Magnum 6K16V

16-port, Configurable Managed Fiber Switch

Features

- **Industrial Ethernet Managed Switch, designed for vertical or DIN-Rail mounting, convection cooling (no fans)**

- **Provides 2 modular slots for user selection of 100 Mb, 10 Mb, Gigabit fiber ports, and copper 10/100, Gigabit ports**

- **Choose from a family of 20 port modules for almost unlimited configuration flexibility**

- **Options include -48VDC, 24VDC, 125VDC, and 250VDC power, dual source, or AC**

- **IEEE 1613 and IEC 61850 standards for electric power substations**

GarrettCom®

Industrial Networking at Its Best™

Magnum™ 6K16V Managed Fiber Switches provide modularity of fiber and copper ports, 10Mb 100Mb and Gigabit speed ports, and comprehensive management software in a compact industrial-grade package. Setting a new standard for Industrial and Carrier Class applications, heavy duty Ethernet Switch jobs are readily accommodated with an extended temperature rating of -40°C to 60°C by the UL Component Parts method, or -50°C to 95°C by the IEC 60068 Type Test method. With options such as all popular DC power input types, worldwide AC power, and DIN-Rail mounting, the hardened Magnum 6K16V is a "go-anywhere do-anything" Industrial Ethernet Switch.

The large family of port modules offer the choice of all fiber media (all connector types, multi- and single-mode) and 10/100 Mb auto-negotiating RJ-45 ports. Standard GBIC ports can be configured for a variety of Gigabit cabling types and distances.

High performance features include non-blocking speed on all ports and 802.1p QoS Traffic Prioritization. Magnum 6K16Vs are "plug-and-play" ready for use as backbone switches where a mix of bursty data traffic and priority streaming traffic for VoIP and audio/video applications is present.

Magnum 6K16V Fiber Switches are provided with LAN management software including SNMP, Tag- and Port-based VLANs, IGMP Snooping and Port Security, control via command line interface. For high availability LANs using ring topologies, Spanning Tree Protocol, Link-Loss-Learn™ and S-Ring™ are available. See the Managed Networks Software (MNS-6K) and S-Ring datasheets for additional details on the comprehensive set of software programs and options.

Designed for use in transportation and traffic control systems, power utilities, industrial factory-floor jobs, and video surveillance systems with segments requiring Gigabit backbone interconnections, the Magnum 6K16V is easy to install and operate. The next generation of industrial applications will need advanced managed network software, operation at extended temperatures, fiber ports modularity, support for self-healing ring structures, and gigabit backbone configurability. The Magnum 6K16V has all of these, and is available now.

Magnum 6K16V Managed Fiber Switches have heavy duty metal cases and auto-ranging power supplies for operation with standard AC power worldwide. Internal DC power supplies are optional. The 6K16Vs and all other Magnum products are designed and manufactured in the USA and backed by a three year warranty.

PERFORMANCE:

Gigabit Ports, 1000 Mb: Configurable, standard GBIC transceiver modules, up to 4 Gigabit ports.

Fiber Ports, 100 Mb (multi-mode and single-mode)**:** Configurable SC, ST, LC MTRJ, Small Form Factor (SFF) is featured for high fiber port density.

Fiber Ports, 10 Mb: Configurable, ST, up to 8 fiber ports, each FDX or HDX, default is HDX mode.

RJ-45 Ports: 100 or 10 Mb speed, full- or half-duplex mode, per port, individually determined. 10/100 auto-negotiating and auto-cross, up to 16 ports.

Processing type: Store and Forward with IEEE 802.3x full-duplex flow control. All Ports non-blocking. System aggregate forward and filter rate 6.0 Mpps.

