PATTON Electronics Co.

Diamond Edge Model 3224
G.SHDSL IpDSLAM

Installation Guide

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Contents

About this guide

This guide describes installing and configuring a Patton Electronics Model 3224 IpDSLAM. By the time you are finished with this guide, your IpDSLAM will be installed. The instructions in this guide are based on the following assumptions:

- The IpDSLAM will connect to an uplink network
- There is a LAN connected to one of the Ethernet ports of the IpDSLAM
- Subscribers will be connected to remote G.SHDSL modems

Audience

This guide is intended for the following users:

- Operators
- Installers
- Maintenance technicians

Structure

This guide contains the following chapters:

- Chapter 1 describes the IpDSLAM
- Chapter 2 describes installing the IpDSLAM hardware
- Chapter 3 describes configuring the IpDSLAM for use
- Chapter 4 details how to power up and deactivate the IpDSLAM
- Chapter 5 contains troubleshooting and maintenance information
- Chapter 6 contains information on contacting Patton technical support for assistance

For best results, read the contents of this guide *before* you install the IpDSLAM.

Precautions

Notes and cautions, which have the following meanings, are used throughout this guide to help you become aware of potential IpDSLAM problems:

Note Calls attention to important information.

The shock hazard symbol and WARNING heading indicate a potential electric shock hazard. Strictly follow the warning instructions to avoid injury caused by electric shock.

The alert symbol and WARNING heading indicate a potential safety hazard. Strictly follow the warning instructions to avoid personal injury.

The shock hazard symbol and CAUTION heading indicate a potential electric shock hazard. Strictly follow the instructions to avoid property damage caused by electric shock.

The alert symbol and CAUTION heading indicate a potential hazard. Strictly follow the instructions to avoid property damage.

Typographical conventions used in this document

This section describes the typographical conventions and terms used in this guide.

General conventions

The procedures described in this manual use the following text conventions:

Table 1. General conventions

Convention	Meaning
Futura bold type	Indicates the names of menu bar options.
Italicized Futura type	Indicates the names of options on pull-down menus.
Futura type	Indicates the names of fields or windows.
Garamond bold type	Indicates the names of command buttons that execute an action.
< >	Angle brackets indicate function and keyboard keys, such as <SHIFT>, <CTRL>, <C>, and so on.
`Are you ready?`	All system messages and prompts appear in the `Courier` font as the system would display them.
`% dir *.*`	Bold Courier font indicates where the operator must type a response or command

Mouse conventions

The following conventions are used when describing mouse actions:

Table 2. Mouse conventions

Convention	Meaning
Left mouse button	This button refers to the primary or leftmost mouse button (unless you have changed the default configuration).
Right mouse button	This button refers the secondary or rightmost mouse button (unless you have changed the default configuration).
Point	This word means to move the mouse in such a way that the tip of the pointing arrow on the screen ends up resting at the desired location.
Click	Means to quickly press and release the left or right mouse button (as instructed in the procedure). Make sure you do not move the mouse pointer while clicking a mouse button.
Double-click	Means to press and release the same mouse button two times quickly
Drag	This word means to point the arrow and then hold down the left or right mouse button (as instructed in the procedure) as you move the mouse to a new location. When you have moved the mouse pointer to the desired location, you can release the mouse button.

Compliance Information

Radio and TV Interference

The Model 3224 generates and uses radio frequency energy, and if not installed and used properly—that is, in strict accordance with the manufacturer's instructions—may cause interference to radio and television reception. The Model 3224 has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart B of Part 15 of FCC rules, which are designed to provide reasonable protection from such interference in a commercial installation. However, there is no guarantee that interference will not occur in a particular installation. If the Model 3224 causes interference to radio or television reception, which can be determined by disconnecting the cables, try to correct the interference by one or more of the following measures: moving the computing equipment away from the receiver, re-orienting the receiving antenna, and/or plugging the receiving equipment into a different AC outlet (such that the computing equipment and receiver are on different branches).

FCC Part 68 (ACTA) Statement

This equipment complies with Part 68 of FCC rules and the requirements adopted by ACTA. On the bottom side of this equipment is a label that contains—among other information—a product identifier in the format *US: AAAEQ##TXXXX*. If requested, this number must be provided to the telephone company.

The method used to connect this equipment to the premises wiring and telephone network must comply with the applicable FCC Part 68 rules and requirements adopted by the ACTA.

If this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice isn't practical, the telephone company will notify the customer as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations or procedures that could affect the operation of the equipment. If this happens the telephone company will provide advance notice in order for you to make necessary modifications to maintain uninterrupted service.

If trouble is experienced with this equipment, for repair or warranty information, please contact our company. If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.

Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information.

Industry Canada Notice

This equipment meets the applicable Industry Canada Terminal Equipment Technical Specifications. This is confirmed by the registration number. The abbreviation, IC, before the registration number signifies that registration was performed based on a Declaration of Conformity indicating that Industry Canada technical specifications were met. It does not imply that Industry Canada approved the equipment.

This Declaration of Conformity means that the equipment meets certain telecommunications network protective, operational and safety requirements. 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. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above condition may not prevent degradation of service in some situations. Repairs to some certified equipment should be made by an authorized maintenance facility 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 the user to disconnect the equipment. Users should ensure for their own protection that the ground connections of the power utility, telephone lines and internal metallic water pipe system, are connected together. This protection may be particularly important in rural areas.

Users should not attempt to establish or modify ground connections themselves, instead they should contact the appropriate electric inspection authority or electrician.

Chapter 1 Introduction

Chapter contents

Model 3224 IpDSLAM overview

The Model 3224 (see figure 1) connects up to 24 G.SHDSL devices to multiple WAN and Ethernet uplink ports with completely flexible routing and packet filtering. The IpDSLAM combines dual-redundant, removable power supplies, an IP firewall, a router, and a centralized management system into an ultra-sleek 1U chassis. The subscriber side connects to compatible G.SHDSL modems for data rates up to 4.6 Mbps over a single pair of copper wires. Expandable via optional industry standard PMC cards, the IpDSLAM provides numerous different types of uplink options.

Each 4.6-Mbps G.SHDSL port requires only a single twisted pair (2-wires) for full-duplex data transmission at ranges in excess of 5 km. The TC-PAM line encoding ensures spectral compatibility within existing voice/data bundles. The entire system can be managed through SNMP/HTTP-based management screens from any HTML browser.

Figure 1. Model 3224 IpDSLAM (*Forest Green* version shown)

Hardware overview

The Model 3224 combines transmission and routing technology, concentrating 24 G.SHDSL ports and a flexible selection of WAN links into a 1U-high managed chassis. The IpDSLAM (see figure 2) comprises a 1U-high, 19-inch wide chassis containing a motherboard and two dual-redundant power supplies. The hot swappable power supplies are available in universal AC power input with IEC-320 receptacles or -48 VDC power block configurations.

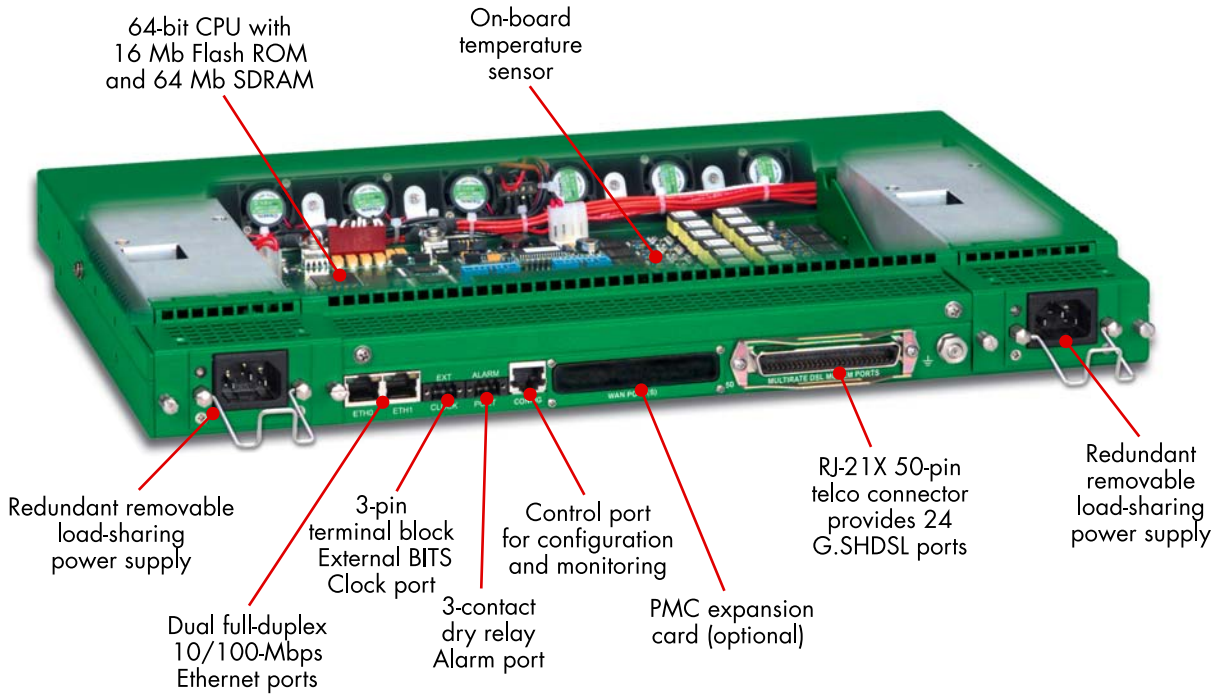

Figure 2. Model 3224 IpDSLAM features

LAN

Dual 10/100-Mbps Ethernet LAN ports are presented on RJ-45 connectors with an auto-sensing/full-duplex 10Base-T or 100Base-T interface. Also included are:

- 100Base-TX half-/full-duplex operation (100 + 100)
- 10Base-T half-/full-duplex operation (10 + 10)
- Auto negotiation and fallback
- 10/100 Mbps link and status indicators

RS-232 control port

The RS-232 port provides for initial configuration of the Model 3224. The RS-232 port supports:

- Asynchronous data rates of 19.2 kbps, 8 data bits, no parity, 1 stop bit.
- An RJ-45 connector with EIA-561 pinouts
- A management interface that supports VT-100 terminals
- Hardware flow control (RTS and CTS)

- Hardware CD and DTR signals for external modems

Power system

Power consumption is less than 135 watts

Removable internal dual-redundant AC or DC, load-sharing power supplies

The Model 3224 can only be configured with two AC power supplies or two DC supplies, you cannot mix AC and DC supplies in the same chassis.

- AC power supply
  - 115/230 VAC, 50/60 Hz
  - 1.5 A, 250 V Time Lag Fuse
- DC power supply
  - 40 to 72 VDC
  - 5.0 A, 125V Time Lag Fuse

Central processing unit

The 3224 employs a 64 bit/64 bit data bus PMC-Sierra RM5261A RISC processor with 32 kbytes data cache and 32 kb instruction cache running at 400Mhz. Bundled with the CPU is:

- 16 MB Flash ROM
- 64 MB SDRAM

G.SHDSL ports

The 24 G.SHDSL ports operate at data-rates up to 4.6 Mbps and are accessible via the RJ-21X 50-pin telco connector. Each port uses one twisted-pair (2-wires) for full-duplex communication. The G.SHDSL ports can support PPP for efficient layer 2 switching. Other features include:

- ITU-T 991.2/ETSI 101 135
- Programmable speeds from 192 kbps to 4.6 Mbps/2-wire full-duplex symmetric
- TC-PAM line encoding
- “Plug-and-Play” Annex A/Annex B automatic configuration between the 3224’s G.SHDSL IpDSLAM and the G.SHDSL CPE modems
- Built-in line surge protection
- G.SHDSL configuration parameters and line status indicators accessible to upper-level utility or application software

Alarm port

The alarm port notifies the operator that a pre-defined alarm has occurred. The principal features are:

- User-defined alarm condition configured through the NMS
- User selectable major and minor alarms for G.SHDSL, WAN, clocking, power, and over-temperature.

- 3-pin terminal block connector
- 3-contact dry relay for external alarm systems

Temperature
Operating range: 32 to 104°F (0 to +40°C)

Altitude
Maximum operating altitude: 15,000 feet (4,752 meters)

Humidity
5 to 90% relative humidity (RH), non-condensing

Physical dimensions
Height: 1.75 inches (4.44 cm), width: standard 19-inch (48.26 cm), depth: 12 inches (30.48 cm); weight: 8.94 lbs (20.12 kg). Also see figure 3 for height, width, and depth dimensions.

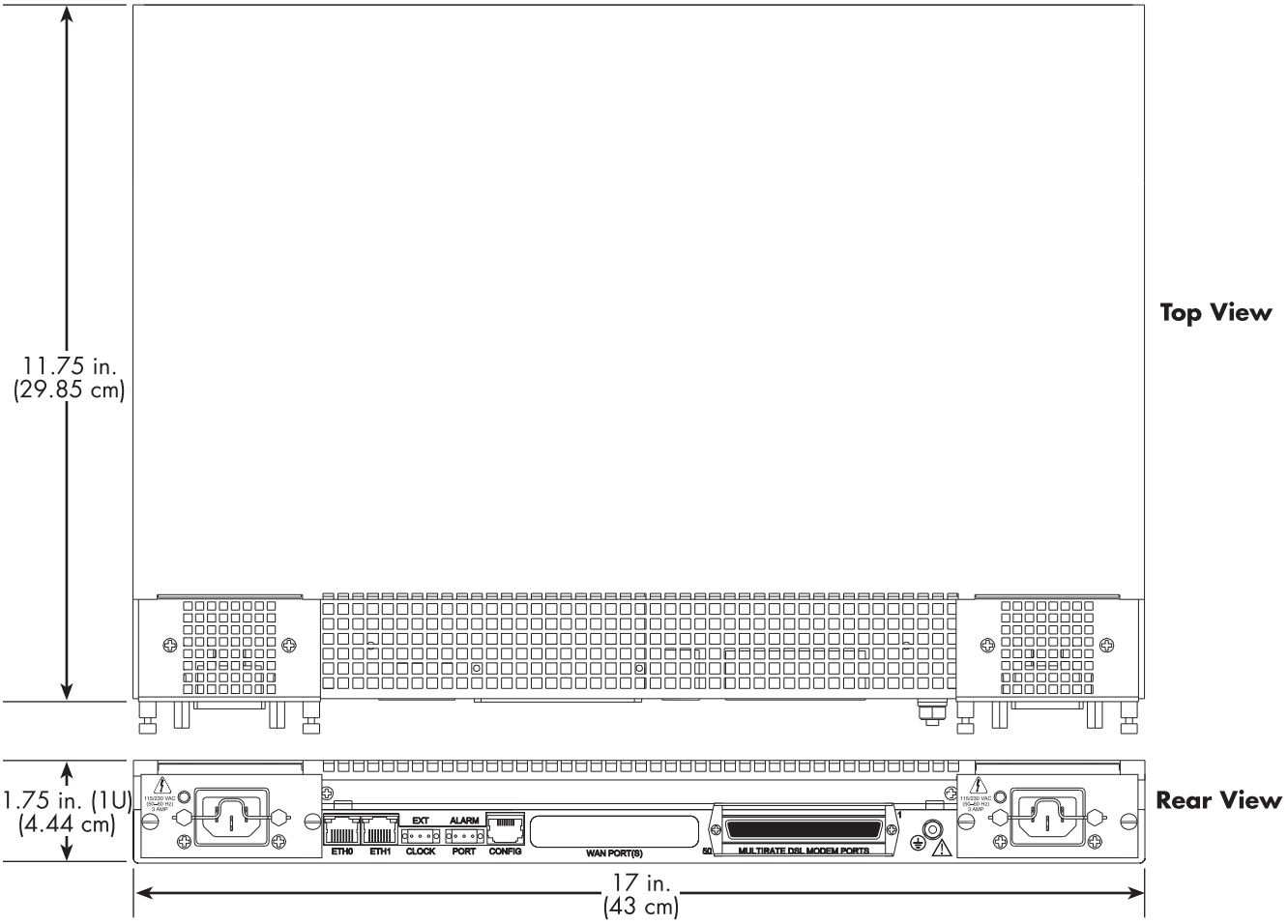

Figure 3. Model 3224 IpDSLAM chassis physical dimensions

Management services

- Out-of-Band RS-232 configuration port for management and control
- SNMP version 1 MIB II configuration management
- TELNET/SSH
- SYSLOG Client
- Remote Software Upgrade via FTP/TFTP
- Built-in HTTP/HTTP server for complete configuration and control using a standard Web browser

