DSL Interface Cards

Overview

This document describes Cisco digital subscriber line (DSL) interface cards and how to connect Cisco DSL interface cards to a network. It contains the following sections:

For an overview of Cisco interface cards used for Cisco access routers see the *Cisco Interface Cards for Cisco Access Routers* document.

ADSL WICs

The DSL wide area network (WAN) interface cards (WICs) support one DSL line between a single customer premises equipment (CPE) subscriber and a central office.

Asymmetric digital subscriber line (ADSL) WICs are available in three variations:

- ADSL over POTS (WIC-1ADSL)
- ADSL over POTS with Dying Gasp support (WIC-1ADSL-DG)
- ADSL over ISDN with Dying Gasp support (WIC-1ADSL-I-DG)

The ADSL over POTS interface card is commonly used to provide ADSL services over ordinary telephone lines. The ADSL-over-ISDN interface card is used to provide ADSL services in those areas of the world that have extensive ISDN backbones already in place.

Note   The term *dying gasp* refers to *power status* as defined in ITU-T standard G.991.2, section 7.1.2.5.3.

LEDs on ADSL WICs

ADSL WICs have three LEDs, which are shown in Figure 62 and are described in Table 14.
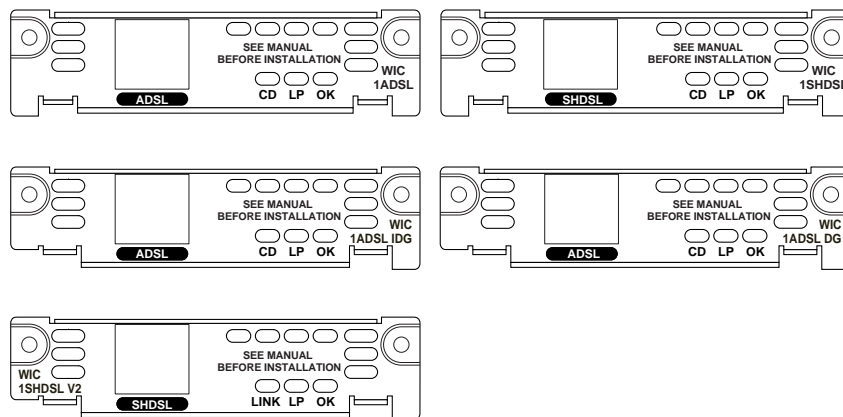
Figure 62   ADSL and G.SHDSL WIC Front Panels

Table 14   ADSL WIC LEDs

LED	Color	Description
CD LED	Green	Lit when the unit is connected to the network and operating normally. On ADSL interface cards only, this LED blinks while training with DSLAMs. Does not apply to the WIC-1SHDSL-V2 or WIC-1SHDSL-V3 interface cards.
LP LED	Yellow	DSL interface is in loopback mode.
	Off	Normal operation.
OK LED	Green	Enabled when the card is detected by the router.
LINK (CD) LED	Green and Yellow	Green when cells or frames are passing between the host and the DSLAM. Yellow when the T1E1 framer detects an alarm. Applies only to the WIC-1SHDSL-V2 and WIC-1SHDSL-V3 interface cards.

Supported Platforms

For a list of the platforms supported by a Cisco interface card refer to *Platform Support for Cisco Interface Cards*.

Finding Support Information for Platforms and Cisco IOS Software Images

Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at http://www.cisco.com/go/fn. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.

G.SHDSL WICs

The Multirate Symmetrical High-Speed Digital Subscriber Line (G.SHDSL) cards support two or more DSL lines.

The G.SHDSL WICs are available in the following variations:

- The WIC-1SHDSL is a 1-port interface card that supports one pair of copper wire (2-wire G.SHDSL). It is compatible with Cisco G.SHDSL line cards in the Cisco 6015, Cisco 6130, Cisco 6160, or Cisco 6260 digital subscriber line access multiplexer (DSLAM).

- The WIC-1SHDSL-V2 and WIC-1SHDSL-V3 interface cards are 1-port cards. They support all G.SHDSL features, and supply two twisted pairs of wires to implement 4-wire (two-line) G.SHDSL. These WICs support dying gasp and wetting current. They also provide a higher symmetrical bandwidth and longer reach than 2-wire G.SHDSL.

⚠

Caution   To comply with the Telcordia GR-1089 NEBS standard for electromagnetic compatibility and safety, connect the 1-port G.SHDSL interface card (WIC-1SHDSL-V2 and WIC-1SHDSL-V3) only to intra-building or non-exposed wiring or cabling. The intrabuilding cable must be shielded and the shield must be grounded at both ends.

