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January 2007*

*OmniStack® LS 6200 Series
Getting Started Guide
Installationsanleitung*



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**This Manual documents OmniStack® 6200 hardware and software.
The functionality described in this Manual is subject to change without notice.**

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Warning

This equipment has been tested and found to comply with the limits for Class A digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide

reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions in this guide, may cause interference to radio communications. Operation of this equipment in a residential area is likely to cause interference, in which case the user will be required to correct the interference at his own expense.

The user is cautioned that changes and modifications made to the equipment without approval of the manufacturer could void the user's authority to operate this equipment. It is suggested that the user use only shielded and grounded cables to ensure compliance with FCC Rules.

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the radio interference regulations of the Canadian department of communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la Class A prescrites dans le règlement sur le brouillage radioélectrique édicté par le ministère des communications du Canada.

Utilice sólo adaptadores con las siguientes características eléctricas y que estén debidamente certificados de acuerdo a la legislación vigente. El uso de otros adaptadores podría dañar el dispositivo y anular la garantía además de provocar riesgos al usuario.

	Características de entrada:	Características de salida:
OS-LS-6224P	AC100/115/220/230V; 50/60Hz; 2.0/1.7/0.9/ 0.9A; Clase I	DC 12V, 4.0A; -50V, 3.6A
OS-LS-6248P	AC100/115/220/230V; 50/60Hz; 4.0/3.4/1.8/ 1.8A; Clase I	DC 12V, 7.5A; -50V, 7.5A
OS-LS-6224	AC 100/115/220/230V; 50/60Hz; 0.4/0.4/0.2/ 0.2A; Clase I	DC 12V, 4.5A
OS-LS-6248	AC100/115/220/230V; 50/60Hz; 0.6/0.6/0.4/ 0.4A; Clase I	DC 12V, 4.5A

Adaptador:

	Modelo:	Marca comercial:
OS-LS-6224P	OS-LS-62BP-P	3Y Power
OS-LS-6248P	OS-LS-62BP-P	Alcatel
OS-LS-6248	OS-LS-62BP-DC & OS-LS-62BP	Accton & 3Y Power
OS-LS-6224	OS-LS-62BP-DC & OS-LS-62BP	Accton & 3Y Power

Compliances and Safety Warnings

FCC - Class A

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart A of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference. You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

You may use unshielded twisted-pair (UTP) for RJ-45 connections - Category 3 or better for 10 Mbps connections, Category 5 or better for 100 Mbps connections, Category 5, 5e, or 6 for 1000 Mbps connections. For fiber optic connections, you may use 50/125 or 62.5/125 micron multimode fiber or 9/125 micron single-mode fiber.

- Warnings:**
1. Wear an anti-static wrist strap or take other suitable measures to prevent electrostatic discharge when handling this equipment.
 2. When connecting this hub to a power outlet, connect the field ground lead on the tri-pole power plug to a valid earth ground line to prevent electrical hazards.

Industry Canada - Class A

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled "Digital Apparatus," ICES-003 of the Department of Communications. Cet appareil numérique respecte les limites de bruits radioélectriques applicables aux appareils numériques de Classe A prescrites dans la norme sur le matériel brouilleur: "Appareils Numériques," NMB-003 édictée par le ministère des Communications.

CE Mark Declaration of Conformance for EMI and Safety (EEC)

This information technology equipment complies with the requirements of the Council Directive 89/336/EEC on the Approximation of the laws of the Member States relating to Electromagnetic Compatibility and 73/23/EEC for electrical equipment used within certain voltage limits and the Amendment Directive 93/68/EEC. For the evaluation of the compliance with these Directives, the following standards were applied:

- RFI Emission:
- Limit class A according to EN55022:1998
 - Limit class A for harmonic current emission according to EN61000-3-2/1995
 - Limitation of voltage fluctuation and flicker in low-voltage supply system according to EN61000-3-3/1995

- Immunity:
- Product family standard according to EN55024:1998
 - Electrostatic Discharge according to EN61000-4-2:1995 (Contact Discharge: ± 4 kV, Air Discharge: ± 8 kV)
 - Radio-frequency electromagnetic field according to EN61000-4-3:1996 (80 - 1000 MHz with 1 kHz AM 80% Modulation: 3 V/m)
 - Electrical fast transient/burst according to EN61000-4-4:1995 (AC/DC power supply: ± 1 kV, Data/Signal lines: ± 0.5 kV)
 - Surge immunity test according to EN61000-4-5:1995 (AC/DC Line to Line: ± 1 kV, AC/DC Line to Earth: ± 2 kV)
 - Immunity to conducted disturbances, Induced by radio-frequency fields: EN61000-4-6:1996 (0.15 - 80 MHz with 1 kHz AM 80% Modulation: 3 V/m)
 - Power frequency magnetic field immunity test according to EN61000-4-8:1993 (1 A/m at frequency 50 Hz)
 - Voltage dips, short interruptions and voltage variations immunity test according to EN61000-4-11:1994 (>95% Reduction @10 ms, 30% Reduction @500 ms, >95% Reduction @5000 ms)
- LVD:
- EN60950-1

Caution: Do not plug a phone jack connector in the RJ-45 port. This may damage this device.

Attention: Les raccordeurs ne sont pas utilisé pour le système téléphonique!

Safety Compliance

Warning: Fiber Optic Port Safety



When using a fiber optic port, never look at the transmit laser while it is powered on. Also, never look directly at the fiber TX port and fiber cable ends when they are powered on.

Avertissement: Ports pour fibres optiques - sécurité sur le plan optique



Ne regardez jamais le laser tant qu'il est sous tension. Ne regardez jamais directement le port TX (Transmission) à fibres optiques et les embouts de câbles à fibres optiques tant qu'ils sont sous tension.

Warnhinweis: Faseroptikanschlüsse - Optische Sicherheit



Niemals ein Übertragungslaser betrachten, während dieses eingeschaltet ist. Niemals direkt auf den Faser-TX-Anschluß und auf die Faserkabelenden schauen, während diese eingeschaltet sind.

Underwriters Laboratories Compliance Statement

Important! Before making connections, make sure you have the correct cord set. Check it (read the label on the cable) against the following:

Operating Voltage Electrical Cord Requirements	
Operating Voltage	Cord Set Specifications
120 Volts	UL Listed/CSA Certified Cord Set
	Minimum 18 AWG
	Type SVT or SJT three conductor cord
	Maximum length of 15 feet
	Parallel blade, grounding type attachment plug rated 15A, 125V
240 Volts (Europe only)	Cord Set with H05VV-F cord having three conductors with minimum diameter of 0.75 mm ²
	IEC-320 receptacle
	Male plug rated 10A, 250V

The unit automatically matches the connected input voltage. Therefore, no additional adjustments are necessary when connecting it to any input voltage within the range marked on the rear panel.

Please read the following safety information carefully before installing the switch:

WARNING: Installation and removal of the unit must be carried out by qualified personnel only.

- The unit must be connected to an earthed (grounded) outlet to comply with international safety standards.
- Do not connect the unit to an A.C. outlet (power supply) without an earth (ground) connection.
- The appliance coupler (the connector to the unit and not the wall plug) must have a configuration for mating with an EN 60320/IEC 320 appliance inlet.
- The socket outlet must be near to the unit and easily accessible. You can only remove power from the unit by disconnecting the power cord from the outlet.
- This unit operates under SELV (Safety Extra Low Voltage) conditions according to IEC 60950. The conditions are only maintained if the equipment to which it is connected also operates under SELV conditions.

France and Peru only

This unit cannot be powered from IT† supplies. If your supplies are of IT type, this unit must be powered by 230 V (2P+T) via an isolation transformer ratio 1:1, with the secondary connection point labelled Neutral, connected directly to earth (ground).

† Impédance à la terre

Power Cord Set	
U.S.A. and Canada	The cord set must be UL-approved and CSA certified.
	The minimum specifications for the flexible cord are: - No. 18 AWG - not longer than 2 meters, or 16 AWG. - Type SV or SJ - 3-conductor
	The cord set must have a rated current capacity of at least 10 A
	The attachment plug must be an earth-grounding type with NEMA 5-15P (15 A, 125 V) or NEMA 6-15P (15 A, 250 V) configuration.
Denmark	The supply plug must comply with Section 107-2-D1, Standard DK2-1a or DK2-5a.
Switzerland	The supply plug must comply with SEV/ASE 1011.
U.K.	The supply plug must comply with BS1363 (3-pin 13 A) and be fitted with a 5 A fuse which complies with BS1362.
	The mains cord must be <HAR> or <BASEC> marked and be of type HO3VVF3GO.75 (minimum).
Europe	The supply plug must comply with CEE7/7 ("SCHUKO").
	The mains cord must be <HAR> or <BASEC> marked and be of type HO3VVF3GO.75 (minimum).
	IEC-320 receptacle.

