

## Hotwire® 6321/6322 IDSL Routers Installation Instructions

Document Number 6321-A2-GN10-00

March 2000

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### Product-Related Documents

Document Number	Document Title
8000-A2-GB26	<i>Hotwire MVL, RADSL, IDSL, and Packet SDSL Cards, Models 8310/8312, 8510/8373/8374, 8323/8324, and 8343/8344, User's Guide</i>

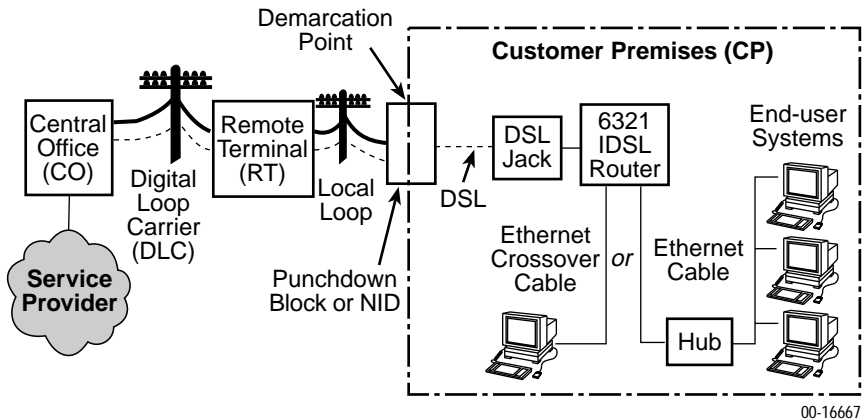
# Hotwire 6321/6322 IDSL Routers Overview

The Hotwire® 6321 and 6322 IDSL (Integrated Services Digital Network Digital Subscriber Line) Routers are components in the Hotwire DSLAM (Digital Subscriber Line Access Multiplexer) system. Both Hotwire IDSL Routers interoperate with either the Hotwire 8323 or 8324 IDSL Card:

- Hotwire 6321 IDSL Router with one Ethernet port
- Hotwire 6322 IDSL Router with a 4-port Ethernet hub

Both the Hotwire 6321 and the Hotwire 6322 IDSL Routers operate as an IP router connecting a DSL link to an Ethernet network. The Hotwire IDSL packet-based system provides high-speed Internet or corporate LAN access over a combination of traditional twisted-pair copper telephone wiring and ISDN transport, such as T1 or fiber. These products have three data channels that are configurable for a total of 144 kbps.

## Network Overview with a Hotwire 6321 IDSL Router



DSL – Digital Subscriber Line  
NID – Network Interface Device

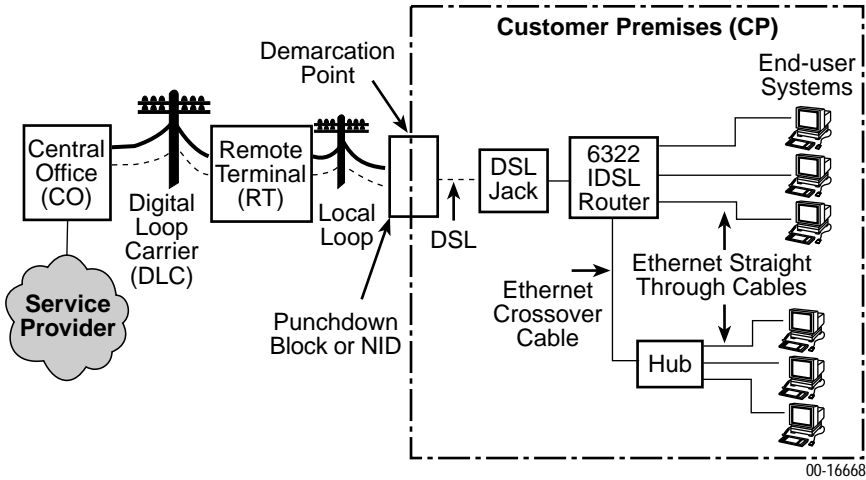
----- New Wiring Connections

### NOTES:

In this document:

- End-user system is used to represent any host with an Ethernet connection.
- Service provider is used to represent any Internet Service Provider (ISP) or remote LAN provider.

## Network Overview with a Hotwire 6322 IDSL Router



DSL – Digital Subscriber Line  
NID – Network Interface Device

----- New Wiring Connections

### NOTE:

For Ethernet cabling details, refer to *Installing the Hotwire 6321/6322 IDSL Router* on page 6.

