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SCSI-Fibre Channel Router

Support Handbook

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Related Publications

- SCSI-Fibre Channel Router Installation and User Guide (310-605846), revision 1.0.2 to present.

SCSI-Fibre Channel Router Revision History

Host Microcode Version	Device Microcode Version	Date	Document
7.60	2.04	9/99	Release

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1. Introduction

This support handbook is broken into three basic sections. The first section is for troubleshooting problems that occur during a first time installation of the SCSI Extender. Its layout is designed to walk the user through the installation process. If any problems occur during the installation, they are directed to other troubleshooting areas for immediate remedy.

The second section is for SCSI Extender systems that have been running successfully in the past but have now encountered a problem. The user will be directed through a series of steps until the problem is ascertained and then corrected.

The third section handles all specifications, and basic operations for each building block of the SCSI Extender system. The building blocks include the SCSI-FC Routers, the cabling (both SCSI and optical) and the installation and utilization of the serial port and its associated software.

1.2. SCSI-FC Router Defined

There are two SCSI-FC Routers in a single Fibre Channel loop. To prevent confusion, the following diagram defines the various SCSI-FC Routers by their positions within the loop. The SCSI-FC Router directly attached to the host or the server is the 'host router' and the SCSI-FC Router directly connected to the device (disk or tape drives) is the 'device router'.
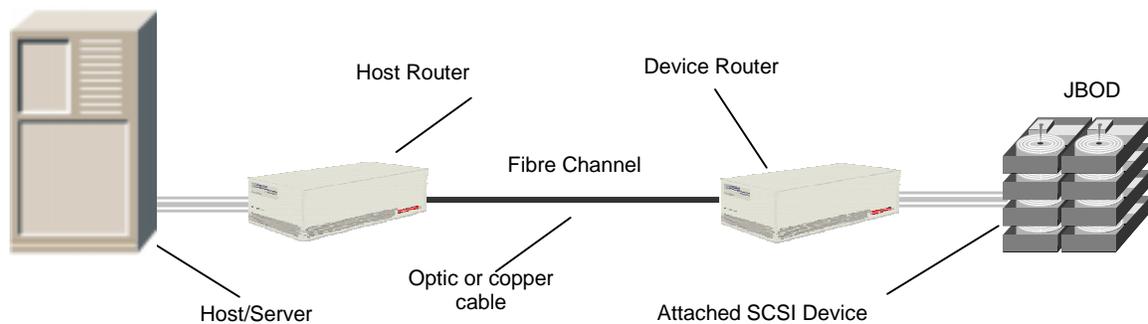
Figure 1-1. SCSI-FC Routers Defined

2. Installation Troubleshooting

2.1.   Step One: Check Microcode

1. Ensure the user has the latest SCSI-FC Router microcode.
   - To check the SCSI-FC Router microcode using the serial port, see section 6.2.5 Display VPD. See section 6.2.5.1 About - Display VPD, item 2 to determine microcode location on the VPD screen.
   - To check the SCSI-FC Router microcode using the router LEDs, see 4.2.2 Checking Microcode Revision .
2. To determine and/or download the latest SCSI-FC Router microcode, follow the steps below:
   a) Go to Vicom's web page http://www.vicom.com
   b) Click the **Service and Support** button.
   c) Go to the **Software Download** section at the bottom of the Service and Support page.
   d) Click the Controllers/Serial disk link. This will open the **Controller/Serial disk** page as displayed in Figure 2-1.
3. Save the correct microcode to a hard or floppy disk.
4. Next download the saved microcode to the appropriate router (see section 6.2.9 'H': Download SCSI-FC Router Microcode).

> ***Controllers/Serial Disk***
> SCSI-FC (host) Router (SCSI Extender) U7_760.ima 182kb
> SCSI-FC (device) Router (SCSI Extender) T7_204.ima 169kb
> UltraLink 2000: u3_726.ima 317kb
> UltraLink 2000i: u3_726.ima 317kb
> UltraLink 1000: u3_7_4.ima 227kb
> SLIC 1355: r2_6_8.ima 179kb
> 7190-200: u3_7_2.ima 226kb
> 7190-100: r2_6_8.ima 179kb
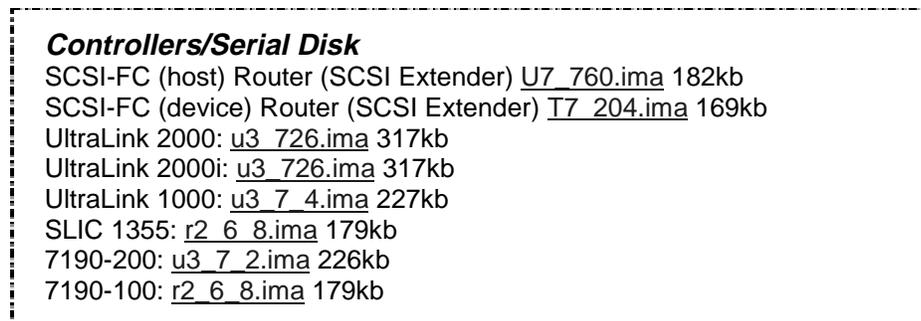
Figure 2-1. Vicom's Microcode Download Web Page

2.2.   Step Two: Ensure Attached Device(s) Function(s) Properly

Refer to the SCSI device's operating manual and ensure that it is functioning properly. The SCSI device(s) will be the device(s) (disk or tape drives) attached to the device router (see Figure 1-1).

