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SCSI-Fibre Channel Router

Support Handbook

Copyright

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SCSI-Fibre Channel Router ™ is a trademark of Hewlett-Packard Company.
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This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la Classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Spécification ATI Classe A (France)

DECLARATION D'INSTALLATION ET DE MISE EN EXPLOITATION d'un matériel de traitement de l'information (ATI), classé A en fonction des niveaux de perturbations radioélectriques émis, définis dans la norme européenne EN 55022 concernant la Compatibilité Electromagnétique.

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檢 磁 xxxxYxxx   (TBD)

Harmonics Conformance (Japan)

(N/A)

German Noise Declaration

Schalldruckpegel Lp = 50 dB(A)
Am Arbeitsplatz (operator position)
Normaler Betrieb (normal operation)
Nach ISO 7779:1988 / EN 27779:1991 (Typprüfung)

Laser Safety

A. Certification and Classification Information

This product contains a laser internal to the Optical Link Module (OLM) for connection to the Fibre communications port.

In the USA, the OLM is certified as a Class 1 laser product conforming to the requirements contained in the Department of Health and Human Services (DHHS) regulation 21 CFR, Subchapter J. The certification is indicated by a label on the plastic OLM housing.

Outside the USA, the OLM is certified as a Class 1 laser product conforming to the requirements contained in IEC 825-1:1993 and EN 60825-1:1994, including Amendment 11:1996.

The OLM includes the following certifications:
- UL Recognized Component (USA)
- CSA Certified Component (Canada)
- TUV Certified Component (European Union)
- CB Certificate (Worldwide)

B. Product Information

Each fiber channel port optionally contains a transmitter and receiver optical subassembly (optical link module). The transmitter subassembly contains internally a semiconductor laser diode in the wavelength range of 850 to 1300 nanometers. In the event of a break anywhere in the fibre path, the OLM control system prevents laser emissions from exceeding Class 1 levels.

Class 1 laser products are not considered hazardous.

WARNING	**There are no user maintenance or service operations or adjustments to be performed on any OLM model.**

C. Usage Restrictions

Failure to comply with these usage restrictions may result in incorrect operation of the system and points of access may emit laser radiation above Class 1 limits established by the IEC and the U.S. DHHS.

D. Laser Safety (Finland) LASERTURVALLISUUS

LUOKAN 1 LASERLAITE
KLASS 1 LASER APPARAT

HP 3000 -sarjan tietokoneisiin asennettava A5814A / SCSI-Fibre Channel Router-lukulaite
on käyttäjän kannalta turvallinen luokan 1 laserlaite. Normaalissa käytössä laitteen suojakotelointi estää lasersäteen pääsyn laitteen ulkopuolelle. Laitteen turvallisuusluokka on määritetty standardin EN 60825-1 (1994) mukaisesti.

VAROITUS !
Laitteen käyttäminen muulla kuin käyttöohjeessa mainitulla tavalla saattaa altistaa käyttäjän turvallisuusluokan 1 ylittävälle näkyvälle/näkymättömälle lasersäteilylle.

VARNING !
Om apparaten används på annat sätt än i bruksanvisning specificerats, kan användaren utsättas för synlig/osynlig laserstrålning, som överskrider gränsen för laserklass 1.

A5814A / SCSI-Fibre Channel Router -lukulaitteen sisällä ei ole käyttäjän huollettavissa olevia kohteita. Laitteen saa avata ja huoltaa ainoastaan sen huoltamiseen koulutettu henkilö.

VARO !
Mikäli laitteen suojakotelo avataan, voit altistua lasersäteilylle laitteen ollessa toiminnassa.

VARNING !
Om apparatens skyddshölje öppnas då apparaten är i funktion, kan användaren utsättas för laserstrålning.

Tiedot laitteessa käytettävän laserdiodin säteilyominaisuuksista:

        Aallonpituus 850-1300 nm

Safety Notices

Danger
An electrical outlet that is not correctly wired could place hazardous voltage on metal parts of the system or the products that attach to the system. Verify that the wiring and grounding of the electrical outlets you use have been checked by a licensed electrician.

Danger
The enclosure should only be opened by authorized service personnel. Internal to the enclosure are exposed areas of high voltage and sensitive components. Incorrect handling of internal components may cause harmful electric shock and/or damage to the unit. Any attempt by non-authorized personnel to open the product's enclosure may, at Vicom's discretion, void the warranty.

Caution
In the United States use only GBIC units or Fibre-Optic products that comply with FDA radiation performance standards, 21 CFR Subchapter J. Internationally use only GBIC units or Fibre-Optic products that comply with IEC standard 825-1. Optical products that do not comply with these standards may produce light that is hazardous to the eyes.

Important: The user should also ensure that only 'harmonized' (for EMEA) power cords are used with the equipment.

Licensing Agreement
This Product contains embedded software ("Firmware") and is furnished with utility software ("Software"). Both the Firmware and the Software are provided to you pursuant to the following license terms:

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- Government Users: This paragraph applies only to end users that are branches or agencies of the U.S. Government. The Firmware and Software are part of a commercial product that was developed entirely at private expense and without the use of any U.S. Government funds. Consistent with 48 C.F.R. 12.212 and 48 C.F.R. 227.7202-1 through 227.7202-4 (JUNE 1995), all U.S. Government end users acquire the Firmware and Software with only those rights set forth above.

Limited Warranty Terms and Conditions

VICOM warrants that its Products will be free from defects in material and workmanship under normal use and service for a period of one year after delivery to the initial end user purchaser, but no longer than eighteen months after the date of shipment by VICOM.

VICOM's sole obligation under this warranty will be to repair or replace (at VICOM's option) any Product, or units or parts thereof, which are reported as defective in material or workmanship and returned to VICOM pursuant to VICOM's then-current return procedures, and which upon inspection VICOM has determined to be defective. If replacement is necessary, Vicom reserves the right to replace the unit with a unit that is equivalent or better in functionality then the unit being replaced.

VICOM will not be responsible for failure of the Products, or any part thereof, and the foregoing warranty will not apply, if such failure is attributable to: (a) accident (including damages during shipment), neglect, misuse, or abuse, or (b) exposure of the Products to conditions beyond the environmental, power, or operating specifications published by VICOM.

Any attempt to open the product's enclosure may, at Vicom's discretion, void the warranty. The express warranty set forth above is extended only to the original end user purchaser and may not be assigned or transferred to any other parties.

VICOM DISCLAIMS ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, REGARDING THE PRODUCT YOU HAVE PURCHASED, INCLUDING THE FIRMWARE AND THE SOFTWARE. IN NO EVENT WILL VICOM BE LIABLE FOR ANY SPECIAL, CONSEQUENTIAL, OR INCIDENTAL DAMAGES FOR BREACH OF WARRANTY.

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	Note
7.60	2.5	9/99	HP3000 Distance Solution
7.62	n/a	5/2000	SCSI-FC Connectivity

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1. Introduction

This support handbook addresses the various installation and run time issues associated with the SCSI-FC Router. It is presented in three main sections: the first deals with supporting the 'Distance Solution' option for the SCSI-FC Router, the second section covers similar issues for the SCSI-FC Connectivity option and finally, the third section presents a look at Serial Port Diagnostics that are available for troubleshooting the router with a host computer.

Within each of the first two sections, the handbook details procedures for troubleshooting problems that occur during a first time installation of the router ('Installation Troubleshooting'). 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. Next, there are instructions for troubleshooting routers that have been running successfully in the past but have now encountered a problem ('Run Time Troubleshooting'). The user will be directed through a series of steps until the problem is ascertained and then corrected. Each section then concludes with descriptions of the router's DIP switches, LED status codes and cabling for ensuring that these elements of the router are properly understood.

The third section handles the installation and utilization of the serial port and its associated diagnostic 1software.

1.1. System Requirements

- Fiber Channel cable: 62 or 50 micron fiber optic cable
- SCSI-FC Router (host) microcode revision 7.62 or later
- SCSI-FC Router (device) microcode revision 2.5 or later
- SCSI-2 HVD compliant host adapter
- SCSI-2 compliant host
- SCSI-2 compliant cabling
- Proper AC (alternating current) electrical power source

1.2. SCSI-FC Router Capabilities Defined

The SCSI-FC Router device is capable of functioning as a distance solution or as a SCSI-Fibre Channel connectivity device. The distance solution is specific to the HP3000® platform, whereas the connectivity option is available with the HP3000, HP9000® and Windows NT® platforms.

1.2.1. Distance Solution

When used with the HP3000 platform the SCSI-FC Router may be configured as a distance solution. By converting SCSI to Fibre Channel, this configuration can provide lengths of 30m (98 ft) to 10 km (6.2 miles) depending on the fiber optic cable used.

In a distance solution, there are two SCSI-FC Routers in a single Fibre Channel loop, each being defined by its position within the loop. The first is directly attached to the host (server) and is referred to as the 'host router'. The other SCSI-FC Router is directly connected to the SCSI devices (disk or tape drives) and is known as the 'device router'. The host router and the device router thus form a '1-to1' router relationship.

As is shown in Figure 1-2, SCSI-FC Routers as a Distance Solution, the connection between the host router and the host and the connection between the device router and the target devices are both SCSI connections. The connection between the two routers, however, is maintained with Fibre Channel. This permits the host to be at a much greater distance from the target devices than if they were connected directly to one another via a SCSI connection.
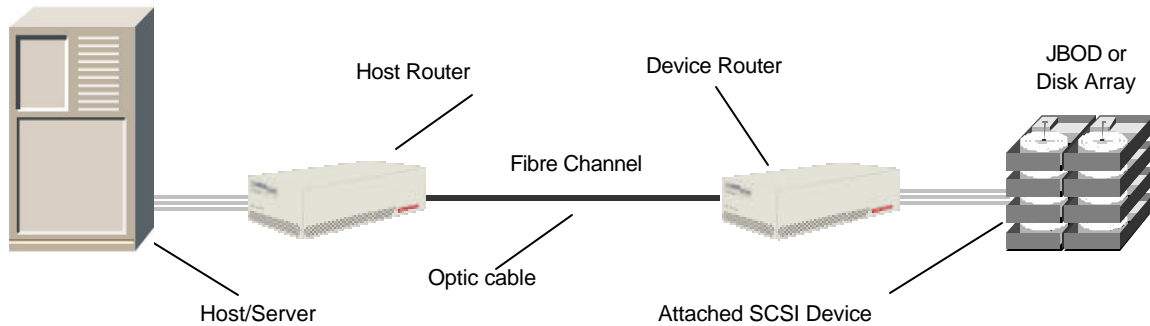
Figure 1-1. SCSI-FC Routers as a Distance Solution

1.2.2. SCSI-Fibre Channel Connectivity

The SCSI-FC Router can also be used as a connectivity device that allows SCSI hosts to interoperate with FC storage loops. This option is available with the HP3000, HP 9000 and Windows NT host platforms.

When the SCSI-FC Router is used in this manner, there is only a single router used in the storage loop. As is shown in Figure 1-3, *SCSI-FC Router as a Connectivity Device*, the connection between the router and the host is a SCSI connection. The connection between the router, however, and the target devices is maintained with Fibre Channel.
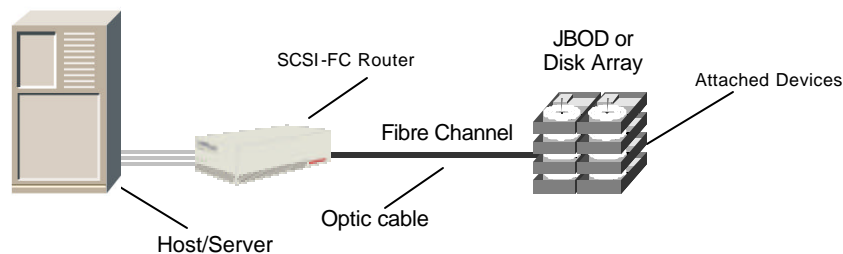
Figure 1-2. SCSI-FC Router as a Connectivity Device

2. Distance Solution

The following section details the recommended procedures for troubleshooting the installation and operation of the SCSI-FC Router distance solution. Other potential support issues, such as switch settings, LED codes, cabling and connections, and router replacement are also covered.

2.1. Installation Troubleshooting

Many support issues for the SCSI-FC Router will be the result of an incorrect installation. The following section provides a step-by-step troubleshooting approach to ensure that all installation requirements have been properly met.

2.1.1. Step One: Check Microcode

1. Determine which version of microcode is currently installed on the SCSI-FC Router.
    - The SCSI-FC Router microcode version can be checked using the serial port. See Section 4.2.4.1.2 or 4.3.4.1.2 to determine microcode location on the VPD screen.
    - The SCSI-FC Router microcode version can also be checked using the router's LEDs. See Section 2.3.2.2*.*

2. The latest available version of the microcode for the SCSI-FC Router will be listed and available for download from the Vicom web site.
   a) Go to Vicom's web page http://www.vicom.com
   b) Click the **Customer Support** button.
   c) Go to the **General Support** section.
   d) Click the 'Downloads' link. Look for the SCSI-FC Router in the table and compare the latest microcode version number that is listed with the version number that was determined in Step 1 above.
   e) If the user's router has a version older than that listed, download the new microcode and save it to a hard or floppy disk.
3. Next download the saved microcode to the appropriate router.

