

### Overview

Designed for the c-Class BladeSystem enclosure, the HP 1:10Gb Ethernet BL-c Switch delivers sixteen 1Gb downlinks, four 1Gb uplinks along with 3 10Gb uplinks (CX4, XFP) and a 10Gb cross-connect in a single bay form factor. A robust set of industry standard Ethernet Layer 2 switching and Layer 3 routing functions, QOS, security and High Availability features round out this extremely flexible and capable switch. The HP 1:10Gb Ethernet BL-c Switch dramatically reduces cabling, power and cooling requirements compared to stand-alone switches, while providing over 34Gb of uplink bandwidth to handle the most demanding applications. A combination of excellent performance which includes low latency, wire speed performance for Layer 2 and Layer 3 packets and low power consumption makes the HP 1:10Gb Ethernet BL-c Switch an ideal solution for any large data center environment.

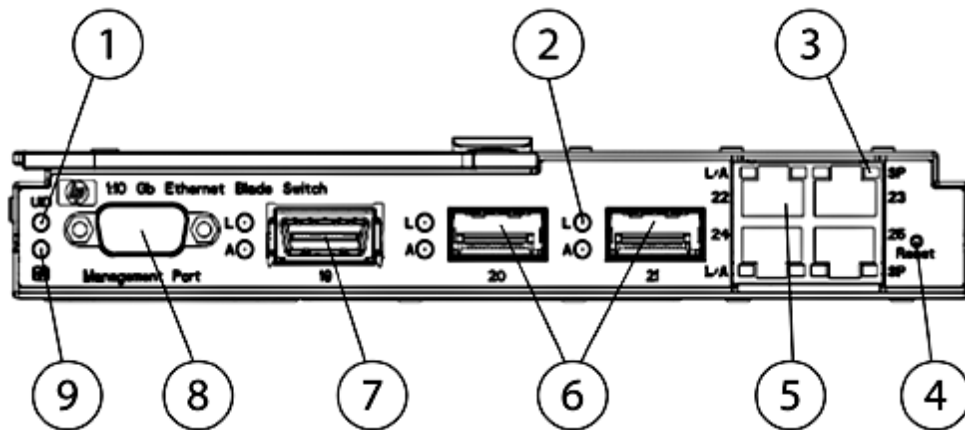


Figure 1 HP 1:10Gb Ethernet BL-c Switch Front Bezel

- |                           |                                |
|---------------------------|--------------------------------|
| 1. UID LED                | 6. 10Gb XFP Module Cages       |
| 2. Link Activity LEDs     | 7. 10Gb CX4 Uplink Port        |
| 3. Speed LEDs             | 8. DB-9 Serial Management Port |
| 4. Reset Button           | 9. Health LED                  |
| 5. RJ-45 1Gb Uplink Ports |                                |

### What's New

- Support for HP ProLiant BL680 G5 server blade
- Support for HP BladeSystem c3000 Enclosure

### Overview

#### At A Glance

##### Performance:

- Non blocking architecture
- Wire speed switching on all four 10/100/1000T RJ-45 uplink ports
- Wire speed switching on all three 10Gb uplink ports
- Wire speed switching on all sixteen 1Gb server ports
- 178.5 millions pps (full duplex)
- Greater than 1:1 downlink to uplink bandwidth ratio
- Store and Forward Switching

##### Management:

- Offers simplified management through two CLI options - Alteon or iSCLI
- Can be managed through HTTP, HTTPS, SNMP, and Blade Network's BladeHarmony Manager

##### Security:

- Robust ACLs provide maximum security.
- Port security based on 802.1x limits access to unwanted users
- Secured access through SSH and HTTPS (SSL)
- Offers RADIUS Authentication
- Traffic can be forwarded between VLANs (802.1Q) through IP forwarding-preventing traffic from being exposed unnecessarily to the outside network
- Offers TACACS+ Authentication

Models

Models	
HP 1:10Gb Ethernet BL-c Switch	438031-B21

Compatibility

HP ProLiant Servers	HP ProLiant BL460c
	HP ProLiant BL465c
	HP ProLiant BL480c
	HP ProLiant BL680c G5
	HP ProLiant BL685c
	HP ProLiant BL860c
ProLiant BL c-Class	HP BladeSystem c3000 Enclosure
Server Blade Enclosures	HP BladeSystem c7000 Enclosure

### Standard Features

Required Network Cabling	10Base-T	Categories 3, 4 or 5 UTP (100 meters) EIA/TIA-568 100-ohm STP (100 meters)
	100Base-TX	Category 5 UTP (100 meters) EIA/TIA-568 100-ohm STP (100 meters)
	1000Base-T	Category 5 UTP (100 meters) EIA/TIA-568 100-ohm STP (100 meters)
	10Gb	Multimode fiber cable; 62.5/125 or 50/125 microns Singlemode fiber cable: 9/125 micron
		The following CX4 cable lengths have been qualified and can be purchased directly from HP. Please see the Related Options section of this QuickSpecs. HP BLadeSystem c-Class.5m 10-GbE CX4 Cable HP BLadeSystem c-Class 1m 10-GbE CX4 Cable HP BLadeSystem c-Class 15m 10-GbE CX4 Cable

