



# LOOP-AM 3440 Access DCS-MUX



## Features :

- Support DACS (Digital Access Cross-connect System) with full cross-connect
- Support full DS0 cross-connect, backplane capacity up to 128 Mbps
- Single controller, dual controller (1+1 protection) option
- Support 1 for 1 protection Y-BOX (Optional)
- Up to 64E1 or 64T1 WAN ports, or 4 E1/ T1 ATM Frame Relay
- Single -48V DC or optional dual -48V DC with load sharing
- 12 DTE plug-in slots
- **Mini plug-in card types:**
  - E1 card
  - T1 card
  - Mini Quad E1/ T1 card
  - E1/T1 ATM/Frame Relay card
  - 10/100baseT Router card
  - 10/100baseT Router (Phase 2) card
  - Fiber optical card
- **Single-slot DTE plug-in card types:**
  - 10-channel U card
  - 6-channel U card
  - 3-channel MDSL card without line power
  - 4-channel G.SHDSL card
  - 4-channel E1/ T1 card
  - 4-channel Ethernet switch card
  - 8-channel Ethernet switch card
  - 8-channel 2W/4W E&M card
  - 8-channel G.703 card at 64 Kbps data rate
  - 8-channel Dry Contact I/O card
  - 12-channel FXS card
  - 12-channel FXO card
  - 12-channel Magneto card
- **Dual-slot DTE plug-in card types:**
  - 6-channel X.21 card
  - 6-channel V.35 card
  - 6-channel V.36 card
  - 6-channel EIA530 card
  - 5-channel RS232 with X.50 substrate card
  - 3-channel MDSL card with line power
- Telnet, SLIP, SNMP, and Inband management support
- Craft interface port for connection to external LCD display
- Compatible to a GUI network management system.

## Description

The Loop-AM 3440 is an access DCS-MUX that can combine various digital access interfaces into E1 or T1 lines for convenient transport and switching. The Loop-AM 3440 Access DCS-MUX provides access for a variety of interfaces, including mini Quad E1/T1, Quad E1/T1, 10/100baseT Router, MDSL, G.SHDSL, G.703, U type, RS232, V.35, E&M, FXS, FXO and FOM. These interfaces are compatible with other Loop products such as the Loop-H 3900 (MDSL) and the Loop-U 3500 (U). Using these products, a DTE interface can be extended over RS232 copper wire pairs. Up to 120 time slots for the MDSL, U, RS232, X.21, V.36 and V.35 interfaces are then multiplexed to fill an E1 or T1 line, with full flexibility of time slot interchange.

This unit is a full cross-connect and can act as a mini DACS. This means that one or more of the WAN ports can be used as a Drop & Insert function with fractional E1/T1 lines, which can be muxed into a full E1/T1 line.

Redundancy is available in dual CPU controller and power supply options, making it an excellent fit for critical applications. And, though the chassis does not contain and has no need for fan cooling, a fan tray is available.

The Loop-AM 3440 supports local control and diagnostics by using an external 2-line by 40-character LCD display and keypads, or by using a VT-100 terminal connected to the console port. The Loop-AM 3440 also supports Ethernet, SLIP, Telnet, and SNMP, so that it can be controlled and diagnosed from remote locations as well. An in-band management channel with GUI are available. In addition to the LCD display, there is LED indication for all plug-in cards.

Finally, the Loop-AM 3440 consists of a rugged chassis made from reinforced aluminum, giving this equipment a more durable structure and a longer physical life.

## Ordering Information

To specify options, choose from list below:

Model	Description	Note
<b>Main Unit</b>		
Loop-AM 3440-CH	Main Unit Chassis without CPU, power, E1/T1 card	Basic Controller <b>(Discontinued)</b>
Loop-AM 3440-CHA	Wideband Main Unit without CPU, power, E1/T1 card	Basic Controller
<b>CPU Module</b>		
Loop-AM 3440-CCA	CPU card for 128Mbits backplane capacity (order two for redundancy)	For Loop-AM 3440-CHA only.
Loop-AM 3440-CC	CPU card for 32Mbits backplane capacity (order two for redundancy)	<b>(Discontinued)</b>
<b>Mini Plug-in Module</b> (Select 1 to 4 cards from below list.)		
Loop-AM 3440-E1	E1 Interface	
Loop-AM 3440-T1	T1 Interface	
Loop-AM 3440-M4E75	Mini Quad E1 Interface w/ 75 ohm	<ul style="list-style-type: none"> <li>• For Loop-AM 3440-CHA with Loop-AM 3440-CCA CPU only.</li> <li>• Include a 1M 8-BNC to DB25 Conversion Cable</li> </ul>
Loop-AM 3440-M4E120	Mini Quad E1 Interface w/ 120 ohm	<ul style="list-style-type: none"> <li>• Include a 1M 4-Phone Jack to DB25 Conversion Cable</li> </ul>
Loop-AM 3440-MT	Mini Quad T1 Interface	<ul style="list-style-type: none"> <li>• For Loop-AM 3440-CHA with Loop-AM 3440-CCA CPU only.</li> <li>• Include a 1M 4-Phone Jack to DB25 Conversion Cable</li> </ul>
Loop-AM 3440-AFRE	E1 Frame Relay to ATM inter-working or Frame Relay to Frame Relay concentration	
Loop-AM 3440-AFRT	T1 Frame Relay to ATM inter-working or Frame Relay to Frame Relay concentration	
Loop-AM 3440-RT	Router Interface	
Loop-AM 3440-R2	Router (Phase 2) Interface	
Loop-AM 3440-FOM	Fiber Optical Interface	
<b>Dual Slot Plug-in Module</b> (Shares the 12 available slots with the single slot cards.)		
Loop-AM 3440-3H	3-channel 2Mbits MDSL plug-in module	With line power, takes 2 DTE slots per card.
Loop-AM 3440-5RS232	5-channel RS232 with X.50 substrate plug-in module	
Loop-AM 3440-6V35	6-channel V.35 plug-in module with DB25S connector, for M34 please order conversion cable connector below	
Loop-AM 3440-6V35A	6-channel V.35 plug-in module with DB25S connector, for M34 please order conversion cable connector below. (2Mbits per channel)	
Loop-AM 3440-6V36A	6-channel V.36 card with DB25 connector via conversion cable to DB37	For Loop-AM 3440-CHA with Loop-AM 3440-CCA CPU only.
Loop-AM 3440-6X21A	6-channel X.21 card with DB15 connector	
Loop-AM 3440-6E530A	6-channel EIA530 card with DB25 connector	
Loop-AM 3440-6RS449A	6-channel EIA530 card with DB25 connector via conversion cable	
<b>Single Slot Plug-in Module</b> (Shares the 6 available slots with the dual slot cards.)		
Loop-AM 3440-4E1-cc	4-channel E1 Interface where <b>cc</b> = <b>RJ</b> for RJ48C connector <b>BNC</b> for RJ48C connector	For Loop-AM 3440-CHA with Loop-AM 3440-CCA CPU only.
Loop-AM 3440-4T1	4-channel T1 Interface	
Loop-AM 3440-3HA	3-channel 8Mbits MDSL plug-in module (2Mbits per channel)	<ul style="list-style-type: none"> <li>• For Loop-AM 3440-CHA with Loop-AM 3440-CCA CPU only.</li> <li>• With line power, takes 2 DTE slots per card.</li> </ul>

Loop-AM 3440-3H-LP	Line power daughter board for Loop-AM 3440-3H and Loop-AM 3440-3HA (One board for each MDSL channel)	<ul style="list-style-type: none"> <li>• Factory installed option available with -48 Vdc powered chassis only.</li> <li>• Fan tray required.</li> </ul>
Loop-AM 3440-3H-P5	Sealing current daughter board for Loop-AM 3440-3H and Loop-AM 3440-3HA (One board for each MDSL channel)	
Loop-AM 3440-4GH	4-channel G.SHDSL plug-in module	<ul style="list-style-type: none"> <li>• For Loop-AM 3440-CHA with Loop-AM 3440-CCA CPU only.</li> <li>• With line power, takes 2 DTE slots per card.</li> </ul>
Loop-AM 3440-8DC	8-channel dry contact I/O plug-in module	For Loop-AM 3440-CHA with Loop-AM 3440-CCA CPU only.
Loop-AM 3440-4EH	4-channel Ethernet switch plug-in module	For Loop-AM 3440-CHA with Loop-AM 3440-CCA CPU only.
Loop-AM 3440-8EH	8-channel Ethernet switch plug-in module	For Loop-AM 3440-CHA with Loop-AM 3440-CCA CPU only.
Loop-AM 3440-10U	10-channel IDSL plug-in module	
Loop-AM 3440-6U	6-channel IDSL plug-in module	
Loop-AM 3440-8CD	8-channel G.703 Interface at 64 Kbps data rate	For Loop-AM 3440-CHA with Loop-AM 3440-CCA CPU only.
Loop-AM 3440-8EM	8-channel 2W/4W E&M plug-in module	
Loop-AM 3440-12FXS	12-channel FXS plug-in module w/ 600/ 900 Impedance, Battery Reverse, w/o Ground Start and Metering Pulse	
Loop-AM 3440-12FXS-M	12-channel FXS plug-in module w/ 600/ 900 Impedance, Battery Reverse, [ Metering Pulse ]	
Loop-AM 3440-12FXS-G	12-channel FXS plug-in module w/ 600/ 900 Impedance, Battery Reverse, and [ Ground Start ]	
Loop-AM 3440-12FXS-GM	12-channel FXS plug-in module w/ 600/ 900 Impedance, Battery Reverse, [ Ground Start, and Metering Pulse ]	For Loop-AM 3440-CHA with Loop-AM 3440-CCA CPU only.
Loop-AM 3440-12FXO	12-channel FXO plug-in module w/ 600/ 900 Impedance, Battery Reverse, w/o Ground Start and Metering Pulse	<ul style="list-style-type: none"> <li>• w/: with</li> <li>• w/o: without</li> </ul>
Loop-AM 3440-12FXO-M	12-channel FXO plug-in module w/ 600/ 900 Impedance, Battery Reverse, [ Metering Pulse ]	
Loop-AM 3440-12FXO-G	12-channel FXO plug-in module w/ 600/ 900 Impedance, Battery Reverse, [ Ground Start ]	
Loop-AM 3440-12FXO-GM	12-channel FXO plug-in module w/ 600/ 900 Impedance, Battery Reverse, [ Ground Start, and Metering Pulse ]	
Loop-AM 3440-12MAG-1G	12-channel Magneto plug-in module w/ L1. GND	
Loop-AM 3440-12MAG-12	12-channel Magneto plug-in module w/ L1, L2	
Loop-AM 3440-12MAG-1G2	12-channel Magneto plug-in module w/ L1, L2, and L1. GND	

#### Others

Loop-AM 3440-SD	Single -48V DC Power Module	Order 2 single DC for dual DC application.
Loop-AM 3440-AP	AC to DC adapter	
Loop-AM 3440-FAN	Fan tray	Power supplied from rear of chassis.
Loop-AM 3440-LCD	External LCD monitor	Optional
Loop-AM 3440-ERING	E1 ring software	Optional (Only available for CHA, CCA, and 4E1)
23.000V35.LF0	V.35 DB25 to M34 conversion cable (1-foot)	
Loop-VV-B	1 for 1 protection Y-Box with BNC connectors (4-E1)	
Loop-VV-R	1 for 1 protection Y-Box with RJ48C connectors (16-E1)	

#### For Example:

#### Loop-AM 3440-CHA, Loop-AM 3440-CCA, Loop-AM 3440-4E1, Loop-AM 3440-10U, Loop-AM 3440-SD:

For model 3440 wideband controller with CPU card for 128Mbits backplane capacity, 4-channel E1 interface, one 10-port IDSL plug-in module, and one single DC power.

## **LOOP-AM 3440 E1/T1 MUX Product Specifications**

### **Fiber Optical Interface**

Source	MLM Laser	System Gain	30 dB
Wavelength	1310 ± 50 nm, 1550 ± 40 nm	Line Code	Scrambled NRZ
Power	-26 or -8 dBm	Detector Type	PIN-FET
Receiver Sensitivity	-38 dBm at BER < 10 <sup>-10</sup>	Fiber Type	Single mode
Data Rate	8Mbps (4x2Mbps)	Connector	SC/PC
Status Report	Card Type, Loopback, LOS	Protection	PDH optical ring
Management	Remote management via EOC channel		

### **2M MDSL Line Interface**

- Up to twelve 3-port MDSL cards without line power.
- Up to six cards with line power option, as the line power cards use two plug-in slots.
- Up to 2M max. data rate for each MDSL card.
- Full duplex with adaptive echo cancellation MDSL line coding.
- Unconditioned 19-26 AWG twisted pair.
- Line rate: 272, 400, 528, 784, 1168, 1552, 2064, 2320 for data rates n x 64 Kbps.

