

# Alcatel-Lucent OmniSwitch 6465

## Compact hardened ethernet switches

The Alcatel-Lucent OmniSwitch 6465 is a family of ruggedized, fully manageable and fan-less Gigabit Ethernet switches. Designed for Industrial Ethernet applications, these hardened ethernet family offers a range of DIN rail and 19" rack mountable switches that are ideal for a wide variety of Industrial applications such as Intelligent Transportation, Railway, smart cities and Utilities.



**OS6465-P6**



**OS6465-P12**



**OS6465-P28**

OS6465 switches are a family of hardened, compact, fan-less gigabit Ethernet switches that have been designed specifically for industrial applications. The switches run on the widely deployed and field-proven Alcatel-Lucent Operating system that offers high security, reliability, performance and easy management. These switches are designed to operate in extended temperatures, offer higher EMI/EMC tolerance, a flexible range in power inputs options and high surge protection.

The OS6465 series offers HPOE (60W PoE) providing power to a range of new age devices from PTZ IP cameras on toll booths, LED lights and building management gateways in smart buildings to industrial control systems. These switches are easy to deploy and offer out-of-the-box plug-and-play, Zero-touch provisioning, network automation and disaster recovery options. These switches support IEEE 1588v2 PTP for the nanosecond-level precision timing requirements of industrial devices and applications. With support for MACSec on all ports, OS6465 enables end-to-end encrypted networks. The OS6465 family offers advanced system and network level resiliency features and convergence through standardized protocols in a space efficient form factor.

These versatile industrial switches are ideal for deployment in transportation and traffic control systems, utilities, IP surveillance systems and outdoor installations, to name a few.

### **Datasheet**

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Features	Benefits
<ul style="list-style-type: none"> <li>Designed for Industrial applications</li> </ul>	<ul style="list-style-type: none"> <li>Operates at a wider temperature range from -40°C to +75°C, withstands greater shock, vibrations, surge and EMI/EMC variance</li> <li>Redundant power supply inputs with standard 1x 3 terminal block</li> <li>Alarm relays to connect external alarm systems</li> <li>Compact DIN rail mountable design</li> </ul>
<ul style="list-style-type: none"> <li>Convection cooled fan-less models</li> </ul>	<ul style="list-style-type: none"> <li>Fan-less operations increases resiliency and maximizes uptime for converged mission-critical networks</li> </ul>
<ul style="list-style-type: none"> <li>Advanced Industrial PoE capabilities with support for HPoE (60 W) on all models</li> </ul>	<ul style="list-style-type: none"> <li>Enables converged deployments and is ideal for all type of PoE application requirements from outdoor wireless APs, to PTZ surveillance cameras and video displays</li> </ul>
<ul style="list-style-type: none"> <li>Virtual Chassis to connect multiple switches for creating a single chassis-like entity</li> </ul>	<ul style="list-style-type: none"> <li>Increases system redundancy, resiliency and system scalability while simplifying deployment, operations and management of the network</li> </ul>
<ul style="list-style-type: none"> <li>Hot-swappable, fully redundant power supplies</li> <li>Delivers redundant ring topologies using industry standard protocols</li> </ul>	<ul style="list-style-type: none"> <li>Field upgradable, highly redundant network solution maximizes network uptime</li> </ul>
<ul style="list-style-type: none"> <li>Switch Backup &amp; Restore</li> </ul>	<ul style="list-style-type: none"> <li>Simplifying switch replacement in field and minimizing network downtime using USB drive. Encryption of USB ensures optimal security.</li> </ul>
<ul style="list-style-type: none"> <li>IEEE 1588v2 PTP support</li> </ul>	<ul style="list-style-type: none"> <li>Support for peer-to-peer and end-to-end transparent clock provides precise nanosecond time synchronization for devices on industrial networks</li> </ul>
<ul style="list-style-type: none"> <li>Simplified installation and service provisioning</li> </ul>	<ul style="list-style-type: none"> <li>Out-of-the-box Zero-touch provisioning and network automation with automatic protocol and topology discovery</li> </ul>
<ul style="list-style-type: none"> <li>MACSec Support</li> </ul>	<ul style="list-style-type: none"> <li>MACSec encryption support provides a secure network access ensuring data confidentiality &amp; integrity</li> </ul>