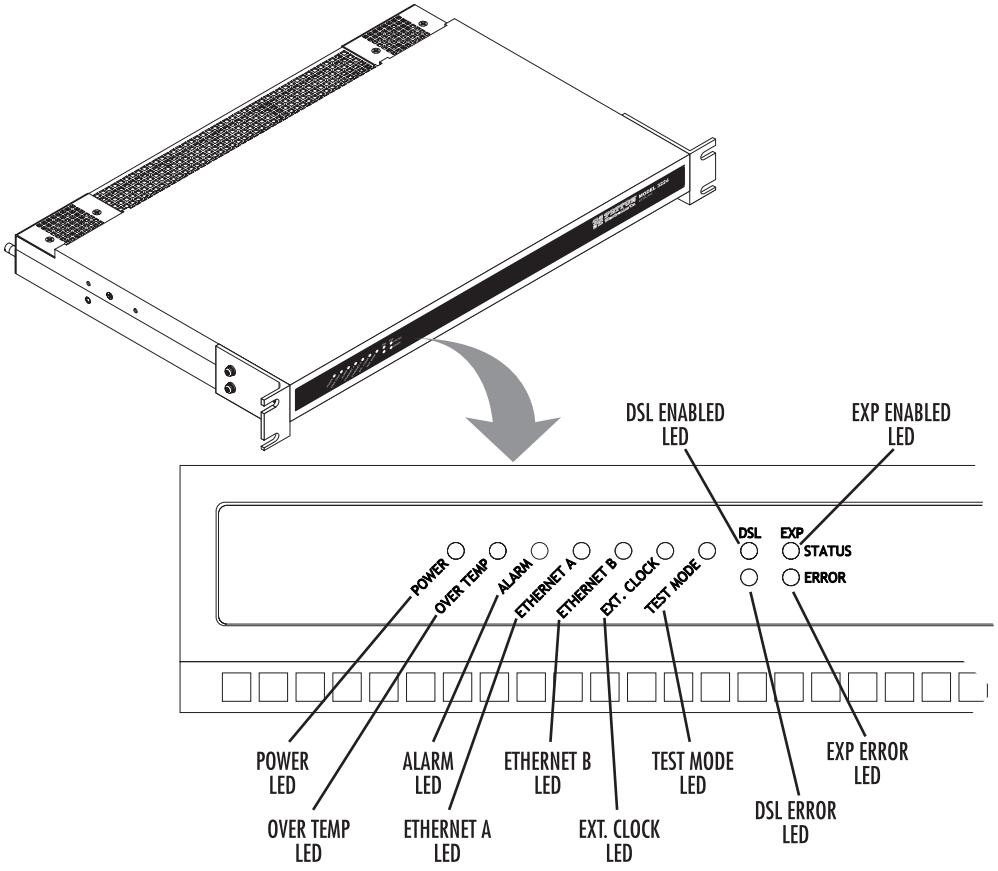

Figure 4. Model 3224 front panel LEDs

LED Display

front panel (see figure 4) display the status of the four WAN ports, the G.SHDSL ports, the Ethernet LAN port, power, and the alarms. The front panel includes LEDs for:

- POWER: Green if power is being applied. Flashing if one power supply fails or only one power supply is in use.
- OVER TEMP: Red if the IpDSLAM is over temperature. Off if operating within the configured temperature range.
- ALARM: Yellow if the IpDSLAM is in an alarm condition. Off if operating normally.

- ETHERNET A: Green if Ethernet link status is normal. Off if port is not configured or connected. Blinking indicates activity.
- ETHERNET B: Green if Ethernet link status is normal. Off if port is not configured or connected. Blinking indicates activity.
- EXT. CLOCK: Green if the IpDSLAM is being driven by the BITS clock. Off if the Model 3224 is using a circuit based Network Clock or Internal Clock.
- TESTING: Yellow if any of the DSL ports or any of the WAN uplink ports are in local switching or loopback mode, respectively. Off if all ports are in normal operation.
- DSL PORTS: Green to indicate all DSL ports are configured and sync'd up. Flashing green indicates at least one port is in the process of synchronizing. Red indicates loss of sync on any DSL port.
- EXP CARD: Green indicates normal activity on PMC expansion module. Red indicates loss alarm condition on expansion module.

Approvals

The Model 3224 IpDSLAM has achieved the following approvals and certifications:

- United States and Canada
  - Safety: UL60950 and CSA C22.2 No. 60950
  - EMC: FCC Part 15, Class A
  - Telecom: FCC Part 68 (ACTA) and Industry Canada CS03
- Europe (CE Mark)
  - RTTE Directive: EN55022: 1998 (Class A) Radiated and Conducted Emissions, EN55024: 1998 Immunity, and EN 60950 Safety of Information Technology Equipment
- International
  - Safety: CB Test Certificate per IEC 60950

Power Considerations

This device contains no user serviceable parts.

DC powered units:

- Connect the equipment to an approved 40–72 VDC supply source that is electrically isolated from the AC mains. The DC source must be reliably connected to earth.
- The DC source must be located within the same premises as the device.
- An approved disconnect device with minimum 3.0 mm contact separation must be provided in the DC supply to the equipment. The disconnect device must be rated for a minimum of 72 VDC, 5.0 A, and must be positioned within easy reach of the user's position during operation.

AC powered units:

- The AC mains outlet must be within 3 meters of the device and shall be easily accessible.
- The mains supply cord set must be an approved grounded type acceptable to the authorities in the country where the equipment is operated.

Chapter 2 Hardware installation

Chapter contents

Introduction

This chapter contains the following procedures for installing the Model 3224 IpDSLAM:

Note Before installing the IpDSLAM, you will need to obtain the line type and encoding of any WAN uplink port from your local telephone company (telco).

- "Unpacking the Model 3224 IpDSLAM" —lists the contents in the IpDSLAM shipping container
- "IpDSLAM chassis installation" —describes installing the IpDSLAM on a flat surface or in a standard 19-inch rack
- "Cable installation" on page 21—describes installing the power and network interface cables
- "Completing the hardware installation" on page 27—describes testing the IpDSLAM hardware to verify that it is ready for software configuration

Unpacking the Model 3224 IpDSLAM

Inspect the shipping carton for external damage. Note any damage before removing the container contents. Report equipment damage to the shipping carrier immediately for claim purposes. Save all packing materials in case you need to return an item to the factory for servicing.

- The IpDSLAM comes with the following items:
- The Model 3224 Packet Digital Subscriber Loop Access Multiplexer (IpDSLAM)
- An RJ45-to-RJ45 cable for use with the console and Ethernet ports
- A DB9-RJ45 (EIA-561) adapter for connecting a PC's serial port to the console port
- Rack mounting kit with rack ears and mounting hardware
- *Model 3224 IpDSLAM Getting Started Guide*
- CD-ROM containing product literature and the *IpDSLAM Administrator's Reference Guide*

Note Power cables are shipped separately from the Model 3224.

IpDSLAM chassis installation

Do the following:

1. If you have not done so already, remove the IpDSLAM from its shipping container.

   Note The IpDSLAM should be placed as close as possible to the termination jack provided by the Telco. Avoid installing the IpDSLAM in a location where the power cords or network interface cables could be accidentally disconnected. The location should be well ventilated. Do not block the IpDSLAM's cooling vents.

2. If you are installing the DACS in a 19-inch rack, go to step 3. Otherwise, place the DACS at the desired location, then go to "Cable installation" on page 21.

3. Install the rack mounting ears onto the IpDSLAM using the mounting hardware provided.
4. Place the IpDSLAM at the desired position in the rack.
5. Secure the IpDSLAM in position with the mounting screws.

Cable installation

This section describes installing the power, ground, and network interface cables.

Attaching the cable retainer clip

To secure the power cord, it is necessary to attach the metal retainer clips (if applicable to your model). Squeeze the clip and insert into the holes in the screws on either side of the power connector on your unit. The clip will pop into place.

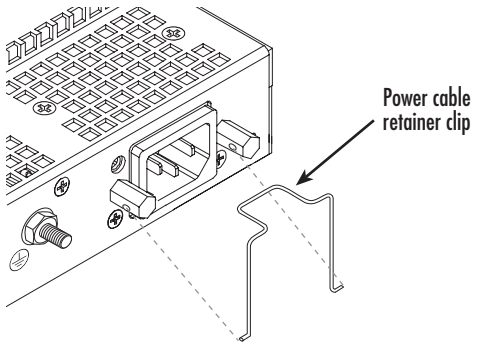

Figure 5. Attaching the cable retainer clip

Grounding the Model 3224—AC and DC Power Supplies

1. Assemble a ground wire using #10 AWG wire with green-colored insulation and two ring terminals. Make the wire long enough to reach one of the following ground sources:

- The building ground rod (generally located at the site's main service entrance)
- A sprinkler system pipe
- A cold-water pipe
- Building structural steel

To avoid the risk of personal injury, the distance between ground and the equipment must not exceed the distance specified in either local electrical codes or the National Electrical Code.

