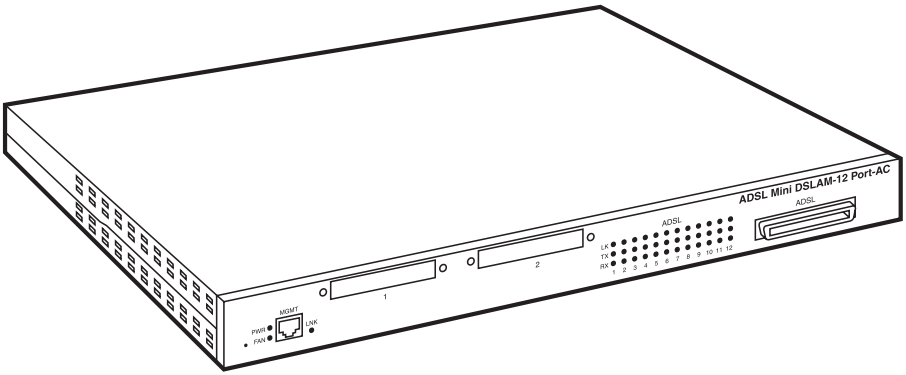
BLACK BOX®
NETWORK SERVICES

MAY 2001
LRA1201A

ADSL 12-Port Mini-DSLAM



CUSTOMER SUPPORT INFORMATION

Order **toll-free** in the U.S.: Call **877-877-BBOX** (outside U.S. call **724-746-5500**)
FREE technical support 24 hours a day, 7 days a week: Call **724-746-5500** or fax **724-746-0746**
Mailing address: **Black Box Corporation**, 1000 Park Drive, Lawrence, PA 15055-1018
Web site: **www.blackbox.com** • E-mail: **info@blackbox.com**

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.

EUROPEAN UNION DECLARATION OF CONFORMITY

This equipment complies with the requirements of the European EMC Directive 89/336/EEC.

CE

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 connectado 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 fisica 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 lineas de energia.

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 objectos liquidos 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: Objectos 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.

TRADEMARKS USED IN THIS MANUAL

UL® is a registered trademark of Underwriters Laboratories Incorporated.

Any other trademarks mentioned in this manual are acknowledged to be the property of the trademark owners.

1. Specifications

Bandwidth: Full rate: 8 Mbps downstream, 1.5 Mbps upstream; G.lite: 1.5 Mbps downstream, 512 kbps upstream

Distance: Up to 18,000 ft. (5.5 km)

Standards: IPacket™ and AutoIP™ compliant; NEBS: Level 3; EMC: FCC Part 15 Class A, CSA/C108.8, CE; Safety: UL® 1950; CSA C22.2 No. 950, CE

Indicators: LEDs: (1) PWR; Per-port LEDs: (1) LNK, (1) TX, (1) RX

Interface: ADSL: Ethernet, T1/E1, DS3/E3 (using uplink interface modules LRA1210C through LRA1214C)

Connectors: (1) RJ-21, (2) uplink interface module slots

Temperature: Operating: -40 to +149°F (-40 to +65°C); Storage: -40 to +158°F (-40 to +70°C)

Power: AC: 100 to 125 VAC, 2 amps *or* 200 to 240 VAC, 1 amp; DC: 48 VDC, 2.9 amps

Size: 1.75"H (1 rack unit) x 17"W x 14"D (4.4 x 43.2 x 35.6 cm)

Weight (Chassis only): 11.2 lb. (5.1 kg)

2. Introduction

CAUTION

Electronic equipment can be damaged by electrostatic discharges (ESD). We strongly recommend using proper static precautions when handling this equipment or any other information technology equipment.

The ADSL 12-Port Mini DSLAM remote access multiplexor is fully compliant with IPacket and AutoIP technology. It's ideal for high-speed, business-class DSL in a remote terminal, or as a small-scale central office or in-building DSL.

Supporting 10/100 Ethernet, T1/E1, and DS3/E2 backhaul technologies, the Mini-DSLAM can be deployed in a variety of network designs, and can deliver high-speed ADSL from locations that were previously considered too remote. With the Mini-DSLAM, CLECs, ILECs, and IP network service providers can extend their high-speed broadband Internet service areas.

Designed specifically for remote terminal co-location, the Mini-DSLAM can be managed remotely and only requires a single rack unit (1.75"H). The ADSL Mini-DSLAM uses existing T1/E1 technology within Digital Loop Carrier (DLC) systems for data backhaul to the main central office. Telcos can deploy extremely high-speed ADSL services to those service areas served through DLCs. The Mini-DSLAM supports 12 individual single copper pair ADSL lines, and data rates ranging from 512 kbps up to 8 Mbps symmetrical bandwidth distances up to 18,000 ft (5.5 km).

IPacket Technology

IPacket technology provides optimized IP services that make Ethernet easy to use and reliable on the service network. It eliminates the complexity of ATM and Frame Relay from this portion of the network, greatly decreasing administration and configuration costs. Also, more bandwidth is available for data transport. With IPacket, you regain 20% of bandwidth that was previously lost to transport overhead.

