BROCADE

SilkWorm 200E

Hardware Reference Manual

Supporting Fabric OS v5.0.1

Brocade Communications Systems, Incorporated

Document History

The following table lists all versions of the *SilkWorm 200E Hardware Reference Manual*.

Document Title	Publication Number	Summary of Changes	Publication Date
SilkWorm 200E Hardware Reference Manual	53-0000633-01	First release.	January 2005
SilkWorm 200E Hardware Reference Manual	53-0000633-02		September 2005
SilkWorm 200E Hardware Reference Manual	53-0000633-03	Updated with new regulatory information and support for Extended Fabrics.	January 2006

Contents

Chapter 3   **Operating and Maintaining the SilkWorm 200E**

Chapter 4   **SilkWorm 200E Specifications**

Index

About This Document

This document is written for network administrators. It provides a complete set of Brocade SilkWorm 200E switch installation procedures and an overview of the switch hardware. This document is specific to the Brocade SilkWorm 200E switch running Fabric OS v5.1.0.

"About This Document" contains the following sections:

- "How This Document Is Organized," next
- "Supported Hardware and Software" on page vi
- "Document Conventions" on page vi
- "Additional Information" on page vii
- "Getting Technical Help" on page ix
- "Document Feedback" on page x

How This Document Is Organized

This document is organized to help you find the information that you need as quickly and easily as possible. The document begins with an introduction to the SilkWorm 200E switch and proceeds through installation and operation procedures.

The document contains the following components:

- Chapter 1, "Introducing the SilkWorm 200E" provides a brief overview of the switch itself.
- Chapter 2, "Installing and Configuring the SilkWorm 200E" describes the installation procedures for the switch.
- Chapter 3, "Operating and Maintaining the SilkWorm 200E" provides an overview of switch operation.
- Chapter 4, "SilkWorm 200E Specifications"provides the technical specifications for the switch.

Supported Hardware and Software

Although many different software and hardware configurations are tested and supported by Brocade Communications Systems, Inc. for Fabric OS v5.1.0, documenting all possible configurations and scenarios is beyond the scope of this document.

This document is specific to Fabric OS v5.1.0. To obtain information about an Fabric OS version other than v5.1.0, see the documentation specific to that OS version.

Document Conventions

This section describes text formatting conventions and important notices formats.

Text Formatting

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

bold text	Identifies command names
	Identifies the names of user-manipulated GUI elements
	Identifies keywords and operands
	Identifies text to enter at the GUI or CLI
italic text	Provides emphasis
	Identifies variables
	Identifies paths and Internet addresses
	Identifies document titles
`code` text	Identifies CLI output
	Identifies syntax examples

For readability, command names in the narrative portions of this guide are presented in mixed lettercase: for example, **switchShow**. In actual examples, command lettercase is often all lowercase. Otherwise, this manual specifically notes those cases in which a command is case sensitive. The **ficoncupset** and **ficoncupshow** commands are an exception to this convention.

Notes, Cautions, and Warnings

The following notices appear in this document.

Note

A note provides a tip, emphasizes important information, or provides a reference to related information.

Caution

A caution alerts you to potential damage to hardware, firmware, software, or data.

Warning
A warning alerts you to potential danger to personnel.

Key Terms

For definitions specific to Brocade and Fibre Channel, refer to the *Brocade Glossary.*

For definitions of SAN-specific terms, visit the Storage Networking Industry Association online dictionary at *http://www.snia.org/education/dictionary.*

Additional Information

This section lists additional Brocade and industry-specific documentation that you might find helpful.

Brocade Resources

The following related documentation is provided on the Brocade Documentation CD-ROM and on the Brocade Web site, through Brocade Connect.

Note
Go to *http://www.brocade.com* and click **Brocade Connect** to register at no cost for a user ID and password.

Fabric OS

- *Fabric OS Administrator's Guide*
- *Fabric OS Command Reference Manual*
- *Fabric OS MIB Reference Manual*
- *Fabric OS System Error Message Reference Manual*
- *Brocade Glossary*

Fabric OS Optional Features

- *Web Tools Administrator's Guide*
- *Web Tools EZ Administrator's Guide*
- *Fabric Watch Administrator's Guide*
- *Fabric Manager Administrator's Guide*
- *Secure Fabric OS Administrator's Guide*

Release notes are available on the Brocade Connect Web site and are also bundled with the Fabric OS firmware.

For practical discussions about SAN design, implementation, and maintenance, you can purchase *Building SANs with Brocade Fabric Switches* through:

http://www.amazon.com

For additional Brocade documentation, visit the Brocade SAN Info Center and click the Resource Library location:

http://www.brocade.com

Optional Brocade Features

Optional Brocade features include:

Advanced Performance Monitoring
: Enables more effective end-to-end SAN performance analysis to enhance performance tuning, increase productivity, optimize resource utilization, and reduce costs.

Extended Fabrics
: Supports the reliable, high-speed connectivity of SilkWorm switches over dark fiber or Dense Wave Division Multiplexing (DWDM) equipment at distances up to 500 kilometers to enhance business continuance operations.

Fabric Watch
: Continuously monitors SAN fabrics for potential faults based on thresholds set for a variety of SAN fabric elements and events—automatically alerting administrators to potential problems before they become costly failures.

ISL Trunking
: Optimizes the performance and availability of SAN fabrics while simplifying ISL management. Two 4 Gbit/sec SilkWorm switches can automatically group up to eight ISLs into a single logical "trunk" with a total throughput of up to 32 Gbit/sec.

Advanced Zoning
: Automatically groups SAN fabric-connected devices into logical zones that restrict access to "member" devices in the zone. Advanced Zoning uses hardware enforcement at both the port and WWN level to provide more robust data protection.

Secure Fabric OS
: Provides a comprehensive security solution to help protect mission-critical data. Key features include centralized policy-based security management, management data encryption, and authentication to create a fabric-wide trusted environment with control over all levels of fabric access and communication.

FICON® CUP
: Enables IBM host-based management programs to manage FICON fabric switches in-band by sending commands to the Fabric OS emulated control device.

Other Industry Resources

In addition to this manual, the following information about fabric security and the Secure Fabric OS product is available:

- White papers, online demos, and data sheets are available through the Brocade Web site at:

  http:// www.brocade.com/products/software.jhtml

- Best practice guides, including the SAN Security Best Practice Guide, white papers, online demos, data sheets, and other documentation is available through the Brocade Partner Web site.

- The CERT® Coordination Center of Carnegie Mellon University provides industry-level information about certification at:

  http://www.cert.org

For additional resource information, visit the Technical Committee T11 Web site. This Web site provides interface standards for high-performance and mass storage applications for Fibre Channel, storage management, and other applications:

  http://www.t11.org

For information about the Fibre Channel industry, visit the Fibre Channel Industry Association Web site:

  http://www.fibrechannel.org

Getting Technical Help

Contact your switch support supplier for hardware, firmware, and software support, including product repairs and part ordering. To expedite your call, have the following information available:

1. **General Information**

   - Technical Support contract number, if applicable

   - Switch model

   - Switch operating system version

   - Error numbers and messages received

   - **supportSave** command output

   - Detailed description of the problem and specific questions

   - Description of any troubleshooting steps already performed and results

   - Serial console and telnet session logs

   - syslog message logs

2. **Switch Serial Number**

   The switch serial number and corresponding bar code are provided on the serial number label, as shown here:

   FT00X0054E9

The serial number label is located as follows:

- *SilkWorm 2000-series switches:* Bottom of chassis.
- *SilkWorm 3014 switches*: Top of chassis, under the insertion arm.
- *SilkWorm 3016 and 4012 switches:* Side of switch module.
- *SilkWorm 200E, 3200, and 3800 switches:* nonport side of chassis.
- *SilkWorm 3250, 3850, 3900, 4100, 4900,* and *7500 switches*: Bottom of chassis.
- *SilkWorm 24000, and 48000 directors:* Inside the front of the chassis, on the wall to the left of the ports.
- *SilkWorm Multiprotocol Router Model AP7420:* On the bottom of the chassis and on the back of the chassis.

3. **World Wide Name (WWN)**

- *SilkWorm 200E, 3014, 3016, 3250, 3600, 3850, 3900, 4012, 4100, 4900, 200E switches and SilkWorm 24000, and 48000 directors:* Provide the license ID. Use the **licenseIdShow** command to display the license ID.
- *SilkWorm Multiprotocol Router Model AP7420:* Provide the switch WWN. Use the **switchShow** command to display the switch WWN.
- *All other SilkWorm switches:* Provide the switch WWN. Use the **wwn** command to display the switch WWN.

