

# Road map for installing the 5802 and 5877 expansion units□□

ESCALA Power7



REFERENCE  
86 A1 27FF 03



# ESCALA Power7

## Road map for installing the 5802 and 5877 expansion units□□

This publication concerns the following models:

- Bull Escala E5-700 (Power 750 / 8233-E8B)
- Bull Escala M6-700 (Power 770 / 9117-MMB)
- Bull Escala M7-700 (Power 780 / 9179-MHB)
- Bull Escala E1-700 (Power 710 / 8231-E2B)
- Bull Escala E2-700 / E2-700T (Power 720 / 8202-E4B)
- Bull Escala E3-700 (Power 730 / 8231-E2B)
- Bull Escala E4-700 / E4-700T (Power 740 / 8205-E6B)

References to Power 755 / 8236-E8C models are irrelevant.

## Hardware

May 2011

BULL CEDOC  
357 AVENUE PATTON  
B.P.20845  
49008 ANGERS CEDEX 01  
FRANCE

**REFERENCE**  
**86 A1 27FF 03**

The following copyright notice protects this book under Copyright laws which prohibit such actions as, but not limited to, copying, distributing, modifying, and making derivative works.

Copyright © Bull SAS 2007-2011

Printed in France

Suggestions and criticisms concerning the form, content, and presentation of this book are invited. A form is provided at the end of this book for this purpose.

To order additional copies of this book or other Bull Technical Publications, you are invited to use the Ordering Form also provided at the end of this book.

### **Trademarks and Acknowledgements**

We acknowledge the right of proprietors of trademarks mentioned in this book.

*The information in this document is subject to change without notice. Bull will not be liable for errors contained herein, or for incidental or consequential damages in connection with the use of this material.*

---

# Contents

<b>Safety notices</b> . . . . .	<b>v</b>
<b>Installing the 5802 and 5877 expansion units.</b> . . . . .	<b>1</b>
<b>Installing the 5802 and 5877 expansion units: Details</b> . . . . .	<b>3</b>
<b>Notices</b> . . . . .	<b>19</b>
Trademarks . . . . .	20
Electronic emission notices . . . . .	20
Class A Notices . . . . .	20
Class B Notices . . . . .	24
Terms and conditions . . . . .	27



---

## Safety notices

Safety notices may be printed throughout this guide:

- **DANGER** notices call attention to a situation that is potentially lethal or extremely hazardous to people.
- **CAUTION** notices call attention to a situation that is potentially hazardous to people because of some existing condition.
- **Attention** notices call attention to the possibility of damage to a program, device, system, or data.

### World Trade safety information

Several countries require the safety information contained in product publications to be presented in their national languages. If this requirement applies to your country, a safety information booklet is included in the publications package shipped with the product. The booklet contains the safety information in your national language with references to the U.S. English source. Before using a U.S. English publication to install, operate, or service this product, you must first become familiar with the related safety information in the booklet. You should also refer to the booklet any time you do not clearly understand any safety information in the U.S. English publications.

### German safety information

Das Produkt ist nicht für den Einsatz an Bildschirmarbeitsplätzen im Sinne § 2 der Bildschirmarbeitsverordnung geeignet.

### Laser safety information

IBM® servers can use I/O cards or features that are fiber-optic based and that utilize lasers or LEDs.

### Laser compliance

IBM servers may be installed inside or outside of an IT equipment rack.

## DANGER

When working on or around the system, observe the following precautions:

Electrical voltage and current from power, telephone, and communication cables are hazardous. To avoid a shock hazard:

- Connect power to this unit only with the IBM provided power cord. Do not use the IBM provided power cord for any other product.
- Do not open or service any power supply assembly.
- Do not connect or disconnect any cables or perform installation, maintenance, or reconfiguration of this product during an electrical storm.
- The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords.
- Connect all power cords to a properly wired and grounded electrical outlet. Ensure that the outlet supplies proper voltage and phase rotation according to the system rating plate.
- Connect any equipment that will be attached to this product to properly wired outlets.
- 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, unless instructed otherwise in the installation and configuration procedures.
- Connect and disconnect cables as described in the following procedures when installing, moving, or opening covers on this product or attached devices.

To Disconnect:

1. Turn off everything (unless instructed otherwise).
2. Remove the power cords from the outlets.
3. Remove the signal cables from the connectors.
4. Remove all cables from the devices

To Connect:

1. Turn off everything (unless instructed otherwise).
2. Attach all cables to the devices.
3. Attach the signal cables to the connectors.
4. Attach the power cords to the outlets.
5. Turn on the devices.

(D005)

## DANGER



Observe the following precautions when working on or around your IT rack system:

- Heavy equipment—personal injury or equipment damage might result if mishandled.
- Always lower the leveling pads on the rack cabinet.
- Always install stabilizer brackets on the rack cabinet.
- To avoid hazardous conditions due to uneven mechanical loading, always install the heaviest devices in the bottom of the rack cabinet. Always install servers and optional devices starting from the bottom of the rack cabinet.
- Rack-mounted devices are not to be used as shelves or work spaces. Do not place objects on top of rack-mounted devices.



- Each rack cabinet might have more than one power cord. Be sure to disconnect all power cords in the rack cabinet when directed to disconnect power during servicing.
- Connect all devices installed in a rack cabinet to power devices installed in the same rack cabinet. Do not plug a power cord from a device installed in one rack cabinet into a power device installed in a different rack cabinet.
- An electrical outlet that is not correctly wired could place hazardous voltage on the metal parts of the system or the devices that attach to the system. It is the responsibility of the customer to ensure that the outlet is correctly wired and grounded to prevent an electrical shock.

#### CAUTION

- Do not install a unit in a rack where the internal rack ambient temperatures will exceed the manufacturer's recommended ambient temperature for all your rack-mounted devices.
- Do not install a unit in a rack where the air flow is compromised. Ensure that air flow is not blocked or reduced on any side, front, or back of a unit used for air flow through the unit.
- Consideration should be given to the connection of the equipment to the supply circuit so that overloading of the circuits does not compromise the supply wiring or overcurrent protection. To provide the correct power connection to a rack, refer to the rating labels located on the equipment in the rack to determine the total power requirement of the supply circuit.
- *(For sliding drawers.)* Do not pull out or install any drawer or feature if the rack stabilizer brackets are not attached to the rack. Do not pull out more than one drawer at a time. The rack might become unstable if you pull out more than one drawer at a time.
- *(For fixed drawers.)* This drawer is a fixed drawer and must not be moved for servicing unless specified by the manufacturer. Attempting to move the drawer partially or completely out of the rack might cause the rack to become unstable or cause the drawer to fall out of the rack.

(R001)

**CAUTION:**

Removing components from the upper positions in the rack cabinet improves rack stability during relocation. Follow these general guidelines whenever you relocate a populated rack cabinet within a room or building:

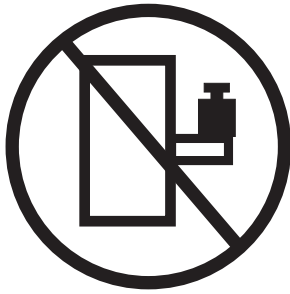
- Reduce the weight of the rack cabinet by removing equipment starting at the top of the rack cabinet. When possible, restore the rack cabinet to the configuration of the rack cabinet as you received it. If this configuration is not known, you must observe the following precautions:
  - Remove all devices in the 32U position and above.
  - Ensure that the heaviest devices are installed in the bottom of the rack cabinet.
  - Ensure that there are no empty U-levels between devices installed in the rack cabinet below the 32U level.
- If the rack cabinet you are relocating is part of a suite of rack cabinets, detach the rack cabinet from the suite.
- Inspect the route that you plan to take to eliminate potential hazards.
- Verify that the route that you choose can support the weight of the loaded rack cabinet. Refer to the documentation that comes with your rack cabinet for the weight of a loaded rack cabinet.
- Verify that all door openings are at least 760 x 230 mm (30 x 80 in.).
- Ensure that all devices, shelves, drawers, doors, and cables are secure.
- Ensure that the four leveling pads are raised to their highest position.
- Ensure that there is no stabilizer bracket installed on the rack cabinet during movement.
- Do not use a ramp inclined at more than 10 degrees.
- When the rack cabinet is in the new location, complete the following steps:
  - Lower the four leveling pads.
  - Install stabilizer brackets on the rack cabinet.
  - If you removed any devices from the rack cabinet, repopulate the rack cabinet from the lowest position to the highest position.
- If a long-distance relocation is required, restore the rack cabinet to the configuration of the rack cabinet as you received it. Pack the rack cabinet in the original packaging material, or equivalent. Also lower the leveling pads to raise the casters off of the pallet and bolt the rack cabinet to the pallet.

(R002)

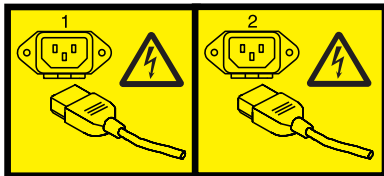
(L001)



(L002)



(L003)



or



All lasers are certified in the U.S. to conform to the requirements of DHHS 21 CFR Subchapter J for class 1 laser products. Outside the U.S., they are certified to be in compliance with IEC 60825 as a class 1 laser product. Consult the label on each part for laser certification numbers and approval information.

