

Hotwire® 7974, 7975, 7976, 7984, 7985, and 7986 Standalone Termination Unit Installation Instructions

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Hotwire 7974, 7975, 7976, 7984, 7985, and 7986 Standalone Termination Unit User's Guide

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Installation Overview

Installation and configuration of the Hotwire® 79xx Standalone Termination Unit consists of:

- Connecting power to the unit.
- Connecting to the network.
- Connecting to a DTE.
- Connecting a system terminal.
- Providing initial unit identity information or changing existing identity information.
- Configuring your unit using the Configuration Edit menus.

Before you install the Hotwire 79xx Standalone Termination Unit, read the *Important Safety Instructions* on page 33.

See the User's Guide for additional information about:

- Configuration options
- Messages and troubleshooting
- Technical specifications
- Cables, connectors, and pin assignments

Connecting Power to the Unit

If your package includes a power pack: Plug the power pack into an ac outlet having a nominal voltage rating between 100–240 Vac. Connect the output cable of the power pack to the connector marked POWER on the rear panel.

If your package includes a direct-connection +24 Vdc power cable: Connect the unit to an external +24 Vdc SELV (Safety Extra Low Voltage) power source as described in *Connecting the Unit to an Optional External +24 Vdc Power Source*.

If you will use a –48 Vdc power supply: Connect the unit to an external –48 Vdc SELV power source as described in the documentation shipped with the power supply and power cable.

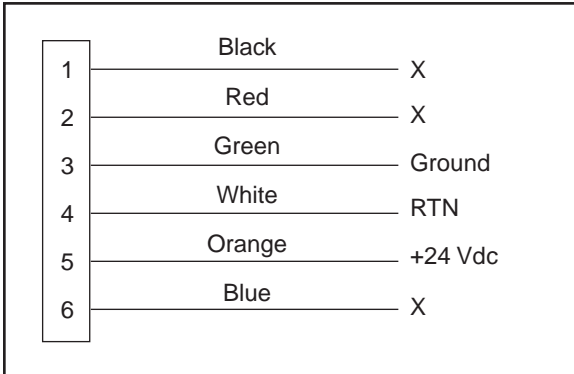
Connecting the Unit to an Optional External +24 Vdc Power Source

Using the dc power cable, the Hotwire 79xx Standalone Termination Unit is capable of operating on a +24 Vdc SELV power supply.

► Procedure

To use the dc power cable:

1. Connect the green wire to a suitable ground.
2. Connect the orange wire to the +24 Vdc source.
3. Connect the white wire to the return.
4. Cut the black, red, and blue wires off at the outer insulation.
5. Plug the power connector into the 79xx Standalone Termination Unit.



99-14158-02

+24 Vdc Power Supply Pinouts

Connecting to the Network

► Procedure

To connect your unit to the network:

1. Connect one end of the supplied network cable into the rear panel DSL jack.
2. Connect the other end to your DSL network interface.

NOTE:

Do *not* use a flat VF network cable as this may severely degrade the performance of the termination unit. Use only Cat 5 twisted-pair network cable.

Connecting to a DTE

Model	DTE Connection
7974, 7984	The DSX-1 interface is an RJ48C, 8-position, unkeyed modular connector. An RJ48C-to-DB15 T1 network interface adapter cable is available from Paradyne.
7975, 7985	The synchronous interface is a 25-pin EIA-530-A interface. Depending on the cable used, the interface can be adapted to an X.21, RS-449, or V.35 interface.
7976, 7986	The G.703 interface is either two BNC connectors (Transmit and Receive) for a 75-ohm unbalanced interface or an RJ48C, 8-position, unkeyed modular connector for a 120-ohm balanced interface.

See *Cables and Pin Assignments* in the User's Guide for specifications of the connectors and cables.

Ferrite Choke (Model 7975 Only)

► Procedure

To install the ferrite choke onto the DTE cable:

1. Open the ferrite choke and place it around the cable as close to the cable connector as possible.
2. Close the two halves around the cable and snap the choke shut, pressing down on the plastic latch to secure it in place.
3. Add a tie wrap (not included) as shown to prevent the ferrite choke from slipping down the cable.

All ferrite chokes that are supplied must be installed following these instructions to ensure compliance with FCC Part 15, VCCI, and CISPR22 rules.

Hotwire 79xx Standalone Termination Unit LEDs

The following table contains a description of the LEDs on the Hotwire 79xx Standalone Termination Unit front panel.

Label	Color	LED is . . .*	Indicating . . .
POWER	Green	On Off Slow Cycling Pulsing	Unit failure. No power to the unit. Unit is in minimum mode and a download is required. Normal Operation.
ALARM	Red	On Off	Device failure, or self-test has failed. Self-test passed.
TEST	Yellow	On Off Slow Cycling	Loopback test or 511 test pattern in progress. No tests in progress. Self-test in progress.
DSL	Green	On Off Slow Cycling Fast Cycling	DSL link is up. The DSL link is down. DSL training in progress. An OOF condition.
DSX-1 DTE G.703	Green	On Off Slow Cycling Fast Cycling	DTE port is operational. No signal on DTE port. DSX-1: Yellow Alarm Indication received. Sync DTE: Not applicable. G.703: Remote Alarm Indication received. DSX-1: OOF, LOF, EER, or AIS condition. Sync DTE: Not applicable. G.703: OOF, LOF, EER, or AIS condition.
* Slow Cycling:		LED turns off and on in equal duration once per second.	
Fast Cycling:		LED turns off and on in equal duration 5 times per second.	
Pulsing:		LED turns off momentarily once per second.	