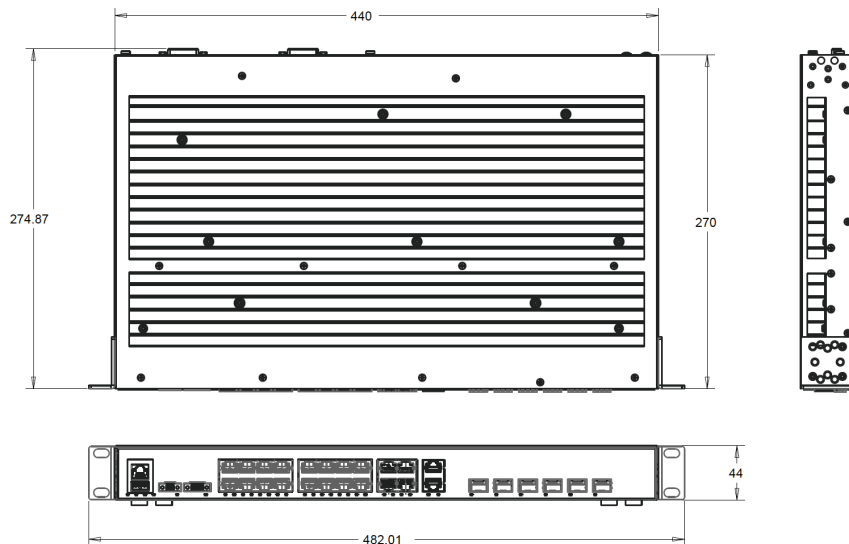
## Alcatel-Lucent OmniSwitch 6465 models

The OmniSwitch 6465 family offers customers an extensive selection of Gigabit fixed-configuration switches with up to 60 watts of PoE per port and power supply options that accommodate the most demanding requirements. The models can be mounted on DIN rail, 19" rack or a wall/panel.

All the models of OS6465 family support 60W PoE, IEEE1588v2 PTP (peer-to-peer & end-to-end transparent clock), MACSec and Alarm relays. All ports of OS6465-P6 and OS6465-P12 are capable of IEEE 1588v2 and MACSec. All ports of OS6465-P28 are capable of IEEE 1588v2 & MACSec (except ports 27, 28). OS6465 switches offer a surge protection of 6KV on all copper ports. OmniSwitch 6465 switches can form a Virtual Chassis between any models creating a single chassis-like entity using 1G SFP ports. OS6465-P28 switches can form a virtual chassis using 10G SFP+ ports. Up to 4 switches can be connected in a Virtual Chassis configuration with option to scale up to 8 in future.

	Gigabit ports (RJ45)	SFP ports	1G/10G SFP+ ports	60W HPOE, POE+ ports	Description
OS6465-P6	4	2	0	2, 2	Fixed-configuration hardened fan-less compact DIN-mount chassis with four 10/100/1000 Base-T PoE+ ports, two of which can support 60W HPoE, and two 100/1000 Base-X SFP ports.
OS6465-P12	8	4	0	4, 4	Fixed-configuration hardened fan-less compact DIN-mount chassis with eight 10/100/1000 Base-T PoE+ ports, four of which can support 60W HPoE, and four 100/1000 Base-X SFP ports.
OS6465-P28	22	2	4	8, 14	Fixed-configuration hardened fan-less 19" rack width chassis with 22 10/100/1000 Base-T PoE+ ports, eight of which can support 60W HPoE, two 100/1000 Base-X SFP ports, and four 1G/10G SFP+ ports.





**OS6465-P28**

## Switch power input specifications

OmniSwitch 6465-P6 and OS6465-P12 models support dual redundant, 1x3 terminal block inputs for power supplies in the front with three wire input cables : +VDC, -VDC and ground.

### OS6465-P6/OS6465-P12

Input voltage range	Maximum current	PoE type supported
54.5 - 57 V	3.5 A	HPoE (60 W)
50 - 57 V	3.5 A	IEEE 802.3AT (30 W)
44 - 57 V	3.5 A	IEEE 802.3 AF (15 W)
24 - 60 V	1.5 A	System power only

These switches can be powered with a Power Supply whose output meets the specifications above. When both input ports (PS1) and (PS2) are used, both inputs shall be powered by identical UL evaluated power supplies only.

## OS6465 power supplies

OmniSwitch 6465-P6 and OS6465-P12 models support 180 W and 75 W AC power supplies. In addition, P6 and P12 switches have been functionally tested with third party DC power supplies for interoperability. In a redundant configuration, power supplies can be installed in any manner AC+AC, AC+DC or DC+DC.