Veillez lire à fond l'information de la sécurité suivante avant d'installer le Switch:

AVERTISSEMENT: L'installation et la dépose de ce groupe doivent être confiés à un

personnel qualifié.

- Ne branchez pas votre appareil sur une prise secteur (alimentation électrique) lorsqu'il n'y a pas de connexion de mise à la terre (mise à la masse).
- Vous devez raccorder ce groupe à une sortie mise à la terre (mise à la masse) afin de respecter les normes internationales de sécurité.
- Le coupleur d'appareil (le connecteur du groupe et non pas la prise murale) doit respecter une configuration qui permet un branchement sur une entrée d'appareil EN 60320/IEC 320.
- La prise secteur doit se trouver à proximité de l'appareil et son accès doit être facile. Vous ne pouvez mettre l'appareil hors circuit qu'en débranchant son cordon électrique au niveau de cette prise.
- L'appareil fonctionne à une tension extrêmement basse de sécurité qui est conforme à la norme IEC 60950. Ces conditions ne sont maintenues que si l'équipement auquel il est raccordé fonctionne dans les mêmes conditions.

France et Pérou uniquement:

Ce groupe ne peut pas être alimenté par un dispositif à impédance à la terre. Si vos alimentations sont du type impédance à la terre, ce groupe doit être alimenté par une tension de 230 V (2 P+T) par le biais d'un transformateur d'isolement à rapport 1:1, avec un point secondaire de connexion portant l'appellation Neutre et avec raccordement direct à la terre (masse).

Cordon électrique - Il doit être agréé dans le pays d'utilisation	
Etats-Unis et Canada:	Le cordon doit avoir reçu l'homologation des UL et un certificat de la CSA.
	Les spécifications minimales pour un câble flexible sont AWG No. 18, ou AWG No. 16 pour un câble de longueur inférieure à 2 mètres. - type SV ou SJ - 3 conducteurs
	Le cordon doit être en mesure d'acheminer un courant nominal d'au moins 10 A.
	La prise femelle de branchement doit être du type à mise à la terre (mise à la masse) et respecter la configuration NEMA 5-15P (15 A, 125 V) ou NEMA 6-15P (15 A, 250 V).
Danemark:	La prise mâle d'alimentation doit respecter la section 107-2 D1 de la norme DK2 1a ou DK2 5a.
Suisse:	La prise mâle d'alimentation doit respecter la norme SEV/ASE 1011.
Europe	La prise secteur doit être conforme aux normes CEE 7/7 ("SCHUKO") LE cordon secteur doit porter la mention <HAR> ou <BASEC> et doit être de type HO3VVF3GO.75 (minimum).

Bitte unbedingt vor dem Einbauen des Switches die folgenden Sicherheitsanweisungen durchlesen:

WARNUNG: Die Installation und der Ausbau des Geräts darf nur durch Fachpersonal

erfolgen.

- Das Gerät sollte nicht an eine ungeerdete Wechselstromsteckdose angeschlossen werden. • Das Gerät muß an eine geerdete Steckdose angeschlossen werden, welche die internationalen Sicherheitsnormen erfüllt.
- Der Gerätestecker (der Anschluß an das Gerät, nicht der Wandsteckdosenstecker) muß einen gemäß EN 60320/IEC 320 konfigurierten Geräteeingang haben.
- Die Netzsteckdose muß in der Nähe des Geräts und leicht zugänglich sein. Die Stromversorgung des Geräts kann nur durch Herausziehen des Gerätenetzkabels aus der Netzsteckdose unterbrochen werden.
- Der Betrieb dieses Geräts erfolgt unter den SELV-Bedingungen (Sicherheitskleinstspannung) gemäß IEC 60950. Diese Bedingungen sind nur gegeben, wenn auch die an das Gerät angeschlossenen Geräte unter SELV-Bedingungen betrieben werden.

Stromkabel. Dies muss von dem Land, in dem es benutzt wird geprüft werden:	
Schweiz	Dieser Stromstecker muß die SEV/ASE 1011 Bestimmungen einhalten.
Europe	Das Netzkabel muß vom Typ HO3VVF3GO.75 (Mindestanforderung) sein und die Aufschrift <HAR> oder <BASEC> tragen. Der Netzstecker muß die Norm CEE 7/7 erfüllen ("SCHUKO").

Warnings and Cautionary Messages

- Warning:** This product does not contain any serviceable user parts.
- Warning:** Installation and removal of the unit must be carried out by qualified personnel only.
- Warning:** When connecting this device to a power outlet, connect the field ground lead on the tri-pole power plug to a valid earth ground line to prevent electrical hazards.
- Warning:** This switch uses lasers to transmit signals over fiber optic cable. The lasers are compliant with the requirements of a Class 1 Laser Product and are inherently eye safe in normal operation. However, you should never look directly at a transmit port when it is powered on.
- Caution:** Do not plug a phone jack connector in the RJ-45 port. This may damage this device. Les raccordeurs ne sont pas utilisé pour le système téléphonique!
- Caution:** Use only twisted-pair cables with RJ-45 connectors that conform to FCC standards.
- Caution:** Wear an anti-static wrist strap or take other suitable measures to prevent electrostatic discharge when handling this equipment.
-
- Achtung:** Dieses Produkt enthält keine Teile, die eine Wartung vom Benutzer benötigen.
- Achtung:** Installation und Deinstallation des Gerätes müssen von qualifiziertem Servicepersonal durchgeführt werden.
- Achtung:** Wenn das Gerät an eine Steckdose angeschlossen wird, muß der Masseanschluß am dreipoligen Netzstecker mit Schutzterde verbunden werden, um elektrische Gefahren zu vermeiden.
- Achtung:** Dieses Gerät nutzt Laser zur Signalübertragung über Glasfasern. Die Laser entsprechen den Anforderungen an eine Lasereinrichtung der Klasse 1 und sind durch ihre Bauart im normalen Betrieb sicher für die Augen. Trotzdem sollte niemals direkt in den einen Übertragungskanal geblickt werden, wenn er eingeschaltet ist.

Wichtige Sicherheitshinweise (Germany)

1. Bitte lesen Sie diese Hinweise sorgfältig durch.
2. Heben Sie diese Anleitung für den späteren Gebrauch auf.
3. Vor jedem Reinigen ist das Gerät vom Stromnetz zu trennen. Verwenden Sie keine Flüssigoder Aerosolreiniger. Am besten eignet sich ein angefeuchtetes Tuch zur Reinigung.
4. Die Netzanschlußsteckdose soll nahe dem Gerät angebracht und leicht zugänglich sein.
5. Das Gerät ist vor Feuchtigkeit zu schützen.
6. Bei der Aufstellung des Gerätes ist auf sicheren Stand zu achten. Ein Kippen oder Fallen könnte Beschädigungen hervorrufen.
7. Die Belüftungsöffnungen dienen der Luftzirkulation, die das Gerät vor Überhitzung schützt. Sorgen Sie dafür, daß diese Öffnungen nicht abgedeckt werden.
8. Beachten Sie beim Anschluß an das Stromnetz die Anschlußwerte.
9. Verlegen Sie die Netzanschlußleitung so, daß niemand darüber fallen kann. Es sollte auch nichts auf der Leitung abgestellt werden.
10. Alle Hinweise und Warnungen, die sich am Gerät befinden, sind zu beachten.
11. Wird das Gerät über einen längeren Zeitraum nicht benutzt, sollten Sie es vom Stromnetz trennen. Somit wird im Falle einer Überspannung eine Beschädigung vermieden.
12. Durch die Lüftungsöffnungen dürfen niemals Gegenstände oder Flüssigkeiten in das Gerät gelangen. Dies könnte einen Brand bzw. elektrischen Schlag auslösen.
13. Öffnen sie niemals das Gerät. Das Gerät darf aus Gründen der elektrischen Sicherheit nur von autorisiertem Servicepersonal geöffnet werden.
14. Wenn folgende Situationen auftreten ist das Gerät vom Stromnetz zu trennen und von einer qualifizierten Servicestelle zu überprüfen:
 - a. Netzkabel oder Netzstecker sind beschädigt.
 - b. Flüssigkeit ist in das Gerät eingedrungen.
 - c. Das Gerät war Feuchtigkeit ausgesetzt.
 - d. Wenn das Gerät nicht der Bedienungsanleitung entsprechend funktioniert oder Sie mit Hilfe dieser Anleitung keine Verbesserung erzielen.
 - e. Das Gerät ist gefallen und/oder das Gehäuse ist beschädigt.
 - f. Wenn das Gerät deutliche Anzeichen eines Defektes aufweist.
15. Zum Netzanschluß dieses Gerätes ist eine geprüfte Leitung zu verwenden. Für einen Nennstrom bis 6A und einem Gerätegewicht größer 3kg ist eine Leitung nicht leichter als H05VV-F, 3G, 0.75mm² einzusetzen.

