1 Omni Switch/Router Chassis and Power Supplies

Alcatel's Omni Switch/Router (OmniS/R) is an advanced, multi-layer switching platform (Layer 2 and 3) that supports the most demanding switch requirements. With Omni Switch/Router, network administrators can replace aging FDDI or Fast Ethernet backbones with high capacity Gigabit Ethernet backbones.

♦ Note ♦

Omni Switch/Router modules can be distinguished from older OmniSwitch modules by the **X** in the module name. For example, the ESM-100C-32W is an OmniSwitch module whereas the ES**X**-100C-32W is an Omni Switch/Router module.

Omni Switch/Router has a distributed switching fabric. In a 9-slot chassis operating at full duplex, Omni Switch/Router offers an aggregate 22 Gigabit per second (Gbps) distributed switching fabric. In addition, Omni Switch/Router offers new high density switching modules, including auto-sensing 10/100 Ethernet modules that offer high speed network connections to servers and desktops. (See *Omni Switch/Router Applications and Configurations* on page 1-5 for examples.)

The Omni Switch/Router Management Processor Module (MPX) module provides the core routing, VLAN MAC learning, SNMP, and file management functions for the entire Omni Switch/Router. In addition, the MPX has an Ethernet plug-in port for managing the switch. Only one MPX is required per Omni Switch/Router, but you can add another MPX for redundancy. See Chapter 2, “The Omni Switch/Router MPX,” for more information on the MPX.

♦ Important Note ♦

Omni Switch/Router switching modules require an MPX. You cannot install any version of the MPM (i.e, MPM-C, MPM 1G, MPM II, or original MPM) in a chassis with an MPX.

An Omni Switch/Router Hardware Routing Engine (HRE-X). The HRE-X offers high-speed Layer 3 switching from 1.5 to 12.0 million packets per second (Mpps) in a fully loaded chassis. See *The Omni Switch/Router Hardware Routing Engine (HRE-X)* on page 1-19 for more information on the HRE-X.

Omni Switch/Router switching modules perform software filtering, translations between dissimilar network interfaces, and hardware-based switching. Omni Switch/Router switching modules have an additional on-board interface connector for the HRE-X.

Currently, Omni Switch/Router switching modules consist of Gigabit Ethernet modules, auto-sensing Ethernet modules, Fast 10/100 Ethernet modules, 10 Mbps Ethernet modules, Token Ring modules, ATM uplink modules, FDDI modules, and WAN modules. See Chapter 3, "Omni Switch/Router Switching Modules," for documentation.

♦ Important Note ♦

Omni Switch/Router modules require the use of an Omni Switch/Router chassis (see *Omni Switch/Router Chassis and Power Supplies* on page 1-7). Do *not* install an Omni Switch/Router module in an OmniSwitch chassis and do *not* install an OmniSwitch module in an Omni Switch/Router chassis.

Omni Switch/Router User Interface (UI) Software

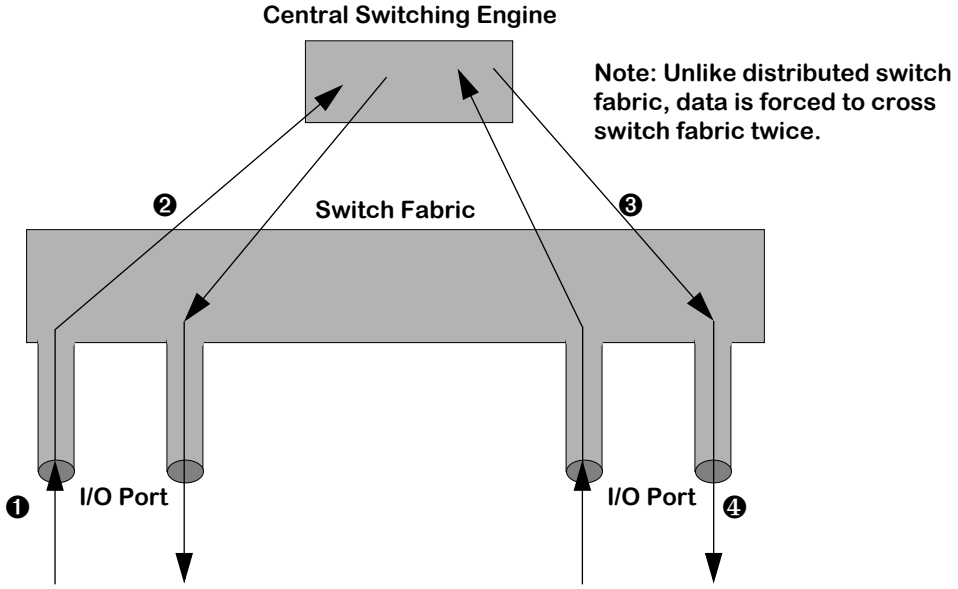
Omni Switch/Router hardware uses the same User Interface (UI) commands and Network Management Software (NMS) as OmniSwitch hardware. Omni Switch/Router modules support broadcast management, multicast management, any-to-any switching, virtual LANs (VLANs), firewalls, user authentication, WAN access, and policy-based configuration.

Omni Switch/Router Network Management Software (NMS)

You need Release 3.4, or higher, of Alcatel's X-Vision Network Management Software (NMS) to operate with Omni Switch/Router hardware.

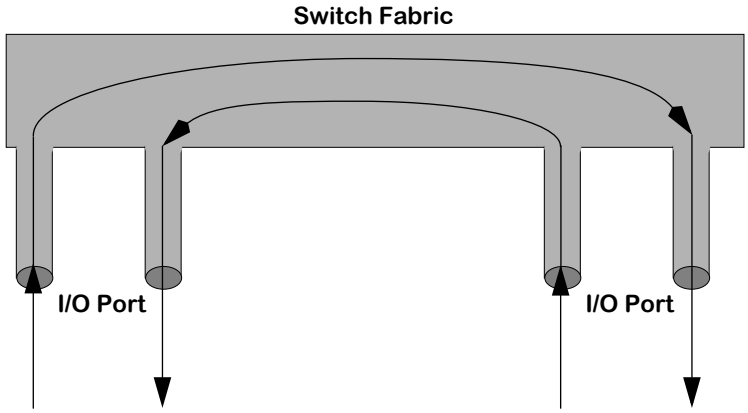
Omni Switch/Router Distributed Switching Fabric

Many switches in the market employ a shared memory architecture, which uses a central switching engine to send data to the appropriate port. As shown in the figure below, data enters the input port (❶ below), crosses the switching fabric on its way to the central switching engine(❷ below), and *again* crosses the switching fabric (❸ below) before exiting the appropriate output port (❹ below).



