

T1 and E1 Line Cards
Models 8995-B2 and 8997-B2
Installation and User's Guide

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Product Documentation Online

Complete documentation for this product is available at www.paradyne.com.
Select *Support* → *Technical Manuals*.

Document Number	Document Title
8400-A2-GB20	<i>Shelf Concentration and Processing (SCP) Card with ATM Uplink User's Guide</i>
8400-A2-GB21	<i>Shelf Concentration and Processing (SCP) Card with IP Uplink User's Guide</i>
8400-A2-GZ40	<i>Shelf Concentration and Processing (SCP) Card Installation Instructions</i>
8620-A2-GN20	<i>8620 Broadband Loop Carrier Installation Guide</i>
8820-A2-GN20	<i>8820 Broadband Loop carrier Installation Guide</i>

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T1 and E1 Line Cards Description

The Models 8995 and 8997 line cards can be used in any 8620 or 8820 Broadband Loop Carrier (BLC) managed by a Shelf Concentration and Processing (SCP) card.

Physical Description

Each 8995 or 8997 access line card connects through one 50-position Telco connector (RJ48M) on the rear of the chassis. Each supports:

- Short haul and long haul configurations
- Surge protection for standards compliance
- Local and remote loopback testing functions
- Selectable test patterns
- Loopbacks and statistics

Each 8995 T1 line card supports:

- ESF framing
- B8ZS line code

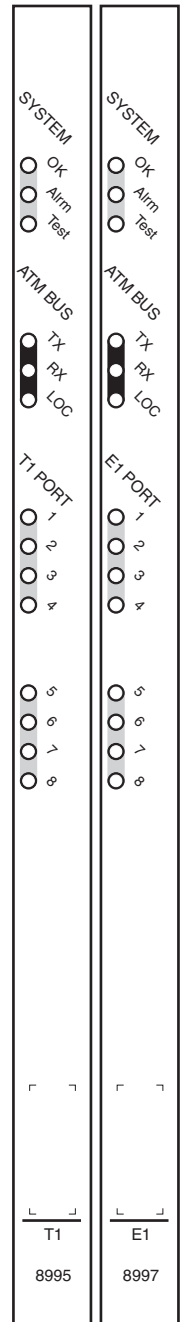
Each 8997 E1 line card supports:

- G.703 framing
- HDB3 line code
- 75 Ohm or 120 Ohm operation

ATM Features

ATM features include support for:

- Four service categories:
 - Constant Bit Rate (CBR)
 - Real-Time Variable Bit Rate (rt-VBR)
 - Non-Real-Time Variable Bit Rate (nrt-VBR)
 - Unspecified Bit Rate (UBR)
- 24 virtual circuits (VCs) per port
- Virtual Path (VP) switching
- Traffic shaping by virtual circuit (VC) or logical port



04-17498

04-17499

-
- Traffic policing, configurable at the virtual channel connection (VCC) level
 - F4 and F5 Operation, Administration, and Maintenance (OAM)
 - ATM Forum Traffic Management Specification Version 4.0
 - Congestion Management:
 - CLP 1 threshold
 - CLP 0+1 threshold
 - Early packet discard
 - Partial packet discard

IMA Features

IMA features include support for:

- ATM Forum Inverse Multiplexing Specification Version 1.1
- 1–8 IMA groups
- IMA configuration by port
- Automatic compensation for link differential delays up to 100 ms
- Selectable IMA frame length
- Selectable timing source:
 - Building Integrated Timing Supply (BITS)
 - Any T1 or E1 port
 - SCP card network interface
 - SCP card oscillator

CES Features

CES features include support for:

- 24 CES Interworking Functions (IWFs) per port (8995) or 31 CES IWFs per port (8997)
- CAS – Robbed Bit Signaling (8995) or Bit Oriented Signaling (8997)

Application Examples

Applications for the 8995 and 8997 line cards include subtending T1/E1 ATM or IMA devices, deploying ATM over T1 or E1, deploying ATM over T1 through Digital Loop Carriers (DLCs), and transmitting voice over broadband.

Subtending ATM or IMA Devices

Figure 1 shows a scenario where excess capacity of a high speed WAN connection is put to use by subtending DSLAMs in neighboring buildings.