### **8M MDSL Line Interface**

- Up to twelve 3-port MDSL cards without line power.
- Up to six cards with line power option, as the line power cards use two plug-in slots.
- Per port up to 2M max. data rate.
- Full duplex with adaptive echo cancellation MDSL line coding.
- Unconditioned 19-26 AWG twisted pair.
- Line rate: 272, 400, 528, 784, 1168, 1552, 2064, 2320 for data rates n x 64 Kbps.

### **G.shdsl Line Interface**

- Number of port: 4
- Line code: 16-TCPAM, full duplex with adaptive echo cancellation
- Electrical: Unconditioned 19-26 AWG twisted pair
- Connector: RJ45
- Sealing current: Max. 20 MA source current

### **Clock**

- Source: From System, Line

### **Diagnostics Test**

- G.shdsl Loopback: To-LINE, To-bus
- BERT: QRSS

### **U Interface**

Data Port	Up to twelve 10-port or 6-port DTU cards
Type	Full duplex with echo cancellation
Line Type	Unconditioned twisted pair 19-26 AWG
Line Rate	56, 64, 112 or 128 Kbps
Line Coding	2B1Q
Connector	RJ48C

### **DTE Interface (V.35/ V.36)**

Data Port	Up to six 6-port DTE V.35/ V.36 cards
Data Rate	n x 64 Kbps, n = 1 to 32
Connector	For V.35 card: DB25S (optional conversion cable DB25S to M34 connector) For V.36 card: DB25S (optional conversion cable DB25S to DB37 connector)

### **DTE Interface (EIA530)**

Data Port	Up to six 6-port EIA530 DTE card
Data Rate	n x 64 Kbps, n = 1 to 32
Connector	DB25S (optional conversion cable DB25S to M34 connector)

### **DTE Interface (X.21)**

Data Rate	56 or 64 Kbps *n (n=1 - 24/31)	Connector	DB15
Mapping	Any sequential time slots	Remote Sending	ESF Mode, proprietary message

### **DTE Interface (RS232-X.50 mux.)**

Data Port	Up to six 5-port RS232 cards with X.50 plug-in, subrate, with subrate mux		
MUX	(a) 5 independent RS232, or (b) 5 subrate RS232 (X.50) muxed to 64K		
Data Rate	Mode (a) 5 independent RS232 :	1.2K, 2.4K, 4.8K, 9.6K, 19.2K, 38.4K, 48K , 64K SYNC	
		1.2K, 2.4K, 4.8K, 9.6K, 19.2K ASYNC	
	Mode (b) 5 mux together :	1.2K, 2.4K, 4.8K, 9.6K SYNC	
		1.2K, 2.4K, 4.8K, 9.6K ASYNC	

**NOTE:** Mode (a) and mode (b) cannot be mixed.

Connector	DB25S
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### Network Line Interface - T1

Line Rate 1.544 Mbps  $\pm$  50 bps  
Line Code AMI or B8ZS  
Input Signal ABAM cable length up to 655 feet

Output Signal DSX1  
Framing D4/ESF (selectable)  
Connector RJ48C

### Network Line Interface - E1

Line Rate 2.048 Mbps  $\pm$  50 ppm  
Line Code AMI or HDB3  
Input Signal ITU G.703 to -10dB  
Output Signal ITU G.703

Framing ITU G.704  
Connector BNC/RJ48C  
Electrical 75 ohm Coax/120 ohm twisted pair  
Jitter ITU G.823

### Network Line Interface - Mini 4E1

Line Rate 2.048 Mbps  $\pm$  50 ppm  
Line Code AMI or HDB3  
Input Signal ITU G.703 to -10dB  
Output Signal ITU G.703