PS models	OS6465-BPN	OS6465-BPN-H
Description	Modular AC power supply. Provides up to 75 W of system and PoE power to one OS6465-P6 or OS6465-P12 switch	Modular AC DIN Mount Power supply. Provides up to 180 W of system and PoE power to one OS6465-P6 or OS6465-P12 switch
Dimensions (H x W x D)	12.52 cm x 3.2 cm x 10.2 cm (4.93 in x 1.26 in x 4.01 in)	12.52 cm x 6.3 cm x 11.35 cm (4.93 in x 2.48 in x 4.47 in)
Weight	0.51 kg (1.12 lbs)	1.03 kg (2.27 lbs)
Input voltage	100 VAC to 240 VAC	100 VAC to 240 VAC
Input current	1.55A	2.6A

PS models	OS6465-BPN	OS6465-BPN-H
Max output power	75 W	180 W
Surge protection	Surge Level 4: 4 KV Line to ground 2 KV Line to Line	Surge Level 4: 4 KV Line to ground 2 KV Line to Line
Fans	0	0
Operating temp	-40°C to 70°C	-40°C to 70°C
Mounting	DIN	DIN
PoE type supported	IEEE 802.3 at (30 W) IEEE 802.3 af (15 W)	HPoE (60 W) IEEE 802.3 at (30 W) IEEE 802.3 af (15 W)

PS models	OS6465-BPR	OS6465-BPRD
Description	Modular AC rack mount power supply. Provides up to 180 W of system and PoE power to one OS6465-P28 switch	Modular DC rack mount Power supply. Provides up to 180 W(@48V input)/140W (@24V Input) of system and PoE power to one OS6465-P28 switch
Dimensions (H x W x D)	5.1 cm x 9.5 cm x 18.1 cm (2 in x 3.74 in x 7.12 in)	5.1 cm x 9.5 cm x 18.1 cm (2 in x 3.74 in x 7.12 in)
Weight	1.42 kg (3.14 lbs)	1.42 kg (3.14 lbs)
Input voltage	100 VAC to 240 VAC	-20 VDC to -72 VDC
Input current	3A/100V to 127 VAC 1.5A/200V to 240 VAC	12A/-20V to -28 VDC 6A/-36V to -72 VDC
Max output power	180 W	180 W
Surge protection	Surge Level 4: 4 KV Line to ground 2 KV Line to Line	Surge Level 4: 2 KV Line to ground 1 KV Line to Line
Fans	0	0
Operating temp	-40°C to 75°C	-40°C to 75°C
Mounting	19" Rack	19" Rack
PoE type supported	HPoE (60 W) IEEE 802.3 at (30 W) IEEE 802.3 af (15 W)	HPoE (60 W) IEEE 802.3 at (30 W) IEEE 802.3 af (15 W)

## Product specifications and measurements

### Per-port LEDs

- Non-PoE ports - green: link/activity
- PoE ports - amber: link/activity

### System LEDs

- OK: green/amber operational status of the switch
- VC: green/amber master or slave role in VC configuration. Number of blinks identify stacking unit number
- PS1: Green/Amber - status for the primary power supply
- PS2: Green/Amber - status for the backup power supply
- ALRM IN: Amber when alarm in
- ALRM OUT: Amber when alarm out

## Scalability numbers and speeds

- Wire rate at layer 2 and layer 3 on all ports
- Jumbo frame size: 9216 bytes (for 1 Gb/s)
- Total number of MAC addresses: 16 K
- Total number of IPv4 routes: 128
- Number of VLANs: 4,000

### Virtual chassis

- Maximum number of units in a VC: 4
- Remote VC connection: using iSFP-GIG-SX, iSFP-GIG-LX

## Compliance and certifications

### Commercial safety

- UL 60950-1, 2nd Ed.
- IEC 60950-1; all national deviations
- EN 60950-1; all 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
- CU, EAC, Russia
- ANATEL, Brazil
- CCC, China
- KCC Korea
- BSMI, Taiwan
- EN 60825-1 Laser
- EN 60825-2 Laser
- CDRH Laser
- RoHS and WEEE directives compliant
- REACH directive

## Commercial EMI/EMC

- 47 CRF FCC Part 15: 2015 Subpart B (Class A)VCCI (Class A, with UTP Cables)
- ICES-003:2012 Issue 5, Class A
- AS/NZS 3548 (Class A) – C-Tick
- CE marking for European countries (Class A)
- CE Emission
  - EN50581 (RoHS Recast)
  - EN 55032 (EMI & EMC requirement)
  - EN 55024 (Immunity Characteristics)
  - EN 61000-3-2(Harmonic Current emissions)
  - EN 61000-3-3
  - EN 61000-4-2
  - EN 61000-4-3
  - EN 61000-4-4
  - EN 61000-4-5 (Surge Immunity, Class 4)
  - EN 61000-4-6
  - EN 61000-4-8
  - EN 61000-4-9
  - EN 61000-4-11
  - IEEE802.3: Hi-pot Test (2.25 KV DC on all Ethernet Ports)

## Industrial

### Industrial environmental

- IEC 60870-2-2 (operational temperature)
- IEC 60068-2-1 (temperature type test - cold)
- IEC 60068-2-2 (temperature type test - hot)
- IEC 60721-3-1: Class 1K5 (storage temperature)
- IEC 60068-2-30: 5% to 95% non-condensing humidity
- IEC 60255-21-2 (mechanical shock)
- IEC 60255-21-1 (vibration)