2.3.   Step Three: Setup Device Router

1. Choose one of SCSI-FC Routers to be the device router, as defined in section 1.2 of this manual and as shown in Figure 1-1. (Either router may be used as the device router.)
2. Ensure that the device router and the SCSI device(s) to be attached are powered off.
3. On the device router set all DIP switches on switch one (SW1) to the down position. ▪▪▪▪▪▪▪▪
   - To locate switch one (SW1), see Figure 3-2.
4. Set the disk or tape mode on the device router as described below. For further information on mode settings, see section 4.2.
   - If the device(s) being attached is (are) SCSI drives then on one of the SCSI-FC Routers, set DIP switch 7 in the down position on switch 2 (SW2) to activate the disk mode. ▪▪▪▪▪▪▪▪
   - If the device(s) being attached is (are) SCSI tape drives then on one of the SCSI-FC Routers, set DIP switches 1 and 7 in the down position on switch 2 (SW2) to activate the tape mode. ▪▪▪▪▪▪▪▪

5. Attach the device router to the desired SCSI device(s) as shown in Figure 2-2 below. Ensure that cable and connectors are securely fastened.
   - To locate the SCSI-FC Router SCSI connector, see Figure 3-2.
   - To ensure proper cable specifications, see section 5.2.
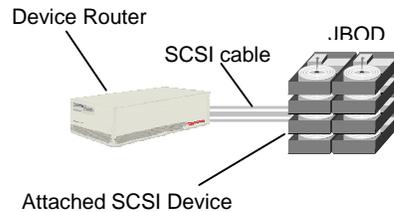
Figure 2-2 Example of Step Three Completed

2.4.   Step Four: Clear the Node Mapping Table of the Host Router

Clear the Node Mapping Table of the other SCSI-FC Router (this will be used as the host router). See section 4.2.5 Clearing the Node Mapping Table Mode.

2.5.   Step Five: Setup Host Router

1. Ensure that the host router is powered off.
2. On the host router set all DIP switches on switch one (SW1) to the down position.
   - To locate switch one (SW1), see Figure 3-2
3. Attach the host router to the device router with the appropriate copper or fiber optic cable. Ensure that cable and connectors are securely fastened.
   - To ensure proper cable specifications, see section 5.4.
4. At this point the host/server should not be attached as shown below in Figure 2-3.
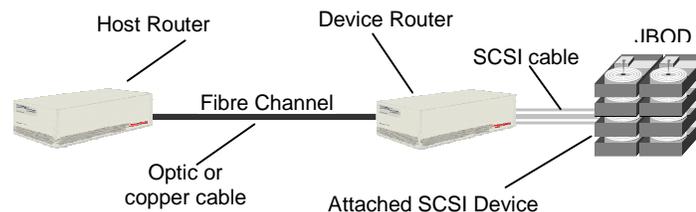
Figure 2-3. Example of Step Five Completed

2.6.   Step Six: Run Connection Check

To check the connection between the two SCSI-FC Routers, run the connection check. See section 4.2.3 Running the Connection Check Mode.

2.7.   Step Seven: Run Subsystem Device Check

To check the connection from the host router to the attached SCSI device, run subsystem check. See section 4.2.4 Running the Subsystem Device Check Mode.

Note: If the device check test fails after passing the connection check test in section 2.6 then the communication problem is between the device router and the attached SCSI device(s).

2.8.   Step Eight: Set Normal Operating Modes

1. Power off the host router.
2. On the host router, set DIP switches 0 and 2 on switch two (SW2) to the down position to activate the host operating mode.
3. Attach the host router to the host/server with the appropriate SCSI cable. Ensure that cable and connectors are securely fastened.
   - To ensure proper cable specifications, see section 5.2.
4. The configuration should match the diagram in Figure 1-1.

2.9.   Step Nine: Power Down Sequence

1. Power off the host/server if on.
2. Power off the host router if on.
3. Power off the device router if on.
4. Power off the SCSI device(s) if on.
5. Proceed to Step Ten: Power Up Sequence if all devices are powered down.

2.10. Step Ten: Power Up Sequence

1. Power on the attached SCSI device(s). If disk drives allow spin up time to complete (maximum 2 minutes).
2. Power on the device router.
3. When the LEDs stop blinking on the device router, power on the host router.
4. When the LEDs stop blinking on the host router, power on the host/server.
5. When this procedure has been successfully completed the host router Status LED (see Table 3-1. SCSI-FC Router LED) should be Solid On to indicate a complete loop.
6. Ensure the host sees all the device(s) on the device router's SCSI bus by forcing a SCSI I/O scan. Refer to the host's manual for further information if necessary.

   Example:
   ```
   ISL>help
   ISL>ode                  (offline diagnostic environment)
   ODE>mapper
   Mapper>run
           10    I/O adapter
           10/16          Upper Bus Converter
           10/16/12          HP-PB Fast Wide SCSI
           10/16/12.0.0   Seagate ST34571WC
           10/16/12.1.0   IBM DGH509y
           10/16/12.2.0   Quantum DLT-7000 Tape Drive
           10/16/12.3.0
           10/16/12.4.0
           10/16/12.5.0
           …
           10/16/12.15.0
           . . . . .
   mapper>exit
   ode>exit
   ISL>start norecovery group=config
   ```

   NOTE: The Host router will respond to all SCSI target INQUIRES without a SCSI device being configured as demonstrated in the above ODE listing. Make sure you see the product ID's from the SCSI device(s) being displayed.

7. If the host has seen all the device(s) on the device router, then the installation is successful and normal operation may begin.

3. Run Time Troubleshooting

3.1. Step One: Stop I/O Operations

- Stop all running applications to the storage subsystem. This will ensure that all data transfers (I/O operations) to the storage system have been stopped.
- Toggle the SCSI-FC Router's power switch.

3.2. Step Two: Ensure Proper Operating Mode

Ensure that both SCSI-FC Routers are in their proper operating mode before beginning.

- For the host router, see section 4.2.1 Setting Host Router Operating Mode .
- For the device router with disk drive(s) attached, see section 4.2.6 Setting SCSI-FC Router Disk Mode.
- For the device router with tape drive(s) attached, see section 4.2.7 Setting SCSI-FC Router Tape Mode.

3.2.1. Step Three: Check SCSI-FC Router LEDs

 Are the SCSI-FC Router's status LED (green) and the power LED (green) solid-on and the fault LED (yellow) off. (For LED location, see Figure 3-1 and Figure 3-2).

- **Yes:** Go to Step 5 (section 3.3)
- **No:** Go to the next question, below.

 Do the LEDs match any of the descriptions in Table 3-1. SCSI-FC Router LED?

- **Yes:** In the row that matches the SCSI-FC Router's LED display, go to the last column labeled 'Go to Section' and go the section listed.
- **No:** Go to step 5, section 3.3.

