

GE Harris Uses Magnum Fiber Switches and Mixed-Media Hubs in High-Availability Utility Substation Control System in Oman

An Industrial Ethernet Application

TECHNOLOGY TODAY

Interest in using Ethernet for industrial applications is growing steadily. Standard Ethernet provides interoperability, which makes it easier to configure tailored user applications at a highly competitive cost. However, industrial applications have special needs such as DC power, mixed-speed fiber ports, and expanded operating temperatures that are not readily available from many Ethernet manufacturers.

ABOUT THE OMAN MINISTRY OF ELECTRICITY AND WATER

The Oman Ministry of Electricity and Water (OMEW) is charged with the construction and maintenance of a large power-generating infrastructure that includes 31 power stations with a total installed capacity of 1,794 MW. The system includes 200 main substations and roughly 11,000 distribution transformers.

THE CHALLENGE

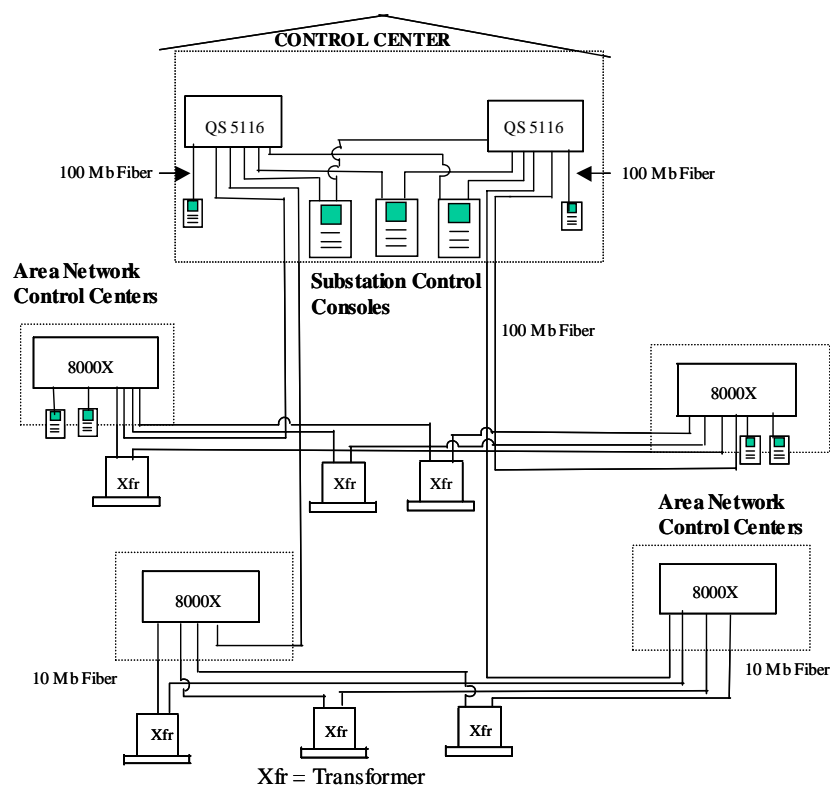
The Oman Ministry of Electricity and Water wanted to reduce substation operating costs, while maximizing the use of existing assets. Other goals for the program were to improve substation electrical system performance, reliability, and security. GE Harris Energy Control Systems, LLC, Melbourne, Fla., was asked to create a fully redundant system that included prefabricated control buildings and outdoor cabinets that would be easily connected to existing substation apparatus.

The remoteness of some of the substations, coupled with the temperature extremes in Oman dictated use of hardened industrial-grade Ethernet products. In addition, the application needed to support both existing copper and new fiber media, and to support 10 and 100 Mb Ethernet performance standards.

THE SOLUTION

GE Harris learned of the Magnum line of Industrial Ethernet products from Dynavar Networking, Inc., Calgary, Alberta, Canada. Dynavar, a high-tech provisioner of a wide variety of internetworking products in North America and around the world, recommended GarrettCom's broad off-the-shelf line of flexible, highly reliable, DC-powered, extended-temperature Ethernet switches and hubs.

Magnum 8000X Mixed-Media Hubs are installed in the outlying buildings in the substation, where they collect data from sensors connected to transformers throughout the substation. The sensors are economically linked with 10 Mb fiber media.



GE Utility Substation Control System Oman Ministry of Electricity and Water

The Magnum 8000X Mixed-Media Hubs are connected via a 100 Mb fiber backbone port to a QS5116 Fiber Switch located in the control center. The switch routes data at 100 Mb speeds to substation control consoles and to a communications module that monitors the network itself. The fully redundant system provides extra operating assurance for substations located in remote areas.

THE RESULT

The Magnum components in the substation monitoring and control installations meet Oman's requirements for a cost-effective, highly reliable networking solution. Off-the-shelf versions of the 8000X and the QS5116 with -48VDC or 125VDC power options meant that they could be installed using available power, without costly customization.

GE Harris Energy Control Systems, LLC, uses Magnum Ethernet products for its power automation, monitoring, and control systems. Hardened Magnum products are on call from Siberia to the Sahara where they provide reliable support under extreme conditions.

MAGNUM 8000X MIXED-MEDIA HUBS

The Magnum 8000X Mixed-Media Hubs provide full flexibility on a per-port basis. The 16-port hubs support any mix of Ethernet speeds and media to support economical 10 Mb Ethernet where appropriate, and 100 Mb Ethernet where performance is required.

MAGNUM QUAD-SERIES FIBER SWITCHES

The Magnum Quad-Series Fiber Switches boost the performance of Ethernet LANs with a flexible architecture that supports a mix of RJ-45 or any of the fiber port types and cable modes in 4-port increments. Features include large 8 MB packet buffers, and store-and-forward switching to filter faulty packets, minimizing traffic congestion. Extended operating temperatures and power supplies at -48VDC or 125VDC are off-the-shelf options for both Quad-Series Fiber Switches and 8000X Mixed-Media Hubs.

ABOUT GARRETTCOM

GarrettCom, Inc., is the leading manufacturer of industrial and carrier-class Ethernet LAN products. GarrettCom offers a comprehensive line of ETSI and NEBS-certified switches and hubs for use in telecommunications, industrial, and automated environments. GarrettCom markets its products through a network of resellers, OEMs, system integrators, and distributors worldwide. For more information on GarrettCom and its products, visit www.GarrettCom.com.

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