**CAUTION:**

This product might contain one or more of the following devices: CD-ROM drive, DVD-ROM drive, DVD-RAM drive, or laser module, which are Class 1 laser products. Note the following information:

- 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 the controls or adjustments or performance of procedures other than those specified herein might result in hazardous radiation exposure.

(C026)

**CAUTION:**

Data processing environments can contain equipment transmitting on system links with laser modules that operate at greater than Class 1 power levels. For this reason, never look into the end of an optical fiber cable or open receptacle. (C027)

**CAUTION:**

This product contains a Class 1M laser. Do not view directly with optical instruments. (C028)

**CAUTION:**

Some laser products contain an embedded Class 3A or Class 3B laser diode. Note the following information: laser radiation when open. Do not stare into the beam, do not view directly with optical instruments, and avoid direct exposure to the beam. (C030)

**Power and cabling information for NEBS (Network Equipment-Building System) GR-1089-CORE**

The following comments apply to the IBM servers that have been designated as conforming to NEBS (Network Equipment-Building System) GR-1089-CORE:

The equipment is suitable for installation in the following:

- Network telecommunications facilities
- Locations where the NEC (National Electrical Code) applies

The intrabuilding ports of this equipment are suitable for connection to intrabuilding or unexposed wiring or cabling only. The intrabuilding ports of this equipment *must not* be metallically connected to the interfaces that connect to the OSP (outside plant) or its wiring. These interfaces are designed for use as intrabuilding interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE) and require isolation from the exposed OSP cabling. The addition of primary protectors is not sufficient protection to connect these interfaces metallically to OSP wiring.

**Note:** All Ethernet cables must be shielded and grounded at both ends.

The ac-powered system does not require the use of an external surge protection device (SPD).

The dc-powered system employs an isolated DC return (DC-I) design. The DC battery return terminal *shall not* be connected to the chassis or frame ground.

## Installing the 5802 and 5877 expansion units

Use the table in this brief installation guide as an overview to the individual tasks required for installing your 5802 and 5877 expansion units.

You can use the following table to read about and complete the high-level tasks for installing the 5796 and 7314-G30 expansion units.

*Table 1. Tasks to install the expansion unit into a rack*

Task	Where to find associated information
<p>Perform inventory.</p> <p>Ensure that you have the rails.</p> <p>Ensure that you have both a Philips-head and flat-head screwdriver.</p>	<p>Locate the inventory list for your expansion unit, and verify that you received all of the parts that you ordered.</p> <p>Each order contains, at a minimum, the following items:</p> <ul style="list-style-type: none"> <li>• Left and right rack-mounting rails</li> <li>• Mounting screws</li> <li>• Power supply cables</li> </ul> <p>If your shipment contains parts that are not required to complete the installation procedure, store those parts until they are required to be used.</p> <p>If you have incorrect, missing, or damaged parts, consult any of the following resources:</p> <ul style="list-style-type: none"> <li>• Your IBM reseller.</li> <li>• IBM Rochester manufacturing automated information line at 1-800-300-8751 (United States only).</li> <li>• Directory of worldwide contacts at <a href="http://www.ibm.com/planetwide">http://www.ibm.com/planetwide</a>. (Select your location to view the service and support contact information.)</li> </ul> <p>You can also obtain order information from your marketing representative or IBM Business Partner.</p>
<p>Verify that you have a rack.</p>	<p>You must have a rack installed. If you do not have a rack installed, see <i>Installing the rack</i> (<a href="http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7hbf/t42rack.htm">http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7hbf/t42rack.htm</a>).</p>
<p>Prepare to install the expansion unit.</p>	<p>To ensure that you have taken all preparatory steps to install this expansion unit, see <i>Installing the 5802 or 5877 in a rack</i> (<a href="http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/p7ham_5802_prepare.htm">http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/p7ham_5802_prepare.htm</a>).</p>
<p>Power off the system, if required, to install the expansion unit.</p>	<p>For requirements and procedures relating to shutting down and powering off the system, see <i>Overview for I/O expansion units</i> (<a href="http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/p7hamconcepts.htm">http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/p7hamconcepts.htm</a>).</p>
<p>Determine where to install the expansion unit in the rack.</p>	<p>For suggestions about how to organize the hardware in your rack and to assign a location for the expansion unit, see <i>Determining the location</i> (<a href="http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/p7ham_5802_locateinrack.htm">http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/p7ham_5802_locateinrack.htm</a>).</p>

Table 1. Tasks to install the expansion unit into a rack (continued)

Task	Where to find associated information
Mark the location on the rack where the expansion unit will be installed.	<p>If you have a rack-mounting template for the disk drive enclosure, use it to mark the location.</p> <p>If you do not have a rack-mounting template, see Marking the location (<a href="http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/p7ham_5802_markrack.htm">http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/p7ham_5802_markrack.htm</a>).</p>
Install the rail assembly on the rack.	To install the mounting hardware on the rack, see Attaching the mounting hardware to the rack ( <a href="http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/p7ham_5802_installmounting.htm">http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/p7ham_5802_installmounting.htm</a> ).
Install the expansion unit on the rail assembly.	To install the expansion unit on the rail assembly, see Installing the 5802 or 5877 on the rail assembly ( <a href="http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/p7ham_5802_installhardware.htm">http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/p7ham_5802_installhardware.htm</a> ).
<p><b>5802 only</b></p> <p>Review information about connecting the expansion unit, and cable it to the server.</p>	<p>To learn about cabling the expansion unit, see Configuring the disk drive subsystem on the 5802 expansion unit (<a href="http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/sas5802enclosure.htm">http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/sas5802enclosure.htm</a>).</p> <p>To connect the expansion unit, see Cabling the 5802 disk subsystem (<a href="http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/config5802enclosure.htm">http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/config5802enclosure.htm</a>).</p>
Apply power to the hardware.	<p>Connect power cables, and apply power to the expansion unit.</p> <p>If you powered down either the server or the partition before connecting the expansion unit cables to it, apply power to it.</p>

---

## Installing the 5802 and 5877 expansion units: Details

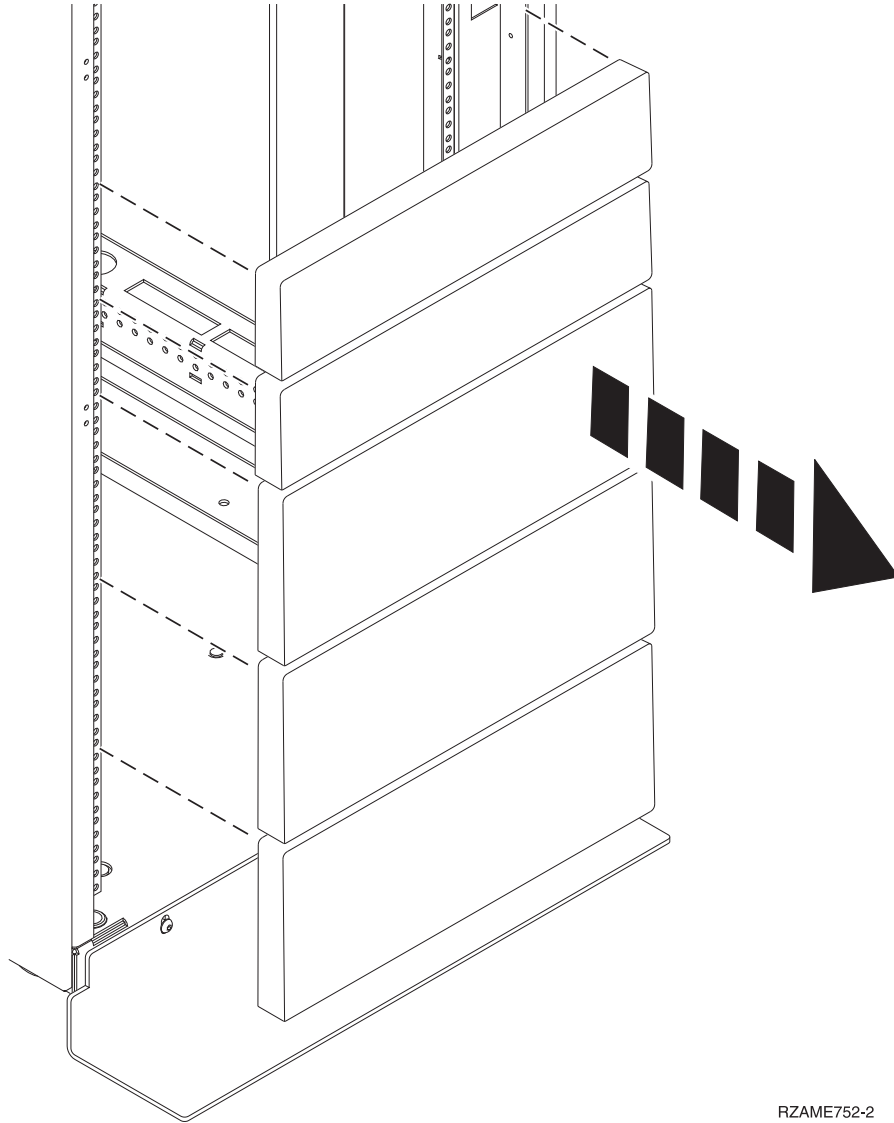
The detailed installation procedure includes information from online references that are specified in the brief installation guide. You can use the expanded instructions in this procedure to install your expansion unit into a rack and to cable it to a server.

