IBM BladeCenter Copper Pass-thru Module

Installation Guide

IBM BladeCenter Copper Pass-thru Module

IBM

Installation Guide

Note:

Before using this information and the product it supports, read the *Warranty Information* document, the general information in Notices, and the *Important Notices* document that comes with the product. Read the IBM Safety Information and the *License Agreement for Machine Code (LAMC)* document on the IBM *Documentation* CD. Read the *Environmental Notices and User Guide* on the IBM *Environmental Notices* CD.

Contents

Safety

Before installing this product, read the Safety Information.

قبل تركيب هذا المنتج، يجب قراءة الملاحظات الآمنية

Antes de instalar este produto, leia as Informações de Segurança.

在安装本产品之前，请仔细阅读 Safety Information
(安全信息)。

安裝本產品之前，請先閱讀「安全資訊」。

Prije instalacije ovog produkta obavezno pročitajte Sigurnosne Upute.

Před instalací tohoto produktu si přečtěte příručku bezpečnostních instrukcí.

Læs sikkerhedsforskrifterne, før du installerer dette produkt.

Lees voordat u dit product installeert eerst de veiligheidsvoorschriften.

Ennen kuin asennat tämän tuotteen, lue turvaohjeet kohdasta Safety
Information.

Avant d'installer ce produit, lisez les consignes de sécurité.

Vor der Installation dieses Produkts die Sicherheitshinweise lesen.

Πριν εγκαταστήσετε το προϊόν αυτό, διαβάστε τις πληροφορίες ασφάλειας
(safety information).

לפני שתתקינו מוצר זה, קראו את הוראות הבטיחות.

A termék telepítése előtt olvassa el a Biztonsági előírásokat!

Prima di installare questo prodotto, leggere le Informazioni sulla Sicurezza.

製品の設置の前に、安全情報をお読みください。

본 제품을 설치하기 전에 안전 정보를 읽으십시오.

Пред да се инсталира овој продукт, прочитајте информацијата за безбедност.

Les sikkerhetsinformasjonen (Safety Information) før du installerer dette
produktet.

Przed zainstalowaniem tego produktu, należy zapoznać się
z książką "Informacje dotyczące bezpieczeństwa" (Safety Information).

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Antes de instalar este produto, leia as Informações sobre Segurança.

Перед установкой продукта прочтите инструкции по технике безопасности.

Pred inštaláciou tohto zariadenia si pečítaje Bezpečnostné predpisy.

Pred namestitvijo tega proizvoda preberite Varnostne informacije.

Antes de instalar este producto, lea la información de seguridad.

Läs säkerhetsinformationen innan du installerar den här produkten.

Important:

All caution and danger statements in this documentation begin with a number. This number is used to cross reference an English caution or danger statement with translated versions of the caution or danger statement in the *IBM Safety Information* book.

For example, if a caution statement begins with a number 1, translations for that caution statement appear in the *IBM Safety Information* book under statement 1.

Be sure to read all caution and danger statements in this documentation before performing the instructions. Read any additional safety information that comes with your server or optional device before you install the device.

Statement 1:

DANGER

Electrical current from power, telephone, and communication cables is hazardous.

To avoid a shock hazard:

- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- Connect all power cords to a properly wired and grounded electrical outlet.
- Connect to properly wired outlets any equipment that will be attached to this product.
- When possible, use one hand only to connect or disconnect signal cables.
- Never turn on any equipment when there is evidence of fire, water, or structural damage.
- Disconnect the attached power cords, telecommunications systems, networks, and modems before you open the device covers, unles instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following table when installing, moving, or opening covers on this product or attached devices.

To Connect:	To Disconnect:
1. Turn everything OFF.	1. Turn everything OFF.
2. First, attach all cables to devices.	2. First, remove power cords from outlet.
3. Attach signal cables to connectors.	3. Remove signal cables from connectors.
4. Attach power cords to outlet.	4. Remove all cables from devices.
5. Turn device ON.	

Statement 2:

CAUTION:
When replacing the lithium battery, use only IBM Part Number 33F8354 or an equivalent type battery recommended by the manufacturer. If your system has a module containing a lithium battery, replace it only with the same module type made by the same manufacturer. The battery contains lithium and can explode if not properly used, handled, or disposed of.

Do not:

- **Throw or immerse into water**
- **Heat to more than 100°C (212°F)**
- **Repair or disassemble**

Dispose of the battery as required by local ordinances or regulations.

Statement 3:

CAUTION:
When laser products (such as CD-ROMs, DVD drives, fiber optic devices, or transmitters) are installed, note the following:

• **Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.**

• **Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.**

DANGER

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following.

Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.

Class 1 Laser Product
Laser Klasse 1
Laser Klass 1
Luokan 1 Laserlaite
Appareil À Laser de Classe 1

Statement 6:

CAUTION:
If you install a strain-relief bracket option over the end of the power cord that is connected to the device, you must connect the other end of the power cord to an easily accessible power source.

Statement 8:

CAUTION:
Never remove the cover on a power supply or any part that has the following label attached.

Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

Statement 13:

DANGER

Overloading a branch circuit is potentially a fire hazard and a shock hazard under certain conditions. To avoid these hazards, ensure that your system electrical requirements do not exceed branch circuit protection requirements. Refer to the information that is provided with your device for electrical specifications.

WARNING: Handling the cord on this product or cords associated with accessories sold with this product, will expose you to lead, a chemical known to the State of California to cause cancer, and birth defects or other reproductive harm. *Wash hands after handling.*

ADVERTENCIA: El contacto con el cable de este producto o con cables de accesorios que se venden junto con este producto, pueden exponerle al plomo, un elemento químico que en el estado de California de los Estados Unidos está considerado como un causante de cancer y de defectos congénitos, además de otros riesgos reproductivos. *Lávese las manos después de usar el producto.*

Chapter 1. Introducing the IBM BladeCenter Copper Pass-thru Module

This *Installation Guide* for the IBM® BladeCenter® Copper Pass-thru Module contains information about:

- Installing the module
- Connecting the module to your existing network infrastructure

For installation details, see Chapter 2, "Installing and removing a copper pass-thru module," on page 7. For additional information, see the instructions in your BladeCenter unit documentation.

A BladeCenter unit such as the IBM eServer™ BladeCenter Type 8677 or the IBM @server BladeCenter T Types 8720 and 8730 supports installation of up to four I/O modules that enable it to communicate with your external resources. Some types of BladeCenter units support fewer I/O modules. Several types of I/O modules are available, each specifically designed to communicate with a specific environment. The IBM BladeCenter Copper Pass-thru Module is one of the types of I/O modules that can be installed in a BladeCenter unit. The copper pass-thru module provides an unconfigured network connection that enables the blade servers in the BladeCenter unit to connect to an existing network infrastructure. No configuration of the copper pass-thru module is required.

