

Power Systems

*PCI adapter placement for the
8231-E2B, 8231-E1C, 8231-E1D,
8231-E2C, 8231-E2D, or 8268-E1D*

IBM

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*PCI adapter placement for the
8231-E2B, 8231-E1C, 8231-E1D,
8231-E2C, 8231-E2D, or 8268-E1D*

IBM

Note

Before using this information and the product it supports, read the information in “Safety notices” on page v, “Notices” on page 37, the *IBM Systems Safety Notices* manual, G229-9054, and the *IBM Environmental Notices and User Guide*, Z125-5823.

This edition applies to IBM Power Systems servers that contain the POWER7 processor and to all associated models.

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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, safety information documentation is included in the publications package (such as in printed documentation, on DVD, or as part of the product) shipped with the product. The documentation 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 documentation. You should also refer to the safety information documentation any time you do not clearly understand any safety information in the U.S. English publications.

Replacement or additional copies of safety information documentation can be obtained by calling the IBM Hotline at 1-800-300-8751.

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)

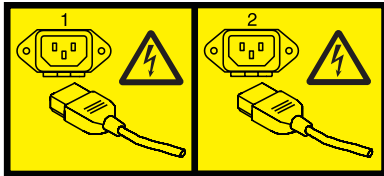
(L001)



(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)

CAUTION:

The battery contains lithium. To avoid possible explosion, do not burn or charge the battery.

Do Not:

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

Exchange only with the IBM-approved part. Recycle or discard the battery as instructed by local regulations. In the United States, IBM has a process for the collection of this battery. For information, call 1-800-426-4333. Have the IBM part number for the battery unit available when you call. (C003)

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.

PCI adapter placement for the 8231-E2B, 8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, or 8268-E1D

Find information about the Peripheral Component Interconnect (PCI), PCI-X, and PCI Express (PCIe) adapters that are supported for the 8231-E2B, 8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, or 8268-E1D systems.

The following features are electromagnetic compatibility (EMC) Class B features. See the Class B Notices in the Hardware Notices section.

Table 1. Electromagnetic compatibility (EMC) Class B features

Feature	Description
1912, 5736	PCI-X DDR 2.0 Dual Channel Ultra320 SCSI Adapter
1983, 5706	Port 10/100/1000 Base-TX Ethernet PCI-X Adapter
1986, 5713	1 Gb iSCSI TOE PCI-X Adapter
2728	4-port USB PCIe Adapter
4764	PCI-X Cryptographic Coprocessor
4807	PCIe Cryptographic Coprocessor
5717	4-port 10/100/1000 Base-TX PCI Express Adapter
5732	10 Gb Ethernet-CX4 PCI Express Adapter
5748	POWER® GXT145 PCI Express Graphics Accelerator
5767	2-port 10/100/1000 Base-TX Ethernet PCI Express Adapter
5768	2-port Gb Ethernet-SX PCI Express Adapter
5769	10 Gb Ethernet-SR PCI Express Adapter
5772	10 Gb Ethernet-LR PCI Express Adapter
5785	4 Port Async EIA-232 PCIe Adapter
EC2G and EL39	PCIe LP 2-Port 10 GbE SFN6122F Adapter
EC2H and EL3A	PCIe LP 2-Port 10 GbE SFN5162F Adapter
EC2J	PCIe 2-Port 10 GbE SFN6122F Adapter
EC2K	PCIe 2-Port 10 GbE SFN5162F Adapter

Supported PCI adapters for the 8231-E2B, 8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, or 8268-E1D

Find information about the Peripheral Component Interconnect (PCI), PCI-X, and PCI Express (PCIe) adapters that are supported for the 8231-E2B, 8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, or 8268-E1D systems.

Find reference information that information technology (IT) personnel and service representatives can use in determining where to install PCI adapters in the 8231-E2B, 8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, or 8268-E1D.

Adapters supported on the AIX®, IBM i, or Linux operating system

Table 2 lists the adapters that are supported in systems running the AIX, IBM i, or Linux operating system.

Important:

- This document does not replace the latest sales and marketing publications and tools that document supported features.
- Before adding or rearranging adapters, use the System Planning Tool to validate the new adapter configuration. See the IBM System Planning Tool website (www.ibm.com/systems/support/tools/systemplanningtool/).
- If you are installing a new feature, ensure that you have the software required to support the new feature and determine whether you must install any existing program temporary fix (PTF) prerequisites. To do this, use the IBM Prerequisite website (www-912.ibm.com/e_dir/eServerPrereq.nsf).

Table 2 lists the supported PCIe adapters.

The adapters are listed with their feature codes (FC), customer card identification number (CCIN), along with their description, and the systems on which they are supported.

Table 2. PCIe adapters supported on systems running the AIX, IBM i, or Linux operating system.

Feature code	CCIN	Description	System
5277	57D2	4-port Async EIA-232 PCIe 1X LP Adapter (FC 5277; CCIN 57D2) <ul style="list-style-type: none"> • Low-profile adapter • Extra-high bandwidth • Short, x1 • OS support: AIX and Linux operating systems 	8231-E2B, 8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, and 8268-E1D
5289	57D4	PCIe 2-port Async EIA-232 PCIe 1X LPC Adapter (FC 5289; CCIN 57D4) <ul style="list-style-type: none"> • Short, x1 • PCIe 1.1 • Two ports through RJ45 by using the DB9 connector • EIA-232 Compatible • OS support: AIX, IBM i, and Linux operating systems 	8231-E2C and 8231-E2D
5290	57D4	PCIe LP 2-port Async EIA-232 Adapter (FC 5290; CCIN 57D4) <ul style="list-style-type: none"> • Low-profile adapter • PCIe 1.1 • Short, x8 • 2 Ports through RJ45 by using the DB9 connector • EIA-232 compatible • OS support: AIX, IBM i, and Linux operating systems 	8231-E2B, 8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, and 8268-E1D
5785	57D2	4 Port Async EIA-232 PCIe Adapter (FC 5785; CCIN 57D2) <ul style="list-style-type: none"> • Short, x1 • OS support: AIX and Linux operating systems 	8231-E2C and 8231-E2D

Table 2. PCIe adapters supported on systems running the AIX, IBM i, or Linux operating system (continued).

Feature code	CCIN	Description	System
5273	577D	8 Gb PCI Express Dual-port Fibre Channel Adapter (FC 5273; CCIN 577D) <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 • OS support: AIX, IBM i, and Linux operating systems 	8231-E2B, 8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, and 8268-E1D
5276	5774	4-Gb PCI Express Dual-port Fibre Channel Adapter (FC 5276; CCIN 5774) <ul style="list-style-type: none"> • Low-profile adapter • Short, x4 • OS support: AIX, IBM i, and Linux operating systems 	8231-E2B, 8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, and 8268-E1D
EN0B	577F	PCIe2 LP 16 Gb 2-port Fibre Channel Adapter (FC EN0B; CCIN 577F) <ul style="list-style-type: none"> • Short, low-profile, x8 • Extra-high bandwidth • OS support: AIX, IBM i, and Linux operating systems 	8231-E1D, 8231-E2D, and 8268-E1D
5735	577D	8 Gb PCI Express Dual-port Fibre Channel Adapter (FC 5735; CCIN 577D) <ul style="list-style-type: none"> • Short, x8 • Extra-high bandwidth: If only one port is planned to be active in normal operation, the adapter is counted as an extra-high bandwidth adapter. If both ports are planned to be active, the adapter must be treated as two extra-high bandwidth adapters. • OS support: AIX, IBM i, and Linux operating systems 	8231-E2C and 8231-E2D
5773	5773	4 Gb PCI Express Single Port Fibre Channel Adapter (FC 5773; CCIN 5773) <ul style="list-style-type: none"> • Short, x4 • High bandwidth • OS support: AIX and Linux operating systems 	8231-E2C and 8231-E2D
5774	5774	4 Gb PCI Express Dual-port Fibre Channel Adapter (FC 5774; CCIN 5774) <ul style="list-style-type: none"> • Short, x4 • Extra-high bandwidth • OS support: AIX, IBM i, and Linux operating systems 	8231-E2C and 8231-E2D
EN0Y	EN0Y	PCIe2 LP 8Gb 4-port Fibre Channel Adapter (FC EN0Y; CCIN EN0Y) <ul style="list-style-type: none"> • Short, low-profile • PCIe generation 2, x8 • Short form factor plus (SFF+) Host Bus Adapter (HBA) • Extra-high bandwidth • OS support: AIX, IBM i, and Linux operating systems 	8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, and 8268-E1D
5269	5269	POWER GXT145 PCI Express Graphics Accelerator (FC 5269; CCIN 5269) <ul style="list-style-type: none"> • Low-profile adapter • Short, x1 • OS support: AIX and Linux operating systems 	8231-E2B, 8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, and 8268-E1D

Table 2. PCIe adapters supported on systems running the AIX, IBM i, or Linux operating system (continued).

Feature code	CCIN	Description	System
EC41		PCIe2 LP 3D Graphics Adapter x1 (FC EC41) <ul style="list-style-type: none"> • PCIe 2.1, single lane (x1) • Short, low-profile, half-length adapter • Not hot-pluggable • Passive cooling • Supports two DVI-I displays with a required breakout cable • OS support: Linux operating system • Supported on Firmware level 7.8, or later 	8231-E1D, 8231-E2D, and 8268-E1D
5748	5748	POWER GXT145 PCI Express Graphics Accelerator (FC 5748; CCIN 5748) <ul style="list-style-type: none"> • Short, x1 • Not hot-pluggable • OS support: AIX and Linux operating systems 	8231-E2C and 8231-E2D
EJ0J	57B4	PCIe3 RAID SAS Adapter (FC EJ0J; CCIN 57B4) <ul style="list-style-type: none"> • Regular-height adapter • PCIe3, short, x8 • Transfer speed of 6 Gbps • No write cache • One PCIe x8 slot per adapter • Adapters can be installed singly or in pairs • OS support: AIX, IBM i, and Linux operating systems 	8231-E2D
EJ0L	57CE	PCIe3 12 GB Cache RAID SAS quad-port 6 Gb Adapter (FC EJ0L; CCIN 57CE) <ul style="list-style-type: none"> • Regular-height adapter, short • PCIe3 x8 • Transfer speed of 6 Gbps • 12 GB write cache • One PCIe x8 slot per adapter • Adapters are installed in pairs • OS support: AIX, IBM i, and Linux operating systems 	8231-E2D
EJ0M	57B4	PCIe3 LP RAID SAS Adapter (FC EJ0M; CCIN 57B4) <ul style="list-style-type: none"> • Low-profile adapter • PCIe3, short, x8 • Transfer speed of 6 Gbps • No write cache • One PCIe x8 slot per adapter • Adapters are installed in pairs to enable mirroring • OS support: AIX, IBM i, and Linux operating systems 	8231-E1D, 8231-E2D, and 8268-E1D

Table 2. PCIe adapters supported on systems running the AIX, IBM i, or Linux operating system (continued).