MASTER SCSI-FC ROUTER				
Power LED (Green)	**Status LED (Green)**	**Fault LED (Yellow)**	**Description**	**Go to Section**
Off	Off	Off	No Power	3.2.2
Solid On	Fast Blink	Off	Web Walk (Normal Condition)	3.2.3
Solid On	Blinks Code	Solid On	Status Codes for Fault LED	Table 4-2
Slow Blink (LED is On 90% and Off 10%)			**Steady Blink** (LED is ON 50% and Off 50%)	

Table 3-1. SCSI-FC Router LED
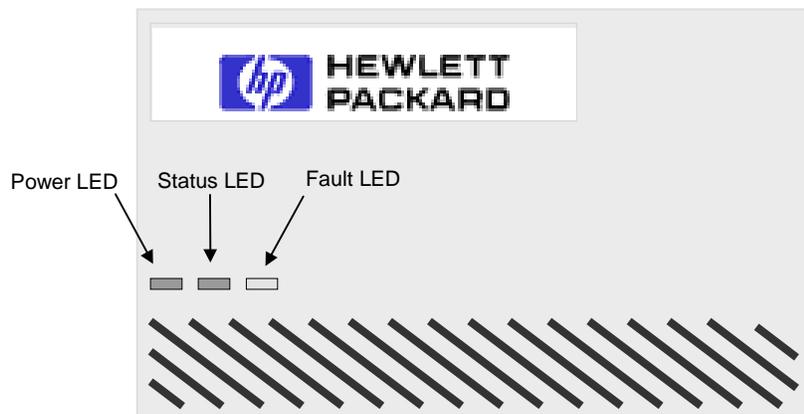
Figure 3-1. SCSI-FC Router Front Panel
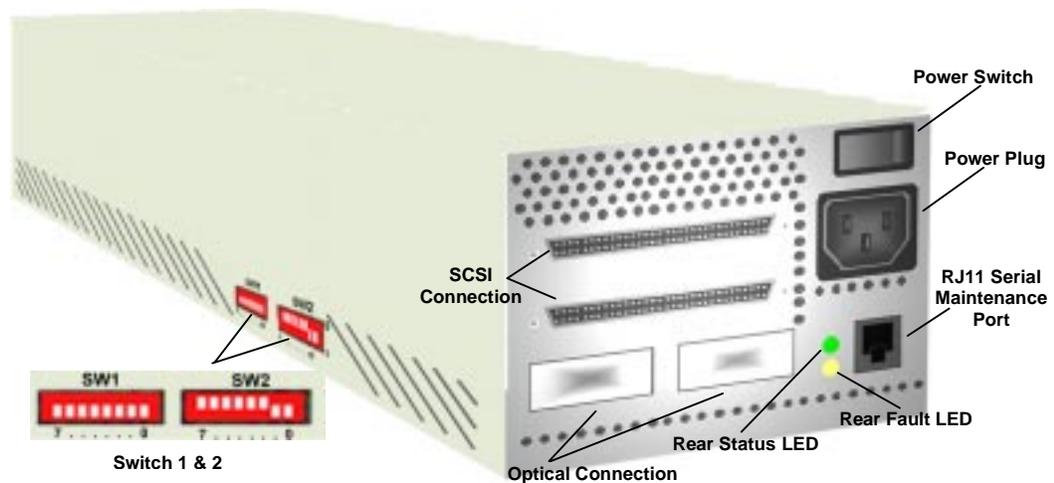
Figure 3-2. SCSI-FC Router Rear Panel

3.2.2.   Power LED - Not Lit

This indicates that there is no power to the SCSI-FC Router.

1. Ensure an AC plug is connected to a working wall outlet and the other end is connected to the SCSI-FC Router unit.
2. Ensure the power switch is in the on position (1 represents on and 0 represents off).
    *   See Figure 3-2. SCSI-FC Router Rear Panel for power switch location.
3. If LED is still not lit then turn off unit and replace the power cable.
4. If LED is still not lit then recycle the SCSI-FC Router's power.
5. If LED is still not lit then replace the SCSI-FC Router unit.
    *   Go to section 4.4.1 Replacing a SCSI-FC Router.
6. After replacing the unit and the problems persist, contact your SCSI-FC Router vendor.

3.2.3.   Status LED (green) - Fast Blink

This is a normal condition. However, it is not a normal condition if the web walk last longer than 10 seconds or if it happens frequently (once an hour).

1. If conditions continue then toggle the power switch.
    *   See Figure 3-2 for power switch location if necessary.
2. If the status LED is still blinking fast after the power switch is toggled then run a connection check.
    *   Go to section 4.2.3 to Running the Connection Check Mode.
3. If the status LED is still blinking fast and no error was found after running the connection check then run a subsystem check.
    *   Go to section 4.2.4 to Running the Subsystem Device Check Mode.
4. If the status LED is still blinking fast and no error was found after running the subsystem device check then replace the SCSI-FC Router.
    *   Go to section 4.4.1 Replacing a SCSI-FC Router.
5. After replacing the unit and the problems persist, contact your SCSI-FC Router vendor.

3.3.   Step Four: Define Other Symptoms

3.3.1.   Host Operating System Can Not Boot

A SCSI ID conflict with the host may be possible.
- Verify that the SCSI-FC Router has not been connected to an internal SCSI bus.

3.3.2.   The SCSI-FC Router Web Walks too Often

1. There may be a problem with SCSI cabling. Ensure all the requirements have been met (see section 5.2 SCSI Cabling)
2. There may be a problem with SCSI termination. Ensure all the requirements have been met (see section 5.2 SCSI Cabling and 5.3 SCSI Termination).
3. A SCSI target ID conflict is possible.
   - Refer to host adapter documentation for further information.
   - Ensure Switch 1 (SW1) is set properly (see section 4.1 Switch 1 (SW1) SCSI ID Settings.)
4. A possible host problem can be a defective SCSI cable between the host PC and the SCSI-FC Router unit.
   - Check the SCSI connection and connector (see section 5.1 Check Cabling and Connectors)
5. Another possible host problem is a defective SCSI Host Bus Adapter.
   - To ensure that the SCSI host adapter is working properly, attach a known good SCSI device to the adapter. If it works then it is probably not the SCSI adapter or the cable used that is causing the problem. If it doesn't work then replace the SCSI host adapter.
6. The SCSI interface of the SCSI-FC Router unit may be defective. Replace the SCSI-FC Router. (see section 4.4.1 Replacing a SCSI-FC Router to replace a SCSI-FC Router).
7. If problems persist, contact your SCSI-FC Router vendor.

