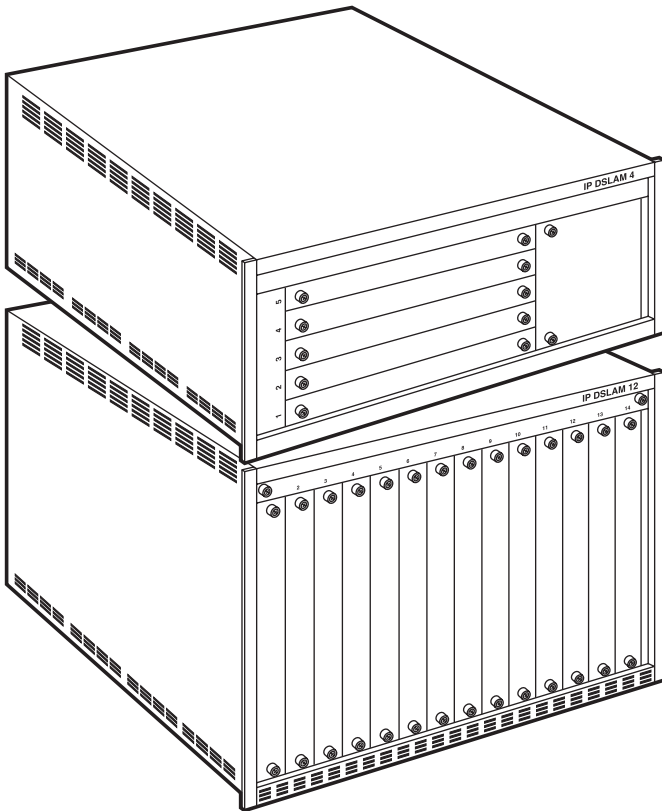




# DSLAM Chassis: 1-x-4-Slot or 2-x-12-Slot DSL Access Multiplexor Uplink Module



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**FEDERAL COMMUNICATIONS COMMISSION  
AND  
INDUSTRY CANADA  
RADIO FREQUENCY INTERFERENCE STATEMENTS**

This equipment generates, uses, and can radiate 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 communication. It has been tested and found to comply with the limits for a Class A computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference when the equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user at his own expense will be required to take whatever measures may be necessary to correct the interference.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

*This digital apparatus does not exceed the Class A limits for radio noise emission from digital apparatus set out in the Radio Interference Regulation of Industry Canada.*

*Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique publié par Industrie Canada.*

## NORMAS OFICIALES MEXICANAS (NOM) ELECTRICAL SAFETY STATEMENT

### INSTRUCCIONES DE SEGURIDAD

1. Todas las instrucciones de seguridad y operación deberán ser leídas antes de que el aparato eléctrico sea operado.
2. Las instrucciones de seguridad y operación deberán ser guardadas para referencia futura.
3. Todas las advertencias en el aparato eléctrico y en sus instrucciones de operación deben ser respetadas.
4. Todas las instrucciones de operación y uso deben ser seguidas.
5. El aparato eléctrico no deberá ser usado cerca del agua—por ejemplo, cerca de la tina de baño, lavabo, sótano mojado o cerca de una alberca, etc..
6. El aparato eléctrico debe ser usado únicamente con carritos o pedestales que sean recomendados por el fabricante.
7. El aparato eléctrico debe ser montado a la pared o al techo sólo como sea recomendado por el fabricante.
8. Servicio—El usuario no debe intentar dar servicio al equipo eléctrico más allá a lo descrito en las instrucciones de operación. Todo otro servicio deberá ser referido a personal de servicio calificado.
9. El aparato eléctrico debe ser situado de tal manera que su posición no interfiera su uso. La colocación del aparato eléctrico sobre una cama, sofá, alfombra o superficie similar puede bloquea la ventilación, no se debe colocar en libreros o gabinetes que impidan el flujo de aire por los orificios de ventilación.
10. El equipo eléctrico deber ser situado fuera del alcance de fuentes de calor como radiadores, registros de calor, estufas u otros aparatos (incluyendo amplificadores) que producen calor.
11. El aparato eléctrico deberá ser conectado a una fuente de poder sólo del tipo descrito en el instructivo de operación, o como se indique en el aparato.