Document Feedback

Because quality is our first concern at Brocade, we have made every effort to ensure the accuracy and completeness of this document. However, if you find an error or an omission, or you think that a topic needs further development, we want to hear from you. Forward your feedback to:

documentation@brocade.com

Provide the title and version number and as much detail as possible about your comment, including the topic heading and page number and your suggestions for improvement.

Chapter

Introducing the SilkWorm 200E

1

The SilkWorm 200E is a Fibre Channel switch that supports link speeds of 1, 2, and 4 Gbit/sec. It includes the Brocade Fabric Operating System (Fabric OS) and is compatible with the entire Brocade SilkWorm product family. The SilkWorm 200E can operate in a fabric containing multiple switches or as the only switch in a fabric.

This chapter provides the following information:

SilkWorm 200E Features

SilkWorm 200E provides the following features;

- 1U chassis. The chassis can be installed as a standalone unit or mounted in a standard Electronic Industries Association (EIA) 19 in. (48.26 cm) cabinet.
- 16 fixed Fibre Channel ports, with the following characteristics:
  - 1-, 2-, or 4-Gbit/sec ports, with automatic negotiation to the highest common speed of all devices connected to port
  - Port interfaces compatible with small-form-factor pluggable (SFP) transceivers, including short wavelength (SWL) and long wavelength (LWL) formats
  - Universal and self-configuring: capable of becoming an F_Port (fabric enabled), FL_Port (fabric loop enabled), or E_Port (expansion port)
- Brocade Goldeneye ASIC for Fibre Channel switching
- One RS-232 serial port, using a DB-9 connector
- One 10/100 Mbit/sec Ethernet port, using an RJ-45 connector
- One built-in fixed power unit (not a FRU)

- Three built-in fans (there are no fan FRUs)
  The fans in the SilkWorm 200E do not return RPM values, so a **fanShow** command will not display RPMs.

- The following light-emitting diodes (LEDs):

  - system power LED
    One LED (green) to indicate system valid power

  - system status LED
    One LED (green/amber) to indicate system status

  - Ethernet status LEDs
    Two Ethernet LEDs to indicate speed and link status

  - port status LEDs
    16 LEDs (green/amber) to indicate status for each port

  - port link speed LEDs
    16 LEDs (green/amber) to indicate link speed for each port

Port Side View

Figure 1-1 shows the port side of SilkWorm 200E.

All LEDs are on the port side of the switch: the nonport side is used for serial-number labeling and to allow the free flow of air. The SilkWorm 200E enclosure has forced-air cooling, with the fans pushing the air from the nonport side of the chassis through the enclosure, exhausting to the port side.

For a complete description of the locations and interpretations of these LEDs, refer to "Interpreting LED Activity" on page 3-1.

Figure 1-1 Port Side of SilkWorm 200E
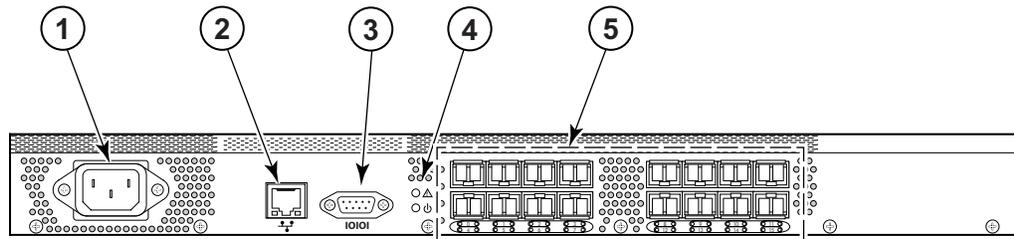
1	Power Receptacle	4	System Status LED (top)
2	Ethernet Port		System Power LED (bottom)
3	Console Port	5	Fibre Channel Ports

Nonport Side View

The nonport side of the SilkWorm 200E is used solely for air flow and for serial number labels. There are two labels on the rear of the chassis. Both labels contain a serial number for the switch, but the left label also contains the SilkWorm 200E MAC address and WWN.

Weight and Physical Dimensions

Table 1-1 lists the weight and physical dimensions of the SilkWorm 200E switch.

Table 1-1 Switch Specifications

SilkWorm 200E	Dimensions
Height	1.69 in. (4.29 cm)
Width	16.87 in. (42.85 cm)
Depth	12.10 in. (30.734 cm)
Weight	8.8 lbs (4.0 kg)

Memory Specifications

The SilkWorm 200E memory specifications are shown in Table 1-2.

Table 1-2   Memory Specifications

Memory Type	Installed Memory
Main memory (SDRAM)	128 MB
Compact flash	256 MB

Supported Fabric Configurations

The SilkWorm 200E is an entry-level switch; it should not be included in a fabric of more than 10 domains.

EZSwitchSetup CD

The SilkWorm 200E is shipped with a Brocade EZSwitchSetup CD. This CD provides an application for quickly and easily setting up the switch configuration. You can also choose to perform the switch setup steps manually as described in "Initial Setup of the SilkWorm 200E" on page 2-6.

Refer to the documentation that comes with the EZSwitchSetup CD for more information.

ISL Trunking Groups

If your SilkWorm 200E switch is licensed for Brocade ISL Trunking, use the trunking groups available on the switch. For the SilkWorm 200E, the maximum number of ports per trunk is four.

The Fibre Channel ports are numbered from left to right, color-coded into groups of four to indicate the groups of ports that can be used in the same interswitch link (ISL) trunking group. The number of trunking ISLs can be from two through four ports within a single trunk group. The trunk groups are shown in Figure 1-2.

Figure 1-2 Trunking Groups
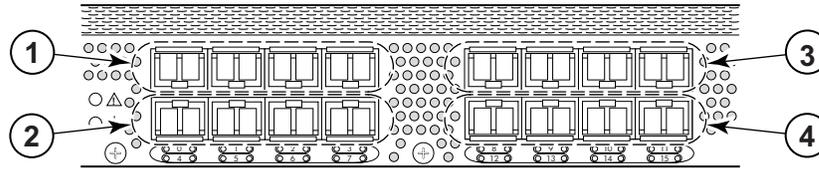
1	Trunk Group 1: Ports 0 through 3	3	Trunk Group 3: Ports 8 through 11
2	Trunk Group 2: Ports 4 through 7	4	Trunk Group 4: Ports 12 through 15

> **Note**
>
> Brocade ISL Trunking is optional software that allows you to create trunking groups of ISLs between adjacent switches. For more information about trunking, refer to the *Fabric OS Administrator's Guide*.

Supported Optional Features

The SilkWorm 200E supports the following optional Brocade software, which you can activate by purchasing the corresponding license key:

- Brocade Extended Fabrics
- Brocade Web Tools
- Brocade Secure Fabric OS
- Brocade Advanced Zoning
- Brocade ISL Trunking
- Brocade Fabric Watch
- Brocade Advanced Performance Monitoring
- Ports on Demand (basic switch is ports 0 through 7):
  - One Ports on Demand license is required to activate ports 8 through 11.
  - A second Ports on Demand license is required to activate ports 12 through 15.

For information on any of these features, refer to the *Fabric OS Administrator's Guide*.

Ports on Demand License

SilkWorm 200E can be purchased with 8, 12, or 16 licensed ports. As your needs increase, you can activate unlicensed ports by purchasing and installing the Brocade Ports on Demand optional licensed product. After it has been installed, the license appears under the **licenseShow** command as *Ports on Demand license*.

Ports on Demand is ready to be unlocked in the switch firmware. Its license might be part of the licensed paper pack supplied with switch software, or you can purchase the license separately from your switch vendor, who will provide you with a key to unlock it.

By default, ports 0 through 7 are enabled on the SilkWorm 200E. To enable ports 8 through 11, install a Ports on Demand license key. To enable ports 12 through 15, install another Ports on Demand license.

After you have installed the license keys, you must enable the ports. You can do so without disrupting switch operation by using the **portEnable** command on each port individually. Alternatively, you can disable and reenable the switch to activate all ports simultaneously.

To install a Ports on Demand license, you can either use the supplied license key or generate a license key. Typically the switch is shipped with a paper pack that specifies the transaction key to use with the Software License Keys link. Use this transaction key on the Brocade Web site at *www.brocade.com* and click **products> Software>Software License Keys** and follow the instructions to generate the key. You can also use this site to generate other license keys for your switch.

Unsupported Features

The following features are not supported in the SilkWorm 200E:

*   Brocade SES
*   Brocade QuickLoop

Chapter

2

Installing and Configuring the SilkWorm 200E

This chapter provides the following information:

Items Included with the SilkWorm 200E

The following items are included with the standard shipment of the SilkWorm 200E. When you open the SilkWorm 200E packaging, verify that these items are included in the package and that no damage has occurred during shipping:

- One SilkWorm 200E Fibre Channel switch

- An accessory kit containing:

  - Brocade EZSwitchSetup CD
    This CD provides an application for quickly and easily setting up the switch configuration. Refer to the documentation that comes with the CD for more information.

