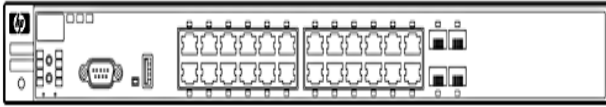


# QuickSpecs

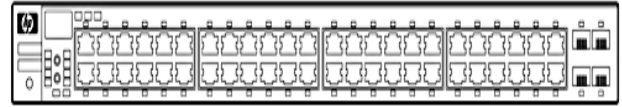
## HPE 3500 and 3500 yl Switch Series

### Overview

### HPE 3500 and 3500 yl Switch Series



**HP 3500-24G-PoE yl Switch**



**HP 3500-48G-PoE yl Switch**

### Models

HP 3500-48G-PoE+ yl Switch

J9311A

HP 3500-24G-PoE+ yl Switch

J9310A

### Key features

- Advanced access layer and small distribution
- Enterprise-class performance and security
- Intelligent edge feature set with L2 to L4 support
- Scalable 10/100/1000 PoE+ and 10/100 PoE
- Unified core-to-edge HPE ProVision software

### Product overview

The HPE 3500 and 3500 yl Switch Series consists of advanced intelligent-edge switches, available in 24-port and 48-port fixed-port models. The foundation for these switches is a purpose-built, programmable HPE ProVision ASIC that allows the most demanding networking features, such as quality of service (QoS) and security, to be implemented in a scalable, yet granular, fashion. With a variety of Gigabit Ethernet and 10/100 interfaces; integrated PoE+, PoE, and non-PoE options; and versatile 10GbE connectivity (CX4, X2, and SFP+) on Gigabit Ethernet switches, the 3500 and 3500 yl Switch Series offers excellent investment protection, flexibility, and scalability as well as ease of deployment, operation, and maintenance.

### Features and Benefits

#### Software-defined networking

- **OpenFlow**  
supports OpenFlow 1.0 and 1.3 specifications to enable SDN by allowing separation of the data (packet forwarding) and control (routing decision) paths

#### Unified Wired and Wireless

- **HTTP redirect function**  
supports HPE Intelligent Management Center (IMC) bring your own device (BYOD) solution

#### Quality of Service (QoS)

- **Advanced classifier-based QoS**  
classifies traffic using multiple match criteria based on Layer 2, 3, and 4 information; applies QoS policies such as setting priority level and rate limit to selected traffic on a per-port or per-VLAN basis

## Overview

- **Layer 4 prioritization**  
enables prioritization based on TCP/UDP port numbers
- **Traffic prioritization**  
allows real-time traffic classification into eight priority levels mapped to eight queues
- **Bandwidth shaping**
  - **Port-based rate limiting**  
provides per-port ingress-/egress-enforced increased bandwidth
  - **Classifier-based rate limiting**  
uses an access control list (ACL) to enforce increased bandwidth for ingress traffic on each port
  - **Reduced bandwidth**  
provides per-port, per-queue egress-based reduced bandwidth
- **Class of Service (CoS)**  
sets the IEEE 802.1p priority tag based on IP address, IP Type of Service (ToS), Layer 3 protocol, TCP/UDP port number, source port, and DiffServ

## Management

- **Remote intelligent mirroring**  
mirrors selected ingress/egress traffic based on ACL, port, MAC address, or VLAN to a local or remote HP 8200 zl, 6600, 6200 yl, 5400 zl, or 3500 Switch anywhere on the network
- **RMON, XRMON, and sFlow v5**  
provide advanced monitoring and reporting capabilities for statistics, history, alarms, and events
- **IEEE 802.1AB Link Layer Discovery Protocol (LLDP)**  
advertises and receives management information from adjacent devices on a network, facilitating easy mapping by network management applications
- **Uni-Directional Link Detection (UDLD)**  
monitors a cable between two switches and shuts down the ports on both ends if the cable is broken, turning the bidirectional link into a unidirectional one; this prevents network problems such as loops
- **Management simplicity**  
common software features and CLI implementation across all ProVision-based switches (including the zl and yl switches)
- **Command authorization**  
leverages RADIUS to link a custom list of CLI commands to an individual network administrator's login; an audit trail documents activity
- **Friendly port names**  
allow assignment of descriptive names to ports
- **Dual flash images**  
provide independent primary and secondary operating system files for backup while upgrading
- **Multiple configuration files**  
stores easily to the flash image
- **Comware CLI**
  - **Comware-compatible CLI**  
bridges the experience of Hewlett Packard Enterprise Comware CLI users who are using the ProVision CLI
  - **Display and fundamental Comware CLI commands**  
are natively embedded in the switch CLI; display output is formatted as on Comware-based switches; fundamental commands provide Comware-familiar initial switch setup
  - **Configuration Comware CLI commands**  
when Comware commands are entered, CLI help is elicited to formulate the correct ProVision software CLI command

## Connectivity

- **IEEE 802.3af Power over Ethernet (PoE)**

## Overview

provides up to 15.4 W per port to IEEE 802.3af-compliant PoE-powered devices such as IP phones, wireless access points, and security cameras

- **IEEE 802.3af Power over Ethernet Plus (PoE+)**

provides up to 30 W per port to IEEE 802.3 for devices that use PoE/PoE+, such as video IP phones, IEEE 802.11n wireless access points, and advanced pan/zoom/tilt security cameras

- **Prestandard PoE support**

detects and provides power to prestandard PoE devices; see list of supported devices in the product FAQs at <http://www.hpe.com/networking>

- **Jumbo frames**

on Gigabit Ethernet and 10-Gigabit Ethernet ports, jumbo frames allow high-performance remote backup and disaster-recovery services

- **Auto-MDIX**

provides automatic adjustments for straight-through or crossover cables on all 10/100 and 10/100/1000 ports

- **IPv6**

- **IPv6 host**

enables switches to be managed in an IPv6 network

- **Dual stack (IPv4 and IPv6)**

transitions from IPv4 to IPv6, supporting connectivity for both protocols

- **MLD snooping**

forwards IPv6 multicast traffic to the appropriate interface

- **IPv6 ACL/QoS**

supports ACL and QoS for IPv6 network traffic

- **IPv6 routing**

supports static and OSPFv3 routing protocols

- **6in4 tunneling**

supports encapsulation of IPv6 traffic in IPv4 packets

## Performance

- **High-speed/capacity architecture**

up to 153.6 Gbps crossbar switching fabric provides intra- and inter-module switching with up to 111.5 million pps throughput on the purpose-built ProVision ASICs

- **Selectable queue configurations**

allows for increased performance by selecting the number of queues and associated memory buffering that best meet the requirements of the network applications

## Resiliency and high availability

- **NEW Virtual Router Redundancy Protocol (requires Premium License)**

allows groups of two routers to dynamically back each other up to create highly available routed environments

- **IEEE 802.1s multiple Spanning Tree Protocols**

provides high link availability in multiple VLAN environments by allowing multiple spanning trees; encompasses IEEE 802.1D Spanning Tree Protocol and IEEE 802.1w Rapid Spanning Tree Protocol

- **IEEE 802.3ad Link Aggregation Control Protocol (LACP) and HPE port trunking**

support up to 144 trunks, each with up to eight links (ports) per trunk

- **Distributed trunking**

enables loop-free and redundant network topology without using Spanning Tree Protocol; allows a server or switch to connect to two switches using one logical trunk for redundancy and load sharing

- **Uplink Failure Detection**

provides active-standby network path redundancy for servers that are configured for active-standby NIC teaming

- **NEW SmartLink**

## Overview

provides easy-to-configure link redundancy of active and standby link

### Layer 2 switching

- **IEEE 802.1ad Q-in-Q (requires Premium License)**  
increases the scalability of an Ethernet network by providing a hierarchical structure; connects multiple LANs on a high-speed campus or metro network
- **HPE switch meshing**  
dynamically load balances across multiple active redundant links to increase available aggregate bandwidth
- **VLAN support and tagging**  
supports the IEEE 802.1Q standard and 2,048 VLANs simultaneously
- **IEEE 802.1v protocol VLANs**  
isolate select non-IPv4 protocols automatically into their own VLANs
- **GARP VLAN Registration Protocol**  
allows automatic learning and dynamic assignment of VLANs
- **Rapid Per-VLAN Spanning Tree (RPVST+)**  
allows each VLAN to build a separate spanning tree to improve link bandwidth usage; is compatible with PVST+

### Layer 3 services

- **User Datagram Protocol (UDP) helper function**  
allows UDP broadcasts to be directed across router interfaces to specific IP unicast or subnet broadcast addresses and prevents server spoofing for UDP services such as DHCP
- **Loopback interface address**  
defines an address in Routing Information Protocol (RIP) and Open Standard Path First (OSPF), improving diagnostic capability
- **Route maps**  
provide more control during route redistribution; allow filtering and altering of route metrics

### Layer 3 routing

- **Static IP routing**  
provides manually configured routing for both IPv4 and IPv6 networks
- **Routing Information Protocol (RIP)**  
provides RIPv1 and RIPv2 routing
- **OSPF (requires Premium License)**  
provides OSPFv2 for IPv4 routing and OSPFv3 for IPv6 routing
- **Border Gateway Routing Protocol (requires Premium License)**  
provides IPv4 Border Gateway Routing Protocol that is scalable, robust, and flexible

### Security

- **Access control lists (ACLs)**  
provide filtering based on the IP field, source/destination IP address/subnet, and source/destination TCP/UDP port number on a per-VLAN or per-port basis
- **Multiple user authentication methods**
  - **IEEE 802.1X users per port**  
provides authentication of multiple IEEE 802.1X users per port
  - **Web-based authentication**  
authenticates from Web browser for clients that do not support IEEE 802.1X supplicant
  - **MAC-based authentication**  
client is authenticated with the RADIUS server based on client's MAC authentication

## Overview

- **Concurrent IEEE 802.1X, Web, and MAC authentication schemes per port**  
switch port accepts up to 32 sessions of IEEE 802.1X, Web, and MAC authentications
- **Virus throttling**  
detects traffic patterns typical of worm-type viruses and either throttles or entirely prevents the virus from spreading across the routed VLANs or bridged interfaces without requiring external appliances
- **DHCP protection**  
blocks DHCP packets from unauthorized DHCP servers, preventing denial-of-service attacks
- **Secure management access**  
delivers secure encryption of all access methods (CLI, GUI, or MIB) through SSHv2, SSL, and/or SNMPv3
- **Switch CPU protection**  
provides automatic protection against malicious network traffic trying to shut down the switch
- **ICMP throttling**  
defeats ICMP denial-of-service attacks by enabling any switch port to automatically throttle ICMP traffic
- **Identity-driven ACL**  
enables implementation of a highly granular and flexible access security policy and VLAN assignment specific to each authenticated network user
- **STP BPDU port protection**  
blocks Bridge Protocol Data Units (BPDUs) on ports that do not require BPDUs, preventing forged BPDU attacks
- **Dynamic IP lockdown**  
works with DHCP protection to block traffic from unauthorized hosts, preventing IP source address spoofing
- **Dynamic ARP protection**  
blocks ARP broadcasts from unauthorized hosts, preventing eavesdropping or theft of network data
- **STP Root Guard**  
protects the root bridge from malicious attacks or configuration mistakes
- **Detection of malicious attacks**  
monitors 10 types of network traffic and sends a warning when an anomaly that potentially can be caused by malicious attacks is detected
- **Port security**  
allows access only to specified MAC addresses, which can be learned or specified by the administrator
- **MAC address lockout**  
prevents particular configured MAC addresses from connecting to the network
- **Source-port filtering**  
allows only specified ports to communicate with each other
- **RADIUS/TACACS+**  
eases switch management security administration by using a password authentication server
- **Secure Shell**  
encrypts all transmitted data for secure remote CLI access over IP networks
- **Secure Sockets Layer (SSL)**  
encrypts all HTTP traffic, allowing secure access to the browser-based management GUI in the switch
- **Secure FTP**  
allows secure file transfer to and from the switch; protects against unwanted file downloads or unauthorized copying of a switch configuration file
- **Management Interface Wizard**  
helps secure management interfaces such as SNMP, telnet, SSH, SSL, Web, and USB at the desired level
- **Switch management logon security**  
helps secure switch CLI logon by optionally requiring either RADIUS or TACACS+ authentication
- **Security banner**  
displays a customized security policy when users log in to the switch

## Convergence

- **IP multicast routing (requires Premium License)**

## Overview

includes PIM Sparse and Dense modes to route IP multicast traffic

- **IP multicast snooping (data-driven IGMP)**  
prevents flooding of IP multicast traf
- **LLDP-MED (Media Endpoint Discovery)**  
defines a standard extension of LLDP that stores values for parameters such as QoS and VLAN to configure automatically network devices such as IP phones
- **PoE allocations**  
support multiple methods (automatic, IEEE 802.3af class, LLDP-MED, or user specified) to allocate PoE power for more efficient energy savings
- **Auto VLAN configuration for voice**
  - **RADIUS VLAN**  
uses a standard RADIUS attribute and LLDP-MED to automatically configure a VLAN for IP phones
  - **CDPv2**  
uses CDPv2 to configure legacy IP phones
- **NEW Local MAC Authentication**  
assigns attributes such as VLAN and QoS using locally configured profile that can be a list of MAC prefixes

## Warranty and support

- **Limited Lifetime Warranty**  
See <http://www.hpe.com/networking/warrantysummary> for warranty and support information included with your product purchase.
- **Software releases**  
to find software for your product, refer to <http://www.hpe.com/networking/support>; for details on the software releases available with your product purchase, refer to <http://www.hpe.com/networking/warrantysummary>

## Configuration

### Build To Order:

BTO is a standalone unit with no integration. BTO products ship standalone are not part of a CTO or Rack-Shippable solution.