12. Precaución debe ser tomada de tal manera que la tierra física y la polarización del equipo no sea eliminada.
13. Los cables de la fuente de poder deben ser guiados de tal manera que no sean pisados ni pellizcados por objetos colocados sobre o contra ellos, poniendo particular atención a los contactos y receptáculos donde salen del aparato.
14. El equipo eléctrico debe ser limpiado únicamente de acuerdo a las recomendaciones del fabricante.
15. En caso de existir, una antena externa deberá ser localizada lejos de las líneas de energía.
16. El cable de corriente deberá ser desconectado del cuando el equipo no sea usado por un largo periodo de tiempo.
17. Cuidado debe ser tomado de tal manera que objetos líquidos no sean derramados sobre la cubierta u orificios de ventilación.
18. Servicio por personal calificado deberá ser provisto cuando:
  - A: El cable de poder o el contacto ha sido dañado; u
  - B: Objetos han caído o líquido ha sido derramado dentro del aparato; o
  - C: El aparato ha sido expuesto a la lluvia; o
  - D: El aparato parece no operar normalmente o muestra un cambio en su desempeño; o
  - E: El aparato ha sido tirado o su cubierta ha sido dañada.

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# 1. Specifications

**Bandwidth**—IDSL: 144/148 kbps (symmetrical); SDSL: 2.3 Mbps/144 kbps (symmetrical); T1/E1: 2 Mbps/112 kbps (symmetrical), ADSL/G.Lite: 1.5 Mbps/512 kbps

**Line Type**—Leased, PSTN, ISDN

**Network Interface**—IEEE 802.3 Ethernet 10BASE-T

**Slots**—LRA1200A-4: (4) access module slots, (1) uplink module slot;  
LRA1200A-12: (12) access module slots, (2) uplink module slots;  
LRA1203C: (2) uplink interface module slots

**Indicators**—LEDs: Connection, Power, Collision, TX, RX, Link

**Regulatory Compliance**—NEBS: Level 3; EMC: FCC Part 15, Class A; CSA/C108.8; CE; Safety: UL® 1950; CSA C22.2 No. 950; CE

**Temperature Tolerance**—Operating: 32 to 122°F (0 to 50°C); Storage: -40 to +158°F (-40 to +70°C)

**Humidity**—5 to 95% noncondensing

**Altitude**—-200 to 16,500 ft. (-61 to 5029.2 m)

**Power**—Chassis: AC: Requires external AC to -48 VDC power converter;  
DC: Dual -48 VDC terminal blocks, 30 amps maximum, 15 amps typical

**Size**—LRA1200A-4: 7"H x 17"W x 18"D (17.8 x 43.2 x 45.7 cm); LRA1200A-12: 15.75"H (9 rack units) x 17"W x 18"D (40 x 43.2 x 45.7 cm)

**Weight (Chassis only)**—47 lb. (21.3 kg)

## 2. Installing the DSLAM Chassis

### 2.1 Overview

IP DSLAMs deliver high-speed data and voice connections over existing telephone copper lines. The 1-x-4 and 2-x-12-Slot DSLAM chassis use multiple access technologies (IDSL, SDSL, T1, ADSL, etc.) for upstream delivery to the provider's packet network. The IP DSLAMs achieve this in conjunction with the SDSL Subscriber Unit (LRA1200A-S), E1 Subscriber Unit (LRA1200A-E), or T1 Subscriber Unit (LRA1200A-T), which is used on the other end of the copper line at the customer premise.

### 2.2 The Complete DSLAM System

The complete DSLAM system consists of these components:

- a 5- or 14-slot chassis (LRA1200A-4 or LRA1200A-12),
- a DSL Access Multiplexor Uplink Module (LRA1203C) that installs in slot #5 of the 5-slot DSLAM or slot #13 and/or #14 of the 14-slot DSLAM,
- your choice of Uplink Interface Modules that install *inside* the DSL Access Multiplexor Uplink Module (LRA1203C), and provide connection to
- your choice of Backhaul Units,
- your choice of 12-Port Access Multiplexor Modules that install in slots #1–4 of the 5-slot chassis or slots #1-12 of the 14-slot chassis. The Access Multiplexor Modules provide the connections to ADSL/G.lite, IDSL, SDSL 1000, SDSL 2000, T1 or E1, and
- your choice of Subscriber Units (SDSL, T1 or E1) connected to the Ethernet port on a hub/switch or Ethernet PC network interface card.

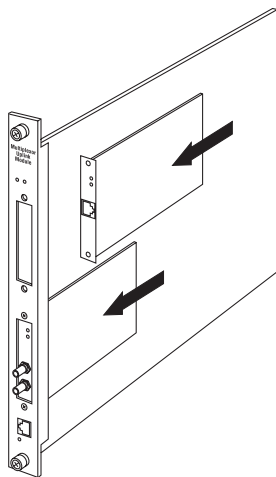
This manual covers the DSLAM Chassis 1-x-4-Slot (LRA1200A-4), DSLAM Chassis 2-x-12-Slot (LRA1200A-12), and the DSL Access Multiplexor Uplink Module (LRA1203C). When you order any of the other part numbers listed on the following pages, you will receive a separate manual for each part number.