Notes:

1. In this document, the term *BladeCenter unit* refers to any IBM BladeCenter, BladeCenter T, or other BladeCenter-class chassis model, except where specifically indicated otherwise.
2. Some models of BladeCenter units support only two I/O modules, in I/O module bay 1 and bay 2. See the documentation that comes with each BladeCenter unit for information about the number and type of I/O modules supported.

Blade servers communicate with the copper pass-thru module using integrated Ethernet controllers or through an optional blade server I/O expansion card. Ethernet controllers integrated on the blade server system board are connected to I/O-module bay 1 and bay 2. The I/O expansion cards are connected to I/O-module bay 3 and bay 4.

Performance, reliability, and expansion capabilities were key considerations in the design of the copper pass-thru module. These design features make it possible for you to customize the system hardware to meet your needs today, while providing flexible expansion capabilities for the future.

1

You can obtain up-to-date information about the copper pass-thru module and other IBM server products at http://www-947.ibm.com/support/entry/portal/documentation/.

The product name and serial number are located on the identification label on the side of the copper pass-thru module. You will need this information when you register the copper pass-thru module with IBM. See "Major components of the copper pass-thru module" on page 5 for an illustration that shows the location of the identification label.

Note: The illustrations in this document might differ slightly from your hardware.

Related documentation

This *Installation Guide* contains detailed installation and setup instructions for the IBM BladeCenter Copper Pass-thru Module. This document also provides general information about the copper pass-thru module, including information about features and how to get help.

In addition to this *Installation Guide*, the following related documentation is provided with your BladeCenter unit and blade server:

- *Rack Installation Instructions*

  This document contains the instructions to install your BladeCenter unit in a rack.

- *IBM BladeCenter Installation and User's Guide*

  This document is provided in PDF on the IBM BladeCenter unit *Documentation* CD. It provides general information about the BladeCenter unit, including:

  - Information about features
  - How to set up, cable, and start your BladeCenter unit
  - How to install options in your BladeCenter unit
  - How to configure your BladeCenter unit
  - How to perform basic troubleshooting of your BladeCenter unit
  - How to get help

- IBM BladeCenter blade server *Installation and User's Guides*

  Each type of blade server has a customized *Installation and User's Guide*. These documents are provided in PDF on the IBM BladeCenter unit or option *Documentation* CD. They provide general information about your blade server, including:

  - Information about features
  - How to set up and start your blade server

- How to install options in your blade server
- How to configure your blade server
- How to install an operating system on your blade server
- How to perform basic troubleshooting of your blade server
- How to get help
- *Safety Information*

  This document is in PDF on the IBM BladeCenter unit or option *Documentation* CD. It contains translated caution and danger statements. Each caution and danger statement that appears in the documentation has a number that you can use to locate the corresponding statement in your language in the *Safety Information* book.
- *Hardware Maintenance Manual and Troubleshooting Guides*

  These documents are in PDF on the IBM BladeCenter unit *Documentation* CD. They contain information to help you solve problems yourself, and they contain information for service technicians.

Depending on your blade server model, additional documents might be included on the IBM BladeCenter unit *Documentation* CD.

Features and specifications

This section provides a summary of the features and specifications for the copper pass-thru module.

The features include:

- Ports
  - Three external copper ports for making connections to network infrastructure. Each port provides connections for up to five bi-directional copper channels.
  - Fourteen internal bi-directional ports, connected through the copper pass-thru cables to each of the blade servers
- Status and error LEDs

  Information LEDs on the front panel indicate I/O module port status and errors.
- Cables:
  - Up to three copper pass-thru module cables can be connected to the copper pass-thru module. One copper pass-thru module cable is provided.
  - The copper pass-thru module cables are terminated with industry-standard bi-directional connectors.

Inventory checklist

Make sure that the shipping carton contains the following items:

- One IBM @server BladeCenter Copper Pass-thru Module
- One copper pass-thru module cable
- One IBM *Documentation* CD
- One IBM *Environmental Notices* CD
- One *Warranty Information* document
- One *Important Notices* document

If any of these items are missing or damaged, contact your local reseller for replacement.

Notices and statements used in this book

The caution and danger statements that appear in this book are also in the multilingual *Safety Information* guide on the IBM *Documentation* CD. Each statement is numbered for reference to the corresponding statement in the *Safety Information* guide.

The following notices and statements are used in this book:

- **Note:** These notices provide important tips, guidance, or advice.
- **Important:** These notices provide information or advice that might help you avoid inconvenient or problem situations.
- **Attention:** These notices indicate possible damage to programs, devices, or data. An attention notice is placed just before the instruction or situation in which damage could occur.
- **Caution:** These statements indicate situations that can be potentially hazardous to you. A caution statement is placed just before the description of a potentially hazardous procedure step or situation.
- **Danger:** These statements indicate situations that can be potentially lethal or extremely hazardous to you. A danger statement is placed just before the description of a potentially lethal or extremely hazardous procedure step or situation.

Major components of the copper pass-thru module

Figure 1 shows the major components of the copper pass-thru module.

Note: The illustrations in this document might differ slightly from your hardware.

Figure 1. Copper pass-thru module
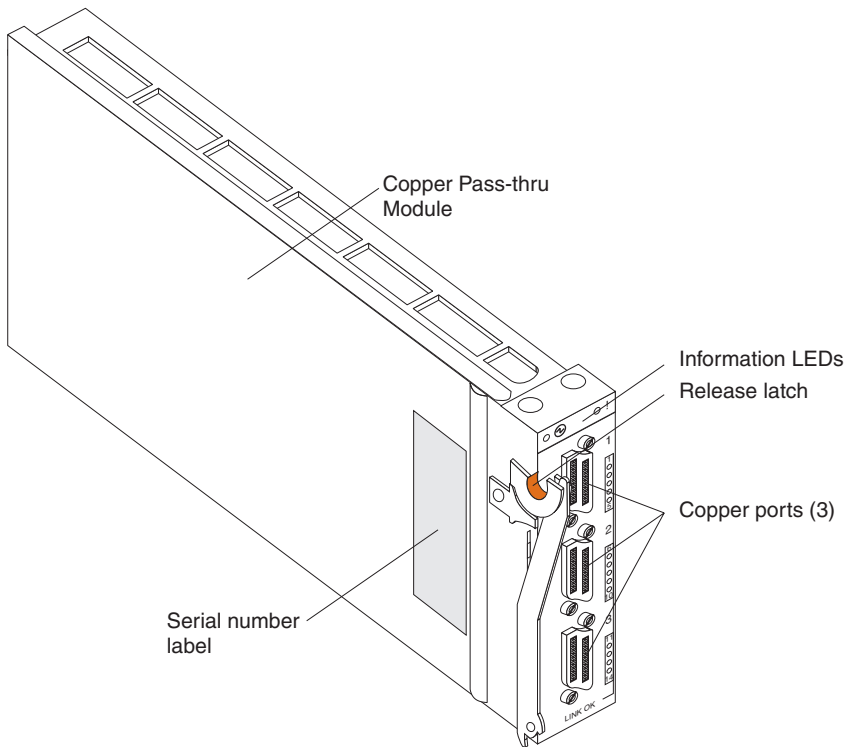
For more information about the components of the front panel, see Chapter 3, "Information LEDs and external ports," on page 23.