- This information is provided in printed form as list of basic tasks for installing the 5802 and 5877 expansion units. For best results, use the online version of this information: Installing the 5802 and 5877 expansion units (<http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ecy/p7ecy.pdf>).
- This procedure assumes that you are installing the 5802 or 5877 expansion unit into an existing rack. If the rack is not yet installed, you must first complete the procedure for Installing the rack (<http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7hbf/t42rack.htm>).
- Before installing the expansion unit into a rack, read the Rack safety notices (<http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7hbf/racksafety.htm>).

To install the 5802 or 5877 expansion unit, complete the following tasks in the chronological order provided:

1. Unpack the expansion unit as follows:
  - a. Refer to the kitting list provided with the rack installation kit, and complete a parts inventory.
  - b. Locate the rack-mounting hardware kit and the system rail assemblies that were included with your expansion unit.
2. Determine where to install the expansion unit into the rack as follows:
  - a. Determine where in the rack to place the expansion unit in relation to other system hardware. As you prepare, organize larger and heavier units into the lower part of the rack, and plan to install units into the lower part of the rack first. Record the EIA locations in your plan.

**Note:** The expansion unit is four Electronic Industries Alliance (EIA) units high. An EIA unit is 44.50 mm (1.75 in.) in height. The rack contains three mounting holes for each EIA unit of height. This system unit, therefore, is 177.8 mm (7 in.) high and covers 12 mounting holes in the rack.
  - b. If necessary, remove the filler panels to allow access to the inside of the rack enclosure where you plan to place the expansion unit.



RZAME752-2

Figure 1. Removing the filler panels

- c. If necessary, remove the front and rear rack doors.
- d. Mark the rack location where you will install the expansion unit, using one of the following methods:
  - 1) If you have a rack-mounting template, use it to mark the location.
  - 2) If you do not have a rack-mounting template, complete the following steps:
    - a) Face the front of the rack and work from the left side. Make a note of both the lowest and highest EIA units to be used for the expansion unit. Use tape, a marker, or pencil to mark the bottom mounting hole (**A**) of the highest EIA unit. Mark the rack so that the mark can also be seen from the rear of the rack.



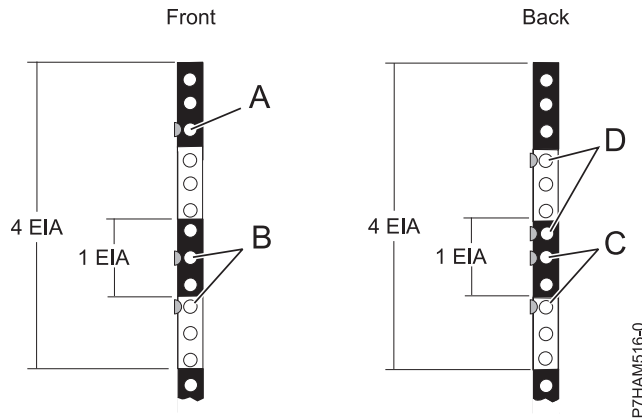


Figure 2. Marking the installation locations

- b) Mark the top mounting hole of the lowest EIA unit. Count up two holes and place another mark beside that mounting hole. Mark the rack so that these marks can also be seen from the rear of the rack. You now have two **(B)** marks on the rack, with one mounting hole between the marks.
  - c) Repeat the last two steps to place three marks on the corresponding mounting holes on the front-right side of the rack.
  - d) Go to the rear of the rack. On the left side, find the EIA unit that corresponds to the lowest EIA unit marked on the front of the rack.
  - e) Mark the top mounting hole of this EIA unit. Count up two holes and place another mark beside that mounting hole. You now have two **(C)** marks on the rack, with one mounting hole between the marks.
  - f) Count up one mounting hole from where you placed your last mark, and place another mark next to that mounting hole. Then count up three holes and place another mark beside that mounting hole. You now have two **(D)** marks on the rack, with three mounting holes between the marks.
  - g) Repeat the last two steps to place four marks on the corresponding mounting holes on the rear-right side of the rack.
3. Install the rail assembly into the rack as follows:

**Important:** To complete this procedure, use two people to attach the rail assembly to the rack. Position one person in front of the rack and one person at the rear of the rack.

**CAUTION:**

**Installing the rails in the rack is a complex procedure. To install the rails correctly, you must perform each task in the following order. Failure to do so might cause rail failure and potential danger to yourself and the system unit.**

- a. Rotate down the front and back clamps **(C)** on the left and right rails, as shown in the following figure.
- b. On each rail, remove the tape holding the spring **(B)** to the rail. Hook the end of the spring around the circular standoff on the rail.
- c. Start at the front of the rack. Extend the right rail and insert the rail pins **(D)** into the two lowest mounting holes marked on the rack so that the rail is facing upward. Rotate up the front clamp **(C)** to secure the rail in place.

**Notes:**

- If your rack has the square mounting holes, remove the rail pins **(D)** from the rail. Install the larger rail pins provided with the rack installation kit.

- The rail installation can be completed by one person. However, the installation is easier if one person is positioned at the front of the rack and one person is positioned at the rear of the rack.

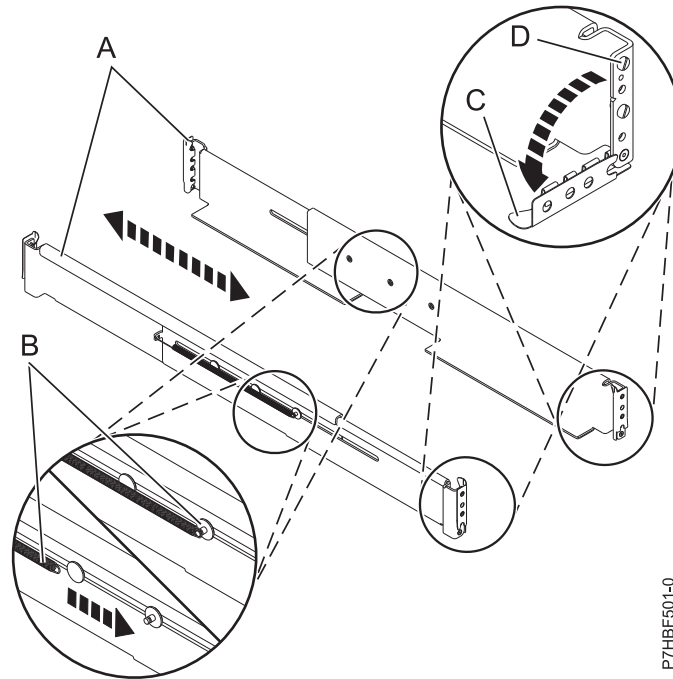


Figure 3. Installing the rails

- Extend the left rail and insert the rail pins (**D**) into the two lowest mounting holes marked on the rack. Rotate up the front clamp (**C**) to secure the rail in place.
- Move to the rear of the rack, extend the right rail, and insert the rail pins (**D**) into the two lowest mounting holes marked on the rack. Rotate up the back clamp (**C**) to secure the rail in place.
- Extend the left rail and insert the rail pins (**D**) into the two lowest mounting holes marked on the rack. Rotate up the back clamp (**C**) to secure the rail in place.
- At the rear of the rack, use two M5 screws (**E**), one below each rail pin (**D**), to secure the left rail to the back of the rack.
- Use two M5 screws (**E**), one below each rail pin (**D**), to secure the right rail to the back of the rack.
- Move to the front of the rack. Use one M5 screw (**E**) below the top rail pin to secure the left rail to the front of the rack.