Traditional Shared Memory Architecture

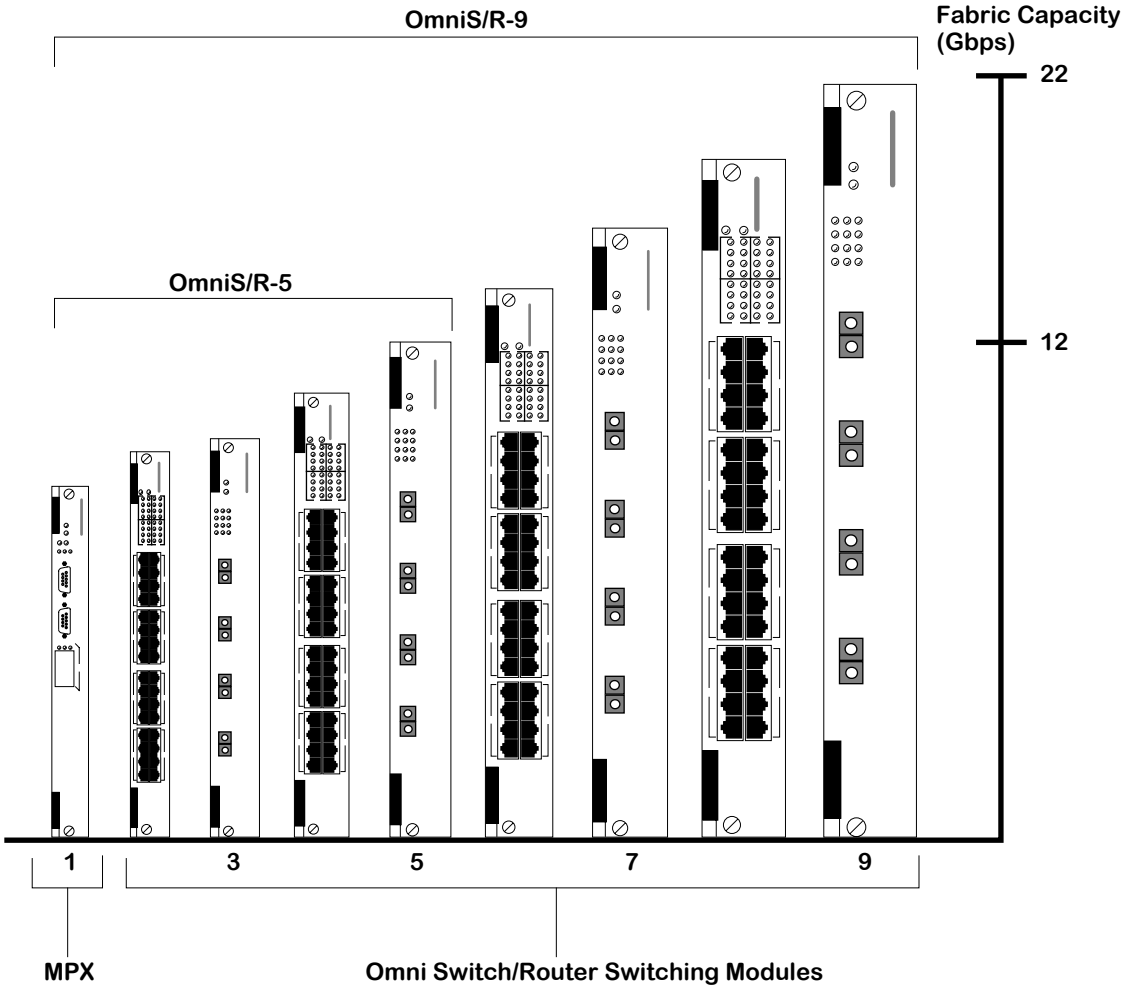
In contrast, Omni Switch/Router switches use a distributed switching fabric. As shown in the figure below, data enters the input port and crosses the switching fabric *only once* before exiting the appropriate output port. Compared to the shared memory architecture, only half as much bandwidth is required since data just crosses the switching fabric once.



Omni Switch/Router Distributed Switching Fabric

Omni Switch/Router Fabric Capacity

In a chassis with Omni Switch/Router modules only, each Omni Switch/Router module provides 2.4 Gbps of switching capacity in full-duplex mode. In a chassis with all Omni Switch/Router modules, the Omni Switch/Router architecture provides up to a 22 Gbps distributed switching fabric. As shown in the figure below, an OmniS/R-9 with an MPX and eight (8) Omni Switch/Router switching modules provides 22 Gbps of switching capacity and an OmniS/R-5 with an MPX and four (4) Omni Switch/Router switching modules provides 12 Gbps of switching capacity.



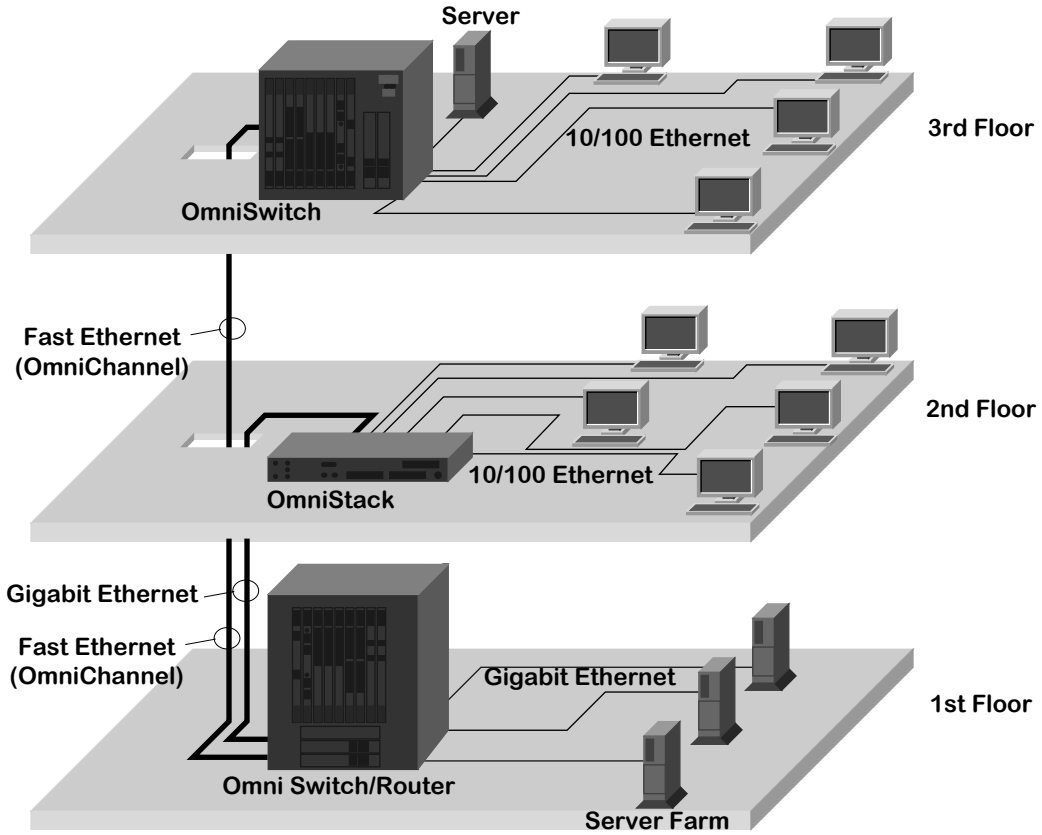
Omni Switch/Router Fabric Capacity in OmniS/R-5 and OmniS/R-9 Chassis

Omni Switch/Router Applications and Configurations

Omni Switch/Router hardware is ideally suited to meet the most demanding server and backbone needs. In addition, Omni Switch/Router hardware can be integrated easily with OmniSwitches and with OmniStack workgroup switches. The examples that follow show how the Omni Switch/Router can be used as a network backbone and as the central switch/router in a wiring closet.