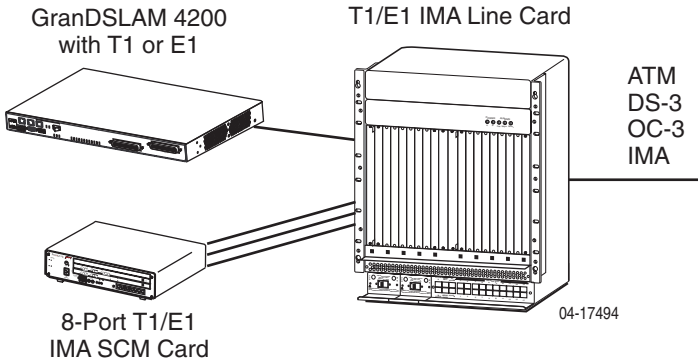


Figure 1. Subtending Application

Deploying ATM Over T1 or E1

In Figure 2, broadband services are deployed over T1 or E1, such as to customers for whom the bandwidth of bonded xDSL is insufficient.

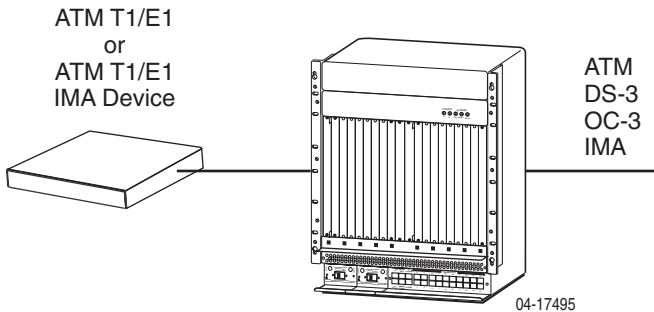


Figure 2. ATM Over T1 or E1

Deploying ATM Over T1 or E1 Through DLCs

In [Figure 3](#), broadband service is deployed to customers for whom IDSL is inadequate or prohibitively expensive.

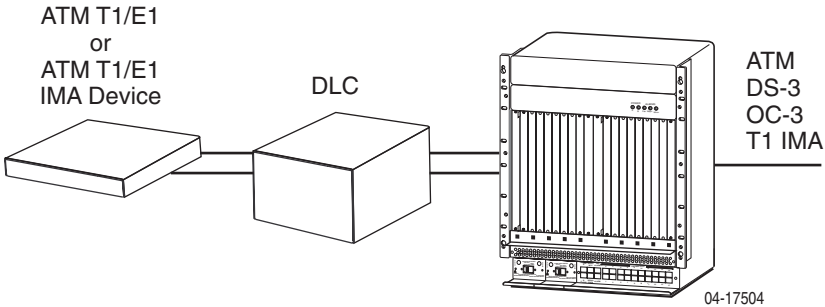


Figure 3. ATM Over T1 or E1 Through DLCs

Voice Over T1 or E1 ATM

[Figure 4](#) shows voice services implemented using ATM over standard T1 or E1 lines.

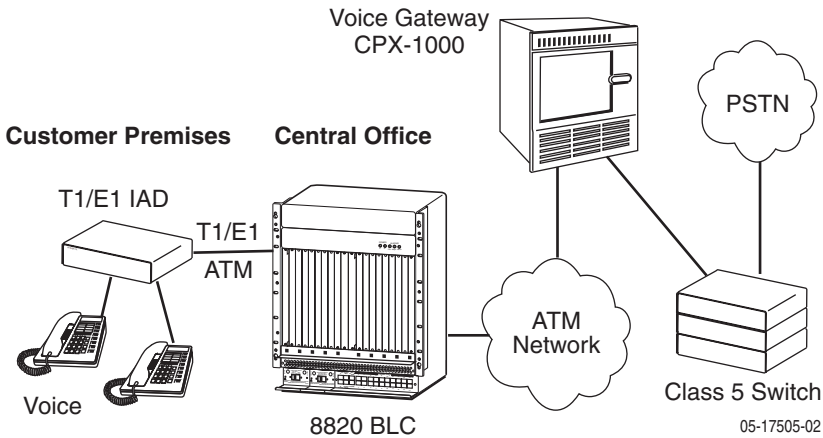


Figure 4. Voice Over T1 or E1 ATM

Voice Over T1 or E1 CES

Figure 5 shows voice services implemented using Circuit Emulation Services (CES) over standard T1 or E1 lines.

