

FrameSaver® SLV NNI Network Access Module (NAM) Installation Instructions

Document Number 9110-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 documents:

9024-A2-GB20

FrameSaver SLV 9x24 User's Guide

9110-A2-GB40

FrameSaver SLV 9110 NNI Supplement

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

Package Checklist

Verify that your package contains the following:

- FrameSaver SLV NNI NAM
- FrameSaver SLV NNI I/O
- FrameSaver SLV NNI Quick Reference* (Document No. 9110-A2-GL10)

When your equipment arrives, inspect it for physical damage and tighten any screws that may have worked loose. Contact your sales representative immediately if there are any signs of shipping damage, or if anything is missing from your package. Otherwise, proceed with the installation.

Before You Begin

Make sure you have:

- A clean, well-lit, and ventilated site that is free from environmental extremes.
- One-to-two feet of clearance for cable connections.
- A small, flat-blade screwdriver.
- A Phillips screwdriver.
- Two cables for the NNI and Local port connections to a DSX-1 panel or switch port.
- A cable for either an asynchronous terminal or PC connection:
 - Asynchronous terminal – DB15-to-DB25 plug
 - PC – DB15-to-DB9 socket

See the User's Guide for additional information on:

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

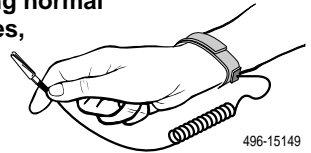
Safety Instructions

The 9110 NNI has been designed and approved for central office use and must not be used as customer premises equipment.

Please read the *Important Safety Instructions* and *EMI Warnings* starting on page 16.

⚠ HANDLING PRECAUTIONS FOR STATIC-SENSITIVE DEVICES

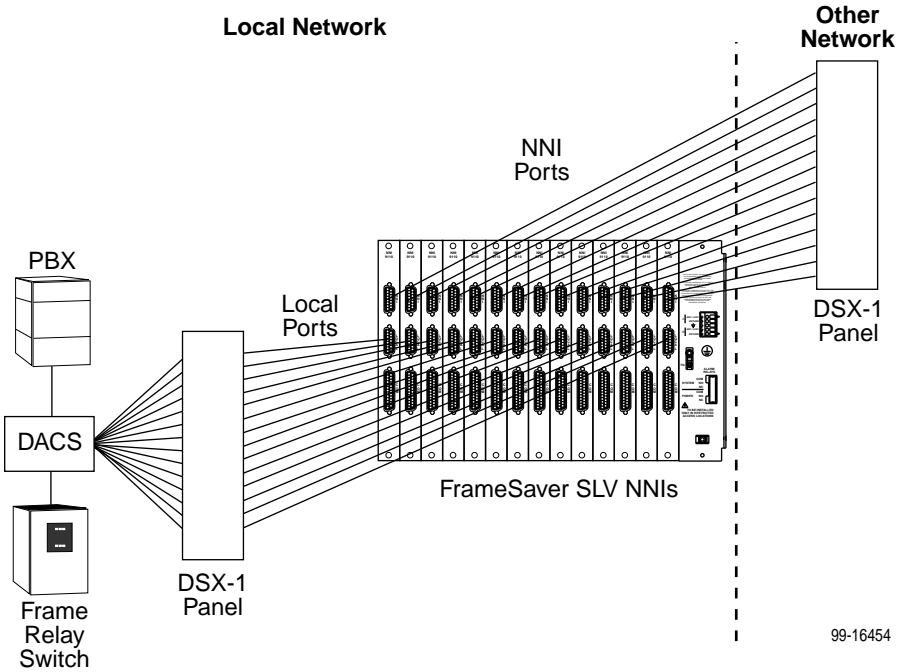
This product is designed to protect sensitive components from damage due to electrostatic discharge (ESD) during normal operation. When performing installation procedures, however, take proper static control precautions to prevent damage to equipment. If you are not sure of the proper static control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



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NNI Cabling Overview

The following illustration provides an overview of how NNI units are connected to the local network and another service provider's network. The carrier side is the local service provider's network equipment.