Omni Switch/Router as the Backbone Connecting Several Networks

The figure below shows how Omni Switch/Router Gigabit Ethernet and 10/100 Ethernet modules can be used as a network backbone. In this example, two networks on two different floors need high speed access to a server farm on the first floor.

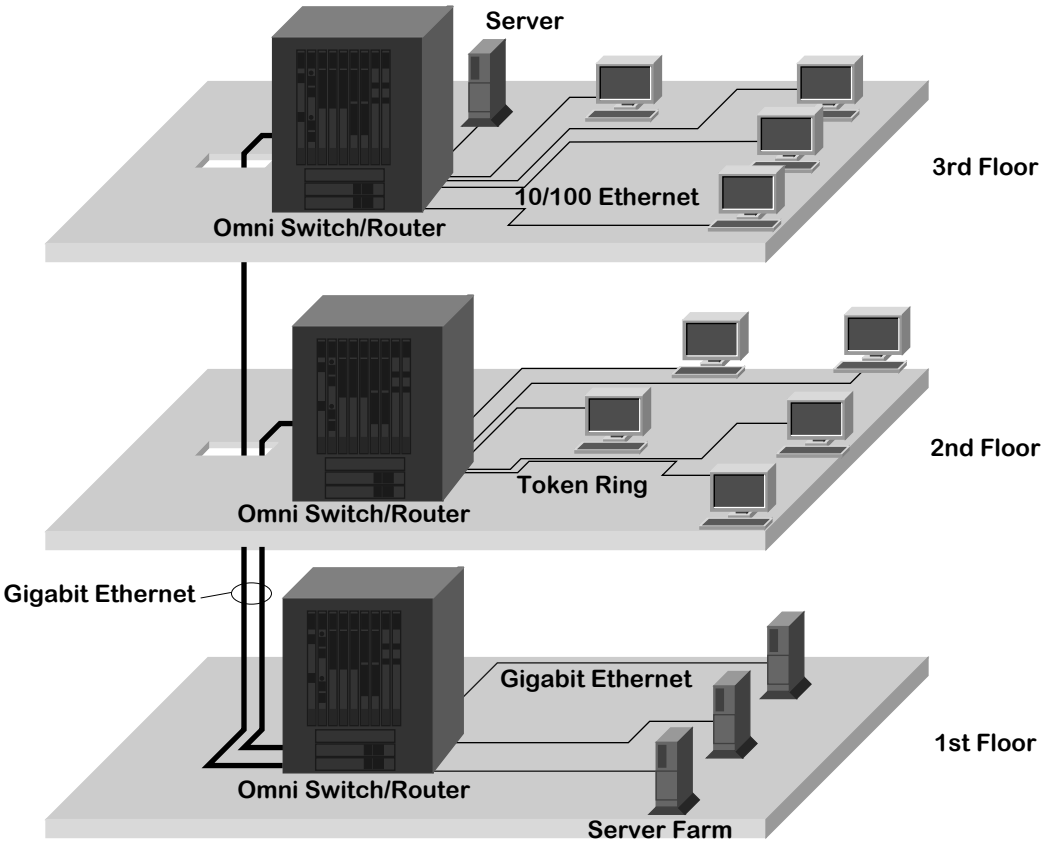


Using Omni Switch/Router in a Network Backbone

The servers each have dedicated Gigabit Ethernet connections to Omni Switch/Router modules on the first floor. The Omni Switch/Router chassis on the first floor is connected to the network on the second floor via a Gigabit Ethernet link to the OmniStack on the second floor. The Omni Switch/Router chassis on the first floor is connected via a 10/100 Ethernet link, using OmniChannel, to the OmniSwitch chassis on the third floor containing a Fast Ethernet module, such as the ESM-100C-12. See Chapter 19, "Managing Ethernet Modules," for more information on OmniChannel.

Omni Switch/Router as the Central Backbone Switch/Router and in the Wiring Closet

The figure below shows Omni Switch/Router chassis used in the wiring closet and as a network backbone switch/router connecting the wiring closets and server farm. On the third floor, an Omni Switch/Router chassis connects a mixture of 10BaseT and 100BaseTx workstations with an auto-sensing Ethernet module. In addition, this Omni Switch/Router chassis connects the workstations to a local server with a Gigabit Ethernet module. On the second floor, an Omni Switch/Router connects legacy Token Ring workstations. On the first floor, the Omni Switch/Router connects the networks on the upper floors to the server farm using a Gigabit Ethernet module.



Using Omni Switch/Router in the Wiring Closet

Omni Switch/Router Chassis and Power Supplies

The Omni Switch/Router chassis houses the MPX, switching modules, and one or two power supplies. The modular design of the chassis provides the ability to configure your Omni Switch/Router to meet your networking needs. The Omni Switch/Router chassis also offer such failure resistant features as redundant MPXs, redundant power supplies, and hot swapping of switching modules. (See Chapter 7, "OmniSwitch Switching Modules," for more information on hot swapping switching modules.)

There are two (2) different versions of the Omni Switch/Router chassis — a five-slot version called the OmniS/R-5 (described below) and a nine-slot version called the OmniS/R-9, which is documented in the *OmniS/R-9* on page 1-10. The OmniS/R-5 and OmniS/R-9 chassis, the MPX module, and several switching modules have met FCC Class B requirements.

Slot 1 is reserved for the MPX; you *cannot* install a switching module in Slot 1. You can install a switching in Slot 2 (if an MPX is installed in Slot 1) or an MPX. When dual-redundant MPXs are installed, one of them must be installed in Slot 1 and the other in Slot 2. On the OmniS/R-5, Slots 3 through 5 are reserved for switching modules. On the OmniS/R-9, Slots 3 through 9 are reserved for switching modules.

♦ Important Note ♦

You *must* have an MPX acting as the management module; you cannot use any version of the MPM.