## Package Checklist

Verify that your package contains the following:

- Model 6321 or Model 6322 IDSL Router
- DSL interface cable with RJ11 modular plugs
- Power cord with power transformer

## Wiring and Cables Needed

You will need the following wiring and standard connectors with this product:

- Standard RJ11 wall jack for the DSL cabling.
- DSL cabling: New or existing unshielded twisted-pair wiring (CAT3 or better). The CAT3 wiring must meet EIA/TIA-568 specifications with 24 AWG (.5 mm) or 26 AWG (.4 mm).
- Ethernet cabling: New or existing shielded twisted-pair wiring (CAT5 or better). The CAT5 wiring must meet EIA/TIA-568 specifications with 24 AWG (.5 mm) or 26 AWG (.4 mm). A straight-through or crossover Ethernet cable is used.

Refer to *Installing the Hotwire 6321/6322 IDSL Router* on page 6 for cabling details.

## Optional Cable

The Hotwire 6321/6322 IDSL Routers are typically configured remotely by the service provider. The following optional cabling and adapter are only used with this product to configure the router locally:

- Console cabling: Straight-through cable with 8-pin non-keyed modular plugs (Part No. 035-0276-1431)
- Console adapter:
  - 8-pin modular to DB9 adapter plug (Part No. 002-0093-0031), or
  - A configurable RJ to DB9 adapter wired as shown in *Cables & Connectors* on page 13.

## Installing the DSL Access Wiring

The local loop terminates at the punchdown block or NID. Wiring must be connected from the customer premises side of the punchdown block or the NID to an RJ11 jack. Typically, the punchdown block is installed in commercial locations and the NID is installed in residential locations.

### ► Procedure

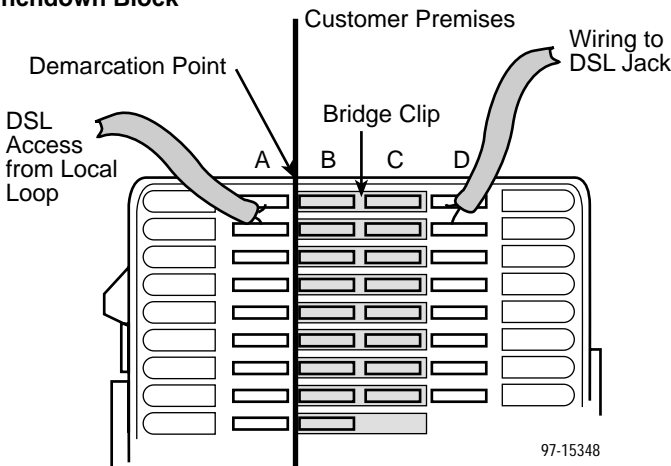
1. Access the punchdown block or NID.

#### **⚠ WARNING:**

**Do not continue unless the DSL access line from the local loop has been disconnected at the NID or punchdown block. Refer to *Important Safety Instructions* on page 18.**

2. Disconnect the DSL access pair from the local loop. A punchdown block is used in the following example.

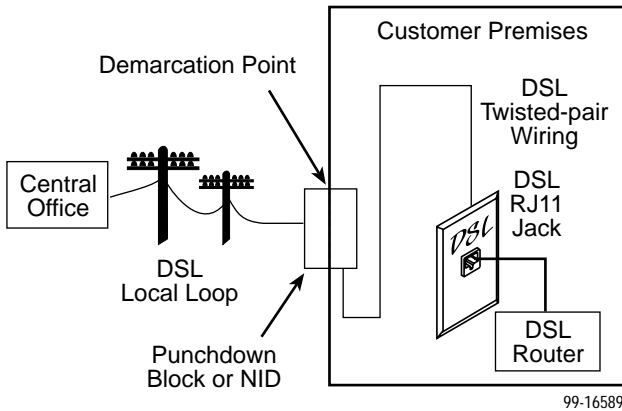
#### Punchdown Block



3. Locate the DSL pair of T1/R1 connectors on the customer premises side of the NID or punchdown block. Attach the wiring that will be connected to the DSL jack.

## Connecting to the DSL Access Wiring

The Hotwire 6321 or 6322 IDSL Router connects to the local loop via wiring from the demarcation point to an RJ11 wall jack. The DSL twisted-pair wiring from the local loop terminates at a new or existing wall jack. It may be necessary to install a standard single RJ11 jack or replace a single jack with a double RJ11 jack.



### ► Procedure

1. Wiring can be run from the punchdown block or NID to a new or existing wall jack. Match the pair colors on both ends.
2. Label the DSL jack.
3. Reconnect the DSL access pair at the punchdown block or NID. Tighten both terminal screws with a flat-blade screwdriver.

The RJ11 6-pin jack uses the center two pins. For pin assignments, refer to *Cables & Connectors* on page 13.