Feature code	CCIN	Description	System
EJ10	57B4	PCIe3 4 x8 SAS Port Adapter (FC EJ10; CCIN 57B4) <ul style="list-style-type: none"> • Regular-height adapter • PCIe3 x8 • Transfer speed of 6 Gbps • Supports DVD and tape drives • No write cache • One PCIe x8 slot per adapter • OS support: AIX, IBM i, and Linux operating systems 	8231-E2D
EJ11	57B4	PCIe3 LP 4 x8 SAS Port Adapter (FC EJ11; CCIN 57B4) <ul style="list-style-type: none"> • Low-profile adapter • PCIe3, short, x8 • Transfer speed of 6 Gbps • Supports DVD and tape drives • No write cache • One PCIe x8 slot per adapter • OS support: AIX, IBM i, and Linux operating systems 	8231-E1D, 8231-E2D, and 8268-E1D
5260	576F	PCIe2 LP 4-port 1 GbE Adapter (FC 5260; CCIN 576F) <ul style="list-style-type: none"> • Low-profile adapter • PCIe generation 1 or generation 2, x4 • High bandwidth • Four-port 1 Gb Ethernet • OS support: AIX, IBM i, and Linux operating systems 	8231-E2B, 8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, and 8268-E1D
5270	2B3B	10 Gb FCoE PCIe Dual-port Adapter (FC 5270; CCIN 2B3B) <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 • OS support: AIX and Linux operating systems 	8231-E2B, 8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, and 8268-E1D
5271	5717	4-port 10/100/1000 Base-TX PCI Express Adapter (FC 5271; CCIN 5717) <ul style="list-style-type: none"> • Low-profile adapter • Short, x4 • OS support: AIX and Linux operating systems 	8231-E2B, 8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, and 8268-E1D
5272	5732	10 Gb Ethernet-CX4 PCI Express Adapter (FC 5272; CCIN 5272) <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 • OS support: AIX and Linux operating systems 	8231-E2B, 8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, and 8268-E1D
5274	5768	2-port Gb Ethernet-SX PCI Express Adapter (FC 5274; CCIN 5768) <ul style="list-style-type: none"> • Low-profile adapter • Short, x4 • OS support: AIX, IBM i, and Linux operating systems 	8231-E2B, 8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, and 8268-E1D

Table 2. PCIe adapters supported on systems running the AIX, IBM i, or Linux operating system (continued).

Feature code	CCIN	Description	System
5275	2B54	10 Gb Ethernet-SR PCI Express Adapter (FC 5275; CCIN 2B54) <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 • OS support: AIX and Linux operating systems 	8231-E2B, 8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, and 8268-E1D
5279	2B52	PCIe2 LP 2x10 GbE SFP+ Copper 2x1 GbE UTP Adapter (FC 5279; CCIN 2B52) <ul style="list-style-type: none"> • Low-profile, Short, x8 • PCIe 2 • OS support: Linux operating system 	8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, and 8268-E1D
5280	2B54	PCIe2 LP 2x10 GbE SR 2x1 GbE UTP Adapter (FC 5280; CCIN 2B54) <ul style="list-style-type: none"> • Low-profile, short, x8 • PCIe 2 • OS support: Linux operating system 	8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, and 8268-E1D
5281	5767	1 Gb Ethernet UTP 2-port PCIe Adapter (FC 5281; CCIN 5767) <ul style="list-style-type: none"> • Low-profile, short, x8 • PCIe 2 • OS support: AIX, IBM i, and Linux operating system 	8231-E2B, 8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, and 8268-E1D
5284	5287	PCIe2 LP 2-port 10 GbE SR Adapter (FC 5284; CCIN 5287) <ul style="list-style-type: none"> • Generation 2, x8 • Low-profile adapter • Extra-high bandwidth • 10 GBASE-SR short-reach optics • OS support: AIX, IBM i (supported only through VIOS), and Linux operating systems 	8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, and 8268-E1D
5286	5288	PCIe2 LP 2-port 10 GbE SFP+ Copper Adapter (FC 5286; CCIN 5288) <ul style="list-style-type: none"> • Generation 2, low-profile adapter • Two 10 Gb Ethernet ports • OS support: AIX and Linux operating systems 	8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, and 8268-E1D
5708	2B3B	10 Gb FCoE PCIe Dual-port Adapter (FC 5708; CCIN 2B3B) <ul style="list-style-type: none"> • Low-profile capable • Extra-high bandwidth • PCIe 2.0 adapter with x8 generation 1 • Convergence enhanced Ethernet (CEE) supported • OS support: AIX, IBM i with VIOS, and Linux operating systems 	8231-E2C and 8231-E2D
5717	5717	4-port 10/100/1000 Base-TX PCI Express Adapter (FC 5717; CCIN 5717) <ul style="list-style-type: none"> • Short, x4 • High bandwidth • OS support: AIX and Linux operating systems 	8231-E2C and 8231-E2D

Table 2. PCIe adapters supported on systems running the AIX, IBM i, or Linux operating system (continued).

Feature code	CCIN	Description	System
5732	2B43	10 Gb Ethernet-CX4 PCI Express Adapter (FC 5732; CCIN 2B43) <ul style="list-style-type: none"> • Short, x8 • Extra-high bandwidth • OS support: AIX and Linux operating systems 	8231-E2C and 8231-E2D
5767	5767	2-port 10/100/1000 Base-TX Ethernet PCI Express Adapter (FC 5767; CCIN 5767) <ul style="list-style-type: none"> • Short, x4 • High bandwidth • OS support: AIX, IBM i, and Linux operating systems 	8231-E2C and 8231-E2D
5768	5768	2-port Gigabit Ethernet-SX PCI Express Adapter (FC 5768; CCIN 5768) <ul style="list-style-type: none"> • Short, x4 • High bandwidth • OS support: AIX, IBM i, and Linux operating systems 	8231-E2C and 8231-E2D
5769	2B44	10 Gb Ethernet-SR PCI Express Adapter (FC 5769; CCIN 2B44) <ul style="list-style-type: none"> • Short, full-high, x8 • Regular-height • Extra-high bandwidth • OS support: AIX and Linux operating systems 	8231-E2C and 8231-E2D
5772	576E	10 Gb Ethernet-LR PCI Express Adapter (FC 5772; CCIN 576E) <ul style="list-style-type: none"> • Short, x8 • Regular-height card • Extra-high bandwidth • OS support: AIX, IBM i, and Linux operating systems 	8231-E2C and 8231-E2D
5899	576F	PCIe2 4-port 1 GbE Adapter (FC 5899; CCIN 576F) <ul style="list-style-type: none"> • Regular-height adapter • PCIe generation 1 or generation 2, x4 • High bandwidth • Four-port 1 Gb Ethernet • OS support: AIX, IBM i, and Linux operating systems 	8231-E2C and 8231-E2D
9056	5767	PCIe LP 2-port 1 GbE TX adapter (FC 9056; CCIN 5767) <ul style="list-style-type: none"> • Low-profile, PCIe x4 • PCIe 1.0a compliant • High bandwidth • Two full-duplex 10/100/1000 Base-TX UTP connections to gigabit Ethernet (GbE) LANs • OS support: AIX, IBM i, and Linux operating systems 	8231-E1C

Table 2. PCIe adapters supported on systems running the AIX, IBM i, or Linux operating system (continued).

Feature code	CCIN	Description	System
EC27	EC27	<p>PCIe2 LP 2-port 10 GbE RoCE SFP+ adapter (FC EC27; CCIN EC27)</p> <ul style="list-style-type: none"> • Short, low-profile • PCIe generation 2, x8 • Extra-high bandwidth, low latency 10 Gb Ethernet • OS support: AIX and Linux operating systems • Firmware level 7.6, or later 	8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, and 8268-E1D
EN0J	2B93	<p>PCIe2 LP 4-port (10 Gb FCoE, 1 GbE) SFP+ Adapter (FC EN0J, CCIN 2B93)</p> <ul style="list-style-type: none"> • Low-profile adapter • Extra-high bandwidth • OS support: AIX, IBM i, and Linux operating systems 	8231-E1D, 8231-E2D, and 8268-E1D
EN0L	2CC1	<p>PCIe2 LP 4-port (10Gb FCoE and 1GbE) Copper and RJ45 Adapter (FC EN0L; CCIN 2CC1)</p> <ul style="list-style-type: none"> • Low-profile adapter • Fibre Channel over Ethernet (FCoE) converged network adapter (CNA) • Provides network interface controller (NIC) • Single root I/O virtualization (SR-IOV) capable • OS support: AIX, IBM i, and Linux operating systems 	8231-E1D, 8231-E2D, and 8268-E1D
EN0T	2CC3	<p>PCIe2 LP 4-port (10Gb+1GbE) SR+RJ45 Adapter (FC EN0T; CCIN 2CC3)</p> <ul style="list-style-type: none"> • Short, low-profile • PCIe generation 2, x8 • two 10 Gb SR optical ports and two 1 Gb RJ45 ports • NIC network convergence adapter • Local are network (LAN) adapter • Requires available PCIe slot in the FC 5685 PCIe Riser Card (generation 2) • OS support: AIX, IBM i (supported only through VIOS), and Linux operating systems 	8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, and 8268-E1D
EN0V	2CC3	<p>PCIe2 LP 4-port (10Gb+1GbE) Copper SFP+RJ45 Adapter (FC EN0V; CCIN 2CC3)</p> <ul style="list-style-type: none"> • Short, low-profile • PCIe generation 2, x8 • Two 10 Gb copper twinax small form-factor pluggable (SFP+) ports • Two 1 Gb RJ45 ports • Ethernet network interface controller (NIC) function • Requires available PCIe slot in the FC 5685 PCIe Riser Card (generation 2) • OS support: AIX, IBM i (supported only through VIOS), and Linux operating systems 	8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, and 8268-E1D

Table 2. PCIe adapters supported on systems running the AIX, IBM i, or Linux operating system (continued).

