

IBM x-series of Ethernet Switches



Installation and User Guide

Service information: 4002-X2A, 4002AX2

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Note:

Before using this information and the product it supports, be sure to read the general information in Appendix B, "Notices," on page 51.

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Preface

This publication is provided for use with your particular IBM® Ethernet switch or router product or product family. It provides information on installing, configuring, maintaining, and using your product. Please retain this publication and the accompanying documentation CD in a convenient location for easy reference and future use.

The following sections provide information on safety and environmental considerations, related publications and resources, as well as how to get assistance, and how to send IBM feedback on this publication.

- “Safety notices”
- “Product recycling and disposal” on page xix
- “Product documents” on page xx
- “Getting help” on page xxiii
- “How to send your comments” on page xxiii

Safety notices

This section contains important safety information that should be read before starting any installation or service procedure.

- “Safety notices and labels,” including:
 - “Notes” on page xii
 - “Attention notices” on page xii
 - “Caution notices” on page xii
 - “Danger notices” on page xiii
 - “Safety labels” on page xvi
- “Rack safety” on page xviii

Safety notices and labels

When using this product, observe the danger, caution, and attention notices contained in this guide. The notices are accompanied by symbols that represent the severity of the safety condition. The danger and caution notices are listed in numerical order based on their IDs, which are displayed in parentheses, for example (D004), at the end of each notice. Use this ID to locate the translation of these danger and caution notices in the *IBM Systems Safety Notices (G229–9054)* publication, which is on the product documentation CD that accompanies this product.

The following notices and statements are used in IBM documents. They are listed below in order of increasing severity of potential hazards. Follow the links for more detailed descriptions and examples of the notes, attention notices, caution, and danger notices in the sections that follow.

- **“Notes” on page xii:** These notices provide important tips, guidance, or advice.
- **“Attention notices” on page xii:** These notices indicate potential damage to programs, devices, or data.
- **“Caution notices” on page xii:** These statements indicate situations that can be potentially hazardous to you.

- “**Danger notices**” on page xiii: These statements indicate situations that can be potentially lethal or extremely hazardous to you. Safety labels are also attached directly to products to warn of these situations.
- In addition to these notices, “Safety labels” on page xvi may be attached to the product to warn of potential hazards.

Notes

Notes can provide tips, guidance, suggestions, or advice for simplifying procedures, clarifying information, or avoiding potential problems. A sample note follows.

Note: The POE LEDs work only when POE is enabled on your device.

Attention notices

An attention notice indicates the possibility of damage to a program, device, or system, or to data. An exclamation point symbol may accompany an attention notice, but is not required. A sample attention notice follows:

Attention: Do not bend a fibre cable to a radius less than 5 cm (2 in.); you can damage the cable. Tie wraps are not recommended for optical cables because they can be easily overtightened, causing damage to the cable.

ESD precautions: Attention: Many of the field replaceable units (FRUs) are sensitive to electrostatic discharge (ESD), and can potentially be damaged by improper handling. Wear a wrist grounding strap connected to chassis ground (if the device is plugged in) or a bench ground. Store all ESD-sensitive components in antistatic packaging.

Caution notices

A caution notice calls attention to a situation that is potentially hazardous to people because of some existing condition. A caution notice can be accompanied by different symbols, as in the examples below:

If the symbol is...	It means....
	A hazardous electrical condition with less severity than electrical danger.
	A generally hazardous condition not represented by other safety symbols.
	A specification of product weight that requires safe lifting practices. The weight range of the product is listed below the graphic, and the wording of the caution varies, depending on the weight of the device.
	A potential hazard of pinching the hand or other body parts between parts.
	A hazardous condition due to moving parts nearby.

If the symbol is...	It means....
	<p>A hazardous condition due to the use of a laser in the product. Laser symbols are always accompanied by the classification of the laser as defined by the U.S. Department of Health and Human Services (for example, Class I, Class II, and so forth).</p>

Read and comply with the following caution notices before installing or servicing this device.



CAUTION:

Energy hazard present. Shorting may result in system outage and possible physical injury. Remove all metallic jewelry before servicing. (C001)



CAUTION:

This product is equipped with a 3-wire (two conductors and ground) power cable and plug. Use this power cable with a properly grounded electrical outlet to avoid electrical shock. (C018)



CAUTION:

Servicing of this product or unit is to be performed by trained service personnel only. (C032)

Danger notices

A danger notice calls attention to a situation that is potentially lethal or extremely hazardous to people. A lightning bolt symbol accompanies a danger notice to represent a dangerous electrical condition. Read and comply with the following danger notices before installing or servicing this device.



DANGER

To prevent a possible shock from touching two surfaces with different protective ground (earth), use one hand, when possible, to connect or disconnect signal cables. (D001)



DANGER

Overloading a branch circuit is potentially a fire hazard and a shock hazard under certain conditions. To avoid these hazards, ensure that your system electrical requirements do not exceed branch circuit protection requirements. Refer to the information that is provided with your device or the power rating label for electrical specifications. (D002)



DANGER

If the receptacle has a metal shell, do not touch the shell until you have completed the voltage and grounding checks. Improper wiring or grounding could place dangerous voltage on the metal shell. If any of the conditions are not as described, STOP. Ensure the improper voltage or impedance conditions are corrected before proceeding. (D003)



DANGER

An electrical outlet that is not correctly wired could place hazardous voltage on 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. (D004)

The following general electrical danger notice provides instructions on how to avoid shock hazards when servicing equipment. Unless instructed otherwise, follow the procedures in this danger notice.



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 below 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)

If the weight of the product is greater than 227 kg (500 lb), the following statement and notice apply. This could apply if multiple products are installed in a single cabinet, and that cabinet and products needs to be moved.

Delivery and subsequent transportation of the equipment: The customer should prepare his environment to accept the new product based on the installation planning information provided, with assistance from an IBM Installation Planning Representative (IPR) or IBM authorized service provider. In anticipation of the equipment delivery, the final installation site should be prepared in advance such that professional movers/riggers can transport the equipment to the final installation site within the computer room. If for some reason, this is not possible at the time of delivery, the customer will need to make arrangements to have professional movers/riggers return to finish the transportation at a later date. Only professional movers/riggers should transport the equipment. The IBM authorized service provider will only perform minimal frame repositioning within the computer room, as needed, to perform required service actions. The customer is also responsible for using professional movers/riggers in the case of equipment relocation or disposal.



DANGER

Heavy equipment—personal injury or equipment damage might result if mishandled. (D006)

Safety labels

As an added precaution, safety labels are often installed directly on products or product components to warn of potential hazards. These can be either danger or caution notices, depending upon the level of the hazard.

The actual product safety labels may differ from these sample safety labels:



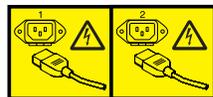
DANGER

Hazardous voltage, current, or energy levels are present inside any component that has this label attached. Do not open any cover or barrier that contains this label. (L001)



DANGER

Rack-mounted devices are not to be used as a shelf or work space. (L002)



DANGER

Multiple power cords. The product might be equipped with multiple power cords. To remove all hazardous voltages, disconnect all power cords. (L003)



DANGER

Hazardous voltage present. Voltages present constitute a shock hazard, which can cause severe injury or death. (L004)



CAUTION:

Hazardous energy present. Voltages with hazardous energy might cause heating when shorted with metal, which might result in splattered metal, burns, or both. (L005)



CAUTION:

Hazardous moving parts nearby (L008)



CAUTION:

Pinch hazard. (L012)

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Rack safety

Rack installation

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.

(R001 part 1 of 2)

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 part 2 of 2)

Rack relocation (19" rack)

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 do the following:
 - 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 when moving the rack 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 came with your rack cabinet for the weight of a loaded rack cabinet.
 - Verify that all door openings are at least 760 x 2030 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.
 - Once the rack cabinet is in the new location, do the following:
 - 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)

Product recycling and disposal

Refer to the *IBM Systems Environmental Notices and User Guide* (Z125-5823) for translated environmental statements and information regarding product recycling and disposal. This document may be provided either in printed version or on the product documentation CD.

See “Removing the battery” on page 38 for battery removal instructions, if needed to meet environmental regulations.

Product documents

The following documents contain information related to this product. The documentation may be printed material or may be on the documentation CD that is shipped with the product. Newer versions of product documentation may be available through the IBM Publications Center web site www.ibm.com/shop/publications/order or through the IBM Systems Networking Support web site www.ibm.com/systems/support/networking. Search by product, publication title, or publication number.

- *IBM x-series of Ethernet Switches Installation and User Guide*, GC27-2267 (this document)
- *IBM Systems Safety Notices*, G229–9054
- *IBM Systems Environmental Notices and User Guide*, Z125-5823
- *IBM Warranty*

Software documents

IBM Ethernet switch and router products use software licensed from Brocade Communications Systems, Inc. You can find software publications that support your product on the CD-ROM supplied with this product.

The software publications associated with this product are:

- *FastIron and Turbolron 24X Configuration Guide*
- *IronWare MIB Reference*

These software publications reflect only the original Brocade products names. Use the cross-reference of products in Table 1 to assist you when determining which information in those publications applies to your product. Brocade products with no IBM equivalents are not listed in the table. Note that the IBM products can be ordered with additional features, while Brocade products with those additional features may be offered as separate models.

Table 1. Comparable IBM and Brocade products.

IBM product name	IBM machine type	IBM model (HVEC/XCC model in parentheses)	Brief product description	Brocade product name	Brocade product part number
Ethernet Router B04M	4003	M04	4U modular Ethernet router with 4 interface slots	NetIron MLX-4	NI-MLX-4-AC
Ethernet Router B08M	4003	M08	7U modular Ethernet router with 8 interface slots	NetIron MLX-8	NI-MLX-8-AC
Ethernet Router B16M	4003	M16	14U modular Ethernet router with 16 interface slots	NetIron MLX-16	NI-MLX-16-AC
Ethernet Router B32M	4003	M32	33U modular Ethernet and IP router with 32 interface slots	NetIron MLX-32	NI-MLX-32-AC-A
Ethernet Switch B04R	4003	R04	4U modular Ethernet switch with 4 interface slots	BigIron RX-4	BI-RX-4-AC

Table 1. Comparable IBM and Brocade products. (continued)

IBM product name	IBM machine type	IBM model (HVEC/XCC model in parentheses)	Brief product description	Brocade product name	Brocade product part number
Ethernet Switch B08R	4003	R08	7U modular Ethernet switch with 8 interface slots	BigIron RX-8	BI-RX-8-AC
Ethernet Switch B16R	4003	R16	14U modular Ethernet switch with 16 interface slots	BigIron RX-16	BI-RX-16-AC-A
Ethernet Switch B32R	4003	R32	33U modular Ethernet switch with 32 interface slots	BigIron RX-32	I-RX-32-AC-A
Ethernet Switch B08S	4003	S08	6U modular Ethernet switch with 8 interface slots	FastIron SX 800	FI-SX800-AC
Ethernet Switch B16S	4003	S16	14U modular Ethernet switch with 16 interface slots	FastIron SX 1600	FI-SX1600-AC
Ethernet Switch B24X	4002	X2A (4002AX2)	1U Ethernet switch with twenty-four 10/1 GbE SFP+/SFP ports plus four 10/100/1000 MbE RJ45 ports	Ethernet Switch B24X	TI-24X-AC
Ethernet Switch B24C (C)	4002	C2A (4002AC2)	1U Ethernet switch with twenty-four 10/100/1000 MbE RJ45 ports including four combination 100/1000 MbE SFP ports and one module slot for optional 2-port 10 GbE XFP module	NetIron CES 2024C	NI-CES-2024C-AC
Ethernet Switch B24C (F)	4002	C2B (4002BC2)	1U Ethernet switch with twenty-four 100/1000 MbE SFP ports including four combination 10/100/1000 MbE RJ45 ports and one module slot for optional 2-port 10 GbE XFP module	NetIron CES 2024F	NI-CES-2024F-AC
Ethernet Switch B48C (C)	4002	C4A (4002AC4)	1U Ethernet switch with forty-eight 10/100/1000 MbE RJ45 ports including four combination 100/1000 SFP ports	NetIron CES 2048C	NI-CES-2048C-AC
Ethernet Switch B48C (F)	4002	C4B, (4002BC4)	1U Ethernet switch with forty-eight 100/1000 MbE SFP ports	NetIron CES 2048F	NI-CES-2048F-AC
Ethernet Switch B50C (C)	4002	C5A, (4002AC5)	1U Ethernet switch with forty-eight 10/100/1000 MbE RJ45 ports plus two 10 GbE XFP ports	NetIron CES 2048CX	NI-CES-2048CX-AC
Ethernet Switch B50C (F)	4002	C5B, (4002BC5)	1U Ethernet switch with forty-eight 100/1000 MbE SFP ports plus two 10 GbE XFP ports	NetIron CES 2048FX	NI-CES-2048FX-AC

Table 1. Comparable IBM and Brocade products. (continued)

IBM product name	IBM machine type	IBM model (HVEC/XCC model in parentheses)	Brief product description	Brocade product name	Brocade product part number
Ethernet Switch B48G	4002	G4A, (4002AG4)	1.5U Ethernet switch with forty-eight 10/100/1000 MbE RJ45 (PoE capable) ports including four combination 100/1000 MbE SFP ports and one module slot for optional 2-port 10 GbE (XFP or CX4) module	FastIron GS	FGS648P
Ethernet Switch B50G	4002	G5A, (4002AG5)	1.5U Ethernet switch with forty-eight 10/100/1000 MbE RJ45 (PoE capable) ports including four combination 100/1000 MbE SFP ports plus 2-port 10 GbE CX4 module supporting stacking	FastIron GS-STK	FGS648P-STK

Accessibility features for the IBM x-series of Ethernet Switches

Accessibility features help users who have a disability, such as restricted mobility or limited vision, to use information technology products successfully.