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# Installing the Hotwire 6321/6322 IDSL Router

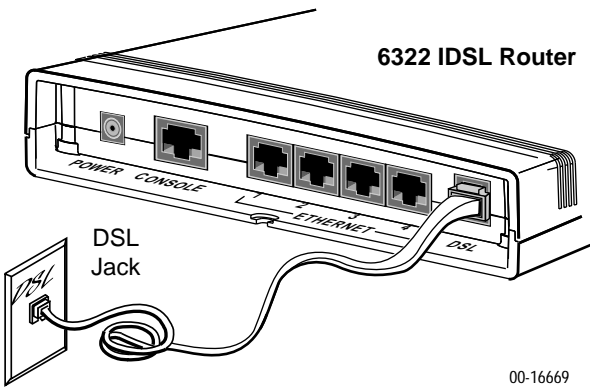
Place the Hotwire 6321/6322 IDSL Router on a flat surface with clearance for the rear connectors.

**NOTE:**

The following illustrations show the Hotwire 6322 IDSL Router with a 4-port Ethernet hub. The Hotwire 6321 IDSL Router is identical except that it has one Ethernet port.

► **Procedure**

1. Use the RJ11 6-pin cable for the DSL connection. Insert one end of the cable into the jack labeled DSL. Insert the other end into the wall jack labeled DSL.



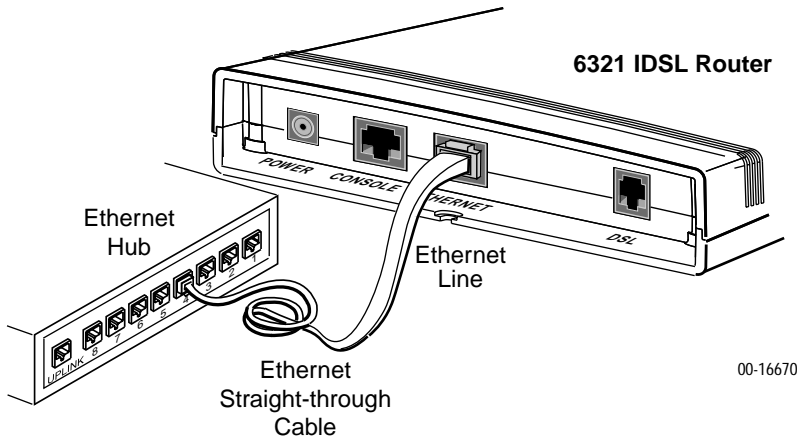
00-16669

If you are installing a . . .	Then go to . . .
Hotwire 6321 IDSL Router	page 7
Hotwire 6322 IDSL Router	page 8

2. Use an 8-pin Ethernet cable for the Ethernet connection. Insert one end of the cable into the jack labeled ETHERNET.

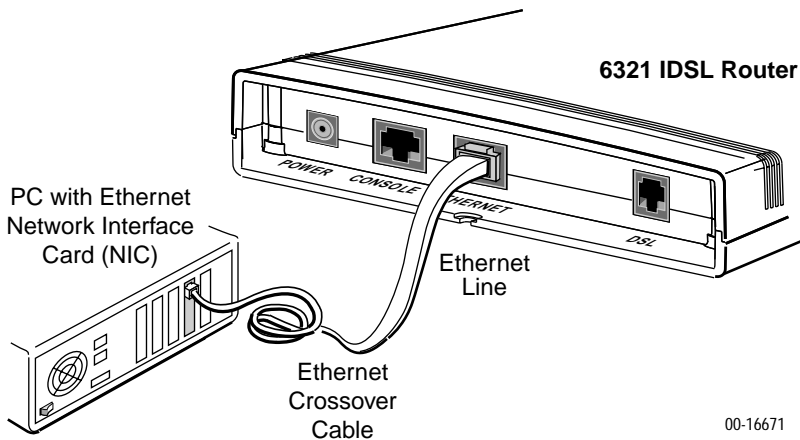
If you are installing the Hotwire 6322 IDSL Router, go to page 8.

- For a 6321 IDSL Router, use a straight-through cable to connect the other end to an Ethernet hub. Do not connect a straight-through cable to the external hub's UPLINK connection (this connection requires a crossover cable).



-or-

- For a 6321 IDSL Router, use an Ethernet crossover cable and connect the other end to a PC with an Ethernet Network Interface Card (NIC) installed.

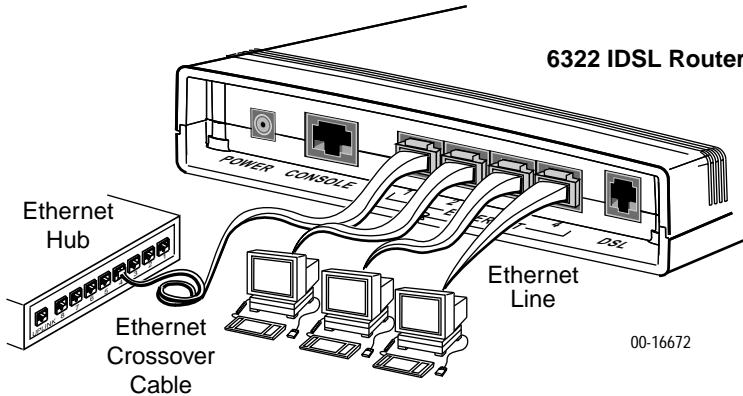


If you are installing the Hotwire 6321 IDSL Router, go to page 7.