LEDs on G.SHDSL WICs

The ADSL and G.SHDSL WICs have three LEDs, which are shown in Figure 63 and are described in Table 15.
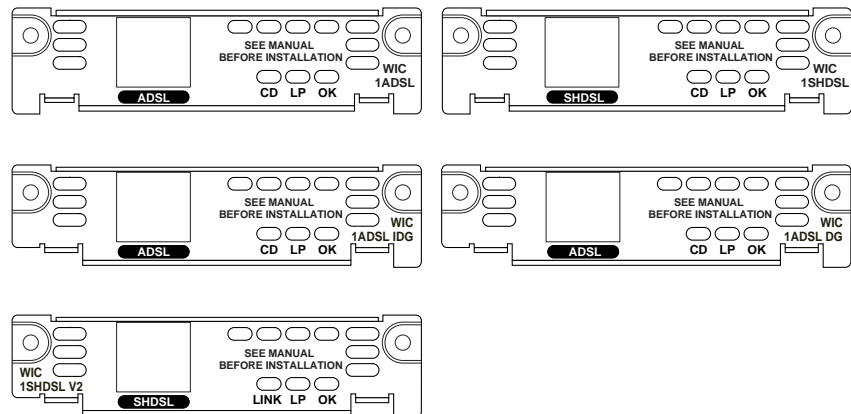
Figure 63   *G.SHDSL WIC Front Panels*

Table 15   *G.SHDSL WIC LEDs*

LED	Color	Description
CD LED	Green	Lit when the unit is connected to the network and operating normally. On ADSL interface cards only, this LED blinks while training with DSLAMs. Does not apply to the WIC-1SHDSL-V2 or WIC-1SHDSL-V3 interface cards.
LP LED	Yellow	DSL interface is in loopback mode.
	Off	Normal operation.

Table 15   G.SHDSL WIC LEDs (continued)

LED	Color	Description
OK LED	Green	Enabled when the card is detected by the router.
LINK (CD) LED	Green and Yellow	Green when cells or frames are passing between the host and the DSLAM. Yellow when the T1E1 framer detects an alarm. Applies only to the WIC-1SHDSL-V2 and WIC-1SHDSL-V3 interface cards.

Supported Platforms

Table 16 lists the Cisco router platforms that are compatible with each mode available on the WIC-1SHDSL-V2 interface card.

Table 16   Cisco router platforms compatible with WIC-1SHDSL-V2 interface card

Mode	Cisco Platforms
2-wire ATM	• Cisco 1721 • Cisco 1751 • Cisco 1760 • Cisco 1841 • Cisco 26*xx*XM • Cisco 2691 • Cisco 28*xx* • Cisco 3631 • Cisco 37*xx* • Cisco 38*xx*
2-wire T1/E1 in back-to-back configurations	• Cisco 1721 • Cisco 1751 • Cisco 1760 • Cisco 26*xx*XM
4-wire ATM	• Cisco 1721 • Cisco 1751 • Cisco 1760 • Cisco 1841 • Cisco 26*xx*XM • Cisco 2691 • Cisco 28*xx* • Cisco 3631 • Cisco 37*xx* • Cisco 38*xx*

Table 17 lists the Cisco router platforms that are compatible with each mode available on the WIC-1SHDSL-V3 interface card.

Table 17   Cisco router platforms compatible with WIC-1SHDSL-V3 interface card

Mode	Cisco Platforms
2-wire ATM	• Cisco 1721 • Cisco 1751 • Cisco 1760 • Cisco 1841 • Cisco 26*xx*XM • Cisco 2691 • Cisco 28*xx* • Cisco 37*xx* • Cisco 38*xx*
4-wire ATM	• Cisco 1721 • Cisco 1751 • Cisco 1760 • Cisco 1841 • Cisco 26*xx*XM • Cisco 2691 • Cisco 28*xx* • Cisco 37*xx* • Cisco 38*xx*

For a list of the platforms supported by a Cisco interface card refer to *Platform Support for Cisco Interface Cards*.

Finding Support Information for Platforms and Cisco IOS Software Images

Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at http://www.cisco.com/go/fn. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.

G.SHDSL High Speed WICs (HWICs)

The G.SHDSL high speed WICs (HWICs) are available in the following variations:

- The G.SHDSL HWICs support up to four pairs of DSL: two inverse multiplexing over ATM (IMA) lines, and two ATM segmentation and reassembly (SAR) lines. The four DSL pairs are bundled in groups and configured in the Cisco IOS command-line interface (CLI) by using the **dsl-group** command.

    - The HWIC-2SHDSL provides two ports of connectivity through one *RJ-11* connector. It supports *1-Pair* groups or *2-Pair* groups.

    - The HWIC-4SHDSL provides four ports of connectivity through one *RJ-45* connector. It combines four ports of data into one line or two lines with either inverse multiplexing over ATM (*IMA*) groups or *M-pair* groups, and it supports *1-Pair* groups or *2-Pair* groups.

✎
Note   The Cisco HWIC-2SHDSL provides support for the Dying Gasp feature; however, the Cisco HWIC-4SHDSL does not provide support for this feature. The term *dying gasp* refers to power status as defined in ITU-T standard G.991.2, section 7.1.2.5.3.

LEDs on G.SHDSL HWICs

The G.SHDSL HWICs have 4 LEDs that indicate DSL functionality. Figure 64 and Figure 65 show the front panels and LEDs for the HWIC-2SHDSL and HWIC-4SHDSL. The LED descriptions follow.
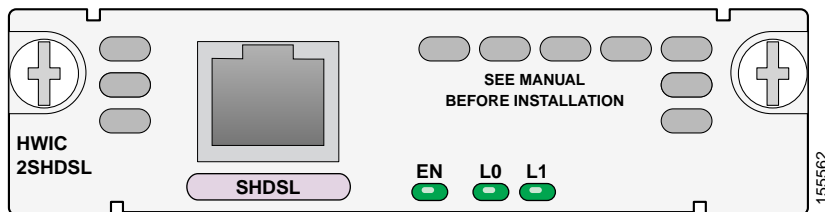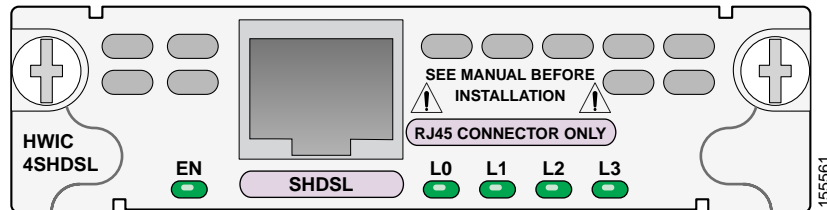
Figure 64   *HWIC-2SHDSL Front Panel*