Der arbeitsplatzbezogene Schalldruckpegel nach DIN 45 635 Teil 1000 beträgt 70dB(A) oder weniger.

Environmental Statement

The manufacturer of this product endeavours to sustain an environmentally-friendly policy throughout the entire production process. This is achieved through the following means:

- Adherence to national legislation and regulations on environmental production standards.
- Conservation of operational resources.
- Waste reduction and safe disposal of all harmful un-recyclable by-products.
- Recycling of all reusable waste content.
- Design of products to maximize recyclables at the end of the product's life span.

- Continual monitoring of safety standards.

End of Product Life Span

This product is manufactured in such a way as to allow for the recovery and disposal of all included electrical components once the product has reached the end of its life.

Manufacturing Materials

There are no hazardous nor ozone-depleting materials in this product.

Documentation

All printed documentation for this product uses biodegradable paper that originates from sustained and managed forests. The inks used in the printing process are non-toxic.

Purpose

This guide details the hardware features of the OmniStack® 6200 switch, including its physical and performance-related characteristics, and how to install the switch.

Audience

This guide is for system administrators with a working knowledge of network management. You should be familiar with switching and networking concepts.

Zielgruppe Dieser Anleitung ist fuer Systemadministratoren mit Erfahrung im Netzwerkmanagement. Sie sollten mit Switch- und Netzwerkkonzepten vertraut sein.

Related Publications

The following publication gives specific information on how to operate and use the management functions of the switch:

The OmniStack® 6200 User Guide

Also, as part of the switch's firmware, there is an online web-based help that describes all management related features.

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Chapter 1: Introduction

Overview

The OmniStack® 6200 series has nine platforms:

- **OS-LS-6212** – Ethernet based switch with 12 RJ-45 10/100Base-TX ports, two Gigabit combo uplink ports (with SFP or 10/100/1000Base-TX interfaces) and two ports full-duplex Gigabit stacking
- **OS-LS-6212P** – Ethernet based switch with 12 RJ-45 10/100Base-TX ports providing standard-based Power over Ethernet, two Gigabit combo uplink ports (with SFP or 10/100/1000Base-TX interfaces) and two ports full-duplex Gigabit stacking
- **OS-LS-6224** – Ethernet based switch with 24 RJ-45 10/100Base-TX ports, two Gigabit combo uplink ports (with SFP or 10/100/1000Base-TX interfaces) and two ports full-duplex Gigabit stacking
- **OS-LS-6224P** – Ethernet based switch with 24 RJ-45 10/100Base-TX ports providing standard-based Power over Ethernet, two Gigabit combo uplink ports (with SFP or 10/100/1000Base-TX interfaces) and two ports full-duplex Gigabit stacking
- **OS-LS-6224U** – Ethernet based switch with 24 100Base-FX external SFP ports, two Gigabit combo ports with assicated Mini-GBIC slots or RJ-45 ports and two 1000Base-T stacking ports
- **OS-LS-6248** – Ethernet based switch with 48 RJ-45 10/100Base-TX ports, two Gigabit combo uplink ports (with SFP or 10/100/1000Base-TX interfaces) and two ports full-duplex Gigabit stacking
- **OS-LS-6248P** – Ethernet based switch with 48 RJ-45 10/100Base-TX ports providing standard-based Power over Ethernet, two Gigabit combo uplink ports (with SFP or 10/100/1000Base-TX interfaces) and two ports full-duplex Gigabit stacking
- **OS-LS-6224-DC** – 24 RJ-45 10/100Base-TX ports, two Gigabit combo uplink ports (with SFP or 10/100/1000Base-TX interfaces) and two ports full-duplex Gigabit stacking. In addition, the OS-LS-6224 -DC is powered by a DC power source rather than an AC.
- **OS-LS-6248-DC** – 48 RJ-45 10/100Base-TX ports, two Gigabit combo uplink ports (with SFP or 10/100/1000Base-TX interfaces) and two ports full-duplex Gigabit stacking. In addition, the OS-LS-6248 -DC is powered by a DC power source rather than an AC.

All devices have a management port which is used for debugging and management purposes.

All the platforms can operate as standalone systems, or can be stacked together in the same system.

Switch Architecture

The Fast Ethernet Switch employs a wire-speed, non-blocking switching fabric. This permits simultaneous wire-speed transport of multiple packets at low latency on all ports. This switch also features full-duplex capability on all ports, which effectively doubles the bandwidth of each connection.

Network Management Options

This switch contains a comprehensive array of LEDs for “at-a-glance” monitoring of network and port status. It also includes a management agent that allows you to configure or monitor the switch using its embedded management software, or via SNMP applications. To manage the switch, you can make a direct connection to the RS-232 console port (out-of-band), or you can manage the switch through a network connection (in-band) using Telnet, the on-board Web agent, or Windows-based network management software.

For a detailed description of the switch’s advanced features, refer to the User Guide.

Description of Hardware

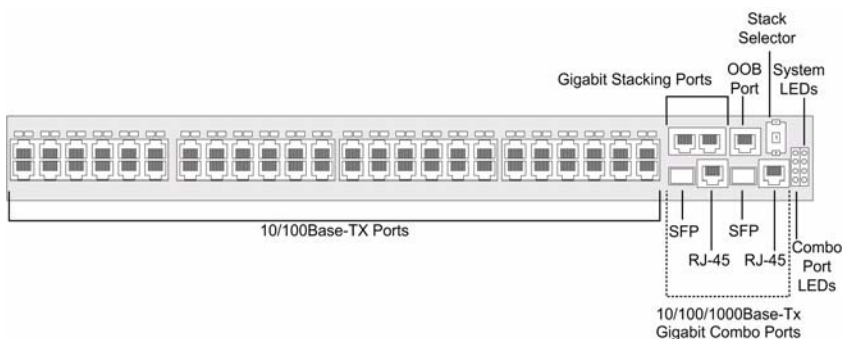


Figure 1-1. Front Panel

10/100/1000BASE-T Ports

There are two types of RJ-45 ports, Ethernet ports that operate at 10 Mbps, 100 Mbps or 1000 Mbps, half or full duplex, and Fiber ports that operate at 1000 Mbps, full duplex.

Because all ports on this switch support automatic MDI/MDI-X operation, you can use straight-through cables for all network connections to PCs or servers, or to other switches or hubs. (See “1000BASE-T Pin Assignments” on page B-30)

Each of these ports support auto-negotiation, so the optimum transmission mode (half or full duplex), and data rate (10, 100, or 1000 Mbps) can be selected automatically. If a device connected to one of these ports does not support auto-negotiation, the communication mode of that port can be configured manually.

Each port also supports auto-negotiation of flow control, so the switch can automatically prevent port buffers from becoming saturated.

On the LS-OS-6224U, there are two RJ-45 ports, which are shared with two of the SFP transceiver slots.

SFP Slots

On all devices except the LS-OS-6224U, the Small Form Factor Pluggable (SFP) transceiver slots are shared with two of the RJ-45 ports (Ports 25~26/49~50). In its default configuration, if an SFP transceiver (purchased separately) is installed in a slot and has a valid link on its port, the associated RJ-45 port is disabled and cannot be used. The switch can also be configured to force the use of an RJ-45 port or SFP slot, as required.

Note: When selecting a fiber SFP device, considering safety, please make sure that it can function at a temperature that is not less than the recommended maximum operational temperature of the product. You must also use an approved Laser Class 1 SFP transceiver.

Hinweis: Hinweis: Bei der Wahl eines Glasfasertransceivers muß für die Beurteilung der Gesamtsicherheit beachtet werden, das die maximale Umgebungstemperatur des Transceivers für den Betrieb nicht niedriger ist als die für dieses Produkts. Der Glasfasertransceiver muß auch ein überprüftes Gerät der Laser Klasse 1 sein.

Status LEDs

The LEDs, which are located on the front panel for easy viewing, are shown below and described in the following table.

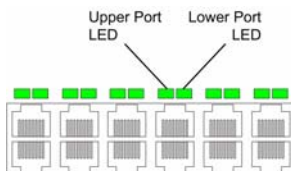


Figure 1-2. Port LEDs

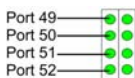


Figure 1-3. Combo Port LEDs

Table 1-1. Port Status LEDs

Port Status LEDs		
LED	Condition	Status
RJ-45 Ports		
Non-POE	On Green	A port has established a valid network connection, it is linked.
	Flashing Green	Activity has been detected on the port.
POE	On Amber	A port has established a valid network connection, it is linked.
	Flashing Amber	Activity has been detected on the port.
SFP Ports		
	On Green	An SFP transceiver port has established a valid 1000 Mbps network connection. The associated RJ-45 port is disabled.
	Off	An SFP transceiver port has no valid link, or the link has failed. The associated RJ-45 port is enabled.
	Flashing Green	An SFP transceiver port has established a valid 1000 Mbps network connection, and activity has been detected on the port. The associated RJ-45 port is disabled.
100Base-FX Port LED		
	On Green	Port has established a valid network connection, it is linked.
	Flashing Green	Activity has been detected on the port.
Stacking Ports		
	Off	Device is a standalone.

