

COMARRA

TELECOM TRANSMISSION SOLUTION



VCL - MX

**E1, 2 Mbps 30 Channel
Drop - Insert, Voice and Data Multiplexer**

Product Brochure & Data Sheet

COMARRA

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Product Overview

The VCL-MX, 2Mbps ~ 30 Channel E1 voice and data, Drop-Insert Multiplexer provides full range of POTS (voice) and digital data services to subscribers located at different locations, requiring to interconnect and establish a voice and data network over an E1 link. The VCL-MX is a simple, yet powerful E1 Channel Bank for connecting and integrating analog communication equipment with digital E1 services.

The VCL-MX, E1, Drop-Insert Multiplexer provides voice telephony and digital data services which may include:

The Multiplexer may be used in Terminal or Drop-Insert configuration to provide:

- Toll Quality Voice services
- Interconnect LAN (Campus Network)
- Interconnect Computer Terminals
- Provide LAN-WAN Interconnectivity
- Provide Leased Lines on DSL for SOHO Applications

Voice Interfaces

- FXO
- FXS
- E&M (2 Wire and 4 Wire)
- FXS-FXS (Hot-line)

Data Interfaces:

- RS232
- G.703 @ 64 Kbps, co-directional
- IDSL @ 128 Kbps
- V.35, n X 64 Kbps
- V.36, n X 64 Kbps
- X.21, n X 64 Kbps
- RS530, n X 64 Kbps
- 10BaseT - Ethernet Bridge
- 10BaseT - Router
- Analog I/O Card
- Digital I/O Card
- Universal Data Interface Card

The VCL-MX E1 Interface operates at a primary rate of 2.048 Mbits/Sec and provides a host of features including, channel drop and insert facility over a network of VCL-MX, E1 Multiplexers, for voice and data applications.

The VCL-MX has an effective, CLI (text) based "Network Management System", which may be used for configuring the system, subsequent remote monitoring and management of the inter-connected systems in the network. Both Inband and Out-of-Band configuration and monitoring options are available.

An extensive set of alarms, for easy maintenance are provided in the system.



VCL-MX, E1, Drop-Insert, Voice and Data Multiplexer

VCL-MX is available in four versions:

VCL-MX Version # 1 - Voice and Data Drop-Insert Multiplexer without In-band Management Interface

Available Interfaces:

Voice Interfaces: FXO / FXS / E&M

Data Interfaces: RS232 / iDSL / G.703

VCL-MX Version # 2 - Voice and Data Drop-Insert Multiplexer with In-band Management Interface

Available Interfaces:

Voice Interfaces: FXO / FXS / E&M

Data Interfaces: RS232 / iDSL / G.703

VCL-MX Version # 3 - Voice and Data Drop-Insert Multiplexer with In-band Management Interface and "n" X 64 Kbps data options

Available Interfaces:

Voice Interfaces: FXO / FXS / E&M

Data Interfaces: RS232 / iDSL / G.703

nX64 Interfaces: V.35 / V.36 / X.21 / RS530 /

10BaseT / Fractional E1 / Universal Data

Interface Card

VCL-MX Version # 4 - Voice and Data Drop-Insert Multiplexer with In-band Management Interface and "n" X 64 Kbps data options (75 Ohms unbalance / 120 Ohms balance E1 Impedance)

Available Interfaces:

Voice Interfaces: FXO / FXS / E&M

Data Interfaces: RS232 / iDSL / G.703

nX64 Interfaces: V.35 / V.36 / X.21 / RS530 /

10BaseT / Fractional E1 / Analog I/O Card /

Digital I/O Card / Universal Data Interface Card

Features

- Voice and Digital Data services.
- Any combination ("mix-n-match") of Voice and Digital Data services deployed from a single VCL-MX "Smart Shelf".
- Drop and Insert applications.
- Digital Data option may be used for internet access or video conferencing application.
- Wireless applications including Cellular Networks.
- Digital Microwave Radio.
- SCADA applications.
- Frame Relay circuit termination.
- Powerful Network Management System for monitoring and network control.
- Compliance with all relevant ITU-T (CCITT) recommendations.
- 3U (Version 1, Version 2, Version 3), 6U (Version 4) high, compact construction.

