Product Bulletin

GarrettCom® Magnum 10KG Configurable Managed Switch with Timing

Next Generation industrial switch offers up to eight Gb ports and 16 100Mb ports with configurability and reliability.

The Magnum 10KG Switch Provides the Bandwidth and Advanced Port Configurability For Data-intensive Utility and Industrial Applications Such as the Smart Grid.

Features

- Next Generation industrial switch offers up to eight Gb ports and 16 100Mb ports with configurability and reliability

- Dual hot-swappable power supplies in a 1U or 1.5U rack-mount package

- Precision timing, full IEEE 1588v2 implementation

- Energy-efficient thermal design for maximum reliability

- Substation-Hardened, IEC 61850-3 compliant

Configurability and Reliability

The Magnum10KG Switch provides the bandwidth and advanced port configurability for data-intensive utility and industrial applications such as the Smart Grid. New advanced thermal design techniques (patent pending) enable the 10KG to deliver high reliability and configurability even at extended operating temperatures. Special rack-mount cooling features include Thermal Fins for extra heat dissipation and internal heat transfer techniques that use the case as a heat sink. Cooler operation of internal electronic components leads to longer life-time and increased reliability.

Smart Grid Optimization

Next Generation industrial switch features, especially for power utility facilities in the Smart Grid, importantly include high precision IEEE 1588v2 timing synchronization with precision as low as single-digit nanoseconds. The Magnum 10KG provides a new advanced level of 1588v2 timing features and accuracy, using integrated hardware and software. Advanced timing is supported on 100Mb and Gb ports, and is configurable on both fiber and copper port types.

GarrettCom Magnum 10KG - Configurable Managed Switch

Hot-Swappable Power Supplies

The Magnum 10KG also offers configurable dual hot-swappable power supplies for redundancy and increased reliability. Both high voltage AC/DC and low voltage DC hot-swappable power supplies are configurable in the Magnum 10KG. Different power supply types may be selected for each of the two hotswappable slots. Software monitors each power supply, and can signal when a power supply module swap is needed. The swap-out can readily be done while the 10KG Switch continues in operation.

Power-Sourcing PoE

The eight port configuration slots in the Magnum 10KG provide the flexibility for network designers to configure up to eight fiber or copper Gb ports and up to 16 100 Mb SFF fiber or copper ports. Copper ports can optionally be Power- Sourcing PoE. Modules may be configured for regular port types, IEEE 1588 v2 timing, or combinations.

Secure Management Software

Magnum 10KG Managed Switches come with field-proven MNS-6K and MNS-6K-SECURE Management Software. MNS-6K features include LAN software support including SNMP management, IPv6, Secure Web Management, IGMP, graphical user interface (GUI), redundant LANs support, and many network management security and ease-of-use features.

Rugged Design

Magnum 10KG 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. Moisture and corrosion-protecting Conformal Coating is optional. The Magnum 10KG is designed and manufactured in the USA and is backed by a five year warranty.

Product Specifications

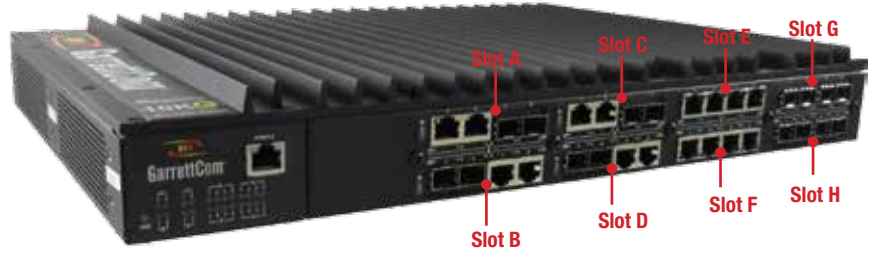| Type	10KG
Product Description	Magnum 10KG Fiber-configurable Convection-cooled Managed Switch, base unit. Provides 10 modular slots for configuration flexibility of up to eight Gb ports and 16 copper or fiber ports. Includes 2 slots for Hot-Swap Power Supplies; Case with thermal fins.
Mechanical	
Enclosure	Rugged high-strength sheet metal. 1.5U rack-mounting or stand-alone
Rack-mounting Brackets	19" included
Cooling Method	Free convection, special (patent pending) thermal techniques
Dimensions	2.63in H (with thermal fins) x17.5in W x 12.in D (4.3cm H x 44.5cm W x 30.7cm D)
Weight	14.2 lbs. (6.5 kg)
Network Standards	
Ethernet	IEEE 802.3z, 802.3ab, 802.1p: 100BASE-TX, -FX, 1000BASE-SX, -LX
Auto-negotiation and Auto-crossover	TP, IEEE 802.3u
IEEE 1588v2	Compliant
IPv6	Compliant
Performance	
Fiber Ports, 100 Mb (multi-mode and single-mode)	Configurable in modules. Regular ST or SC at 2/module, or SFF (Small Form Factor) for high fiber port density, 4 per module. Each FDX or HDX, default is FDX mode
Gigabit Ports, 1000 Mb	Configurable, std. See configuration guide for 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, 16 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: 8K nodes, self-learning, with address aging Packet buffers: 512KB for 10 and 100Mb, 128KB for Gb Latency: 6µs + packet time max (TX - TX, TX - FX, FX - FX, TX-G, G-G)
AC (IEC-type, Male Recessed)	
Power Input, AC	100 to 240 VAC, 47 to 63 Hz (auto ranging)
Power Consumption	30 watts typical when fully loaded