Figure 65   *HWIC-4SHDSL Front Panel*

EN	Status of the system:
	Green—Operating system is running.
	Amber—Interface card is resetting.
	Blinking—System is initializing.
L0, L1, L2, L3	Status of link:
	On—Link is active.
	Off—Link is inactive (disabled).
	Blinking— Link is training / Link alarm.

Supported Platforms

For a list of the platforms supported by a Cisco interface card refer to *Platform Support for Cisco Interface Cards*.

Finding Support Information for Platforms and Cisco IOS Software Images

Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at http://www.cisco.com/go/fn. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.

ADSL High Speed WICs (HWICs)

ADSL high speed WICs (HWICs) provide ADSL support to platforms with HWIC-enabled interface slots, such as the Cisco 1800 series (modular), Cisco 2800 series, and Cisco 3800 series integrated services routers. Standard ADSL, ADSL2, ADSL2+, and Dying Gasp are supported.

ADSL HWICs are available in the following variations:

- ADSL over POTS (ADSLoPOTS) HWICs
  - HWIC-ADSL, a 1-port ADSLoPOTS card
  - HWIC-ADSL-B/ST, a 2-port card with a port for ADSLoPOTS and a data-only backup port for an ISDN BRI S/T connection
- ADSL over ISDN (ADSLoISDN) HWICs
  - HWIC-ADSLI, a 1-port ADSLoISDN card
  - HWIC-ADSLI-B/ST, a 2-port card with a port for ADSLoISDN and a data-only backup port for an ISDN BRI S/T connection

> **Note** ADSL HWICs can be inserted only in those interface slots that are enabled to receive HWICs. To determine which slots in your router are enabled to receive HWICs, refer to the *Interface Card Slot Locations and Numbering on Cisco Access Routers* section of the *Overview of Cisco Interface Cards for Access Routers* chapter of the *Cisco Interface Cards Hardware Installation Guide*.

ADSL HWICs are all packaged in Cisco's standard single-wide HWIC form factor.

The ADSL port is connected to the WAN with a straight-through RJ-11 cable supplied with the card.

The ISDN port is connected to an NT1 device with a straight-through RJ-45 cable, not supplied.

LEDs on ADSL HWICs

ADSL HWICs have 3 LEDs that indicate DSL functionality. Those ADSL HWICs with a backup ISDN port have three additional LEDs that indicate ISDN functionality.

Figure 66 and Figure 67 show the front panels and LEDs for the ADSLoPOTS and ADSLoISDN HWICs. The LED descriptions are listed in Table 18.

Figure 66   ADSLoPOTS HWIC Front Panel
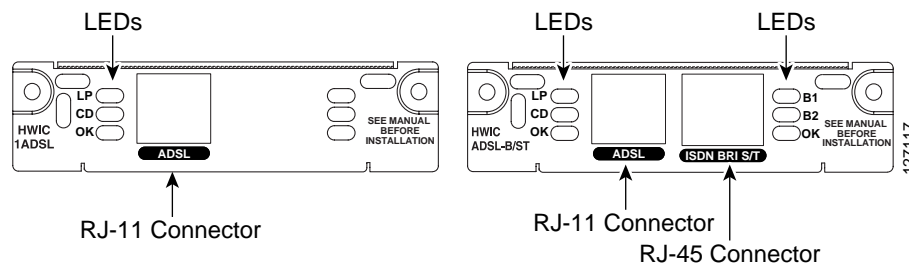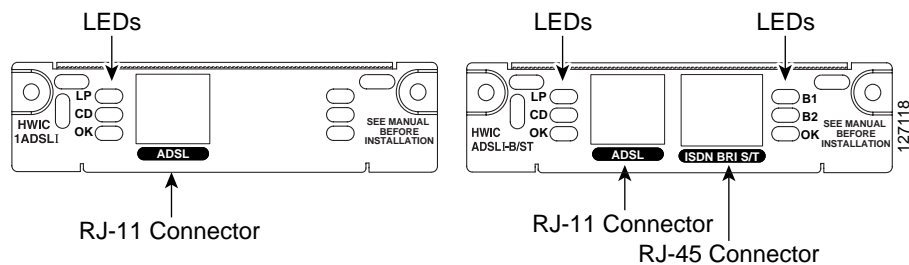

Figure 67   ADSLoISDN HWIC Front Panel

Table 18   ADSL HWIC LEDs

LED	Color	Description
LP	Yellow	DSL interface is in loopback mode.
	Off	Normal operation.
CD	Green	Lit when the unit is connected to the network and operating normally. This LED blinks slowly while downloading ADSL firmware, and blinks rapidly while training with DSLAMs.
OK (ADSL)	Green	Enabled when the card is detected by the router. This LED blinks while downloading firmware.
B1	Green	ISDN port. Blinks with active connection on the first B channel.
B2	Green	ISDN port. Blinks with active connection on the second B channel.
OK (ISDN)	Green	ISDN port has established a connection with the central office switch (D channel).