Highlights

- Field upgradable to provide voice, data or both services.
- Flexibility on use of transmission medium - copper, fiber, or wireless.
- Choice of Interfaces for Data Applications.
- RS-232, PC Interface "Network Control And Management Software".
- In-band system configuration and management interface.
- Out-of-band system configuration and management interface through 10BaseT Terminal (Optional)
- Channel assignment independent of slot position in the subrack.
- Extensive set of alarms.
- User Selectable Internal or Loop-Timed clock options

Transmission Mediums

The VCL-MX offers an excellent flexibility on the choice of transmission medium over which it may be deployed. The transmission medium can be either of the following:

- Copper
- Optical Fiber
- Wireless

Application of VCL-MX

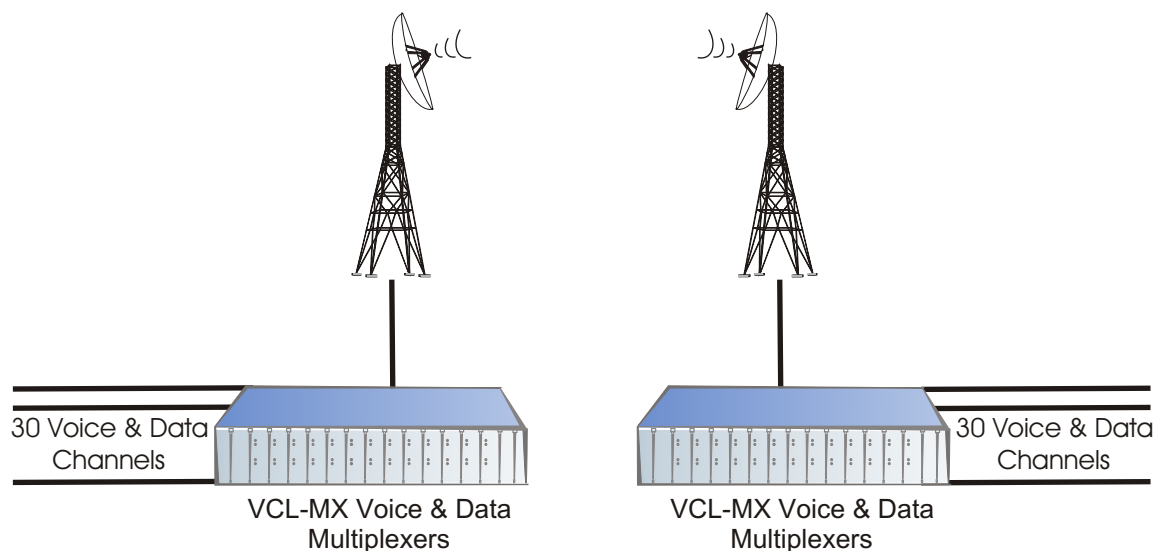
POTS (voice), digital data, or real-time video conferencing services (V.35, V.36, X.21, RS530, 10BaseT Router, 10 BaseT Ethernet Bridge) high-speed digital data interface options allows point-to-point network solutions for providing a video conferencing channel of up to 1984 Kbps).

- Junction Mux - for digital interconnection of analog exchanges.
- Drop & Insert applications.
- Wireless network applications.
- High-speed data ports for digital communication links providing Leased Lines access to Internet Service Provider (ISPs) with speeds ranging from 64Kbps up to 1984 Kbps digital data interface options.
- Micro-Cellular infrastructure applications for providing cell-switch connectivity.
- Wide area networking.
- Internet Access over POTS lines - All POTS interfaces operate @ 64Kbps and support V.34 (33.6Kbps) dial-up modems.