## NOTE

The 12-Port Access Multiplexor Modules (LRA1204C through LRA1209C), Uplink Interface Modules (LRA1210C through LRA1214C), Subscriber Units (LRA1200A-S, LRA1200A-E, LRA1200A-T), and Backhaul Units (LRA1215A through LRA1218A) are discussed in separate user manuals that ship with the modules or units.

### 2.3 Available Modules

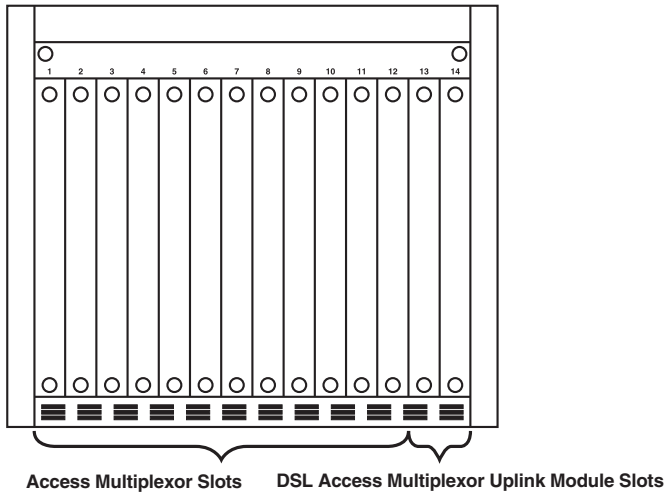
- The 12-Port Access Multiplexor Modules (LRA1204C, LRA1205C, LRA1206C, LRA1207C, LRA1208C, or LRA1209C) provide the connections to ADSL/G.Lite, IDSL, SDSL 1000, SDSL 2000, T1 or E1.
- The Multiplexor Uplink Module (LRA1203C—see Figure 2-1) houses an Uplink Interface Module (LRA1210C, LRA1211C, LRA1212C, LRA1213C, or LRA1214C), which provides the connection to the Backhaul Units (LRA1215A, LRA1215A-12, LRA1215A-12-DC, LRA1216A, LRA1216A-6, LRA1216A-6-DC, LRA1217A, LRA1217A-12, LRA1217A-12-DC, LRA1218A, LRA1218A-6, or LRA1218-6-DC).



**Figure 2-1. Installing Uplink Interface Modules (LRA1210C through LRA1214C) into the DSL Access Multiplexor Uplink Module (LRA1203C).**

## 2.4 2-x-12-Slot DSLAM Chassis (LRA1200A-12)

This is a 14-slot DSLAM chassis. Slots 1 through 12 are reserved for Access Multiplexor Modules (LRA1204C through LRA1209C) and slot 13 and 14 are reserved for DSL Access Multiplexor Uplink Modules (LRA1203C). You may place Access Multiplexor Modules in any order in slots 1 through 12. The DSLAM Chassis requires only one DSL Access Multiplexor Uplink Module (LRA1203C); the second is for redundancy. When using only one DSL Access Multiplexor Uplink Module, it may reside in either slot 13 or 14. Uplink Interface Modules (LRA1210C through LRA1214C) install into a slot right on the DSL Access Multiplexor Uplink Module (LRA1203C); see Figure 2-1. The chassis includes mounting ears for a standard 19" equipment rack, or you can use special mounting brackets that are available for 23" equipment racks. Call Technical Support at 724-746-5500 for details.



**Figure 2-2. 2-x-12-slot DSLAM chassis.**

## 2.5 1-x-4-Slot DSLAM Chassis (LRA1200A-4)

This is a 5-slot chassis. Slots 1 through 4 are reserved for Access Multiplexor Modules (LRA1204C through LRA1209C), and slot 5 is reserved for the DSL Access Multiplexor Uplink Module (LRA1203C). Uplink Interface Modules (LRA1210C through LRA1214C) install into a slot right on the DSL Access Multiplexor Uplink Module (LRA1203C); see Figure 2-1.

Access Modules (LRA1204C through LRA1209C) may be placed in any order in slots 1 through 4. The 5-slot chassis houses only one DSL Access Multiplexor Uplink Module (LRA1203C). The chassis includes mounting ears for a standard 19" equipment rack; special mounting brackets are available for 23" equipment racks. Call Black Box Technical Support at 724-746-5500 for details.