OmniS/R-5

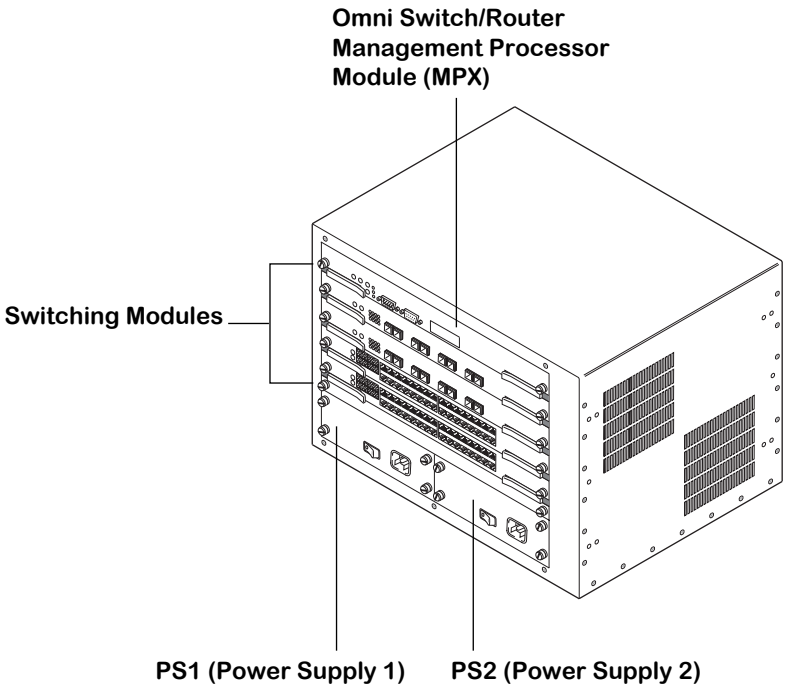
The OmniS/R-5 chassis has five slots for an MPX and switching modules (see figure below). Slots are numbered from 1 to 5 starting with the topmost slot. Slots for two power supplies are located at the bottom of the chassis.

♦ Warning ♦

If you have an OmniS/R-5 with a single power supply, do *not* remove the cover on the empty power supply slot. In addition, if you have any empty switching module slots in an OmniS/R-5, you *must* cover them with blank panels (available from Alcatel) to prevent your chassis from overheating.

Covering empty slots forces air to flow directly over the power supplies, thereby cooling them. If the power supplies are not properly cooled, they will overheat and shut down.

The entire chassis can be wall-mounted or rack-mounted. You can view all cabling, power supplies, module interfaces, and LEDs at the front of the chassis.



The OmniS/R-5

The OmniS/R-5 uses the MPX. Slot 1 is reserved for the MPX; you *cannot* install a switching module in Slot 1. You can install a switching in Slot 2 (if an MPX is installed in Slot 1) or an MPX. When dual-redundant MPXs are installed, one of them must be installed in Slot 1 and the other in Slot 2. Slots 3 through 5 are reserved for switching modules.

The OmniS/R-5 provides bays for two power supplies. The power supplies are self-enclosed to allow safe hot-insertion and hot-removal. When two power supplies are installed, they share the electrical load. If one should fail, the remaining power supply automatically takes up the load without any disruption to the operation. See Chapter 5, "OmniSwitch Power Supplies," for more information on installing and removing power supplies. See *OmniS/R-5 Technical Specifications* on page 1-9 for more information.

The OmniS/R-5 uses one of the following power supplies:

OmniS/R-PS5-375 The standard power supply. It can provide 60 Amps of current at 5 Volts and can provide 375 Watts of power.

OmniS/R-PS5-DC375 A -48 volt (input voltage) DC version of the OmniS/R-PS5-375 power supply. This power supply has a capacity of 60 Amps and can provide 375 Watts of power. It requires the use of 12 to 14 gauge wire for connections to the DC power source. See *Connecting a DC Power Source to an OmniS/R-PS5-DC375 or an OmniS/R9-DC650* on page 1-21 for more information.

♦ Caution ♦

This unit may be equipped with two power connections. To reduce the risk of electrical shock, disconnect both power connections before servicing the unit.

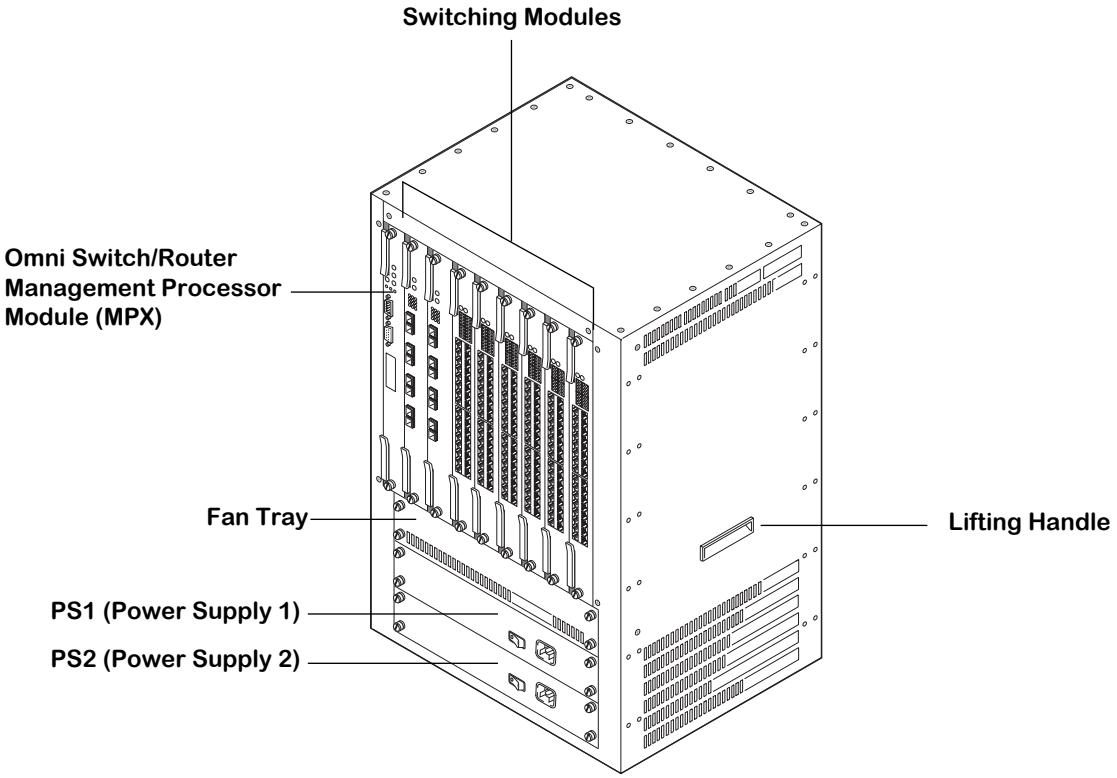
♦ VORSICHT ♦

Das Gerat kann mit zwei Netzanschlussen ausgestattet sein. Um einen elektrischen Schlag zu vermeiden, immer beide Anschlusse vor der Wartung vom Netz trennen.