### Industrial safety

- UL 508
- UL 61010
- EN 50021
- Hazardous location
  - ISA 12.12.01 (UL 1604)
  - CSA22.2/213
- IP30

### Industrial emission

- EN 61805-3
- EN 55032 (Emission Standard)
- EN 61000-3-2
- EN 61000-3-3
- EN 55024/EN 55035 (Immunity Standard)
- EN 61000-4-2 to EN 61000-4-8

- EN 61000-4-11
- EN 61000-4-12
- EN 61000-4-16
- EN 61000-4-17
- EN 61000-4-29
- IEC 60255-5
- IEEE 1613

## Industry specific

### Electric power substation

- IEEE 1613, Section 4 to 8
- IEC 61850-3

### Railway applications

- EN 50121-4
- EN 50155:2017
- EN 61373
- EN 62236-4
- EN61000-6-4
- EN61000-6-2

### Intelligent transportation (road)

- NEMA TS-2

### Marine certifications

- DNVGL-CG-0339†
- IEC 60945:2002†

† Requires mandatory DNV kit for compliance

### Federal certifications

- Trade Agreements Act (TAA)

## Detailed product features

### Simplified manageability and configuration

- Intuitive CLI in a scriptable Python & BASH environment via console, Telnet or Secure Shell (SSH) v2 over IPv4/IPv6
- Powerful WebView Graphical Web Interface via HTTP and HTTPS over IPv4/IPv6
- Network Automation and Programmability Abstraction Layer with Multivendor (NAPALM) support
- Fully programmable RESTful web services interface with XML and JSON support. API enables access to CLI and individual mib objects
- Integrated with Alcatel-Lucent OmniVista® products for network management
- Integrated with Nokia Network Services Platform (NSP)© for network management
- Full configuration and reporting using SNMPv1/2/3 to facilitate third-party network management over IPv4/IPv6
- File upload using USB, TFTP, FTP, SFTP or SCP using IPv4/IPv6

- Human-readable ASCII-based configuration files for off-line editing, bulk configuration and out-of-the-box auto-provisioning
- Non-volatile memory for start-up configuration
- Multiple microcode image support with fallback recovery
- Dynamic Host Configuration Protocol (DHCP) relay for IPv4/IPv6
- IEEE 802.1AB Link Layer Discover Protocol (LLDP) with Media Endpoint Discover (MED) extensions
- Network Time Protocol (NTP)
- DHCPv4 and DHCPv6 server managed by Nokia VitalQIP® DNS/DHCP IP Address Management
- Access to the AOS console via USB Adapter with Bluetooth technology provides wireless management access, eliminating the need of console cables

### Cloud ready with OmniVista® Cirrus

- OmniVista® Cirrus offers a secure, resilient and scalable cloud-based network management. It offers hassle free network deployment and easy service roll-out with advanced analytics for smarter decision making. It provides IT friendly Unified Access with secure authentication and policy enforcement for users and devices.

### Monitoring and troubleshooting

- Local (on the flash) and remote server logging (Syslog): event and command logging
- IP tools: ping and trace route
- Dying Gasp support via SNMP and syslog messages
- Loopback IP address support for management per service
- Policy- and port-based mirroring
- Remote port mirroring
- sFlow v5 and Remote Monitoring (RMON)
- Unidirectional Link Detection (UDLD), Digital Diagnostic Monitoring (DDM)

### Resiliency and high availability

- Unified management, control and virtual chassis technology
- Virtual Chassis 1+N redundant supervisor manager
- Smart continuous switching technology

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- ITU-T G.8032/Y1344 2010: 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 1x1 STP mode
- IEEE 802.3ad/802.1AX Link Aggregation Control Protocol (LACP) and static LAG groups across modules
- Dual-home link support for sub-second link protection without STP
- Virtual Router Redundancy Protocol (VRRP) with tracking capabilities
- IEEE protocol auto-discovery
- Redundant and hot-swappable power supplies
- Built-in CPU protection against malicious attacks
- Split Virtual Chassis protection: Auto-detection and recovery of Virtual Chassis splitting due to one or more VFL or stack element failures\*
- User Network Profile (UNP) simplifies NAC by dynamically providing pre-defined policy configuration to authenticated clients – VLAN, ACL, BW
- Secure Shell (SSH) with public key infrastructure (PKI) support
- Terminal Access Controller Access-Control System Plus (TACACS+) client
- Centralized Remote Access Dial-In User Service (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)
- DHCP Snooping, DHCP IP and Address Resolution Protocol (ARP) spoof protection
- ARP poisoning detection
- IP Source Filtering as a protective and effective mechanism against ARP attacks
- LLDP Security mechanism for rogue device detection and restriction

## Advanced security

### Switch software security

- AOS secured diversified code solution is available on OmniSwitch® 6465, hardening it at both the software source code and binary executable levels to enhance overall network security.
- AOS secured diversified code protects networks from intrinsic vulnerabilities, code exploits, embedded malware, and potential back doors that could compromise mission critical operations.
- AOS secured diversified code is a proactive, defense approach toward network security that continuously defines and implements value-add capabilities to address both current and future threats.