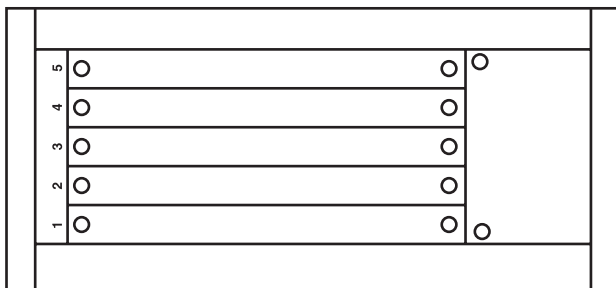


Figure 2-3. 1-x-4-slot DSLAM chassis.

## 2.6 Installation

### CAUTION

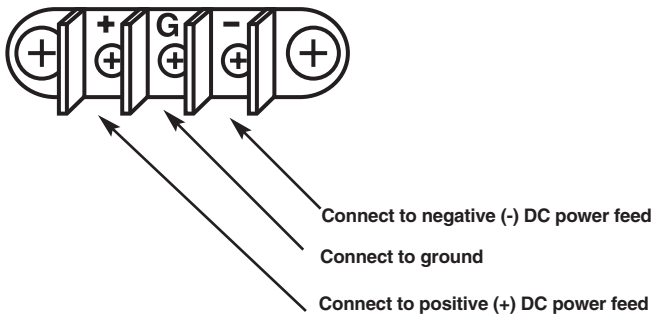
**We strongly recommend that you use proper grounding techniques when installing the DSLAM chassis and modules.**

#### 2.6.1 DC POWER INSTALLATIONS

- When mounting the unit in an equipment rack, please keep these guidelines in mind.
  - Maximum recommended ambient temperature is 86°F (30°C). Internal temperatures of the rack should be considered for continued safe operation.
  - Do not block power-supply vents or otherwise restrict airflow when installing the unit in the rack.

## DSLAM CHASSIS AND DSL ACCESS MULTIPLEXOR UPLINK MODULE

- Consider mechanically loading the rack so that the rack remains stable and unlikely to tip over.
  - Consider the overall loading of the branch circuit before installing any equipment in a rack environment.
  - Make sure that a reliable grounding path is maintained in the rack system. This unit is intended for a grounded connection.
2. Attach the -48 VDC power leads and ground connection to the appropriate terminals indicated on the back of the unit, and supply power to the unit.



**Figure 2-4. -48 VDC terminals on the back of the unit.**

### 2.6.2 AC POWER INSTALLATIONS

An external power converter is required to power the IP DSLAMs. Follow the instructions included with the AC-to-DC power converter you are using to power the IP DSLAM.

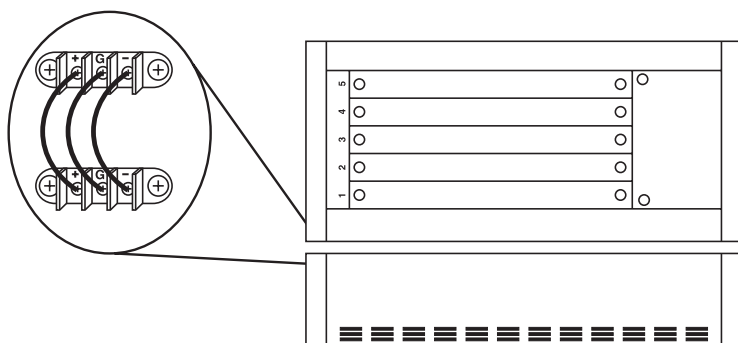


Figure 2-5. AC power installation.

## 2.7 Installing Access Multiplexor, Uplink Interface, and DSL Access Multiplexor Uplink Modules

The following modules install in slots 1 through 4 of the IP DSLAM 1-x-4-Slot Chassis or slots 1 through 12 of the IP DSLAM 2-x-12-Slot Chassis: 12-Port Access Multiplexor Modules (LRA1204C, LRA1205C, LRA1206C, LRA1207C, LRA1208C, LRA1209C). The DSL Access Multiplexor Uplink Module (LRA1203C) installs in Slot 5 in the DSLAM 1-x-4-Slot Chassis or slots 13 and 14 in the DSLAM 2-x-12-Slot Chassis. Uplink Interface Modules (LRA1210C through LRA1214C) install in a slot on the DSL Access Multiplexor Uplink Module (LRA1203C). The Uplink Interface Modules provide connections to backhaul equipment (LRA1215A through LRA1218A).