Accessibility features

Use and operation of this device is accomplished primarily through external devices which may provide different accessibility features.

The following list includes the major accessibility features in the product either directly or through external devices or interfaces:

- Keyboard-only operation
- Interfaces that are commonly used by screen readers
- Keys that are discernible by touch but do not activate just by touching them
- Industry-standard devices for ports and connectors
- The attachment of alternative input and output devices

Keyboard navigation

This product uses standard Microsoft® Windows® navigation keys.

Vendor software

These products include certain vendor software that is not covered under the IBM license agreement. IBM makes no representation about the accessibility features of these products. Contact the vendor for the accessibility information about its products.

Related accessibility information

You can view the publications for these products in Adobe Portable Document Format (PDF) using the Adobe Acrobat Reader. The PDFs are provided on a CD that is packaged with the product. An accessible HTML version of this document is also included on the documentation CD for this product.

IBM and accessibility

See the IBM Human Ability and Accessibility Center for more information about the commitment that IBM has to accessibility: www.ibm.com/able.

Getting help

For the latest version of your product documentation, visit the web at www.ibm.com/shop/publications/order. Search by form number or title.

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For support information for this product and other IBM products, see the following web site: www.ibm.com/systems/support/. Select your product family, and follow the web navigation to your specific product.

You can also contact IBM within the United States at 1-800-IBMSERV (1-800-426-7378). For support outside the United States, you can find the service number at: www.ibm.com/planetwide/.

Visit www.ibm.com/contact for the contact information for your country or region.

Taiwan Contact Information

IBM Taiwan Product Service Contact Info:
IBM Taiwan Corporation
3F, No 7, Song Ren Rd., Taipei Taiwan
Tel: 0800-016-888

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
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- A detailed description of any information that should be changed

About This Document

This guide describes the IBM x-series of Ethernet Switch products from IBM. It provides procedures for installing the IBM Ethernet Switch B24X switch, cabling, and performing a basic configuration of the switch. This guide also provides information on managing and maintaining the switch. When reference to a specific model is not required, the general terms *switch*, *product*, or *device* will be used to

refer to all models. The term *x-series* may also be used when needed to differentiate between different IBM Ethernet switch product lines.

Audience

This manual is designed for system administrators with a working knowledge of Layer 2 and Layer 3 switching and routing.

You should be familiar with the following protocols if applicable to your network: IP, RIP, OSPF, IS-IS, BGP4, MBGP, IGMP, PIM, DVMRP, IPX, AppleTalk, FSRP, VRRP, and VRRPE.

Supported hardware and software

The following hardware platform is supported by this release of this guide:

- x-series of Ethernet switches Series

Document conventions

This section describes text formatting conventions and important notice formats used in this document.

Text formatting

The narrative-text formatting conventions that are used are as follows:

Table 2. Formatting conventions

bold text	Identifies command names Identifies the names of user-manipulated GUI elements Identifies keywords Identifies text to enter at the GUI or CLI
<i>italic text</i>	Provides emphasis Identifies variables Identifies document titles
code text	Identifies CLI output

For readability, command names in the narrative portions of this guide are presented in bold: for example, **show version**.

Command syntax conventions

Command syntax in this manual follows these conventions:

Table 3. Command syntax conventions

command and parameters	Commands and parameters are printed in bold.
[]	Optional parameter.
<i>variable</i>	Variables are printed in italics enclosed in angled brackets < >.
...	Repeat the previous element, for example “member[;member...]”
	Choose from one of the parameters.

Chapter 1. Product Overview

The IBM Ethernet Switch B24X provides high port density and 512 MB of DDR RAM when shipped from the factory. The B24X delivers a full complement of standards-based, feature-rich Layer 2 switching capability. The extensive feature set supports network requirements ranging from basic connectivity to multicast-enabled full streaming audio and video applications for converged services.

The B24X supports the following:

- Twenty-four SFP+ ports at either 1 GbE or 10 GbE using the standard E1MG optics, as well as the new SFP+ 10GbE optics
- Four 10/100/1000 RJ-45 ports

Software features

Software features differ depending on the software version that is loaded on the device. When first shipped, the devices support full Layer 2 Switching.

For a complete list of software features supported, refer to the release notes or the *FastIron and Turbolron 24X Configuration Guide*.

Hardware features

This section describes the physical characteristics of the models. For details about physical dimensions, power supply specifications, and pin-outs, refer to Appendix A, "Hardware Specifications," on page 43.

Figure 1 shows the B24X.

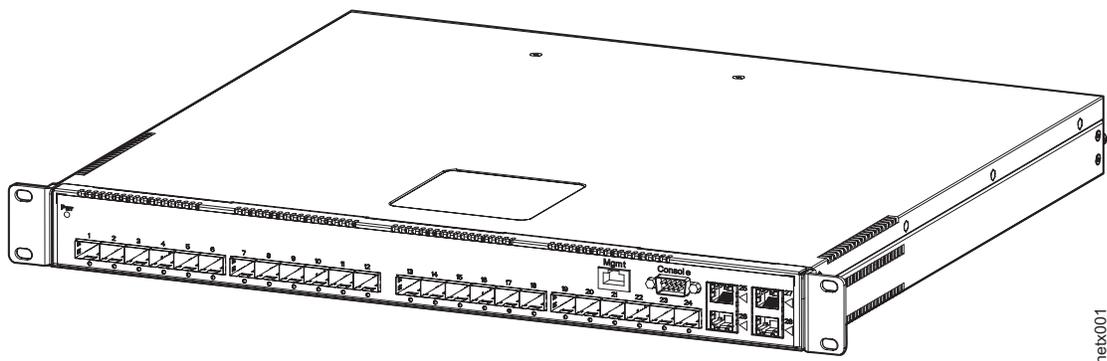


Figure 1. IBM Ethernet Switch B24X

The B24X contains the following ports:

- Twenty-four (24) SFP+ 10 Gigabit and Gigabit Ethernet fiber ports
- Four (4) 10/100/1000 Mbps copper ports, supporting 100Base-TX and 1000Base-T RJ-45 connectors

Control features

The B24X front panel has the following control features:

- Serial management interface-DB-9 connector interface (Console Port)
- 10/100/1000 RJ-45 Management Port

1 shows the Management port and **2** shows the Console port.

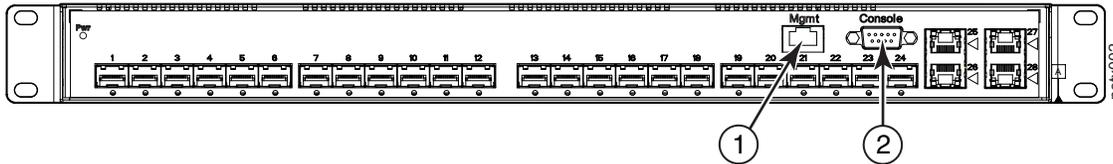


Figure 2. Console and Management ports

Serial management interface (Console port)

The serial management interface (port labeled Console) enables you to configure and manage the device using a third-party terminal emulation application on a directly connected PC, straight-through EIA or TIA DB-9 serial cable (M/F) is included. The console port is located in the upper right of the front panel.

Management port

The Management port provides connectivity to your existing management network through 10/100/1000 copper ports that uses auto-sensing and auto-negotiating to determine the speed (10 Mbps, 100 Mbps, or 1000 Mbps) and mode (full-duplex or half-duplex) of the port at the other end of the link, and adjusts port speed accordingly. The Management port on the B24X supports RJ-45 copper connectors, auto MDI or MDIX detection, and has an RJ-45 unshielded twisted pair (UTP) connector.

Note: This port interfaces with the CPU only and not the data plane.

Network interfaces

Table 4 describes the network interfaces supported on B24X devices. For network interface specifications, refer to Table 13 on page 47.

Table 4. Network interfaces

Interface	Show Media Description
1000Base-BX-D	M-GBXD
1000Base-BX-U	M-GBXU
1000Base-LHA	M-LHA
1000Base-LHB	M-LHB
1000Base-LX	M-LX
1000Base-SX	M-SX
1000Base-SX2	M-SX2
1000Base-T	C
100Base-TX	
10GBase-LR	XG-LR

Table 4. Network interfaces (continued)

Interface	Show Media Description
10GBase-SR	XG-SR

Viewing the media types installed in the ports

The show media command displays the types of media (copper or fiber) installed in the ports. The following example is **show media** output.

```
FastIron# show media
Port 1: Type : 10G XG-SR(SFP+)
Vendor: Brocade Version: 1
Part# : PLRXPLSCS4371 Serial#: C833UQ06H
Port 2: Type : EMPTY
Port 3: Type : EMPTY
Port 4: Type : EMPTY
Port 5: Type : EMPTY
Port 6: Type : 10G XG-SR(SFP+)
Vendor: Brocade Version: 1
Part# : PLRXPLSCS4371 Serial#: C847UQ04C
Port 7: Type : 10G XG-SR(SFP+)
Vendor: Brocade Version: 1
Part# : PLRXPLSCS4371 Serial#: C847UQ04H
Port 8: Type : EMPTY
Port 9: Type : EMPTY
Port 10: Type : EMPTY
Port 11: Type : EMPTY
Port 12: Type : EMPTY
Port 13: Type : 10G XG-SR(SFP+)
Vendor: Brocade Version: 1
Part# : PLRXPLSCS4371 Serial#: C847UQ04T
Port 14: Type : 10G XG-SR(SFP+)
Vendor: Brocade Version: 1
Part# : PLRXPLSCS4371 Serial#: C847UQ04R
Port 15: Type : 10G XG-SR(SFP+)
Vendor: Brocade Version: 1
Part# : PLRXPLSCS4371 Serial#: C847UQ050
Port 16: Type : 10G XG-SR(SFP+)
Vendor: Brocade Version: 1
Part# : PLRXPLSCS4371 Serial#: C847UQ059
Port 17: Type : EMPTY
Port 18: Type : EMPTY
Port 19: Type : 10G XG-SR(SFP+)
Vendor: Brocade Version: 1
Part# : PLRXPLSCS4371 Serial#: C847UQ04K
Port 20: Type : 10G XG-SR(SFP+)
Vendor: Brocade Version: 1
Part# : PLRXPLSCS4371 Serial#: C833UQ068
Port 21: Type : EMPTY
Port 22: Type : EMPTY
Port 23: Type : EMPTY
Port 24: Type : EMPTY
Port 25: Type : 1G M-C (Gig-Copper)
Port 26: Type : 1G M-C (Gig-Copper)
Port 27: Type : 1G M-C (Gig-Copper)
Port 28: Type : 1G M-C (Gig-Copper)
```

10 Gbps ports

Ports 1 - 24 support 1-GbE SFP transceivers and 10-GbE SFP and SFP+ transceivers listed in Table 4 on page 2. **1** in Figure 3 on page 4 shows GbE ports 1-24, numbered from left to right.

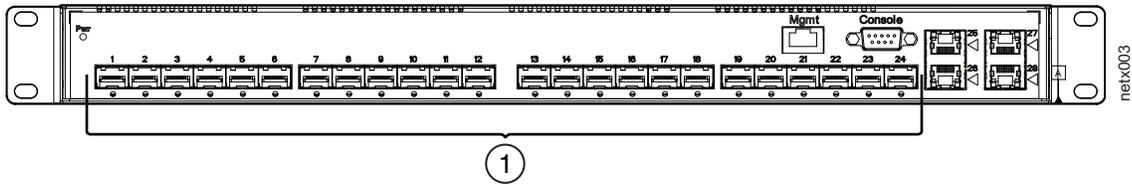


Figure 3. 24 10-GbE ports

Four 10/100/1000 Mbps ports

The ports 25~28 are 10/100/1000 copper ports that use auto-sensing and auto-negotiating to determine the speed (10 Mbps, 100 Mbps, or 1000 Mbps) and mode (full-duplex or half-duplex) of the port at the other end of the link, and adjust port speed accordingly.

10/100/1000 ports on the B24X support RJ-45 copper connectors. The output of the **show media** command displays **C** next to the ports that have copper connectors installed.

Gigabit copper ports on the B24X support auto MDI or MDIX detection. For more information about this feature, refer to “Configuring MDI/MDIX” in the *FastIron and Turbolron 24X Configuration Guide*.

10GbE SFP+ transceiver

The B24X supports a 10GbE SFP+ transceiver specifically for ports 1-24. LEDs on the module faceplates indicate operational status:

- If the LED is on, the port is connected. If the LED is off, no connection exists, or the link is down.
- If the LED is on or blinking, traffic is being transmitted and received on the port.