Feature code	CCIN	Description	System
EN0X	2CC4	<p>PCIe2 LP 2-port 10 GbE BaseT RJ45 Adapter (FC EN0X; CCIN 2CC4)</p> <ul style="list-style-type: none"> • Short, low-profile • PCIe generation 2, x8 • Two 10 Gb RJ45 ports • Local area network (LAN) adapter • Requires available PCIe slot in the FC 5685 PCIe Riser Card (generation 2) • OS support: AIX, IBM i (supported only through VIOS), and Linux operating systems 	8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, and 8268-E1D
EC29	EC29	<p>PCIe2 LP 2-port 10 GbE RoCE SR adapter (FC EC29; CCIN EC29)</p> <ul style="list-style-type: none"> • Low-profile adapter • PCIe generation 2, x8 • Extra-high bandwidth, low latency 10 Gb Ethernet • OS support: AIX and Linux operating systems • Firmware level 7.6, or later 	8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, and 8268-E1D
EC2G	EC2G	<p>PCIe LP 2-Port 10 GbE SFN6122F Adapter (FC EC2G; CCIN EC2G)</p> <ul style="list-style-type: none"> • High bandwidth • Low-profile adapter • Supports Solarflare OpenOnload • OS support: Linux operating system 	8231-E1D, 8231-E2D, and 8268-E1D
EC2H	EC2H	<p>PCIe LP 2-Port 10 GbE SFN5162F Adapter (FC EC2H; CCIN EC2H)</p> <ul style="list-style-type: none"> • High bandwidth • Low-profile adapter • OS support: Linux operating system 	8231-E1D, 8231-E2D, and 8268-E1D
2728	57D1	<p>4-port USB PCIe Adapter (FC 2728; CCIN 57D1)</p> <ul style="list-style-type: none"> • Regular-height adapter • Single-slot, half-length PCIe adapter • PCIe 1.1 • OS support: AIX and Linux operating systems 	8231-E2C and 8231-E2D
4808	4765	<p>PCIe Cryptographic Coprocessor (FC 4808; CCIN 4765)</p> <ul style="list-style-type: none"> • Generation 3 blind-swap cassette • PCIe x4, full-height, half-length • OS support: AIX and IBM i operating systems 	8231-E2C and 8231-E2D
5283	58E2	<p>PCIe2 LP 2-port 4X InfiniBand QDR Adapter (FC 5283; CCIN 58E2)</p> <ul style="list-style-type: none"> • Generation 2 low-profile adapter • Extra-high bandwidth • Requires available PCIe slot in the FC 5685 PCIe Riser Card (generation 2) • OS support: AIX and Linux operating systems 	8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, and 8268-E1D

Table 2. PCIe adapters supported on systems running the AIX, IBM i, or Linux operating system (continued).

Feature code	CCIN	Description	System
2053	57CD	PCIe RAID and SSD SAS Adapter 3 Gb Low-profile (FC 2053; CCIN 57CD) <ul style="list-style-type: none"> • Short, x8 • Double-wide, low-profile adapter, requires two slots • VIOS attachment requires version 2.2, or later 	8231-E2B, 8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, and 8268-E1D
2055	57CD	PCIe RAID and SSD SAS Adapter 3 Gb with Blind-Swap Cassette (FC 2055; CCIN 57CD) <ul style="list-style-type: none"> • Short, x8 • Double-wide, low-profile adapter, requires two slots • OS support: AIX, IBM i, and Linux operating systems • VIOS attachment requires version 2.2, or later 	8231-E2C and 8231-E2D
5278	57B3	PCIe Dual-x4 SAS Adapter (FC 5278; CCIN 57B3) <ul style="list-style-type: none"> • Low-profile adapter • Extra-high bandwidth • Short, x8 • OS support: AIX, IBM i, and Linux operating systems 	8231-E2B, 8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, and 8268-E1D
5805	574E	PCIe 380 MB Cache Dual - x4 3 Gb SAS RAID Adapter (FC 5805; CCIN 574E) <ul style="list-style-type: none"> • Short, dual x4 • SAS RAID adapter • Installed in pairs • OS support: AIX, IBM i, and Linux operating systems 	8231-E2C and 8231-E2D
5901	57B3	PCIe Dual - x4 SAS Adapter (FC 5901; CCIN 57B3) <ul style="list-style-type: none"> • Short • Extra-high bandwidth • OS support: AIX, IBM i, and Linux operating systems 	8231-E2C and 8231-E2D
5913	57B5	PCIe2 1.8 GB Cache RAID SAS Tri-port 6 Gb Adapter (FC 5913; CCIN 57B5) <ul style="list-style-type: none"> • Full-height, short, PCIe2 x8 • Transfer speed of 6 Gbps • Write cache backup of 1.8 GB • One PCIe x8 slot per adapter • Adapters are installed in pairs • OS support: AIX, IBM i, and Linux operating systems 	8231-E2C and 8231-E2D
ESA1	57B4	PCIe2 RAID SAS Adapter Dual-port 6 Gb (FC ESA1; CCIN 57B4) <ul style="list-style-type: none"> • Regular-height adapter • PCIe generation 2, x8 • OS support: AIX, IBM i, and Linux operating systems 	8231-E2C and 8231-E2D
ESA2	57B4	PCIe2 RAID SAS Adapter Dual-port 6 Gb LP (FC ESA2; CCIN 57B4) <ul style="list-style-type: none"> • Short, low-profile • PCIe generation 2, x8 • OS support: AIX, IBM i, and Linux operating systems 	8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, and 8268-E1D

Table 2. PCIe adapters supported on systems running the AIX, IBM i, or Linux operating system (continued).

Feature code	CCIN	Description	System
EN13	576C	PCI Express 2-Line WAN with Modem (FC EN13; CCIN 576C) <ul style="list-style-type: none"> • Short, x4 • Non-CIM • OS support: IBM i operating system 	8231-E2C and 8231-E2D
EN14	576C	PCI Express 2-Line WAN with Modem (FC EN14; CCIN 576C) <ul style="list-style-type: none"> • Short, x4 • CIM • OS support: IBM i operating system 	8231-E2C and 8231-E2D
ES09	578A	IBM Flash Adapter 90 (PCIe2 0.9TB) (FC ES09; CCIN 578A) <ul style="list-style-type: none"> • PCIe generation 2, x8 • 900 GB eMLC Flash storage • One PCIe x8 slot per adapter • Adapters are installed in pairs to enable mirroring • OS support: AIX and Linux operating systems 	8231-E2D

PCI adapters placement rules and slot priorities for the 8231-E2B, 8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, or 8268-E1D

Find information about the placement rules and slot priorities for the Peripheral Component Interconnect (PCI), PCI-X, and PCI Express (PCIe) adapters that are supported for the 8231-E2B, 8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, or 8268-E1D systems that contain the POWER7[®] processor and the associated I/O expansion units.

PCI adapter placement rules and slot priorities for the 8231-E2B

Some adapters must be placed in specific PCI Express (PCIe) slots to function correctly or to perform optimally. Learn how to determine the slot to install Peripheral Component Interconnect (PCI) adapters for the IBM Power[®] 730 Express (8231-E2B) system.

PCI slot descriptions

Figure 1 on page 12 shows the rear view of the 8231-E2B system with the location codes for the PCI adapter slots. Table 3 on page 12 describes the slots. Table 4 on page 12 shows details of the slot priorities and the maximum supported adapters on the 8231-E2B system.

All slots in this system are low-profile slots only. Each PCIe is a separate PCI host bridge (PHB).

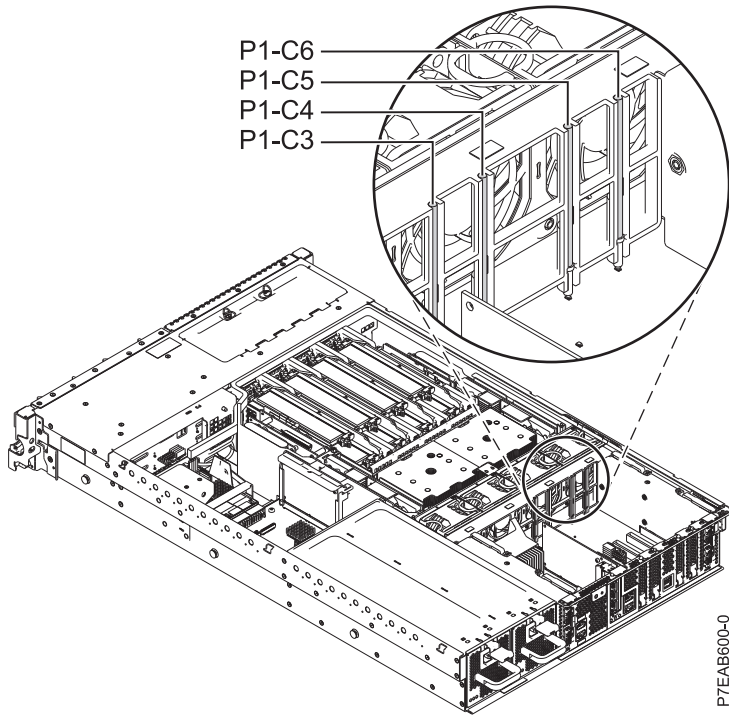


Figure 1. Rear view of the 8231-E2B with location codes for the PCI slots

Table 3. PCI slot locations and descriptions. This table describes the slots shown in Figure 1.

Slot	Location code	Description	PHB	Adapter size
Slot 1	P1-C3	PCIe x8	PCIe PHB0 module A	Low-profile
Slot 2	P1-C4	PCIe x8	PCIe PHB1 module A	Low-profile
Slot 3	P1-C5	PCIe x8	PCIe PHB2 module A	Low-profile
Slot 4	P1-C6	PCIe x8	PCIe PHB3 module A	Low-profile

PCIe adapters

All slots in this system are the same and have equal importance while installing the adapter. Use this information to identify slot placement priorities and the maximum number of specified adapters that you can install. Ensure to verify if the adapter is supported for your system. For details about the supported adapters, see “Supported PCI adapters for the 8231-E2B, 8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, or 8268-E1D” on page 1.