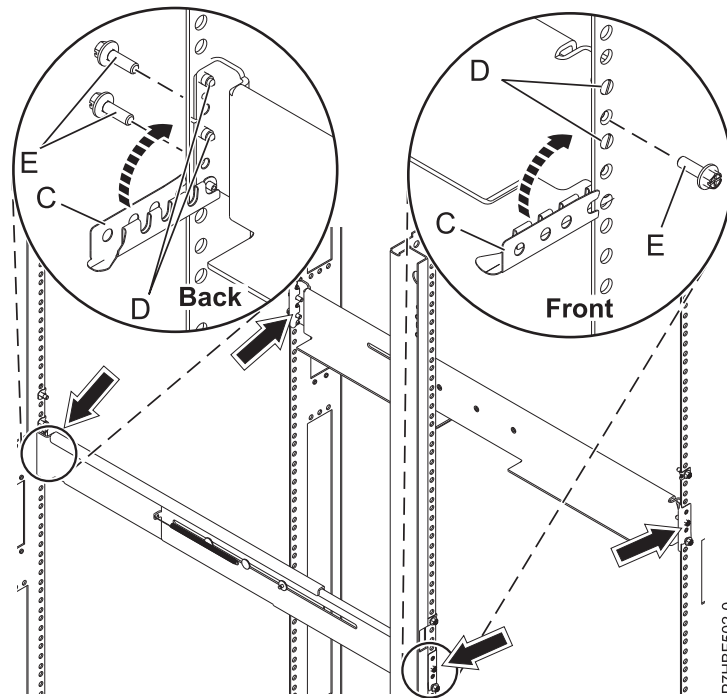


Figure 4. Attaching the rails

- j. Use one M5 screw (E), below the top rail pin (D), to secure the right rail to the front of the rack. See the previous figure.
- k. Locate the remaining marks made previously on the front Electronic Industries Alliance (EIA) strips of the rack cabinet. Each side contains one mark. Insert one nut clip (F) at the mark on the right side of the rack as shown in the following figure.
- l. Insert a nut clip (F) at the mark on the left side of the rack.
- m. From the back of the rack cabinet, locate the remaining marks made previously on the rear Electronic Industries Alliance (EIA) strips. Each side contains two marks. Insert a nut clip (F) at each mark on the right side of the rack.

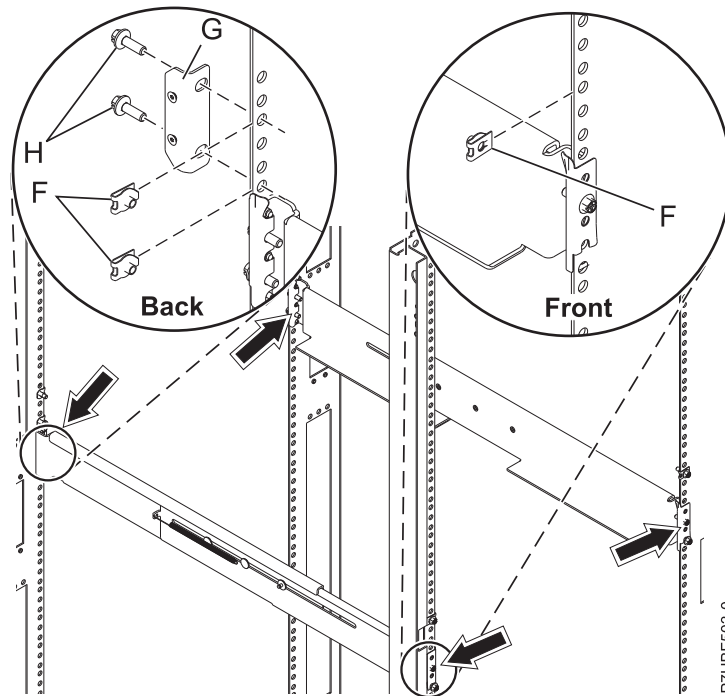


Figure 5. Installing the retention bracket

- n. Use two M5 screws (**H**) to attach the retention bracket (**G**) to the rack on the right side.
  - o. Insert a nut clip (**F**) at each mark on the left side of the rack.
  - p. Use two M5 screws (**H**) to attach the retention bracket (**G**) to the rack on the left side.
4. Install the expansion unit onto the rails as follows:
- a. To remove the shipped cover from the rear of the expansion unit, remove the four thumb screws that are used to secure it. Pull off the cover.
- Note:** There are two thumb screws at the top of the cover and one on each side.
- b. If the bezel is installed on the front of the system, remove it by completing the following steps:
    - 1) Remove the two M5 securing screws (**A**) as shown in Figure 6 on page 9.
    - 2) Remove the service information holder from the slot in the bezel.
    - 3) Using the two blue touch points on each side of the expansion unit, pull the bezel straight out to remove the bezel from the front of the expansion unit.
    - 4) Remove the two nut clips that were used to secure the bezel to the expansion unit from the EIA flange.

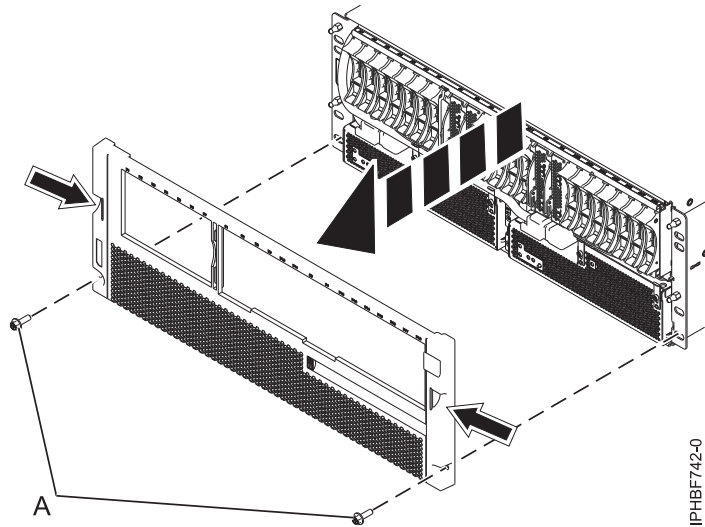


Figure 6. Removing the service information holder and bezel

- c. Using three people, hold onto the four handles (**I**), as shown in the following figure, to lift the expansion unit and position it over the front of the rails.

**Attention:** Three people are required to safely lift the expansion unit. Using fewer than three people to lift the expansion unit can result in injury.

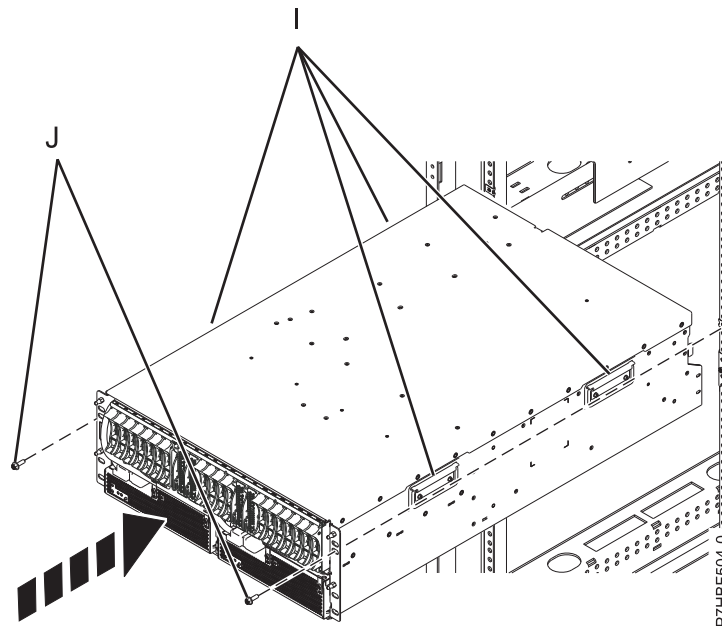


Figure 7. Installing the expansion unit into a rack

- d. Slide the expansion unit into the rack.
- e. Install the two M5 securing screws (**J**) through the expansion unit and into the nut clips on the left and right rails. See the previous figure.
- f. Install the bezel (**L**) onto the expansion unit. Press the bezel into place and secure it with two M5 screws (**M**) on the left and right rails. See the following figure.
- g. Insert the service information holder (**N**) into the slot in the bezel.

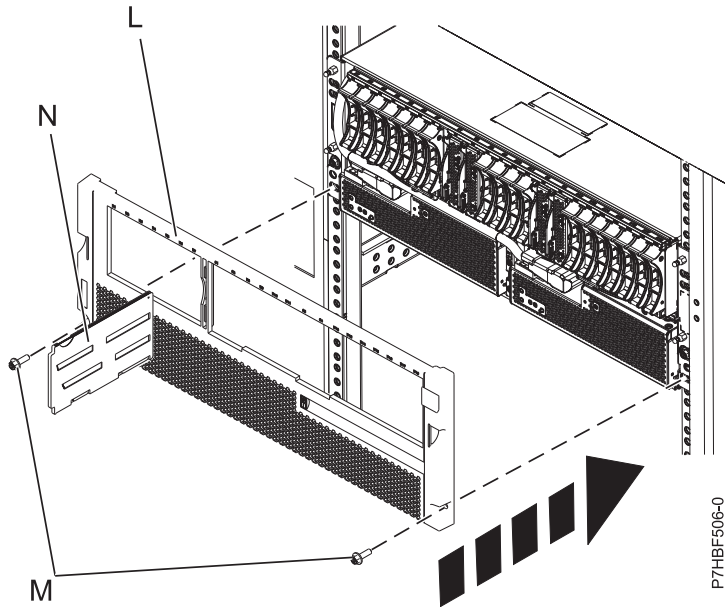


Figure 8. Installing the bezel and service information holder

- h. At the rear of the system, install the four securing screws (K) through the expansion unit and retention brackets on the left and right rails.