Applications

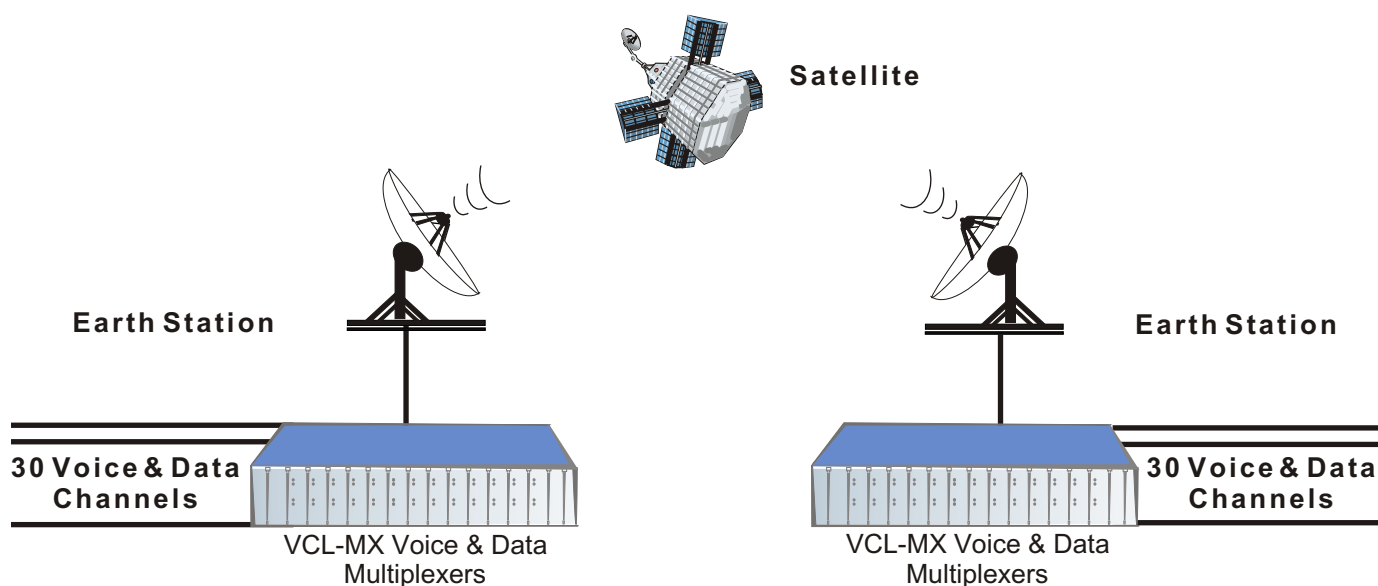
Application # 01

VCL-MX E1, 2Mbps Voice & Data Multiplexers Connecting over Digital Microwave Radio Links



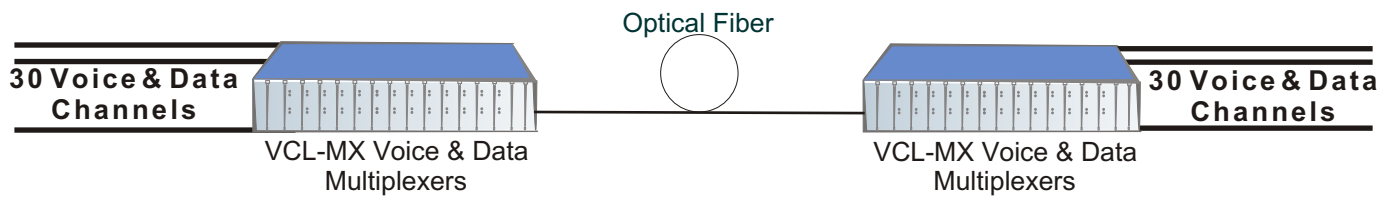
Application # 02

VCL-MX E1, 2Mbps Voice & Data Multiplexer Connecting over Digital Satellite Circuits



