

Hotwire® TDM SDSL Standalone Termination Units Models 7974-A2, 7975-A2, and 7976-A2 Installation Instructions

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Models 7974-A2, 7975-A2, and 7976-A2, User's Guide*

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Package Checklist

Verify that your package contains:

- Hotwire® Standalone Termination Unit
- 24 VDC power transformer with separate power cable
- or -
6-conductor direct connection DC power cable
- 8-position-modular-to-8-position-modular network cable
- DB9-to-8-position modular terminal cable

Notify your sales representative if anything is missing.

Installation Overview

Installation and configuration of the Hotwire 797x 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 unit, read the *Important Safety Instructions* on page 35.

See the User's Guide for additional information about:

- Configuration Options
- Messages and Troubleshooting
- Technical Specifications
- Connectors, Cables, and Pin Assignments

Connecting Power to the Unit

If your package includes a power transformer:

1. Plug the power cable into an AC outlet having a nominal voltage rating between 100 – 240 VAC.
2. Connect the power cable to the transformer.
3. Connect the output cable of the transformer to the connector marked POWER on the rear panel.

If your package includes a direct-connection DC power cable:

Connect the unit to an external +24 or –48 VDC SELV (Safety Extra Low Voltage) power source as described in the following section.

Connecting the Unit to an Optional External +24 or –48 VDC Power Source

Using the DC power cable, the unit is capable of operating on a +24 VDC or –48 VDC SELV power supply.

► Procedure

To use the DC power cable for +24 VDC:

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 unit.

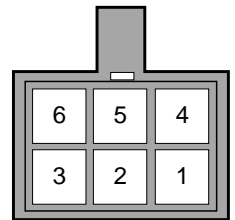
► Procedure

To use the DC power cable for –48 VDC:

1. Connect the green wire to a suitable ground.
2. Connect the orange wire to the –48 VDC source.
3. Connect the black wire to the return.
4. Cut the red, white, and blue wires off at the outer insulation.
5. Plug the power connector into the unit.

Power Cable Pinouts

Pin Number	Wire Color	Signal
1	Black	–48 VDC Return
2	Red	–48 VDC Return
3	Green	Ground
4	White	+24 VDC Return
5	Orange	–48 VDC +24 VDC
6	Blue	No Connection



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Connecting to the Network

► Procedure

To connect your unit to the network:

1. Connect one end of the supplied 8-position-modular-to-8-position-modular 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 unit. Use only Cat 5 twisted-pair network cable.

Connecting to a DTE

Model	DTE Connection
7974	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	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	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 *Connectors, Cables, and Pin Assignments* in the User's Guide for specifications of the connectors and cables.

LEDs

The following table contains a description of the LEDs on the Hotwire 797x Standalone Termination Unit's 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 797x 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 supplied 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 797x

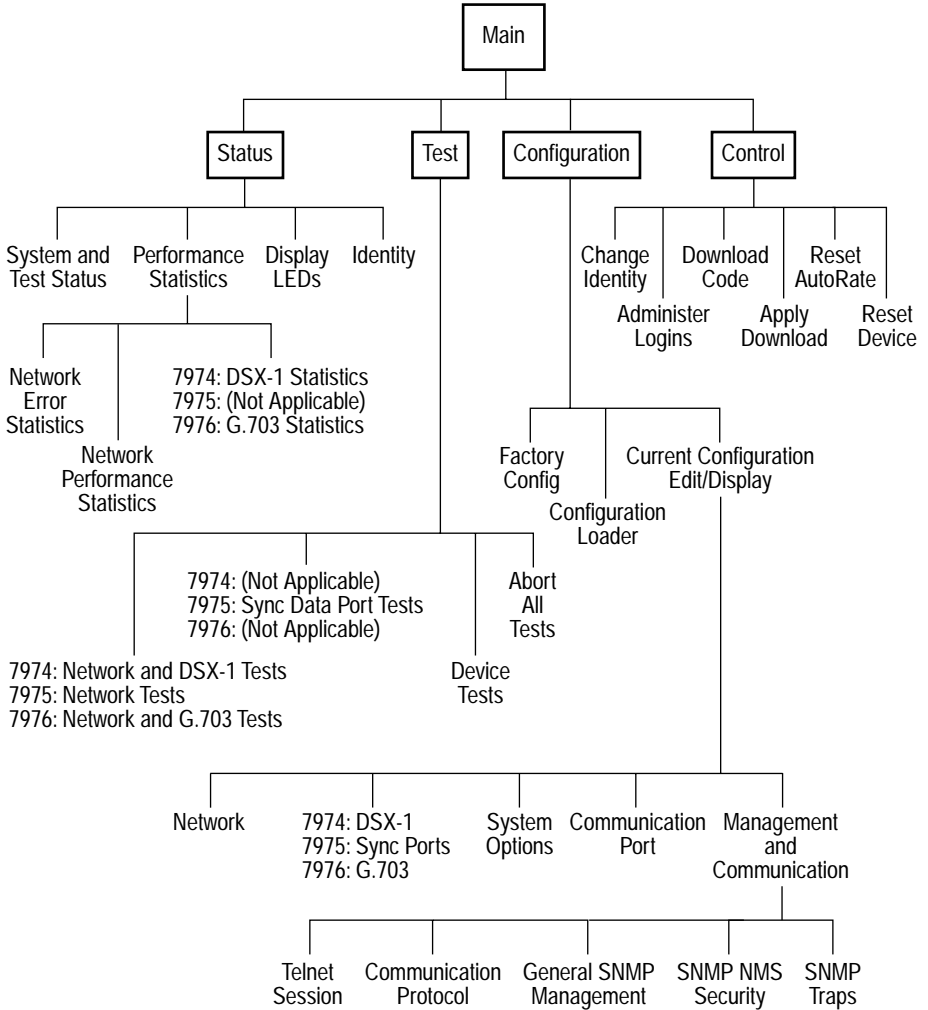
                                         MAIN MENU

