Magnum 6K32FC & 6K32FRC

Fiber-configurable Convection-cooled Industrial Managed Switch

Features

- **Convection-cooled 1U rack-mount package, for dusty and dirty industrial environments**

- **Provides four modular slots for configuration flexibility of up to 8 Gb ports or 16 standard fiber ports or 32 copper ports (some PoE)**

- **Energy-efficient thermal design enables operation at extended temperatures with high reliability**

- **Choice of Regular or "Reverse" case designs provide power and port cables in the front or in the rear**

- **Power input choices: 24VDC, -48VDC, 110-250VDC power, DC Dual Source, universal AC**

GarrettCom®

Industrial Networking at Its Best™

The Magnum™ 6K32F**C** Switch provides rack-mount space efficiency and rich fiber port configurability in a convection-cooled unit (no fans) for heavy duty industrial applications where the presence of dust and dirt may inhibit normal cooling. Moisture- and corrosion- protecting Conformal Coating is optional. New static thermal design techniques (patent pending) enable the 6K32FC to deliver high reliability even at extended operating temperatures. Special rack-mount cooling techniques include:

- internal heat barriers confine heat to areas where it is least detrimental
- large power supply heat sinks to dissipate the power heat loss
- aluminum case material used for efficient heat conduction & distribution
- perforated case areas enable some vertical air flow via convection
- cooling space above and below the unit in the rack, 1/2U top and bottom
- multiple heat sinks distribute heat from internal electronic components
- premium high-efficiency components used to minimize heat generation

The highest energy efficiency of any rack-mount industrial switch not only enables high reliability, but also makes the 6K32FC a "green" environmentally friendly product.

The four configuration slots in the Magnum 6K32FC provide the flexibility for network designers to configure up to sixteen 100 Mb standard ST or SC fiber ports, and/or some 10 Mb fiber ports, and/or one to 8 Gigabit ports, or some copper ports, or combinations including 100Mb SFF fiber ports. SFP, GBIC, and fixed gigabit ports can be configured for a variety of Gigabit fiber and copper cabling types and distances. Copper ports can optionally be Power-Sourcing PoE. There are over 30 modules for various port types and combinations to choose from.

Magnum 6K32FC Managed Switches come with LAN software support including SNMP management, Secure Web Management, IGMP, graphical user interface (GUI), redundant LANs support, and many network management security and ease-of-use features. See the Managed Networks Software (MNS-6K and MNS-6K-SECURE) datasheets for more details.

Magnum 6K32FCs are ideal for building a fiber-rich industrial network for use in harsh industrial applications in power utilities, plants and factories and mines, transportation, telecommunications, video surveillance and oil & gas facilities. The networks commonly include industrial IEDs, RTUs, HMI computers, routers, video surveillance cameras, smaller field switches, and other managed switches for multiple Gigabit backbone interconnections or redundancy.

Magnum 6K32FC Managed Switches have rugged metal cases for regular or "Reverse" rack-mounting, and auto-ranging power supplies for operation with standard AC power worldwide, or internal DC power supply choices. The 6K32FCs and all other Magnum products are designed and manufactured in the USA and have a three year warranty.

PERFORMANCE:

Fiber Ports, 100 Mb (multi-mode and sgl-mode)**:** Configurable in modules. Regular ST or SC at 4/module, or SFF (Small Form Factor) for high fiber port density, 8 per module. Each FDX or HDX, default is FDX mode
Fiber Ports, 10 Mb: Configurable, up to 4 ST ports max. per module, multi-mode or single-mode. Each port may be FDX or HDX, default is HDX
Gigabit Ports, 1000 Mb: Configurable, std. See selection of modules.
RJ-45 Ports: 100 or 10 Mb speed, full- or half-duplex mode, per port, individually determined.10/100 auto-negotiating & auto-cross, 32 ports max.
All Ports non-blocking:
Processing type: Store and Forward with IEEE 802.3x full-duplex flow control
System aggregate forward and filter rate: 11.9Mpps
Address table: 4K nodes, self-learning, with address aging
Packet buffers: 240 KB for 10 and 100Mb, 120KB for Gb
Latency: 6μs + packet time max (TX - TX, TX - FX, FX - FX, TX-G, G-G)

NETWORK STANDARDS:
IEEE 802.3z, 802.3ab, 802.1p: 100BASE-TX, -FX, 1000BASE-SX, -LX
Auto-negotiation and auto-crossover on TP, IEEE 802.3u
See MNS-6K and MNS-6K-SECURE datasheets for software, network security, redundant LANs management, GUI and other software features.

OPERATING ENVIRONMENT:
IEC 60068 Operating temp. per "Type Test" -40° to 185°F (-40° to 85°C)
UL 60950 "Component Parts" temperature rating: 140°F (60°C)
Storage: -40° to 185°F (-40°to 85°C),
Ambient relative humidity: 5% to 95% (non-condensing)
Altitude: -200 to 13000ft (-60 to 4000m)
Conformal coating (humidity protection) option: Request quote

RELAY CONTACTS FOR ALARMS (OPTIONAL):
Form C, one NC indicating internal power, one NC software controllable.