Supported Platforms

For a list of the platforms supported by a Cisco interface card refer to *Platform Support for Cisco Interface Cards*.

Finding Support Information for Platforms and Cisco IOS Software Images

Use Cisco Feature Navigator to find information about platform support and Cisco IOS software image support. Access Cisco Feature Navigator at http://www.cisco.com/go/fn. You must have an account on Cisco.com. If you do not have an account or have forgotten your username or password, click **Cancel** at the login dialog box and follow the instructions that appear.

Cables

The twisted-pair straight-through cable for customer premises equipment (CPE) applications is supplied. The RJ-45-to-RJ-45 BRI cable to connect the ISDN BRI ports on ADSLoISDN HWICs is not supplied. The two-line Y-cable for central office (CO) and 4-wire patch panel applications is not supplied.

Note The Y-cable must have the wires for pins 3 and 4 twisted together; wires for pins 2 and 5 must also be twisted together. Each pair goes to its own connector at the patch panel end.

Connecting a DSL Interface Card to the Network

See the following sections for information on connecting DSL interface cards to a network.

- Connecting the DSL Ports on WICs and HWICs, page 9
- Connecting the ISDN Ports on HWICs, page 12
- Connecting the SHDSL Port on the G.SHDSL HWICs, page 12

Connecting the DSL Ports on WICs and HWICs

Use a straight-through RJ-11 cable for this connection.

Table 19 shows the ADSL WIC and HWIC pinouts.

Table 19   ADSL WIC and HWIC Pinouts

Pin	Signal
3	Tip
4	Ring

Note If you are connecting an ADSL interface card to an RJ-11 wall jack that has the DSL pair wired for pins 2 and 5, you must use an RJ-11 crossover cable (lavender with blue stripe). The RJ-11 crossover cable is orderable separately as a spare.

Table 20 shows the WIC-1SHDSL pinouts.

Table 20 **WIC-1SHDSL Pinouts**

Pin	Signal
3	Tip
4	Ring

Table 21 shows the RJ-14C pinouts on the WIC-1SHDSL-V2 and WIC-1SHDSL-V3 interface cards.

Table 21 **WIC-1SHDSL-V2 RJ-14C Pinouts**

Pins	Signal	Line
3 and 4	3 = Tip, 4 = Ring	0
2 and 5	2 = Tip, 5 = Ring	1

To connect a DSL interface card to the WAN, complete the following steps:

Step 1 Confirm that the router is turned off.

Warning **To comply with the Telcordia GR-1089 NEBS standard for electromagnetic compatibility and safety, connect the HWIC-2SHDSL and HWIC-4SHDSL interface cards only to intra-building or unexposed wiring or cable. The intra-building port(s) of the equipment or subassembly must not be metallically connected to interfaces that connect to the OSP or its wiring. These interfaces are designed for use as intra-building interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE, Issue 4) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metallically to OSP wiring.**

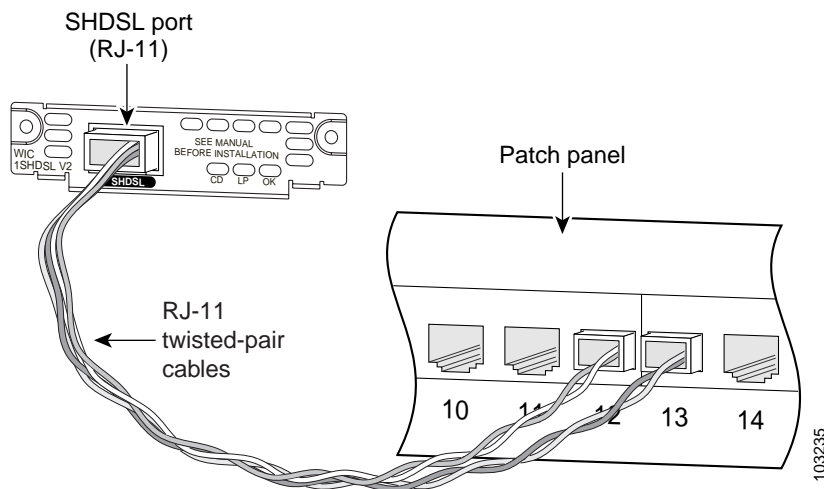**Step 2** Connect one end of the cable to the ADSL or G.SHDSL port on the card.

Step 3   Connect the other end to the wall jack (RJ-11) at your site, as shown in Figure 68.

Figure 68   *Connecting an ADSL Card to the Wall Jack*
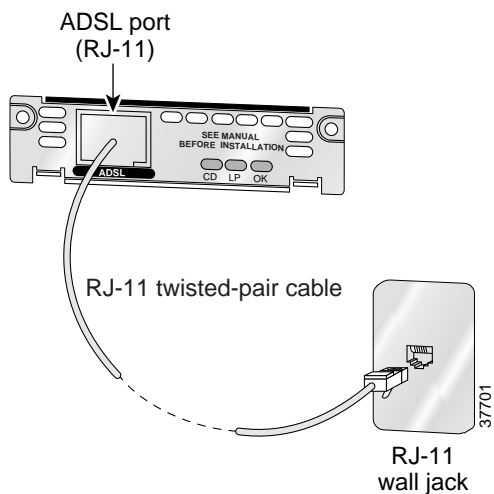
Alternately, when connecting a G.SHDSL card to a 4-wire patch panel, use a Y-cable as shown in Figure 69.