- For a 6322 IDSL Router, use a straight-through cable to connect the other end to a PC with an Ethernet Network Interface Card (NIC) installed.

**-and/or-**

- Use an Ethernet crossover cable to connect the other end to an external hub.

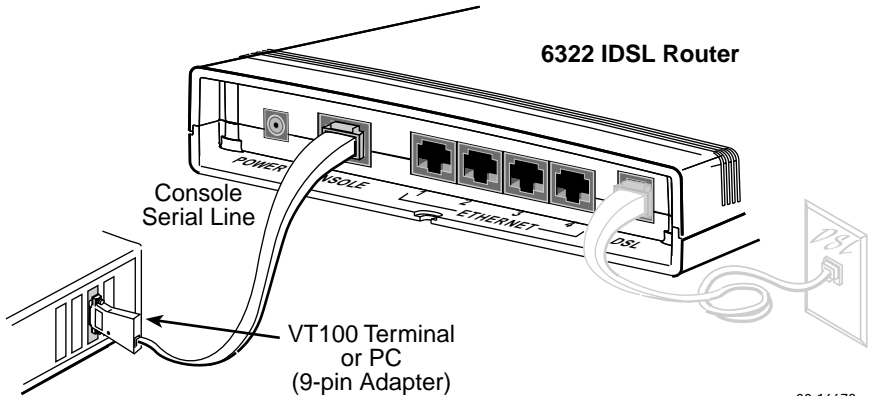


For the IDSL router cable pin assignments, refer to *Cables & Connectors* on page 13.

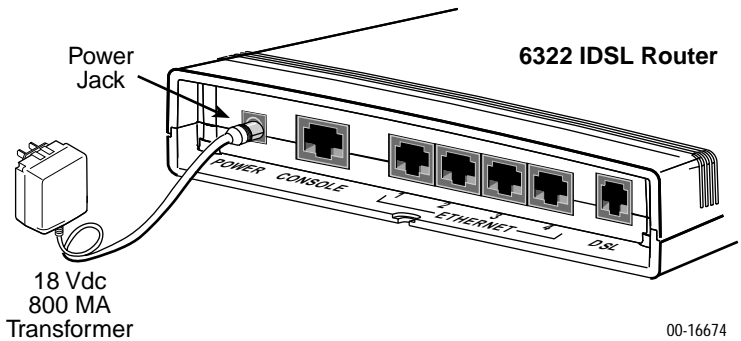
3. The Console port acts as a DCE and uses an 8-pin straight-through cable for the connection to a VT100-compatible terminal or a PC running a terminal emulation program.

This is an **optional** connection used only for local configuration of the DSL router. For details, refer to *Local Console Access* on page 12.

Connect the DB9 adapter to the PC and connect the cable to a PC or laptop. Insert one end of the straight-through cable into the jack labeled CONSOLE. Insert the other end into the DB9 adapter for the serial port of the VT100 terminal or PC.



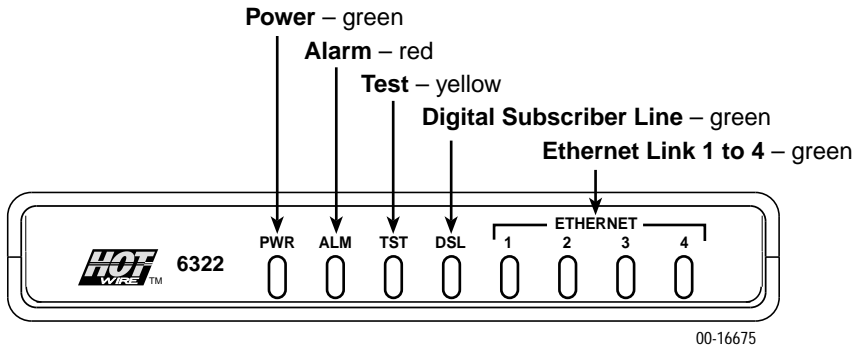
4. Insert the supplied power cord's round end into the jack labeled POWER. Plug the transformer into an ac outlet.



The Hotwire 6321/6322 IDSL Router hardware installation is now complete. When the power cord is installed, the IDSL router goes through a power-on self-test.

## Power-On

When power is applied, the Hotwire 6321/6322 IDSL Router performs self-diagnostics and the PWR LED is on. The self-diagnostics includes a power-on self-test. During the power-on self-test, all of the LEDs turn on for one second.



Refer to *Troubleshooting* on page 11 for LED indications requiring action.