Copper pass-thru module cables:

Up to three copper pass-thru module cables can be connected to the copper pass-thru module. Figure 2 shows a sample IBM @server BladeCenter copper pass-thru module cable. One copper pass-thru module cable comes with the copper pass-thru module. Copper pass-thru module cables and other optional components for the copper pass-thru module are listed at http://www.ibm.com/eserver/xseries/.

Figure 2. Copper pass-thru module cables

CAT5E copper connectors

Multi-port copper connector
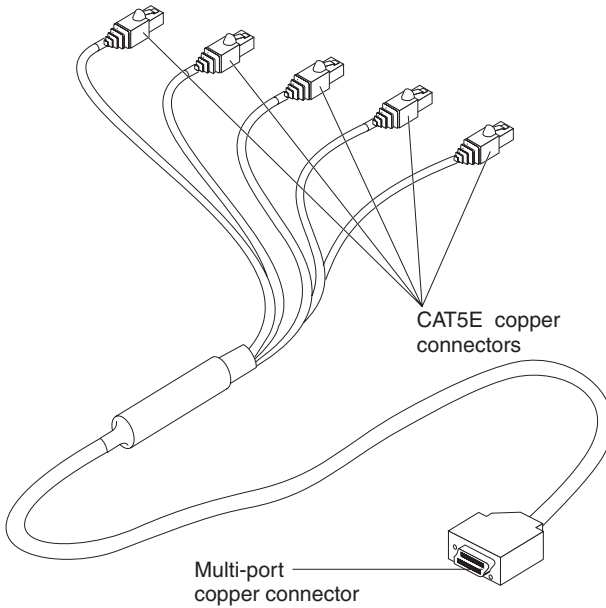
Chapter 2. Installing and removing a copper pass-thru module

Figure 3 shows the BladeCenter I/O-module bay locations.

Figure 3. BladeCenter I/O module bay locations
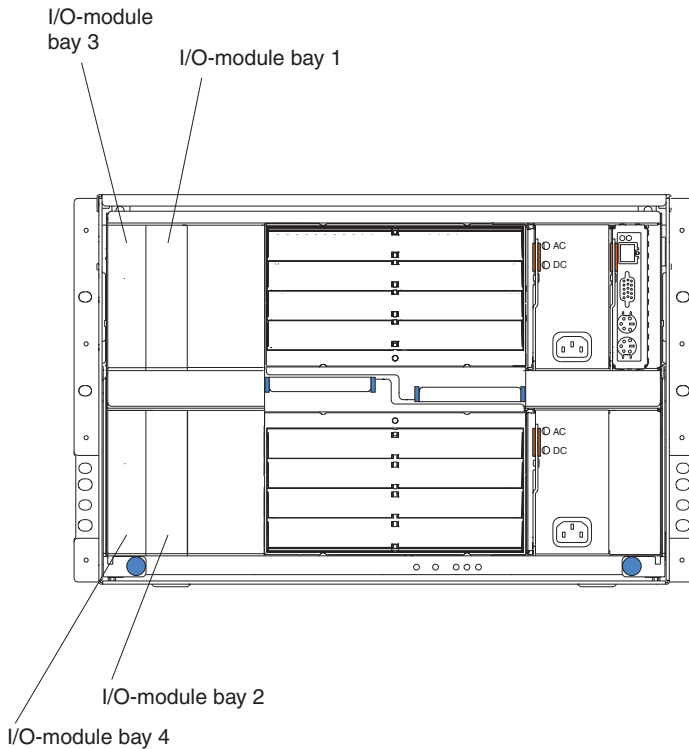
Attention: To maintain proper system cooling and performance, each module bay must contain either a module or a filler module; each blade bay must contain either a blade server, expansion unit, or a filler blade.

Figure 4 on page 8 shows the BladeCenter T I/O module locations.

Figure 4. BladeCenter T I/O module bay locations

I/O module interface requirements

Your BladeCenter unit has two or four I/O-module bays and supports a minimum of one hot-swap I/O module in I/O-module bay 1 or bay 2. Several types of I/O modules are available to meet specific network requirements. Each of the I/O modules must support the blade server interface to which it connects. See http://www-947.ibm.com/support/ entry/portal/ documentation/ for a list of options available for your BladeCenter unit.
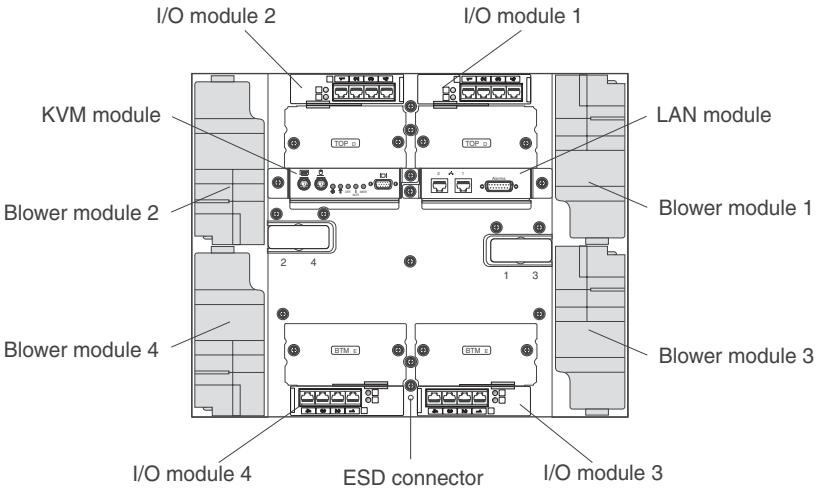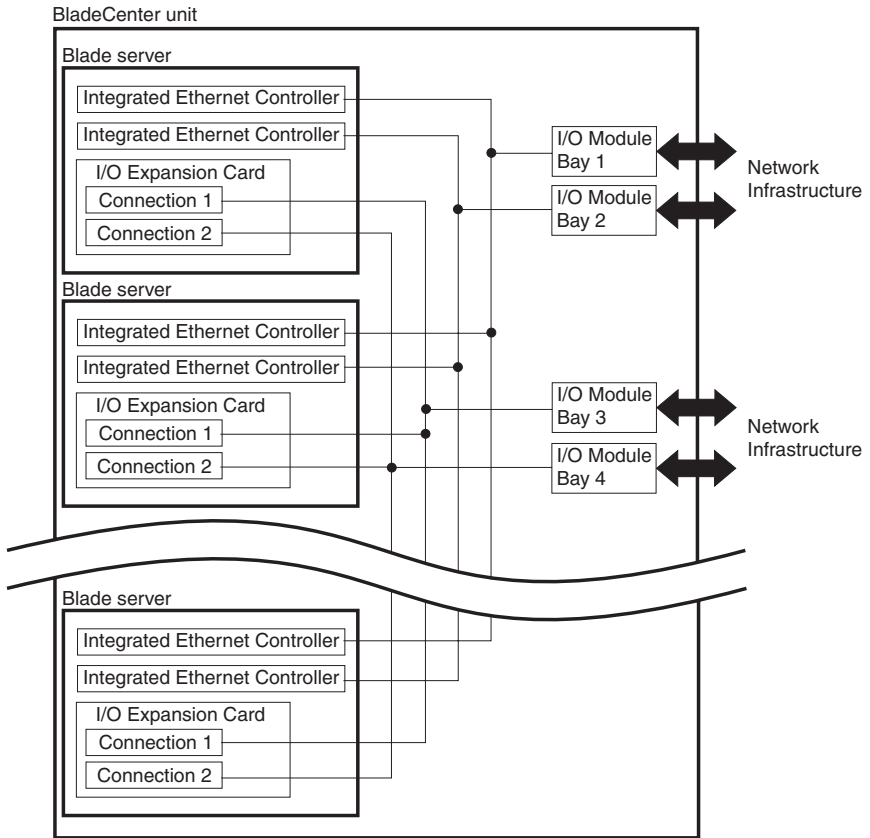
The blade server integrated Ethernet controllers support connection with the Ethernet switch modules and pass-thru modules. The I/O module in I/O-module bay 1 provides a network connection to one of the Ethernet controllers in all the blade servers in the BladeCenter unit. To provide a network connection for the second Ethernet controller in each blade server, install an I/O module in I/O-module bay 2.

