

Alcatel-Lucent OmniSwitch 6450-10

Gigabit Ethernet LAN Switch

The Alcatel-Lucent OmniSwitch® 6450 Stackable Gigabit Ethernet LAN value switch family includes a series of 10-port models (non-PoE, Power over Ethernet [PoE], Fast and Gigabit Ethernet) for classroom, workgroup and small enterprise segments. Designed with an optimized size, low-power consumption, fan-less and fan models and a rich software feature set, the OmniSwitch 6450-10 models provide a highly available, self-protective, easily managed and eco-friendly collocation solution.



OmniSwitch 6450-P10S



OS6450-10L/10/10M
OmniSwitch 6450-P10L/P10

Service providers offering managed services have the option to install the Metro services license enabling a set of Metro Ethernet features. This allows the OmniSwitch 6450-10 port models to be quickly integrated into the provider's network as advanced customer premise equipment (CPE) devices. The OS6450-P10S is especially designed for small cell access point deployments requiring higher PoE power and precision network timing.

The Alcatel-Lucent OmniSwitch 6450-10 models use the latest technologies and Alcatel-Lucent Operating System (AOS) innovations.

Solutions benefiting from the OmniSwitch 6450-10 switches are:

- Classroom and workgroup networks
- Small enterprise or branch office networks
- Commercial and residential managed services
- Service Provider networks deployments

Datasheet

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The Alcatel-Lucent OmniSwitch 6450-10 offers eight user ports for smaller network environments. These models are power and acoustically optimized, with a half-rack width (8.5 in./21.59 cm), and have a fixed configuration chassis in a 1 RU form factor. All models are fan-less (except -P10S) and have an internal power supply. The -P10L/-P10 PoE models are both IEEE 802.3af/802.3at compliant with a 115 W power budget for PoE attached devices. The P10S PoE model supports IEEE 802.3af/802.3at, and is compliant the PoE section of the PoH (Power over HDBase-T over four pair) standard with a 280W power budget for PoE attached devices.

The OmniSwitch 6450-10L/P10L models have the user port speeds fixed for 10/100M operation. These models are upgradeable to gigabit speeds in the future using the OS6450-10L-UPGD license upgrade.

Table 1. OmniSwitch 6450-10 model configurations

Chassis	10/100 ports	10/100/1000 ports	Gig combo ports	SFP uplink (Gigabit) SFP stacking (5 Gb/s)*	Power supply supported	Backup power supply supported
Non-PoE models						
OS6450-10L	8	0	2	2	Internal AC	N/A
OS6450-10/10M	0	8	2	2	Internal AC	N/A
PoE models						
OS6450-P10L	8	0	2	2	Internal AC	N/A
OS6450-P10	0	8	2	2	Internal AC	N/A
OS6450-P10S	0	8	0	2	Internal AC	N/A

Port information:

- RJ-45 combo port configurable to be RJ10/100/1000Base-T
- SFP combo port supporting 100/1000Base-X transceivers for short, long and very long distances
- SFP fixed fiber interfaces support only gigabit SFP transceivers or SFP stacking cable.
- All P10S ports support 1588v2 Transparent Clock and is a non-stackable switch

Technical specifications

Port	OS6450-10L	OS6450-10/10M	OS6450-P10L	OS6450-P10	OS6450-P10S*
RJ-45 10/100 ports	8	0	8	0	0
RJ-45 10/100/1000 ports	0	8	0	8	8
RJ-45/SFP 10/100/1000 combo ports	2	2	2	2	0
SFP uplink/stacking ports	2	2	2	2	2
PoE ports	0	0	8	8	8
Maximum units stackable*	4	4	4	4	N/A
Dimensions					
Switch width	8.50 in. (21.5 cm)				
Switch height	1.73 in. (4.4 cm)				
Switch depth	11 in. (28 cm)				