### Service and Support

This product is covered by a global limited warranty and supported by HP Services and a worldwide network of HP Authorized Channel Partners. Hardware diagnostic support and repair is available for three years from date of purchase. Support for software and initial setup is available for 90 days from date of purchase. Additional support may be covered under the warranty or available for an additional fee. Enhancements to warranty services are available through HP Care Pack services or customized service agreements.

The HP 1:10Gb Ethernet BL-c Switch Limited Warranty includes 1 year Parts, 1 year Labor, 1-year on-site support.

Care Pack services provide a range of life cycle support options that let you choose the service levels that meet your business requirements, from basic to mission-critical.

A full range of HP Care Pack hardware and software services are available including:

- Installation and start up
- Education courses
- Extended onsite hardware coverage hours from same business day 13 hours, 5 day to 24 hours, 7 days call window with options including 4-hour response or 6-hour Call To Repair
- Comprehensive range of software technical support for Microsoft, Linux, ProLiant Essentials and VMware-based IT solutions helping to deliver high level of application availability. Response times range from 30 mins for critical problems to 2 hours.
- System Management, Performance Services and Mission Critical Support Solution

HP Care Pack services for the c7000 and c3000 Enclosure cover the enclosure, power supplies and fans. HP qualified rack options are covered by these services when installed within the same rack. HP supported c-Class enclosure devices including pass thru, Ethernet interconnect and virtual connect modules are also covered by the c7000 and c3000 enclosure Care Pack services.

**NOTE:** For more information on HP Care Pack services, contact any of our worldwide sales offices or resellers or visit our worldwide Web site on the internet at: <http://www.hp.com/hps/carepack>

**NOTE:** For more complete information on HP Services offerings, customers and resellers, please visit us at: <http://www.hp.com/hps>

**NOTE:** Additional information regarding worldwide limited warranty and technical support is available at: <http://h18004.www1.hp.com/products/servers/platforms/warranty/index.html>

### Related Options

HP 10-GbE CX4 Cables	HP BLadeSystem c-Class .5m 10-GbE CX4 Cable	444477-B21
	HP BLadeSystem c-Class 1m 10-GbE CX4 Cable	444477-B22
	HP BLadeSystem c-Class 15m 10-GbE CX4 Cable	444477-B27
XFP Options	HP SR XFP Option Kit	443756 B21
	<b>NOTE:</b> Each kit contains a single 850nm SR XFP fiber module. Only HP supplied XFP modules will operate in the HP 1:10Gb Ethernet BL-c Switch.	
	HP LR XFP Option Kit	443757 B21
Service and Support Offerings	<b>NOTE:</b> Each kit contains a single 1310nm LR XFP fiber module. Only HP supplied XFP modules will operate in the HP 1:10Gb Ethernet BL-c Switch.	
	<b>NOTE:</b> The HP Care Pack service part numbers below for ProLiant BL c-Class server blades, cover the server blade and all HP branded hardware options qualified for the server, purchased at the same time or afterwards, internal to the server.	
	<b>Hardware Services On-site Service</b>	
	4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years, Electronic	UE458E
	4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UE459E
	6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UE460E
	<b>Support Plus 24</b>	
	Onsite Hardware support 24x7, 4-Hour response and Microsoft O/S Software Technical support offsite, onsite at HP's discretion, 24x7 2-Hour response time including HP holidays, Electronic	UE473E
	<b>NOTE:</b> HP Care Pack services for the c7000 and c3000 Enclosure cover the enclosure, power supplies and fans. HP qualified rack options are covered by these services when installed within the same rack. HP supported c-Class enclosure devices including pass thru, Ethernet interconnect and virtual connect modules are also covered by the c7000 and c3000 enclosure Care Pack services.	
	<b>NOTE:</b> SAN/Fabric switches for the HP c-Class BladeSystem are not covered under the c7000 and c3000 enclosure Care Packs, SAN/Fabric switches carry separate Care Packs. SAN/Fabric Switch Care Pack service level support should always be uplifted to match existing storage or server service level.	
	<b>Hardware Support Services On-site Service</b>	
	Next Business Day On-site Service, 5-Day x 9-Hour Coverage, 3 Years, Electronic -	UE477E
	<b>NOTE:</b> Uplifts the Ethernet devices to the same level of warranty as the c-class enclosure	
	4-Hour On-site Service, 5-Day x 13-Hour Coverage, 3 Years, Electronic	UE478E
	4-Hour On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UE479E
	6-Hour Call to Repair, On-site Service, 7-Day x 24-Hour Coverage, 3 Years, Electronic	UE480E
	<b>Installation &amp; Start-up Services</b>	
	HP BladeSystem c-Class Infrastructure Installation and Startup Service, Electronic	UE602E
	HP BladeSystem Enhanced Network Installation and Startup Service, Electronic	UE603E
	ProLiant BL c-Class Blade Server Hardware Installation, Electronic	UE493E
	ProLiant BL c-Class Enclosure and Server Blade Hardware Installation, Electronic	UE494E
	<b>NOTE:</b> For more information, customer/resellers can contact <a href="http://www.hp.com/services/ bladesystems services">http://www.hp.com/services/ bladesystems services</a>	