In BladeCenter units that support four I/O modules, if you install an I/O expansion card on any blade server, you must install a hot-swap I/O module that supports the interface type used in I/O-module bay 3 to obtain connection 1 for the I/O expansion card. To provide connection 2 for the I/O expansion card, install an I/O module that supports the interface type used in I/O-module bay 4. The I/O modules in I/O-module bay 3 and bay 4 provide connections to all the I/O expansion cards in the BladeCenter unit.

BladeCenter unit

Blade server

Integrated Ethernet Controller

Integrated Ethernet Controller

I/O Expansion Card

Connection 1

Connection 2

Blade server

Integrated Ethernet Controller

Integrated Ethernet Controller

I/O Expansion Card

Connection 1

Connection 2

Blade server

Integrated Ethernet Controller

Integrated Ethernet Controller

I/O Expansion Card

Connection 1

Connection 2

I/O Module Bay 1

I/O Module Bay 2

I/O Module Bay 3

I/O Module Bay 4

Network Infrastructure

Network Infrastructure

Important: In a BladeCenter unit that supports four I/O modules, the I/O modules in I/O-module bays 3 and 4 on the BladeCenter unit must both be of the same type and must both support the I/O expansion card network-interface type. For example, if you add an Ethernet expansion card to a blade server, the modules in I/O-module bays 3 and 4 on the BladeCenter unit must both be the same and of a type compatible with the Ethernet expansion card. All other I/O expansion cards installed on other blade servers in the BladeCenter unit must also be compatible with these I/O modules. In this example, you could then install two Ethernet-switch modules or two copper pass-thru modules. Copper pass-thru modules are compatible with Ethernet expansion cards.

For additional information, see the *Installation and User's Guide* for your BladeCenter unit on the IBM BladeCenter unit *Documentation* CD.

Blade server Ethernet controller numbering

The numbering of the Ethernet controllers in a blade server is operating-system dependent. You can configure the blade server Ethernet-controller designations by modifying your operating-system settings.

The routing of an Ethernet controller to a particular I/O-module bay depends on the type of blade server. You can find out which Ethernet controller is routed to which I/O module bay by completing the following steps:

1. Install an Ethernet-switch module or pass-thru module in I/O-module bay 1.

2. Make sure that the ports on the Ethernet-switch module or copper pass-thru module are enabled (**I/O Module Tasks > Management > Advanced Management** in the management module Web-based user interface).

3. Enable one of the Ethernet controllers on the blade server. Make a note of the designation for the controller.

4. Ping an external computer on the network connected to the I/O module. If you can ping the external computer, the Ethernet controller that you enabled is associated with the I/O module in I/O-module bay 1. The other Ethernet controller in the blade server is associated with the I/O module in I/O-module bay 2.

If the Ethernet controller that is associated with I/O-module bay 1 does not have the designation that you want, modify the blade-server operating-system settings to change the Ethernet-controller designations.

In a BladeCenter unit that supports four I/O modules, if you have installed an I/O expansion card on a blade server, communications from the option are routed to I/O-module bays 3 and 4. You can make sure which controller on the card is routed to which I/O-module bay by performing the same steps, using a controller on the I/O expansion card and a compatible Ethernet-switch module or copper pass-thru module in I/O bay 3 or 4.

Installation guidelines

Before you begin to install the copper pass-thru module in the BladeCenter unit, read the following information:

- Read the safety information beginning on page v and "Handling static-sensitive devices," and read the safety statements in the BladeCenter unit documentation.

- Blue on a component indicates touch points, where you can grip a component to remove it from or install it in the Bladecenter unit, open or close a latch, and so on.

- Orange on components and labels in your BladeCenter unit identifies hot-swap or hot-plug components. You can install or remove hot-swap modules while the BladeCenter unit is running. For complete details about installing or removing a hot-swap or hot-plug component, see the detailed information in this chapter.

- The copper pass-thru module supports a 1000 Mbps cable only. Do not connect a 10/100 Mbps cable to the module.

- For a list of supported options for your BladeCenter unit, go to http://www-03.ibm.com/services/supline/products/.

System reliability considerations

Attention: To help ensure proper cooling, performance, and system reliability, make sure that:

- Each of the module bays on the rear of the BladeCenter unit has either a module or filler module installed.

- A removed hot-swap module is replaced with an identical module or filler module within 1 minute of removal.

- Cables for the optional modules are routed according to the illustrations and instructions in this document.

Handling static-sensitive devices

Attention: Static electricity can damage electronic devices and your BladeCenter unit. To avoid damage, keep static-sensitive devices in their static-protective packages until you are ready to install them.

To reduce the possibility of electrostatic discharge, observe the following precautions:

- Limit your movement. Movement can cause static electricity to build up around you.

- Handle the device carefully, holding it by its edges or its frame.

- Do not touch solder joints, pins, or exposed printed circuitry.