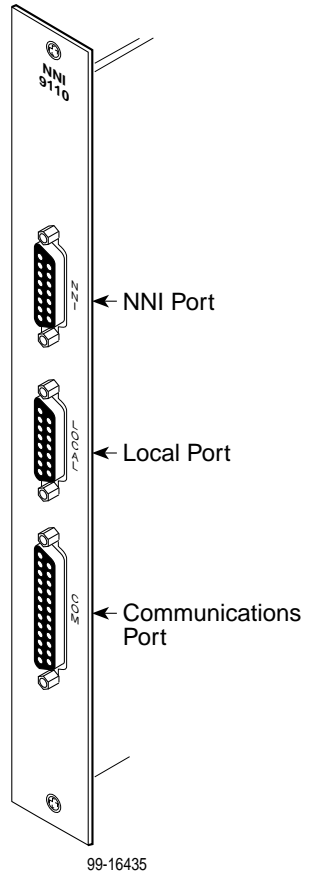
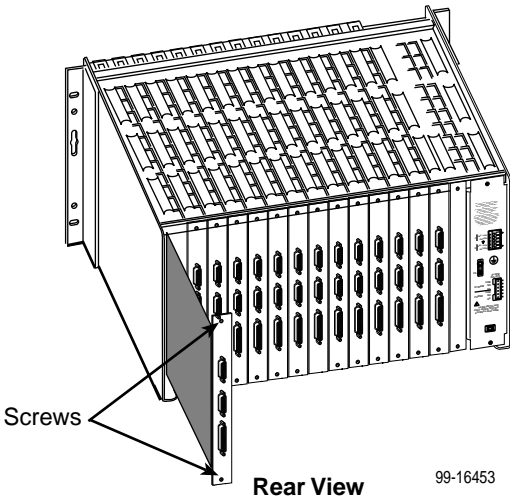


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Installing the I/O Card

The NAM's I/O card provides the NNI network, local network, and COM port connections. The I/O card inserts directly behind the NAM that it supports in the housing.

1. Remove the I/O card from the shipping box.
To avoid damaging the card, handle it 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.



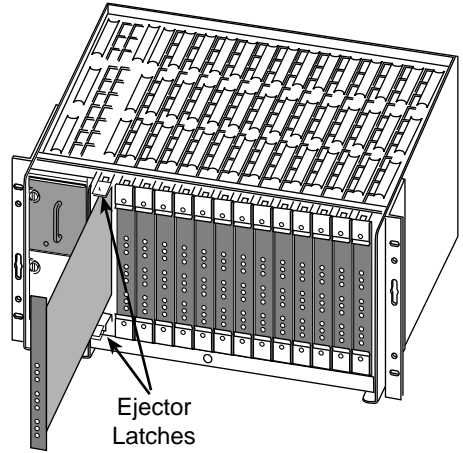
3. Using a small, Phillips screwdriver, alternately tighten the captive screws until they are all snug.

Installing the NAM into a Multislot Housing

CAUTION:

Be sure that you install the NAM in the correct slot so that 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 the appropriate slot.
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. Verify that the NAM OK LED lights.
If the OK LED does not light, make sure the power cable is securely seated at both ends.



Front View

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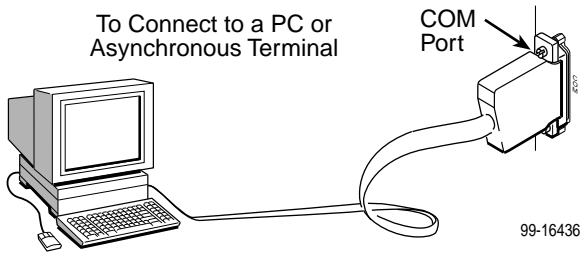
If you are still having problems, contact your service representative.

Connecting the COM Port to an Asynchronous Terminal

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

To connect a terminal or PC to the COM Port:

1. Configure the terminal or PC so it is compatible with the 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 unit's 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, make sure the cable is securely seated at both ends, recheck the terminal/PC configuration, or press the Enter key again. See *Troubleshooting* in the User's Guide for other possible causes.

A Quick Guide to Configuration

The unit operates using default (factory-set) configuration options except for changes 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 <i>Menu Hierarchy</i> 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 to place the cursor 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 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 unit. It is assumed that the system is configured for factory default settings at the start of the installation.

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 appear in the center column under the screen title.

If any failure messages appear, reset the unit by removing and reinserting the NAM. The unit will perform the self-test again. If the failure reappears, call your service representative for assistance.

