Magnum DX940e

Industrial Cellular Router

With more configurable ports and extensive Verizon-certified 4G/LTE capability, this compact industrial router brings enhanced flexibility and security to remote access.

+ Offers **enhanced connectivity** with high-speed Verizon, AT&T and worldwide 4G/LTE cellular interface for secure remote access

+ **Uses high-end, robust cybersecurity mechanisms** with advanced safety features, IP routing and guaranteed network protection with firewall layers

+ **Integrates seamlessly into existing infrastructures** through up to six highly configurable Gigabit Ethernet interfaces and legacy leased circuits for backward compatibility

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Key Features

- High-speed all-Gigabit Ethernet interfaces, with up to six ports

- Verizon-certified 4G/LTE cellular interface for North American markets to provide secure remote connectivity

- T1/E1/DDS or GbE for WAN support; Multiple Gigabit Ethernet and serial ports for LAN

- NERC-CIP compliant for secure data transfer across public networks

- RS232 and RS485 protocols-based Serial-to-IP conversion for backward compatibility and interfacing with legacy equipment

- Enhanced cybersecurity capabilities: SSL/TLS encryption, IPSec-VPN tunneling, Layer 3 Firewall and secure IP routing with advanced RIP, OSPF and BGP features

- Operating temperature range of -40°C to +85°C

Now backed by Verizon's certified 4G/LTE technology, the Magnum DX940e Industrial Cellular Router features enhanced VPN and firewall capabilities for secure, NERC-CIP compliant data transfer over public networks.

Be certain.
Belden.

Reliable, Secure Connections for Cellular Communication

Data requirements and compliance standards are on the rise, including NERC CIP's requirement for higher security protocols to safeguard information traveling from one place to another. When data is traveling to its end destination, especially over far distances, it is imperative that networks are secure and reliable, so critical information can be deployed without interruption.

In addition to the need for improved security measures, more devices are accessing the internet since the introduction of the IIoT. 4G/LTE capabilities are the crucial gateway to ensuring continuous wireless connectivity. The DX940e supports all ranges of connectivity, but it is most beneficial for secure remote access and serial communication. The heightened connectivity is supported by NERC CIP standards to ensure end-receiver devices are safe from both physical and cyber threats.

The firewall and encryption features within the DX940e meet these standards and more by supporting VPN connectivity.

Applications

The DX940e is ideal for applications that require high-speed and secure data transfer remotely over long distances, especially those where cellular signals are readily available. The router's ruggedized, compact and flexible design helps with integration into tight infrastructures and compliance with NERC CIP standards makes it ideal for both wired and cellular WAN networks.

Markets

The DX940e is best suited for utility markets, including energy and power, transmission and distribution, smart grids and substations, bringing reliable connectivity into hard-to-reach places. Roadside traffic controls, transportation stations and other locations where cellular signals are critical will also benefit from this upgraded router. The device can be placed on both moving vehicles and used in control rooms, providing user and communication metrics. The oil and gas industry is another suitable application for the DX940e, as the router can withstand harsh conditions in moisture-rich environments.


With up to six configurable Gigabit Ethernet ports, Belden's Magnum DX940e utility router offers dynamic routing protocols and enhanced cybersecurity features for highly configurable and secure remote communication.

Technical Information

Type	DX940e
Product Description	DX940e base unit with configurable four 1000Mb or 100Mb SFP Ethernet or 10/100/1000 RJ45 ports. Other additions: 4 serial, 2 gigabit fiber/copper, choice of two WAN access ports (4G/LTE Cellular, T1/E1, DDS WAN). Includes IP routing, Ethernet switching and secure management. MNS-DX software license included. Panel mount. Panel, DIN-RAIL or Rack mounting options and conformal coating is also available.
Specifications	
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/reverse terminal server, Serial Multipoint & Multimaster Topologies; PPP with authentication.
Performance	
Serial DB9 Ports	RS232/RS485 software selectable DB9 interface. Serial data rate from 300 bps to 230.4 kbps. Data length: 1 to 32 bits.
RJ45 Ports	10/100 Mb speed, full- or half-duplex mode. 1000 Mb speed full-duplex mode. Each port individually determined, auto-negotiation and auto-cross
Fiber Ports (Multi-mode and Single-mode)	Configurable 100Mb or 1000Mb speed (based on the SFP type). 100 Mb speed with FDX or HDX, default is FDX mode. 1000 Mb speed with FDX only. Max. 6 SFP (Small Form-factor Pluggable) for high fiber port density.
Cellular WAN Ports	4G/LTE Bands: Americas/EMEA (B1, B2, B3, B4, B5, B7, B12, B13, B20, B25, B26, B29, B30, B41); APAC (B1, B3, B5, B7, B8, B18, B19, B21, B28, B38, B39, B40, B41) 3G/WCDMA Bands: Americas/EMEA (B1, B2, B3, B4, B5, B8); APAC (B1, B5, B6, B8, B9, B19) 3G/TD-SCDMA Bands: APAC (B39)
Wired WAN Ports	WAN Ports DDS: 56/64kb OR T1/E1: 1.544Mb / 2.048Mb G.703; Full rate and fractional (N*56/64kb); Integral CSU/DSU
Network Standards	
Auto-Negotiation on TP	IEEE 802.3z, 802.3ab, 802.1p: 100BASE-TX, -FX, 1000BASE-TX, -FX
Flow Control & Prioritization	TP, IEEE 802.3u
VLANs	Max. 4K VLAN entries
Spanning Tree	IEEE 802.1D STP; IEEE 802.1D-2004 RSTP
DiffServ	IEEE 802.1p: DiffServ, traffic prioritization for routed IP flows/ports
Software	
Software	MNS-DX, MNS-DX-ADVAR and MNS-DX-SECURE licensed software
Management & Diagnostics	
Ease-of-Use	Industrial HiVision or Web-based Graphical User Interface (GUI) or CLI access via SSH or Telnet. Powerful built-in protocol analyzer to assist with troubleshooting.
Other	Please refer to MNS-DX software datasheet for full list of management and diagnostics features. (http://media.beldensolutions.com/garrettcom/techsupport/software/datasheets/mnsdxds.pdf)
Operating Environment	
Operating Temperature	IEC 60068 Operating temp. per "Type Test 4 hours" -40 °F to 185 °F (-40 °C to +85 °C)
Temperature Rating (Components)	UL 60950 "Component Parts" temperature rating: 140 °F (+60 °C)
Storage Temperature	-40 °F to 185 °F (-40 °C to +85 °C)
Ambient Relative Humidity	5% to 95% (non-condensing)
Altitude	-200 to 13000 ft (-60 to 4000 m)
Conformal Coating (Humidity Protection)	Please refer to Configuration Guide section Step 7 for available conformal coating options
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 x 22.86 x 4.45 cm); 1 RU
Weight	5 lbs (2.3 kg)
Power Supply Options	
High Voltage	90 to 250 V AC or DC, 50 to 60 Hz, 0.2 A
Low Voltage	24 to 48 V DC, 0.75 A
Power Consumption	33 Watts for fully loaded Fiber configuration; 20 Watts minimum
Serial LED Indicators	
Per DB-9 or RJ45 Port	One LED/port indicating active connection.
Ethernet LED Indicators	
Per RJ45 or Fiber Port	Link/Activity One LED/port indicating Link (solid green) and Activity (blinks to indicate activity).
Approvals*	
Declaration of Conformity	CE, FCC, EN 60950
Safety of Industrial Control Equipment	cUL508
Railways	EN 50155
Substation	IEC 61850-3, IEEE 1613
Traffic Control	NEMA TS-2 & TEES
Warranty	
Warranty	Three Years

* The specifications and technical information regarding the products in this publication are subjects to change and may be amended by way of the further development of this products.

Magnum DX940e Configuration Guide

Slot C

Slot A Slot B Slot D

DX940ETXH - **2GTX** - **CDS** - **VZW** - **4S** - **SA** - **C8**
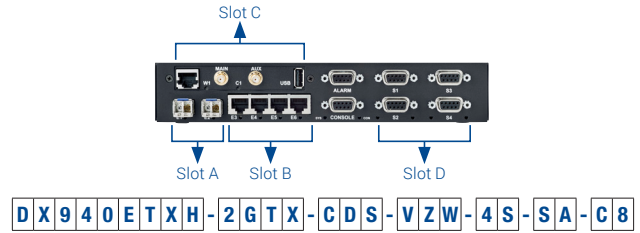
Product Family

DX940ETXH = 90 to 250 V DC/AC, 4 x 10/100/1000 Mb RJ45 ports
DX940ETXL = 24 to 48 V DC, 4 x 10/100/1000 Mb RJ45 ports
DX940EFXH = 90 to 250 V DC/AC, 4 x 100/1000 Mb SFP ports
DX940EFXL = 24 to 48 V DC, 4 x 100/1000 Mb SFP ports

Slot A (Gigabit Port)

2GTX = 2x 10/100/1000 Mb RJ45 ports   XXXX = Blank Slot
2GSX = 2x 1000 Mb SFP ports

Slot C (WAN Port)

CEL = 1 4G/LTE cellular   DDS = 1 DDS WAN port
CDS = 1 4G/LTE cellular + 1 DDS   TE1 = 1 T1/E1 WAN port
CT1 = 1 4G/LTE cellular + 1 E1/T1   XXX = Blank Slot

Carrier (only with 4G/LTE capability)

ATT = For ATT Networks   **VZW** = For VZW Networks
XXX = For all other carriers   AEM = For Americas/EMEA carriers
                                    APC = For APAC carriers

Slot D (Serial Port)

4S = 4 DB9-DTE Serial ports   XX = 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

C5 = 5 mil, for moisture protect   **C8** = 8 mil, for moisture protect
XX = No Conformal Coating

DX940e Accessories

Model No.	Description
SFP-SX	Gb SX, 850 nm wavelength, 550 meters
SFP-ESX	Gb SX, 1310 nm wavelength, 2 km
SFP-LX25	Gb LX, 1310 nm wavelength, 25 km
SFP-ZX40	Gb ZX, 1550 nm wavelength, 40 km
SFP-ZX70	Gb ZX, 1550 nm wavelength, 70 km
SFP-GTP	Gb Copper
SFP-LX10	Gb LX, 1310 nm wavelength, 10 km
SFP100P-RJ45	100 Mb Copper SFP transceiver, 10/100 auto-negotiating
SFP100P-FXMM2	100FX Fiber Optic SFP transceiver, multimode, 2 km
SFP100P-FXSM20	100FX Fiber Optic SFP transceiver, singlemode, 20 km
SFP100P-FXSM40	100FX Fiber Optic SFP transceiver, singlemode, 40 km
CONSOLE-CBLQD	Console attachment cable serial null Modem (aka X-modem) cable with DB9 connectors
CONSOLE-CBLQU	Console attachment cable serial null Modem (aka X-modem) cable with a USB connector
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: ACCDX-00-RM or ACC-DX-00-RRM
ATT-SIM1	ATT certified SIM card module with 250 MB/mo plan
ATT-SIM2	ATT certified SIM card module with 5 GB/mo plan
VZW-SIM1	Verizon certified SIM card module with 250 MB/mo plan
VZW-SIM2	Verizon certified SIM card module with 5 GB/mo plan