- Do not leave the device where others can handle and possibly damage the device.
- While the device is still in its static-protective package, touch it to any *unpainted* metal surface of the BladeCenter unit chassis or any *unpainted* metal surface on any other grounded rack component in the rack you are installing the device in for at least 2 seconds. (This drains static electricity from the package and from your body.)
- Remove the device from its package and install it directly into your BladeCenter unit without setting it down. If it is necessary to set the device down, place it in its static-protective package. Do not place the device on your BladeCenter chassis or on a metal table.
- Take additional care when handling devices during cold weather because heating reduces indoor humidity and increases static electricity.
- On a BladeCenter T unit, use an ESD wrist strap and the ESD connectors. Electrostatic discharge (ESD) is the release of stored static electricity that can damage electric circuits. Static electricity is often stored in your body and discharged when you come in contact with an object with a different potential. The ESD wrist strap safely channels the electricity from your body to a proper ground (the BladeCenter T unit).

  Use an ESD wrist strap whenever you are working on a BladeCenter T unit, especially when you are handling modules, options, and blade servers. To work properly, the wrist strap must have a good contact at both ends (touching your skin at one end and connected to the ESD connector on the front or back of the BladeCenter T unit).

  Location of ESD connector (front of unit)
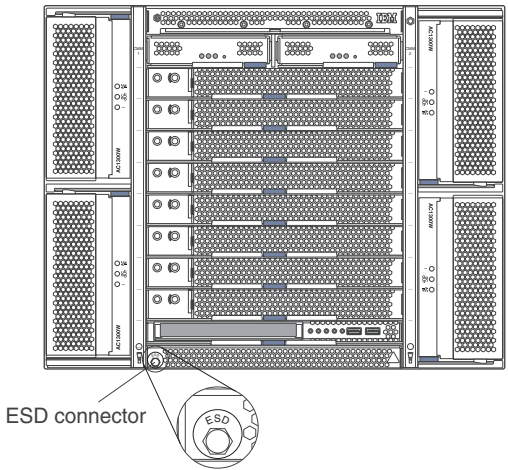
ESD connector

Location of ESD connector (rear of unit)
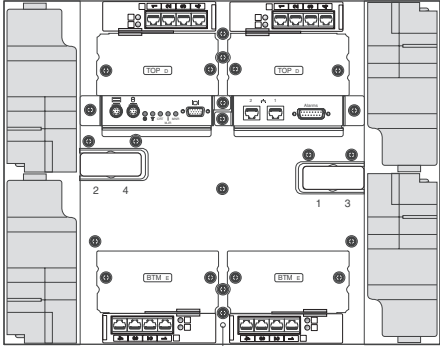
ESD connector

Installing a copper pass-thru module

Statement 3:

CAUTION:
When laser products (such as CD-ROMs, DVD drives, fiber optic devices, or transmitters) are installed, note the following:

- **Do not remove the covers. Removing the covers of the laser product could result in exposure to hazardous laser radiation. There are no serviceable parts inside the device.**
- **Use of controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.**

DANGER

> **Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following.**
>
> **Laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam.**

Class 1 Laser Product
Laser Klasse 1
Laser Klass 1
Luokan 1 Laserlaite
Appareil À Laser de Classe 1

Statement 8:

CAUTION:
Never remove the cover on a power supply or any part that has the following label attached.

**Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.**

The following illustration shows how to install a copper pass-thru module in an I/O-module bay in the rear of an IBM @server BladeCenter Type 8677 or similar BladeCenter unit.
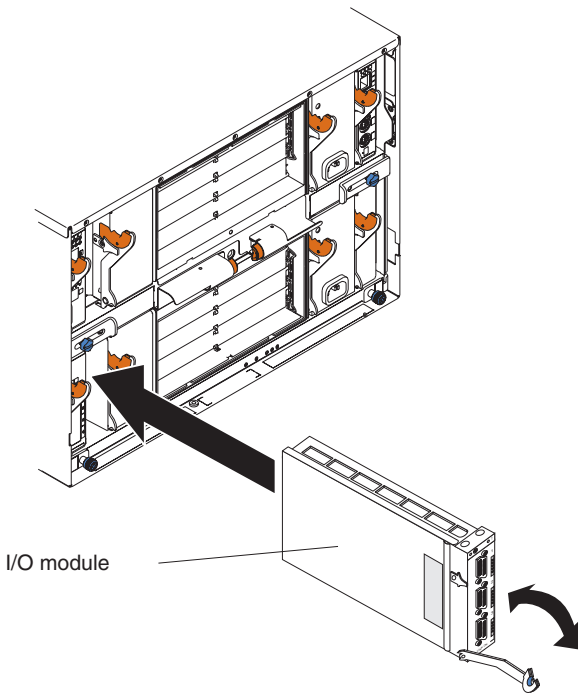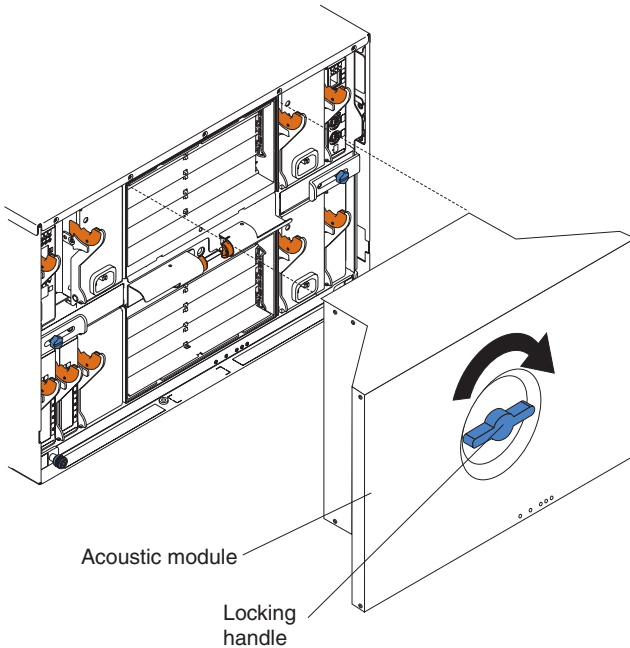
I/O module

The following illustration shows how to install a copper pass-thru module in an I/O module bay in the rear of an IBM @server BladeCenter T Type 8720 or 8730 or similar BladeCenter unit.
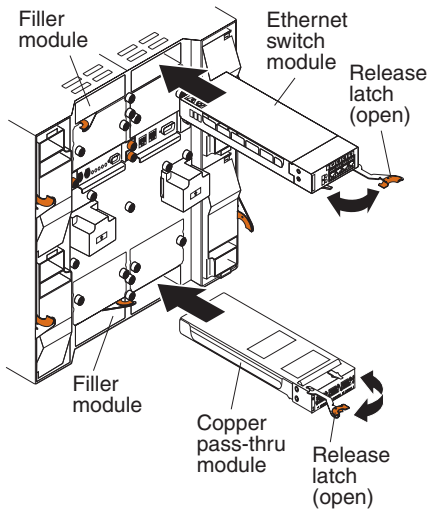
Complete the following steps to install a copper pass-thru module:

1. Make sure that you are using the latest versions of device drivers, firmware, and BIOS code for your blade server and management module. Go to the IBM Support Web site, http://www.ibm.com/pc/support/ for the latest information about upgrading the device drivers, firmware, and BIOS code for BladeCenter components. The latest instructions are in the documentation that come with the updates.

