ALCATEL-LUCENT OMNISWITCH 10K
MODULAR LAN CHASSIS

The Alcatel-Lucent OmniSwitch™ 10K Modular LAN Chassis platform is a high-capacity, high-performance modular Ethernet LAN switch that is field proven in enterprise, service provide and data center environments. Based on the Alcatel-Lucent Operating System (AOS), which is a state-of-the-art, scriptable OS, the OmniSwitch 10K delivers uninterrupted network uptime with non-stop Layer 2 and Layer 3 forwarding and in service software upgrades. Deep packet buffers, a lossless virtual output queuing (VOQ) fabric, and extensive traffic management capabilities improve application performance and user experience. Its scalability and Layer 2/3 fabric throughput will meet your bandwidth requirements for today and tomorrow.

Layer 2/3 network deployments are simplified and the network has better performance and resiliency because of the OmniSwitch 10K's virtual chassis and its implementation of Multi-Chassis Link Aggregation (MC-LAG) and Edge Ring Protection (ERP). The OmniSwitch 10K's implementation of Edge Virtual Bridging VEPA (IEEE802.1Qbg EVB) and use of Alcatel-Lucent dynamic Virtual Network Profiles (vNP) allows network virtualization, readying the network for simplified, fully automated data center and cloud deployments over Shortest Path Bridging (IEEE 802.1aq SPB-M) or Multiple VLAN Registration Protocol (MVRP) backbones.

The OmniSwitch 10K is a perfect fit for data center applications and serves as a long-term upgrade to any network because of its class leading low-power consumption, front-to-back cooling, compact form factor, and all front-accessible components.

FEATURES	BENEFITS
• High-density, non-blocking 10/40 GigE ports with large packet buffers	• Maximum network performance delivers quality bandwidth for improved application and user experience.Reduces network layers and investment/operation costs
• Unified virtual chassis • Simplified management • Multi-Chassis Link Aggregation (MC-LAG)	• The OmniSwitch virtual chassis increases system redundancy and resiliency providing maximum uptime and high availability in the network. Optimizes/simplifies Layer 2 and Layer 3 network designs and reduces administration overhead while increasing network capacity with resilient multipath active-active dual homing multi-chassis support. Works with any Ethernet device that supports standard 802.3ad or static LAG. • Provides interoperability, investment protection, and flexibility
• Scalable network virtualization architecture for guarantee SLA delivery over standard Ethernet fabric: Edge Virtual Bridging (EVB), Shortest Path Bridging (SPB) and dynamic Virtual Network Profiles (vNP)	• Comprehensive and flexible fabric architecture designed to automate and simplify the end to end deployment of campus, data center, cloud-based services while preventing host address explosion and flooding with built-in SLA service support at low capital and operating costs and based on interoperable proven standards
• Alcatel-Lucent OmniVista™ 2500 Virtual Machine Manager (VMM) and Virtual Network Profiles (vNP) integration	• Unifies physical and virtual infrastructures providing network operators with a comprehensive end-to-end network view for VM inventory, location tracking, event and log auditing and provisioning operations. This enables error-free network administration operations and simplifies the deployment of new value added services.
• DCB support: Lossless Ethernet for all traffic	• Extends the lossless capability beyond FCoE to any traffic type in any CoS queue and for many queues simultaneously in the same port. Allows the administrator to have a hands-off operation using application-based dynamic Lossless configuration via Enhanced Transmission Selection (ETS) or manually engineered and tuned to the application needs.

DETAILED PRODUCT FEATURES

Simplified manageability

- Intuitive Alcatel-Lucent Command Line Interface (CLI) in a scriptable BASH environment via console, telnet or SSHv2
- Powerful Alcatel-Lucent WebView Graphical Web Interface via HTTP and HTTPS
- Full configuration and reporting using SNMPv1/2/3 across all OmniSwitch families to facilitate third-party network management
- File upload using USB, TFTP, FTP, SFTP or SCP
- Multiple microcode image support with fallback recovery
- Local (on the flash) and remote server logging (Syslog): event and command logging
- Loopback IP address support for management per service
- Management VRF support
- Policy and port-based mirroring
- Remote port mirroring
- sFlow v5 and RMON
- UDLD and DDM
- DHCP relay
- IEEE 802.1AB LLDP with MED extensions
- NTP