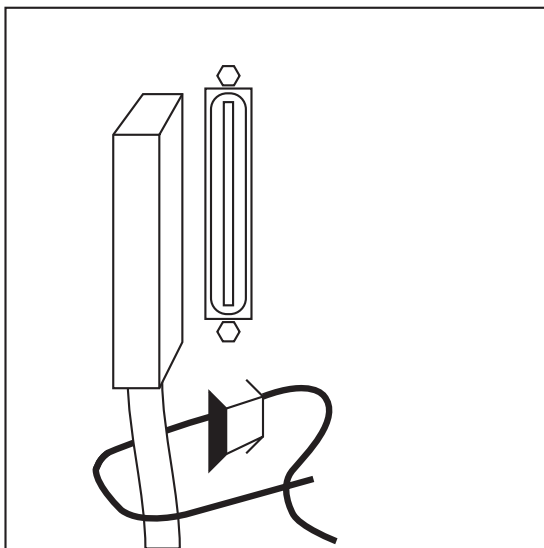
1. Make sure that you're using proper grounding techniques when installing modules into the IP DSLAM.
2. Align the module with the slot module guides and slide the module gently, but firmly, all the way into the chassis.
3. Tighten the screws on the front of the Module.

All modules for IP DSLAMs are hot-swappable. This includes 12-Port Access Multiplexor Modules, Uplink Interface Modules, DSL Access Multiplexor Uplink Modules, and fan trays. Installing or removing a module while the chassis is powered on does not affect operational status of other modules within the chassis.

## 2.8 Connecting Cables to the IP DSLAMs

Cables used to connect copper pairs into the IP DSLAMs may be connected with the chassis powered on or off. Take extra caution when installing cables near the DC terminal blocks. Cable pin-out information is module-specific; refer to the appropriate section for each module for this information.

To install cables on the back of the IP DSLAMs, simply push the RJ-21 connector onto the connector on the back of the chassis. Secure the cable in place using one of the provided cable ties.



**Figure 2-6. Connecting cables to the DSLAM.**

## 2.9 Installing and Removing the Fan-Tray Module

The fan-tray module may be installed when the chassis is either powered on or off. We recommend *always* using the fan tray when an IP DSLAM is in service.

To install the fan tray, simply guide the module into the fan tray slot and tighten the screws. To remove the fan tray, allow the fan blades to come to a complete stop. Loosen the screws and disengage the fan tray from the backplane. Do not touch the fan blades until they come to a complete stop.

If you need additional assistance, call Black Box Technical Support at 724-746-5500.



### NOTE

The 12-Port Access Multiplexor Modules (LRA1204C through LRA1209C), Uplink Interface Modules (LRA1210C through LRA1214C), Subscriber Units (LRA1200A-S, LRA1200A-E, LRA1200A-T), and Backhaul Units (LRA1215A through LRA1218A) are discussed in separate user manuals that ship with the modules or units.

## 3. Introduction to DSLAM Software

### 3.1 System Requirements

To access the IP DSLAM's embedded management (firmware on a chip installed on the DSL Access Multiplexor Uplink Module (LRA1203C), you must have a compatible browser installed on your computer. Compatible browsers include, but are not limited to, Microsoft® Internet Explorer (v4.0 or higher), and Netscape Navigator (v4.0 or higher).

If you are experiencing difficulties, make certain that JavaScript is enabled on your browser. You don't need to enable Java or a Java Virtual Machine (Java VM) since the embedded management system does not use Java. However, JavaScript is required to ensure that pages are loaded and viewed correctly by your browser.

The embedded management system has been optimized for Microsoft Internet Explorer v4.0 or higher. If you are having difficulties with another browser, call Black Box Technical Support at 724-746-5500.

To view the embedded help system properly (by clicking the "Help" icon), you must have an active connection to the Internet, and you must have Adobe Acrobat Reader (available free from [www.adobe.com](http://www.adobe.com)).

### 3.2 Overview

#### 3.2.1 IPD CHASSIS MANAGEMENT

The management system accesses statistical and configuration data using a common web browser.

The IPD Management System is easy to use, and no configuration is necessary for the DSLAM to operate at default settings. If you require a change in the default parameters, the embedded management system easily allows you to modify all configurable parameters. In addition, a contact database is integrated into the management system to allow you to easily manage your DSL subscriber base.

### 3.2.2 DEFAULT SETTINGS

The default settings for the IPD Management Systems are:

Parameter	Default Setting
Slot 13 IP Address	192.168.254.252*
Slot 14 IP Address	192.168.254.253*
Slot 5 IP Address	192.168.254.252*
Base Username	general
Base Password	Password**
Administrator Username	superuser
Administrator Password	Password**
Allow Inline Management	No
Protocol Filtering	Off
IP Filter Ranges	0.0.0.0 to 255.255.255.255

\*The default IP address will adjust itself automatically based upon where the uplink module is installed. This prevents duplicate IP address conflicts between Default IP Addresses.