2. Review the information in "Safety" on page v, "Installation guidelines" on page 11, and "Handling static-sensitive devices" on page 11.

3. If the BladeCenter unit is an IBM @server BladeCenter Type 8677 unit, remove the acoustic-attenuation module, if one is installed, from the rear of the unit.

Acoustic module

Locking handle

4. Select an I/O-module bay in which to install the copper pass-thru module.

5. Remove the filler module from the selected bay. Store the filler module for future use.

6. If you have not already done so, touch the static-protective package that contains the copper pass-thru module to any *unpainted* metal surface of the BladeCenter unit chassis or any *unpainted* metal surface on any other grounded rack component for at least two seconds.

7. Remove the copper pass-thru module from its static-protective package.

8. Make sure that the release latch on the copper pass-thru module is in the open position (perpendicular to the module).

9. Slide the copper pass-thru module into the appropriate I/O-module bay until it stops.

10. Push the release latch on the front of the copper pass-thru module to the closed position.

11. Make sure that the LEDs on the copper pass-thru module indicate that it is operating properly. (See "Information LEDs" on page 25 for LED locations.) Make sure that:

    - The green power LED is lit.
    - The amber copper pass-thru module error LED is not lit.
    - The LINK OK LED is lit.

    If LED conditions are not as specified, see "Troubleshooting" on page 29.

12. If you have other modules to install, do so now; otherwise, go to step 13.

13. Attach any cables required by the copper pass-thru module. See Chapter 4, "Completing the installation," on page 27 for instructions. For the location of the connectors on the BladeCenter unit, see the *Installation and User's Guide* for your BladeCenter unit on the BladeCenter unit *Documentation* CD.

14. Replace the acoustic-attenuation module, if you removed it in step 3 on page 18.

15. Make sure that the ports on the copper pass-thru module are enabled (**I/O Module Tasks > Management > Advanced Management** in the management module Web-based interface).

Removing a copper pass-thru module

Statement 8:

CAUTION:
Never remove the cover on a power supply or any part that has the following label attached.


Hazardous voltage, current, and energy levels are present inside any component that has this label attached. There are no serviceable parts inside these components. If you suspect a problem with one of these parts, contact a service technician.

Complete the following steps to remove a copper pass-thru module:

1. If the BladeCenter unit is an IBM @server BladeCenter Type 8677 unit, remove the acoustic-attenuation module, if installed, from the rear of the unit (see step 3 on page 18 to locate the attenuation module).
2. Disconnect any cables from the selected copper pass-thru module.

3. Pull the release latch to the fully-open position as shown in the illustration. The module moves out of the bay slightly.
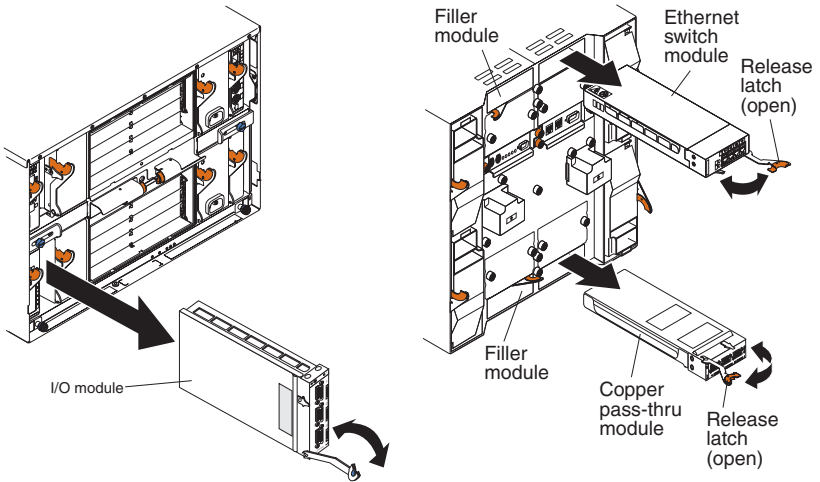
4. Slide the module out of the bay and set it aside.
5. Place either another I/O module or a filler module in the bay within 1 minute.
6. If you placed another copper pass-thru module in the bay, reconnect any cables that you disconnected in step 2 on page 20.
7. Replace the acoustic-attenuation module option, if you removed it in step 1 on page 20.

Chapter 3. Information LEDs and external ports

This chapter describes the information LEDs (also known as indicators) on the copper pass-thru module and identifies the copper pass-thru module external ports.

Front panel

The front panel of the copper pass-thru module has status LEDs, an LED matrix, and three external copper-interface ports, as shown in the following illustration. Each interface port supports up to five-channels of bi-directional communication, which support fourteen external communication channels.

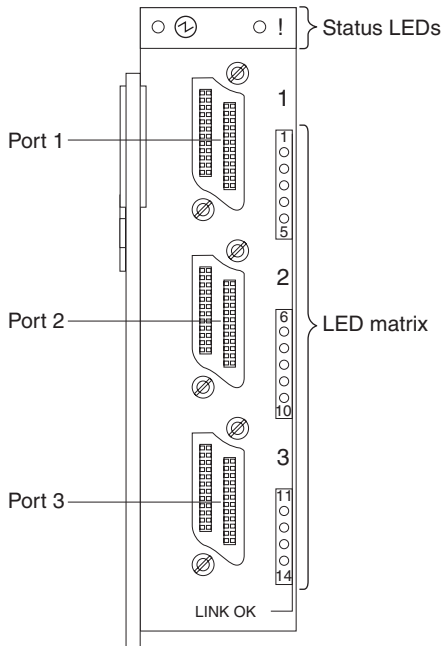**Note:** The port-3 E connector is not used.

Figure 5. Copper pass-thru module external ports and LED matrix

The copper pass-thru module contains:
- LEDs that display the status of the copper pass-thru module and its network connections (see "Information LEDs" on page 25).

- Three external bi-directional interface ports. The copper pass-thru module cable that connects to each module port provides five copper connectors for connecting to the existing network infrastructure. Table 1 shows how each blade-server bay is assigned to a copper pass-thru module cable connector.
- Fourteen internal ports; connected through the copper pass-thru module cable connectors to each blade-server port.

