



CHAPTER 3

Removing and Installing Port Adapters

This chapter describes how to remove the Cisco PA-T3/E3-EC port adapters from the supported platform and also how to install a new or replacement port adapter. This chapter contains the following sections:

- [Handling Port Adapters, page 3-2](#)
- [Online Insertion and Removal, page 3-2](#)
- [Warnings and Cautions, page 3-3](#)
- [Port Adapter Removal and Installation, page 3-4](#)
- [Cables and Connectors, page 3-7](#)



Note

When a port adapter slot is not in use, a port adapter blank panel must fill the empty slot to allow the router or switch to conform to electromagnetic interference (EMI) emissions requirements and to allow proper airflow across the port adapters. If you plan to install a new port adapter in a slot that is not in use, you must first remove the port adapter blank panel.



Caution

When powering off the router, wait a minimum of 30 seconds before powering it on again.

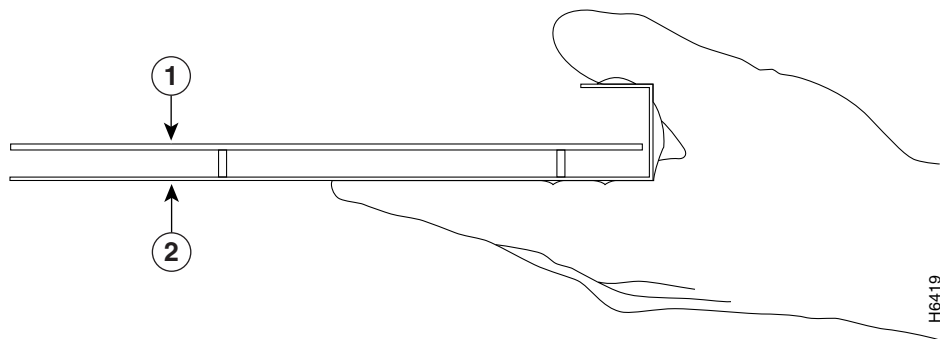
Handling Port Adapters

Each port adapter circuit board is mounted to a metal carrier and is sensitive to electrostatic discharge (ESD) damage.



Caution Always handle the port adapter by the carrier edges and handle; never touch the port adapter components or connector pins. (See [Figure 3-1](#).)

Figure 3-1 Handling a Port Adapter



1	Printed circuit board	2	Metal carrier
----------	-----------------------	----------	---------------

Online Insertion and Removal

The Cisco 7200 VXR and Cisco 7301 platforms support online insertion and removal (OIR) of port adapters; therefore, you do not have to power down routers when removing and replacing a PA-T3/E3-EC in Cisco 7200 VXR routers or the Cisco 7301 router.



Note As you disengage the module from the router or switch, online insertion and removal (OIR) administratively shuts down all active interfaces in the module.

It is wise to gracefully shut down the system before removing a port adapter that has active traffic moving through it. Removing a module while traffic is flowing through the ports can cause system disruption. Once the module is inserted, the ports can be brought back up.



Note After removing a PA-T3/E3-EC, wait 3 minutes before reinstalling or reinserting a PA-T3/E3-EC.



Note Online insertion and removal (OIR) is not supported on the Port Adapter Jacket Card. OIR is supported on the port adapter. You must have the chassis powered off to install or remove the Port Adapter Jacket Card.

OIR allows you to install and replace modules while the router is operating; you do not need to notify the software or shut down the system power, although you should not run traffic through the module you are removing while it is being removed. OIR is a method that is seamless to end users on the network, maintains all routing information, and preserves sessions.

The following is a functional description of OIR for background information only; for specific procedures for installing and replacing a module in a supported platform, refer to the [“Port Adapter Removal and Installation” section on page 3-4](#).

Each module has a bus connector that connects it to the router. The connector has a set of tiered pins in three lengths that send specific signals to the system as they make contact with the module. The system assesses the signals it receives and the order in which it receives them to determine if a module is being removed from or introduced to the system. From these signals, the system determines whether to reinitialize a new interface or to shut down a disconnected interface.