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Port	OS6450-10L	OS6450-10/10M	OS6450-P10L	OS6450-P10	OS6450-P10S*
Performance (Aggregated)					
Switch capacity (with 2GigE uplinks)	5.6 Gb/s	20 Gb/s	5.6 Gb/s	20 Gb/s	20 Gb/s
Switch capacity (with 4GigE uplinks)	9.6 Gb/s	24 Gb/s	9.6 Gb/s	24 Gb/s	N/A
Max frame rate (4GigE or 2GigE uplinks)	14.28 Mp/s	35.70 Mp/s	14.28 Mp/s	35.70 Mp/s	29.76 Mp/s (2 uplinks)
Stacking capacity (2x5Gbs stacking)	10/20 Gb/s	10/20 Gb/s	10/20 Gb/s	10/20 Gb/s	N/A
Operating conditions					
Operating temperature	0°C to +45°C 32°F to +113°F	0°C to +45°C 32°F to +113°F			
Storage temperature	-40°C to +75°C -40°F to +167°F	-40°C to +75°C -40°F to +167°F			
Humidity (operating and storage)	5% to 95%	5% to 95%	5% to 95%	5% to 95%	5% to 95%
MTBF (hours)	695,192	695,192	499,729	499,729	329,729
Power supply efficiency	85.6%	85.6%	90.1%	90.1%	88.46%
Fan-less design (Yes/No)	Yes	Yes	Yes	Yes	No (1+1 redundant)
Acoustic (dB)	Silent	Silent	Silent	Silent	<40 db(A)
System power consumption (watts/btu)**					
• 0% traffic	12.40 W/42.31	13.00 W/44.35	12.90 W/44.01	14.20 W/48.45	20.20 W/68.92
• 50% traffic	12.70 W/43.33	15.00 W/51.18	13.61 W/46.43	16.30 W/55.61	22.25 W/75.92
• 100% traffic	12.70 W/43.33	15.2 W/ 51.86	13.65 W/46.57	16.35 W/55.78	23.80 W/81.20
PoE power budget	N/A	N/A	115 W	115 W	280 W
Max PoE power/ port (up to the power budget)	N/A	N/A	31 W	31 W	Ports 1-4: 75 W (four pair)
Ports 5-8: 31W (two pair)					
PoE device heat dissipation (btu)	N/A	N/A	409	409	921

*All PoE ports support IEEE 802.3af/802.3at. PoE (four pair) ports 1-4 are compliant with the PoE portion of the Power over HD Base-T (PoH) standard with a 280W PoE power budget.

**Power consumption measured with 64 byte packets at varied % traffic conditions on all port, including the stacking ports

Indicators

System LEDs

- System (OK) (chassis HW/SW status)
- PWR (primary power supply status)
- PRI (virtual chassis primary)
- BPS (backup power status)
- STK (stacking indicator for 10 port models)

Per-port LEDs

- 10/100/1000: PoE, link/activity
- SFP: Link/activity
- Stacking: Link/activity

Compliance and certifications

Commercial

EMI/EMC

- FCC CRF Title 47 Subpart B (Class A limits. Note: Class A with UTP cables)
- VCCI (Class A limits. Note: Class A with UTP cables)

- AS/NZS 3548 (Class A limits. Note: Class A with UTP cables)
- CE-Mark: Marking for European countries (Class A limits. Note: Class A with UTP cables)
- CE-Mark
 - 2006/95/EC: Low voltage Directive
 - 2004/108/EC: EMC-Directive
 - 2011/65/EU: RoHS-Directive
- EN 55022: 2010 (EMI and EMC requirement)

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- EN 61000-3-3: 2008
- EN 61000-3-2: 2006+A1:2009+A2 (Limits for harmonic current emissions)
- EN 55024: 2010 (ITE Immunity characteristics)
 - EN 61000-4-2: 2008
 - EN 61000-4-3: 2010
 - EN 61000-4-4: 2011
 - EN 61000-4-5: 2005
 - EN 61000-4-6: 2008
 - EN 61000-4-8: 2009
 - EN 61000-4-11: 2004
- IEEE802.3: Hi-Pot Test (2250 V DC on all Ethernet ports)
- EN 50581: 2012 Standard for technical documentation for RoHS recast