Product Specifications (continued)

DC Dual Power Source (optional)	
When non-hot-swappable power supplies are ordered, the Magnum 10KG 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 24/48VDC.	

Hot-Swappable Power Supply Options (Up to 2 of the following may be chosen)	
High (H) Nominal	Input 90 to 250V AC/DC
Low (L) Nominal	Input 22VDC to 60VDC
	(Standard Terminal Block: "-, GND, +", Power Consumption: 55 watts when fully loaded with 8 Gb ports and 16 100Mb fiber.

LED Indicators, 100 Mb and 10 Mb Fiber Ports	
L/H	Steady on when fiber link is operational and blinking for data traffic
F/H	ON = full-duplex mode, OFF = half-duplex mode

LED Indicators, per RJ-45 Port	
L/A	Steady on when fiber link is operational and blinking for data traffic
F/H	ON = full-duplex mode, OFF = half-duplex mode

Relay Contacts for Alarms (except PoE version)	
Two Alarm Contact	HW & SW alarms are normally open until the unit is powered and software started. Under normal operation they are closed. Form C hardware alarm will be opened with 1) any power supply loss and 2) fan failures. Form C software alarm will be opened when any pre-defined software event occurs. For PoE versions: One software controllable Form C alarm with NC/NO.

Operating Environment	
Operating Temperature	IEC 60068 Operating temp. per "Type Test" -40° to 185°F (-40° to 85°C)
Temperature Rating (components)	UL 60950 140°F (60°C)
Storage Temperature	-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)	Request quote

Network Cable Connectors	
1000 Mb Ports	Standard SFPs and GBICs supported, see modules description
100 Mb Fiber Ports	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 Ports	Multi-mode and single-mode ST
100 Mb Copper Ports	Category 5 UTP/STP; 10 Mb: Cat. 3,4, 5 UTP/STP

Agency Standards Approval and Compliance	
UL/cUL 60950, EN55022 FCC Part 15	CE, EMC & ENV
IEC61850-3	EMC and Environmental Operating Conditions Class C for Power Substations
IEEE 1613 Class 2	Environmental Standard for Electric Power Substations
NEMA TS-2	Traffic Control
EN50155	Railways

Warranty	
Warranty	Five Years

Magnum 10KG Configuration Guide

Magnum 10KG Managed Switch

Base unit is configurable hardened managed switch. Provides eight modular slots for configuration flexibility of up to eight Gb ports and 16 100Mb fiber or copper ports. Optional dual hot-swap power supplies.

