Magnum DX940

Configurable Router with Cellular

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

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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 celllular 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.

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 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.

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.

Specifications

Magnum DX940 Configurable Router with Cellular

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; DNP3 support

SOFTWARE

See MNS-DX data sheet for details on MNS-DX, MNS-DX-SECURE and MNS-DX-ADVAR 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.

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

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.

Magnum DX940-4FXSFP-H	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
Magnum DX940-4FXSFP-L	Same as model DX940-4FXSFP-H except with 24-48V DC/AC Power
Magnum DX940-4RJ-H	Same as model DX940-4FXSFP-H except with four 10/100 RJ45 ports
Magnum DX940-4FXSFP-L	Same as model DX940-4FXSFP-H except with four 10/100 RJ45 ports & 24-48V DC/AC Power

Configuration Options:

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

DXC-CW	1 EVDO 3G cellular wireless port
DXC-CW-T1E1	1 EVDO 3G cellular wireless port & 1 E1/T1 port
DXC-CW-DDS	1 EVDO 3G cellular wireless port & 1 DDS port
DXC-T1E1	1 T1E1 WAN port with integral DSU/CSU
DXC-DDS	1 DDS WAN port
DXCW-ANT-DIPOLE	Omni-directional external dipole Antenna. This pair of "rabbit ears" antennas has 3 db gain, and attaches to both of the cellular port connectors.
DXCW-ANT-DOME	Omni-directional low profile external dome antenna. Has 3 db gain. Suitable for mounting on side of a building.
DXCW-ANT-POLE	Omni-directional 3db external antenna. Suitable for mounting on a tower or on a pole.
DXC-4SERIAL	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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