  - Brocade Documentation CD

  - Brocade Fabric Manager Evaluation CD

  - One grounded 6 ft (1.8 m) country-specific power cable

  - One 10 ft (3.0 m) RS-232 serial cable; if necessary, convert this RS-232 cable to an RJ-45 connector by removing the adapter on the end of the cable

  - Four rubber mounting feet, required for setting up the switch as a standalone unit

  - Optional SFPs (small-form-factor pluggable)

Facility Requirements

To ensure correct operation, the facility in which the switch is used must meet the following requirements shown in Table 2-1.

Table 2-1   Facility Requirements

Type	Requirements
Electrical	• Primary AC input 100-240 VAC, 2.0A, 47-63 Hz; switch autosenses input voltage • Adequate supply circuit, line fusing, and wire size, as specified by the electrical rating on the switch nameplate • Circuit protected by a circuit breaker and grounded in accordance with local electrical codes
Thermal	• A minimum air flow of 24 cu ft/min available in the immediate vicinity of the switch • Ambient air temperature not exceeding 40° C (104° F) while the switch is operating
Cabinet (when rack-mounted)	• One rack unit in a 19-in. (48.3 cm) cabinet • All equipment in cabinet grounded through a reliable branch circuit connection • Additional weight of switch not to exceed the cabinet's weight limits • Cabinet secured to ensure stability in case of unexpected movement, such as an earthquake

Environmental Requirements

To ensure proper operation, the switch must not be subjected to environmental conditions beyond which it was tested. The ranges specified in Table 2-2 list the acceptable environment for both operating and non-operating conditions.

Table 2-2   Environmental Requirements

Condition	Acceptable Range During Operation	Acceptable Range During Non-Operation
Temperature	-10° to +40° C (12° to 122° F)	-50° to 100° C (-122° to 212° F)
Humidity	20% to 85% RH noncondensing, at 40° C, with maximum gradient of 10% per hour	10% to 85% RH noncondensing, at 70° C
Altitude	0 to 10,000 ft (3 km) above sea level	0 to 39,370 ft (12 km) above sea level
Shock	20 G, 6 ms duration, half sine wave	15 G, 12-18 ms duration, trapezoid
Vibration	0.5 G, 5-500 Hz	2.0 G, 5-500 Hz
Air flow	Normal: 24 cu ft/min	None required

> **Note**
> The -10° to 40° Celsius range applies to the ambient air temperature at the air intake vents on the nonport side of the switch. The temperature inside the switch can be up to 80° Celsius during switch operation.
>
> If the internal temperature range exceeds the operating ranges of the components, the LEDs, error messages, and Fabric Watch alerts indicate a problem. Enter the **tempShow** or Fabric Watch commands to view temperature status.

Installation and Safety Considerations

You can install the SilkWorm 200E switch in three ways:

1. As a standalone unit on a flat surface.

2. In an Electronic Industries Association (EIA) cabinet using a fixed-rail rack mount kit. The optional fixed-rail rack mount kit can be ordered from your switch retailer.

3. In an EIA cabinet using an optional slide-rail rack mount kit. The optional slide-rail rack mount kit can be ordered from your switch retailer. When mounting into a slide-rail rack, you can mount the chassis to slide from either the port side or the nonport side.

Electrical Considerations

For successful installation and operation of the switch, ensure that the following electrical requirements are met:

- Primary AC input 100-240 VAC (switch auto senses input voltage), 47-63 Hz

- Correctly wired primary outlet, with circuit protected by a circuit breaker and grounded in accordance with local electrical codes

- Adequate supply circuit, line fusing, and wire size, as specified by the electrical rating on the switch nameplate.

Environmental Considerations

For successful installation and operation of the switch, ensure that the following environmental requirements are met:

- At a minimum, adequate cooling requires that you install the switch with the nonport side, which contains the air intake vents, facing the cool-air aisle.

- All equipment in the rack should force air in the same direction to avoid intaking exhaust air.

- Verify that a minimum of 24 cu ft/min of air flow is available to the air intake vents on the nonport side of the switch.

- Verify that the ambient air temperature does not exceed 40° C (104° F) while the switch is operating.

- If installing the switch in a cabinet:
  - The cabinet must be a standard EIA cabinet.
  - Plan a cabinet space that is 1 rack unit (1.75 in.; 4.45 cm) high, 19 in. (48.3 cm) wide.
  - Ground all equipment in the cabinet through a reliable branch circuit connection and maintain ground at all times. Do not rely on a secondary connection to a branch circuit, such as a power strip.
  - Ensure that airflow and temperature requirements are met on an ongoing basis, particularly if the switch is installed in a closed or multicabinet assembly.
  - Verify that the additional weight of the switch does not exceed the cabinet's weight limits or unbalance the cabinet in any way.
  - Secure the cabinet to ensure stability in case of unexpected movement, such as an earthquake.

Items Required for Installation

The following items are required for configuring and connecting the SilkWorm 200E for use in a network and fabric:

- SilkWorm 200E installed and connected to a power source
- Workstation with an installed terminal emulator, such as HyperTerminal
- Unused IP address and corresponding subnet mask and gateway address
- Serial cable (provided)
- Ethernet cable
- SFPs and compatible cables, as required
- Access to an FTP server for backing up the switch configuration (optional)

Installing a Standalone SilkWorm 200E

To install the SilkWorm 200E as a standalone unit, follow the procedure described here:

1. Unpack the SilkWorm 200E and verify that all items listed on page 2-4 are present and undamaged.

2. Apply the adhesive rubber feet. Applying the rubber feet onto the switch helps prevent the switch from sliding off the supporting surface.

   a. Clean the indentations at each corner of the bottom of the switch to ensure that they are free of dust or other debris that might lessen the adhesion of the feet.

   b. With the adhesive side against the chassis, place one rubber foot in each indentation and press into place.

3. Place the switch on a flat, sturdy surface.

4. Provide power to the switch as described in "Powering the SilkWorm 200E On and Off" on page 3-1.

⚠️ **Caution**
Do not connect the switch to the network until the IP address is correctly set.

Installing a SilkWorm 200E into an EIA Cabinet

The SilkWorm 200E can be installed into an EIA cabinet using one of the following optionally available rack mount kits. Refer to the documentation that is shipped with the rack kit for installation instructions.

- If you purchased the fixed rack mount kit, see the *Fixed Rack Mount Kit Installation Procedure*.

- If you purchased the mid-mount rack kit, see the *Mid-Mount Rack Kit Installation Procedure*.

- If you purchased the slide rack mount kit, see the *Slide Rack Mount Kit Installation Procedure*. The switch can be installed using the slide rack mount kit in two ways:

  - To allow the port side of the switch to slide out of the exhaust-air side of the cabinet. In this installation, the port side of the switch is flush with the edge of the cabinet.

  - To allow the nonport side of the switch to slide out of the cool-air side of the cabinet. In this installation, the port side of the switch is set 3 in. back from the edge of the cabinet, allowing a more gradual bend in the fiber-optic cables.

Recommendations for Cable Management

The minimum bend radius for a 50 micron cable is 2 in. under full tensile load and 1.2 in. with no tensile load.

Cables can be organized and managed in a variety of ways: for example, using cable channels on the sides of the cabinet or patch panels to minimize cable management. Following is a list of recommendations:

*   Plan for rack space required for cable management before installing the switch.

*   Leave at least 3.28 ft (1 m) of slack for each port cable. This provides room to remove and replace the switch, allows for inadvertent movement of the rack, and helps prevent the cables from being bent to less than the minimum bend radius.

*   If you are using Brocade ISL Trunking, consider grouping cables by trunking groups. The cables used in trunking groups must meet specific requirements, as described in the *Fabric OS Administrator's Guide*.

*   For easier maintenance, label the fiber optic cables and record the devices to which they are connected.

*   Keep LEDs visible by routing port cables and other cables away from the LEDs.

*   Use velcro straps to secure and organize fibre optic cables. Do not use tie wraps on fiber optic cables, because wraps are easily overtightened and can damage the optic fibers.

Initial Setup of the SilkWorm 200E

There are two methods to setup a SilkWorm 200E. The below steps are a manual method for completing the configuration. You can also use the EZSwitchSetup CD to configure the switch; refer to the documentation that comes with the CD for instructions on using the EZSwitchSetup application.