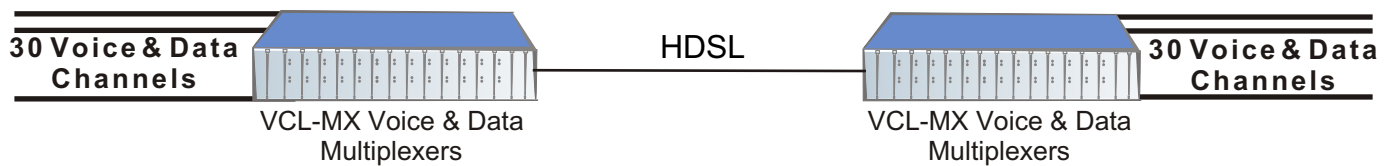
Application # 03

VCL-MX E1, 2Mbps Voice & Data Multiplexer Connecting over Optical Fiber Links



Application # 04

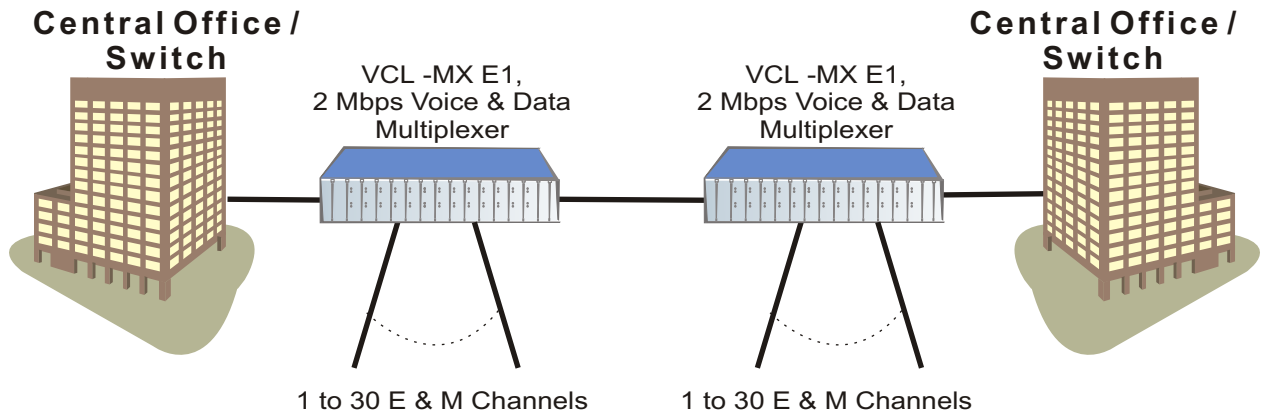
VCL-MX E1, 2Mbps Voice & Data Multiplexer Connecting over HDSL Links



