

E1 Access Series ERM-MUX/PLUS-LD

Multi-Service E1 Multiplexer



The ERM-MUX/PLUS-LD is a Rack Type E1 CSU/DSU Time Division Multiplexer for Fractional E1 network access which is designed for non-stop operation and provides an economic solution for central site installations. There are 10 slots available for hot-swappable ERM-MUX/PLUS-LD-I/O cards for installation into the ERM-MUX/PLUS-LD Rack. Two slots are provided for MUX-E1 cards, which may be configured as four separate E1 links or for redundant 2+2 operation of the E1 lines, safe guarding against expensive network down time. Two slots are also available for CPU cards, with the second CPU card acting as a hot stand by in case of primary card failure. Each MUX-E1 card may be linked to another ERM-MUX/PLUS-LD Rack to provide a variety of Datacom & Voice over E1 network services.

The ERM-MUX/PLUS-LD optionally accommodates up to two separate power supplies, which may derive power from AC (110/220) or DC (-48V) power sources. When two power supplies are installed, the modules provide complete power redundancy and are hot swappable even during the E1 cards' transmission. The ERM-MUX/PLUS-LD provides all interface connections on the front panel. BNC and RJ-45 are used for E1 Line interface connections, RJ-45 connections are used for all voice (FXO, FXS, E&M), for 10/100 Ethernet Bridge and G.703/64K Co-directional. Optional cable adapters are used to convert the DB-62F DCE ports of the I/O cards to RS-232 or HP68F DCE port of I/O card to V.35, RS-232, RS-530, RS-449, RS-422, X.21 and X.50. When cards are inserted in slots, LEDs will show the Line status on the front panel.

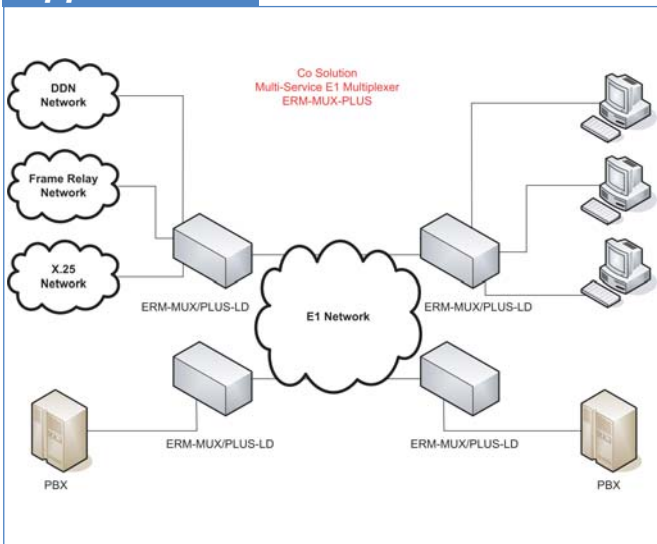
Features

- CPU redundancy (1+1)
- Drop & Insert function
- E1 redundancy (2+2)
- Datacom (V.35, RS-530, X.21), G.703/64 co-directional, Ethernet, DXO, FXS, KXS, E&M, LD
- NMP, SNMP and Web based management
- Power redundancy (1+1) [AC+AC, DC+DC, AC+DC]

Specifications

General Specification		
Power	AC	90 — 250VAC
	DC	-48VDC
Environment	Temperature	0 — 60°C (Operating); 0 — 70°C (Storage)
	Humidity	0 — 90% non condensing
Power Consumption	10W	
Dimensions(WxDxH)	350mm x 438mm x 176mm	
Weight	8kg (Chassis + dual power card + 8 I/O cards) 450g (per line card)	
Compliance	ITU-G.703, G.704, G.706, G.732, and G.823	

Application



Other Datacom I/O

Specifications

N x 64 Module, 4 channels, High Speed Data Interfaces	
Interfaces types	RS-530, X.21, V.35, RS-449 and RS-232
Connector	HD68 Female with appropriate cable adapter
Line code	NRZ
Data rate	N x 64kbps, where N equal 1 to 31 in CCS and N equal 1 to 30 in CAS
Async Module, 6 channels, <= 38.4kbps Async or 6 channels, 64/128kbps Sync	
Interfaces types	RS-232(V.24)
Connector	HD62 Female with appropriate cable adapter
Line code	NRZ
Data rate	<=38.4kbps x 6ch or 64/128kbps x 6 channels
G.703/64K Co-directional Module, 4 channels, Co-directional 64K	
Interfaces types	G.703/64K Co-directional
Connector	RJ-45 x 4
Line code	ITU-T G.703/64K, Co-directional
Data rate	64Kbps ±100ppm x 4 channels
Line impedance	120 ohm (balanced)
Frame mode	Unframed only
X.50 Module, 5 channels, <=19.2kbps, supports Async or Sync	
Interfaces types	RS-232(V.24)
Connector	High density DB62 connector, Female(DCE) with appropriate cable
Line code	NRZ
Data rate	From 2.4k — 19.2kbps x 5ch
Loopback type	Local loopback; Remote loopback

