The DX940 Provides a Secure and Reliable Way to Provide Connectivity Over a Cellular Network to Utility Substations, Roadside Traffic Controls, Energy Generation Facilities, Transportation Depots and Other Locations Where Cellular Signals are Readily Available.

Features
- Configurable network Interfaces of 4 types:
  - Cellular Wireless
  - Ethernet ports
  - T1/E1 or DDS WAN
  - Serial RS232/RS485
- Substation hardened, -40° to +85° C, no fans
- Modbus TCP ASCII/RTU internetworking
- Cyber security: IPSec, VPN, SSL and firewall
- Panel, DIN-Rail or rack mounting

Secure and Reliable
High speed data access over cellular communications is a new choice for reaching the local networks in remote industrial facilities. This cellular technology is used to transfer data in the Magnum DX940 Industrial Router.

The Cellular WAN interface in the DX940 provides a secure and reliable way to provide connectivity over a cellular network to utility substations, roadside traffic controls, energy generation locations, transportation depots, and other locations where cellular signals are readily available.

The Magnum DX940 uses the proven 3G EVDO REV A, EVDO, CDMA technology for cellular access. 3G cellular infrastructure sends data on a public network. Using the VPN capabilities in the DX940’s software allows for secure, NERC-CIP-compliant data transfer on a public network.

Secure and Reliable
Besides a cellular WAN interface, the DX940 can be configured with six Ethernet ports, and four serial ports. Ethernet port options include Gb and 100Mb copper and fiber. In addition to the cellular port, a WAN port can be configured for T1/E1 or DDS circuits. The unit supports T1 to cellular fall back for WAN redundancy. The DX940 is purpose-built to be deployed and located in harsh environments.
GarrettCom Magnum DX940 - Configurable Router with Cellular

Secure Management Software

The Magnum DX940 includes MNS-DX software for the necessary handshakes and authentications which are required for configuring cellular access. MNS-DX also includes IP routing, Ethernet switching, Serial-to-IP terminal services, and network security features. With the use of MNS-DX, the Magnum DX940 router can be easily installed and be up and running in a couple of hours compared to days or weeks for setting up leased line or dial-up connections.

Extra security features such as IPSec/VPN (including GRE tunnels for VPN), stateful firewall, RADIUS, syslog, Secure Seal SSL, SSH port forwarding and other security capabilities can be added via an MNS-DX-SECURE license key.

MNS-DX-SECURE also provides IP firewall features including address/port inspection/filtering, VPN connectivity over IPSec with strong 3DES, AES encryption, and both shared key (PSK) and X.509 certificates. Advanced routing capability for OSPF and BGP networks is enabled using the MNS-DX-ADVAR software license key.

Optional serial ports enable Serial-IP terminal services via RS232, RS485, and RS422 serial interfaces as well as protocols such as DNP, telnet, and Modbus, including Modbus-ASCII/RTU to Modbus-TCP interworking. MNS-DX-SECURE also enables serial devices to transmit data securely using Serial-SSL connections.

Rugged Design

The DX940 operates at -40°C to +85°C without open vent holes or fans, and meets IP52 rating.

Hard metal packaging is standard and conformal coating for protection against moisture and corrosion is also available.

