



Installing the Cisco 7204

This chapter explains the procedures for installing and starting the Cisco 7204. The chapter contains the following sections:

- [Rack-Mounting the Cisco 7204, page 3-1](#)
- [General Installation, page 3-9](#)
- [Providing a Chassis Ground Connection for the Router Chassis, page 3-11](#)
- [Connecting Port Adapter Cables, page 3-13](#)
- [Connecting I/O Controller Cables, page 3-13](#)
- [Connecting Power, page 3-20](#)
- [Starting the Cisco 7204, page 3-23](#)

A rack-mount and cable-management kit is included in the shipping container. The rack-mount brackets in the kit are for mounting the Cisco 7204 in standard, 19-inch-wide, 4-post equipment racks or telco-type equipment racks. The rack-mount brackets are not suitable for use with other racks, such as 23-inch 2-post racks. The cable-management brackets are designed to relieve the strain on port adapter interface cables that are installed on port adapters in a Cisco 7204. If you are installing an equipment shelf or using mounting hardware other than that supplied with the chassis, review the guidelines in the [“Equipment Racks” section on page 2-6](#) in the chapter [“Preparing for Installation”](#), then proceed to the [“General Installation” section on page 3-9](#).

If you do not plan to install your Cisco 7204 in an equipment rack, proceed to the section [“General Installation” section on page 3-9](#).

Rack-Mounting the Cisco 7204

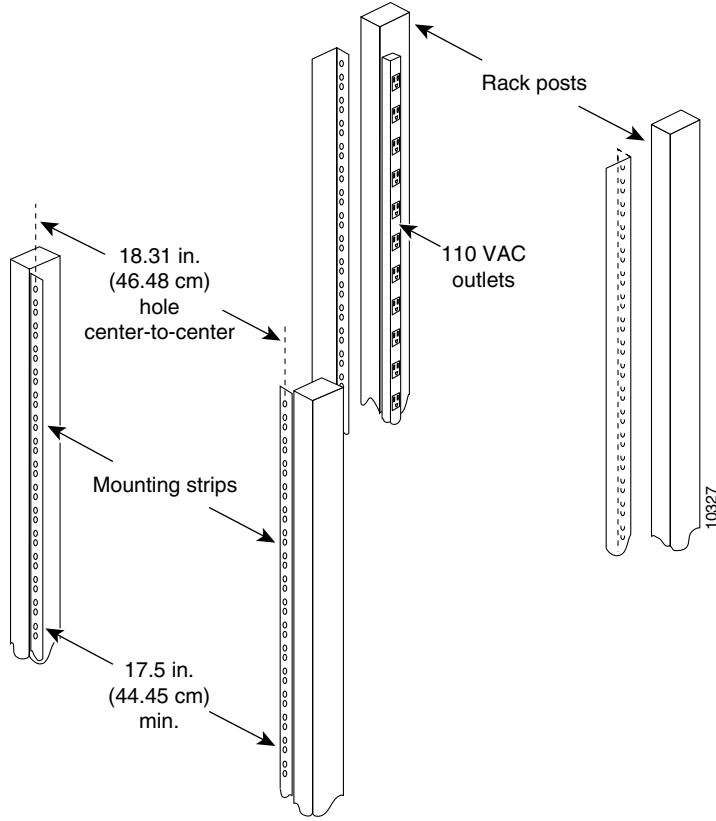
The chassis mounts to two rack posts with brackets that attach to either the front or the rear sides of the chassis. The inside width between the two posts or mounting strips (left and right) must be at least 17 inches (43.18 cm).

Some equipment racks provide a power strip along the length of one of the mounting strips. [Figure 3-2](#) shows a typical 4-post equipment rack with a power strip along one of the back posts. If your rack has this feature, consider the position of the strip when planning fastener points and ensure that you will be able to pull port adapters and other FRUs straight out of their respective slots.

The inlet and exhaust ports for cooling air are located on the right and left of the chassis, respectively, so multiple routers can be stacked in a rack with little or no vertical clearance.

(DRAFT LABEL) ALPHA DRAFT - CISCO CONFIDENTIAL

Figure 3-1 Typical 4-post Equipment Rack Posts and Mounting Strips



If you want the port adapter end (the front) of the chassis recessed in the rack, install the rack-mount brackets at the front or rear of the chassis in the orientation shown in [Figure 3-2](#). If you want the front of the chassis protruding out of the rack, install the rack-mount brackets at the front or rear of the chassis in the orientation shown in [Figure 3-3](#).

Figure 3-2 Installing the Chassis in a 4-post Rack—Front Installation Shown

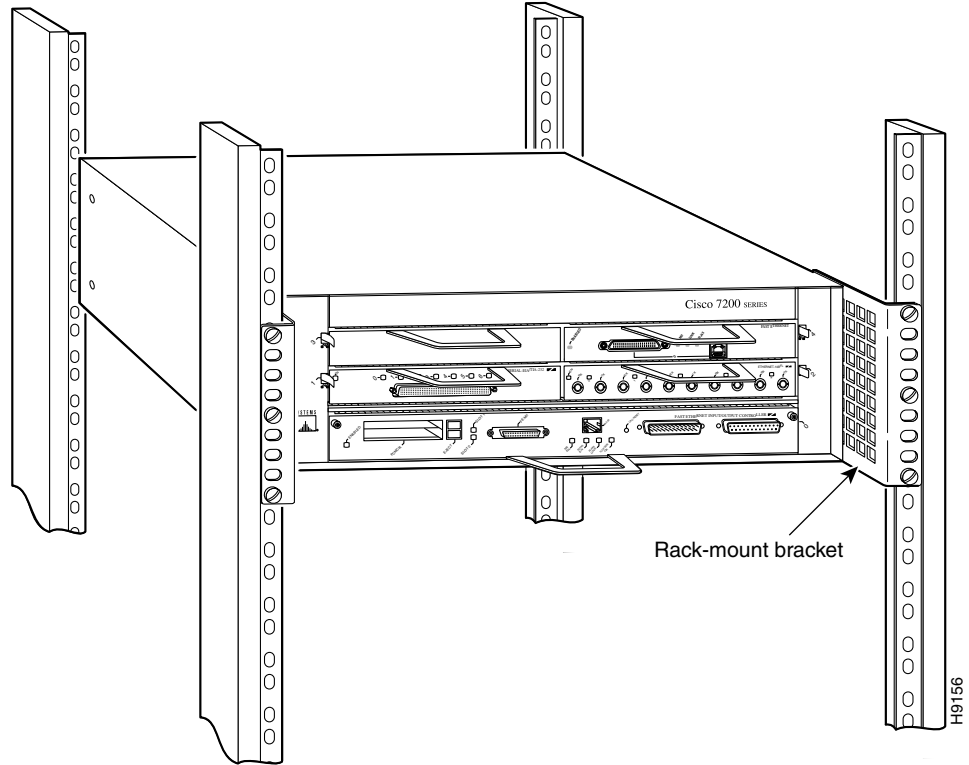
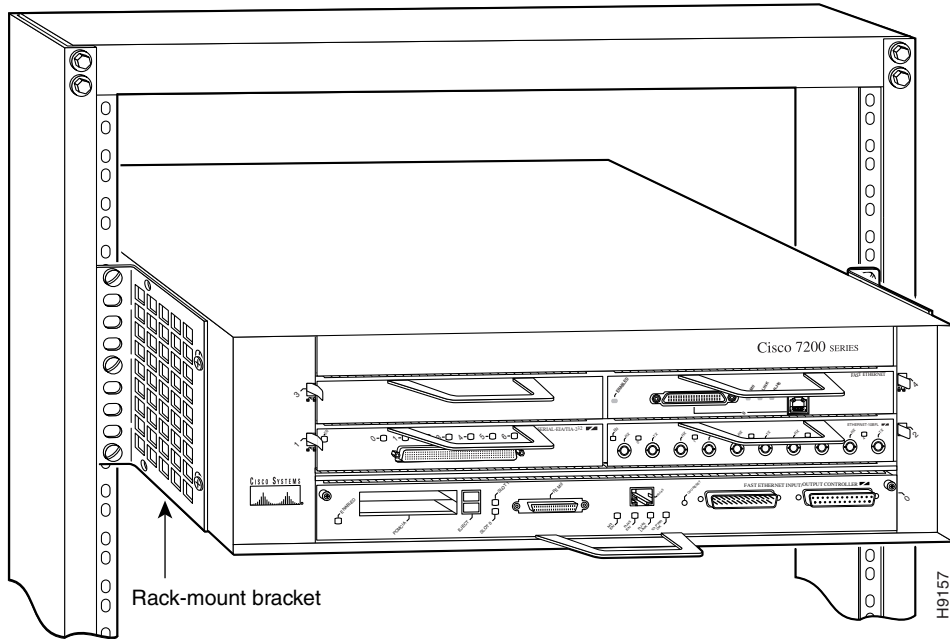