LEDs for network interfaces and power supplies

The fiber and copper ports on the B24X provide status information through the LEDs listed in Table 5. The following are the LEDs for network interfaces and power supplies:

- 24 10-Gbps fiber ports (1~24 port) have LEDs located under each of them.
- Four 10/100/1000 copper ports (25~28) have Link and Activity LEDs to indicate port status.
- The Management port has a Link LED and Activity LED to indicate port status. The Link LED is on the left of the copper connector and the Activity LED is on the right.
- The System power on LED is on the left side of the front panel.
- The dual power supply 1 and 2 LEDs are on the front panel of the power supply (when you are facing the rear of the device).

Table 5. LEDs

LEDs	Position	State	Meaning
10Gbps Port LEDs			

Table 5. LEDs (continued)

LEDs	Position	State	Meaning
LNK or ACT	Located under the 10-GbE ports	On	The port is connected.
		Off	No fiber port connection exists or the link is down.
		Blinking	Traffic is begin transmitted or received on the fiber port.
10/100/1000 Copper Port LEDs			
Lnk	This is the left LED on RJ45	On	The port is connected.
		Off	No copper port connection exists or the link is down.
Act	This is the right LED on RJ45	On or Blinking	Traffic is being transmitted or received on the copper port.
		Off	No traffic is being transmitted or received on the fiber port.
Management Port LEDs			
Lnk	This is the left LED on RJ45	On	The port is connected.
		Off	No copper port connection exists or the link is down.
Act	This is the right LED on RJ45	On or Blinking	Traffic is being transmitted or received on the copper port.
		Off	No traffic is being transmitted or received on the fiber port.
System Power and Power Supply LEDs			
Power	On the upper left side of the front panel (when facing the front of the device)	On	The device is powered on and has enough power to operate.
		Off	The device is not powered on, or has been powered on but does not have sufficient power to operate.

Table 5. LEDs (continued)

LEDs	Position	State	Meaning
AC OK	Upper center of power supply's front panel (when facing the rear of the device)	On	Indicated power supply is installed and is functioning normally. Note: Power supply 1 is located in the right-hand bay and power supply 2 in the left-hand bay (when facing the rear of the device).
		Off	Power supply is not installed or is not providing power.

Power supplies

Each B24X comes with one AC power supply installed, and a optional second power supply for redundancy. See “Replacing AC power supplies” on page 34 for instructions on installing a power supply.

Figure 4 shows the front panel of the AC power supplies used in the B24X. **1** is the AC LED.

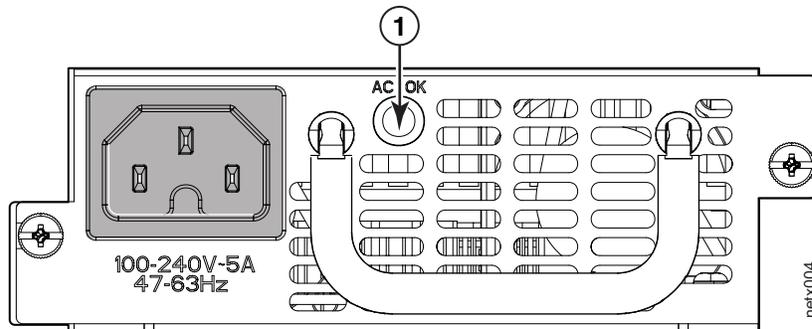


Figure 4. AC power supply front panel

The power supplies are auto-sensing and auto-switching, and provide up to 300 watts of total output power, having a universal input (90 VAC to 264 VAC) and 12 VDC regulated output.

Power supplies can be swapped in or out of the device while the device is running, and without opening the device. You can remove one of the supplies without interrupting operation because the remaining power supply provides enough power for all of the ports.

For power supply hardware specifications, refer to “Power supply specifications” on page 48.

CAUTION:

Disconnect the power supply cable from the power source (outlet) before you install it in or remove it from the device. Failure to do this can result in damage to the power supply or the device, or both (the device can be running while a power supply is being installed or removed, but the power supply itself should not be connected to a power source).

Attention: The B24X power supply is designed exclusively for use with the B24X. Installing the power supply in a device other than a B24X will cause extensive damage to your equipment.

Chapter 2. Installing the B24X

This chapter contains information on how to install the B24X switch.

Attention: Before starting any installation procedure, refer to “Safety notices” on page xi.

Unpacking a system

Attention: The procedures in this manual are intended for qualified service personnel.

Information about configuring IP addresses and connecting network devices is in Chapter 3, “Connecting Network Devices and Checking Connectivity,” on page 19.

Systems ship with all of the items listed below. Please review the list and verify the contents. If any items are missing, please contact the place of purchase.

Package contents

Verify the package contents listed below:

- IBM Ethernet Switch B24X device with dual AC power supplies installed
- AC power cord
- Rack mount brackets and mounting screws (already secured on the device)
- CD-ROM containing software images and user documentation (including this guide)
- Warranty card

General requirements

To manage the system, you will need the following items for serial connection to a Layer 2 or Layer 3 switch:

- A management station, such as a PC running a terminal emulation application.
- A serial cable (provided).
- Use the serial connection to perform basic configuration tasks, such as assigning an IP address and network mask. This information is required to manage the system using IronView Network Manager or using the CLI through Telnet.

Summary of installation tasks

Follow the steps listed in Table 6 to install your B24X device. Details for each of these steps are provided in this chapter and in the following chapter.

Table 6. Summary of installation tasks

Task No.	Task	Where to Find More Information
1	Ensure that the physical environment where the device will be installed has the proper cabling and ventilation.	“Preparing the installation site” on page 12

Table 6. Summary of installation tasks (continued)

Task No.	Task	Where to Find More Information
2	Install the device on a desktop or in an equipment rack. Devices may also be wall-mounted.	"Installing the device" on page 12
3	When the device is installed, plug the power cord into a nearby power source that adheres to the regulatory requirements outlined in this manual.	"Powering on the system" on page 14
4	Verify that power LED is on after the system is powered-on.	"Verifying proper operation" on page 14
5	Attach a terminal or PC to the device. This enables you to configure the device through the Command Line Interface (CLI).	"Attaching a PC or terminal" on page 15
6	No default password is assigned to the CLI. For additional access security, assign a password.	"Assigning permanent passwords" on page 19
7	Before attaching equipment to the device, you must configure an interface IP address to the subnet on which it will be located. Initial IP address configuration is performed using the CLI with a direct serial connection.	"Configuring IP addresses" on page 20
8	Once you power-on the device and assign IP addresses, the system is ready to accept network equipment.	"Connecting network devices" on page 21
9	Test IP connectivity by pinging other devices and tracing routes.	"Testing connectivity" on page 24
10	Continue configuration using the CLI. You also can use IronView Network Manager to manage the device.	<i>FastIron and Turbolron 24X Configuration Guide</i>
11	Secure access to the device.	<i>FastIron and Turbolron 24X Configuration Guide</i>

Installation precautions

Attention: Before starting any installation procedure, refer to "Safety notices" on page xi.

General precautions

Attention: Do not install the device in an environment where the operating ambient temperature might exceed 40°C (104°F).

Make sure that air flow around the front, sides, and back of the device is not restricted.

Never leave tools inside the device.

Attention: Use the erase startup-config command only for new systems. If you enter this command on a system you have already configured, the command erases the configuration. If you accidentally do erase the configuration on a configured system, enter the write memory command to save the running configuration to the startupconfig file.

Power precautions

The following precautions apply to B24X devices:

Attention: Make sure you insert the power supply right-side up. It is possible to insert the supply upside down, although the supply will not engage with the power backplane cotter pin when plugged upside down. The label of the power supply is on the top when you plug in the power supply right-side up when the power connector is on the left and the fan vent is on the right.

Attention: Remove the power cord from a power supply before you install it in or remove it from the device. Otherwise, the power supply or the device could be damaged. (The device can be running while a power supply is being installed or removed, but the power supply itself should not be connected to a power source.)

Attention: The B24X power supply is designed exclusively for use with B24X devices. Installing the power supply in a device other than the B24X will cause extensive damage to your equipment.

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)

CAUTION:

Power supplies are hot swappable. However, IBM recommends that you disconnect the power supply from AC power before installing or removing the supply. The device can be running while a power supply is being installed or removed, but the power supply itself should not be connected to a power source. Otherwise, you could be injured or the power supply or other parts of the device could be damaged.

CAUTION:

For safety reasons, the ESD wrist strap should contain a series 1 MB ohm resistor.

Preparing the installation site

Ensure that any required facility electrical work has been completed before starting the installation, and that there is adequate clear work space to accomplish the installation.

Cabling infrastructure

Ensure that the proper cabling is installed in the site. Refer to “Device specifications” on page 43 or visit www.ibm.com/systems/support/networking.

Installation location

Before installing the device, plan its location and orientation relative to other devices and equipment. Allow at least 3 in. of space at the front of the device for the twisted-pair, fiber-optic, and power cabling. Also, allow a minimum of 3 in. of space between the sides and the back of the device and walls or other obstructions.

Installing the device

You can install switch devices on a desktop or in an equipment rack. See “Rack safety” on page xviii before installing this device in a rack or cabinet.

Desktop installation

Complete the following steps for desktop installation:

1. Set the device on a flat desktop, table, or shelf. Make sure that adequate ventilation is provided for the system. A 3 in. clearance is recommended on each side.
2. Proceed to “Powering on the system” on page 14.

Rack mount installation

For rack mount installation, it is recommended that you use a Telco equipment rack.

The B24X device is compatible with two rack mount kits; a kit with short mounting brackets that ships with the device, and long mounting brackets (not supplied) to prevent the device from sagging when installed in a non-compliant (non-Telco) equipment rack.

In addition to the rack mount kit, you will need the following tools for installation:

- #2 Phillips-head screwdriver
- Four 12-24 screws to mount the device in the rack.

Attention: Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

Complete the following steps to install the rack mount brackets and mount the device in a rack:

1. Remove the rack mount kit from the shipping carton. The kit contains two mounting brackets.

2. Place the Network switch on a hard flat surface with the front panel facing you.
3. Attach a rack-mount bracket to one side of the Network switch with the supplied screws. Then attach the other bracket to the other side.

Attention: Make sure you use the screws supplied with the mounting brackets. Using the wrong screws could damage the B24X and would invalidate your warranty.

Figure 5 shows how to attach the short mounting brackets.

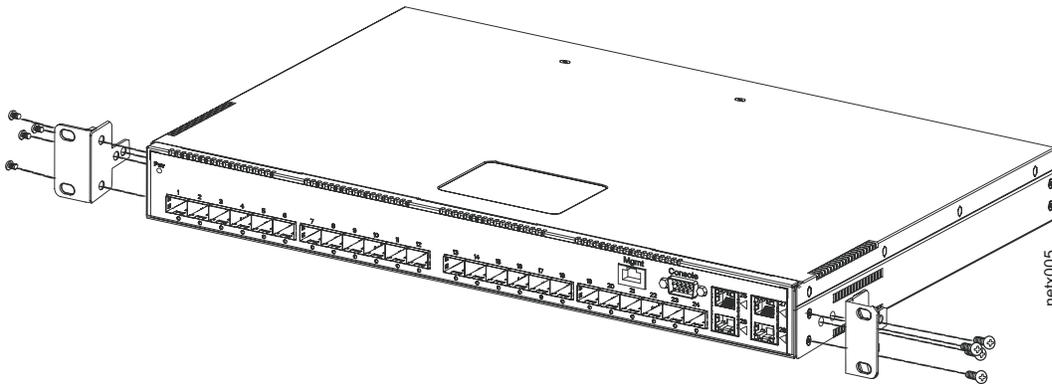


Figure 5. Attaching the short mounting brackets

4. Mount the device in the rack as illustrated in Figure 6.

Note: Although Figure 6 shows a device with short mounting brackets, the procedure for securing a device with long mounting brackets is the same.

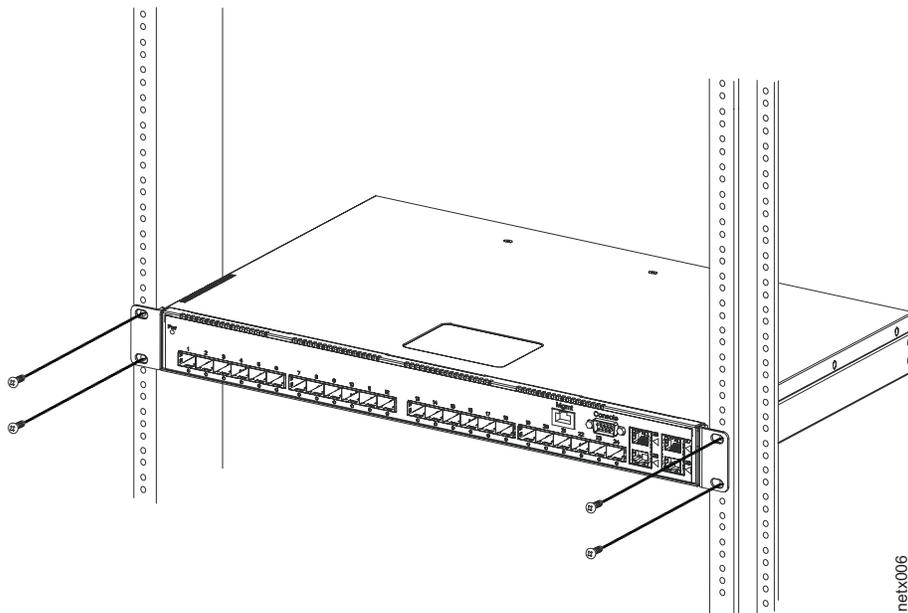


Figure 6. Installing the device in a rack

5. Proceed to “Powering on the system” on page 14.

Powering on the system

Note that the outlet should be installed near the equipment and should be easily accessible. Install the outlet using the following steps:

1. Ensure that all power supplies are fully and properly inserted.
2. Remove the power cord from the shipping package.
3. Attach the AC power cord to the AC connector on the rear panel as shown in Figure 7.