Table 4. Adapter slot priorities and maximums for PCIe adapters

Feature code	Description	Maximum number of adapters supported per system
5277	4-port Async EIA-232 PCIe 1X LP Adapter (FC 5277; CCIN 57D2) <ul style="list-style-type: none"> • Low-profile adapter • Extra-high bandwidth • Short, x1 • OS support: AIX and Linux operating systems 	4

Table 4. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	Maximum number of adapters supported per system
5290	PCIe LP 2-port Async EIA-232 Adapter (FC 5290; CCIN 57D4) <ul style="list-style-type: none"> • Low-profile adapter • PCIe 1.1 • Short, x8 • 2 Ports through RJ45 by using the DB9 connector • EIA-232 compatible • OS support: AIX, IBM i, and Linux operating systems 	2
5273	8 Gb PCI Express Dual-port Fibre Channel Adapter (FC 5273; CCIN 577D) <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 • OS support: AIX, IBM i, and Linux operating systems 	4
5276	4-Gb PCI Express Dual-port Fibre Channel Adapter (FC 5276; CCIN 5774) <ul style="list-style-type: none"> • Low-profile adapter • Short, x4 • OS support: AIX, IBM i, and Linux operating systems 	4
5269	POWER GXT145 PCI Express Graphics Accelerator (FC 5269; CCIN 5269) <ul style="list-style-type: none"> • Low-profile adapter • Short, x1 • OS support: AIX and Linux operating systems 	4
5260	PCIe2 LP 4-port 1 GbE Adapter (FC 5260; CCIN 576F) <ul style="list-style-type: none"> • Low-profile adapter • PCIe generation 1 or generation 2, x4 • High bandwidth • Four-port 1 Gb Ethernet • OS support: AIX, IBM i, and Linux operating systems 	4
5270	10 Gb FCoE PCIe Dual-port Adapter (FC 5270; CCIN 2B3B) <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 • OS support: AIX and Linux operating systems 	4
5271	4-port 10/100/1000 Base-TX PCI Express Adapter (FC 5271; CCIN 5717) <ul style="list-style-type: none"> • Low-profile adapter • Short, x4 • OS support: AIX and Linux operating systems 	4
5272	10 Gb Ethernet-CX4 PCI Express Adapter (FC 5272; CCIN 5272) <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 • OS support: AIX and Linux operating systems 	4

Table 4. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	Maximum number of adapters supported per system
5274	2-port Gb Ethernet-SX PCI Express Adapter (FC 5274; CCIN 5768) <ul style="list-style-type: none"> • Low-profile adapter • Short, x4 • OS support: AIX, IBM i, and Linux operating systems 	4
5275	10 Gb Ethernet-SR PCI Express Adapter (FC 5275; CCIN 2B54) <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 • OS support: AIX and Linux operating systems 	4
5281	1 Gb Ethernet UTP 2-port PCIe Adapter (FC 5281; CCIN 5767) <ul style="list-style-type: none"> • Low-profile, short, x8 • PCIe 2 • OS support: AIX, IBM i, and Linux operating system 	4
2053	PCIe RAID and SSD SAS Adapter 3 Gb Low-profile (FC 2053; CCIN 57CD) <ul style="list-style-type: none"> • Short, x8 • Double-wide, low-profile adapter, requires two slots • VIOS attachment requires version 2.2, or later 	2
5278	PCIe Dual-x4 SAS Adapter (FC 5278; CCIN 57B3) <ul style="list-style-type: none"> • Low-profile adapter • Extra-high bandwidth • Short, x8 • OS support: AIX, IBM i, and Linux operating systems 	4

Performance notes

Use the information in this section to determine the maximum number of adapters that can be placed in a system while still maintaining optimum performance.

Performance notes regarding GX++ channel adapters

Table 4 on page 12 identifies the slot placement priorities and the maximum number of specified adapters that can be installed for connectivity. However, for optimum performance, you might want to further limit the total number of high bandwidth and extra-high bandwidth adapters. The system supports the FC 5266 GX++ dual port adapter. When plugging in these adapters, if only one adapter is being configured it must be placed in the GX++ slot 2. This placement helps distribute the I/O traffic over the GX buses to the processors.

PCI adapter placement rules and slot priorities for the 8231-E1C, 8231-E1D, or 8268-E1D

Some adapters must be placed in specific PCI Express (PCIe) slots to function correctly or to perform optimally. Learn how to determine the slot to install PCI adapters for the 8231-E1C, 8231-E1D, or 8268-E1D system.

PCI slot descriptions

The 8231-E1C, 8231-E1D, or 8268-E1D system has five PCIe x8 G2 low-profile slots and one PCIe x4 low-profile slot. All slots support enhanced error handling (EEH), but are not hot pluggable. Figure 2 shows the rear view of the system with the location codes for the PCI adapter slots. Table 5 describes the slots. All slots in this system are low-profile slots only. Each PCIe is a separate PCI host bridge (PHB). PCIe slots 1 and 4 have an x16 connector and the other slots have an x8 connector.

For the information about the maximum adapters that are supported on your system, see Table 6 on page 16.

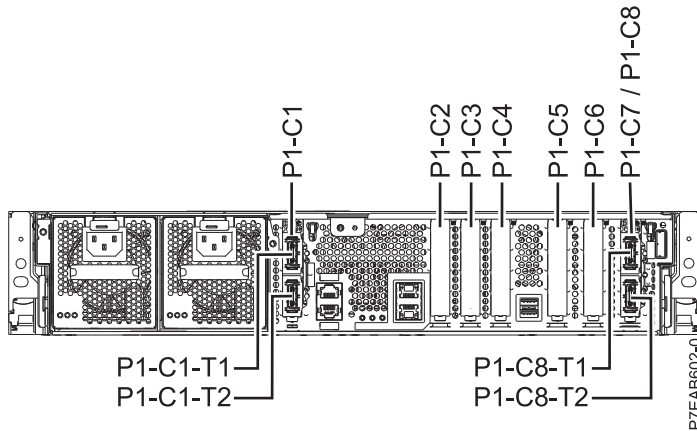


Figure 2. Rear view of the system with location codes

Table 5. PCI slot locations and descriptions

Slot	Location code	Description	PHB	Adapter size	Direct memory access (DMA) capable
Slot 1	P1-C2	PCIe x8 G2	PCIe-PHB5	Low-profile	64-bit
Slot 2	P1-C3	PCIe x8 G2	PCIe-PHB4	Low-profile	32-bit
Slot 3	P1-C4	PCIe x8 G2	PCIe-PHB3	Low-profile	32-bit
Slot 4	P1-C5	PCIe x8 G2	PCIe-PHB2	Low-profile	64-bit
Slot 5	P1-C6	PCIe x8 G2	PCIe-PHB1	Low-profile	32-bit
Slot 6 ¹	P1-C7	PCIe x4 G2	PCIe-PHB0	Low-profile	32-bit

¹ The following PCIe adapters are the only adapters that are supported at PCIe slot 6 (P1-C7):

- FC 5260
- FC 5899

Note: If the GX adapter is installed in P1-C8, then the PCIe slot 6 (P1-C7) is not available to install FC 5260 or FC 5899 and the feature must be installed in other slots.

PCIe adapters

Use this information to identify slot placement priorities and the maximum number of specified adapters that you can install. Verify whether the adapter is supported for your system. For details about the supported adapters, see “Supported PCI adapters for the 8231-E2B, 8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, or 8268-E1D” on page 1.

Table 6. Adapter slot priorities and maximums for PCIe adapters

Feature code	Description	Slot priorities	Maximum number of adapters supported
5277	4-port Async EIA-232 PCIe 1X LP Adapter (FC 5277; CCIN 57D2) <ul style="list-style-type: none"> • Low-profile adapter • Extra-high bandwidth • Short, x1 • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5	5
5290	PCIe LP 2-port Async EIA-232 Adapter (FC 5290; CCIN 57D4) <ul style="list-style-type: none"> • Low-profile adapter • PCIe 1.1 • Short, x8 • 2 Ports through RJ45 by using the DB9 connector • EIA-232 compatible • OS support: AIX, IBM i, and Linux operating systems 	1, 2, 3, 4, 5	2
5273	8 Gb PCI Express Dual-port Fibre Channel Adapter (FC 5273; CCIN 577D) <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 • OS support: AIX, IBM i, and Linux operating systems 	1, 2, 3, 4, 5	5
5276	4-Gb PCI Express Dual-port Fibre Channel Adapter (FC 5276; CCIN 5774) <ul style="list-style-type: none"> • Low-profile adapter • Short, x4 • OS support: AIX, IBM i, and Linux operating systems 	1, 2, 3, 4, 5	5
EN0B	PCIe2 LP 16 Gb 2-port Fibre Channel Adapter (FC EN0B; CCIN 577F) <ul style="list-style-type: none"> • Short, low-profile, x8 • Extra-high bandwidth • OS support: AIX, IBM i, and Linux operating systems 	1, 2, 3, 4, 5	5
EN0Y	PCIe2 LP 8Gb 4-port Fibre Channel Adapter (FC EN0Y; CCIN EN0Y) <ul style="list-style-type: none"> • Short, low-profile • PCIe generation 2, x8 • Short form factor plus (SFF+) Host Bus Adapter (HBA) • Extra-high bandwidth • OS support: AIX, IBM i, and Linux operating systems 	1, 2, 3, 4, 5	5
5269	POWER GXT145 PCI Express Graphics Accelerator (FC 5269; CCIN 5269) <ul style="list-style-type: none"> • Low-profile adapter • Short, x1 • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5	5

Table 6. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	Slot priorities	Maximum number of adapters supported
EC41	PCIe2 LP 3D Graphics Adapter x1 (FC EC41) <ul style="list-style-type: none"> • PCIe 2.1, single lane (x1) • Short, low-profile, half-length adapter • Not hot-pluggable • Passive cooling • Supports two DVI-I displays with a required breakout cable • OS support: Linux operating system • Supported on Firmware level 7.8, or later 	1, 2, 3, 4, 5	4
EJ0M	PCIe3 LP RAID SAS Adapter (FC EJ0M; CCIN 57B4) <ul style="list-style-type: none"> • Low-profile adapter • PCIe3, short, x8 • Transfer speed of 6 Gbps • No write cache • One PCIe x8 slot per adapter • Adapters are installed in pairs to enable mirroring • OS support: AIX, IBM i, and Linux operating systems 	1, 2, 3, 4, 5	5
EJ11	PCIe3 LP 4 x8 SAS Port Adapter (FC EJ11; CCIN 57B4) <ul style="list-style-type: none"> • Low-profile adapter • PCIe3, short, x8 • Transfer speed of 6 Gbps • Supports DVD and tape drives • No write cache • One PCIe x8 slot per adapter • OS support: AIX, IBM i, and Linux operating systems 	1, 2, 3, 4, 5	5
5260	PCIe2 LP 4-port 1 GbE Adapter (FC 5260; CCIN 576F) <ul style="list-style-type: none"> • Low-profile adapter • PCIe generation 1 or generation 2, x4 • High bandwidth • Four-port 1 Gb Ethernet • OS support: AIX, IBM i, and Linux operating systems 	6, 1, 2, 3, 4, 5	6
5270	10 Gb FCoE PCIe Dual-port Adapter (FC 5270; CCIN 2B3B) <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5	5
5271	4-port 10/100/1000 Base-TX PCI Express Adapter (FC 5271; CCIN 5717) <ul style="list-style-type: none"> • Low-profile adapter • Short, x4 • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5	5