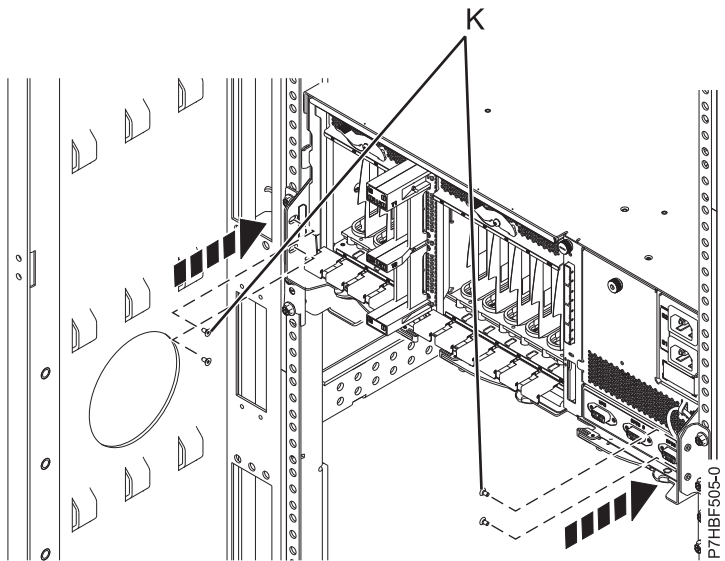


Figure 9. Installing four screws at the rear of the system

- 5. **5802 only:** Connect the SAS cables to the disk drive enclosure as follows:
  - a. Review the following information related to connecting this device:
    - 1) Review the connector locations.

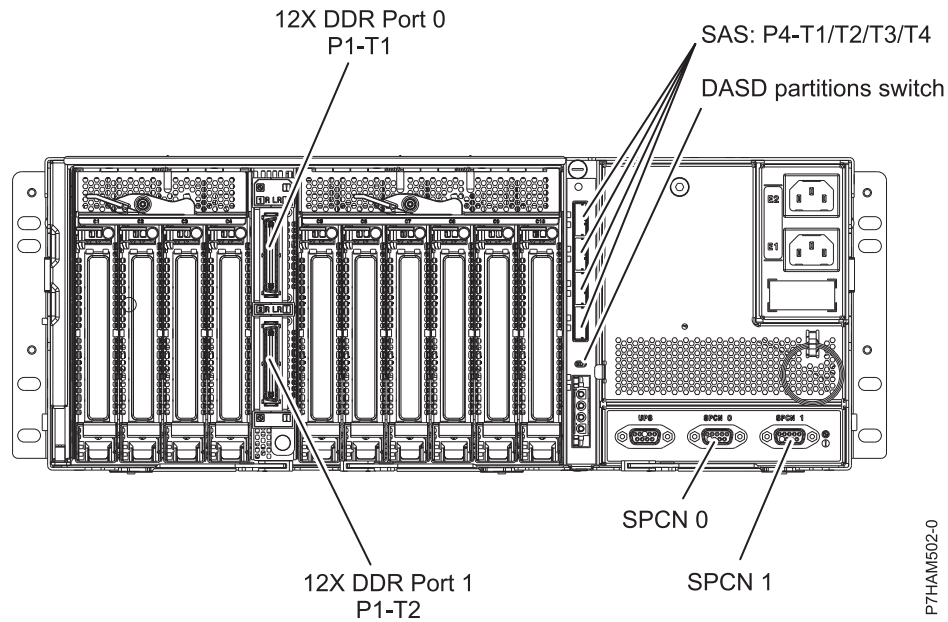


Figure 10. Model 5802 and 5877 connector locations

- 2) Review the following information about configuring the disk drive subsystem:
  - a) The 5802 SAS disk drive enclosure can hold up to 18 disk drives. The disks in this enclosure can be organized in several different configurations depending on the operating system used, the type of SAS adapter, and the position of the hard-disk-drive partitions switch.

**Notes:**

- The hard-disk-drive partitions switch is located at the rear of the 5802 SAS disk drive enclosure. The hard-disk-drive partitions switch is located just below the SAS connectors.
- If the hard-disk-drive partitions switch position is changed, you must cycle the power to the 5802 SAS disk drive enclosure for the 5802 to sense the new position of the hard-disk-drive partitions switch.

The 5802 SAS disk drive enclosure supports the following operating systems:

- AIX®
- IBM i
- Linux

To determine the level of software you need to support the 5802 SAS disk drive enclosure, see IBM Prerequisite ([http://www-912.ibm.com/e\\_dir/eServerPrereq.nsf](http://www-912.ibm.com/e_dir/eServerPrereq.nsf)).

Table 2. Positions of the hard-disk-drive toggle switch

Operating system	Position 1	Position 2	Position 4
AIX	Either a (FC 5901) - PCIe Dual - x4 SAS Adapter or two (FC 5903) - PCIe Dual - x4 3Gb SAS RAID Adapters	Either two (FC 5901) - PCIe Dual - x4 SAS Adapters or two (FC 5903) - PCIe Dual - x4 3Gb SAS RAID Adapters	Four (FC 5901) - PCIe Dual - x4 SAS Adapters

Table 2. Positions of the hard-disk-drive toggle switch (continued)

Operating system	Position 1	Position 2	Position 4
IBM i	Not supported	Either two (FC 5901) - PCIe Dual - x4 SAS Adapters or two (FC 5903) - PCIe Dual - x4 3Gb SAS RAID Adapters	Not supported
Linux	Either a (FC 5901) - PCIe Dual - x4 SAS Adapter or two (FC 5903) - PCIe Dual - x4 3Gb SAS RAID Adapters	Either two (FC 5901) - PCIe Dual - x4 SAS Adapters or two (FC 5903) - PCIe Dual - x4 3Gb SAS RAID Adapters	Four (FC 5901) - PCIe Dual - x4 SAS Adapters

**Note:** FC means feature code.

**Tip:** If you are planning to configure RAID arrays, ensure that you have the following minimum number of available disks for each RAID level:

**RAID 0**

One drive minimum per array

**RAID 5**

Three drives minimum per array

**RAID 6**

Four drives minimum per array

**RAID 10**

Two drives minimum per array

For additional SAS RAID controller information for the AIX operating system, see SAS RAID controller for AIX ([http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ebj/sascontroller\\_kickoff\\_aix.htm](http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ebj/sascontroller_kickoff_aix.htm)).

For additional SAS RAID controller information for the Linux operating system, see SAS RAID controller for Linux ([http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ebk/sascontroller\\_kickoff.htm](http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ebk/sascontroller_kickoff.htm)).

For information related to device parity protection, see Device parity protection (<http://publib.boulder.ibm.com/infocenter/systems/scope/i5os/topic/rzaly/rzalydpy.htm>).

- b. Connect a SAS adapter to your disk drive enclosure as follows:
  - 1) To select a cabling configuration that suits your requirements, see the following table.
  - 2) Cable the 5802 disk subsystem.

**Note:** For SAS cable information, see Serial-attached SCSI cable planning (<http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7had/p7hadsascabling.htm>).



Table 3. Configuration requirements of the 5802 disk subsystem

Configuration features	Configuration requirements
<p>Two hard-disk-drive partitions with nine disks per hard disk drive partition.</p> <p>A multi-initiator high-availability configuration.</p> <p>Dual Serial-attached SCSI (SAS) connectivity to all drives.</p>	<p>For related physical cabling, see Figure 11 on page 14.</p> <p>Operating system: AIX, IBM i, or Linux</p> <p>SAS adapter card: Either two (FC 5901) - PCIe Dual - x4 SAS Adapters or two (FC 5903) - PCIe Dual - x4 3Gb SAS RAID Adapters</p> <p>Hard-disk-drive partitions switch: position 2</p> <p>Cables: Four (FC 3688) - SAS cables (AT) 0.6 meter.</p> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• For AIX and Linux operating systems, this must be a RAID configuration.</li> <li>• You must have a minimum of one disk drive per hard-disk-drive partition.</li> </ul>
<p>One hard-disk-drive partition with 18 disks and a single SAS adapter.</p>	<p>For related physical cabling, see Figure 12 on page 15.</p> <p>Operating system: AIX or Linux</p> <p>SAS adapter: One (FC 5901) - PCIe Dual - x4 SAS Adapter</p> <p>Hard-disk-drive partitions switch: position 1</p> <p>Cables: One (FC 3688) - SAS cable (AT) 0.6 meter.</p>
<p>Two hard-disk-drive partitions with nine disks per hard-disk-drive partition and a single SAS adapter.</p>	<p>For related physical cabling, see Figure 13 on page 15.</p> <p>Operating system: AIX, IBM i, or Linux</p> <p>SAS adapter: One (FC 5901) - PCIe Dual - x4 SAS Adapter</p> <p>Hard-disk-drive partitions switch: position 2</p> <p>Cables: Two (FC 3688) - SAS cables (AT) 0.6 meter.</p> <p><b>Note:</b> You must have a minimum of one disk drive per hard-disk-drive partition.</p>
<p>Two hard-disk-drive partitions with nine disks per hard-disk-drive partition and two SAS adapters.</p>	<p>For related physical cabling, see Figure 14 on page 15.</p> <p>Operating system: AIX, IBM i, or Linux</p> <p>SAS adapter: Two (FC 5901) - PCIe Dual - x4 SAS Adapters</p> <p>Hard-disk-drive partitions switch: position 2</p> <p>Cables: Two (FC 3688) - SAS cables (AT) 0.6 meter.</p> <p><b>Note:</b> You must have a minimum of one disk drive per hard-disk-drive partition.</p>
<p>Two hard-disk-drive partitions with nine disks per hard-disk-drive partition and four SAS adapters (two pairs of SAS adapters, each running a set of nine disk drives).</p> <p>This is a multi-initiator high-availability configuration.</p> <p>Dual SAS connectivity to all drives.</p>	<p>For related physical cabling, see Figure 15 on page 16.</p> <p>Operating system: AIX, IBM i, Linux</p> <p>SAS adapter: Either four (FC 5901) - PCIe Dual - x4 SAS Adapters or four (FC 5903) - PCIe Dual - x4 3Gb SAS RAID Adapters</p> <p>Hard-disk-drive partitions switch: position 2</p> <p>Cables: Four (FC 3688) - SAS cables (AT) 0.6 meter.</p> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• For AIX and Linux operating systems, this must be a RAID configuration.</li> <li>• You must have a minimum of one disk drive per hard-disk-drive partition.</li> </ul>