Step 1. Choose 10KG chassis and power input type.	
Model No.	**Description, Base Unit of Magnum 10KG Managed Switch**
10KG-AC	Front mount w/ worldwide AC power (100-240V), Fan-cooled chassis
10KG-H	Front mount with AC/DC power (90-250V)
10KG-HH	Front mount with two fixed AC/DC power (90-250V)
10KG-HL	Front mount with one "H" (90-250V AC/DC) and one "L" (24/48VDC) fixed power supplies.
10KG-HSPHH	Front mount, incl two slots for "H" (90-250V AC/DC) Hot-Swap Power Supply
10KG-HSPHL	Front mount, incl 2 slots for one "H" (90-250V AC/DC) and one "L" (24/48VDC) Hot-Swap Power Supply
10KG-HSPLL	Front mount, incl two slots for "L" (24/48VDC) Hot-Swap Power Supply
10KG-L	Front mount with 24/48VDC power
10KG-LL	Front mount with two "L" (24/48VDC) fixed power supplies.
With Thermal Fins	
10KG-AC-TF	Front mount w/ worldwide AC power (100-240V); thermal fins. Fan-cooled chassis.
10KG-H-TF	Front mount with AC/DC power (90-250V); thermal fins
10KG-HH-TF	Front mount with two fixed AC/DC power (90-250V); thermal fins
10KG-HL-TF	Front mount with one "H" (90-250V AC/DC) and one "L" (24/48DC) fixed power supplies; thermal fins
10KG-HSPHH-TF	Front mount with two "H"(90-250V AC/DC) Hot Swap power slots
10KG-HSPHL-TF	Front mount, incl two slots for one "H" (90-250V AC/DC) and one "L" (24/48VDC) Hot-Swap Power Supply; thermal fins
10KG-HSPLL-TF	Front mount w/ two slots for "L" (24/48VDC) Hot-Swap PS; thermal fins
10KG-L-TF	Front mount with 24/48DC power; thermal fins
10KG-LL-TF	Front mount with two "L" (24/48VDC) fixed power supplies; thermal fins
Reverse	
10KGR-AC	Reverse mount w/ worldwide AC power (100-240V). Fan-cooled chassis.
10KGR-H	Reverse mount with AC/DC power (90-250V)
10KGR-HH	Reverse mount with two fixed AC/DC power (90-250V)

Model No.	Description
10KGR-HL	Reverse mount with one "H" (90-250V AC/DC) and one "L" (24/48VDC) fixed power supplies
10KGR-HSPHH	Rev. mount, incl two slots for "H" (90-250V AC/DC) Hot-Swap Power Supply
10KGR-HSPHL	Reverse mount, incl two slots for one "H" (90-250V AC/DC) and one "L" (24/48VDC) Hot-Swap Power Supply
10KGR-HSPLL	Rev. mount, incl two slots for "L" (24/48VDC) Hot-Swap Power Supply
10KGR-L	Reverse mount with 24/48VDC power
10KGR-LL	Reverse mount with two "L" (24/48VDC) fixed power supplies
Reverse with Thermal Fins	
10KGR-AC-TF	Reverse mount w/ worldwide AC power (100-240V); thermal fins, Fan-cooled chassis
10KGR-H-TF	Reverse mount with AC/DC power (90-250V); thermal fins
10KGR-HH-TF	Reverse mount with two fixed AC/DC power (90-250V); thermal fins
10KGR-HL-TF	Reverse mount with one "H" (90-250V AC/DC) and one "L" (24/48DC) fixed power supplies; thermal fins
10KGR-HSPHH-TF	Reverse mount w/ two "H"(90-250V AC/DC) Hot Swap power slots
10KGR-HSPHL-TF	Reverse mount, incl two slots for one "H" (90-250V AC/DC) and one "L" (24/48VDC) Hot-Swap Power Supply; thermal fins
10KGR-HSPLL-TF	Rev. mount w/ two slots for "L" (24/48VDC) Hot-Swap Power Supply; thermal fins
10KGR-L-TF	Reverse mount with 24/48VDC power; thermal fins
10KGR-LL-TF	Reverse mount with two "L" (24/48VDC) fixed power supplies; thermal fins
PoE Models	
10KGP-HSPLL	Same as 10KG-HSPLL but supports PoE.
10KGP-HSPLL-TF	Same as 10KG-HSPLL-TF but supports PoE.
10KGPR-HSPLL	Same as 10KGR-HSPLL but supports PoE.
10KGPR-HSPLL-TF	Same as 10KGR-HSPLL-TF but supports PoE.
10KGP-L	Same as 10KG-L but supports PoE.
10KGP-L-TF	Same as 10KG-L-TF but supports PoE.
10KGPR-L	Same as 10KGR-L but supports PoE.
10KGPR-L-TF	Same as 10KGR-L-TF but supports PoE.
10KGP-LL	Same as 10KG-LL but supports PoE.
10KGP-LL-TF	Same as 10KG-LL-TF but supports PoE.
10KGPR-LL	Same as 10KGR-LL but supports PoE.
10KGPR-LL-TF	Same as 10KGR-LL-TF but supports PoE.

Step 2. If "HSP" base unit with hot swappable power supplies is selected, choose up to two power supply modules. For "-HF" or "-LF" models below, ALSO choose KT-RFAN option (see step 5) *Note, for PoE, every power supply chosen must be -48V.