Technical Specifications

Shipping Dimensions	Length	290 mm (11.42 in.)	
	Width	368 mm (14.49 in.)	
Shipping Weight	Height	60 mm (2.36 in.)	
		2.0 Kg (4.41 lbs)	
Product Specifications Hardware	Performance	34 Gbps external port bandwidth per BladeSystem enclosure (68 Gbps full duplex)	
		Forwarding rate 1.5 million pps per Gigabit port, (64-byte packets) and 14.8 million pps per 10 Gig port	
		Non-blocking, full-wire speed for all connections Auto-MDI/MDIX, auto-negotiation and auto-sensing with full-duplex support.	
		Forwarding Mode	Store and forward
		MAC Addresses	Supports 16K MAC addresses per switch in a BladeSystem Enclosure
		Forwarding Table Age Time	1 to 1,000,000 seconds (default: 300 seconds)
		(Maximum age)	
		Jumbo Frame Support	9278 Byte
		Multicast Groups	1000
		Memory	256 MB Main, 64MB flash and 1MB packet buffer per interconnect switch
Connectors and Cabling	Connector	4 RJ-45	
		2 10Gb XFP Module cages	
		1 10Gb CX4	
		1 DB-9 Management	
		FCC Class A	
		ICES-003 Class A	
		AS/NZS 3548 Class A	
		VCCI Class A	
		Cable Support	
Network Transfer Rate	Network Transfer Rate	10 Base-T (half-duplex)	10 Mbps
		10 Base-T (full-duplex)	20 Mbps
		100 Base-TX (half-duplex)	100 Mbps
		100 Base-TX (full-duplex)	200 Mbps
		1000 Base-TX (half and full-duplex)	2000 Mbps
		10Gb (full duplex)	20000 Mbps
		For the front panel Ethernet ports, there are 2 LEDs per port.	
		RJ-45 Port Speed LED	RJ-45 and 10 Gb Link/Activity LED
		Off	10 Mbps
		Green	100 Mbps
Indicators	Indicators	Amber	1 Gbps
		Solid Green	Link
		Blinking	Activity
Dimensions	Dimensions	Length	10.5 in (267.7 mm)
		Width	7.5 in (192.79 mm)
		Height	1.1 in (27.94 mm)
Weight	Weight	1.7 Kg (3.7 lbs.)	
Environmental Ranges	Environmental Ranges	Temperature Range	
		Operating	50° to 95° F (10° to 35° C)
		Non-operating	-40° to 158° F (-40° to 70° C)
		Relative Humidity (non-condensing)	Operating 5% to 95%