\*\*Please note that all username and password values are case-sensitive.

### 3.2.3 WHERE MANAGEMENT INFORMATION IS STORED

The IP DSL Access Multiplexor Management System is powered by an embedded web server, which resides in the firmware of the DSL Access Multiplexor Uplink Module (LRA1203C). One DSL Access Multiplexor Uplink Module (LRA1203C) is required for each DSLAM chassis.

All configuration is stored in two locations:

1. On the individual access modules, and
2. Within non-volatile memory (NVRAM) of the DSL Access Multiplexor Uplink Module (LRA1203C).

### 3.2.4 BACKING UP MANAGEMENT INFORMATION

Configuration backup is inherent in the IP DSLAM. Upon powering the DSLAM for the first time, all access modules will be in default configuration modes. Once a parameter has been changed, the access module notes the change, and the DSL Access Multiplexor Uplink Module (LRA1203C) stores the information in FLASH memory.

The configuration storage is bidirectionally redundant. That is, if an access module is replaced, it will retrieve configuration data from the uplink module. Likewise, if an uplink module is replaced, configuration changes from installed access modules will be retrieved by the uplink module and stored in FLASH memory.

## NOTE

**If both an Access Multiplexor Module (LRA1204C through LRA1209C) and the DSL Access Multiplexor Uplink Module (LRA1203C) are replaced simultaneously, the configuration data for the Access Multiplexor Module will be lost.**

**If a DSL Access Multiplexor Uplink Module is inserted into an empty DSLAM chassis, the NVRAM on the module will be cleared. This is normal behavior.**

### 3.2.5 CLEARING OR UPDATING NVRAM

Non-volatile RAM (NVRAM) is used by the uplink module to store all configuration settings. To clear NVRAM, simply insert the uplink module into an empty chassis, and wait for the boot cycle to complete (approximately 3 seconds).

To:	Do This:
Clear NVRAM Update NVRAM	Insert the uplink module into an empty chassis. Make changes within management or insert the module into an occupied chassis.

### 3.2.6 RESTORING MANAGEMENT SETTINGS

Restoring management settings is an automatic function. As described in the previous chapter, access module configurations are stored in the flash memory of uplink modules that are installed in the DSLAM, in such a way that configurations will be updated automatically if you replace an access module or uplink module.

### 3.2.7 ACCESSING THE MANAGEMENT SYSTEM

#### *Using the IPD Management System for the First Time*

The IPD Management System uses the HTTP protocol to serve HTML pages to your web browser from an embedded web server. This web server resides on the uplink module(s). Two TCP/IP addresses must be set on an uplink module before your browser can access the management system on that uplink module.

If two DSL Access Multiplexor Uplink Modules (LRA1203C) are used (for example, for redundancy in the IP DSLAM 12), each uplink module must have its own unique IP address. To access the management system for the first time, connect your laptop to the management port (on the front of the DSL Access DSL

Access Multiplexor Uplink Module, LRA1203C), and point your web browser to the default IP address.

Uplink Module Location	Default IP Address
Slot 5	192.168.254.252
Slot 13	192.168.254.252
Slot 14	192.168.254.253

1. Once you have accessed the management system, click on the **Uplink View** button in the main toolbar.
2. To enable in-band access (access from the network), you must set a unique and valid IP address for the uplink module.
3. Once an IP address has been entered, you must click the **Allow Inband Access** box to allow inband access.

### NOTE

**The default IP addresses are 192.168.254.252 and 192.168.254.253.  
The default username and password are superuser and Password.**

#### *Subsequent Access to the IPD Management System*

Use the IP address that you have configured for the uplink module to gain subsequent access to the management system.

1. Using any computer on your network, launch a web browser. See **Section 3.1** for any system and browser requirements.
2. Type the IP address of the uplink module into the address field at the top of your browser, and press the **Return** key.

You should now have access to the management system. You will be prompted to log in before you will be allowed to make any configuration changes.

The IP address for the uplink module must first be set for the uplink module as defined in *Using the IPD Management System for the First Time* (previous page).

Each uplink module must have a unique IP address. TCP/IP does not allow the use of duplicate IP addresses. Because the uplink modules communicate with each other, duplicate IP addresses will interfere with the management system.

To manage the DSLAM from the network, the **Allow Inband Access** box can be checked. Until this box is checked, the management system will not be accessible from the network.