2.1.2. Step Two: Ensure That Attached Devices Function 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).

2.1.3. Step Three: Set Up Device Router

1. Choose one of SCSI-FC Routers to be the device router, as defined in Section 1.2 and as seen 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 2-4.
   - For more information on SCSI switch settings, see Section 2.3.1.
4. Set switch 2 (SW2) of the device router to one of the four device router modes (UW disk mode, UW tape mode, FW disk mode or FW tape mode) as described below. For the device router to operate properly when used with a SCSI Fast and Wide storage subsystem it must be set to one of the Fast and Wide settings listed below. (For further information on SW2 mode settings, see Section 2.3.2)
   - If the devices being attached are SCSI Ultra Wide drives, then on switch 2 (SW2) of the device router, set DIP switch 7 in the down position to activate the UW disk mode.
   - If the devices being attached are SCSI Ultra Wide tape drives, then on SW2 of the device router, set DIP switches 0 and 7 in the down position to activate the UW tape mode.
   - If the devices being attached are SCSI Fast Wide drives, then on SW2 of the device router, set DIP switches 5 and 7 in the down position to activate the FW disk mode.
   - If the devices being attached are SCSI Fast Wide tape drives, then on SW2 of the device router, set DIP switches 0, 5 and 7 in the down position to activate the FW tape mode.

5. Attach the device router to the desired SCSI device(s) as shown in Figure 2-1. Ensure that cable and connectors are securely fastened.
   - To locate the SCSI-FC Router SCSI connector, see Figure 2-4.
   - For the proper cable specifications, see Section 2.6.2.
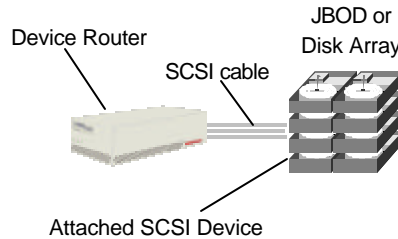
Figure 2-1. Completed Setup of the Device Router

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

For further information on the role of the Node Mapping Table, see Section 2.3.2.5.
1. Ensure that the host router is powered off and that it is not connected to the device router.
2. On SW2 of the host router, set DIP switches 4 and 5 in the down position to clear the Node Mapping Table.
3. Power on the host router. The power LED (green) should be solid on. If the power LED is off, see Section 2.2.3.1 *(Power LED Not Lit)*
4. When the Fault LED (yellow) is solid on and the Status LED (green) is blinking, it indicates that the Node Mapping Table has been cleared. (To locate the front and rear Fault LEDs, see Figure 2-3 and Figure 2-4, respectively).

   Note: When the Node Mapping Table has been cleared, the Status LED (green) blinks a status code of 060 as described in Table 2-3 (Diagnostic Status Codes for Fault LED). To decipher the LED read-out, see Section 2.4.1

5. This process will take approximately 10 seconds.
6. Power off the host router.

2.1.5. Step Five: Set Up Host Router

1. Ensure that the host router is powered off.
2. On SW1 of the host router set all DIP switches to the down position
   (To locate switch one (SW1), see Figure 2-4.)
3. Attach the host router to the device router with the appropriate fiber optic cable. Ensure that cable and connectors are securely fastened.
   (To ensure proper cable specifications, see Section 2.6.4.)
4. At this point the host/server should not be attached, as shown below in Figure 2-2.
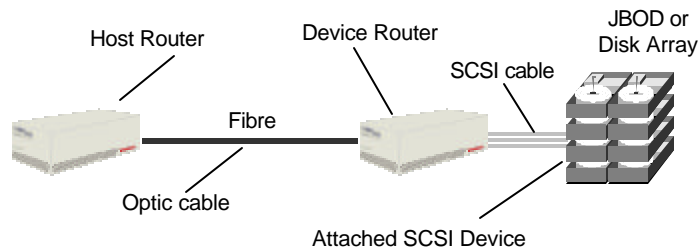
Figure 2-2. Example of Step Five Completed

2.1.6. Step Six: Run Connection Check

The connection check verifies the Fibre Channel connection between the two routers.
1. Power on the SCSI devices. If the devices are disk drives, then allow spin up time to complete (maximum 2 minutes).
2. Power on the device router. The power LED (green) should be solid on. If it is off, then see Section 2.2.3.1 (Power LED Not Lit).
3. On SW2 of the host router, set DIP switch 4 in the down position to activate the Connection Check mode.
4. Power on the host router. The power LED (green) should be solid on. If it is off then see Section 2.2.3.1 (Power LED Not Lit).
5. The testing process will take approximately 1 minute. When the test is complete, 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 the connection following the procedure outlined in Section 2.6.1.

2.1.7. Step Seven: Run Subsystem Device Check

The subsystem device check verifies the communication link between the SCSI-FC Routers and the attached SCSI device(s).
1. Power off the host router.
2. Set DIP switch 5 on SW2 of the host router in the down position to activate the Device Check mode.
3. Power on the host router. The power LED (green) should be solid on. If it is off then see Section 2.2.3.1 (Power LED Not Lit).
4. The testing process will take approximately 1 minute. When the test is complete, 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 procedure outlined in Section 2.6.1.

    Note: If the device check test fails after passing the connection check test in Section 2.1.6, then the communication problem is between the device router and the attached SCSI device(s).

2.1.8. Step Eight: Set Operating Mode

1. Power off the host router.
2. On SW2 of the host router, set DIP switches 0 and 2 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 2.6.2.)
4. The configuration should match the diagram in Figure 1-1.

Note: Steps 9 and 10, the Power Down and Power Up Sequences, should be considered *optional*. If cycling the power on the storage devices is operationally problematic, these steps may be ignored.

2.1.9. Step Nine: Power Down Sequence (optional)

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) once all devices are powered down.