Table 3. Configuration requirements of the 5802 disk subsystem (continued)

Configuration features	Configuration requirements
<p>One hard-disk-drive partition with 18 disks and dual SAS adapters.</p> <p>This is a multi-initiator high-availability configuration.</p> <p>Dual SAS connectivity to all drives.</p>	<p>For related physical cabling, see Figure 16 on page 16.</p> <p>Operating system: AIX or Linux</p> <p>SAS adapter: Either two (FC 5901) - PCIe Dual - x4 SAS Adapters or two (FC 5903) - PCIe Dual - x4 3Gb SAS RAID Adapters</p> <p>Hard-disk-drive partitions switch: position 1</p> <p>Cables: Two (FC 3688) - SAS cables (AT) 0.6 meter.</p> <p><b>Note:</b> For AIX and Linux operating systems, this must be a RAID configuration.</p>
<p>Four hard-disk-drive partitions:</p> <ul style="list-style-type: none"> <li>• Partition 1: Drives 01-05</li> <li>• Partition 2: Drives 06-09</li> <li>• Partition 3: Drives 10-14</li> <li>• Partition 4: Drives 15-18</li> </ul> <p>This configuration is optimized for boot partitions.</p>	<p>For related physical cabling, see Figure 17 on page 16.</p> <p>Operating system: AIX or Linux</p> <p>SAS adapter card: One (FC 5901) PCIe Dual - X4 SAS adapter is required for each of the four disk partitions with an installed disk drive.</p> <p>Hard-disk-drive partitions switch: position 4</p> <p>Cables: One (FC 3688) SAS (AT) 0.6 meter is required for each FC 5901 driving one of the four disk partitions.</p> <p><b>Note:</b> You must have one (FC 5901) PCIe Dual - X4 SAS adapter and one (FC 3688) SAS 0.6 meter cable for every disk partition that has an installed internal disk drive.</p>

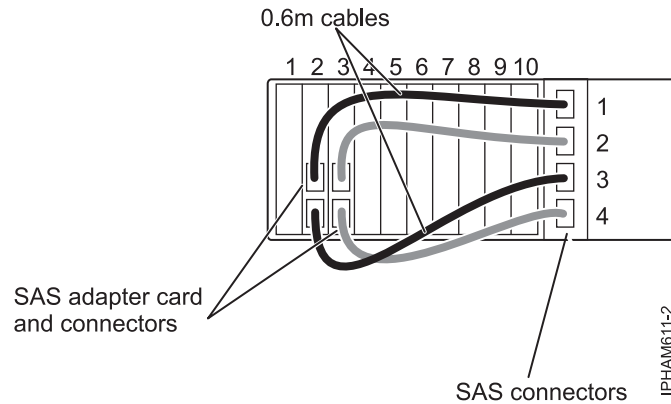


Figure 11. Physical cabling example: Two hard-disk-drive partitions with nine disks per hard-disk-drive partition, dual SAS adapters, and hard-disk-drive partitions switch position 2

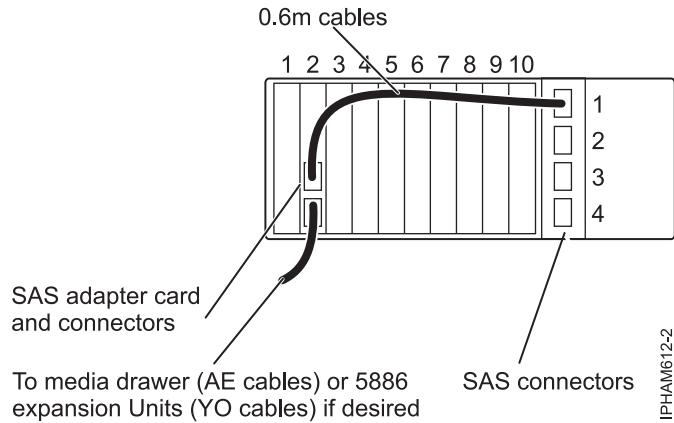


Figure 12. Physical cabling example: One hard-disk-drive partition with 18 disks, a single SAS adapter, and hard-disk-drive partitions switch position 1

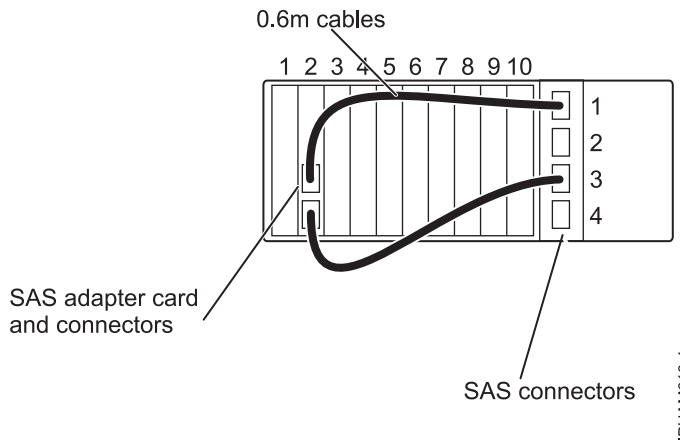


Figure 13. Physical cabling example: Two hard-disk-drive partitions with nine disks per hard-disk-drive partition, a single SAS adapter, and hard-disk-drive partitions switch position 2

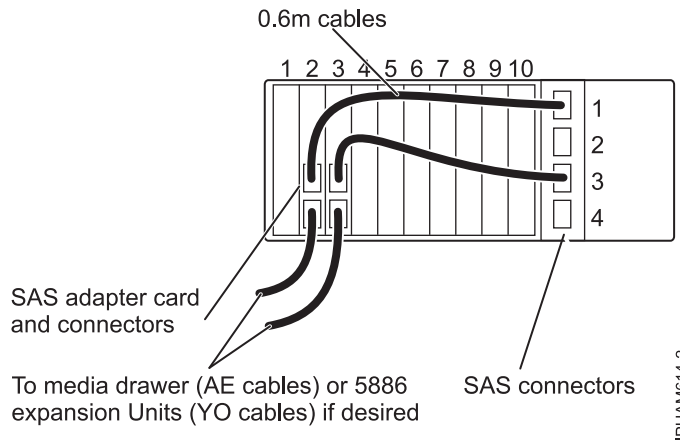


Figure 14. Physical cabling example: Two hard-disk-drive partitions with nine disks per hard-disk-drive partition, two SAS adapters, and hard-disk-drive partitions switch position 2

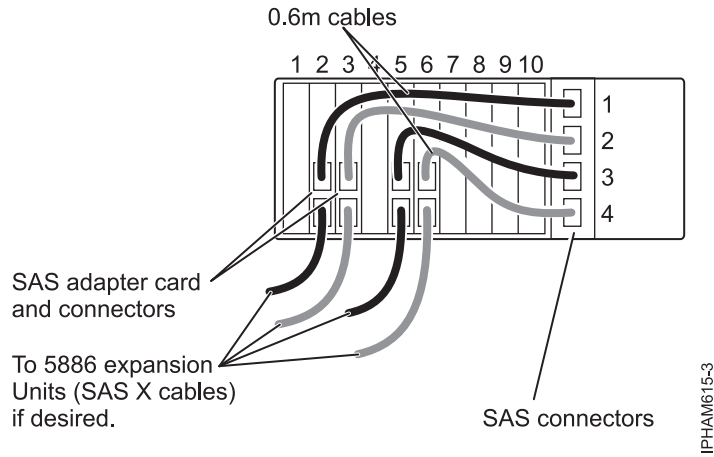


Figure 15. Physical cabling example: Two hard-disk-drive partitions with nine disks per hard-disk-drive partition, four SAS adapters, and hard-disk-drive partitions switch position 2