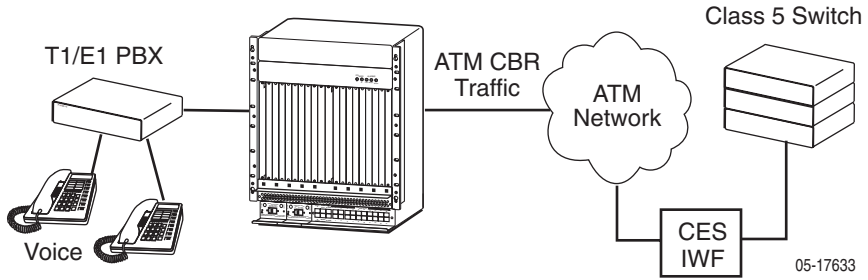


Figure 5. Voice Over T1 or E1 CES

Installation Overview

Installation and configuration of the T1 or E1 Line Card consists of:

- Obtain the applicable cable; refer to [Cabling](#) on page 13 for part numbers.
- Make sure the BLC is installed and power is supplied to the chassis.
- Install the card in the BLC.
- Connect to the T1 or E1 uplink.
- Configure your unit using the web or TL1 interface. Refer to the SCP card's online Help or the *8620 and 8820 Broadband Loop Carrier TL1 Reference* for configuration information.

Be sure to register your warranty at www.paradyne.com/warranty.

Installing T1 and E1 Line Cards

HANDLING PRECAUTIONS FOR STATIC-SENSITIVE DEVICES



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

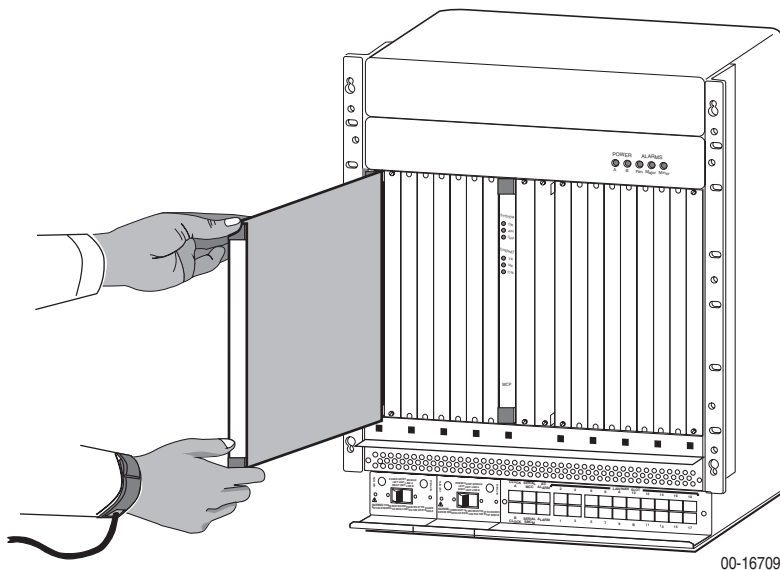
A T1 or E1 Line Card can be installed in, removed from, and replaced in a BLC without disrupting service to the other cards in the chassis.

Procedure

To install the T1 or E1 Line Card:

1. Determine in which slot the unit will be installed. Verify that cards in adjacent slots have been fastened.
2. Remove the filler plate from the installation slot and store for possible later use.

3. Holding the T1 or E1 Line Card with the component side facing up (8620 BLC) or facing right (8820 BLC), insert it into the card guides.



CAUTION:

Do not force the unit into the slot. This could damage the backplane connectors. If the card does not seat properly, remove the card and reinstall it. If it still does not seat properly, call your service representative.

4. Slide the unit into the slot until the power and network connectors seat firmly in the mating connectors on the backplane.

The unit performs a power-on self-test. All of the LEDs turn ON and OFF briefly. When the self-test is completed successfully, the SYSTEM OK LED begins to pulse.

If the LED is not pulsing, notify your service representative. See [Front Panel LEDs](#) on page 12.

5. Secure the unit by fastening the screws at each end of the faceplate.

Front Panel LEDs

The following table describes the meaning and states of the LEDs on the front panel.

Type	LED	LED is . . . *	Indicating . . .
SYSTEM	OK	Green, On	Card failure. System processing functions have stopped.
		Off	No power to card.
		Green, Pulsing	Card is functioning normally.
	Alarm	Amber, On	Alarm is present on the card.
		Off	Normal operation, no alarms.
	Test	Amber, On	Test in progress.
	Off	Normal operation, no tests.	
ATM BUS	TX	Off	Inactive.
		Green, Fast Blinking	Cells are being transmitted.
	RX	Off	Inactive, link down.
		Green, Fast Blinking	Cells are being received.
	LOC	Yellow, On	Loss Of Clock. ATM bus clock signal is not present.
		Off	Normal operation.
T1 PORT (8995) E1 PORT (8997)	1-8	Green, On	Good signal; the link is active.
Yellow, On		Link is in an alarm state.	
Off		Link is disabled.	