2. Install the ground wire between the grounding stud (see figure 6) and the grounding source.

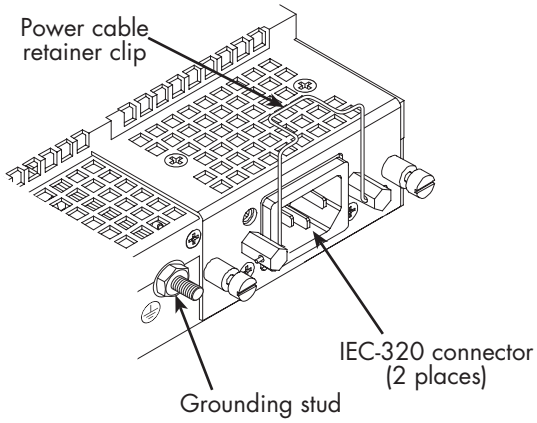

Figure 6. IEC-320 connector and grounding stud locations

Installing the power cables—AC power supply

This section describes installing the female end of the power cables into the IEC-320 connectors on the IpDSLAM. ***Do not connect the male end of the power cables to the power outlet at this time.***

WARNING

To avoid the risk of injury from electric shock, the power cords connected to the IEC-320 connectors must be grounded power cords.

CAUTION

The IpDSLAM power supply can be configured for 115 or 230 VAC operation. By default, the 3224/230 IpDSLAM is set to 230 VAC and the 3224/115 is set to 115 VAC. If you need to change the voltage setting for your power supplies, contact your Patton distributor or Patton Electronics technical support.

Verify that the proper voltage is present before plugging the power cord into the receptacle. Failure to do so could result in equipment damage.

CAUTION

The Model 3224 can only be configured with two AC power supplies or two DC supplies, you cannot mix AC and DC supplies in the same chassis.

CAUTION

The Model 3224 does not have a power switch, so it will activate upon connection to a power source.

CAUTION

The AC main socket outlet must be located within 10 feet (3 meters)

Do the following:

1. Connect the earth ground of the AC source to the grounding stud on the IpDSLAM as described in the section "Grounding the Model 3224—AC and DC Power Supplies" on page 21.
2. Install a power cable into an IEC-320 connector (see figure 6 on page 22).
3. Rotate the power cable retainer clip so it secures the power cable plug in the IEC-320 connector as shown in figure 7.

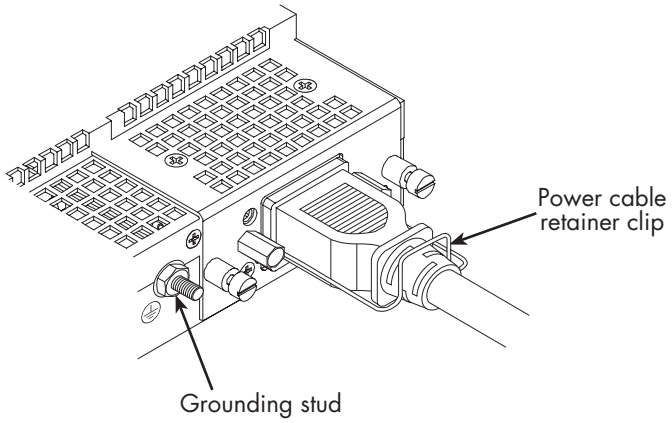

Figure 7. Power cable retainer clip

4. Repeat steps 2 and 3 to install the remaining power cable.

Installing the power cables—DC Power Supply

This section describes installing the DC power cables to the DC power terminal blocks on the IpDSLAM. ***Do not connect the remaining end of the power cables to the DC power source at this time.***

CAUTION

The Model 3224 can only be configured with two AC power supplies or two DC supplies, you cannot mix AC and DC supplies in the same chassis.

CAUTION

The Model 3224 does not have a power switch, so it will activate upon connection to a power source.

CAUTION

To avoid the risk of injury from electric shock, the power cords connected to the IEC-320 connectors must be grounded power cords.

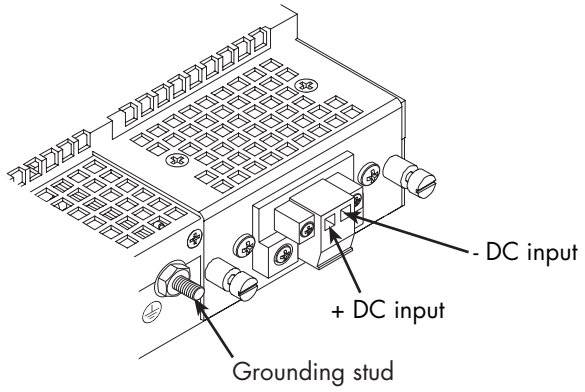

Figure 8. DC connector, - DC and + DC Input view

Do the following:

1. Connect the earth ground of the DC source to the grounding stud on the IpDSLAM as described in section "Grounding the Model 3224—AC and DC Power Supplies" on page 21.
2. Remove approximately 1/4-inch of insulation from the end of each wire.
3. Insert the stripped end of the positive lead into the "+DC input" of the terminal block. Tighten the screw until the power lead is firmly fastened. Repeat the procedure for the negative lead, using the "-DC input" of the terminal block. Make sure that all strands of the wire are captured and that there is no exposed wire.
4. Repeat steps 1 through 3 to install the remaining DC power connection.

Connecting the Ethernet ports

The IpDSLAM has two 10/100 Ethernet interfaces for connection to your LAN (see figure 9). The Ethernet port will autosense the correct speed of the local LAN and automatically negotiate half- or full-duplex operation. This section describes connecting the IpDSLAM to the Ethernet LAN via an Ethernet hub, switch, or workstation.

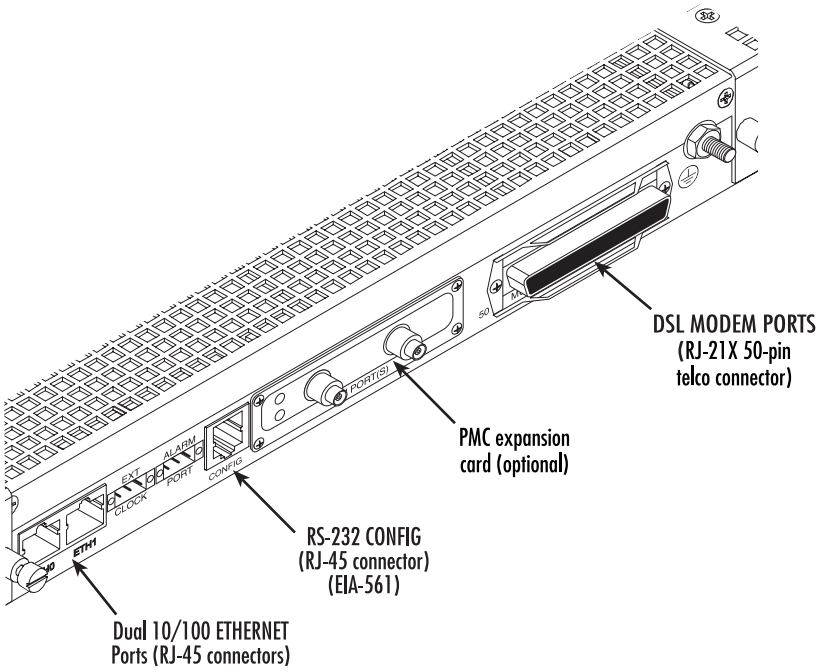

Figure 9. Model 3224 network and configuration ports

Connecting the 10/100Base-T Ethernet ports to an Ethernet switch or hub

The 10/100Base-T Ethernet ports (see figure 9) are designed to connect to an Ethernet switch or hub. The Ethernet RJ-45 pin and signal definitions for the IpDSLAM or for a NIC card in a workstation/PC are shown in figure 10. Connect a straight-through CAT-5 cable (one wired as shown in figure 10) between the IpDSLAM and the hub/switch.

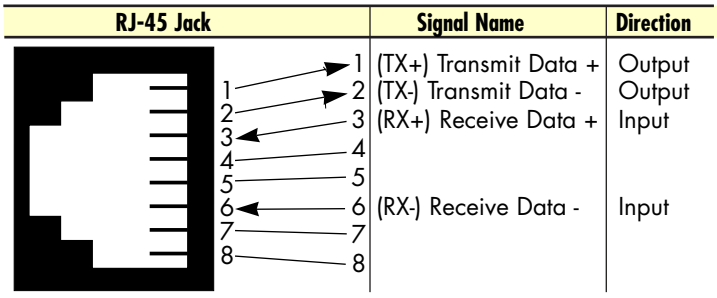

Figure 10. Straight-through RJ-45-to-RJ-45 Ethernet cable diagram

Connecting a 10/100Base-T Ethernet port to an Ethernet-capable workstation

The 10/100Base-T Ethernet ports can connect to a single Ethernet-capable workstation or PC by means of a cross-over cable. Refer to figure 11 to assemble a cross-connect cable that will connect between the NIC Ethernet port in the workstation and one of the IpDSLAM 10/100Base-T Ethernet ports.

