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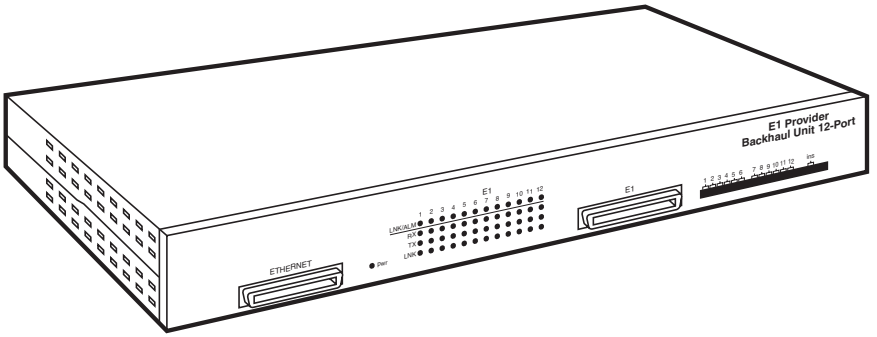
BLACK BOX®
NETWORK SERVICES

JANUARY 2001
LRA1217A-12
LRA1217A-12-DC

E1 Provider Backhaul Unit, 12-Port



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**
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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 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

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

1. Introduction

These instructions provide basic installation procedures for the E1 Provider Backhaul Unit, 12-Port. Two models are available:

- E1 Provider Backhaul Unit, 12-Port, AC (LRA1217A-12), AC.
- E1 Provider Backhaul Unit, 12-Port, DC (LRA1217A-12-DC).

CAUTION

Excess static electricity can damage your unit. Use proper static-protection handling techniques when installing and handling this equipment.

2. Installation

1. Unpack the E1 Provider Backhaul Unit, 12-Port and power supply (AC version only). Attach the included rubber feet for stackable installations, or attach rackmount brackets and mount the unit in an equipment rack. When mounting the unit in an equipment rack, please keep these guidelines in mind:

   a. The maximum recommended temperature is 86°F (30°C). Consider the internal temperatures of the rack for continued safe operation.

   b. Do not block the power-supply vents or otherwise restrict airflow when installing the unit in a rack.

   c. Consider the mechanical loading of the rack so that the rack remains stable and unlikely to tip over.

   d. Consider the overall loading of the branch circuit before installing any equipment in a rack environment.

   e. Maintain a reliable grounding path in the rack system. This unit is intended for a grounded connection.

2. For AC units, plug the power supply into both the power source and the back of the unit. It does not matter which order. For DC units, attach the DC power leads and ground connection to the appropriate terminals indicated on the back of the unit, and supply power to the unit. Verify that the Power LED is lit.

NOTE

Until the E1 link is established, the LNK, Tx, and Rx LEDs will also be lit on each port. When the E1 link has been established, the Tx and Rx LEDs will function normally, indicating activity on the Ethernet segment.

3. Verify that switch configuration is correct for the E1 line (see Table 2-1).

Table 2-1. Provider Switch Configuration (Per Port)

Switch #1	Switch #2	Timeslots	Bandwidth
DOWN	DOWN	1–31	1.984 Mbps
UP	DOWN	1–24	1.536 Mbps*
DOWN	UP	1–16	1.024 Mbps
UP	UP	1–8	512 kbps

*Default setting.

In addition, a third switch bank, entitled LINE, is provided to select the following for *all* of the E1 lines:

Switch	DOWN	UP
1 (Framing)	Extender Super Frame*	Super Frame
2 (Line Coding)	B8ZS*	AMI
5 (Timing)	Local*	Loop
6 (Not used)		

*Default settings.

Switch	0 dB*	-7.5 dB	-15 dB	-22.5 dB
3 (Line Buildout)	DOWN	UP	DOWN	UP
4 (Line Buildout)	DOWN	DOWN	UP	UP

*Default setting.

4. Attach the RJ-21 connector/cable to the E1 connector on the unit. This connection is typically made to a punchdown block for copper wire cross-connects in a telco office/room, or with an RJ-21 to RJ-45 breakout cable.

5. Verify the E1 connection via the E1 LED on the front of the unit. A steadily pulsing green LED (once per second) indicates that the E1 connection is established and operational.

6. Connect the local RJ-21 Ethernet connector/cable to network equipment (such as an Ethernet switch) and verify the physical link by the LNK LED on the front of the unit.

NOTE

The Provider units do NOT present Ethernet link (LNK) to the Ethernet network equipment if the E1 connection is not present. This feature allows for remote monitoring of the E1 line by simply monitoring the Ethernet port for link status.

Once the units have established both E1 and Ethernet links on both sides of the connection, normal data communication will flow through the units. This will provide a very long Ethernet connection at E1 speeds.

Table 2-2. E1 RJ-21 Port Pinout

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

Table 2-3. Ethernet RJ-21 Port Pinout

Port	Pin	
1	26	TX1+
	1	TX1-
	27	RX1+
2	2	RX1-
	28	TX2+
	3	TX2-
3	29	RX2+
	4	RX2-
	30	TX3+
	5	TX3-
	31	RX3+
	6	RX3-
4	32	TX4+
	7	TX4-
	33	RX4+
	8	RX4-
5	34	TX5+
	9	TX5-
	35	RX5+
	10	RX5-
6	36	TX6+
	11	TX6-
	37	RX6+
	12	RX6-
7	38	TX7+
	13	TX7-
	39	RX7+
	14	RX7-
8	40	TX8+
	15	TX8-
	41	RX9+
	16	RX9-
9	42	TX9+
	17	TX9-
	43	RX9+
	18	RX9-
10	44	TX10+
	19	TX10-
	45	RX10+
	20	RX10-

Table 2-3 (continued). Ethernet RJ-21 Port Pinout

Port	Pin	
11	46	TX11+
	21	TX11-
	47	RX11+
	22	RX11-
12	48	TX12+
	23	TX12-
	49	RX12+
	245	RX12-

LED Indicators

Each Ethernet/E1 port features the following status LEDs for at-a-glance monitoring:

- PWR: Steady green indicates normal operation.

Ethernet LEDs

- LNK: Steady green indicates an Ethernet link.
- RX: Flashing amber indicates data receive from the E1 line.
- TX: Flashing amber indicates data transmit to the E1 line.

E1 LED

- LNK/ALM: Flashing green indicates that E1 is operational (no red alarm).

  Solid green indicates link (frame synchronization), but no traffic is being received.

  No green indicates a red alarm (carrier failure alarm).

  Solid amber indicates a yellow alarm (carrier failure alarm).

  Flashing amber indicates a blue alarm (carrier failure alarm).