3.3.3.   Host Computer Does Not Detect Any of the Devices

1. Some host systems require a two-minute delay after powering up the storage subsystem.
   - Wait two minutes after powering up drives and SCSI-FC Router before powering up the host.
2. There may be a problem with SCSI cabling. Ensure all the requirements have been met (see section 5.2 SCSI Cabling).
3. There may be a problem with SCSI termination. Ensure all the requirements have been met (see section 5.2 SCSI Cabling and 5.3 SCSI Termination).
4. A SCSI target ID conflict is possible.
   - Ensure that the SCSI controller (host adapter) is set to use SCSI ID 7. (Refer to host adapter documentation for further information.)
   - Ensure dip switch 1 (SW1) is set properly (see section 4.1 Switch 1 (SW1) SCSI ID Settings).
5. A possible host problem can be a defective SCSI cable between the host PC and the SCSI-FC Router unit.
   - Check the SCSI connection and connector (see section 5.1 Check Cabling and Connectors).
6. Another possible host problem is a defective SCSI Host Bus Adapter.
   - To ensure that the SCSI host adapter is working properly, attach a known good SCSI device to the adapter. If it works then it is probably not the SCSI adapter or the cable used that is causing the problem. If it doesn't work then replace the SCSI host adapter.
7. The SCSI interface of the SCSI-FC Router (see section 4.4.1 to replace a SCSI-FC Router).
8. If problems persist, contact your SCSI-FC Router vendor.

3.3.4.   Host Computer Detects Some of the Devices

1. Some host systems require a two-minute delay after powering up the subsystem.
   - Wait two minutes after powering up drives and SCSI-FC Router before powering up the host.
2. There may be a problem with SCSI cabling. Ensure all the requirements have been met (see section 5.2 SCSI Cabling).
3. There may be a problem with SCSI termination. Ensure all the requirements have been met (see section 5.2 SCSI Cabling and 5.3 SCSI Termination).
4. A SCSI target ID conflict is possible.
   - Ensure that the SCSI controller (host adapter) is set to use SCSI ID 7. (Refer to host adapter documentation for further information.)
5. If the problem continues, ensure that the only other SCSI device connected to the host adapter is a single SCSI-FC Router controller.
6. If problems persist, contact your SCSI-FC Router vendor.

4. SCSI-FC Router

4.1.   Switch 1 (SW1) SCSI ID Settings

On both of the SCSI-FC routers, all the DIP switches on switch one (SW1) should be down. ▮▮▮▮▮▮▮▮

4.2.   Switch 2 (SW2) SCSI-FC Router Mode Switches

The SCSI-FC Router mode is selected by utilizing the DIP switches in SW2 (for SW2's location, see Figure 3-2. SCSI-FC Router Rear Panel). The SCSI-FC Router power must be cycled to effect a change in mode. The first four DIP switches are independent of the other DIP switches on switch 2 (SW2).

- DIP switch 4 and 5 are independent of all other DIP switches on SW2 and activate the Connection Check or the Subsystem Device Check. And when activated simultaneously they clear the node mapping table.
- DIP switch 6 is not used at this point.

Mode	Switch 7	Switch 6	Switch 5	Switch 4	Switch 3	Switch 2	Switch 1	Switch 0	DIP Switch Setting
Host Router	0	0	0	0	0	1	0	1	▮▮▮▮▮ ▮▮
Host Microcode Revision	0	0	0	0	1	1	0	1	▮▮▮▮ ▮▮▮
Device Microcode Revision	1	0	0	0	1	1	0	1	▮▮▮ ▮▮▮
Connection Check	0	0	0	1	0	0	0	0	▮▮▮ ▮▮▮▮
Device Check	0	0	1	0	0	0	0	0	▮▮ ▮▮▮▮▮
Clear Mapping Table	0	0	1	1	0	0	0	0	▮▮ ▮▮ ▮▮▮▮
Disk Mode	1	0	0	0	0	0	0	0	▮▮▮▮▮▮▮▮
Tape Mode	1	0	0	0	0	0	0	1	▮▮▮▮▮▮▮
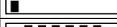
Table 4-1. DIP Switch Settings for Mode Selection

4.2.1.   Setting Host Router Operating Mode

1. Ensure power is off to the router that will be used as the host router.
2. On the host router, set host operating mode on switch two (SW2). ▮▮▮▮▮ ▮▮
3. Power on the router.
4. The router is now set to function as a host router.

4.2.1.1.   About – Host Router Operating Mode

This is the normal operating mode of the host SCSI-FC Router. The host router connects directly to the host/server and to the device router as depicted in Figure 1-1. SCSI-FC Routers Defined. Two host routers can not exist simultaneously on the same serial loop.

4.2.2.   Checking Microcode Revision

1. Power off the SCSI-FC Router.
2. Set switch two (SW2).
   - If user is checking the host router microcode, set SW2 to the Host Microcode Revision mode. ▮▮▮▮ ▮▮ ▮
   - If user is checking the device router microcode, set SW2 to the Device Microcode Revision mode. ▮▮▮▮ ▮▮ ▮
3. Power on the SCSI-FC Router.
4. Watch the blinking pattern of the Status LED (see section 4.3.1 to decipher the LED readout).
5. After revision level is determined, power off the router, return it to its proper operating mode and power it on.

4.2.2.1. About - Microcode Revision Mode

In this mode, the SCSI-FC Router microcode revision level will be presented as a status code on the Status LED. The microcode revision is a three digit number. A decimal separates the first digit from the second. See section 4.3.1 to decipher the LED readout.

- *Example: Revision number 7.60*

4.2.3. Running the Connection Check Mode

1. Power off the host router.
2. Power on the SCSI device(s). If disk drives then allow spin up time to complete (maximum 2 minutes).
3. Power on the device router.
   - The power LED (green) is solid on. If the power LED is off then see section 3.2.2 Power LED - Not Lit.
4. On the host router, set DIP switch 4 in the down position on switch 2 (SW2) to activate the Connection Check mode. ▪▪▪▪▪▪▪▪
   - This will check the Fibre Channel connection between the two routers.
5. Power on the host router.
   - The power LED (green) is solid on. If the power LED is off then see section 3.2.2 Power LED - Not Lit.
6. The testing process will take approximately 1 minute. When the test has completed the status LED and the fault LED will display one of two possible formats.
   - If the Status LED (green) is solid on and the Fault LED (yellow) is off then the Fibre Channel connection is good.
   - If the Fault LED (yellow) is solid on and the Status LED (green) is blinking then this indicates a problem with the Fibre Channel connection. Check this connection following the process in section 5.1.