Resiliency and high availability

- Smart continuous switching technology
- In-Service Software Upgrade (ISSU)
- Unified management, control and fabric virtual chassis technology
- Multi-chassis Link Aggregation (MC-LAG)
- ITU-T G.8032 Ethernet Ring Protection
- IEEE 802.1s Multiple Spanning Tree Protocol (MSTP) encompasses IEEE 802.1D Spanning Tree Protocol (STP) and IEEE 802.1w Rapid Spanning Tree Protocol (RSTP)
- 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
- Virtual Router Redundancy Protocol (VRRP)
- Bidirectional Forwarding Detection (BFD)
- Redundant and hot-swappable power supplies
- Redundant fans
- Hot swappable fan tray
- Hot swappable supervisor and modules
- Built-in CPU protection against malicious attacks

Data center networking

- Dynamic Virtual Network Profiles (vNP)
- Edge Virtual Bridging (EVB) – IEEE802.1Qbg
- Priority Flow Control (PFC) – IEEE802.1Qbb
- Enhanced Transmission Selection (ETS) – IEEE802.1Qaz
- Data Center Bridging Capabilities Exchange Protocol (DCBX) – IEEE802.1Qaz
- Shortest Path Bridging (SPB-M) – IEEE802.1aq

Advanced security

- SSH with public key infrastructure (PKI) support
- TACACS+ client
- Centralized RADIUS and Lightweight Directory Access Protocol (LDAP) administrator authentication
- Centralized RADIUS for device authentication and network access control authorization
- Learned Port Security (LPS) or MAC address lockdown
- Access Control Lists (ACLs); flow-based filtering in hardware (Layer 1 to Layer 4)

Quality of Service (QoS)

- Priority queues: Eight hardware-based queues per port
- Traffic prioritization: Flow-based QoS
- Flow-based traffic policing and bandwidth management
- Egress traffic shaping
- Lossless Virtual Output Queuing (VOQ) with configurable scheduling algorithms
- Deep packet buffers for simultaneous high-burst absorption in all ports
- DiffServ architecture
- Congestion avoidance: Support for end-to-end head-of-line (E2E-HOL) blocking prevention, IEEE 802.1Qbb Priority-based Flow Control (PFC) and IEEE 802.3x Flow Control (FC)

IPv4 routing

- Multiple Virtual Routing and Forwarding (VRF)
- Static routing, Routing Information Protocol (RIP) v1 and v2
- Open Shortest Path First (OSPF) v2 with graceful restart
- Border Gateway Protocol (BGP) v4 with graceful restart
- Generic Routing Encapsulation (GRE) and IP/IP tunneling
- Virtual Router Redundancy Protocol (VRRP v2)
- DHCP relay (including generic UDP relay)
- Address Resolution Protocol (ARP)
- Policy-based routing

IPv6 routing

- Multiple Virtual Routing and Forwarding (VRF)
- Internet Control Message Protocol version 6 (ICMPv6)
- Static routing
- Routing Information Protocol Next Generation (RIPng)
- OSPF v3
- BGP v4 multiprotocol extensions for IPv6 routing (MP-BGP)
- Graceful restart extensions for OSPF and BGP
- Virtual Router Redundancy Protocol (VRRPv3)
- Network Discovery Protocol (NDP)
- Policy-based routing

IPv4/IPv6 multicast

- Internet Group Management Protocol (IGMP) v1/v2/v3 snooping
- Protocol Independent Multicast – Sparse-Mode (PIM-SM), Source Specific Multicast (PIM-SSM), Protocol Independent Multicast – Dense-Mode (PIM-DM), Bidirectional Protocol Independent Multicast (PIM-BiDir)
- Distance Vector Multicast Routing Protocol (DVMRP)
- Multicast Listener Discovery (MLD) v1/v2 snooping

Advanced Layer 2

- Ethernet services support using IEEE 802.1ad Provider Bridges (also known as Q-in-Q or VLAN stacking) or IEEE802.1aq Shortest Path Bridging (SPB-M):
  - ¬ Ethernet Virtual Connection (EVC) support for transparent LAN services such as E-LAN, E-Line and E-Tree
  - ¬ Multipoint Ethernet VPN (EVPN) over I-SID service virtualization or Q-in-Q tunnels
  - ¬ Ethernet network-to-network interface (NNI) and user network interface (UNI)
  - ¬ Service Access Point (SAP) profile identification
  - ¬ Service VLAN (SVLAN) and Customer VLAN (CVLAN) support
  - ¬ VLAN translation and mapping including CVLAN to SVLAN
  - ¬ C-tag to S-tag priority mapping
- Port mapping