Note: Align the locating notch on the underside of the AC power cord before inserting.

4. Insert the power cord plug into a properly grounded 115V or 120V electrical outlet.

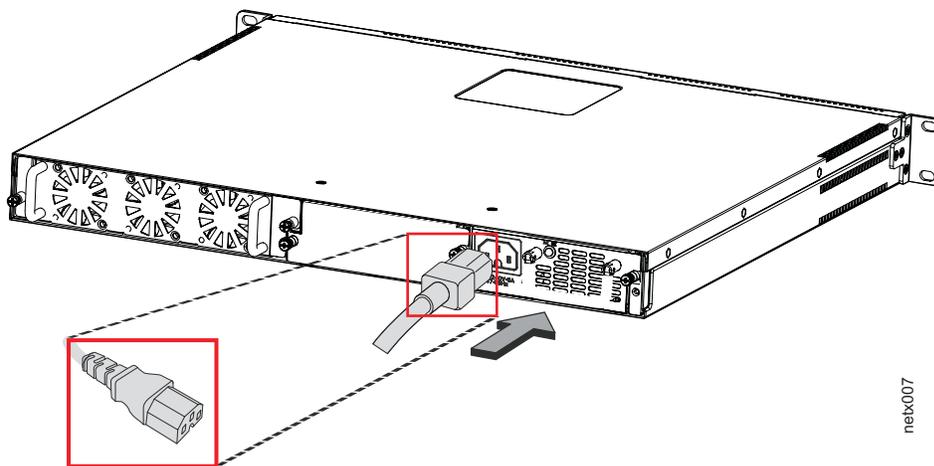


Figure 7. Attaching the AC power cord

5. Repeat this procedure for the second power supply.
6. Verify the device is working properly (refer to “Verifying proper operation”).

Powering off the system

To turn an AC system off, unplug all power cords from the power source. There is no power switch for the device.

Verifying proper operation

After you have installed any additional power supplies and powered on the system, verify that the device is working properly.

1. Verify that the LEDs on the power supply and system power LED are solid green.
2. Verify proper operation by observing the LEDs on the front panel.

10 Gbps port LEDs should be lit while the device performs diagnostics. After the diagnostics are complete, the LEDs will be dark except for those that are attached by cables to other devices.

If the links on these cables are good and the connected device is powered on, the link LEDs will light. Table 7 provides more details on specific LED conditions after system start-up.

Observing the power status LEDs

Table 7 lists the device LEDs that show power status.

Table 7. Power LEDs

LEDs	Position	State	Meaning
Pwr (Power)	Left-most LED on the front panel	On	The device is powered on and has enough power to operate.
		Off	The device is not powered on, or has been powered on but does not have sufficient power to operate.
AC OK	On power supply 1 front panel	On	Power supply 1 is installed and is functioning normally. Power supply 1 is located in the right-hand bay (when you are facing the rear of the device).
		Off	Power supply 1 is not installed or is not providing power.
AC OK	On power supply 2 front panel	On	Power supply 2 is installed and is functioning normally. Power supply 2 is located in the left-hand bay (when you are facing the rear of the device).
		Off	Power supply 2 is not providing power.

The software regularly polls the hardware for power status information. You can display the status information from any management session using the **show chassis** CLI command. In addition, the software automatically generates a Syslog message and SNMP trap if a status change occurs.

Attaching a PC or terminal

To assign an IP address, you must have access to the Command Line Interface (CLI). The CLI is a text-based interface that can be accessed through a direct serial connection to the device or through Telnet connections.

You will need to assign an IP address using the CLI. You can access the CLI by attaching management station through a serial cable to the Console port. After you assign an IP address, you can access the system through Telnet or IronView Network Manager.

Complete the following steps to attach a management station using the serial port:

1. Use a straight-through cable to connect a PC or terminal to the male DB-9 serial port connector.

Note: You need to run a terminal emulation program on the PC.

2. Open the terminal emulation program and set the session parameters as follows:
 - Baud: 9600 bps
 - Data bits: 8
 - Parity: None
 - Stop bits: 1
 - Flow control: None

When you establish the serial connection to the system, press Enter to display the CLI prompt in the terminal emulation window. For example:

```
TurboIron>
```

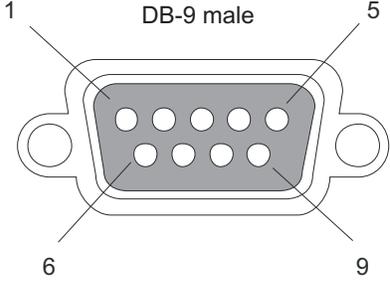
When you see one of these prompts, you are connected to the system and can proceed to “Assigning permanent passwords” on page 19.

You can customize the prompt by changing the system name. Refer to the *FastIron and TurboIron 24X Configuration Guide*.

If you do not see a prompt:

- Make sure the cable is securely connected to your PC and to the device.
- Check the settings in your terminal emulation program. In addition to the session settings listed above, make sure the terminal emulation session is running on the same serial port you attached to the device.

The EIA or TIA 232 serial communication port serves as a connection point for management by a PC or SNMP workstation. The switches come with a standard male DB-9 connector, shown in Figure 8 on page 17.

Pin assignment	Pin number	Switch signal
	1	Reserved
	2	TXD (output)
	3	RXD (input)
	4	Reserved
	5	GND
	6	Reserved
	7	CTS (input)
	8	RTS (output)
	9	Reserved

net_com004

Figure 8. Serial port pin and signalling details

Most PC serial ports also require a cable with a female DB-9 connector.

Terminal connections will vary, requiring either a DB-9 or DB-25 connector, male or female.

Serial cable options between a switch or router and a PC or terminal are shown in Figure 9.

DB-9 to DB-9 Female switch		Terminal or PC	DB-9 to DB-25 Female switch		Terminal or PC
1	Reserved	1	1	Reserved	8
2	→	2	2	→	3
3	←	3	3	←	2
4	Reserved	4	4	Reserved	20
5	—	5	5	—	7
6	Reserved	6	6	Reserved	6
7	←	7	7	←	4
8	→	8	8	→	5
9	Reserved	9	9	Reserved	22

net_com005

Figure 9. Serial port pin assignments showing cable connection options to a terminal or PC

Note: As indicated in Figure 8 and Figure 9, some of the wires should not be connected. If you do connect the wires that are labeled "Reserve", you might get unexpected results with some terminals.

Chapter 3. Connecting Network Devices and Checking Connectivity

This chapter provides the details for connecting network devices and checking network connectivity.

Attention: The procedures in this manual are intended for qualified service personnel.

Assigning permanent passwords

By default, the CLI is not protected by passwords. To secure CLI access, IBM strongly recommends assigning passwords.

Note: You can assign passwords using IronView Network Manager if an enable password for a Super User has been configured on the device.

The CLI contains the following access levels:

- **User EXEC**-The level you enter when you first start a CLI session. At this level, you can view some system information but you cannot configure system or port parameters.
- **Privileged EXEC**-Also called the Enable level, and can be secured by a password. At this level, you can perform tasks such as manage files on the flash module, save the system configuration to flash, and clear caches.
- **CONFIG**-This level lets you configure the system IP address, and switching and routing features. To access the CONFIG mode, you must already be logged into the Privileged level of the EXEC mode (the Enable level).

You can set the following levels of Enable passwords:

- **Super User** - Allows complete read-and-write access to the system. This is generally for system administrators and is the only password level that allows you to configure passwords.

Note: You must set a super user password before you can set other types of passwords.

- **Port Configuration** - Allows read-and-write access for specific ports but not for global (system-wide) parameters.
- **Read Only** - Allows access to the Privileged EXEC mode and CONFIG mode but only with read access.

Complete the following steps to set passwords:

1. At the opening CLI prompt, enter the following command to change to the Privileged level of the EXEC mode.

```
TurboIron> enable
```

2. Access the CONFIG level of the CLI by entering the following command.

```
TurboIron# configure terminal  
TurboIron(config)#
```

3. Enter the following command to set the super-user password.

```
TurboIron(config)# enable super-user-password <text>
```

Note: You must set the super user password before you can set other types of passwords.

4. Enter the following commands to set the port configuration and read-only passwords.

```
TurboIron(config)# enable port-config-password <text>
TurboIron(config)# enable read-only-password <text>
```

Note: If you forget your super user password, refer to “Recovering from a lost password.”

Syntax: enable super-user-password | read-only-password |
port-config-password <text>

Passwords can be up to 32 characters long.

Recovering from a lost password

By default, the CLI does not require passwords. However, if someone has configured a password for the device but the password has been lost, you can regain super-user access to the device using the following procedure.

Note: Recovery from a lost password requires direct access to the serial port and a system reset.

Complete the following steps to recover from a lost password:

1. Start a CLI session over the serial interface to the device.
2. Reboot the device.
3. While the system is booting, before the initial system prompt appears, enter **b** to enter the boot monitor mode.
4. Enter **no password** at the prompt. (You cannot abbreviate this command.)
5. Enter **boot system flash primary** at the prompt. This command causes the device to bypass the system password check.
6. After the console prompt reappears, assign a new password.

Configuring IP addresses

You must configure at least one IP address using the serial connection to the CLI before you can manage the system using the other management interfaces. In addition, routers require an IP subnet address for the subnet in which you plan to place them in your network.

The x-series devices support both classical IP network masks (Class A, B, and C subnet masks, and so on) and Classless Interdomain Routing (CIDR) and network prefix masks as follows:

- To enter a classical network mask, enter the mask in IP address format. For example, for an IP address with a Class-C subnet mask enter the following:
209.157.22.99 255.255.255.0
- To enter a prefix number for a network mask, enter a forward slash (/) and the number of bits in the mask immediately after the IP address. For example, enter the following for an IP address that has a network mask with 24 significant (“mask”) bits:
209.157.22.99/24

By default, the CLI displays network masks in classical IP address format (example: 255.255.255.0). You can change the display to the prefix format. Refer to the *FastIron and Turbolron 24X Configuration Guide*.

Devices running Layer 2 software

Complete the following steps to configure an IP address on a device running Layer 2 software:

1. At the opening CLI prompt, enter **enable**.

```
TurboIron> enable
```

2. Enter the following command at the Privileged EXEC level prompt (for example, TurboIron Switch#), then press Enter. This command erases the factory test configuration if still present.

```
TurboIron# erase startup-config
```

Attention: Use the erase startup-config command only for new systems. If you enter this command on a system you have already configured, the command erases the configuration. If you accidentally do erase the configuration on a configured system, enter the write memory command to save the running configuration to the startup-config file.

3. Access the configuration level of the CLI by entering the following command.

```
TurboIron# configure terminal Privileged EXEC Level  
TurboIron(config)# Global CONFIG Level
```

4. Configure the IP address and mask for the switch.

```
TurboIron(config)# ip address 192.22.3.44 255.255.255.0
```

5. Set a default gateway address for the switch.

```
TurboIron(config)# ip default-gateway 192.22.3.1
```

Note: You do not need to assign a default gateway address for single subnet networks.

Syntax: enable [<password>]

Syntax:configure terminal

Syntax:[no] ip address <ip-addr> <ip-mask>

or

Syntax:[no] ip address <ip-addr>/<mask-bits>

Syntax: ip default-gateway <ip-addr>

Connecting network devices

IBM devices support connections to routers, switches, and hubs from other vendors, as well as other IBM devices.

Connectors and cable specifications

Refer to “Cable specifications” on page 46 for cable lengths and types supported on the B24X devices. For port pinouts, refer to “10/100/1000 Gigabit port pinouts” on page 46.

Connecting to Ethernet or fast Ethernet hubs

For copper connections to Ethernet hubs, a 10/100Base-TX or 1000Base-T switch, or another device, a crossover cable is required (Figure 10 on page 22 and

Figure 11). If the hub is equipped with an uplink port, it will require a straight-through cable instead of a crossover cable.

Note: The 802.3ab standard (automatic MDI or MDIX detection) calls for automatic negotiation of the connection between two 1000Base-T ports. Therefore, a crossover cable may not be required; a straight-through cable may work as well. For more information about this feature, refer to the *FastIron and TurboIron 24X Configuration Guide*.

