

PB 356

**GarrettCom<sup>®</sup> Magnum<sup>™</sup>  
DX940**

Industrial Router with Cellular,  
T1/E1 or DDS WAN interface and  
configurable with six Ethernet  
ports and four serial ports.



**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 Shell, 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-ADVANCED 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

Type	DX940
<b>Product Description</b>	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>Specifications</b>	
<b>Serial Protocols</b>	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 & Multimaster Topologies; PPP with authentication.
<b>Performance</b>	
<b>Serial DB9 Ports</b>	RS232/RS485 software selectable DB9 interface. Serial data rate from 300 bps to 230.4 kbps. Data length - 1-32 bits.
<b>RJ-45 Ports</b>	100 or 10 Mb speed, full- or half-duplex mode, per port, individually determined. 10/100 auto-negotiating & auto-cross
<b>Fiber Ports</b> <small>(multi-mode and single-mode)</small>	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.
<b>Gigabit Ports, 1000 Mb</b>	Configurable, std. See configuration guide for selection of modules
<b>Cellular WAN Ports</b>	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.
<b>WAN Ports</b>	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
<b>Network Standards</b>	
<b>Auto-Negotiation on TP</b>	IEEE 802.3z, 802.3ab, 802.1p: 100BASE-TX, -FX, 1000BASE-SX, -LX
<b>Flow Control &amp; Prioritization</b>	TP, IEEE 802.3u
<b>VLANs</b>	Compliant
<b>Spanning Tree</b>	Compliant
<b>DiffServ</b>	IEEE 802.1p: DiffServ, traffic prioritization for routed IP flows/ports
<b>Software</b>	
MNS-DX and MNS-DX-SECURE licensed software	

# MAGNUM DX940

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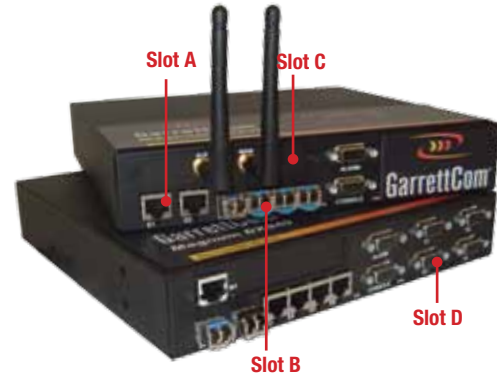
## Product Specifications (continued)

Management & Diagnostics	
<b>Ease-of-Use</b>	Web-based Graphical User Interface (GUI) or CLI access remote SSH or TELNET connection. Powerful built-in protocol analyzer to assist with troubleshooting.
<b>Other</b>	Comprehensive statistics, SNMP MIB II and SNMP Traps, Routing Information, DHCP, ARP and other tables.
Operating Environment	
<b>Operating Temperature</b>	IEC 60068 Operating temp. per "Type Test" -40° to 185°F (-40° to 85°C)
<b>Temperature Rating</b> (components)	UL 60950 "Component Parts" temperature rating: 140°F (60°C)
<b>Storage Temperature</b>	-40° to 185°F (-40° to 85°C)
<b>Ambient Relative Humidity</b>	5% to 95% (non-condensing)
<b>Altitude</b>	-200 to 13000ft (-60 to 4000m)
<b>Conformal Coating</b> (humidity protection)	Request quote
Mechanical	
<b>Enclosure</b>	Rugged high-strength sheet metal
<b>Mounting</b>	19" ETSI and 23" Rack, Panel Mount and DIN-Rail
<b>Cooling Method</b>	Convection.
<b>Dimensions</b>	9.5" W x 9.0" D x 1.75" H (24.13 cm x 22.86cm x 4.45 cm); 1 RU
<b>Weight</b>	5 lbs (2.3 kg)
Power Supply Options	
<b>High Voltage</b>	90-250V AC or DC, 50-60Hz, 0.2A, 18 watts
<b>Low Voltage</b>	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	
<b>L/A</b>	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	
<b>Warranty</b>	Three Years

## Magnum DX940 Configuration Guide

### Magnum DX940 Configurable Router with Cellular

Magnum DX940 Configurable Industrial Router, base unit with four RJ45 10/100 Ethernet ports or four 100Mb SFP Ethernet ports in slot B. Panel mounting standard. Two Alarm Contacts, software controlled. Wire speed filtering and forwarding across all Ethernet ports. MNS-DX software license included. Software includes IP Routing, per VLAN Routing, ICMP, ARP, Diffserv, Port Security, event logging and alarms, and more. Web-based GUI and CLI via Telnet.