Port Status LEDs		
LED	Condition	Status
	Green	Stack in normal operating state (Master Unit)
	Green Blinking	Master Unit is initiating stack (Master Unit)
	Amber	Stack in normal operating state (Stack Member Unit)
	Amber Flashing	Master Unit is initiating stack (Stack Member Unit)



Figure 1-4. System LEDs

Table 1-2. System Status LEDs

System Status LEDs		
LED	Condition	Status
Power	On Green	Switch is receiving power.
	Amber	Internal power supply fault.
	Off	Power off or failure.
Diag	Flashing Green	System self-diagnostic test in progress.
	On Green	System self-diagnostic test successfully completed.
	On Amber	System self-diagnostic test has failed.
BPS	On Green	The Backup Power Supply is connected and operating normally.
	On Amber	The Backup Power Supply is connected but faulty.
	Off	The Backup Power Supply is off or disconnected.
Stack	On Green	Stack normal operating state (Master unit).
	Flashing Green	System initialization (Master unit).
	On Amber	Stack normal operating state (Slave unit).
	Flashing Amber	System initialization (Slave unit), or system in arbitrating/election state.

Setting Stacking/Standalone Modes

The OS6200 switch provides Stacking and Standalone working modes. To Set the required mode by using the Unit push button perform the following procedures:

To work in a stacking mode :

1. Reboot the Alcatel OS6200 switch.
2. Wait until the LED color turns to green.
3. Hold the Unit button until one of the Ethernet port LEDs flashes in Amber. When flashing, the port LED indicates the unit number to be changed to a Stacking mode.
4. Press the Unit button with short intervals until the required unit ID is selected. Releasing the button for more then 10 seconds sets the selected unit to a stacking mode.
5. To set the device back to a Standalone mode, keep pressing the button with short intervals until no port LED is flashing (after port 8). Keeping the button released for more than 10 seconds stes the mode automatically.

Note: When the OS6200 is in stand-alone mode, the "stack" LED is off. If the switch is in stacking mode, the LED flashes green or amber (green for master, and amber for backup or slave).

Optional Backup Power Supply

The switch supports an optional Backup Power Supply (BPS), that can supply power to the switch in the event of failure of the internal power supply. The U24 device support three kind of BPS:

- **100W** — OS-LS-62BP-DC — OS LS-6200 modular DC backup power supply. Provides backup power to one non-PoE switch.



Figure 1-5. DC BPS Back Panel

- **126W** — OS-LS-62BP — OS LS-6200 modular AC backup power supply. Provides backup power to one non-PoE switch.



Figure 1-6. AC BPS Back Panel

- **510W** — OS-LS-62BP-POS — LS-6200 modular AC backup power supply. Provides backup power to one OS LS-6200 PoE capable switch.



Figure 1-7. PoE BPS Back Panel

Power Supply Receptacles

There are two power receptacles on the rear panel of the switch. The standard power receptacle is for the AC power cord. The receptacle labeled “BPS” is for the optional Backup Power Supply.

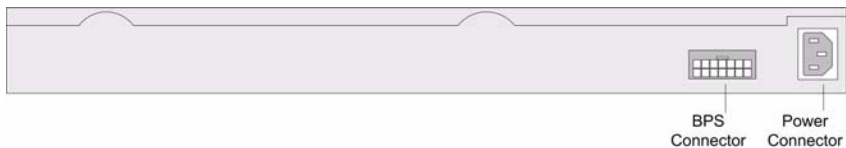


Figure 1-8. Power Supply Receptacle

Features and Benefits

Connectivity

- 12/24/48 dual-speed ports for easy Fast Ethernet integration and for protection of your investment in legacy LAN equipment.
- Auto-negotiation enables each RJ-45 port to automatically select the optimum communication mode (half or full duplex) if this feature is supported by the attached device; otherwise the port can be configured manually.
- Independent RJ-45 10/100BASE-T and RJ-45 10/100/1000BASE-T ports with auto MDI/MDI-X pinout selection.
- Unshielded (UTP) cable supported on all RJ-45 ports: Category 3, 4 or 5 for 10 Mbps connections, Category 5 or 5e for 100 Mbps connections, and Category 5 or better for 1000 Mbps connections.
- IEEE 802.3 Ethernet, 802.3u Fast Ethernet, 802.3z and 802.3ab Fast Ethernet compliance ensures compatibility with standards-based hubs, network cards and switches from any vendor.

Expandability

- Supports 1000BASE-SX and 1000BASE-LX SFP transceivers.

Performance

- Transparent bridging
- Switching table with a total of 16K MAC address entries
- Provides store-and-forward switching
- Supports wire-speed switching
- Supports flow control, using back pressure for half duplex and IEEE 802.3x for full duplex
- Broadcast storm control
- Desktop or rack-mountable

Management

- “At-a-glance” LEDs for easy troubleshooting
- Network management agent:
 - Manages switch in-band or out-of-band
 - Supports Telnet, SNMP/RMON and Web-based interface

Chapter 2: Installing the Switch

Selecting a Site

Switches can be mounted in a standard 19-inch equipment rack or on a flat surface. Be sure to follow the guidelines below when choosing a location.

- The site should:
 - be at the center of all the devices you want to link and near a power outlet.
 - be able to maintain its temperature within 0 to 45°C (32 to 113 °F) and its humidity within 5% to 95%, non-condensing
 - provide adequate space (approximately two inches) on all sides for proper air flow
 - be accessible for installing, cabling and maintaining the devices
 - allow the status LEDs to be clearly visible
- Make sure twisted-pair cable is always routed away from power lines, fluorescent lighting fixtures and other sources of electrical interference, such as radios and transmitters.
- Make sure that the unit is connected to a separate grounded power outlet that provides 100 to 240 VAC, 50 to 60 Hz, is within 2.44 m (8 feet) of each device and is powered from an independent circuit breaker. As with any equipment, using a filter or surge suppressor is recommended.

Ethernet Cabling

To ensure proper operation when installing the switch into a network, make sure that the current cables are suitable for 10BASE-T, 100BASE-TX or 1000BASE-T operation. Check the following criteria against the current installation of your network:

- Cable type: Unshielded twisted pair (UTP) or shielded twisted pair (STP) cables with RJ-45 connectors; Category 3 or better for 10BASE-T, Category 5 or better for 100BASE-TX, and Category 5e or better for 1000BASE-T.
- Protection from radio frequency interference emissions
- Electrical surge suppression
- Separation of electrical wires (switch related or other) and electromagnetic fields from data based network wiring
- Safe connections with no damaged cables, connectors or shields

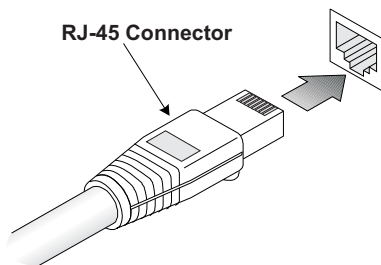


Figure 2-1. RJ-45 Connections

Equipment Checklist

After unpacking the switch, check the contents to be sure you have received all the components. Then, before beginning the installation, be sure you have all other necessary installation equipment.

Package Contents

- Fast Ethernet Switch
- Four adhesive foot pads
- Bracket Mounting Kit containing two brackets and screws for attaching the brackets to the switch
- Power Cord—either US, Continental Europe or UK
- RS-232 console cable
- Ethernet Cable Adapter
- This Getting Started Guide
- User Guide

Optional Rack-Mounting Equipment

If you plan to rack-mount the switch, be sure to have the following equipment available:

- Mounting screws for each device you plan to install in a rack—these are not included
- A screwdriver (Phillips or flathead, depending on the type of screws used)

Mounting

A switch unit can be mounted in a standard 19-inch equipment rack or on a desktop or shelf. Mounting instructions for each type of site follow.

Rack Mounting

Before rack mounting the switch, pay particular attention to the following factors:

- **Temperature:** Since the temperature within a rack assembly may be higher than the ambient room temperature, check that the rack-environment temperature is within the specified operating temperature range. (See page C-34.)
- **Mechanical Loading:** Do not place any equipment on top of a rack-mounted unit.
- **Circuit Overloading:** Be sure that the supply circuit to the rack assembly is not overloaded.
- **Grounding:** Rack-mounted equipment should be properly grounded. Particular attention should be given to supply connections other than direct connections to the mains.