Connecting to a System Terminal

An optional system maintenance terminal may be attached to your Hotwire 79xx Standalone Termination Unit through the modular jack on the rear panel. The system maintenance terminal allows you to view the status of the unit and change configuration options. The terminal must be a VT100-compatible terminal or a PC running terminal emulation software.

► Procedure

To connect your unit to a system terminal:

1. Connect the 9-pin end of the terminal cable into a COM port on your PC.
2. Plug the other end into the modular jack on the rear panel.
3. Set the communication parameters on your PC or terminal to:
 - 9600 baud
 - 8 bit characters
 - no parity
 - 1 stop bit
 - no flow control

Press Enter from your terminal or PC to activate the Main Menu for the attached unit. The system runs diagnostics and status checks. After a few moments, the Main Menu or Logon screen appears on your terminal.

```
main                                                    Hotwire
                                                         Model 79xx

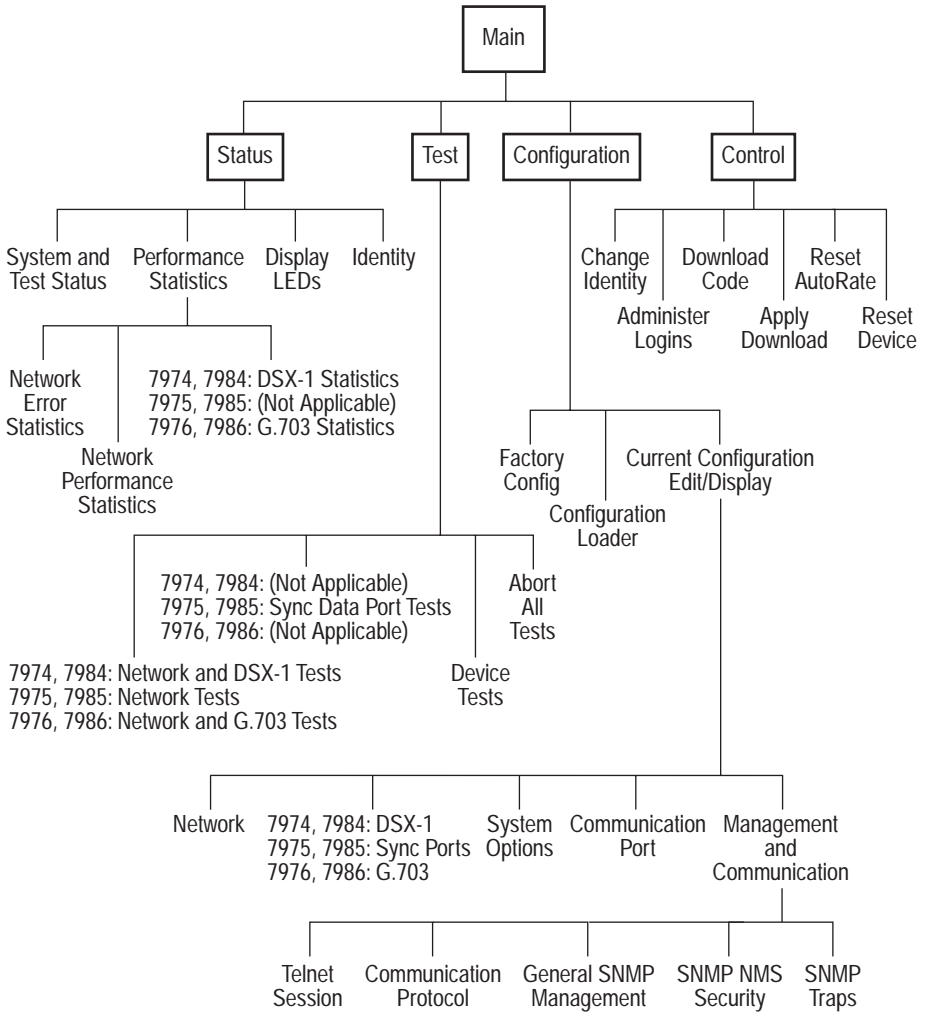
                MAIN MENU

                Status
                Test
                Configuration
                Control

-----
Ctrl-a to access these functions                               Exit
```

Asynchronous Terminal Interface Menu

The following illustration shows the menu paths to the different terminal screens.



Entering Identity Information

After accessing your unit for the first time, use the Change Identity screen to determine SNMP administrative system information that will be displayed on the Identity screen of the Status branch. To access the Identity screen, follow this menu selection sequence:

Main Menu → Control → Change Identity

Selecting a Configuration Method

You can make configuration changes either through a VT100-compatible terminal and the unit's Configuration menus or by manually changing switches on the board. The unit is shipped with the switchpacks disabled to allow settings to be made through the Configuration menus. To use the switchpacks, see *Configuring the Unit Using the Internal Switches* on page 23.

Configuring the Unit Using the Configuration Menus

Use the Configuration menu to select, display, or change configuration option settings.

NOTE:

The 79xx Standalone Termination Unit is shipped configured as an NTU. If you are using this unit as an NTU, the configuration options may not need to be altered.

The 79xx Standalone Termination Unit has two sets of configuration option settings:

- **The Current Configuration:** The 79xx Standalone Termination Unit's active set of configuration options.
- **The Default Factory Configuration:** A read-only configuration area containing the factory default configuration options.