OmniS/R-5 Technical Specifications	
Total Module Slots	5
Total Slots for Switching Modules	4
Physical Dimensions	12.25" (31.12 cm) high, 17.14" (43.54 cm) wide, 13" (33.02 cm) deep
Weight	approximately 55 lb. (24.09 kg), fully populated with modules and power supplies.
Switching Backplane	Up to 12 Gbps (aggregate) switching fabric capacity
Voltage Range	90-265 VAC, 47 to 63 Hz auto-ranging and auto-sensing.
Current Draw	6 Amps at 100/115 VAC; 3 Amps at 230 VAC
Watts (Output)	375
Current Provided	60 Amps at 5 Volts (V1) 5 Amps at 12 Volts (V2) 3 Amps at 3.3 Volts (V3) 5.1 Amps at 1.5 Volts (V4)
Temperature Operating Range	0 to 45 degrees Celsius 32 to 113 degrees Fahrenheit
Humidity	Relative humidity operating range from 0 to 95 percent non-condensing.
Altitude	Sea level to 10,000 feet (3 km)
Heat Generation	1280 BTUs per hour (one power supply)
Agency Listings	UL 1950; CSA-C22.2; EN60950; FCC Part 15, Subpart B (Class A); EN55022, 1987/EN50081; FCC Class B; C.I.S.P.R. 22: 1985; EN50082-1, 1992; IEC 801-2, 1991; IEC 801-3, 1984; IEC 801-4, 1988

OmniS/R-9

The OmniS/R-9 chassis has nine slots for an MPX and switching modules (see figure below). Slots are numbered from 1 to 9 starting with the left-most slot. Slots for two power supplies are located at the bottom of the chassis. A separate, removable fan tray containing four fans is located above the power supply module bays.



The OmniS/R-9

A fully loaded OmniS/R-9 weighs nearly 100 lbs. Therefore, it is recommended that if you are rack-mounting the chassis you use a rack mount shelf instead of just brackets. Using a shelf will ensure that the weight of the chassis can be supported. In addition, the OmniS/R-9 contains side handles to make lifting and installation easier.

The OmniS/R-9 uses the MPX. Slot 1 is reserved for the MPX; you *cannot* install a switching module in Slot 1. You can install a switching in Slot 2 (if an MPX is installed in Slot 1) or an MPX. When dual-redundant MPXs are installed, one of them must be installed in Slot 1 and the other in Slot 2. Slots 3 through 9 are reserved for switching modules.

♦ Important Note ♦

You *must* have an MPX acting as the management module; you cannot use any version of the MPM. See Chapter 2, "The Omni Switch/Router MPX," for more information on the MPX.

The OmniS/R-9 provides bays for two power supplies. The power supplies are self-enclosed to allow safe hot-insertion and hot-removal. When two power supplies are installed, they share the electrical load. If one should fail, the remaining power supply automatically takes up the load without any disruption to the operation. See Chapter 5, "OmniSwitch Power Supplies," for more information on installing and removing power supplies.

The OmniS/R-9 uses one of the following power supplies:

OmniS/R-PS9-650	The standard power supply. It can provide 120 Amps of current at 5 Volts and can provide 650 Watts of power.
OmniS/R-PS9-DC650	A -48 volt (input voltage) DC version of the OmniS/R-PS9-650 power supply. This power supply has a capacity of 120 Amps and can provide 650 Watts of power. It requires the use of 12 to 14 gauge wire for connections to the DC power source. See *Connecting a DC Power Source to an OmniS/R-PS5-DC375 or an OmniS/R9-DC650* on page 1-21 for more information.

See *OmniS/R-9 Technical Specifications* on page 1-12 for more information.

♦ Caution ♦

This unit may be equipped with two power connections. To reduce the risk of electrical shock, disconnect both power connections before servicing the unit.

♦ VORSICHT ♦

Das Gerat kann mit zwei Netzanschlussen ausgestattet sein. Um einen elektrischen Schlag zu vermeiden, immer beide Anschlusse vor der Wartung vom Netz trennen.

OmniS/R-9 Technical Specifications	
Total Module Slots	9
Total Slots for Switching Modules	8
Physical Dimensions	24.50" (62.23 cm) high, 16.60" (42.16 cm) wide, 13.25" (36.66 cm) deep
Weight	96 lb. (43.55 kg), fully populated with modules and power supplies.
Switching Backplane	Up to 22 Gbps (aggregate) switching fabric capacity
Voltage Range	90-264 VAC, 47 to 63 Hz auto-ranging and auto-sensing.
Current Draw	12 Amps at 100/115 VAC; 6 Amps at 230 VAC
Watts (Output)	650
Current Provided	120 Amps at 5 Volts 4 Amps at 12 Volts 6 Amps at 3.3 Volts 8 Amps at 1.5 Volts
Temperature Operating Range	0 to 45 degrees Celsius 32 to 113 degrees Fahrenheit
Humidity	Relative humidity operating range from 0 to 95 percent non-condensing.
Altitude	Sea level to 10,000 feet (3 km)
Heat Generation	2219 BTUs per hour (one power supply)
Agency Listings	UL 1950; CSA-C22.2; EN60950; EN55022, 1987/EN50081; C.I.S.P.R. 22: 1985; EN50082-1, 1992; IEC 801-2, 1991; IEC 801-3, 1984; IEC 801-4, 1988; VCCI V-3/94.04 (Class 1); FCC Part 15, Subpart B (Class A); FCC Class B

Omni Switch/Router Power Requirements

Always make sure that the total power requirements of the modules in your chassis do not exceed the limits of your power supply. To check the power consumption of your configuration, refer to the tables on the following pages and add up the **DC Current Draw** of all modules in your switch. The tables beginning on page page 1-14 list modules *without* an HRE-X and the tables beginning on page 1-16 list modules *with* an HRE-X.

♦ Note ♦

The WSX-M013-2W and WSX-M013-4W modules do not support installation of an HRE-X and are not listed in the HRE-X table.

The total power consumption of all your modules should be below the current provided by your power supply, which is listed in *OmniS/R-5* on page 1-7 for the OmniS/R-5 and in *OmniS/R-9 Technical Specifications* on page 1-12 for the OmniS/R-9.