Model No.	Description, Base Unit of Magnum 10KG Managed Switch
HSPM-H	AC or DC power (90-250V)
HSPM-HF	AC or DC power (90-250V) w/internal cooling fan
HSPM-L	24/48 DC power (22-60V) Note: for PoE at -48VDC: Input should be -44 to -57VDC
HSPM-LF	24/48 DC power (22-60V) w/ internal cooling fan; Note: for PoE at -48VDC: Input should be -44 to -57VDC
10K-PSBLNK	Blank cover for one hot-swap power supply slot

Step 3. Choose modules for Gigabit Slots A, B, C, and D (may be blank).

Module No.	Gigabit Modules for Slots A - D
10-2RJSFP	Two combo/dual media ports for copper RJ45 10/100/1000 Mb or SFP. Ports are auto media detect and may use either RJ45 or SFP module. Includes 1588 timing capability.
Gigabit SFP Fiber 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
100Mb SFP Transceivers	
SFP100P-FXMM2	100FX Fiber Optic SFP transceiver, multi-mode, 2Km
SFP100P-FXSM20	100FX Fiber Optic SFP transceiver, single-mode, 20Km
SFP100P-FXSM40	100FX Fiber Optic SFP transceiver, single-mode, 40Km
SFP100P-RJ45	100Mb Copper SFP transceiver, 10/100 auto-negotiating

Magnum 10KG Configuration Guide (continued)

Step 4. Choose 1 port module for up to 4 slots (E – H) (some may be blank) Configure timing in slots E – H in pairs only i.e. E, F or G, H etc…

For example, if slot E has a timing module, then slot F must have a timing module or be unpopulated. If slot G has timing, then slot H must have timing or be unpopulated.

Module No.	1588 Timing	10/ 100	100BASE-FX(MM)	100BASE-FX(SM)
10K4-RJ45		4		
10K4T-RJ45	X	4		
10K4PX-RJ45*		4 (PoE+ 802.3at)		
10K4-MLC			4 (LC)	
10K4T-MLC	X		4 (LC)	
10K4-SLC				4 (20km LC)
10K4T-SLC	X			4 (20km LC)
10K4-SLCL				4 (40km LC)
10K4T-SLCL	X			4 (40km LC)
10K4-MTRJ			4 (MTRJ)	
10K4T-MTRJ	X		4 (MTRJ)	
10K2-MSC			2 (SC)	
10K2T-MSC	X		2 (SC)	
10K2-MST			2 (ST)	
10K2T-MST	X		2 (ST)	
10K2-SST				2 (20km ST)
10K2T-SST	X			2 (20km ST)
10K2-SSC				2 (20km SC)
10K2T-SSC	X			2 (20km SC)
10K2-SSCL				2 (40km SC)
10K2-F10ST	Module with two multi-mode 10Mb ST ports			
10K4-FXSFP	SFP module w/ 4 100Mb SFP open xcvr slots			

* Configure in PoE-supporting base units only, up to sixteen 802.3af ports per 10KG

100Mb SFP Transceivers	
SFP100P-FXMM2	100FX Fiber Optic SFP transceiver, multi-mode, 2Km
SFP100P-FXSM20	100FX Fiber Optic SFP transceiver, single-mode, 20Km
SFP100P-FXSM40	100FX Fiber Optic SFP transceiver, single-mode, 40Km
SFP100P-RJ45	100Mb Copper SFP transceiver, 10/100 auto-negotiating

Step 5. Choose Options and Extras

Model No.	Base Unit Description
KT-RFAN	Removeable fan unit for extra cooling of 10-series products. Optional for 0 to 16 fiber ports, required for 18 to 36 fiber ports.
CONSOLE-CBLQD	Console attachment cable serial null Modem cable with one RJ-45 for 10K and a DB-9
CONSOLE-CBLQU	Console attachment cable serial null Modem cable with one RJ-45 for 10K and a USB
MNS-6K-SECURE-LIC1	Optional, licensed per switch for extra security
S-RING-KEY	Software, optional self-healing redundant ring management
CONFORM05-RMOD	Conformal coating, 5 mil, for moisture protection
CONFORM08-RMOD	Conformal coating, 8 mil, for corrosive environments
DUAL-SRC-L	Provides two separate 24/48VDC power inputs (the unit will operate from either or both) to accommodate redundant 24/48V installations for increased availability and ease of DC power source maintenance. Includes internal diode protection to prevent feedback. Order this option as a line item, for factory configuration. The unit will have its model number changed to append "-DSRC". ONLY available on "L", "LL" or "HSPLL" chassis options. Note - not needed for "LL" PoE chassis which are inherently dual-source.