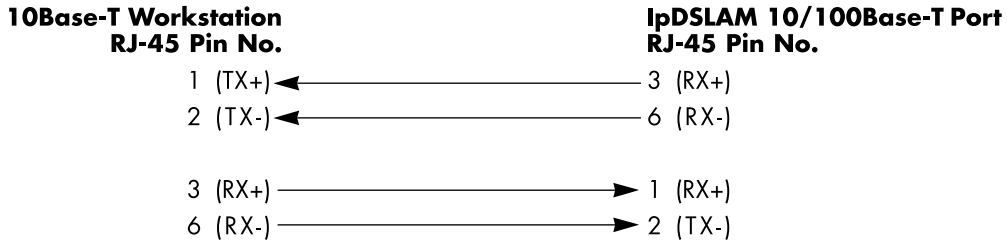

Figure 11. Cross-over RJ-45-to-RJ-45 Ethernet cable diagram

Connecting the EIA-561 RS-232 configuration port (DCE configured)

Install the supplied RJ-45-to-RJ-45 cable with the DB9-RJ45 adapter between the IpDSLAM RS-232 port (see figure 9 on page 25) and an open serial port on your computer. If you need to assemble your own cable, refer to the pinout diagram in figure 12.

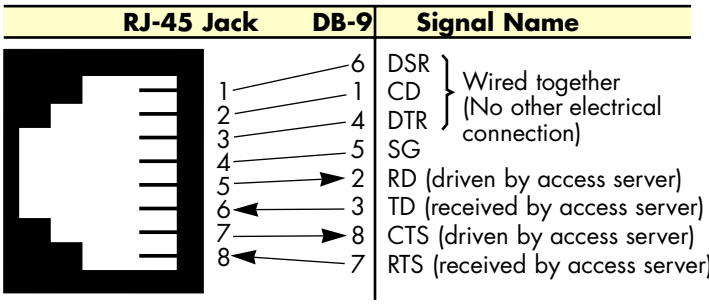

Figure 12. DB-9-to-RJ-45 cable diagram

Connecting the DSL Ports

The remote (CPE) G.SHDSL modems are connected to the IpDSLAM via the RJ-21X cable. Consult Appendix A, “Network Ports (RJ-21X) connector pin-out” in order to connect the CPE G.SHDSL modems to the selected G.SHDSL modem port on the Model 3224.

Note The 2-wire G.SHDSL modem lines are polarity insensitive so you only need to match the correct twisted pairs without being concerned about matching the individual wires of the twisted pair.

1. Connect the RJ-21X connector of the cable into the 50-pin RJ-21X receptacle on the rear of the 3224.
2. The other end of the cable has 25 non-terminated twisted-pairs for connection to punch-down blocks. Select the twisted-pairs which will be used for active G.SHDSL modem connections and terminate on the punch-down blocks. Only 24 of the twisted pairs will be used since there are 24 G.SHDSL modem connections, each being a 2-wire connection.

3. Select and attach the appropriate twisted pair from each remote (CPE) G.SHDSL modem on punch-down blocks for connection to the chosen G.SHDSL port in the 3224.

Completing the hardware installation

This section verifies that the IpDSLAM hardware is operational to the point where you can begin configuring the software settings.

AC Units

For AC units, do the following:

The IpDSLAM power supply can be configured for 115 or 230 VAC operation. By default, the 3224/230 IpDSLAM is set to 230 VAC and the 3224/115 is set to 115 VAC. If you need to change the voltage setting for your power supplies, contact your Patton distributor or Patton Electronics technical support.

Verify that the proper voltage is present before plugging the power cord into the receptacle. Failure to do so could result in equipment damage.

1. Verify that the AC power cord included with your IpDSLAM is compatible with local standards. If it is not, refer to chapter 6, "Contacting Patton for assistance" on page 45 to find out how to replace it with a compatible power cord.
2. Connect the male end of the power cord to an appropriate power outlet.
3. Verify that the green POWER LED is lit. If the POWER LED is flashing green, refer to chapter 5, "Maintenance" on page 41.

Hardware installation is complete. Refer to chapter 3, "Configuring the IpDSLAM for operation" on page 29.

DC Units

For DC units, do the following:

Note An approved external power supply that incorporates a disconnect device must be used and positioned within easy reach of the operator's position.

1. Connect the equipment to a 40–72 VDC, 2.5A supply source that is electrically isolated from the AC source. The 40–72 VDC source is to be reliably connected to a ground.
2. Verify that the green POWER LED is lit. If the POWER LED is flashing green, refer to chapter 5, "Maintenance" on page 41.

Hardware installation is complete. Refer to chapter 3, "Configuring the IpDSLAM for operation" on page 29.

Chapter 3 Configuring the IpDSLAM for operation

Chapter contents

Introduction

This chapter contains the following procedures for configuring the Model 3224 IpDSLAM for operation:

- "Configuration prerequisites"—lists the items you need to have on hand before configuring the IpDSLAM.
- "Preparing the IpDSLAM for configuration"—describes setting up the IpDSLAM IP address and netmask parameters.

Configuration prerequisites

You will need the following to configure the IpDSLAM:

- A PC workstation with a serial port and a VT-100 terminal emulation software program such as HyperTerminal™
- A PC with an Ethernet port and a WWW browser connected to the remote access server's local LAN
- The IP address and subnet mask for the IpDSLAM's Ethernet port

Preparing the IpDSLAM for configuration

Before the IpDSLAM can be configured the IP address and the netmask needs to be set up. This setup is done through the RS-232 CONFIG port on the IpDSLAM.

1. If you have not done so already, install the supplied DB-9-to-RJ-45 cable between the IpDSLAM RS-232 port (see figure 9 on page 25) and an open serial port on your computer.
2. Start a new VT-100 terminal session configured with the following characteristics:
   - Direct connection to COM port
   - 19.2 kbps
   - 8 bits
   - No parity
   - 1 Stop bit
   - No flow control

3. Set up the terminal emulation program as follows:

– Open a terminal emulation session.

– Enter a name for this connection.

– Click on the *Connect using:* pop-up menu and choose the *Direct to ComX* option (where *X* is the number of the COM port onto which you connected the cable in step 1) (see figure 13.

Figure 13. Hyperterminal properties

– Configure the COM port settings as shown in figure 14.

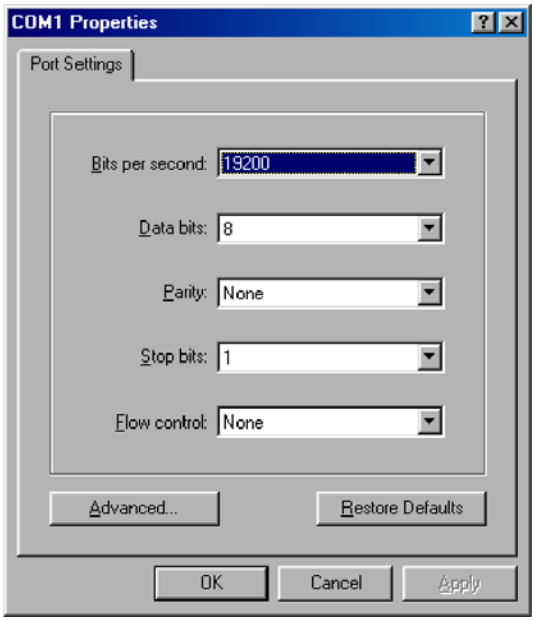

Figure 14. COM properties

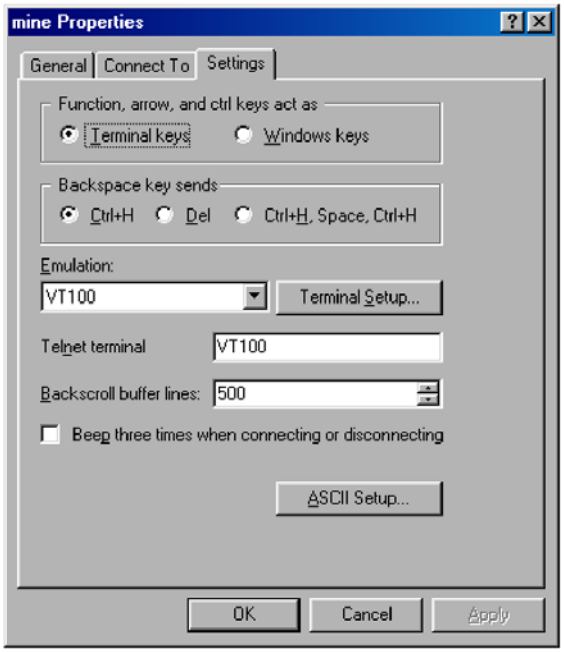

Figure 15. Terminal keys configuration

– Configure the Settings for *Function, arrow and ctrl keys act as* to *Terminal keys* as shown in figure 15.

IP address quick start modification

At turn on, boot up information will display on your Hyperterminal connection window, followed by a login request window.