♦ Caution ♦

It is possible, but *not recommended*, to have a configuration in which the current draw of the installed modules exceeds the power provided by a single power supply. However, such a configuration would *require two power supplies and would not allow you to have power redundancy.*

Module Power Requirements *without* an HRE-X

Module	Description	DC Current Draw (Amps)	FCC Class Approval
MPX	Management Processor Module.	3.75	B
GSX-FM/FS/FSH-2W	Gigabit Ethernet module with two (2) fiber SC ports.	6.75	B
GSX-FM/FS-4W	Gigabit Ethernet module with four (4) fiber SC ports.	10.0	B
ESX-100C-12W	Auto-Sensing 10/100 Ethernet module with twelve (12) copper RJ-45 ports.	5.75	B (STP cable) A (UTP cable)
ESX-100C-32W	Auto-Sensing 10/100 Ethernet module with thirty-two (32) RJ-45 ports.	11.25	B (STP cable) A (UTP cable)
ESX-100FM/FS-12W	Fast Ethernet (100 Mbps) module with twelve (12) fiber MT-RJ ports.	10.0	B
ESX-FM-24W	10 Mbps Ethernet module with twenty-four (24) fiber VF-45 ports	13.0	B
TSX-C-32W	Token Ring (Lobe Only) with thirty-two (32) copper RJ-45 ports.	9.25	B (STP cable) A (UTP cable)
TSX-CD-16W	Token Ring (Station/Lobe) with sixteen (16) copper RJ-45 ports.	7.0	B (STP cable) A (UTP cable)
ASX-155FM/FS/FSH-1W	ATM 155 Mbps (OC-3) with one (1) fiber SC port.	5.25	B
ASX-155FM/FS/FSH-2W	ATM 155 Mbps (OC-3) with two (2) fiber SC ports.	6.25	B
ASX-155RFM/RFS-1W	ATM 155 Mbps (OC-3) with one (1) redundant fiber SC port.	5.75	B
ASX-622RFM/RFS-1W	ATM 622 Mbps (OC-12) with one (1) redundant fiber SC port.	11.0	B
ASX-D3-1W	ATM with one (1) DS3 port	5.75	B
ASX-D3-2W	ATM with two (2) DS3 ports.	7.25	B
ASX-E3-1W	ATM with one (1) E3 port	5.75	B
ASX-E3-2W	ATM with two (2) E3 port	7.25	B

continued on next page...

Module Power Requirements *without* an HRE-X (continued)

Module	Description	DC Current Draw (Amps)	FCC Class Approval
FSX-FM-1W	FDDI module with 1 multimode port	5.25	B
FSX-FM-2W	FDDI module with 2 multimode ports	6.25	B
FSX-FS-1W	FDDI module with 1 single-mode port	5.25	B
FSX-FS-2W	FDDI module with 2 single-mode ports	6.25	B
FSX-FSH-1W	FDDI module with 1 single-mode port (high-powered laser optics)	5.25	B
FSX-FSH-2W	FDDI module with 2 single-mode ports (high-powered laser optics)	6.25	B
WSX-S-2W	WAN module with 2 serial ports	4.75	B
WSX-SC-4W	WAN module with 4 serial ports	6.25	B
WSX-SC-8W	WAN module with 8 serial ports	8.25	B
WSX-BRI-SC-1W	WAN ISDN module with 1 serial and 1 BRI port	5.75	B
WSX-BRI-SC-2W	WAN ISDN module with 2 serial and 2 BRI ports	7.25	B
WSX-FT1-SC-1W	WAN module with 1 serial and 1 T1 or E1 port	5.75	A
WSX-FE1-SC-1W	WAN module with 1 serial and 1 T1 or E1 port	5.75	B
WSX-FT1-SC-2W	WAN module with 2 serial and 2 T1 or E1 ports	7.25	B
WSX-FE1-SC-2W	WAN module with 2 serial and 2 T1 or E1 ports	7.25	B
WSX-M013-2W	WAN module with two (2) channelized DS3 ports	6.5	B
WSX-M013-4W	WAN module with four (4) channelized DS3 ports	8.5	B

Module Power Requirements *with* an HRE-X

Module	Description	DC Current Draw (Amps)	FCC Class Approval
MPX	Management Processor Module.	5.25	B
GSX-FM/FS-2W	Gigabit Ethernet module with two (2) fiber SC ports.	8.25	B
GSX-FM/FS-4W	Gigabit Ethernet module with four (4) fiber SC ports.	11.5	B
ESX-100C-12W	Auto-Sensing 10/100 Ethernet module with twelve (12) copper RJ-45 ports.	7.25	B (STP cable) A (UTP cable)
ESX-100C-32W	Auto-Sensing 10/100 Ethernet module with thirty-two (32) RJ-45 ports.	12.75	B (STP cable) A (UTP cable)
ESX-100FM/FS-12W	Fast Ethernet (100 Mbps) module with twelve (12) fiber MT-RJ ports.	11.5	B
ESX-FM-24W	10 Mbps Ethernet module with twenty-four (24) fiber VF-45 ports	14.5	B
TSX-C-32W	Token Ring (Lobe Only) with thirty-two (32) copper RJ-45 ports.	10.75	B (STP cable) A (UTP cable)
TSX-CD-16W	Token Ring (Station/Lobe) with sixteen (16) copper RJ-45 ports.	8.5	A
ASX-155FM/FS/FSH-1W	ATM 155 Mbps (OC-3) with one (1) fiber SC port.	6.75	B
ASX-155FM/FS/FSH-2W	ATM 155 Mbps (OC-3) with two (1) fiber SC ports.	7.75	B
ASX-155RFM/RFS-1W	ATM 155 Mbps (OC-3) with one (1) redundant fiber SC port.	7.25	B
ASX-155RFM/RFS-2W	ATM 155 Mbps (OC-3) with two (2) redundant fiber SC port.	8.75	B
ASX-622RFM/RFS-1W	ATM 622 Mbps (OC-12) with one (1) redundant fiber SC port.	12.5	B
ASX-D3-1W	ATM with one (1) DS3 port	7.25	B
ASX-D3-2W	ATM with two (2) DS3 port	8.75	B
ASX-E3-1W	ATM with one (1) E3 port	7.25	B
ASX-E3-1W	ATM with one (1) E3 port	8.75	B

continued on next page...

