



# FrameSaver® SLV 9191 Multiservices Network Access Module (NAM) Installation Instructions

Document Number 9191-A2-GN10-20

August 2000

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Select *Library* → *Technical Manuals* → *FrameSaver Frame Relay Devices*.

Select the following document:

9191-A2-GB20

*FrameSaver SLV Multiservices Access Unit, Models 9191, 9192, and 9195,  
User's Guide*

To order 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

## Package Checklist

Verify that your package contains the following:

- FrameSaver SLV NAM
- NAM I/O card
- T1 network cable
- ISDN BRI or PRI cable, if applicable
- FrameSaver SLV Multiservices Access Unit, Models 9191, 9192, and 9195,  
Quick Reference* (Document No. 9191-A2-GL10)

For Models 9192 and 9195, the FrameSaver SLV 9191 NAM is already installed in the 2-slot and 5-slot housings. Use this document to set up the NAM for operation.

Be sure to register your warranty at [www.paradyne.com/warranty](http://www.paradyne.com/warranty).

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# Before You Begin

Make sure you have:

- A small, flat-blade screwdriver.
- A small, Phillips screwdriver.
- FrameSaver ISDN Dial Backup Module (DBM) Installation Instructions* (Document No. 9000-A2-GN19) if installing an ISDN DBM.  
When a NAM with DBM is being replaced, the DBM must be transferred to the replacement NAM.
- Configuration information for the unit being replaced.
- Appropriate cables:
  - DSX cable and DSX-1 adapter cable, if needed
  - COM Port-to-Terminal or COM Port-to-PC cable
  - Data port cables
  - Modem cable
  - ISDN DBM cable, if applicable

See the User's Guide for additional information on:

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

## Cables You May Need to Order

<b>If connecting to a . . .</b>	<b>Order a . . .</b>	<b>Feature/Part Number</b>
T1 line interface/connector <i>(For use in Canada)</i>	T1 line interface cable, RJ48C-to-CA81A	3100-F1-510
Asynchronous terminal	COM Port-to-Terminal Cable 8-pin modular-to-DB25P	3100-F2-540
PC	COM Port-to-PC Cable D-Sub9-to-8-pin modular	3100-F2-550
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

Contact your sales representative to order cables.

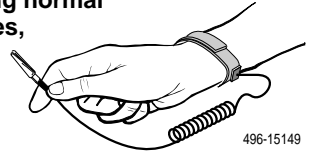
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# Safety Instructions

Please refer to the *Important Safety Instructions* beginning on page 19.

## **⚠ 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.**



## Removing a NAM and its I/O Card

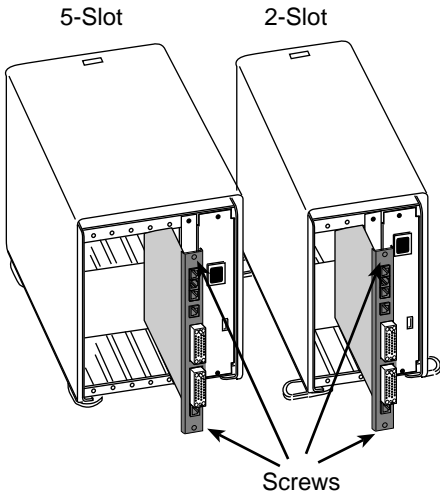
The NAM and its matching I/O card can be removed without powering off the system, and without having to reconfigure the card each time it is moved. However, all system functionality is lost when it is removed. When removed and inserted into another housing, the NAM applies its configuration from the previous housing to its current housing.

- If the NAM is moved from a 2-slot housing to a 5-slot housing, the operator can use the configuration of the APM in Slot 02 of the previous housing. APMs in Slots 03 – 05 will be configured with the factory default settings.
- If the NAM is moved from a 5-slot housing to a 2-slot housing, the factory default configuration options will be loaded.