Application # 05

VCL-MX E1, 2Mbps Voice & Data Multiplexer

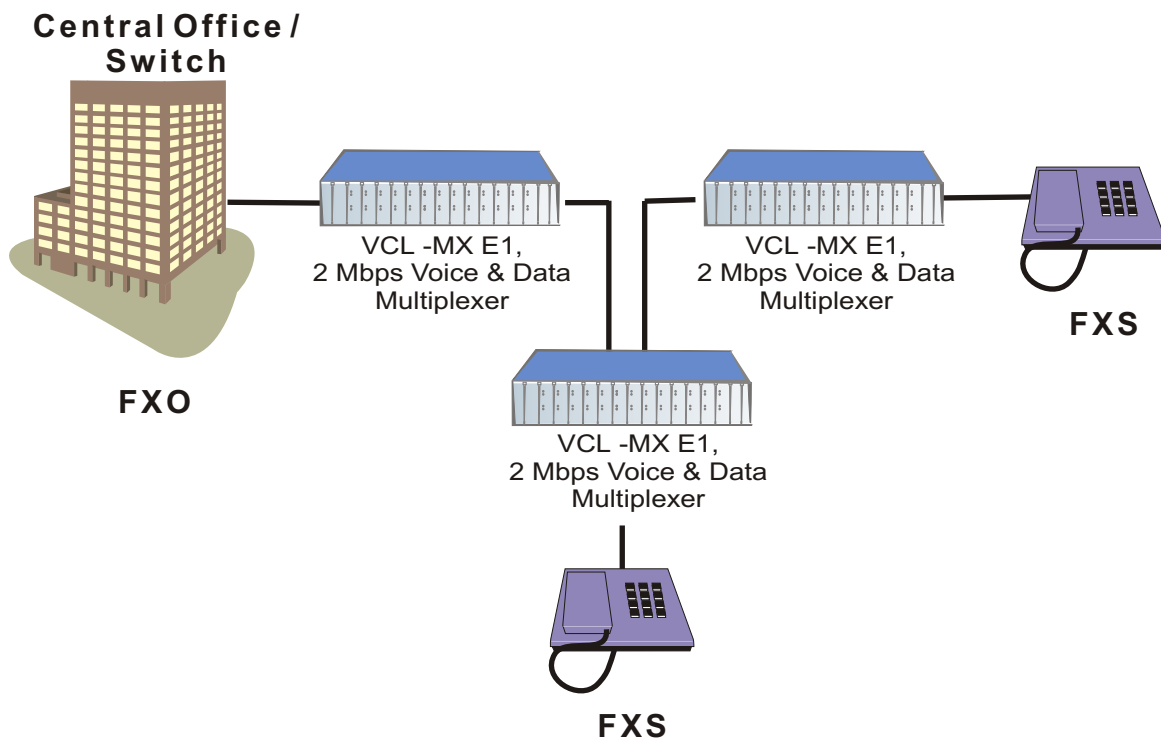
Connecting at the Central Office / Switch - E & M Interfaces



Application # 06

VCL-MX E1, 2Mbps Voice & Data Multiplexer

Using in a Subscriber Loop Point to Point or Drop / Insert Application



FXO/JNC 2 wire exchange loop interface card

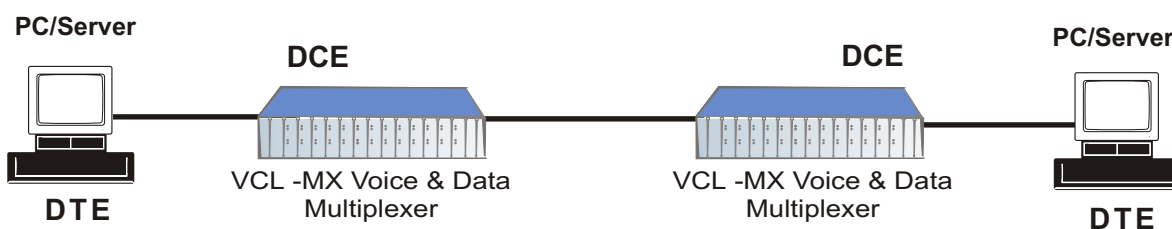
FXO/SLC 2 wire subscriber loop interface card