                                         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.



00-16496-02

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. See the User's Guide for detailed information about the configuration options and switch settings.

Configuring the Unit Using the Configuration Menus

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

NOTE:

The Hotwire 797x Standalone Termination Unit is shipped configured as an NTU. If using this unit as an NTU, the configuration options may not need to be altered.

The unit has two sets of configuration option settings:

- **The Current Configuration:** The 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 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
```

```
Model: 797x
```

```
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      MainMenu  Exit  
Save
```

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 (Model 7974)
SYNC Port	Synchronous Data Port Options, Table 3	Synchronous DTE interface (Model 7975)
G.703	G.703 Interface Options, Table 4	G.703 interface (Model 7976)
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.
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 (Model 7974): 1552 Default Setting (Model 7975, 7976): 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.
Max DSL AutoRate
Possible Settings (depends on model): 144, 272, 400, 528, 784, 1040, 1552, 2064 Default Setting (Model 7974): 1552 Default Setting (Model 7975, 7976): 2064
Determines the maximum rate to which the unit can AutoRate.

Table 1. Network Interface Options (2 of 2)

EIA-530 Payload Rate
(Models 7974 and 7976) Possible Settings: 64, 128, 512, 768, 1024, 1536, 2048 Default Setting: [Highest multiple of 64 kbps supported by the DSL Line Rate]
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.
Transmit Attenuation
Possible Settings: 0dB – 15dB Default Setting: 0dB
Determines how much the unit's transmit power is reduced to accommodate a short line length.
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 field, 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 – Model 7974

Line Coding
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.
Excessive Error Rate Threshold
Possible Settings: 1E–4, 1E–5, 1E–6, 1E–7, 1E–8, 1E–9 Default Setting: 1E–4
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.
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).
Primary Clock Source
Possible Settings: DSX, Internal Default Setting: Internal
Specifies from where the unit will derive its timing.

Table 3. Synchronous Data Port Options – Model 7975 (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 or an external clock provided by the DTE connected to the synchronous data port.
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 – Model 7975 (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 – Model 7976

Framing
Possible Settings: Framed, Unframed Default Setting: Framed
Specifies whether G.704 framing is used for the G.703 interface.
Line Coding
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 from where the unit will derive its timing.

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 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
(Model 7974) 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
(Model 7974) 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.
G.703 Line Termination
(Model 7976) Possible Settings: 75 ohms, 120 ohms Default Setting: 120 ohms
Specifies which G.703 connection's are being used by the unit, the 75 Ω TX and RX connectors or the 120 Ω interface.

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.

Table 6. Communication Port Options (2 of 2)

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 whether 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.
Port Access Level
(Terminal Use Only) Possible Settings: Administrator, Operator Default Setting: Administrator
Specifies the highest level of access allowed when accessing an AT1 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

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.
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

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.
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

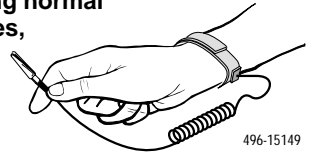