Configuration Options

Refer to *Configuration Options* in the User's Guide for general configuration information.

Setting the System Clock

1. Select Date & Time.

Main Menu → Control → Date & Time

2. Move the cursor to the Date, then the Time field to enter:
 - Date in the mm/dd/yyyy format (month/day/year).
 - Time in the hh:mm format (hours:minutes).
3. Save the settings.

Setting Up SNMP Management

1. Set up the node.

Main Menu → Configuration → Management and Communication → Communication Protocol

2. Minimally, enter the following:
 - Node IP Address
 - Node Subnet Mask
3. Save the configuration and return to the Management and Communication menu.
4. Select General SNMP Management.

Configuration → Management and Communication → General SNMP Management

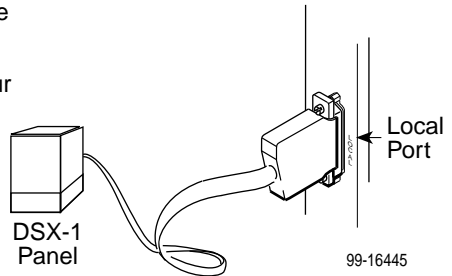
5. Minimally, set Name 1 Access to Read/Write.
6. Save the configuration.

Setting Up LMI

Change the LMI Protocol setting if Annex-D is not correct; Annex-D is the default setting.

Connecting to Local Service Provider Equipment Via the Local Port

1. Insert the DB15 end of the network cable into the NNI port.
2. Insert the other end of the cable into your DSX-1 frame relay panel, switch port, or DACS.
3. Check the NNI 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 Local physical options are configured correctly.

Configuration → Local → Physical

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

Main Menu → Status → System and Test Status

If **LMI Down**, **Local** appears for more than three minutes, or any other Local-related status message appears, refer to the status information in *Displaying System Information* in the User's Guide for possible reasons.

Entering Trap Managers

Once the FrameSaver NNI 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 NOC NMS:
 - Enable SNMP Traps
 - Number of Trap Managers
 - NMS *n* IP Address (*n* being the first, second, third, etc. trap manager entered)
3. Save the configuration.

Setting Up a Management PVC to the NOC

Management between the FrameSaver NNI unit and the service provider's network operations or control center (NOC or NCC) needs to be set up. A non-multiplexed DLCI must have the Local port configured to carry management data between the FrameSaver NNI unit and the NOC console.

If two service provider partners are sharing the NNI unit, two management PVCs may be configured – one management PVC going to the local service provider's NOC on the Local port , and one management PVC going to the partner service provider's NOC on the NNI port.

To set up NOC management:

1. Select DLCI Records on the Local port:

Configuration → Local → DLCI Records

2. Select **M**odify. The **M**odify 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 **D**LCI in connections. **U**ppdate DLCI usage as follows: prompt appears.
5. Select the **D**elate EDLCI Connections and Make a Mgmt Only PVC option.
6. Select **Y**es at the prompt.

PVC connections for the selected DLCI are broken, the NNI DLCI mapped to this Local 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 the unit, run an IP Ping test to ping the NMS at the NOC and verify that the management path from the NNI unit to the NOC NMS is functioning. To run the IP Ping test, NMS trap managers must have been configured for the remote unit and one of those trap managers must be the central site NMS.

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:

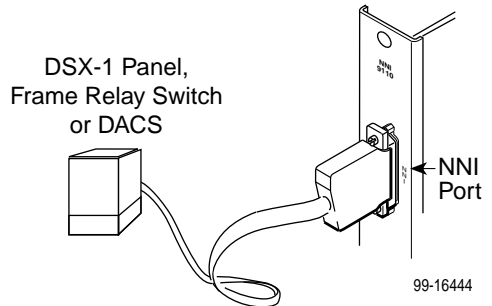
When running tests, the cursor is positioned over the Start command. Press Enter to start the test. Stop is displayed while the test is running. Press Enter again to issue the Stop command.

- 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 User's Guide for information about IP Ping-related messages.

Connecting to the Partner Service Provider's Network (IEC/IXC)

1. Connect one end of the DSX-1 cable to the NNI port.
2. Connect the other end of the cable to the other service provider's equipment (or DSX-1 panel).
3. Check the Local port 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. 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

system Operational should appear. If not, refer to the status information in *Displaying System Information* of the User's Guide.