Displaying Configuration Options

To display configuration options, you must first load a configuration into the edit area. To load a configuration option set into the configuration edit area, follow this menu selection sequence:

Main Menu → Configuration (Load Configuration From)

Make a selection by placing the cursor at your choice and pressing Enter.

If you select ...	Then ...
Current Configuration	The selected configuration option set is loaded and the Configuration Edit/Display menu screen appears.
Default Factory Configuration	The selected configuration option set is loaded and the Configuration Edit/Display menu screen appears.
Configuration Loader	The Configuration Loader screen is displayed allowing you to upload or download configurations from a TFTP server.

Configuration Edit/Display

The Configuration Edit/Display screen is displayed when the current, customer, or default configuration is loaded. To access the Configuration Edit/Display screen, follow this menu selection sequence:

Main Menu → Configuration → Current Configuration

– or –

Main Menu → Configuration → Default Factory Configuration

```
main/config/edit
```

```
Hotwire
Model: 79xx
```

```
CONFIGURATION EDIT/DISPLAY
```

```
Network
DSX-1 | SYNC Port | G.703
System Options
Communication Port
Management and Communication
```

```
-----
Ctrl-a to access these functions, ESC for previous menu
Save
```

```
MainMenu Exit
```

Select . . .	To Access the . . .	To Configure the . . .
Network	Network Interface Options, Table 1	DSL network interface on the unit.
DSX-1	DSX-1 Interface Options, Table 2	DSX-1 interface (Models 7974, 7984);
SYNC Port	Synchronous Data Port Options, Table 3	Synchronous DTE interface (Model 7975, 7985);
G.703	G.703 Interface Options, Table 4	G.703 interface (Models 7976, 7986)
System Options	System Options, Table 5	General system options of the unit.
Communication Port	Communication Port Options, Table 6	Unit's COM port options.
Management and Communication	<ul style="list-style-type: none"> ■ Telnet Session Options, Table 7 ■ Communication Protocol Options, Table 8 ■ General SNMP Management Options, Table 9 ■ SNMP NMS Security Options, Table 10 ■ SNMP Traps Options, Table 11 	Management support of the unit through SNMP and Telnet.

Table 1. Network Interface Options (1 of 2)

Margin Threshold
Possible Settings: -5db, -4db, -3db, -2db, -1db, 0db, 1db, 2db, 3db, 4db, 5db, 6db, 7db, 8db, 9db, 10db Default Setting: 0db
Determines the level, expressed in decibels, at which a signal-to-noise margin alarm condition is reported.
Excessive Error Rate Threshold
Possible Settings: 1E-4, 1E-5, 1E-6, 1E-7, 1E-8, 1E-9 Default Setting: 1E-6
Determines the error rate at which an excessive error rate (EER) condition is recognized. The rate is the ratio of the number of CRC errors to the number of bits received in a certain period.

Table 1. Network Interface Options (2 of 2)

AutoRate
Possible Settings: Enable, Disable Default Setting: Disable
Determines whether the unit automatically adjusts to the best line rate for conditions, or is fixed at the rate in the DSL Line Rate field.
DSL Line Rate
Possible Settings (depends on model): 144, 272, 400, 528, 784, 1040, 1552, 2064 Default Setting (Models 7974, 7984): 1552 Default Setting (Models 7975, 7985): 144 Default Setting (Models 7976, 7986): 2064
Determines the fixed line rate of the LTU when AutoRate is disabled, and the maximum line rate that can be used when AutoRate is enabled.
Payload Rate
Possible Settings (depends on model): 64, 128, 192, 256, 320, 384, 448, 512, 576, 640, 704, 768, 832, 896, 960, 1024, 1088, 1152, 1216, 1280, 1344, 1408, 1472, 1536, 1600, 1664, 1728, 1792, 1856, 1920, 1984, 2048 Default Setting: [Highest multiple of 64 kbps supported by the DSL Line Rate]
Models 7974, 7976, 7984, 7986. When the NTU has an EIA-530-A interface, the Payload Rate set on the LTU determines the port speed of the synchronous port of the NTU.
Peer IP Address
Possible Settings: 001.000.000.000 – 223.255.255.255, Clear Default Setting: 000.000.000.000
Specifies the peer IP address for the NTU, to provide remote management providing the remote management link on the DSL loop.
Circuit Identifier
Possible Settings: [ASCII Text], Clear Default Setting: [blank]
Uniquely identifies the circuit number of the transmission vendor's DSL line for troubleshooting purposes.

Table 2. DSX-1 Interface Options – Models 7974 and 7984

Line Coding Format
Possible Settings: AMI, B8ZS Default Setting: B8ZS
Specifies the line coding format to be used by the DSX-1 interface.
Line Framing
Possible Settings: ESF, D4 Default Setting: ESF
Specifies the framing format to be used by the DSX-1 interface.
Line Equalization
Possible Settings: 0–133, 133–266, 266–399, 399–533, 533–655 Default Setting: 0–133
Compensates for signal distortion for a DSX-1 signal over a given distance.
Send (AIS) on Network Failure
Possible Settings: Enable, Disable Default Setting: Enable
Specifies the action taken on the signal transmitted to the DSX when a valid signal cannot be recovered from the network interface (LOS or cognitions OOF, AIS, or EER).
Send All Ones on DSX-1 Failure
Possible Settings: Enable, Disable Default Setting: Enable
Specifies the action taken on the signal transmitted to the DSX when a valid signal cannot be recovered from the network interface (LOS or conditions OOF, AIS, or EER).
Primary Clock Source
Possible Settings: DSX, Internal Default Setting: Internal
Specifies where the unit will derive its timing from.