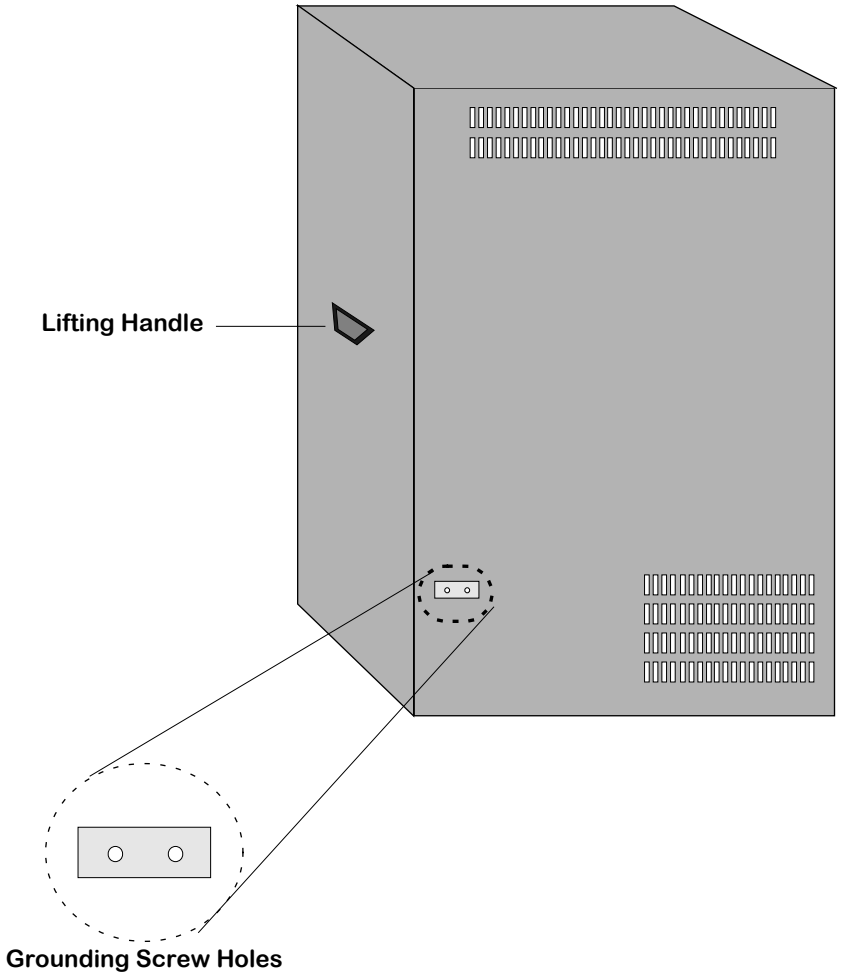
Module Power Requirements *with* an HRE-X (continued)

Module	Description	DC Current Draw (Amps)	FCC Class Approval
FSX-FM-1W	FDDI module with 1 multimode port	6.75	B
FSX-FM-2W	FDDI module with 2 multimode ports	7.75	B
FSX-FS-1W	FDDI module with 1 single-mode port	5.75	B
FSX-FS-2W	FDDI module with 2 single-mode ports	7.75	B
FSX-FSH-1W	FDDI module with 1 single-mode port (high-powered laser optics)	6.75	B
FSX-FSH-2W	FDDI module with 2 single-mode ports (high-powered laser optics)	7.75	B
WSX-S-2W	WAN module with 2 serial ports	6.25	B
WSX-SC-4W	WAN module with 4 serial ports	7.75	B
WSX-SC-8W	WAN module with 8 serial ports	9.75	B
WSX-BRI-SC-1W	WAN ISDN module with 1 serial and 1 BRI port	7.25	B
WSX-BRI-SC-2W	WAN ISDN module with 2 serial and 2 BRI ports	8.75	B
WSX-FT1-SC-1W	WAN module with 1 serial and 1 T1 or E1 port	7.25	B
WSX-FE1-SC-1W	WAN module with 1 serial and 1 T1 or E1 port	7.25	B
WSX-FT1-SC-2W	WAN module with 2 serial and 2 T1 or E1 ports	8.75	B
WSX-FE1-SC-2W	WAN module with 2 serial and 2 T1 or E1 ports	8.75	B

Grounding a Chassis

Omni Switch/Routers have two grounding screw holes on the back of the chassis. These holes use 10-32 screws and are approximately 1 inch apart. In addition, these holes do not have paint and are surrounded by a small paint-free rectangular section, which provides for a good connection contact.

The figure below shows the location of the grounding screw holes on the back of an OmniS/R-9. They are located approximately four (4) inches from the bottom of the chassis and approximately one (1) inch from the left-hand side of the rear of the chassis.

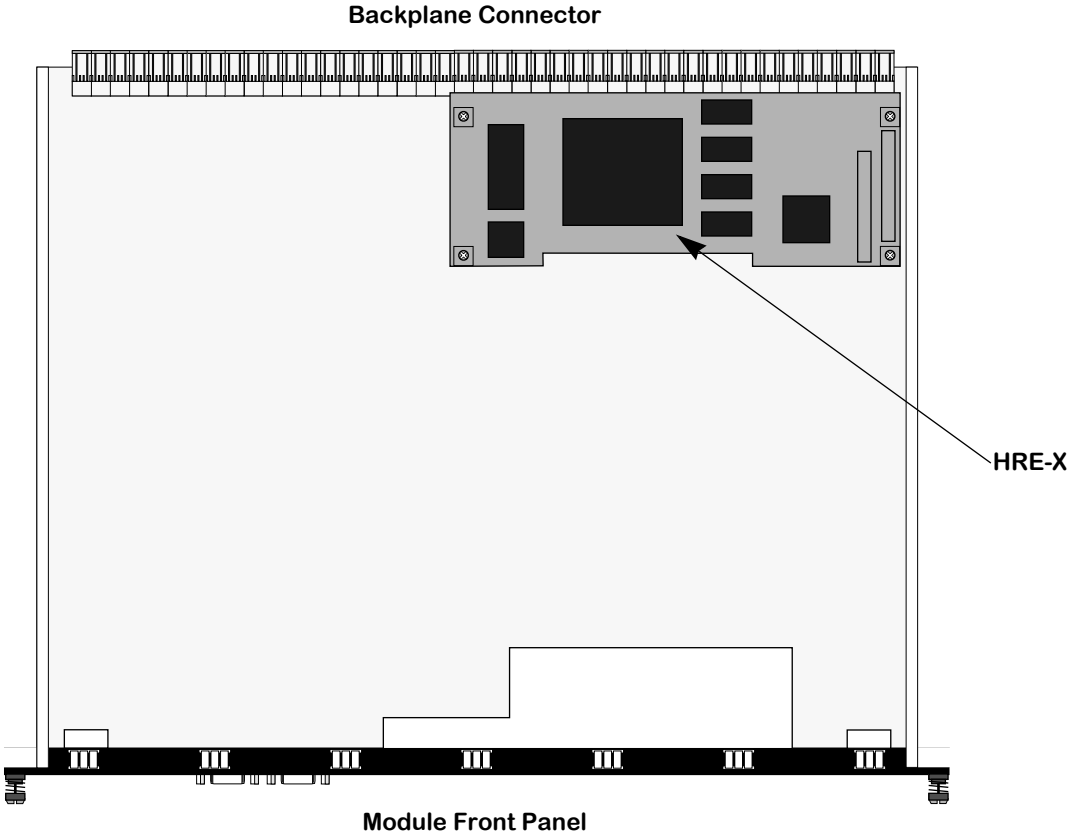


Grounding Screw Holes on an OmniS/R-9

On an OmniS/R-5, they are located about one (1) inch from the bottom of the chassis and approximately one (1) inch from the left-hand side of the rear of the chassis.