Specifically, when you insert a module, the longest pins make contact with the module first, and the shortest pins make contact last. The system recognizes the signals and the sequence in which it receives them.

When you remove or insert a module, the pins send signals to notify the system of changes. The router then performs the following procedure:

1. Rapidly scans the system for configuration changes.
2. Initializes newly inserted port adapters or administratively shuts down any vacant interfaces.
3. Brings all previously configured interfaces on the module back to their previously installed state. Any newly inserted interface is put in the administratively shutdown state, as if it was present (but not configured) at boot time. If a similar module type is reinserted into a slot, its ports are configured and brought online up to the port count of the originally installed module of that type.

**Note**

Before you begin installation, read [Chapter 2, “Preparing for Installation,”](#) for a list of parts and tools required for installation.

Warnings and Cautions

Observe the following warnings and cautions when installing or removing port adapters.

**Note**

If a port adapter locking lever or other retaining mechanism does not move to the locked position, the port adapter is not completely seated in the midplane. Carefully pull the port adapter halfway out of the slot, reinsert it, and move the port adapter locking lever or other mechanism to the locked position.

**Caution**

To prevent jamming the carrier between the upper and the lower edges of the port adapter slot, and to ensure that the edge connector at the rear of the port adapter mates with the connection at the rear of the port adapter slot, make certain that the carrier is positioned correctly, as shown in the cutaway in the following illustrations.

**Caution**

When performing the following procedures, wear a grounding wrist strap to avoid ESD damage to the card. Some platforms have an ESD connector for attaching the wrist strap.

Port Adapter Removal and Installation

In this section, the illustrations that follow give step-by-step instructions on how to remove and install port adapters. This section contains the following illustrations:

- [Cisco 7200 VXR Routers—Removing and Installing a Port Adapter, page 3-5](#)
- [Cisco 7201 Router—Removing and Installing a Port Adapter, page 3-6](#)
- [Cisco 7301 Router—Removing and Installing a Port Adapter, page 3-7](#)

**Warning**

Hazardous voltage or energy is present on the backplane when the system is operating. Use caution when servicing. Statement 1034

**Note**

After removing a PA-T3/E3-EC, wait 3 minutes before reinstalling or reinserting a PA-T3/E3-EC.

Cisco 7200 VXR Routers—Removing and Installing a Port Adapter

Figure 3-2 Installing a Port Adapter in a Cisco 7200 VXR Router

Step 1

To remove the port adapter, place the port adapter lever in the unlocked position. (See A.) The port adapter lever remains in the unlocked position.

Step 2

Grasp the handle of the port adapter and pull the port adapter from the router, about halfway out of its slot. If you are removing a blank port adapter, pull the blank port adapter completely out of the chassis slot.

Step 3

With the port adapter halfway out of the slot, disconnect all cables from the port adapter. After disconnecting the cables, pull the port adapter from its chassis slot.

Step 4

To insert the port adapter, carefully align the port adapter carrier between the upper and the lower edges of the port adapter slot. (See B.)

