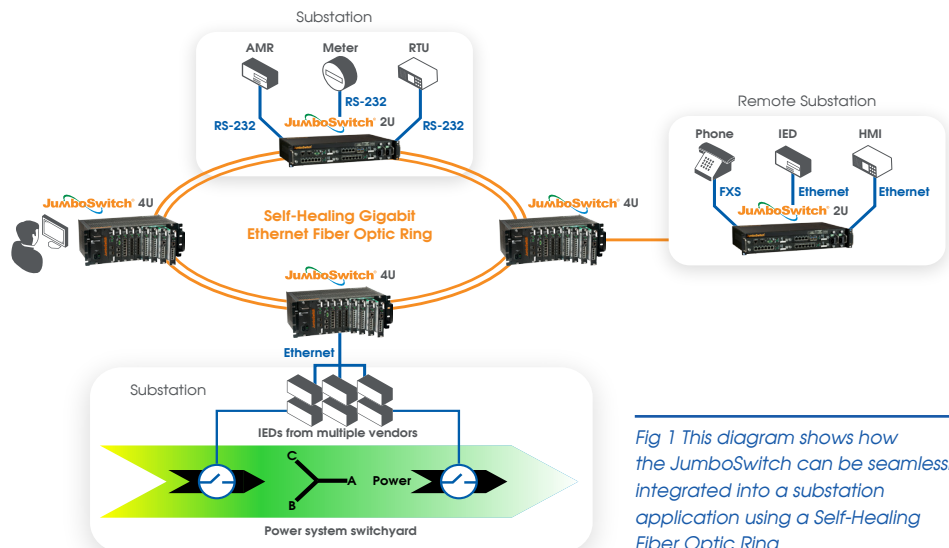

Fig 1 This diagram shows how the JumboSwitch can be seamlessly integrated into a substation application using a Self-Healing Fiber Optic Ring

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It is scalable, easily capable of meeting high bandwidth demand, industrial hardened for harsh environments, efficiently supports related data devices and offers fiber optic bandwidth, security and interference immunity advantages.

The self healing counter-rotating rings technology supported on the JumboSwitch offers the reliability and resilience of SONET/SDH systems in a more cost-effective, scalable, Gigabit Ethernet platform. Because of the connectionless nature of packet switching, it provides more efficient add-drop capability and extremely easy administration and provisioning.

Special Features

JumboSwitch offers several features that are typically not available on traditional Industrial Switches from other vendors.

- Industrial grade VoIP+ Virtual PBX card which can be deployed with or without external SIP server or Call Manager

- TDM over IP/Ethernet card that

  can transmit/receive T1, E1 or ISDN primary signals at zero bit-error or frame slips consecutively

- "Turbo" Serial-over-IP card for Teleprotection with less than 3msec latency, end-to end

Network Management Special Features

The JumboSwitch offers a powerful Network Management System, TCView®, with comprehensive fault management, configuration, administrative and security features typically not available on traditional Industrial Switches: These features include:

- Remote Software/Firmware download capability\ Extensive Asset Management capabilities including ongoing collection of system part/serial numbers and version numbers/upgrade dates for precise inventory management

- Remote Monitoring for "live" operating temperatures, power consumption and fiber ports TX/RX power of critical fiber links for each interface card

These features can be especially critical for industrial applications. For example, TCView's precise power consumption and temperature sensing capabilities could be used to create real time preventive maintenance parameters (e.g. identify any degradations) for network IEDs being used in extremely hot or cold environments.

About TC Communications

Specializing in Fiber Optic Communications networks, TC Communications, Inc. was established in 1991 to design and manufacture fiber optic products for communications networks.

With extensive analog and digital design capabilities in TDM and IP technologies, TC product lines cover the entire spectrum of the fiber optic communications. Specific products include all types of Ethernet Backbone Switches, Industrial Ethernet Switches, Self-Healing Ring Ethernet Switches, Media Converters, Modems, Multiplexers, Telephone/Data Multiplexers and Telephone Extenders.

Fig 2 JumboSwitch is available in four different chassis and multiple DIN rail configurations making it customizable to any application.

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Quality

Designed and made in
Irvine CA since 1991