#### HP 3500-24G-PoE+ yl Switch

- 20 autosensing 10/100/1000 port
- 4 dual-personality ports
- min=0 \ max=4 SFP Transceivers
- 1 open module slot
- 1U - Height

J9310A  
See Configuration  
**NOTE:1, 2**

#### PDU Cable NA/MEX/TW/JP

- C15 PDU Jumper Cord (NA/MEX/TW/JP)

J9310A#B2B

#### PDU Cable ROW

- C15 PDU Jumper Cord (ROW)

J9310A#B2C

#### HP 3500-48G-PoE+ yl Switch

- 44 autosensing 10/100/1000 port
- 4 dual-personality ports
- min=0 \ max=4 SFP Transceivers
- 1 open module slot
- 1U - Height

J9311A  
See Configuration  
**NOTE:1, 2**

#### PDU Cable NA/MEX/TW/JP

- C15 PDU Jumper Cord (NA/MEX/TW/JP)

J9311A#B2B

#### PDU Cable ROW

- C15 PDU Jumper Cord (ROW)

J9311A#B2C

### Configuration Rules:

#### Note 1

#### The following Transceivers install into this Switch:

HPE X111 100M SFP LC FX Transceiver	J9054C
HPE X121 1G SFP LC LH Transceiver	J4860C
HPE X121 1G SFP LC LX Transceiver	J4859C
HPE X121 1G SFP LC SX Transceiver	J4858C
HP X122 1G SFP LC BX-D Transceiver	J9142B
HP X122 1G SFP LC BX-U Transceiver	J9143B

#### Note 2

Localization required on orders without #B2B or #B2C options.

## Configuration

### Remarks:

Drop down under power supply should offer the following options and results:  
 Switch/Router/Power Supply to PDU Power Cord - #B2B in North America, Mexico, Taiwan, and Japan or #B2C ROW. (Watson Default B2B or B2C for Rack Level CTO)  
 Switch/Router/Power Supply to Wall Power Cord - Localized Option (Watson Default for BTO and Box Level CTO)

## Factory Racked Models

HP 3500-48G-PoE+ yl Switch	J9311A
<ul style="list-style-type: none"> <li>• 44 autosensing 10/100/1000 port</li> <li>• 4 dual-personality ports</li> <li>• min=0 \ max=4 SFP Transceivers</li> <li>• 1 open module slot</li> <li>• 1U - Height</li> </ul>	See Configuration <b>NOTE:1, 2</b>
PDU Cable NA/MEX/TW/JP	J9311A#B2B
<ul style="list-style-type: none"> <li>• C15 PDU Jumper Cord (NA/MEX/TW/JP)</li> </ul>	
PDU Cable ROW	J9311A#B2C
<ul style="list-style-type: none"> <li>• C15 PDU Jumper Cord (ROW)</li> </ul>	
HP 3500-24G-PoE+ yl Switch	J9310A
<ul style="list-style-type: none"> <li>• 20 autosensing 10/100/1000 port</li> <li>• 4 dual-personality ports</li> <li>• min=0 \ max=4 SFP Transceivers</li> <li>• 1 open module slot</li> <li>• 1U - Height</li> </ul>	See Configuration <b>NOTE:1, 2</b>
PDU Cable NA/MEX/TW/JP	J9310A#B2B
<ul style="list-style-type: none"> <li>• C15 PDU Jumper Cord (NA/MEX/TW/JP)</li> </ul>	
PDU Cable ROW	J9310A#B2C
<ul style="list-style-type: none"> <li>• C15 PDU Jumper Cord (ROW)</li> </ul>	

### Configuration Rules

#### Note 1

The following Transceivers install into this Module (Max=4):

HPE X111 100M SFP LC FX Transceiver	J9054C
HPE X121 1G SFP LC LH Transceiver	J4860C
HPE X121 1G SFP LC LX Transceiver	J4859C



## Configuration

HPE X121 1G SFP LC SX Transceiver	J4858C
HP X122 1G SFP LC BX-D Transceiver	J9142B
HP X122 1G SFP LC BX-U Transceiver	J9143B

**Note 2** If this switch is factory installed in HPE Universal Racks, Then the J9583A#0D1 is required.

EMEA then J9583A#0D1 is required.

APD, Japan and China then J9583A#0D1 is required.

CLIC Only - Allow the J9583AZ in all regions.

**Enter the following menu selections as integrated to the CTO Model X server above if order is factory built.**

## Modules

J9311A, J9310A only - System (std 0 // max=1) User Selection (min 0 / max=1) per Chassis

HP 10GbE 2-port X2 / 2-port CX4 yl Module

- min=0 \ max=2 X2 Transceivers

J8694A

See Configuration

**NOTE:1**

HP 10GbE 2-port SFP+ / 2-port CX4 yl Module

- min=0 \ max=2 SFP+ Transceivers

J9312A

See Configuration

**NOTE:2**

### Configuration Rules:

**Note 1** The following Transceivers install into this Module:

HP X131 10G X2 SC LR Transceiver	J8437A
HP X131 10G X2 SC LRM Transceiver	J9144A

**Note 2** The following Transceivers install into this Module:

HPE X132 10G SFP+ LC ER Transceiver	J9153A
HPE X132 10G SFP+ LC LR Transceiver	J9151A
HPE X132 10G SFP+ LC LRM Transceiver	J9152A
HPE X132 10G SFP+ LC SR Transceiver	J9150A
HPE X242 10G SFP+ to SFP+ 1m Direct Attach Copper Cable	J9281B
HPE X242 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	J9283B
HPE X242 10G SFP+ to SFP+ 7m Direct Attach Copper Cable	J9285B
HP X244 10G XFP to SFP+ 1m Direct Attach Copper Cable	J9300A
HP 10G X244 XFP to SFP+ 3m Direct Attach Copper Cable	J9301A
HP 10G X244 XFP to SFP+ 5m Direct Attach Copper Cable	J9302A

## Transceivers

### SFP Transceivers

## Configuration

HPE X111 100M SFP LC FX Transceiver	J9054C
HPE X121 1G SFP LC LH Transceiver	J4860C
HPE X121 1G SFP LC LX Transceiver	J4859C
HPE X121 1G SFP LC SX Transceiver	J4858C
HP X122 1G SFP LC BX-D Transceiver	J9142B
HP X122 1G SFP LC BX-U Transceiver	J9143B

### SFP+ Transceivers

HPE X132 10G SFP+ LC ER Transceiver	J9153A
HPE X132 10G SFP+ LC LR Transceiver	J9151A
HPE X132 10G SFP+ LC LRM Transceiver	J9152A
HPE X132 10G SFP+ LC SR Transceiver	J9150A
HPE X242 10G SFP+ to SFP+ 1m Direct Attach Copper Cable	J9281B
HPE X242 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	J9283B
HPE X242 10G SFP+ to SFP+ 7m Direct Attach Copper Cable	J9285B
HP X244 10G XFP to SFP+ 1m Direct Attach Copper Cable	J9300A
HP 10G X244 XFP to SFP+ 3m Direct Attach Copper Cable	J9301A
HP 10G X244 XFP to SFP+ 5m Direct Attach Copper Cable	J9302A

### X2 Transceivers

HP X131 10G X2 SC LR Transceiver	J8437A
HP X131 10G X2 SC LRM Transceiver	J9144A

## Internal Power Supplies

Power Supplies included

## Cables

### Multi-Mode Cables

HPE LC to LC Multi-mode OM3 2-Fiber 0.5m 1-Pack Fiber Optic Cable	AJ833A
HPE LC to LC Multi-mode OM3 2-Fiber 1.0m 1-Pack Fiber Optic Cable	AJ834A
HPE LC to LC Multi-mode OM3 2-Fiber 2.0m 1-Pack Fiber Optic Cable	AJ835A
HPE LC to LC Multi-mode OM3 2-Fiber 5.0m 1-Pack Fiber Optic Cable	AJ836A
HPE LC to LC Multi-mode OM3 2-Fiber 15.0m 1-Pack Fiber Optic Cable	AJ837A
HPE LC to LC Multi-mode OM3 2-Fiber 30.0m 1-Pack Fiber Optic Cable	AJ838A
HPE LC to LC Multi-mode OM3 2-Fiber 50.0m 1-Pack Fiber Optic Cable	AJ839A
HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 1m Cable	QK732A
HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 2m Cable	QK733A
HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 5m Cable	QK734A
HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 15m Cable	QK735A
HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 30m Cable	QK736A
HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 50m Cable	QK737A

## Switch Enclosure Options

## Configuration

### Rack Mount kits

HPE X410 1U Universal 4-post Rackmount Kit

J9583A  
See Configuration  
**NOTE:1**

HP Integrity rx1600 Rack Support Shelf Kit

AB469A  
See Configuration  
**NOTE:3**

### Configuration Rules:

**Note 1** Default with switch.

**Note 3** This has existing rules that say 1 per 20 if 1U and 1 per 10 if its 3U or more. This rule is fine for ProCurve.  
**NOTE:** Both parts above are required to ship the 62xx Series Switches installed in a rack.  
Exceptions- The Shelf Kit (AB469A) may be removed if the Switch is supported underneath by a full depth Server of 3U height or greater mounted on fixed rails

### Software

HP 3500 yl Premium License

J8993A

### External Power supplies

HPE 620 Redundant/External Power Supply

J8696A

- Height = 1U

No Power Cord

J8696A#AC3

- No Localized Power Cord Selected

HPE ProCurve 630 Redundant and/or External Power Supply

J9443A

- Height = 1U

See Configuration  
**NOTE:1**

No Power Cord

J9443A#AC3

- No Localized Power Cord Selected

### Configuration Rules:

**Note 1** See HPN Rack Menu for integration details.

## Technical Specifications

### HP 3500-48G-PoE+ yl Switch (J9311A)

<b>I/O ports and slots</b>	1 open module slot 44 autosensing 10/100/1000 ports; Media Type: Auto-MDIX; Duplex: 10BASE-T/100BASE-TX: half or full; 1000BASE-T: full only (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T) 1 RJ-45 serial console port 4 dual-personality ports; each port can be used as either an RJ-45 10/100/1000 port (IEEE 802.3 Type 10BASE-T; IEEE 802.3u Type 100BASE-TX; IEEE 802.3ab 1000BASE-T Gigabit Ethernet) with PoE or an open mini-GBIC slot (for use with mini-GBIC transceivers) Supports a maximum of 4 10GbE ports, with optional module														
<b>Physical characteristics</b>	<table border="0"> <tr> <td style="vertical-align: top;"><b>Dimensions</b></td> <td>17.44(w) x 16.93(d) x 1.73(h) in (44.3 x 43.0 x 4.4 cm) (1U height)</td> </tr> <tr> <td style="vertical-align: top;"><b>Weight</b></td> <td>15.54 lb (7.05 kg)</td> </tr> </table>	<b>Dimensions</b>	17.44(w) x 16.93(d) x 1.73(h) in (44.3 x 43.0 x 4.4 cm) (1U height)	<b>Weight</b>	15.54 lb (7.05 kg)										
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<b>Memory and processor</b>	<table border="0"> <tr> <td style="vertical-align: top;"><b>10G module</b></td> <td>ARM9 @ 200 MHz; packet buffer size: 36 Mb QDR SDRAM</td> </tr> <tr> <td style="vertical-align: top;"><b>Management Module</b></td> <td>Stackable memory and processor: Freescale PowerPC 8540 @ 666 MHz, 4 MB flash, 128 MB compact flash, 256 MB DDR SDRAM</td> </tr> </table>	<b>10G module</b>	ARM9 @ 200 MHz; packet buffer size: 36 Mb QDR SDRAM	<b>Management Module</b>	Stackable memory and processor: Freescale PowerPC 8540 @ 666 MHz, 4 MB flash, 128 MB compact flash, 256 MB DDR SDRAM										
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<b>Management Module</b>	Stackable memory and processor: Freescale PowerPC 8540 @ 666 MHz, 4 MB flash, 128 MB compact flash, 256 MB DDR SDRAM														
<b>Mounting and enclosure</b>	Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); Horizontal surface mounting only														
<b>Performance</b>	<table border="0"> <tr> <td style="vertical-align: top;"><b>1000 Mb Latency</b></td> <td>&lt; 3.4 <math>\mu</math>s (FIFO 64-byte packets)</td> </tr> <tr> <td style="vertical-align: top;"><b>10 Gbps Latency</b></td> <td>&lt; 2.1 <math>\mu</math>s (FIFO 64-byte packets)</td> </tr> <tr> <td style="vertical-align: top;"><b>Throughput</b></td> <td>up to 111.5 Mpps</td> </tr> <tr> <td style="vertical-align: top;"><b>Routing/Switching capacity</b></td> <td>149.8 Gb/s</td> </tr> <tr> <td style="vertical-align: top;"><b>Switch fabric speed</b></td> <td>153.6 Gb/s</td> </tr> <tr> <td style="vertical-align: top;"><b>Routing table size</b></td> <td>10000 entries (IPv4)</td> </tr> <tr> <td style="vertical-align: top;"><b>MAC address table size</b></td> <td>64000 entries</td> </tr> </table>	<b>1000 Mb Latency</b>	< 3.4 $\mu$ s (FIFO 64-byte packets)	<b>10 Gbps Latency</b>	< 2.1 $\mu$ s (FIFO 64-byte packets)	<b>Throughput</b>	up to 111.5 Mpps	<b>Routing/Switching capacity</b>	149.8 Gb/s	<b>Switch fabric speed</b>	153.6 Gb/s	<b>Routing table size</b>	10000 entries (IPv4)	<b>MAC address table size</b>	64000 entries
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## Technical Specifications

	<b>Current</b>	7.3/3.3 A
	<b>Idle power</b>	132 W
	<b>Maximum power rating</b>	638 W
	<b>PoE power</b>	398 W
<b>Safety</b>		CSA 22.2 No. 60950; UL 60950; IEC 60950; EN 60950
<b>Emissions</b>		FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A
<b>Immunity</b>	<b>EN</b>	EN 55024, CISPR 24
	<b>ESD</b>	IEC 61000-4-2; 4 kV CD, 8 kV AD
	<b>Radiated</b>	IEC 61000-4-3; 3 V/m
	<b>EFT/Burst</b>	IEC 61000-4-4; 1.0 kV (power line), 0.5 kV (signal line)
	<b>Surge</b>	IEC 61000-4-5; 1 kV/2 kV AC
	<b>Conducted</b>	IEC 61000-4-6; 3 V
	<b>Power frequency magnetic field</b>	IEC 61000-4-8; 1 A/m, 50 or 60 Hz
	<b>Voltage dips and interruptions</b>	IEC 61000-4-11; >95% reduction, 0.5 period; 30% reduction, 25 periods
	<b>Harmonics</b>	EN 61000-3-2, IEC 61000-3-2
	<b>Flicker</b>	EN 61000-3-3, IEC 61000-3-3
<b>Management</b>		HP PCM+; HP PCM (included); command-line interface; Web browser; configuration menu; out-of-band management (serial RS-232C)
<b>Notes</b>		J8177B Gigabit 1000BASE-T mini-GBIC is not supported on the 3500 series switches. Supported 1G SFP transceivers are revision "B" or later (product number ends with the letter "B" or later, for example, J9142B, J8177C).
<b>Services</b>		Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.