# Installing the I/O Card

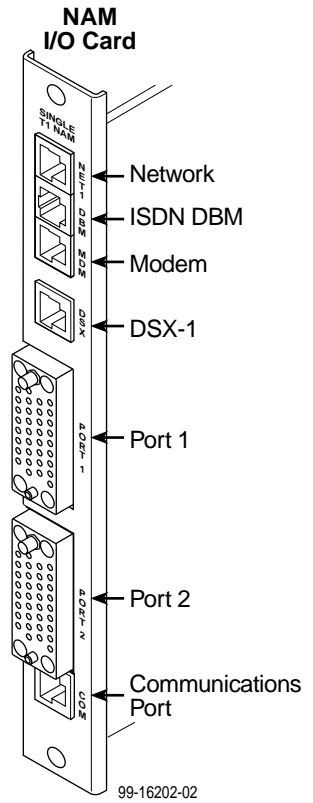
The NAM's I/O card provides the network, DSX, DBM, modem, DTE and COM port connections. The I/O card inserts next to the power supply and directly behind the NAM that it supports in the housing (Slot 01).

1. Remove the I/O card from the shipping box.  
To avoid damaging the card, handle by the top and bottom edges only.
2. At the rear of the carrier, align the I/O card with the upper and lower tracks of the slot.  
Push gently toward the midplane until it stops and the card cannot be pushed any further.



Rear View

99-16362-01



3. Using a small, Phillips screwdriver, alternately tighten the captive screws until they are all snug.

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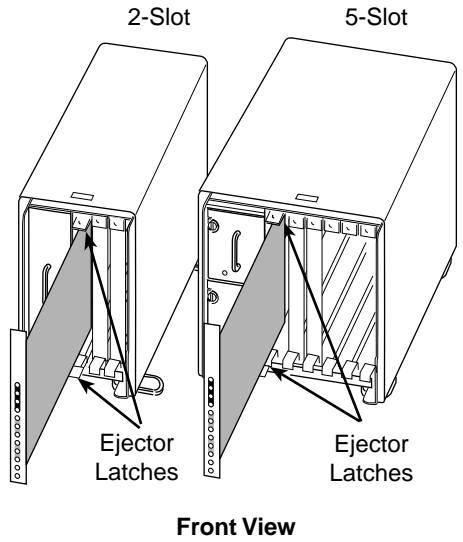
# Installing the NAM into a Multislot Housing

The illustration shows the 2-slot and 5-slot multislot housings.

**CAUTION:**

**Be sure that you install the NAM in the first slot, next to the power supply, so it mates with its matching I/O card. Otherwise, you could damage your card.**

1. Remove the NAM from the shipping box. Handle only by the top and bottom edges to avoid damaging the card.
2. At the front of the housing, align the NAM with the upper and lower tracks of Slot 1.
3. Slide the NAM into the tracks until it seats with the midplane connectors. Use care not to force the card or bend any pins.
4. Close the housing's upper and lower ejector latches to lock the card into place, then tighten the captive screws on the ejector latches.
5. Apply power to the housing, if not already applied.
6. Check that the OK LED lights.  
If the OK LED is on, you have power.  
If not, refer to *Troubleshooting* in the User's Guide for possible explanations.



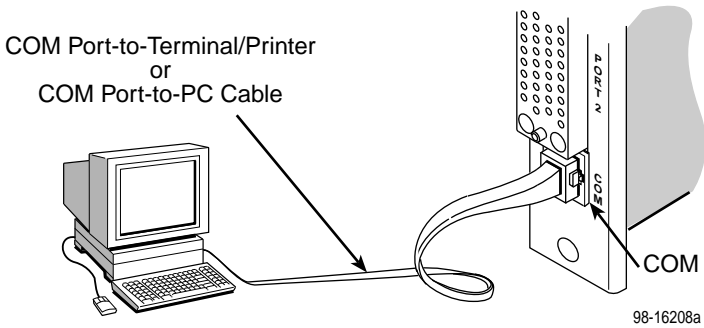
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# Connecting the COM Port to an Asynchronous Terminal

A VT100-compatible asynchronous terminal or a PC providing VT100 terminal emulation must be used to set up access to 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 8-pin end of the cable into the COM port for the appropriate slot.