1. At the prompt type **setup**, then press <enter> to access the 3224 setup menu.

```
To perform initial system configuration, login using 'setup'.

3224 login: setup

3221Configuration Menu:

                N - Configure network interfaces.
                D - Restore configuration to factory defaults.
                W - Save configuration to non-volatile storage.
                L - Logout

                R - Reboot
```

2. To change the 3224's Ethernet A default IP address of 192.168.200.1/24 to your selected IP address, select option *N,* then press <enter>. The 3224 will display IP address and netmask for Ethernet interfaces.

```
>> N

3224 Network Interface Configuration

                                                  Address              Netmask            Enable
                                                ---------------      ---------------        ------
        A - Ethernet 0                     192.168.200.98    255.255.255.0   yes
        B - Ethernet 1                     0.0.0.0                0.0.0.0              no

        G - Default Gateway

        X - Exit Menu

>>>
```

3. To change the IP address for Ethernet 0 (A) enter option *A,* then press <enter>. At the prompt type the new IP address and netmask, and enable the interface.

```
Address [192.168.200.98]: [new IP address] <enter>
Netmask [255.255.255.0]: [new mask] <enter>

      Enable Interface [yes/no]: yes
```

The 3224 will display the new IP address and netmask for interface A.

```
224 Network Interface Configuration

                                                         Address              Netmask            Enable
                                                         ---------------      ---------------        -----
       A - Ethernet 0                              192.168.100.10  255.255.255.0     yes
       B - Ethernet 1                              0.0.0.0               0.0.0.0              no

       G - Default Gateway

       X - Exit Menu

>>
```

4. The IP address has now been successfully changed. Full configuration of the 3224 can now be done via the web based configuration menus.

Web operation and configuration

Now that the IP address has been configured for your application, you can complete the configuration using any standard web browser.

PC configuration

Note To connect the PC to the Ethernet LAN to communicate with the Model 3224, the PC's IP address should be on the same subnet as the 3224 Ethernet 0 interface.

Connect a straight-through Ethernet cable between the PC's NIC or PCMCIA Ethernet card and an Ethernet hub or switch.

This completes the initial configuration of the Model 3224. The next steps in configuration will be done using your web browser connected via Ethernet to the Model 3224. Consult the *Model 3224 Administrator Reference Guide* and *Model 3224 Applications Reference Guide* for configuration information.

Displaying the 3224 web administration pages

Do the following:

1. Connect your PC's Ethernet connection to the Ethernet LAN.
2. Connect the 3224's rear panel Ethernet port A to the Ethernet LAN.
3. At your PC, open a web browser session. In your browser's URL/address field type the IP address of the Model 3224 (for example, if the Model 3224's IP address is 123.124.221.10, you would type 123.124.221.10 in the browser's URL/address field).
4. A login prompt will appear. In the username field type **superuser**, then press <tab> to move the cursor to the *Password* field. In the *Password* field type **superuser**, then press <enter>.

5. The Model 3224 Configuration Menu home page will appear (see figure 16).

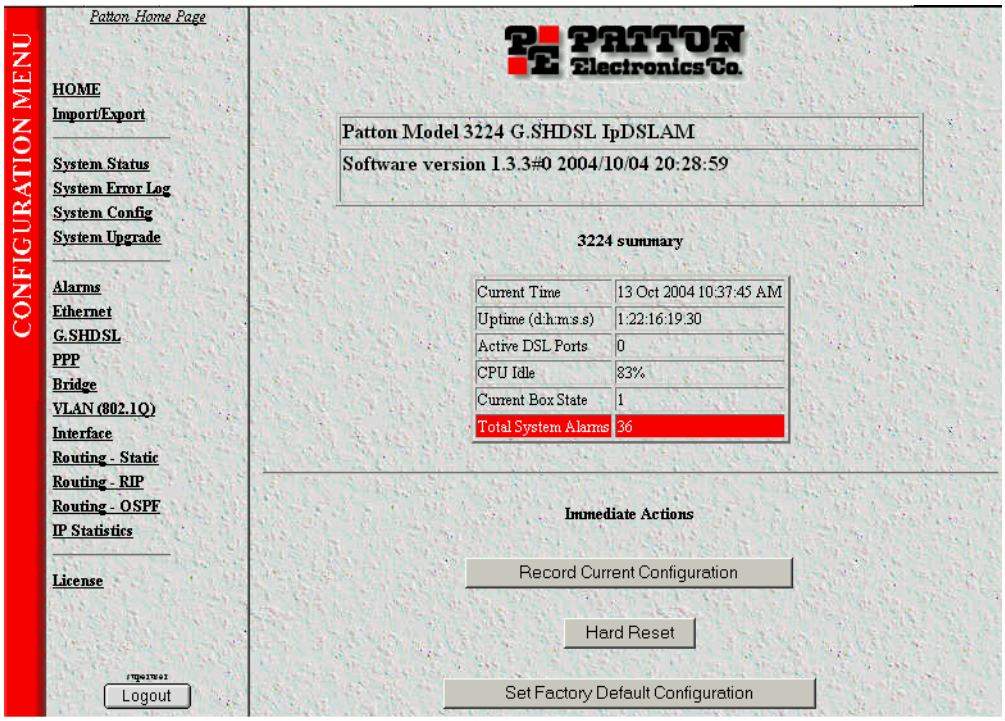

Figure 16. Model 3224 Configuration Menu home page

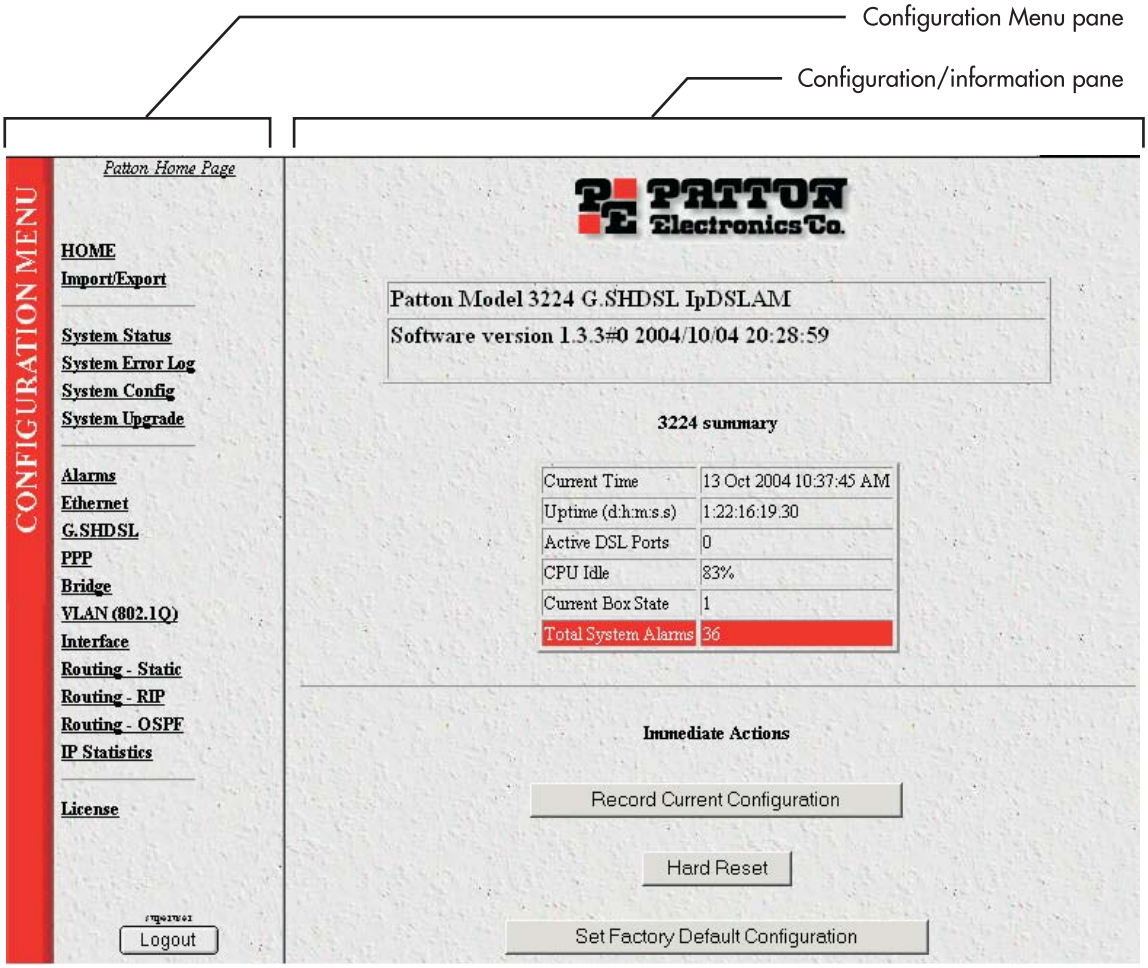

Figure 17. Home Page window panes

The HOME window is divided into two panes: the Configuration Menu pane and the Configuration/information pane (see figure 17). The Configuration Menu contains the links to the various Model 3224 subsystems, while in the Configuration/information pane; you can view status and other information or make changes to the system configuration. Unlike the Configuration Menu pane, which appears the same no matter which subsystem page you may select, the Configuration/information pane contents will change as you move from one subsystem page to another.

