



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 52E1 or 52T1 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
- 1/2 slot plug-in card types:
 - E1 card
 - T1 card
 - E1/T1 ATM/Frame Relay card
 - 10/100baseT Router 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 E1/ T1 card
 - 8-channel 2W/4W E&M card
 - 8-channel G.703 card at 64 Kbps data rate
 - 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 AMX-1344 is an access DCS-MUX that can combine various digital access interfaces into E1 or T1 lines for convenient transport and switching. The AMX-1344 Access DCS-MUX provides access for a variety of interfaces, including Quad E1/T1, 10/100baseT Router, HDSL, G.703, U type, RS232, V.35, E&M, FXS, and FXO. These interfaces are compatible with other Olencom products such as the HM-1000 (HDSL) and the IM-1000 (U). Using these products, a DTE interface can be extended over 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 AMX-1344 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 AMX-1344 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 AMX-1344 consists of a rugged chassis made from reinforced aluminum, giving this equipment a more durable structure and a longer physical life.

AMX-1344 E1/T1 MUX Product Specifications

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.

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 muxed.

| | |
|-----------|-------|
| Connector | DB25S |
|-----------|-------|

Network Line Interface - T1

| | | | |
|--------------|----------------------------------|---------------|---------------------|
| Line Rate | 1.544 Mbps ± 50 bps | Output Signal | DSX1 |
| Line Code | AMI or B8ZS | Framing | D4/ESF (selectable) |
| Input Signal | ABAM cable length up to 655 feet | Connector | RJ48C |

Network Line Interface - E1

| | | | |
|---------------|---------------------|------------|----------------------------------|
| Line Rate | 2.048 Mbps ± 50 ppm | Framing | ITU G.704 |
| Line Code | AMI or HDB3 | Connector | BNC/RJ48C |
| Input Signal | ITU G.703 to -10dB | Electrical | 75 ohm Coax/120 ohm twisted pair |
| Output Signal | ITU G.703 | Jitter | ITU G.823 |

Network Line Interface - 4T1

| | | | |
|--------------|----------------------------------|---------------|---------------------|
| Line Rate | 1.544 Mbps \pm 50 bps | Output Signal | DSX1 |
| Line Code | AMI or B8ZS | Framing | D4/ESF (selectable) |
| Input Signal | ABAM cable length up to 655 feet | Connector | RJ48C |

Network Line Interface - 4E1

| | | | |
|---------------|-------------------------|------------|----------------------------------|
| Line Rate | 2.048 Mbps \pm 50 ppm | Framing | ITU G.704 |
| Line Code | AMI or HDB3 | Connector | BNC, RJ48C |
| Input Signal | ITU G.703 to -10dB | Electrical | 75 ohm Coax/120 ohm twisted pair |
| Output Signal | ITU G.703 | 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 |

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 μ -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 μ -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 Programmable

- 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 μ -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

- Ringling Send Across
 Signaling
 Signaling Bit A,B,C,D
- Cadence: 1 sec on 2 sec off, or 2 sec on 4 sec off
 Tip and Ring, Tip and Ground, Ring and Ground
 Magneto MRD(Ringing across Tip and Ring or Tip and Ground)
 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 (WxHxD)
 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 (2¹⁵-1 PRBS, 3-in-24, 1-in-8, 2-in-8, 1:1 patterns)
 U/MDSL/DTE interface (2¹¹-1 BERT)



Application Illustration:

