PARADYNE™

FrameSaver® SLV 9124
Installation Instructions

Document Number 9124-A2-GN10-00

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Product Documentation on the World Wide Web

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Complete documentation for this product is available at **www.paradyne.com**. Select *Library* → *Technical Manuals* → *FrameSaver Frame Relay Devices.*

Select the following document:

9124-A2-GH30
FrameSaver SLV 9124 Technical Reference

To request a paper copy of a Paradyne document:

- Within the U.S.A., call 1-800-PARADYNE (1-800-727-2396)
- Outside the U.S.A., call 1-727-530-8623

Before You Begin

Make sure you have:

- ❑ A dedicated, grounded power outlet that is protected by a circuit breaker within 6 feet of the FrameSaver SLV (service level verifier) unit.
- ❑ A clean, well-lit, and ventilated site that is free from environmental extremes.
- ❑ One-to-two feet of clearance for cable connections.
- ❑ A physical connection to the frame relay T1 network.
- ❑ An async (asynchronous) terminal or PC (personal computer) and an EIA-232 cable to connect to and set up the FrameSaver unit.
- ❑ A DSX-1 cable and adapter cable.
- ❑ Node IP Addresses and Subnet Masks. See your network administrator for this information.
- ❑ IP Addresses and Subnet Masks of trap manager(s).

See the Technical Reference for additional information on:

- *Troubleshooting*
- *Technical Specifications*
- *Cables, Connectors, and Pin Assignments*

Package Checklist

Verify that your package contains the following:

- ❑ FrameSaver SLV 9124 unit
- ❑ Power cord with a desktop120 Vac or 100–240 Vac power transformer, depending upon the model ordered.
- ❑ RJ48C modular cable for U.S. network access.
- ❑ *FrameSaver SLV 9124 Quick Reference* (Document No. 9124-A2-GL10)

Visit the Paradyne World Wide Web site at **www.paradyne.com** to register your warranty. Select *Service & Support → Warranty Registration.*

Cables You May Need to Order

If connecting to a . . .	**Order a . . .**	**Model/Feature Number**
T1 line interface/connector *(For use in Canada*)	T1 line interface cable, RJ48C-to-CA81A	3100-F1-510
LAN	Customer converter with a DB25 plug on one end and an 8-pin modular jack on the other end, with a custom 8-conductor cable and LAN adapter	3100-F2-910
External device (e.g., a modem)	Standard EIA-232-D crossover cable	9008-F1-550
DSX-1 Cable	DSX-1 Adapter Cable RJ48C-to-DB15	9008-F1-560

Contact your sales representative to order cables.

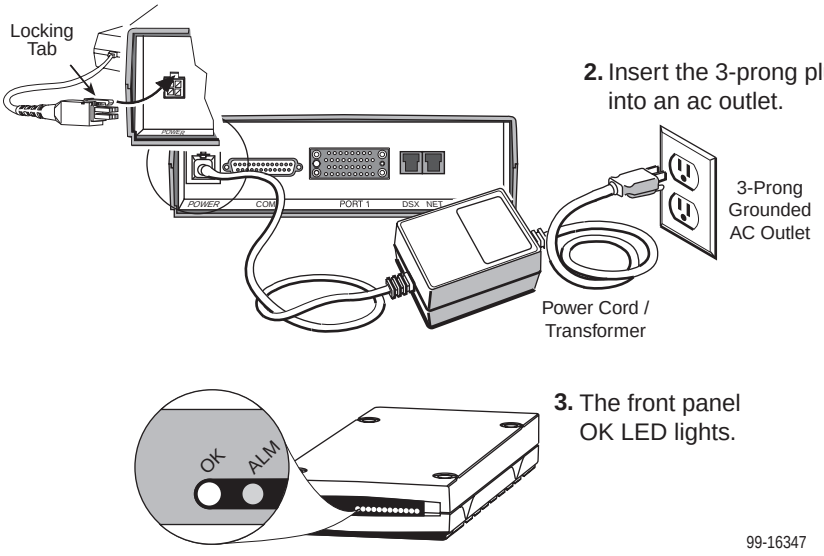
Safety Instructions

Please refer to the *Important Safety Instructions* and *EMI Warnings* beginning on page 16.

Installing the Power Supply and Cord

1. Insert the 4-prong plug into the POWER jack.

When inserting the plug at the rear of the FrameSaver unit, align the plug with the notch above the POWER jack. Make sure the locking tab snaps securely into the jack.



4. Plug the power cord into the grounded power outlet.

Verification Check:

❑ Did any LEDs light?

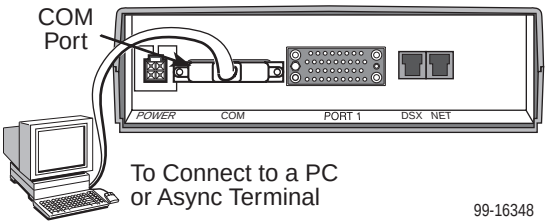
– If yes, the FrameSaver unit has power.

– If no, refer to *Troubleshooting* in the Technical Reference.

Connecting the COM Port to an Asynchronous Terminal

The FrameSaver unit must first be directly connected to a VT100-compatible asynchronous terminal or a PC providing VT100 terminal emulation to set up access and management of the unit.

1. Configure the terminal or PC to be compatible with the FrameSaver unit:
   – COM Port in use by your PC: COM1 or COM2.
   – COM Port Baud Rate is set to 19.2 kbps.
   – Character length is set to 8 data bits.
   – Parity is set to none.
   – Stop bit is set to 1.
   – Flow Control is set to None.
2. Insert the DB25 end of the EIA-232 cable into the FrameSaver unit's COM port.



3. Insert the other end of the cable into the terminal or PC.
4. Tighten the screws on each side of the connector to secure them.
5. Press Enter on the keyboard (or Return, depending upon your keyboard) to display the Main Menu.

Verification Check:

❑ Did the Main Menu appear?
   – If yes, continue with the installation.
   – If no, recheck terminal and FrameSaver unit compatibility (see settings in Step 1), or press the Enter key.

   Refer to *Troubleshooting* in the Technical Reference for other possible explanations.

A Quick Guide to Configuration

The FrameSaver unit should operate using the default (factory-set) configuration options, except for specified in these installation instructions. Refer to the following table for instructions on how to navigate through the menus.

Press the . . .	**To . . .**
Esc key	Go back one screen or menu level. To see a visual representation of the menu levels, see *Menu Hierarchy* in the Quick Reference.
Tab key, or up (↑) and down (↓) arrow keys	Move the cursor from one menu item to the next.
Enter or Return key	Complete the menu or option selection.
Spacebar	Display the next available setting when changing a configuration option. All the available settings for an option appears at the bottom of the screen.

As an example, follow these steps to go to the Configuration Edit/Display menu so you can start setting up the unit. To load a configuration for editing:

1. From the Main Menu, press the down arrow key twice so the cursor is on Configuration.
2. Press Enter to display the Configuration menu. The Load Configuration From menu appears.
3. Press Enter to select Current Configuration (the cursor is already on this selection). The Configuration Edit/Display menu appears.

This sequence of steps would be shown as the menu selection sequence:

Main Menu → *Configuration* → *Load Configuration From:* → *Current Configuration*

To save a configuration option change:

1. Press Ctrl-a to switch to the function keys area at the bottom of the screen.
2. Type **s** or **S** (Save) and press Enter. The Save Configuration To menu appears.
3. Press Enter again to save your changes to the Current Configuration.
4. Press Esc until the Configuration Edit/Display menu reappears to continue configuring the unit.

   Press Ctrl-a, type **m** (MainMenu), and press Enter to return to the Main Menu.

The following sections guide you through installation and setup of the FrameSaver unit. It is assumed that the unit is configured for factory default settings at the start of the installation, and that the automatic Time Slot Assignment and Auto-Configuration features will be used. For more information about configuration options, refer to the configuration option tables in the Technical Reference.

Installing and Setting Up the FrameSaver SLV

To complete the installation, you must:

- Verify that self-test passed.
- Configure the FrameSaver unit.
- Connect to the network and continue configuration.
- Connect to the DSX.
- Connect to the DTE.
- Check the connections.

NOTE:

Follow these instructions as they are presented. The unit should be configured first before connecting the cables. Otherwise, installation time will be increased.

Verifying that Self-Test Passed

Before starting to configure the FrameSaver unit, confirm that the unit passed the self-test.

1. Follow this menu selection sequence from the Main Menu, pressing Enter after each selection:

   Main Menu → *Status* → *System and Test Status*

2. Check the Self-Test Results field (in the center of the System and Test Status screen).
   - If **`Passed`** appears, the FrameSaver unit successfully completed the self-test.
   - If any failure messages appear, reset the unit by disconnecting, then reconnecting the power cord. The unit will perform the self-test again. If the failure reappears, call your service representative for assistance.

Configuring the FrameSaver Unit

To configure the FrameSaver unit:

- Set the system clock.
- Set up the Network physical interface.
- Set up the Data Port physical interface.
- Set up management.
- Change automatic frame relay discovery configuration, if necessary.

The FrameSaver unit is set to automatically configure the following:

- Time Slot Assignment
- Auto-Configuration

See *Configuration* in the Technical Reference for additional information about the configuration of these features.

Setting Up the System Clock

1. Select System Information.

   Main Menu → *Control* → *System Information*

2. Move the cursor to the date field and enter the:
   – Date in mm/dd/yyyy format (month/day/year).
   – Time in hh:mm format (hours:minutes).
3. Save the date and time.

Setting Up the Network Interface

1. Select the network interface's physical configuration options.

   Configuration → *Network* → *Physical*

2. Configure the interface to match the network provider's settings.
3. Save the configuration and return to the Network menu.
4. Select Frame Relay.
5. Configure the frame relay characteristics to match the network provider's settings.
6. Save the configuration.

Setting Up the Data Port

1. Configure the physical characteristics of the user data port.

   Configuration → *Data Ports* → *Physical*

2. Change any options that may be necessary for the port.
3. Save any changes and return to the Data Ports menu.
4. Select Frame Relay.
5. Configure the port to match the DTE's settings, if necessary.
6. Save the configuration.

Setting Up Management

For remote sites, node information and SNMP management needs to be set up. For the central site, local management between the unit and the router must also be set up.

To set up the node and SNMP management:

1. Set up the node.

   Main Menu → Configuration → Management and Communication → IP Node

2. Minimally, enter the following options:
   - Node IP Address
   - Node Subnet Mask
3. Save the configuration and return to the Management and Communication menu.
4. Select General SNMP Management.
5. Minimally, set Name 1 Access to Read/Write.
6. Save the configuration.

To set up local management at the central site unit:

1. Create a DLCI for the data port.

   Configuration → Data Ports → DLCI Records

2. Save the configuration and return to the Configuration Edit/Display menu.
3. Select Management PVC.

   Configuration → Management and Communication → Management PVC

4. Make the DLCI Record a management DLCI to create a Management PVC.

   Minimally, enter the following options for each of the DLCI Records created:
   - Name for the management DLCI.
   - Special and the IP Address for the interface if it is different from the Node IP Address.
   - Primary Link for this DLCI (i.e., the DLCI's destination interface).
   - Primary DLCI (i.e., the DLCI number at the other end of the PVC).
5. Save the configuration.

Setting Up Automatic Frame Relay Discovery Configuration

The default frame relay discovery mode is 1MPort. No auto-configuration occurs until the network cable is connected. If you do not want management links configured or auto-configuration, change the default setting for the FR Discovery feature.

The following table describes the difference between the various settings.

FR Discovery Mode	Description
1MPort *(Default)*	Auto-configuration is enabled, and for each DLCI discovered on the network, a multiplexed network DLCI and a standard port DLCI will be configured and connected. The multiplexed network DLCI will contain one EDLCI for management traffic (EDLCI/2), and one EDLCI for customer data (EDLCI/0). The customer data EDLCI on the network will be cross-connected to the data port DLCI.
1Port	Auto-configuration is enabled. For each DLCI discovered on the network, a multiplexed network DLCI and a standard port DLCI will be configured and connected (EDLCI/0), creating a PVC within the FrameSaver unit. No management DLCIs will be configured on the network interface.
NetOnly	Auto-configuration is enabled, DLCIs are discovered on the network interface, but no cross-connections are configured.
Disable	No frame relay discovery takes place. No DLCIs will be configured on the network interface. The user must manually configure DLCIs and PVC connections.

See *Using Auto-Configuration* in *Typical Applications* and *Setting Up Automatic Configuration* of the Technical Reference for more information.

To change the default setting for Frame Relay (FR) Discovery:

1. Select Auto-Configuration.

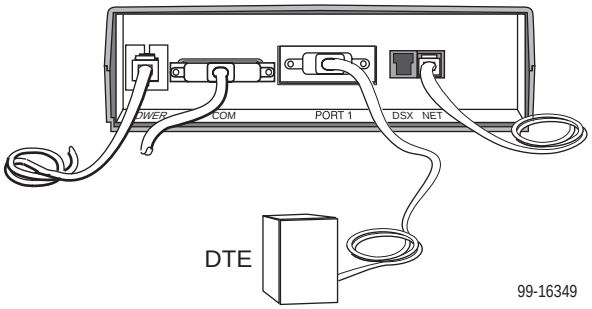
   Main Menu → Auto-Configuration

2. Select another frame relay discovery mode.
3. Save the change. The **`Delete All DLCIs and PVC Connections?`** prompt will appear.
4. Make your selection, Yes or No.

   NOTE:
   If auto-configuration creates a multiplexed DLCI, but a standard DLCI is needed, change the DLCI to standard from the network DLCI Records screen: *Configuration → Network → DLCI Records*

Connecting to the Network

1. Insert the 8-pin connector of the RJ48C network cable into the network interface.
2. Insert the other end of the cable into the RJ48C modular jack.



NOTE:
After connecting the network cable, wait a few minutes to allow Auto-Configuration a chance to discover the frame relay characteristics and DLCIs.

Verification Check:

❑ Check the Network LEDs. Is the Sig (signal) LED on, and are the OOF (out of frame), and ALM (alarm) LEDs off?

– If yes, the network interface is set up correctly and is ready to pass data.
– If no, check that both ends of the network cable are properly seated, then verify that the network physical options are configured correctly.

Main Menu → Configuration → Network → Physical

❑ Check Health and Status messages in the left column of the System and Test Status screen to see the LMI status, to verify that LMI is up.

Main Menu → Status → System and Test Status

– If **`LMI Down, Network`** appears for more than three minutes, or any other network-related status message appears, refer to the status information in *Displaying System Information* of the Technical Reference for possible reasons for the messages and what can be done to resolve the problem.

Entering SNMP Trap Managers

Now that the FrameSaver unit is connected to the network, SNMP Trap Managers can be configured.

To enter SNMP managers:

1. Select SNMP Traps configuration options.

   Main Menu → Configuration → Management and Communication → SNMP Traps

2. Minimally, enter at least one trap manager – the central site's NMS trap manager:
   - SNMP Traps is set to Enable
   - Number of Trap Managers
   - NMS *n* IP Address (*n* being the first, second, third, etc., trap manager entered)
   - Destination (of the management PVC that will be used to reach the trap manager)

3. Save the configuration.

Setting Up Service Provider Connectivity

If management needs to be set up between a service provider's customer and its network operations center (NOC), a non-multiplexed DLCI must be configured to carry management data between the customer's central site and the NOC console. This requires that a frame relay discovered DLCI needs to be modified. This is because all auto-configured network DLCIs are configured as multiplexed DLCIs.

To set up NOC management:

1. Select DLCI Records on the network interface:

   Configuration → Network → DLCI Records

2. Select Modify. The **`Modify DLCI Record for DLCI Number?`** prompt appears.

3. Select the DLCI that will be used by pressing the spacebar until the correct DLCI number appears, then select it.

4. Change the DLCI Type from Multiplexed to Standard.

   The **`DLCI in connections. Update DLCI usage as follows:`** prompt appears.

5. Select the **`Delete EDLCI Connections and Make a Mgmt Only PVC`** option.

6. Select Yes at the prompt.

   PVC connections for the selected DLCI are broken, the Port-1 DLCI mapped to this network DLCI and the embedded management DLCI (EDLCI) are deleted, and the selected DLCI will be reconfigured as a management PVC using the Node IP Address.

Verifying the End-to-End Path

After installation of a remote site unit, run an IP Ping test to ping the NMS at the central site and verify that the entire path from the remote unit to the NMS is functioning. To run the IP Ping test, NMS trap managers must have been configured for the remote unit. One of those trap managers must be the central site NMS.

If trap managers were not configured, run a Connectivity test.

1. Select the IP Ping test.

   Main Menu → *Test* → *IP Ping*

2. Enter the IP Address of the device being pinged, then select Start.

   NOTE:
   When running tests, the cursor is positioned over the Start command. Press Enter to start the test. Stop is displayed while the test is running. Press Enter again to issue the Stop command.

   – While the test is running, **`In Progress...`** is displayed in the Status field.
   – When the test is finished, **`alive. Latency =` *nn* `ms`** should appear as the Status (*nn* being the amount of time the test took in milliseconds).

   If any other message is displayed, additional testing will be required. See *Device Messages* in *Displaying System Information* of the Technical Reference for information about IP Ping-related messages.

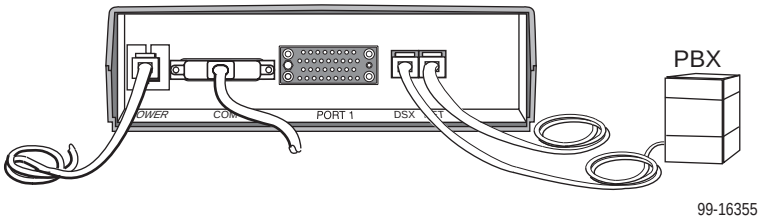
Connecting to the DSX

1. Connect the 8-positon modular plug end of the DSX cable to the DSX-1 interface. If your DSX cable has a DB15 end, use the DSX-1 adapter cable (see *Cables You May Need to Order* on page 2).

   Refer to the pin assignment information in the Technical Reference to ensure you have proper connections.

2. Connect the other end of the cable to the CPE (customer premises equipment, like a PBX).

3. Tighten the screws on each side of the connector to secure them.



Verification Check:

❑ Check the DSX LEDs. Is the Sig (DSX-1 signal) LED on, and are the DSX-1 OOF (out of frame) and ALM (alarm) LEDs off?

– If yes, the DSX interface is set up correctly and ready to communicate.

– If no, check that both ends of the DSX cable are properly seated and secured.

When OFF is on, match the Line Framing Format and Line Coding Format options to the network provider's settings.

When ALM is on, contact the service provider.

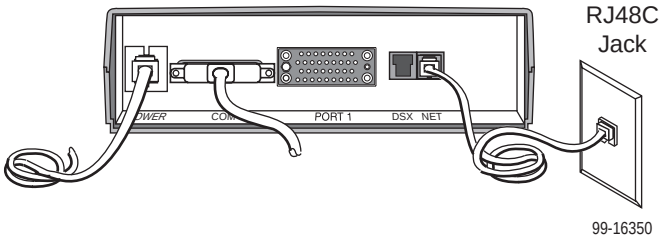
❑ Check Health and Status messages in the left column of the System and Test Status screen to verify that there are no DSX-1 Health and Status messages.

– If any DSX-1 messages appear, refer to the status information in *Displaying System Information* of the Technical Reference.

In the Technical Reference, see *Displaying System Information* for additional status information, and *Troubleshooting* for additional troubleshooting information.

Connecting to the DTE

1. Connect one end of the DTE's V.35 cable to the data port.
2. Plug the other end of the cable into the DTE.
3. Tighten the screws on each side of the connector to secure them.



Verification Check:

❑ Is the port OK LED on?

– If yes, the port is ready to communicate.
– If no, check that both ends of the V.35 cable are properly seated and secured.

❑ Check Health and Status messages in the left column of the System and Test Status screen for messages.

Main Menu → *Status* → *System and Test Status*

– If **`System Operational`** appears, the Port-1 interface is set up correctly and is operational.
– If **`System Operational`** does not appear, refer to the status information in *Displaying System Information* of the Technical Reference.

NOTE:

When any error conditions are detected, a status message will appear at the bottom right corner of the screen.

Checking Connections

Check that Data is Being Received

1. Return to the Main Menu**.**
2. Select Performance Statistics**,** and select an interface's frame relay statistics (e.g., Network Frame Relay).

   Main Menu →Status → Performance Statistics → Network Frame Relay

3. Verify that the Frames Received and Characters Received counts under the Frame Relay Link statistics are incrementing, and there are no errors under the Frame Relay LMI statistics.
   – If data is being received, count increments occur after refreshing the screen.
   – If data is not being received, recheck the cable connections, and replace or repair a damaged cable. Recheck LMI status; you may need to contact your service provider. Next, check the DLCI's status.