## 4. Management Views

### 4.1 Front-Panel Display

The front-panel display in the main NMS window illustrates the following at a glance:

- Which slots in the DSLAM are populated.
- Which type of access module occupies a slot.
- The status of the ports on the access module:
  - Red = unpopulated port/no DSL link
  - Green = populated port/DSL link
  - Gray= non-functional port
  - Yellow = alarm
- The type and status of uplink interface modules.

#### 4.1.1 CHANGING SYSTEM CONFIGURATIONS

The global system configurations are accessible by clicking on the **Uplink** button (located in the toolbar in the main window). Clicking the **Uplink** button will access the uplink module view. Most global settings are configurable on the uplink module, including:

- Changing uplink module IP addresses. The uplink module's IP address is used to access the NMS.
- Allow or deny in-band management of the DSLAM. In-band management allows the NMS system to be accessed from anywhere on the network.

#### 4.1.2 CHANGING SYSTEM PASSWORDS

The system passwords may be changed only if you are currently logged in as **superuser**. To change system passwords, click on the **Password** button. A new floating window will be opened with appropriate fields to change the passwords.

You must submit the changes before the new passwords will take effect.

## 4.2 Configuration Information Display

The bulk of actual management functions are performed in the **Slot** and **Port** views, accessible by:

1. Clicking on any slot or individual port shown in the chassis view.
2. Clicking on the respective **Port** and **Slot** icons in the main toolbar.

The specific capabilities of the configuration information display vary depending upon the type of access module being managed currently. However, the following are consistent:

- Slot and port selector—These selectors allow the configuration information display to manage a new slot/port directly from within the configuration information display. An alternative to selecting slot/port combinations here would be to return to the main window and click on a new port within the front-panel display, or search for a new circuit ID.
- A display of the access module type and firmware revision of the currently managed access module.
- Fields to configure a **Circuit ID**, two **IP Ranges**, and **Speed** selectors.
- Virtual LAN configuration fields, including **VLAN ID Range**, **VLAN ID**, **Flood**, and **Priority**.

### 4.2.1 CIRCUIT ID

The **Circuit ID** is an identifier field for use in labeling a specific port. Typically, a service provider will use a corresponding circuit ID# or customer ID number from an OSS system, to facilitate troubleshooting.

#### NOTE

**The Circuit ID is NOT integrated with any OSS system at this time, and is for reference only. However, as the circuit ID is searchable, we highly recommend that you use this field.**

### 4.2.2 IP RANGE 1

The two fields directly beneath the **IP Range 1** heading denote the start and end IP addresses in a range of allowed addresses. The default setting is 0.0.0.0 and 255.255.255.255, which indicates that all IP addresses are allowed. By changing the **IP Range 1**, you are indicating that an allowed IP range needs to be enforced, and the DSLAM will filter all IP addresses outside of the configured range.

### 4.2.3 IP RANGE 2

These fields behave identically to IP Range 1, except that they indicate a second range of allowed IP addresses for that port. This allows the administrator to dictate two ranges of non-congruous IP addresses that are allowed to communicate on that port.

### 4.2.4 TYPE

The **Type** field reaffirms the type of access module currently being managed by the configuration information display. This field is read-only and can't be modified.

### 4.2.5 SPEED

The **Speed** selection provides a pop-down list of available speeds for the specific port being managed. The number of available speeds, as well as the individual speed options, will vary depending on the type of access module being managed. For example, the LRA1205C supports two speeds (128K and 144K), while the LRA1208C supports eight speed settings up to 1.54 Mbps.

All ports can be set to speed selection OFF, which will disable that port.

### 4.2.6 VLAN RANGE

The IP DSLAM supports 802.1Q virtual LANs (VLANs). A VLAN is indicated by tagging packets with a VLAN ID. The VLAN range fields indicate the start and end VLAN IDs that are to be supported on an individual port. The use of the VLAN range will also affect how that port handles 802.1Q VLAN tags. VLAN ranges are listed on the next page.



Start VLAN ID=0, end VLAN ID=[blank]

This is the default setting, and indicates that 802.1Q VLAN support is turned OFF for that port. All ports in VLAN 0 will be multiplexed normally without the use of VLAN tags.

Start VLAN=1 through 4095, end VLAN=[blank]

By indicating a single VLAN ID, the port will be automatically denoted as an 802.1Q VLAN access port. All packets received on this port will be tagged with the appropriate VLAN ID, and will be flooded only to other VLANs of the same VLAN ID\*.

Start VLAN=1 through 4095, end VLAN=1 through 4095

By indicating a range of positive integers between 1 and 4095, a VLAN ID Range is set. By setting a valid range, the port will be automatically designated as an 802.1Q VLAN trunk port, and will allow only packets tagged with a VLAN ID within the set range to communicate on the port.