G.703 E1 I/O



Features

- 1+1 E1 protection or 2-E1 mode
- Hot-Swappable card
- 2 + 2 protection when 2 cards installed
- Unbalanced BNC or balanced RJ-45

Specifications - 1+1 E1 Line Card

Connectors	BNC for unbalanced; RJ45 Connector for balanced	
Framing	Unframed/Framed; CCS(PCM31)/ CAS(DCM30)	
Bit rate	2.048Mbps ±50 ppm	
Line code	AMI/ HDB3	
Line impedance	75 ohm, unbalanced (BNC) 120 ohm, balanced (RJ-45)	
Relative receive level	I O/ -43dB	
Transmit level	Pulse amplitude	Nominal 2.37V ±10% for 75ohm Nominal 3.00V ±10% for 120ohm
	Zero amplitude	±0.1V
Transmit frequency tracking	Internal timing ±30 ppm Loopback timing ±50 ppm External timing ±100 ppm	
Jitter performance	According to ITU-T G.823	
Compliance	ITU-T G.703, G.704, G.706 and G.732	

Ethernet I/O

Features

- Auto padding of undersized packets to meet the minimum Ethernet packet size requirement
- Automatic address learning, aging and deletion after 5 minutes
- Bridge module - 2 channels
- Buffering modes can be selected according to the setting of WAN and LAN line speeds
- Ethernet interface has automatic Twisted Pair polarity correction LAN
- Forwarding and filtering rate at wire speed with through put latency of 1 frame
- Real-time filtering with 256 address tables
- Up to 340 packet-buffering capacity

Specifications - 2 ch Ethernet Bridge

LAN	
Standard	Fully compliant with IEEE 802.3/ 802.3u
Connector	RJ45
Speeds	10BASE-T/100BASE-TX, Full or Half Duplex
Frames	Supports 64 to 1522 byte packet lengths, standard and extended length frames for VLAN tagging, etc
WAN	
Protocol	Synchronous HDLC
Rates	n x 64(56) Kbps, up to 2048Kbps

Sub-E1 I/O

Features

- Each card provides two E1 loops, each loop provides E1A/E1B channel independently
- Hot-Swappable
- Each first E1 loop may provide external clock to be used as system clock source

Specifications - 2 ch Sub E1 Card

Connectors	BNC for unbalanced; RJ45 Connector for balanced	
Framing	Framed CCS(PCM31) / CAS(PCM30)	
CRC check	CRC4 On/Off	
Bit rate	2.048Mbps ±50 ppm	
Line code	AMI/ HDB3	
Line impedance	75 ohm, unbalanced (BNC) 120 ohm, balanced (RJ-45)	
Relative receive level	0/ -43dB	
Transmit level	Pulse amplitude	Nominal 2.37V ±10% for 75ohm Nominal 3.00V ±10% for 120ohm
	Zero amplitude	±0.1V
Loopback type	Remote digital loopback	
Jitter performance	According to ITU-T G.823	
Compliance	ITU-T G.703, G.704, G.706 and G.732	

E&M Voice I/O

Features

- BD/GD wires are for battery and ground detection
- E&M card provides 6 independent channels
- E&M interface provides 1 pair of E and 1 pair of M
- E&M wires used in communicating control information
- Each E&M can support Type I, II, III, IV or V
- Each E&M voice channel can independently set Type
- Loop current range is normally 5-30mA, 70mA max
- Timeslot 16 complies with ITU-T G.711
- TX / RX attenuation, and 2 / 4 wire operation

Specifications - 6 ch E&M Voice Card

Input level	0 to -16dB, in 0.5dB steps
Output level	0 to -16dB, in 0.5dB steps
Impedance	900 or 600 Ohms; option
Return loss	2Wire 300-600Hz: >12dB 2Wire 600-3400Hz: >15dB 4Wire 300-3400Hz: >20dB
Group delay	2Wire @-10dBm0: <750uSec 4Wire @-10dBm0: <600uSec
Total Distortion	according to ITU-T G.223
Channel Cross-talk	not exceed -65dB, 1020Hz@0dBm
Out-of-band signal attenuation	-25dBm@4.6K-72KHz
Level not to exceed	-50dBm
Noise	<-65dBm0p weighted
Interface Connector	RJ45 x 6

FXO Voice



Features

- FXO card provides 6 independent channels
- Card has one alarm LED and 6 ring indicator LEDs
- Connect directly to PSTN

Specifications - 6 ch FXO Card

Connectors	RJ-45 x 6
On-hook resistance	> 100K ohms
Off-hook resistance	< 300 ohms
Input level	0 to -5dB, adj. in 0.5dB steps
Output level	0 to -7.5dB, adj. in 0.5dB steps
Impedance	600 Ohms
Power	DC voltage >70V DC current >150mA

FXS Voice

Features

- FXS card provides 6 independent channels
- Card has one alarm LED and 6 ring indicator LEDs
- Connects to standard telephones