2.1.10 Step Ten: Power Up Sequence (optional)

1. Power on the attached SCSI device(s). If the devices are disk drives, then allow spin up time to complete (maximum 2 minutes).
2. Power on the device router.
3. When the device router's LEDs stop blinking, power on the host router.
4. When the host router's LEDs stop blinking, power on the host/server.
5. When this procedure has been successfully completed, the host router's Status LED should be Solid On to indicate a complete loop.
6. Verify that 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 (for HP3000):

```
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) connected to the device router, then the installation is successful and normal operation may begin.

2.2. Run Time Troubleshooting

If it is determined that the SCSI-FC Router was properly installed, but normal run time operations remain problematic, the following section can be used as a step-by-step troubleshooting approach to help determine the nature of the user's problem.

2.2.1. Step One: Stop I/O Operations

- Stop all applications connected 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.

2.2.2. 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 2.3.2.1 *Setting Host Router Operating Mode.*
- For a device router with disk drive(s) attached, see Section 2.3.2.6 *Setting UW SCSI-FC Router Disk Mode.*
- For a device router with tape drive(s) attached, see Section 2.3.2.7 *Setting UW SCSI-FC Router Tape Mode.*

2.2.3. Step Three: Check SCSI-FC Router LEDs

1. Are the SCSI-FC Router's status LED (green) and power LED (green) solid-on and the fault LED (yellow) is off? (For front and rear LED locations, see Figures 2-3 and 2-4, respectively).
- **Yes:** Go to Section 2.1.5, *Set Up Host Router*.
- **No:** Go to the next question, below.

2. Do the LEDs match any of the descriptions in Table 2-1, *SCSI-FC Router LED*?
- **Yes:** In the row that matches the SCSI-FC Router's LED display, read the last column labeled 'Go to' and refer to the section/table listed.
- **No:** Go to Section 2.1.5, *Set Up Host Router*.

SCSI-FC ROUTER				
Power LED (Green)	**Status LED (Green)**	**Fault LED (Yellow)**	**Description**	**Go to**
Off	Off	Off	No Power	2.2.3.1
Solid On	Fast Blink	Off	Web Walk (Normal Condition)	n/a
Solid On	Blinks Code	Solid On	Status Codes for Fault LED	Table 2-3
Slow Blink (LED is On 90% and Off 10%)			**Steady Blink** (LED is ON 50% and Off 50%)	

Table 2-1. SCSI-FC Router LED

2.2.3.1. Power LED - Not Lit

This indicates that there is no power to the SCSI-FC Router.
1. Verify that an AC plug is connected to a working wall outlet and the other end is connected to the SCSI-FC Router unit.
2. Ensure that the power switch is in the 'on' position (1 represents 'on' and 0 represents 'off'). (See Figure 2-4, *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 2.5.1, *Replacing a SCSI-FC Router*.)
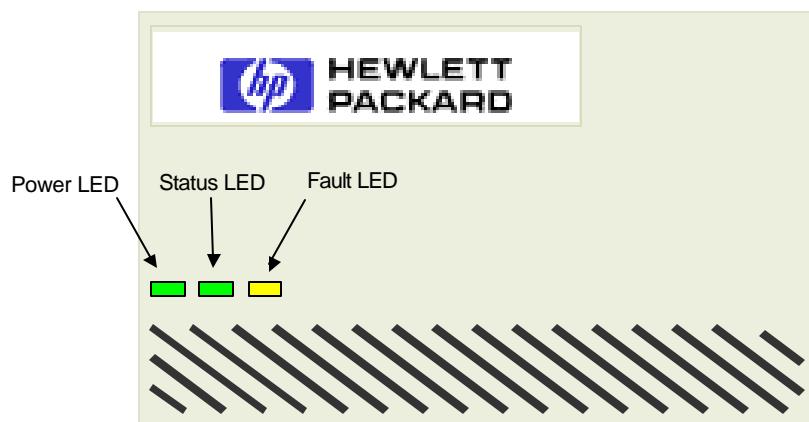
Figure 2-3. SCSI-FC Router Front Panel

SCSI
Connector
Ports

Power Switch

Power Plug
Socket

RJ11 Serial
Maintenance
Port

SW1   SW2

SW1   SW2

7 0   7 0

Switch 1 and Switch 2

Fault LED

Rear Status LED

Fibre Channel Ports
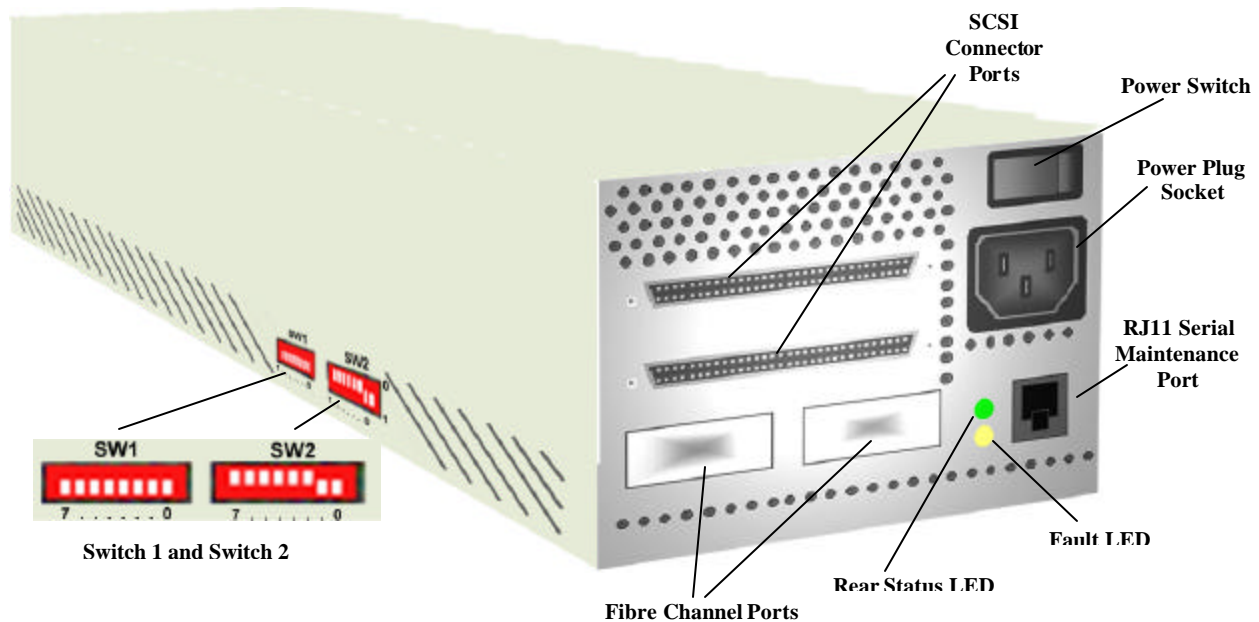
Figure 2-4. SCSI-FC Router Rear Panel

2.2.3.2.   Status LED (green) - Fast Blink

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

1. If conditions continue then toggle the power switch. (See Figure 2-4 for power switch location.)
2. If the status LED is still blinking fast after the power switch is toggled then run a connection check. (Go to Section 2.3.2.3, *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 2.3.2.4, *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 2.5.1 *Replacing a SCSI-FC Router.*)

2.2.4. Step Four: Define Other Symptoms

If any of the following operating conditions are encountered, try to resolve the problem with the troubleshooting lists provided here.

2.2.4.1.   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.

2.2.4.2.   The SCSI-FC Router Web Walks Too Often

1. There may be a problem with the SCSI cabling. Ensure that all the cabling requirements have been met (see section 2.6.2, *SCSI Cabling*).
2. There may be a problem with SCSI termination. Verify that all the termination requirements have been met (see Section 2.6.3, *SCSI Termination*).
3. A SCSI target ID conflict is possible.
    * Refer to host adapter documentation for further information.
    * Ensure that Switch 1 (SW1) on the SCSI-FC Router is set properly (see Section 2.3.1, Switch 1 (SW1) SCSI ID Settings).
4. The SCSI cable between the host computer and the SCSI-FC Router unit may be defective. Check the SCSI connection and connector (see Section 2.6.1, *Check Cabling and Connectors*)
5. Another possible problem that will affect the host 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 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. If this is determined to be the case, replace the SCSI-FC Router. (see Section 2.5.1 *Replacing a SCSI-FC Router*).
7. If problems persist, contact your SCSI-FC Router vendor.

2.2.4.3.   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 the SCSI cabling. Ensure that all the cabling requirements have been met (see Section 2.6.2, *SCSI Cabling*).
3. There may be a problem with SCSI termination. Ensure that all the termination requirements have been met (see Section 2.6.3, *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 that Switch 1 (SW1) is set properly on the device router. See Section 2.3.1, *Switch 1 (SW1) SCSI ID Settings*.
5. The SCSI cable between the host computer and the SCSI-FC Router unit may be defective. Check the SCSI connection and connector (see Section 2.6.1, *Check Cabling and Connectors*).
6. Another possible problem that will affect the host 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 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 may be defective. (see Section 2.5.1, to replace the SCSI-FC Router).

2.2.4.4.   Host Computer Detects Some (but not all) 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 the SCSI cabling. Ensure that all the cabling requirements have been met (see Section 2.6.2, *SCSI Cabling*).
3. There may be a problem with SCSI termination. Ensure that all the termination requirements have been met (see Section 2.6.3, *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 that Switch 1 (SW1) is set properly on the device router. See Section 2.3.1, *Switch 1 (SW1) SCSI ID Settings*.
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.

2.3. Switch Settings

In order for run time operations to be successful, each SCSI-FC Router's switches must be properly utilized. Switch 1 (SW1) is used to select SCSI IDs for the devices on the SCSI bus. Switch 2 (SW2) is used to set the mode that the router will operate in.

2.3.1. SCSI ID Settings (SW1)

How many devices will be on the SCSI bus? (**Note**: only one is recommended)
- **One:** Go to Section 2.3.1.2.
- **More than one:** Go to Section 2.3.1.3.

2.3.1.1.   Important Issues Concerning SCSI ID Selection

When a DIP switch on SW1 (see Figure 25) is in the 'up' position, this will prevent the SCSI-FC Router from assigning the two IDs associated with that switch to the drives (DIP switch 3 is the only switch that has one SCSI ID associated with it, all other switches correspond to two IDs).
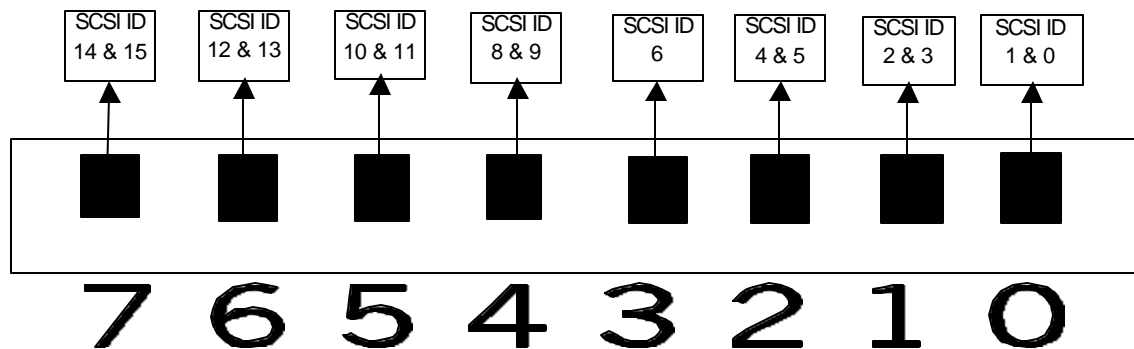
Figure 2-5. DIP Switch One and Its Associated SCSI IDs

2.3.1.2.   Set SW1 to Share SCSI Bus with One Device

1. Power off the SCSI-FC Router
2. Set DIP switch 3 on SW1 to the up position
    (This ensures that SCSI ID 6 will remain available to be assigned to the SCSI device that will share the SCSI bus.)
3. Power on the SCSI-FC Router.
4. Switch 1 (SW1) is now properly set.

2.3.1.3.   Set SW1 to Share SCSI Bus With More Than One Device

1. Power off the SCSI-FC Router
2. Select a number of DIP switches so that the SCSI IDs represented by the switches equals the number of devices that will share the SCSI bus.
3. Set the selected DIP switches on SW1 to the up position.
4. Power on the SCSI-FC Router.
5. Switch 1 (SW1) is now properly set.

2.3.2. SCSI-FC Router Modes (SW2)

The DIP switches on SW2 are used to set the operating mode of the SCSI-FC Router. The following differences exist between the modes available to host routers and device routers:

- For normal operations, host routers should be set to 'host' mode, whereas device routers must be set to the mode that corresponds to the type of device(s) they are attached to (e.g. UW Disk Mode).
- Only host routers can be set to use the 'connection check', 'device check' or 'clear mapping table' modes.
- Either type of router can be set to 'microcode revision' mode.

Note: The SCSI-FC Router's power must be cycled to effect a change in mode.

Table 2-2 illustrates the modes that are available for host routers and device routers and the specific switch setting that activates each mode.

Mode	Switch 7	Switch 6	Switch 5	Switch 4	Switch 3	Switch 2	Switch 1	Switch 0	DIP Switch Setting
Host Router Modes									
Host Mode	0	0	0	0	0	**1**	0	**1**	
Microcode Revision	0	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	
Device Router Modes									
UW Disk Mode	**1**	0	0	0	0	0	0	0	
UW Tape Mode	**1**	0	0	0	0	0	0	**1**	
FW Disk Mode	**1**	0	**1**	0	0	0	0	0	
FW Tape Mode	**1**	0	**1**	0	0	0	0	**1**	
Microcode Revision	**1**	0	0	0	**1**	**1**	0	**1**	

Table 2-2. DIP Switch Settings for Mode Selection

2.3.2.1. Setting 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 as a Distance Solution*. Two host routers cannot exist simultaneously on the same FC loop.

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.

2.3.2.2. Checking Microcode Revision

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. *Example: Revision number 7.60*

To run the Microcode Revision mode follow the steps below:
1. Power off the SCSI-FC Router.
2. Set the DIP switches on SW2 to activate 'microcode revision' mode. Be aware that host routers and device routers do not share the same setting for this mode (please consult Table 2-2).
3. Power on the SCSI-FC Router.
4. Watch the blinking pattern of the Status LED (see Section 2.4 to decipher the LED readout).
5. After the revision level is determined, power off the router, return it to its proper operating mode and power it on.

2.3.2.3.   Running the 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 cannot be established or if a high number of errors are reported then the test will fail.

1. Power off the host router.
2. Power on the SCSI device(s). If the devices are disk drives, then allow spin up time to complete (maximum 2 minutes).
3. Power on the device router. The power LED (green) should be solid on. If the power LED is off, then see Section 2.2.3.1, *Power LED – Not Lit.*
4. On SW 2 of the host router, set DIP switch 4 in the down position 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) should be solid on. If the power LED is off, then see Section 2.2.3.1, *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 outlined in Section 2.6.1.

2.3.2.4.   Running the 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.

1. Power off the host router.
2. On SW2 of the host router, set DIP switch 5 to 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) should be solid on. If the power LED is off, then see Section 2.2.3.1, *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 a communication problem exists between the device router and the SCSI device(s). Check this connection following the process outlined in Section 2.6.1.

Note: If the device check fails after passing the connection check, then the communication problem is between the device router and the attached SCSI device(s)

2.3.2.5.   Clearing the 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.

1. Power off the host router.
2. Disconnect the host router from the device router (if connected).
3. On SW2 of the host router, set DIP switches 4 and 5 in the down position to clear the Node Mapping Table.
4. Power on the host router. The power LED (green) should be solid on. If the power LED is off, then see Section 2.2.3.1, *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.

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 2-3, Diagnostic Status Codes for Fault LED). To decipher the LED read-out, see Section 2.4.1.

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.

2.3.2.6.   Setting UW SCSI-FC Router Disk Mode
This is the normal operating mode of the device SCSI-FC Router when SCSI Ultra Wide disk drive(s) 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 as a Distance Solution.* Two device routers cannot exist simultaneously on the same FC loop.

1. Power off the device router.
2. On SW2 of the device router, set DIP switch 7 to the down position activate the disk mode.
3. Power on the device router.

2.3.2.7.   Setting UW SCSI-FC Router Tape Mode
This is the normal operating mode of the device SCSI-FC Router when SCSI Ultra Wide tape drive(s) 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 as a Distance Solution.* Two device routers cannot exist simultaneously on the same FC loop.

1. Power off the device router.
2. On SW2 of the device router, set DIP switch 1 and DIP switch 7 to the down position on to activate the tape mode.
3. Power on the device router.

2.3.2.8.   Setting FW SCSI-FC Router Disk Mode
This is the normal operating mode of the device router when SCSI Fast Wide disk drive(s) are attached. For the device router to operate properly, when used with a SCSI Fast and Wide disk storage system, it must be set to the FW setting. Because most RAID or JBOD storage systems use a converter, the Ultra Wide setting cannot be used. If the disk drives attached have no converter or if they are simple disk drives then the SCSI-FC Router will be able to setup the proper operating speed with each disk drive attached. Two device routers cannot exist simultaneously on the same FC loop.

1. Power off the device router.
2. On SW2 of the device router, set DIP switch 5 and DIP switch 7 to the down position to activate the FW disk mode.
3. Power on the device router.

2.3.2.9.   Setting FW SCSI-FC Router Tape Mode

This is the normal operating mode of the device SCSI-FC Router when SCSI Fast Wide tape drive(s) are attached. For the device router to operate properly when used with a SCSI Fast and Wide tape drive storage system, it must be set to the FW setting. Because most RAID or JBOD storage systems use a converter, the Ultra Wide setting cannot be used. If the tape drives attached have no converter or if they are simple tape drives then the SCSI-FC Router will be able to setup the proper operating speed with each tape drive attached. Two device routers cannot exist simultaneously on the same FC loop.

1. Power off the device router.
2. On SW2 of the device router, set DIP switches 1, 5 and 7 to the down position to activate the FW tape mode.
3. Power on the device router.

2.4. LED Codes

2.4.1. Numerical Presentation Through the LED

Both status codes and error codes are digital numbers presented by 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

2.4.2. 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 FC 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.	n/a
068	An illegal operating mode has been used.	Return to the proper operating mode and recycle power on the SCSI-FC Router (see Section 2.3.2.1 or 2.3.2.6 - 2.3.2.9).

Table 2-3. Diagnostic Status Codes for Fault LED

2.5. SCSI-FC Router Replacement

2.5.1. Replacing a SCSI-FC Router

1. Power off the SCSI-FC Router being replaced. The SCSI-FC Router that will replace it should also be powered off.
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 connectors are securely fastened.
4. Clear the Node Mapping Table of the new SCSI-FC Router (see Section 2.1.4).
5. Power on the new SCSI-FC Router.
6. 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.
7. Replacement of the SCSI-FC Router is complete.

2.5.2. Drive Removal and Replacement

- If any drive (tape or disk) is removed from the configuration, the SCSI-FC Router will take approximately 5 seconds to update.
- If any drive (tape or disk) is added to the configuration, the SCSI-FC Router will take approximately 2 minutes to update.

2.6. Cabling and Connections

2.6.1. Check Cabling and Connectors
1. Power off the device(s) to which the connector is attached before removing it.
2. Observe both connectors on the ends of the cable. Ensure that pins are not broken, bent or pushed in.
3. If a connector is damaged, replace it 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 that the cable length does not exceed the lengths recommended in Section 2.6.2 or 2.6.4.
6. If problems still exist, power off the device and replace the cable.

2.6.2. SCSI Cabling
- Only the SCSI-FC Router 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.

2.6.3. SCSI Termination
SCSI termination must exist at both ends of the SCSI bus (see Figure 2-6). This applies to the connection between the host computer and the (host) router in both solutions and also between the device router and the storage device(s) in the distance solution. To terminate the SCSI-FC Router's SCSI bus add the External SCSI-FC Router SCSI terminator. To terminate the attached SCSI device, refer to the SCSI device's operating manual for information concerning proper termination.
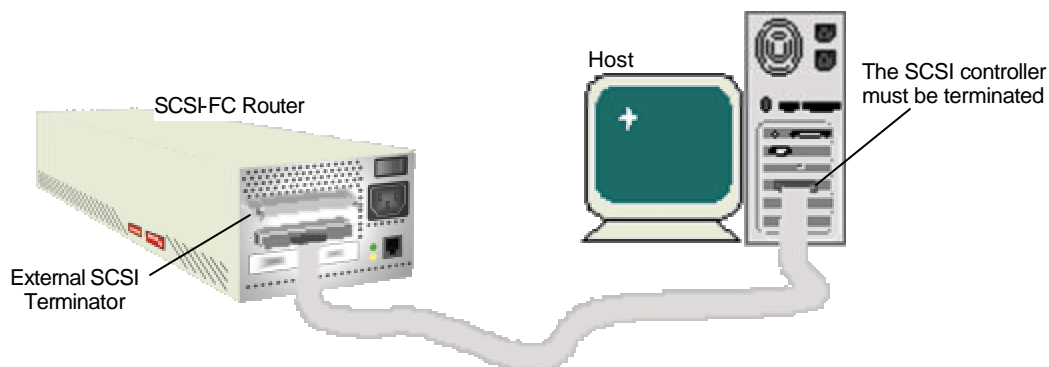
Figure 2-6. Example of a SCSI-FC Router Termination

2.6.4. Fiber Channel Cabling
The Fibre Channel architecture automatically provides termination, therefore, unlike SCSI cabling, there is no need for additional steps to terminate an FC bus.

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

3. SCSI-FC Connectivity

The following section details the recommended procedures for troubleshooting the installation and operation of the SCSI-FC Router connectivity solution. Other potential support issues, such as switch settings, LED codes, cabling and connections, and router replacement are also covered.

3.1. Installation Troubleshooting

Many support issues for the SCSI-FC Router will be the result of an incorrect installation. The following section provides a step-by-step troubleshooting approach to ensure that all installation requirements have been properly met.

3.1.1. Step One: Check Microcode

1. Determine which version of microcode is currently installed on the SCSI-FC Router.
    - The SCSI-FC Router microcode version can be checked using the serial port. See Section 4.2.4.1.2 or 4.3.4.1.2, to determine microcode location on the VPD screen.
    - The SCSI-FC Router microcode version can also be checked using the router's LEDs. See Section 3.3.2.2.
2. The latest available version of the microcode for the SCSI-FC Router will be listed and available for download from the Vicom web site.
    - f)   Go to Vicom's web page http://www.vicom.com
    - g)   Click the **Customer Support** button.
    - h)   Go to the **General Support** section.
    - i)   Click the '**Downloads**' link. Look for the SCSI-FC Router in the table and compare the latest microcode version number that is listed with the version number that was determined in Step 1 above.

      Note: At publication time for this document, the H microcode that has undergone HP quality assurance testing for this solution is version 7.62 (or higher, as advised by Vicom).
    - j)   If the user's router has a version older than that listed, download the new microcode and save it to a hard or floppy disk.
3. Next download the saved microcode to the appropriate router.

3.1.2. Step Two: Ensure That Attached Devices Function Properly

Refer to the storage device's operating manual and ensure that it is functioning properly. The storage device(s) will be the device(s) attached to the SCSI-FC Router (see Figure 1-2).

3.1.3. Step Three: Clear the Node Mapping Table of the Router

For further information on the role of the Node Mapping Table, see Section 3.3.2.4.
1. Ensure that the router is powered off.
2. On SW2 of the router, set DIP switches 4 and 5 to the down position to clear the Node Mapping Table.
3. Power on the router. The power LED (green) should be solid on. If the power LED is off, see Section 3.2.3.1 *(Power LED Not Lit)*
4. When the Fault LED (yellow) is solid on and the Status LED (green) is blinking, it indicates that the Node Mapping Table has been cleared. (To locate the front and rear Fault LEDs, see Figure 3-1 and Figure 3-2, respectively).

Note: When the Node Mapping Table has been cleared, the Status LED (green) blinks a status code of 060 as described in Table 2-3 (Diagnostic Status Codes for Fault LED). To decipher the LED read-out, see Section 3.4.1

5. This process will take approximately 10 seconds.

6. Power off the router.

3.1.4. Step Four: Set Up Router
1. Ensure that the host router is powered off.
2. On SW1 of the router set all DIP switches to the down position.
3. Attach the router to the storage devices with the appropriate fiber optic cable. Ensure that cable and connectors are securely fastened. (To ensure proper cable specifications, see Section 2.6.4.)
4. At this point the host/server should not be attached.

3.1.5. Step Five: Run Subsystem Device Check
The subsystem device check verifies the communication link between the SCSI-FC Router and the attached storage device(s).
1. Power off the router.
2. Set DIP switch 5 on SW2 in the down position to activate the Device Check mode.
3. Power on the router. The power LED (green) should be solid on. If it is off, then see Section 3.2.3.1 (Power LED Not Lit).
4. The testing process will take approximately 1 minute. When the test is complete, 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 router to the storage 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 router and the storage device(s). Check this connection following the procedure outlined in Section 3.6.1.

3.1.6. Step Six: Set Operating Mode
1. Power off the router.
2. On SW2 of the router, set DIP switches 0 and 2 to the down position to activate the 'host' operating mode (or DIP switches 0,1 and 2 should be down for configurations that include storage arrays using volume set addressing, see Section 3.3.2.5, *Array Controller Mode*).
3. Attach the 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 3.6.2.)
4. The configuration should match the diagram in Figure 1-2.

Note: Steps 7 and 8, the Power Down and Power Up Sequences, should be considered *optional*. If cycling the power on the storage devices is operationally problematic, these steps may be ignored.

3.1.7. Step Seven: Power Down Sequence (optional)
1. Power off the host/server if on.
2. Power off the router if on.
3. Power off the storage device(s) if on.
4. Proceed to Step Eight (Power Up Sequence) once all devices are powered down.

3.1.8. Step Eight: Power Up Sequence (optional)
1. Power on the attached storage device(s). If the devices are disk drives, then allow spin up time to complete (maximum 2 minutes).
2. Power on the router.
3. When the router's LEDs stop blinking, power on the host/server.

4. When this procedure has been successfully completed, the router's Status LED should be Solid On to indicate a complete loop.

5. Verify that the host sees all the device(s) on the SCSI bus by forcing a SCSI I/O scan. Refer to the host's manual for further information if necessary.

Example (for HP3000):
```
ISL>help
ISL>ode                         (offline diagnostic environment)
ODE>mapper
Mapper>run
            11      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
            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 device being configured as demonstrated in the above ODE listing. Make sure you see the product ID's from the device(s) being displayed.