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## Status LEDs

All of the LEDs turn on and off during the power-on self-test. After a successful self-test, the LEDs should appear as indicated in **BOLD** in the Condition column below.

LED	Condition	Status
PWR	<b>ON</b>	The IDSL router has power.
ALM	Blinking <b>OFF</b> ON	The IDSL router has detected a system failure. No active alarms. An alarm condition exists.
TST	<b>OFF</b> ON	No active tests. The TST LED is on during the power-on self-test and during a test initiated by the service provider.
DSL	Blinking <b>ON</b> OFF	The IDSL router is establishing the active DSL link. The LED blinks on and off about five times per second. The DSL link is now active and ready to transmit and receive data. The DSL link has not been established.
ETHERNET LINKS 1-4	<b>ON</b> OFF	The Ethernet connection is active. No Ethernet 10/100BaseT device is detected.

# Troubleshooting

LED Symptom	Action
All LEDs are on.	If the LEDs remain on after ten minutes, the IDSL router is not functional. Contact the service provider.
ALM LED remains on.	The power-on self-test may have failed. Unplug the unit and reapply power. If the alarm LED is still on, contact the service provider.
ALM and TST LEDs are blinking.	Firmware download may be in progress. If firmware download is not in progress or the LEDs continue blinking after ten minutes, contact the service provider.
DSL LED is off.	Verify that the DSL cable is securely installed on both ends. If the problem continues, contact the service provider.
DSL LED continues to blink after the power-on self-test.	The IDSL router is attempting to establish the DSL link or adjusting the rate of the DSL line due to line conditions. If the DSL LED continues to blink for more than ten minutes, contact the service provider.
DSL LED is on and there is no data transmission.	The DSL link has been established but there is no data transmission. First, verify the Ethernet connection. If the problem persists, contact the service provider.
DSL & ETHERNET LEDs are on and there is no data transmission.	The DSL link and the Ethernet link have been established but there is no data transmission. If the problem continues, contact the service provider.
ETHERNET LED is off.	Verify that the Ethernet cable is securely installed at both ends, and at least one PC is connected and powered on.
	Verify that the correct straight-through or crossover cable is installed. Refer to <i>Installing the Hotwire 6321/6322 IDSL Router</i> on page 6.
PWR LED is off.	Check that the power cord is securely installed on both ends.
	If no LEDs are on, the power supply may be defective. Test the outlet to verify power. If the problem persists, contact the service provider.
	If other LEDs are on, the PWR LED may be burned out. Unplug the unit and reapply power; watch all LEDs during the power-on self-test to verify that the PWR LED is functioning.
TST LED is on.	A test initiated by the service provider may be active. Wait five minutes. If the TST LED does not go off, contact the service provider.

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## Hotwire 6321/6322 IDSL Router Configuration Setup

The Console cable is connected to a VT100-compatible terminal or a PC running a terminal emulation program. Verify the terminal settings:

- Data rate set to 19.2 kbps (19200 bps)
- Character length set to 8
- Parity set to None
- Stop bits set to 1
- Flow control set to Off or None

### Local Console Access

When the local console connection is first established, access control to the IDSL router displays an initial prompt of `Login>`.

#### ► Procedure

1. At the initial prompt of `Login>`, enter the factory default Login ID of `paradyne`.
2. At the `password>` prompt, enter the factory default Password of `abc123`.
3. At the next prompt for System ID, the factory default is `CUSTOMER>`.  
Type `show system` to display hardware/firmware information and Selftest Results (optional).

Refer to the *Hotwire DSL Routers User's Guide* for configuration settings and command line entries.

### Increasing the Number of End-User Systems

The Hotwire 6321/6322 IDSL Router can support differing numbers of end-user systems depending on the functions that are enabled and traffic loading. Typical configurations will provide support for up to 32, 64, or 256 hosts (end-user systems). The number of end-user systems can be increased with the use of subnets utilizing static addressing or by using a default gateway connection.

Increasing the number of PCs may require cabling changes. Refer to *Cables & Connectors* on page 13.

Refer to the *Hotwire DSL Routers User's Guide* for configuration settings and command line entries.

# Cables & Connectors

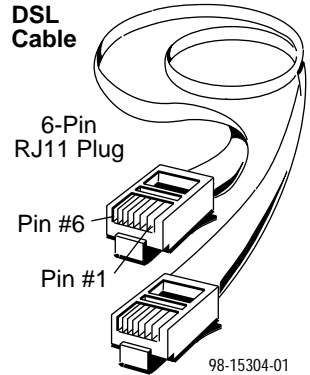
This section is reference information.

Use a CAT3 or better cable for the DSL line.

- The DSL interface connector uses a 6-pin, non-keyed modular plug.