3. Insert the other end of the cable into the terminal or PC.
4. Press Enter on the keyboard to display the Main Menu.  
If the Main Menu does not appear, recheck the terminal or PC settings (see Step 1), or press the Enter key. Refer to *Troubleshooting* in the User's Guide for other possible explanations.

## Verifying that Self-Test Passed

To verify that the unit passed its self-test, go to the System and Test Status screen.

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

The results of the self-test appears on the next screen line, under the screen title.

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.

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# A Quick Guide to Configuration

The FrameSaver unit should operate using the default (factory-set) configuration options, with exception to the changes specified in these installation instructions. Refer to the following table for help in navigating the menus.

Press the ...	To ...
Esc key	Go back one screen or menu level. To see a visual representation of the menu levels, see <i>Menu Hierarchy</i> in the Quick Reference.
Tab key, or Up (↑), Down (↓), Left (←) and Right (→) 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*

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.

In the sections that follow, only the minimum option changes required are included so you will have a quick and trouble-free installation. See the configuration option tables in the User's Guide for more information about configuration options.

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## Assigning the Node IP Address

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.

## Setting Up Physical Interfaces

1. Select each interface's physical configuration options.

*Configuration → Network → Physical*

*Configuration → Data Ports → Physical*

*Configuration → DSX-1 (if the DSX-1 interface will be used)*

If installing a FrameSaver SLV NAM with an ISDN DBM, postpone configuring the DBM interface until later.

2. Configure the Network and DSX-1 interfaces to match the network provider's settings. Be sure to enable the Interface Status option for these interfaces. (The network interface is already enabled on a FrameSaver SLV NAM.)

Configure Data Ports to match the DTE's settings. If Port-2 will be used, enable Port Status for the port.

3. Save the configurations.

## Setting Frame Relay Characteristics

When installing a FrameSaver SLV NAM, frame relay characteristics must be configured for the network and data ports.

1. Select the interface's frame relay configuration options.

*Configuration → Network → Frame Relay*

*Configuration → Data Ports → Frame Relay*

2. Configure each interface according to the local management interface (LMI) and assigned line conditions supplied by the service provider.
3. Save the configurations.

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## Setting Up the Modem

The unit has an integral modem for remote management. It is already set up for dial-in access to the unit, with Port Use set to Terminal.

If using the modem for dialed IP network connectivity (SNMP, Telnet, FTP, or trap dial-out):

1. Select Modem Port.

*Configuration → Management and Communication → Modem Port*

2. Minimally, change Port Use to Net Link, and assign the interface's IP Address and Subnet Mask if it is different from the Node's. Change Link Protocol to SLIP, if necessary (PPP is the default setting).
3. Save the configuration.

## Setting Up Call Directories if Trap Dial-Out Is Desired

1. Set up directory phone numbers.

*Main Menu → Control → Modem Call Directories*

2. Select Directory Number A (for Alarm).
3. Enter the phone number(s). Valid characters include:
  - ASCII text
  - B for blind dialing
  - W for wait for dial tone
  - P for pulse dialing unless B specified
  - T for tone dialing unless B specified
  - Space, underscore ( \_ ), comma ( , ) for a 2-second pause, and dash ( - ) readability characters
4. Save the phone number(s).

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## Setting Up Management

1. Select General SNMP Management.

*Configuration → Management and Communication → General SNMP Management*

2. Minimally, set Name 1 Access to Read/Write.
3. Save the configuration.

## Setting Up Local Management at the Central Site

1. Create a DLCI for the data port.

*Configuration → Data Ports → DLCI Records*

2. Save the configuration.
3. Create a Management PVC using the data port DLCI just created.

*Configuration → Management and Communication → Management PVC*

Minimally, enter the following options:

- Name for the management PVC
- Interface IP Address and Subnet Mask, if different from the Node's
- Primary Link for this Management PVC (the user data port)
- Primary DLCI (i.e., the data port DLCI)

4. Save the configuration.

## Automatic Configuration

The FrameSaver unit provides several automatic configuration features. Frame Relay Discovery and configuration is one of these features.