To rack-mount devices:

1. Attach the brackets to the device using the screws provided in the Bracket Mounting Kit.

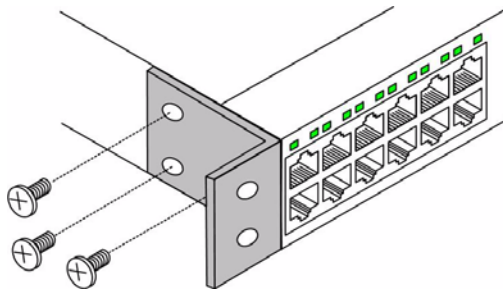


Figure 2-2. Attaching the Brackets

2 Installing the Switch

2. Mount the device in the rack, using rack-mounting screws (not provided).

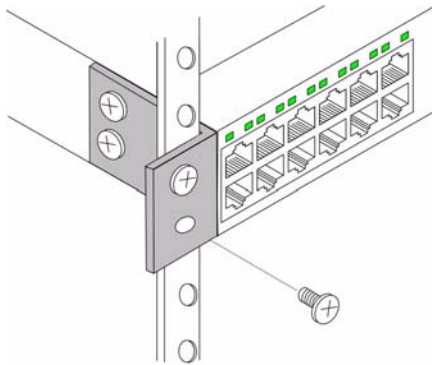


Figure 2-3. Installing the Switch in a Rack

3. If installing a single switch only, turn to “Connecting to a Power Source” at the end of this chapter.
4. If installing multiple switches, mount them in the rack, one below the other, in any order.

Desktop or Shelf Mounting

1. Attach the four adhesive feet to the bottom of the first switch.

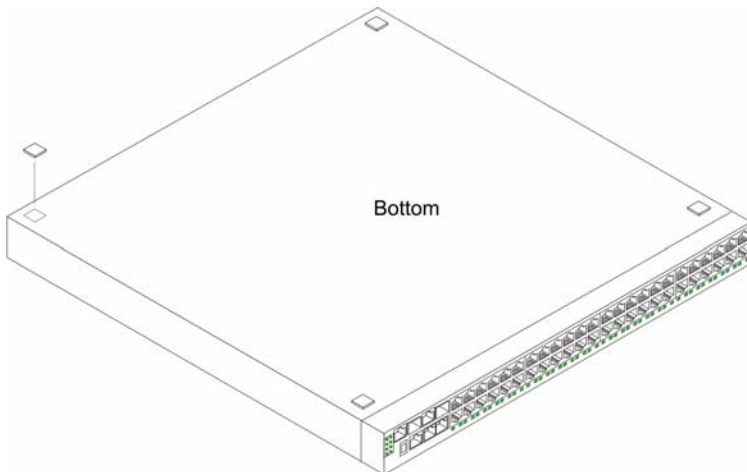


Figure 2-4. Attaching the Adhesive Feet

2. Set the device on a flat surface near an AC power source, making sure there

are at least two inches of space on all sides for proper air flow.

3. If installing a single switch only, go to “Connecting to a Power Source” at the end of this chapter.
4. If installing multiple switches, attach four adhesive feet to each one. Place each device squarely on top of the one below, in any order.

Installing an Optional SFP Transceiver into the Switch

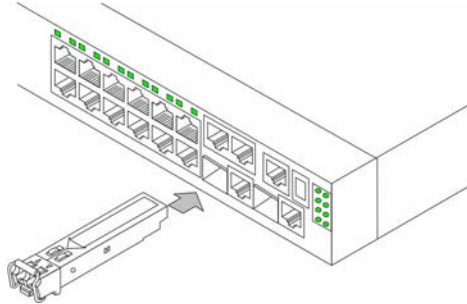


Figure 2-5. Inserting an SFP Transceiver into a Slot

To install an SFP transceiver, do the following:

1. Consider network and cabling requirements to select an appropriate SFP transceiver type.
2. Insert the transceiver with the optical connector facing outward and the slot connector facing down. Note that SFP transceivers are keyed so they can only be installed in one orientation.
3. Slide the SFP transceiver into the slot until it clicks into place.

Note: SFP transceivers are hot-swappable. The switch does not need to be powered off before installing or removing a transceiver. However, always first disconnect the network cable before removing a transceiver.

Connecting to a Power Source

To connect a device to a power source:

1. Insert the power cable plug directly into the receptacle located at the back of the device.

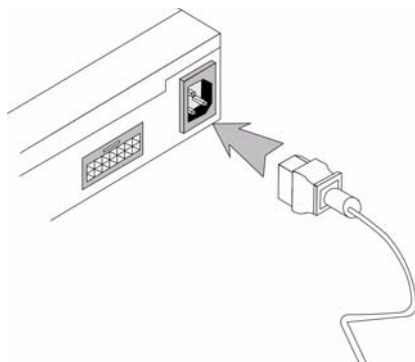


Figure 2-6. Power Receptacle

2. Plug the other end of the cable into a grounded, 3-pin socket.

Note: For International use, you may need to change the AC line cord. You must use a line cord set that has been approved for the receptacle type in your country.

3. Check the front-panel LEDs as the device is powered on to be sure the Power LED is lit. If not, check that the power cable is correctly plugged in.
4. If you have purchased a Backup Power Supply, connect it to the switch and to an AC power source now, following the instructions included with the package.

Connecting the BPS to the Switch

1. Insert the power cable plug (AC/DC) directly into the receptacle located at the back of the device.
2. Check the front-panel LED as the device is powered on to be sure the Power LED is lit. If not, check that the power cable is correctly plugged in.
3. Connect the 12V feeding cable to the BPS and to the switch.

Installation Instructions in German

Eine Site Auswählen

Die Schalter können in ein Standard-19-Zoll-Ausrüstungsgestell oder auf eine flache Ebene montiert werden.

Zum Auswählen eines Standortes beachten Sie bitte die nachstehenden Richtlinien.

- Die Site sollte:
 - Sich in der Mitte aller anzuschließenden Geräte sowie in der Nähe einer Netzsteckdose befinden;

- Imstande sein, eine Temperatur zwischen 0 und 45 °C (32 und 113 °FF) und eine Feuchtigkeit innerhalb von 5% bis 95% (nichtkondensierend) beizubehalten;
- In einem genügend weiten Abstand (ungefähr 5 cm oder zwei Zoll) von allen Seiten für eine ausreichende Belüftung aufgestellt werden;
- Für das Installieren, die Kabelverlegung und für Wartungen und Reparaturen leicht zugänglich sein.
- Die LED-Statusanzeigedioden müssen stets klar und leicht sichtbar sein.
- Sicherstellen, dass das verdrehte Kabel stets weg von anderen Stromkabeln, Neonleuchteinrichtungen und anderen Quellen von möglichen elektrischen Störungen verlegt wird, wie z. B. von Radios und Transmittern.
- Sicherstellen, dass das Gerät an eine separate Stromquelle mit Erdanschluss mit einer Netzspannung von 100 bis 240 V AC (Wechselstromspannung), 50 bis 60 Hz, und innerhalb in einem Abstand von 2,44 m (8 Fus) zu jedem Gerät installiert wird und an einem separaten Trennschalter bzw. Leistungsschalter mit Strom versorgt wird. Für alle Geräte wird empfohlen, einen Filter oder einen Überspannungsschutz zu verwenden.

Montage

Switch-Einheiten können an ein standardmäßiges 19-Zoll Einrichtungsrack, einen Arbeitstisch oder ein Regal montiert werden. Folgend finden Sie die Montageanweisungen für jeden Positionstyp.

Rack-Montage

Beachten Sie die folgenden Faktoren, bevor Sie die Rack-Montage beginnen:

- Temperatur: Da die Temperatur innerhalb einer Rackeinheit höher als die Raumumgebungstemperatur sein kann, stellen Sie bitte sicher, dass die Rackumgebungstemperatur innerhalb des angegebenen Betriebstemperaturbereichs liegt. (Siehe "Temperatur" auf Seite C-2.)
- Mechanische Last: Stellen Sie kein Gerät auf eine Rack-Montageeinheit.
- Stromüberlastung: Stellen Sie sicher, dass der Netzkreis der Rackeinheit nicht überlastet wird.
- Erdung: Die Rack-Montageeinheit muss richtig geerdet werden. Besondere Acht sollten Sie bei Verbindungen geben, die nicht direkt zum Netz führen.

So montieren Sie Geräte an ein Rack:

1. Befestigen Sie die Metallwinkel mit den im Metallwinkel-Montageset erhältlichen Schrauben an dem Gerät.
2. Befestigen Sie das Gerät mit vier Rackmontageschrauben (nicht beigelegt) an dem Rack.
3. Wenn Sie nur einen Switch installieren, dann springen Sie bitte über zu "Verbinden mit einer Stromquelle" auf Seite 3-5 am Ende dieses Kapitels.

2 Installing the Switch

4. Wenn Sie mehrere Switches installieren möchten, dann montieren Sie sie untereinander in einer beliebigen Reihenfolge.

Chapter 3: Making Network Connections

Connecting Network Devices

This switch is designed to interconnect multiple segments (or collision domains). It can be connected to network cards in PCs and servers, as well as to hubs, switches or routers. It may also be connected to devices using optional SFP transceivers.