Safety agency certifications

- CB Scheme: Certification per IEC 60950/EN 60950 with all different country deviations, IEC 60950-1:2005: 2nd Edition
 - IEC 62368-1
 - UL 60950 United States
 - IEC 60950-1:2006; all national deviations
 - EN 60950-1: 2nd Edition+A11: 2009+A1: 2010+A12: 2011 (Electric/Health & Safety) all national deviations
 - CAN/CSA-C22.2 No. 60950-1-03
 - NOM-019 SCFI, Mexico
 - AS/NZ TS-001 and 60950:2000, Australia
 - UL-AR, Argentina
 - UL-GS Mark, Germany
- IEC 60825-1 Laser, IEC 60825-2 Laser
- CDRH Laser

Detailed product features

Simplified management

Configuration management interfaces

- Intuitive Alcatel-Lucent command-line interface (CLI) with familiar interface reducing training costs
- Easy-to-use, point-and-click web-based element manager (WebView) with built-in help for easy configuration
- Integration with Alcatel-Lucent OmniVista for network management
- Full configuration and reporting using SNMPv1/2/3 across all OmniSwitch families to facilitate third-party Network Management System (NMS) integration

- Remote Telnet management or Secure Shell access using SSHv2
- File upload using USB, TFTP, FTP, SFTP, or SCP for faster configuration
- Human-readable ASCII-based configuration files for offline editing and bulk configuration
- Managed by Alcatel-Lucent 5620 Service Aware Manager

Monitoring and troubleshooting

- Local (on the flash) and remote server logging: Syslog and command log
- Port-based mirroring for troubleshooting and lawful interception supporting four sessions with multiple sources-to-one destination
- Policy-based mirroring - allows selection of the type of traffic to mirror by using quality of service (QoS) policies
- Remote port mirroring that facilitates passing mirrored traffic through the network to a remotely connected device
- Port monitoring feature that allows capture of Ethernet packets to a file, or for on-screen display to assist in troubleshooting
- sFlow v5 and RMON: For advanced monitoring and reporting capabilities for statistics, history, alarms, and events
- IP tools: Ping and trace route
- Digital Diagnostic Monitoring (DDM): Real-time diagnostics of fiber connections for early detection of optical signal deterioration
- Time Domain Reflectometry (TDR): For locating breaks or other discontinuity in copper cables

Network configuration

- Auto remote configuration download feature
- Auto-negotiating 10/100/1000 ports automatically configure port speed and duplex setting
- Auto MDI/MDIX automatically configures transmit and receive signals to support straight through and crossover cabling
- BootP/Dynamic Host Configuration Protocol (DHCP) client allows auto-config of switch IP information for simplified deployment
- DHCP relay to forward client requests to a DHCP server

- Alcatel-Lucent Mapping Adjacency Protocol (AMAP) for building topology maps
- IEEE 802.1AB Link Layer Discovery Protocol (LLDP) with MED extensions for automated device discovery
- Multiple VLAN Registration Protocol (MVRP) for IEEE 802.1Q-compliant. VLAN pruning and dynamic VLAN creation
- Auto QoS for switch management traffic as well as traffic from Alcatel-Lucent IP phones
- IEEE 1588v2 Precision Timing Protocol (PTP) via end-to-end Transparent Clock (TC) for network-wide time synchronized applications:
 - "S" models only
- Network Time Protocol (NTP) for networkwide time synchronization
- Stackable to 4 units