### Access control

- Alcatel-Lucent Access Guardian framework for comprehensive user-policy-based NAC
- Autosensing IEEE 802.1X multi-client, multi-VLAN support
- MAC-based authentication for non-IEEE 802.1X hosts
- Web based authentication (captive portal): a customizable web portal residing on the switch

\*Future support

## QoS

- Priority queues: Eight hardware-based queues per port for flexible QoS management
- Traffic prioritization: Flow-based QoS Flow-based traffic policing and bandwidth management
- 32-bit IPv4/128-bit IPv6 non-contiguous mask classification
- Egress traffic shaping
- 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)
- Auto-QoS support for Generic Object Oriented Substation Events (GOOSE) messages

## Layer-3 routing and multicast

### IPv4 routing

- Static routing
- Routing Information Protocol (RIP) v1 and v2
- Virtual Router Redundancy Protocol (VRRPv2)
- DHCP relay (including generic UDP relay)

- Address Resolution Protocol (ARP)
- Policy-based routing and server load balancing
- DHCPv4 server

### IPv6 routing

- Internet Control Message Protocol version 6 (ICMPv6)
- Static routing
- Virtual Router Redundancy Protocol version 3 (VRRPv3)
- Neighbor Discovery Protocol (NDP)\*
- Policy-based routing and server load balancing
- DHCPv6 server

### IPv4/IPv6 multicast

- Internet Group Management Protocol (IGMP) v1/v2/v3 snooping
- Multicast Listener Discovery (MLD) v1/v2 snooping

## Advanced Layer-2 services

- Ethernet services support using IEEE 802.1ad Provider Bridges (also known as Q-in-Q or VLAN stacking)
- Ethernet OAM (802.1ag, ITU-T Y.1731): Connectivity Fault Management (L2 ping & Link trace)
- Ethernet in First mile: Link OAM (802.3ah)
- 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
- Port mapping
- DHCP Option 82: Configurable relay agent information
- Multiple VLAN Registration Protocol (MVRP)
- HA-VLAN for Layer 2 clusters such as MS-NLB and active-active Firewall clusters\*
- Customer Provider Edge (CPE) test head traffic generator and analyzer tool
- TR-101 Point-to-Point Protocol over Ethernet (PPPoE) Intermediate Agent allowing for the PPPoE network access method
- Service Assurance Agent (SAA) for proactively measuring network health, reliability and performance.
- Jumbo frame support



- Bridge Protocol Data Unit (BPDU) blocking
- STP Root Guard

## Supported standards

### IEEE standards

- IEEE 802.1D STP
- IEEE 802.1p CoS
- IEEE 802.1Q VLANs
- IEEE 802.1ab (LLDP)
- IEEE 802.1ag (OA&M)
- IEEE 802.1ad Provider Bridges Q-in-Q/ VLAN stacking
- IEEE 802.1ak (Multiple VLAN Registration Protocol (MVRP))
- IEEE 802.1s MSTP
- IEEE 802.3i 10BASE-T
- IEEE 802.1w RSTP
- IEEE 802.3x Flow Control
- IEEE 802.3z Gigabit Ethernet
- IEEE 802.3ab 1000Base-T
- IEEE 802.3ac VLAN Tagging
- IEEE 802.3ad/802.1AX Link Aggregation
- IEEE 802.3ae 10 GigE
- IEEE 802.3af Power over Ethernet
- IEEE 802.3at PoE Plus
- IEEE 1588v2 Precision Time Protocol

### ITU-T recommendations

- ITU-T G.8032/Y.1344 2010: Ethernet Ring Protection (ERPv2)
- ITU-T Y.1731 OA&M fault and performance management

### IETF RFCs

#### IPv4

- RFC 2131 Dynamic Host Configuration Protocol (DHCPv4)
- RFC 4022/2452 MIB for IPv4 TCP
- RFC 4113/2454 MIB for IPv4 UDP
- RFC 4292/4293 IPv4 MIBs

#### 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

#### IP Multicast

- RFC 2365 Multicast
- RFC 2710/3019/3810/MLD v2 for IPv6
- RFC 2933 IGMP MIB
- RFC 3376 IGMPv3 (includes IGMP v2/v1)

- RFC 4541 Considerations for IGMP and MLD Snooping Switches
- RFC 5132 Multicast Routing MIB