- DHCP Option 82: Configurable relay agent information
- Multicast VLAN Registration Protocol (MVRP)
- HA-VLAN for L2 clusters such as MS-SLB
- Jumbo frame support
- Bridge Protocol Data Unit (BPDU) blocking
- STP Root Guard
- Active-active Multi-Chassis Link Aggregation (MCLAG)

COMPLIANCE AND CERTIFICATIONS

Commercial

EMI/EMC

- FCC 47 CFR Part 15 Class A
- ICES-003 Class A
- CE marking for European countries (Class A)
- 89/336/EEC EMC Directive ??
- EN55022:1998:2006 Class A
- EN55024 :1998:A1: 2001+A2:2003
- EN61000-3-2,
- EN61000-3-3
- EN61000-4-2
- EN61000-4-3
- EN61000-4-4
- EN61000-4-5
- EN61000-4-6
- EN61000-4-8
- EN61000-4-11
- CISPR22:1997 Class A
- VCCI (Class A)
- AS/NZS 3548 (Class A)
- IEEE 802.3 Hipot requirement and 1.5 kV surge on data port for copper interfaces

Safety agency certifications

- US UL 60950
- IEC 60950-1:2001; all national deviations
- EN 60950-1: 2001; all deviations
- CAN/CSA-C22.2 No. 60950-1-03
- AS/NZ TS-001 and 60950:2000, Australia
- UL-AR, Argentina
- UL-GS Mark, Germany
- GOST, Russian Federation ??
- EN 60825-1 Laser
- EN 60825-2 Laser
- CDRH Laser

TECHNICAL SPECIFICATIONS

Supported standards

- IEEE standards
- IEEE 802.1D (STP)
- IEEE 802.1p (CoS)
- IEEE 802.1Q (VLANs)
- IEEE 802.1ad (Provider Bridges) (Q-in-Q/ VLAN stacking)
- IEEE 802.1ak (Multiple VLAN Registration Protocol MVRP)
- IEEE 802.1aq (Shortest Path Bridging SPB)
- IEEE 802.1Qaz (ETS)
- IEEE 802.1Qbb (PFC)
- IEEE 802.1s (MSTP)
- IEEE 802.1w (RSTP)
- 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 802.3ae (10 G Ethernet)
- IEEE 802.3ba (40 G Ethernet)

ITU-T standards

- ITU-T G.8032/Y.1344 2010: Ethernet Ring Protection (ERPv2)

IETF standards

IPv4

- RFC 2003 IP/IP Tunneling
- RFC 2784 GRE Tunneling

OSPF

- RFC 1765 OSPF Database Overflow
- RFC 1850/2328 OSPF v2 and MIB
- RFC 2154 OSPF MD5 Signature
- RFC 2370/3630 OSPF Opaque LSA
- RFC 3101 OSPF NSSA Option
- RFC 3623 OSPF Graceful Restart
- RFC 2470 OSPFv3 for IPv6

RIP

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

BGP

- RFC 1269/1657/4273 BGP v3 and v4 MIB
- RFC 1403/1745 BGP/OSPF Interaction
- RFC 1771-1774/2842/2918/3392/4271 BGP v4
- RFC 1965 BGP AS Confederations
- RFC 1966 BGP Route Reflection
- RFC 1997/1998 BGP Communities Attribute
- RFC 2042 BGP New Attribute
- RFC 2385 BGP MD5 Signature
- RFC 2439 BGP Route Flap Damping
- RFC 2545 BGP-4 Multiprotocol Extensions for IPv6 Routing
- RFC 2858/4760 Multiprotocol Extensions for BGP-4
- RFC 3065 BGP AS Confederations
- RFC 4456 BGP Route Reflection
- RFC 4486 Subcodes for BGP Cease Notification
- RFC 4724 - Graceful Restart for BGP

