GarrettCom DX Routers Deliver Secure Data Communications for Eastern Iowa Light & Power

An Industrial Networking Application

TECHNOLOGY TODAY

Throughout North America, power utilities such as Eastern Iowa Light & Power are successfully automating their substation facilities with modern-day networking technology as the needs and uses of their facilities change. Many factors—among them NERC CIP compliance—are driving this trend. Better access to information, secure remote access, and cost savings are playing a major role. Substation-hardened Ethernet routers and terminal servers help Eastern Iowa Light & Power not only with the management of the electricity distribution operations but also with modern-day challenges such as physical and cyber security as well as cost management.
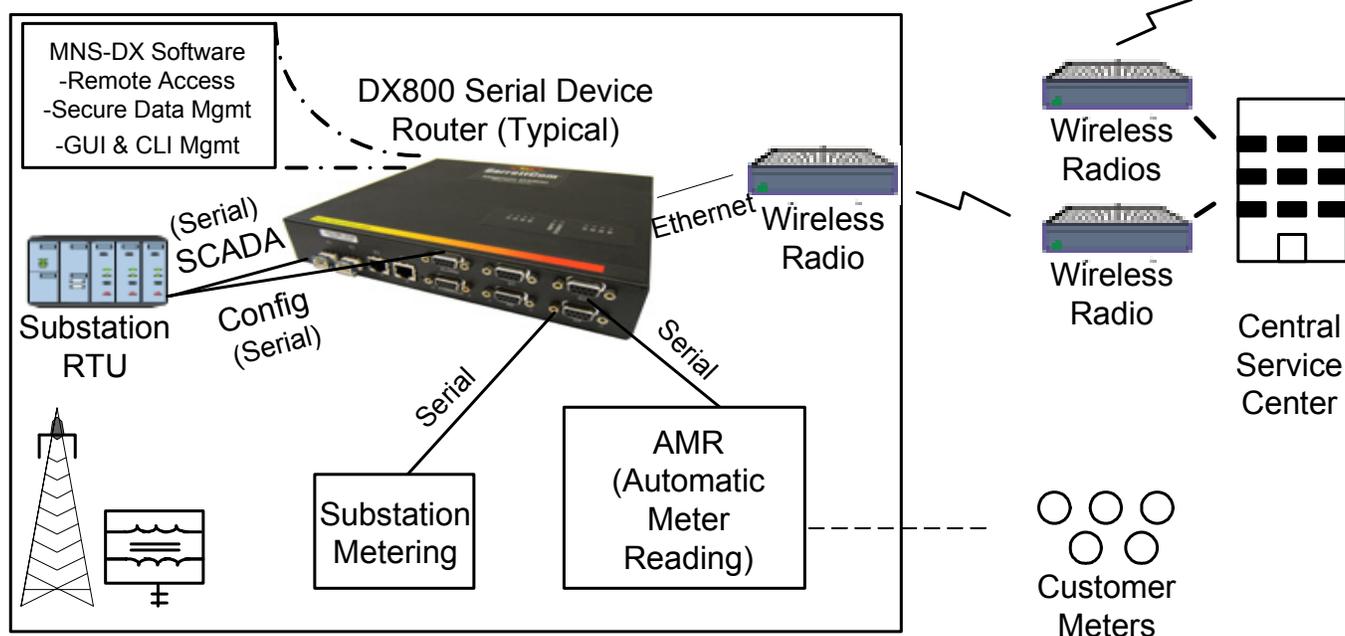
ABOUT EASTERN IOWA LIGHT & POWER

Eastern Iowa Light & Power is a power distribution utility supplying power to customers in 12 counties running north and south along the Mississippi River. The Cooperative distributes nearly 600 million KWHs per year over 4,700 miles of power lines to 25,000 meters. The coop's diverse membership includes traditional farm operations, rural housing developments, industrial and commercial operations, schools

THE CHALLENGE

Eastern Iowa Light & Power's challenge has been bringing all of its substations online in order to better access information—particularly customer metering data. Prior to this automation project, Eastern Iowa could only collect metering data periodically via meter readers physically going to each customer location. With automated meter reading (AMR), Eastern Iowa will have access to current customer metering data automatically while dramatically cutting meter reading costs.