To configure the SilkWorm 200E, you must perform the following tasks:

1. "Provide Power to the Switch" on page 2-7

2. "Create a Serial Connection" on page 2-7

3. "Connect to the Switch Using the Serial Connection" on page 2-7

4. "Set the Switch IP Address" on page 2-8

5. "Create an Ethernet Connection" on page 2-8

6. "Set the Switch Domain ID" on page 2-8

7. "Install SFPs and Cable the Switch" on page 2-9

8. "Set the Switch Date and Time" on page 2-10

9. "Synchronize Local Time with an External Source" on page 2-10

10. "Correct the Time Zone of a Switch" on page 2-11

11. "Verify Correct Operation and Backup the Configuration" on page 2-12

> ⚠️ **Caution**
> Do not connect the switch to the network until the IP address is correctly set.

Provide Power to the Switch

To provide power to the SilkWorm 200E:

1. Connect the power cords to both power supplies and then to power sources on separate circuits to protect against AC failure. Ensure that the cords have a minimum service loop of 6 in. available and are routed to avoid stress.

2. Power on the power supplies by flipping both AC switches to the "1" symbol. The power supply LEDs display amber until POST is complete, and then change to green. The switch usually requires from 1 to 3 min to boot and complete POST.

> **Note**
>
> Power is supplied to the switch as soon as the first power supply is connected and turned on.

3. After POST is complete, verify that the switch power and status LEDs on the left of the port side of the switch are green.

Create a Serial Connection

To create a serial connection to the SilkWorm 200E:

1. Remove the plug from the serial port and insert the serial cable provided with the SilkWorm 200E.

2. Connect the serial cable to the serial port on the switch and to an RS-232 serial port on the workstation. If the serial port on the workstation is RJ-45 instead of RS-232, you can remove the adapter on the end of the serial cable and insert the exposed RJ-45 connector into the RJ-45 serial port on the workstation.

3. Disable any serial communication programs running on the workstation.

4. Open a terminal emulator application (such as HyperTerminal for Windows or TERM in a UNIX environment) and configure the application as follows:

    *   In a Windows NT, 2000, 2003, ME, or XP environment:

        Bits per second: 9600

        Databits: 8

        Parity: None

        Stop bits: 1

        Flow control: None

    *   In a UNIX environment, enter the following command at the prompt:

        ```
        tip /dev/ttyb -9600
        ```

Connect to the Switch Using the Serial Connection

To log in to the switch through the serial connection:

1. Verify that the switch has completed POST. When POST is complete, the port status and switch power and status LEDs return to a standard healthy state (green).

2. When the terminal emulator application stops reporting information, press **Enter** to display the login prompt.

Set the Switch IP Address

To replace the default IP address and related information:

1. Enter the **ipAddrSet** command at the terminal emulator application prompt, and enter the requested information at the prompts:

```
switch:admin> ipaddrset
Ethernet IP Address [10.77.77.77]:10.32.53.47
Ethernet Subnetmask [255.0.0.0]:255.255.240.0
Fibre Channel IP Address [0.0.0.0]:
Fibre Channel Subnetmask [0.0.0.0]:
Gateway IP Address [0.0.0.0]:10.32.48.1
Set IP address now? [y = set now, n = next reboot]:y
IP address being changed...
Committing configuration...Done.
switch:admin>
```

2. Optionally, verify that the address was correctly set by entering the **ipAddrShow** command at the prompt.

3. Record the IP address on the pull out tab provided for this purpose on the port side of the SilkWorm 200E.

4. If the serial port is no longer required, log out of the serial console, remove the serial cable, and replace the plug in the serial port.

Create an Ethernet Connection

To create an Ethernet connection to the SilkWorm 200E:

1. Remove the plug from the Ethernet port.

2. Connect an Ethernet cable to the switch Ethernet port and to the workstation or to an Ethernet network containing the workstation.

> **Note**
> At this point, the switch can be accessed remotely, by command line or by Web Tools. Ensure that the switch is not being modified from any other connections during the remaining tasks.

Set the Switch Domain ID

To set the switch domain ID:

1. Log on to the switch by telnet, using the admin account.

2. Modify the domain ID if required.

   The default domain ID is 1. If the switch is not powered on until after it is connected to the fabric and the default domain ID is already in use, the domain ID for the new switch is automatically reset to a unique value. If the switch is connected to the fabric after is has been powered on and the default domain ID is already in use, the fabric segments. To find the domain IDs that are currently in use, run the **fabricShow** command on another switch in the fabric.

    a.   Disable the switch by entering the **switchDisable** command.

    b.   Enter the **configure** command. The command prompts display sequentially; enter a new value or press **Enter** to accept each default value.

    c.   Enter **y** after the "Fabric param" prompt:

```
Fabric param (yes, y, no, n): [no] y
```

    d.   Enter a unique domain ID (such as the domain ID used by the previous switch, if still available):

```
Domain: (1..239) [1] 3
```

    e.   Complete the remaining prompts or press **Ctrl-D** to accept the remaining settings without completing all the prompts.

    f.   Reenable the switch by entering the **switchEnable** command.

Install SFPs and Cable the Switch

To install SFPs and cable the switch:

1.   Install the SFP transceivers in the Fibre Channel ports, as required. The ports selected for use in trunking groups must meet specific requirements. For a list of these requirements, see the *Fabric OS Administrator's Guide*.

    a.   Remove the plugs from the ports to be used.

    b.   Position a transceiver so that it is oriented correctly and insert it into a port until it is firmly seated and the latching mechanism clicks.

    For instructions specific to the type of transceiver, see the transceiver manufacturer's documentation.

> **Note**
>
> The transceivers are keyed to ensure correct orientation. If a transceiver does not install easily, ensure that it is correctly oriented.

    c.   Repeat Steps a and b for the remaining ports, as required.

2.   Connect the cables to the transceivers.

The cables used in trunking groups must meet specific requirements. For a list of these requirements, see the *Fabric OS Administrator's Guide*.

> **Caution**
>
> A 50-micron cable should not be bent to a radius less than 2 in. under full tensile load and 1.2 in. with no tensile load. Tie wraps are not recommended for optical cables because they are easily overtightened.

a. Orient a cable connector so that the key (the ridge on one side of connector) aligns with the slot in the transceiver. Then, insert the cable into the transceiver until the latching mechanism clicks. For instructions specific to cable type, see the cable manufacturer's documentation.

> **Note**
>
> The cable connectors are keyed to ensure correct orientation. If a cable does not install easily, ensure that it is correctly oriented.

b. Repeat Step a for the remaining cables as required.

3. Check the LEDs to verify that all components are functional. The LEDs should display green.

4. Verify the correct operation of the SilkWorm 200E by entering the **switchShow** command from the workstation.

Set the Switch Date and Time

The date and time switch settings are used for logging events. Switch operation does not depend on the date and time; a switch with an incorrect date and time value still functions properly.

You can synchronize the local time of the principal or primary fabric configuration server (FCS) switch to that of an external Network Time Protocol (NTP) server.

To set the date and time of a switch:

1. Log in to the switch as admin.

2. Enter the **date** command at the command line using the following syntax:

    date "*MMDDhhmm[CC]YY*"

    where:

    - MM is the month (01-12)

    - DD is the date (01-31)

    - hh is the hour (00-23)

    - mm is minutes (00-59)

    - CC is the century (19-20)

    - YY is the year (00-99)

Year values greater than 69 are interpreted as 1970-1999; year values less than 70 are interpreted as 2000-2069. The date function does not support Daylight Savings Time or time zones, so changes will have to be reset manually.

```
switch:admin> date
Fri May  5 21:50:00 UTC 2001
switch:admin>
switch:admin> date "0624165205"
Tue Jun 24 16:52:30 UTC 2005
switch:admin>
```

Synchronize Local Time with an External Source

To synchronize the local time of the principal or primary FCS switch with that of an external NTP server:

1. Log in as admin.

2. Enter the **tsClockServer** *ipaddr* command.

   The *ipaddr* variable represents the IP address of the NTP server that the switch can access. This argument is optional; by default the value is "LOCL".

```
switch:admin> tsclockserver
LOCL
switch:admin> tsclockserver 132.163.135.131
switch:admin>
```

Correct the Time Zone of a Switch

If the time of your switch(es) is off by hours (and not minutes), use the following procedure on all switches.

To set the time zone:

1. Log in as admin.

2. Enter the **tsTimeZone** command as follows:

   tstimezone [*houroffset* [*, minuteoffset*]]

   For Pacific Standard Time, enter **tsTimeZone -8,0**

   For Central Standard Time, enter **tsTimeZone -6,0**

   For Eastern Standard Time, enter **tsTimeZone -5,0**

   The default time zone for switches is universal time conversion (UTC), which is 8 hours ahead of Pacific Standard Time. Additional time zone conversions are listed later in this section.

   The parameters listed do not apply if the time zone of the switch(es) has already been changed from the default (8 hours ahead of PT).

   For more detailed information about the command parameters, see the **tsTimeZone** command in the *Fabric OS Command Reference Manual*.