SNMP Traps
Possible Settings: Enable, Disable Default Setting: Disable
Controls the generation of SNMP trap messages.
Number of Trap Managers
Possible Settings: 1, 2, 3, 4, 5 Default Setting: 1
Sets the number of SNMP management systems that will receive SNMP traps.
NMS <i>n</i> IP Address
Possible Settings: 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.
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 S3 and S4 to manually configure the unit. Use the illustration on page 26 to locate Switchpacks S3 and S4.

⚠ 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.



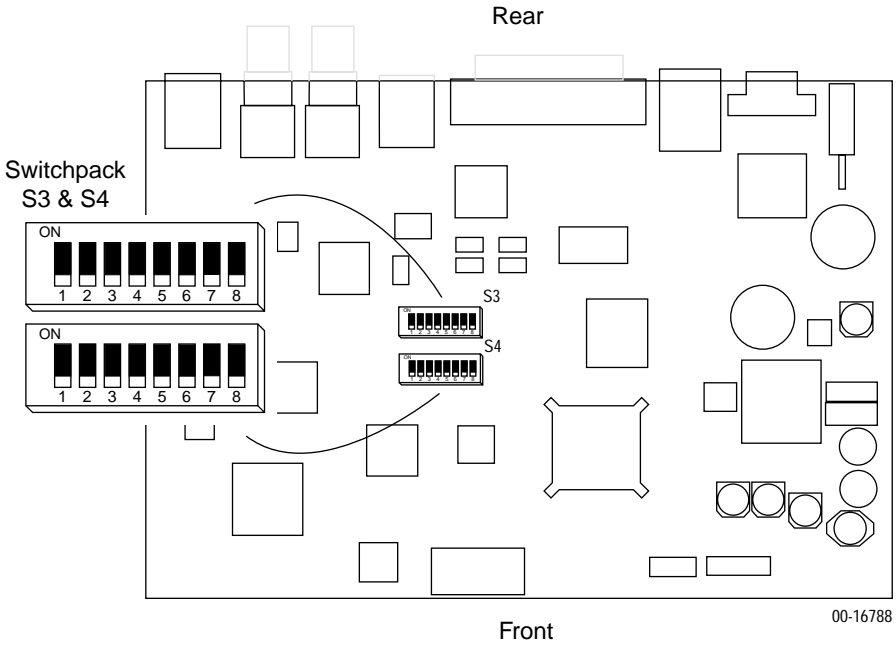
► Procedure

To configure the unit using internal Switchpacks S1 and S2:

1. Power off the unit. Remove the enclosure cover by removing the two screws at the top of the unit, then pushing a flat-blade screwdriver through the slots on both sides of the housing to free the four inner latches.
2. Locate Switchpack S4 on the circuit board using the illustration on page 26.
3. Set Switch 1 on Switchpack S4 to ON to enable Switchpacks S3 and S4.
4. After you enable the switchpacks, you must set the switches to your desired configuration. Refer to the illustration on page 26 and Tables 12 through 23.
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 S3 and S4.



Hotwire 797x Standalone Termination Unit Switchpack Locations

Model 7974 Switchpack Definitions

Tables 12 through 15 list Model 7974 Switchpack definitions.

Table 12. Switchpack S4 Definitions

Switch # . . .	Allows you to . . .	Default in Bold
1	Enable or disable Switchpacks S3 and S4. OFF = Switchpacks Disabled ON = Switchpacks Enabled	
2	Not used	
3	Select the unit's primary timing source. Valid only for a unit configured as the LTU. OFF = Internal Clock ON = DSX-1 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. Refer to Table 13. 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 (all Off) = 0–133 feet	

Table 13. Line Equalization, Switches 6–8 on Switchpack S4

Switch Position			Line Equalization	Default in Bold
8	7	6		
OFF	OFF	OFF	0–133 feet	
OFF	OFF	ON	133–266 feet	
OFF	ON	OFF	266–399 feet	
OFF	ON	ON	399–533 feet	
ON	OFF	OFF	533–655 feet	
ON	OFF	ON	0–133 feet	
ON	ON	OFF	0–133 feet	
ON	ON	ON	0–133 feet	

Table 14. Switchpack S3 Definitions

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 S3-3 through S3-5. OFF = Fixed Rate ON = AutoRate Enabled	
3, 4, 5	Control the DSL line rate of the unit. Refer to Table 15. If AutoRate is enabled, this switch represents the maximum DSL AutoRate value. 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 = Enabled	
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 S4 (switchpack enable/disable). OFF = Current Firmware ON = Previous Firmware	

Table 15. DSL Line Rate, Switches 3–5 on Switchpack S3

Switch Position			DSL Line Rate <i>Default in Bold</i>
5	4	3	
OFF	OFF	OFF	1552 kbps
OFF	OFF	ON	144 kbps
OFF	ON	OFF	272 kbps
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

Model 7975 Switchpack Definitions

Tables 16 through 19 list Model 7975 Switchpack definitions.

Table 16. Switchpack S4 Definitions

Switch # . . .	Allows you to . . . <i>Default in Bold</i>
1	Enable or disable Switchpacks S3 and S4. 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. Valid only for a unit configured as the LTU. OFF = Internal clock ON = External Clock
4, 5, 6, 7, 8	Control Sync Port Data Rate (refer to Table 17, 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)

NOTE:

Sync Port and DSL Line Rates can only be selected from a unit configured as the LTU (Switchpack S3 #1) with AutoRate disabled (Switchpack S3 #2).

Table 17. Selectable Payload Rates (1 of 2)

Sync Port Payload Rate	Switchpack S4 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

Table 17. Selectable Payload Rates (2 of 2)

Sync Port Payload Rate	Switchpack S4 Switch Number					Associated DSL Line Rate
	8	7	6	5	4	
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

NOTE:

The 1 Mbps unit Payload Rate defaults to 1024 kbps (all OFF).

Table 18. Switchpack S3 Definitions

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 S4 (switchpack enable/disable). OFF = Current Firmware ON = Previous Firmware	

Table 19. DSL Line Rate, Switches 3–5 on Switchpack S3

Switch Position			DSL Line Rate <i>Default in Bold</i>