*Main Menu → Auto-Configuration*

The default discovery mode is 1MPort. In this mode, for each DLCI discovered on the network, the unit creates a network interface DLCI containing two EDLCIs (embedded DLCIs – one for Port-1 data and the other for management), a Port-1 DLCI with the same number, and a management PVC, then cross-connects them.

### NOTE:

When 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*

Other modes can be selected. See *Setting Up Automatic Configuration* in *Configuration* of the User's Guide for information about other modes and how the Frame Relay Discovery Mode can be changed.

No automatic configuration occurs until the network cable is connected. If you do not want management links configured or automatic configuration, change the default setting for the Frame Relay Discovery feature.

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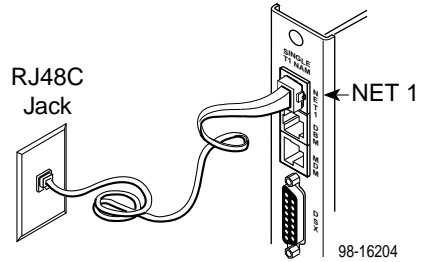
## Time Slot Assignment

Network time slots are discovered automatically when Time Slot Discovery is enabled (the default setting) on the Frame Relay Network 1 Assignments screen. This feature can be disabled if you want to manually configure time slots.

See *Assigning Time Slots/Cross Connections* in *Configuration of the User's Guide* for additional information about this feature.

## Connecting to the Network

1. Insert the 8-pin connector on the RJ48C network cable into the NET1 interface.
2. Insert the other end of the cable into the RJ48C modular jack.
3. Check the Network LEDs. Is the Sig (signal) LED on, and are the OOF (out of frame), and ALM (alarm) LEDs off? If not, make sure both ends of the network cable are properly seated and secured.



4. Verify that the network physical options are configured correctly.

*Main Menu → Configuration → Network → Physical*

5. 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 *Operation and Maintenance* of the User's Guide for possible reasons.

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# Setting Up the ISDN DBM

FrameSaver 9128 units may be equipped with an ISDN PRI DBM. These instructions are for units with ISDN backup capability.

The following guidelines apply:

- **Central site** configuration guidelines:
  - Set up the ISDN DBM physical Interface.
  - Configure a Link Profile for each remote site.
  - Configure the system to answer calls from the remote sites. (If the central site unit has a PRI DBM, it is already configured to answer calls.)
  - Leave Automatic Backup Configuration disabled.
  - Manually create alternate DLCIs on the ISDN Backup Link.
  - Manually specify ISDN DLCIs as alternate DLCIs for the PVC Connection after the primary DLCIs have been automatically discovered from the primary network Link LMI or manually configured.
  
- **Remote site** configuration guidelines:
  - Set up the ISDN DBM physical Interface.
  - Configure a Link Profile for the central site in the first link profile, called HQ\_Site. This ensures that a backup DLCI will be created automatically on the backup link for each DLCI discovered on the network interface using the central site's link profile.
  - Configure the remote system to originate calls to the central site. (If the remote system has a BRI DBM, it is already configured to originate calls.)
  - Enable the Automatic Backup Configuration feature. (If the remote system has a BRI DBM, it already has this feature enabled.)
  - Set the criteria by which automatic backup will take place.

## Setting Up the DBM Physical Interface

1. Configure the DBM interface.

*Main Menu → Configuration → ISDN → Physical*

2. Minimally, set the following configuration options:

- Interface Status is set to Enable.
- Originate or Answer is set to Answer for a central site, and set to Originate for a remote site.