Table 1. Blade server bay to port and cable assignments in BladeCenter Type 8677 unit

Blade server bay	Copper pass-thru module external port	Copper pass-thru module cable connector
1	Port 1 (transceiver 1)	A
2	Port 1 (transceiver 2)	B
3	Port 1 (transceiver 3)	C
4	Port 1 (transceiver 4)	D
5	Port 1 (transceiver 5)	E
6	Port 2 (transceiver 6)	A
7	Port 2 (transceiver 7)	B
8	Port 2 (transceiver 8)	C
9	Port 2 (transceiver 9)	D
10	Port 2 (transceiver 10)	E
11	Port 3 (transceiver 11)	A
12	Port 3 (transceiver 12)	B
13	Port 3 (transceiver 13)	C
14	Port 3 (transceiver 14)	D

Table 2. Blade server bay to port and cable assignments in BladeCenter T unit

| Blade server bay	Copper Pass-thru Module external port	Copper pass-thru module cable connector-pair
1	Port 1 (transceiver 1)	A
2	Port 1 (transceiver 2)	B
3	Port 1 (transceiver 3)	C
4	Port 1 (transceiver 4)	D
5	Port 1 (transceiver 5)	A
6	Port 2 (transceiver 6)	B
7	Port 2 (transceiver 7)	C
8	Port 2 (transceiver 8)	D

Notes:

1. Copper pass-thru module cable connectors are marked as A, B, C, D, and E to indicate their channel number.
2. The port-3 E connector is not used.

Information LEDs

There are two sets of LEDs on the copper pass-thru module front panel. The first row of LEDs at the top of the I/O module represent I/O-module status and include the power LED and the copper pass-thru module error LED (!). The second set of LEDs are grouped in an LED matrix that indicates the link status for each copper-port channel and copper-port errors. The following illustration shows the LEDs on the copper pass-thru module. A description of each LED follows the illustration.

Figure 6. Information LEDs
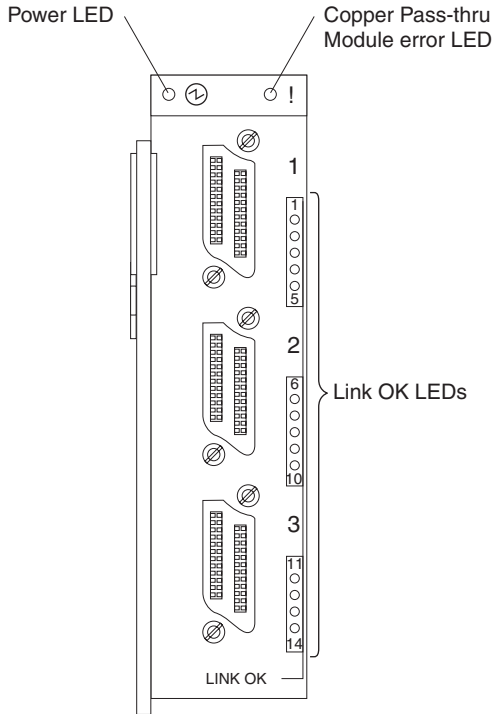
Notes:

1. The illustrations in this document might differ slightly from your hardware.

2. An amber LED is lit when an error or event has occurred. To identify the error or event, check the other LEDs on the copper pass-thru module.

3. An LED test occurs whenever the I/O module is turned on. All LEDs are lit and remain lit for approximately 5 seconds and then return to a normal state.

Power LED

This green LED is at the top of the I/O module on the front panel. When this LED is lit, it indicates that the I/O module has passed the POST and is operational.

Copper pass-thru module error LED (!)

This amber LED is at the top of the I/O module on the front panel. This LED indicates that the I/O module has an error. If the I/O module fails the POST, this error LED is lit.

LINK OK LEDs

There are fourteen green LINK OK LEDs on the right side of the LED matrix on the front panel. Each of these LEDs indicates that there is a valid connection to a device on that port channel and that both ends of this connection are successfully communicating using compatible network protocols. (See Chapter 4, "Completing the installation," on page 27 for information about supported networking environments.) The LINK OK LEDs are arranged in a way that identifies each port channel (LED columns A, B, C, D, and E) and the transceiver (LED rows 1, 2, and 3) that is associated with it. If a LINK OK LED is not lit, make sure that the blade server is in the correct slot and is powered-on.

Chapter 4. Completing the installation

This chapter provides instructions for connecting the copper pass-thru module to your existing network infrastructure.

The module automatically configures itself to operate in several networking environments. No manual configuration or special device drivers are needed. See the documentation for your existing network infrastructure for configuration information.

Cable connection

The copper pass-thru module is connected to existing network infrastructure using copper CAT5E cables. One cable comes with the copper pass-thru module. A sample copper pass-thru module cable is shown below:

CAT5E copper connectors

Multi-port copper connector
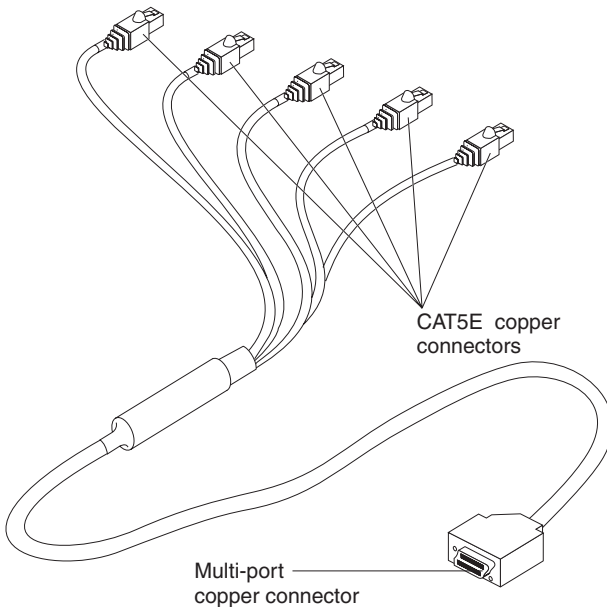
The CAT5E cable connectors that are attached to your network infrastructure are numbered to identify their port channel. See Table 1 on page 24 for blade-server-to-port mapping information.

Attention: To avoid damage to your cables, follow these guidelines:

- Use care when routing the cable along a folding cable-management arm. Some ports will not operate if the cable is incorrectly connected.

- For devices on slide rails, leave enough slack in the cable so that it does not bend to a radius less than 38 mm (1.5 in.) when extended or become pinched when retracted.

- Route the cable away from places where it can be damaged by other devices in the rack cabinet.

- Do not use plastic cable ties in place of cable straps.

- Do not overtighten the cable straps or bend the cables to a radius less than 38 mm (1.5 in.).

- Do not put excess weight on the cable at the connection point. Be sure that the cable is well supported.

Connecting to the copper pass-thru module

The end of the copper pass-thru cable with one connector is attached to one of the port connectors on the copper pass-thru module. Complete the following steps to connect a copper pass-thru cable to the copper pass-thru module:

1. Orient the cable connector so that the cable connector key aligns with the key in the port connector of the copper pass-thru module; then, insert the cable connector in the port connector. Make sure that the cable is routed *upwards* in the rack cabinet; this cable route provides for the 45° *upwards* angle of the cable connector.

2. Press on the connector to seat the connector in place and tighten the captive thumb-screws until the cable is secure on the module.

Note: Some ports will not operate if the cable is not correctly connected.

To disconnect the cable, loosen the two captive thumb-screws and remove the cable from the module.