AutoIP Architecture

The AutoIP architecture is easy to deploy, delivering IDSL, SDSL, ADSL, and T1/E1 rapidly and with lower provisioning costs. AutoIP includes AutoSync line provisioning, AutoConfig configuration management, AutoRestore backup/recovery services, and AutoFilter traffic management. Together, these services deliver IP broadband services simply and easily.

3. Installation

Step 1: Unpack and Inspect the ADSL 12-Port Mini-DSLAM

Remove the Mini-DSLAM from its packaging and inspect the contents. You should have the following components:

- ADSL 12-Port Mini-DSLAM
- (4) Rubber feet
- (10) Rackmount bracket screws
- (2) Rackmount brackets
- (1) AC power cord

If anything is missing or damaged, please call Black Box at 724-746-5500.

Step 2: Installing the Uplink Interface Module

NOTE

Do not power on the Mini-DSLAM until after the uplink interface module has been installed.

Using a Phillips screwdriver, unscrew the Mini-DSLAM chassis and carefully lift off the top half of the chassis; set aside. Remove the blanking plate from the slot selected for the uplink interface module (either slot may be used). Carefully position the uplink interface module with the faceplate facing out of the vacated slot. Make sure that the connector between the module and the Mini-DSLAM is fully aligned. Secure the module in place with the four provided screws. Replace the chassis top and reattach with all eight screws.

Step 3: Site Selection

When selecting a site for the DSLAM, consider the following:

- The maximum recommended ambient temperature is 149°F (65°C). Internal temperatures of the rack should be considered.
- Place the DSLAM so that the cables will not become a tripping hazard or be dislodged from the unit.

- Do not block power supply vents or otherwise restrict airflow when installing the DSLAM in the rack.
- Consider mechanical loading of 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.
- Maintain a reliable grounding path in the rack system. The Mini-DSLAM is intended for a grounded connection.

For table-top mounting, attach the rubber feet to the bottom of the Mini-DSLAM. For rack mounting, attach the rackmount brackets to the sides of the Mini-DSLAM at the desired position with the provided screws.

Step 4: Powering Up the Mini-DSLAM

Connect power to the Mini-DSLAM from an appropriate power source. Turn on the power switch located on the top of the AC inlet. Verify that the Power LED is lit.

Step 5: Making the ADSL Connection

Plug the ADSL cable into the ADSL RJ-21 connector on the Mini-DSLAM. Verify the ADSL connection via the LNK LED on the front of the unit. A blinking LNK LED indicates that traffic is being received from the ADSL line.

NOTE

The distance of the copper cable between the Mini-DSLAM and the ADSL modem will affect the linking of the ADSL connection. If the distance is greater than a particular speed will support, the units will not link up.

The ADSL pinout information is as follows.

Table 3-1. ADSL pinout.

Port	DSL		Voice	
	Tip	Ring	Tip	Ring
1	26	1	39	14
2	27	2	40	15
3	28	3	41	16
4	29	4	42	17
5	30	5	43	18
6	31	6	44	19
7	32	7	45	20
8	33	8	46	21
9	34	9	47	22
10	35	10	48	23
11	36	11	49	24
12	37	12	50	25

Operational Modes

The ADSL 12-Port Mini-DSLAM supports both Full Rate and G.lite operational modes. The tables on the next page outline the various possible speed settings for both modes.

FULL RATE: G.DMT, T1.413, AND ALCATEL

All require an in-line splitter to be installed both at the customer premise and the Central Office or wherever the IP DSLAM may be located.

Table 3-2. Full rate speeds.

Upstream (kbps)	Downstream (kbps)
64	128
128	256
256	512
320	768
384	1024
448	1280
512	1536
768	1792
1024	2048
1280	2304
1536	2560
	3584
	4608
	5632
	7680

G.LITE

Table 3-3. G.lite speeds.

Upstream (kbps)	Downstream (kbps)
64	128
128	256
192	384
256	512
320	768
384	1024
448	1280
512	1536

Default Settings

These default settings may be changed by using the Mini DSLAM Network Management System (NMS). Please see the NMS users' guide for further instruction.

Adaptive Port Mode

Once the ADSL link had been established, it will negotiate the best data rate possible for the line before transmitting data.

VPI/VCI Detect On

Once established, the ADSL link will also configure itself to the detected VPI/VCI (Virtual Path Identifier/Virtual Channel Identifier) of packets being transmitted from the remote end station.

LED Indicators

- PWR: Steady green indicates normal operation for the entire module.

Per Port

- LNK: Pulsing green (once per second) indicates the ADSL connection is operational and the unit is receiving data packets from the remote unit on the other side of the ADSL connection. Steady green indicates the ADSL link exists, but there is no traffic flow.
- RX: Flashing amber indicates data is being received from the ADSL line.
- TX: Flashing amber indicates data is being transmitted to the ADSL line.

© Copyright 2001. Black Box Corporation. All rights reserved.

1000 Park Drive • Lawrence, PA 15055-1018 • 724-746-5500 • Fax 724-746-0746