4.2.3.1. About - Connection Check Mode

This will check the Fibre Channel connection between the SCSI-FC Routers. In this mode, the host router will perform a test to ensure that communication to the device router is operating correctly. If communication can not be established or if a high number of errors are reported then the test will fail.

4.2.4. Running the Subsystem Device Check Mode

1. Power off the host router.
2. Set DIP switch 5 on switch two (SW2) in the down position to activate the Device Check mode.
   - This will check the communication between the SCSI-FC Routers and the attached SCSI device(s). ▪▪▪▪▪▪▪▪
3. Power on the host router.
   - The power LED (green) is solid on. If the power LED is off then see section 3.2.2 Power LED - Not Lit.
4. The testing process will take approximately 1 minute. When the test has completed the status LED and the fault LED will display one of two possible formats.
   - If the Status LED (green) is solid on and the Fault LED (yellow) is off then the connection from the host router to the SCSI device(s) is good.
   - If the Fault LED (yellow) is solid on and the Status LED (green) is blinking then this indicates a communication problem between the device router and the SCSI device(s). Check this connection following the process in section 5.1.

   Note: If the device check test fails after passing the connection check test in section 4.2.3 then the communication problem is between the device router and the attached SCSI device(s).

4.2.4.1.   About - Subsystem Device Check Mode

In this mode, the host router will talk to the SCSI devices (disk or tape drives) attached to the device router ensuring that proper communication is established.

4.2.5.   Clearing the Node Mapping Table Mode

1. Power off the host router.
2. If connected then disconnect the host router from the device router.
3. On the host router, set DIP switches 4 and 5 in the down position on switch 2 (SW2) to clear the Node Mapping Table.
4. Power on the host router.
   - The power LED (green) is solid on. If the power LED is off then see section 3.2.2 Power LED - Not Lit.
5. When the Fault LED (yellow) is solid on and the Status LED (green) is blinking, it indicates that the Node Mapping Table is cleared.
   - To locate the Fault LED, see Figure 3-1. SCSI-FC Router Front Panel or Figure 3-2. SCSI-FC Router Rear Panel.

   Note: When the Node Mapping Table has been cleared the Status LED (green) blinks a status code of 060 as described in the status code table (see Table 4-2. Diagnostic Status Codes for Fault LED). To decipher the LED read-out, see section 4.3.1.

6. The process will take approximately 10 seconds.
7. Power off the host router, set the host mode, and reconnect it to the device router.
8. When powered on the host router will resume normal operations.

4.2.5.1.   About – Node Mapping Table Mode

The host SCSI-FC Router contains a table of all the nodes on the Fibre Channel and their corresponding IDs. In this mode the SCSI-FC Router will clear this table enabling a new map to be established.

4.2.6.   Setting SCSI-FC Router Disk Mode

1. Power off the device router. (Either router can be used as the device router).
2. Set DIP switch 7 in the down position on switch 2 (SW2) to activate the disk mode.
   - This will be used as the device router (see Figure 1-1).
3. Power on the device router.
4. The SCSI-FC Router is now set as device router.

4.2.6.1.   About - SCSI-FC Router Disk Mode

This is the normal operating mode of the device SCSI-FC Router when SCSI disk drives are attached. The device router connects directly to the host router and to the attached SCSI device (disk or tape drive) as depicted in Figure 1-1. SCSI-FC Routers Defined. Two device routers can not exist simultaneously on the same serial loop.

4.2.7.   Setting SCSI-FC Router Tape Mode

1. Power off the device router. (Either router can be used as the device router).
2. Set DIP switch 1 and DIP switch 7 in the down position on switch 2 (SW2) to activate the tape mode.
   - This will be used as the device router (see Figure 1-1).
3. Power on the device router.
4. The SCSI-FC Router is now set as device router.

4.2.7.1. About - SCSI-FC Router Tape Mode

This is the normal operating mode of the device SCSI-FC Router when SCSI tape drives are attached. The device router connects directly to the host router and to the attached SCSI device as depicted in Figure 1-1. SCSI-FC Routers Defined. Two device routers can not exist simultaneously on the same serial loop.

4.3. LED

4.3.1. Read a Numerical Presentation Through the LED

Both status codes and error codes are digital numbers represented through the blinking LED. The presentation of digital numbers is as follows:

Numerical Digits

0 = short, fast blink
1 = LED blinks once
2 = LED blinks twice with one short duration between blinks
3 = LED blinks 3 times with one short duration between each blink (two total) and so on...

Example of numeric presentation 060

Rapid/fast blink	Medium Duration 2-seconds	Blinks 6 times (Short duration between each blink)	Medium Duration 2-seconds	Rapid/fast blink
0	OFF	6	OFF	0

Long Duration   4 - Seconds
OFF

Rapid/fast blink	Medium Duration 2-seconds	Blinks 6 times (Short duration between each blink)	Medium Duration 2-seconds	Rapid/fast blink
0	OFF	6	OFF	0

4.3.1.1. LED Status Code Table

User Serviceable Diagnostic Status Codes		
Status Code	Description	Action
006	Too many SCSI errors recorded.	Check all connections and/or replace the SCSI cables with *"known-good"* shielded SCSI cables. User must cycle the power to clear any lockup cases that the defective cables may have caused.
058	The SCSI-FC Router detected an SSA Unique ID duplication in the same loop.	Contact Hewlett Packard for replacement SCSI-FC Router.
060	The SCSI-FC Router has completed clearing the Node Mapping Table.	
068	An illegal operating mode has been used.	Return to the proper operating mode and recycle power on the SCSI-FC Router (see section 4.2.1 or 4.2.6).

Table 4-2. Diagnostic Status Codes for Fault LED

4.4.   SCSI-FC Router Replacement

4.4.1.   Replacing a SCSI-FC Router

1. Power off the SCSI-FC Router being replaced and the SCSI-FC Router that will replace it.
2. Set switch one and two (SW1 and SW2) on the new SCSI-FC Router to match the switch settings on the (old) SCSI-FC Router that is being replaced.
3. Swap each of the old connections from the replacement (old) SCSI-FC Router to the new SCSI-FC Router. Ensure that all cables and connector are securely fastened.
4. Power on the new SCSI-FC Router.
5. After the LEDs have finished blinking, the power LED (green) and status LED (green) should be solid on and the fault LED (yellow) should be off.
   - To locate the LED's location, see Figure 3-1. SCSI-FC Router Front Panel and Figure 3-2. SCSI-FC Router Rear Panel.
6. Replacement of the SCSI-FC Router is complete.