* Pulsing: LED turns off momentarily once per second.

Fast Blinking: LED turns off and on in equal duration 4 times per second.

Cabling

The following cables are used with this product:

- **Model 8995 or Model 8997 using 120 Ohm outputs:** Feature Number 8026-F1-001, which terminates in eight 8-pin modular jacks. See [Table 1, Feature Number 8026-F1-001 Pin Assignments, on page 18](#).
- **Model 8997 using 75 Ohm outputs:** Feature Number 8027-F1-001, which terminates in 16 BNC jacks. See [Table 2, Feature Number 8027-F1-001 Pin Assignments, on page 19](#).

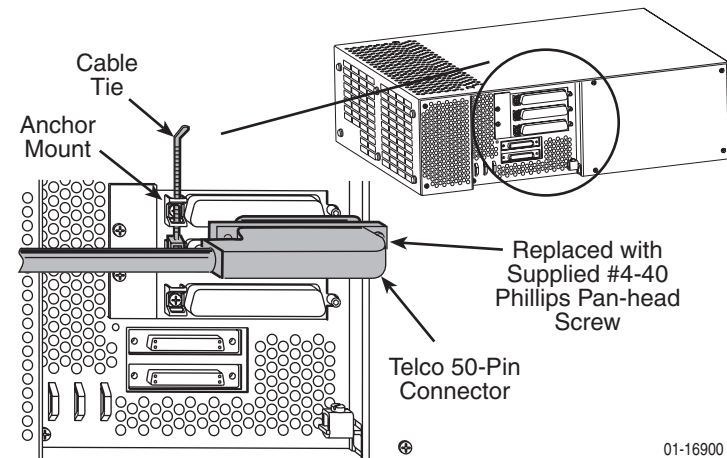
Attach the cable to the 50-pin Telco jack that is associated with the slot the T1 or E1 line card resides in.

Fastening the Cable with Cable Ties

► Procedure

To fasten the Telco connector to the chassis using the provided cable ties:

1. Replace the longer captive screw on the cable connector with the #4-40 Phillips pan-head screw shipped in a plastic bag with the BLC.
2. Locate the connector on the back of the chassis that corresponds with the slot where you installed the T1 or E1 card. Connectors are labeled 2 and 3 on the 8620 BLC, and 1–18 on the 8820 BLC.
3. Plug the Telco 50-pin cable into the appropriate connector.
4. Thread the provided cable tie through the anchor mount on the end of the connector where the cable will lie. Tighten the cable tie around the connector and cut off any excess.



01-16900

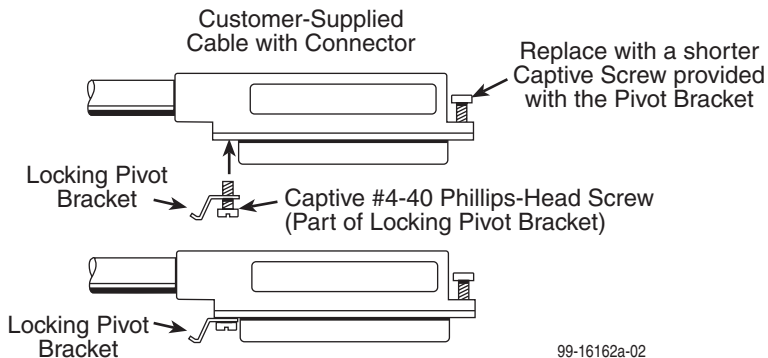
5. Secure the other end of the Telco 50-pin cable by tightening the captive pan-head screw.
6. If a ferrite choke is included with your T1 or E1 card, install it on the cable as close as possible to the chassis. If the choke fits loosely on the cable, hold it in place with a cable tie.

Fastening a Cable with Locking Pivot Brackets

► Procedure

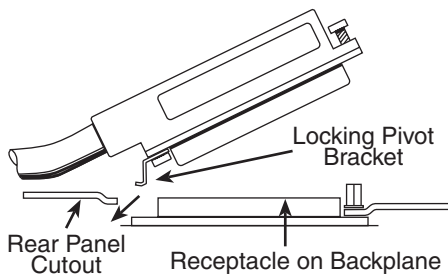
To fasten a Telco connector to the chassis with locking pivot brackets:

1. Replace the longer captive screw on the cable connector with the #4-40 Phillips pan-head screw shipped in a plastic bag with the BLC.
2. Install the locking pivot bracket onto the cable end of the connector using the captive screw, as illustrated below.



