

# Magnum 6KQ

## Industrial Ethernet Managed Field Switch

### Features

- Heavy Duty Field Switch for industrial networking applications
- Full-featured MNS-6K software in a small factory-floor package
- Highly configurable, all fiber port types, up to 12 100Mb, 10 Mb, Gb with SFPs
- Advanced thermal design with metal case used as a heat sink (no fans)
- DC power at 24V, 48V, 125V, Dual-Source; PoE; Panel or DIN-Rail mounting



DIN-Rail  
Mount



Panel Mount

Magnum™ 6KQ Managed Field Switches provide maximum configurability in their class. The fiber-rich 6KQ can be configured with up to 12 100Mb fiber ports and two Gigabit ports. For 10/100 copper, regular or PoE-equipped 10/100 RJ-45 or 10/100/1000 copper ports may be configured to a maximum of 12 at 10/100 and 2 Gig ports. Magnum 6KQ comes with the best-of-breed MNS-6K managed networks software featuring GUI ease of use, Secure Web Management, SNMPv2,v3 management, 802.1p QoS Prioritization, Tag-based VLANs, IGMP Snooping and IGMP-L2 multicast management, port security, RADIUS and TACACS+ support, and a choice of redundancy options including RSTP and GarrettCom's rapid-ring-recovery S-Ring and RS-Ring products. See the Managed Networks Software (MNS-6K) datasheet for more information.

Magnum 6KQs are ideal for building a switched, hardened Ethernet network infrastructure, connecting edge devices such as PLCs and IEDs with upstream switches or routers. Designed for use in industrial applications such as factory floors and control cabinets, industrial video surveillance systems with PoE, power utility substations, tariffed carrier field facilities, or transportation and oil and gas, the rugged Magnum 6KQ handles stressful workloads (mixes of bursty data traffic and priority streaming traffic) as well as harsh environmental conditions.

Advanced patent pending thermal design techniques use the 6KQ's metal case as a heat sink. The unique ribbed-surface aluminum case offers maximum heat dissipation without fans to keep internal components cool and reliable. This sealed-case design enables the unit to operate in the harshest industrial grade environments and achieves high EMI noise immunity. Available with Conformal Coating options and rated IP53 for dust and water resistance, the 6KQ Field Switches are designed to meet Class 1, Division 2 certification requirements for hazardous environments such as those found in oil and gas facilities.

The 6KQ is highly configurable with multiple fiber and copper options. Four 10/100 RJ-45 ports (either regular or PoE) are standard in the base unit. Gigabit ports may be 10/100/1000 auto-negotiating copper or compact SFPs.

The 6KQ can be configured with the user's choice of DC power supplies: 24V for factory floor, 48V for tariffed carrier field facilities and for PoE-powered applications such as video surveillance, and 125V for power utility substations. External AC power supplies are optional.

Like all Magnum products, the 6KQ Field Switch has all appropriate agency approvals and compliance certifications, including: third-party UL testing for safety and temperature rating, NEBS L3 compliance, IEC 61850 & IEEE 1613 for power utilities, and NEMA TS-2 for use outdoors.



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# Specifications

## Industrial Ethernet Managed Field Switch

### PERFORMANCE:

**Fiber Ports, 100 Mb:** Configurable SC, ST, LC and MTRJ, multi-mode and single-mode for each type, max of 12 fiber  
**Fiber Ports, 10 Mb:** Configurable, ST, up to 4 fiber mm ports, each FDX or HDX, default is HDX mode.  
**RJ-45 Ports: 100 or 10 Mb speed,** full- or half-duplex mode, per port, individ. determined. 10/100 auto-negotiating & auto-cross, up to 12 ports.  
PoE Ports, RJ-45 Power Sourcing per IEEE 802.3af, power on data pair, configurable up to 8 PoE ports.  
**Gigabit Ports, 1000 Mb:** Configurable, standard SFP transceiver modules or 10/100/1000Mb copper, up to 2 Gigabit ports.  
**Processing type:** Store and Forward with IEEE 802.3p QOS and IEEE 802.3x full-duplex flow control.  
All Ports non-blocking. System aggregate forward and filter rate 4.76M pps.  
Address table: 4K nodes, with address aging time of 300 seconds typical.  
Packet buffers: 240 KB for 10/100 and 120KB for 1000 Mb  
Latency: 6µs + packet time max (TX - TX, TX - FX, FX - FX, TX-G, G-G)