Framing ITU G.704  
Connector DB25S  
Electrical 75 ohm Coax/120 ohm twisted pair  
Jitter ITU G.823

### Network Line Interface - Mini 4T1

Line Rate 1.544 Mbps  $\pm$  50 bps  
Line Code AMI or B8ZS  
Input Signal ABAM cable length up to 655 feet

Output Signal DSX1  
Framing D4/ESF (selectable)  
Connector DB25S

### Network Line Interface - 4T1

Line Rate 1.544 Mbps  $\pm$  50 bps  
Line Code AMI or B8ZS  
Input Signal ABAM cable length up to 655 feet

Output Signal DSX1  
Framing D4/ESF (selectable)  
Connector RJ48C

### Network Line Interface - 4E1

Line Rate 2.048 Mbps  $\pm$  50 ppm  
Line Code AMI or HDB3  
Input Signal ITU G.703 to -10dB  
Output Signal ITU G.703

Framing ITU G.704  
Connector BNC, RJ48C  
Electrical 75 ohm Coax/120 ohm twisted pair  
Jitter ITU G.823

### Router Interface

Number of ports 2 LAN ports, Max. 31 WAN ports  
Physical Interface 10 Base T x 1, 10/100 BaseT x 1  
Connector RJ45  
Routing protocol RIP-I, RIP-II  
Data Rates Channelized N x 64 Kbps up to T1/E1 capacity  
Supporting Protocols TCP/IP, PPP, HDLC  
Management VT-100, SNMP

### Router (Phase 2) Interface

#### **LAN Interface**

- 2 LAN ports
- Physical interface 10/100 Mbps

#### **Physical Interface**

- WAN: Up to 64 TDM ports
- LAN: Two 10/100 Base-T Ethernet port
  - Speed auto-sensing
  - Half/full duplex auto-negotiation
  - Configurable fixed speed/duplex mode
  - Auto MDI/MDI-X crossover

#### **Data Rate**

- Channelized N x 64 Kbps ( N = 1 to 32 ) up to T1/E1 capacity

#### **DHCP**

- DHCP server support for LAN users (RFC2131, RFC2132)
- BOOTP compatible

#### **WAN Interface**

- Max. 64 WAN ports
- Layer 2 protocol: HDLC, PPP, Cisco compatible HDLC, Frame Relay (up to 64 PVCs)

#### **Routing Protocol**

- RIP-I, RIP-2
- OSPF
- Static Route

#### **Internet Access Sharing**

- NAT and NAPT support PAT (Port Address Translation)
- Virtual service (Address/port forwarding)

#### **Access Control & Firewall**

- Packet filtering based on
  - Up to 4 control lists
  - Inbound/outbound direction
  - Source/destination IP address
  - Protocol types (ICMP, TCP, UDP)
  - Port number rang

### Remote Bridge

- PPP/BCP
- User configurable aging time
- Up to 16K MAC Table
- Cisco ISL packet transparent
- VLAN packet transparent
- Bridge with IP
- 802.1D Spanning Tree Protocol support
- Padding/un-padding Ethernet CRC checksum

### Management

- SNMP
- MIB: MIB-II and proprietary MIB
- Telnet
- Serial console with CLI
- TFTP firmware download
- Configuration upload/ download

### Administration & Diagnostics

- Ping
- Trace route
- Telnet

### Console Port

- Connector DB9S
- ElectricRS232
- Protocol CLI

### Performance Monitor

- Alarm History
- Alarm Queue

### Ethernet Switch Interface

- Support Mapping each 802.1Q VLAN ID to a physical or logical channel (Data rate = K x 64Kbps, K=1 to 32)
- Routing Protocol (Future option)
- Management: Central management by controller via RS-485
- Life cycle: MTBF > 10 years
- Manufacturing and Components: RoHS Compliance
- Ethernet LAN Port
  - Port Number: 4 or 8 port (manufacture option)
  - Connector Type: RJ45
  - Data rate: Mx64Kbps (M=1 to 32) **NOTE: Each Ethernet port can access MxDS0 of backplane bus**
  - Support Auto-negotiation
  - Support MDIX
  - Support Bridge function
  - Support 802.3 10BaseT, 802.3u 100BaseTX, 802.1q VLAN
  - Support Spanning Tree Protocol and Group Spanning Tree Protocol
- Ethernet WAN Port
  - Data rate per WAN port: N x 64Kbps (N = 1 to 32)
  - WAN Protocol:
    - MLPPP (Phase II)
    - PPP
    - HDLC
    - Cisco-like HDLC
    - Frame Relay (up to 64 PVCs)
    - Remote Bridge support (padding/un-padding Ethernet CRC checksum)