Table 6. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	Slot priorities	Maximum number of adapters supported
5272	10 Gb Ethernet-CX4 PCI Express Adapter (FC 5272; CCIN 5272) <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5	5
5274	2-port Gb Ethernet-SX PCI Express Adapter (FC 5274; CCIN 5768) <ul style="list-style-type: none"> • Low-profile adapter • Short, x4 • OS support: AIX, IBM i, and Linux operating systems 	1, 2, 3, 4, 5	5
5275	10 Gb Ethernet-SR PCI Express Adapter (FC 5275; CCIN 2B54) <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5	5
5279	PCIe2 LP 2x10 GbE SFP+ Copper 2x1 GbE UTP Adapter (FC 5279; CCIN 2B52) <ul style="list-style-type: none"> • Low-profile, Short, x8 • PCIe 2 • OS support: Linux operating system 	1, 2, 3, 4, 5	5
5280	PCIe2 LP 2x10 GbE SR 2x1 GbE UTP Adapter (FC 5280; CCIN 2B54) <ul style="list-style-type: none"> • Low-profile, short, x8 • PCIe 2 • OS support: Linux operating system 	1, 2, 3, 4, 5	5
5281	1 Gb Ethernet UTP 2-port PCIe Adapter (FC 5281; CCIN 5767) <ul style="list-style-type: none"> • Low-profile, short, x8 • PCIe 2 • OS support: AIX, IBM i, and Linux operating system 	1, 2, 3, 4, 5	5
5284	PCIe2 LP 2-port 10 GbE SR Adapter (FC 5284; CCIN 5287) <ul style="list-style-type: none"> • Generation 2, x8 • Low-profile adapter • Extra-high bandwidth • 10 GBASE-SR short-reach optics • OS support: AIX, IBM i (supported only through VIOS), and Linux operating systems 	1, 2, 3, 4, 5	5
5286	PCIe2 LP 2-port 10 GbE SFP+ Copper Adapter (FC 5286; CCIN 5288) <ul style="list-style-type: none"> • Generation 2, low-profile adapter • Two 10 Gb Ethernet ports • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5	5

Table 6. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	Slot priorities	Maximum number of adapters supported
9056	PCIe LP 2-port 1 GbE TX adapter (FC 9056; CCIN 5767) <ul style="list-style-type: none"> • Low-profile, PCIe x4 • PCIe 1.0a compliant • High bandwidth • Two full-duplex 10/100/1000 Base-TX UTP connections to gigabit Ethernet (GbE) LANs • OS support: AIX, IBM i, and Linux operating systems 	1, 2, 3, 4, 5	1
EC27	PCIe2 LP 2-port 10 GbE RoCE SFP+ adapter (FC EC27; CCIN EC27) <ul style="list-style-type: none"> • Short, low-profile • PCIe generation 2, x8 • Extra-high bandwidth, low latency 10 Gb Ethernet • OS support: AIX and Linux operating systems • Firmware level 7.6, or later 	1, 2, 3, 4, 5	5
EC29	PCIe2 LP 2-port 10 GbE RoCE SR adapter (FC EC29; CCIN EC29) <ul style="list-style-type: none"> • Low-profile adapter • PCIe generation 2, x8 • Extra-high bandwidth, low latency 10 Gb Ethernet • OS support: AIX and Linux operating systems • Firmware level 7.6, or later 	1, 2, 3, 4, 5	5
EC2G	PCIe LP 2-Port 10 GbE SFN6122F Adapter (FC EC2G; CCIN EC2G) <ul style="list-style-type: none"> • High bandwidth • Low-profile adapter • Supports Solarflare OpenOnload • OS support: Linux operating system 	2, 3, 5, 1, 4	4
EC2H	PCIe LP 2-Port 10 GbE SFN5162F Adapter (FC EC2H; CCIN EC2H) <ul style="list-style-type: none"> • High bandwidth • Low-profile adapter • OS support: Linux operating system 	2, 3, 5, 1, 4	4
EN0J	PCIe2 LP 4-port (10 Gb FCoE, 1 GbE) SFP+ Adapter (FC EN0J, CCIN 2B93) <ul style="list-style-type: none"> • Low-profile adapter • Extra-high bandwidth • OS support: AIX, IBM i, and Linux operating systems 	1, 2, 3, 4, 5	5
EN0L	PCIe2 LP 4-port (10Gb FCoE and 1GbE) Copper and RJ45 Adapter (FC EN0L; CCIN 2CC1) <ul style="list-style-type: none"> • Low-profile adapter • Fibre Channel over Ethernet (FCoE) converged network adapter (CNA) • Provides network interface controller (NIC) • Single root I/O virtualization (SR-IOV) capable • OS support: AIX, IBM i, and Linux operating systems 	1, 2, 3, 4, 5	5

Table 6. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	Slot priorities	Maximum number of adapters supported
EN0T	<p>PCIe2 LP 4-port (10Gb+1GbE) SR+RJ45 Adapter (FC EN0T; CCIN 2CC3)</p> <ul style="list-style-type: none"> • Short, low-profile • PCIe generation 2, x8 • two 10 Gb SR optical ports and two 1 Gb RJ45 ports • NIC network convergence adapter • Local are network (LAN) adapter • Requires available PCIe slot in the FC 5685 PCIe Riser Card (generation 2) • OS support: AIX, IBM i (supported only through VIOS), and Linux operating systems 	1, 4, 2, 3, 5	5
EN0V	<p>PCIe2 LP 4-port (10Gb+1GbE) Copper SFP+RJ45 Adapter (FC EN0V; CCIN 2CC3)</p> <ul style="list-style-type: none"> • Short, low-profile • PCIe generation 2, x8 • Two 10 Gb copper twinax small form-factor pluggable (SFP+) ports • Two 1 Gb RJ45 ports • Ethernet network interface controller (NIC) function • Requires available PCIe slot in the FC 5685 PCIe Riser Card (generation 2) • OS support: AIX, IBM i (supported only through VIOS), and Linux operating systems 	1, 4, 2, 3, 5	5
EN0X	<p>PCIe2 LP 2-port 10 GbE BaseT RJ45 Adapter (FC EN0X; CCIN 2CC4)</p> <ul style="list-style-type: none"> • Short, low-profile • PCIe generation 2, x8 • Two 10 Gb RJ45 ports • Local area network (LAN) adapter • Requires available PCIe slot in the FC 5685 PCIe Riser Card (generation 2) • OS support: AIX, IBM i (supported only through VIOS), and Linux operating systems 	1, 4, 2, 3, 5	5
5283	<p>PCIe2 LP 2-port 4X InfiniBand QDR Adapter (FC 5283; CCIN 58E2)</p> <ul style="list-style-type: none"> • Generation 2 low-profile adapter • Extra-high bandwidth • Requires available PCIe slot in the FC 5685 PCIe Riser Card (generation 2) • OS support: AIX and Linux operating systems 	1 and 4	2
2053 ²	<p>PCIe RAID and SSD SAS Adapter 3 Gb Low-profile (FC 2053; CCIN 57CD)</p> <ul style="list-style-type: none"> • Short, x8 • Double-wide, low-profile adapter, requires two slots • VIOS attachment requires version 2.2, or later 	2 and 5 or 3	

Table 6. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	Slot priorities	Maximum number of adapters supported
5278	PCIe Dual-x4 SAS Adapter (FC 5278; CCIN 57B3) <ul style="list-style-type: none"> • Low-profile adapter • Extra-high bandwidth • Short, x8 • OS support: AIX, IBM i, and Linux operating systems 	1, 2, 3, 4, 5	5
ESA2	PCIe2 RAID SAS Adapter Dual-port 6 Gb LP (FC ESA2; CCIN 57B4) <ul style="list-style-type: none"> • Short, low-profile • PCIe generation 2, x8 • OS support: AIX, IBM i, and Linux operating systems 	1, 2, 3, 4, 5	2

¹The adapter requires two adjacent slots.

Performance notes

Use this information to help determine the maximum number of adapters that can be placed in a system while still maintaining optimum performance.

Performance notes regarding GX++ channel adapters

Table 6 on page 16 identifies the slot placement priorities and the maximum number of specified adapters that can be installed for connectivity. However, for optimum performance, you might want to further limit the total number of high bandwidth and extra-high bandwidth adapters. The system supports only one type of GX++ adapter, feature code (FC) EJ0H (GX++ LP 1-port PCIe2 x8 adapter). When you install these adapters, if only one adapter is being configured then you must place the adapter in the GX++ slot 2. This placement helps distribute the I/O traffic over the GX buses to the processors.

PCI adapter placement rules and slot priorities for the 8231-E2C or 8231-E2D

Some adapters must be placed in specific PCI Express (PCIe) slots to function correctly or to perform optimally. Learn how to determine the slot to install PCI adapters for the 8231-E2C or 8231-E2D system.

PCI slot descriptions

The 8231-E2C or 8231-E2D system has five PCIe x8 G2 low-profile slots and one PCIe x4 low-profile slot. All slots support enhanced error handling (EEH), but are not hot pluggable. Figure 3 on page 22 shows the rear view of the system with the location codes for the PCI adapter slots. Table 7 on page 22 provides information about the slots. All slots in this system are low-profile slots only. Each PCIe is a separate PCI host bridge (PHB). PCIe slots 1 and 4 have an x16 connector and the other slots have x8 connector.

For the information about the maximum adapters that are supported on your system, see Table 8 on page 23.

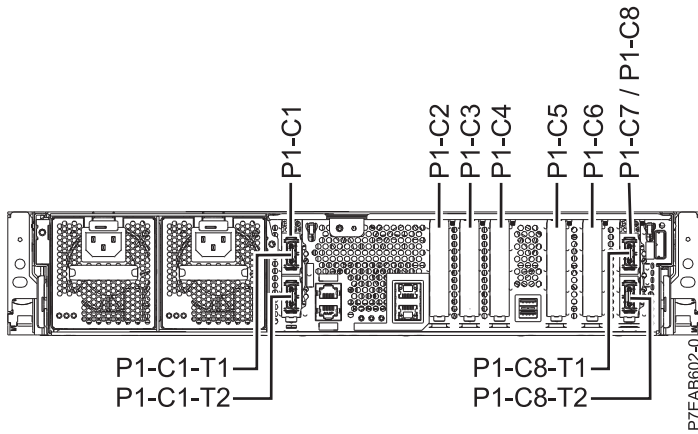


Figure 3. Rear view of the system with location codes

Table 7. PCI slot locations and descriptions. This table describes the slots shown in Figure 3.