Figure 69   *Connecting a G.SHDSL Card to a Patch Panel With a Y-Cable*

Step 4   Turn on power to the router.

Step 5   To connect the card to the network, you must configure the DSL interface card in the router to the no shutdown state. Enter the **no shut** command in the router configuration. Verify that the CD LED comes on, indicating that the interface card is connected to the network.

Note   Step 5 does not apply to the WIC-1SHDSL-V2 or WIC-1SHDSL-V3.

Connecting the ISDN Ports on HWICs

Use an RJ-45-to-RJ-45 BRI cable (not included) to connect the ISDN BRI port to an ISDN NT1 device. Refer to the online document *Cisco Modular Access Router Cable Specifications* for pinouts.

To connect an ISDN BRI S/T port to the WAN, follow these steps:
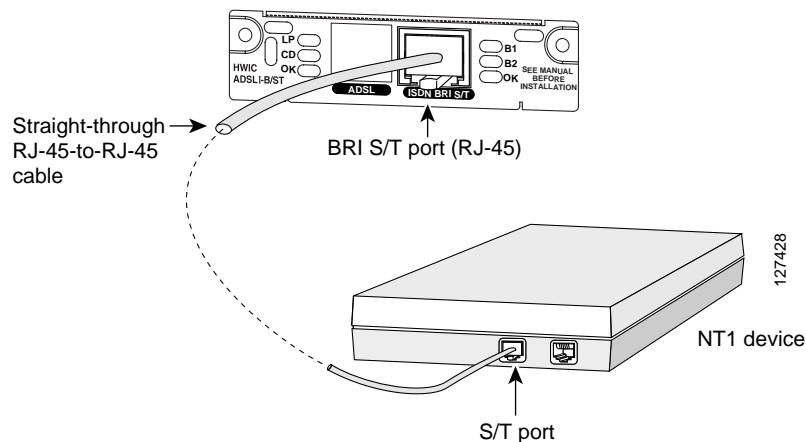
Step 1   Confirm that the router is turned off.

Warning   **To comply with the Telcordia GR-1089 NEBS standard for electromagnetic compatibility and safety, connect the HWIC-ADSL-B/ST or HWIC-ADSLI-B/ST ISDN BRI S/T port only to intra-building or unexposed wiring or cable. The intra-building port(s) of the equipment or subassembly must not be metallically connected to interfaces that connect to the OSP or its wiring. These interfaces are designed for use as intra-building interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE, Issue 4) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metallically to OSP wiring.**

Step 2   Connect one end of a straight-through RJ-45-to-RJ-45 cable to the S/T interface.

Step 3   Connect the other end of the cable to the NT1 device, as shown in Figure 70.

Figure 70   *Connecting the BRI S/T Port*

Step 4   Connect the NT1 device to the ISDN wall jack according to the documentation that came with the NT1 device.

Step 5   Turn on power to the router.

Connecting the SHDSL Port on the G.SHDSL HWICs

Connect Cisco G.SHDSL HWICs as described next:

- Cisco HWIC-2SHDSL—Use a standard *RJ-11* straight-through cable to establish connection between the HWIC and a network device.
- Cisco HWIC-4SHDSL—Use a standard *RJ-45* straight-through cable to establish connection between the HWIC and a network device.

Warning   **To comply with the Telcordia GR-1089 NEBS standard for electromagnetic compatibility and safety, connect the HWIC-2SHDSL and HWIC-4SHDSL interface cards only to intra-building or unexposed wiring or cable. The intra-building port(s) of the equipment or subassembly must not be metallically connected to interfaces that connect to the OSP or its wiring. These interfaces are designed for use as intra-building interfaces only (Type 2 or Type 4 ports as described in GR-1089-CORE, Issue 4) and require isolation from the exposed OSP cabling. The addition of Primary Protectors is not sufficient protection in order to connect these interfaces metallically to OSP wiring.**

Figure 71 shows the *RJ-45* pin assignment. Table 22 identifies the *RJ-45* signal assignment by pin.

Caution   Inserting an *RJ-11* connector into the Cisco HWIC-4SHDSL port may deform pins 1 and 8, which may prevent solid contact between the connector and the plug in subsequent connections. If solid contact is prevented, line -1 tip and line -3 ring will not work properly.

Figure 71   *RJ-45 Pin Assignment*
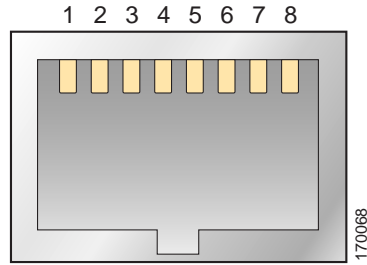
Table 22   *RJ-45 Signal Assignment by Pin*

Pin	Signal
1	Line 1 tip
2	Line 1 ring
3	Line 2 tip
4	Line 0 tip
5	Line 0 ring
6	Line 2 ring
7	Line 3 tip
8	Line 3 ring

To connect the Cisco HWIC-4SHDSLwith a DSLAM that supports two or four *RJ-11* connections, modify the standard *RJ-45* cable, using one of the following diagrams as applicable:

- Figure 72 shows how to modify the cable and connect the Cisco HWIC-4SHDSL with a DSLAM that supports four *RJ-11* cable connections.