The Omni Switch/Router Hardware Routing Engine (HRE-X)

The Omni Switch/Router Hardware Routing Engine (HRE-X) is available for the MPX and all Omni Switch/Router switching modules except for the WSX-M013-2W and WSX-M013-4W. The HRE-X is a submodule, which plugs into an Omni Switch/Router module, that provides high speed Layer 3 distributed routing for IP and IPX traffic. The HRE-X intercepts frames from the switching logic and determines if a frame should be switched or routed. If a frame needs to be routed, the HRE-X will automatically add the appropriate routing information.



MPX with an HRE-X

The HRE-X has the following restrictions:

- You *must* have Release 3.4.4 software, or later, on your Omni Switch/Router.
- Do *not* install an HRE-X on an MPX unless it is Revision A10, or later.
- Do *not* install an HRE-X on a GSX-FM/FS-4W unless it is Revision B04, or later.
- Do *not* install an HRE-X on a WSX-M013-2W or WSX-M013-4W.

Each HRE-X routes up to 1.5 million packets per second. In an OmniS/R-9 with an HRE-X on every switching module, for example, you could have up to 12 Mpps routed throughput. On a per switch basis, the HRE-X also supports over 256,000 route entries and 64,000 Next Hop destinations.

Valid HRE-X Configurations

You can configure an Omni Switch/Router chassis in one of two ways: with an HRE-X on every single Omni Switch/Router switching module (distributed routing) or a single HRE-X on the MPX (centralized routing).

Distributed Routing. In this configuration, you *must* install an HRE-X on every single switching module in the chassis. In addition, you *cannot* install an HRE-X on the MPX. For example, in an OmniS/R-9 with a single MPX, you would need eight (8) HRE-Xs for all the switching modules. As a general rule, this configuration is recommended in networks of more than four subnets from any one switch.

Centralized Routing. In this configuration, you *must* install the HRE-X on the MPX but not on any Omni Switch/Router switching modules. The HRE-X will perform routing for all Omni Switch/Router switching modules in the chassis. As a general rule, this configuration is recommended for networks of two to four subnets from any one switch.

Connecting a DC Power Source to an OmniS/R-PS5-DC375 or an OmniS/R9-DC650

The OmniS/R-5 can use a DC power supply called the OmniS/R-5-DC375 and the OmniS/R-9 can use a DC power supply called the OmniS/R9-DC650. These power supplies contain a female power connector as shown in the figure below. These supplies requires the use of 12 gauge wire. A clamp inside each connector keeps the power wire tightly in place during operation. This connector has side screws that can be used to remove the connector.

OmniS/R-PS5-DC375
and
OmniS/R-PS9-DC650

OmniS/R-5 and OmniS/R-9 DC Power Supply Connector Style

Installing DC Power Source Wire Leads

These instructions describe how to connect your 3-wire DC power source to the power connector on your DC power supply. A small flat-tip screwdriver and a wire stripper are required for this procedure.

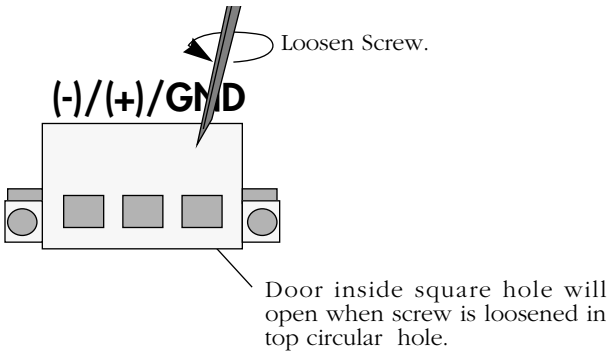
1. Prepare the three (3) wires—12 gauge—that will plug into the power supply. First make sure they are not plugged into the 48-volt power source. Next, use a wire stripper to carefully strip about a half-inch off the end of each wire, removing the outer insulation to expose the copper core.

2. Twist the loose strands of copper wire together so that they form a tight braid. If possible, solder the entire braid of wire together for better conductivity.

3. Open the wire bay door for one of the three (3) power connector holes. The procedure for opening the bay door is different for each power connector style. Follow the instructions on the next page for your connector style.

4. The front of this connector contains a row of square holes. It also contains three circular holes on top containing screws; you loosen the screws in these holes to open the square holes on the connector front so that you can insert the wire lead.

    a. Insert a small flat-tip screwdriver into one of the top three (3) screw holes. Loosen the screw so that the door for the wire bay on the connector front opens.



Opening Wire Bay on Screw-Style Connector

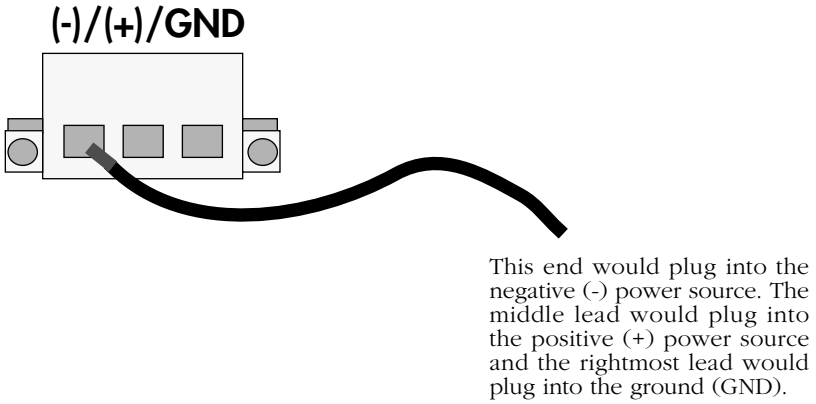
5. Insert the appropriate wire lead into the open circular hole. The silkscreen above each hole indicates which power lead—negative (-), positive (+), or ground (GND)—to plug into which hole. The lead you insert *must* match the lead attached to the 48-volt power source (i.e., negative to negative, positive to positive, ground to ground).

♦ Warning ♦

You must plug DC wire leads into the correct holes in the DC power connector. Use the labels above the DC power connector as a guide to positive , negative, and ground connections.

If you plug wire leads into wrong holes the power supply will not work and could result in damage.

Push the wire in far enough such that it reaches the back wall of the connector, about a half inch inside.



Inserting the Wire Lead Into the Circular Hole

6. Close the wire bay. The procedure for closing the bay door is different for each power connector style. Follow the instructions below for your connector style.

7. Using the small screwdriver from Step 3a, tighten the screw above the wire bay into which you inserted a wire lead. The wire lead should be securely attached inside the connector. You should be able to pull on the wire and not dislodge it.

8. Repeat Steps 3 through 6 for the remaining two wire leads. Be sure that the end of each lead attaches to the same power source that you connected to on the power supply (i.e., negative to negative, positive to positive, ground to ground).