Table 3. Synchronous Data Port Options – Models 7975 and 7985 (1 of 2)

Port Type
Possible Settings: E530A, V.35, RS449, X.21 Default Setting: E530A
Determines the port type for the data port.
Payload Rate
Possible Settings: 64, 128, 192, 256, 320, 384, 448, 512, 576, 640, 704, 768, 832, 896, 960, 1024, 1088, 1152, 1216, 1280, 1344, 1408, 1472, 1536, 1600, 1664, 1728, 1792, 1856, 1920, 1984, 2048 Default Setting: 128
Specifies the payload rate of the port. This option is not displayed on the unit when AutoRate is enabled or the unit is configured as an NTU. The LTU configures the payload rate for the NTU when AutoRate is disabled.
Transmit Clock Source
Possible Settings: Internal, External Default Setting: Internal
Specifies whether the transmitted data for the synchronous data port is clocked using an internal clock provided by the LTU (synchronized to the clock source specified by the clock source configuration option) or an external clock provided by the DTE connected to the synchronous data port. If an external clock is used, it must be synchronized to the same clock source as the LTU.
Invert Transmit Clock
Possible Settings: Disable, Enable Default Setting: Disable
Specifies whether the clock supplied by the termination unit on the TXC interchange circuit DB (CCITT 114) is phase inverted with respect to the Transmitted Data interchange circuit BA (CCITT 103). This configuration option is useful when long cable lengths between the termination unit and the DTE are causing data errors.
Send All Ones on Data Port Not Ready
Possible Settings: Both, Disable, DTR, RTS Default Setting: Both
Specifies the conditions on the data port that determine when valid data is not being sent from the DTE. When this condition is detected, all ones are sent to the network.
Action on Network LOS Alarm
Possible Settings: Halt, None Default Setting: Halt
Specifies the action taken on the synchronous data port when an LOS (Loss Of Signal) alarm is received on the network interface.

Table 3. Synchronous Data Port Options – Models 7975 and 7985 (2 of 2)

Network Initiated Data Channel Loopback
Possible Settings: Disable, Enable Default Setting: Disable
Allows the initiation and termination of a Data Channel Loopback (DCLB) by the receipt of a DCLB-actuate sequence or DCLB-release sequence from the network or far-end device.
Port (DTE) Initiated Loopbacks
Possible Settings: Disable, DTLB, DCLB, Both Default Setting: Disable
Allows the initiation and termination of a local Data Terminal Loopback (DTLB) or remote Data Channel Loopback (DCLB) by the DTE connected to this port. (DTLB is equivalent to a V.54 loop 3, and DCLB is equivalent to a V.54 loop 2.) Control of these loopbacks is through the DTE interchange circuits as specified by the V.54 standard.
ElasticStore
Possible Settings: Disable, Enable Default Setting: Enable
Used to enable or disable a first-in, first-out (FIFO) buffer circuit for the incoming external clock. This circuit is used to compensate for the differences between the frequencies of the data clocks for the two units in the circuit. This option only applies if the unit is set for external timing. Do not enable Elastic Store if the attached DCE has an elastic store buffer larger than 32 bits.

Table 4. G.703 Interface Options – Models 7976 and 7986

Framing
Possible Settings: Framed, Unframed Default Setting: Framed
Specifies whether G.704 framing is used for the G.703 interface.
Line Coding Format
Possible Settings: AMI, HDB3 Default Setting: HDB3
Specifies the line coding format to be used by the G.703 interface.
Line Framing
Possible Settings: CRC4, noCRC4 Default Setting: noCRC4
Specifies the framing format to be used by the G.703 interface.
Time Slot 16
Possible Settings: Signaling, Data Default Setting: Signaling
Specifies whether the G.703 interface is used for voice or data.
Send (AIS) on Network Failure
Possible Settings: Enable, Disable Default Setting: Enable
Specifies the action taken on the signal transmitted to the G.703 when a valid signal cannot be recovered from the network interface (LOS or conditions OOF, AIS, or EER).
Primary Clock Source
Possible Settings: G.703, Internal Default Setting: Internal
Specifies where the unit will derive its timing from.

Table 5. System Options

DSL Mode
Possible Settings: LTU, NTU Default Setting: NTU
Controls whether the unit is configured as a control unit or tributary unit. NOTE: Changing this option will reset the termination unit.
Test Timeout
Possible Settings: Enable, Disable Default Setting: Enable
Allows tests to end automatically. The feature should be enabled when the unit is remotely managed so that control can be regained after a test is accidentally executed.
Test Duration (min)
Possible Settings: 1–120 Default Setting: 10
Number of minutes for a test to be active before automatically ending.
Telco Initiated Loopback (Models 7974 and 7984)
Possible Settings: Enable, Disable Default Setting: Enable
Determines if the unit will respond to loopback commands on the DSX-1 interface.
Remote Telco Line Loopback (Models 7974 and 7984)
Possible Settings: Enable, Disable Default Setting: Disable
Determines if the unit will perform a Telco-initiated loopback on just the local unit or if the loopback will be performed on the remote DSL unit.