NOTE:

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

Check that Data is Being Received

1. Return to the Main Menu.
2. Select Performance Statistics, and select a port's frame relay statistics (e.g., NNI Frame Relay).

Main Menu → Status → Performance Statistics → NNI 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 check the frame relay switch configuration.
4. Repeat Steps 2 and 3 for the other port (e.g., Local Frame Relay).

Check FrameSaver NNI Connections

Check the SLV statistics to verify that the FrameSaver NNI unit is keeping statistics between itself and another FrameSaver NNI, and between itself and the endpoint unit.

1. Return to the Performance Statistics menu.
2. Select NNI SLV, and verify that the two NNI units on each side of the IEC/IXC are communicating and collecting data.

The **Interior** column should show the other FrameSaver NNI unit's DLCI number and IP address, and statistics should be showing a count instead of Unknown.

 - If so, both FrameSaver NNI units are installed and operational.
 - If not, check that FrameSaver NNI unit at the other end is installed.

The **Exterior** column, for DLCIs that terminate in the FrameSaver NNI unit, should show the endpoint unit's DLCI number and IP address, and statistics should be showing a count instead of Unknown.

 - If so, both FrameSaver NNI and endpoint units are set up correctly and are operational.
 - If not, recheck the cable connections, and replace or repair a damaged cable. Check that the endpoint unit is installed.
3. Press the spacebar to cycle through the DLCIs passing through the unit. All the appropriate DLCIs should appear at the bottom of the screen and in the Far End DLCI field. Do this for both the Interior and Exterior statistics.
 - If so, the units and their DLCIs are operational.
 - If not, check the DLCI's status.
4. Repeat Steps 1–3 for the Local port statistics, between the NNI unit and the endpoint.

See *Displaying System Information* in the User's Guide for additional status information. See *Troubleshooting* in the NNI Supplement for additional troubleshooting information.

Check PVC Connections

Check that all Management PVC connections are configured, and to see whether they are active.

1. Return to the Status menu.
2. Select Management Connection Status.

The PVC Connection Status screen shows all management connections. The management PVC, its destination interface and DLCI number, and whether the management connection is active.

- If active, the NOC should be able to Ping the unit.
- If not active, no data traffic can be carried by the management connection. If the management connection is configured correctly, the circuit may be down.

See *Displaying System Information* in the User's Guide for additional status information. See *Troubleshooting* in the NNI Supplement 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. All installation and service must be performed by qualified service personnel, as opening or removing covers may expose dangerous voltage points or other risks.
3. This product is intended to be used in a restricted access location. Connect the product to a –48 Vdc SELV (Safety Extra Low Voltage) supply source that is electronically isolated from the ac source. The –48 Vdc source is to be reliably connected to earth. Connect the earthing (grounding) conductor to the protective earthing (grounding) lug connector, identified by the protective earth symbol. This is a safety feature. Equipment grounding is vital to ensure safe operation.

Prior to installation, use a voltmeter/ohmmeter to check the wiring for the presence of earth ground. If the wiring is not properly grounded, the installation must not continue until a qualified electrician has corrected the problem.

A readily accessible disconnect device as part of the building installation shall be incorporated into the fixed wiring. The disconnect device (a –48 Vdc, 15 or 20A circuit breaker or switch) must be included in the ungrounded supply conductor. Overcurrent protection must be a 15 or 20A, –48 Vdc fuse or circuit breaker.

This product is to be installed only in a Restricted Access Location (dedicated equipment rooms, equipment closets, or the like) in accordance with articles 110-16, 110-17 and 110-18 of the National Electrical Code, ANSI/NFPA 70, and articles 2-308, 2-310, 2-312, 2-314, 2-200, and 2-202 of the Canadian Electrical Code.

The rear I/O panel has provision for a permanently connected protective earthing (grounding) conductor. Connect a 6–14 AWG conductor to this solderless lug connector, identified by the protective earth symbol.

4. 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.
5. Do not allow anything to rest on the power cord and do not locate the product where persons will walk on the power cord.
6. 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.
7. 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.
8. 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.
9. 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.
10. Filler panels are provided with the access carrier to cover unused slots. You *must* install filler panels on the unused slots to avoid possible injury from electrical shock and to maintain compliance with FCC rules.
11. 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.

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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