### HP 3500-24G-PoE+ yl Switch (J9310A)

<b>I/O ports and slots</b>		20 autosensing 10/100/1000 ports; Media Type: Auto-MDIX; Duplex: 10BASE-T/100BASE-TX: half or full; 1000BASE-T: full only (IEEE 802.3 Type 10BASE-T, IEEE 802.3u Type 100BASE-TX, IEEE 802.3ab Type 1000BASE-T) 1 RJ-45 serial console port 4 dual-personality ports; each port can be used as either an RJ-45 10/100/1000 port (IEEE 802.3 Type 10BASE-T; IEEE 802.3u Type 100BASE-TX; IEEE 802.3ab 1000BASE-T Gigabit Ethernet) with PoE or an open mini-GBIC slot (for use with mini-GBIC transceivers) 1 open module slot Supports a maximum of 4 10-GbE ports
<b>Physical characteristics</b>	<b>Dimensions</b>	17.44(w) x 15.43(d) x 1.73(h) in (44.3 x 39.2 x 4.4 cm) (1U height)
	<b>Weight</b>	13.86 lb (6.29 kg)
<b>Memory and processor</b>	<b>10G module</b>	ARM9 @ 200 MHz; Packet buffer size: 36 Mb QDR SDRAM
	<b>Management Module</b>	Stackable memory and processor: Freescale PowerPC 8540 @ 666 MHz, 4

## Technical Specifications

		MB flash, 128 MB compact flash, 256 MB DDR SDRAM
<b>Mounting and enclosure</b>	Mounts in an EIA-standard surface mounting only	19 in. telco rack or equipment cabinet (hardware included); Horizontal
<b>Performance</b>	<b>1000 Mb Latency</b>	< 3.4 $\mu$ s (FIFO 64-byte packets)
	<b>10 Gbps Latency</b>	< 2.1 $\mu$ s (FIFO 64-byte packets)
	<b>Throughput</b>	up to 75.7 Mpps
	<b>Routing/Switching capacity</b>	101.8 Gb/s
	<b>Switch fabric speed</b>	105.6 Gb/s
	<b>Routing table size</b>	10000 entries (IPv4)
	<b>MAC address table size</b>	64000 entries
<b>Environment</b>	<b>Operating temperature</b>	32°F to 131°F (0°C to 55°C); 32°F to 104°F (40°C) when used with any X2 10-GbE
	<b>Operating relative humidity</b>	15% to 95% @ 104°F (40°C), noncondensing
	<b>Nonoperating/Storage temperature</b>	-40°F to 158°F (-40°C to 70°C)
	<b>Nonoperating/Storage relative humidity</b>	15% to 90% @ 149°F (65°C), noncondensing
	<b>Altitude</b>	up to 15,000 ft. (4.6 km)
	<b>Acoustic</b>	Power: 57.0 dB, Pressure: 40.5 dB ISO 7779, ISO 9296
<b>Electrical characteristics</b>	<b>Frequency</b>	50 / 60 Hz
	<b>Description</b>	The switch automatically adjusts to any voltage between 100-127 and 200-240 V with either 50 or 60 Hz.
	<b>Maximum heat dissipation</b>	865 BTU/hr (912.9 kJ/hr)
	<b>Voltage</b>	100 - 127 / 200 - 240 VAC, rated
	<b>Current</b>	6.6 / 3.0 A
	<b>Idle power</b>	94 W
	<b>Maximum power rating</b>	616 W
	<b>PoE power</b>	398 W
<b>Safety</b>	CSA 22.2 No. 60950; UL 60950; IEC 60950; EN 60950	
<b>Emissions</b>	FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A	
<b>Immunity</b>	<b>EN</b>	EN 55024, CISPR 24
	<b>ESD</b>	IEC 61000-4-2; 4 kV CD, 8 kV AD
	<b>Radiated</b>	IEC 61000-4-3; 3 V/m
	<b>EFT/Burst</b>	IEC 61000-4-4; 1.0 kV (power line), 0.5 kV (signal line)
	<b>Surge</b>	IEC 61000-4-5; 1 kV/2 kV AC
	<b>Conducted</b>	IEC 61000-4-6; 3 V
	<b>Power frequency magnetic field</b>	IEC 61000-4-8; 1 A/m, 50 or 60 Hz
	<b>Voltage dips and interruptions</b>	IEC 61000-4-11; >95% reduction, 0.5 period; 30% reduction, 25 periods

## Technical Specifications

**Harmonics** EN 61000-3-2, IEC 61000-3-2

**Flicker** EN 61000-3-3, IEC 61000-3-3

### Management

HP PCM+; HP PCM (included); command-line interface; Web browser; configuration menu; out-of-band management (serial RS-232C)

### Notes

J8177B Gigabit 1000BASE-T mini-GBIC is not supported on the 3500 series switches. Supported 1G SFP transceivers are revision "B" or later (product number ends with the letter "B" or later, for example, J9142B, J8177C).

### Services

Refer to the Hewlett Packard Enterprise website at <http://www.hpe.com/networking/services> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.

### Standards and protocols BGP

(applies to all products in series)

RFC 1997 BGP Communities Attribute  
RFC 2918 Route Refresh Capability  
RFC 4271 A Border Gateway Protocol 4 (BGP-4)  
RFC 4456 BGP Route Reflection: An Alternative to Full Mesh Internal BGP (IBGP)  
RFC 5492 Capabilities Advertisement with BGP-4

#### Device management

RFC 1591 DNS (client)  
HTML and telnet management

#### General protocols

IEEE 802.1ad Q-in-Q  
IEEE 802.1AX-2008 Link Aggregation  
IEEE 802.1D MAC Bridges  
IEEE 802.1p Priority  
IEEE 802.1Q VLANs  
IEEE 802.1s Multiple Spanning Trees  
IEEE 802.1v VLAN classification by Protocol and Port  
IEEE 802.1w Rapid Reconfiguration of Spanning Tree  
IEEE 802.3ad Link Aggregation Control Protocol (LACP)  
IEEE 802.3af Power over Ethernet  
IEEE 802.3x Flow Control  
RFC 768 UDP  
RFC 783 TFTP Protocol (revision 2)  
RFC 792 ICMP  
RFC 793 TCP  
RFC 826 ARP  
RFC 854 TELNET  
RFC 868 Time Protocol  
RFC 951 BOOTP  
RFC 1058 RIPv1  
RFC 1350 TFTP Protocol (revision 2)  
RFC 1519 CIDR  
RFC 1542 BOOTP Extensions  
RFC 2030 Simple Network Time Protocol (SNTP) v4  
RFC 2131 DHCP  
RFC 2453 RIPv2

RFC 4213 Basic Transition Mechanisms for IPv6 Hosts and Routers  
RFC 4251 SSHv6 Architecture  
RFC 4252 SSHv6 Authentication  
RFC 4253 SSHv6 Transport Layer  
RFC 4254 SSHv6 Connection  
RFC 4291 IP Version 6 Addressing Architecture  
RFC 4293 MIB for IP  
RFC 4294 IPv6 Node Requirements  
RFC 4419 Key Exchange for SSH  
RFC 4443 ICMPv6  
RFC 4541 IGMP & MLD Snooping Switch  
RFC 4861 IPv6 Neighbor Discovery  
RFC 4862 IPv6 Stateless Address Auto-configuration  
RFC 5095 Deprecation of Type 0 Routing Headers in IPv6  
RFC 5340 OSPFv3 for IPv6  
RFC 5453 Reserved IPv6 Interface Identifiers  
RFC 5519 Multicast Group Membership Discovery MIB (MLDv2 only)  
RFC 5722 Handling of Overlapping IPv6 Fragments

#### MIBs

IEEE 802.1ap (MSTP and STP MIB's only)  
RFC 1213 MIB II  
RFC 1493 Bridge MIB  
RFC 1724 RIPv2 MIB  
RFC 1850 OSPFv2 MIB  
RFC 2021 RMONv2 MIB  
RFC 2096 IP Forwarding Table MIB  
RFC 2613 SMON MIB  
RFC 2618 RADIUS Client MIB  
RFC 2620 RADIUS Accounting MIB  
RFC 2665 Ethernet-Like-MIB  
RFC 2668 802.3 MAU MIB  
RFC 2674 802.1p and IEEE 802.1Q Bridge MIB  
RFC 2737 Entity MIB (Version 2)  
RFC 2787 VRRP MIB  
RFC 2863 The Interfaces Group MIB  
RFC 2925 Ping MIB  
RFC 2933 IGMP MIB

## Technical Specifications

RFC 2548 (MS-RAS-Vendor only)  
 RFC 3046 DHCP Relay Agent Information Option  
 RFC 3576 Ext to RADIUS (CoA only)  
 RFC 3768 VRRP  
 RFC 4675 RADIUS VLAN & Priority  
 UDLD (Uni-directional Link Detection)

### IP multicast

RFC 3376 IGMPv3 (host joins only)  
 RFC 3973 PIM Dense Mode  
 RFC 4601 PIM Sparse Mode

### IPv6

RFC 1981 IPv6 Path MTU Discovery  
 RFC 2375 IPv6 Multicast Address Assignments  
 RFC 2460 IPv6 Specification  
 RFC 2464 Transmission of IPv6 over Ethernet Networks  
 RFC 2710 Multicast Listener Discovery (MLD) for IPv6  
 RFC 2925 Definitions of Managed Objects for Remote Ping, Traceroute, and Lookup Operations (Ping only)  
 RFC 3019 MLDv1 MIB  
 RFC 3315 DHCPv6 (client and relay)  
 RFC 3484 Default Address Selection for IPv6  
 RFC 3587 IPv6 Global Unicast Address Format  
 RFC 3596 DNS Extension for IPv6  
 RFC 3810 MLDv2 for IPv6  
 RFC 4022 MIB for TCP  
 RFC 4087 IP Tunnel MIB  
 RFC 4113 MIB for UDP

### Network management

IEEE 802.1AB Link Layer Discovery Protocol (LLDP)  
 RFC 2819 Four groups of RMON: 1 (statistics), 2 (history), 3 (alarm) and 9 (events)  
 RFC 3176 sFlow  
 ANSI/TIA-1057 LLDP Media Endpoint Discovery (LLDP-MED)  
 SNMPv1/v2c/v3  
 XRMON

### OSPF

RFC 2328 OSPFv2  
 RFC 3101 OSPF NSSA  
 RFC 5340 OSPFv3 for IPv6

### QoS/CoS

RFC 2474 DiffServ Precedence, including 8 queues/port  
 RFC 2597 DiffServ Assured Forwarding (AF)  
 RFC 2598 DiffServ Expedited Forwarding (EF)

### Security

IEEE 802.1X Port Based Network Access Control  
 RFC 1492 TACACS+  
 RFC 2865 RADIUS (client only)  
 RFC 2866 RADIUS Accounting  
 RFC 3579 RADIUS Support For Extensible Authentication Protocol (EAP)  
 Secure Sockets Layer (SSL)  
 SSHv2 Secure Shell



## Accessories

### HPE 3500 and 3500 yl Switch Series accessories

#### Modules

HP 10GbE 2-port X2 / 2-port CX4 yl Module	J8694A
HP 10GbE 2-port SFP+ / 2-port CX4 yl Module	J9312A

#### Transceivers

HPE X111 100M SFP LC FX Transceiver	J9054C
HPE X121 1G SFP LC LH Transceiver	J4860C
HPE X121 1G SFP LC LX Transceiver	J4859C
HPE X121 1G SFP LC SX Transceiver	J4858C
HPE X132 10G SFP+ LC ER Transceiver	J9153A
HPE X132 10G SFP+ LC LR Transceiver	J9151A
HPE X132 10G SFP+ LC LRM Transceiver	J9152A
HPE X132 10G SFP+ LC SR Transceiver	J9150A
HPE X242 40G QSFP+ to QSFP+ 1m Direct Attach Copper Cable	JH234A
HPE X242 40G QSFP+ to QSFP+ 3m Direct Attach Copper Cable	JH235A
HPE X242 40G QSFP+ to QSFP+ 5m Direct Attach Copper Cable	JH236A

#### Cables

HPE X242 10G SFP+ to SFP+ 1m Direct Attach Copper Cable	J9281B
HPE X242 10G SFP+ to SFP+ 3m Direct Attach Copper Cable	J9283B
HPE X242 10G SFP+ to SFP+ 7m Direct Attach Copper Cable	J9285B
HP X244 10G XFP to SFP+ 1m Direct Attach Copper Cable	J9300A
HP 10G X244 XFP to SFP+ 3m Direct Attach Copper Cable	J9301A
HPE LC to LC Multi-mode OM3 2-Fiber 0.5m 1-Pack Fiber Optic Cable	AJ833A
HPE LC to LC Multi-mode OM3 2-Fiber 1.0m 1-Pack Fiber Optic Cable	AJ834A
HPE LC to LC Multi-mode OM3 2-Fiber 2.0m 1-Pack Fiber Optic Cable	AJ835A
HPE LC to LC Multi-mode OM3 2-Fiber 5.0m 1-Pack Fiber Optic Cable	AJ836A
HPE LC to LC Multi-mode OM3 2-Fiber 15.0m 1-Pack Fiber Optic Cable	AJ837A
HPE LC to LC Multi-mode OM3 2-Fiber 30.0m 1-Pack Fiber Optic Cable	AJ838A
HPE LC to LC Multi-mode OM3 2-Fiber 50.0m 1-Pack Fiber Optic Cable	AJ839A
HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 1m Cable	QK732A
HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 2m Cable	QK733A
HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 5m Cable	QK734A
HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 15m Cable	QK735A
HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 30m Cable	QK736A
HPE Premier Flex LC/LC Multi-mode OM4 2 fiber 50m Cable	QK737A

#### EPS/RPS

HPE 620 Redundant/External Power Supply	J8696A
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**Accessories**

HPE ProCurve 630 Redundant and/or External Power Supply J9443A

**Mounting Kit**

HPE X410 1U Universal 4-post Rackmount Kit J9583A

**License**

HP 3500 yl Premium License J8993A

## Accessory Product Details

**NOTE:** Details are not available for all accessories. The following specifications were available at the time of publication.