IS-IS

- RFC 1142/1195/3719/3787 IS-IS v4
- RFC 2763/2966/3567 Adjacencies and route management
- RFC 3373/draft-ietf-isis-igp-p2p-over-lan Point to point over LAN
- RFC 5306 Graceful restart
- RFC 6329 IS-IS Extensions Supporting IEEE 802.1aq SPB

IP multicast

- RFC 1075/draft-ietf-idmr-dvmrp-v3-11.txt DVMRP
- RFC 2365 Multicast
- RFC 2710/3019/3810/MLD v2 for IPv6
- RFC 2715 PIM and DVMRP interoperability*
- RFC 2933 IGMP MIB
- RFC 3376 IGMPv3 (includes IGMP v2/v1)
- RFC 3569 Source-Specific Multicast (SSM)
- RFC 3973 Protocol Independent Multicast-Dense Mode (PIMDM)
- RFC 4087 IP tunnel MIB
- RFC 4541 Considerations for IGMP and MLD snooping switches
- RFC 4601/5059 PIM-SM
- RFC 5015 BiDIR PIM
- RFC 5060 Protocol Independent Multicast MIB
- RFC 5240 PIM Bootstrap Router MIB
- RFC 5132 Multicast Routing MIB

IPv6

- RFC 1886/3596 DNS for IPv6
- RFC 1981 Path MTU Discovery for IPv6
- RFC 2292/2553/3493/3542 IPv6 Sockets
- RFC 2373/2374/3513/3587/ 4291 IPv6 Addressing
- RFC 4007 IPv6 Scoped Address Architecture
- RFC 4193 Unique Local IPv6 Unicast Addresses
- RFC 2460//2462/2464 Core IPv6
- RFC 2461 NDP
- RFC 2463/2466/4293/4443 ICMP v6 and MIB
- RFC 2452/2454 IPv6 TCP/UDP MIB
- RFC 2711 IPv6 Router Alert Option
- RFC 2893/4213 IPv6 Transition Mechanisms
- RFC 3056 IPv6 Tunneling
- RFC 3484 Default Address Selection IPv6
- RFC 3542/3587 IPv6
- RFC 3595 TC for Flow Label

Manageability

- RFC 959/2640 FTP
- RFC 1350 TFTP Protocol
- RFC 2131 DHCP Server/Client
- 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 2616 /2854 HTTP and HTML
- RFC 2667 IP Tunneling MIB
- RFC 2668/3636 IEEE 802.3 MAU MIB
- RFC 2674 VLAN MIB
- RFC 3414 User-based Security Model
- RFC 4251 Secure Shell Protocol Architecture
- RFC 4252 The Secure Shell (SSH) Authentication Protocol

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 FTP Security Extensions
- RFC 2284 PPP EAP
- RFC 2869/2869bis RADIUS Extension
- RFC 4301 Security Architecture for IP
- RFC 1826/1827/4303/4305 Encapsulating Payload (ESP) and cryto algorithms

QoS

- 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 ARP
- RFC 919/922 Broadcasting Internet Datagram
- RFC 925/1027 Multi-LAN ARP/Proxy ARP
- RFC 950 Subnetting
- 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 2338/3768/2787 VRRP and MIB
- RFC 3021 Using 31-bit Prefixes
- RFC 3060 Policy Core
- RFC 3176 sFlow

Table 1. Chassis model

OMNISWITCH 10K	
Fan tray slots	12, 8 NI slots, 2 half-slots for CMM/CFM
Management module slots (CMM)	2
Fabric module slots (CFM)	2
Network interface slots (NI)	8
Power supply (AC/DC) slots	4
Height (19-in. and 23-in. rack mount)	16U
Dimensions (HxWxD)	71.2 x 44.2 x 58.5 cm (28 x 17.4 x 23 in.)
Weight (loaded)	89.8 kg (198 lb)
Environment	
Operating temperature	0°C to 45°C (32°F to 113°F)
Storage temperature	10°C to 70°C (14°F to 158°F)
Operating and storage humidity	10% to 90% (non-condensing)
Heat dissipation (fully loaded - worst case)	14572 BTU/hr

