

IMX-4E1

E1 Inverse Multiplexer



FEATURES

- Provides inverse multiplexing to transmit a single high-speed data channel over up to four E1 links
- Data rates from 1.92 Mbps to 7.68 Mbps, with automatic rate fallback
- Sync data port interfaces: V.35, RS-530, V.36/RS-449, X.21 or HSSI
- Features Ethernet/Fast Ethernet bridge with VLAN support as DTE interface to connect 10BaseT and 100BaseT LANs and VLANs over E1 services
- Compensates for differential delays up to 64 msec
- Built-in BERT (V.52) and remote/local loopbacks

DESCRIPTION

- The IMX-4E1 Inverse Multiplexer enables splitting and transmitting a high-speed data channel of up to 7.68 Mbps, over up to four E1 links. IMX-4E1 spans the bandwidth gap between E1 and E3, providing increased bandwidth where services higher than E1 are either not available or too expensive.
- IMX-4E1 can be ordered with either two or four E1 links. For long range applications, an optional built-in LTU for each of the links is available.

- System timing options include:
 - Internal clock: the internal oscillator is the source for E1 links.
 - Loopback: the E1 transmit clock is derived from one of the E1 receive clocks.
 - Station clock: the E1 transmit clock is the source for framed/unframed all "1"s or G.703 compatible.
- Diagnostics capabilities include:
 - Local/remote data port loopback
 - Local/remote E1 links loopback
 - V.52 BERT.
- Setup, control, status, alarms and diagnostic information are provided via the front panel LCD display or an ASCII terminal/Telnet.
- The supervisory port supports dial-in/dial-out for remote out-of-band configuration and monitoring (dial-in), as well as for alarm reporting (dial-out).

SPECIFICATIONS

E1 INTERFACE

- **Number of links**
2 or 4
- **Compliance**
ITU-T Rec. G.703, G.704; G.823
- **Data rate**
2.048 Mbps (per link)
- **Line code**
HDB3
- **Framing**
 - *With CRC-4:* Time slot 0 multiframe for CRC-4 protection, and no multiframe (G.732N), intended for use with CCS.
 - *Without CRC-4:* No multiframe (G.732N), intended for use with CCS
- **Impedance**
 - 120Ω, balanced
 - 75Ω, unbalanced

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- **Signal level**
Receive level:
0 to -34 dB with LTU
0 to -10 dB without LTU
Transmit pulse:
Balanced: $\pm 3V (\pm 10\%)$
Unbalanced: $\pm 2.37V (\pm 10\%)$
- **Jitter performance**
As per ITU-T G.823
- **Connectors**
8-pin RJ-45, for balanced
Two BNC coaxial for unbalanced

DATA PORT INTERFACE

- **Data rate (sync type only)**
 $n \times 1.920$ Mbps (where $n=1$ to 4),
up to 7.68 Mbps
- **Interfaces and connectors**
 - V.35 with 34-pin connector
 - RS-530 with 25-pin connector
 - V.36/RS-449 with 37-pin connector (using RS-530 port, via supplied conversion cable)
 - X.21 with 15-pin connector
 - HSSI with 50-pin SCSI-2 connector
 - IR-ETH (Ethernet Bridge): RJ-45
 - IR-ETH/QH (Ethernet/Fast Ethernet bridge): RJ-45

Note: For specifications of Ethernet interfaces, refer to Table 1.

SUPERVISORY PORT

- **Interface**
V.24/RS-232, async
- **Connector**
9-pin D-type, female
- **Speed**
300-9600 bps, autobaud

GENERAL

- **Sync Data Port Timing**
DCE or External-DCE
- **System Timing**
Loopback (from any E1 link)
Internal (± 32 ppm)
Station clock
- **E1 Differential Delay**
Up to 64 msec
- **Station Clock**
Bit rate: 2.048 Mbps
Line code: AML or HDB3
Impedance: 120 Ω
Connector: 8-pin RJ-45
Format: Framed/Unframed all "1"s
or G.703 compatible
- **Diagnostics**
 - Local/remote loopbacks for data port and E1 links
 - Bert V.52, built-in
- **Statistics and Alarms**
E1 CRC-4 diagnostics per ITU-T G.706
Alarm buffer size: 100 events
- **Alarm Response**
Received impairment on E1
E1 response: Remote alarm
- **Indicators**
E1 (per link): LOC SYNC LOSS,
REM SYNC LOSS
Data port: TD, RD, TEST
- **Front Panel Control**
LCD: 2 rows x 16 characters
Push-buttons: Cursor, Scroll, Enter
- **Power Supply**
100 to 240 VAC, 18.5W
-48 VDC, 18.5W

Physical

Height: 4.4 cm / 1.7 in (1U)
Width: 43.2 cm / 17. in
Depth: 24.2 cm / 9.5 in
Weight: 2.3 kg / 5.0 lb

- **Environment**
Temperature: 0-45°C / 32-113°F
Humidity: Up to 90%,
non-condensing

ORDERING

IMX-4E1/#/*/~/%

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Specify number of E1 links

2 for 2 E1 links

4 for 4 E1 links

* Specify data port interface:

V35 for V.35

530 for RS-530

V36 for V.36/RS-449 (via supplied conversion cable)

X21 for X.21

HSSI for high-speed serial

ET for IR-ETH (UTP)

ET/QH for IR-ETH/QH (UTP)

~ Specify power supply:

AC for 100 to 240 VAC

48 for -48 VDC

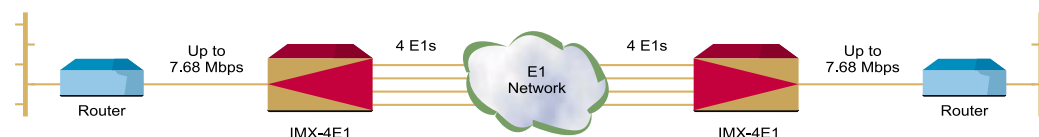
% Specify **LTU** for built-in LTU (default is without LTU)

Table 1. Ethernet Interface Modules Characteristics

Interface Module	LAN Table (addresses)	Filtering & Forwarding (frames/sec)	Buffer (frames)	Delay (frames)	Line Code	WAN Protocol	VLAN Support
IR-ETH	10,000	15,000	256	1	Manchester	HDLC	No
IR-ETH/QH	1,000	150,000	170	1	• Manchester (10BT) • MLT3 (100BT)	PPP	Yes

Note: Both Ethernet interface modules conform to the IEEE 802.3/Ethernet V2 standard.

APPLICATION



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