- Figure 73 shows how to modify the cable and connect the Cisco HWIC-4SHDSL with a DSLAM that supports two *RJ-11* cable connections.

Figure 72   *Standard RJ-45 Connector to Four Standard RJ-11 Connectors*
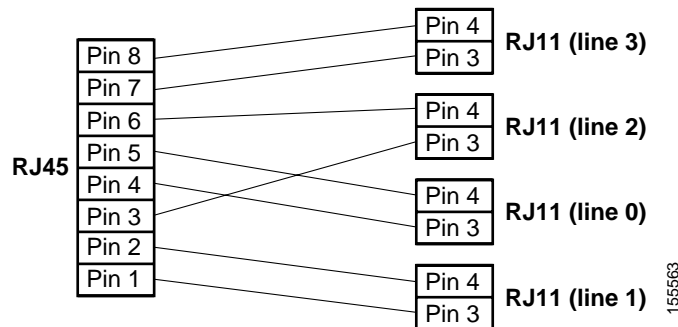
Figure 73   *Standard RJ-45 Connector to Two Standard RJ-11 Connectors*
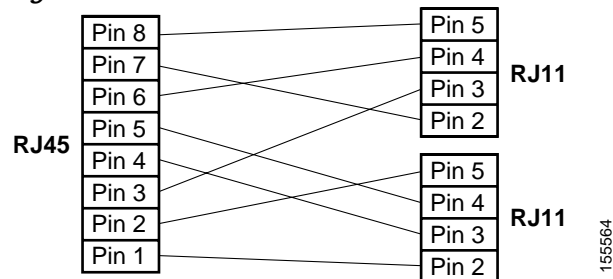
Using POTS Splitters and Microfilters with an ADSL-over-POTS WIC (WIC-1ADSL)

POTS splitters and microfilters apply to the ADSL-over-POTS WIC only. They are used on telephone lines to ensure voice- and data-call quality. POTS splitters result in the best data and voice performance when the router and the telephone are used on the same telephone line.

POTS Splitters

A POTS splitter (also called a *splitter*) is installed on a telephone line that is connected to both data (high-frequency) and voice (low-frequency) devices. The splitter routes the high-frequency and low-frequency signals on the telephone line to the correct device. Signals intended for the router can disrupt voice calls; signals intended for voice calls can affect router operation.

Most splitters must be installed by the telephone company; however, some splitters can be installed by the customer. If you are not sure what type of splitter to use, contact your service provider.

Figure 74 is an example of a type of POTS splitter that is installed at the customer premises by the customer. Other types of POTS splitters are installed by the telephone company on an exterior wall of the customer premises.

Figure 74   *POTS Splitters*
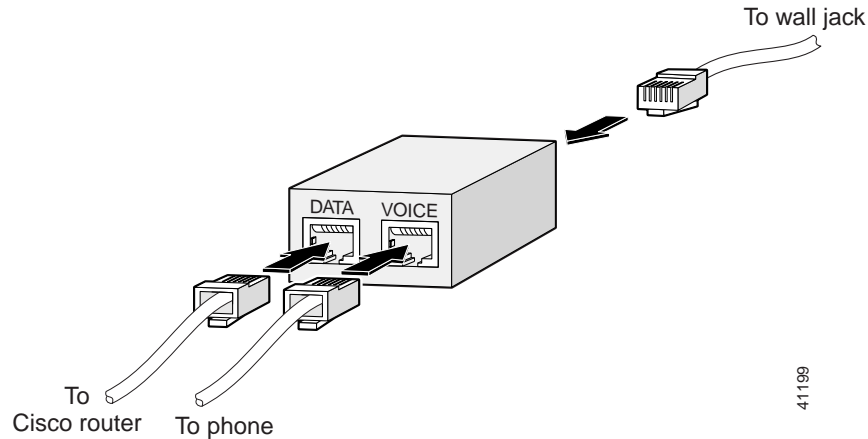
Microfilters

Microfilters are installed on telephones to improve voice-call quality when voice and data equipment are using the same telephone line (twisted pair). You should use microfilters only when the two following conditions exist:

- The documentation for the telephone you are using with the router states that microfilters should be used with the phone.
- Poor telephone call quality can be resolved by installing a microfilter on the phone line.

Figure 75 shows one type of microfilter.

Figure 75   *Microfilter*
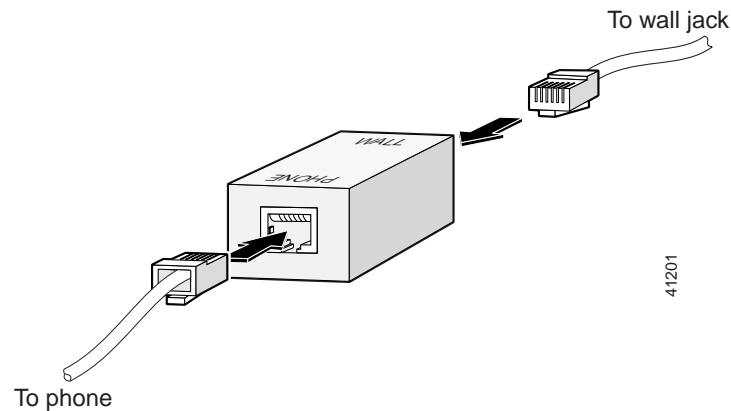
Common Splitter and Microfilter Configurations

This section describes the most common scenarios for using splitters and microfilters. The scenarios are listed from most common to least common.

