Access DCS-Mux

DCB-AM 3440
Access DCS-MUX

Description

The DCB-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 DCB-AM 3440 Access DCS-MUX provides access for a variety of interfaces, including Quad E1/T1, 10/100baseT Router, MDSL, U type (ISDN), RS232, V.35, E&M, FXS, and FXO. These interfaces are compatible with other DCB products such as the DCB-H 3900 (MDSL) and the DCB-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 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 DCB-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 DCB-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 DCB-AM 3440 consists of a rugged chassis made from reinforced aluminum, giving this equipment a more durable structure and a longer physical life.

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
- 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
- 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
  - 12-channel FXS card
  - 12-channel FXO card
  - 12-channel Magneto card
- Dual-slot DTE plug-in card types:
  - 6-channel V.35 card
  - 5-channel RS232 with X.50 subrate 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

Ordering Information

To specify options, choose from list below:

Model	Description	Note
Main Unit		
DCB-AM 3440-CH	Main Unit Chassis without CPU, power, E1/T1 card	Basic Controller
DCB-AM 3440-CHA	Wideband Main Unit without CPU, power, E1/T1 card	Basic Controller
CPU Module		
DCB-AM 3440-CCA	CPU card for 128Mbits backplane capacity (order two for redundancy)	For DCB-AM 3440-CHA only.
DCB-AM 3440-CC	CPU card for 32Mbits backplane capacity (order two for redundancy)	
Plug-in Module (Select 1 to 4 cards from below list.)		
DCB-AM 3440-E1 DCB-AM 3440-T1	E1 Interface T1 Interface	
DCB-AM 3440-AFRE	E1 Frame Relay to ATM inter-working or Frame Relay to Frame Relay concentration	
DCB-AM 3440-AFRT	T1 Frame Relay to ATM inter-working or Frame Relay to Frame Relay concentration	
DCB-AM 3440-RT	Router Interface	
Plug-in Module (Select 1 to 6 cards from below list.)		
DCB-AM 3440-3H	3-channel 2Mbits MDSL plug-in module	With line power, takes 2 DTE slots per card.
DCB-AM 3440-6V35	6-channel V.35 plug-in module with DB25S connector, for M34 please order conversion cable connector below.	
DCB-AM 3440-6V35A	6-channel V.35 plug-in module with DB25S connector, for M34 please order conversion cable connector below. (2Mbits per channel)	For DCB-AM 3440-CHA with DCB-AM 3440-CA CPU only.
DCB-AM 3440-5RS232	5-channel RS232 with X.50 subrate plug-in module	
Plug-in Module (Select 1 to 12 cards from below list.)		
DCB-AM 3440-4E1-**cc**	4-channel E1 Interface where **cc** = **RJ** for RJ48C connector 　　　　　　**BNC** for RJ48C connector	For DCB-AM 3440-CHA with DCB-AM 3440-CA CPU only.
DCB-AM 3440-4T1	4-channel T1 Interface	
DCB-AM 3440-3HA	3-channel 8Mbits MDSL plug-in module (2Mbits per channel)	• For DCB-AM 3440-CHA with DCB-AM 3440-CA CPU only. • With line power, takes 2 DTE slots per card.
DCB-AM 3440-3H-LP	MDSL line power daughter board (One board for 1-channel MDSL plug-in module only.)	• Factory installed option available with -48 Vdc powered chassis only. • Fan tray required.
DCB-AM 3440-10U	10-channel IDSL plug-in module	• w/: with • w/o: without
DCB-AM 3440-6U	6-channel IDSL plug-in module	
DCB-AM 3440-8EM	8-channel 2W/4W E&M plug-in module	
DCB-AM 3440-12FXS-GM	12-channel FXS plug-in module w/ 600/ 900 Impedance, Battery Reverse, Ground Start, and Metering Pulse	
DCB-AM 3440-12FXS-M	12-channel FXS plug-in module w/ 600/ 900 Impedance, Battery Reverse, Metering Pulse, w/o Ground Start	
DCB-AM 3440-12FXS	12-channel FXS plug-in module w/ 600/ 900 Impedance, Battery Reverse, w/o Ground Start and Metering Pulse	

DCB-AM 3440-12FXO-GM	12-channel FXO plug-in module w/ 600/ 900 Impedance, Battery Reverse, Ground Start, Metering Pulse
DCB-AM 3440-12FXO-G	12-channel FXO plug-in module w/ 600/ 900 Impedance, Battery Reverse, Ground Start, w/o Metering Pulse
DCB-AM 3440-12FXO-M	12-channel FXO plug-in module w/ 600/ 900 Impedance, Battery Reverse, Metering Pulse, w/o Ground Start
DCB-AM 3440-12FXO	12-channel FXO plug-in module w/ 600/ 900 Impedance, Battery Reverse, w/o Ground Start and Metering Pulse
DCB-AM 3440-12FXO-NR	12-channel FXO plug-in module w/ 600 Impedance and Transformer, w/o Battery Reverse, Ground Start, and Metering Pulse
DCB-AM 3440-12MAG-1G	12-channel Magneto plug-in module w/ L1. GND
DCB-AM 3440-12MAG-12	12-channel Magneto plug-in module w/ L1, L2
DCB-AM 3440-12MAG-1G2	12-channel Magneto plug-in module w/ L1, L2, and L1. GND

