




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

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.



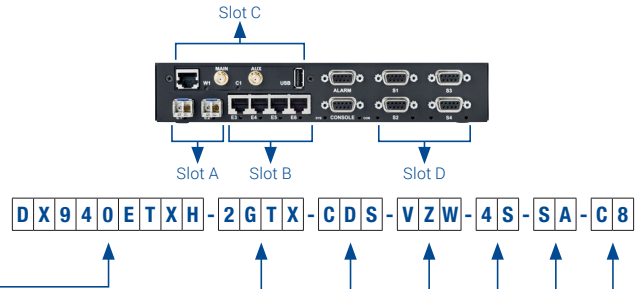
With up to six configurable Gigabit Ethernet ports, Belden's Magnum DX940e utility router offers dynamic routing protocols and enhanced cybersecurity features for highly configurable and secure remote communication.

Technical Information

| | |
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| 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



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: ACC-DX-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 |

Got questions? Need to talk to an expert? Send us an email:
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