Slot	Location code	Description	PHB	Adapter size	Direct memory access (DMA) capable
Slot 1 ¹	P1-C2	PCIe x8 G2	PCIe-PHB5	Low-profile	64-bit
Slot 2	P1-C3	PCIe x8 G2	PCIe-PHB4	Low-profile	32-bit
Slot 3	P1-C4	PCIe x8 G2	PCIe-PHB3	Low-profile	32-bit
Slot 4	P1-C5	PCIe x8 G2	PCIe-PHB2	Low-profile	64-bit
Slot 5 ¹	P1-C6	PCIe x8 G2	PCIe-PHB1	Low-profile	32-bit
Slot 6 ^{1, 2}	P1-C7	PCIe x4 G2	PCIe-PHB0	Low-profile	32-bit

¹Slot 1, slot 5, and slot 6 availability:

- If the GX++ Dual-port 12x Channel Attach adapter (feature code (FC) EJ0G) is installed in GX++ slot 2 in the 8231-E2C system, slot 6 (P1-C7), slot 5 (P1-C6), and slot 1 (P1-C2) are not available to install any PCI adapter.
- The FC EJOG adapter occupies slot 6 and slot 5.
- The SPCN connector on the GX adapter tailstock occupies slot 1.

²The following PCIe adapters are the only adapters that are supported at PCIe slot 6 (P1-C7):

- FC 5260
- FC 5899

PCIe adapters

Use this information to identify slot placement priorities and the maximum number of specified adapters that you can install. Verify whether the adapter is supported for your system. For details about the supported adapters, see “Supported PCI adapters for the 8231-E2B, 8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, or 8268-E1D” on page 1.

Table 8. Adapter slot priorities and maximums for PCIe adapters

Feature code	Description	Slot priorities	Maximum number of adapters supported
5277	4-port Async EIA-232 PCIe 1X LP Adapter (FC 5277; CCIN 57D2) <ul style="list-style-type: none"> • Low-profile adapter • Extra-high bandwidth • Short, x1 • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5	5
5289	PCIe 2-port Async EIA-232 PCIe 1X LPC Adapter (FC 5289; CCIN 57D4) <ul style="list-style-type: none"> • Short, x1 • PCIe 1.1 • Two ports through RJ45 by using the DB9 connector • EIA-232 Compatible • OS support: AIX, IBM i, and Linux operating systems 	Not supported in the system. Can be installed in a FC 5802 or 5877 expansion unit.	20
5290	PCIe LP 2-port Async EIA-232 Adapter (FC 5290; CCIN 57D4) <ul style="list-style-type: none"> • Low-profile adapter • PCIe 1.1 • Short, x8 • 2 Ports through RJ45 by using the DB9 connector • EIA-232 compatible • OS support: AIX, IBM i, and Linux operating systems 	1, 2, 3, 4, 5	2
5785	4 Port Async EIA-232 PCIe Adapter (FC 5785; CCIN 57D2) <ul style="list-style-type: none"> • Short, x1 • OS support: AIX and Linux operating systems 	Not supported in the system. Can be installed in a FC 5802 or 5877 expansion unit.	20
5273	8 Gb PCI Express Dual-port Fibre Channel Adapter (FC 5273; CCIN 577D) <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 • OS support: AIX, IBM i, and Linux operating systems 	1, 2, 3, 4, 5	5
5276	4-Gb PCI Express Dual-port Fibre Channel Adapter (FC 5276; CCIN 5774) <ul style="list-style-type: none"> • Low-profile adapter • Short, x4 • OS support: AIX, IBM i, and Linux operating systems 	1, 2, 3, 4, 5	5
5735	8 Gb PCI Express Dual-port Fibre Channel Adapter (FC 5735; CCIN 577D) <ul style="list-style-type: none"> • Short, x8 • Extra-high bandwidth: If only one port is planned to be active in normal operation, the adapter is counted as an extra-high bandwidth adapter. If both ports are planned to be active, the adapter must be treated as two extra-high bandwidth adapters. • OS support: AIX, IBM i, and Linux operating systems 	Not supported in the system. Can be installed in a FC 5802 or 5877 expansion unit.	20

Table 8. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	Slot priorities	Maximum number of adapters supported
5773	4 Gb PCI Express Single Port Fibre Channel Adapter (FC 5773; CCIN 5773) <ul style="list-style-type: none"> • Short, x4 • High bandwidth • OS support: AIX and Linux operating systems 	Not supported in the system. Can be installed in a FC 5802 or 5877 expansion unit.	20
5774	4 Gb PCI Express Dual-port Fibre Channel Adapter (FC 5774; CCIN 5774) <ul style="list-style-type: none"> • Short, x4 • Extra-high bandwidth • OS support: AIX, IBM i, and Linux operating systems 	Not supported in the system. Can be installed in a FC 5802 or 5877 expansion unit.	20
EN0B	PCIe2 LP 16 Gb 2-port Fibre Channel Adapter (FC EN0B; CCIN 577F) <ul style="list-style-type: none"> • Short, low-profile, x8 • Extra-high bandwidth • OS support: AIX, IBM i, and Linux operating systems 	1, 2, 3, 4, 5	5
EN0Y	PCIe2 LP 8Gb 4-port Fibre Channel Adapter (FC EN0Y; CCIN EN0Y) <ul style="list-style-type: none"> • Short, low-profile • PCIe generation 2, x8 • Short form factor plus (SFF+) Host Bus Adapter (HBA) • Extra-high bandwidth • OS support: AIX, IBM i, and Linux operating systems 	1, 2, 3, 4, 5	5
5269	POWER GXT145 PCI Express Graphics Accelerator (FC 5269; CCIN 5269) <ul style="list-style-type: none"> • Low-profile adapter • Short, x1 • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5	5
EC41	PCIe2 LP 3D Graphics Adapter x1 (FC EC41) <ul style="list-style-type: none"> • PCIe 2.1, single lane (x1) • Short, low-profile, half-length adapter • Not hot-pluggable • Passive cooling • Supports two DVI-I displays with a required breakout cable • OS support: Linux operating system • Supported on Firmware level 7.8, or later 	1, 2, 3, 4, 5	4
5748	POWER GXT145 PCI Express Graphics Accelerator (FC 5748; CCIN 5748) <ul style="list-style-type: none"> • Short, x1 • Not hot-pluggable • OS support: AIX and Linux operating systems 	Not supported in the system. Can be installed in a FC 5802 or 5877 expansion unit.	8

Table 8. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	Slot priorities	Maximum number of adapters supported
EJ0J	<p>PCIe3 RAID SAS Adapter (FC EJ0J; CCIN 57B4)</p> <ul style="list-style-type: none"> • Regular-height adapter • PCIe3, short, x8 • Transfer speed of 6 Gbps • No write cache • One PCIe x8 slot per adapter • Adapters can be installed singly or in pairs • OS support: AIX, IBM i, and Linux operating systems 	Not supported in the system. Can be installed in a FC 5802 or 5877 expansion unit.	6
EJ0L	<p>PCIe3 12 GB Cache RAID SAS quad-port 6 Gb Adapter (FC EJ0L; CCIN 57CE)</p> <ul style="list-style-type: none"> • Regular-height adapter, short • PCIe3 x8 • Transfer speed of 6 Gbps • 12 GB write cache • One PCIe x8 slot per adapter • Adapters are installed in pairs • OS support: AIX, IBM i, and Linux operating systems 	Not supported in the system. Can be installed in a FC 5802 or 5877 expansion unit.	6
EJ0M	<p>PCIe3 LP RAID SAS Adapter (FC EJ0M; CCIN 57B4)</p> <ul style="list-style-type: none"> • Low-profile adapter • PCIe3, short, x8 • Transfer speed of 6 Gbps • No write cache • One PCIe x8 slot per adapter • Adapters are installed in pairs to enable mirroring • OS support: AIX, IBM i, and Linux operating systems 	1, 2, 3, 4, 5	5
EJ10	<p>PCIe3 4 x8 SAS Port Adapter (FC EJ10; CCIN 57B4)</p> <ul style="list-style-type: none"> • Regular-height adapter • PCIe3 x8 • Transfer speed of 6 Gbps • Supports DVD and tape drives • No write cache • One PCIe x8 slot per adapter • OS support: AIX, IBM i, and Linux operating systems 	Not supported in the system. Can be installed in a FC 5802 or 5877 expansion unit.	6
EJ11	<p>PCIe3 LP 4 x8 SAS Port Adapter (FC EJ11; CCIN 57B4)</p> <ul style="list-style-type: none"> • Low-profile adapter • PCIe3, short, x8 • Transfer speed of 6 Gbps • Supports DVD and tape drives • No write cache • One PCIe x8 slot per adapter • OS support: AIX, IBM i, and Linux operating systems 	1, 2, 3, 4, 5	5

Table 8. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	Slot priorities	Maximum number of adapters supported
5260	PCIe2 LP 4-port 1 GbE Adapter (FC 5260; CCIN 576F) <ul style="list-style-type: none"> • Low-profile adapter • PCIe generation 1 or generation 2, x4 • High bandwidth • Four-port 1 Gb Ethernet • OS support: AIX, IBM i, and Linux operating systems 	6, 1, 2, 3, 4, 5	6
5270	10 Gb FCoE PCIe Dual-port Adapter (FC 5270; CCIN 2B3B) <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5	5
5271	4-port 10/100/1000 Base-TX PCI Express Adapter (FC 5271; CCIN 5717) <ul style="list-style-type: none"> • Low-profile adapter • Short, x4 • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5	5
5272	10 Gb Ethernet-CX4 PCI Express Adapter (FC 5272; CCIN 5272) <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5	5
5274	2-port Gb Ethernet-SX PCI Express Adapter (FC 5274; CCIN 5768) <ul style="list-style-type: none"> • Low-profile adapter • Short, x4 • OS support: AIX, IBM i, and Linux operating systems 	1, 2, 3, 4, 5	5
5275	10 Gb Ethernet-SR PCI Express Adapter (FC 5275; CCIN 2B54) <ul style="list-style-type: none"> • Low-profile adapter • Short, x8 • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5	5
5279	PCIe2 LP 2x10 GbE SFP+ Copper 2x1 GbE UTP Adapter (FC 5279; CCIN 2B52) <ul style="list-style-type: none"> • Low-profile, Short, x8 • PCIe 2 • OS support: Linux operating system 	1, 2, 3, 4, 5	5
5280	PCIe2 LP 2x10 GbE SR 2x1 GbE UTP Adapter (FC 5280; CCIN 2B54) <ul style="list-style-type: none"> • Low-profile, short, x8 • PCIe 2 • OS support: Linux operating system 	1, 2, 3, 4, 5	5