3. Repeat steps 1 and 2 on all switches that the time zone needs to be set.

   This needs to be done only once, because the value is stored in nonvolatile memory. For U.S. time zones, use the following table to determine the correct parameter for the **tsTimeZone** command.

Local Time	tsTimeZone parameter (difference from UTC)
Atlantic Standard	-4,0
Atlantic Daylight	-3,0
Eastern Standard	-5,0
Eastern Daylight	-4,0
Central Standard	-6,0
Central Daylight	-5,0
Mountain Standard	-7,0
Mountain Daylight	-6,0

Local Time	tsTimeZone parameter (difference from UTC)
Pacific Standard	-8,0
Pacific Daylight	-7,0
Alaskan Standard	-9,0
Alaskan Daylight	-8,0
Hawaiian Standard	-10,0

Verify Correct Operation and Backup the Configuration

To verify correct operation and backup with switch configuration:

1. Check the LEDs to verify that all components are functional.

2. Verify the correct operation of the SilkWorm 200E by entering the **switchShow** command from the workstation.

    This command provides information about switch and port status.

3. Run the **portcfgpersistentenable** command to activate the FC ports for FC operation.

4. Verify the correct operation of the SilkWorm 200E in the fabric by entering the **fabricShow** command from the workstation.

    This command provides general information about the fabric.

5. Back up the switch configuration to an FTP server by entering the **configUpload** command and following the prompts.

    This command uploads the switch configuration to the server, making it available for downloading to a replacement switch if necessary.

    Brocade recommends backing up the configuration on a regular basis to ensure that a complete configuration is available for downloading to a replacement switch. For specific instructions about how to back up the configuration, see the *Fabric OS Administrator's Guide*. The **switchShow**, **fabricShow**, and **configUpload** commands are described in detail in the *Fabric OS Command Reference Manual.*

Chapter

3

Operating and Maintaining the SilkWorm 200E

This chapter provides the following information:

- "Powering the SilkWorm 200E On and Off" next
- "Interpreting LED Activity" on page 3-1
- "Interpreting POST Results" on page 3-6
- "Management Features of the SilkWorm 200E" on page 3-7
- "SilkWorm 200E FRU Units" on page 3-7
- "Maintaining the SilkWorm 200E" on page 3-8

Powering the SilkWorm 200E On and Off

To power on the SilkWorm 200E, connect the power cable to the AC receptacle on the switch and to a power source. The switch runs POST by default each time it is powered on, reset, or rebooted, and requires a minimum of 3 minutes to run.

To end the flow of power to the SilkWorm 200E, remove the power cord from the power source.

Interpreting LED Activity

System activity and status can be determined through the activity of the LEDs on the switch.

There are three possible LED states: no light, a steady light, and a flashing light. The steady lights and flashing lights can be green or amber.

The LEDs flash either of these colors during boot, POST, or other diagnostic tests. This is normal and does not indicate a problem unless the LEDs do not indicate a healthy state after all boot processes and diagnostic tests are complete.

LED Locations

All SilkWorm 200E LEDs are located on the port side. They include:

- system power LED
  One LED (green) to indicate system valid power.

SilkWorm 200E Hardware Reference Manual
Publication Number: 53-1000633-03

3-1

- system status LED
  One LED (green/amber) to indicate system status.

- Ethernet status LEDs
  Two Ethernet LEDs to indicate speed and link status.

- port status LEDs
  16 LEDs (green/amber) to indicate status for each port.

- port link speed LEDs
  16 LEDs (green/amber) to indicate link speed for each port.

Figure 3-1 shows the LEDs on the SilkWorm 200E.

Figure 3-1   Detailed View, SilkWorm 200E LEDs
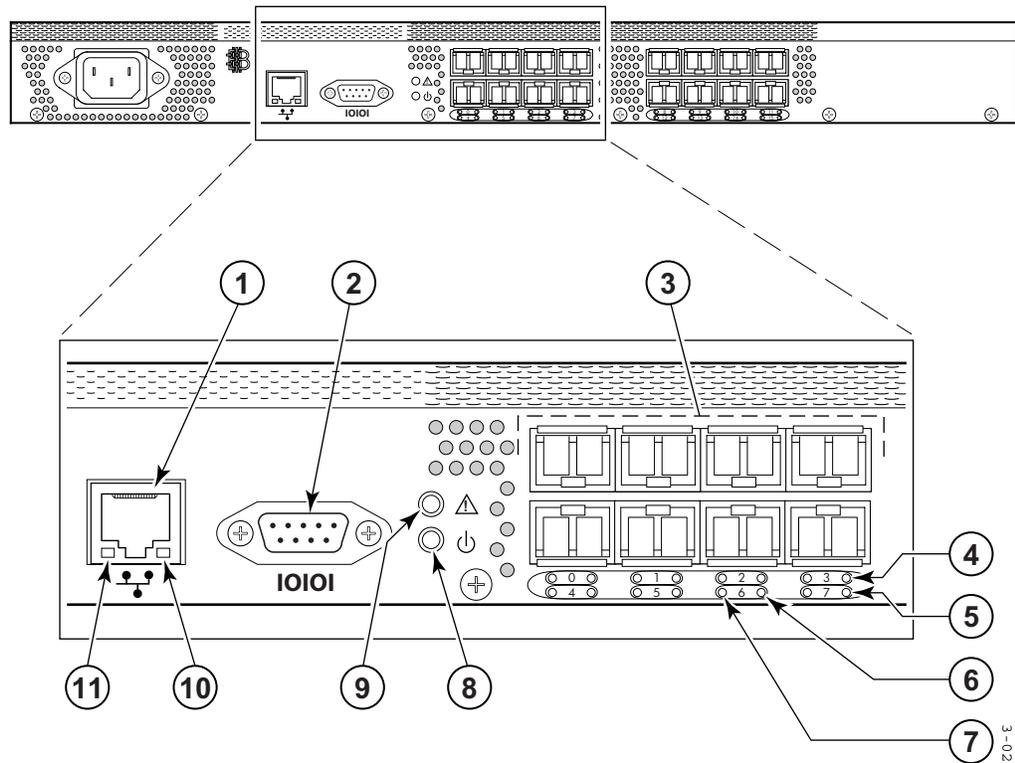
1	Ethernet port	7	Port status LEDs
2	Console port	8	Power status LEDs
3	Fibre Channel ports	9	System status LEDs
4	LEDs for top ports	10	Ethernet speed LED
5	LEDs for bottom ports	11	Ethernet link LED
6	Port speed LEDs		

Interpreting LED Patterns

Table 3-1 through Table 3-4 summarize SilkWorm 200E LED locations, color, and meaning, as well as any recommended user response.

Power Status LEDs

The power status LED patterns are shown in Table 3-1.

Table 3-1   Power Status LED Patterns

LED Name, Location	LED Color	Status of Hardware	Recommended Action
Power Status LED	No light	Switch is off, or power supply has failed.	Verify that switch is on and has completed booting.
	Steady green	Switch is on and power supplies are functioning properly.	No action is required.

System Status LEDs

The system status LED patterns are shown in Table 3-2.

Table 3-2   System Status LED Patterns During Normal Operation

LED Name, Location	LED Color	Status of Hardware	Recommended Action
System Status LED	No light	Switch is off, boot is not complete, or boot failed.	Verify that switch is on and has completed booting.
	Steady green	Switch is operational.	No action is required.
	Slow-flashing green (on 1 second, off 1 second)	One or both of the following are true: • One or more environmental ranges are exceeded. • Error log contains one or more port diagnostic error messages.	1. Check environmental conditions, error log, Port Status LEDs, SFPs, cables, and loopback plugs. 2. Correct error condition. 3. Clear error log. 4. Rerun diagnostics to verify fix.
	amber	Switch is faulty, or initializing.	Wait a few moments to verify that the switch is not initializing.

Port LEDs

Each port has two LEDs: a port speed and a port status indicator. Table 3-3 shows the LED location, color, and meaning for these port LEDs.

Table 3-3   Port LED Patterns During Normal Operation

LED Name, Location	LED Color	Status of Hardware	Recommended Action
Port Status	No light	No light or signal carrier (SFP or cable) detected.	Check SFP and cable.
	Steady green	Port is online (connected to external device) but has no traffic.	No action is required.
	Slow-flashing green (on 1 second, off 1 second)	Port is online but segmented, indicating a loopback cable or incompatible switch.	Verify that the correct device is connected to the port and that the switch and port settings are correct.
	Fast-flashing green (on 1/4 second, off 1/4 second)	Port is in internal loopback (diagnostic).	No action is required.
	Flickering green	Port is online, with traffic flowing through port.	No action is required.
	Steady amber	Port is receiving light or signal carrier but is not yet online.	No action is required.
	Slow-flashing amber (on 1 second, off 1 second)	Port is disabled as the result of diagnostics or **portDisable** command. If all ports are slow-flashing amber, the switch could be disabled.	Enable the port using the **portEnable** command; refer to *Fabric OS Command Reference Manual* for more information. If all ports are slow-flashing amber, enable the switch (**switchEnable** command).
	Fast-flashing amber (on 1/4 second, off 1/4 second)	Port is faulty.	1. Check the Port Status LEDs, error log, SFP, and cable or loopback plug. 2. Clear the error log. 3. Rerun the diagnostics to verify that the error condition is fixed.