Product Specifications

<table>
<thead>
<tr>
<th>Type</th>
<th>DX940</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Description</td>
<td>DX940 base unit with configurable four 100Mb SFP Ethernet or 10/100 RJ45 ports. Other additions: 4 serial, 2 gig fiber/copper, choice of two WAN access ports (Cellular, T1/E1, DDS WAN). Includes IP routing, Ethernet switching and secure management. MNS-DX software license included. Panel mount. Other mounting options and conformal coating are also available.</td>
</tr>
<tr>
<td>Specifications</td>
<td></td>
</tr>
<tr>
<td>Serial Protocols</td>
<td>Async to TCP/IP – including Modbus gateway for connectivity to serial Modbus devices and to other Modbus Ethernet devices; TCP/IP to serial/reverse terminal server, Serial Multipoint &amp; Multimaster Topologies; PPP with authentication.</td>
</tr>
<tr>
<td>Performance</td>
<td></td>
</tr>
<tr>
<td>RJ-45 Ports</td>
<td>100 or 10 Mb speed, full- or half-duplex mode, per port, individually determined. 10/100 auto-negotiating &amp; auto-cross</td>
</tr>
<tr>
<td>Fiber Ports</td>
<td>Configurable in modules, at 2/module, or SFF (Small Form Factor) for high fiber port density, 4 per module. Each FDX or HDX, default is FDX mode.</td>
</tr>
<tr>
<td>Gigabit Ports, 1000 Mb</td>
<td>Configurable, std. See configuration guide for selection of modules</td>
</tr>
<tr>
<td>Cellular WAN Ports</td>
<td>3G EVDO REV A, EVDO, CDMA.; Frequency – 1900MHz/800 MHz; supports antenna diversity. Cellular Antennas - optional high gain external antennas available. Used when the cellular signal is weak or not available due to enclosed areas.</td>
</tr>
<tr>
<td>WAN Ports</td>
<td>DDS: 56/64 kbps OR T1/E1: 1.544 Mbps / 2.048 Mbps G.703; Full rate and fractional (N*64/64kbps); Integral CSU/DSU</td>
</tr>
<tr>
<td>Auto-Negotiation on TP</td>
<td>IEEE 802.3z, 802.3ab, 802.1p: 100BASE-TX, -FX, 1000BASE-SX, -LX</td>
</tr>
<tr>
<td>Flow Control &amp; Prioritization</td>
<td>TP; IEEE 802.3u</td>
</tr>
<tr>
<td>VLANs</td>
<td>Compliant</td>
</tr>
<tr>
<td>Spanning Tree</td>
<td>Compliant</td>
</tr>
<tr>
<td>DiffServ</td>
<td>IEEE 802.1p: DiffServ, traffic prioritization for routed IP flows/ports</td>
</tr>
</tbody>
</table>
## Product Specifications (continued)

### Software

MNS-DX and MNS-DX-SECURE licensed software

### Management & Diagnostics

**Ease-of-Use**

Web-based Graphical User Interface (GUI) or CLI access remote SSH or TELNET connection. Powerful built-in protocol analyzer to assist with troubleshooting.

**Other**

Comprehensive statistics, SNMP MIB II and SNMP Traps, Routing Information, DHCP, ARP and other tables.

### Operating Environment

**Operating Temperature**

IEC 60068 Operating temp. per “Type Test” -40° to 185°F (-40° to 85°C)

**Temperature Rating (Components)**

UL 60950 “Component Parts” temperature rating: 140°F (60°C)

**Storage Temperature**

-40° to 185°F (-40° to 85°C)

**Ambient Relative Humidity**

5% to 95% (non-condensing)

**Altitude**

-200 to 13000ft (-60 to 4000m)

**Conformal Coating (humidity protection)**

Request quote

### Mechanical

**Enclosure**

Rugged high-strength sheet metal

**Mounting**

19” ETSI and 23” Rack, Panel Mount and DIN-Rail

**Cooling Method**

Convection.

**Dimensions**

9.5” W x 9.0” D x 1.75” H (24.13 cm x 22.86cm x 4.45 cm); 1 RU

**Weight**

5 lbs (2.3 kg)

### Power Supply Options

**High Voltage**

90-250V AC or DC, 50-60Hz, 0.2A, 18 watts

**Low Voltage**

24-48V DC, 0.75A, 18 watts

### Serial LED Indicators Per DB-9 or RJ45 Port

One LED/port indicating active connection.

### Ethernet LED Indicators Per RJ45 or Fiber Port

L/A

One LED/port indicating Link (solid green) and Activity (blinks to indicate activity).