Figure 3-3 Installing the Chassis in a Telco-Type Rack—Front Installation Shown



(DRAFT LABEL) ALPHA DRAFT - CISCO CONFIDENTIAL

If you plan to install the cable-management brackets on a Cisco 7204 that you are rack-mounting, you *must* install the cable-management brackets and the rack-mount brackets on the chassis *before* you install the chassis in the rack.

There are two cable-management bracket configurations when rack-mounting the Cisco 7204 from the front. In the first configuration, the cable-management brackets are installed over the rack-mount brackets, and four screws secure both sets of brackets to the chassis. (Refer to [Figure 3-4](#).) In the second configuration, two screws secure each rack-mount bracket to the chassis, and two additional screws secure each cable-management bracket to a rack-mount bracket. (Refer to [Figure 3-5](#).)

Figure 3-4 Rack-Mounting the Chassis in a Telco-Type Rack with Installed Cable-Management Brackets—Front Installation Shown

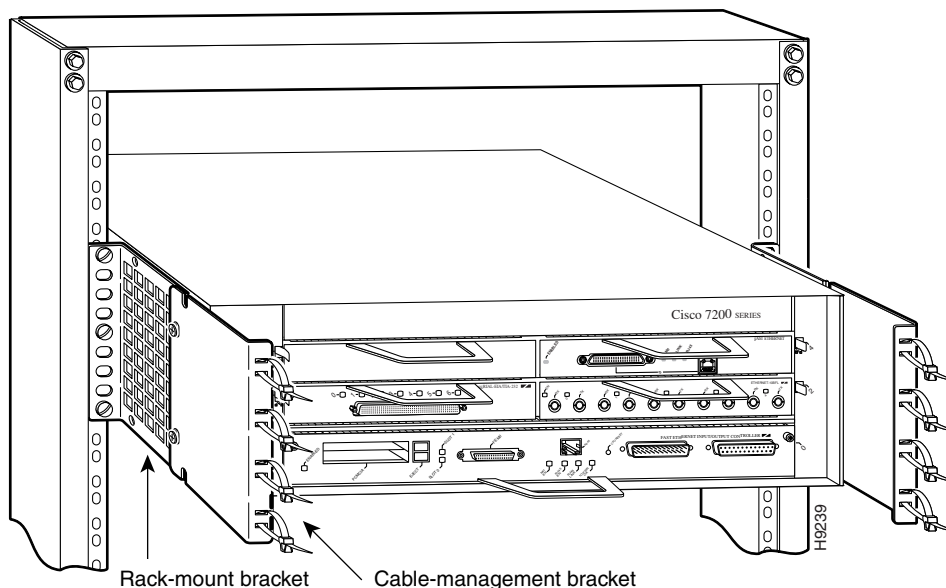
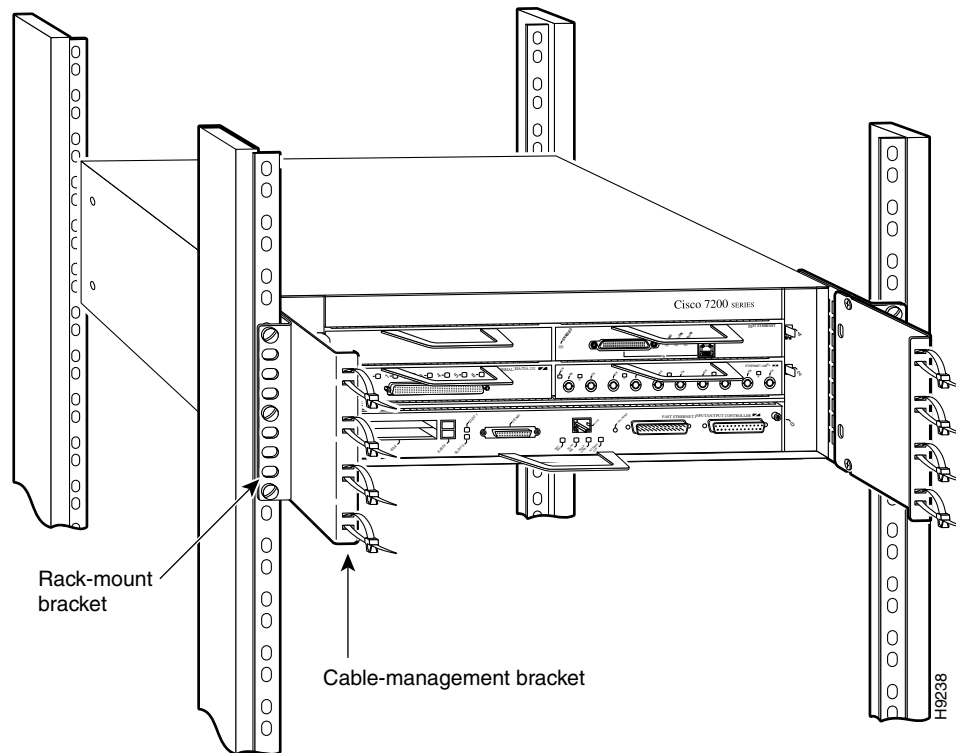


Figure 3-5 Rack-Mounting the Chassis in a 4-post Rack with Installed Cable-Management Brackets—Front Installation Shown



If you are rack-mounting a Cisco 7200 series router from the rear, the rack-mount brackets are installed at the rear of the chassis, and the cable-management brackets are installed at the front of the chassis. You must install both sets of brackets *before* you install the chassis in the rack.

Installing the Brackets on the Chassis

This section explains how to install the rack-mount and cable-management brackets at the front and the rear of the Cisco 7204. Before installing the chassis in the rack, you must install a rack-mount bracket on each side of the front or rear of the chassis. If you are rack-mounting the chassis from the front and you plan to use the cable-management brackets, you must install the cable-management brackets when you install the rack-mount brackets on the chassis.

If you are rack-mounting the chassis from the rear, you may install the rack-mount and cable-management brackets separately; however, both sets of brackets must be installed on the chassis before the chassis is installed in the rack.

The parts and tools required for installing the rack-mount and cable-management brackets are listed in the “[Tools for Installation](#)” section on page 2-10 in Chapter 2, “[Preparing for Installation](#)” of this guide.



Warning

After attaching the brackets, and to avoid injury, we recommend that two people install the chassis in the rack. (One person should support the chassis in the rack while the second person installs the fasteners.)

(DRAFT LABEL) ALPHA DRAFT - CISCO CONFIDENTIAL**Installing the Brackets on the Front of the Chassis**

To install the rack-mount and cable-management brackets on a Cisco 7204 for a front rack-mount configuration, complete the following steps:

- Step 1** Locate the threaded holes in the front sides of the chassis. If you plan to use the cable-management brackets in your rack-mount configuration, proceed with Step 2. If you do not plan to use the cable-management brackets, skip to Step 3.
- Step 2** If you want the front of the chassis protruding out of the rack, align the first rack-mount bracket and the first cable-management bracket to the threaded holes in the right side of the chassis as shown in [Figure 3-6](#).
- If you want the front of the chassis recessed in the rack, align the first rack-mount bracket to the threaded holes in the right side of the chassis as shown in [Figure 3-7](#).