Resiliency and high availability

- Rapid Ring Spanning Tree Protocol (RRSTP optimized for ring topology to provide less than 100 ms convergence time
- IEEE 802.1s Multiple Spanning Tree Protocol: Encompasses IEEE 802.1D STP and IEEE 802.1w Rapid Spanning Tree Protocol
- Per-VLAN spanning tree (PVST) and Alcatel-Lucent 1x1 STP mode
- IEEE 802.3ad Link Aggregation Control Protocol (LACP) and static LAG groups across modules is supported
- Dual-home link (DHL) support for sub second link protection without STP
- Virtual Router Redundancy Protocol (VRRP) to provide highly available routed environments
- Broadcast and multicast storm control to avoid degradation in overall system performance
- Unidirectional Link Detection (UDLD): Detects and disables unidirectional links on fiber optic interfaces
- Layer 2 port loopback detection for preventing customer loops on Ethernet access ports
- Redundant and hot-swappable power supplies, transceivers modules offering uninterruptable service
- Dual image and dual configuration files storage provides backup

Advanced security

Access control

- AOS Access Guardian framework for comprehensive user policy- based Network Access Control (NAC)
- Autosensing 802.1X multi-client, multi-VLAN
- MAC-based authentication for non-802.1x hosts
- Web-based authentication (Captive Portal) – a customizable web portal residing on the switch that can be used for authenticating supplicants as well as non-supplicants
- Group mobility rules and “guest” VLAN support
- The host integrity check (HIC) agent on each switch makes it a HIC enforcer and facilitates endpoint device control for company policy compliance.
- Supports dynamic Change of Authentication (CoA) and enforces traffic remediation or restriction for noncompliant devices.
- User Network Profile (UNP) – simplify NAC management and control by dynamically providing pre-defined policy configuration to authenticated clients – VLAN, ACL, BW, HIC
- SSH for secure CLI session with public key infrastructure (PKI) support
- Centralized RADIUS and Lightweight Directory Access Protocol (LDAP) user authentication
- Private VLAN feature for user traffic segregation

Containment, monitoring and quarantine

- Alcatel-Lucent Quarantine Manager and quarantine VLAN (not supported)
- Learned Port Security (LPS) or MAC address lockdown – secures the network access on user or trunk ports based on MAC address
- DHCP Snooping, DHCP IP Spoof protection
- TACACS+ client allows for authentication authorization and accounting with a remote TACACS+ server
- Dynamic Address Resolution Protocol (ARP) protection and ARP poisoning detection

- Access control lists to filter out unwanted traffic including denial of service attacks; flow-based filtering in hardware (L1-L4)
- Bridge Protocol Data Unit (BPDU) blocking – automatically shuts down user ports if a STP BPDU packet is seen to prevent topology loops
- STP Root Guard – prevents edge devices from becoming Spanning Tree Protocol root node

Converged networks

PoE

- The PoE models support Alcatel-Lucent IP phones and WLAN access points, as well as any IEEE 802.3af or IEEE 802.3at compliant end device.
- The P10S PoE model supports IEEE 802.3af, IEEE 802.3at and is compliant the PoE section of the PoH (Power over HDBase-T) standard
- Configurable per port PoE priority and max power for power allocation
- Dynamic PoE allocation delivers only the power needed by the Powered Devices (PD) up to the total power budget for most efficient power consumption.

QoS

- Priority queues: Eight hardware-based queues per port for flexible QoS management
- Traffic prioritization: Flow-based QoS with internal and external (that is, remarking) prioritization
- Bandwidth management: Flow-based bandwidth management, ingress rate limiting; egress rate shaping per port
- Queue management: Configurable scheduling algorithm – Strict Priority (SQP), Weighted Round Robin (WRR) and Deficit Round Robin (DRR)
- Congestion avoidance: Support for End-to-End Head of Line (E2E-HOL) Blocking Protection
- Auto QoS for switch management traffic as well as traffic from Alcatel-Lucent IP phones
- Three color marker – single/dual rate – policing with commit BW, excess BW, burst size