Table 3-3   Port LED Patterns During Normal Operation (Continued)

LED Name, Location	LED Color	Status of Hardware	Recommended Action
	Alternating green and amber	Port is bypassed.	Check configuration of Fibre Channel loop.
Port Speed	Green on amber off	Port is transmitting/receiving at 2 Gbit/sec.	No action is required.
	Green off amber off	Port is transmitting/receiving at 1 Gbit/sec.	No action is required.
	Amber on green off	Port is transmitting/receiving at 4 Gbit/sec.	No action is required.

Ethernet LEDs

Each Ethernet port has two LEDs, described in Table 3-4

Table 3-4   Ethernet LED Patterns

LED Name, Location	LED Color	Status of Hardware	Recommended Action
Ethernet speed LED	no light	Port speed is 10 Mb/sec	No action is required.
	steady green	Port speed is 100 Mb/sec	No action is required.
Ethernet link LED	amber	Link is valid	No action is required.
	blinking amber	Traffic is flowing	No action is required.

Interpreting POST Results

POST is a system check that is performed each time the switch is powered on, rebooted, or reset, and during which the LEDs flash different colors.

To determine whether POST completed successfully and whether any errors were detected:

- Verify that the LEDs on the switch indicate that all components are healthy. If one or more LEDs do not display a healthy state:

    - Verify that the LEDs are not set to "beacon" (this can be determined through the switchShow command or Web Tools). For information about how to turn beaconing on and off, see the *Fabric OS Administrator's Guide* or the *Advanced Web Tools Administrator's Guide*.

    - Follow the recommended action for the observed LED behavior

- Verify that **diagShow** command displays that the diagnostic status for all ports in the switch is OK.

- Review the system log for errors. Errors detected during POST are written to the system log, which is viewed using the **errShow** command. For more information about this command, see the *Fabric OS Command Reference Manual*. For information about specific error messages, see the *Fabric OS System Error Message Reference Manual*.

Management Features of the SilkWorm 200E

Using any of the management tools built into the SilkWorm 200E listed in Table 3-5, you can monitor fabric topology, port status, physical status, and other information used for performance analysis and system debugging.

When running IP over Fibre Channel, these management tools must be run on both HBA and switch and must be supported by both HBA and HBA driver.

Table 3-5   Management Options for SilkWorm 200E

Management Tool	Out-of-Band Support	In-Band Support
Command line interface Up to two admin sessions and four user sessions simultaneously. For more information, refer to the *Fabric OS Administrator's Guide* and the *Fabric OS Command Reference Manual.*	Ethernet or serial connection	IP over Fibre Channel
Brocade Fabric Manager	Ethernet connection	IP over Fibre Channel
Brocade Advanced Web Tools For information, refer to the *Web Tools Administrator's Guide*.	Ethernet connection	IP over Fibre Channel
Standard SNMP applications For information, refer to the *Fabric OS MIB Reference Manual*.	Ethernet connection	IP over Fibre Channel
Management server For more information, refer to the *Fabric OS Administrator's Guide* and the *Fabric OS Command Reference Manual*.	Ethernet connection	Native in-band interface (over HBA only)

SilkWorm 200E FRU Units

In the SilkWorm 200E, the only parts that are field replaceable are the SFPs. The entire switch is a FRU.

The fan units and power supply are not field replaceable in this switch.

Maintaining the SilkWorm 200E

The SilkWorm 200E does not require any regular physical maintenance; it was designed to minimize the chance of failure.

Ensure that the environmental conditions, described in "Facility Requirements" on page 2-2, are met. This helps prevent failure of the switch due to distress or abuse.

This section contains the following topics:

- "Installing an SFP" next
- "Removing an SFP" on page 3-10
- "Diagnostic Tests" on page 3-11

Installing an SFP

If your SilkWorm 200E did not come with installed SFPs, or you are replacing older ones, follow these instructions to install an SFP:

1. Making sure that the bail (wire handle) is in the unlocked position, place the SFP in the correctly oriented position on the port, as shown in Figure 3-2.

2. Slide the SFP into the port until you feel it click into place; then close the bail.

Note

Each SFP has a 10-pad gold-plated PCB-edge connector on the bottom. The correct position to insert an SFP into the upper row of ports is with the gold edge down. The correct position to insert an SFP into the lower row of ports is with the gold edge up.

Figure 3-2   Installing an SFP in the upper row of port slots
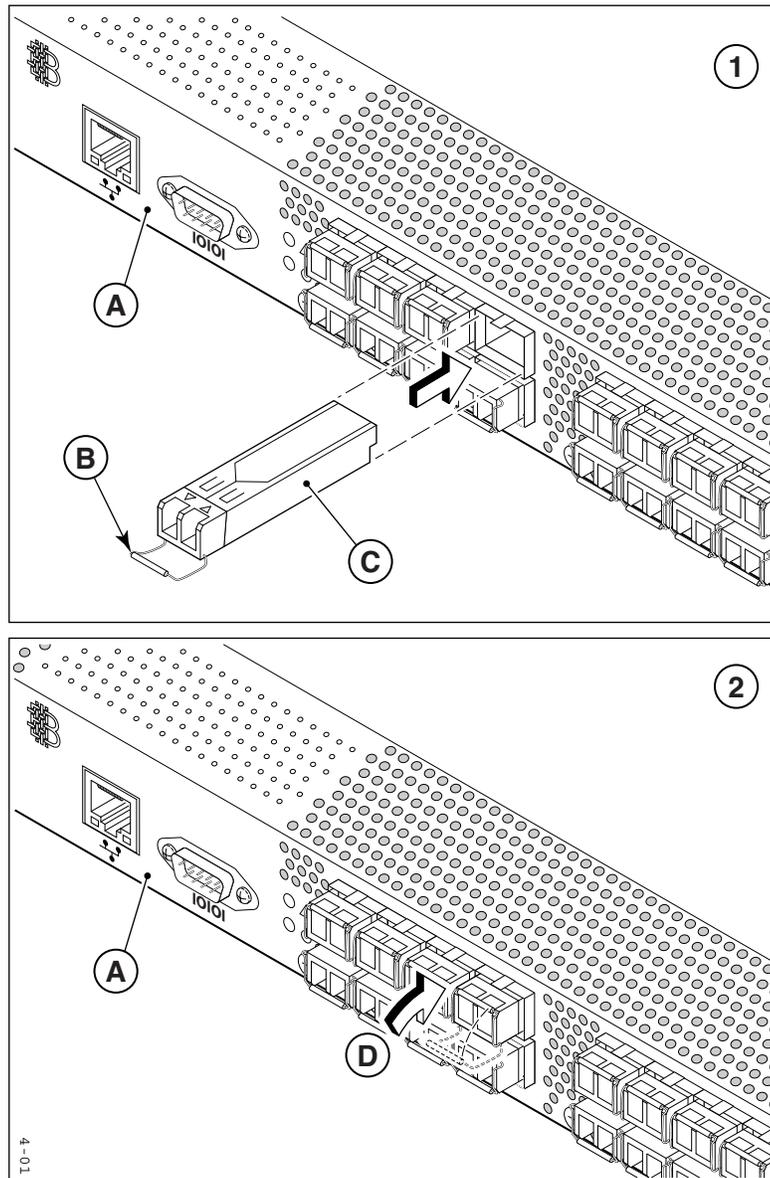
Legend for Figure 3-2:

    A   SilkWorm 200E

    B   SFP with open bail

    C   SFP

    D   Close bail

Note

For the lower row of port slots, the SFP must be inserted upside down, with the gold-edge PCB connector on the top portion of the SFP as it is inserted.

Removing an SFP

SFPs can deteriorate over time, and may need to be replaced periodically.

To remove an SFP:

1. Press and hold the cable release, as shown in Figure 3-3.

2. Remove the cable from the SFP.

3. Pull the bail (wire handle) to release the SFP.

4. Grasping it by the bail, gently but firmly pull the SFP out of the port.

⚠️ **Caution**
If the SFP you are removing does not have a bail, use a small implement such as a screwdriver to press the release trigger beneath the port. Non-bailed SFPs can be damaged by the removal process and are not recommended. Refer to the *Brocade Compatibility Matrix* for a list of supported SFPs and devices.