   Helpful Hint:
   Refresh the screen to update the counts that are displayed.

In the Technical Reference, see *Displaying System Information* for additional status information, and *Troubleshooting* for additional troubleshooting information.

Check PVC Connections

Check PVC connections to verify that all PVCs, including management PVCs, are configured, and to see whether the PVC is active.

1. Return to the Status menu**.**

   Main Menu → Status → System and Test Status

2. Select PVC Connection Status.

   The PVC Connection Status screen shows all PVC connections; the interface and DLCI number of the source interface and DLCI number for the destination interface. You can also see whether the PVC is active.

3. Verify that each PVC is active.
   – If active, the FrameSaver unit should be passing data.
   – If not active, no data traffic can be carried by the PVC. If the PVC is configured correctly, the circuit may be down.

In the Technical Reference, see *Displaying System Information* for additional status information, and *Troubleshooting* for additional troubleshooting information.

⚠ Important Safety Instructions

1. Read and follow all warning notices and instructions marked on the product or included in the manual.
2. This product is intended to be used with a 3-wire grounding type plug – a plug which has a grounding pin. This is a safety feature. Equipment grounding is vital to ensure safe operation. Do not defeat the purpose of the grounding type plug by modifying the plug or using an adapter.

   Prior to installation, use an outlet tester or a voltmeter to check the ac receptacle for the presence of earth ground. If the receptacle is not properly grounded, the installation must not continue until a qualified electrician has corrected the problem.

   If a 3-wire grounding type power source is not available, consult a qualified electrician to determine another method of grounding the equipment.
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 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.
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.

In order to maintain compliance with FCC limits, any supplied ferrite chokes must be installed in accordance with the card installation instructions.

⚠ 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.

Government Requirements

Certain governments require that instructions pertaining to connection to the telephone network be included in the user documentation. Specific instructions are listed in the following sections.

United States
Notice to Users of the Telephone Network

This equipment complies with Part 68 of the FCC rules. On the bottom of the housing is a label that contains, among other information, the FCC registration number for this equipment. If the unit comes with an integral modem, the ringer equivalence number (REN) will also be labeled. If requested, please provide this information to your telephone company.

The REN is used to determine the number of devices that may be connected to the telephone line. Excessive RENs on the line may result in the devices not ringing in response to an incoming call. In most, but not all areas, the sum of RENs should not exceed five (5.0). To be certain of the number of devices that can be connected to the line, as determined by the total RENs, contact the local telephone company.

If your unit causes harm to the telephone network, the telephone company may discontinue your service temporarily. If possible, they will notify you in advance. But if advance notice is not practical, you will be notified as soon as possible. You will be advised of your right to file a complaint with the FCC.

Your telephone company may make changes in facilities, equipment, operations, or procedures that could affect the proper operation of your equipment. If so, you will be given advance notice so as to give you an opportunity to maintain uninterrupted service.

No repairs may be performed by the user. Should you experience difficulty with this equipment, refer to the *Warranty, Sales, Service, and Training Information* on page 20.

Make the T1 network connection using a Universal Service Order Code (USOC) type RJ48C jack for single-line installations and type RJ48H jack for multiline installations. Specify both the Service Order Code 6.0F, as well as the proper Facility Interface Code, to the telephone company when ordering the T1 line. The T1 equipment can be configured to support any of the framing format and line signaling techniques shown in the table below. The T1 equipment's configuration must correspond to the T1 line's parameters.

T1 Facility Interface Codes

Interface Code	Description
04DU9-BN	1.544 Mbps superframe format (SF) without line power
04DU9-DN	1.544 Mbps SF and B8ZS without line power
04DU9-1KN	1.544 Mbps ANSI ESF without line power
04DU-1SN	1.544 Mbps ANSI ESF and B8ZS without line power

After the telephone company has installed the requested services and jacks, you can connect the unit with the cable provided. An FCC-compliant telephone cord and modular plug are provided with this equipment. This equipment is designed to be connected to the telephone network or premises wiring using a compatible modular jack that is Part 68 compliant.

Canada
Notice to Users of the Canadian Telephone Network

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 20.

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 there. Select *Service & Support* →*Warranty Registration*.)
- **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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