Table 6. Communication Port Options (1 of 2)

Port Use
Possible Settings: Terminal, Net Link Default Setting: Terminal
Specifies how the communications port is to be used.
Port Type
Possible Settings: Asynchronous, Synchronous Default Setting: Asynchronous
When Port Use is set to Net Link, Port Type controls whether the communication port will be asynchronous or synchronous.
Data Rate
Possible Settings: 9.6, 14.4, 19.2, 28.8, 38.4, 115.2 Default Setting: 9.6
Specifies the communication port baud rate.
Character Length (Terminal Use Only)
Possible Settings: 7, 8 Default Setting: 8
Determines the character length of the communication port.
Parity (Terminal Use Only)
Possible Settings: None, Odd, Even Default Setting: None
Specifies the parity of the communication port.
Stop Bits (Terminal Use Only)
Possible Settings: 1, 1.5, 2 Default Setting: 1
Specifies the number of stop bits for the communication port.
Ignore Control Leads (Terminal Use Only)
Possible Settings: Disable, DTR Default Setting: Disable
Specifies whether DTR is used.
Login Required (Terminal Use Only)
Possible Settings: Enable, Disable Default Setting: Disable
Specifies if an ID and password are required to access the asynchronous terminal interface on the communication port. Login IDs are created with a password and access level.

Table 6. Communication Port Options (2 of 2)

Port Access Level (Terminal Use Only)
Possible Settings: Administrator, Operator Default Setting: Administrator
Specifies the highest level of access allowed when accessing an ATI session through a Telnet session.
Inactivity Timeout (Terminal Use Only)
Possible Settings: Enable, Disable Default Setting: Disable
Provides automatic logoff of a Telnet session.
Disconnect Time (Minutes) (Terminal Use Only)
Possible Settings: 1 – 60 Default Setting: 5
Number of minutes of inactivity before the session terminates automatically. Timeout is based on no keyboard activity.

Table 7. Telnet Session Options (1 of 2)

Telnet Session
Possible Settings: Enable, Disable Default Setting: Enable
Specifies if the unit will respond to a Telnet session request from a Telnet client on an interconnected IP network.
Telnet Login Required
Possible Settings: Enable, Disable Default Setting: Disable
Specifies whether a user ID and password are required to access to the ATI through a Telnet session. Login IDs are created with a password and access level.
Session Access Level
Possible Settings: Administrator, Operator Default Setting: Administrator
The Telnet session access level is interrelated with the access level of the Login ID.
Inactivity Timeout
Possible Settings: Enable, Disable Default Setting: Disable
Provides automatic logoff of a Telnet session.

Table 7. Telnet Session Options (2 of 2)

Disconnect Time (Minutes)
Possible Settings: 1 – 60 Default Setting: 5
Number of minutes of user inactivity before a Telnet session terminates automatically. Time out is based on no keyboard activity.

Table 8. Communication Protocol Options (1 of 2)

Node IP Address
Possible Settings: 001.000.000.000 – 223.255.255.255 Default Setting: 000.000.000.000
Specifies the Node IP address.
Node Subnet Mask
Possible Settings: 000.000.000.000 – 255.255.255.255 Default Setting: 000.000.000.000
Specifies the Node Subnet Mask.
Default Network Destination
Possible Settings: None, COM, DSL Default Setting: None
Specifies where the default management network is connected. For example, if your default network is connected to the COM port, select COM as the default management network destination.
Communication Port IP Address
Possible Settings: 001.000.000.000 – 223.255.255.255 Default Setting: 000.000.000.000
Specifies the unit's Communication Port IP Address when the unit is configured as a network communication link.
Communication Port Subnet Mask
Possible Settings: 000.000.000.000 – 255.255.255.255 Default Setting: 000.000.000.000
Specifies the unit's Communication Port Subnet Mask when the unit is configured as a network communication link.

Table 8. Communication Protocol Options (2 of 2)

Communication Port Link Protocol
Possible Settings: PPP, SLIP Default Setting: PPP
Specifies the unit's Communication Port link layer protocol when the unit is configured as a network communication link.

Table 9. General SNMP Management Options

SNMP Management
Possible Settings: Enable, Disable Default Setting: Disable
Enable or disables the SNMP management features.
Community Name 1
Possible Settings: ASCII text field, Public Default Text: Public
Identifies the name of the community allowed to access the unit's MIB. The community name must be supplied by an external SNMP manager when that manager attempts to access an object in the MIB.
Name 1 Access
Possible Settings: Read, Read/Write Default Setting: Read
Determines the access level for Community Name 1.
Community Name 2
Possible Settings: ASCII text field, Public Default Text: (null string)
Identifies the name of the second community allowed to access the unit's MIB. The community name must be supplied by an external SNMP manager when that manager attempts to access an object in the MIB.
Name 2 Access
Possible Settings: Read, Read/Write Default Setting: Read
Determines the access level for Community Name 2.

Table 10. SNMP NMS Security Options

NMS IP Validation
Possible Settings: Enable, Disable Default Setting: Disable
Specifies whether security checking is performed on the IP address of SNMP management systems attempting to access the node.
Number of Managers
Possible Settings: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 Default Setting: 1
Specifies the number of SNMP management systems that can send SNMP messages.
NMS <i>n</i> IP Address
Possible Settings: 001.000.000.000 – 223.255.255.255, Clear Default Setting: 000.000.000.000
Specifies the Internet Protocol address used to identify each SNMP trap manager.
Access Level
Possible Settings: Read, Read/Write Default Setting: Read
Determines the access level allowed for an authorized NMS when IP address validation is being performed.

Table 11. SNMP Traps Options (1 of 2)

SNMP Traps
Possible Settings: Enable, Disable Default Setting: Disable
Controls the generation of SNMP trap messages.
Number of Trap Managers
Possible Settings: 1, 2, 3, 4, 5 Default Setting: 1
Sets the number of SNMP management systems that will receive SNMP traps.
NMS <i>n</i> IP Address
Possible Settings: 001.000.000.000 – 223.255.255.255, Clear Default Setting: 000.000.000.000
Specifies the Internet Protocol address used to identify each SNMP trap manager.