5	4	3	
OFF	OFF	OFF	2064 kbps (2 Mbps unit only)
OFF	OFF	ON	144 kbps
OFF	ON	OFF	272 kbps
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 (2 Mbps unit only)

NOTE:

On 1 Mbps units the DSL line rate defaults to 1040 kbps (all OFF).

Model 7976 Switchpack Definitions

Tables 21 through 20 list Model 7976 Switchpack definitions.

Table 21. Switchpack S4 Definitions

Switch # . . .	Allows you to . . .	<i>Default in Bold</i>
1	Enable or disable Switchpacks S3 and S4. OFF = Switchpacks Disabled ON = Switchpacks Enabled	
2	Control line termination. OFF = 120 Ohm ON = 75 Ohm	
3	Select the unit's primary timing source. Valid only for a unit configured as the LTU. OFF = Internal Clock ON = External Clock	
4	Control the unit's E1 line coding. OFF = HDB3 ON = AMI	
5	Determine whether the unit will use G.704 framing. Unframed mode (ON) is valid only when Switches 3–5 of Switchpack S3 are set to full rate (all Off). OFF = Framed ON = Unframed	
6	Enable CRC-4 generation and monitoring. Valid only for a unit configured as the LTU. The NTU is automatically configured to match the LTU setting. OFF = Disable CRC-4 generation and monitoring ON = Enable CRC-4 generation and monitoring	
7	Control whether Channel 16 contains signaling information or data. OFF = Channel 16 is used for signaling (voice mode) ON = Channel 16 is used for data (data mode)	
8	Not used	

Table 22. Switchpack S3 Definitions

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. Valid only for a unit configured as the LTU. OFF = Fixed Rate ON = AutoRate Enabled	
3, 4, 5	Select one of eight preset DSL line rates. Refer to Table 23. 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 unit allows you to change between the two versions of firmware. This switch is independent from the position of Switch 1 on Switchpack S4 (switchpack enable/disable). OFF = Current Firmware ON = Previous Firmware	

Table 23. DSL Line Rate, Switches 3–5 on Switchpack S3

Switch Position			DSL Line Rate	<i>Default in Bold</i>
5	4	3		
OFF	OFF	OFF	2064 kbps	
OFF	OFF	ON	144 kbps	
OFF	ON	OFF	272 kbps	
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	

▲ 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 or –48 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 Notices

UNITED STATES – EMI NOTICE:

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.

CANADA – EMI NOTICE:

The following notice applies to models that have been certified by Industry Canada as indicated by the certification label on the bottom of the unit.

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.

Canada

Notice to Users of the Canadian Telephone Network

The following notice applies to units that have been CS-03 certified and bear the Industry Canada certification label.

The Industry Canada label identifies certified equipment. This certification means that the equipment meets telecommunications network protective, operational and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

CAUTION:

Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

The Ringer Equivalence Number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 5.

If your equipment is in need of repair, refer to *Warranty, Sales, Service, and Training Information* on page 39.

CE Marking

When the product is marked with the CE mark, this demonstrates full compliance with the following European Directives:

- **Directive 72/73/EEC** – Council Directive of 19 February 1973 on the harmonization of the laws of the member states relating to electrical equipment designed for use within certain voltage limits, as amended by Directive 93/68EEC.
- **Directive 89/336/EEC** – Council Directive of 3 May 1989 on the approximation of the laws of the member states relating to Electro-Magnetic Compatibility (EMC), as amended by Directive 93/68/EEC.

Japan

Class A ITE

<p>この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラス A 情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。</p>
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This is a Class A product based on the standard of the Voluntary Control Council for interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective actions.

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

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