## RJ11 6-Pin Connector

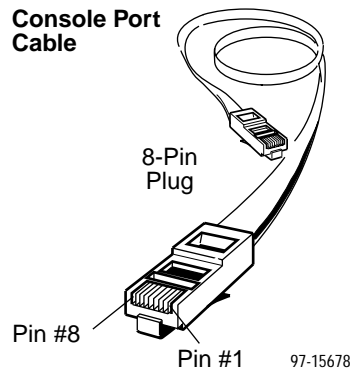
Pin #	Function
1 & 2	Not used
3	DSL Ring
4	DSL Tip
5 & 6	Not used



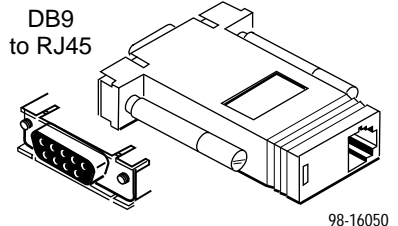
- The Console connector uses 8-pin non-keyed modular plugs and a DB9 adapter.
- See *Hotwire 6321/6322 IDSL Router Configuration Setup* on page 12.

## RJ45 8-Pin Connector

Pin #	Circuit	Direction
1	Not used	—
2	DTR	Input to Console port
3	TXD	Input
4	Signal Ground	—
5	Signal Ground	—
6	RXD	Output
7	DSR	Output
8	Not used	—



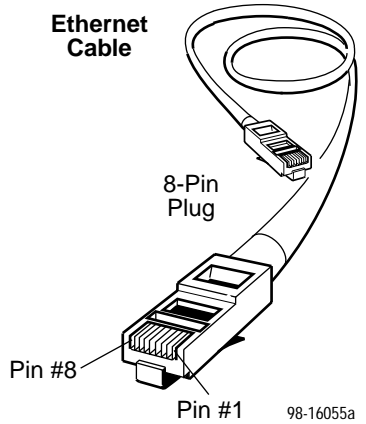
## DB9 Adapter Plug



- The Ethernet interface connector uses an 8-pin, non-keyed modular plug. Use shielded twisted-pair CAT5 or better cables.
  - To connect a Hotwire 6321 IDSL Router to an Ethernet hub or a Hotwire 6322 IDSL Router to a PC with an Ethernet NIC card installed, use the straight-through connection.

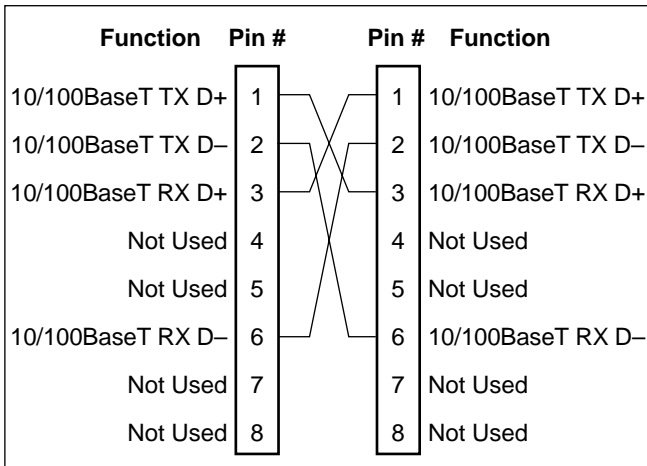
### 8-Pin Straight-Through Connection

Pin #	Function
1	10/100BaseT TX D+
2	10/100BaseT TX D-
3	10/100BaseT RX D+
4 & 5	Not used
6	10/100BaseT RX D-
7 & 8	Not used



- To connect a Hotwire 6321 IDSL Router to a PC with an Ethernet NIC card installed or a Hotwire 6322 IDSL Router to an external hub, use an Ethernet crossover cable.

### 8-Pin Ethernet Crossover Cable



Pin #1/2 = Orange/White Twisted Pair

Pin #3/6 = Blue/White Twisted Pair

99-16518

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# Optional Hotwire 6321/6322 IDSL Router Wall Placement

The Hotwire 6321/6322 IDSL Router is designed for tabletop placement. The IDSL router can also be mounted on a wall. To mount the IDSL router, you will need:

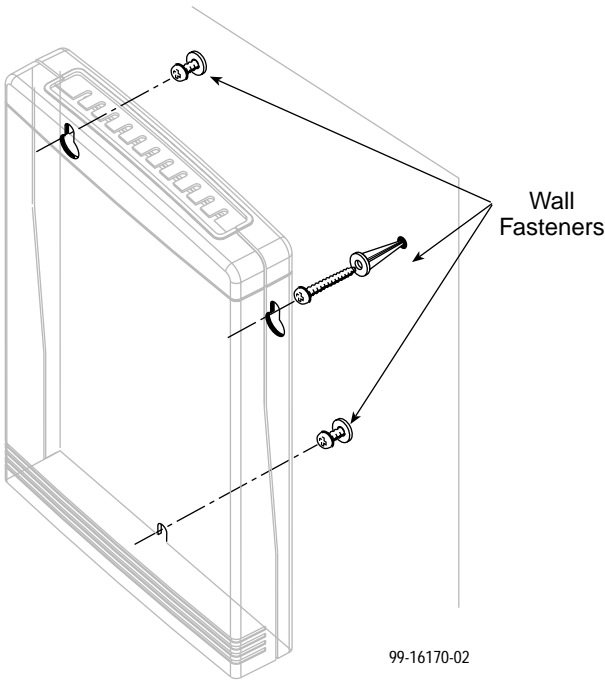
- Three slotted-head #6 self-threading screws with molly bolts
- Drill and 3/16" drill bit for the molly bolts
- Screwdriver

A template with the dimensions for the three screws is provided. See *IDSL Router Hardware Template* on page 16.

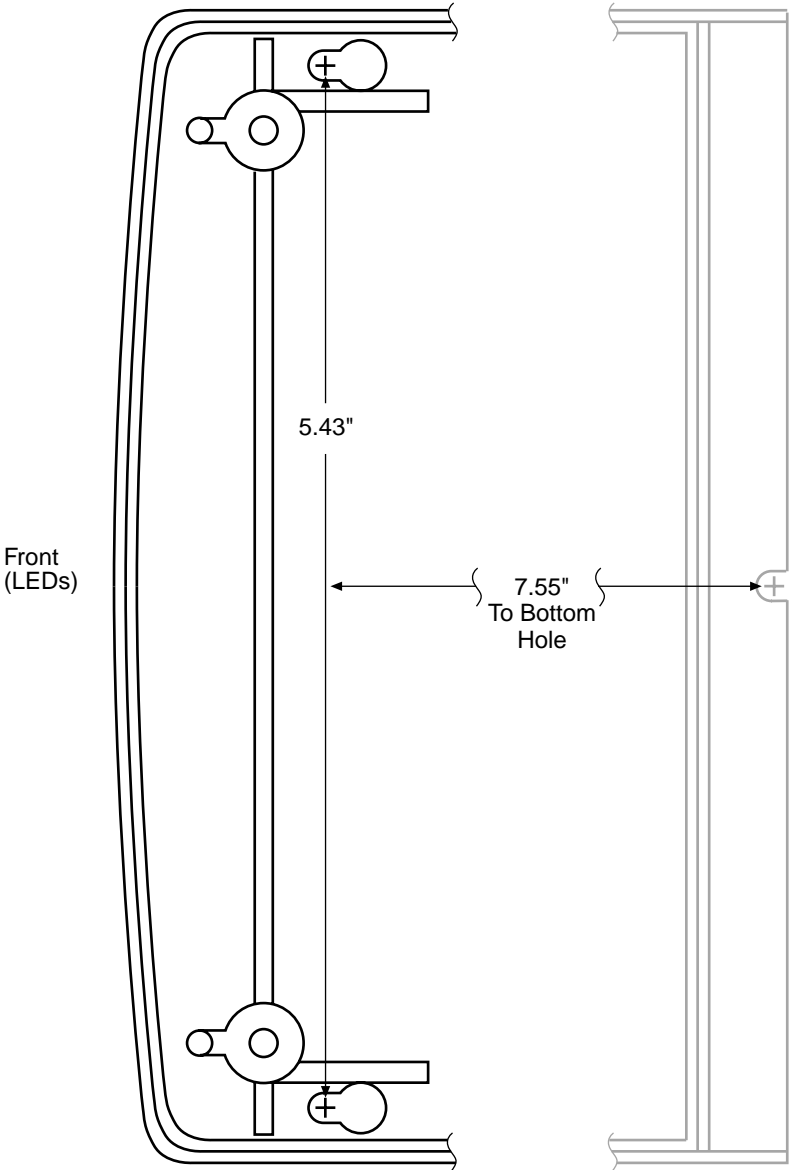
## ► Procedure

To mount the IDSL router:

1. Use a drill to install the plastic anchors (molly bolts).
2. Use a screwdriver to install the screws. Do not install the screws flush with the wall. Leave enough clearance to hang the IDSL router housing from the screws.