A VLAN range is useful when you have multiple DSL lines running to multiple locations, and each location contains a LAN that is already using 802.1Q VLANs. The VLAN range allows your already-tagged packets to communicate through the DSLAM and the service provider's network, so that VLANs can be used between remote locations.

#### 4.2.7 FLOOD

The flood section refers to the method in which the DSLAM should handle incoming broadcasts on a specific port. The 802.1Q standard dictates that broadcasts are forwarded within a VLAN (that is, a VLAN is a broadcast domain). However, you may want to prevent broadcasts from being flooded out of DSL access ports on the DSLAM even if the VLAN IDs are identical.

The flood options are:

**Upl (uplink)**—All broadcasts are flooded to the DSLAM's uplink ports only, preventing communication between DSL access ports without the intervention of an upstream device (such as a router).

**Vln (VLAN)**—All broadcasts are flooded to the DSLAM's uplink ports as well as to other DSL access ports with the sender's VLAN ID.

### 4.2.8 PRIORITY

Using the 801.1p standard (a subset of 802.1Q), up to eight levels of prioritization can be set on a specific port. Because 802.1p is a standard technology supported by most LAN equipment vendors today, this prioritization may be maintainable throughout the service provider's and/or your networks.

Prioritization levels are numerical. (0) applies no priority tag, (1) applies the lowest priority, and (7) applies the highest priority.

### 4.2.9 PROTOCOL

Each port may be set to allow only TCP/IP traffic, or to allow all protocols. This is easily accomplished by setting the Protocol selection in the slot view to **IP** (to allow only IP traffic) or **ALL** (to allow all traffic).

# 5. Troubleshooting

## 5.1 Can't Access the Web Server

Under certain circumstances, the web server (which serves the embedded management pages) may be inaccessible. Initial connectivity is only possible using the default IP address via the management console port.

## 5.2 Clearing the ARP Cache

The end system being used to access the embedded management system may keep a record of IP address and MAC address locations in a local ARP cache. This will prevent the end system from correctly finding the embedded web server if:

1. The same system accessed the server for the local management port, and changed the IP address.
2. The same end system was then moved to an inband connection (accessing the server from within the network), using the new IP address.

The ARP cache will timeout eventually, or it can be cleared manually. For a Windows® PC, open a DOS console and type:

`arp -a`. If the web server's IP address is in the arp cache, type `arpn -d [the IP address]` where *[the IP address]* is the arp cache entry you wish to clear.

## 5.3 Changing the IP Address

Once the IP address is changed, the connection with the web server will be lost. Close all browser windows and appoint a new browser window to the new IP address.

## 5.4 Enabling In-Band Management

If a connection cannot be established from within the network, it may be because the "Allow Inband" option has not been set. Access the management system out-of-band by connecting through the management port on the front of the LRA1203C and verify that this setting has been activated.

- Change to the Uplink View.
- Click the checkbox labeled "Allow Inband Access" so that it is checked.

### 5.5 Web Pages Are Loading Slowly

If the embedded management system is displaying properly but pages are refreshing very slowly, first try completely exiting from your browser and re-launching the application. If the problem persists, call Technical Support at 724-746-5500.

### 5.6 Multiple User Access

The embedded web management system is intended to work optimally with up to three concurrent users accessing the system. If more than three users are accessing the web server concurrently, the system may experience a slowdown.

### 5.7 Verifying In-Band Connection Speed

If you are accessing the system via an inband connection from a remote customer site (you are accessing the system through a provisioned DSL connection), verify the connection speed setting. For example, a 128-kbps IDSL connection may cause a delay when downloading a web page if there is heavy traffic traversing a line. Under normal conditions, however, even 128 kbps is sufficient for management system access.

### 5.8 Network Congestion

Because the embedded web server that powers the management system is a TCP/IP device, extensive network congestion may impact the performance of the management system. However, if this is the case, other network tasks will also slow down.

### 5.9 Pages Are Not Updating

The embedded management system uses several JavaScript event handlers to update configuration fields, which are then written immediately to NVRAM. Typically, the management system recognizes that a change has been made when the cursor leaves an input field, or when the selection of a pull-down menu has changed. If you are experiencing problems with configuration settings being recognized by the management system, try hitting the **Tab** key or clicking in the background area of the page to force the web server to trigger the change.

## **5.10 Browser Cache Settings**

Make certain that your browser is not configured for perpetual caching. Internet Explorer for Windows has a selectable cache option where new pages will be loaded “never,” forcing the browser to always load cached versions of the web page. If this setting is present in the browser, the management system will never indicate updates because the page will never be re-loaded by the browser.



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