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

3.2. Run Time Troubleshooting

If it is determined that the SCSI-FC Router was properly installed, but normal run time operations remain problematic, the following section can be used as a step-by-step troubleshooting approach to help determine the nature of the user's problem.

3.2.1. Step One: Stop I/O Operations

- Stop all applications connected 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.

3.2.2. Step Two: Ensure Proper Operating Mode

Ensure that the SCSI-FC Router is in the proper operating mode before beginning. See Section 3.3.2.1, *SCSI-FC Router Host Mode.*

3.2.3. Step Three: Check SCSI-FC Router LEDs

1. Are the SCSI-FC Router's status LED (green) and power LED (green) solid-on and the fault LED (yellow) is off? (For front and rear LED locations, see Figures 3-1 and 3-2, respectively).
    - **Yes:** Go to Section 3.1.4, *Set Up Router.*
    - **No:** Go to the next question, below.
2. 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, read the last column labeled 'Go to' and refer to the section/table listed.
    - **No:** Go to Section 3.1.4, *Set Up Router.*

SCSI-FC ROUTER

Power LED (Green)	Status LED (Green)	Fault LED (Yellow)	Description	Go to
Off	Off	Off	No Power	3.2.3.1
Solid On	Fast Blink	Off	Web Walk (Normal Condition)	n/a
Solid On	Blinks Code	Solid On	Status Codes for Fault LED	Table 3-3
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

3.2.3.1. Power LED - Not Lit

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

1. Verify that an AC plug is connected to a working wall outlet and the other end is connected to the SCSI-FC Router unit.
2. Ensure that 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 3.5.1, *Replacing a SCSI-FC Router.*)
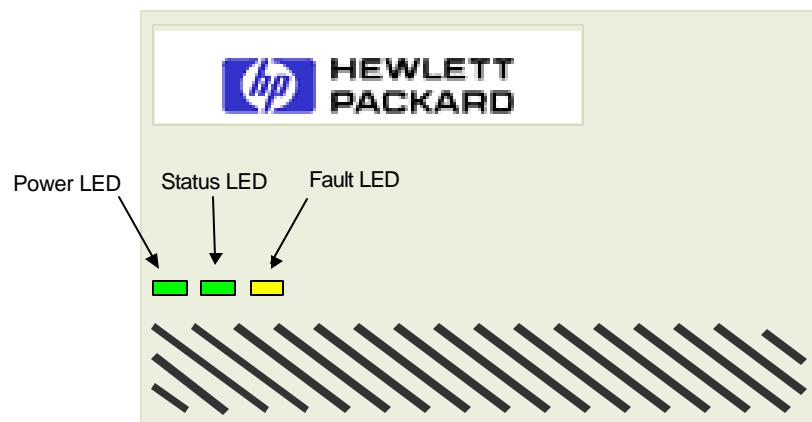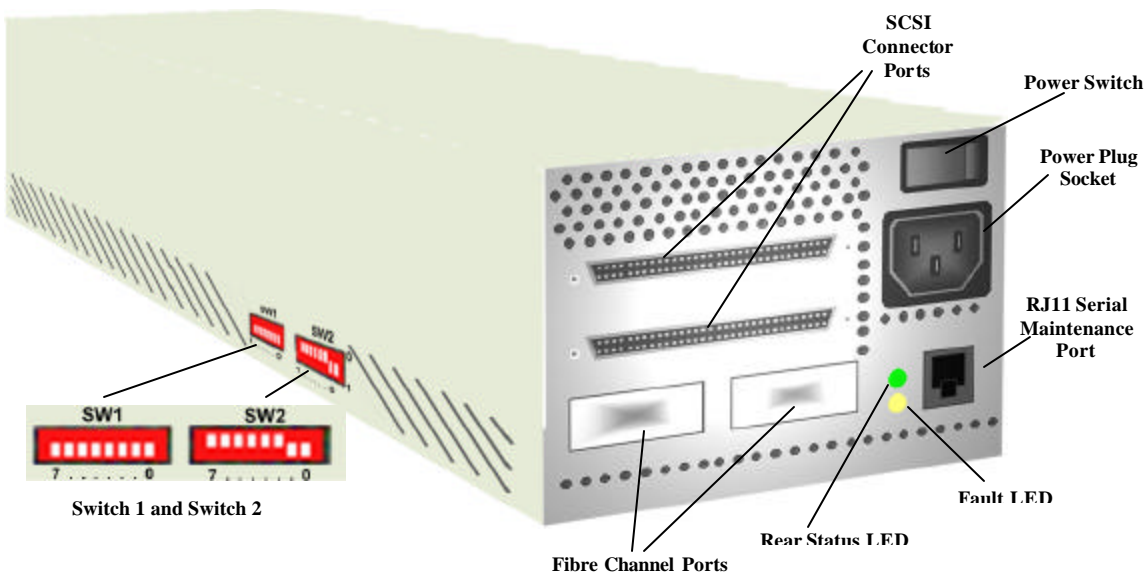

Figure 3-1. SCSI-FC Router Front Panel

Figure 3-2. SCSI-FC Router Rear Panel

3.2.3.2.   Status LED (green) - Fast Blink

This is a normal condition. However, it is not a normal condition if the web walk lasts 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.)
2. If the status LED is still blinking fast after the power switch is toggled then run a subsystem check. (Go to Section 3.3.2.3, *Running the Subsystem Device Check Mode.*)
3. 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 3.5.1 *Replacing a SCSI-FC Router.*)

3.2.4. Step Four: Define Other Symptoms

If any of the following operating conditions are encountered, try to resolve the problem with the troubleshooting lists provided here.

3.2.4.1.   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.

3.2.4.2.   The SCSI-FC Router Web Walks too Often

1. There may be a problem with the SCSI cabling. Ensure that all the cabling requirements have been met (see section 3.6.2, *SCSI Cabling*).
2. There may be a problem with SCSI termination. Verify that all the termination requirements have been met (see Section 3.6.3, *SCSI Termination*).
3. A SCSI target ID conflict is possible.
   - Refer to host adapter documentation for further information.
   - Ensure that Switch 1 (SW1) on the SCSI-FC Router is set properly (see Section 3.3.1, SW1 SCSI ID Settings).
4. The SCSI cable between the host computer and the SCSI-FC Router unit may be defective. Check the SCSI connection and connector (see Section 3.6.1, *Check Cabling and Connectors*).
5. Another possible problem that will affect the host is a defective SCSI Host Bus Adapter. To ensure that the SCSI host adapter is working properly, attach a known good storage device to the adapter. If it works, then it is probably not the SCSI adapter or the cable 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. If this is determined to be the case, replace the SCSI-FC Router. (see Section 3.5.1 *Replacing a SCSI-FC Router*).

3.2.4.3.   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 the SCSI cabling. Ensure that all the cabling requirements have been met (see Section 3.6.2, *SCSI Cabling*).
3. There may be a problem with SCSI termination. Ensure that all the termination requirements have been met (see Section 3.6.3, *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 that Switch 1 (SW1) is set properly on the router. See Section 3.3.1, *SW1 SCSI ID Settings*.

5. The SCSI cable between the host computer and the SCSI-FC Router unit may be defective. Check the SCSI connection and connector (see Section 2.6.1, *Check Cabling and Connectors*).
6. Another possible problem that will affect the host is a defective SCSI Host Bus Adapter. To ensure that the SCSI host adapter is working properly, attach a known good storage device to the adapter. If it works, then it is probably not the SCSI adapter or the cable 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 may be defective. (see Section 3.5.1, to replace the SCSI-FC Router).

3.2.4.4.   Host Computer Detects Some (but not all) 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 the SCSI cabling. Ensure that all the cabling requirements have been met (see Section 3.6.2, *SCSI Cabling*).
3. There may be a problem with SCSI termination. Ensure that all the termination requirements have been met (see Section 3.6.3, *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 that Switch 1 (SW1) is set properly on the router. See Section 3.3.1, *SW1 SCSI ID Settings*.
5. If the problem continues, ensure that the only other storage device connected to the host adapter is a single SCSI-FC Router controller.