5. Repeat this procedure for the remaining ports, as required.

Figure 3-3   Removing an SFP
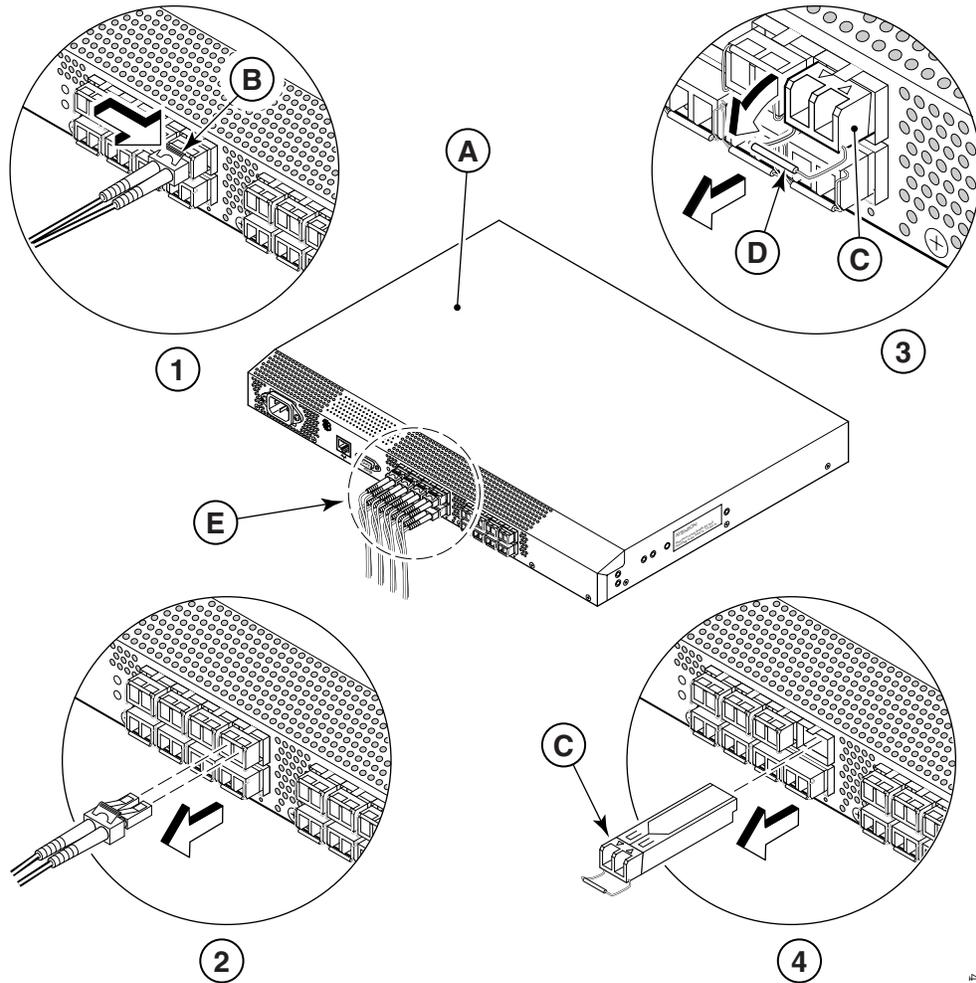
Legend for Figure 3-3:

    A   SilkWorm 200E

    B   Cable release

    C   SFP

    D   Bail

    E   Cabled Fibre Channel ports

Diagnostic Tests

In addition to POST, Fabric OS includes diagnostic tests to help troubleshoot the hardware and the firmware. This includes tests of internal connections and circuitry, fixed media, and the SFPs and cables in use.

The tests are implemented by command, either through a telnet session or through a terminal set up for a serial connection to the switch. Some tests require the ports to be connected by external cables, to allow diagnostics to verify the serializer/deserializer interface, SFP, and cable.

All diagnostic tests are run at link speeds of 1, 2, and 4 Gbit/sec, depending on the speed of the link being tested.

Caution
Diagnostic tests can temporarily lock the transmit and receive speed of the links during diagnostic testing.

For information about specific diagnostic tests, refer to the *Fabric OS Administrator's Guide*.

Chapter

4

SilkWorm 200E Specifications

This chapter provides the following information:

System Specifications

Table 4-1 lists the system specifications for the SilkWorm 200E.

Table 4-1 System Specifications

Specification	Description
Autoconfiguring port types	F_Port, FL_Port, and E_Port
System architecture	Nonblocking shared-memory switch
System processor	PPC440GP, 333 MHz
SDRAM	128 MB DDR SDRAM onboard memory operating at 133 MHz
Compact flash	256 MB module
ANSI Fibre Channel protocol	FC-PH (Fibre Channel Physical and Signaling Interface standard)
Modes of operation	Fibre Channel Class 2, Class 3, Class F
Fabric initialization	Complies with FC-SW-2 6.6
Ethernet port	One 10/100 Mbit/sec Ethernet port; accessed through RJ45 connector
Terminal port	One UART interface for terminal, accessed through DB9 connector
ASIC	Goldeneye ASIC for Fibre Channel Switching
Port Status LEDs	16 LEDs (green/amber) to indicate status for each port
Link Speed LEDs	16 LEDs (green/amber) to indicate link speed for each port
System Power LED	One LED (green) to indicate system power

Table 4-1   System Specifications (Continued)

Specification	Description
System Status LED	One LED (green/amber) to indicate system status
Ethernet LEDs	Two Ethernet LEDs to indicate speed and link status
Power supply	One fixed power supply (not a FRU)
Fans	Three fixed fans operating at dual speeds (not a FRU). RPM data are not available for these fans.
FC-IP (IP over Fibre Channel)	Complies with FC-IP 2.3 of FCA profile
Aggregate switch I/O bandwidth	128 Gbit/sec if all 16 ports running at 4 Gbit/sec, full duplex
Port-to-port latency	Less than 2 microseconds with no contention (destination port is free)
EMC (electromagnetic compatibility)	Emissions An operating SilkWorm 200E conforms to the emissions requirements specified by the following regulations: • FCC Rules & Regulations, Part 15 subpart B, Class A • CSA C108.8 Class A • VCCI Class A ITE • CISPR 22 Class A • EN55022 Class A • Korean EMC Requirements • BSMI Standard CNS 13438 • EMC Directive 89/336/EEC • EN50082-2/EN55024: 1998 • ICES-003 Class A Immunity • IEC 61000-4-2 Severity Level 3 for Electrostatic Discharge • IEC 61000-4-3 Severity Level 3 for Radiated Fields • IEC 61000-4-4 Severity Level 3 for Fast Transients • IEC 61000-4-5 Severity Level 3 for Surge Voltage • IEC 61000-4-6 Conducted Emissions • IEC 61000-4-11 Voltage Variations • EN 61000-4-12 Oscillatory Waves Immunity • EN 61000-3-2 Limits for Harmonic Current Emissions • EN 61000-3-3 JEIDA

Power Supply Specifications

The power supply is universal and capable of functioning worldwide without using voltage jumpers or switches. It meets IEC 61000-4-5 surge voltage requirements and is autoranging in terms of accommodating input voltages and line frequencies. The power supply has its own built-in fan for cooling, pushing the air toward the port side of the switch. The power supply is not removable.

Table 4-2 lists the power supply specifications for the SilkWorm 200E.

Table 4-2   SilkWorm 200E Power Supply Specifications

Specification	Value
Outlet	Correctly wired and earth-grounded
Maximum output from the power supply	75 watts, with fans operating
Maximum system power consumption	50 - 65 watts (depending on SFP vendor)
Input voltage	100 - 240 VAC (nominal 80% efficiency), autoranging
Input line frequency	47 - 63 Hz
Harmonic distortion	Active power factor correction per IEC1000-3-2
BTU rating	266 BTU
Inrush current	25A, each line input
Input line protection	Fused in both hot and neutral lines

Data Transmission Ranges

Table 4-3 provides the data transmission ranges for different cable types and port speeds.

Table 4-3   Data Transmission Ranges

Port Speed	Cable Size (microns)	Short Wavelength (SWL)	Long Wavelength (LWL)
1 Gbit/sec	50	1,640 ft (500 m)	NA
	62.5	984 ft (300 m)	NA
	9	NA	10 km (6.2 mi)
2 Gbit/sec	50	984 ft (300 m)	NA
	62.5	492 ft (150 m)	NA
	9	NA	10 km (6.2 mi)
4 Gbit/sec	50	492 ft (150 m)	NA
	62.5	230 ft (70 m)	NA
	9	NA	10 km (6.2 mi)

Up to 500km at 1G is supported when using long distance transport system such as DWDM.