Table 2. Network interface characteristics

MODEL NUMBERS	CPU	MEMORY	PORT COUNT	INTERFACE TYPE	L2 TABLE	L3 TABLE IPV4/IPV6	POLICY TABLE	MPLS*/SPBM SUPPORT	DCB SUPPORT
OS10K-CMM	1.5 GHz dual-core	4Gb SDRAM, 2Gb CF	3	USB, Console, 10/100/1000Base-Tx	N/A	N/A	N/A	N/A	N/A
OS10K-CFM	N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A
OS10K-GNI-C48E	1.2 GHz dual-core	1.2GB packet buffer	48	10/100/1000Base-Tx	256K*	256K*	4K	Yes	No
OS10K-GNI-U48E	1.2 GHz dual-core	1.2GB packet buffer	48	SFP	256K*	256K*	2K	Yes	No
OS10K-XNI-U32S	1.2 GHz dual-core	4.8GB packet buffer	32	SFP+, SFP 1GigE	32K	16K	2K	No	No
OS10K-XNI-U32E	1.2 GHz dual-core	4.8GB packet buffer	32	SFP+, SFP 1GigE	128K	16K	2K	Yes	Yes
OS10K-XNI-U16E	1.2 GHz dual-core	2.4GB packet buffer	16	SFP+, SFP 1GigE	128K	16K	2K	Yes	Yes
OS10K-XNI-U16L	1.2 GHz dual-core	2.4GB packet buffer	16	SFP+, SFP 1GigE	128K	16K	2K	Yes	Yes
OS10K-QNI-U4E	1.2 GHz dual-core	2.4GB packet buffer	4	QSFP+	128K	16K	2K	Yes	Yes
OS10K-QNI-U8E	1.2 GHz dual-core	4.8GB packet buffer	8	QSFP+	128K	16K	2K	Yes	Yes

*Hardware capacity, future software support

OMNISWITCH 10K ORDERING INFORMATION

Chassis and power supply

MODEL NUMBER	DESCRIPTION
OS10K8-CB-X-XX	OS10K base bundle includes 1 x OS10K chassis, 2 x fan trays, 2 x power supplies, 1 x OS10K-CMM chassis management module, 1 x OS10K-CFM chassis fabric module and fully featured AOS software with advanced IP routing SW (IPv4/IPv6). X-XX denotes power supply type and country specific power cord
OS10K8-RCB-X-XX	OS10K redundant bundle includes 1 x OS10K chassis, 2 x fan trays, 4 x power supplies, 2 x OS10K-CMM chassis management module, 2 x OS10K-CFM chassis fabric module and fully featured AOS software with advanced IP routing SW (IPv4/IPv6). X-XX denotes power supply type and country specific power cord
OS10K-FAN-TRAY	OS10K fan tray. Spare
OS10K-PS-25A-XX	OS10K AC power supply. Provides up to 2.5 kW of power, auto-ranging 110VAC-240VAC. -XX country power cord designator
OS10K-PS-24D	OS10K DC power supply. Provides up to 2.4 kW of power. 36v-72v DC input power

Management and switching fabric modules

MODEL NUMBER	DESCRIPTION
OS10K-CMM	OS10K Chassis Management Module with SSL (DES, 3DES, RC2, RC4). The OS10K-CMM Chassis Management Module includes a processor module, a fabric module, and AOS software with advanced IP routing SW (IPv4/IPv6)
OS10K-CFM	OS10K Chassis Fabric Module. OS10K-CFM provides additional switch capacity and increased fabric redundancy

Network interface cards

MODEL NUMBER	DESCRIPTION
Gigabit modules	
OS10K-GNI-C48E	OS10K Gigabit network interface card offers 48 wire rate RJ-45 1000Base-T ports. This Enhanced network interface card is MPLS ready, and provides large table support for L2, L3, and ACL policies.
OS10K-GNI-U48E	OS10K Gigabit network interface card offers 48 unpopulated wire rate 1000BaseX SFP ports. This Enhanced network interface card is MPLS ready, and provides large table support for L2, L3, and ACL policies.