Layer 2, Layer 3 routing and multicast

Layer 2 switching

- Up to 16,000 MACs
- Up to 4000 VLANs

- Up to 2K Access Control Lists (ACLs)
- Latency: <4 μs

IPv4 and IPv6

- Static routing for IPv4 and IPv6
- RIP v1 and v2 for IPv4, RIPng for IPv6
- Up to 256 IPv4/128 IPv6 static and RIP routes
- Up to 128 IPv4 and 16 IPv6 interfaces
- Up to 1k Arp entries

Multicast

- IGMPv1/v2/v3 snooping to optimize multicast traffic
- Multicast Listener Discovery (MLD) v1/v2 snooping
- Up to 1000 multicast groups/stack
- IP Multicast VLAN (IPMVLAN) for optimized multicast replication at the edge saving network core resources

Network protocols

- DHCP relay (including generic UDP relay)
- ARP
- DHCP relay
- DHCP relay to forward client requests to a DHCP server
- Generic User Datagram Protocol (UDP) relay per VLAN
- DHCP Option 82 – configurable relay agent information

Metro Ethernet access (features available on “M” models or with metro license upgrade)

- Ethernet services support per IEEE 802.1ad Provider Bridge
 - Transparent LAN Services with Service VLAN (SVLAN) and Customer VLAN (CVLAN) concept
 - Ethernet network-to-network interface (NNI) and user network interface (UNI) services
 - Service Access Point (SAP) profile identification
 - CVLAN to SVLAN translation and mapping
- IEEE 802.1ag Ethernet OAM: Connectivity Fault Management (L2 ping and link trace)
- Ethernet OAM compliant with IEEE 802.3ah
- ITU-T G.8032 Ethernet Ring Protection designed for loop protection and fast convergence times (sub 50 ms) in ring topologies
- Private VLAN feature for user traffic segregation

- Service Assurance Agent (SAA) for proactively measuring network health, reliability and performance. Four SAA tests including L2-MAC, IP, ETH-LB and ETH-DMM depending on your network requirements
- Customer Provider Edge (CPE) test head traffic generator and analyzer tool used in the metro Ethernet network to validate customer Service Level Agreements (SLA)
- IPMVLAN for optimized multicast replication at the edge saving network core resources
- Layer 2 Multicast VLAN Replication (MVR) – allows users from different multicast VLANs to subscribe to a multicast group from an upstream trunk interface
- Three color marker – single/dual rate – policing with commit BW, excess BW, burst size
- TR-101 Point-to-Point Protocol over Ethernet (PPPoE) Intermediate Agent allowing for the PPPoE network access method
- MAC-forced forwarding support according to RFC 4562
- L2CP – Layer 2 Control Protocol for tunneling a customer’s L2CP frames, using a well known address, on a given UNI for the EPL and EVPL services
- Dying Gasp using SNMP and Ethernet OAM delivery
- Metro Ethernet Forum CE 2.0 Certified
- Managed by Alcatel-Lucent 5620 Service Aware Manager

Supported standards

IEEE standards

- IEEE 802.1D (STP)
- IEEE 802.1p (CoS)
- IEEE 802.1Q (VLANs)
- IEEE 802.1ad (Provider Bridge)
- Q-in-Q (VLAN stacking)
- IEEE 802.1ag (Connectivity Fault Management)
- IEEE 802.1s (MSTP)
- IEEE 802.1w (RSTP)
- IEEE 802.1X (Port-based Network Access Protocol)
- IEEE 802.3i (10Base-T)
- IEEE 802.3u (Fast Ethernet)
- IEEE 802.3x (Flow Control)
- IEEE 802.3z (Gigabit Ethernet)
- IEEE 802.3ab (1000Base-T)

- IEEE 802.3ac (VLAN Tagging)
- IEEE 802.3ad (Link Aggregation)
- IEEE 802.3af (Power over Ethernet)
- IEEE 802.3at (Power over Ethernet)
- IEEE 802.ah (Ethernet first mile)
- IEEE 1588v2 Precision Timing Protocol (PTP) “S” models only
 - End-to-end Transparent Clock (TC)
 - IPv4 Unicast address or Ethernet Multicast Encapsulation

