

### 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



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. 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 DX940 is purpose-built to be deployed and located in harsh environments.

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.

The Magnum DX940 comes with MNS-DX software which provides the capabilities to configure and operate the DX940 for your network. MNS-DX includes 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, 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-ADVVAR 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.

The DX940 meets IEEE 1613 and IEC 61850-3 specifications for EMI/ESD protection. It 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.

The DX940 is 9" by 9.5" and one 1.75" rack unit deep, with mounting options for panels, DIN rails, 19" or 23" racks. Integration of wide-input auto-ranging AC/DC power supplies and telco-compatible CSU/DSU functionality into the base DX940 product further reduces space requirements and local wiring complexity.



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Industrial Networking at Its Best™

### CONFIGURABLE PORTS

**Four 10/100 Ethernet ports** Configured as auto negotiating RJ45 copper ports  
**Four 100M SFP Ethernet ports** SFP fiber modules available as 100Mb fiber (multi-mode and single-mode.) Single-mode up to 40km. Multi-mode up to 2km  
**Two Gigabit Ethernet ports**  
 Two 10/100/1000 Copper ports or two Gigabit SFP sockets for Gigabit fiber via Gb SFP's  
**Four Serial DB9 ports** RS232/RS485 software selectable DB9 interface. Serial data rate from 300 bps to 230.4 kbps. Data length - 1-32 bits.  
**Cellular WAN ports** 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. Please refer to the technical brief on Cellular Antennas.  
**WAN Ports** DDS: 56/64 kbps OR T1/E1: 1.544 Mbps / 2.048 Mbps G.703; Full rate and fractional (N\*56/64kbps); Integral CSU/DSU

### NETWORK STANDARDS

IEEE 802.3z, 802.3ab, 802.1p: 100BASE-TX, -FX, 1000BASE-SX, -LX,  
 IEEE 802.3u: Auto-negotiation on TP  
 IEEE 802.3x, 802.1p: flow control and prioritization  
 IEEE 802.1Q: VLANs, maximum 32 VLANs  
 IEEE 8021.1d, 802.1w: Spanning Tree, Rapid Spanning Tree including RSTP  
 2004 extensions providing sub-second hop on rings  
 IEEE 802.1p: DiffServ, traffic prioritization for routed IP flows/ports

### SERIAL PROTOCOLS

Async to TCP/IP – including Modbus gateway for connectivity to serial Modbus devices and to other Modbus Ethernet devices; TCP/IP to serial terminal server, reverse terminal server; Serial Multipoint and Multimaster Topologies; PPP with authentication

### SOFTWARE

See MNS-DX data sheet for details on MNS-DX, MNS-DX-SECURE and MNS-DX-ADVANCED 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 trouble shooting  
 Other: Comprehensive statistics, SNMP MIB II and SNMP Traps, Routing Information, DHCP, ARP and other tables.

## Ordering Information

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.

<b>Magnum DX940-4FXSFP-H</b>	Magnum DX940 Configurable Router base unit. Provides 4 modular slots for configuration Ethernet, serial, WAN & cellular port flexibility. Includes four 100Mb SFP ports. 90-250V DC/AC Power
<b>Magnum DX940-4FXSFP-L</b>	Same as model DX940-4FXSFP-H except with 24-48V DC/AC Power
<b>Magnum DX940-4RJ-H</b>	Same as model DX940-4FXSFP-H except with four 10/100 RJ45 ports
<b>Magnum DX940-4FXSFP-L</b>	Same as model DX940-4FXSFP-H except with four 10/100 RJ45 ports & 24-48V DC/AC Power