Figure 3-6 *Installing the Rack-Mount Brackets on the Front of the Chassis so the Front Protrudes Out of the Rack*

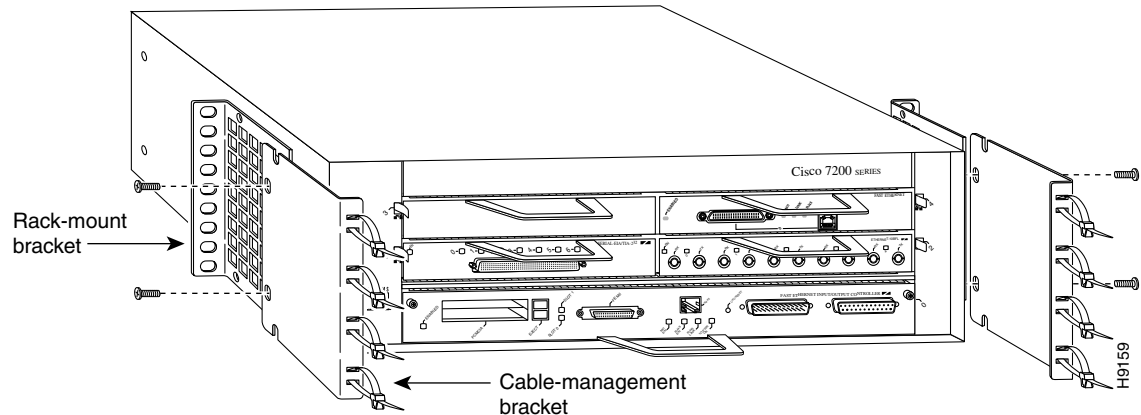
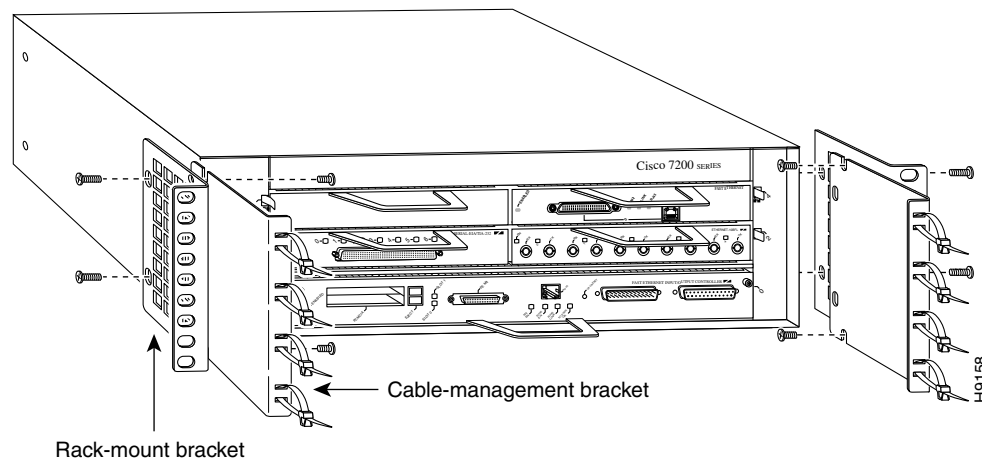


Figure 3-7 *Installing the Rack-Mount Brackets on the Front of the Chassis so the Front is Recessed in the Rack*



- Step 3** If you aligned the first rack-mount bracket and cable-management bracket to the right side of the chassis, thread two M4 x 8-mm Phillips flathead screws through both brackets and into the side of the chassis. Use a number 2 Phillips screwdriver to tighten the screws. (Refer to [Figure 3-6](#).)
- If you aligned only the first rack-mount bracket to the right side of the chassis, thread two M4 x 8-mm Phillips flathead screws through the bracket into the side of the chassis and use a number 2 Phillips screwdriver to tighten the screws. Then align the first cable-management bracket to the rack-mount bracket and thread two M4 x 8-mm Phillips flathead screws through the two brackets. Use a number 2 Phillips screwdriver to tighten the screws. (Refer to [Figure 3-7](#).)
- Step 4** Repeat Step 1 through Step 3 for the other cable-management bracket (if required) and rack-mount bracket.

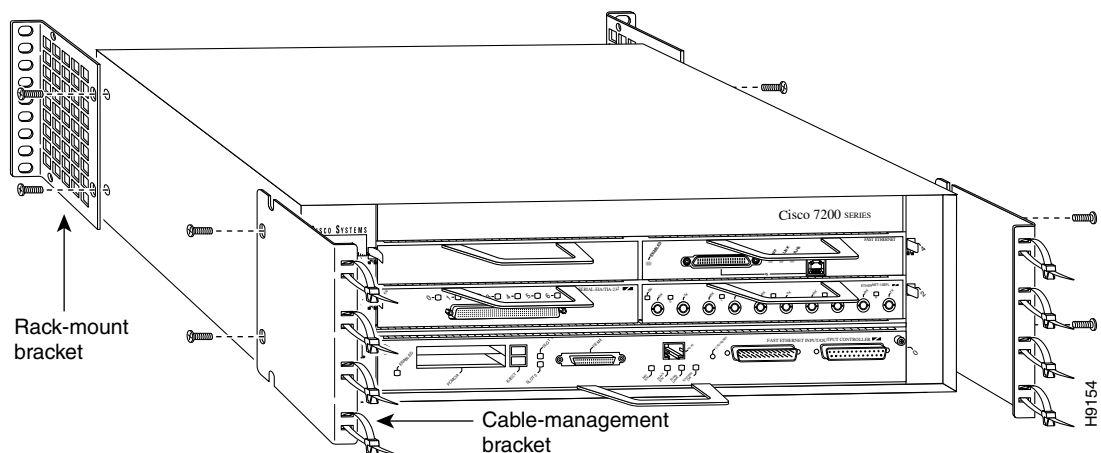
This completes the procedure for installing the rack-mount and cable-management brackets on a Cisco 7204 for a front rack-mount configuration.

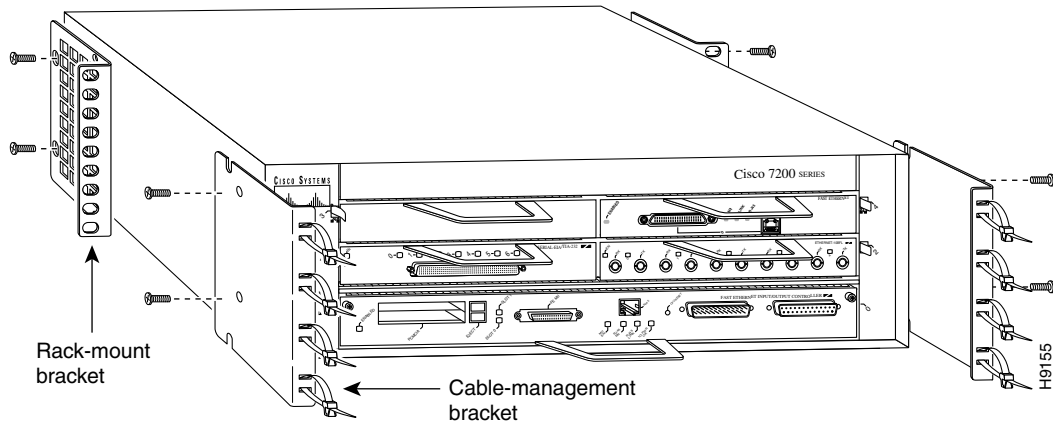
Installing Brackets on the Rear of the Chassis

To install the rack-mount and cable-management brackets on a Cisco 7204 for a rear rack-mount configuration, complete the following steps:

- Step 1** Locate the threaded holes in the rear sides of the chassis.
- Step 2** Align the first rack-mount bracket to the threaded holes in the right side of the chassis.
- If you want the front of the chassis protruding out of the rack, align the rack-mount bracket to the chassis as shown in [Figure 3-8](#). If you want the front of the chassis recessed in the rack, align the rack-mount bracket to the chassis as shown in [Figure 3-9](#).