ITU-T standards

- ITU-T G.8032: Draft (June 2007) Ethernet Ring Protection
- ITU-T Y.1731 OA&M fault and performance management

IETF standards

RIP

- RFC 1058 RIP v1
- RFC 1722/1723/1724/2453 RIP v2 and MIB
- RFC 1812/2644 IPv4 Router Requirement
- RFC 2080 RIPng for IPv6

IP Multicast

- RFC 1112 IGMP v1
- RFC 2236/2933 IGMP v2 and MIB
- RFC 2365 Multicast
- RFC 3376 IGMPv3 for IPv6

IPv6

- RFC 1886 DNS for IPv6
- RFC 2292/2373/2374/2460/2462
- RFC 2461 NDP
- RFC 2463/2466 ICMP v6 and MIB
- RFC 2452/2454 IPv6 TCP/UDP MIB
- RFC 2464/2553/2893/3493/3513
- RFC 3056 IPv6 Tunneling
- RFC 3542/3587 IPv6
- RFC 4007 IPv6 Scoped Address Architecture
- RFC 4193 Unique Local IPv6 Unicast Addresses

Manageability

- RFC 1350 TFTP Protocol
- RFC 854/855 Telnet and Telnet options
- RFC 1155/2578-2580 SMI v1 and SMI v2
- RFC 1157/2271 SNMP
- RFC 1212/2737 MIB and MIB-II
- RFC 1213/2011-2013 SNMP v2 MIB
- RFC 1215 Convention for SNMP Traps
- RFC 1573/2233/2863 Private Interface MIB

- RFC 1643/2665 Ethernet MIB
- RFC 1901-1908/3416-3418 SNMP v2c
- RFC 2096 IP MIB
- RFC 2570-2576/3411-3415 SNMP v3
- RFC 3414 User-based security model
- RFC 2616/2854 HTTP and HTML
- RFC 2667 IP Tunneling MIB
- RFC 2668/3636 IEEE 802.3 MAU MIB
- RFC 2674 VLAN MIB
- RFC 4251 Secure Shell Protocol architecture
- RFC 4252 The Secure Shell (SSH) Authentication Protocol
- RFC 959/2640 FTP

Security

- RFC 1321 MD5
- RFC 2104 HMAC Message Authentication
- RFC 2138/2865/2868/3575/2618 RADIUS Authentication and Client MIB
- RFC 2139/2866/2867/2620 RADIUS Accounting and Client MIB
- RFC 2228 step
- RFC 2284 PPP EAP
- RFC 2869/3579 Radius Extension

Quality of service

- RFC 896 Congestion control
- RFC 1122 Internet Hosts
- RFC 2474/2475/2597/3168/3246 DiffServ
- RFC 3635 Pause Control
- RFC 2697 srTCM
- RFC 2698 trTCM

Others

- RFC 791/894/1024/1349 IP and IP/Ethernet
- RFC 792 ICMP
- RFC 768 UDP
- RFC 793/1156 TCP/IP and MIB
- RFC 826/903 ARP and Reverse ARP
- RFC 919/922 Broadcasting Internet datagram
- RFC 925/1027 Multi LAN ARP/Proxy ARP
- RFC 950 Sub-netting
- RFC 951 BootP
- RFC 1151 RDP
- RFC 1191 Path MTU Discovery
- RFC 1256 ICMP Router Discovery
- RFC 1305/2030 NTP v3 and Simple NTP

- RFC 1493 Bridge MIB
- RFC 1518/1519 CIDR
- RFC 1541/1542/2131/3396/3442 DHCP
- RFC 1757/2819 RMON and MIB
- RFC 2131/3046 DHCP/BootP Relay
- RFC 2132 DHCP Options
- RFC 2251 LDAP v3
- RFC 3060 Policy Core
- RFC 3176 sFlow
- RFC 3021 Using 31-bit prefixes