3.3. Switch Settings

In order for run time operations to be successful, the SCSI-FC Router's switches must be properly utilized. Switch 1 (SW1) is used to select SCSI IDs for the devices on the SCSI bus. Switch 2 (SW2) is used to set the mode that the router will operate in.

Note: In the SCSI-FC Connectivity solution, the storage devices/arrays are Fibre Channel devices, however, they will appear as SCSI devices to the host computer. This is because the SCSI-FC Router is mapping them as such, based on the settings on SW1.

3.3.1. SCSI ID Settings (SW1)

How many devices will be on the SCSI bus? (**Note**: only one is recommended)
- **One:** Go to Section 3.3.1.2.
- **More than one:** Go to Section 3.3.1.3.

3.3.1.1. Important Issues Concerning SCSI ID Selection

When a DIP switch on SW1 (see Figure 3-3) is in the 'up' position, this will prevent the SCSI-FC Router from assigning the two IDs associated with that switch to the drives (DIP switch 3 is the only switch that has one SCSI ID associated with it, all other switches correspond to two IDs).
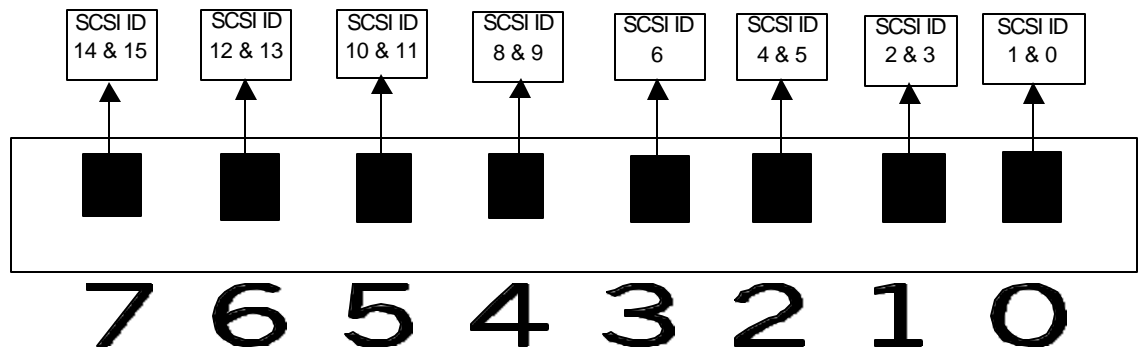
Figure 3-3. DIP Switch One and Its Associated SCSI IDs

3.3.1.2. Set SW1 to Share SCSI Bus with One Device

1. Power off the SCSI-FC Router.
2. Set DIP switch 3 on SW1 to the up position.
    (This ensures that SCSI ID 6 will remain available to be assigned to the SCSI device that will share the SCSI bus.)
3. Power on the SCSI-FC Router.
4. Switch 1 (SW1) is now properly set.

3.3.1.3. Set SW1 to Share SCSI Bus With More Than One Device

1. Power off the SCSI-FC Router.
2. Select a number of DIP switches so that the SCSI IDs represented by the switches equals the number of devices that will share the SCSI bus.
3. Set the selected DIP switches on SW1 to the up position.
4. Power on the SCSI-FC Router.
5. Switch 1 (SW1) is now properly set.

3.3.2. SCSI-FC Router Modes (SW2)

- The DIP switches on SW2 are used to set the operating mode of the SCSI-FC Router

Note: The SCSI-FC Router's power must be cycled to effect a change in mode.

Table 3-2 illustrates the modes that are available for the SCSI-FC Router used in the connectivity option and the specific switch setting that activates each mode.

Mode	Switch 7	Switch 6	Switch 5	Switch 4	Switch 3	Switch 2	Switch 1	Switch 0	DIP Switch Setting
Host Mode	0	0	0	0	0	**1**	0	**1**	
Microcode Revision	0	0	0	0	**1**	**1**	0	**1**	
Device Check	0	0	**1**	0	0	0	0	0	
Clear Mapping Table	0	0	**1**	**1**	0	0	0	0	
Array Controller	0	0	0	0	0	**1**	**1**	**1**	

Table 3-2. DIP Switch Settings for Mode Selection

3.3.2.1. SCSI-FC Router Host Mode

This is the operating mode to be used when the SCSI-FC Router is connected to any storage devices **except** those using '*volume set addressing*'. (For these see Section 3.3.2.5).
1. Ensure power is off to the router that will be used as the host router.
2. On the router, set host operating mode on switch two (SW2).
3. Power on the router.

3.3.2.2. Checking Microcode Revision

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. *Example: Revision number 7.60*

To run the Microcode Revision mode follow the steps below:
1. Power off the SCSI-FC Router.
2. Set the DIP switches on SW2 to activate 'microcode revision' mode.
3. Power on the SCSI-FC Router.
4. Watch the blinking pattern of the Status LED (see Section 3.4 to decipher the LED readout).
5. After the revision level is determined, power off the router, return it to its proper operating mode and power it on.

3.3.2.3. Running the Subsystem Device Check Mode

In this mode, the router will talk to the storage devices ensuring that proper communication is established.
1. Power off the router.
2. On SW2 of the router, set DIP switch 5 to the down position to activate the Device Check mode. This will check the communication between the SCSI-FC Router and the attached storage device(s).
3. Power on the router. The power LED (green) should be solid on. If the power LED is off, then see Section 3.2.3.1, *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 router to the storage device(s) is good.
- If the Fault LED (yellow) is solid on and the Status LED (green) is blinking, then a communication problem exists between the router and the storage device(s). Check this connection following the process outlined in Section 3.6.1.

3.3.2.4. Clearing the Node Mapping Table Mode

The 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.

1. Power off the router.
2. On SW2 of the router, set DIP switches 4 and 5 in the down position to clear the Node Mapping Table.
3. Power on the router. The power LED (green) should be solid on. If the power LED is off, then see Section 3.2.3.1, *Power LED – Not Lit.*
4. When the Fault LED (yellow) is solid on and the Status LED (green) is blinking, it indicates that the Node Mapping Table is cleared.
5. The process will take approximately 10 seconds.
6. Power off the router, set the host mode, and reconnect it to the storage devices.
7. When powered on, the router will resume normal operations.

3.3.2.5. Array Controller Mode

The SCSI-FC Router must be placed in this mode if the storage subsystem is set to 'Volume Set Addressing' mode (Array Controller Addressing mode).

3.4. LED Codes

3.4.1. Numerical Presentation Through the LED

Both status codes and error codes are digital numbers presented by 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

3.4.2. 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 FC 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.	n/a
068	An illegal operating mode has been used.	Return to the proper operating mode and recycle power on the SCSI-FC Router (see Section 3.3.2.1).

Table 2-3. Diagnostic Status Codes for Fault LED

3.5. SCSI-FC Router Replacement

3.5.1. Replacing a SCSI-FC Router

1. Power off the SCSI-FC Router being replaced. The SCSI-FC Router that will replace it should also be powered off.
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 connectors are securely fastened.
4. Clear the Node Mapping Table of the new SCSI-FC Router (see Section 3.1.3).
5. Power on the new SCSI-FC Router.
6. 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.
7. Replacement of the SCSI-FC Router is complete.

3.5.2. Drive Removal and Replacement

- If any drive is removed from the configuration, the SCSI-FC Router will take approximately 5 seconds to update.
- If any drive is added to the configuration, the SCSI-FC Router will take approximately 2 minutes to update.

3.6. Cabling and Connections

3.6.1. Check Cabling and Connectors

1. Power off the device(s) to which the connector is attached before removing it.
2. Observe both connectors on the ends of the cable. Ensure that pins are not broken, bent or pushed in.
3. If a connector is damaged, replace it 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 that the cable length does not exceed the lengths recommended in Section 3.6.2 or 3.6.4.
6. If problems still exist, power off the device and replace the cable.

3.6.2. SCSI Cabling

- Only the SCSI-FC Router 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.

3.6.3. SCSI Termination

SCSI termination must exist at both ends of the SCSI bus (see Figure 2-6). This applies to the connection between the host computer and the (host) router in both solutions and also between the device router and the storage device(s) in the distance solution. To terminate the SCSI-FC Router's SCSI bus add the External SCSI-FC Router SCSI terminator. To terminate the attached SCSI host, refer to the SCSI host's operating manual for information concerning proper termination.
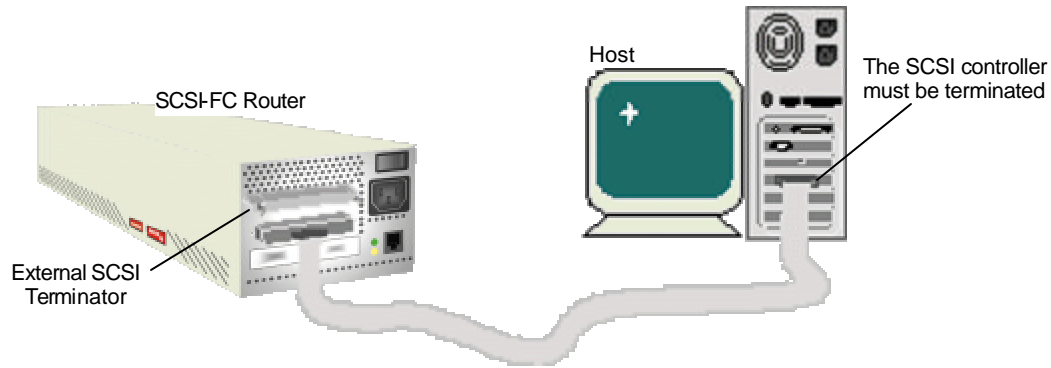

Figure 3-4. Example of a SCSI-FC Router Termination

3.6.4. Fiber Channel Cabling

The Fibre Channel architecture automatically provides termination, therefore, unlike SCSI cabling, there is no need for additional steps to terminate an FC bus.

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

4. Serial Port Diagnostics

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).

Using RJ11 Cable – reverse (straight-through) from a serial port connection on the host, a user may perform diagnostic tests on the SCSI-FC Router using either Windows HyperTerminal or PROCOMM PLUS® 3.0 or later. Each of these software tools requires either Windows 95 (or later) or Windows NT.

4.1. Modular Adapter Construction

A pre-wired modular adapter is provided with the SCSI-FC Router, however if for some reason another adapter needs to be constructed, follow the directions below.
> ➢ If using a DB9 to RJ11 Modular Adapter then go to Section 4.2.1.
> ➢ If using a DB25 to RJ11 Modular Adapter then go to Section 4.2.2.

4.1.1. DB9 to RJ11 Modular Adapter

1. Disassemble the modular adapter and study the position of each part to ensure proper assembly.
2. When opened, wires should be attached to the RJ11 connector but not attached to the DB9 connector.

3. Cut the RJ11 wires coming from pin 1 and pin 6 (these pins won't be used).
4. Solder RJ11 pin 5 (black) to the middle of RJ11 pin 2 (yellow). Do not solder the end of pin 2 and pin 5 together. Pin 2 will be inserted into the DB9. (User may have to cut the wires coming from pin 2 and pin 5 and solder all three together.)
5. Insert the RJ11 pin 2 into the DB9 pin 5.
6. Insert the RJ11 pin 3 into the DB9 pin 3.
7. Insert the RJ11 pin 4 into the DB9 pin 2.
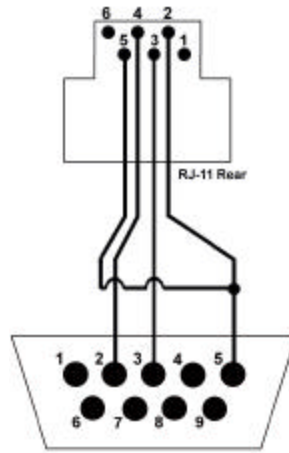8. Re-assemble the connector and it is ready for use.

Figure 4-1. The DB9 to RJ11 Modular Adapter Wiring Diagram

4.1.2. DB25 to RJ11 Modular Adapter

1. Disassemble modular adapter and study the position of each part to ensure proper assembly.
2. When opened, wires should be attached to the RJ11 connector but not attached to the DB9 connector.
3. Cut the RJ11 wires coming from pin 1 and pin 6 (these pins won't be used).
4. Solder RJ11 pin 5 (black) to the middle of RJ11 pin 2 (yellow). Do not solder the end of pin 2 and pin 5 together. Pin 2 will be inserted into the DB9. (User may have to cut the wires coming from pin 2 and pin 5 and solder all three together.)
5. Insert the RJ11 pin 2 into the DB9 pin 7.
6. Insert the RJ11 pin 3 into the DB9 pin 2.
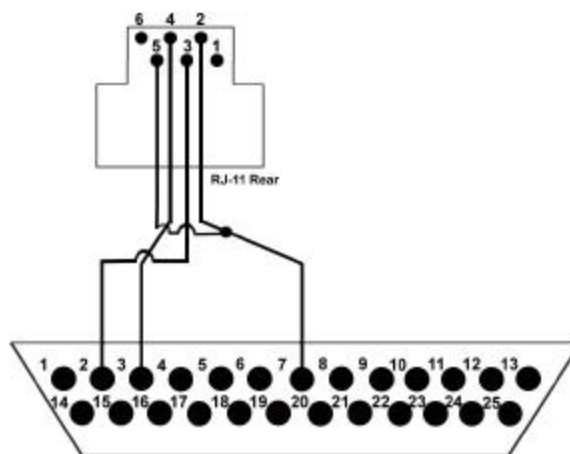7. Insert the RJ11 pin 4 into the DB9 pin 3.