#### IPv6

- RFC 1981 Path MTU Discovery
- RFC 2460 IPv6 Specification
- RFC 2464 IPv6 over Ethernet
- RFC 2465 MIB for IPv6: Textual Conventions (TC) and General Group
- RFC 2466 MIB for IPv6: ICMPv6 Group
- RFC 3484 Default Address Selection
- RFC 3493/2553 Basic Socket API
- RFC 3542/2292 Advanced Sockets API
- RFC 3587/2374 Global Unicast Address Format
- RFC 3595 TC for IPv6 Flow Label
- RFC 3596/1886 DNS for IPv6
- RFC 4007 Scoped Address
- RFC 4022/2452 MIB for IPv6 TCP
- RFC 4113/2454 MIB for IPv6 UDP
- RFC 4193 Unique Local Addresses
- RFC 4213/2893 Transition Mechanisms
- RFC 4291/3513/2373 Addressing Architecture (uni/any/multicast)
- RFC 4292/4293 IPv6 MIBs
- RFC 4443/2463 ICMPv6
- RFC 4861/2461 Neighbor Discovery\*
- RFC 4862/2462 Stateless Address Autoconfiguration
- RFC 5095 Deprecation of Type 0 Routing Headers in IPv6\*

#### Manageability

- RFC 854/855 Telnet and Telnet options
- RFC 959/2640 FTP
- RFC 1350 TFTP Protocol
- 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 1867 Form-based File Upload in HTML
- RFC 1901-1908/3416-3418 SNMP v2c
- RFC 2096 IP MIB
- RFC 2131 DHCP Server/Client
- RFC 2388 Returning Values from Forms: multipart/form-data

- RFC 2396 Uniform Resource Identifiers (URI): Generic Syntax
- RFC 2570-2576/3410-3415/3584 SNMP v3
- RFC 2616 /2854 HTTP and HTML
- RFC 2668/3636 IEEE 802.3 MAU MIB
- RFC 2674 VLAN MIB
- RFC 3023 XML Media Types
- RFC 3414 User-based Security Model
- RFC 3826 (AES) Cipher Algorithm in the SNMP User-based Security Model
- RFC 4122 A Universally Unique Identifier (UUID) URN Namespace
- RFC 4234 Augmented BNF for Syntax Specifications: ABNF
- RFC 4251 Secure Shell Protocol Architecture
- RFC 4252 The Secure Shell (SSH) Authentication Protocol
- RFC 4627 JavaScript Object Notation (JSON)
- RFC 6585 Additional HTTP Status Codes

#### Security

- RFC 1321 MD5
- RFC 1826/1827/4303/4305 Encapsulating Payload (ESP) and crypto algorithms
- 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

#### QoS

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

#### 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

\*Future support

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- RFC 950 Subnetting
- RFC 951 BOOTP
- RFC 1151 RDP
- RFC 1191 Path MTU Discovery
- RFC 1256 ICMP Router Discovery
- RFC 1305/2030/5905 NTP v4 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
- RFC 4562 MAC-Forced Forwarding