Step 5

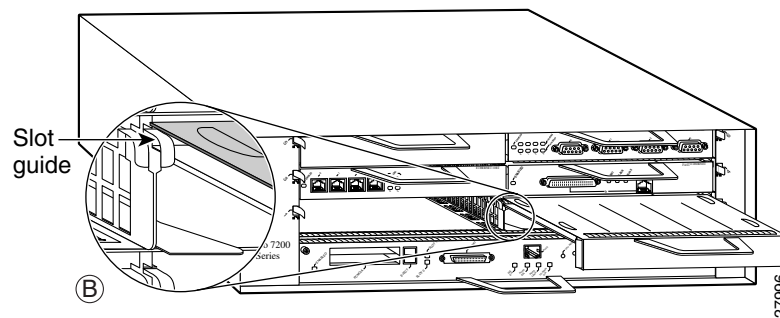
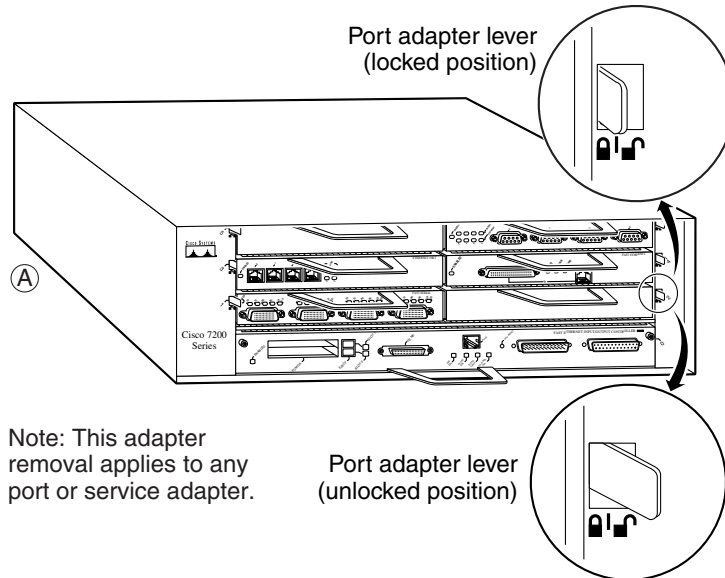
Carefully slide the new port adapter halfway into the port adapter slot. (See B.)

Step 6

With the port adapter halfway into the slot, connect all required cables to the port adapter. After connecting all required cables, carefully slide the port adapter all the way into the slot until the port adapter is seated in the router midplane.

Step 7

After the port adapter is properly seated, lock the port adapter lever. (See A.)



Cisco 7201 Router—Removing and Installing a Port Adapter

Step 1

Use an ESD wrist strap to ground yourself to the router.

Step 2

To remove the port adapter, place the port adapter lever in the unlocked position. The port adapter lever remains in the unlocked position.

Step 3

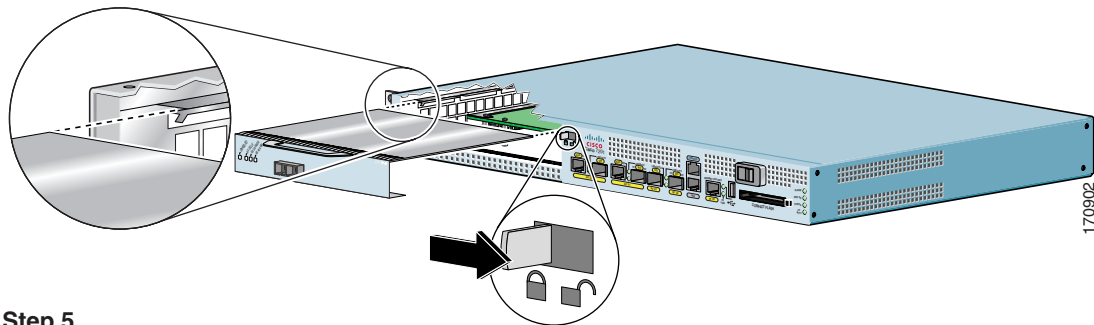
Grasp the handle of the port adapter and pull the port adapter about halfway out of its slot. If you are removing a blank port adapter, pull the blank port adapter completely out of the chassis slot.

Step 4

With the port adapter halfway out of the slot, disconnect all cables from the port adapter. After disconnecting the cables, pull the port adapter from the chassis slot.

Caution

The port adapter must slide into the slot guides close to the chassis lid. Do not allow the port adapter components to come in contact with the system board or the port adapter could be damaged.



Step 5

To insert the port adapter, carefully align the port adapter carrier in the slot guides. Slide the new port adapter halfway into the chassis.

Step 6

Connect all the required cables to the port adapter. After connecting all required cables, carefully slide the port adapter all the way into the slot until the port adapter is seated in the midplane.

Step 7

After the port adapter is properly seated, lock the port adapter lever.

Cisco 7301 Router—Removing and Installing a Port Adapter

Figure 3-3 Installing a Port Adapter in a Cisco 7301 Router

Step 1

Use an ESD wrist strap to ground yourself to the router.