Table 8. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	Slot priorities	Maximum number of adapters supported
5281	1 Gb Ethernet UTP 2-port PCIe Adapter (FC 5281; CCIN 5767) <ul style="list-style-type: none"> • Low-profile, short, x8 • PCIe 2 • OS support: AIX, IBM i, and Linux operating system 	1, 2, 3, 4, 5	5
5284	PCIe2 LP 2-port 10 GbE SR Adapter (FC 5284; CCIN 5287) <ul style="list-style-type: none"> • Generation 2, x8 • Low-profile adapter • Extra-high bandwidth • 10 GBASE-SR short-reach optics • OS support: AIX, IBM i (supported only through VIOS), and Linux operating systems 	1, 2, 3, 4, 5	5
5286	PCIe2 LP 2-port 10 GbE SFP+ Copper Adapter (FC 5286; CCIN 5288) <ul style="list-style-type: none"> • Generation 2, low-profile adapter • Two 10 Gb Ethernet ports • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5	5
5708	10 Gb FCoE PCIe Dual-port Adapter (FC 5708; CCIN 2B3B) <ul style="list-style-type: none"> • Low-profile capable • Extra-high bandwidth • PCIe 2.0 adapter with x8 generation 1 • Convergence enhanced Ethernet (CEE) supported • OS support: AIX, IBM i with VIOS, and Linux operating systems 	Not supported in the system. Can be installed in a FC 5802 or 5877 expansion unit.	20
5717	4-port 10/100/1000 Base-TX PCI Express Adapter (FC 5717; CCIN 5717) <ul style="list-style-type: none"> • Short, x4 • High bandwidth • OS support: AIX and Linux operating systems 	Not supported in the system. Can be installed in a FC 5802 or 5877 expansion unit.	20
5732	10 Gb Ethernet-CX4 PCI Express Adapter (FC 5732; CCIN 2B43) <ul style="list-style-type: none"> • Short, x8 • Extra-high bandwidth • OS support: AIX and Linux operating systems 	Not supported in the system. Can be installed in a FC 5802 or 5877 expansion unit.	20
5767	2-port 10/100/1000 Base-TX Ethernet PCI Express Adapter (FC 5767; CCIN 5767) <ul style="list-style-type: none"> • Short, x4 • High bandwidth • OS support: AIX, IBM i, and Linux operating systems 	Not supported in the system. Can be installed in a FC 5802 or 5877 expansion unit.	20

Table 8. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	Slot priorities	Maximum number of adapters supported
5768	2-port Gigabit Ethernet-SX PCI Express Adapter (FC 5768; CCIN 5768) <ul style="list-style-type: none"> • Short, x4 • High bandwidth • OS support: AIX, IBM i, and Linux operating systems 	Not supported in the system. Can be installed in a FC 5802 or 5877 expansion unit.	20
5769	10 Gb Ethernet-SR PCI Express Adapter (FC 5769; CCIN 2B44) <ul style="list-style-type: none"> • Short, full-high, x8 • Regular-height • Extra-high bandwidth • OS support: AIX and Linux operating systems 	Not supported in the system. Can be installed in a FC 5802 or 5877 expansion unit.	20
5772	10 Gb Ethernet-LR PCI Express Adapter (FC 5772; CCIN 576E) <ul style="list-style-type: none"> • Short, x8 • Regular-height card • Extra-high bandwidth • OS support: AIX, IBM i, and Linux operating systems 	Not supported in the system. Can be installed in a FC 5802 or 5877 expansion unit.	20
5899	PCIe2 4-port 1 GbE Adapter (FC 5899; CCIN 576F) <ul style="list-style-type: none"> • Regular-height adapter • PCIe generation 1 or generation 2, x4 • High bandwidth • Four-port 1 Gb Ethernet • OS support: AIX, IBM i, and Linux operating systems 	Not supported in the system. Can be installed in a FC 5802 or 5877 expansion unit.	20
9056	PCIe LP 2-port 1 GbE TX adapter (FC 9056; CCIN 5767) <ul style="list-style-type: none"> • Low-profile, PCIe x4 • PCIe 1.0a compliant • High bandwidth • Two full-duplex 10/100/1000 Base-TX UTP connections to gigabit Ethernet (GbE) LANs • OS support: AIX, IBM i, and Linux operating systems 	1, 2, 3, 4, 5	1
EC27	PCIe2 LP 2-port 10 GbE RoCE SFP+ adapter (FC EC27; CCIN EC27) <ul style="list-style-type: none"> • Short, low-profile • PCIe generation 2, x8 • Extra-high bandwidth, low latency 10 Gb Ethernet • OS support: AIX and Linux operating systems • Firmware level 7.6, or later 	1, 2, 3, 4, 5	5
EC29	PCIe2 LP 2-port 10 GbE RoCE SR adapter (FC EC29; CCIN EC29) <ul style="list-style-type: none"> • Low-profile adapter • PCIe generation 2, x8 • Extra-high bandwidth, low latency 10 Gb Ethernet • OS support: AIX and Linux operating systems • Firmware level 7.6, or later 	1, 2, 3, 4, 5	5

Table 8. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	Slot priorities	Maximum number of adapters supported
EC2G	PCIe LP 2-Port 10 GbE SFN6122F Adapter (FC EC2G; CCIN EC2G) <ul style="list-style-type: none"> • High bandwidth • Low-profile adapter • Supports Solarflare OpenOnload • OS support: Linux operating system 	2,3,5,1,4	4
EC2H	PCIe LP 2-Port 10 GbE SFN5162F Adapter (FC EC2H; CCIN EC2H) <ul style="list-style-type: none"> • High bandwidth • Low-profile adapter • OS support: Linux operating system 	2,3,5,1,4	4
EN0J	PCIe2 LP 4-port (10 Gb FCoE, 1 GbE) SFP+ Adapter (FC EN0J, CCIN 2B93) <ul style="list-style-type: none"> • Low-profile adapter • Extra-high bandwidth • OS support: AIX, IBM i, and Linux operating systems 	1, 2, 3, 4, 5	5
EN0L	PCIe2 LP 4-port (10Gb FCoE and 1GbE) Copper and RJ45 Adapter (FC EN0L; CCIN 2CC1) <ul style="list-style-type: none"> • Low-profile adapter • Fibre Channel over Ethernet (FCoE) converged network adapter (CNA) • Provides network interface controller (NIC) • Single root I/O virtualization (SR-IOV) capable • OS support: AIX, IBM i, and Linux operating systems 	1, 2, 3, 4, 5	5
EN0T	PCIe2 LP 4-port (10Gb+1GbE) SR+RJ45 Adapter (FC EN0T; CCIN 2CC3) <ul style="list-style-type: none"> • Short, low-profile • PCIe generation 2, x8 • two 10 Gb SR optical ports and two 1 Gb RJ45 ports • NIC network convergence adapter • Local are network (LAN) adapter • Requires available PCIe slot in the FC 5685 PCIe Riser Card (generation 2) • OS support: AIX, IBM i (supported only through VIOS), and Linux operating systems 	1, 4, 2, 3, 5	5

Table 8. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	Slot priorities	Maximum number of adapters supported
EN0V	<p>PCIe2 LP 4-port (10Gb+1GbE) Copper SFP+RJ45 Adapter (FC EN0V; CCIN 2CC3)</p> <ul style="list-style-type: none"> • Short, low-profile • PCIe generation 2, x8 • Two 10 Gb copper twinax small form-factor pluggable (SFP+) ports • Two 1 Gb RJ45 ports • Ethernet network interface controller (NIC) function • Requires available PCIe slot in the FC 5685 PCIe Riser Card (generation 2) • OS support: AIX, IBM i (supported only through VIOS), and Linux operating systems 	1, 4, 2, 3, 5	5
EN0X	<p>PCIe2 LP 2-port 10 GbE BaseT RJ45 Adapter (FC EN0X; CCIN 2CC4)</p> <ul style="list-style-type: none"> • Short, low-profile • PCIe generation 2, x8 • Two 10 Gb RJ45 ports • Local area network (LAN) adapter • Requires available PCIe slot in the FC 5685 PCIe Riser Card (generation 2) • OS support: AIX, IBM i (supported only through VIOS), and Linux operating systems 	1, 4, 2, 3, 5	5
2728	<p>4-port USB PCIe Adapter (FC 2728; CCIN 57D1)</p> <ul style="list-style-type: none"> • Regular-height adapter • Single-slot, half-length PCIe adapter • PCIe 1.1 • OS support: AIX and Linux operating systems 	Not supported in the system. Can be installed in a FC 5802 or 5877 expansion unit.	20
4808	<p>PCIe Cryptographic Coprocessor (FC 4808; CCIN 4765)</p> <ul style="list-style-type: none"> • Generation 3 blind-swap cassette • PCIe x4, full-height, half-length • OS support: AIX and IBM i operating systems 	Not supported in the system. Can be installed in a FC 5802 or 5877 expansion unit.	8
5283	<p>PCIe2 LP 2-port 4X InfiniBand QDR Adapter (FC 5283; CCIN 58E2)</p> <ul style="list-style-type: none"> • Generation 2 low-profile adapter • Extra-high bandwidth • Requires available PCIe slot in the FC 5685 PCIe Riser Card (generation 2) • OS support: AIX and Linux operating systems 	1 and 4	2
2053 ¹	<p>PCIe RAID and SSD SAS Adapter 3 Gb Low-profile (FC 2053; CCIN 57CD)</p> <ul style="list-style-type: none"> • Short, x8 • Double-wide, low-profile adapter, requires two slots • VIOS attachment requires version 2.2, or later 	2 and 5 or 3	2