## Ordering information

Part number	Description
<b>OmniSwitch 6465 models</b>	
OS6465-P6	OS6465-P6: Hardened Gigabit Ethernet fixed configuration fan-less compact din-mount chassis with 4 RJ-45 10/100/1000 Base-T PoE+ ports out of which 2 ports are 60W PoE capable, 2 100/1000 Base-X SFP ports, RS-232 Console (RJ45), 1 Alarm relay Input, 1 alarm relay output and USB port. The bundle includes user manuals access card and hardware for mounting on a TS-35/7.5 or 15 DIN rail. Power supply shall be ordered separately.
OS6465-P6-xx	OS6465-P6-xx: Hardened Gigabit Ethernet fixed configuration fan-less compact din-mount chassis with 4 RJ-45 10/100/1000 Base-T PoE+ ports out of which 2 ports are 60W PoE capable, 2 100/1000 Base-X SFP ports, RS-232 Console (RJ45), 1 Alarm relay Input, 1 alarm relay output and USB port. The bundle includes one AC power supply, country-specific power cord, user manuals access card and hardware for mounting on a TS-35/7.5 or 15 DIN rail.
OS6465-P12	OS6465-P12: Hardened Gigabit Ethernet fixed configuration fan-less compact din-mount chassis with 8 RJ-45 10/100/1000 Base-T PoE+ ports out of which 4 ports are 60W PoE capable, 4 100/1000 Base-X SFP ports, RS-232 Console (RJ45), 1 Alarm relay Input, 1 alarm relay output and USB port. The bundle includes user manuals access card and hardware for mounting on a TS-35/7.5 or 15 DIN rail. Power supply shall be ordered separately.
OS6465-P12-xx	OS6465-P12-xx: Hardened Gigabit Ethernet fixed configuration fan-less compact din-mount chassis with 8 RJ-45 10/100/1000 Base-T PoE+ ports out of which 4 ports are 60W PoE capable, 4 100/1000 Base-X SFP ports, RS-232 Console (RJ45), 1 Alarm relay Input, 1 alarm relay output and USB port. The bundle includes one AC power supply, country-specific power cord, user manuals access card and hardware for mounting on a TS-35/7.5 or 15 DIN rail.
OS6465-P28	OS6465-P28: Hardened Gigabit Ethernet L3 fixed configuration fan-less chassis in a 1U form factor with 22 10/100/1000 Base-T PoE+ ports out of which 8 ports are 60W PoE capable, two 100/1000 Base-X SFP ports, four (1G/10G) SFP+ ports, RS-232 Console (RJ45), 1 Alarm relay Input, 1 alarm relay output and one USB port. The bundle includes user manuals access card and hardware for mounting in a 19" rack. Power supply shall be ordered separately.
OS6465-P28-xx	OS6465-P28-xx: Hardened Gigabit Ethernet L3 fixed configuration fan-less chassis in a 1U form factor with 22 10/100/1000 Base-T PoE+ ports out of which 8 ports are 60W PoE capable, two 100/1000 Base-X SFP ports, four (1G/10G) SFP+ ports, RS-232 Console (RJ45), 1 Alarm relay Input, 1 alarm relay output and one USB port. The bundle includes one AC power supply, country-specific power cord, power supply tray, user manuals, access card and hardware for mounting in a 19" rack.
OS6465-P28D	OS6465-P28D: Hardened Gigabit Ethernet L3 fixed configuration fan-less chassis in a 1U form factor with 22 10/100/1000 Base-T PoE+ ports out of which 8 ports are 60W PoE capable, two 100/1000 Base-X SFP ports, four (1G/10G) SFP+ ports, RS-232 Console (RJ45), 1 Alarm relay Input, 1 alarm relay output and one USB port. The bundle includes one DC power supply, power supply tray, user manuals, access card and hardware for mounting in a 19" rack.
<b>OmniSwitch 6465 TAA Certified Switches</b>	
TA6465-P6	TA6465-P6: Hardened Gigabit Ethernet fixed configuration fan-less compact din-mount chassis with 4 RJ-45 10/100/1000 Base-T PoE+ ports out of which 2 ports are 60W PoE capable, 2 100/1000 Base-X SFP ports, RS-232 Console (RJ45), 1 Alarm relay Input, 1 alarm relay output and USB port. The bundle includes user manuals access card and hardware for mounting on a TS-35/7.5 or 15 DIN rail. Power supply shall be ordered separately.
TA6465-P12	TA6465-P12: Hardened Gigabit Ethernet fixed configuration fan-less compact din-mount chassis with 8 RJ-45 10/100/1000 Base-T PoE+ ports out of which 4 ports are 60W PoE capable, 4 100/1000 Base-X SFP ports, RS-232 Console (RJ45), 1 Alarm relay Input, 1 alarm relay output and USB port. The bundle includes user manuals access card and hardware for mounting on a TS-35/7.5 or 15 DIN rail. Power supply shall be ordered separately.