Figure 4-2. The DB25 to RJ11 Modular Adapter Wiring Diagram

4.2. Windows HyperTerminal

HyperTerminal (hypertrm.exe) is supplied as part of the Windows NT and Windows 98 operating systems. It can be configured as the host terminal for accessing the serial port on the SCSI-FC Router.

4.2.1. Installing HyperTerminal

If HyperTerminal is not installed on your computer, install it from the Windows distribution CD. (Hewlett-Packard recommends installing HyperTerminal on a laptop to provide mobility.)

1. From the Windows Start button select, Settings, Control Panel, Add/Remove Programs, Windows Setup.
2. Click the 'Communications' check box that appears next.
3. Then click on the 'Details' button.
4. Select the 'HyperTerminal' check box. and click "OK".
5. Click "OK" again to begin the installation.

4.2.2. Setting Up HyperTerminal

The first time HyperTerminal is run, a setup wizard will guide the user through setting up a connection type (configuring a Modem). Select 'Manual Configuration' and choose 'Direct Serial Connection Between two PCs' from the list box. Select the host's serial port (COM1, COM2, etc.) that will support the connection to the SCSI-FC Router. Once that is accomplished, follow the steps listed below in order to connect the host to the SCSI-FC Router.

1. Start HyperTerminal.

2. First, you will be prompted for a "Connection Description". Type a name for this setup and select an Icon. Click OK.
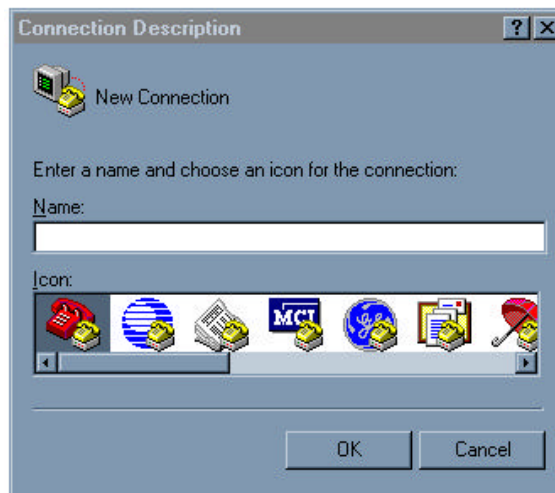

Figure 4-3. Windows HyperTerminal Connection Description

3. Next, you will be prompted for the type of connection that you want to establish. Select the desired connection type in the "Connect using:" list box and then click OK.

Figure 4-4. Specifying a Connection Type for HyperTerminal

4. You will be prompted for the selected port settings. Enter the settings shown in Figure 4-5. Then click OK.
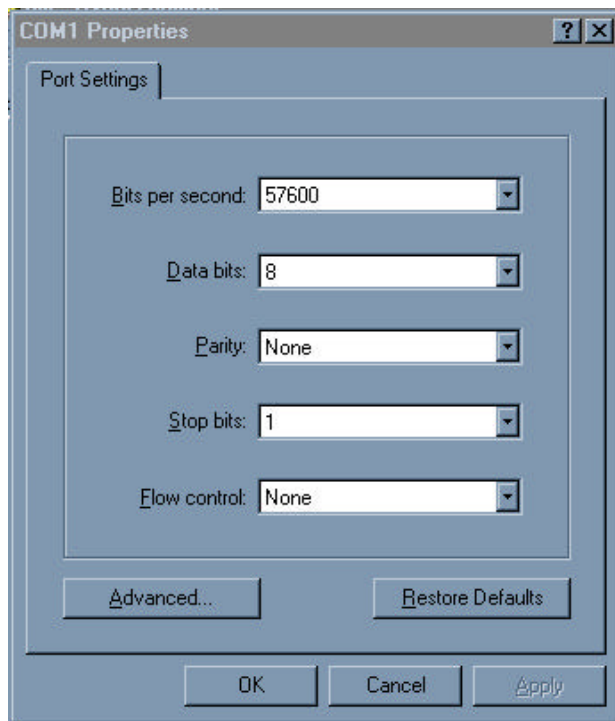

Figure 4-5. HyperTerminal Port Settings Box

5. Select "File, Properties" from the menu bar and then select the "Settings" tab in the Properties dialog box. Match the settings to those in Figure 4-6.

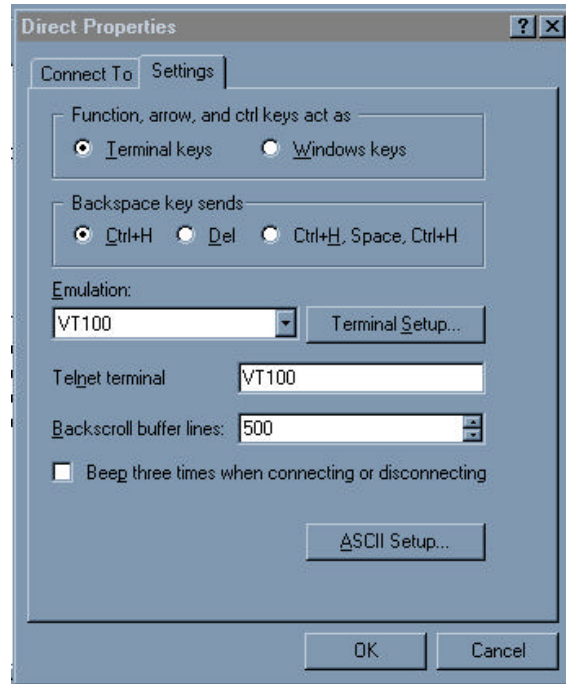*Figure 4-6. HyperTerminal Settings Tab*

6. Click on "Terminal Setup…". Match the settings to those in Figure 4-7. Click OK.
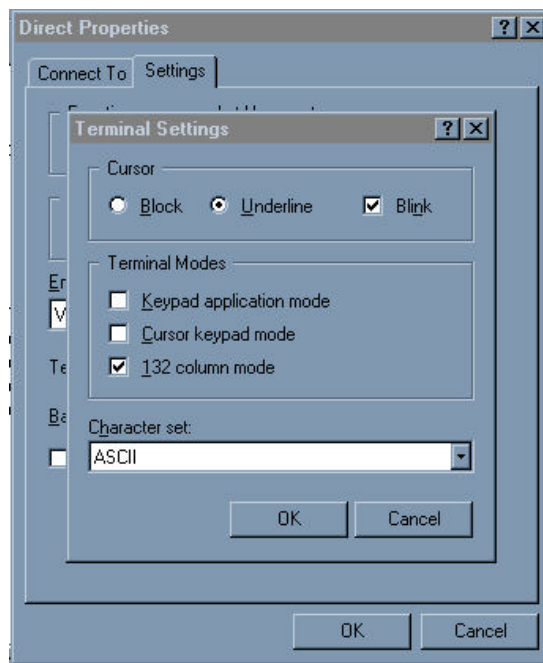

Figure 4-7. Terminal Settings

7. Click on "ASCI Setup…". Match the settings with those in Figure 4-8. Click OK.
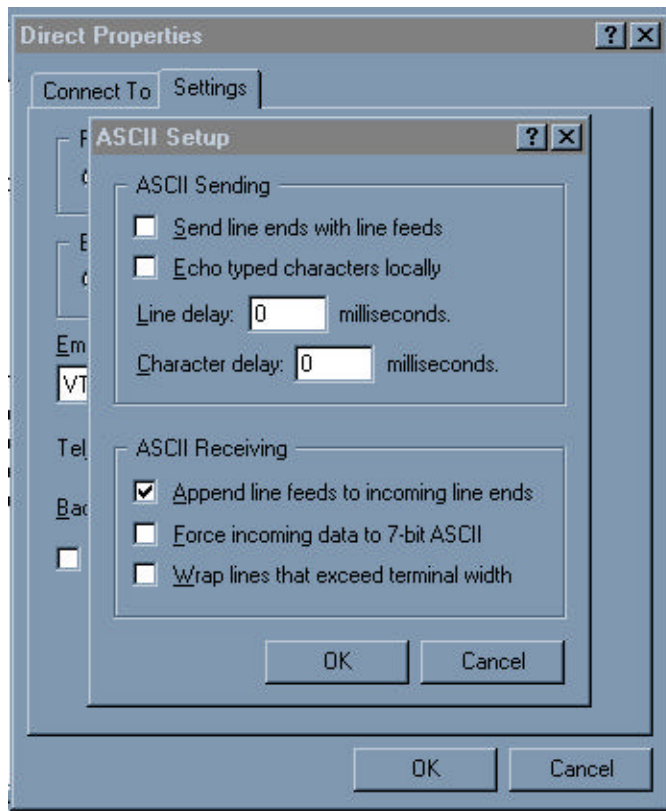
Figure 4-8. ASCII Setup Box

8. Click OK again and the properties box will close. Setup is now complete.

4.2.3. Enabling the Serial Port

In order to enable the SCSI-FC Router's serial port to provide diagnostic information, the user must first activate the Windows HyperTerminal program from the Windows Start button (Programs, Accessories, Communications). The enabling process for the serial port will be identical for Hyperterminal as well as for any other communication software utility tool, such as Procomm Plus

1. After the communications utility (e.g. Hyperterminal) is activated, at the cursor, type **hello** and press enter.

    Note: *When typing hello, it will not be visible on the screen. It should also be in lower-case letters only, so ensure that the 'Caps Lock' key is not pressed.*

2. If the screen reads '**serial port is enabled**' then startup was successful.
3. At the cursor, enter a question mark '**?**' to view the menu.

4.2.4. Serial Port Operation

As is shown in Figures 5-7 and 5-8, a number of serial port diagnostic and maintenance commands are available for the user in the 'Serial Port Menu'. The menu options available will be identical for Hyperterminal as well as for any other communication software utility tool, such as Procomm Plus. The differences occur in the way that several of the commands proceed past the point of selecting the menu item. For the benefit of new users however, the whole sequence will be presented here for Hyperterminal, and then set out again separately later, for Procomm Plus.

4.2.4.1.1.   '?': Show Serial Port Service Utility Key Assignments Menu

This command will display a list of functions as shown in Figure 5-7. If using the SCSI-FC Router in a distance solution, please note that functions that appear on the screen in Figure 57 are utilized with the host router (SCSI-FC Router H). This is also the screen that will appear if the router is being used as a connectivity device. Figure 5-8 shows the menu that appears for use by the device router (SCSI-FC Router D).

Serial Port Service Utility Key Assignments:

'1': Display VPD
'2': Show SCSI Map
'R': Force Hardware Reset
'C': Clean Up Configuration Table
'H': Download SCSI-FC Router H Microcode From Local Computer
'D': Download SCSI-FC Router D Microcode From Local Computer
'?': Show Serial Port Service Utility Key Assignments Menu
'q': Quit Serial Port Service Utility

Figure 5-7. Serial Port Menu (for Host Router in Distance Solution)

Serial Port Service Utility Key Assignments:

'1': Display VPD
'2': Show SCSI Map
'R': Force Hardware Reset
'I': ?Download SCSI-FC Router H Microcode from Local Computer
'T': ?Download SCSI-FC Router D Microcode from Local Computer
'?': Show Serial Port Service Utility Key Assignments Menu
'q': Quit Serial Port Service Utility

Figure 5-8. Serial Port Menu (for Device Router in Distance Solution)

4.2.4.1.2.   '1': Display VPD

This function is used to display important information *(**V**ital **P**roduct **D**ata)* for attached SCSI-FC Router. See Figure 5-9 "VPD Screen". In this function, an attached SCSI-FC Router is referred to as the local SCSI-FC Router.

```
********* SHOW LOCAL SCSI-FC ROUTER VPD *********

Product Type: SCSI-FC Router H
SCSI-FC router H Firmware Revision: 7.60.15   08-17-1999  11:30:36
SCSI-FC router D Firmware Revision: 2.04.06   08-10-1999  10:38:27
Loader Revision: 1.09.08
Unique ID: 00000060-2200360C
Unit Serial Number: 00220006
PCB Number: 00179289

DIP SW1 = 11111110    DIP SW2 = 00000011  (1 = down : 0 = up)
            76543210                 76543210
```

Figure 5-9. VPD Screen

1. To display the VPD screen of the local SCSI-FC Router, enter the number one '**1**'.
2. **Product Type** – The first line describes the use of the local SCSI-FC Router.
    *   SCSI-FC Router H - An 'H' represents host router.
    *   SCSI-FC Router D - A 'D' represents a device router.
3. **SCSI-FC Router H/D Firmware Revision** – These screen items provide the firmware/microcode revision level and the date and time of development for the respective routers.
4. **Loader Revision** – displays the local SCSI-FC Router's loader revision level (for internal use only).
5. **Unique ID** – displays the local SCSI-FC Router's unique ID assigned by the manufacturer.
6. **Unit Serial Number** – displays the local SCSI-FC Router's Unit Serial Number.
7. **PCB Number** - displays the local SCSI-FC Router's Printed Circuit Board number (for internal use only).
8. **DIP SW1 = 0000101   DIP SW2 = 1111111** – displays the DIP switch setting of SW1 and SW2.

4.2.4.1.3.   '2': Show SCSI Map

This command will display a map of local SCSI device(s) (tape or disk 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, enter the number '2' to display the SCSI Map as shown in Figure 5-10.
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(s).
    - Device Type – describes what the corresponding device(s) is (are).
    - 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 5-10. SCSI Map

4.2.4.1.4.   'R': Force Hardware Reset

This command will reset only the local SCSI-FC Router. This is recommended when lockup occurs.