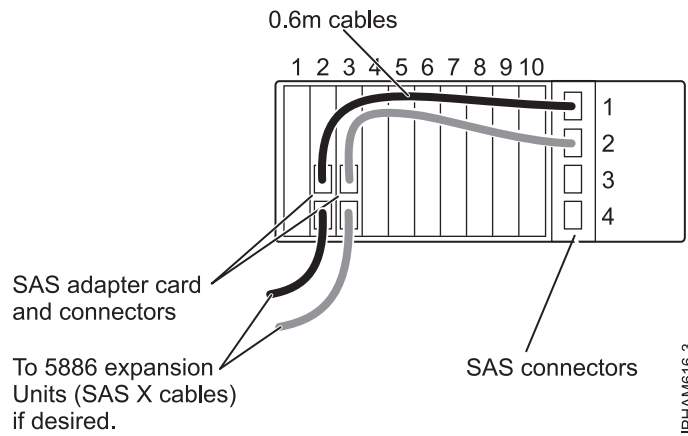


Figure 16. Physical cabling example: One hard-disk-drive partition with 18 disks, dual SAS adapters, and hard-disk-drive partitions switch position 1

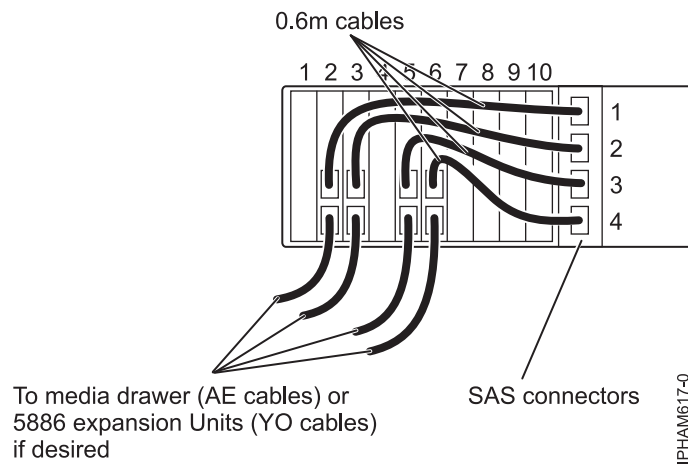


Figure 17. Physical cabling example: Four hard-disk-drive partitions with four or five disks per hard-disk-drive partition and hard-disk-drive partitions switch position 4

- 3) Set the hard-disk-drive partitions switch to the correct position for your cabling configuration by using the table in this section.
- 4) Install the 12X adapter into your server.
- 5) Connect the 12X DDR cable to your 5802 or 5877 expansion unit. For information about 12X Double Data Rate (DDR) cables, see Identifying 12X and SPCN cables (<http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/identifycables.htm>).

**Note:** Two modes are available for connecting the 12X interface:

- Double-barrel mode: Using two 12X DDR cables, connect port 0 of the 5802 or 5877 expansion unit to port 0 of the 12X interface on the server, and connect port 1 of the 5802 or 5877 expansion unit to port 1 of the 12X interface on the server.
  - Loop mode.
- 6) Install the other end of the 12X DDR cable to the 12X adapter on the server.
  - 7) Add the disk drives to the operating system you are using.
6. Cable the expansion unit to the server as follows:

**Notes:**

You might need to power off the server before connecting the cables. For information about powering off the server, see Overview for I/O expansion units (<http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/p7hamconcepts.htm>).

This unit uses 12x Double Data Rate (DDR) and system power control network (SPCN) cables to connect to the server.

Do not perform 12x DDR cable configuration changes, such as moving existing expansion units to different GX adapters at the same time you add new expansion units.

If you are adding a new expansion unit or migrating expansion units from another IBM Power Systems™ server, you might not be able to allocate the expansion unit resources to logical partitions on the new server until an SPCN firmware update is completed for the expansion units.

- a. Complete all applicable prerequisites for installing your expansion units. For detailed procedures related to preparing to connect your expansion units, see Prepare to connect your expansion units (<http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/prepare.htm>).
- b. Connect the expansion unit to the system. For a detailed procedure that describes how to connect your expansion units to the system, see Connect your expansion units (<http://publib.boulder.ibm.com/infocenter/systems/scope/hw/topic/p7ham/iphamsetup.htm>).



---

## Notices

This information was developed for products and services offered in the U.S.A.

The manufacturer may not offer the products, services, or features discussed in this document in other countries. Consult the manufacturer's representative for information on the products and services currently available in your area. Any reference to the manufacturer's product, program, or service is not intended to state or imply that only that product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any intellectual property right of the manufacturer may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any product, program, or service.

The manufacturer may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not grant you any license to these patents. You can send license inquiries, in writing, to the manufacturer.

**The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law:** THIS INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. The manufacturer may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to websites not owned by the manufacturer are provided for convenience only and do not in any manner serve as an endorsement of those websites. The materials at those websites are not part of the materials for this product and use of those websites is at your own risk.

The manufacturer may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Any performance data contained herein was determined in a controlled environment. Therefore, the results obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

Information concerning products not produced by this manufacturer was obtained from the suppliers of those products, their published announcements or other publicly available sources. This manufacturer has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to products not produced by this manufacturer. Questions on the capabilities of products not produced by this manufacturer should be addressed to the suppliers of those products.

All statements regarding the manufacturer's future direction or intent are subject to change or withdrawal without notice, and represent goals and objectives only.

The manufacturer's prices shown are the manufacturer's suggested retail prices, are current and are subject to change without notice. Dealer prices may vary.

This information is for planning purposes only. The information herein is subject to change before the products described become available.

This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

If you are viewing this information in softcopy, the photographs and color illustrations may not appear.

The drawings and specifications contained herein shall not be reproduced in whole or in part without the written permission of the manufacturer.

The manufacturer has prepared this information for use with the specific machines indicated. The manufacturer makes no representations that it is suitable for any other purpose.

The manufacturer's computer systems contain mechanisms designed to reduce the possibility of undetected data corruption or loss. This risk, however, cannot be eliminated. Users who experience unplanned outages, system failures, power fluctuations or outages, or component failures must verify the accuracy of operations performed and data saved or transmitted by the system at or near the time of the outage or failure. In addition, users must establish procedures to ensure that there is independent data verification before relying on such data in sensitive or critical operations. Users should periodically check the manufacturer's support websites for updated information and fixes applicable to the system and related software.

### **Ethernet connection usage restriction**

This product is not intended to be connected directly or indirectly by any means whatsoever to interfaces of public telecommunications networks.

---

## **Trademarks**

IBM, the IBM logo, and [ibm.com](http://ibm.com) are trademarks or registered trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of IBM trademarks is available on the Web at Copyright and trademark information at [www.ibm.com/legal/copytrade.shtml](http://www.ibm.com/legal/copytrade.shtml).

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

Other product or service names might be trademarks of IBM or other companies.

---

## **Electronic emission notices**

When attaching a monitor to the equipment, you must use the designated monitor cable and any interference suppression devices supplied with the monitor.

## **Class A Notices**

The following Class A statements apply to the IBM servers that contain the POWER7<sup>®</sup> processor and its features unless designated as electromagnetic compatibility (EMC) Class B in the feature information.

## **Federal Communications Commission (FCC) statement**

**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.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. IBM is not responsible for any radio or television interference caused by using other than recommended cables and connectors or by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate the equipment.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

### **Industry Canada Compliance Statement**

This Class A digital apparatus complies with Canadian ICES-003.

### **Avis de conformité à la réglementation d'Industrie Canada**

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

### **European Community Compliance Statement**

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

This product has been tested and found to comply with the limits for Class A Information Technology Equipment according to European Standard EN 55022. The limits for Class A equipment were derived for commercial and industrial environments to provide reasonable protection against interference with licensed communication equipment.

European Community contact:  
IBM Deutschland GmbH  
Technical Regulations, Department M456  
IBM-Allee 1, 71139 Ehningen, Germany  
Tele: +49 7032 15-2937  
email: tjahn@de.ibm.com

**Warning:** This is a Class A product. In a domestic environment, this product may cause radio interference, in which case the user may be required to take adequate measures.

### **VCCI Statement - Japan**

この装置は、クラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

VCCI-A

The following is a summary of the VCCI Japanese statement in the box above:

This is a Class A product based on the standard of the VCCI Council. If this equipment is used in a domestic environment, radio interference may occur, in which case, the user may be required to take corrective actions.

### **Japanese Electronics and Information Technology Industries Association (JEITA) Confirmed Harmonics Guideline (products less than or equal to 20 A per phase)**

高調波ガイドライン適合品

### **Japanese Electronics and Information Technology Industries Association (JEITA) Confirmed Harmonics Guideline with Modifications (products greater than 20 A per phase)**

高調波ガイドライン準用品

### **Electromagnetic Interference (EMI) Statement - People's Republic of China**

#### **声 明**

此为 A 级产品,在生活环境中,  
该产品可能会造成无线电干扰。  
在这种情况下,可能需要用户对其  
干扰采取切实可行的措施。

Declaration: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user may need to perform practical action.