5. Cabling and Connections

5.1. Check Cabling and Connectors

1. Be sure to power off the device (tape or disk drive) to which the connector is connected before removing it.
2. Visually study the end of both connectors on the cable. Ensure that pins are not broken, bent or pushed in.
3. If a connector is damaged, replace connector and power on the device.
4. Ensure that the connector is securely fastened to the device. A loose connection can cause termination problems.
5. Ensure the cable length does not exceed Hewlett Packard's recommended length (see section 5.2)
6. If problem still exist, power off the device and replace the cable.
7. If problem still exist, contact the device vendor.

5.2. SCSI Cabling

- The SCSI-FC Router model only attaches to a differential interface and a differential terminator.
- SCSI cable length for the SCSI-FC Router should not exceed 25 meters (82 feet).
- SCSI-FC Router supports attachment to an external 68 pin SCSI-II shielded cable.

5.3. SCSI Termination

SCSI termination must exist at both ends of the SCSI bus (see Figure 5-1). To terminate the SCSI-FC Router's SCSI bus add the External SCSI-FC Router SCSI terminator. To terminate the attached SCSI device (disk or tape drive), refer to the SCSI device's operating manual for information concerning proper termination.
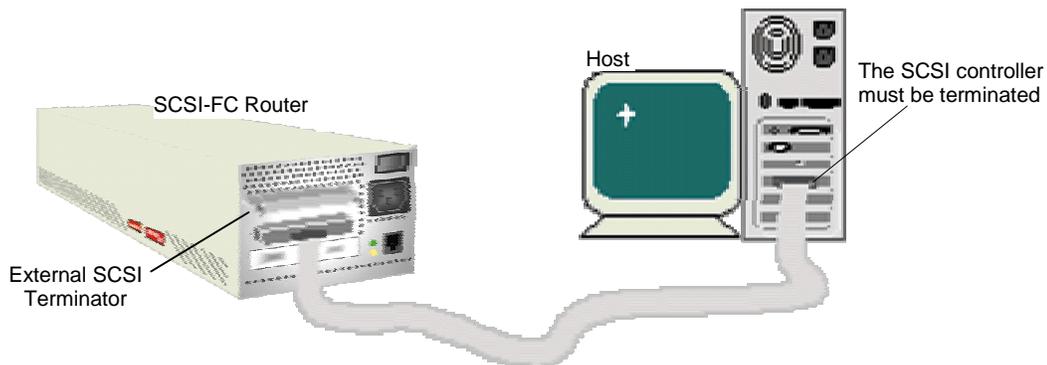
Figure 5-1. Example of a SCSI-FC Router Termination

5.4.   Copper and Fiber Optic Cabling

5.4.1.   Short Wavelength

- Cable: 50 or 62.5 micron fibre optic
- Distance: 500 m (1640 ft) or 172m (564 ft)
- Connector: Dual SC

5.4.2.   Long Wavelength

- Cable: 9 micron fibre optic
- Distance: 10 km (6.2 miles)
- Connector: Dual SC

5.4.3.   Copper

- Cable: Twinax
- Connector: Two DB-9 or HSSDC
- Distance: 30m (98 ft) equalized: 20 m (65.6 ft) non-equalized

5.5.   FC Termination

Optical termination is automatically provided with the Fibre Channel architecture, therefore termination is not needed.

6. Serial Port

The SCSI-FC Router provides a serial port for router diagnostic and maintenance (see Figure 3-2. SCSI-FC Router Rear Panel for serial port location). The local SCSI-FC Router or local router is the router connected by its serial port to the host computer (typically a laptop computer).

6.1. Serial Port Requirements

- Windows 95 or later
- Windows NT
- Serial Port Connection
- RJ11 Cable – reverse (straight-through)
- PROCOMM PLUS® 3.0 or later

6.2.   PROCOMM PLUS

PROCOMM is communication software that resides on separate computer other than the host server. To ensure mobility, Hewlett Packard recommends that PROCOMM be installed on a laptop PC. The PC will be linked to the SCSI-FC Router's serial port allowing the PC to access the SCSI-FC Router performing basic maintenance.

6.2.1. Installing PROCOMM PLUS

Install the PROCOMM PLUS software in a proper computer. Hewlett Packard recommends installing PROCOMM on a laptop to provide mobility. Follow directions in the PROCOMM PLUS installation guide for PROCOMM installation.

6.2.2. Setting Up PROCOMM PLUS

1. Set Xmodem protocol.
2. Set modem baud rate to 57600.
3. Select '**Incoming CR to CR/LF**' (see Figure 6-1. Serial Port/PROCOMM Setup Information).
4. Set '**Tab stops every 4 positions**' (see Figure 6-1. Serial Port/PROCOMM Setup Information).
5. Connect the computer serial port to the SCSI-FC Router RJ-11 serial port (see Figure 3-2. SCSI-FC Router Rear Panel for serial port location).
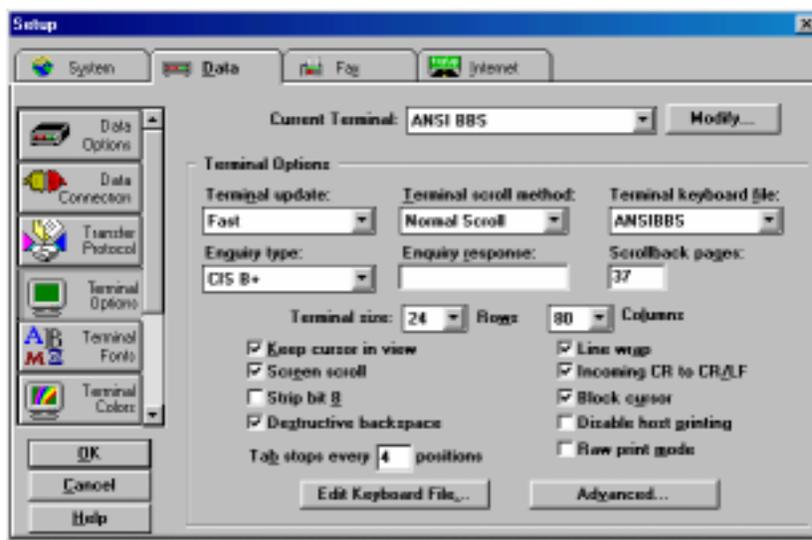

Figure 6-1. Serial Port/PROCOMM Setup Information

6.2.3. Starting PROCOMM PLUS

Refer to the PROCOMM PLUS manual to activate the PROCOMM software.