### Co-directional Interface

Interface	ITU G.703 64 Kbps co-directional interface
Connector	120ohm, RJ48
Line Distance	Up to 500 meters
Loopback	DTE Payload Loopback, Local Loopback

### ATM Frame Relay Network Line Interface

- Supporting Network Interworking (FRF.5) and service interworking (FRF.8).
- Network Interface:
  - T1 Module: *T1 ATM UNI*  
*FR (n x 64 Kbps, n=1 to 31)*
  - E1 Module: *E1 ATM UNI*  
*FR (n x 64 Kbps, n= 1 to 31)*
- Up to 31 logical FR channels can be concentrated/ de-concentrated to FR or ATM.
- Service Ports:
  - T1/FT1 interface: *n x 64 Kbps, n=1 to 24*
  - E1/FE1 interface: *n x 64 Kbps, n= 1 to 31*
- Support HDLC to FR
- Support HDLC to ATM
- Supporting FR to FR multiplexing.
- Support up to 128 DLCIs for total of 31 FR interfaces.
- Support up to 128 VCs.
- Peak cell rate on DLCI basis.
- Manufacturing disable/enable ATM scrambling for internal testing (E1 ATM only).

- AAL0 and AAL5 are supported in the ATM adaptation layer.
- Support VBR service.
- ITU FR management protocols are supported.
- Flash memory software download through RS485.
- Only the PVC type of ATM/FR service is supported.

#### E&M Voice Card

Connector RJ45 connector  
 Alarm Conditioning CGA busy after 2.5 seconds of LOS, LOF  
 Encoding A-law or  $\mu$ -law, user selectable together for all  
 Impedance Balanced 600 or 900 ohms  
 Longitudinal Rejection 55 dB  
 Loss Adjustment -21 to +10 dB / 0.1dB step transmit & receive  
 Signal/Distortion > 46dB with 1004 Hz, 0dBm input  
 Frequency Response - 0.25 to -1 dB from 300 to 3400 Hz  
 Signaling Type 1, Type 2, Type 3, Type 4, and Type 5, Transmit only, A side and B side for all types

- All in-band signaling tones are carried transparently by the digitizing process.
- Customer is responsible for in-band signaling compatibility between a telephone and a switch, or between a PBX and a switch.

#### E&M Signaling Bits

		E&M							
		M - Tx				E - Rx			
		A	B	C	D	A	B	C	D
Normal	IDLE - ON HOOK	0	0	0	1	0	0	*	*
	ACTIVE - OFF HOOK	1	1	0	1	1	1	*	*
A-Bit Invert	IDLE - ON HOOK	1	1	0	1	1	1	*	*
	ACTIVE - OFF HOOK	0	0	0	1	0	0	*	*

NOTE: \* = Don't care.

#### Voice Card ( 12 FXS , 12 FXO )

Connector RJ11  
 Alarm Conditioning CGA busy after 2.5 seconds of LOS, LOF  
 Encoding A-law or  $\mu$ -law, user selectable together for all  
 Impedance Balanced 600 or 900 ohms (selectable together for all)  
 Longitudinal Rejection 55 dB  
 Longitudinal Max 2.5 volts peak AC  
 Loss Adjustment -21 to +10 dB / 0.1dB step transmit & receive  
 Signal/ Distortion > 46dB with 1004 Hz, 0dBm input  
 Frequency Response - 0.25 to -1 dB from 300 to 3400 Hz, coincide with ITU-T G.712  
 Idle Channel Noise Max. -65 dBmop  
 Inter-Modulation Coincide with ITU-T B.712  
 Loop Resistance Min. 300 ohm, Max. 1800 ohm  
 2-Wire Return Loss >28 dB echo, >20 dB signing  
 FXS Loop Feed Nominal - 48Vdc with 20mA current limit  
 FXS Ringing 1 REN at 5K meters per port  
 16.5Hz, 20Hz, 25Hz, 50Hz, user selectable for all  
 78 Vrms (sine wave)  
 2 sec on 4 sec off, or 1 sec on 2 sec off optional for PLAR  
 Signaling Loop Start, DTMF, pulse, PLAR, Battery Reverse  
 Optional Signaling Ground Start, Metering pulse (12KHz, 16KHz)  
 (for special order)  
 Signaling Bit A,B,C,D Programable