<b>HP 10GbE 2-port X2 / 2-port CX4 yl Module</b> (J8694A)	<b>Physical characteristics</b>	<b>Ports</b>	2 open 10-GbE X2 transceiver slots 2 10-GbE ports (IEEE 802.3ak Type 10GBASE-CX4); Duplex: full only
		<b>Dimensions</b>	7.76(d) x 7.52(w) x 14.29(h) in. (19.7 x 19.1 x 36.3 cm)
	<b>Environment</b>	<b>Weight</b>	1.54 lb. (0.7 kg)
		<b>Operating temperature</b>	32°F to 131°F (0°C to 55°C)
		<b>Operating relative humidity</b>	15% to 95%, noncondensing
		<b>Nonoperating/Storage temperature</b>	-40°F to 158°F (-40°C to 70°C)
	<b>Nonoperating/Storage relative humidity</b>	15% to 90%, noncondensing	
		<b>Cabling</b>	Maximum distance: • CX4: 15 m using CX4 cable or 300 m using media converter with ribbon MMF
	<b>Notes</b>	Operating temperature is 32°F to 104°F (0°C to 40°C) if any X2 10-GbE optic or transceiver is inserted in any X2 slot. One 0.5 m CX4 cable is included.	
	<b>Services</b>	Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.	

<b>HP 10GbE 2-port SFP+ / 2-port CX4 yl Module</b> (J9312A)	<b>Physical characteristics</b>	<b>Ports</b>	2 SFP+ 10-GbE ports (IEEE 802.3ae Type 10GBASE-LR); Duplex: full only 2 CX4 10-GbE ports (IEEE 802.3ak Type 10GBASE-CX4); Duplex: full only
		<b>Dimensions</b>	7.76(d) x 7.52(w) x 14.29(h) in. (19.7 x 19.1 x 36.3 cm)
	<b>Environment</b>	<b>Weight</b>	1.45 lb. (0.66 kg)
		<b>Operating temperature</b>	32°F to 131°F (0°C to 55°C)
		<b>Operating relative humidity</b>	15% to 95%, noncondensing
		<b>Nonoperating/Storage temperature</b>	-40°F to 158°F (-40°C to 70°C)
	<b>Nonoperating/Storage relative humidity</b>	15% to 90%, noncondensing	
		<b>Cabling</b>	Maximum distance: • CX4: 15 m using CX4 cable or 300 m using media converter with ribbon MMF
	<b>Notes</b>	Operating temperature is 32°F to 104°F (0°C to 40°C) if any SFP+ 10-GbE optic or transceiver is inserted in any SFP+ slot. One 0.5 m CX4 cable is included.	
	<b>Services</b>	Refer to the Hewlett Packard Enterprise website at	

## Accessory Product Details

<http://www.hpe.com/networking/services> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.

<b>HPE X111 100M SFP LC FX Transceiver (J9054C)</b>	<b>Ports</b>	1 LC 100BASE-FX port (IEEE 802.3u Type 100BASE-FX); Duplex: half or full	
	<b>Physical characteristics</b>	<b>Dimensions</b>	2.7(d) x 0.54(w) x 0.48(h) in. (6.86 x 1.38 x 1.22 cm)
		<b>Weight</b>	0.06 lb. (0.03 kg)
		<b>Environment</b>	<b>Operating temperature</b> 32°F to 158°F (0°C to 70°C) <b>Operating relative humidity</b> 5% to 95% <b>Nonoperating/Storage temperature</b> -40°F to 185°F (-40°C to 85°C) <b>Nonoperating/Storage relative humidity</b> 5% to 85% <b>Altitude</b> up to 10,000 ft. (3 km)
	<b>Cabling</b>	Cable type: 62.5/125 $\mu$ m or 50/125 $\mu$ m (core/cladding) diameter, graded-index, low metal content, multimode fiber optic, complying with ITU-T G.651 and ISO/IEC 793-2 Type A1b or A1a, respectively; Maximum distance: <ul style="list-style-type: none"> <li>• 2 km (full duplex) or 412 m (half duplex)</li> </ul>	
	<b>Notes</b>	Transmitter wavelength: 1310nm Power consumption is 1.1 watt maximum. For supported platforms and minimum software requirements to support this product, see the document titled "Support for the J9054C 100-FX SFP-LC Transceiver" on the "ProCurve Mini-GBICs and SFPs" Manuals Web page.	
	<b>Services</b>	Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.	

<b>HPE X121 1G SFP LC LH Transceiver (J4860C)</b>  A small form-factor pluggable (SFP) Gigabit LH transceiver that provides a full-duplex Gigabit solution up to 70 km on single-mode fiber.	<b>Ports</b>	1 LC 1000BASE-LH port (no IEEE standard exists for 1550 nm optics); Duplex: full only
	<b>Physical characteristics</b>	Dimensions: 2.17(d) x 0.60(w) x 0.46(h) in. (5.5 x 1.53 x 1.18 cm) Weight: 0.04 lb. (0.02 kg)
	<b>Environment</b>	Operating temperature: -40°F to 185°F (-40°C to 85°C) Operating relative humidity: 0% to 95% @ 77°F (25°C), noncondensing Nonoperating/Storage temperature: -40°F to 185°F (-40°C to 85°C) Altitude: up to 10,000 ft. (3 km)
	<b>Cabling</b>	Cable type:  <ul style="list-style-type: none"> <li>• Low metal content, single-mode fiber-optic, complying with ITU-T G.652 and ISO/IEC 793-2 Type B1;</li> </ul> Maximum distance:

## Accessory Product Details

- 10-70,000 m (single-mode fiber)

<b>Notes</b>	Power consumption is 0.8 watts typical with 1 watt maximum at 100% utilization. For distances less than 20 km, a 10 dB attenuator must be used. For distances between 20 km and 40 km, a 5 dB attenuator must be used. Attenuators can be purchased from most cable vendors.
<b>Services</b>	Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.

<b>HPE X121 1G SFP LC LX Transceiver</b> (J4859C)  HP X121 1G SFP LC LX Transceiver: An SFP format gigabit transceiver with LC connectors using LX technology.	<b>Ports</b>	1 LC 1000BASE-LX port (IEEE 802.3z Type 1000BASE-LX); Duplex: full only
	<b>Physical characteristics</b>	Dimensions: 2.24(d) x 0.54(w) x 0.486(h) in. (5.69 x 1.37 x 1.23 cm) Weight: 0.04 lb. (0.02 kg)
	<b>Environment</b>	Operating temperature: 32°F to 158°F (0°C to 70°C) Operating relative humidity: 0% to 85%, noncondensing Nonoperating/Storage temperature: -40°F to 212°F (-40°C to 100°C) Altitude: up to 10,000 ft. (3 km)
	<b>Cabling</b>	Type: <ul style="list-style-type: none"> <li>• Either single mode or multimode; 62.5/125 <math>\mu\text{m}</math> or 50/125 <math>\mu\text{m}</math> (core/cladding) diameter, graded-index, low metal content, multimode fiber optic, complying with ITU-T G.651 and ISO/IEC 793-2 Type A1b or A1a, respectively; Low metal content, single-mode fiber-optic, complying with ITU-T G.652 and ISO/IEC 793-2 Type B1;</li> </ul> <p>Maximum distance:</p> <ul style="list-style-type: none"> <li>• 2-550 m (multimode 62.5 <math>\mu\text{m}</math> core diameter, 500 MHz*km bandwidth)</li> <li>• 2-550 m (multimode 50 <math>\mu\text{m}</math> core diameter, 400 MHz*km bandwidth)</li> <li>• 2-550 m (multimode 50 <math>\mu\text{m}</math> core diameter, 500 MHz*km bandwidth)</li> <li>• 2-10,000 m (single-mode fiber)</li> </ul>
	<b>Notes</b>	A mode conditioning patch cord may be needed in some multimode fiber installations. Wavelength: 1310nm Power Consumption: < 500mW Typical
	<b>Services</b>	Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.

<b>HPE X121 1G SFP LC SX Transceiver</b> (J4858C)	<b>Ports</b>	1 LC 1000BASE-SX port; Duplex: full only
	<b>Physical characteristics</b>	Dimensions: 2.24(d) x 0.54(w) x 0.48(h) in. (5.69 x 1.37 x 1.22 cm) Weight: 0.04 lb. (0.02 kg) Transceiver form factor: SFP

## Accessory Product Details

<p>A small form-factor pluggable (SFP) Gigabit SX transceiver that provides a full-duplex Gigabit solution up to 550 m on multimode fiber.</p>	<p><b>Environment</b></p>	<p>Operating temperature: 32°F to 158°F (0°C to 70°C)          Operating relative humidity: 5% to 85%, noncondensing          Nonoperating/Storage temperature: -40°F to 203°F (-40°C to 85°C)          Altitude: up to 10,000 ft. (3 km)</p>
	<p><b>Electrical characteristics</b></p>	<p>Power consumption typical: 0.4 W          Power consumption maximum: 0.7 W</p>
	<p><b>Cabling</b></p>	<p>Type:</p> <ul style="list-style-type: none"> <li>62.5/125 <math>\mu\text{m}</math> or 50/125 <math>\mu\text{m}</math> (core/cladding) diameter, graded-index, low metal content, multimode fiber optic, complying with ITU-T G.651 and ISO/IEC 793-2 Type A1b or A1a, respectively;</li> </ul> <p>Maximum distance:</p> <ul style="list-style-type: none"> <li>2-220 m (62.5 <math>\mu\text{m}</math> core diameter, 160 MHz*km bandwidth)</li> <li>2-275 m (62.5 <math>\mu\text{m}</math> core diameter, 200 MHz*km bandwidth)</li> <li>2-500 m (50 <math>\mu\text{m}</math> core diameter, 400 MHz*km bandwidth)</li> <li>2-550 m (50 <math>\mu\text{m}</math> core diameter, 500 MHz*km bandwidth)</li> </ul> <p>Cable length: 2-550m          Fiber type: Multi Mode</p>
<p><b>Services</b></p>	<p>Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.</p>	

### HP X122 1G SFP LC BX-D Ports Transceiver (J9142B)

A small form-factor pluggable (SFP) Gigabit-BX (bi-directional) "downstream" transceiver that provides a full-duplex Gigabit solution up to 10 km on one strand of single-mode fiber. The J9142B connects to the J9143B "upstream" transceiver, or to any IEEE-standard 1000BASE-BX10-U ("upstream") device.

<p><b>Physical characteristics</b></p>	<p><b>Dimensions</b></p> <p>2.19(d) x 0.54(w) x 0.46(h) in. (5.57 x 1.37 x 1.18 cm)</p>
<p><b>Environment</b></p>	<p><b>Weight</b></p> <p>0.04 lb. (0.02 kg)</p> <p><b>Operating temperature</b></p> <p>32°F to 158°F (0°C to 70°C)</p> <p><b>Operating relative humidity</b></p> <p>0% to 95%, non-condensing</p> <p><b>Non-operating/Storage temperature</b></p> <p>-40°F to 185°F (-40°C to 85°C)</p>
<p><b>Cabling</b></p>	<p>Type:</p> <p>Single-mode fiber optic, complying with ITU-T G.652;</p> <p>Maximum distance:</p> <ul style="list-style-type: none"> <li>0.5-10,000 m (single-mode fiber)</li> </ul>
<p><b>Notes</b></p>	<p>Transmit wavelength: 1490 nm. Receive wavelength: 1310 nm.          Power consumption is 1 watt maximum.          For supported platforms and minimum software requirements to support this product, see the document titled "Support for the HP BX Transceivers" on the "HP Mini-GBICs and SFPs" Manuals Web page.          The J9142B connects to the J9143B "upstream" transceiver, or to any IEEE-</p>

## Accessory Product Details

	<b>Services</b>	<p>standard 1000BASE-BX10-U ("upstream") device. (A 1000-BX-D transceiver can only connect to a 1000-BX-U product. You cannot connect two 1000-BX-D transceivers together.)</p> <p>Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.</p>
<p><b>HP X122 1G SFP LC BX-U Ports Transceiver</b> (J9143B)</p> <p>A small form-factor pluggable (SFP) Gigabit-BX (bi-directional) "upstream" transceiver that provides a full-duplex Gigabit solution up to 10 km on one strand of single-mode fiber. The J9143B connects to the J9142B "downstream" transceiver, or to any IEEE-standard 1000BASE-BX10-D ("downstream") device.</p>	<p><b>Physical characteristics</b></p> <p><b>Environment</b></p> <p><b>Cabling</b></p> <p><b>Notes</b></p> <p><b>Services</b></p>	<p>1 LC 1000BASE-BX10 port (IEEE 802.3ah Type 1000BASE-BX10-U); Duplex: full only</p> <p><b>Dimensions</b> 2.19(d) x 0.54(w) x 0.46(h) in. (5.57 x 1.37 x 1.18 cm)</p> <p><b>Weight</b> 0.04 lb. (0.02 kg)</p> <p><b>Operating temperature</b> 32°F to 158°F (0°C to 70°C)</p> <p><b>Operating relative humidity</b> 0% to 95%, non-condensing</p> <p><b>Non-operating/Storage temperature</b> -40°F to 185°F -40°C to 85°C</p> <p><b>Type:</b> Single-mode fiber optic, complying with ITU-T G.652;</p> <p><b>Maximum distance:</b></p> <ul style="list-style-type: none"> <li>0.5-10,000 m (single-mode fiber)</li> </ul> <p>Transmit wavelength: 1310 nm. Receive wavelength: 1490 nm. For supported platforms and minimum software requirements to support this product, see the document titled "Support for the HP BX Transceivers" on the "HP Mini-GBICs and SFPs" Manuals Web page. The J9143B connects to the J9142B "downstream" transceiver, or to any IEEE-standard 1000BASE-BX10-D ("downstream") device. (A 1000-BX-U transceiver can only connect to a 1000-BX-D product. You cannot connect two 1000-BX-U transceivers together.) Power consumption is 1 watt maximum.</p> <p>Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.</p>

<p><b>HP X131 10G X2 CX4 Transceiver</b> (J8440C)</p> <p>HP X131 10G X2 CX4 Transceiver: An X2 format 10-gigabit CX4 transceiver.</p>	<p><b>Ports</b></p> <p><b>Connectivity</b></p> <p><b>Physical characteristics</b></p> <p><b>Environment</b></p>	<p>1 CX4 10-GbE port (IEEE 802.3ak Type 10GBASE-CX4); Duplex: full only</p> <p><b>Connector type</b> CX4</p> <p><b>Dimensions</b> 3.54(d) x 1.42(w) x 0.53(h) in. (8.99 x 3.61 x 1.35 cm)</p> <p><b>Weight</b> 0.18 lb. (0.08 kg)</p> <p><b>Transceiver form factor</b> X2</p> <p><b>Operating temperature</b> 32°F to 131°F (0°C to 55°C)</p> <p><b>Operating relative</b> 15% to 95%, noncondensing</p>
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## Accessory Product Details

	<b>humidity</b>	
	<b>Nonoperating/Storage temperature</b>	-40°F to 185°F (-40°C to 85°C)
	<b>Altitude</b>	up to 10,000 ft. (3 km)
<b>Electrical characteristics</b>	<b>Power consumption typical</b>	1.0 W
	<b>Power consumption maximum</b>	3.3 W
<b>Cabling</b>	Maximum distance:	
	• 15m with CX4 cables	
	• 300m with optical media converter and multimode fiber cable	
<b>Notes</b>	Connector: CX4; Duplex: full Use CX4 10-GbE cable (0.5-15 m) For suggested vendors of CX4 cables, please see the "Cabling" answers on the "HP 10-GbE Transceivers" FAQs Web page.	
<b>Services</b>	Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.	