Twisted-Pair Devices

Each device requires an unshielded twisted-pair (UTP) cable with RJ-45 connectors at both ends. Use Category 5, 5e or 6 cable for 1000BASE-T connections, Category 5 for 100BASE-TX connections, and Category 3, 4 or 5 for 10BASE-T connections.

Cabling Guidelines

The RJ-45 ports on the switch support automatic MDI/MDI-X pinout configuration, so you can use standard straight-through twisted-pair cables to connect to any other network device (PCs, servers, switches, routers, or hubs).

See Appendix B for further information on cabling.

Caution: Do not plug a phone jack connector into an RJ-45 port. This will damage the switch. Use only twisted-pair cables with RJ-45 connectors that conform to FCC standards.

Connecting to PCs, Servers, Hubs and Switches

1. Attach one end of a twisted-pair cable segment to the device's RJ-45 connector.

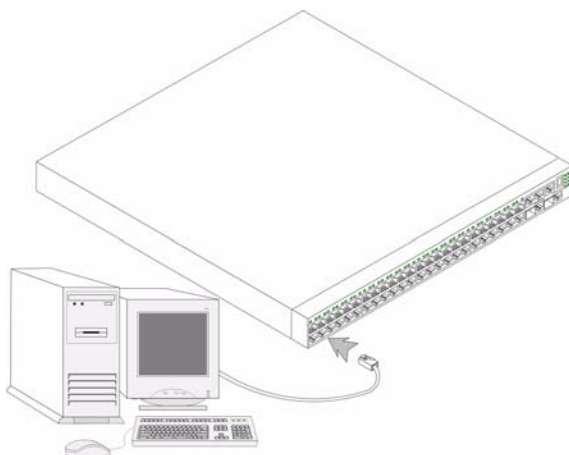


Figure 3-1. Making Twisted-Pair Connections

3 Making Network Connections

2. If the device is a PC card and the switch is in the wiring closet, attach the other end of the cable segment to a modular wall outlet that is connected to the wiring closet. (See “Wiring Closet Connections” on the next page.) Otherwise, attach the other end to an available port on the switch.
3. Make sure each twisted pair cable does not exceed 100 meters (328 ft) in length.

Note: Avoid using flow control on a port connected to a hub unless it is actually required to solve a problem. Otherwise back pressure jamming signals may degrade overall performance for the segment attached to the hub.

4. As each connection is made, the green Link LED (on the switch) corresponding to each port will light to indicate that the connection is valid.

Network Wiring Connections

Today, the punch-down block is an integral part of many of the newer equipment racks. It is actually part of the patch panel. Instructions for making connections in the wiring closet with this type of equipment follows.

1. Attach one end of a patch cable to an available port on the switch, and the other end to the patch panel.
2. If not already in place, attach one end of a cable segment to the back of the patch panel where the punch-down block is located, and the other end to a modular wall outlet.
3. Label the cables to simplify future troubleshooting.

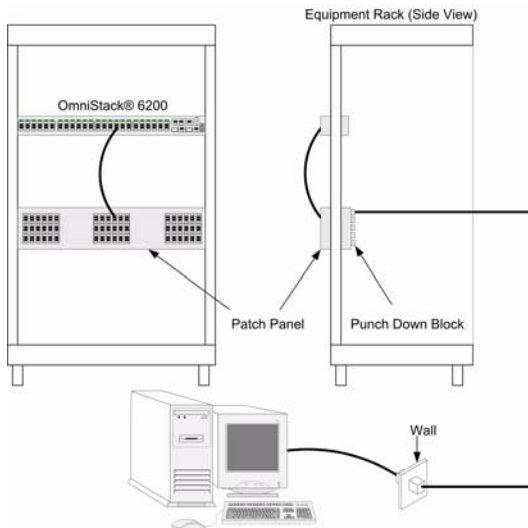


Figure 3-2. Network Wiring Connections

Fiber Optic SFP Devices

An optional Gigabit SFP transceiver (1000BASE-SX, or 1000BASE-LX) can be used for a backbone connection between switches, or for connecting to a high-speed server.

Each multimode fiber optic port requires 50/125 or 62.5/125 micron multimode fiber optic cabling with an LC connector at both ends.

Each single-mode fiber port requires 9/125 micron single-mode fiber optic cable with an LC connector at both ends.

Caution: This switch uses lasers to transmit signals over fiber optic cable. The lasers are compliant with the requirements of a Class 1 Laser Product and are inherently eye safe in normal operation. However, you should never look directly at a transmit port when it is powered on.

1. Remove and keep the LC port's rubber cover. When not connected to a fiber cable, the rubber cover should be replaced to protect the optics.
2. Check that the fiber terminators are clean. You can clean the cable plugs by wiping them gently with a clean tissue or cotton ball moistened with a little ethanol. Dirty fiber terminators on fiber cables will impair the quality of the light transmitted through the cable and lead to degraded performance on the port.
3. Connect one end of the cable to the LC port on the switch and the other end to the LC port on the other device. Since LC connectors are keyed, the cable can be attached in only one orientation.

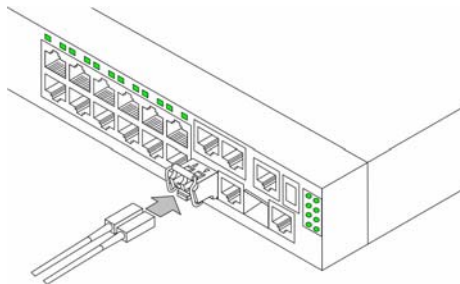


Figure 3-3. Making LC Port Connections

4. As a connection is made, check the green Link LED on the switch corresponding to the port to be sure that the connection is valid.

The 1000BASE-SX and 1000BASE-LX fiber optic ports operate at 1 Gbps full duplex, with auto-negotiation of flow control. The maximum length for fiber optic cable operating at Gigabit speed will depend on the fiber type as listed under “1000 Mbps Gigabit Ethernet Collision Domain” on page 3-24.

Connectivity Rules

When adding hubs (repeaters) to your network, please follow the connectivity rules listed in the manuals for these products. However, note that because switches break up the path for connected devices into separate collision domains, you should not include the switch or connected cabling in your calculations for cascade length involving other devices.

1000BASE-T Cable Requirements

All Category 5 UTP cables that are used for 100BASE-TX connections should also work for 1000BASE-T, providing that all four wire pairs are connected. However, it is recommended that for all critical connections, or any new cable installations, Category 5e (enhanced Category 5) or Category 6 cable should be used. The Category 5e specification includes test parameters that are only recommendations for Category 5. Therefore, the first step in preparing existing Category 5 cabling for running 1000BASE-T is a simple test of the cable installation to be sure that it complies with the IEEE 802.3ab standards.

1000 Mbps Gigabit Ethernet Collision Domain

Table 3-1. Maximum 1000BASE-T Gigabit Ethernet Cable Length

Cable Type	Maximum Cable Length	Connector
Category 5, 5e, 6 100-ohm UTP or STP	100 m (328 ft)	RJ-45

Table 3-2. Maximum 1000BASE-SX Gigabit Ethernet Cable Length

Fiber Size	Fiber Bandwidth	Maximum Cable Length	Connector
62.5/125 micron multimode fiber	160 MHz/km	2-220 m (7-722 ft)	LC
	200 MHz/km	2-275 m (7-902 ft)	LC
50/125 micron multimode fiber	400 MHz/km	2-500 m (7-1641 ft)	LC
	500 MHz/km	2-550 m (7-1805 ft)	LC

Table 3-3. Maximum 1000BASE-LX Gigabit Ethernet Cable Length

Fiber Size	Fiber Bandwidth	Maximum Cable Length	Connector
9/125 micron single-mode fiber	N/A	2 m - 5 km (7 ft - 3.2 miles)	LC

100 Mbps Fast Ethernet Collision Domain

Table 3-4. Maximum Fast Ethernet Cable Distance

Type	Cable Type	Max. Cable Length	Connector
100BASE-TX	Category 5 or better 100-ohm UTP or STP	100 m (328 ft)	RJ-45

10 Mbps Ethernet Collision Domain

Table 3-5. Maximum Ethernet Cable Distance

Cable Type	Maximum Length	Connector
Twisted Pair, Categories 3, 4, 5 or better 100-ohm UTP	100 m (328 ft)	RJ-45

Cable Labeling and Connection Records

When planning a network installation, it is essential to label the opposing ends of cables and to record where each cable is connected. Doing so will enable you to easily locate inter-connected devices, isolate faults and change your topology without need for unnecessary time consumption.

To best manage the physical implementations of your network, follow these guidelines:

- Clearly label the opposing ends of each cable.
- Using your building's floor plans, draw a map of the location of all network-connected equipment. For each piece of equipment, identify the devices to which it is connected.
- Note the length of each cable and the maximum cable length supported by the switch ports.
- For ease of understanding, use a location-based key when assigning prefixes to your cable labeling.
- Use sequential numbers for cables that originate from the same equipment.
- Differentiate between racks by naming accordingly.
- Label each separate piece of equipment.
- Display a copy of your equipment map, including keys to all abbreviations at each equipment rack.