- All in-band signaling tones are carried transparently by the digitizing process.
- Customer is responsible for in-band signaling compatibility between a telephone and a switch, or between a PBX and a switch.

#### Magneto Voice Card (old crank-handle hot-line telephones)

Connector RJ11  
 Alarm Conditioning CGA busy after 2.5 seconds of LOS, LOF  
 Encoding A-law or  $\mu$ -law, user selectable together for all  
 Impedance Balanced 600 or 900 ohms (selectable together for all)  
 Longitudinal Rejection 55 dB  
 Loss Adjustment -21 to +10 dB / 0.1dB step transmit & receive  
 Signal/ Distortion > 46dB with 1004 Hz, 0dBm input  
 Frequency Response - 0.25 to -1 dB from 300 to 3400 Hz, coincide with ITU-T G.712

Idle Channel Noise Max. -65 dBmop  
Inter-Modulation Coincide with ITU-T B.712  
Return Loss >28 dB echo, >20 dB signing

#### **Signaling**

Minimum Detectable Ringing Voltage 32 Vdc  
Ringing Detectable Across Tip and Ring, Tip and Ground, Ring and Ground  
Ringing Generation Voltage: 78RMS  
Frequency: 20Hz  
Cadence: 1 sec on 2 sec off, or 2 sec on 4 sec off  
Ringing Send Across Tip and Ring, Tip and Ground, Ring and Ground

Signaling Magneto MRD(Ringing across Tip and Ring or Tip and Ground)  
Signaling Bit A,B,C,D Programable

- Signaling is carried transparently by the digitizing process.
- Use Magneto card default setting for communications between magneto telephones
- Use Magneto card PLAR mode setting for communications between a magneto telephone and a regular telephone

#### **Front Panel**

LED 1 per U/MDSL/V.35-interface, ACO, Power, SYNC/TEST, LOF, BPV, RAI/AIS

#### **Physical /Electrical**

Dimensions 435 x 225.5 x 220 mm (W×H×D)  
Power Single/ Dual -48V DC, 100 Watts max.  
Temperature 0-50°C  
Humidity 0-95%RH (non-condensing)  
Mounting Desk-top stackable, 19" /23" rack mountable  
Line Power Supply (For MDSL card only) Available only with DC power.  
(For MDSL card only) 60 mA constant current source, selectable peak voltage of 190 Vdc  
Sealing Current Supply (For MDSL card only) 20 mA constant current source.

#### **Clock Source**

Internal, E1/T1 Line, External

#### **Alarm Relay**

Alarm Relay, Fuse alarm, and performance alarm

#### **System Configuration Parameters**

Active Configuration, Stored Configuration, and Default Configuration (Stored in Non-volatile Memory)

#### **Supervisor**

- RS232, VT100 - front panel
- 10 Base-T, Ethernet, SNMP - front panel
- CONSOLE/SLIP - front panel
- In-band 64 Kbps

#### **Performance Monitor**

Performance Registers Last 24 hours performance in 15 minutes interval and last 7 days in 24 hours summary  
Separate Registers 12 MDSL ports, network, user, and remote site  
Performance Reports Reports include MDSL port unsync Date & Time, Errored Second, Unavailable Second, E1 Bursty Errored Second, Severe Errored Second, Degraded Minutes, and Controlled Slip Second. Also available in Statistics (%)  
Alarm Queue Containing 40 alarm records which record the latest alarm type, location, and date & time  
Threshold Bursty Seconds, Severely Errored Second, Degraded Minutes