**IDSL Router Hardware Template**



98-16171

# Hotwire 6321/6322 IDSL Router Technical Specifications

Item	Specification*
<b>Height x Width x Depth</b>	1.43" x 6.00" x 8.75" (3.64 cm x 15.24 cm x 22.23 cm)
<b>Weight</b>	1 lb. 1 oz. (0.48 kg)
<b>External Power Supply</b> Class 2 Transformer normal service input voltage range	Input: 100 Vac ( $\pm 10\%$ ), 50 Hz; 120 Vac ( $\pm 10\%$ ), 60 Hz; or 230 Vac ( $\pm 10\%$ ), 50/60 Hz Output: 18 Vdc nominal at 0.8A
<b>Unit Power Consumption</b>	<ul style="list-style-type: none"> <li>■ Model 6321: 5 watts (nom)</li> <li>■ Model 6322: 8 watts (nom)</li> </ul>
<b>Approvals</b> FCC Part 15 Safety Certifications	Class B Subpart B digital device Refer to equipment's label for approvals on product.
<b>Physical Environment</b> Operating temperature Storage temperature Relative humidity Shock and vibration	32° F to 104° F (0° C to 40° C) -4° F to 158° F (-20° C to 70° C) 5% to 95% (noncondensing) Withstands normal shipping and handling
<b>Interface Connectors</b> DSL Interface Console Interface Ethernet Type II Frame	RJ11 6-pin 8-pin 10/100BaseT 8-pin <ul style="list-style-type: none"> <li>■ Model 6321: One Ethernet connector</li> <li>■ Model 6322: Four Ethernet connectors</li> </ul>
* Technical Specifications subject to change without notification.	

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## **⚠ Important Safety Instructions**

1. Read and follow all warning notices and instructions marked on the product or included in the manual.
2. Slots and openings in the cabinet are provided for ventilation. To ensure reliable operation of the product and to protect it from overheating, these slots and openings must not be blocked or covered.
3. Do not allow anything to rest on the power cord and do not locate the product where persons will walk on the power cord.
4. Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous high voltage points or other risks. Refer all servicing to qualified service personnel.
5. General purpose cables are used with this product for connection to the network. Special cables, which may be required by the regulatory inspection authority for the installation site, are the responsibility of the customer. Use a UL Listed, CSA certified, minimum No. 24 AWG line cord for connection to the Digital Subscriber Line (DSL) network.
6. When installed in the final configuration, the product must comply with the applicable Safety Standards and regulatory requirements of the country in which it is installed. If necessary, consult with the appropriate regulatory agencies and inspection authorities to ensure compliance.
7. A rare phenomenon can create a voltage potential between the earth grounds of two or more buildings. If products installed in separate buildings are **interconnected**, the voltage potential may cause a hazardous condition. Consult a qualified electrical consultant to determine whether or not this phenomenon exists and, if necessary, implement corrective action prior to interconnecting the products.
8. Input power to this product must be provided by one of the following: (1) a UL Listed/CSA certified power source with a Class 2 or Limited Power Source (LPS) output for use in North America, or (2) a certified transformer, with a Safety Extra Low Voltage (SELV) output having a maximum 240 VA available, for use in the country of installation.
9. In addition, since the equipment is to be used with telecommunications circuits, take the following precautions:
  - Never install telephone wiring during a lightning storm.
  - Never install telephone jacks in wet locations unless the jack is specifically designed for wet locations.
  - Never touch uninsulated telephone wires or terminals unless the telephone line has been disconnected at the network interface.
  - Use caution when installing or modifying telephone lines.
  - Avoid using a telephone (other than a cordless type) during an electrical storm. There may be a remote risk of electric shock from lightning.
  - Do not use the telephone to report a gas leak in the vicinity of the leak.

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## Canada EMI Warnings

### WARNING:

**To Users of Digital Apparatus in Canada:**

**This Class B digital apparatus meets all requirements of the Canadian interference-causing equipment regulations.**

**Cet appareil numérique de la classe B respecte toutes les exigences du règlement sur le matériel brouilleur du Canada.**

## Declaration of Conformity

This Declaration of Conformity is made by Paradyne Corporation pursuant to Parts 2 and 15 of the Federal Communications Commission's Rules. This compliance information statement pertains to the following products:

Trade Name: Hotwire  
Model Numbers: 6321-A1-200 & 6322-A1-200

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The name, address, and telephone number of the responsible party is given below:

Paradyne Corporation  
8545 126th Avenue North  
Largo, FL 33773-1502  
Phone: (727) 530-2000

The authority to operate this equipment is conditioned by the requirement that no modifications will be made to the equipment unless the changes or modifications are expressly approved by Paradyne Corporation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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## Warranty, Sales, Service, and Training Information

Contact your local sales representative, service representative, or distributor directly for any help needed. For additional information concerning warranty, sales, service, repair, installation, documentation, training, distributor locations, or Paradyne worldwide office locations, use one of the following methods:

- **Internet:** Visit the Paradyne World Wide Web site at [www.paradyne.com](http://www.paradyne.com). (Be sure to register your warranty at [www.paradyne.com/warranty](http://www.paradyne.com/warranty).)
- **Telephone:** Call our automated system to receive current information by fax or to speak with a company representative.
  - Within the U.S.A., call 1-800-870-2221
  - Outside the U.S.A., call 1-727-530-2340

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