Application # 07

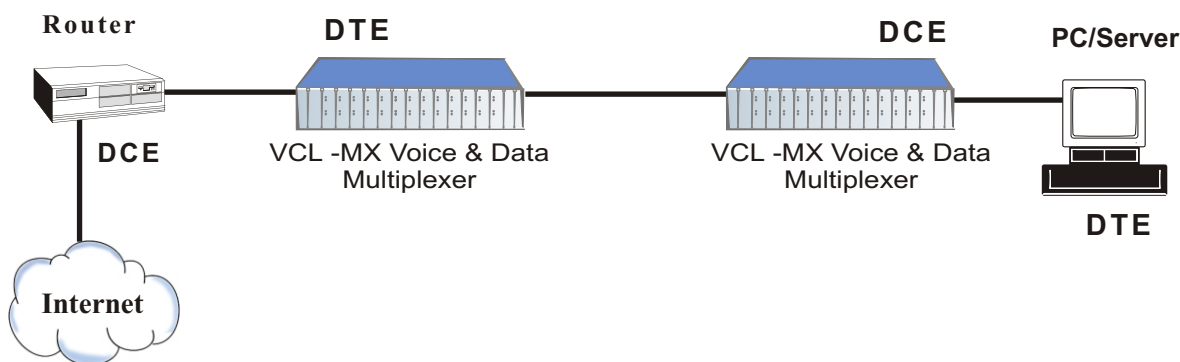
VCL-MX E1, 2Mbps Voice & Data Multiplexer

Providing Synchronous (V.11, X.21, V.35, V.36, RS422, RS530)
 “n x 64 Kbps Data Interfaces

DCE- Remote DCE Configuration
 Data interface card (Application 1)

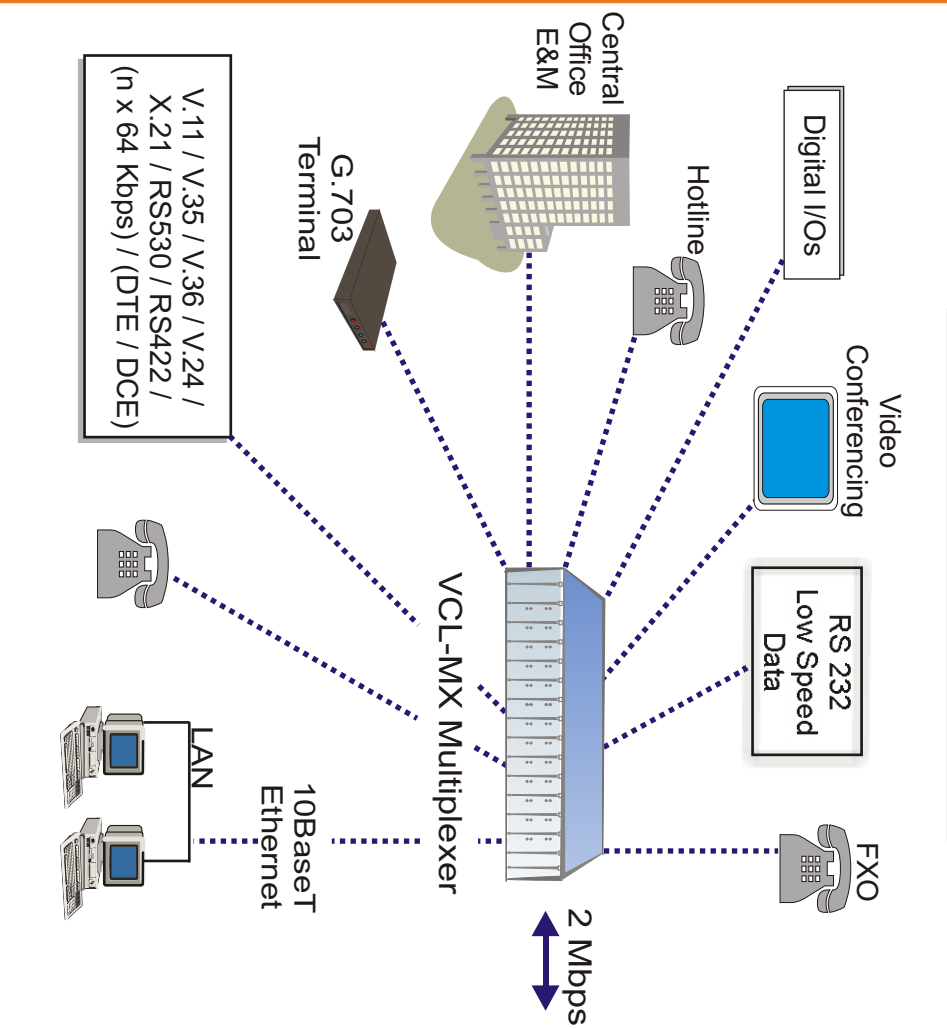


DCE- Remote DTE Configuration
 Data interface card (Application 2)