Specifications - 6 ch FXS Card

Connectors	RJ-45 x 6
Effective ring voltage	AC 75VRMS $\pm 15V$ @25Hz $\pm 3Hz$ sine less than 10% THD
Ring voltage	>AC50VRMS at 300mA load
Loop resistance	<1.8K Ohms; voltage -48VDC including 300 Ohms
Handset current	>18mA
On-hook current	10mA $\pm 3mA$
Loop current range	18-50mA(off-hook)
Surge protection	1000V, 10uSec transient response, decay to 50% in 700uSec 300VRMS for less than 200mSec; no damage to any components 220VRMS for 15 minutes damage only local loop, no fire hazard
Input level	0 to -5dB, adj. in 0.5dB steps
Output level	0 to -7.5dB, adj. in 0.5dB steps
Impedance	900 or 600 Ohms; option
Return loss	300-600Hz: >12dB; 600-3400Hz: >15dB
Group delay	-10dBm0: <750uSec
Total Distortion	According to ITU-T G.223
Channel crosstalk	< -65dB, 1020Hz@0dBm
Out-of-band signal attenuation	-25dBm@4.6K-72KHz; not to exceed -50dBm
Noise	< -65dBm0p weighted

Features

- FXO card provides 6 independent channels
- LD (loop detect) provides 4 independent channels
- Hot swappable card
- Connectors located on face

Specifications

Connectors	RJ-45 x 6
Effective ring voltage	AC 75VRMS ±5V@25Hz ±3Hz sine less than 10% THD
Ring voltage	>AC50VRMS at 300mA load
Surge protection	1000V, 10uSec transient response, decay to 50% in 700uSec 300VRMS for less than 200mSec; no damage to any components 220VRMS for 15 minutes damage only local loop, no fire hazard
Input level	0 to -5dBr, adj. in 0.5dB steps
Output level	0 to -7.5dBr, adj. in 0.5dB steps
Impedance	900 or 600 Ohms; option
Return loss	300-600Hz: >12dB; 600-3400Hz: >15dB
Group delay	@-10dBm0: <750uSec
Total Distortion	According to ITU-T G.223
Channel crosstalk	Not exceed -65dB, 1020Hz@0dBm
Out-of-band signal attenuation	-25dBm@4.6K-72KHz; not to exceed -50dBm
Noise	<-65dBm0p weighted

SNMP

Features

- Able to read and set or modify the configuration at the same time
- The NMS enables the administrator to load the default setting configuration or save setting for later recovery
- Support for Telnet to operate from remote site in terminal mode. TFTP function to upgrade firmware
- Card configuration can be saved for recall later or for use on replacement line cards
- Supports web based management and monitoring functions

EMS

Features

- Management systems design for common case, suitable for huge network
- Vendor specific management systems which is easy to implement vendor specific functions

Ordering Info

Master Unit : Rack Mount ERM-MUX/PLUS Chassis	
ERM-MUX/PLUS-LD/AA-CH	19", 4U rack mount chassis for AC+AC power
ERM-MUX/PLUS-LD/AD-CH	19", 4U rack mount chassis for AC+DC power
ERM-MUX/PLUS-LD/DD-CH	19", 4U rack mount chassis for DC+DC power
Optional SNMP Module for ERM-MUX/PLUS	
ERM-MUX/PLUS-LD/SNMP	SNMP interface module (installs onto the CPU card)
CPU Card	
ERM-MUX/PLUS-LD-CPU	CPU card for NMP management (without SNMP I/F module)
Voice Interface Card	
ERM-MUX/PLUS-LD-FXO	6 channels FXO voice interface card
ERM-MUX/PLUS-LD-FXS	6 channels FXS voice interface card
ERM-MUX/PLUS-LD-E&M	6 channels 2/4 wires E&M voice interface card
ERM-MUX/PLUS-LD-MAGNETO	6 channels MAGNETO interface card
ERM-MUX/PLUS-LD	4 channels loop detect voice card

Low-Speed Interface Card	
ERM-MUX/PLUS-LD-RS-232	6 channels RS-232(V.24) interface card
ERM-MUX/PLUS-LD-G64K	4 channels G.703 64Kbps Co-directional interface card
ERM-MUX/PLUS-LD-X50	5 channels RS-232(V.24) interface card
High-Speed Interface Card	
ERM-MUX/PLUS-LD-HS-SERIAL	4 channels V.35/X.21/RS-449/RS-530 (cable selected) interface card
ERM-MUX/PLUS-LD-ET10/100	2 Channels Ethernet (10/100Base Tx) interface card
Power Module for ERM-MUX/PLUS (Redundant Power Protection Available)	
ERM-MUX/AC	AC power plug-in module (110/220 VAC)
ERM-MUX/ACV	AC power plug-in module with Voice Support
ERM-MUX/DC	DC power plug-in module (±48VDC)
ERM-MUX/DCV	DC power plug-in module with Voice Support
LTU Card	
ERM-MUX/PLUS-LD-E1	2 channels main E1 LTU card: G.703/G.704 (Fractional E1)
ERM-MUX/PLUS-LD-SubE1	2 channels E1A/E1B card: G.703/G.704