1. To reset the local SCSI-FC Router, enter the upper-case letter **R**'. Do this only once. If entered successfully the screen will read as follows:

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

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

4.2.4.1.5.   'C': Clean Up Configuration Table

This function removes the old, unused configurations from the database.

1. To clean up the configuration table of the local router, enter the upper-case letter '**C**'. Do this only once. If entered successfully, the screen will read as follows:

```
Please Wait Until Boot Up Again .....
```

2.  After the reset has concluded and the screen reads '**Ready .. … .**', access the serial port by typing '**hello**'.

**Note:** *'Cleaning up' the configuration table is actually equivalent to **deleting** the existing configuration database contained within the router. Please only use this option if you are certain you wish to do this.*

### 4.2.4.1.6.   'H': Download SCSI-FC Router Microcode

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

1. Ensure that the SCSI-FC Router is in the host mode.
2. Enter the upper-case letter '**H**'.
3. The SLIC will respond as in the screen shot above, indicating that it is ready to receive the



microcode file.
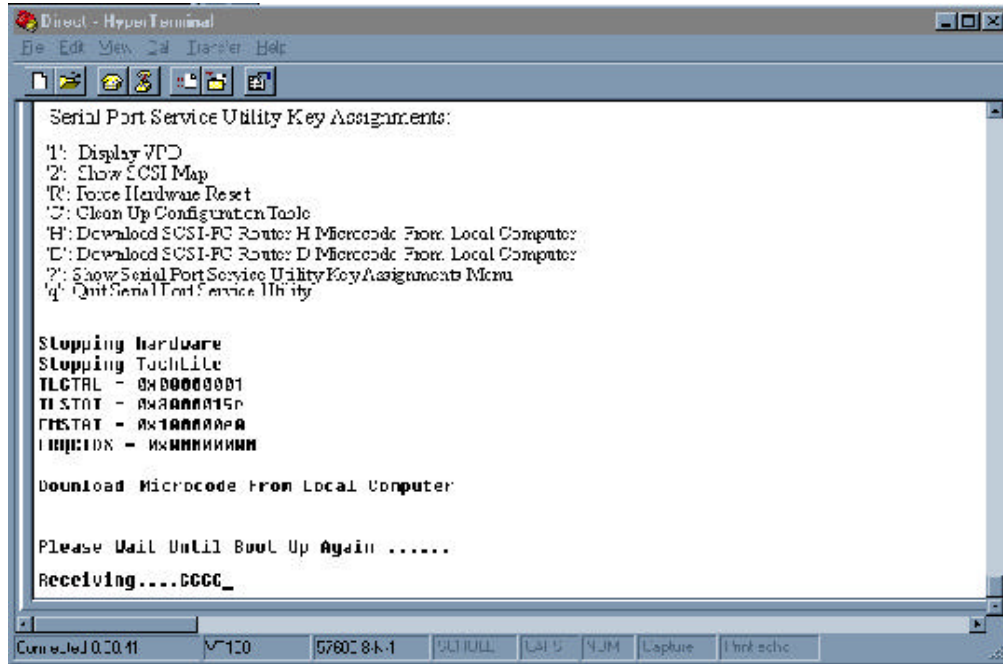
4. At this point, despite the ongoing screen feedback message, the router is not actually receiving anything, until the Hyperterminal program is instructed, as to what is required to provide. There will only be a limited time period allowing the user to progress to the following step providing this instruction, before the router exits from this stage of the process, due to an in-built 'time-out' mechanism. If premature evacuation occurs, simply repeat the process described to here.
5. From the HyperTerminal menu bar, select "Transfer, Send File".

6. Chose Xmodem in the Protocol box.
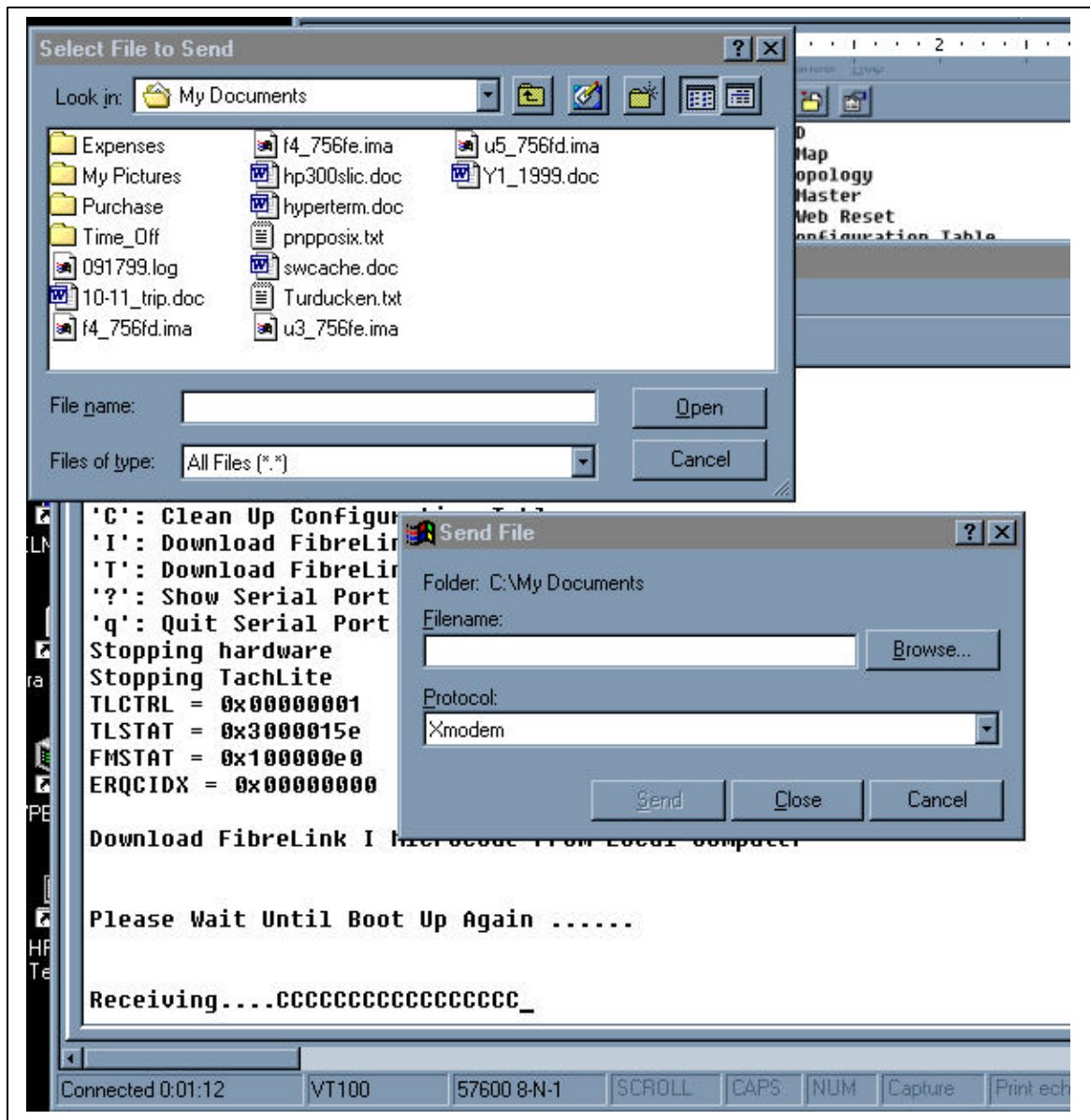


7. Click on Browse to search on the local computer or network, to select the microcode file that will be downloaded to the local router. Click on the microcode filename, then click Open.  The microcode filename will appear in the Filename box of the Send File dialog box.  Click Send to start the download.
8. At this point, the actual download will commence, provided that the process has not timed out, as mentioned just prior.
9. Wait for download to complete to begin normal operations.

> **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.*

### 4.2.4.1.7.   'D': Download SCSI-FC Router Microcode

This function is used to update the microcode for the local *device* router. The instructions are similar to those for the *host* router, except for several steps.

1. Disconnect the Fibre Channel cable from the device router.
2. Power off the device router.
3. Change the device router from Device mode to Host mode.
4. Power on the device router.
5. Activate the Windows HyperTerminal software (see Section 5.1.3)
6. Enter the upper-case letter '**D**' for device router.
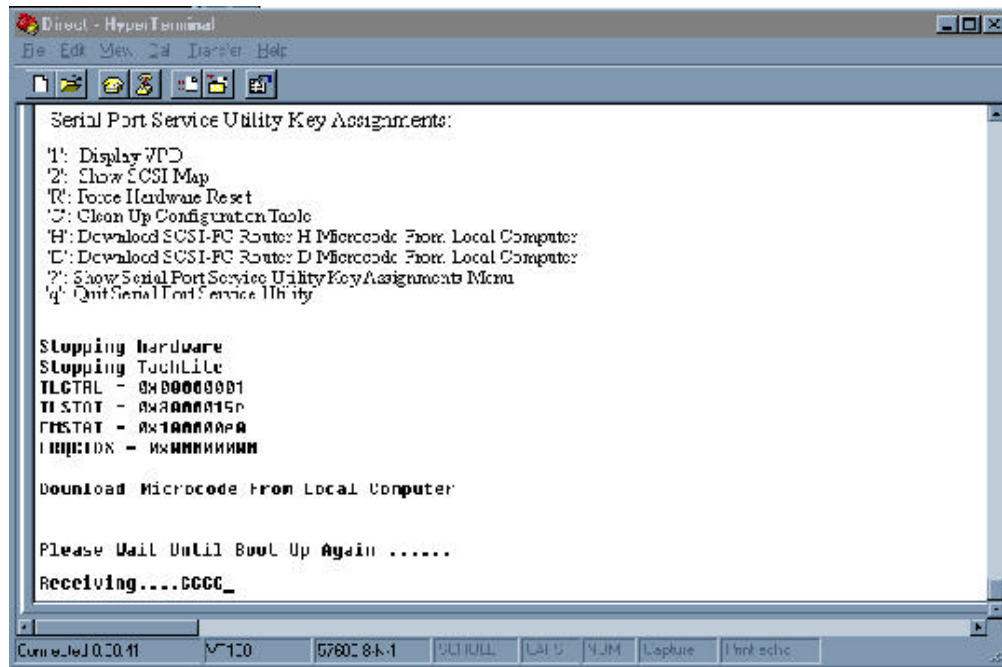


7. The SLIC will respond as in the screen shot above, indicating that it is ready to receive the microcode file.
8. At this point, despite the ongoing screen feedback message, the router is not actually receiving anything, until the Hyperterminal program is instructed, as to what is required to provide. There will only be a limited time period allowing the user to progress to the following step providing this instruction, before the router exits from this stage of the process, due to an in-built 'time-out' mechanism. If premature evacuation occurs, simply repeat the process described to here.
9. From the HyperTerminal menu bar, select "Transfer, Send File".

10.   Chose Xmodem in the Protocol box.
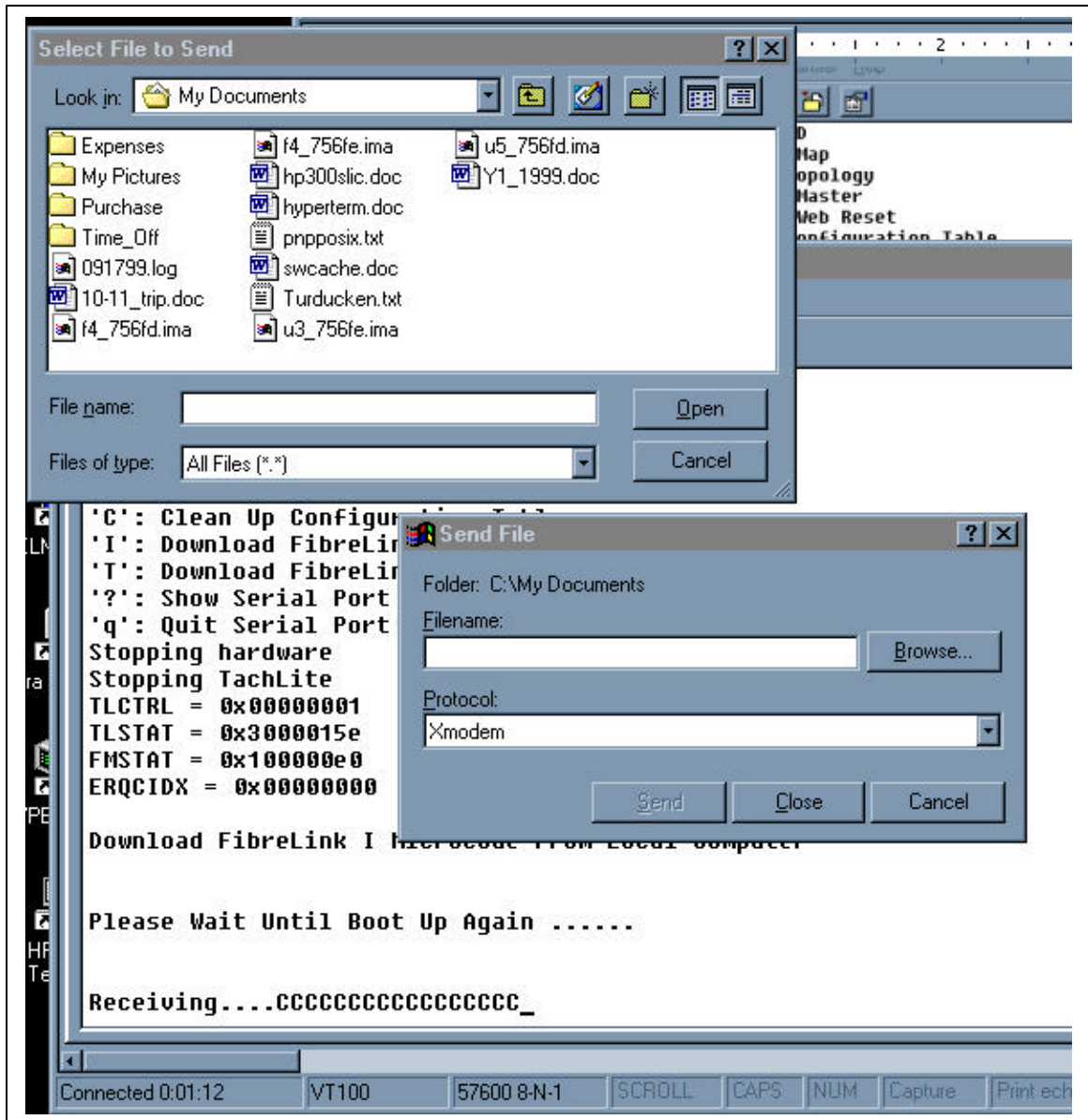


11.   Click on Browse to search the local computer or network, then select the microcode file
      that will be downloaded to the local router. Click on the microcode filename, then click Open.
      The microcode filename will appear in the Filename box of the Send File dialog box.  Click
      Send to start the download.
12.   At this point, the actual download will commence, provided that the process has not timed
      out, as mentioned just prior.
13.   Wait for download to complete before moving to the next step.