NETWORK CABLE CONNECTORS:
1000 Mb ports: standard SFPs and GBICs supported, see modules description
100 Mb Fiber ports connector options: multi-mode FX-MTRJ, LC, ST, SC;
 sgl-mode 20km LC, SC and ST, and 50km "long reach" sgl-mode LC, SC.
10 Mb Fiber port connector: multi-mode and single-mode ST
100 Mb Copper: Category 5 UTP/STP; 10 Mb: Cat. 3,4, 5 UTP/STP

AC POWER SUPPLY (INTERNAL):
AC Power Connector: IEC-type, male recessed, ON/OFF switch (optional)
Power Input, AC: 100 to 240 VAC, 47 to 63 Hz (auto ranging)
Power Consumption: 45 watts typical with 16 fully-loaded fiber ports, 30 watts typical for a copper-only 32-port model.

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)
Magnum 6K32FC 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.

DUAL POWER SUPPLIES (OPTIONAL)
Magnum 6K32FC models with 125VDC, 250VDC and 110VDC nominal power input may be ordered with Dual Power Supplies, load-sharing with software monitoring, for continuity of operation when either one of the two power supplies or their associated power input is inoperative.

MECHANICAL:
Enclosure: Rugged high-strength sheet metal. Suitable for 1U rack-mounting or stand-alone.
Rack-mounting brackets: 19" included; ETSI and 23" Telco optional.
Cooling Method: free convection, special (patent pending) thermal techniques
Dimensions: 1.70inHx17.0inWx9.0inD (4.32cmHx 43.2cmW x 22.9cmD)
Weight: rack-mount 5.0 lbs. (2.0 kg)

LED INDICATORS, 100 Mb and 10 Mb FIBER PORTS:
LK: Steady on when fiber link is operational.
ACT: On with port activity, FDX/HDX

LED INDICATORS PER RJ-45 PORT:
LK: On when twisted-pair link is operational.
ACT: Blinking with port activity. LK and ACT combined on fixed ports.
FDX/HDX: ON = full-duplex mode, OFF = half-duplex mode.
100/10 ON = 100Mb speed, OFF = 10Mb

AGENCY APPROVALS AND STANDARDS COMPLIANCE:
UL Listed (UL 60950), cUL, CE, Emissions meet FCC Part 15, Class A
IEC61850 EMC and Operating Conditions Class C for Power Substations
IEEE 1613 Class 2 Environmental Std for Electric Power Substations
NEBS Level 3 and ETSI Compliant for Carrier Central Offices
DNV certified
WARRANTY:
Three years   Made in USA

Ordering Information

Magnum 6K32FC Magnum 6K32FC Fiber-configurable Convection-cooled Managed Switch, base unit. Provides four port module slots which may be configured with a selection of 10/100/1000 Mb fiber and copper connector types, 8 ports max. each slot. For licensed management software, see applicable MNS-6K and MNS-6K-SECURE datasheets.
Magnum 6K32FRC "Reverse" model, same as Model 6K32FC except user ports and the power input connectors are in the rear. Two sets of LEDs (both rear and front) provide duplicate status data for viewing from either side.

Configuration Options: Magnum 6K32FC base unit has four port module slots, each of which may be configured with a module from below, max of 8Gb or 16 100Mb fiber or 32 10/100 copper (or Power Sourcing PoE) ports:

6KP8-45MT	"4+4" module for 6Ks, w/four 10/100 RJ-45 and four 100 Mb 2km multi-mode FX MTRJ connectors
6KP8-SLC	SFF Fiber module for 6K Switches, w/eight 100 Mb 15km single-mode FX LC connectors
6KP8-RJ45	TP Module for 6K Switches, w/eight 10/100 Mb auto-negotiating RJ-45 ports
6KP8-MTRJ	SFF Fiber module for 6K Switches, w/eight 100 Mb 2km multi-mode FX MTRJ connectors
6KP8-45SLC	"4+4" module for 6Ks, w/four 10/100 RJ-45 and four 100 Mb 20km single-mode FX LC connectors
6KP6-RJMST	"4+2" module for 6Ks, w/four 10/100 RJ-45 and two 100 Mb 2km multi-mode FX ST connectors
6KP4-F10ST	"2+2" 10 Mb fiber module for 6K Switches, with four 10 Mb 2km FL ST connectors
6KP6-RJSSC	"4+2" module for 6Ks, w/four 10/100 RJ-45 and two 100 Mb 20km single-mode FX SC connectors
6KP6-RJSSCL	"4+2" module for 6Ks, w/four 10/100 RJ-45 and two 100 Mb 40km single-mode FX SC connectors
6KP6-RJ10ST	"4+2" module for 6Ks, w/four 10/100 RJ-45 and two 10 Mb 2km FL ST connectors
6KP4-FXSC	"2+2" 100 Mb Fiber module for 6K Switches, w/four 100 Mb FX SC connectors.
6KP4-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
6KP2-2GSX	Two-port one-slot Gigabit 6K module for 6K Switches, uses one 6K slot and provides two Gigabit Fiber SXSC (1000BASE-SX multi-mode) ports. Includes front-panel sheet metal cover.
6KE-2GCU	Two-port one-slot Gigabit 6K module for 6K Switches, uses one 6K slot and provides two Gigabit Copper (1000BASE-T) auto-negotiating ports. Includes front-panel sheet metal cover.
6KP3-1CU2FXT	Three-port one-slot Gigabit 6K module for 6K32FC switches, uses one 6K slot and provides one Gigabit copper (1000BASE-T) auto-negotiating port and two 100Mb ST Fiber FX multi-mode ports.