Figure 3-8 *Installing the Rack-Mount Brackets on the Rear of the Chassis so the Front Protrudes Out of the Rack*



(DRAFT LABEL) ALPHA DRAFT - CISCO CONFIDENTIAL**Figure 3-9** Installing the Rack-Mount Brackets on the Rear of the Chassis so the Front is Recessed in the Rack

- Step 3** Thread two M4 x 8-mm Phillips flathead screws through the rack-mount bracket and into the side of the chassis. Use a number 2 Phillips screwdriver to tighten the screws.
- Step 4** Repeat [Step 1](#) through [Step 3](#) for the other rack-mount bracket.
- Step 5** If you plan to include the cable-management brackets in your rear rack-mount configuration, align the first cable-management to the threaded holes in the front sides of the chassis. (Refer to [Figure 3-8](#) and [Figure 3-9](#).)
- Step 6** Thread two M4 x 8-mm Phillips flathead screws through the bracket and into the chassis. Use a number 2 Phillips screwdriver to tighten the screws.
- Step 7** Repeat [Step 5](#) and [Step 6](#) for the other cable-management brackets.

This completes the procedure for installing the rack-mount brackets and cable-management brackets on the Cisco 7204. Proceed to the following section “[Installing the Chassis in the Rack](#).”

**Warning**

To prevent injury, review the safety precautions in [Chapter 2, “Preparing for Installation”](#) before installing the router in a rack.

Installing the Chassis in the Rack

After installing the brackets on the chassis, mount the router by securing the rack-mount brackets to two posts or mounting strips in the rack using the six slotted screws provided. Because the brackets support the weight of the entire chassis, be sure to use all six slotted screws to fasten the two rack-mount brackets to the rack posts. [Figure 3-2](#), [Figure 3-3](#), [Figure 3-4](#), and [Figure 3-5](#) show typical installations in 19-inch, 4-post and 2-post equipment racks.

We recommend that you allow at least one or two inches of vertical clearance between the router and any equipment directly above and below it.

**Warning**

To maintain a low center of gravity, ensure that heavier equipment is installed near the bottom of the rack.

**Warning**

To prevent the rack from tipping when installing the router in telco-type racks, ensure that the rack is bolted to the floor and, if necessary, anchored with appropriate fixtures.

To install the chassis in the rack, complete the following steps:

- Step 1** On the chassis, ensure that all captive screws on the network processing engine, the I/O controller, and each power supply are tightened and the port adapter levers are in the locked position.
- Step 2** Make sure that your path to the rack is unobstructed. If the rack is on wheels, ensure that the brakes are engaged or that the rack is otherwise stabilized.

**Warning**

To prevent damage to the chassis or personal injury, never attempt to lift or tilt the Cisco 7204 using the port adapter handles or the I/O controller handle; they are not designed to support the weight of the router. *Always* have someone help you when installing the Cisco 7204.



Note Two people should perform Step 3 through Step 6.

- Step 3** Position the chassis so that the front end is closest to you; then lift the chassis and move it to the rack. To prevent injury, avoid sudden twists or moves.
- Step 4** Slide the chassis into the rack, pushing it back until the brackets (installed at the front or rear of the chassis) meet the mounting strips or posts on both sides of the equipment rack.
- Step 5** While keeping the brackets flush against the posts or mounting strips, position the router so the holes in the brackets are aligned with those in the mounting strips.
- Step 6** Insert all six 10-32 x 3/8 slotted screws (three on each side) through the brackets and into the mounting strip (use the top and bottom bracket holes, as shown in [Figure 3-2](#), [Figure 3-3](#), [Figure 3-4](#), and [Figure 3-5](#)). Using a 1/4-inch, flat-blade screwdriver, tighten all the screws.

This completes the procedure for installing the chassis in the rack. Proceed to the [“Connecting Port Adapter Cables”](#) section on page 3-13 in this chapter to continue the installation.

General Installation

The router should already be in the area where you will install it, and your installation location should already be determined. If not, refer to the [“Site Requirements”](#) section on page 2-4 in [Chapter 2](#), [“Preparing for Installation.”](#)

When installing the Cisco 7204 on a workbench or tabletop, ensure that the surface is clean and in a safe location and that you have considered the following:

- The router requires at least three inches of clearance at the inlet and exhaust vents (the right and left sides of the router).
- The router should be installed off the floor. (Dust that accumulates on the floor is drawn into the interior of the router by the cooling fans. Excessive dust inside the router can cause overtemperature conditions and component failures.)

(DRAFT LABEL) ALPHA DRAFT - CISCO CONFIDENTIAL

- There must be approximately 19 inches of clearance at the front and rear of the router for installing and replacing router FRUs, or accessing network cables or equipment.
- Port adapter and power supply filler panels are installed.
- The router will receive adequate ventilation (it is not being installed in an enclosed cabinet where ventilation is inadequate).
- If you plan to install the cable-management brackets on the front of the chassis, you have unpacked and set aside the two cable-management brackets and four M4 x 8-mm Phillips flathead screws.
- Provide an adequate chassis ground (earth) connection for your router chassis.



Note We strongly recommend that you provide a chassis ground connection. Refer to the following section [“Providing a Chassis Ground Connection for the Router Chassis”](#) for instructions.

Following are the steps for installing the Cisco 7204 on a workbench or tabletop:

-
- Step 1** Remove any debris and dust from the tabletop or workbench, as well as the surrounding area. Also make sure your path between the router and its new location is unobstructed.
 - Step 2** On the chassis, ensure that all captive screws on the network processing engine, the I/O controller, and each power supply are tightened and the port adapter levers are in the locked position.

**Warning**

To prevent damage to the chassis or personal injury, never attempt to lift or tilt the Cisco 7204 using the port adapter handles or the I/O controller handle; they are not designed to support the weight of the router. Always have someone help you when installing the Cisco 7204.

-
- Step 3** Lift the chassis by placing your hands around the chassis sides and lifting the chassis from underneath. To prevent injury, avoid sudden twists or moves.
 - Step 4** Place the router on the tabletop or workbench.
 - Step 5** Ensure that there is at least three inches of clearance at the inlet and exhaust vents of the router and no exhaust air from other equipment will be drawn into the chassis. Also, ensure that there is approximately 19 inches of clearance at the front and rear of the chassis.

This completes the general installation.

To install the cable-management brackets on the Cisco 7204, complete the following steps:

-
- Step 1** Locate the threaded holes in the front sides of the chassis.
 - Step 2** Align the first cable-management bracket to the threaded holes in the right side of the chassis. (Refer to [Figure 3-9](#).)
 - Step 3** Thread two M4 x 8-mm Phillips flathead screws through the bracket and into the chassis. Use a number 2 Phillips screwdriver to tighten the screws.
 - Step 4** Repeat Step 1 through Step 3 for the other cable-management bracket.

This completes the steps for installing the cable-management brackets on the Cisco 7204.

To secure port adapter interface cables to the cable-management brackets, complete the following steps:

**Note**

The eight removable tie wraps installed on the cable-management brackets secure port adapter interface cables to the brackets. We recommend that you use the tie wraps that shipped with the cable-management brackets. You can use standard tie wraps; however, you will have to cut and replace them with new tie wraps when you want to release or secure an interface cable to a bracket.

Step 1 Select a tie wrap and release its locking mechanism.

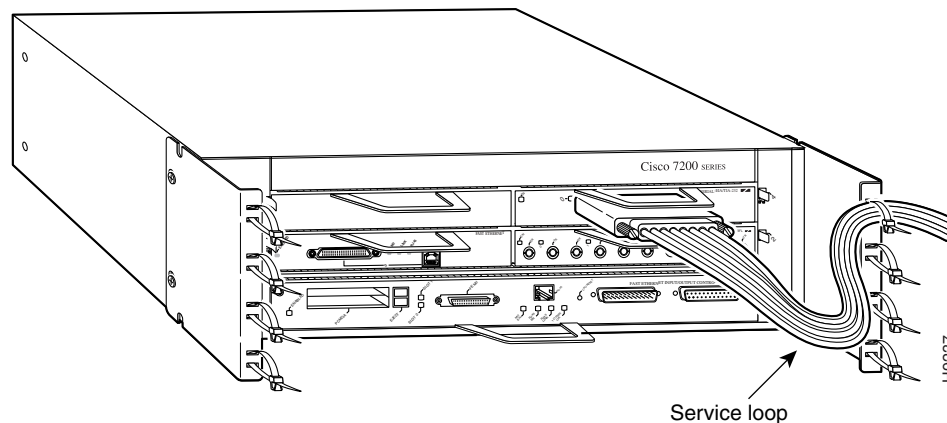
Step 2 Carefully lace the interface cables from a port adapter installed in the chassis between the two ends of the unlocked tie wrap.