Network interface cards (continued)

MODEL NUMBER	DESCRIPTION
10 Gigabit modules	
OS10K-XNI-U16E	OS10K network interface card includes 16 unpopulated 10G SFP+ ports. This Standard interface card does not support MPLS or the large tables for L2, L3, and ACL policies.
OS10K-XNI-U16L	OS10K network interface card includes 8 unpopulated 10G SFP+ ports and 8 unpopulated 1G SFP+ ports. 1G ports can be updated to 10G through license upgrade. Supports standard tables for L2, L3 and ACL policies
OS10K-XNI-U32E	Distribution Pack: OS10K network interface card includes 32 unpopulated 10G SFP+ ports. Supports standard tables for L2, L3 and ACL policies
OS10K-XNI-U32ES	Distribution Pack: OS10K network interface card includes 32 unpopulated 10G SFP+ ports. Supports standard tables for L2, L3 and ACL policies
OS10K-XNI-U32S	OS10K network interface card includes 32 unpopulated 10G SFP+ ports. Supports standard tables for L2, L3 and ACL policies
40 Gigabit Ethernet modules	
OS10K-QNI-U4E	OS10K network interface card includes 4 unpopulated 40G QSFP+ ports. Supports standard tables for L2, L3 and ACL policies
OS10K-QNI-U8E	OS10K network interface card includes 8 unpopulated 40G QSFP+ ports. Supports standard tables for L2, L3 and ACL policies
Software license	
OS10K-U16L-UPG	Software Upgrade to provide 10G on 8 ports of 1Gig
OS10K-SW-DC	Data Center Software for support of DCBX, FCoE and EVB on OS10K. One license required per chassis
OS10K-SW-A	Advanced Software for support of MPLS, SPB and Virtual Chassis on OS10K. One license required per chassis.
GE transceivers	
SFP-GIG-T	1000Base-T Gigabit Ethernet Transceiver (SFP MSA). SFP works at 1000 Mb/s speed and full-duplex mode.
SFP-GIG-SX	1000Base-SX Gigabit Ethernet optical transceiver (SFP MSA).
SFP-GIG-LX	1000Base-LX Gigabit Ethernet optical transceiver (SFP MSA).
SFP-GIG-LH40	1000Base-LH Gigabit Ethernet optical transceiver (SFP MSA). Typical reach of 40 km on 9/125 ?m SMF.
SFP-GIG-LH70	1000Base-LH Gigabit Ethernet optical transceiver (SFP MSA). Typical reach of 70 km on 9/125 ?m SMF.
10 GE transceivers	
SFP-10G-SR	10 Gigabit optical transceiver (SFP+). Supports multimode fiber over 850 nm wavelength (nominal) with an LC connector. Typical reach of 300 m
SFP-10G-LR	10 Gigabit optical transceiver (SFP+). Supports monomode fiber over 1310 nm wavelength (nominal) with an LC connector. Typical reach of 10 km
SFP-10G-ER	10 Gigabit optical transceiver (SFP+). Supports monomode fiber over 1550 nm wavelength (nominal) with an LC connector. Typical reach of 40 km
SFP-10G-LRM	10 Gigabit optical transceiver (SFP+). Supports multimode fiber over 1310 nm wavelength (nominal) with an LC connector. Typical reach of 220 m on FDDI-grade (62.5?m)
SFP+ Direct attached cables	
SFP-10G-C1M	10 Gigabit direct attached copper cable (1 m, SFP+).
SFP-10G-C3M	10 Gigabit direct attached copper cable (3 m, SFP+).
SFP-10G-C7M	10 Gigabit direct attached copper cable (7 m, SFP+).
40 GE transceivers	
QSFP-40G-SR	Four channel 40 Gigabit optical transceiver (QSFP+). Supports link lengths of 100 m and 150 m, respectively, on OM3 and OM4 multimode fiber cables.
QSFP-40G-LR	Four channel 40 Gigabit optical transceiver (QSFP+). Supports single mode fiber over 1310nm wavelength. Typical reach 10 km
QSFP+ Direct attached cables	
QSFP-40G-C1M	40 Gigabit direct attached copper cable (1 m, QSFP+).
QSFP-40G-C3M	40 Gigabit direct attached copper cable (3 m, QSFP+).
QSFP-40G-C7M	40 Gigabit direct attached copper cable (7 m, QSFP+).

Contact your Alcatel-Lucent reseller for additional information on country specific power cords and a complete list of Alcatel-Lucent SFP+ and SFP transceivers.

Service and support

Warranty

Limited warranty to the original owner of one year on hardware and 90 days on software.

Alcatel·Lucent
Enterprise