### NETWORK STANDARDS:

IEEE 802.3, 802.3ab, 802.1p:10BASE-FL;100BASE-TX,FX;1000BASE-SX,LX,ZX  
Auto-negotiation and auto-cross on 10/100 TP and PoE, IEEE 802.3u  
See MNS-6K datasheet for software network standards and software features.  
All 10 Mb ports obey the rules for configuring 10 Mb Ethernet  
All 100 Mb ports use Fast Ethernet rules. 1000 Mb ports use Gigabit rules.

### OPERATING ENVIRONMENT:

UL 60950 and "Component Parts" rating: -40° to 140°F (-40° to 60°C)  
IEC 60068 "Type Test" rating: -60° to 195°F (-50° to 85°C)  
Storage: -60° to 210°F (-50° to 100°C)  
Relative humidity: 5% to 95% (non-condensing)  
Altitude: -200 to 13,000ft (-60 to 4,000m)  
Conformal coating (humidity protection) optional: Request quote

### RELAY CONTACTS FOR ALARMS (OPTIONAL):

Form C, one NC indicating internal power, one NC software controllable.

### NETWORK CABLE CONNECTORS:

1000Mb fiber ports: all standard Gb SFP Transceiver types supported  
1000Mb copper ports:10/100/1000Mb auto-negotiating, Cat5e & 6 UTP/STP  
100Mb Copper and PoE: Category 5 UTP/STP; 10 Mb: Cat. 3, 4, 5 UTP/STP  
100 Mb Fiber ports connector options: multi-mode FX-MTRJ, LC, ST, SC;  
sgl-mode 15Km LC, 20Km SC and ST, and 40Km "long reach" sgl-mode SC.  
10 Mb Fiber port connector: multi-mode ST, 10BASE-FL  
For other port types and port connector types, request quote

### DC POWER SUPPLY (Internal, floating ground for internal PCBs):

Power Input: 24V nominal (18 to 36V), 48V nominal (36 to 60V), 125V nominal (88 to 150V)  
Power Input for PoE: 48VDC pass-through, add up to 15 watts per PoE port  
Power Consumption: 35 watts typical for a fully-loaded fiber model, 20 watts typical for 4 port copper-only model.  
Std. Terminal Block: "-", GND, "+". Dual Source Terminal Block is -A, -B, +A, +B, chassis ground.

### DC DUAL POWER SOURCE (OPTIONAL)

All Magnum 6KQ models (24VDC, 48VDC, 125VDC) may be ordered with optional Dual-Source DC power input, for continuity of operation when either one of the DC input sources is interrupted.

### MECHANICAL:

Enclosure: High-strength extruded aluminum for heat-sinking. Vertical panel-mounting brackets included.  
DIN-Rail mounting: Model # DIN-Rail-6KQ, optional  
Enclosure Ingress Protection rating: IP53, protects against (5)dust particles and (3)spraying liquids per IEC 60529, and NEMA-3,3X  
Cooling Method: Convection, fully-enclosed ribbed-surface aluminum case used as a heat sink, designed for vertical mounting, no fans.  
Dimensions: 6.85 in H x 7.50 in W x 2.0 in D in vertical panel-mount position. (17.4cm H x 19.1cm W x 5.08cm D) Weight: 3 lbs. (1.3 kg)

### LED INDICATORS (two sets) PER RJ-45 PORT:

LK: Steady ON when twisted-pair link is operational.  
ACT: ON with port activity  
100/10 ON = 100Mb speed, OFF = 10Mb  
(Port-side LED set only) F/H: ON for full-duplex, OFF for half-duplex  
(PoE only, port-side only) PoE: ON for power to PD device. Note: LK/ACT port becomes steady ON for Link, blinking for activity.

