

## E1 Line Interface Modules for ATM Inverse Multiplexing

### Introduction to E1-IMA LIMs

The operational capabilities of an Xedge switch is determined in part by the slot controller in use and the number and type of associated line interface modules (LIMs). The Xedge E1 IMA LIM is used for high density ATM cell relay concentration and switching over 16 discrete E1 ports, or for inverse multiplexing of an ATM cell stream via 8, 4, or 2 E1 groups over 16 physical ports.

Two models of E1 IMA LIMs are available for use with their corresponding Xedge slot controller(s):

- The Xedge E1-IMA is used with Xedge PCX (Packet Cell Switch) or Xedge ECC (Enhanced Cell Controller)
- The Xedge E1-IMA+ is only used with Xedge PCL (Packet Cell Link)

In this document all physical and operational descriptions apply to both types of E1 LIMs, except where noted. Other slot controller and LIM combinations may also be supported in your network. Contact your GDC representative for more information.

### LIM Features

- Sixteen port E1 module
- For ATM IMA or 16 port E1 discrete operation
- ATM UNI and NNI format
- IMA UNI/NNI allows each E1 to be configured as a discrete E1 UNI/NNI, or assigned to an IMA group
- Comprehensive alarm reporting and performance monitoring
- Supports optional E1 Distribution Panel cabling
- Meets North American transmission standards

### Specifications

- Standards: ANSI T1.102, T1.107, T1.408, ITU-T G.703, G.804, ATM Forum UNI 3.1, ATMF compliant IMA
- Interface: E1
- Connector Type: 50 pin Telco 100/120 ohms
- Line Encoding: B8ZS, AMI, HDB3
- Framing: SF, ESF, Unframed, or G.704 Milliframe (E1)
- Transmit Line: Selectable to > 644 feet
- Transmit Timing: From received clock; internal oscillator; primary or secondary system reference (line of Node Timing Module)

### Intended Use

The E1 IMA LIM installs behind its slot controller at the midplane connector to provide all physical interfaces, cell delineation and convergence sub-layers. Up to two LIMs plug into a compatible slot controller at the rear panel of the Xedge chassis. The 16 physical links (0-15) of the IMA LIMs can be partitioned into 1, 2, 3 or 4 IMA Groups.

- With two IMA Groups, each group can be allocated up to eight physical links.
- With four IMA Groups, each group can be allocated up to four physical links.

### Diagnostics & Alarms

#### Loopbacks

The E1 IMA supports Transmit, Receive, and Payload Loopbacks

#### Status Indications

- IS (In Service)
- AL (Loopback or Loss of Frame)
- IS and AL (Loss of Service)

#### Alarms & Performance

The E1 IMA supports the physical layer alarms and performance monitoring statistics listed below:

- Loss Of Signal
- Loss Of Frame
- Alarm Indication Signal
- Far End Receiver Failure
- Line Coding Violations
- Line Errored Seconds
- Line Severely Errored Second
- Errored Seconds
- Severely Errored Seconds
- Alarm Indication Signal Seconds
- Unavailable Seconds
- Far End Errored Seconds

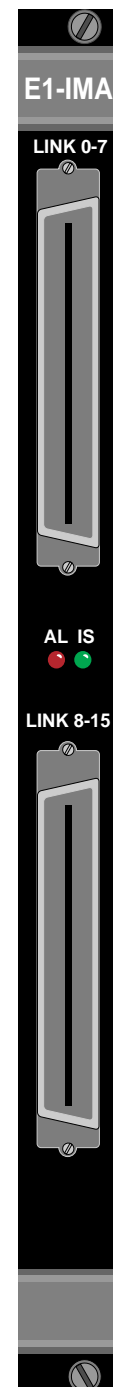


Figure 1: Front Panel Features of Xedge E1 IMA or E1 IMA+ LIMs