Others

DCB-AM 3440-SD	Single –48V DC Power Module	Order 2 single DC for dual DC application.
DCB-AM 3440-FAN	Fan tray	Power supplied from rear of chassis.
DCB-AM 3440-LCD	External LCD monitor	Optional
M34 conversion cable	V.35 DB25 to M34 conversion cable	

For Example:
DCB-AM 3440-CH, DCB-AM 3440-CC, DCB-AM 3440-E1, DCB-AM 3440-10U, DCB-AM 3440-SD:
For model 3440 controller with CPU card for 32Mbits backplane capacity, E1 interface, one 10-port IDSL plug-in module, and one single DC power.

DCB-AM 3440-CHA, DCB-AM 3440-CCA, DCB-AM 3440-4E1, DCB-AM 3440-10U, DCB-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.

DCB-AM 3440 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
Connector	DB25S (optional conversion cable DB25S to M34 connector)

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 $\pm$ 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 - E1

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

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
Supporting 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

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 with20mA 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 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
	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
CONSOLE/SLIP - front panel
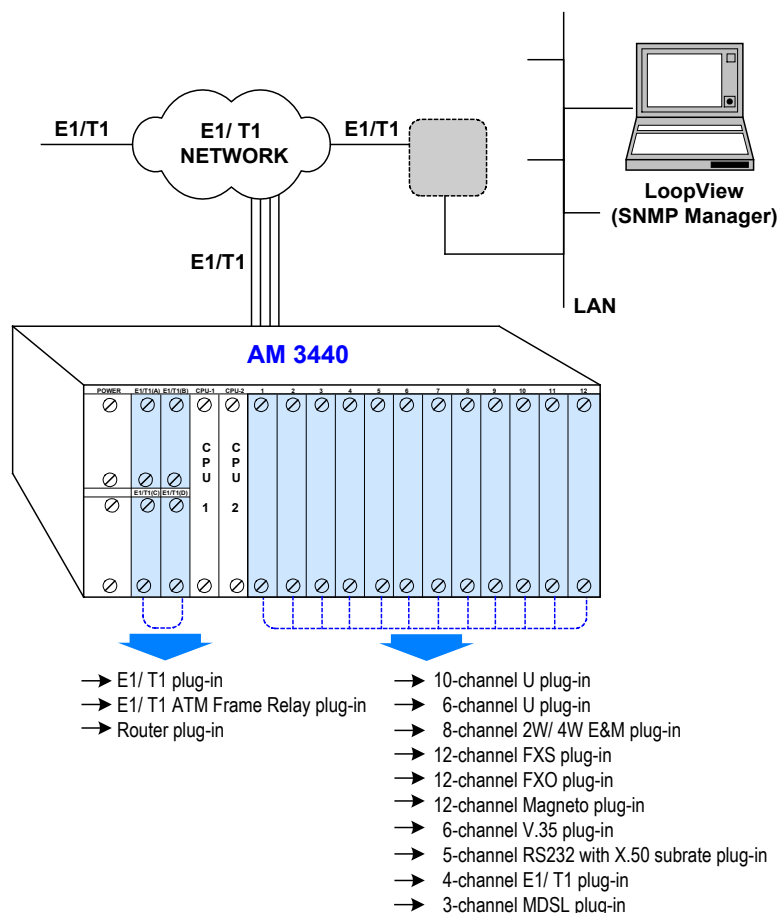10 Base-T, Ethernet, SNMP - front panel
In-band 64 Kbps

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^{15}-1 PRBS, 3-in-24, 1-in-8, 2-in-8, 1:1 patterns)
	U/MDSL/DTE interface (2^{11}-1 BERT)

Application Illustration:

→ E1/ T1 plug-in
→ E1/ T1 ATM Frame Relay plug-in
→ Router plug-in

→ 10-channel U plug-in
→ 6-channel U plug-in
→ 8-channel 2W/ 4W E&M plug-in
→ 12-channel FXS plug-in
→ 12-channel FXO plug-in
→ 12-channel Magneto plug-in
→ 6-channel V.35 plug-in
→ 5-channel RS232 with X.50 subrate plug-in
→ 4-channel E1/ T1 plug-in
→ 3-channel MDSL plug-in