<b>FrameSaver with BRI</b>	<b>FrameSaver with PRI</b>
Configure the B-channels: <ul style="list-style-type: none"><li>■ Service Profile ID1 (SPID)</li><li>■ Local Phone Number 1</li><li>■ Service Profile ID2 (SPID)</li><li>■ Local Phone Number 2</li></ul>	Configure T1 physical characteristics to match the service provider's settings. <ul style="list-style-type: none"><li>■ Local Phone Number</li></ul>

3. Save the configuration and return to the ISDN menu.

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## Setting Up Automatic Backup Configuration

The Automatic Backup Configuration feature, included on the Auto-Configuration menu, is used to automatically create alternate DLCI records and PVC connections on the ISDN DBM (backup) interface. A BRI DBM is set up for Single\_Site\_Backup. A PRI DBM is set up for Multi\_Site\_Backup.

See the User's Guide for additional information.

## Modifying ISDN Link Profiles

1. Select Link Profiles, then Modify.
2. Add a name and phone number to the ISDN Link Profile(s) created by Automatic Backup Configuration.
  - Name for the destination entered (e.g., Tampa). The default setting is HQ\_Site.
  - Link Status set to Auto.
  - Phone numbers entered:

Originating Unit	Answering Unit
Outbound phone number. Valid characters include: <ul style="list-style-type: none"><li>■ Numbers (0–9)</li><li>■ Special characters * and #</li><li>■ Spaces</li><li>■ Parentheses ( )</li></ul>	Inbound Calling ID1 and ID2. These are the phone numbers of units from which calls will be accepted.  Valid characters include: <ul style="list-style-type: none"><li>■ Numbers (0–9)</li></ul>

### NOTE:

Remember to include local dial-out numbers (i.e., 9, then the number).

3. Save the configuration.

## Setting the Criteria for Automatic Backup

1. Enable Auto Backup.

*Main Menu → Configuration → Auto Backup Criteria*

When a failure occurs, the unit automatically enables the Alternate Link and traffic is rerouted over the backup (alternate) interface.

2. Specify When Auto Backup Allowed – Always or Restrict. If Restrict is selected, specify the days and hours of the week during which automatic backup can take place.
3. Save the configuration.

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# Configuring SNMP Trap Managers and Trap Dial-Out

Once the FrameSaver unit is connected to the network, SNMP trap managers, SNMP traps, and trap dial-out can be configured.

1. Select SNMP Traps.

*Main Menu → Configuration → Management and Communication → SNMP Traps*

2. Configure the following:

- Enable SNMP Traps.
- Identify the total Number of Trap Managers.
- Specify the IP address of the NMS(s) to which traps will be sent.
- Specify the network Destination for the Trap Manager(s).
- Select desired trap categories.
- Enable Trap Dial-Out, if desired.

3. Save the configuration.

4. Return to the Main Menu.

## Verifying the End-to-End Path

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

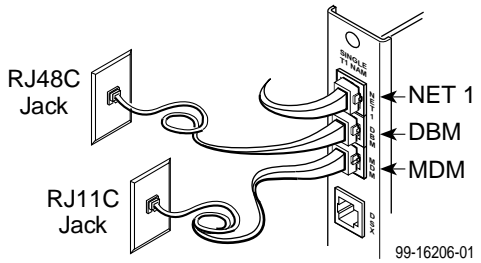
When running tests, the cursor is positioned over the Start command. Press Enter to start the test. Stop is displayed while the test is running. Press Enter again to issue the Stop command.

- While the test is running, **In Progress...** appears 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 Operation and Maintenance* of the User's Guide for information about IP Ping-related messages.

## Connecting to the ISDN

1. Insert the 8-pin connector on the ISDN cable into the DBM interface.
2. Insert the other end of the cable into the ISDN service RJ48C jack.