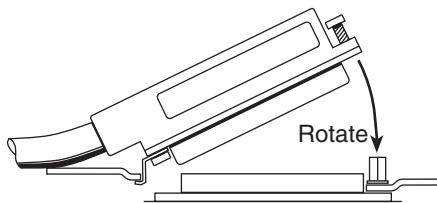
3. Locate the connector on the back of the chassis that corresponds with the slot where you installed the T1 or E1 card. Connectors are labeled 2 and 3 on the 8620 BLC, and 1–18 on the 8820 BLC.

4. Insert the bottom edge of the locking pivot bracket inside the lower edge of the rear panel cutout next to that connector.



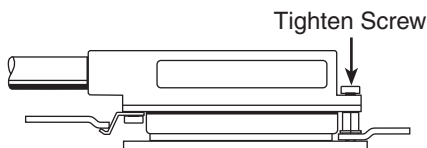
99-16163d-01

5. Align the two connectors.
6. Rotate the connector until it is fully seated.



99-16163e-01

7. Tighten the captive screw on the top of the cable's connector.



99-16163f-01

8. If a ferrite choke is included with your T1 or E1 card, install it on the cable as close as possible to the chassis. If the choke fits loosely on the cable, hold it in place with a cable tie.

Logging In to the BLC

To access the web interface:

► Procedure

1. Open your web browser. (Internet Explorer Version 6 or above is recommended.)
2. Type `http://` and the IP address of the SCP card into the Address field of your browser window. The default address is 10.10.10.10:



3. A login window appears. Enter the User ID and Password, and click on OK. The web interface screen appears.
4. Click on the Configuration menu tab. The configuration screens listed depend on the types of line cards and SCP card installed in the chassis.

Configuration

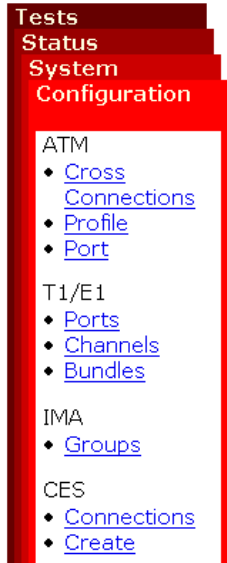
The following list shows the web interface Configuration screens most likely to require modification, along with some fields found on each screen. Refer to the online Help for information.

■ Configuration → ATM → Cross Connection → Create by Port

- Port A
- Port A VPI
- Port A Start and End VCI
- Segment Endpoint
- Port B
- Port B VPI
- Port B VCI

■ Configuration → ATM → Cross Connection → Create by Slot

- Start and End Slot
- Start and End Port
- Slot VPI
- Slot VCI
- Segment Endpoint
- SCP
- SCP Port VPI
- SCP Port Start VCI
- SCP Segment Endpoint
- Upstream Profile



-
- Downstream Profile
 - **Configuration → T1/E1 → Ports**
 - Circuit Name
 - Line Type
 - Line Build Out
 - Line Equalization
 - Timing
 - Port Status
 - **Configuration → IMA → Groups**
 - Group Status
 - Frame Length
 - Minimum Links
 - **Configuration → CES → Create**
 - DS0 Channel/DS0 Bundle
 - Connection Type
 - Service
 - Clock Mode
 - CAS
 - Partial Fill
 - CDVT
 - Port Status
 - VPI/VCI

Connector Pin Assignments

Table 1 lists connector pin assignments for the Model 8995 T1 IMA line card, and the Model 8997 E1 line card when used with modular connectors for a 120-ohm E1 connection. Table 2 lists connector pin assignments for the Model 8997 when used with BNC connectors for a 75-ohm E1 connection.