Address table: 4K nodes, with address aging time of 155 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 802.3z, 802.3ab, 802.1p: 10BASE-FL, 100BASE-TX, -FX, 1000BASE-SX, -LX Auto-negotiation and auto-cross on TP, IEEE 802.3u

See MNS-6K datasheet for software network standards, Link-Loss-Learn, and other 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:

IEC 60068 Operating temp. per "Type Test" -60° to 205°F (-50° to 95°C)

UL 60950 and "Component Parts" rating: -40° to 140°F (-40° to 60°C)
     Storage: -60° to 210°F (-50°to 100°C)

Relative humidity: 5% to 95% (non-condensing)

Altitude: -200 to 13000ft (-60 to 4000m)

Conformal coating (humidity protection) option: Request quote

RELAY CONTACT FOR ALARMS:

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

NETWORK CABLE CONNECTORS:

1000 Mb ports: all standard GBIC Transceiver types supported

100 Mb Copper: 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; single-mode LC, 20Km SC and ST, and 40Km "long reach" single-mode SC.

10 Mb Fiber port connector: multi-mode and single-mode ST

AC POWER SUPPLY (INTERNAL):

AC Power Connector: IEC-type, male, recessed, top of unit

Power Input: 100 - 240 VAC, 47 to 63 Hz, auto ranging

Power Consumption: 50 watts typical for a fully-loaded fiber model, 30 watts typical for 16 port copper-only models.

DC POWER SUPPLY OPTIONS:

-48VDC: Input -36 to -70VDC (PoE input range: -44 to -57VDC)

24VDC: Input 20 to 40VDC

125VDC, 250VDC, and 110VDC nominal: Input 88 to 300VDC

Std. Terminal Block: "-, GND, +",   **Power Consumption:** Same as AC

DC DUAL POWER SOURCE (OPTIONAL)

The Magnum 6K16V DC models may be ordered with optional Dual DC power input, for continuity of operation when either one of the DC input sources is interrupted. Available for -48VDC, 24VDC, 125VDC or 250VDC.

MECHANICAL:

Enclosure: High-strength metal.For vertical panel or DIN-Rail mounting.

DIN-Rail mounting: Model DIN-Rail-VRM, optional

Cooling Method: Convection, designed for vertical mounting, no fans

Dimensions: 9.50 in H x 8.75 in W x 1.75 in D
             24.1 cm H x 22.2 cm W x 4.4 cm D

Weight: 4.2 lbs. (1.9 kg)

LED INDICATORS PER RJ-45 PORT:

LK: Steady on when twisted-pair link is operational.

ACT: On with port activity

F/H: ON = full-duplex mode, OFF = half-duplex mode.

100/10 ON = 100Mb speed, OFF = 10Mb

LED INDICATORS, 100Mb and 10Mb FIBER PORTS:

LK: Steady on when fiber link is operational.

ACT: On with port activity

F/H: ON = full-duplex mode, OFF = half-duplex mode.

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 and 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.

IEC 61850 EMC and Operating Conditions Class C for Power Substations

IEEE 1613 Class 2 Environmental Standard for Electric Power Substations

NEBS L3 and ETSI compliant

NEMA TS-2 and TEES for traffic control equipment.

WARRANTY:

Three years   Made in USA

Ordering Information

Magnum 6K16V   Magnum 6K16V Managed Fiber Switch, base unit for vertical mounting. May be configured with a variety of 10/100/1000 Mb fiber and copper port connector types from a family of port modules. 16 ports max. 4K node address table, 240KB packet buffers For licensed management software, see applicable MNS-6K datasheet.

Configuration Options: Magnum 6K16V base unit has two port module slots, each of which may be a module from below:

6KP8V-45MT	"4+4" module for 6Ks, w/four 10/100 RJ-45 and four 100 Mb 2km multi-mode FX MTRJ connectors
6KP8V-SLC	SFF Fiber module for 6K Switches, w/eight 100 Mb 15km single-mode FX LC connectors
6KP8V-RJ45	TP Module for 6K16V switches, w/eight 10/100 Mb auto-negotiating RJ-45 ports
6KP8V-MTRJ	SFF Fiber module for 6K Switches, w/eight 100 Mb 2km multi-mode FX MTRJ connectors
6KP8V-45SLC	"4+4" module for 6Ks, w/four 10/100 RJ-45 and four 100 Mb 20km single-mode FX LC connectors
6KP6V-RJMST	"4+2" module for 6Ks, w/four 10/100 RJ-45 and two 100 Mb 2km multi-mode FX ST connectors
6KP6V-RJSSC	"4+2" module for 6Ks, w/four 10/100 RJ-45 and two 100 Mb 20km single-mode FX SC connectors
6KP6V-RJSSCL	"4+2" module for 6Ks, w/four 10/100 RJ-45 and two 100 Mb 40km single-mode FX SC connectors
6KP6V-RJ10ST	"4+2" module for 6Ks, w/four 10/100 RJ-45 and two 10 Mb 2km FL ST connectors
6KP4V-FXSC	"2+2" 100 Mb Fiber module for 6K Switches, w/four 100 Mb FX SC connectors.
6KP4V-F10ST	"2+2"10 Mb fiber module for 6K Switches, w/four 10Mb 2km FL ST connectors
	Note: Several other Port Module types are available. See Configuration Guide.
6KP7-1GSFP6RJ	"G+6" module for 6Ks, w/one SFP Gigabit Port and six 10/100 Mb RJ45 ports
6KP7-1G2RJ4MLC	"G+4+2" module for 6Ks, w/one SFP Gigabit Port, four multi-mode LC fiber ports, and two 10/100 RJ-45
6KP7-1G2RJ4SLC	"G+4+2" module for 6Ks, w/one SFP Gigabit Port, four single-mode LC fiber ports, and two 10/100 RJ-45
6KP7-1G2RJ4SLCL	"G+4+2" module for 6Ks, w/one SFP Gb Port, four sgl-mode long-haul LC fiber ports, and two 10/100 RJ-45
6KP3V-G2SC	"G+2" module for 6K16V Switches, uses one 6K slot and provides one GBIC open transceiver port for a user-selectable GBIC Transceiver module, plus 2 100Mb 2km FX SC fiber ports. Includes front panel.
GBPMV-2OTX	Two-port Gigabit 6K module for 6K16V switches, provides two GBIC open transceiver ports.
GBIC-SXSC	GBIC transceiver module for use in GBPM-COTX, one SX port with multi-mode SC fiber connector
GBIC-LXSC10	GBIC transceiver module for use in GBPM-COTX, one LX port with single-mode SC 10Km
	Note: Single-mode GBICs are available at 10Km, 25Km, 40Km, and 70Km.
6KP2V-2GSX	Two-port one-slot Gigabit 6K module for 6K16V switches, uses one 6K slot & provides two Gigabit Fiber SXSC (1000BASE-SX multi-mode) ports. Includes front-panel sheet metal cover.
6KP2V-2GCU	Two-port one-slot Gigabit 6K module for 6K16V switches, uses one 6K slot and provides two Gigabit Copper auto-negotiating ports. Includes front-panel sheet metal cover.

GarrettCom®

Industrial Networking at Its Best™

GarrettCom, Inc.
47823 Westinghouse Drive
Fremont, CA 94539
PH: (510) 438-9071
FAX: (510) 438-9072
Email: mktg@garrettcom.com
Web: www.GarrettCom.com

Magnum 6K16V Configuration Guide

Magnum 6K16V Managed Fiber Switch, base unit, for vertical mounting. May be configured with a variety of 10/100/1000 Mb fiber and copper port connector types via selection from a family of port modules. 16 ports max. Wire speed filtering/ forwarding across all ports, 2 alarm contacts. Metal brackets for vertical wall/ panel mounting included. *Note: MNS-6K and MNS-6K-SECURE software are licensed for 6K switches.*
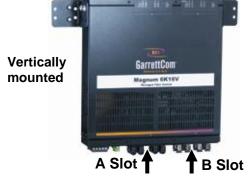
Step 1. Choose 6K16V chassis and power input type:

Model #	Base Unit, Description
6K16V	AC Power
6K16V-24VDC	24V (18-36) DC power
6K16V-48VDC	-48V (36-70) DC power
6K16V-125VDC	125V (88-300) DC power
6K16V-250VDC	250V (88-300) DC power

Vertically mounted

A Slot ↑   ↑ B Slot

Step 2. Choose 1 module for slot A and/or B (may be blank):
PoE module is desired, see **PoE Configuration Guide**.