The first substations with DX800 router/terminal servers are connected to Ethernet wireless radios in bridge mode (see illustration below). The wireless radio connections provide dedicated continuous two-way communications from each substation to the control center. Other substations upgraded later may be connected by Ethernet over private fiber media, or by terrestrial/digital DDS or T1 serial using a DX900 companion product with a WAN port. The flexibility and security features of the Magnum DX product line enable all of the connection types planned by Eastern Iowa to be implemented over time.

Magnum DX Routers at Eastern Iowa Light & Power Substations

Other Substations

MNS-DX Software
-Remote Access
-Secure Data Mgmt
-GUI & CLI Mgmt

DX800 Serial Device Router (Typical)

(Serial) SCADA

Ethernet

Wireless Radio

Wireless Radios

Substation RTU

Config (Serial)

Wireless Radio

Central Service Center

Serial

Serial

Substation Metering

AMR (Automatic Meter Reading)

Customer Meters

DX Routers at Eastern Iowa Light & Power

THE SOLUTION

Eastern Iowa Light & Power selected GarrettCom and its Magnum DX800 Serial Device Routers. Eastern Iowa liked the hardened quality of the DX800 units as well as the GUI software, rich with security features. At each of Eastern Iowa substations, the Magnum DX800 connects to the substation RTU to receive the SCADA data over one of the DX800's four serial ports. Another DX800 serial port serves as the configuration port for the RTU.

The two remaining DX800 serial ports are used to access the metering data. One serial port is used for automatic meter reading (AMR) and accesses customers' metering data. The other serial port is used for substation metering and measures the power input to the substation. The data is sent from one of the DX800's Ethernet ports into a GE Multilin MDS spread spectrum radio and then out to a central control room 10-15 miles away.

THE RESULTS

Many of the substations have been fully automated for secure metering data collection with the remainder scheduled for automation over the next year. The DX800 is remotely managed. For remote access security, it has management security software, a firewall, SSL (Secure Socket Layer) that encrypts communications connection information, IPSec encrypted VPNs (virtual private network), and multi-level password protection. The new automated system has been very effective in reducing costs. No longer does Eastern Iowa need to use meter readers to go to every customer locations to read every meter. Furthermore, Eastern Iowa can now access metering data immediately rather than only once a month. Such a system will also enable Eastern Iowa more flexibility in designing pricing options for its customers.

ABOUT MAGNUM PRODUCTS

Magnum DX Routers & Device Servers combine features of a Serial Device Server, Ethernet Switch and an IP Router in a single product, Magnum DX Products deliver secure multi-protocol networking in a compact, rugged package built for heavy-duty industrial sites, substations, and other harsh environments. The Magnum DX line is IEEE 1613/IEC 61850-3 compliant for power utility substations.

Each DX unit serves as a multi-protocol concentration and access point for a fiber-based Ethernet connection to a small site. Encrypted per-session SSL and IPsec VPN capabilities, along with other industrial firewall and port security features, assure cyber-security protections will extend cost effectively all the way to end-point devices and small facilities.

ABOUT GARRETTCOM

GarrettCom, Inc. is the leading manufacturer of industrial and power utility networking products. GarrettCom offers a comprehensive line of IEC 61850, NEBS and ETSI-certified switches for use in power utility, factory floor, telecommunications, and outdoor environments. The company's management software supports redundant rings and secure web-based access to local and remote networks. GarrettCom offers a full solution of cyber and physical security solutions design to protect power utilities and other critical industries as well as insure NERC CIP compliance. 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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47823 Westinghouse Dr.. • Fremont, CA 94539
PH: (510) 438-9071 • FAX: (510) 438-9072
Email: gcimktg@garrettcom.com • Web: www.GarrettCom.com