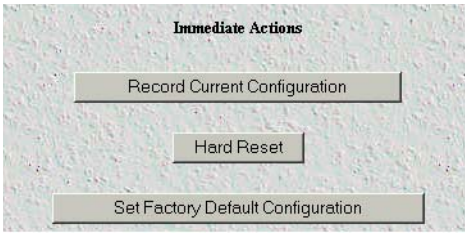

Figure 18. Immediate Actions buttons

From the Home page, the following actions can be performed:

- **Record Current Configuration**—clicking on this button (see figure 18) saves the current configuration in volatile DRAM memory to FLASH memory. Once the configuration is saved into FLASH memory, the configuration will not be lost even if the power is cycled on the 3224. changes made to the 3224 configuration are stored in volatile DRAM, enabling the user to set the box up with a working configuration before committing it to storage in FLASH. When you select **Record Current Configuration**, the 3224 stores your changes to FLASH memory.

  Note If you want to save the configuration changes that you have made, you must click on **Record Current Configuration**, otherwise all configuration changes will be lost if the power to the Model 3224 is turned off.

- **Hard Reset**—this button (see figure 18) causes the Model 3224 to perform a cold restart. When you select **Hard Reset**, the DACS confirms that you want to execute this command. Then, the DACS will disconnect all current sessions, re-initialize the interfaces, and re-load configuration parameters from FLASH.
- **Set Factory Default Configuration**—this button (see figure 18) clears out the configuration in FLASH and loads the factory default parameters into FLASH memory. The factory default settings will not execute on the Model 3224 until it is re-booted by doing a Hard Reset.

Chapter 4 Operation and shutdown

Chapter contents

Introduction

This chapter describes how to start or power-down the IpDSLAM.

Activating the IpDSLAM

Once the IpDSLAM has been installed, no operator action is required under normal conditions; the IpDSLAM is designed for unattended operation. The IpDSLAM does not have a power switch. When either power supply is connected to power, the IpDSLAM will immediately begin its boot-up cycle. However, both power supplies must be connected to power for the redundancy feature to work.

When power is applied to the IpDSLAM the following should occur:

1. The *POWER* LED illuminates.
2. The *Link 1 Frame* LED illuminates, indicating that the IpDSLAM is synchronizing with the T1/E1/PRI signal.
3. After 5 seconds, the *Link A Error* LED flashes, indicating that the IpDSLAM is satisfied with the quality of the T1/E1/PRI signal.
4. After 10 seconds, the *Link A Error* LED extinguishes, indicating that the IpDSLAM is satisfied with the network signal and that the link is ready for use.
5. There are two LEDs on each IpDSLAM 10/100 Ethernet port: a green LED that indicates line speed, and a yellow LED that indicates link status and activity.

   The yellow LED is either flashing yellow (meaning that packets are being received at the Ethernet port) or solid yellow (meaning that the link is valid but no packets are being received).

   The green LED is either lit (indicating 100 Mbps operation) or off (indicating 10 Mbps operation).

   Note The green LED reflects the speed of the last valid Ethernet connection.

The IpDSLAM is operational.

De-activating the IpDSLAM

Perform the following procedure to deactivate the IpDSLAM.

1. Disconnect the male ends of both power cords from the power distribution strip or to a wall outlet.
2. Verify that the *POWER* LED extinguishes.

Chapter 5 Maintenance

Chapter contents

Introduction

This chapter describes replacing a Model 3224 power supply. If you require more help, refer to chapter 6, "Contacting Patton for assistance" on page 45.

Replacing a power supply

Model 3224 IpDSLAM power supplies are hot-swappable, so a defective supply can be replaced without deactivating the IpDSLAM. Do the following to replace a malfunctioning power supply:

Note You will need a flat-tip screwdriver to perform the following procedure.

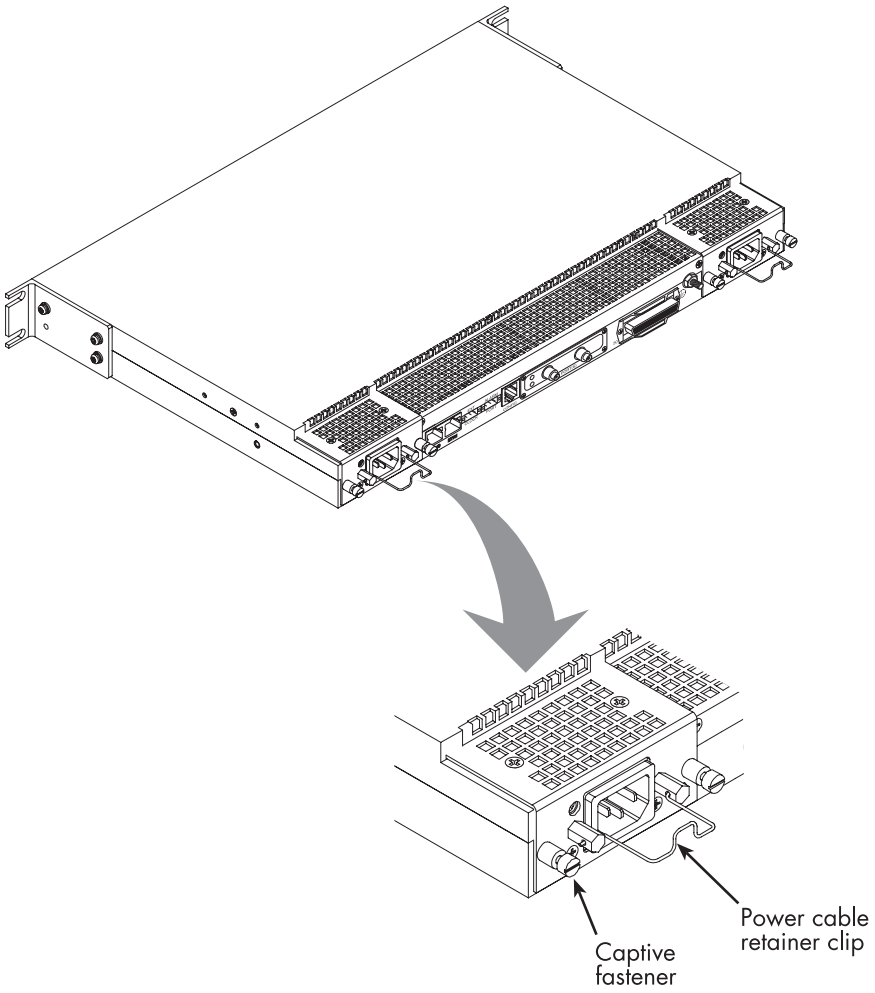

Figure 19. Captive fasteners and power cable retainer clip locations

1. At the malfunctioning power supply, rotate the power cable retaining clip (see figure 19) so it is no longer attached to the power cord.
2. Disconnect the power cable plug from the malfunctioning power supply.

3. Using a flat-tip screwdriver, loosen the two captive fasteners (see figure 19) enough so they are no longer connecting the power supply to the IpDSLAM chassis.
4. Carefully, pull the power supply from the IpDSLAM chassis until it is completely removed.

CAUTION

Do not use the power cable retainer clip as a handle when removing the power supply from the IpDSLAM chassis. Failing to comply with this caution could result in damage to the power supply.

5. Place the failed power supply on a non-static surface.
6. Remove the replacement power supply from its shipping container.
7. Insert the power supply into the IpDSLAM chassis (as shown in figure 20) until the locking tabs are pressing against the chassis. When that occurs, push down on the locking tabs while pressing the power supply completely into the chassis.