Connecting to network infrastructure

The end of the copper pass-thru cable with five bi-directional (duplex) connectors is connected to your network infrastructure. Each bi-directional connector provides a transmit-and-receive pair for one of the five bi-directional channels supported by the cable. (See Table 1 on page 24 for blade-server-bay-to-CAT5E-connector mapping.) Complete the following steps to connect one of the copper pass-thru cable channels to your network infrastructure:

1. Orient the cable connectors with the port connectors of your infrastructure, making sure that the cable-connector keys align with the keys in the port connectors; then, insert the cable connectors in the port connectors.

2. Press the copper cable connector until it clicks and locks in place.

To disconnect the cable, release the lock before removing the cable from the port.

Configuring the copper pass-thru module

The copper pass-thru module provides an unconfigured network connection and requires no configuration to communicate with network resources. The copper pass-thru module provides an advanced configuration that enables or disables the ports. See the BladeCenter unit *Management Module User's Guide* for general information on managing BladeCenter I/O modules.

Updating I/O module firmware

Go to the IBM Support Web site, http://www.ibm.com/pc/support/ for the latest information about upgrading the firmware for your I/O module. The latest instructions are in the documentation that comes with the update.

Troubleshooting

If you are having a problem, use the following information to help you to determine the cause of the problem and the action to take. Additional troubleshooting and debugging procedures are available in the *Hardware Maintenance Manual and Troubleshooting Guide* for your BladeCenter unit on the IBM BladeCenter unit *Documentation* CD.

Make sure that you are using the latest versions of device drivers, firmware, and BIOS code for your blade server and management module. If these items are obsolete, the BladeCenter unit might not recognize the I/O module and might not turn it on. Go to the IBM Support Web site, http://www-947.ibm.com/support/entry/portal/documentation/ for the latest information about upgrading the device drivers, firmware, and BIOS code for BladeCenter components. The latest instructions are in the documentation that come with the updates.

To determine whether your installation problem is caused by the hardware, perform the following tasks:

- Make sure that the I/O module is installed correctly.
- Make sure that all peripheral devices connected to the I/O module are turned on, operating properly, and are properly connected.
- Make sure that the blade servers and I/O expansion cards using the I/O modules are installed correctly in the BladeCenter unit.
- The copper pass-thru module must be connected using a 1000 Mbps cable or the LINK OK LED will not light. Using a 10/100 Mbps cable will cause port problems and connection issues.

To determine whether your installation problem is caused by the system configuration, check the I/O module settings using the management-module Web-based interface. See the BladeCenter unit *Management Module User's Guide* on the IBM BladeCenter unit or option *Documentation* CD for general information on managing BladeCenter I/O modules.

If you still have a system configuration problem, see the documentation that comes with your IBM BladeCenter unit, or contact your IBM technical-support representative.

Appendix A. Getting help and technical assistance

If you need help, service, or technical assistance or just want more information about IBM products, you will find a wide variety of sources available from IBM to assist you. This appendix contains information about where to go for additional information about IBM and IBM products, what to do if you experience a problem with your @server or IntelliStation® system, and whom to call for service, if it is necessary.

Before you call

Before you call, make sure that you have taken these steps to try to solve the problem yourself:

- Check all cables to make sure that they are connected.
- Check the power switches to make sure that the system is turned on.
- Use the troubleshooting information in your system documentation, and use the diagnostic tools that come with your system. Information about diagnostic tools is in the *Hardware Maintenance Manual and Troubleshooting Guide* or *Problem Determination Guide* on the IBM *xSeries Documentation* CD or IBM *BladeCenter Documentation* CD or in the IntelliStation *Hardware Maintenance Manual* at the IBM support Web site.
- Go to the IBM support Web site at http://www-947.ibm.com/support/entry/portal/docdisplay?brand=5000008&lndocid=SERV-CALL to check for technical information, hints, tips, and new device drivers or to submit a request for information.

You can solve many problems without outside assistance by following the troubleshooting procedures that IBM provides in the online help or in the publications that are provided with your system and software. The information that comes with your system also describes the diagnostic tests that you can perform. Most @server and IntelliStation systems, operating systems, and programs come with information that contains troubleshooting procedures and explanations of error messages and error codes. If you suspect a software problem, see the information for the operating system or program.

Using the documentation

Information about your IBM BladeCenter or IntelliStation system and preinstalled software, if any, is available in the documentation that comes with your system. That documentation includes printed books, online books, readme files, and help files. See the troubleshooting information in your system documentation for instructions for using the diagnostic programs. The troubleshooting information or the diagnostic programs might tell you that you

need additional or updated device drivers or other software. IBM maintains pages on the World Wide Web where you can get the latest technical information and download device drivers and updates. To access the latest documentation, go to http://www-947.ibm.com/support/ entry/portal/documentation/, enter the name of your product in the **Quick Find** field and press **Enter**. Also, some hardcopy documents are available through the IBM Publications Center at http://www.elink.ibmlink.ibm.com/ public/applications/publications/cgibin/pbi.cgi.

Getting help and information from the World Wide Web

On the World Wide Web, the IBM Web site has up-to-date information about IBM @server and IntelliStation products, services, and support. The address for IBM IntelliStation information is http://www.ibm.com/systems/intellistation/.

You can find service information for your IBM products, including supported options, at http://www.ibm.com/supportportal/.

Software service and support

Through IBM Support Line, you can get telephone assistance, for a fee, with usage, configuration, and software problems with xSeries servers, BladeCenter products, IntelliStation workstations, and appliances. For information about which products are supported by Support Line in your country or region, see http://www.ibm.com/services/sl/products/.

For more information about Support Line and other IBM services, see http://www-03.ibm.com/services/supline/products/, or see http://www.ibm.com/planetwide/ for support telephone numbers. In the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

Hardware service and support

You can receive hardware service through IBM Services or through your IBM reseller, if your reseller is authorized by IBM to provide warranty service. See http://www.ibm.com/planetwide/ for support telephone numbers, or in the U.S. and Canada, call 1-800-IBM-SERV (1-800-426-7378).

In the U.S. and Canada, hardware service and support is available 24 hours a day, 7 days a week. In the U.K., these services are available Monday through Friday, from 9 a.m. to 6 p.m.

Appendix B. Notices

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In the United States, IBM has established a collection process for reuse, recycling, or proper disposal of used IBM sealed lead acid, nickel cadmium, nickel metal hydride, and battery packs from IBM equipment. For information on proper disposal of these batteries, contact IBM at 1-800-426-4333. Have the IBM part number listed on the battery available prior to your call.

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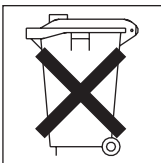
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Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment 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 instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

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    Technical Regulations, Abteilung M372
    IBM-Allee 1, 71139 Ehningen, Germany
    Telephone: +49 7032 15 2941
    Email: lugi@de.ibm.com

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