### **Electromagnetic Interference (EMI) Statement - Taiwan**

#### **警告使用者：**

這是甲類的資訊產品，在  
居住的環境中使用時，可  
能會造成射頻干擾，在這  
種情況下，使用者會被要  
求採取某些適當的對策。

The following is a summary of the EMI Taiwan statement above.

Warning: This is a Class A product. In a domestic environment this product may cause radio interference in which case the user will be required to take adequate measures.

**IBM Taiwan Contact Information:**

台灣IBM 產品服務聯絡方式：  
台灣國際商業機器股份有限公司  
台北市松仁路7號3樓  
電話：0800-016-888

### **Electromagnetic Interference (EMI) Statement - Korea**

이 기기는 업무용(A급)으로 전자파적합기기로서 판매자 또는 사용자는 이 점을 주의하시기 바라며, 가정외의 지역에서 사용하는 것을 목적으로 합니다.

### **Germany Compliance Statement**

#### **Deutschsprachiger EU Hinweis: Hinweis für Geräte der Klasse A EU-Richtlinie zur Elektromagnetischen Verträglichkeit**

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2004/108/EG zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaaten und hält die Grenzwerte der EN 55022 Klasse A ein.

Um dieses sicherzustellen, sind die Geräte wie in den Handbüchern beschrieben zu installieren und zu betreiben. Des Weiteren dürfen auch nur von der IBM empfohlene Kabel angeschlossen werden. IBM übernimmt keine Verantwortung für die Einhaltung der Schutzanforderungen, wenn das Produkt ohne Zustimmung von IBM verändert bzw. wenn Erweiterungskomponenten von Fremdherstellern ohne Empfehlung von IBM gesteckt/eingebaut werden.

EN 55022 Klasse A Geräte müssen mit folgendem Warnhinweis versehen werden:

"Warnung: Dieses ist eine Einrichtung der Klasse A. Diese Einrichtung kann im Wohnbereich Funk-Störungen verursachen; in diesem Fall kann vom Betreiber verlangt werden, angemessene Maßnahmen zu ergreifen und dafür aufzukommen."

#### **Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten**

Dieses Produkt entspricht dem "Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)". Dies ist die Umsetzung der EU-Richtlinie 2004/108/EG in der Bundesrepublik Deutschland.

#### **Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG) (bzw. der EMC EG Richtlinie 2004/108/EG) für Geräte der Klasse A**

Dieses Gerät ist berechtigt, in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen.

Verantwortlich für die Einhaltung der EMV Vorschriften ist der Hersteller:  
International Business Machines Corp.  
New Orchard Road  
Armonk, New York 10504  
Tel: 914-499-1900

Der verantwortliche Ansprechpartner des Herstellers in der EU ist:  
IBM Deutschland GmbH  
Technical Regulations, Abteilung M456  
IBM-Allee 1, 71139 Ehningen, Germany  
Tel: +49 7032 15-2937  
email: tjahn@de.ibm.com

Generelle Informationen:

Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55022 Klasse A.

### **Electromagnetic Interference (EMI) Statement - Russia**

**ВНИМАНИЕ!** Настоящее изделие относится к классу А.  
В жилых помещениях оно может создавать  
радиопомехи, для снижения которых необходимы  
дополнительные меры

### **Class B Notices**

The following Class B statements apply to features designated as electromagnetic compatibility (EMC) Class B in the feature installation information.

### **Federal Communications Commission (FCC) statement**

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult an IBM-authorized dealer or service representative for help.

Properly shielded and grounded cables and connectors must be used in order to meet FCC emission limits. Proper cables and connectors are available from IBM-authorized dealers. IBM is not responsible for

any radio or television interference caused by unauthorized changes or modifications to this equipment. Unauthorized changes or modifications could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

### **Industry Canada Compliance Statement**

This Class B digital apparatus complies with Canadian ICES-003.

### **Avis de conformité à la réglementation d'Industrie Canada**

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

### **European Community Compliance Statement**

This product is in conformity with the protection requirements of EU Council Directive 2004/108/EC on the approximation of the laws of the Member States relating to electromagnetic compatibility. IBM cannot accept responsibility for any failure to satisfy the protection requirements resulting from a non-recommended modification of the product, including the fitting of non-IBM option cards.

This product has been tested and found to comply with the limits for Class B Information Technology Equipment according to European Standard EN 55022. The limits for Class B equipment were derived for typical residential environments to provide reasonable protection against interference with licensed communication equipment.

European Community contact:  
IBM Deutschland GmbH  
Technical Regulations, Department M456  
IBM-Allee 1, 71139 Ehningen, Germany  
Tele: +49 7032 15-2937  
email: tjahn@de.ibm.com

### **VCCI Statement - Japan**

この装置は、クラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。

取扱説明書に従って正しい取り扱いをして下さい。 VCCI-B

### **Japanese Electronics and Information Technology Industries Association (JEITA) Confirmed Harmonics Guideline (products less than or equal to 20 A per phase)**

高調波ガイドライン適合品

**Japanese Electronics and Information Technology Industries Association (JEITA)  
Confirmed Harmonics Guideline with Modifications (products greater than 20 A per  
phase)**

高調波ガイドライン準用品

**IBM Taiwan Contact Information**

台灣IBM 產品服務聯絡方式：  
台灣國際商業機器股份有限公司  
台北市松仁路7號3樓  
電話：0800-016-888

**Electromagnetic Interference (EMI) Statement - Korea**

이 기기는 가정용(B급)으로 전자파적합기기로서 주로 가정에서 사용하는 것을 목적으로 하며, 모든 지역에서 사용할 수 있습니다.

**Germany Compliance Statement**

**Deutschsprachiger EU Hinweis: Hinweis für Geräte der Klasse B EU-Richtlinie zur  
Elektromagnetischen Verträglichkeit**

Dieses Produkt entspricht den Schutzanforderungen der EU-Richtlinie 2004/108/EG zur Angleichung der Rechtsvorschriften über die elektromagnetische Verträglichkeit in den EU-Mitgliedsstaaten und hält die Grenzwerte der EN 55022 Klasse B ein.

Um dieses sicherzustellen, sind die Geräte wie in den Handbüchern beschrieben zu installieren und zu betreiben. Des Weiteren dürfen auch nur von der IBM empfohlene Kabel angeschlossen werden. IBM übernimmt keine Verantwortung für die Einhaltung der Schutzanforderungen, wenn das Produkt ohne Zustimmung von IBM verändert bzw. wenn Erweiterungskomponenten von Fremdherstellern ohne Empfehlung von IBM gesteckt/eingebaut werden.

**Deutschland: Einhaltung des Gesetzes über die elektromagnetische Verträglichkeit von Geräten**

Dieses Produkt entspricht dem "Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)". Dies ist die Umsetzung der EU-Richtlinie 2004/108/EG in der Bundesrepublik Deutschland.

**Zulassungsbescheinigung laut dem Deutschen Gesetz über die elektromagnetische Verträglichkeit von  
Geräten (EMVG) (bzw. der EMC EG Richtlinie 2004/108/EG) für Geräte der Klasse B**

Dieses Gerät ist berechtigt, in Übereinstimmung mit dem Deutschen EMVG das EG-Konformitätszeichen - CE - zu führen.

Verantwortlich für die Einhaltung der EMV Vorschriften ist der Hersteller:  
International Business Machines Corp.  
New Orchard Road  
Armonk, New York 10504  
Tel: 914-499-1900

Der verantwortliche Ansprechpartner des Herstellers in der EU ist:  
IBM Deutschland GmbH  
Technical Regulations, Abteilung M456  
IBM-Allee 1, 71139 Ehningen, Germany  
Tel: +49 7032 15-2937  
email: tjahn@de.ibm.com

Generelle Informationen:

**Das Gerät erfüllt die Schutzanforderungen nach EN 55024 und EN 55022 Klasse B.**

---

## Terms and conditions

Permissions for the use of these publications is granted subject to the following terms and conditions.

**Personal Use:** You may reproduce these publications for your personal, noncommercial use provided that all proprietary notices are preserved. You may not distribute, display or make derivative works of these publications, or any portion thereof, without the express consent of the manufacturer.

**Commercial Use:** You may reproduce, distribute and display these publications solely within your enterprise provided that all proprietary notices are preserved. You may not make derivative works of these publications, or reproduce, distribute or display these publications or any portion thereof outside your enterprise, without the express consent of the manufacturer.

Except as expressly granted in this permission, no other permissions, licenses or rights are granted, either express or implied, to the publications or any information, data, software or other intellectual property contained therein.

The manufacturer reserves the right to withdraw the permissions granted herein whenever, in its discretion, the use of the publications is detrimental to its interest or, as determined by the manufacturer, the above instructions are not being properly followed.

You may not download, export or re-export this information except in full compliance with all applicable laws and regulations, including all United States export laws and regulations.

THE MANUFACTURER MAKES NO GUARANTEE ABOUT THE CONTENT OF THESE PUBLICATIONS. THESE PUBLICATIONS ARE PROVIDED "AS-IS" AND WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY, NON-INFRINGEMENT, AND FITNESS FOR A PARTICULAR PURPOSE.