Table 11. SNMP Traps Options (2 of 2)

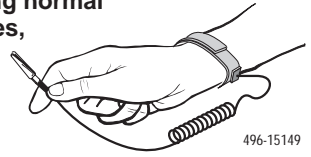
NMS <i>n</i> Destination
Possible Settings: DSL, COM Default Setting: DSL
Provides the network destination path of each trap manager.
General Traps
Possible Settings: Disable, Warm, AuthFail, Both Default Setting: Both
Determines which SNMP traps are sent to each trap manager.
Enterprise Specific Traps
Possible Settings: Enable, Disable Default Setting: Disable
Determines if SNMP traps are generated for enterprise-specific events.
Link Traps
Possible Settings: Disable, Up, Down, Both Default Setting: Both
Determines if SNMP traps are generated for link up and link down for one of the communication interfaces.
Link Traps Interfaces
Possible Settings: Network, [DSX, SYNC, or G.703], All Default Setting: All
Determines if the SNMP <i>linkUp</i> , SNMP <i>linkDown</i> , and interface-related <i>enterpriseSpecific</i> traps are generated for the network interface, DTE port, or both. Depending on the model, the DTE option appears as DSX, SYNC, or G.703.

Configuring the Unit Using the Internal Switches

Use internal Switchpacks S1 and S2 to manually configure the unit. Use the illustration on page 24 to locate Switchpacks S1 and S2.

⚠ HANDLING PRECAUTIONS FOR STATIC-SENSITIVE DEVICES

This product is designed to protect sensitive components from damage due to electrostatic discharge (ESD) during normal operation. When performing installation procedures, however, take proper static control precautions to prevent damage to equipment. If you are not sure of the proper static control precautions, contact your nearest sales or service representative.



► Procedure

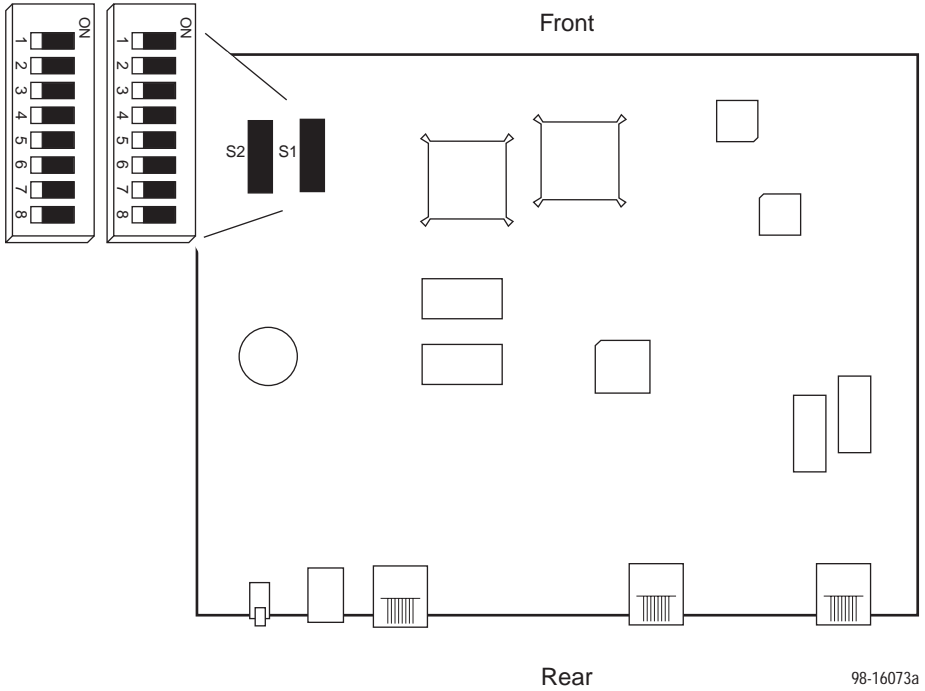
To configure the unit using internal Switchpacks S1 and S2:

1. Power off the unit. Remove the enclosure cover by pushing a flat-blade screwdriver through the slots on both sides of the housing to free the four inner latches.
2. Locate Switchpack S1 on the circuit board.
3. Set Switch 1 on Switchpack S1 to ON to enable Switchpacks 1 and 2.
4. After you enable the switchpacks, you must set the switches to your desired configuration. Refer to Tables 12 through 19.
5. Replace and secure the cover.
6. Power on the board to reset and enable the new configuration.

Switchpack Locations

Use the following illustration to locate Switchpacks S1 and S2 on the circuit board.

Switchpack S1 & S2



Hotwire Standalone Termination Unit Switchpack Locations

Switchpack Definitions for Models 7974 and 7984

Table 12 lists Switchpack S1 definitions.

Table 12. Switchpack S1 Definitions (Models 7974 and 7984)

Switch # . . .	Allows you to . . . <i>Default in Bold</i>
1	Enable or disable Switchpacks S1 and S2. OFF = Switchpacks Disabled ON = Switchpacks Enabled
2	Not used
3	Select the unit's primary timing source. Only valid for units configured as LTU. OFF = Internal Clock ON = External Clock
4	Control the unit's T1 line coding. OFF = B8ZS ON = AMI
5	Control the unit's framing format OFF = ESF ON = D4
6, 7, 8	Control the unit's line equalization. The three switches form a binary value used as an index to the table of equalization values. Off denotes 0 (zero) and On denotes 1 (one). 000 = 0–133 feet 001 = 133–266 feet 010 = 266–399 feet 011 = 399–533 feet 100 = 533–655 feet 101 = 0–133 feet 110 = 0–133 feet 111 = 0–133 feet

Table 13 lists Switchpack S2 definitions.