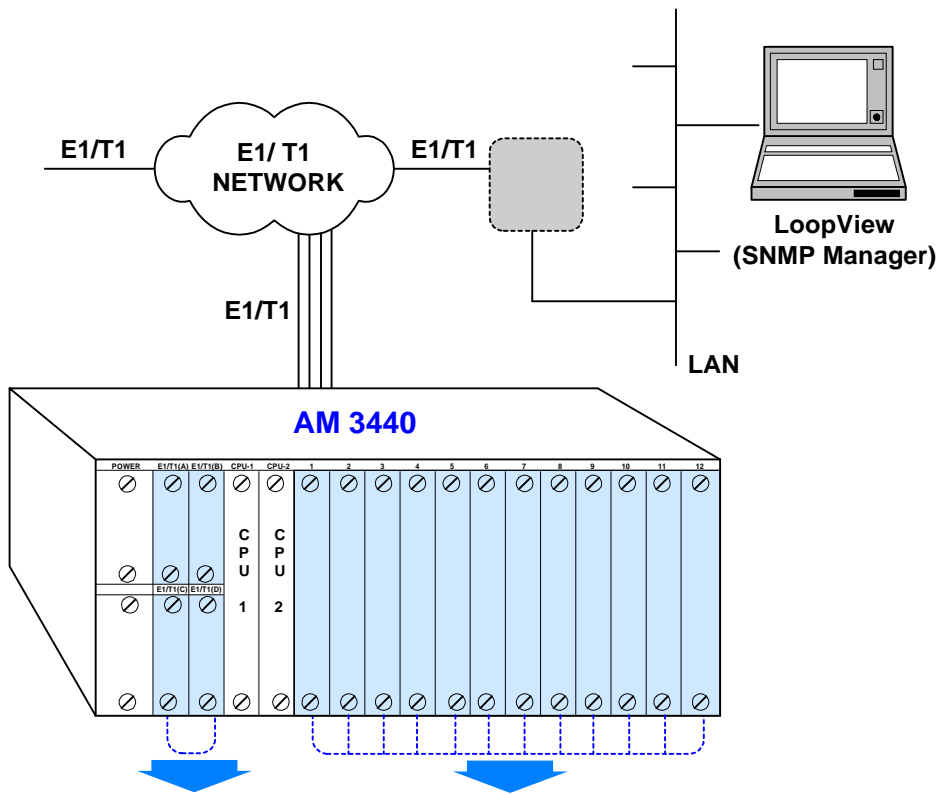
#### **Diagnostics Test Line**

Loopback E1/T1 interface (Line Loopback, Payload Loopback, Local Loopback)  
MDSL interface (Payload Loopback, Local loopback)  
U interface (Local Loopback, Payload Loopback)  
Test Pattern E1/T1 interface (2<sup>15</sup>-1 PRBS, 3-in-24, 1-in-8, 2-in-8, 1:1 patterns)  
U/MDSL/DTE interface (2<sup>11</sup>-1 BERT)

#### **Compliance**

EN55022 Class A, EN50024, FCC Part 15 Class A, FCC Part 68, CS-03, IEC60950, UL60950  
ITU G.703, G.704, G.706, G.732, G.736, G.823, G.826, G.711, G.775, O.151  
ITU-T V.11, V.28, V.54

## Application Illustration:



- E1/ T1 plug-in
- Mini Quad E1/ T1 plug-in
- E1/ T1 ATM Frame Relay plug-in
- 10/100 BaseT Router plug-in
- 10/100 BaseT Router(Phase 2) plug-in
- Fiber Optical plug-in
- 10-channel U plug-in
- 6-channel U plug-in
- 8-channel 2W/ 4W E&M plug-in
- 8-channel G.703 64 Kbps plug-in
- 8-channel Dry Contact I/O plug-in
- 12-channel FXS plug-in
- 12-channel FXO plug-in
- 12-channel Magneto plug-in
- 6-channel X.21 plug-in
- 6-channel V.35 plug-in
- 6-channel V.36 plug-in
- 6-channel EIA530 plug-in
- 5-channel RS232 with X.50 substrate plug-in
- Quad E1/ T1 plug-in
- 4-channel G.SHDSL plug-in
- 3-channel 2M/ 8M MDSL plug-in
- 4-channel Ethernet switch plug-in
- 8-channel Ethernet switch plug-in



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