



## MIM-4E1

### Installation Instructions

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10. This Agreement shall be governed by the laws of the State of Florida, without regard to its provisions concerning conflicts of laws.

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## Unpacking and Inspecting the Equipment

### HANDLING PRECAUTIONS FOR STATIC-SENSITIVE DEVICES

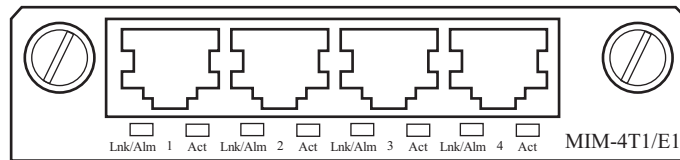


This product is designed to protect sensitive components from damage due to electrostatic discharge (ESD) during normal operation. When performing installation procedures, however, take proper static control precautions to prevent damage to equipment. If you are not sure of the proper static control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

If there is any visible damage, do not attempt to install the MIM-4E1; contact your sales representative.

## Installing the MIM-4E1

The MIM-4E1 Micro Interface Module provides additional uplink ports for the 4929 DSLAM or BSX8000-5 Broadband Services Switch.



05-17671

**NOTE:** All MIMs are hot swappable, although removal of a MIM disengages the upstream network connection for the DSLAM.

### Procedure

1. Using a flat-head screwdriver to loosen the fastening screws, remove the cover plate from the MIM port on the front of your 4929 or BSX8000.

**CAUTION:** The cover plate should be stored for possible future use: if the MIM is removed from your 4929 or BSX-8000, it must be replaced with either another MIM or a cover plate. Do not operate a 4929 or BSX8000 with an open MIM port.

2. Align the MIM-4E1 with the module guides inside the MIM port.
3. Slide the MIM-4E1 firmly into place. Do not use excessive force.
4. Secure the MIM-4E1 by tightening the fastening screws on the MIM faceplate with a flat-head screwdriver.

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## Connecting the E1 Lines

A primary feature of the MIM-4E1 is loop bonding capability, though the module can function with a single E1 connection as well.

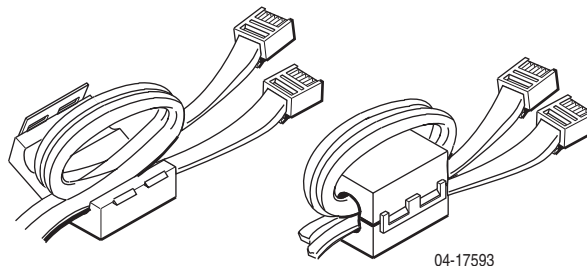
NOTE: A MIM-4E1 must be connected with E1 provider equipment; a connection between the MIM-4E1 and E1 subscriber equipment will not function.

### Loop Bonded Connection

Using multiple E1 lines for one network connection (loop bonding ) multiplies the speed and data passing capability of the connection. Multiple E1 lines also provide backup should any of the lines become disabled. A MIM-4E1 can only establish loop bonded connections with other loop bonding capable E1 provider equipment; refer to the E1 Loop Bonding Product to Product Feature Compatibility list (Document Number COMP-A2-GK43 ).

#### ► Procedure

1. If ferrite chokes are supplied with your MIM:
  - Open a ferrite choke.
  - One or two cables will fit in the ferrite choke. Make a loop at the end of your cables and close them in the ferrite choke. Position the choke as close as possible to the RJ48C connectors.
  - Snap shut the ferrite choke.



2. Plug your E1 cables into the E1 RJ48C ports on the MIM-4E1 faceplate; the order of connection is not important.
3. Verify all connections: the Port 1 and Port 2 Lnk LEDs on the MIM-4E1 faceplate will flash green to indicate the connections are established and operational.

### Single E1 Connection

A single line connection may be established between a MIM-4E1 and Paradyne's E1 provider equipment (stand-alone or IP DSLAM module), regardless of loop bonding capability.

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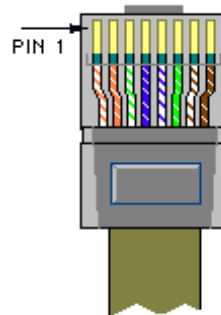
## ► Procedure

1. If a ferrite choke is supplied with your MIM:
  - Open the ferrite choke.
  - Make a loop at the end of your cable and close it in the ferrite choke. Position the choke as close as possible to the RJ48C connector.
  - Snap shut the ferrite choke.
2. Plug your E1 cable into one of the E1 RJ48C ports on the MIM-4E1. Any port may be used.
3. Verify the connection: the E1 link LED on the front of the MIM will flash green to indicate the connection is established and operational.

## E1 RJ48C Pinouts

If you are using a shielded E1 cable for your network connection, it must be grounded through pins 3, 6, 7, and 8.