Step 2

To remove a port adapter, use a Phillips screwdriver to turn the screw holding the port adapter latch. The screw should be loose enough to allow the latch to rotate to an unlocked position. (See A.) The latch can rotate 360°.

Step 3

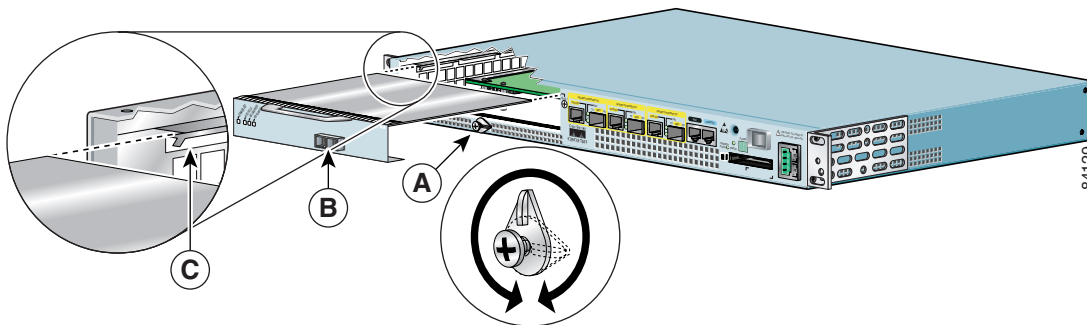
Grasp the handle and pull the port adapter from the router, about halfway out of its slot. (See B.) If you are removing a blank port adapter, pull the blank port adapter completely out of the chassis slot.

Step 4

With the port adapter halfway out of the slot, disconnect all cables from the port adapter. After disconnecting the cables, pull the port adapter from its chassis slot.

Caution

The port adapter must slide into the slot guides close to the chassis lid. (See C.) Do not allow the port adapter components to come in contact with the system board or the port adapter could be damaged.



Step 5

To insert the port adapter, carefully align the port adapter carrier in the slot guides. (See C.) Slide the new port adapter halfway into the chassis.

Step 6

Connect all required cables to the port adapter. After connecting all required cables, carefully slide the port adapter all the way into the slot until the port adapter is seated in the midplane.

Step 7

After the port adapter is properly seated, turn and secure the port adapter latch in the upright, locked position. (See A.) Tighten the screw to ensure the port adapter remains firmly in place.

Cables and Connectors

The interface connectors on the PA-T3/E3-EC are coaxial BNC types, with one connector for transmit (TX) and one for receive (RX). The BNC connectors are transformer-coupled to the PA-T3/E3-EC line interface unit (LIU), which is the analog physical interface on the PA-T3/E3-EC.

The pinout and signal descriptions for the BNC connectors on the PA-T3/E3-EC are as follows:

- Transmit (TX)—Transmitted signals appear on the center contact, and the outer shield is grounded for the 75-ohm 734A coaxial cable you attach to the TX BNC connector.
- Receive (RX)—Received signals appear on the center contact, and the outer shield is grounded for the 75-ohm 734A coaxial cable you attach to the RX BNC connector.

**Caution**

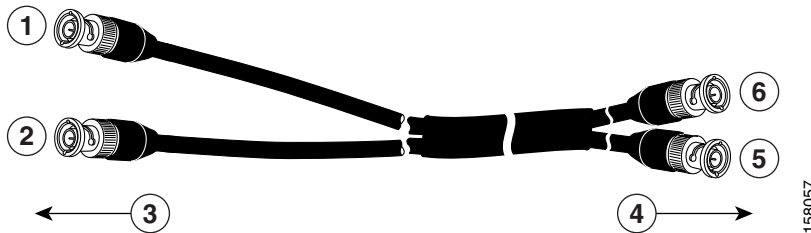
To prevent problems when long cable lengths are required, you *must* ensure that your 75-ohm coaxial cables meet or exceed 734A specifications.