Part number	Description
TA6465-P6-US	TA6465-P6-US: Hardened Gigabit Ethernet fixed configuration fan-less compact din-mount chassis with 4 RJ-45 10/100/1000 Base-T PoE+ ports out of which 2 ports are 60W PoE capable, 2 100/1000 Base-X SFP ports, RS-232 Console (RJ45), 1 Alarm relay Input, 1 alarm relay output and USB port. The bundle includes one AC power supply, US power cord, user manuals access card and hardware for mounting on a TS-35/7.5 or 15 DIN rail.
TA6465-P12-US	TA6465-P12-US: Hardened Gigabit Ethernet fixed configuration fan-less compact din-mount chassis with 8 RJ-45 10/100/1000 Base-T PoE+ ports out of which 4 ports are 60W PoE capable, 4 100/1000 Base-X SFP ports, RS-232 Console (RJ45), 1 Alarm relay Input, 1 alarm relay output and USB port. The bundle includes one AC power supply, US power cord, user manuals access card and hardware for mounting on a TS-35/7.5 or 15 DIN rail.
TA6465-P28-US	TA6465-P28-US: Hardened Gigabit Ethernet L3 fixed configuration fan-less chassis in a 1U form factor with 22 10/100/1000 Base-T PoE+ ports out of which 8 ports are 60W PoE capable, two 100/1000 Base-X SFP ports, four (1G/10G) SFP+ ports, RS-232 Console (RJ45), 1 Alarm relay Input, 1 alarm relay output and one USB port. The bundle includes one AC power supply, US power cord, power supply tray, user manuals, access card and hardware for mounting in a 19" rack.
<b>OmniSwitch 6465 power supplies</b>	
OS6465-BPN-H-xx	OS6465 modular DIN 180 W AC backup power supply. Provides system and PoE power to one OS6465-P6 or OS6465-P12 switch. Ships with country specific power cord
OS6465-BPN-xx	OS6465 modular DIN 75 W AC backup power supply. Provides system and PoE power to one OS6465-P6 or OS6465-P12 switch. Ships with country specific power cord
OS6465-BPR-xx	OS6465 modular rack-mount AC backup power supply. Provides system and PoE power to one OS6465-P28 switch. Ships with country specific power cord.
OS6465-BPRD	OS6465 modular rack-mount DC backup power supply. Provides system and PoE power to one OS6465-P28 switch.
<b>OmniSwitch 6465 DNV certified parts</b>	
OS6465-DNV-DIN	DNV power supply cover kit for OS6465-P6 & OS6465-P12. Mandatory kit for installations requiring DNV certified OS6465-P6 and OS6465-P12. Contains PS cover and all mounting hardware
OS6465-DNV-RACK	DNV power supply cover kit for OS6465-P28. Mandatory kit for installations requiring DNV certified OS6465-P28. Contains PS cover, rear side-support rail, rear support bracket, side mount bracket and all mounting hardware
<b>OmniSwitch 6465 software</b>	
OS-SW-MACSEC	Site license to enable MACSec on OS6465 models. One license per customer at no cost.
<b>OmniSwitch 6465 transceivers</b>	
iSFP-100-MM	100Base-FX industrial transceiver with an LC type interface. This transceiver is designed for use over multimode fiber.
iSFP-100-SM15	100Base-FX industrial transceiver with an LC type interface. This transceiver is designed for use over single-mode fiber up to 15 km.
iSFP-100-SM40	100Base-FX Industrial SFP transceiver with an LC type interface. This transceiver is designed for use over single mode fiber optic cable up to 40 km.
iSFP-GIG-T	1000Base-T industrial Gigabit Ethernet Transceiver (SFP MSA). SFP works at 1000 Mb/s speed and full-duplex mode
iSFP-GIG-SX	1000Base-SX industrial Gigabit Ethernet industrial optical transceiver (SFP MSA)
iSFP-GIG-LX	1000Base-LX industrial Gigabit Ethernet optical transceiver (SFP MSA)
iSFP-GIG-LH40	1000Base-LH industrial Gigabit Ethernet optical transceiver (SFP MSA). Typical reach of 40 km on 9/125 µm SMF
iSFP-GIG-LH70	1000Base-LH industrial Gigabit Ethernet optical transceiver (SFP MSA). Typical reach of 70 km on 9/125 µm SMF
iSFP-GIG-BX-U	1000Base-BX SFP transceiver with an LC type of interface. This bi-directional transceiver is designed for use over single mode fiber optic on a single strand link up to 10 km. Transmits 1310 nm and receives 1490 nm optical signal.
iSFP-GIG-BX-D	1000Base-BX SFP transceiver with an LC type of interface. This bi-directional transceiver is designed for use over single mode fiber optic on a single strand link up to 10 km. Transmits 1490 nm and receives 1310 nm optical signal.

Part number	Description
<b>10G transceivers</b>	
iSFP-10G-LR	10 Gigabit industrial optical transceiver (SFP+). Supports monomode fiber over 1310 nm wavelength (nominal) with an LC connector. Typical reach of 10 km
iSFP-10G-ER	10 Gigabit industrial optical transceiver (SFP+). Supports monomode fiber over 1550 nm wavelength (nominal) with an LC connector. Typical reach of 40 km
iSFP-10G-ZR	10 Gigabit industrial optical transceiver (SFP+). Supports data transmission at 1550nm over up to 80km single mode fiber. LC connector type
<b>SFP+ direct attached cables</b>	
iSFP-10G-C1M	10 Gigabit industrial direct attached copper cable (1 m, SFP+)
iSFP-10G-C3M	10 Gigabit industrial direct attached copper cable (3 m, SFP+)
iSFP-10G-C7M	10 Gigabit industrial direct attached copper cable (7 m, SFP+)

Please replace the “-xx” in the part number with the country-specific power cord (e.g. OS6465-12-US will come with a power cord for the USA, -UK for United Kingdom). ALE offers 11 different power cord options. Please consult the price list for the power cord options offered.

## Warranty

The OmniSwitch 6465 family comes with a Limited Lifetime Hardware Warranty.

## Services and support

For more information about our Professional services, Support services, and Managed services, please go to <https://www.al-enterprise.com/en/services>

Please visit our website to learn more: <https://www.al-enterprise.com/en/products/switches/omniswitch-6465>