## Connecting the Modem

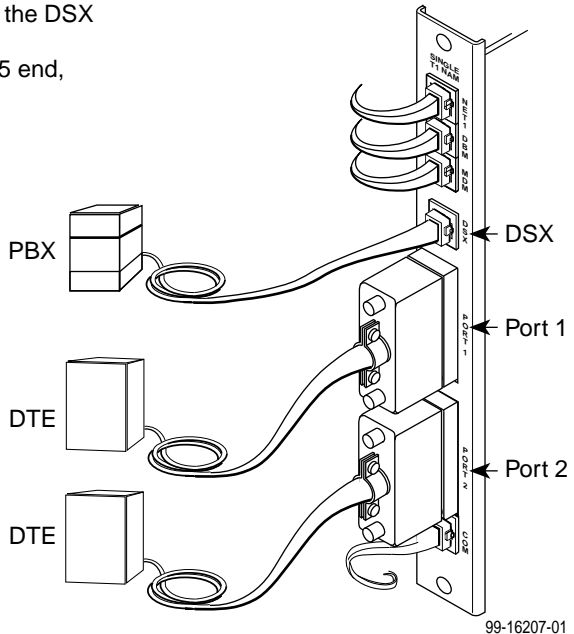
1. Insert the 6-pin connector on the modem cable into the MDM interface.
2. Insert the other end of the cable into the modem service RJ11C jack.

## Connecting to the DSX

1. Insert the 8-pin connector on the DSX cable into the DSX interface.  
If your DSX cable has a DB15 end, use a DSX-1 adapter cable.

Refer to the pin assignment information in the User's Guide to ensure you have the proper connections.

2. Insert the other end of the cable into the CPE (Customer Premises Equipment, such as a PBX).



## Connecting to a DTE

1. Connect one end of the V.35 cable to Port 1 or Port 2.
2. Connect the other end of the V.35 cable to the DTE.

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# Verifying Connections and Setup

Check the modem, DSX, DTE, and PVC connections, as well as the ISDN DBM setup if a DBM is installed.

## Checking the Modem Connection

If Port Use is set to Terminal (dial-in access):

1. Dial the modem's phone number using a remote asynchronous terminal or PC.
2. Verify that the Main Menu appears.

If Port Use is set to Net Link (SNMP, Telnet, FTP, and trap dial-out):

1. Dial the modem's phone number using a PC running PPP or SLIP link protocol.
2. From the PC, run an IP Ping test to the modem interface.

If your results using either method are unsuccessful, make sure both ends of the modem cable are properly seated and secured. Then, verify that the modem was configured correctly (see *Setting Up the Modem* on page 9). Otherwise, refer to the status information in *Operation and Maintenance* of the User's Guide.

## Checking the DSX Connection

1. Verify that the DSX signal (SIG) LED is green, and that the DSX out-of-frame (OOF) and alarm (ALM) LEDs are off. If so, the DSX interface is set up correctly and is operational. If not, make sure both ends of the DSX cable are properly seated.

When ALM is on, contact the service provider.

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

*Main Menu → Status → System and Test Status*

If any DSX-1 messages appear, refer to the status information in *Operation and Maintenance* of the User's Guide.

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## Checking the DTE Connection

Perform these checks for both user data ports.

1. Verify that the Port OK LED is on. If it is, the port is set up correctly and is operational. If not, make sure both ends of the cable are properly seated and secured. Then, check the DTE; RTS or DTR could be down on the DTE.
2. 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 interface is set up correctly and is operational.
- If not, refer to *Status Information in Operation and Maintenance* of the User's Guide.

### NOTE:

When any error conditions are detected, a status message appears along the bottom right corner of the screen.

## Verifying That Data is Being Received

1. Return to the Main Menu, then select Status.
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. Clear the statistics and see whether the counts for Frames Received and Characters Received under the Frame Relay Link are incrementing, and verify that there are no errors under the Frame Relay LMI statistics. Refresh the screen to update the counts.
  - If data is being received, the count increments 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.

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## Checking PVC Connections

Check PVC connections to verify that all PVCs, including management PVCs, are configured, and to see whether the PVC is active or not.