1. After PROCOMM PLUS is activated, the PROCOMM PLUS for Windows Terminal will appear (see Figure 6-2).
2. At the cursor, type **hello** and press enter.

   Note: When typing hello, it will not be visible on the screen.

Figure 6-2. Startup Screen for Serial Port

6.2.4. Show Serial Port Service Utility Key Assignments Menu

1. Connect the computer serial port to the SCSI-FC Router RJ-11 serial port.
   - See Figure 3-2 for serial port location.
2. Activate the PROCOMM PLUS software.
   - See section 6.2.3 Starting PROCOMM PLUS.
3. After PROCOMM PLUS is activated, type and then enter '**?**'.
4. The **Key Assignments Menu** will appear.
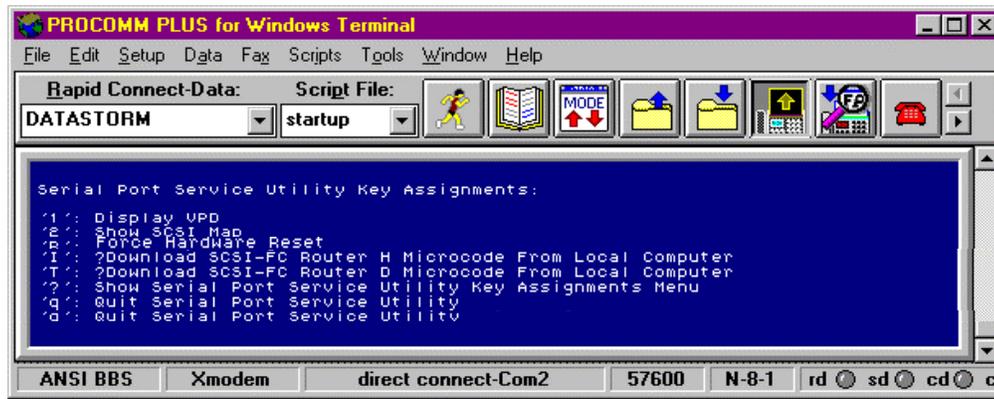

Figure 6-3. Serial Port Menu for Host Router

Figure 6-4. Serial Port Menu for Device Router

Note: The question mark '?' before each menu command in Figure 6-4. Serial Port Menu for Device Router notifies the user that those commands are not available for the device router.

6.2.4.1.   About - Show Serial Port Service Utility Key Assignments Menu

This command will display a list of functions as shown in Figure 6-3 or Figure 6-4. All functions that appear on the screen in Figure 6-3 are utilized with the host router (SCSI-FC Router H). All commands that appear in Figure 6-4 are utilized with the device router. The device router (SCSI-FC Router D) menu is not the same as the host router menu. A question mark '?' before each menu command in Figure 6-4. Serial Port Menu for Device Router notifies the user that those commands can not be used on the device router.

6.2.5.   Display VPD

1. Connect the computer serial port to the SCSI-FC Router RJ-11 serial port.
    -   See Figure 3-2 for serial port location.
2. Activate the PROCOMM PLUS software.
    -   See section 6.2.3 Starting PROCOMM PLUS.
3. After PROCOMM PLUS is activated, type and then enter '**1**'.
4. The **Show Local SCSI-FC Router VPD and Feature** screen will appear.

6.2.5.1.   About - Display VPD

This function is used to display important information *(**V**ital **P**roduct **D**ata)* for attached SCSI-FC Router. An attached SCSI-FC Router is referred to as the local SCSI-FC Router.

Figure 6-5. VPD Screen

1. **Product Type** – The first line describes the use of the local SCSI-FC Router.
    - SCSI-FC Router H - An 'H' represents host router as depicted in Figure 1-1.
    - SCSI-FC Router D - A 'D' represents a device router as depicted in Figure 1-1.
2. **SCSI-FC Router H/D Firmware Revision** - The second and third line provides the firmware/microcode revision level and the date and time that it was developed.
3. **Loader Revision** – displays the local SCSI-FC Router's loader revision level (for internal use only).
4. **Unique ID** – displays the local SCSI-FC Router's unique ID assigned by the manufacturer.
5. **Unit Serial Number** – displays the local SCSI-FC Router's Unit Serial Number.
6. **PCB Number** - displays the local SCSI-FC Router's Printed Circuit Board number (for internal use only).
7. **DIP SW1 = 0000101   DIP SW2 = 1111111** – displays the dip switch setting of DIP switch 1 and switch 2

6.2.6.   Show SCSI Map

1. Connect the computer serial port to the SCSI-FC Router RJ-11 serial port.
    - See Figure 3-2 for serial port location.
2. Activate the PROCOMM PLUS software.
    - See section 6.2.3 Starting PROCOMM PLUS.
3. After PROCOMM PLUS is activated, type and then enter '**2**'.
4. The **Show SCSI Map** screen will appear.

6.2.6.1.   *About - Show SCSI Map*

This command will display a map of local SCSI drives. This will be the same as the host view (the SCSI-FC Routers will be transparent to the host).

1. To display the SCSI Map of the attached SCSI-FC Router, type and enter the number '**2**'.
2. The following information will appear:
    - SCSI ID and LUN – assigned to each disk on the storage loop.
    - Device Status – shows the status of the corresponding device.
    - Device Type – describes what the corresponding device is.
    - BLKSIZ – shows the block size (for tape extender use only).

```
********* SCSI ID/LUN MAP *********

SCSI    SCSI    Device      Device
ID      LUN     Status      Type        BLKSIZ
0       0       Active      Disk        N/A
1       0       Active      Disk        N/A
2       0       Active      Disk        N/A
3       0       Active      Disk        N/A
6       0       Active      Disk        N/A
8       0       Active      Disk        N/A
9       0       Active      Disk        N/A
14      0       Active      Disk        N/A
15      0       Active      Disk        N/A
```

Figure 6-6. SCSI Map

6.2.7.   Force Hardware Reset

1. Connect the computer serial port to the SCSI-FC Router RJ-11 serial port.
    - See Figure 3-2 for serial port location.
2. Activate the PROCOMM PLUS software.
    - See section 6.2.3 Starting PROCOMM PLUS.
3. After PROCOMM PLUS is activated, type and then enter '**R**' (only one time). If entered successfully, the screen will read as follows:

Hardware Reset Now, Please Wait Until Boot Up Again .....