Table 13. Switchpack S2 Definitions (Models 7974 and 7984)

Switch # . . .	Allows you to . . . <i>Default in Bold</i>
1	Control whether the unit is an LTU or an NTU. OFF = NTU ON = LTU
2	Control whether the unit automatically adjusts to the best line rate for conditions, or is fixed at the rate set by Switches S2-3 through S2-5. OFF = Fixed Rate ON = AutoRate Enable
3, 4, 5	Control the DSL line rate of the unit. Refer to Table 19. If AutoRate is enabled, DSL Line Rate represents the AutoRate ceiling. 000 (all Off) = 1552 kbps
6	Control whether Telco loopbacks are supported. OFF = Enabled ON = Disabled
7	Control whether remote Telco loopbacks are supported. OFF = Disabled ON = Enable
8	Emergency Use Only – Switch between two versions of firmware. The unit has two banks of flash memory used to hold executable firmware. This switch allows you to change between the two versions of firmware. This switch is independent from the position of Switch 1 on Switchpack S1 (switchpack enable/disable). OFF = Current Firmware ON = Previous Firmware

Switchpack Definitions for Models 7975 and 7985

Table 14 lists Switchpack S1 definitions.

Table 14. Switchpack S1 Definitions (Models 7975 and 7985)

Switch # . . .	Allows you to . . .	<i>Default in Bold</i>
1	Enable or disable Switchpacks S1 and S2. OFF = Switchpacks Disabled ON = Switchpacks Enabled	
2	Control Sync Port Type. OFF = EIA-530, RS-449, or X.21 ON = V.35	
3	Select the unit's timing source. Only valid for LTU configured units. OFF = Internal clock ON = External Clock	
4, 5, 6, 7, 8	Control Sync Port Data Rate (refer to Table 15, Selectable Payload Rates) NOTE: Switches 4 through 8 are only used when the unit is configured as an LTU and AutoRate is disabled. All OFF = 2048 kbps (1024 kbps for 1 Mbps units)	

Use Table 15 to set the Sync Port Payload Rate. Defaults are shown in bold.

NOTES:

- Sync Port and DSL Line Rates can only be selected from units configured as LTU (Switchpack S2 #1) with AutoRate disabled (Switchpack S2 #2).
- Sync Port Payload Rates above 960 kbps are available only on 2 Mbps models. Payload Rate on 1 Mbps units defaults to 1024 kbps (all OFF).

Table 15. Selectable Payload Rates (Models 7975 and 7985)

Sync Port Payload Rate	Switchpack S1 Switch Number					Associated DSL Line Rate
	8	7	6	5	4	
2048 kbps (32 x 64)	OFF	OFF	OFF	OFF	OFF	2064 kbps
1984 kbps (31 x 64)	ON	ON	ON	ON	ON	2064 kbps
1920 kbps (30 x 64)	ON	ON	ON	ON	OFF	2064 kbps
1856 kbps (29 x 64)	ON	ON	ON	OFF	ON	2064 kbps
1792 kbps (28 x 64)	ON	ON	ON	OFF	OFF	2064 kbps
1728 kbps (27 x 64)	ON	ON	OFF	ON	ON	2064 kbps
1664 kbps (26 x 64)	ON	ON	OFF	ON	OFF	2064 kbps
1600 kbps (25 x 64)	ON	ON	OFF	OFF	ON	2064 kbps
1536 kbps (24 x 64)	ON	ON	OFF	OFF	OFF	1552 kbps
1472 kbps (23 x 64)	ON	OFF	ON	ON	ON	1552 kbps
1408 kbps (22 x 64)	ON	OFF	ON	ON	OFF	1552 kbps
1344 kbps (21 x 64)	ON	OFF	ON	OFF	ON	1552 kbps
1280 kbps (20 x 64)	ON	OFF	ON	OFF	OFF	1552 kbps
1216 kbps (19 x 64)	ON	OFF	OFF	ON	ON	1552 kbps
1152 kbps (18 x 64)	ON	OFF	OFF	ON	OFF	1552 kbps
1088 kbps (17 x 64)	ON	OFF	OFF	OFF	ON	1552 kbps
1024 kbps (16 x 64)	ON	OFF	OFF	OFF	OFF	1040 kbps
960 kbps (15 x 64)	OFF	ON	ON	ON	ON	1040 kbps
896 kbps (14 x 64)	OFF	ON	ON	ON	OFF	1040 kbps
832 kbps (13 x 64)	OFF	ON	ON	OFF	ON	1040 kbps
768 kbps (12 x 64)	OFF	ON	ON	OFF	OFF	784 kbps
704 kbps (11 x 64)	OFF	ON	OFF	ON	ON	784 kbps
640 kbps (10 x 64)	OFF	ON	OFF	ON	OFF	784 kbps
576 kbps (9 x 64)	OFF	ON	OFF	OFF	ON	784 kbps
512 kbps (8 x 64)	OFF	ON	OFF	OFF	OFF	528 kbps
448 kbps (7 x 64)	OFF	OFF	ON	ON	ON	528 kbps
384 kbps (6 x 64)	OFF	OFF	ON	ON	OFF	400 kbps
320 kbps (5 x 64)	OFF	OFF	ON	OFF	ON	400 kbps
256 kbps (4 x 64)	OFF	OFF	ON	OFF	OFF	272 kbps
192 kbps (3 x 64)	OFF	OFF	OFF	ON	ON	272 kbps
128 kbps (2 x 64)	OFF	OFF	OFF	ON	OFF	144 kbps
64 kbps (1 x 64)	OFF	OFF	OFF	OFF	ON	144 kbps

Table 16 lists Switchpack S2 definitions.