OmniSwitch 6450-10 models ordering

Part number	Description
OS6450-10L	Fast Ethernet chassis in a 1 RU form factor with eight 10/100Base-T, two 10/100/1000 RJ-45/SFP combo and two fixed SFP uplink/stacking ports
OS6450-10	Gigabit Ethernet chassis in a 1 RU form factor with eight 10/100/1000Base-T, two 10/100/1000 RJ-45/SFP combo and two fixed SFP uplink/stacking ports
OS6450-10 M	Gigabit Ethernet chassis in a 1 RU form factor with eight 10/100/1000Base-T, two 10/100/1000 RJ-45/SFP combo and two fixed SFP uplink/stacking ports. Metro ethernet services enabled by default
OS6450-P10L	Fast Ethernet chassis in a 1 RU form factor with eight PoE 10/100Base-T, two 10/100/1000 RJ-45/SFP combo and two fixed SFP uplink/stacking ports
OS6450-P10	Gigabit Ethernet chassis in a 1 RU form factor with eight PoE 10/100/1000Base-T, two 10/100/1000 RJ-45/SFP combo and two fixed SFP uplink/stacking ports
OS6450-P10S	Gigabit Ethernet chassis in a 1 RU form factor with eight PoE 10/100/1000Base-T and two fixed gigabit SFP uplink ports. Supports IEEE 802.3af, IEEE 802.3at and 4x75W PoE (four pair) ports compliant with the Power over HD Base-T (PoH) standard with a 280W PoE power budget. Supports 1588v2 precision timing protocol.
License options	All models above support the below license options.
OS6450-10L-UPGD	Software license enabling gigabit speeds on the RJ-45 ports of OS6450-10L and OS6450-P10L chassis to operate at gigabit speed
OS6450-SW-ME	OS6450 software license enables the Metro software features outlined in the Metro Ethernet access section of this data sheet.
Mounting options	Order optional 19" rack mounting kit separately
OS6450-RM-19-L	Simple L-bracket for mounting a single OS6450-10 model switch in a 19-in. rack
OS6450-DUAL-MNT	Two universal mounting and sliding brackets accessory kit. Hardware to mount two 6450-10 units in a 19-in. rack
Gigabit transceivers	
SFP-GIG-LH70	1000Base-LH transceiver with an LC interface for single mode fiber over 1550 nm wavelength. Typical reach of 70 km
SFP-GIG-LH40	1000Base-LH transceiver with an LC interface for single mode fiber over 1310 nm wavelength. Typical reach of 40 km
SFP-GIG-LX	1000Base-LX transceiver with an LC interface for single mode fiber over 1310 nm wavelength. Typical reach of 10 km
SFP-GIG-SX	1000Base-SX transceiver with an LC interface for multimode fiber over 850 nm wavelength. Typical reach of 300 m
SFP-GIG-BX-D	1000Base-BX bidirectional transceiver with an LC type interface for use over single mode fiber optic on a single strand link up to 10 km point to point. Transmits 1490 nm and receives 1310 nm optical signal
SFP-GIG-BX-U	1000Base-BX bidirectional transceiver with an LC type interface for use over single mode fiber optic on a single strand link up to 10 km point to point. Transmits 1310 nm and receives 1490 nm optical signal
100 Megabit transceivers	
SFP-100-MM	100Base-FX transceiver with an LC interface for multimode fiber optic cable
SFP-100-SM15	100Base-FX transceiver with an LC type interface for single mode fiber optic cable up to 15 km
SFP-100-SM40	100Base-FX transceiver with an LC type interface for single mode fiber optic cable up to 40 km
SFP-100-BX-U	100Base-BX bidirectional transceiver with an SC type interface for use over single mode fiber optic on a single strand link up to 20 km point to point, where the client (ONU) transmits 1310 nm and receives 1550 nm optical signal
SFP-100-BX-D	100Base-BX bidirectional transceiver with an SC type interface for use over single mode fiber optic on a single strand link up to 20 km point to point, where the client (OLT) transmits 1550 nm and receives 1310 nm optical signal