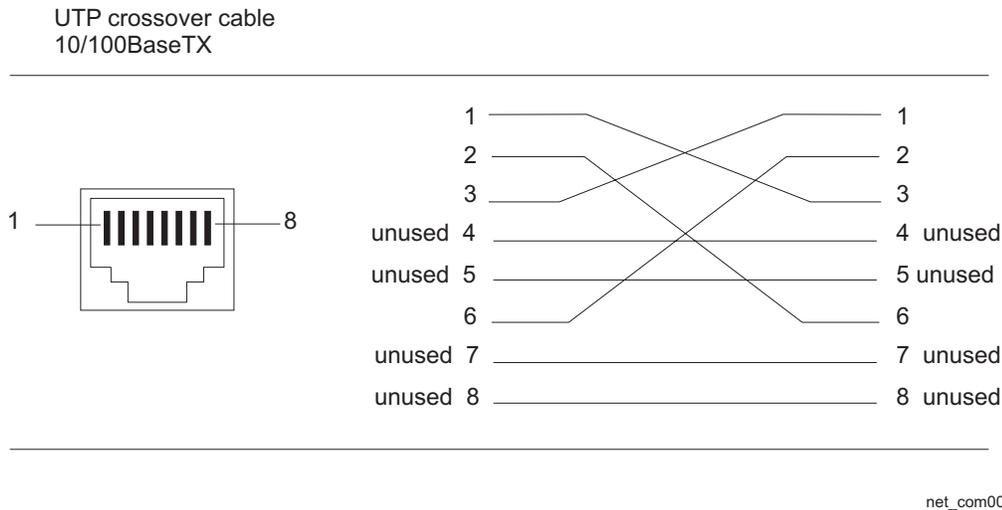


Figure 10. 10 UTP crossover cable

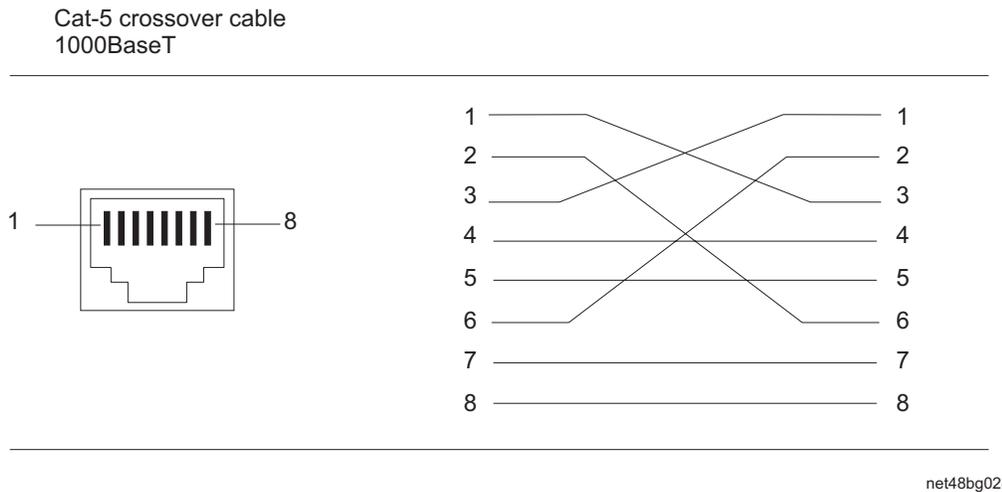


Figure 11. Cat-5 crossover cable for 1000Base-T

Note: The 802.3ab standard calls for automatic negotiation of the connection between two 1000Base-T ports. Consequently, a crossover cable may not be required; a straight-through cable may work as well.

Connecting to workstations, servers, or routers

Straight-through UTP cabling is required for direct UTP attachment to workstations, servers, or routers using network interface cards (NICs).

Fiber cabling is required for direct attachment to Gigabit NICs or switches and routers through fiber ports. Refer to “Connecting a network device to a fiber port.”

Automatic MDI or MDIX detection

All 10/100/1000 Copper ports on the B24X devices support automatic Media Dependent Interface (MDI) and Media Dependent Interface Crossover (MDIX) detection. This feature is enabled on all Gigabit copper ports by default. For each port, you can disable auto MDI or MDIX, designate the port as an MDI port, or designate the port as an MDIX port.

For more information about this feature and how configure it, refer to the *FastIron and Turbolron 24X Configuration Guide*.

Connecting a network device to a fiber port

For direct attachment from the device to a Gigabit NIC, switch, or router, fiber cabling with an LC connector is required.

To connect the device to another network device using a fiber port, you must do the following:

- Install a fiber optic module (SFP transceiver or mini-GBIC for Gigabit Ethernet ports, or SFP+ transceiver for 10-Gigabit Ethernet ports)
- Cable the fiber optic module

The following sections provide information about performing these tasks.

Installing a fiber optic module: You must install a fiber optic module (SFP or SFP+ transceiver) in each Gigabit Ethernet and 10-Gigabit Ethernet fiber port you want to use.

You can install a new fiber optic module in a port while the device is powered on and running.

To install a fiber optic module, you will need an ESD wrist strap with a plug for connection to a metal surface.

CAUTION:

For safety reasons, the ESD wrist strap should contain a series 1 meg ohm resistor.

Complete the following steps to install a fiber optic module:

1. Put on the ESD wrist strap and ground yourself by attaching the clip end to a metal surface (such as an equipment rack) to act as ground.
2. Remove the new module from its protective packaging.
3. Gently insert the fiber optic module into the port until the module clicks into place. The module is keyed to prevent incorrect insertion.

Cabling a fiber optic module: Complete the following steps to cable a fiber optic module:

1. Remove the protective covering from the fiber-optic port connectors and store the covering for future use.
2. Before cabling a fiber optic module, clean the cable connectors and the port connectors thoroughly. For more information, refer to “Cleaning the fiber-optic connector.”
3. Gently insert the cable connector or connectors (a tab on each connector should face upward) into the port connector or connectors until the tabs lock into place.
4. Observe the link and active LEDs to determine if the network connections are functioning properly. Refer to Table 8 on page 25.

Cleaning the fiber-optic connector: To avoid problems with the connection between the fiber optic module (SFP (mini-GBIC) or SFP+) and the fiber cable connectors, clean both connectors thoroughly each time you disconnect and reconnect them. In particular, dust can accumulate in the connectors and cause problems such as reducing the optic launch power.

When not using an SFP or SFP+ connector, make sure to keep the protective covering on.

Testing connectivity

After you install the network cables, you can test network connectivity to other devices by pinging those devices. You also can observe the LEDs related to network connection and perform trace routes.

Pinging an IP address

To verify that a device can reach another device through the network, enter a command such as the following at any level of the CLI on the device.

```
TurboIron> ping 192.33.4.7
```

Syntax: ping <ip addr> | <hostname> [source <ip addr>] [count <num>] [timeout <msec>] [ttl <num>] [size <byte>] [quiet] [numeric] [no-fragment] [verify] [data <1-to-4 byte hex>] [brief]

Note: If you address the ping to the IP broadcast address, the device lists the first four responses to the ping.

Observing LEDs

After you install the network cables, you can observe certain LEDs to determine if the network connections are functioning properly. Table 8 on page 25 describes the LEDs related to network connections, the desired state of each LED, possible abnormal states of each LED, and what to do if an LED indicates an abnormal state.

Table 8. Network connection-related LED states

LED	Desired State	Meaning	Abnormal State	Meaning or Action
Link (Lnk)	On (Green)	A link is established with the remote port.	Off	<p>A link is not established with the remote port. You can do the following:</p> <ul style="list-style-type: none"> • Verify that the connection to the other network device has been properly made. Also, make certain that the other network device is powered on and operating correctly. • Verify that the transmit port on the device is connected to the receive port on the other network device, and that the receive port on the device is connected to the transmit port on the other network device. If you are uncertain, remove the two cable connectors from the port connector and reinsert them in the port connector, reversing their order. • Dust may have accumulated in the cable connector or port connector. For information about cleaning the connectors, refer to “Cleaning the fiber-optic connector” on page 24. • If the other actions don’t resolve the problem, try using a different port or a different cable.
Active (Act)	On or blinking (Yellow)	The port is transmitting and receiving user packets.	Off for an extended period.	<p>The port is not transmitting or receiving user packets. You can do the following:</p> <ul style="list-style-type: none"> • Check the Link LED to make sure the link is still established with the remote port. If not, take the actions described in the Meaning or Action column for the Link LED. • Verify that the port has not been disabled through a configuration change. You can use the CLI. If you have configured an IP address on the device, you also can use IronView Network Manager.

If a problem persists after taking these actions, contact IBM technical support.

Tracing a route

To determine the path through which a device can reach another device, enter a command such as the following at any level of the CLI on the device.

```
TurboIron> traceroute 192.33.4.7
```

Syntax: `traceroute <host-ip-addr> [maxttl <value>] [minttl <value>] [numeric] [timeout <value>] [source-ip <ip addr>]`

The CLI displays trace route information for each hop as soon as the information is received. Traceroute requests display all responses to a given TTL. In addition, if there are multiple equal-cost routes to the destination, the device displays up to three responses by default.

Troubleshooting network connections

- For the indicated port, verify that both ends of the cabling (at the device and the connected device) are snug.
- Verify that the device and the connected device are both powered on and operating correctly.
- Verify that you have used the correct cable type for the connection:
 - For twisted-pair connections to an end node, use straight-through cabling.
 - For fiber-optic connections, verify that the transmit port on the device is connected to the receive port on the connected device, and that the receive port on the device is connected to the transmit port on the connected device.
- Verify that the port has not been disabled through a configuration change. You can use the CLI. If you have configured an IP address on the device, you also can use IronView Network Manager.
- For copper ports, you can test the cable using Virtual Cable Testing (VCT). Refer to “Monitoring Hardware Components” in the *FastIron and Turbolron 24X Configuration Guide*.
- If the other procedures don’t resolve the problem, try using a different port or a different cable.

Support for digital optical monitoring

You can configure your device to monitor optical transceivers in the system, either globally or by specified port. When this feature is enabled, the system monitors the temperature and signal power levels for the optical transceivers in the specified ports. Console messages and syslog messages are sent when optical operating conditions fall below or rise above the SFP+ or SFP manufacturer recommended thresholds. For more information about digital optical monitoring, refer to the *FastIron and Turbolron 24X Configuration Guide*.

Chapter 4. Managing the B24X

This chapter contains information about how to manage temperature settings and how to remove MAC address entries.

Managing temperature settings

This section describes how to display temperature settings on the B24X and how to change the temperature warning levels.

Using the temperature sensor

The B24X comes with two built-in temperature sensors; one at the air intake, and the other at the exhaust (refer to Figure 27 on page 44). The temperature sensor at the air intake monitors the incoming air temperature. The temperature sensor at the air exhaust monitors the air temperature as it exits the device. The temperature sensors cause the device to generate a Syslog message and SNMP trap if the temperature exceeds a specified warning level. The software reads the temperature sensors according to the device poll time, which is 60 seconds by default. If the temperature equals or exceeds the warning temperature the software generates a Syslog message and SNMP trap.

You can use the CLI to perform the following:

- “Displaying the temperature”
- “Changing the temperature warning level” on page 28
- “Changing the device temperature polling interval” on page 28

Displaying the temperature

By default, the software polls the temperature sensor every 60 seconds to get the current temperature. This poll rate is controlled by the device poll time, which also controls how often the software polls other system components.

To display the temperature of a device, enter the **show chassis** command at any level of the CLI. The following shows an example output.

```
TurboIron#show chassis
Power supply 1 (NA - NA - Regular) present, status ok
Power supply 2 not present

Fan 1 ok, speed (auto): [[1]]<->2<->3
Fan 2 ok, speed (auto): [[1]]<->2<->3
Fan 3 ok, speed (auto): [[1]]<->2<->3

Fan controlled temperature: 0.0 deg-C

Fan speed switching temperature thresholds:
Speed 1: NM<----->30          deg-C
Speed 2:  25<----->40          deg-C
Speed 3:   35<----->90          deg-C (shutdown)

Boot Prom MAC: 0011.1122.2233
TurboIron#
```

Displaying temperature messages

The software sends a Syslog message and an SNMP trap if the temperature crosses the warning threshold. The following methods describe how to view the

system log on the device. If you have configured the device to use a Syslog server or SNMP trap receiver, refer to the documentation for the server or receiver.

To display the system log, enter the following command at any CLI level.

```
TurboIron# show log
Syslog logging: enabled (0 messages dropped, 0 flushes, 0 overruns)
Buffer logging: level ACDEINW, 8 messages logged
level code: A=alert C=critical D=debugging M=emergency E=error
I=informational N=notification W=warning
Static Log Buffer:
Dynamic Log Buffer (50 entries):
at 0 days 0 hours 2 minutes 0 seconds, level alert
Temperature 48.0 C degrees, warning level 45.0 C degrees
at 0 days 0 hours 1 minutes 0 seconds, level alert
Temperature 50.0 C degrees, warning level 45.0 C degrees
```

Changing the temperature warning level

The default warning temperature is 45°C. You can change the warning temperature using the **temperature warning** command. The valid range is 0 - 125°C.

B24X devices automatically reset and reload the software when the internal temperature reaches or exceeds the configured shutdown level for five minutes. The B24X has the capability to register negative temperature settings.

To change the temperature at which the device sends a warning, enter a command such as the following at the Privileged EXEC level of the CLI.

```
TurboIron# temperature warning 47
```

Syntax: temperature warning *<value>*

Note: The *<value>* can be 0 - 125.

Changing the device temperature polling interval

The software reads the temperature sensor and polls other hardware sensors according to the value set for the device poll time, which is 60 seconds by default. You can change the device poll time using the CLI.

To change the device poll time, enter a command such as the following at the global CONFIG level of the CLI.

```
TurboIron(config)# chassis poll-time 200
```

Syntax: chassis poll-time *<value>*

Note: The *<value>* can be 0 - 65535.