### Technical Specifications

	<b>Power Specification</b>	<b>Power Requirements</b>	12VDC: 4.0A, 50 W maximum (per interconnect switch)
<b>Product Specifications Software</b>	<b>Security Features</b>	<b>SSHV2, TACACS and TACACS+</b> VLANs can be configured to provide segregation for data - improving bandwidth, performance and limiting traffic to its designated domains. The Switch also provides secured access through SSH v2, protecting against IP spoofing as well as DNS spoofing. Support of HTTPS, RADIUS TACACS and TACACS+ enables users to meet their security requirements.	
	<b>Spanning Tree Features</b>	802.1d, 802.1w, 802.1s Industry standard Spanning Tree provides redundancy and the loop avoidance capabilities to keep the network not only up, but operating at peak performance. Based on the industry standard 802.1w, Rapid Spanning Tree Protocol (RSTP) offers fast convergence - reducing packet loss and downtime in high-availability and high resilient networks. Industry-standard based RSTP offers instant failover to secondary links in an unlikely event of primary link failure. This switch also offers Multiple Spanning Tree Protocol (MSTP; 802.1s) for seamless integration into networks running 802.1s. Multiple Spanning Tree enables networks to utilize individual uplinks for separate VLANs thus improving the overall performance of the network. Up to 32 Spanning Tree Groups (STGs) are supported.	
	<b>Trunking Features</b>	802.3ad Reduced downtime in an unlikely event of link failure by supporting link aggregation protocol. This link aggregation is compatible with Cisco Etherchannel® thus providing seamless integration into Cisco® based networks.	
	<b>VLAN Features</b>	Up to 1000 VLANs (802.1Q) can be configured to provide segregation for data - improving bandwidth, performance and limiting traffic to its designated domains.	
	<b>Management Features</b>	This switch provides multiple easy-to-use configuration and management options. For compatibility, the switch offers the same Alteon CLI as the GbE2 family of switches. This switch also uses an industry standard network administrator CLI (comparable to Cisco®). A Web-based management interface enables administrators to easily configure the most advanced features such as Rapid Spanning Tree, Uplink Failure Detection and SNMP management by pointing and clicking. The switch also enables sophisticated administrators to configure and manage the switch through SNMP. Full Support is provided for SNMP v1v2 and v3.	
	<b>QoS Features</b>	Data can be classified in different priority queues to ensure maximum bandwidth availability for time sensitive and mission critical traffic. Data can be prioritized based on 802.1p CoS and DSCP. Data can be easily reclassified from 802.1P to DSCP or from DSCP to 802.1. The HP 1:10Gb Ethernet BL-c Switch adheres to a strict queue mechanism to ensure important business-sensitive traffic is delivered ahead of other traffic.	

### Technical Specifications

#### Layer 3 Features

- IP Forwarding enables traffic to be forwarded between VLANs without the need of an external router or Layer 3 switch. This reduces traffic in the core network by making Layer 3 routing decisions within the BladeSystem enclosure
- 256 IP interfaces
- 4096 ARP entries
- 2048 Dynamic Route entries
- Global default route
- Static routing support with 128 routing table entries
- Dynamic routing support with entries in routing table
- Dynamic Routing protocol
- RIP v1
- RIP v2
- OSPF
- VRRP (Virtual Router Redundancy Protocol) to maximize high availability in complex network environments

#### Standards Support

- Compliance
- IEEE 802.3
- 802.3u
- 802.3ab
- 802.1d
- 802.1p
- 802.3ac
- 802.3ad (Static), and 802.1Q
- 802.3x
- 802.1x
- SNMP v1 (RFC 1157)
- RMON v1 (RFC 1757) groups 1, 2, 3, and 9
- MIB-II (RFC 1213)
- Bridge MIB (RFC 1493)
- Interface Group MIB (RFC 2863)
- Ethernet MIB (RFC 1643)
- 802.1Q Extended Bridge MIB (RFC 2674)
- Entity MIB (RFC 2037)
- SNMP Trap Convention (RFC 1215)
- Bridge Trap (RFC 1493)
- Remote Monitoring Traps (RFC 1757)
- and HP Enterprise Switch MIBs and Environmental Traps
- IGMP v1 (RFC 1112)
- IGMP v2 (RFC 2236)
- IGMP v3 (RFC 3376)
- SNMP (RFC 1361)
- Telnet (RFC 854)
- TFTP client (RFC 783)
- BootP client, (RFC 2132), and XModem
- QoS (RFC 2474 and RFC 2475)

The HP 1:10Gb Ethernet BL-c Switch uses the Differentiated Services (DiffServ) architecture to provide QoS functions. DiffServ is described in IETF RFCs 2474 and 2475.



### Technical Specifications

<b>Safety and Compliance</b>	TUV to UL 60950-1, and CAN/CSA C22.2 No. 60950-1 and to EN 60950-1
<b>Safety Certifications</b>	CE Marking RoHS 5/6 compliant

<b>Electromagnetic Emissions Certifications</b>	FCC Part 15 Class A
<b>FCC Part 15 Class A</b>	EN 55022: 1998 (CISPR22) EN 55024: 1998 (CISPR24) VCCI Class A AS/NZS 3548 Class A CE CNS 13438 Class A MIC MIC

<b>Environment-friendly Products and Approach</b>	<b>End-of-life Management and Recycling</b>	Hewlett-Packard offers end-of-life HP product return, trade-in, and recycling programs in many geographic areas. For trade-in information, please go to <a href="http://www.hp.com/go/green">http://www.hp.com/go/green</a> . To recycle your product, please go to: <a href="http://www.hp.com/go/green">http://www.hp.com/go/green</a> or contact your nearest HP sales office. Products returned to HP will be recycled, recovered or disposed of in a responsible manner.
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The EU WEEE directive (2002/95/EC) requires manufacturers to provide treatment information for each product type for use by treatment facilities. This information (product disassembly instructions) is posted on the Hewlett Packard web site at: <http://www.hp.com/go/green>. These instructions may be used by recyclers and other WEEE treatment facilities as well as HP OEM customers who integrate and re-sell HP equipment.

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