**Note**

Be sure to leave a small service loop in the interface cable before securing it to the cable-management bracket.

Step 3 With the interface cables between the ends of the tie wrap and the interface cables' service loop in place, tighten the cable tie down around the interface cables until they are secured against the cable-management bracket. (Refer to [Figure 3-10](#).)

Figure 3-10 Securing Interface Cables to the Cable-Management Brackets



Step 4 Repeat Step 1 through Step 3 for any other port adapter interface cables installed in the router.

This completes the procedure for securing port adapter interface cables to the cable-management brackets. Proceed to the following section, “[Providing a Chassis Ground Connection for the Router Chassis](#),” to continue the installation.

Providing a Chassis Ground Connection for the Router Chassis

Before you connect power or turn on power to your router, we strongly recommend that you provide an adequate chassis ground (earth) connection for your router's chassis. Chassis grounding receptacles are provided on each Cisco 7204 router chassis. (Refer to [Figure 1-3](#).)

(DRAFT LABEL) ALPHA DRAFT - CISCO CONFIDENTIAL



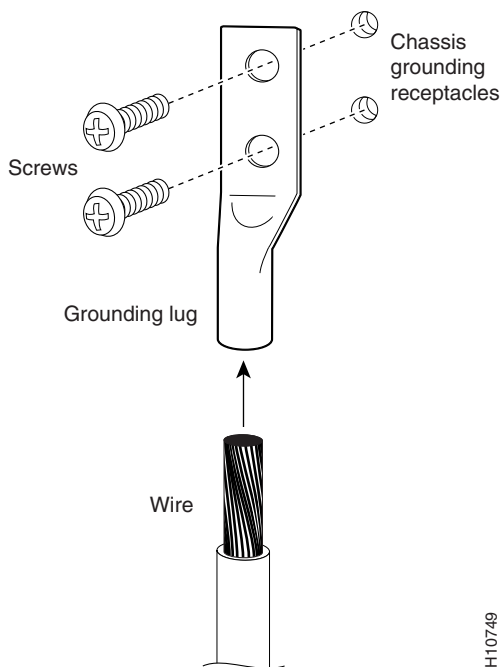
Note Older Cisco 7204 router chassis do not have the grounding receptacles.

To ensure the chassis grounding connection that you provide is adequate, you will need the following parts and tools:

- 1 grounding lug—Must have two number-10 screw holes that have a 0.63-inch (16.002-mm) spacing between them, and a wire receptacle large enough to accept a 6-AWG multistrand, copper wire. (See [Figure 3-11](#).) This grounding lug is not available from Cisco Systems; electrical-connector vendors provide this type of grounding lug.
- 2 Phillips-head machine screws with locking washers—M5 (metric), 0.031-inch (0.8-mm) pitch, 0.315-inch (8-mm) length. These screws are not available from Cisco Systems; they are available from any commercial hardware vendor.
- 1 grounding wire—6 AWG, 0.162-inch (4.115-mm) diameter, with approximately 0.108-inch (2.743-mm) insulation, for a total wire diameter of approximately 0.27 inches (6.858 mm). The wire’s length is dependent on your router location and site environment. This wire is not available from Cisco Systems; it is available from any commercial cable vendor.
- Number 2 Phillips screwdriver.
- Crimping tool large enough to accommodate the diameter of the wire receptacle on your grounding lug.
- Wire stripping tool.

Use the following procedure to attach the grounding lug to the chassis grounding receptacles on your router chassis:

Figure 3-11 Attaching a Grounding Lug to the Chassis Grounding Receptacles



H10749

-
- Step 1** Use the wire stripping tool to strip one end of the 6-AWG wire approximately 0.75 inches (19.05 mm).
 - Step 2** Insert the 6-AWG wire into the wire receptacle on the grounding lug. (See [Figure 3-11](#).)
 - Step 3** Use the crimping tool to carefully crimp the wire receptacle around the wire; this step is required to ensure a proper mechanical connection.
 - Step 4** Locate the chassis grounding receptacles on your router chassis (refer to [Figure 1-3](#) in [Chapter 1](#), “[Product Overview](#).”)
 - Step 5** Insert the two screws through the holes in the grounding lug. (See [Figure 3-11](#).) Ensure that the grounding lug does not interfere with other router hardware, such as power supplies or the network processing engine.
 - Step 6** Use the Phillips screwdriver to carefully tighten the screws until the grounding lug is held firmly to the chassis. Do not overtighten the screws. (See [Figure 3-11](#).)
 - Step 7** Connect the opposite end of the grounding wire to the appropriate grounding point at your site to ensure an adequate chassis ground.
-

This completes the procedure for providing a chassis ground connection.

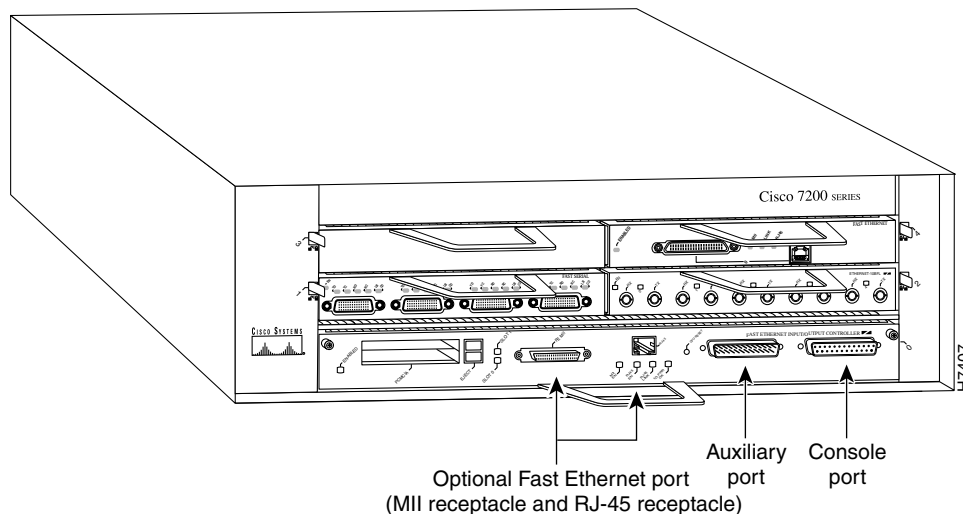
Connecting Port Adapter Cables

The instructions for connecting the cables for each port adapter installed in the Cisco 7204 are contained in the respective configuration note for each port adapter (service adapters do not have cables). For example, if you are connecting the cables for a PA-A3 enhanced ATM port adapter, refer the configuration note *PA-A3 Enhanced ATM Port Adapter Installation and Configuration*. This document is available on Cisco.com.

Instructions for securing port adapter interface cables to the cable-management brackets are contained in the section ““[General Installation](#)” section on page 3-9” earlier in this chapter.

Connecting I/O Controller Cables

The console and auxiliary ports for the Cisco 7204 are located on the I/O controller. The I/O controller also has an optional Fast Ethernet port (refer to [Figure 3-12](#)). This section contains connection equipment and pinout information for the console, auxiliary, and Fast Ethernet ports on the I/O controller.