4. Check the local SCSI-FC Router's fault LED. During reset, it will light.
5. After the reset has concluded and the screen reads '**Ready .. … .**' then the user must access the serial port by typing '**hello**' again.

6.2.7.1.   About - Force Hardware Reset
This command will reset only the local SCSI-FC Router. This is recommended when communication on the serial loop is frozen and the cause can not be determined.

6.2.8.   Clean Up Configuration Table

1. Connect the computer serial port to the SCSI-FC Router RJ-11 serial port.
    - See Figure 3-2 for serial port location.
2. Activate the PROCOMM PLUS software.
    - See section 6.2.3 Starting PROCOMM PLUS.
3. After PROCOMM PLUS is activated, type and then enter '**C**' (only one time). If entered successfully, the screen will read as follows:

Please Wait Until Boot Up Again .....

4. After the reset has concluded and the screen reads '**Ready .. … .**' then the user must access the serial port by typing '**hello**' again.

6.2.8.1.   About - Clean Up Configuration Table
This function removes the old, unused configurations from the database. If user removes any SCSI-FC Router from the serial loop before or during clean up of the configuration table, they must clear the node mapping table (see section 4.2.5 Clearing the Node Mapping Table Mode if necessary) of the SCSI-FC Router before returning it to the serial loop.

6.2.9.   'H': Download SCSI-FC Router Microcode to the Host Router

1. Connect the computer serial port to the SCSI-FC Router RJ-11 serial port.
    - See Figure 3-2 for serial port location.
2. Activate the PROCOMM PLUS software.
    - See section 6.2.3 Starting PROCOMM PLUS.
3. After PROCOMM PLUS is   activated, type and then enter '**H**' for host.
4. Click on the open file icon   in the tool menu.
5. Browse the local computer   to find and then select the microcode file that will be downloaded to the local router.
6. After download is complete the user may begin normal operations.

6.2.10. 'D': Download SCSI-FC Router Microcode

1. Disconnect the Fibre Channel from the device router.
2. Power off the device router.
3. Change the device router from the device mode to the host mode.
4. Power on the device router.
5. Connect the computer serial port to the SCSI-FC Router RJ-11 serial port.
   - See Figure 3-2 for serial port location.
6. Activate the PROCOMM PLUS software.
   - See section 6.2.3 Starting PROCOMM PLUS.
7. After PROCOMM PLUS is activated, type and then enter 'D' for device.
8. Click on the open file icon in the tool menu.
9. Browse the local computer to find and then select the microcode file that will be downloaded to the local router.
10. After download is complete power off the router.
11. Change the device router from the host mode back to the disk or tape mode.
12. Reconnect the Fibre Channel to the device router.
13. Power on the device router.

```
Please Recycle after Timer Armed show up ......
```

6.2.10.1. About - Download SCSI-FC Router Microcode

This function is used to update the microcode for the local router.

> **Warning:** Do not download new microcode to the SCSI-FC if the SCSI-FC is being utilized by the operating system. The SCSI-FC will reset itself after the download is complete, which can cause lost I/Os and system panic.

Appendix A: SCSI-Fibre Channel Router Specifications

Applications
Provides connectivity between SCSI High Voltage Differential (HVD) and Fibre Channel equipment and vice versa.

Hardware Features
SCSI Connectivity
- Protocol: SCSI-2 Ultra-Wide Differential (40MB/sec); supports either initiator (host) or target (device) protocol.
- Data Transfer Rate: 40MByte/sec (per SCSI-FC Router per SCSI Channel) burst
- SCSI-2:   68-pin High Density
- Device Support: One HP3000 and One HP XLR1200®
- Supports: Command Processing, Tagged Queuing, Scatter/Gather, Disconnect/Reconnect, Synchronous and Asynchronous data transfer

Fibre Connectivity
- Protocol: ANSI Fibre Channel (FC-PH) and ANSI Fibre Channel Arbitrated Loop (FC-AL)
- Classes of Service: Class 3
- Topology: FC-AL (private or public), Point to Point
- Data Transfer Rate: 100MBytes/sec (per SCSI-FC Router per Fibre channel)
- Port Speed: 100Mbytes/sec
- Short Wavelength Optical Cable
  - Data Rate: 100Mbytes/sec burst
  - Cable: 50 or 62.5 micron fibre optic
  - Distance: 500 m (1640 ft) or 172m (564 ft)
  - Connector: Dual SC
- Long Wavelength Optical Cable
  - Data Rate: 100Mbytes/sec burst
  - Cable: 9 micron fibre optic
  - Distance: 10 km (6.2 miles)
  - Connector: Dual SC
- Copper Cable
  - Data Rate: 100Mbytes/sec burst
  - Cable: Twinax
  - Connector: Two DB-9 or HSSDC
  - Distance: 30m (98 ft) equalized: 20 m (65.6 ft) non-equalized

Attachment
- Compatible with HP3000® (Operating Systems MPE/iX 5.5 and MPE/iX 6.0)
- HP XLR1200 system

Technical Specifications
Maintenance
External Serial Port   RJ-11 connector (57K baud rate)

Environment
- Operating Temperature   0°C (32°F) to 40°C (104°F)
- Storage Temperature   -40°C (-40°F) to 75°C (167°F)
- Relative Humidity   10% to 95% non-condensing

Tabletop
- Dimensions   Height: 7.62 cm (3 in), Width10.795 cm (4.25 in), Depth 31.115 cm (12.25 in)
- Weight   1.8 kg (3.97 lb)
Note: The SCSI-FC Router can also be installed into a rackmountable hub enclosure.

Power
- 100 - 240 VAC
- 50 - 60 Hz
- 0.75 - 0.50 A

User Interface
LED indicators

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