Table 8. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	Slot priorities	Maximum number of adapters supported
2055 ¹	PCIe RAID and SSD SAS Adapter 3 Gb with Blind-Swap Cassette (FC 2055; CCIN 57CD) <ul style="list-style-type: none"> • Short, x8 • Double-wide, low-profile adapter, requires two slots • OS support: AIX, IBM i, and Linux operating systems • VIOS attachment requires version 2.2, or later 	Not supported in the system. Can be installed in a FC 5802 or 5877 expansion unit.	10
5278	PCIe Dual-x4 SAS Adapter (FC 5278; CCIN 57B3) <ul style="list-style-type: none"> • Low-profile adapter • Extra-high bandwidth • Short, x8 • OS support: AIX, IBM i, and Linux operating systems 	1, 2, 3, 4, 5	5
5805	PCIe 380 MB Cache Dual - x4 3 Gb SAS RAID Adapter (FC 5805; CCIN 574E) <ul style="list-style-type: none"> • Short, dual x4 • SAS RAID adapter • Installed in pairs • OS support: AIX, IBM i, and Linux operating systems 	Not supported in the system. Can be installed in a FC 5802 or 5877 expansion unit.	20
5901	PCIe Dual - x4 SAS Adapter (FC 5901; CCIN 57B3) <ul style="list-style-type: none"> • Short • Extra-high bandwidth • OS support: AIX, IBM i, and Linux operating systems 	1, 2, 3, 4, 5	20
5913	PCIe2 1.8 GB Cache RAID SAS Tri-port 6 Gb Adapter (FC 5913; CCIN 57B5) <ul style="list-style-type: none"> • Full-height, short, PCIe2 x8 • Transfer speed of 6 Gbps • Write cache backup of 1.8 GB • One PCIe x8 slot per adapter • Adapters are installed in pairs • OS support: AIX, IBM i, and Linux operating systems 	Not supported in the system. Can be installed in a FC 5802 or 5877 expansion unit.	16
ESA1	PCIe2 RAID SAS Adapter Dual-port 6 Gb (FC ESA1; CCIN 57B4) <ul style="list-style-type: none"> • Regular-height adapter • PCIe generation 2, x8 • OS support: AIX, IBM i, and Linux operating systems 	Not supported in the system. Can be installed in a FC 5802 or 5877 expansion unit.	20
ESA2	PCIe2 RAID SAS Adapter Dual-port 6 Gb LP (FC ESA2; CCIN 57B4) <ul style="list-style-type: none"> • Short, low-profile • PCIe generation 2, x8 • OS support: AIX, IBM i, and Linux operating systems 	1, 2, 3, 4, 5	2
2893	PCI Express 2-Line WAN with Modem (FC 2893; CCIN 576C) <ul style="list-style-type: none"> • Short, x4 • Non-CIM • OS support: AIX, IBM i, and Linux operating systems 	Not supported in the system. Can be installed in a FC 5802 or 5877 expansion unit.	20

Table 8. Adapter slot priorities and maximums for PCIe adapters (continued)

Feature code	Description	Slot priorities	Maximum number of adapters supported
2894	PCI Express 2-Line WAN with Modem (FC 2894; CCIN 576C) <ul style="list-style-type: none"> • Short, x4 • CIM • OS support: AIX, IBM i, and Linux operating systems 	Not supported in the system. Can be installed in a FC 5802 or 5877 expansion unit.	20
EN13	PCI Express 2-Line WAN with Modem (FC EN13; CCIN 576C) <ul style="list-style-type: none"> • Short, x4 • Non-CIM • OS support: IBM i operating system 	Not supported in the system. Can be installed in a FC 5802 or 5877 expansion unit.	20
EN14	PCI Express 2-Line WAN with Modem (FC EN14; CCIN 576C) <ul style="list-style-type: none"> • Short, x4 • CIM • OS support: IBM i operating system 	Not supported in the system. Can be installed in a FC 5802 or 5877 expansion unit.	20
ES09	IBM Flash Adapter 90 (PCIe2 0.9TB) (FC ES09; CCIN 578A) <ul style="list-style-type: none"> • PCIe generation 2, x8 • 900 GB eMLC Flash storage • One PCIe x8 slot per adapter • Adapters are installed in pairs to enable mirroring • OS support: AIX and Linux operating systems 	1, 2, 3, 4, 5	5
¹ The adapter requires two adjacent slots.			

Performance notes

Use this information to help determine the maximum number of adapters that can be placed in a system while still maintaining optimum performance.

Performance notes regarding GX++ channel adapters

Table 8 on page 23 identifies the slot placement priorities and the maximum number of specified adapters that can be installed for connectivity. However, for optimum performance, you might want to further limit the total number of high-bandwidth and extra-high bandwidth adapters. The system supports the following GX++ adapters feature codes (FCs):

- FC EJ0G: GX++ Dual-port 12x Channel Attach adapter
- FC EJ0H: GX++ LP 1-port PCIe2 x8 Adapter

When you are plugging FC EJ0G GX adapter, ensure that it is placed in GX++ slot 2. If this adapter is installed in GX++ slot 2, PCIe slot 6 (P1-C7) is not available to install any PCIe adapter. Also, the system power control network (SPCN) cable of this GX adapter is installed in PCIe slot 1 (P1-C2).

The FC EJ0H GX adapter can be installed in any GX++ slot. The PCIe cable, such as FC EN05 or FC EN07, connects the FC EJ0H GX adapter and the 5888 PCIe storage enclosure to the system.

Note: The FC EJ0H GX adapter provides only half of the FC 5888 PCIe storage enclosure connections required.

The I/O enclosures, such as FC 5802 and FC 5877, are supported for the 8231-E2C or 8231-E2D system.

I/O expansion units

Find information about the Peripheral Component Interconnect (PCI), PCI-X, and PCI Express (PCIe) adapters supported in the I/O expansion units that are supported for the IBM Power Systems™ servers that contain the POWER7 processor.

PCI slot priorities for the 5802 and 5877 expansion units

Learn about the PCI Express (PCIe) slots in the 5802 and 5877 expansion units.

System description

The 5802 and 5877 expansion units are 19-inch, rack-mountable, I/O expansion drawers that are designed to be attached to the system by using 12X double data rate (DDR) cables.

The expansion units can accommodate 10 generation-3 cassettes. These cassettes can be installed and removed without removing the drawer from the rack. The expansion units do not support I/O processor (IOP) adapters.

Notes:

- PCIe2 adapters that provide extra-high bandwidths aren't supported in the 5802 and 5877 expansion units.
- If a PCI adapter with CCIN 577D is installed in location P1-C4 of a 5802 or 5877 expansion unit, do not complete the install procedure for the PCI adapter in location P1-C5 with the system power on. The install action with the power on might cause the PCI adapter in location P1-C4 to fail.
- If a PCI adapter with CCIN 577D is installed in location P1-C4 of a 5802 or 5877 expansion unit, you can complete the remove and replace procedures for the PCI adapter in location P1-C5 with the system power on. The remove action and the replace action of the PCI adapter in location P1-C5 with the power on does not cause the PCI adapter in location P1-C4 to fail.

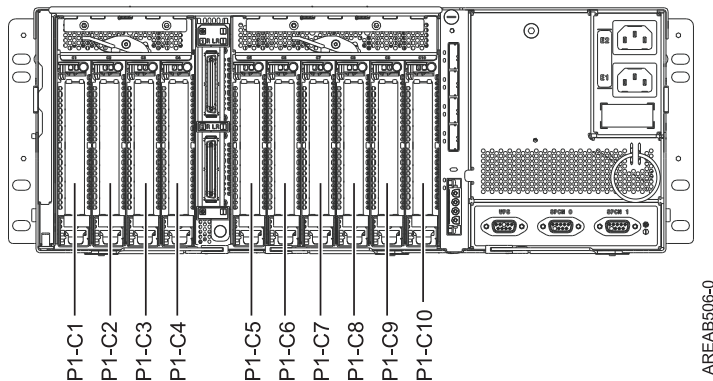


Figure 4. Rear view. This figure shows the rear view of the expansion unit.

Table 9. Location code descriptions

Location code	I/O chip	PCI host bridge (PHB)	Description
P1-C1	I/O chip 1	PHB1	PCIe x8 slot
P1-C2		PHB2	
P1-C3		PHB3	
P1-C4	I/O chip 2	PHB4	
P1-C5		PHB5	
P1-C6		PHB6	
P1-C7	I/O chip 3	PHB7	
P1-C8		PHB8	
P1-C9		PHB9	
P1-C10		PHB10	

Slot priority

The slot priority for all adapters is P1-C1, P1-C4, P1-C2, P1-C5, P1-C3, P1-C6, P1-C7, P1-C8, P1-C9, and P1-C10.

There are three I/O chips. Each I/O chip controls three or four PCI host bridges (PHBs) and each PCIe slot connects directly to a PHB.

- One I/O chip controls slots P1-C1, P1-C2, and P1-C3.
- A second I/O chip controls slots P1-C4, P1-C5, and P1-C6.
- A third I/O chips controls slots P1-C7, P1-C8, P1-C9, and P1-C10.

For best performance, fill P1-C1, P1-C4, P1-C2, P1-C5, P1-C3, and P1-C6 first with the highest bandwidth adapters. Then, fill the remaining slots.

Determining the best place to install your adapter

You can use the placement guidelines and reference tables in this section to determine the best place in which to install your adapter on systems running the IBM i operating system.

Finding the current system configuration in IBM i

You can use the system service tools in the IBM i operating system to find the current system configuration.

Before you begin, you must know the location codes used for the PCI adapter slots on the system with which you are working. See “PCI adapters placement rules and slot priorities for the 8231-E2B, 8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, or 8268-E1D” on page 11 for the location codes for your system.

To find the current system configuration, start an IBM i session and sign on. If you have more than one system, start a session on the system that is being upgraded and for which you have service tools authority. Perform the following steps:

1. Type `strsst` on the command line of the main menu and press Enter.
2. Type your service tools user ID and service tools password on the Start Service Tools (STRSST) Sign On display and press Enter.
3. Select **Start a service tool** from the System Service Tools (SST) display and press Enter.
4. Select **Hardware service manager** from the Start a Service Tool display and press Enter.

5. Select **Packaging hardware resources (system, frames, cards)** from the Hardware Service Manager display and press Enter.
6. Type 9 on the **System Unit** line and press Enter.
7. Select **Include empty positions**.
8. Look for the PCI adapter location codes in the Location column.
9. Make a note of the Type-Model number for each PCI adapter location.
10. Make a note of any PCI adapter locations that are listed in the Description column as an Empty Position.

Note: The Type-Model number is blank for empty positions.

11. Press F12 to return to the previous window.
12. If an expansion unit is attached, perform the following steps. If no expansion unit is attached, go to "PCI adapters placement rules and slot priorities for the 8231-E2B, 8231-E1C, 8231-E1D, 8231-E2C, 8231-E2D, or 8268-E1D" on page 11:
 - Type 9 for the **System Expansion Unit** field and press Enter.
 - Repeat steps 7 to 11 for each expansion unit.
 - Select an available slot in the expansion unit.

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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.

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European Community contact:
IBM Deutschland GmbH
Technical Regulations, Department M372
IBM-Allee 1, 71139 Ehningen, Germany
Tele: +49 7032 15 2941
email: lugi@de.ibm.com

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

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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

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

Der verantwortliche Ansprechpartner des Herstellers in der EU ist:
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IBM-Allee 1, 71139 Ehningen, Germany
Tel: +49 7032 15 2941
email: lugi@de.ibm.com

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European Community contact:
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Technical Regulations, Department M372
IBM-Allee 1, 71139 Ehningen, Germany
Tele: +49 7032 15 2941
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New Orchard Road
Armonk, New York 10504
Tel: 914-499-1900

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

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