### Agency Standards Approval and Compliance

ETL, UL 60950, EN55022, EN55024 FCC Part 15 | CE, EMC & ENV

### Warranty

**Warranty**

Three Years
DX940 Configuration Guide

Product Family
DX940-4RJ-H = 90-250V DC/AC, 4x 10/100Mb RJ45 ports
DX940-4RJ-L = 24-48V DC, 4x 10/100Mb RJ45 ports
DX940-4FXSFP-H = 90-250V DC/AC, 4x 100Mb SFP ports
DX940-4FXSFP-L = 24-48V DC, 4x 100Mb SFP ports

Slot A (Gigabit Port)
DXC-2GCU = 2x 10/100/1000Mb RJ45 ports
DXC-2GSFP = 2x 1000Mb SFP ports
XXX = Blank Slot

Slot C (WAN Port)
DXC-CW = 1 EVDO 3G cellular
DXC-CW-DSS = 1 EVDO 3G cellular + 1 DDS
DXC-CW-T1E1 = 1 EVDO 3G cellular + 1 E1/T1

Slot D (Serial Port)
DXC-4SERIAL = 4 DB9-DTE Serial ports
XXX = Blank Slot

Software
DX = Standard MNS-DX Software
SE = MNS-DX Secure License
AD = MNS-DX ADVAR License
SA = Both Secure and ADVAR

Conformal Coating
Conform05-CRM = 5 mil, for moisture protect
Conform08-CRM = 8 mil, for moisture protect
XX = No Conformal Coating

DX940 Accessories

<table>
<thead>
<tr>
<th>Module No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SFP-SX</td>
<td>Gb SX, 850nm wavelength, 550 meters</td>
</tr>
<tr>
<td>SFP-ESX</td>
<td>Gb SX, 1310nm wavelength, 2km</td>
</tr>
<tr>
<td>SFP-LX25</td>
<td>Gb LX, 1310nm wavelength, 25km</td>
</tr>
<tr>
<td>SFP-ZX40</td>
<td>Gb ZX, 1550nm wavelength, 40km</td>
</tr>
<tr>
<td>SFP-ZX70</td>
<td>Gb ZX, 1550nm wavelength, 70km</td>
</tr>
<tr>
<td>SFP-GT</td>
<td>Gb Copper</td>
</tr>
<tr>
<td>SFP-LX10</td>
<td>Gb LX, 1310nm wavelength, 10km</td>
</tr>
<tr>
<td>SFP100P-RJ45</td>
<td>100Mb Copper SFP transceiver, 10/100 auto-negotiating</td>
</tr>
<tr>
<td>SFP100P-FXMM2</td>
<td>100FX Fiber Optic SFP transceiver, multimode, 2km</td>
</tr>
<tr>
<td>SFP100P-FXSM20</td>
<td>100FX Fiber Optic SFP transceiver, singlemode, 20km</td>
</tr>
<tr>
<td>SFP100P-FXSM40</td>
<td>100FX Fiber Optic SFP transceiver, singlemode, 40km</td>
</tr>
<tr>
<td>CONSOLE-CBL60D</td>
<td>Console attachment cable serial null Modem (aka X-modem) cable with DB9 connectors</td>
</tr>
<tr>
<td>CONSOLE-CBL60U</td>
<td>Console attachment cable serial null Modem (aka X-modem) cable with a USB connector</td>
</tr>
</tbody>
</table>

Module No. | Description |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ACC-DX-00-PM</td>
<td>Panel Mount bracket spares</td>
</tr>
<tr>
<td>ACC-DX-00-DM</td>
<td>Set of two DIN-Rail holders for vertical mount</td>
</tr>
<tr>
<td>ACC-DX-00-RM</td>
<td>Rack-mount brackets for 19&quot; rack mounting</td>
</tr>
<tr>
<td>ACC-DX-00-RRM</td>
<td>Rack-mount brackets for 19&quot; reverse rack mounting</td>
</tr>
<tr>
<td>RMBS-ETSI</td>
<td>Brackets to extend width from 19&quot; to ETSI width; Prerequisite: ACC-DX-00-RRM or ACC-DX-00-RRM</td>
</tr>
<tr>
<td>RMBS-23W</td>
<td>Brackets to extend width from 19&quot; to 23&quot; Telco width; Prerequisite: ACCDX-00-RRM or ACC-DX-00-RRM</td>
</tr>
<tr>
<td>DXCW-ANT-DIPOLE</td>
<td>Omni-directional external dipole Antenna. This pair of “rabbitears” antennas has 3 db gain, and attaches to both of the cellular port connectors.</td>
</tr>
<tr>
<td>DXCW-ANT-POLE</td>
<td>Omni-directional 3db external antenna. Suitable for mounting on a tower or on a pole</td>
</tr>
</tbody>
</table>

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