Removing MAC address entries

You can remove learned MAC address entries from the system MAC address table. You can remove the following entries:

- All MAC address entries
- All MAC address entries for a specified Ethernet port
- All MAC address entries for a specified VLAN
- A specified MAC address entry in all VLANs

For example, to remove entries for the MAC address 000d.cb80.00d in all VLANs, enter the following command at the Privileged EXEC level of the CLI.

```
TurboIron# clear mac-address 000d.cb80.00d0
```

Syntax: `clear mac-address <mac-address> | ethernet <port-num> | vlan <number>`

If you enter the **clear mac-address** command without any parameters, the software removes all MAC entries.

Use the `<mac-address>` parameter to remove a specified MAC address from all VLANs. Specify the MAC address in the following format: HHHH.HHHH.HHHH.

Use the **ethernet** `<port-num>` parameter to remove all MAC addresses for a specified Ethernet port.

Use the **vlan** `<number>` parameter to remove all MAC addresses for a specified VLAN.

Chapter 5. Maintaining the B24X Hardware

This chapter provides instructions for maintaining the B24X hardware.

Attention: The procedures in this manual are for qualified service personnel.

Hardware maintenance schedule

The B24X switch hardware components require minimal maintenance. You should clean the fiber-optic connectors on fiber-optic ports and the connected fiber cable each time you disconnect the cable.

You can replace the following hardware components as needed:

- Fiber optic modules (SFP+ transceivers)
- Power supplies
- Fan tray

Replacing a fiber optic module

You can remove an SFP or SFP+ from a port and replace it with a new one while the B24X is powered on and running.

This section provides information about the following tasks:

- “Removing a fiber optic module”
- “Installing a new fiber optic module” on page 32
- “Cabling a fiber optic module” on page 32

Removing a fiber optic module

You can remove a fiber SFP+ (also called a Small Form-factor Pluggable Plus) or an SFP from a port while the B24X is powered on and running.

Before removing a fiber optic module, have the following on hand:

- An ESD wrist strap with a plug for connection to the ESD connector on the B24X.

CAUTION:

For safety reasons, the ESD wrist strap should contain a series 1 meg ohm resistor.

- The protective covering that you removed from the fiber optic module when you initially installed the module.

Complete the following steps to remove a fiber optic module from a Gigabit Ethernet or 10-Gigabit Ethernet port:

1. Put on the ESD wrist strap and ground yourself by attaching the clip end to a metal surface (such as an equipment rack).
2. Disconnect the fiber cable connector from the port connector.
3. Insert the protective covering into the port connector or connectors.
4. Pull the fiber optic module out of the port by pulling the latch (**1**) forward, away from the front panel of the module as shown in Figure 12 on page 32. This unlocks the module from the front panel. On 1000BaseSX ports, the latch is enclosed in a black sleeve, and on 1000BaseLX ports, the bail latch is enclosed in a blue sleeve.

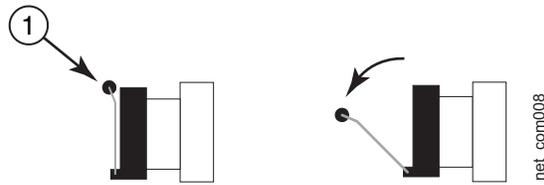


Figure 12. Disconnecting a fiber optic module latch

Note: The latch may be attached to either the top or the bottom of the optical module.

5. Grasp the latch and pull the fiber optic module out of the port.

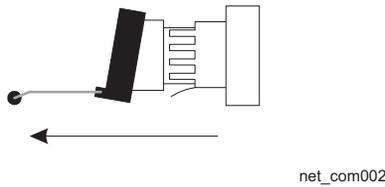


Figure 13. Removing a fiber optic module

6. Store the fiber optic module in a safe, static-free place or in an anti-static bag.
7. Install a new fiber optic module in the port. For information about performing this task, refer to “Installing a new fiber optic module.”

Installing a new fiber optic module

You must install a fiber optic module (SFP+ or SFP transceiver) in each 10-Gigabit Ethernet fiber port you want to use. You can install a new fiber optic module in a port while the device is powered on and running.

To install a fiber optic module, you will need an ESD wrist strap with a plug for connection to a metal surface.

CAUTION:

For safety reasons, the ESD wrist strap should contain a series 1 meg ohm resistor.

Complete the following steps to install a fiber optic module:

1. Put on the ESD wrist strap and ground yourself by attaching the clip end to a metal surface (such as an equipment rack) to act as ground.
2. Remove the new module from its protective packaging.
3. Gently insert the fiber optic module into the port until the module clicks into place. The module is keyed to prevent incorrect insertion.

Cabling a fiber optic module

Complete the following steps to cable a fiber optic module:

1. Remove the protective covering from the fiber-optic port connectors and store the covering for future use.
2. Before cabling a fiber optic module, clean the cable connectors and the port connectors thoroughly. Refer to “Installing a new fiber optic module.”

3. Gently insert the cable connector or connectors (a tab on each connector should face upward) into the port connector or connectors until the tabs lock into place.
4. Observe the link and active LEDs to determine if the network connections are functioning properly. For more information about the LED indicators, refer to Table 8 on page 25.

Cleaning the fiber-optic connectors

To avoid problems with the connection between the fiber optic module (SFP+ or SFP) and the fiber cable connectors, both connectors should be cleaned thoroughly each time you disconnect and reconnect them. In particular, dust can accumulate in the connectors and cause problems such as reducing the optic launch power.

When not using an SFP+ or SFP connector, make sure to keep the protective covering on.

Replacing a power supply

You can replace a power supply while the B24X is powered on and running (if two power supplies are installed). The power supplies are located in slots at the rear of the B24X.

This section provides information about the following topics:

- Installation precautions and warnings
- Determining which power supply failed
- Replacing a power supply

CAUTION:

Power supplies are hot swappable. However, IBM recommends that you disconnect the power supply from AC power before installing or removing the supply. The device can be running while a power supply is being installed or removed, but the power supply itself should not be connected to a power source. Otherwise, you could be injured or the power supply or other parts of the device could be damaged.

Installation precautions and warnings

Attention: Before beginning the installation, refer to the precautions in “Safety notices” on page xi.

Determining which power supply failed

If you are replacing a power supply that has failed and you are not sure which supply has failed, enter the following command at any CLI command prompt:

```
TurboIron#show chassis
Power supply 1 (NA - NA - Regular) present, status ok
Power supply 2 not present
Fan 1 ok, speed (auto): [[1]]<->2<->3
Fan 2 ok, speed (auto): [[1]]<->2<->3
Fan 3 ok, speed (auto): [[1]]<->2<->3
Fan controlled temperature: 0.0 deg-C
Fan speed switching temperature thresholds:
    Speed 1: NM<----->30                deg-C
    Speed 2: 25<----->40                deg-C
    Speed 3: 35<----->90                deg-C (shutdown)
Boot Prom MAC: 0011.1122.2233
TurboIron#
```

This command displays status information for the power supplies and the fans. The power supplies are numbered from left to right. These numbers assume you are facing the front of the device, not the rear.

If the display indicates “Installed (Failed)” for any of the slots, the power supply installed in that particular slot has failed.

Replacing AC power supplies

Use the following procedures for AC power supplies in B24X devices.

You will need a #2 Phillips-head screwdriver to perform these procedures.

Figure 14 shows a front view of the AC power supply.

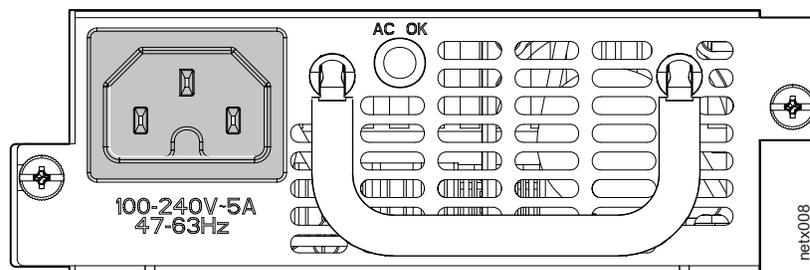


Figure 14. AC power supply

Removing an AC power supply

Follow these steps to remove an AC power supply.

1. Unplug the power cord from the power source.
2. Disconnect the power cord from the power supply.
3. Loosen the two captive power supply locking screws located on the sides of the power supply.

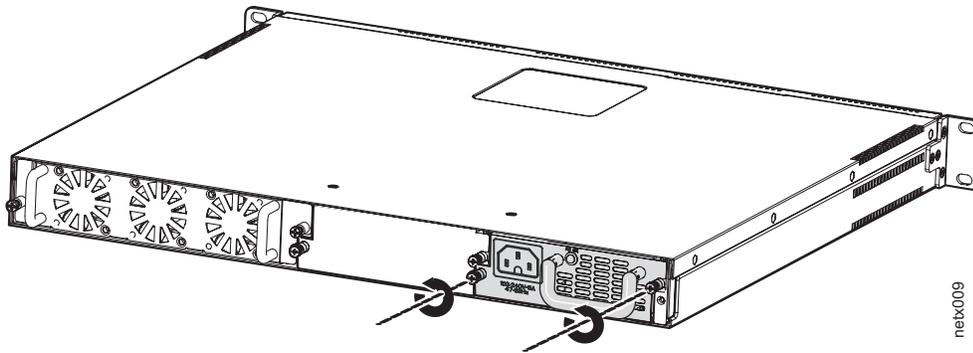


Figure 15. Releasing the power supply

4. Hold the handle on the front panel of the power supply and pull outward. This will disconnect the power supply from the backplane.
5. Continue to pull the power supply until it is removed from the device.

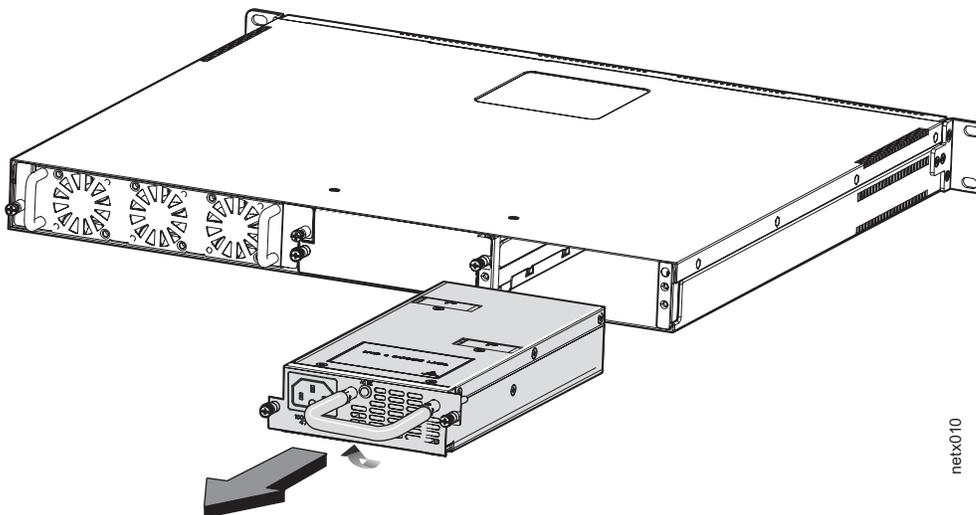


Figure 16. Removing the power supply

6. Place the power supply in an anti-static bag for storage.

Installing an AC power supply

Note: If the empty power supply bay has a cover plate, remove it as shown below before continuing.

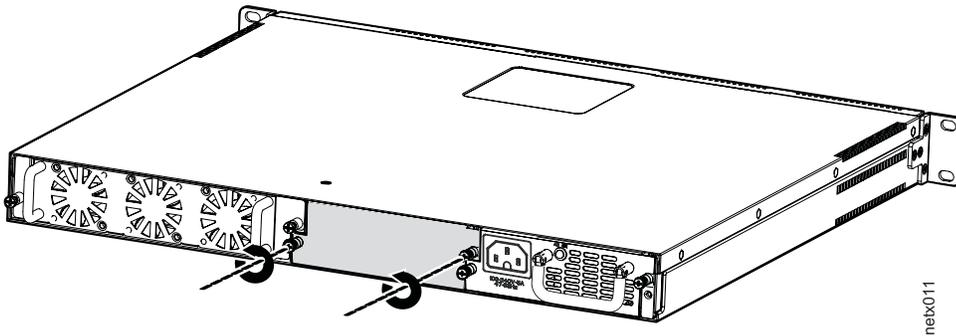


Figure 17. Releasing the cover plate

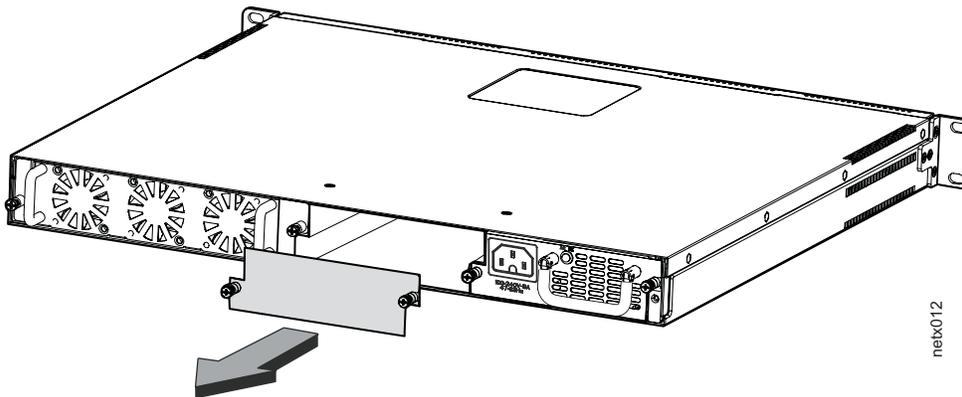


Figure 18. Removing the cover plate

1. Remove the new power supply from its packaging.
2. Hold the bar on the front panel of the power supply with one hand and ensure that the cotter pin on the right side of the power supply is correctly aligned. With the other hand, support the underside of the power supply, and insert the power supply into the empty power supply slot.
3. Push inward until the supply is completely in the slot, so that the connectors on the back of the supply fully engage with the pins on the power backplane.