Figure 3-4 shows the typical 75-ohm 734A coaxial cable pair recommended for use with the PA-T3/E3-EC. Use one 75-ohm coaxial cable for each PA-T3/E3-EC connection: RX and TX.

**Note**

Cisco Systems does not supply cables with the PA-T3/E3-EC. You must supply your own cables.

Figure 3-4 75-Ohm 734A Coaxial Cable Pair



1	TX	4	To DS3 equipment
2	RX	5	TX (out)
3	To PA-T3/E3-EC	6	RX (in)

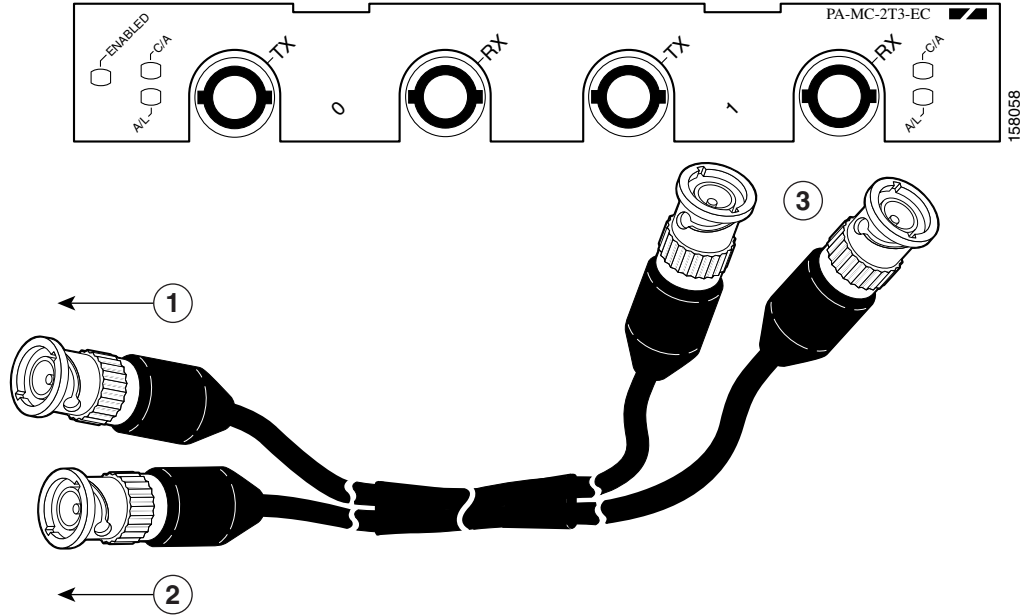
Connecting Cables

This section describes the procedure for attaching 75-ohm 734A coaxial cables between the PA-T3/E3-EC port adapter and your external DS3 equipment. To continue your PA-T3/E3-EC port adapter installation, you must install the port adapter cables. The instructions that follow apply to all supported platforms. On a PA-T3/E3-EC you use only one coaxial cable, and on a PA-2T3/E3-EC you can use one or two

Connect the 75-ohm coaxial cables to the PA-T3/E3-EC port adapter as follows:

- Step 1** Attach the 75-ohm coaxial cables directly to the BNC ports on the PA-T3/E3-EC. Attach one end of a cable to the port labeled TX and one end of a second cable to the port labeled RX. (See [Figure 3-5 on page 3-9](#).)

Figure 3-5 Attaching 75-Ohm, 734A Coaxial Cables to a PA-2T3/E3-EC Port Adapter



1	To RX port on external T3 equipment	3	BNC cables
2	To TX port on external T3 equipment		

- Step 2** Attach the network ends of your two 75-ohm coaxial cables to your external T3 equipment as follows:
- Attach the coaxial cable from the PA-T3/E3-EC TX port to the RX port on your external T3 equipment.
 - Attach the coaxial cable from the PA-T3/E3-EC RX port to the TX port on your external T3 equipment.
- Step 3** Pass the cables through the router cable-management bracket.

This completes the procedure for 75-ohm coaxial cable attachment on PA-T3/E3-EC port adapters.