<b>HP X131 10G X2 SC LR Transceiver (J8437A)</b>  An X2 form-factor transceiver that supports the 10-Gigabit LR standard, providing 10-Gigabit connectivity up to 10 km on single-mode fiber.	<b>Ports</b>	1 SC 10-GbE port (IEEE 802.3ae Type 10GBASE-LR); Duplex: full only
	<b>Connectivity</b>	<b>Connector type</b> SC
		<b>Wavelength</b> 1310 nm
	<b>Physical characteristics</b>	<b>Dimensions</b> 3.48(d) x 1.42(w) x 0.43(h) in. (8.84 x 3.61 x 1.09 cm)
		<b>Weight</b> 0.35 lb. (0.16 kg)
		<b>Transceiver form factor</b> X2
	<b>Environment</b>	<b>Operating temperature</b> 32°F to 104°F (0°C to 40°C)
		<b>Operating relative humidity</b> 15% to 95%, noncondensing
		<b>Nonoperating/Storage temperature</b> -40°F to 185°F (-40°C to 85°C)
		<b>Altitude</b> up to 10,000 ft. (3 km)
	<b>Electrical characteristics</b>	<b>Power consumption typical</b> 2 W
		<b>Power consumption maximum</b> 3 W
	<b>Cabling</b>	Cable type: Low metal content, single-mode fiber-optic, complying with ITU-T G.652 and ISO/IEC 793-2 Type B1;  Maximum distance:  <ul style="list-style-type: none"> <li>• 10 km</li> </ul>
		<b>Cable length</b> 2m to 10km with 9/125 μm single-mode cable



## Accessory Product Details

		<b>Fiber type</b>	Single Mode	
	<b>Notes</b>	Conditioning patch cord cables are not supported For fiber patch cords, use Ultra Physical Contact (UPC) surface termination/polish. Angled Physical Contact (APC) is not recommended		
	<b>Services</b>	Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.		
<b>HP X131 10G X2 SC LRM Transceiver (J9144A)</b>	<b>Ports</b>	1 SC 10-GbE port (IEEE 802.3aq Type 10GBASE-LRM); Duplex: full only		
An X2 form-factor transceiver that supports the 10-Gigabit LRM standard, providing 10-Gigabit connectivity up to 220 m on legacy multimode fiber.	<b>Physical characteristics</b>	<b>Dimensions</b>	3.54(d) x 1.59(w) x 0.7(h) in. (9.0 x 4.05 x 1.78 cm)	
		<b>Weight</b>	0.35 lb. (0.16 kg)	
		<b>Transceiver form factor</b>	X2	
	<b>Environment</b>	<b>Operating temperature</b>	32°F to 158°F (0°C to 70°C)	
		<b>Operating relative humidity</b>	0% to 95%, noncondensing	
		<b>Nonoperating/Storage temperature</b>	-40°F to 185°F (-40°C to 85°C)	
	<b>Electrical characteristics</b>	<b>Altitude</b>	up to 10,000 ft. (3 km)	
		<b>Power consumption typical</b>	3.2 W	
		<b>Power consumption maximum</b>	4.2 W	
	<b>Cabling</b>	Cable type: 62.5/125 $\mu\text{m}$ or 50/125 $\mu\text{m}$ (core/cladding) diameter, graded-index, low metal content, multimode fiber optic, complying with ITU-T G.651 and ISO/IEC 793-2 Type A1b or A1a, respectively (a mode conditioning patch cord may be needed in some multimode fiber installations);  Maximum distance: <ul style="list-style-type: none"> <li>• 0.5-220m with 62.5 <math>\mu\text{m}</math> multimode cable @ 160/500 MHz*km</li> <li>• 0.5-220m with 62.5 <math>\mu\text{m}</math> multimode cable @ 200/500 MHz*km</li> <li>• 0.5-100m with 50 <math>\mu\text{m}</math> multimode cable @ 400/400 MHz*km</li> <li>• 0.5-220m with 50 <math>\mu\text{m}</math> multimode cable @ 500/500 MHz*km</li> <li>• 0.5-220m with 50 <math>\mu\text{m}</math> multimode cable @ 1500/500 MHz*km</li> </ul> <b>Cable length</b> .5m to 220m		
<b>Notes</b>	<b>Fiber type</b>	Multi Mode		
	Wavelength: 1310nm For OM3 cable (50 $\mu\text{m}$ multimode @ 1500/500 MHz*km), a mode-conditioning patch cord is not required. Other multimode cables may require mode-conditioning patch cords to achieve the maximum distances listed above. For supported platforms and minimum software requirements to support this product, see the document titled "Support for the J9144A 10-GbE X2-SC LRM Optic" on the "HP 10-GbE Transceivers" Manuals Web page. Power Consumption: 4W Max			

## Accessory Product Details

<b>Services</b>	Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.
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<b>HPE X132 10G SFP+ LC ER Transceiver (J9153A)</b>	<b>Ports</b>	1 LC 10-GbE port (IEEE 802.3ae Type 10Gbase-ER); Duplex: full only
	<b>Connectivity</b>	<b>Connector type</b> LC
The SFP+ ER Transceiver will transmit 10Gbps over up to 40km using standard OM3 fiber cable. This product expands the HP Networking transceiver portfolio for connections from 0m to 40km. Use only genuine HP transceivers with your HP Networking equipment to ensure reliability and support.	<b>Physical characteristics</b>	<b>Wavelength</b> 1550 nm
		<b>Dimensions</b> 2.22(d) x 0.55(w) x 0.47(h) in. (5.65 x 1.39 x 1.19 cm)
	<b>Environment</b>	<b>Weight</b> .04 lb., Fully loaded
		<b>Transceiver form factor</b> SFP+
		<b>Operating temperature</b> 32°F to 158°F (0°C to 70°C)
	<b>Electrical characteristics</b>	<b>Operating relative humidity</b> 5% to 95%, noncondensing
		<b>Nonoperating/Storage temperature</b> -40°F to 185°F (-40°C to 85°C)
		<b>Nonoperating/Storage relative humidity</b> 5% to 95%, noncondensing
	<b>Cabling</b>	<b>Altitude</b> up to 10,000 ft. (3 km)
		<b>Power consumption typical</b> 1.3 W
<b>Notes</b>	<b>Power consumption maximum</b> 1.5 W	
	<b>Fiber type</b> Single Mode	
<b>Services</b>	Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.	

<b>HPE X132 10G SFP+ LC LR Transceiver (J9151A)</b>	<b>Ports</b>	1 LC 10-GbE port (IEEE 802.3ae Type 10Gbase-LR); Duplex: full only
	<b>Connectivity</b>	<b>Connector type</b> LC
A 10-Gigabit transceiver in	<b>Physical characteristics</b>	<b>Wavelength</b> 1310 nm
		<b>Dimensions</b> 2.19(d) x 0.54(w) x 0.47(h) in. (5.57 x 1.38 x 1.19

## Accessory Product Details

SFP+ form-factor that supports the 10-Gigabit LR standard, providing 10-Gigabit connectivity up to 10 km on single-mode fiber.

<b>Environment</b>	<b>Weight</b>	cm) 0.04 lb. (.02 kg)
	<b>Transceiver form factor</b>	SFP+
	<b>Operating temperature</b>	32°F to 158°F (0°C to 70°C)
	<b>Operating relative humidity</b>	0% to 85%, noncondensing
	<b>Nonoperating/Storage temperature</b>	-40°F to 185°F (-40°C to 85°C)
	<b>Altitude</b>	up to 10,000 ft. (3 km)
<b>Electrical characteristics</b>	<b>Power consumption typical</b>	0.9 W
	<b>Power consumption maximum</b>	1 W
<b>Cabling</b>	Cable type: Low metal content, single-mode fiber-optic, complying with ITU-T G.652 and ISO/IEC 793-2 Type B1; Maximum distance:	
	<ul style="list-style-type: none"> <li>2m-10km with 9/125 <math>\mu</math>m single-mode cable</li> </ul>	
	<b>Cable length</b>	2m to 10km
	<b>Fiber type</b>	Single Mode
<b>Notes</b>	Conditioning patch cord cables are not supported. For fiber patch cords, use Ultra Physical Contact (UPC) surface termination/polish. Angled Physical Contact (APC) is not recommended.	
<b>Services</b>	Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.	

<b>HPE X132 10G SFP+ LC LRM Transceiver</b> (J9152A)	<b>Ports</b>	1 LC 10-GbE port (IEEE 802.3aq Type 10Gbase-LRM); Duplex: full only	
	<b>Connectivity</b>	<b>Connector type</b>	LC
		<b>Wavelength</b>	1310 nm
A 10-Gigabit transceiver in SFP+ form-factor that supports the 10-Gigabit LRM standard, for 10-Gigabit connectivity up to 220 m on legacy multimode fiber.	<b>Physical characteristics</b>	<b>Dimensions</b>	2.19(d) x 0.54(w) x 0.47(h) in. (5.57 x 1.38 x 1.19 cm)
		<b>Weight</b>	0.04 lb. (.02 kg)
	<b>Environment</b>	<b>Transceiver form factor</b>	SFP+
		<b>Operating temperature</b>	32°F to 158°F (0°C to 70°C)
		<b>Operating relative humidity</b>	0% to 85%, noncondensing
		<b>Nonoperating/Storage temperature</b>	-40°F to 185°F (-40°C to 85°C)
		<b>Altitude</b>	up to 10,000 ft. (3 km)
	<b>Electrical characteristics</b>	<b>Power consumption</b>	0.7 W

## Accessory Product Details

		<b>typical</b>	
		<b>Power consumption</b>	1 W
		<b>maximum</b>	
<b>Cabling</b>		Cable type:	62.5/125 $\mu\text{m}$ or 50/125 $\mu\text{m}$ (core/cladding) diameter, graded-index, low metal content, multimode fiber optic, complying with ITU-T G.651 and ISO/IEC 793-2
			Type A1b or A1a, respectively (a mode conditioning patch cord may be needed in some multimode fiber installations);
		Maximum distance:	
			<ul style="list-style-type: none"> <li>• 0.5-220m with 62.5 <math>\mu\text{m}</math> multimode cable @ 160/500 MHz*km</li> <li>• 0.5-220m with 62.5 <math>\mu\text{m}</math> multimode cable @ 200/500 MHz*km</li> <li>• 0.5-100m with 50 <math>\mu\text{m}</math> multimode cable @ 400/400 MHz*km</li> <li>• 0.5-220m with 50 <math>\mu\text{m}</math> multimode cable @ 500/500 MHz*km</li> <li>• 0.5-220m with 50 <math>\mu\text{m}</math> multimode cable @ 1500/500 MHz*km</li> </ul>
		<b>Cable length</b>	0.5m to 220m
		<b>Fiber type</b>	Multi Mode
<b>Notes</b>			For OM3 cable (50 $\mu\text{m}$ multimode @ 1500/500 MHz*km), a mode-conditioning patch cord is not required. Other multimode cables may require mode-conditioning patch cords to achieve the maximum distances listed above.
			For fiber patch cords, use Ultra Physical Contact (UPC) surface termination/polish. Angled Physical Contact (APC) is not recommended.
<b>Services</b>			Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.
<b>HPE X132 10G SFP+ LC SR Transceiver (J9150A)</b>	<b>Ports</b>	1 LC 10-GbE port (IEEE 802.3ae Type 10Gbase-SR); Duplex: full only	
	<b>Connectivity</b>	<b>Connector type</b>	LC
		<b>Wavelength</b>	850 nm
	<b>Physical characteristics</b>	<b>Dimensions</b>	2.19(d) x 0.54(w) x 0.47(h) in. (5.57 x 1.38 x 1.19 cm)
		<b>Weight</b>	0.04 lb. (0.02 kg)
		<b>Transceiver form factor</b>	SFP+
	<b>Environment</b>	<b>Operating temperature</b>	32°F to 158°F (0°C to 70°C)
		<b>Operating relative humidity</b>	0% to 85%, noncondensing
		<b>Nonoperating/Storage temperature</b>	-40°F to 185°F (-40°C to 85°C)
		<b>Altitude</b>	up to 10,000 ft. (3 km)
	<b>Electrical characteristics</b>	<b>Power consumption typical</b>	0.6 W
		<b>Power consumption</b>	0.8 W

A 10-Gigabit transceiver in SFP+ form-factor that supports the 10-Gigabit SR standard, providing 10-Gigabit connectivity up to 300 m on multimode fiber.