Fibre Channel Port Specifications

The Fibre Channel ports in the SilkWorm 200E are compatible with SWL, and LWL SFPs. The strength of the signal is determined by the type of SFP in use.

The ports are capable of operating at 1, 2, and 4 Gbit/sec, and are able to autosense the highest speed capable for all attached devices.

The ports meet all required safety standards. For more information about these standards, see "Regulatory Compliance" on page 4-5.

Serial Port Specifications

The serial port is located on the port side of the switch. It is a three-wire RS-232 port with a DB-9 male connector, designed to connect to a DTE port.

Use the serial port to connect to a computer workstation to configure the switch IP address without connecting to the fabric. The serial port's parameters are 9600 baud, 8 data bits, no parity, 1 stop bit, and no flow control.

The port requires a straight (extension) serial cable with a female 9-pin subminiature-D connector. Only pins 2, 3, and 5 are supported.

> **Note**
>
> To provide dust and ESD protection, keep the safety plug in the serial port when the port is not in use.

Supported SFPs and HBAs

When you receive the SilkWorm 200E, your package contains a set of 16 qualified SFPs. These SFPs have been tested and are known to work with the SilkWorm 200E. Use only SFPs that are tested and supported.

For the most up to date list of supported SFPs and HBAs for the SilkWorm 200E, check Brocade Connect. Using a web browser, connect to *www.brocade.com* and click on the Brocade Connect link.

Regulatory Compliance

This section describes the regulatory compliance requirements for the SilkWorm 200E. It contains:

- "FCC Warning (US only)," next
- "MIC Statement (Republic of Korea)" on page 4-6
- "VCCI Statement" on page 4-6
- "BSMI Statement (Chinese)" on page 4-7
- "CE Statement" on page 4-7
- "Canadian Requirements" on page 4-8
- "Laser Compliance" on page 4-8
- "RTC Battery" on page 4-8
- "Electrical Safety" on page 4-8
- "Regulatory Certifications" on page 4-9

FCC Warning (US only)

This equipment has been tested and complies with the limits for a Class A computing device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, might cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at the user's own expense.

MIC Statement (Republic of Korea)

사용자 안내문 : A 급기기

이 기기는 업무용으로 전자파 적합 등록을 받은 기기
이오니, 판매자 또는 사용자는 이점을 주의하시기
바라며, 만약 잘못 구입하셨을 때에는 구입한 곳에
서 비업무용으로 교환하시기 바랍니다.

VCCI Statement

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance might arise. When such trouble occurs, the user might be required to take corrective actions.

　この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準
に基づくクラス A 情報技術装置です。この装置を家庭環境で使用すると電波
妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ず
るように要求されることがあります。

BSMI Statement (Chinese)

BSMI 通告（僅限於台灣）

大多數的 Dell 電腦系統被 BSMI（經濟部標準檢驗局）劃分為乙類數位裝置。但是，使用某些選件會使有些組態的等級變成甲類。若要確定您的電腦系統適用等級，請檢查所有位於電腦底部或背面板、擴充卡安裝托架，以及擴充卡上的 BSMI 註冊標籤。如果其中有一甲類標籤，即表示您的系統為甲類數位裝置。如果只有 BSMI 的檢驗號碼標籤，則表示您的系統為乙類數位裝置。

一旦確定了系統的 BSMI 等級，請閱讀相關的 BSMI 通告。請注意，BSMI 通告規定凡是未經 Dell Inc.
明確批准的擅自變更或修改，將導致您失去此設備的使用權。

此裝置符合 BSMI（經濟部標準檢驗局）的規定，使用時須符合以下兩項條件：

• 此裝置不會產生有害干擾。

• 此裝置必須能接受所接收到的干擾，包括可能導致無法正常作業的干擾。

甲類

此設備經測試證明符合 BSMI（經濟部標準檢驗局）之甲類數位裝置的限制規定。這些限制的目的是為了在商業環境中使用此設備時，能提供合理的保護以防止有害的干擾。此設備會產生、使用並散發射頻能量；如果未遵照製造廠商的指導手冊來安裝和使用，可能會干擾無線電通訊。請勿在住宅區使用此設備。

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

乙類

此設備經測試證明符合 BSMI（經濟部標準檢驗局）之乙類數位裝置的限制規定。這些限制的目的是為了在住宅區安裝時，能防止有害的干擾，提供合理的保護。此設備會產生、使用並散發射頻能量；如果未遵照製造廠商的指導手冊來安裝和使用，可能會干擾無線電通訊。但是，這並不保證在個別的安裝中不會產生干擾。您可以透過關閉和開啟此設備來判斷它是否會對廣播和電視收訊造成干擾；如果確實如此，我們建議您嘗試以下列一種或多種方法來排除干擾：

• 重新調整天線的接收方向或重新放置接收天線。

• 增加設備與接收器的距離。

• 將設備連接至不同的插座，使設備與接收器連接在不同的電路上。

• 請向經銷商或有經驗的無線電／電視技術人員查詢，以獲得幫助。

CE Statement

⚠ **Caution**
This is a Class A product. In a domestic environment, this product might cause radio interference, and the user might be required to take corrective measures.

The standards compliance label on the SilkWorm 200E contains the CE mark which indicates that this system conforms to the provisions of the following European Council directives, laws, and standards:

• Electromagnetic Compatibility (EMC) Directive 89/336/EEC and the Complementary Directives 92/31/EEC and 93/68/EEC

• Low Voltage Directive (LVD) 73/23/EEC and the Complementary Directive 93/68/EEC

- EN50082-2/EN55024:1998 (European Immunity Requirements)
  - EN61000-3-2/JEIDA (European and Japanese Harmonics Spec)
  - EN61000-3-3

Canadian Requirements

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations, ICES-003 Class A.

Laser Compliance

This equipment contains Class 1 laser products and complies with FDA Radiation Performance Standards, 21 CFR Subchapter I and the international laser safety standard IEC 825-2.

Caution
Use only optical transceivers that are qualified by Brocade Communications Systems, Inc. and comply with the FDA Class 1 radiation performance requirements defined in 21 CFR Subchapter I, and with IEC 825-2. Optical products that do not comply with these standards might emit light that is hazardous to the eyes.

RTC Battery

Caution
Do not attempt to replace the real-time clock (RTC) battery. There is danger of explosion if the battery is incorrectly replaced or disposed of. Contact your switch supplier if the real-time clock begins to lose time.

Electrical Safety

Caution
This switch might have more than one power cord.To reduce the risk of electric shock, disconnect both power cords before servicing.

Caution
Connect the power cord only to a grounded outlet.

Caution
This product is designed for an IT power system with phase-to-phase voltage of 230V. After operation of the protective device, the equipment is still under voltage if it is connected to an IT power system.

Regulatory Certifications

Table 4-4 lists the safety and EMC (electromagnetic compatibility) specifications for which the SilkWorm 200E is certified.

Table 4-4   EMC Certifications

Country	Safety Specification	EMC Specification
Canada	CSA 22.2 No. 60950 Third Ed.	CSA 108.8 Class A
United States	UL 60950 Third Ed., Info. Tech. Equip.	EN55022 Class A FCC Part 15, Subpart B (CFR title 47), Class A
Japan	IEC 60950+A1+A2+A3+A4+A11	EN55022 Class A EN 61000-3-2 Harmonics (JEIDA Limits)
International	IEC 60950+A1+A2+A3+A4+A11	EN55022 Class A
European Union (Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, The Netherlands, United Kingdom) and Republic of Korea	EN 60950:92 +A1:93+A2:93+A3:95+A4:96+A11:97 73/23/EEC EN60825-1:1994/A11, -2 TUV (Germany only) IEC 60950+A1+A2+A3+A4+A11 (NEMKO CB Report) (Norway only)	EN 55022:1998 Class A EN 55024 (Immunity) EN 61000-4-2 Electrostatic Discharge EN 61000-4-3 Radiated Fields EN 61000-4-4 Electrical Fast Transients EN 61000-4-5 Surge Voltage EN 61000-4-6 Conducted Emissions EN 61000-4-8 Magnetic Fields EN 61000-4-11 Voltage Dips and Interruptions EN 61000-3-2 Limits for Harmonic Current Emissions EN 61000-3-3 Flicker
Australia and New Zealand		EN 55022: 1998 Class A

Index

regulatory certifications 4-9

regulatory compliance 4-5

removing an SFP 3-10

RTC battery 4-8

S

serial port specifications 4-4

SilkWorm 200E features 1-1

SilkWorm 200E FRU units 3-7

supported fabric configurations 1-4

supported optional features 1-5

supported SFPs and HBAs 4-5

system specifications 4-1

system status LEDs 3-3

U

unsupported features 1-6

V

VCCI statement 4-6

W

weight and physical dimensions 1-3