Appendix A: Troubleshooting

Diagnosing Switch Indicators

Table A-1. Troubleshooting Chart

Troubleshooting Chart	
Symptom	Action
Power LED is Off	<ul style="list-style-type: none">• Check connections between the switch, the power cord, and the wall outlet.• Contact your dealer for assistance.
Link LED is Off	<ul style="list-style-type: none">• Verify that the switch and attached device are powered on.• Be sure the cable is plugged into both the switch and corresponding device.• Verify that the proper cable type is used and its length does not exceed specified limits.• Check the adapter on the attached device and cable connections for possible defects. Replace the defective adapter or cable if necessary.
Diag LED is Red	<ul style="list-style-type: none">• Try power cycling the switch to clear the condition.• If the condition does not clear, contact your dealer for assistance.

Power and Cooling Problems

If the power indicator does not turn on when the power cord is plugged in, you may have a problem with the power outlet, power cord, or internal power supply. However, if the unit powers off after running for a while, check for loose power connections, power losses or surges at the power outlet, and verify that the fans on the unit are unobstructed and running prior to shutdown. If you still cannot isolate the problem, then the internal power supply may be defective.

Installation

Verify that all system components have been properly installed. If one or more components appear to be malfunctioning (such as the power cord or network cabling), test them in an alternate environment where you are sure that all the other components are functioning properly.

In-Band Access

You can access the management agent in the switch from anywhere within the attached network using Telnet, a Web browser, or other network management software tools. However, you must first configure the switch with a valid IP address,

subnet mask, and default gateway. If you have trouble establishing a link to the management agent, check to see if you have a valid network connection. Then verify that you entered the correct IP address. Also, be sure the port through which you are connecting to the switch has not been disabled. If it has not been disabled, then check the network cabling that runs between your remote location and the switch.

Caution: The management agent can accept up to four simultaneous Telnet sessions. If the maximum number of sessions already exists, an additional Telnet connection will not be able to log into the system.

Appendix B: Cables

Twisted-Pair Cable and Pin Assignments

Caution: DO NOT plug a phone jack connector into any RJ-45 port. Use only twisted-pair cables with RJ-45 connectors that conform with FCC standards.

For 10BASE-T/100BASE-TX connections, a twisted-pair cable must have two pairs of wires. Each wire pair is identified by two different colors. For example, one wire might be green and the other, green with white stripes. Also, an RJ-45 connector must be attached to both ends of the cable.

Caution: Each wire pair must be attached to the RJ-45 connectors in a specific orientation. (See “Cabling Guidelines” on page 3-21 for an explanation.)

The figure below illustrates how the pins on the RJ-45 connector are numbered. Be sure to hold the connectors in the same orientation when attaching the wires to the pins.

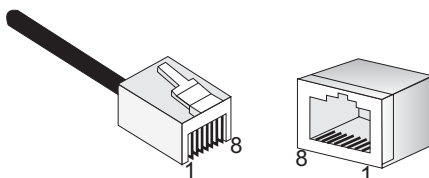


Figure B-1. RJ-45 Connector Pin Numbers

10BASE-T/100BASE-TX Pin Assignments

Use unshielded twisted-pair (UTP) or shielded twisted-pair (STP) cable for RJ-45 connections: 100-ohm Category 3, 4 or 5 cable for 10 Mbps connections or 100-ohm Category 5 cable for 100 Mbps connections. Also be sure that the length of any twisted-pair connection does not exceed 100 meters (328 feet).

The RJ-45 ports on the switch base unit support automatic MDI/MDI-X operation, you can use straight-through cables for all network connections to PCs or servers, or to other switches or hubs. In straight-through cable, pins 1, 2, 3, and 6, at one end of the cable, are connected straight through to pins 1, 2, 3, and 6 at the other end of the cable. When using any RJ-45 port on this switch, you can use either straight-through or crossover cable.

Table B-1. 10/100BASE-TX MDI and MDI-X Port Pinouts

Pin	MDI-X Signal Name	MDI Signal Name
1	Receive Data plus (RD+)	Transmit Data plus (TD+)
2	Receive Data minus (RD-)	Transmit Data minus (TD-)
3	Transmit Data plus (TD+)	Receive Data plus (RD+)
6	Transmit Data minus (TD-)	Receive Data minus (RD-)
4,5,7,8	Not used	Not used

Note: The "+" and "-" signs represent the polarity of the wires that make up each wire pair.

1000BASE-T Pin Assignments

All 1000BASE-T ports support automatic MDI/MDI-X operation, so you can use straight-through cables for all network connections to PCs or servers, or to other switches or hubs.

The table below shows the 1000BASE-T MDI and MDI-X port pinouts. These ports require that all four pairs of wires be connected. Note that for 1000BASE-T operation, all four pairs of wires are used for both transmit and receive.

Use 100-ohm Category 5, 5e or 6 unshielded twisted-pair (UTP) or shielded twisted-pair (STP) cable for 1000BASE-T connections. Also be sure that the length of any twisted-pair connection does not exceed 100 meters (328 feet).

Table B-2. 1000BASE-T MDI and MDI-X Port Pinouts

1000BASE-T MDI and MDI-X Port Pinouts		
Pin	MDI Signal Name	MDI-X Signal Name
1	Bi-directional Data One Plus (BI_D1+)	Bi-directional Data Two Plus (BI_D2+)
2	Bi-directional Data One Minus (BI_D1-)	Bi-directional Data Two Minus (BI_D2-)
3	Bi-directional Data Two Plus (BI_D2+)	Bi-directional Data One Plus (BI_D1+)
4	Bi-directional Data Three Plus (BI_D3+)	Bi-directional Data Four Plus (BI_D4+)
5	Bi-directional Data Three Minus (BI_D3-)	Bi-directional Data Four Minus (BI_D4-)
6	Bi-directional Data Two Minus (BI_D2-)	Bi-directional Data One Minus (BI_D1-)
7	Bi-directional Data One Plus (BI_D4+)	Bi-directional Data One Plus (BI_D3+)
8	Bi-directional Data Four Minus (BI_D4-)	Bi-directional Data Three Minus (BI_D3-)

Cable Testing for Existing Category 5 Cable

Installed Category 5 cabling must pass tests for Attenuation, Near-End Crosstalk (NEXT), and Far-End Crosstalk (FEXT). This cable testing information is specified in the ANSI/TIA/EIA-TSB-67 standard. Additionally, cables must also pass test parameters for Return Loss and Equal-Level Far-End Crosstalk (ELFEXT). These

tests are specified in the ANSI/TIA/EIA-TSB-95 Bulletin, "The Additional Transmission Performance Guidelines for 100 Ohm 4-Pair Category 5 Cabling."

Note that when testing your cable installation, be sure to include all patch cables between switches and end devices.

Adjusting Existing Category 5 Cabling to Run 1000BASE-T

If your existing Category 5 installation does not meet one of the test parameters for 1000BASE-T, there are basically three measures that can be applied to try and correct the problem:

1. Replace any Category 5 patch cables with high-performance Category 5e or Category 6 cables.
2. Reduce the number of connectors used in the link.
3. Reconnect some of the connectors in the link.

Fiber Standards

The current TIA (Telecommunications Industry Association) 568-A specification on optical fiber cabling consists of one recognized cable type for horizontal subsystem and two cable types for backbone subsystems.

Horizontal 62.5/125 micron multimode (two fibers per outlet).

Backbone 62.5/125 micron multimode or single mode.

TIA 568-B will allow the use of 50/125 micron multimode optical fiber in both the horizontal and backbone in addition to the types listed above. All optical fiber components and installation practices must meet applicable building and safety codes.