(DRAFT LABEL) ALPHA DRAFT - CISCO CONFIDENTIAL**Figure 3-12 Cisco 7204 I/O Controller Connections**

Console and Auxiliary Port Connection Equipment

The I/O controller has two EIA/TIA-232 ports: a DCE-mode console port and a DTE-mode auxiliary port. (Refer to [Figure 3-13](#).) The console port is a DCE DB-25 port for connecting a data terminal, which you will use to configure the interfaces and bring up the router. The auxiliary port is a DTE DB-25 plug for connecting a modem or other DCE device (such as a CSU/DSU or other router) to the Cisco 7204.

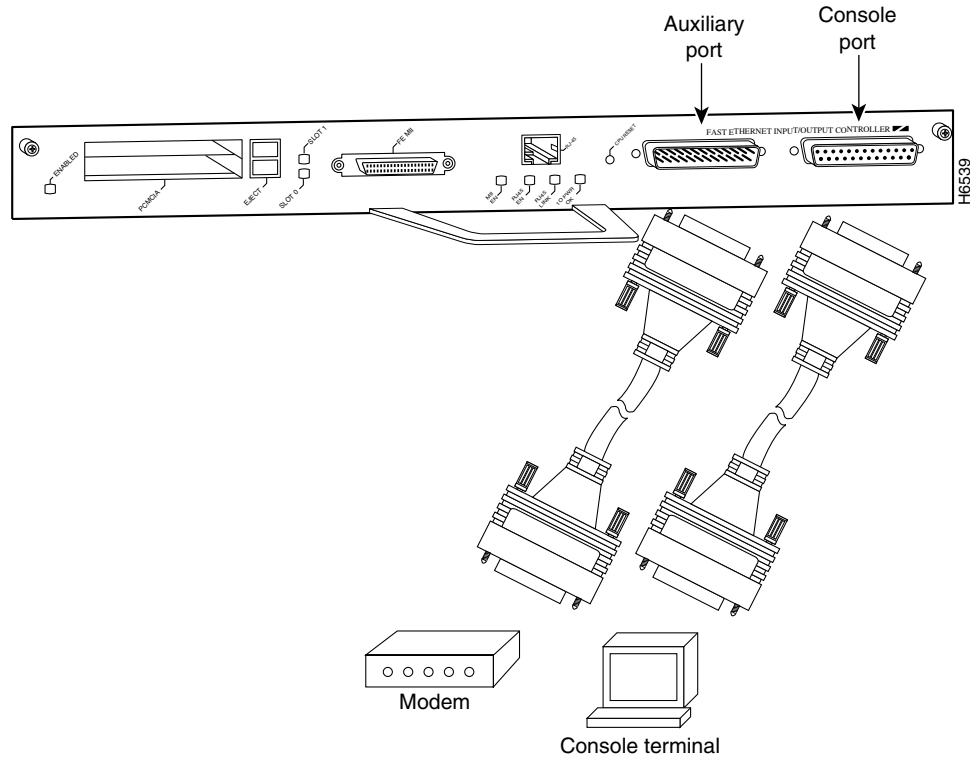

Note

Both the console and auxiliary ports are asynchronous serial ports; any devices connected to these ports must be capable of asynchronous transmission. (Asynchronous is the most common type of serial device; for example, most modems are asynchronous devices.)

Before connecting a terminal to the console port, configure the terminal to match the router console port as follows: 9600 baud, 8 data bits, no parity, 2 stop bits (9600 8N2). You need an EIA/TIA-232 DCE console cable to connect the terminal to the console port. After you establish normal router operation, you can disconnect the terminal.

You must supply your own interface cable between the auxiliary port and the equipment you are connecting. For console and auxiliary port pinouts, refer to the following sections “[Console Port Signals](#)” and “[Auxiliary Port Signals](#).”

Figure 3-13 Console and Auxiliary Port Connections



Console Port Signals

Table 3-1 lists the signals used on the console port. The console port does not support modem control or hardware flow control. Both Data Set Ready (DSR) and Data Carrier Detect (DCD) signals are active when the system is running. The Request To Send (RTS) signal tracks the state of the Clear to Send (CTS) input. The console port requires a straight-through EIA/TIA-232 cable.

Table 3-1 Console Port Signals

Pin	Signal	Direction	Description
1	GND	–	Ground
2	TxD	<—	Transmit Data
3	RxD	—>	Receive Data
6	DSR	—>	Data Set Ready (always on)
7	GND	–	Ground
8	DCD	—>	Data Carrier Detect (always on)

(DRAFT LABEL) ALPHA DRAFT - CISCO CONFIDENTIAL**Auxiliary Port Signals**

Table 3-2 lists the signals used on the auxiliary port. The auxiliary port supports hardware flow control and modem control.

Table 3-2 Auxiliary Port Signals

Pin	Signal	Direction	Description
2	TxD	—>	Transmit Data
3	RxD	<—	Receive Data
4	RTS	—>	Request To Send (used for hardware flow control)
5	CTS	<—	Clear To Send (used for hardware flow control)
6	DSR	<—	Data Set Ready
7	Signal Ground	—	Signal Ground
8	CD	<—	Carrier Detect (used for modem control)
20	DTR	—>	Data Terminal Ready (used for modem control only)

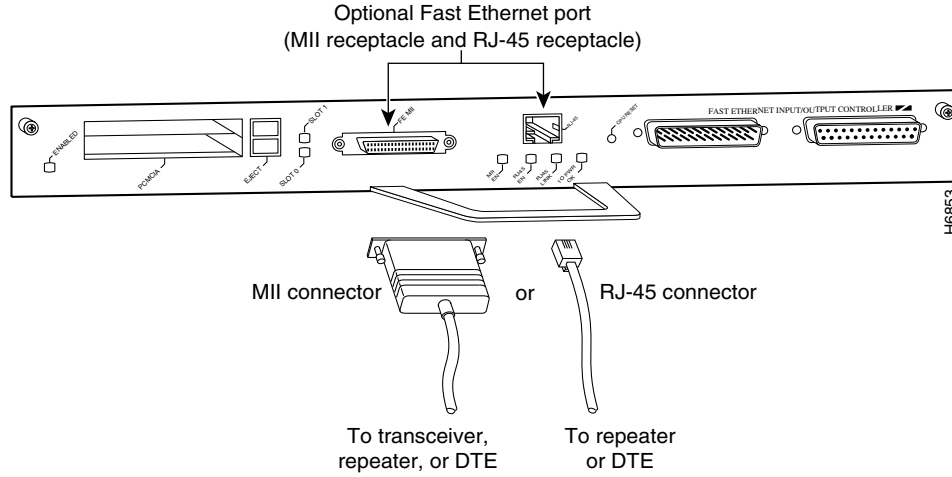
Fast Ethernet Connection Equipment

The I/O controller is available with or without a Fast Ethernet port. The I/O controller with a Fast Ethernet port is equipped with either a single MII port or an MII port and an RJ-45 port (only one port can be used at a time). Although still supported by Cisco Systems, the I/O controller equipped with the single MII port was discontinued as an orderable product in May 1998. The following sections explain Fast Ethernet MII and RJ-45 connection equipment.

Fast Ethernet MII Connection Equipment

The MII port on the I/O controller is a 40-pin, D-shell type connector that is configurable for 100 megabits per second (Mbps) full-duplex or half-duplex (half-duplex is the default). The MII port supports IEEE 802.3u interfaces compliant with the 100BASE-X and 100BASE-T standards. The MII connection requires an external transceiver that permits connection to multimode fiber for 100BASE-FX or 100BASE-T4 physical media (refer to [Figure 3-14](#)).

Figure 3-14 Fast Ethernet Port Connection



Depending on the type of media you use between the MII connection and your switch or hub, the network side of your 100BASE-T transceiver should be appropriately equipped with ST-type connectors (for optical fiber), BNC connectors, and so forth.

Figure 3-15 shows the pin orientation of the MII port on the I/O controller.

The MII port uses 2-56 screw-type locks, called jackscrews, to secure the cable or transceiver to the MII port. MII cables and transceivers have knurled thumbscrews that you fasten to the jackscrews on the MII connector and tighten with your fingers. Use the jackscrews to secure your MII cable to the MII port.