Attention: Make sure you insert the power supply right-side up. It is possible to insert the supply upside down, although the supply will not engage with the power backplane when upside down. The power supply is right-side up when the power connector is on the left and the fan vent is on the right.

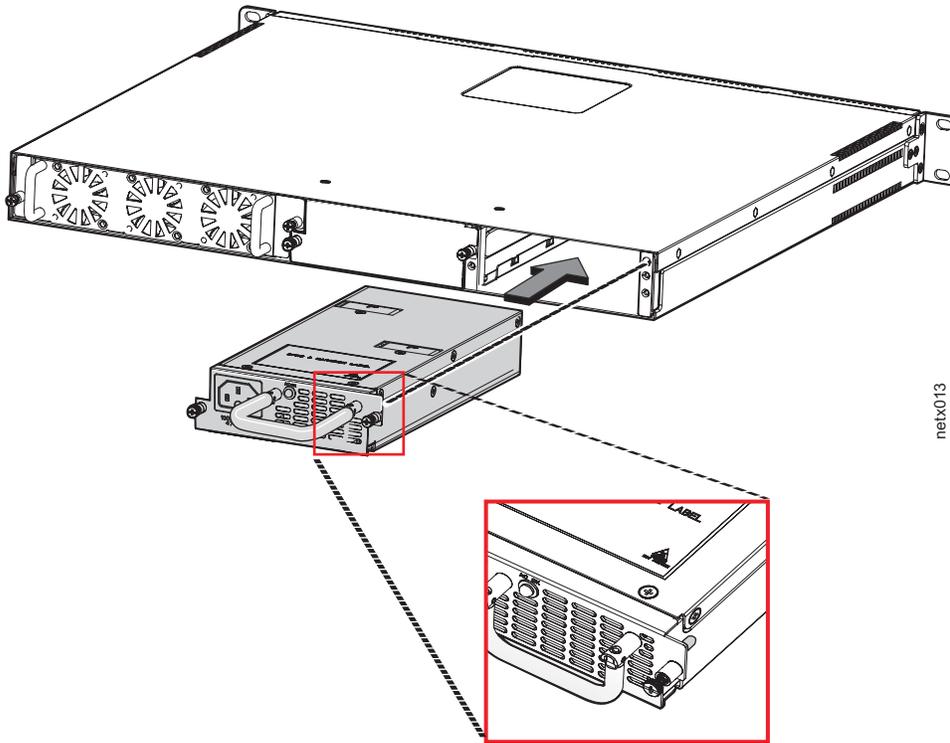


Figure 19. Installing the power supply

4. Lock the power supply in place by securing the two captive screws as shown in Figure 20.

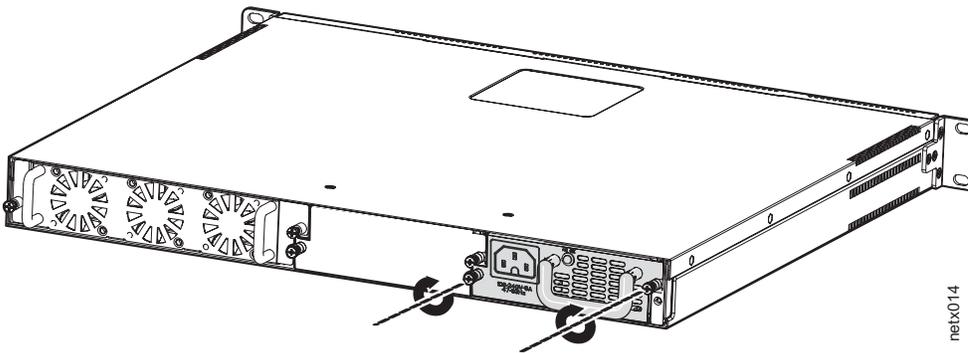


Figure 20. Securing the power supply in the device

5. Connect the power cord to the power supply.

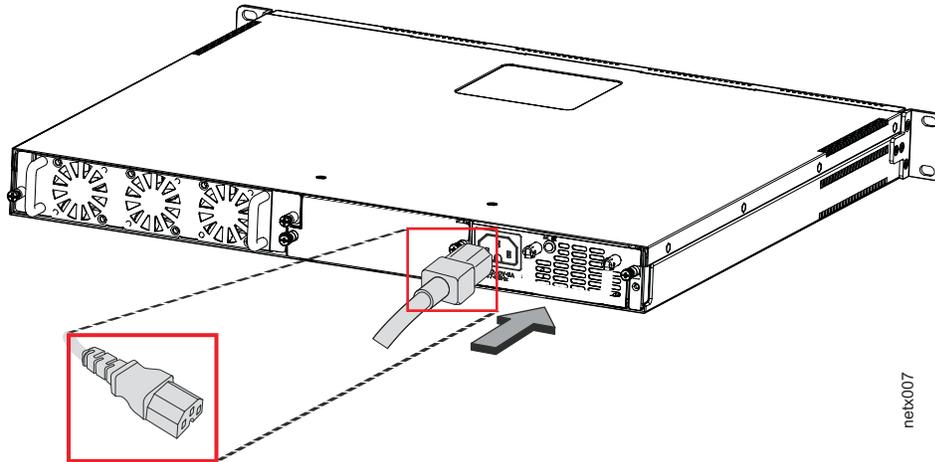


Figure 21. Connecting the power cord

6. Power on the supply and verify that it is working properly as instructed in “Powering on the system” on page 14 and “Verifying proper operation” on page 14.

Removing the battery

To remove the battery from the B24X, perform the following steps:

1. Unscrew fasteners and remove any installed modules.
2. Remove any installed power supplies.
3. Unscrew fasteners and remove the chassis sheet metal cover.
4. Locate BT1 on the main PCBA and remove the CR2032 battery, quantity 1. See **1** in Figure 22 on page 39 for battery location.

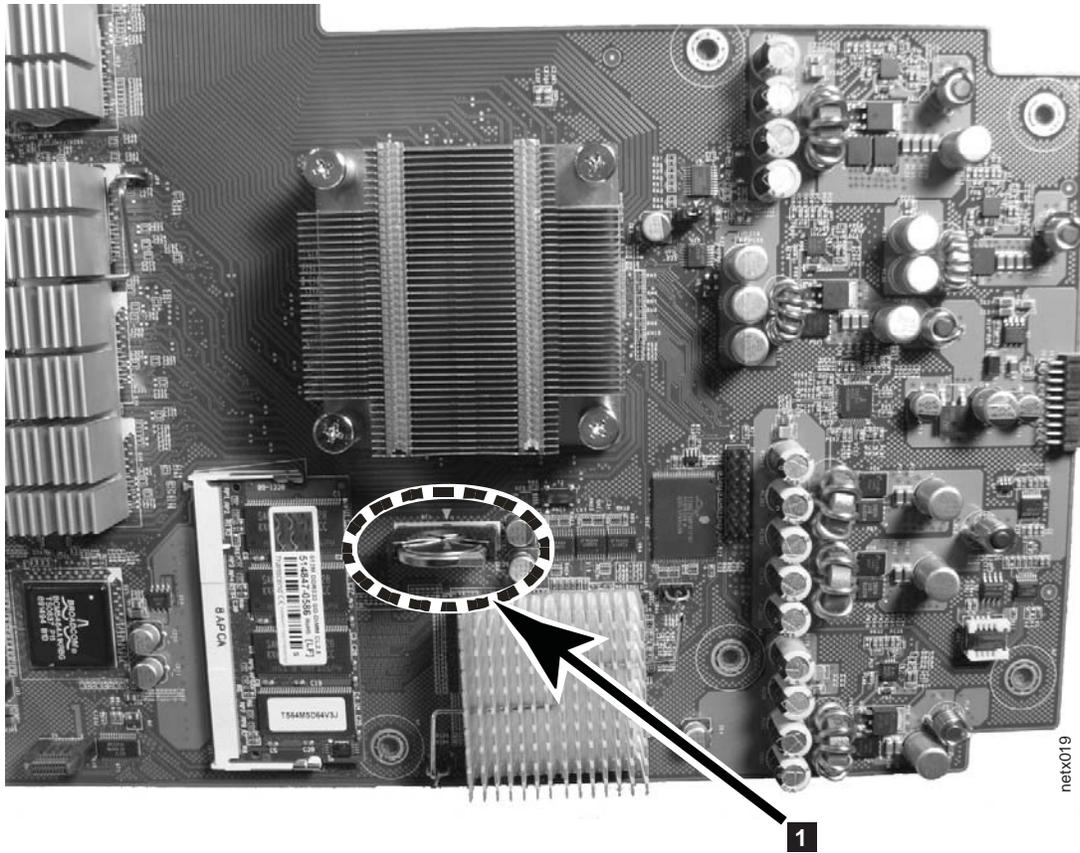


Figure 22. Removing the battery

5. Recycle the battery as appropriate.

Refer to the *Environmental Notices and User Guide* shipped with the product for more information on battery recycling and disposal.

Replacing the fan tray

You can replace the fan tray while the B24X is powered on and running. The fan tray is located in a slot at the rear of the B24X.

This section provides information about the following topics:

- Installation precautions and warnings
- Replacing the fan tray

Installation precautions and warnings

Follow these precautions when removing and installing a fan tray in the B24X.



Figure 23. B24X Fan Tray

CAUTION:
Wait until fans have stopped rotating before removing the fan assembly.

Attention: Never leave tools inside the device.

Removing the fan tray

Use the following procedures to remove the fan tray from B24X devices.

1 in Figure 24 shows the location of the fan tray.

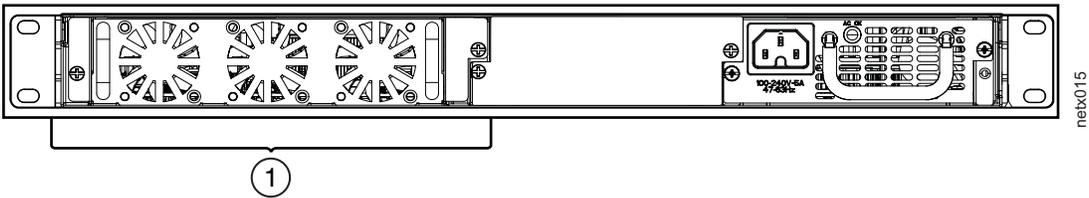


Figure 24. B24X fan tray location

1. Disconnect the power cords from the power supplies.
2. Loosen the two captive screws on the front plate of the fan tray and slide the tray out of the device as shown in Figure 25.

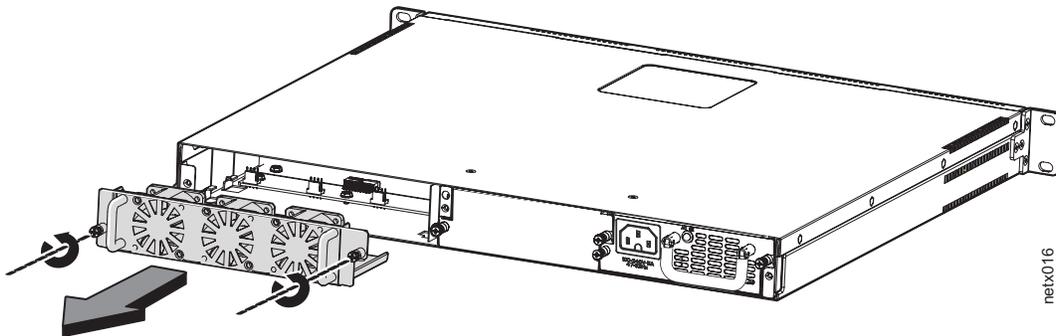


Figure 25. Removing the fan tray

3. Insert the replacement fan tray, as shown in Figure 26 on page 41, and push it all the way into the slot to connect the interface.

Note: Ensure that the fan tray fits between the locating slides (**1**) in the device.

4. Tighten the two captive screws to secure the tray in place.

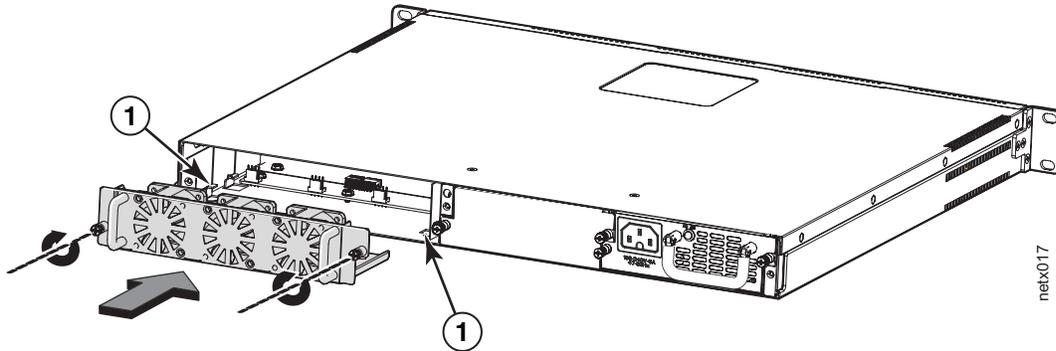


Figure 26. Inserting a replacement fan tray

5. Connect the power cord to the power supply (refer to “Powering on the system” on page 14).
6. Verify that the system is working properly as instructed in “Verifying proper operation” on page 14.