### LED INDICATORS (two sets) per 100Mb and 10Mb FIBER PORTS:

LK: Steady ON when fiber link is operational  
ACT: ON with port activity  
(Port-side LED set only) F/H: ON for full-duplex, OFF for half-duplex

### LED INDICATORS PER Gb PORT:

LK: Steady ON when link is operational.  
ACT: ON with port activity  
1000Mb ON = Gb speed  
(Top-side LED set only, copper only) 100/10 ON = 100Mb speed, OFF = 10Mb  
(Port-side LED set only) F/H: ON for full-duplex, OFF for half-duplex  
(Port-side LED set only, copper only) 3 LEDs indicate Gb, 100Mb or 10Mb speed

### PORT-SPECIFIC SETTINGS:

Port-specific user settings (such as FDX or HDX, copper 10/100 speed) can be set using software commands. (The RJ-45 copper ports are auto-negotiating auto-crossover, there are no user controls for auto-crossover).

### AGENCY APPROVALS AND STANDARDS COMPLIANCE:

UL Listed (UL60950), cUL, CE, Emissions meet FCC Part 15, Class A.  
NEBS L3 and ETSI compliant  
IEC61850 EMC and Operating Conditions Class C for Power Substations  
IEEE 1613 Environmental Standard for Electric Power Substations.  
NEMA TS-2 & TEES for DC-powered and PoE-powered traffic ctrl equipment.  
Class1 Division 2 for hazardous locations = pending

### WARRANTY: Three years

Made in USA

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## Ordering Information

**Magnum 6KQ-24VDC** Magnum 6KQ Managed Field Switch, base unit. May be configured with a variety of 10/100/1000 Mb fiber and copper port connector types from a family of port modules. Non-blocking filtering & forwarding across all ports. Heavy duty metal case designed as heat sink, IP53 for environmental protection, no fans.

**Magnum 6KQ-48VDC** Same as Model 6KQ-24VDC except the power input is -48VDC.

**Magnum 6KQ-125VDC** Same as Model 6KQ-24VDC except the power input is 125VDC range 88-150VDC).

**Magnum 6KQP-48VDC** PoE, same as Model 6KQ-48VDC except the four 10/100 ports are PoE-enabled, data pairs.

**Configuration Options: Each Magnum 6KQ may be configured with a choice for the three modular slots.**

**6KQ4-RJ45** 6KQ module, four 10/100 copper ports, may be used in 6KQ slots B and/or D  
**6KQ4-RJMLC** 6KQ module, two 10/100 copper ports and two 100Mb 2km multi-m. LC fiber ports, slots B and/or D  
**6KQ2-10ST** 6KQ module, two 10 Mb FL 2km multi-mode ST fiber ports, slots B and/or D  
**6KP8-MTRJ** SFF Fiber module for 6K Switches, w/eight 100 Mb 2km multi-mode FX MTRJ connectors  
**6KQ2-MST** 6KQ module, two 100Mb 2km multi-mode ST fiber ports, slots B and/or D  
**6KP6-RJMST** "4+2" module for 6Ks, w/four 10/100 RJ-45 and two 100 Mb 2km multi-mode FX ST connectors  
**6KQ2-SSC** 6KQ module, two 100Mb 20km single-mode SC fiber ports, slots B and/or D  
**P6KQ4-RJ45** PoE 6KQ module, four 10/100 copper ports with PoE on data pairs, may be used in 6KQ slot B only  
**6KQF-4MT** 6KQ module, four 100Mb 2km multi-m. MTRJ fiber ports, factory slot C fiber-only  
**6KQF-2MSC** 6KQ module, two 100Mb 2km multi-mode SC fiber ports, factory slot C fiber-only  
**6KQF-1MST** 6KQ module, one 100Mb 2km multi-mode ST fiber ports, factory slot C fiber-only  
**6KQ-2GSFP** 6KQ Gig module, two SFP pluggable open transceiver ports for user-selectable SFP Gig transceivers in each, configure in 6KQ slot D only

**6KQ-2GCU** 6KQ Gig module, two auto-negotiating 10/100/1000 Mb copper ports, configure in 6KQ slot D only

**Several other Port Modules are available on config. guide at [www.garrettcom.com/techsupport/insertion\\_guides/6kqcg.pdf](http://www.garrettcom.com/techsupport/insertion_guides/6kqcg.pdf)**

**DIN-RAIL-6KQ** DIN-Rail holder for a secure vertical mount of 6KQ, with screws to attach to 6KQ case.

**CONFORMAL CRM** Conformal coating (aka "tropical treatment") of interior PCBs and each module of one 6KQ or 6K8 Switch



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