PIN	CONNECTION
1	Rx Ring
2	Rx Tip
3	not used
4	Tx Ring
5	Tx Tip
6	not used
7	not used
8	not used



## E1 Default Settings

No configuration is necessary for the MIM-4E1 to operate at default settings:

- Speed: Adaptive. The MIM-4E1 determines timeslot and bandwidth configurations via communication with the remote E1 equipment to which it is connected. Each E1 connection has the capability of receiving data across all 31 channels at 1,984 kbps.
- Frame Type: Cyclic Redundancy Check (CRC)
- Line Code: High Density Binary 3 (HDB3)
- Timing: Adaptive. The MIM-4E1 determines clock source via communication with the remote E1 equipment to which it is connected.

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## E1 Parameter Configuration

MIM-4E1 parameters may be configured using the web-based Network Management System (NMS). Refer to the NMS User's Guide (Document Number NMS-A2-GB20) for detailed instructions.

### Frame Type

Frame type is the E1 data encapsulation method. A frame consists of 248 bits (8-bit samples of each of the 31 E1 data channels) plus 8 bits of overhead transmitted at a rate of 8,000 frames per second (1.984 kbps) across the E1 line.

- Cyclic Redundancy Check (Default) – Cyclic Redundancy Check (CRC) scrutinizes data integrity across the E1 line by appending a hexadecimal checksum to the end of each E1 frame (calculated from the previous E1 frame contents). The remote modem then makes a similar calculation upon receipt of each E1 frame and compares it to the checksum of the ensuing E1 frame.
- No Cyclic Redundancy Check – NMS offers an option to disable the Cyclic Redundancy Check function.

### Line Code

Line code is the E1 mode of transmission. The two line code options outlined below both fall within the International Telecommunication Union - Telecommunication Standardization Sector (ITU-T) G.703 Standards for Transmission Facilities.

- High Density Binary 3 (Default) – High Density Binary 3 (HDB3) is used to accommodate the minimum ones density requirement in the European public network. HDB3 line encoding helps prevent loss of synchronization between the MIM-4E1 and remote E1 equipment by using bipolar violations to guarantee the presence of pulses in the E1 line.
- Alternate Mark Inversion – Alternate Mark Inversion (AMI) simply alternates positive and negative pulses. Although AMI links typically encounter long strings of zeros which can potentially cause loss of synchronization between units, Paradyne products meet the European minimum ones density requirement internally such that loss of synchronization is prevented between the MIM-4E1 and remote E1 equipment with AMI just as it is with HDB3.

# LED Indicators

**Table 1. LEDs**

LED	STATE	INDICATION	ADDITIONAL INFORMATION
Lnk/Alm (Port 1 – Port 4)	Flashing Green*	Connection is established and active.	Traffic is flowing.
	Solid Green	Problematic connection.	A connection exists but no data is being passed.
	No Illumination	Red Alarm. The incoming connection to the MIM has been lost; no data is being received.	If the outgoing connection from the MIM has also been lost then the remote E1 equipment to which the MIM is connected will be in Red Alarm as well.
	Solid Amber	Yellow Alarm. The outgoing connection from the MIM has been lost; no data is being transmitted.	The remote E1 equipment has lost its incoming connection and is in Red Alarm.
	Pulsing Amber	Blue Alarm. An indirect connection has been lost; the MIM may no longer be receiving data from the remote E1 equipment.	The remote E1 equipment has lost a connection with an intermediate device and is in Red or Yellow Alarm.
Act (Port 1 – Port 4)	Flashing Green	Transmitting data.	
	Flashing Amber	Receiving data.	

\* A pulsing LED blinks steadily at a rate of once per second. A flashing LED blinks at a more rapid, less constant rate.

## Regulatory Notices

### UNITED STATES – EMI NOTICE:

**This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.**

**The authority to operate this equipment is conditioned by the requirements that no modifications will be made to the equipment unless the changes or modifications are expressly approved by Paradyne Corporation.**

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**▲ CANADA – EMI NOTICE:**

**This Class A digital apparatus complies with Canadian ICES-003.**

**Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.**

**▲ EUROPEAN REGULATORY COMPLIANCE**

**The following regulatory compliance information applies to the MIM-4E1 as installed in the 4929 DSLAM or BSX8000-5 Broadband Services Switch:**

**This Class A product complies with European Norm EN55022.**

**Warning: In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures to correct the situation.**

## Warranty, Sales, Service, and Training Information

Contact your local sales representative, service representative, or distributor directly for any help needed. For additional information concerning warranty, sales, service, repair, installation, documentation, training, distributor locations, or Paradyne worldwide office locations, use one of the following methods:

- **Internet:** Visit the Paradyne World Wide Web site at [www.paradyne.com](http://www.paradyne.com). (Be sure to register your warranty at [www.paradyne.com/warranty](http://www.paradyne.com/warranty).)
- **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
  - Outside the U.S.A., call 1-727-530-2340

## Product Documentation Online

Complete documentation for Paradyne products is available at [www.paradyne.com](http://www.paradyne.com). Select *Support* → *Technical Manuals*.

To order a paper copy of a Paradyne document, or to speak with a sales representative, please call 1-727-530-2000.



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