### Configuration Options:

<b>DXC-2GCU</b>	Two fixed copper ports
<b>DXC-2GSFP</b>	Two SFP open ports
<b>SFP-GTP</b>	Gigabit (Gb) copper transceiver
<b>SFP-SX</b>	Gb SX transceiver 850nm, 550meters distance
<b>SFP-ESX</b>	Gb SX transceiver, 1310nm, 2km distance
<b>SFP-LX10</b>	Gb LX transceiver, 1310nm, 10km distance
<b>SFP-LX25</b>	Gb LX transceiver, 1310nm, 25km distance
<b>SFP-ZX40</b>	Gb ZX transceiver, 1550nm, 40km distance
<b>SFP-ZX70</b>	Gb ZX transceiver, 1550nm, 70km distance
<b>SFP100P-FXMM2</b>	100FX Fiber SFP transceiver, multi-mode, 2km
<b>SFP100P-FXSM20</b>	100FX Fiber SFP transceiver, sgl-mode, 20km
<b>SFP100P-FXSM40</b>	100FX Fiber SFP transceiver, sgl-mode, 40km

### ENVIRONMENTAL MONITORING

Alarm Port: Relay contacts for alarms, Form C, two NC/NO, software controllable

### OPERATING ENVIRONMENT

IEC 60068 Op. Temp. per "Type Test" -40° to 185°F (-40° to 85°C)  
 UL 60950 "Component Parts" temperature rating: 140°F (60°C)  
 Storage: -40° to 185°F (-40°to 85°C),  
 Ambient relative humidity: 5% to 95% (non-condensing)  
 Altitude: -200 to 13000 ft (-60 to 4000 m).  
 Conformal coating (humidity protection option): Request quote.

### POWER OPTIONS

High Voltage (H): 90-250 V AC or DC, 50-60Hz, 0.3A, 27 W  
 Low Voltage DC (L): 24-48 V DC, 1.3A, 31 W

### MECHANICAL

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)  
 Mounting: 19" ETSI and 23" Rack, Panel Mount and DIN-Rail

### AGENCY APPROVALS AND STANDARDS COMPLIANCE

Safety: UL 60950-1, cUL, EN60950-1, CSA C22.2, Emissions meet FCC Part 15, Class A. IEEE 1613 Class 2 Environmental Std., IEC 61850-3, IEC 61000-6-5 for Electric Power Substations, NEMA TS-2 for traffic control

Immunity: EN55024, EN61000-6-2, EN61000-4-2 (ESD), EN61000-4-3 (RF), EN61000-4-4 (EFT), EN61000-4-5 (SURGE) EN61000-4-6 (CRF), EN61000-4-10 (MAG FIELD), EN61000-4-11 (VDI), EN61000-4-12 (OSCILLATION), EN61000-4-16 (CCM), EN61000-4-17 (RIPPLE), EN61000-4-29 (VDI)

### WARRANTY:

Three years

Made in USA

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<b>DXC-CW</b>	1 EVDO 3G cellular wireless port
<b>DXC-CW-T1E1</b>	1 EVDO 3G cellular wireless port & 1 E1/T1 port
<b>DXC-CW-DDS</b>	1 EVDO 3G cellular wireless port & 1 DDS port
<b>DXC-T1E1</b>	1 T1E1 WAN port with integral DSU/CSU
<b>DXC-DDS</b>	1 DDS WAN port

<b>DXCW-ANT-DIPOLE</b>	Omni-directional external dipole Antenna. This pair of "rabbit ears" antennas has 3 db gain, and attaches to both of the cellular port connectors.
<b>DXCW-ANT-DOME</b>	Omni-directional low profile external dome antenna. Has 3 db gain. Suitable for mounting on side of a building.
<b>DXCW-ANT-POLE</b>	Omni-directional 3db external antenna. Suitablefor mounting on a tower or on a pole.

<b>DXC-4SERIAL</b>	Four Serial ports module. Each of the 4 ports is RS232 / RS485 / RS422, software selectable by the user at system initialization. MNS-DX licensed software includes support for Async to TCP/IP connectivity. Serial-IP terminal services, serial Port VLANs and secure management of serial ports.
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