1. Press Esc to return to the Status menu.
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.

## Checking the ISDN Line and Setup

1. Verify the ISDN lines by checking the DBM Interface Status.  
*Main Menu → Status → DBM Interface Status*  
Line Status should be Active. If an invalid (Inv) status (e.g., Inv SPID) is displayed, verify that you entered ISDN physical options correctly.
2. Check backup setup.
  - Have someone disconnect the network cable at the remote site.
  - Check the status of the system:  
*Main Menu → Status → System and Test Status → Health and Status column*
  - Wait as the originating DBM places the backup call.  
The originating system BKP LED starts blinking.  
When the answering FrameSaver SLV NAM modem receives the call, its BKP LED starts blinking, and the **ISDN Active** message appears.  
The BKP LEDs at both ends stop blinking and remain on when the connection is made, and the **Backup Active** message appears.
3. Verify that data is passing between DBMs by selecting a backup link.  
*Main Menu → Status → Performance Statistics → Frame Relay*  
If data is being passed, Frames/Characters Sent and Received (Frame Relay Link) and Status Msg Received (Frame Relay LMI) increment each time the screen is Refreshed.  
A PVC Connectivity test can also be run if the ISDN DLCI is multiplexed.  
*Main Menu → Test → ISDN PVC Tests → [DLCI Number] → Connectivity → Start*

See *Verifying ISDN DBM Operation* in *Dial Backup Modules* of the User's Guide for additional information.

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## **⚠ Important Safety Instructions**

1. Read and follow all warning notices and instructions marked on the product or included in the manual.
2. 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.


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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.

 **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.**

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

 **CANADA – EMI NOTICE:**

**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.**

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# 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 back of the housing is a label that contains, among other information, the FCC registration number and Ringer Equivalence Number (REN) for this equipment. 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 system 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 24.

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

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If an ISDN PRI DBM is installed, make the ISDN PRI connection using a USOC-type RJ48C jack. When ordering an ISDN line from the telephone company, specify the following:

- Service Order Code 6.0F
- Facility Interface Code 04DU-1SN
- Up to 23B Service for an ISDN PRI DBM – Supports up to 23 circuit-switched B-channels, with one local phone number for the entire T1 network connection.
- Circuit Switched Data capability should be specified.

If an ISDN BRI DBM is installed, make the ISDN BRI connection using a USOC-type RJ49C jack. When ordering an ISDN line from the telephone company, specify the following:

- Facility Interface Code 02IS5
- Calling Number Identification Service (CNIS) for both the originating and answering systems for data traffic on the B-channel.
- Capability Package B for 1B-service, which supports up to two circuit-switched B-channels, BRI-B1 and BRI-B2, with one Service Profile Identification (SPID) number and one local phone number.  
Capability Package R for 2B-service, which supports up to two circuit-switched B-channels, BRI-B1 and BRI-B2, with two SPID numbers and two local phone numbers.
- Busy Fixed Call Forwarding for the answering system (typically the central site system) is recommended if getting Capability Package R (2B-service). This feature is only required if all remote systems will call the same phone number. Busy Fixed Call Forwarding forwards a call to the BRI-B2 channel when the BRI-B1 channel is busy.

Make the modem connection using a USOC-type RJ11C jack. The modem cannot be used on public coin phone service provided by the telephone company. Connection to party-line service is subject to state tariffs. Contact the state public utility commission, public service commission, or corporation commission for tariff information.

After the telephone company has installed the requested services and jacks, you can connect the system 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.

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## 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 24.

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## Warranty, Sales, Service, and Training Information

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

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

## Document Feedback

We welcome your comments and suggestions about this document. Please mail them to Technical Publications, Paradyne Corporation, 8545 126th Ave. N., Largo, FL 33773, or send e-mail to [userdoc@paradyne.com](mailto:userdoc@paradyne.com). Include the number and title of this document in your correspondence. Please include your name and phone number if you are willing to provide additional clarification.

## Trademarks

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## Patent Notification

FrameSaver products are protected by U.S. Patents: 5,550,700 and 5,654,966. Other U.S. patents pending.



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