Table 1. Feature Number 8026-F1-001 Pin Assignments (1 of 2)

DS1 or 120 Ohm E1 Port	50-Position Telco Connector Pinouts	8026-F1-001 RJ48C Connector Pinouts	Function
Port 1	27	5	Data Out (Tip)
	2	4	Data Out (Ring)
	26	2	Data In (Tip)
	1	1	Data In (Ring)
Port 2	30	5	Data Out (Tip)
	5	4	Data Out (Ring)
	29	2	Data In (Tip)
	4	1	Data In (Ring)
Port 3	33	5	Data Out (Tip)
	8	4	Data Out (Ring)
	32	2	Data In (Tip)
	7	1	Data In (Ring)
Port 4	36	5	Data Out (Tip)
	11	4	Data Out (Ring)
	35	2	Data In (Tip)
	10	1	Data In (Ring)
Port 5	39	5	Data Out (Tip)
	14	4	Data Out (Ring)
	38	2	Data In (Tip)
	13	1	Data In (Ring)

Table 1. Feature Number 8026-F1-001 Pin Assignments (2 of 2)

DS1 or 120 Ohm E1 Port	50-Position Telco Connector Pinouts	8026-F1-001 RJ48C Connector Pinouts	Function
Port 6	42	5	Data Out (Tip)
	17	4	Data Out (Ring)
	41	2	Data In (Tip)
	16	1	Data In (Ring)
Port 7	45	5	Data Out (Tip)
	20	4	Data Out (Ring)
	44	2	Data In (Tip)
	19	1	Data In (Ring)
Port 8	48	5	Data Out (Tip)
	23	4	Data Out (Ring)
	47	2	Data In (Tip)
	22	1	Data In (Ring)

Table 2. Feature Number 8027-F1-001 Pin Assignments (1 of 2)

75 Ohm E1 Port	Function	50-Position Telco Connector Pinouts	BNC Connector
Port 1	Data In	1	Shell (Ring)
		26	Pin (Tip)
	Data Out	2	Shell (Ring)
		27	Pin (Tip)
Port 2	Data In	4	Shell (Ring)
		29	Pin (Tip)
	Data Out	5	Shell (Ring)
		30	Pin (Tip)

Table 2. Feature Number 8027-F1-001 Pin Assignments (2 of 2)

75 Ohm E1 Port	Function	50-Position Telco Connector Pinouts	BNC Connector
Port 3	Data In	7	Shell (Ring)
		32	Pin (Tip)
	Data Out	8	Shell (Ring)
		33	Pin (Tip)
Port 4	Data In	10	Shell (Ring)
		35	Pin (Tip)
	Data Out	11	Shell (Ring)
		36	Pin (Tip)
Port 5	Data In	13	Shell (Ring)
		38	Pin (Tip)
	Data Out	14	Shell (Ring)
		39	Pin (Tip)
Port 6	Data In	16	Shell (Ring)
		41	Pin (Tip)
	Data Out	17	Shell (Ring)
		42	Pin (Tip)
Port 7	Data In	19	Shell (Ring)
		44	Pin (Tip)
	Data Out	20	Shell (Ring)
		45	Pin (Tip)
Port 8	Data In	22	Shell (Ring)
		47	Pin (Tip)
	Data Out	23	Shell (Ring)
		48	Pin (Tip)

Technical Specifications

Table 3. Models 8996 and 8997 Technical Specifications

Specifications	Criteria
Size	Length: 10.4 inches (26.42 cm) Height: 11.15 inches (28.32 cm) Width: 1.0 inches (2.54 cm)
Weight	Approximately 1.2 lbs. (0.54 kg)
Approvals	
Safety Certifications	Refer to the equipment's label for approvals on product.
Power	48 V power is distributed through the BLC backplane.
Power Dissipation	12.1 watts
Physical Environment	
Operating temperature	-40° to 149° F (-40° to 65° C)
Storage temperature	-4° F to 158° F (-20° C to 70° C)
Relative humidity	5% to 85% (noncondensing)
Shock and vibration	Withstands normal shipping and handling.
T1 and E1 Specifications	
Number of ports	8 T1 or E1
Connector Type	RJ45M-type (50-pin Telco)
Standards Supported	RFC 495, ANSI T1.403, ITU G.703/G.704
Frame Formats	T1: Extended Superframe E1: CRC-4
Line Type	T1: B8ZS E1: HDB3
Data Rates Supported	T1: 1.544 Mbps per T1 (max. 8 T1) E1: 2.048 Mbps per E1 (max. 8 E1)
Facility Datalink Protocol	ANSI T1.403
Cable Distance	T1/E1 (short haul): 200 meters (656 feet) (LBO=0, -7, -15, -22 dB) T1/E1 (long haul): 2000 meters (6561.7 feet)

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- **Telephone:** Call our automated system to receive current information by fax or to speak with a company representative.
 - Within the U.S.A., call 1-800-870-2221
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