## Accessory Product Details

	<b>maximum</b>	
<b>Cabling</b>	Cable type: 62.5/125 $\mu\text{m}$ or 50/125 $\mu\text{m}$ (core/cladding) diameter, graded-index, low metal content, multimode fiber optic, complying with ITU-T G.651 and ISO/IEC 793-2 Type A1b or A1a, respectively; Maximum distance:	
	<ul style="list-style-type: none"> <li>• 2-26m with 62.5 <math>\mu\text{m}</math> multimode cable @ 160 MHz*km</li> <li>• 2-33m with 62.5 <math>\mu\text{m}</math> multimode cable @ 200 MHz*km</li> <li>• 2-66m with 50 <math>\mu\text{m}</math> multimode cable @ 400 MHz*km</li> <li>• 2-82m with 50 <math>\mu\text{m}</math> multimode cable @ 500 MHz*km</li> <li>• 2-300m with 50 <math>\mu\text{m}</math> multimode cable @ 2000 MHz*km</li> </ul>	
	<b>Cable length</b>	2-300m
	<b>Fiber type</b>	Multi Mode
<b>Notes</b>	For fiber patch cords, use Ultra Physical Contact (UPC) surface termination/polish. Angled Physical Contact (APC) is not recommended.	
<b>Services</b>	Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.	

<b>HPE X242 10G SFP+ to SFP+ 1m Direct Attach Copper Cable (J9281B)</b>	<b>Connectivity</b>	Length	3.28 ft. (1 m)
	<b>Physical characteristics</b>	Weight	0.24 lb. (0.11 kg) the cable with an SFP+ transceiver at each end of the cable
	<b>Environment</b>	Operating temperature	32°F to 158°F (0°C to 70°C)
		Operating relative humidity	5% to 95%, noncondensing
		Nonoperating/Storage temperature	14°F to 185°F (-10°C to 85°C)
		Nonoperating/Storage relative humidity	5% to 95%, noncondensing
		Altitude	up to 10,000 ft. (3 km)
	<b>Electrical characteristics</b>	Notes	0.04 watts maximum per transceiver end
	<b>Notes</b>	Electrical Properties	<ul style="list-style-type: none"> <li>• Cable Characteristic Impedance: 100 ohms</li> <li>• Crosstalk between pairs: 2% max</li> <li>• Time delay: 1.31 nsec/ft</li> </ul>
		Physical Properties	<ul style="list-style-type: none"> <li>• Cable Diameter: 0.180"</li> <li>• Minimum Cable Bend Radius: 1.0"</li> </ul>
<b>Services</b>	Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.		

## Accessory Product Details

<b>HPE X242 10G SFP+ to SFP+ 3m Direct Attach Copper Cable (J9283B)</b>	<b>Connectivity</b>	Length	10 ft. (3 m)
	<b>Physical characteristics</b>	Weight	.49 lb. (0.22 kg), Fully loaded the cable with an SFP+ transceiver at each end of the cable
		<b>Environment</b>	Operating temperature
	Operating relative humidity		5% to 95%, noncondensing
	Nonoperating/Storage temperature		14°F to 185°F (-10°C to 85°C)
	Nonoperating/Storage relative humidity		5% to 95%, noncondensing
	Altitude		up to 10,000 ft. (3 km)
	<b>Electrical characteristics</b>	Notes	0.04 watts maximum per transceiver end
	<b>Notes</b>	Electrical Properties	<ul style="list-style-type: none"> <li>• Cable Characteristic Impedance: 100 ohms</li> <li>• Crosstalk between pairs: 2% max</li> <li>• Time delay: 1.31 nsec/ft</li> </ul>
		Physical Properties	<ul style="list-style-type: none"> <li>• Cable Diameter: 0.180"</li> <li>• Minimum Cable Bend Radius: 1.0"</li> </ul>
<b>Services</b>	Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.		

<b>HPE X242 10G SFP+ to SFP+ 7m Direct Attach Copper Cable (J9285B)</b>	<b>Connectivity</b>	Length	22.97 ft. (7 m)
	<b>Physical characteristics</b>	Weight	1.02 lb., Fully loaded the cable with an SFP+ transceiver at each end of the cable
		<b>Environment</b>	Operating temperature
	Operating relative humidity		5% to 95%, noncondensing
	Nonoperating/Storage temperature		14°F to 185°F (-10°C to 85°C)
	Nonoperating/Storage relative humidity		5% to 95%, noncondensing
	Altitude		up to 10,000 ft. (3 km)
	<b>Electrical characteristics</b>	Notes	0.04 watts maximum per transceiver end
	<b>Notes</b>	Electrical Properties	<ul style="list-style-type: none"> <li>• Cable Characteristic Impedance: 100 ohms</li> <li>• Crosstalk between pairs: 2% max</li> <li>• Time delay: 1.31 nsec/ft</li> </ul>
		Physical Properties	<ul style="list-style-type: none"> <li>• Cable Diameter: 0.180"</li> <li>• Minimum Cable Bend Radius: 1.0"</li> </ul>
<b>Services</b>	Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard		

## Accessory Product Details

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<b>HP X242 10G SFP+ to SFP+ 10m Direct Attach Copper Cable (J9286B)</b>	<b>Connectivity</b>	Length	32.82 ft. (10 m)
	<b>Physical characteristics</b>	Dimensions	12(d) x 15(w) x 3(h) in. (30.48 x 38.1 x 7.62 cm)
		Weight	0.99 lb. (0.45 kg), Fully loaded the cable with an SFP+ transceiver at each end of the cable
		<b>Environment</b>	Operating temperature
		Operating relative humidity	5% to 95%, noncondensing
		Nonoperating/Storage temperature	14°F to 185°F (-10°C to 85°C)
		Nonoperating/Storage relative humidity	5% to 95%, noncondensing
		Altitude	up to 10,000 ft. (3 km)
	<b>Electrical characteristics</b>	Maximum power rating	1.2 W
		Notes	Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated. 0.6 watts maximum per transceiver end
<b>Notes</b>	Electrical Properties:	<ul style="list-style-type: none"> <li>Cable Characteristic Impedance: 100 ohms</li> </ul>	
	Physical Properties:	<ul style="list-style-type: none"> <li>Cable Diameter: 0.185"</li> <li>Minimum Cable Bend Radius: .555"</li> </ul>	
<b>Services</b>	Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.		

<b>HP X242 10G SFP+ to SFP+ 15m Direct Attach Copper Cable (J9287B)</b>	<b>Connectivity</b>	Length	49.20 ft. (15 m)
	<b>Physical characteristics</b>	Dimensions	12(d) x 15(w) x 3(h) in. (30.48 x 38.1 x 7.62 cm)
		Weight	1.74 lb. (0.79 kg), Fully loaded the cable with an SFP+ transceiver at each end of the cable
		<b>Environment</b>	Operating temperature
		Operating relative humidity	5% to 95%, noncondensing
		Nonoperating/Storage temperature	14°F to 185°F (-10°C to 85°C)
		Nonoperating/Storage relative humidity	5% to 95%, noncondensing
		Altitude	up to 10,000 ft. (3 km)
	<b>Electrical characteristics</b>	Maximum power rating	1.2 W
		Notes	Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if

## Accessory Product Details

			equipped), 100% traffic, all ports plugged in, and all modules populated. 0.6 watts maximum per transceiver end
	<b>Notes</b>	Electrical Properties:	
		• Cable Characteristic Impedance: 100 ohms	
		Physical Properties:	
		• Cable Diameter: 0.255"	
		• Minimum Cable Bend Radius: 0.765"	
	<b>Services</b>	Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.	
<b>HP X244 10G XFP to SFP+ 1m Direct Attach Copper Cable (J9300A)</b>	<b>Connectivity</b>	Length	3.28 ft. (1 m)
	<b>Physical characteristics</b>	Weight	.27 lb. (0.12 kg), Fully loaded cable with XFP transceiver on one end and SFP+ on the other end
A 1m direct attach copper cable with an XFP connector attached on one end and an SFP+ connector attached on the other end. This cable provides a low price connectivity option between switches/servers/storage to interconnect XFP and SFP+ form factors.	<b>Environment</b>	Operating temperature	32°F to 158°F (0°C to 70°C)
		Operating relative humidity	5% to 95%, noncondensing
		Nonoperating/Storage temperature	32°F to 158°F (0°C to 70°C)
		Nonoperating/Storage relative humidity	5% to 95%, noncondensing
		Altitude	up to 10,000 ft. (3 km)
	<b>Notes</b>	XFP end consumes 2 watts SFP+ end consumes 0.036 watts	
	<b>Services</b>	Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.	
<b>HP 10G X244 XFP to SFP+ 3m Direct Attach Copper Cable (J9301A)</b>	<b>Connectivity</b>	Length	9.84 ft. (3 m)
	<b>Physical characteristics</b>	Weight	.51 lb. (0.23 kg), Fully loaded cable with XFP transceiver on one end and SFP+ on the other end
A 3m direct attach copper cable with an XFP connector attached on one end and an SFP+ connector attached on the other end. This cable provides a low price connectivity option between switches/servers/storage to interconnect XFP and SFP+ form factors.	<b>Environment</b>	Operating temperature	32°F to 158°F (0°C to 70°C)
		Operating relative humidity	5% to 95%, noncondensing
		Nonoperating/Storage temperature	32°F to 158°F (0°C to 70°C)
		Nonoperating/Storage relative humidity	5% to 95%, noncondensing
		Altitude	up to 10,000 ft. (3 km)
	<b>Cabling</b>	Maximum distance:	
		• 3m Direct Attach Cable	
	<b>Notes</b>	XFP end consumes 2 watts SFP+ end consumes 0.036 watts	
	<b>Services</b>	Refer to the Hewlett Packard Enterprise website at	



## Accessory Product Details

<http://www.hpe.com/networking/services> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.

<b>HP 10G X244 XFP to SFP+ 5m Direct Attach Copper Cable (J9302A)</b>	<b>Connectivity</b>	Length	16.4 ft. (5 m)
	<b>Physical characteristics</b>	Weight	.74 lb. (0.34 kg), Fully loaded cable with XFP transceiver on one end and SFP+ on the other end
A 5m direct attach copper cable with an XFP connector attached on one end and an SFP+ connector attached on the other end. This cable provides a low price connectivity option between switches/servers/storage to interconnect XFP and SFP+ form factors.	<b>Environment</b>	Operating temperature	32°F to 158°F (0°C to 70°C)
		Operating relative humidity	5% to 95%, noncondensing
		Nonoperating/Storage temperature	32°F to 158°F (0°C to 70°C)
		Nonoperating/Storage relative humidity	5% to 95%, noncondensing
		Altitude	up to 10,000 ft. (3 km)
<b>Notes</b>		XFP end consumes 2 watts SFP+ end consumes 0.036 watts	
<b>Services</b>		Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.	

<b>HPE LC to LC Multimode OM3 2-Fiber 0.5m 1-Pack Fiber Optic Cable (AJ833A)</b>	<b>Cabling</b>	<b>Cable type:</b>	50/125 μm (core/cladding) diameter, multimode fiber optic, with effective modal bandwidth of 2000 MHz/km as detailed in TIA-492AAAC for distances of up to 300 m
		<b>Maximum distance:</b>	10Gbps Transfer Rate (Ethernet): 300m
	<b>Notes</b>	Cable Specs: Tight buffered duplex fiber optic multimode OM3 50/125 μm fiber optic cable and Ethernet assembly with LC duplex connectors on one end and LC duplex connectors on other end.	
		<ul style="list-style-type: none"> <li>• Dimensions: Core diameter: 50 ± 3.0μm Cladding diameter: 125 ± 2.0μm Coating diameter: 245 ± 10μm</li> <li>• Optical glass: Bandwidth: For LED sources: 1500/500 MHz-km @850/1300nm.</li> <li>• Optical glass: Bandwidth: For Laser sources: 2000/500 MHz-km @850/1300nm. VCSEL Laser sources: 600 / 600 meters @850/1300nm for Gigabit Ethernet compliant links.</li> <li>• CABLE: The cable is duplex zipcord graded index 50/125μm multimode optical fiber and designed to work in both the 850 and 1300 nm wavelength windows.</li> <li>• BULK CABLE &amp; CABLE ASSEMBLY CONFIGURATION:</li> <li>• Jacket Material: Riser Grade - Low Smoke Zero Halogen thermoplastic.</li> <li>• Jacket Color: Aqua for OM3 multimode per TIA 598</li> <li>• Boot Color: White</li> <li>• Insertion Loss: less than 0.5 dB @ 850 with LED source, 0.003 dB/M added for lengths &gt; 30 meters.</li> </ul>	

## Accessory Product Details

- Maximum Cable attenuation: 3.0 dB/km @ 850 nm, 1.0 dB/Km @ 1310 nm @ 23°C as tested in accordance with EIA 455-46.
- Weight: Air Packed Weight: 1 LB Net Weight: 0.454Kg

### Services

Refer to the Hewlett Packard Enterprise website at <http://www.hpe.com/networking/services> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.

**HPE LC to LC Multi-mode OM3 2-Fiber 1.0m 1-Pack Fiber Optic Cable**  
(AJ834A)

### Cabling

#### Cable type:

50/125  $\mu$ m (core/cladding) diameter, multimode fiber optic, with effective modal bandwidth of 2000 MHz/km as detailed in TIA-492AAAC for distances of up to 300 m

#### Maximum distance:

10Gbps Transfer Rate (Ethernet): 300m

### Notes

Cable Specs: Tight buffered duplex fiber optic multimode OM3 50/125  $\mu$ m fiber optic cable and Ethernet assembly with LC duplex connectors on one end and LC duplex connectors on other end.

- Dimensions: Core diameter: 50  $\pm$  3.0 $\mu$ m Cladding diameter: 125  $\pm$  2.0 $\mu$ m Coating diameter: 245  $\pm$  10 $\mu$ m
- Optical Glass Bandwidth: For LED sources: 1500/500 MHz-km @850/1300nm.
- Optical Glass: For Laser sources: 2000/500 MHz-km @850/1300nm. VCSEL Laser sources: Shall achieve 600 / 600 meters @850/1300nm for Gigabit Ethernet compliant links.
- CABLE: The cable is duplex zipcord graded index 50/125 $\mu$ m multimode optical fiber. The cable is designed to work in both the 850 and 1300 nm wavelength windows.
- BULK CABLE & CABLE ASSEMBLY CONFIGURATION:
- Jacket Material: Riser Grade - Low Smoke Zero Halogen thermoplastic.
- Jacket Color: Aqua for OM3 multimode per TIA 598
- Boot Color: White
- Insertion Loss: less than 0.5 dB @ 850 with LED source, 0.003 dB/M added for lengths > 30 meters.
- Maximum Cable attenuation: 3.0 dB/km @ 850 nm, 1.0 dB/Km @ 1310 nm @ 23°C as tested in accordance with EIA 455-46.
- Weight: Air Packed Weight: 1 LB Net Weight: 0.454Kg

### Services

Refer to the Hewlett Packard Enterprise website at <http://www.hpe.com/networking/services> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.