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 6K32FC and 6K32FRC Configuration Guide

GarrettCom®
Industrial Networking at Its Best™

Magnum 6K32FC and FRC Managed Switches, base unit is fiber-configurable convection-cooled managed switch. Provides 4 modular slots for configuration flexibility of up to 8 Gb ports or 16 std fiber ports or 32 copper ports (some PoE). *Note: MNS-6K and MNS-6K-SECURE software are licensed for 6K's.*

Step 1. Choose 6K32FC or 6K32FRC chassis and power input type:

Model #	Base Unit, Description
6K32FRC	Reverse mount with AC Power
6K32FRC -24VDC	Reverse mount with 24V (18-36) DC power
6K32FRC -48VDC	Reverse mount with -48V (36-70) DC power
6K32FRC-125VDC	Reverse mount with 125V (88-300) DC power
6K32FRC-250VDC	Reverse mount with 250V (88-300) DC power
6K32FRC-2AC	Reverse mount w/ 2 internal AC power supplies
6K32FRC-2DC125	Reverse mount with 2 internal 125 DC power
6K32FRC-2DC250	Reverse mount with 2 internal 250 DC power

Model #	Base Units continued…
6K32FC	Front mount with AC Power
6K32FC-24VDC	Front mount with 24V (18-36) DC power
6K32FC-48VDC	Front mount with -48V (36-70) DC power
6K32FC -125VDC	Front mount with 125V (88-300) DC power
6K32FC -250VDC	Front mount with 250V (88-300) DC power

Step 2. Choose 1 module for slots A, B, C & D (some may be blank)
Note: If PoE module is desired, see PoE Configuration Guide:

Module Model #	10/100	10BASE-FL	100BASE-FX(MM)	100BASE-FX(SM)	Gigabit
6KP8-RJ45	8				
6KP8-45-2MT	6		2 (MTRJ)		
6KP8-45-2SLC	6			2 (20km LC)	
6KP6-RJ10ST	4	2 (ST)			
6KP6-RJMST	4		2 (ST)		
6KP6-RJMSC	4		2 (SC)		
6KP6-RJSSC	4			2 (20km SC)	
6KP6-RJSSCL	4			2 (40km SC)	
6KP8-45MT	4		4 (MTRJ)		
6KP8-45MLC	4		4 (LC)		
6KP8-45SLC	4			4 (20km LC)	
6KP4-F10ST		4 (ST)			
6KP4-FLSTFX		2 (ST)	2 (ST)		
6KP4-FXST			4 (ST)		
6KP4-FXSC			4 (SC)		
6KP6-MT10ST		2 (ST)	4 (MTRJ)		
6KP8-MTRJ			8 (MTRJ)		
6KP8-MLC			8 (LC)		
6KP8-SLC				8 (20km LC)	
Gb Modules, fixed ports--Using SFP transceivers (see Step 3)					
6KP7-1GSFP6RJ	One SFP Gigabit Port and Six 10/100 Mb RJ45 ports				
6KP7-1G2RJ4MLC, 6KP7-1G2RJ4SLC, 6KP7-1G2RJ4SLCL w/ 1 SFP Gb port, 2 10/100 RJ45 & 4 m-mode, sgl-mode or "long haul" sgl-mode fiber					
6KP5-1CU4RJ	4 10/100 RJ45			1 CU (fixed Gb copper)	
6KP2-2GSFP				2 SFP	
6KP2-1GSFP1CU				1SFP, 1CU	
6KP1-1GSFP				1 SFP	
6KP1-1GCU				1 CU	
Gigabit Modules using GBICs (see Step 3)					
6KP3-G2SC			2 (SC)		1 GBIC
GBPM-COTX					1 GBIC
GBPM-2OTX					2 GBIC
Gigabit Modules, fixed ports					
6KP2-2GCU					2 CU
6KP3-1CU2FXT			2 (ST)		1 CU

Step 3 (Opt) Choose SFPs or GBICs for Gig Ports

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

Model #	Description (Ports for GBPM-COTX / 6KP5-G4RJ/ 6KP3-G2SC)
GBIC-SXSC	One 1000BASE-SX port with m.m. SC fiber
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

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)
ALARM-TERMBLK	Alarm contacts, 1 power and 1 software
MNS-6K-SECURE	Optional, licensed per switch for extra security
S-RING-KEY	Software, self-healing ring management
RMB-23W	23" 'Telco' rack-mount kit (1U)
RMB-ETSI	ETSI rack-mount kit (1U)
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 environments