Module Model #	10/ 100	10BASE -FL	100BASE- FX(MM)	100BASE- FX(SM)	Gigabit
6KP8V-RJ45	8				
6KP8V-45-2MT	6		2 (MTRJ)		
6KP8V-45-2SLC	6			2 (20km LC)	
6KP6V-RJ10ST	4	2 (ST)			
6KP6V-RJMST	4		2 (ST)		
6KP6V-RJMSC	4		2 (SC)		
6KP6V-RJSSC	4			2 (20km SC)	
6KP6V-RJSSCL	4			2 (40km SC)	
6KP8V-45MT	4		4 (MTRJ)		
6KP8V-45MLC	4		4 (LC)		
6KP8V-45SLC	4			4 (20km LC)	
6KP4V-F10ST		4 (ST)			
6KP4V-FLSTFX		2 (ST)	2 (ST)		
6KP4V-FXST			4 (ST)		
6KP4V-FXSC			4 (SC)		
6KP6V-MT10ST		2 (ST)	4 (MTRJ)		
6KP8V-MTRJ			8 (MTRJ)		
6KP8V-MLC			8 (LC)		
6KP8V-SLC				8 (20km LC)	
Gigabit Modules using GBICs (see Step 3)					
6KP3V-G2SC			2 (SC)		1 GBIC
GBPMV-COTX					1 GBIC
GBPMV-2OTX					2 GBIC
Gigabit Modules, fixed ports					
6KP2V-2GCU					2 CU
6KP5V-1CU4RJ	4				1CU
6KP3V-1CU2FXT			2 (ST)		1 CU
Gigabit Modules, fixed ports—Using Small form factor (SFP) transceivers					
6KP7V-1G2RJ4MLC, 6KP7V-1G2RJ4SLC, 6KP7V-1G2RJ4SLCL w/ 1 SFP Gb port, 2 10/100 RJ45 & 4 m-mode, sgl-mode or "long haul" sgl-mode fiber					
6KP7V-1GSFP6RJ	6				1 SFP
6KP2V-2GSFP					2 SFP
6KP2V-1GSFP1CU					1SFP, 1CU
6KP1V-1GSFP					1 SFP
6KP1V-1GCU					1 CU

Step 3 (Opt) Choose GBICs or SFPs for Gig Ports (if configured) in Slot A and/or B:

Model #	Description (Ports for GBPM-COTX / 6KP5V-G4RJ/ 6KP3V-G2SC)
GBIC-SXSC	One 1000BASE-SX port with m.m. SC fiber connector
GBIC-LXSC10	One 1000BASE-LX/LH port 1310nm s.m. SC 10Km
GBIC-LXSC25	One 1000BASE-LX/LH port 1310nm s.m. SC 25Km
GBIC-TP	One IEEE 802.3ab TP port, RJ-45 connector
GBIC-ZXSC40	One 1000BASE-ZX port 1550nm s.m. SC 40Km
GBIC-ZXSC70	One 1000BASE-ZX port 1550nm s.m. SC 70Km

Gb SFP fiber optic transceivers	
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 4. Choose options & extras:

Model #	Description
6KM-BLNK	Blank cover for 1 unused (A) module slot
DUAL-SRC	Two separate power inputs (24/ 48/125 or 250V)
MNS-6K-SECURE	Optional, licensed per switch for extra security
S-RING-KEY	Software, self-healing ring management
DIN-RAIL-VRM	DIN-Rail mounting brackets for one 6K16V
DIN-VM16-KIT	Variable-height DIN-Rail mounting kit
CONSOLE-CBL	Console attachment cable serial null Modem (aka X-modem) cable with DB9 connectors
CONSOLE-USB	As above, but with a USB connector
CONFORM05-CRM	Conformal coating, 5 mil, for moisture protection
CONFORM08-CRM	Conformal coating, 8 mil, for corrosive environ.

GarrettCom®
Industrial Networking at Its Best™