**HPE LC to LC Multi-mode OM3 2-Fiber 2.0m 1-Pack Fiber Optic Cable**  
(AJ835A)

### Cabling

#### Cable type:

50/125  $\mu$ m (core/cladding) diameter, multimode fiber optic, with effective modal bandwidth of 2000 MHz/km as detailed in TIA-492AAAC for distances of up to 300 m;

## Accessory Product Details

### Notes

#### Maximum distance:

10Gbps Transfer Rate (Ethernet): 300m

Cable Specs: Tight buffered duplex fiber optic multimode OM3 50/125 um fiber optic cable and Ethernet assembly with LC duplex connectors on one end and LC duplex connectors on other end.

- Dimensions: Core diameter: 50 ± 3.0um Cladding diameter: 125 ± 2.0um Coating diameter: 245 ± 10um
- Optical Glass Bandwidth: For LED sources: 1500/500 MHz-km @850/1300nm.
- Optical Glass: For Laser sources: 2000/500 MHz-km @850/1300nm. VCSEL Laser sources: Shall achieve 600 / 600 meters @850/1300nm for Gigabit Ethernet compliant links.
- CABLE: The cable is duplex zipcord graded index 50/125um multimode optical fiber. The cable is designed to work in both the 850 and 1300 nm wavelength windows.
- BULK CABLE & CABLE ASSEMBLY CONFIGURATION:
- Jacket Material: Riser Grade - Low Smoke Zero Halogen thermoplastic.
- Jacket Color: Aqua for OM3 multimode per TIA 598
- Boot Color: White
- Insertion Loss: less than 0.5 dB @ 850 with LED source, 0.003 dB/M added for lengths > 30 meters.
- Maximum Cable attenuation: 3.0 dB/km @ 850 nm, 1.0 dB/Km @ 1310 nm @ 23°C as tested in accordance with EIA 455-46.
- Weight: Air Packed Weight: 1 LB Net Weight: 0.454Kg

### Services

Refer to the Hewlett Packard Enterprise website at

<http://www.hpe.com/networking/services> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.

**HPE LC to LC Multi-mode OM3 2-Fiber 5.0m 1-Pack Fiber Optic Cable (AJ836A)**      **Cabling**

#### Cable type:

50/125 μm core/cladding) diameter, multimode fiber optic, with effective modal bandwidth of 2000 MHz/km as detailed in TIA-492AAAC for distances of up to 300 m;

#### Maximum distance:

10Gbps Transfer Rate (Ethernet): 300m

### Notes

Cable Specs: This specification defines the detail requirements for a tight buffered duplex fiber optic multimode OM3 50/125 um fiber optic cable and Ethernet assembly with LC duplex connectors on one end and LC duplex connectors on other end.

- Dimensions: Core diameter: 50 ± 3.0um Cladding diameter: 125 ± 2.0um Coating diameter: 245 ± 10um
- Optical Glass Bandwidth: For LED sources: 1500/500 MHz-km @850/1300nm.
- Optical Glass: For Laser sources: 2000/500 MHz-km @850/1300nm. VCSEL Laser sources: Shall achieve 600 / 600 meters @850/1300nm for Gigabit Ethernet compliant links.
- CABLE: The cable is duplex zipcord graded index 50/125um multimode optical fiber. The cable is designed to work in both the

## Accessory Product Details

- 850 and 1300 nm wavelength windows.
- BULK CABLE & CABLE ASSEMBLY CONFIGURATION:
- Jacket Material: Riser Grade - Low Smoke Zero Halogen thermoplastic.
- Jacket Color: Aqua for OM3 multimode per TIA 598
- Boot Color: White
- Insertion Loss: less than 0.5 dB @ 850 with LED source, 0.003 dB/M added for lengths > 30 meters.
- Maximum Cable attenuation: 3.0 dB/km @ 850 nm, 1.0 dB/Km @ 1310 nm @ 23°C as tested in accordance with EIA 455-46.
- Weight: Air Packed Weight: 1 LB Net Weight: 0.454Kg

### Services

Refer to the Hewlett Packard Enterprise website at <http://www.hpe.com/networking/services> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.

### HPE LC to LC Multi-mode OM3 2-Fiber 15.0m 1-Pack Fiber Optic Cable (AJ837A)

### Cabling

#### Cable type:

50/125  $\mu$ m (core/cladding) diameter, multimode fiber optic, with effective modal bandwidth of 2000 MHz/km as detailed in TIA-492AAAC for distances of up to 300 m;

#### Maximum distance:

10Gbps Transfer Rate (Ethernet): 300m

### Notes

Cable Specs: Tight buffered duplex fiber optic multimode OM3 50/125  $\mu$ m fiber optic cable and Ethernet assembly with LC duplex connectors on one end and LC duplex connectors on other end.

- Dimensions: Core diameter: 50  $\pm$  3.0 $\mu$ m Cladding diameter: 125  $\pm$  2.0 $\mu$ m Coating diameter: 245  $\pm$  10 $\mu$ m
- Optical Glass Bandwidth: For LED sources: 1500/500 MHz-km @850/1300nm.
- Optical Glass: For Laser sources: 2000/500 MHz-km @850/1300nm. VCSEL Laser sources: Shall achieve 600 / 600 meters @850/1300nm for Gigabit Ethernet compliant links.
- CABLE: The cable is duplex zipcord graded index 50/125 $\mu$ m multimode optical fiber. The cable is designed to work in both the 850 and 1300 nm wavelength windows.
- BULK CABLE & CABLE ASSEMBLY CONFIGURATION:
- Jacket Material: Riser Grade - Low Smoke Zero Halogen thermoplastic.
- Jacket Color: Aqua for OM3 multimode per TIA 598
- Boot Color: White
- Insertion Loss: less than 0.5 dB @ 850 with LED source, 0.003 dB/M added for lengths > 30 meters.
- Maximum Cable attenuation: 3.0 dB/km @ 850 nm, 1.0 dB/Km @ 1310 nm @ 23°C as tested in accordance with EIA 455-46.
- Weight: Air Packed Weight: 1 LB Net Weight: 0.454Kg

### Services

Refer to the Hewlett Packard Enterprise website at <http://www.hpe.com/networking/services> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard

## Accessory Product Details

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<b>HPE LC to LC Multi-mode OM3 2-Fiber 30.0m 1-Pack Fiber Optic Cable (AJ838A)</b>	<b>Cabling</b>	<b>Cable type:</b> 50/125 $\mu\text{m}$ (core/cladding) diameter, multimode fiber optic, with effective modal bandwidth of 2000 MHz/km as detailed in TIA-492AAAC for distances of up to 300 m;
	<b>Notes</b>	<b>Maximum distance:</b> 10Gbps Transfer Rate (Ethernet): 300m  Cable Specs: Tight buffered duplex fiber optic multimode OM3 50/125 $\mu\text{m}$ fiber optic cable and Ethernet assembly with LC duplex connectors on one end and LC duplex connectors on other end. <ul style="list-style-type: none"> <li>• Dimensions: Core diameter: 50 <math>\pm</math> 3.0<math>\mu\text{m}</math> Cladding diameter: 125 <math>\pm</math> 2.0<math>\mu\text{m}</math> Coating diameter: 245 <math>\pm</math> 10<math>\mu\text{m}</math></li> <li>• Optical Glass Bandwidth: For LED sources: 1500/500 MHz-km @850/1300nm.</li> <li>• Optical Glass: For Laser sources: 2000/500 MHz-km @850/1300nm. VCSEL Laser sources: Shall achieve 600 / 600 meters @850/1300nm for Gigabit Ethernet compliant links.</li> <li>• CABLE: The cable is duplex zipcord graded index 50/125<math>\mu\text{m}</math> multimode optical fiber. The cable is designed to work in both the 850 and 1300 nm wavelength windows.</li> <li>• BULK CABLE &amp; CABLE ASSEMBLY CONFIGURATION:</li> <li>• Jacket Material: Riser Grade - Low Smoke Zero Halogen thermoplastic.</li> <li>• Jacket Color: Aqua for OM3 multimode per TIA 598</li> <li>• Boot Color: White</li> <li>• Insertion Loss: less than 0.5 dB @ 850 with LED source, 0.003 dB/M added for lengths &gt; 30 meters.</li> <li>• Maximum Cable attenuation: 3.0 dB/km @ 850 nm, 1.0 dB/Km @ 1310 nm @ 23°C as tested in accordance with EIA 455-46.</li> <li>• Weight: Air Packed Weight: 1 LB Net Weight: 0.454Kg</li> </ul>
	<b>Services</b>	Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.

<b>HPE LC to LC Multi-mode OM3 2-Fiber 50.0m 1-Pack Fiber Optic Cable (AJ839A)</b>	<b>Cabling</b>	<b>Cable type:</b> 50/125 $\mu\text{m}$ (core/cladding) diameter, multimode fiber optic, with effective modal bandwidth of 2000 MHz/km as detailed in TIA-492AAAC for distances of up to 300 m;
	<b>Notes</b>	<b>Maximum distance:</b> 10Gbps Transfer Rate (Ethernet): 300m  Cable Specs: Tight buffered duplex fiber optic multimode OM3 50/125 $\mu\text{m}$ fiber optic cable and Ethernet assembly with LC duplex connectors on one end and LC duplex connectors on other end. <ul style="list-style-type: none"> <li>• Dimensions: Core diameter: 50 <math>\pm</math> 3.0<math>\mu\text{m}</math> Cladding diameter: 125 <math>\pm</math> 2.0<math>\mu\text{m}</math> Coating diameter: 245 <math>\pm</math> 10<math>\mu\text{m}</math></li> </ul>

## Accessory Product Details

- Optical Glass Bandwidth: For LED sources: 1500/500 MHz-km @850/1300nm.
- Optical Glass: For Laser sources: 2000/500 MHz-km @850/1300nm. VCSEL Laser sources: Shall achieve 600 / 600 meters @850/1300nm for Gigabit Ethernet compliant links.
- CABLE: The cable is duplex zipcord graded index 50/125um multimode optical fiber. The cable is designed to work in both the 850 and 1300 nm wavelength windows.
- BULK CABLE & CABLE ASSEMBLY CONFIGURATION:
- Jacket Material: Riser Grade - Low Smoke Zero Halogen thermoplastic.
- Jacket Color: Aqua for OM3 multimode per TIA 598
- Boot Color: White
- Insertion Loss: less than 0.5 dB @ 850 with LED source, 0.003 dB/M added for lengths > 30 meters.
- Maximum Cable attenuation: 3.0 dB/km @ 850 nm, 1.0 dB/Km @ 1310 nm @ 23°C as tested in accordance with EIA 455-46.
- Weight: Air Packed Weight: 1 LB Net Weight: 0.454Kg

### Services

Refer to the Hewlett Packard Enterprise website at <http://www.hpe.com/networking/services> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.

### HPE Premier Flex LC/LC Notes Multi-mode OM4 2 fiber 1m Cable (QK732A)

Cable Specs: Graded-index, "bendable" fiber optic multimode OM3+ 50/125um duplex cable and Ethernet assembly with LC duplex connectors on each end.

- Core Diameter: 50um  $\pm$ 3um, Cladding diameter: 125um  $\pm$ 2um; Coating diameter: 245  $\pm$  10um
- Bandwidth: 3000 MHz-km @ 850nm (Laser)
- Jacket Color: Blue
- Jacket Material: Riser Grade – Low Smoke Zero Halogen (LSZH) thermoplastic
- Boot Color: White
- Outer Jacket Print: HP PremierFlex OM3+ Fiber Optic Cable, 50/125um, Type OFNR (UL), LSZH, cUL, OFN FT4, ROHS. Cable also has a longitudinal white stripe that runs the entire length of the cable.
- Insertion Loss: Less than 0.5dB @ 850nm with LED source, 0.003dB/m added for lengths >30m
- Maximum Cable Attenuation: 3.0 dB/km @ 850nm, 1.0 dB/km @ 1310nm @ 23°C as tested in accordance with EIA 455-45

### Services

Refer to the Hewlett Packard Enterprise website at <http://www.hpe.com/networking/services> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.

### HPE Premier Flex LC/LC Notes Multi-mode OM4 2 fiber 2m Cable (QK733A)

Cable Specs: Graded-index, "bendable" fiber optic multimode OM3+ 50/125um duplex cable and Ethernet assembly with LC duplex connectors on each end.

- Core diameter: 50um  $\pm$ 3um, Cladding diameter: 125um  $\pm$ 2um; Coating diameter: 245  $\pm$  10um

## Accessory Product Details

- Bandwidth: 3000 MHz-km @ 850nm (Laser)
- Jacket Color: Blue
- Jacket Material: Riser Grade – Low Smoke Zero Halogen (LSZH) thermoplastic
- Boot Color: White
- Outer Jacket Print: HP PremierFlex OM3+ Fiber Optic Cable, 50/125um, Type OFNR (UL), LSZH, cUL, OFN FT4, ROHS. Cable also has a longitudinal white stripe that runs the entire length of the cable.
- Insertion Loss: Less than 0.5dB @ 850nm with LED source, 0.003dB/m added for lengths >30m
- Maximum Cable Attenuation: 3.0 dB/km @ 850nm, 1.0 dB/km @ 1310nm @ 23°C as tested in accordance with EIA 455-45

### Services

Refer to the Hewlett Packard Enterprise website at

<http://www.hpe.com/networking/services> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.

### HPE Premier Flex LC/LC Notes Multi-mode OM4 2 fiber 5m Cable (QK734A)

Cable Specs: Graded-index, "bendable" fiber optic multimode OM3+ 50/125um duplex cable and Ethernet assembly with LC duplex connectors on each end.