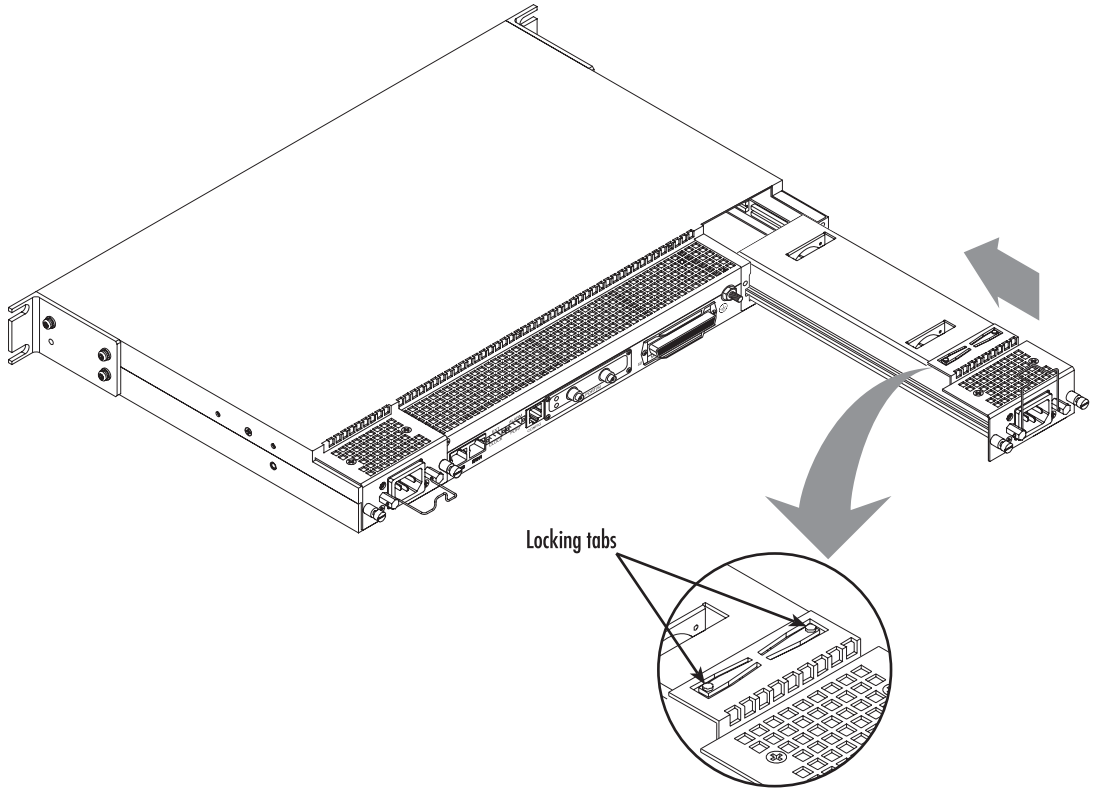

Figure 20. Installing the power supply

8. Using a flat-tip screwdrivers, tighten the captive fasteners to secure the power supply into the IpDSLAM chassis.
9. Plug the power cable connector into the power supply.
10. Rotate the power cable retainer clip so it attaches to the power cable.

11. Place the defective power supply into the shipping container that was used to transport the replacement power supply.
12. Depending on the instructions you received when you obtained your RMA number, return the defective power supply to your distributor or to Patton Electronics.

Chapter 6 Contacting Patton for assistance

Chapter contents

Introduction

This chapter contains the following information:

- "Contact information"—describes how to contact PATTON technical support for assistance.
- "Warranty Service and Returned Merchandise Authorizations (RMAs)"—contains information about the RAS warranty and obtaining a return merchandise authorization (RMA).

Contact information

Patton Electronics offers a wide array of free technical services. If you have questions about any of our other products we recommend you begin your search for answers by using our technical knowledge base. Here, we have gathered together many of the more commonly asked questions and compiled them into a searchable database to help you quickly solve your problems.

- Online support—available at **www.patton.com**.
- E-mail support—e-mail sent to **support@patton.com** will be answered within 1 business day
- Telephone support—standard telephone support is available Monday through Friday, from 8:00 A.M. to 5:00 P.M. EST (8:00 to 17:00 UTC-5), Monday through Friday by calling **+1 (301) 975-1007**

Warranty Service and Returned Merchandise Authorizations (RMAs)

Patton Electronics is an ISO-9001 certified manufacturer and our products are carefully tested before shipment. All of our products are backed by a comprehensive warranty program.

> **Note** If you purchased your equipment from a Patton Electronics reseller, ask your reseller how you should proceed with warranty service. It is often more convenient for you to work with your local reseller to obtain a replacement. Patton services our products no matter how you acquired them.

Warranty coverage

Our products are under warranty to be free from defects, and we will, at our option, repair or replace the product should it fail within one year from the first date of shipment. Our warranty is limited to defects in workmanship or materials, and does not cover customer damage, lightning or power surge damage, abuse, or unauthorized modification.

Out-of-warranty service

Patton services what we sell, no matter how you acquired it, including malfunctioning products that are no longer under warranty. Our products have a flat fee for repairs. Units damaged by lightning or other catastrophes may require replacement.

Returns for credit

Customer satisfaction is important to us, therefore any product may be returned with authorization within 30 days from the shipment date for a full credit of the purchase price. If you have ordered the wrong equipment or you are dissatisfied in any way, please contact us to request an RMA number to accept your return. Patton is not responsible for equipment returned without a Return Authorization.

Return for credit policy

- Less than 30 days: No Charge. Your credit will be issued upon receipt and inspection of the equipment.
- 30 to 60 days: We will add a 20% restocking charge (crediting your account with 80% of the purchase price).
- Over 60 days: Products will be accepted for repairs only.

RMA numbers

RMA numbers are required for all product returns. You can obtain an RMA by doing one of the following:

- Completing a request on the RMA Request page in the *Support* section at **www.patton.com**
- By calling **+1 (301) 975-1000** and speaking to a Technical Support Engineer
- By sending an e-mail to **returns@patton.com**

All returned units must have the RMA number clearly visible on the outside of the shipping container. Please use the original packing material that the device came in or pack the unit securely to avoid damage during shipping.

Shipping instructions

The RMA number should be clearly visible on the address label. Our shipping address is as follows:

Patton Electronics Company
RMA#: xxxx
7622 Rickenbacker Dr.
Gaithersburg, MD 20879-4773 USA

Patton will ship the equipment back to you in the same manner you ship it to us. Patton will pay the return shipping costs.

Appendix A Network Ports (RJ-21X) connector pin-out

Chapter contents

Introduction

Table 3 contains the band-marked color codes for the RJ-21X, 50-pin Telco connector. The Pair Number matches the port number on the DS0 Mapping Management page.

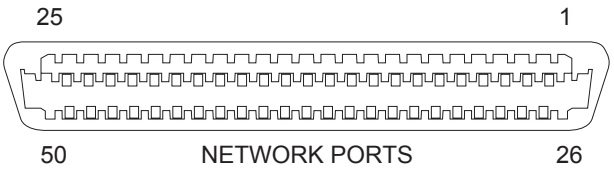

Figure 21. 50-pin Teleco connector

Table 3. Band Marked Color Code

Wire/Color Code	Tip and Ring	Pair Number	50 Pin Positions
White/Blue	Tip 1	Pair 1	26
Blue/White	Ring 1		1
White/Orange	Tip 2	Pair 2	27
Orange/White	Ring 2		2
White/Green	Tip 3	Pair 3	28
Green/White	Ring 3		3
White/Brown	Tip 4	Pair 4	29
Brown/White	Ring 4		4
White/Slate	Tip 5	Pair 5	30
Slate/White	Ring 5		5
Red/Blue	Tip 6	Pair 6	31
Blue/Red	Ring 6		6
Red/Orange	Tip 7	Pair 7	32
Orange/Red	Ring 7		7
Red/Green	Tip 8	Pair 8	33
Green/Red	Ring 8		8
Red/Brown	Tip 9	Pair 9	34
Brown/Red	Ring 9		9
Red/Slate	Tip 10	Pair 10	35
Slate/Red	Ring 10		10
Black/Blue	Tip 11	Pair 11	36
Blue/Black	Ring 11		11
Black/Orange	Tip 12	Pair 12	37
Orange/Black	Ring 12		12
Black/Green	Tip 13	Pair 13	38
Green/Black	Ring 13		13
Black/Brown	Tip 14	Pair 14	39
Brown/Black	Ring 14		14

Table 3. Band Marked Color Code (Continued)

Wire/Color Code	Tip and Ring	Pair Number	50 Pin Positions
Black/Slate	Tip 15	Pair 15	40
Slate/Black	Ring 15		15
Yellow/Blue	Tip 16	Pair 16	41
Blue/Yellow	Ring 16		16
Yellow/Orange	Tip 17	Pair 17	42
Orange/Yellow	Ring 17		17
Yellow/Green	Tip 18	Pair 18	43
Green/Yellow	Ring 18		18
Yellow/Brown	Tip 19	Pair 19	44
Brown/Yellow	Ring 19		19
Yellow/Slate	Tip 20	Pair 20	45
Slate/Yellow	Ring 20		20
Violet/Blue	Tip 21	Pair 21	46
Blue/Violet	Ring 21		21
Violet/Orange	Tip 22	Pair 22	47
Orange/Violet	Ring 22		22
Violet/Green	Tip 23	Pair 23	48
Green/Violet	Ring 23		23
Violet/Brown	Tip 24	Pair 24	49
Brown/Violet	Ring 24		24
Violet/Slate	Not Used	Pair 25 (Not Used)	50
Slate/Violet	Not Used		25