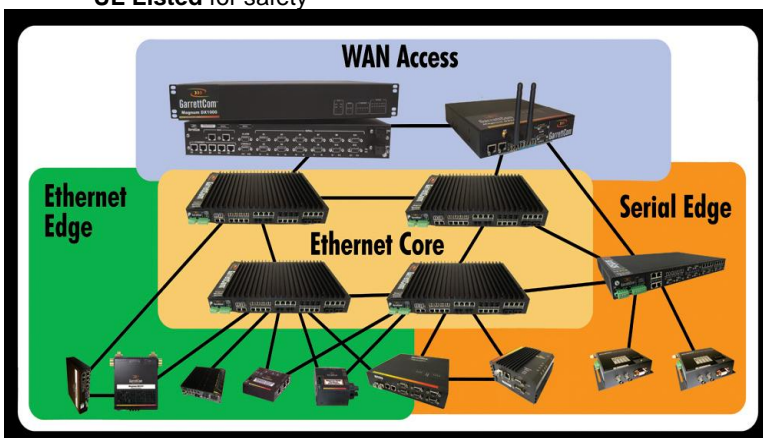


Substation Networking Products

GarrettCom, Inc. provides the Magnum, Dymec, and DynaStar lines of Ethernet, Serial, and WAN products for the power utilities. Products include hardened switches, converters, serial device Routers, terminal servers and WAN routers designed and tested for reliability in harshest conditions and temperatures. GarrettCom is known for its configurability, and offers the widest breadth of fiber options in the industry.

Additional features of GarrettCom products include:

- **Fiber built-in** to accommodate user selection of combinations of 10 Mb or 100 Mb or Gigabit fiber media (and RJ-45, too.)
- High-EMI noise immunity
- **NERC CIP** compliance for security
- **IEC 61850-3** compliance, including GOOSE messaging
- **IEEE 1613 Class 2 tested for substations**
- Magnum **10KT** w/ 1588v2 Precision Timing & Hot-Swap Power
- Power types such as: **125V, 110V, 48V DC**, and **worldwide AC**
- Extended ambient temperature range, **-40°C to +85°C**
- **UL Listed** for safety



Ethernet Edge:

Small and Medium Magnum Switches

Magnum 6K16V, up to 16 ports, all types; industrial Ethernet packaging for vertical mounting, convection cooled (no fans)

Magnum 6KL, Up to four 100Mb fiber ports (SC, ST, LC, and MTRJ), four 10Mb fiber ST ports, or up to four more 10/100 copper ports (or combinations) may also be configured. Up to 2 Gb ports

Magnum 6KQ, managed field switch with up to 16 ports of all media types; advanced thermal design; metal case with a ribbed surface for optimum heat dissipation (no fans)

Magnum 6K8, up to eight ports, compact and configurable, managed field switch; IP53-rated, metal case is a heat sink (no fans)

Magnum 6K PoE Modules up to eight ports, Power Sourcing per IEEE 802.3af standard, for attaching PoE devices to 6K switches

Magnum **P62** hardened 6+2 (six copper, two fiber) heavy-duty outdoor switches

Magnum Edge Switch Family, small un-managed, substation hardened, provides six switch ports, zero or one or two of which may be 100 Mb fiber with others 10/100 copper; models include **ES42**, **ESD42**, **PES42** (PoE) and **IPS42** for AC/DC Power Supply

Magnum Converter Switch Family (Media Converters), Combine a Media Converter with a small Ethernet Switch and you get a Converter Switch. Offers two ports copper & one port fiber; 4 ports copper, or 4 ports copper PoE. Models include **CSG14** (Gb), **CSG14U** (Gb), **CS14**, **CSN14**, **S14**, **PS14** (PoE) & **Dymec Links Ethernet Converters**.

Ethernet Core:

Magnum 6K & 10KT Managed Switches

Magnum 10KT, up to 10 slots, 36 ports, 1588v2 precision timing, hot swappable power, advanced thermal design

Magnum 6K32FC, up to 32 ports, advanced thermal design convection-cooled (no fans), reverse rack-mount model avail.

Magnum 6K32F, up to 32 fiber or copper ports, reverse rack-mount model avail, up to 8 Gigabit, combinations

Magnum 6K32TRC, up to 32 ports, advanced thermal design convection-cooled, reverse 1U rack-mount, configurable

Magnum 6K25e, up to 26 ports, configurable in all ports for media and port types, up to 8 Gb ports, up to 24 fiber ports

Magnum MNS-6K software with SNMP, VLANs, Secure Web Management, CLI, RSTP, Telnet, DHCP and more.

Magnum MNS-6K-SECURE software with **extra security**, SSH, SSL, Access Control, RADIUS, TACACS+, and more

Serial Edge:

Terminal Servers, Converters, Routers

Magnum 10ETS, up to 10 slots of Serial and Ethernet ports, configurable IRIG-B timing modules, hot swappable power

Magnum DX Industrial Routers combine features of a Serial Device Server, Ethernet Switch and IP Router in a single product. **Magnum DX1000-TS** offers twelve Serial, and five Ethernet ports.

Dymec Links Converters, Convert Serial copper to fiber; hardened with 125VDC. Includes **RS232 Single Channel**, **RS232 Multi-Channel**, and **RS485**. **Optical Stars**

DynaStar 1500 Ethernet Terminal Server (DS1500-ETS) Terminal Server, Ethernet switch and IP Router

WAN Access:

DX940 Configurable Industrial Routers features Ethernet, T1/E1, Serial RS232/485, Cellular Wireless.

DX1000-IR Industrial Routers see "Serial Edge" above; "IR" model includes two WAN ports.

DS1500-IFR Industrial Frame Router In a single product, the DS1500-IFR integrates Ethernet, Serial, and WAN.

DS2000 Family Supports multiple serial and Ethernet interfaces, T1/E1 or DDS or other popular WAN interfaces.

Cyber Security:

GarrettCom **Cyber Security** Software Products listing.

To access this sheet online, go to <http://www.garrettcom.com/substation.pdf>

For Power Utilities:

http://www.garrettcom.com/power_utilities.htm (includes substation network architecture and many white papers)

http://www.garrettcom.com/iec61850_ieee1613.htm

http://www.garrettcom.com/ieee1613_class2.htm