Appendix C: Specifications

Physical Characteristics

Ports

OS-LS-6212 – Ethernet based switch with 12 RJ-45 10/100Base-TX ports, two Gigabit combo uplink ports (with SFP or 10/100/1000Base-TX interfaces) and two ports full-duplex Gigabit stacking

OS-LS-6212P – Ethernet based switch with 12 RJ-45 10/100Base-TX ports providing standard-based Power over Ethernet, two Gigabit combo uplink ports (with SFP or 10/100/1000Base-TX interfaces) and two ports full-duplex Gigabit stacking

OS-LS-6224 – Ethernet based switch with 24 RJ-45 10/100Base-TX ports, two Gigabit combo uplink ports (with SFP or 10/100/1000Base-TX interfaces) and two ports full-duplex Gigabit stacking

OS-LS-6224P – Ethernet based switch with 24 RJ-45 10/100Base-TX ports providing standard-based Power over Ethernet, two Gigabit combo uplink ports (with SFP or 10/100/1000Base-TX interfaces) and two ports full-duplex Gigabit stacking

OS-LS-6224U – Ethernet based switch with 24 100 Base-FX external SFP ports, 2 Gigabyte combo ports with associated Min_GBIC slots or RJ-45 ports and 2 1000Base-T stacking ports

OS-LS-6248 – Ethernet based switch with 48 RJ-45 10/100Base-TX ports, two Gigabit combo uplink ports (with SFP or 10/100/1000Base-TX interfaces) and two ports full-duplex Gigabit stacking

OS-LS-6248P – Ethernet based switch with 48 RJ-45 10/100Base-TX ports providing standard-based Power over Ethernet, two Gigabit combo uplink ports (with SFP or 10/100/1000Base-TX interfaces) and two ports full-duplex Gigabit stacking

Network Interface

Ports with RJ-45 connector, auto MDI/X

10BASE-T: RJ-45 (100-ohm, UTP cable; Categories 3, 4, 5)

Maximum Cable Length - 100 m (328 ft)

100BASE-TX: RJ-45 (100-ohm, UTP cable; Category 5)

Maximum Cable Length - 100 m (328 ft)

1000BASE-T: RJ-45 (100-ohm, UTP or STP cable; Category 5, 5e, or 6)

Maximum Cable Length - 100 m (328 ft)

Buffer Architecture

16 MB

Aggregate Bandwidth

12,800 or 17,600 (for 24 port/48 port)

Switching Database

16K MAC address entries

LEDs

System: Power (Power Supply), Diag (Diagnostics), BPS (Backup Power Supply)

Port: Link/Act (Activity), FDX (Duplex/half duplex), Stacking (Activity)

Weight

Non PoE Devices

OS-LS-6212 – 3.0 Kg

OS-LS-6224 – 3.0 Kg

OS-LS-6224U – 3.5 Kg

OS-LS-6248 – 4.1Kg

PoE Devices

OS-LS-6212P – 3.5 Kg

OS-LS-6224P – 4.5Kg

OS-LS-6248P – 5.5Kg

DC Devices

OS-LS-6224-DC – 3.0 Kg

OS-LS-6248 -DC – 4.1Kg

Size

Non PoE Devices

OS-LS-6212 – 440mm x 230mm x 44mm (17.37" x 9.06" x 1.73")

OS-LS-6224 – 440mm x 230mm x 44mm (17.37" x 9.06" x 1.73")

OS-LS-6224U – 440mm x 230mm x 44mm (17.37" x 9.06" x 1.73")

OS-LS-6248 – 440mm x 330mm x 44mm (17.37" x 12.99" x 1.73")

PoE Devices

OS-LS-6212P – 440mm x 230mm x 44mm (17.37" x 9.06" x 1.73")

OS-LS-6224P – 440mm x 330mm x 44mm (17.37" x 12.99" x 1.73")

OS-LS-6248P – 440mm x 330mm x 44mm (17.37" x 9.06" x 1.73")

DC Devices

OS-LS-6224-DC – 440mm x 230mm x 44mm (17.37" x 9.06" x 1.73")

OS-LS-6248-DC – 440mm x 330mm x 44mm (17.37" x 12.99" x 1.73")

Temperature

Operating: 0 to 45°C (32 to 113 °F)

Storage: -40 to 70 °C (-40 to 158 °F)

Humidity

Operating: 5% to 90% (non-condensing)

AC Input

100/115/220/230Vac , 50/60Hz

Power Supply

Non PoE Device

OS-LS-6212 – 30W 100-240VAC 12V/4.5A

OS-LS-6224 – 54W 100-240VAC 12V/4.5A

OS-LS-6224U – 54W, 100-240VAC 12V/4.5A

OS-LS-6248 – 54W 100-240VAC 12V/4.5A

PoE Device

OS-LS-6212P – 135W 100-240VAC 12V/4.5A

OS-LS-6224P – 225W 100-240VAC -50V/3.6A, 12V/4A

OS-LS-6248P – 465W 100-240VAC 12V/7.5A, -50V/7.5A The maximum power supply for PoE devices is 345.

Backup Power Supply

OS-LS-62BP — 126W, 100-240VAC 2-1A.

OS-LS-62BP-P — 510W, 100-240VAC 10 - 5A.

OS-LS-62BP-DC — 100W, 40-72V 3.2-1.8A (Powered by DC only).

Physical Dimensions — 160mm x 320mm x 40mm (6.2" x 12.6" x 1.6")

Power Consumption

OS-LS-6212 – 26.19 Watts at 85% efficiency

OS-LS-6224 – 35.2 Watts at 85% efficiency

OS-LS-6224U – 35.2 Watts at 85% efficiency

OS-LS-6248 – 35.2 Watts at 85% efficiency

Maximum Current

1.0 A @ 110 VAC

0.5 A @ 240 VAC

Noise

Less than 50dBa

Compliances**CE Mark**

FCC Part 15 (CFR 47) Class A

VCCI -V3/97.04, Class A

EN 55022 Class A

EN 50082-1, 1997

IEC 1000-4-2 (EN61000-4-2)

IEC 1000-4-3 (EN61000-4-3)

IEC 1000-4-4 (EN61000-4-4)

IEC 1000-4-5 (EN61000-4-5)

IEC 1000-4-6 (EN61000-4-6)

IEC 1000-4-8 (EN61000-4-8)

IEC 1000-4-11 (EN61000-4-11)

IEC 1000-3-2

IEC 1000-3-3 (EN60555-2)

Glossary

10BASE-T

IEEE 802.3 specification for 10 Mbps Ethernet over two pairs of Category 3, 4, or 5 UTP cable.

1000BASE-LX

IEEE 802.3z specification for Gigabit Ethernet over two strands of 50/125, 62.5/125 or 9/125 micron core fiber cable.

1000BASE-SX

IEEE 802.3z specification for Gigabit Ethernet over two strands of 50/125 or 62.5/125 micron core fiber cable.

1000BASE-T

IEEE 802.3ab specification for Gigabit Ethernet over 100-ohm Category 5, 5e or 6 twisted-pair cable (using all four wire pairs).

Auto-Negotiation

Signalling method allowing each node to select its optimum operational mode (e.g., speed and duplex mode) based on the capabilities of the node to which it is connected.

Bandwidth

The difference between the highest and lowest frequencies available for network signals. Also synonymous with wire speed, the actual speed of the data transmission along the cable.

Collision

A condition in which packets transmitted over the cable interfere with each other. Their interference makes both signals unintelligible.

Collision Domain

Single CSMA/CD LAN segment.

CSMA/CD

CSMA/CD (Carrier Sense Multiple Access/Collision Detect) is the communication method employed by Ethernet, Fast Ethernet, or Gigabit Ethernet.

End Station

A workstation, server, or other device that does not forward traffic.

Ethernet

A network communication system developed and standardized by DEC, Intel, and Xerox, using baseband transmission, CSMA/CD access, logical bus topology, and coaxial cable. The successor IEEE 802.3 standard provides for integration into the OSI model and extends the physical layer and media with repeaters and implementations that operate on fiber, thin coax and twisted-pair cable.

Fast Ethernet

A 100 Mbps network communication system based on Ethernet and the CSMA/CD access method.

Gigabit Ethernet

A 1000 Mbps network communication system based on Ethernet and the CSMA/CD access method.

Full Duplex

Transmission method that allows two network devices to transmit and receive concurrently, effectively doubling the bandwidth of that link.

IEEE

Institute of Electrical and Electronic Engineers.

IEEE 802.3

Defines carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications.

IEEE 802.3ab

Defines CSMA/CD access method and physical layer specifications for 1000BASE-T Gigabit Ethernet.

IEEE 802.3u

Defines CSMA/CD access method and physical layer specifications for 100BASE-TX Fast Ethernet.

IEEE 802.3x

Defines Ethernet frame start/stop requests and timers used for flow control on full-duplex links.

IEEE 802.3z

Defines CSMA/CD access method and physical layer specifications for 1000BASE Gigabit Ethernet.

LAN Segment

Separate LAN or collision domain.

LED

Light emitting diode used for monitoring a device or network condition.

Local Area Network (LAN)

A group of interconnected computer and support devices.

Media Access Control (MAC)

A portion of the networking protocol that governs access to the transmission medium, facilitating the exchange of data between network nodes.

MIB

An acronym for Management Information Base. It is a set of database objects that contains information about the device.

Network Diameter

Wire distance between two end stations in the same collision domain.

RJ-45 Connector

A connector for twisted-pair wiring.

Switched Ports

Ports that are on separate collision domains or LAN segments.

TIA

Telecommunications Industry Association

Transmission Control Protocol/Internet Protocol (TCP/IP)

Protocol suite that includes TCP as the primary transport protocol, and IP as the network layer protocol.

UTP

Unshielded twisted-pair cable.

Virtual LAN (VLAN)

A Virtual LAN is a collection of network nodes that share the same collision domain regardless of their physical location or connection point in the network. A VLAN serves as a logical workgroup with no physical barriers, allowing users to share information and resources as though located on the same LAN.

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