---

*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.*

---

14. After download is complete, power off the router.
15. Change the device router from Host mode
    back to Device mode.
16. Power off the device router.
17. Reconnect the Fibre Channel cable to the device router.
18. Power on the device router.

### 4.2.4.1.8. 'q': Quit Serial Port Service Utility

When serial port diagnosis is complete, it is recommended that the user actively quit the program by selecting this menu option. This alerts the computer running Windows HyperTerminal that the serial port connection has been closed and no more data will be forthcoming.

### 4.3. PROCOMM PLUS

PROCOMM Plus is a prorietary communication software tool, similar to Windows HyperTerminal, that is often used by Vicom engineers, or its customers.

#### 4.3.1. Installing PROCOMM PLUS

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

#### 4.3.2. Setting Up PROCOMM PLUS

1. From the menu bar of the initial screen, select Setup.
2. On the pulldown menu, select Setup.
3. The Setup dialog box will appear. Select the 'Data' tab and the Data dialog box appears (see Figure 5-9).
4. At left of dialog box, select the 'Transfer Protocol' button. Set Xmodem protocol.
5. Next, select the 'Data Connection' button. Set modem baud rate to 57600.
6. Then, select the 'Terminal Options' button and select **Incoming CR to CR/LF**' and **Tab stops every 4 positions**'.
7. Select other check-boxes as shown in Figure 5-9, if appropriate.
8. Click 'OK'.
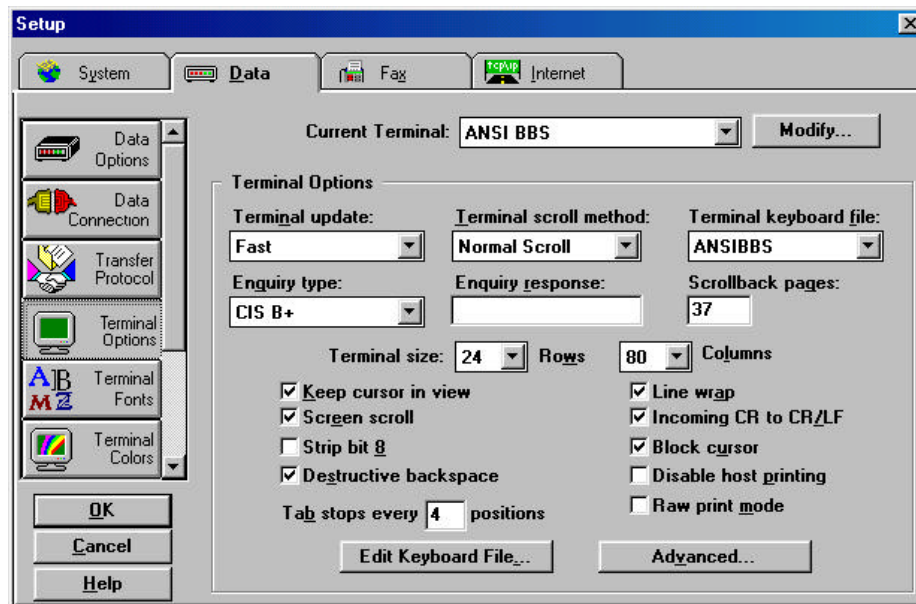9. Connect the computer serial port to the SCSI-FC Router RJ-11 serial port.



*Figure 5-11. Setup Dialog Box*

#### 4.3.3. Enabling the Serial Port with 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 5-10).
2. At the cursor, type **hello** and press enter.

**Note:** When typing hello, it will not be visible on the screen. It should also be in lower-case letters only, so ensure that the 'Caps Lock' key is not pressed.

3. If the screen reads '**serial port is enabled**' then startup was successful.
4. At the cursor, enter a question mark '**?**' to view the menu.

### 4.3.4. Serial Port Operation with PROCOMM PLUS

As is shown in Figure 5-12, a number of serial port diagnostic commands are available for the user in the 'Serial Port Menu'.

**Note:** *The menu commands and screens that the user sees in PROCOMM present the same menu selection options as those presented in Windows HyperTerminal.*

#### 4.3.4.1.1. '?': Show Serial Port Service Utility Key Assignments Menu

This command will display a list of functions as shown in Figure 4-14. If using the SCSI-FC Router in a distance solution, please note that functions that appear on the screen in Figure 4-14 are utilized with the host router (SCSI-FC Router H). This is also the screen that will appear if the router is being used as a connectivity device. Figure 4-15 shows the menu that appears for use by the device router (SCSI-FC Router D).



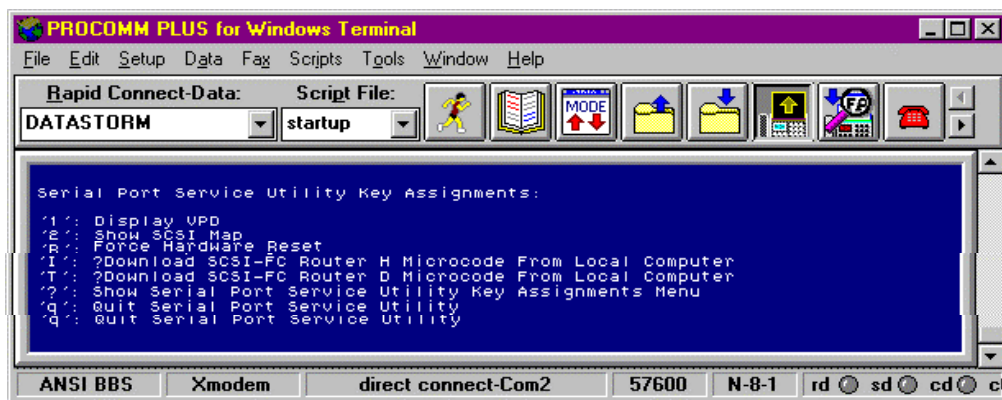*Figure 4-14. Serial Port Menu (for Host Router in Distance Solution)*



*Figure 4-15. Serial Port Menu (for Device Router in Distance Solution)*

#### 4.3.4.1.2. '1': Display VPD

This function is used to display important information *(**V**ital **P**roduct **D**ata)* for attached SCSI-FC Router. See Figure 4-16 "VPD Screen". In this function, an attached SCSI-FC Router is referred to as the local SCSI-FC Router.



*Figure 4-16. VPD Screen*

1.  To display the VPD screen of the local SCSI-FC Router, enter the number one '**1**'.
2.  **Product Type** – The first line describes the use of the local SCSI-FC Router.
    *   SCSI-FC Router H - An 'H' represents host router.
    *   SCSI-FC Router D - A 'D' represents a device router.
3.  **SCSI-FC Router H/D Firmware Revision** – These screen items provide the firmware/microcode revision level and the date and time of development for the respective routers.
4.  **Loader Revision** – displays the local SCSI-FC Router's loader revision level (for internal use only).
5.  **Unique ID** – displays the local SCSI-FC Router's unique ID assigned by the manufacturer.
6.  **Unit Serial Number** – displays the local SCSI-FC Router's Unit Serial Number.
7.  **PCB Number** - displays the local SCSI-FC Router's Printed Circuit Board number (for internal use only).
8.  **DIP SW1 = 0000101   DIP SW2 = 1111111** – displays the DIP switch setting of SW1 and SW2.

### 4.3.4.1.3. '2': Show SCSI Map

This command will display a map of local storage device(s) (tape or disk 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, enter the number '2' to display the SCSI Map as shown in Figure 4-17.
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(s).
    *   Device Type – describes what the corresponding device(s) is (are).
    *   BLKSIZ – shows the block size (for tape extender use only).



*Figure 4-17. SCSI Map*

### 4.3.4.1.4. 'R': Force Hardware Reset

This command will reset only the local SCSI-FC Router. This is recommended when lockup occurs.

1. To reset the local SCSI-FC Router, enter the upper-case letter '**R**'. Do this only once. If entered successfully the screen will read as follows:

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

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

### 4.3.4.1.5.   'C': Clean Up Configuration Table

This function removes the old, unused configurations from the database.

1. To clean up the configuration table of the local router, enter the upper-case letter '**C**'. Do this only once. If entered successfully, the screen will read as follows:

Please Wait Until Boot Up Again .....

2. After the reset has concluded and the screen reads '**Ready .. … .**', access the serial port by typing '**hello**'.

**Note:** *'Cleaning up' the configuration table is actually equivalent to  **deleting** the existing configuration database contained within the router. Please only use this option if you are certain you wish to do this.*

### 4.3.4.1.6.   'H': Download SCSI-FC Router Microcode

This function is used to update the microcode for the local host router.
1. Ensure that the SCSI-FC Router is in the host mode.
2. Enter the upper-case letter '**H**'.
3. Click on the open file icon in the tool menu.
4. Browse the local computer to select the microcode file
   that will be downloaded to the local router.
5. Wait for download to complete to begin normal operations.

> *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.*

### 4.3.4.1.7.   'D': Download SCSI-FC Router Microcode

This function is used to update the microcode for the local device router.
1. Disconnect the Fibre Channel cable from the device router.
2. Power off the device router.
3. Change the device router from Device mode to Host mode.
4. Power on the device router.
5. Activate the PROCOMM Plus software (see Section 4.3.3)
6. Enter the upper-case letter '**D**' for device router.
7. Click on the open file icon in the tool menu.
8. Browse the local computer to select the microcode file that will be downloaded to
   the local router.
9. After download is complete, power off the router.
10. Change the device router from Host mode back to Device mode.
11. Power off the device router.
12. Reconnect the Fibre Channel cable to the device router.
13. Power on the device 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.*

### 4.3.4.1.8.   'q': Quit Serial Port Service Utility

When serial port diagnosis is complete, it is recommended that the user actively quit the program by selecting this menu option. This alerts the computer running PROCOMM that the serial port connection has been closed and no more data will be forthcoming.

# 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 or HP9000 or Windows NT 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 |

## Attachment
Compatible with
--Distance Solution
HP3000 (Operating Systems MPE/iX 5.5 and MPE/iX 6.0)
--SCSI-FC Connectivity
HP3000 (Operating Systems MPE/iX 5.5 and MPE/iX 6.0)
HP9000 (Operating Systems ?.? and ?.?)
Windows NT

HP XLR1200 system

## Technical Specifications

### Maintenance
External Serial Port:

### 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

### Power
| | |
|---|---|
| AC Input: | 100 - 240 VAC, 50 - 60 Hz |
| DC Output: | 5V, 40W |
| Max. Inrush Current: | |
| Current: | 0.75 - 0.50 A |

### Tabletop Dimensions
| | |
|---|---|
| Height: | |
| Width: | |
| Depth: | |
| Weight: | |

Note: The SCSI-FC Router can also be installed into a rackmountable hub enclosure.

### User Interface
LED indicators                                          RJ-11 connector (57
Serial Port

### Emissions
Acoustic:

### Safety Certifications and Compliance
IEC 950:1991 + A1, A2, A3, A4 / EN 60950:1992 + A1, A2, A3, A4
IEC 825-1:1993 / EN 60825-1:1994 + A11, Class 1

### EMC Certifications and Compliance                30A @ 115VAC or 6
CISPR 22:1993 +A1, A2 / EN 55022:1994 +A1, A2 - Class A1
EN 50082-1:1992
IEC 801-2:1991 / prEN 55024-2:1992, 4 kV CD, 8 kV AD
IEC 801-3:1984 / prEN 55024-3:1991, 3 V/m          7.62 cm (3 in)
IEC 801-4:1988 / prEN 55024-4:1993, 0.5 kV Signal Lines795 cm (4.25 in)
1 kV Power Lines31.115 cm (12.25 in)
IEC 1000-3-2:1995 / EN 61000-3-2:1995, Class X, Harmonics(3.97 lb)
IEC 1000-3-3:1994 / EN 61000-3-3: 1995, Flicker

# Index