#### Step 1. Choose DX940 chassis and power input type.

Model No.	Description, Base Unit of Magnum DX940
DX940-4FXSFP-H	90-250V DC/AC power, slot B has 4 100Mb SFP ports
DX940-4FXSFP-L	24-48V DC power, slot B has 4 100Mb SFP ports
DX940-4RJ-H	90-250V DC/AC power, slot B has 4 10/100 RJ45 ports
DX940-4RJ-L	24-48V DC power, slot B has 4 10/100 RJ45 ports

#### Step 2. Optional: Choose Gigabit module for Slot A: (Gb is only available in slot A. Slot A may only be Gb).

Module No.	Gigabit Modules
<i>Gb Modules: Gb fixed copper OR SFP open transceiver slots</i>	
DXC-2GCU (fixed copper ports)	2 CU
DXC-2GSFP (SFP open ports)	2 SFP
<i>Gb SFP Transceivers</i>	
SFP-GTP	Gb Copper
SFP-SX	Gb SX, 850nm wavelength, 550 meters distance
SFP-ESX	Gb SX, 1310nm wavelength, 2km distance
SFP-LX10	Gb LX, 1310nm wavelength, 10km distance
SFP-LX25	Gb LX, 1310nm wavelength, 25km distance
SFP-ZX40	Gb ZX, 1550nm wavelength, 40km distance
SFP-ZX70	Gb ZX, 1550nm wavelength, 70km distance

#### Step 3. For Slot B, Only if using DX940-4FXSFP-H or -L Base Units, Choose SFP Transceivers

Module No.	Gigabit Modules for Slots A - D
SFP100P-RJ45	100Mb Copper SFP transceiver, 10/100 auto-negotiating
SFP100P-FXMM2	100FX Fiber Optic SFP transceiver, multi-mode, 2Km
SFP100P-FXSM20	100FX Fiber Optic SFP transceiver, single-mode, 20Km.
SFP100P-FXSM40	100FX Fiber Optic SFP transceiver, single-mode, 40Km.

#### Step 4. Optional, for Slot C, choose one WAN module

Module No.	Description
DXC-CW	Configure 1 EVDO 3G cellular wireless port in Slot C
DXC-CW-T1E1	Configure 1 EVDO 3G cellular wireless plus 1 E1/T1 port in Slot C
DXC-CW-DDS	Configure 1 EVDO 3G cellular wireless plus 1 DDS port in Slot C
DXC-T1E1	Configure 1 T1/E1 WAN port with integral DSU/CSU in slot C
DXC-DDS	Configure DDS WAN connection in Slot C

#### Step 4b. Optional, if a wireless ("CW") module is chosen for Slot C, choose one of the following cellular antennas

Module No.	Description
DXCW-ANT-DIPOLE	Omni-directional external dipole Antenna. This pair of "rabbitears" 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.

#### Step 5. Optional, for Slot D, select the Serial module below

Model No.	Base Unit Description
DXC-4SERIAL	Four (4) Serial ports module. Each serial port 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.

#### Step 6. Choose options and extras:

Model No.	Base Unit Description
MNS-DX-SECURE-LIC1	Optional, licensed per router for extra security
MNS-DX-ADV-ADV-LIC1	Optional, licensed per router for advanced routing
CONSOLE-CBLQD	Console attachment cable serial null Modem (aka X-modem) cable with DB9 connectors
CONSOLE-CBLQU	As above, but with a USB connector
CONFORM05-CRM	Conformal coating, 5 mil, for moisture protect
CONFORM08-CRM	Conformal coating, 8 mil, for corrosive environ.
ACC-DX-00-PM	Panel Mount bracket spares
ACC-DX-00-DM	Set of two DIN-Rail holders for vertical mount
ACC-DX-00-RM	Rack-mount brackets for 19" rack-mounting
ACC-DX-00-RRM	Rack-mount brackets for 19" Reverse rack-mounting
RMB-ETSI	Brackets to extend width from 19" to ETSI width; Prerequisite: ACC-DX-00-RM or ACC-DX-00-RRM
RMB-23W	Brackets to extend width from 19" to 23" Telco width; Prerequisite: ACC-DX-00-RM or ACC-DX-00-RRM

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