Table 16. Switchpack S2 Definitions (Models 7975 and 7985)

Switch # . . .	Allows you to . . . <i>Default in Bold</i>
1	Control whether the unit is an LTU or an NTU. OFF = NTU ON = LTU
2	Control enabling and disabling of the AutoRate capability. OFF = AutoRate Enabled ON = AutoRate Disabled
3, 4, 5	Select one of eight preset DSL line rates (refer to Table 19). If AutoRate is enabled, DSL Line Rate represents the AutoRate ceiling. All OFF = 2064 (1040 for 1 Mbps units)
6	Control enabling and disabling of the Elastic Store feature. OFF = Elastic Store Enabled ON = Elastic Store Disabled
7	Not used
8	Emergency Use Only – The unit has two banks of flash memory used to hold executable firmware. This switch allows you to change between the two versions of firmware. This switch is independent from the position of Switch 1 on Switchpack S1 (switchpack enable/disable). OFF = Current Firmware ON = Previous Firmware

Switchpack Definitions for Models 7976 and 7986

Table 17 lists Switchpack S1 definitions.

Table 17. Switchpack S1 Definitions (Models 7976 and 7986)

Switch # . . .	Allows you to . . .	<i>Default in Bold</i>
1	Enable or disable Switchpacks S1 and S2. OFF = Switchpacks Disabled ON = Switchpacks Enabled	
2	Control line termination. OFF = 120 Ohm ON = 75 Ohm	
3	Select the unit's primary timing source. Only valid for units configured as LTU. OFF = Internal Clock ON = External Clock	
4	Control the unit's E1 line coding. OFF = HDB3 ON = AMI	
5	Not used	
6	Enable CRC-4 monitoring. Only valid for units configured as LTU. The NTU will automatically be configured to match the LTU setting. OFF = Disable CRC-4 monitoring ON = Enable CRC-4	
7	Control whether Channel 16 contains signaling information or data. OFF = Channel 16 is used for signaling ON = Channel 16 is used for data	
8	Not used	

Table 18 lists Switchpack S2 definitions.

Table 18. Switchpack S2 Definitions (Models 7976 and 7986)

Switch # . . .	Allows you to . . . <i>Default in Bold</i>
1	Control whether the unit is an LTU or an NTU. OFF = NTU ON = LTU
2	Control enabling and disabling of the AutoRate capability. Only valid for units configured as LTU. OFF = Fixed Rate ON = AutoRate Enabled
3, 4, 5	Select one of eight preset DSL line rates (refer to Table 19). If AutoRate is enabled, DSL Line Rate represents the AutoRate ceiling. All OFF = 2064
6, 7	Not used
8	Emergency Use Only – The unit has two banks of flash memory used to hold executable firmware. This switch allows you to change between the two versions of firmware. This switch is independent from the position of Switch 1 on Switchpack S1 (switchpack enable/disable). OFF = Current Firmware ON = Previous Firmware

DSL Line Rate (Switches 3–5 On Switchpack 2)

Use Table 19 to set the DSL Line Rate. Defaults are shown in bold.

Table 19. DSL Line Rate, Switches 3–5 on Switchpack S2

Switch Position			DSL Line Rate
5	4	3	
OFF	OFF	ON	144 kbps (Supported only if 7975 or 7985 is the LTU)
OFF	ON	OFF	272 kbps (Supported only if 7975 or 7985 is the LTU)
OFF	ON	ON	400 kbps
ON	OFF	OFF	528 kbps
ON	OFF	ON	784 kbps
ON	ON	OFF	1040 kbps
ON	ON	ON	1552 kbps
OFF	OFF	OFF	Maximum Rate: 1040 kbps (Model 7975 1 Mbps unit) 1552 kbps (Models 7974 and 7984) 2064 kbps (All other models)

⚠ Important Safety Instructions

1. Read and follow all warning notices and instructions marked on the product or included in the manual.
2. 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 24 Vdc National Electric Code (NEC) ANSI/NFPA 70/Canadian Electric Code (CEC) Class 2 circuit installed in accordance with articles 110-16, 110-17, and 110-18 of the NEC, and articles 2-308, 2-310, 2-312, 2-314, 2-200, and 2-202 of the CEC, or (3) a Safety Extra Low Voltage (SELV) power source with a maximum available output of less than 240 VA, certified for use in the country of installation.
3. 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.
4. Do not allow anything to rest on the power cord and do not locate the product where persons will walk on the power cord.
5. Do not attempt to install or service this product yourself, as opening or removing covers may expose you to dangerous high voltage points or other risks. Refer all installation and servicing to qualified service personnel.
6. General purpose cables are provided with this product. Special cables, which may be required by the regulatory inspection authority for the installation site, are the responsibility of the customer.
7. 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.
8. 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.
9. In addition, if 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.

EMI Warnings

WARNING:

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

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

WARNING:

To Users of Digital Apparatus in Canada:

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.

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. (Be sure to register your warranty at 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