Figure 3-15 MII Port

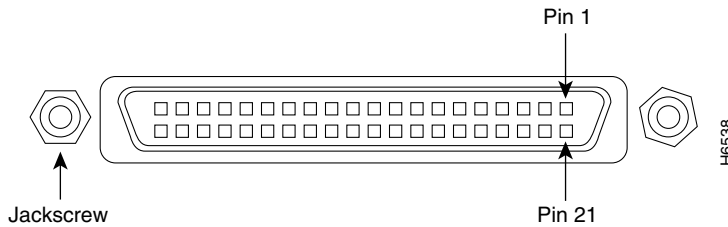


Table 3-2 lists the pinouts and signals for the I/O controller MII port.

Table 3-3 MII Port Pinout

Pin ¹	In	Out	I/O	Description
14–17	–	Yes	–	Transmit Data (TxD)
12	Yes	–	–	Transmit Clock (Tx_CLK) ²
11	–	Yes	–	Transmit Error (Tx_ER)
13	–	Yes	–	Transmit Enable (Tx_EN)
3	–	Yes	–	MII Data Clock (MDC)
4–7	Yes	–	–	Receive Data (RxD)
9	Yes	–	–	Receive Clock (Rx_CLK)
10	Yes	–	–	Receive Error (Rx_ER)

(DRAFT LABEL) ALPHA DRAFT - CISCO CONFIDENTIAL**Table 3-3 MII Port Pinout (continued)**

Pin ¹	In	Out	I/O	Description
8	Yes	–	–	Receive Data Valid (Rx_DV)
18	Yes	–	–	Collision (COL)
19	Yes	–	–	Carrier Sense (CRS)
2	–	–	Yes	MII Data Input/Output (MDIO)
22–39	–	–	–	Common (ground)
1, 20, 21, 40	–	–	–	+5.0 volts (V)

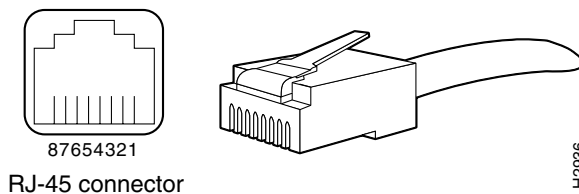
1. Any pins not indicated are not used.
2. Tx_CLK and Rx_CLK are provided by the external transceiver.

Fast Ethernet RJ-45 Connection Equipment

The RJ-45 port on the I/O controller is configurable for 100 Mbps full-duplex or half-duplex (half-duplex is the default) and supports IEEE 802.3, Ethernet, and IEEE 802.3u interfaces compliant with 10BASE-T and 100BASE-TX specifications.

The RJ-45 port supports standard straight-through and crossover Category 5 UTP cables (refer to [Figure 3-14](#)). Cisco Systems does not supply Category 5 UTP cables; these cables are available commercially.

[Figure 3-16](#) shows the RJ-45 connector. [Table 3-4](#) lists the pinouts and signals for the RJ-45 port.

Figure 3-16 RJ-45 Port and Plug**Warning**

To avoid electric shock, do not connect safety extra-low voltage (SELV) circuits to telephone-network voltage (TNV) circuits. LAN ports contain SELV circuits, and WAN ports contain TNV circuits. Some LAN and WAN ports both use RJ-45 connectors. Use caution when connecting cables.

Table 3-4 RJ-45 Port Pinout

Pin	Description
1	Receive Data + (RxD+)
2	RxD–
3	Transmit Data + (TxD+)
6	TxD–



Note

Referring to the RJ-45 pinout in [Figure 3-17](#), proper common-mode line terminations should be used for the unused Category 5, UTP cable pairs 4/5 and 7/8. Common-mode termination reduces electromagnetic interference (EMI).

Depending on your I/O controller RJ-45 interface cabling requirements, use the pinouts shown in [Figure 3-17](#) and [Figure 3-18](#) for straight-through and crossover twisted-pair cable connections.

Figure 3-17 Straight-Through Cable Pinout, I/O Controller RJ-45 Connection to an End Station or DTE

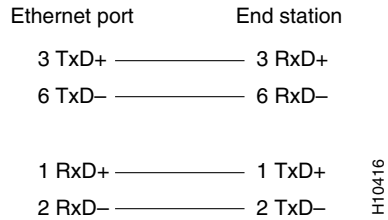
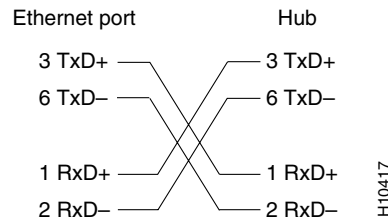
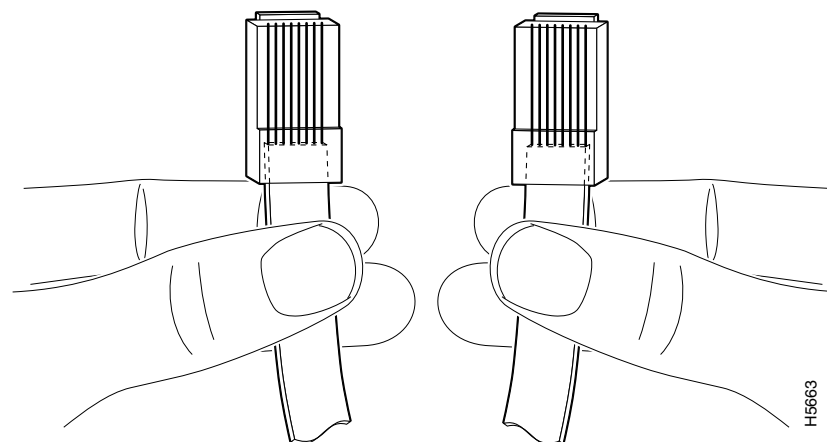


Figure 3-18 Crossover Cable Pinout, I/O Controller RJ-45 Connection to an End Station or DTE



To identify the RJ-45 cable type, hold the two ends of the cable next to each other so you can see the colored wires inside the ends, as shown in [Figure 3-19](#).

Figure 3-19 RJ-45 Cable Identification



H5663

(DRAFT LABEL) ALPHA DRAFT - CISCO CONFIDENTIAL

Examine the sequence of colored wires to determine the type of RJ-45 cable as follows:

- Straight-through—The colored wires are in the same sequence at both ends of the cable.
- Crossover—The first (far left) colored wire at one end of the cable is the third colored wire at the other end of the cable, and the second colored wire at one end of the cable is the sixth colored wire at the other end of the cable.

Connecting Power



Warning

Read the installation instructions before you connect the system to its power source.

This section provides the procedures for connecting AC-input and DC-input power to your Cisco 7204.



Note

Detailed instructions for handling and replacing the Cisco 7204 power supplies are contained in the configuration notes *280-Watt AC-Input Power Supply Replacement Instructions* and *280-Watt DC-Input Power Supply Replacement Instructions*. These documents are available on Cisco.com.



Warning

Only trained and qualified personnel should be allowed to install or replace this equipment.

Connecting AC-Input Power

Connect a 280W AC-input power supply as follows:

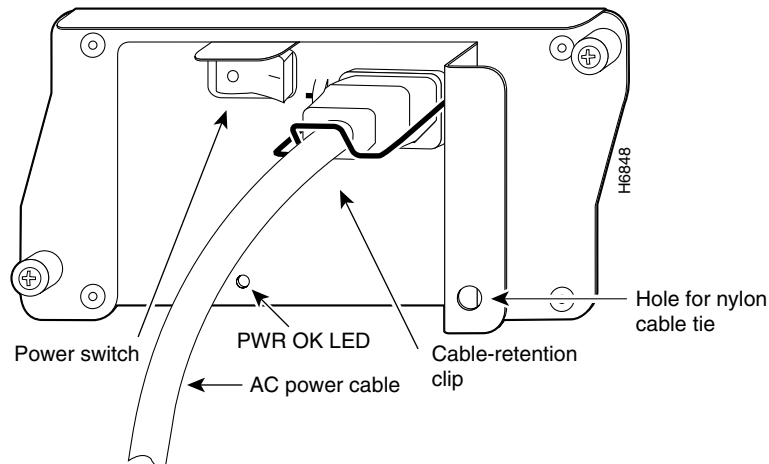
-
- Step 1** At the rear of the router, check that the power switch on the power supply is in the OFF (O) position.
- Step 2** Slide the cable-retention clip up, away from the AC receptacle, and plug in the power cable.
- Step 3** Secure the cable in the power supply AC receptacle by sliding the cable-retention clip up until it fits around the connector. The cable-retention clip provides strain relief for the AC power cable (refer to [Figure 3-20](#)).