Telephone Company-Installed Splitter

This scenario is described below and illustrated in Figure 76.

- The telephone company has provisioned a single copper pair to be used by both the telephone (POTS) service and the router with a DSL interface card, so a POTS splitter must be installed.
- The splitter is installed by the telephone company on the customer premises. This type of splitter is also referred to as a *network interface device* (*NID*).
- The router and telephone are on separate lines (twisted pair) to the splitter.
- The router and telephone share the same telephone line (twisted pair) to the telephone company.
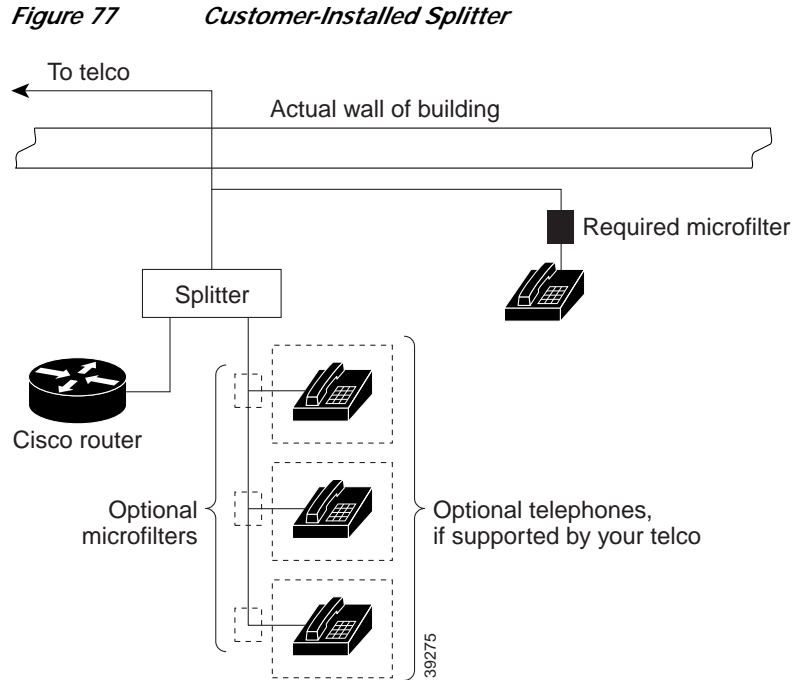
Figure 76   Telephone Company-Installed Splitter
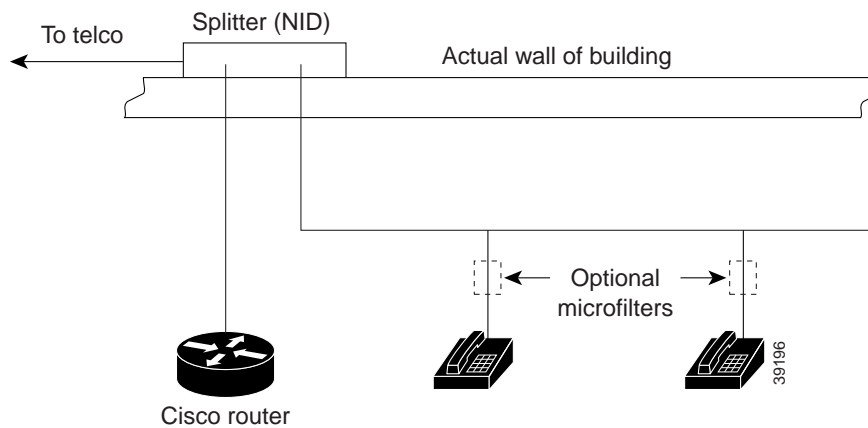
Customer-Installed Splitter

This scenario is described below and illustrated in Figure 77.

- The telephone company has provisioned a single copper pair to be used by both the telephone (POTS) service and the router with a DSL interface card, so a POTS splitter must be installed.
- The splitter is installed by the customer on the customer premises.
- The router and telephone are directly connected to the splitter, which is connected to the telephone line.
- The router and telephone share the same telephone line (twisted pair) to the telephone company.
- For optional telephones connected through the splitter, microfilters are optional. They should be installed only if they improve telephone call quality.
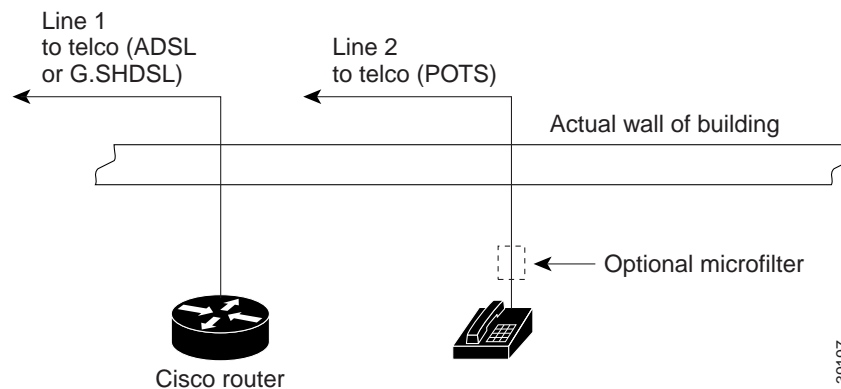- For telephones connected directly to the telephone line, microfilters are required.