Appendix A. Hardware Specifications

This chapter contains the following hardware specifications for B24X devices.

- Device specifications:
 - “Physical dimensions and weight”
 - “Environmental considerations”
 - “Cooling” on page 44
 - “Power source interruptions” on page 44
 - “Pinouts and signalling” on page 45
 - “Cable specifications” on page 46
 - “Power cords” on page 48
- Power supply specifications:
 - “Overview” on page 48
 - “Key features” on page 48
 - “Physical dimensions and weight” on page 48
 - “Environmental considerations” on page 48
 - “Power supply consumption” on page 49
 - “Input connector and plug” on page 49
 - “Electrical specifications” on page 50

Device specifications

The following sections provide hardware specifications for the B24X.

Physical dimensions and weight

Table 9 lists the physical dimensions and weight of the B24X and modules.

Table 9. Physical dimensions and weight of the B24X and modules

Platform	Height	Width	Depth	Weight
B24X	4.28 cm (1.68 in.)	43.5 cm (17.12 in.)	39.37 cm (15.5 in.)	<ul style="list-style-type: none">• 7.4 kg (16.28 lbs) including dual power supplies• 6.01 kg (13.22 lbs) single power supply

Environmental considerations

For optimal performance, operate or store your B24X device in compliance with the following environmental conditions.

Operating environment

Table 10. Operating environmental conditions for the device

Description	Range
Operating temperature	0° - 40°C (32° - 104°F)
Relative humidity	5 to 95%, @ 40°C (104°F), non-condensing

Table 10. Operating environmental conditions for the device (continued)

Description	Range
Operating noise	65 dB
Maximum heat dissipation	689 BTU/Hr

Storage environment

Table 11. Storage environmental conditions for the device

Description	Range
Storage temperature	-25° to 70°C (-23° to 158°F)
Storage humidity	80% maximum, non-condensing

Cooling

The B24X has three speed-adjustable fans that operate simultaneously. If one fan fails, it does not affect the operation of the other fans. The cooling fans cool the CPU, main memory, and voltage regulators. The fans use a pull configuration to intake air from the front left and right sides through the device and then expel it at the rear of the device as shown in Figure 27.

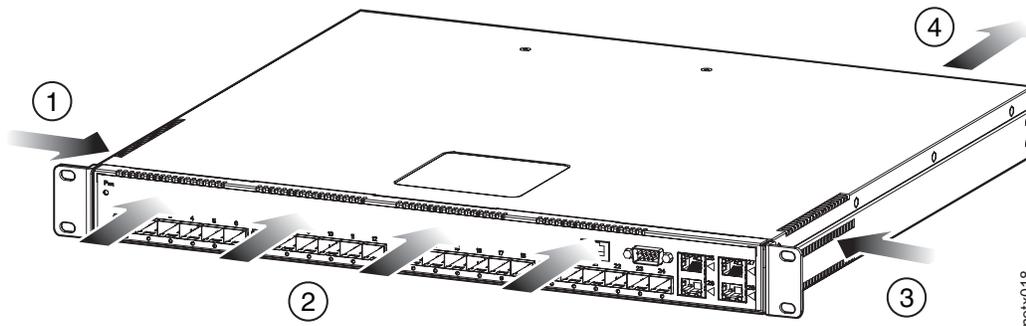


Figure 27. Device air flow

1	Left intake	3	Right intake
2	Front intakes	4	Exhaust

- Total cooling capacity: 200 watts
- Total air flow: 150 LFM
- Fan operating noise: < 65 dB-A.

Note: Operating noise is based on the ISO 7779 standard.

Power source interruptions

Table 12 shows how the B24X protects against power surges and power drops.

Table 12. Device power surge and drop protection

Property	Protection Mechanism
Power surge	MOV and Spark Gap protection
Power drop	The PSU will shut down after AC loss >20ms

Table 12. Device power surge and drop protection (continued)

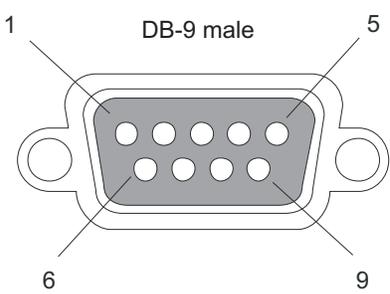
Property	Protection Mechanism
Maximum power draw	300 watts

Pinouts and signalling

This section lists the pinouts for the DB-9 connector and RJ-45 port jacks.

Serial (Console) port pinouts

The Console port is a standard male DB-9 connector, as shown in Figure 28.

Pin assignment	Pin number	Switch signal
 <p>DB-9 male</p>	1	Reserved
	2	TXD (output)
	3	RXD (input)
	4	Reserved
	5	GND
	6	Reserved
	7	CTS (input)
	8	RTS (output)
	9	Reserved

net_com004

Figure 28. Serial port pin and signalling details

Most PC serial ports also require a cable with a female DB-9 connector. Terminal connections will vary, requiring either a DB-9 or DB-25 connector, male or female.

Serial cable options between the B24X and a PC or terminal are shown in Figure 29 on page 46.

DB-9 to DB-9 Female switch		Terminal or PC	DB-9 to DB-25 Female switch		Terminal or PC
1	Reserved	1	1	Reserved	8
2	→	2	2	→	3
3	←	3	3	←	2
4	Reserved	4	4	Reserved	20
5	→	5	5	→	7
6	Reserved	6	6	Reserved	6
7	←	7	7	←	4
8	→	8	8	→	5
9	Reserved	9	9	Reserved	22

net_com005

Figure 29. Serial port pin assignments showing cable connection options to a terminal or PC

As indicated in Figure 28 on page 45 and Figure 29, some of the wires should not be connected. If you do connect the wires that are labeled “Reserved”, you might get unexpected results with some terminals.

10/100/1000 Gigabit port pinouts

Figure 30 lists the pin assignment and signalling for 10/100/1000 ports.

Pin assignment	10BaseT		100BaseTX and 1000BaseT	
	Pin number	MDI-X ports	Pin number	MDI-X ports
	1	RD+	1	RD+
	2	RD-	2	RD-
	3	TD+	3	TD+
	4	Not used	4	CMT
	5	Not used	5	CMT
	6	TD-	6	TD-
	7	Not used	7	CMT
	8	Not used	8	CMT

net_com006

Figure 30. Pin assignment and signalling for 10/100/1000 ports

Cable specifications

Table 13 on page 47 lists the cable specifications for the cables used with the Gigabit, and 10-Gigabit Ethernet ports.

Note: Cable installation and network configuration will affect overall transmission capability. The numbers provided here represent the accepted recommendations of the various standards. For network-specific recommendations, consult your local reseller or system engineer.

Table 13. Cable length summary

Cable Type		Connector Type	Core Diameter (microns)	Modal Bandwidth (MHz*km) or Wavelength (nm)	Range (meters)
1000Base-BX-D	Single-mode Fiber (SMF)	LC connector for SFP module	9	1490 nm	2 - 10000 (10 km)
1000Base-BX-U	SMF	LC connector for SFP module	9	1310 nm	2 - 10000 (10 km)
1000Base-LHA	SMF	LC connector for SFP module	9	1550 nm	2 - 70000 (70 km)
1000Base-LHB	SMF	LC connector for SFP module	9	1550 nm	2 - 120000 (120 km)
1000Base-LX	Multi-mode Fiber (MMF)	LC connector for SFP module	62.5	500	2 - 550
	MMF		50	400	2 - 550
	MMF		50	500	2 - 550
	SMF		9	1300 nm	2 - 10000
1000Base-SX	MMF	LC connector for SFP module	62.5/125	200	.5 - 275
	MMF		62.5/125	500	.5 - 550
	MMF		50/125	900	.5 - 595
	MMF		50/125	1500	.5 - 740
	MMF		50/125	2000	.5 - 860
1000Base-SX 2	MMF	LC connector for SFP module	62.5	500	up to 2000 (2 km)
1000Base-T	Copper	RJ-45 jack for standard unshielded twisted pair (UTP/ Category 5)	n/a	n/a	up to 100 meters
10GBase-LR	SMF	LC connector for XFP module	9	1310 nm	2 - 10000 (10 km)
10GBase-SR	MMF	LC connector for XFP module	62.5/125	160	2 - 26
	MMF		62.5/125	200	2 - 33
	MMF		50/125	400	2 - 66
	MMF		50/125	500	2 - 82
	MMF		50/125	2000	2 - 300

Note: SMF = Single Mode Fiber, MMF = Multi-Mode Fiber.

Power cords

All devices ship with US-compatible power cords unless otherwise specified at the time of order.

For power cord specifications, refer to “Input connector and plug” on page 49.

Power supply specifications

This section contains the following information for the power supplies that ship with B24X devices.

- “Overview”
- “Key features”
- “Physical dimensions and weight”
- “Environmental considerations”
- “Power supply consumption” on page 49
- “Input connector and plug” on page 49
- “Electrical specifications” on page 50

Overview

Each B24X switch comes with one standard, and an optional redundant alternating current (AC) power supply. The following power supply may be installed in your B24X switch:

- IB-IB-RPS11

The power supplies can be swapped in or out of the device while the device is running, without opening the device. You can remove one of the power supplies without interrupting operation. The remaining power supply provides enough power for all the ports.

All power supplies are auto-sensing and auto-switching.

Key features

Refer to “Power supplies” on page 6 for the key features of the B24X power supplies.

Physical dimensions and weight

Table 14. Physical dimensions and weight of power supplies

Power Supply	Dimensions	Weight
AC	4.06 cm (1.6 in.) (H) x 10.67 cm (4.2 in.) (W) x 22.86 cm (9 in.) (D)	1.29 kg (2.84 lbs)

Environmental considerations

For optimal performance, operate or store the power supplies in compliance with the following environmental conditions.

Operating environment

Table 15. Operating environmental conditions for power supplies

Description	Range
Operating temperature	0° - 40°C (32° - 104°F)
Fan inlet temperature	43° - 45°C (109.4° - 113°F)
Fan vent temperature	52° - 53°C (125.6° - 127.4°F)
Relative humidity	20 - 90%, non-condensing
Operating altitude	Up to 3030 meters (10000 feet) above sea level
Operating noise	50 dBA
Cooling	AC: 40 mm, internal fans

Storage environment

Table 16. Storage environmental conditions for power supplies

Description	Range
Storage temperature	-40° to 85°C (-40° to 185°F)
Storage humidity	95% maximum, non-condensing
Storage altitude	4545.45 meter (15,000 feet) maximum

Power supply consumption

The maximum power supply consumption for each B24X model is 300W.

Input connector and plug

Table 17 lists the input connectors for the power supplies.

Table 17. Input connector for power supplies

Power Supply	Input Connector Properties
RPS11	Standard IEC 320 C16 type: UL/cUL 15A/250V, VDE 10A/250V Orientation: Ground pin down

Figure 31 on page 50 shows the power plug and connector for AC power supplies.

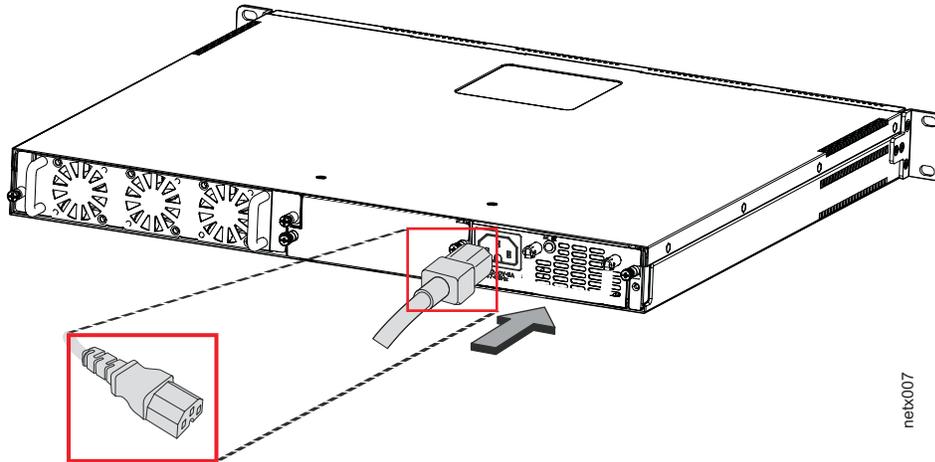


Figure 31. AC power cord plug and input connector

Electrical specifications

Table 18 lists the electrical specifications for the power supplies.

Table 18. Power supply electrical specifications

Description	Ranges
	AC
Input Specifications	
Input voltage range	100 to 240 VAC
Input current	5 Amps
Inrush current	70 amps peak maximum at cold start for a 1/2 cycle at any rated input voltage decaying to the nominal value within 100 milliseconds(240 VAC)
Output Specifications	
Output power	300 watts of total output power

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