Note

For additional AC power cable strain relief, secure the cable to the power supply handle by inserting a nylon cable tie through the hole in the handle and around the cable.

Figure 3-20 Connecting AC-Input Power



- Step 4** Plug the AC power supply cable into the AC power source.
- Step 5** Repeat Step 1 through Step 4 for the second power supply (if present).

This completes the procedure for connecting AC-input power.

Connecting DC-Input Power

Connect a 280W DC-input power supply as follows:



Note

The color coding of the DC-input power supply leads depends on the color coding of the DC power source at your site. Typically, green or green/yellow is used for ground, black is used for +48V (return), and red or white is used for -48V. Make certain the lead color coding you choose for the DC-input power supply matches lead color coding used at the DC power source.



Warning

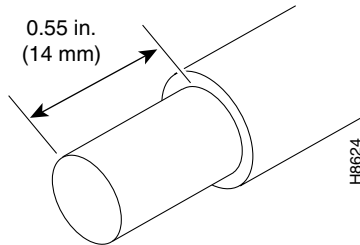
Before completing any of the following steps, and to prevent short-circuit or shock hazards, ensure that power is removed from the DC circuit. To ensure that all power is OFF, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the OFF position, and tape the switch handle of the circuit breaker in the OFF position.



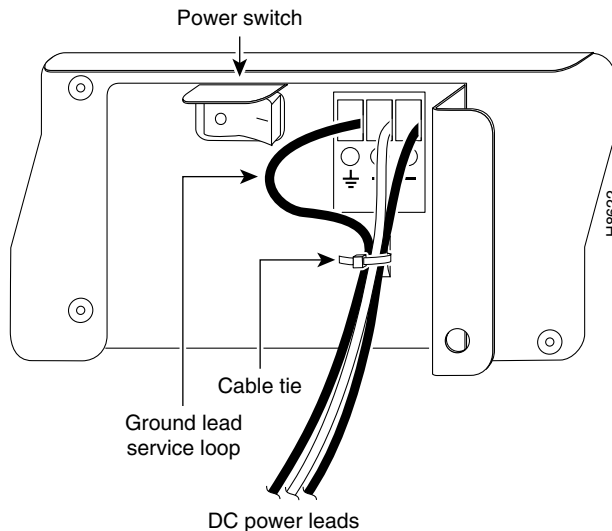
Warning

When installing the unit, the ground connection must always be made first and disconnected last.

- Step 1** Ensure that the -48V and +48V leads are disconnected from the power source.
- Step 2** Using a wire stripper, strip approximately 0.55 inch (14 mm) from the -48V, +48V, and ground leads (refer to [Figure 3-21](#)).

(DRAFT LABEL) ALPHA DRAFT - CISCO CONFIDENTIAL**Figure 3-21 Stripping the DC-Input Leads**

- Step 3** At the rear of the router, check that the power switch on the power supply is in the OFF (O) position (refer to [Figure 3-22](#)).
- Step 4** Insert the stripped end of the ground lead all the way into the ground lead receptacle on the DC-input power supply and tighten the receptacle screw using a 3/16-inch flat-blade screwdriver (refer to [Figure 3-22](#)).

Figure 3-22 Connecting DC-Input Power

- Step 5** Insert the stripped end of the +48V lead all the way into the +48V lead receptacle and tighten the receptacle screw using the same 3/16-inch flat-blade screwdriver. Repeat this step for the -48V lead.



Note Make sure the entire stripped end of each lead is inserted all the way into its receptacle. If any exposed wire at the stripped end of a lead is visible after inserting the lead into its receptacle, remove the lead from the receptacle, use the wire stripper to cut the stripped end of the lead, and repeat [Step 2](#) through [Step 5](#).

- Step 6** After tightening the receptacle screw for the ground, +48V, and -48V DC-input leads, use the cable tie you saved earlier in this procedure to secure the three leads to the power supply faceplate.



Note When securing the ground, +48V, and –48V DC-input leads to the power supply faceplate, leave a small service loop in the ground lead to ensure that the ground lead is the last lead to disconnect from the power supply if a great deal of strain is placed on all three leads (refer to [Figure 3-22](#)).

Step 7 Connect the ground, +48V, and –48V leads to the power source.



Note Each DC-input power supply operating at –48 VDC in North America requires a minimum of 13A service. Each DC-input power supply operating at –60 VDC in the European Community requires a minimum of 8A service.

This product relies on the building's installation for short-circuit (overcurrent) protection. Ensure that a listed and certified fuse or circuit breaker, 20A minimum 60 VDC, is used on all current-carrying conductors.

This completes the procedure for connecting DC-input power. Proceed to the following section, “[Starting the Cisco 7204](#),” to start the router.

Starting the Cisco 7204

After installing your Cisco 7204 and connecting cables, start the router as follows:

- Step 1** Check for the following:
- Each port adapter is inserted in its slot and its respective port adapter lever is in the locked position.
 - The network processing engine and the I/O controller are inserted in their slots and their captive installation screws are tightened.
 - All network interface cables are connected to the port adapters.
 - A Flash memory card is installed in its PCMCIA slot.
 - Each power cable is connected and secured with the cable-retention clip.
 - The console terminal is turned on.
- Step 2** At the rear of the router, place the power switch on the power supply in the ON (I) position. Repeat this if a second power supply is installed. The green OK LED on the power supply turns on.
- Step 3** Listen for the fans; you should immediately hear them operating.
- Step 4** During the boot process, observe the system LEDs. The LEDs on most of the port adapters go on and off in irregular sequence. Some may go on, go out, and go on again for a short time. On the I/O controller, the IO power OK LED comes on immediately.

(DRAFT LABEL) ALPHA DRAFT - CISCO CONFIDENTIAL

- Step 5** Observe the initialization process. When the system boot is complete (a few seconds), the network processing engine begins to initialize the port adapters and the I/O controller. During this initialization, the LEDs on each port adapter behave differently (most flash on and off). The enabled LED on each port adapter goes on when initialization is completed, and the console screen displays a script and system banner similar to the following:

```
Cisco Internetwork Operating System Software
IOS (tm) 7200 Software (C7200-J-M), Version 11.1(17)CA
Copyright (c) 1986-1996 by cisco Systems, Inc.
Compiled Sun 21-Apr-96 04:10 by
```

- Step 6** When you start up the Cisco 7204 for the first time, the system automatically enters the setup command facility, which determines which port adapters are installed and prompts you for configuration information for each one. On the console terminal, after the system displays the system banner and hardware configuration, you will see the following System Configuration Dialog prompt:

```
--- System Configuration Dialog ---
```

```
At any point you may enter a questions mark '?' for help.
Use ctrl-c to abort configuration dialog at any prompt.
Default settings are in square brackets '['].
```

```
continue with configuration dialog? [yes]:
```

You have the option of proceeding with the setup command facility to configure the interfaces, or exiting from setup and using configuration commands to configure global (system-wide) and interface-specific parameters. You do not have to configure the interfaces immediately; however, you cannot enable the interfaces or connect them to any networks until you have configured them.

Many of the port adapter LEDs will not go on until you have configured the interfaces. To verify correct operation of each interface, complete the first-time startup procedures and configuration, then refer to the configuration note for each port adapter for LED descriptions and to check the status of the interfaces.

Your installation is complete. Proceed to [Chapter 4, “Performing a Basic Configuration of the Cisco 7204”](#) to perform a basic configuration for your Cisco 7204.

If the system does not complete each of the steps in the startup procedure, proceed to [Chapter 5, “Troubleshooting the Installation”](#) for troubleshooting recommendations and procedures.