- Core diameter: 50um  $\pm$ 3um, Cladding diameter: 125um  $\pm$ 2um; Coating diameter: 245  $\pm$  10um
- Bandwidth: 3000 MHz-km @ 850nm (Laser)
- Jacket Color: Blue
- Jacket Material: Riser Grade – Low Smoke Zero Halogen (LSZH) thermoplastic
- Boot Color: White
- Outer Jacket Print: HP PremierFlex OM3+ Fiber Optic Cable, 50/125um, Type OFNR (UL), LSZH, cUL, OFN FT4, ROHS. Cable also has a longitudinal white stripe that runs the entire length of the cable.
- Insertion Loss: Less than 0.5dB @ 850nm with LED source, 0.003dB/m added for lengths >30m
- Maximum Cable Attenuation: 3.0 dB/km @ 850nm, 1.0 dB/km @ 1310nm @ 23°C as tested in accordance with EIA 455-45

### Services

Refer to the Hewlett Packard Enterprise website at

<http://www.hpe.com/networking/services> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.

### HPE Premier Flex LC/LC Notes Multi-mode OM4 2 fiber 15m Cable (QK735A)

Cable Specs: Graded-index, "bendable" fiber optic multimode OM3+ 50/125um duplex cable and Ethernet assembly with LC duplex connectors on each end.

- Core diameter: 50um  $\pm$ 3um, Cladding diameter: 125um  $\pm$ 2um; Coating diameter: 245  $\pm$  10um
- Bandwidth: 3000 MHz-km @ 850nm (Laser)
- Jacket Color: Blue
- Jacket Material: Riser Grade – Low Smoke Zero Halogen (LSZH) thermoplastic
- Boot Color: White
- Outer Jacket Print: HP PremierFlex OM3+ Fiber Optic Cable, 50/125um, Type OFNR (UL), LSZH, cUL, OFN FT4, ROHS. Cable also has a longitudinal

## Accessory Product Details

### Services

white stripe that runs the entire length of the cable.

- Insertion Loss: Less than 0.5dB @ 850nm with LED source, 0.003dB/m added for lengths >30m
- Maximum Cable Attenuation: 3.0 dB/km @ 850nm, 1.0 dB/km @ 1310nm @ 23°C as tested in accordance with EIA 455-45

Refer to the Hewlett Packard Enterprise website at

<http://www.hpe.com/networking/services> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.

### HPE Premier Flex LC/LC Notes Multi-mode OM4 2 fiber 30m Cable (QK736A)

Cable Specs: Graded-index, "bendable" fiber optic multimode OM3+ 50/125um duplex cable and Ethernet assembly with LC duplex connectors on each end.

- Core diameter: 50um ±3um, Cladding diameter: 125um ±2um; Coating diameter: 245 ± 10um
- Bandwidth: 3000 MHz-km @ 850nm (Laser)
- Jacket Color: Blue
- Jacket Material: Riser Grade – Low Smoke Zero Halogen (LSZH) thermoplastic
- Boot Color: White
- Outer Jacket Print: HP PremierFlex OM3+ Fiber Optic Cable, 50/125um, Type OFNR (UL), LSZH, cUL, OFN FT4, ROHS. Cable also has a longitudinal white stripe that runs the entire length of the cable.
- Insertion Loss: Less than 0.5dB @ 850nm with LED source, 0.003dB/m added for lengths >30m
- Maximum Cable Attenuation: 3.0 dB/km @ 850nm, 1.0 dB/km @ 1310nm @ 23°C as tested in accordance with EIA 455-45

### Services

Refer to the Hewlett Packard Enterprise website at

<http://www.hpe.com/networking/services> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.

### HPE Premier Flex LC/LC Notes Multi-mode OM4 2 fiber 50m Cable (QK737A)

Cable Specs: Graded-index, "bendable" fiber optic multimode OM3+ 50/125um duplex cable and Ethernet assembly with LC duplex connectors on each end.

- Core diameter: 50um ±3um, Cladding diameter: 125um ±2um; Coating diameter: 245 ± 10um
- Bandwidth: 3000 MHz-km @ 850nm (Laser)
- Jacket Color: Blue
- Jacket Material: Riser Grade – Low Smoke Zero Halogen (LSZH) thermoplastic
- Boot Color: White
- Outer Jacket Print: HP PremierFlex OM3+ Fiber Optic Cable, 50/125um, Type OFNR (UL), LSZH, cUL, OFN FT4, ROHS. Cable also has a longitudinal white stripe that runs the entire length of the cable.
- Insertion Loss: Less than 0.5dB @ 850nm with LED source, 0.003dB/m added for lengths >30m
- Maximum Cable Attenuation: 3.0 dB/km @ 850nm, 1.0 dB/km @ 1310nm @ 23°C as tested in accordance with EIA 455-45

### Services

Refer to the Hewlett Packard Enterprise website at



## Accessory Product Details

<http://www.hpe.com/networking/services> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.

<b>HPE 620 Redundant/External Power Supply</b> (J8696A)	<b>Ports</b>	2 redundant power supply ports Restrictions: 195 W available per port
		2 external power supply ports Restrictions: 398 W available per port
<b>Physical characteristics</b>	<b>Dimensions</b>	15.4(d) x 17.4(w) x 1.73(h) in. (39.12 x 44.2 x 4.39 cm) (1U height)
	<b>Weight</b>	15.2 lb. (6.89 kg)
<b>Mounting</b>		Mounts in an EIA-standard 19 in. telco rack or equipment cabinet (hardware included); horizontal surface mounting only
<b>Environment</b>	<b>Operating temperature</b>	32°F to 131°F (0°C to 55°C)
	<b>Operating relative humidity</b>	15% to 95% @ 104°F (40°C), noncondensing
	<b>Nonoperating/Storage temperature</b>	-40°F to 158°F (-40°C to 70°C)
	<b>Nonoperating/Storage relative humidity</b>	15% to 90% @ 149°F (65°C), noncondensing
	<b>Altitude</b>	up to 10,000 ft. (3 km)
	<b>Acoustic</b>	LwA per ISO 7779: 54.2 dB
<b>Electrical characteristics</b>	<b>Maximum heat dissipation</b>	400 BTU/hr (422 kJ/hr), for the actual 620 itself. PoE-powered device heat dissipation assumed to be outside the 620.
	<b>Voltage</b>	100-127/200-240 VAC
	<b>Current</b>	16/8 A
	<b>Maximum power rating</b>	1440 W
	<b>RPS power</b>	390 W
	<b>PoE power</b>	796 W
	<b>RPS</b>	12 V
	<b>PoE</b>	-50 V
	<b>Frequency</b>	50/60 Hz
	<b>Notes</b>	Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated. Above figures are for maximum RPS and PoE power being supplied to two switches simultaneously. 200 - 240 V power cords shipped with the 620 have a wall plug rated as close to 13 A as specific country standards allow.
<b>Safety</b>		CSA 22.2 No. 60950; EN 60950/IEC 60950; UL 60950

## Accessory Product Details

<b>Emissions</b>	FCC Class A; VCCI Class A; EN 55022/CISPR 22 Class A
<b>Immunity</b>	<p><b>EN</b> EN 55024, CISPR 24</p> <p><b>ESD</b> IEC 61000-4-2</p> <p><b>Radiated</b> IEC 61000-4-3</p> <p><b>EFT/Burst</b> IEC 61000-4-4</p> <p><b>Surge</b> IEC 61000-4-5</p> <p><b>Conducted</b> IEC 61000-4-6</p> <p><b>Power frequency magnetic field</b> IEC 61000-4-8</p> <p><b>Voltage dips and interruptions</b> IEC 61000-4-11</p> <p><b>Harmonics</b> EN 61000-3-2, IEC 61000-3-2</p> <p><b>Flicker</b> EN 61000-3-3, IEC 61000-3-3</p>
<b>Management</b>	Unmanaged power supply; provides information via LEDs (LEDs repeated on front and back panel) or through port interfaces of attached devices
<b>Notes</b>	<p>The 620 supports the HP Switch 2900 Series (RPS) and 3500yl Series (RPS/PoE), as well as 6200yl (RPS) switches. The HP Switch 5400zl Series is not supported.</p> <p>The 620 includes four 2 m RPS/EPS cables. These cables can be used to carry either RPS or PoE power to the switch being powered.</p>
<b>Services</b>	<p>Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.</p>

<b>HPE ProCurve 630 Redundant and/or External Power Supply</b> (J9443A)	<b>Physical characteristics</b>	<b>Dimensions</b>	15(d) x 8.5(w) x 1.73(h) in. (38.1 x 21.59 x 4.39 cm) (1U height)
		<b>Weight</b>	7.9 lb. (3.58 kg)
	<b>Environment</b>	<b>Operating temperature</b>	32°F to 131°F (0°C to 55°C)
		<b>Operating relative humidity</b>	15% to 95% @ 104°F (40°C), noncondensing
		<b>Nonoperating/Storage temperature</b>	-40°F to 158°F (-40°C to 70°C)
		<b>Nonoperating/Storage relative humidity</b>	15% to 90% @ 149°F (65°C), noncondensing
		<b>Altitude</b>	up to 10,000 ft. (3 km)
		<b>Acoustic</b>	Power: 54.2 dB; ISO 7779, ISO 9296
	<b>Electrical characteristics</b>	<b>Maximum heat dissipation</b>	535 BTU/hr (564.42 kJ/hr), for the actual 630 power supply. PoE-powered device heat dissipation assumed to be outside the 630 power supply.
		<b>Voltage</b>	100-127/200-240 VAC
	<b>Current</b>	8/4 A	
	<b>Maximum power rating</b>	740 W	

## Accessory Product Details

		<p><b>PoE power</b> 398 W</p> <p><b>RPS power</b> 185 W</p> <p><b>PoE power</b> 398 W</p> <p><b>Frequency</b> 50/60 Hz</p> <p><b>Notes</b> Maximum power rating and maximum heat dissipation are the worst-case theoretical maximum numbers provided for planning the infrastructure with fully loaded PoE (if equipped), 100% traffic, all ports plugged in, and all modules populated. PoE Power is the power supplied by the internal power supply, it is dependent on the type and quantity of power supplies and may be supplemented with the use of an External Power Supply (EPS). 200-240 V power cords shipped with the 630 power supply have a wall plug rated as close to 13 A as specific country standards allow.</p>
	<b>Notes</b>	<p>The HP 630 RPS/EPS supports the HP 2910al and 3500yl-PoE+ Switches. The HP Switch 5400zl Series is not supported.</p> <p>The 630 RPS/EPS includes two 2-m RPS/EPS cables, which can be used to carry either RPS or PoE+ power to the switch.</p> <p>Minimum software versions required: 2910al PoE+ switches require W.14.35 or later and 3500yl-PoE+ switches require K.14.52 or later</p>
	<b>Services</b>	<p>Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.</p>
<b>HPE X410 1U Universal 4-post Rackmount Kit</b> (J9583A)	<b>Notes</b>	<p>The rack mounting kit supports the 1U, full width switches in the following switch series and the power supply: 1810 Series, 2510 Series, 2520 Series, 2610 Series, 2810 Series, 2910 Series, 3500 Series, and the 620 Power Supply</p> <p>This universal rack mounting kit is design to fit the following racks: HP 10K 10642, HP 10K 10842, Panduit CN, Panduit CS, Wrightline Vantage S2, APC Netshelter 600mm, and APC Netshelter 800mm. It may well fit many other brands and models too.</p>
	<b>Services</b>	<p>Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.</p>
<b>HP 3500 yl Premium License</b> (J8993A)	<b>Services</b>	<p>Refer to the Hewlett Packard Enterprise website at <a href="http://www.hpe.com/networking/services">http://www.hpe.com/networking/services</a> for details on the service-level descriptions and product numbers. For details about services and response times in your area, please contact your local Hewlett Packard Enterprise sales office.</p>

## Summary of Changes

Date	Version History	Action	Description of Change:
01-Aug-2016	From Version 24 to 25	Changed	Adding #AC3 Option on Configuration Section. Accessories updated, minor changes on Features and Benefits and Technical Specifications.
01-Dec-2015	From Version 23 to 24	Changed	Overview and Technical Specifications updated
01-Dec-2014	From Version 22 to 23	Changed	Updated Warranty and support and Technical specifications
09-Oct-2014	From Version 21 to 22	Changed	Overview, Accessories and SKU descriptions were revised
20-Feb-2014	From Version 20 to 21	Changed	Build to Order and Factory Racked Models were revised.
17-Jan-2014	From Version 19 to 20	Changed	Factory Racked Models and Switch Enclosure Options were revised.
09-Dec-2013	From Version 18 to 19	Changed	Updated Features and Benefits, Introduction, and the specifications.
22-Nov-2013	From Version 17 to 18	Added	Configuration was added.
10-Jun-2013	From Version 16 to 17	Added	OM4 cables were added.
24-Sep-2012	From Version 15 to 16	Changed	Updated Features and Benefits, Introduction, and edited the notes and Standards and protocols in specifications.
25-Jun-2012	From Version 14 to 15	Changed	Updated Features and Benefits, Introduction, the specifications, and Accessories.
30-Mar-2012	From Version 13 to 14	Changed	The product name was updated throughout the document.
27-Mar-2012	From Version 12 to 13	Added	HP X242 SFP+ to SFP+ 10m Direct Attach Copper Cable and HP X242 SFP+ to SFP+ 15m Direct Attach Copper Cable were added.
29-Nov-2011	From Version 11 to 12	Changed	The Features and Benefits section was updated.
07-Nov-2011	From Version 10 to 11	Changed	The product name was updated throughout the document.
29-Sep-2011	From Version 9 to 10	Added	Accessory Product Details was added.
05-Jul-2011	From Version 8 to 9	Removed	Removed two cables from the Accessories section.
20-Jun-2011	From Version 7 to 8	Changed	Accessories were revised.
17-Nov-2010	From Version 6 to 7	Changed	Minor edits were made within the QuickSpec.
22-Oct-2010	From Version 5 to 6	Changed	The QuickSpec was rewritten, including changing the title.
02-Jun-2010	From Version 4 to 5	Changed	Updated the Notes section of Technical Specifications.  Updated Standards and Protocols  Added new cables to the Accessories section.
01-Feb-2010	From Version 3 to 4	Added	Added J9310A and J9311A
12-Aug-2009	From Version 2 to 3	Changed	Updated the Notes section of Technical Specifications.
28-Jun-2009	From Version 1 to 2	Changed	The QuickSpec was completely revised, including adding 4 new models and changing the title of the document.

## Summary of Changes



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