Figure 77   Customer-Installed Splitter

To telco

Actual wall of building

Required microfilter

Splitter

Cisco router

Optional microfilters

Optional telephones, if supported by your telco

39275

Router and Telephone Using Separate Telephone Lines

This scenario is described below and illustrated in Figure 78.

- The telephone company has provisioned a single copper pair to be used exclusively by the router with a DSL interface card and a separate copper pair to be used exclusively by the telephone (POTS) service; therefore, neither a POTS splitter nor a microfilter is needed.

- The microfilter is optional; it should be installed only if it improves telephone call quality.

Figure 78   No Splitter, Optional Microfilter

Line 1
to telco (ADSL or G.SHDSL)

Line 2
to telco (POTS)

Actual wall of building

Optional microfilter

Cisco router

39197

Related Documentation

Related documentation is available on Cisco.com or on the Product Documentation DVD. For more information, see the "Obtaining Documentation, Obtaining Support, and Security Guidelines" section on page 19.

Feature Modules

- *Configuring Cisco G.SHDSL HWICs in Cisco Access Routers*

- *1-Port ADSL WAN Interface Card for Cisco 2600 Series and Cisco 3600 Series Routers*, Cisco IOS Release 12.2(4)T

- *1-Port ADSL WAN Interface Card*, Cisco IOS Releases 12.1(3)XJ and 12.2(2)T

- *1-Port ADSL WAN Interface Card*, Cisco IOS Release 12.1(5)YB

- *ATM Mode for Two-Wire or Four-Wire SHDSL*, Cisco IOS Release 12.3(7)T

- *T1/E1 Mode for SHDSL*, Cisco IOS Release 12.3(7)T

- *1-Port G.SHDSL WAN Interface Card for Cisco 2600 Series Routers*, Cisco IOS Release 12.2(4)XL

- *Enhanced Voice and QoS for ADSL and G.SHDSL*, Cisco IOS Release 12.3(2)T

- *Enhanced Voice and QoS for ADSL and G.SHDSL on Cisco 1700 Series, Cisco 2600 Series, Cisco 3600 Series, and Cisco 3700 Series Routers*, Cisco IOS Releases 12.2(8)YN and 12.2(13)T

- *Voice and Quality of Service Features for ADSL and G.SHDSL on Cisco 1700, Cisco 2600, and Cisco 3600 Series Routers*, Cisco IOS Releases 12.2(4)XL and 12.2(13)T

Sample Configurations

- *Configuring IPSec Over ADSL on a Cisco 2600/3600 With ADSL-WIC and Hardware Encryption Modules*

- *Configuring a Cisco 1700/2600/3600 ADSL WIC With a Single IP Address, DHCP, PPPoA, and PPP-PAP*

- *Configuring a Cisco 1700/2600/3600 ADSL WIC With IP Unnumbered E0, DHCP, PPPoA, and PPP-PAP*

- *Configuring a Cisco 1700/2600/3600 ADSL WIC With IP Unnumbered E0, PPPoA, PPP-PAP, and Manually Configured Local LAN Devices*

- *Configuring a Cisco 1700/2600/3600 ADSL WIC (Unnumbered Interface) With RFC1483 Routing Using AAL5SNAP Protocol IP*

- *Configuring a Cisco 1700/2600/3600 ADSL WIC With RFC1483 Routing Using AAL5SNAP Protocol IP*

- *Configuring a Cisco 1700/2600/3600 ADSL WIC Using PPPoA With CHAP and PAP*

- *Configuring a Cisco 1700/2600/3600 ADSL WIC With IRB and NAT Using RFC1483 Bridging*

- *Configuring a Cisco 1700/2600/3600 ADSL WIC With NAT, a DHCP Server, and Easy IP Using PPPoA (aal5mux ppp)*

- *Configuring a Cisco 1700/2600/3600 ADSL WIC as a PPPoE Client With NAT*,

- *Configuring Network Address Translation and Static Port Address Translation to Support an Internal Web Server*

- – *Configuring a Cisco 1700/2600/3600 ADSL WIC With AAL5MUX IP Routing, Multiple PVCs, and Terminating on a Cisco 6400 UAC-NRP*

- – *Configuring a Cisco 1700/2600/3600 ADSL WIC to Support PPPoE Clients, Terminating on a Cisco 6400 UAC*

- – *Configuring a Cisco 1700/2600/3600 ADSL WIC and a Cisco 6400 Configured With IRB Using RFC1483 Bridging (aal5snap)*

- – *Configuring a Cisco 1700/2600/3600 ADSL WIC and a Cisco 6400 in RBE Mode Using RFC1483 Bridging*

Obtaining Documentation, Obtaining Support, and Security Guidelines

For information on obtaining documentation, obtaining support, providing documentation feedback, security guidelines, and also recommended aliases and general Cisco documents, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html