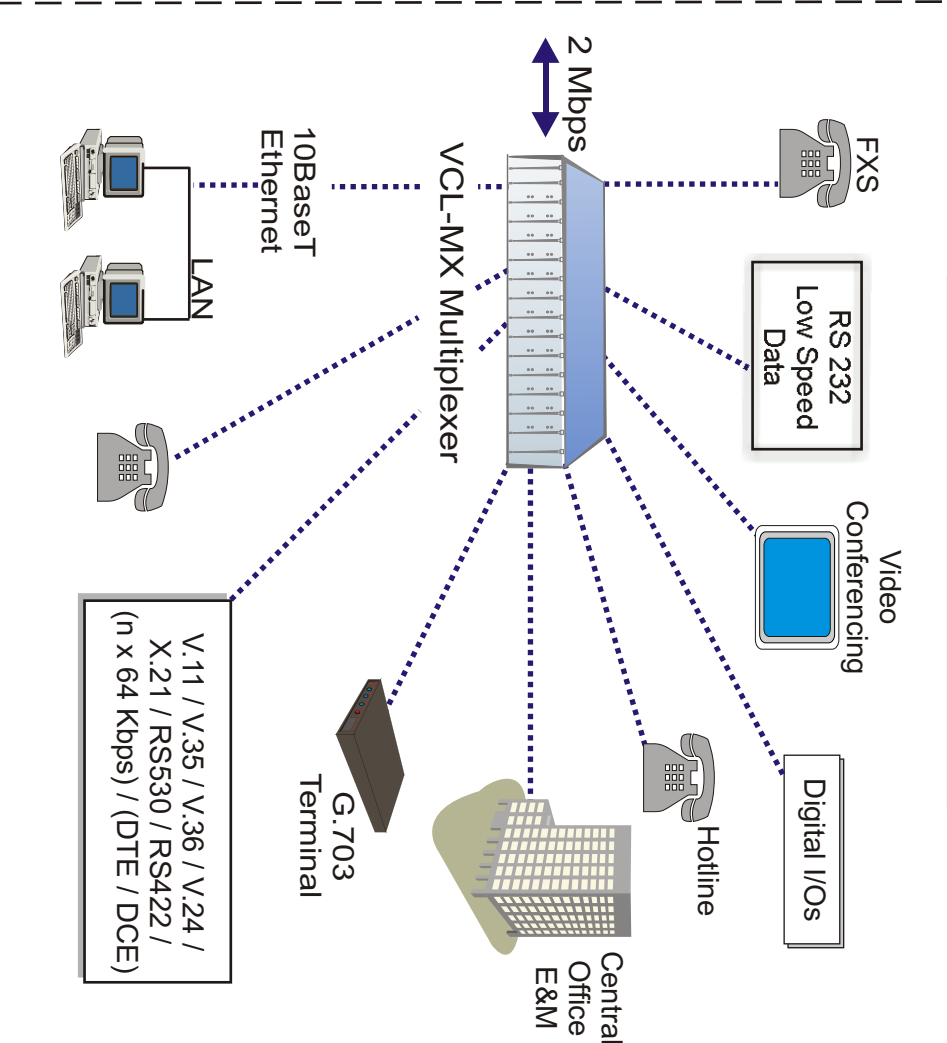


Application # 08

VCL-MX, E1 Multiplexer Interfaces Cards - Voice and Data applications



VCL-MX, E1 Multiplexer Interfaces Cards - Voice and Data applications



User Configurable Interface Card

~Voice Interface :-

- POTS service from a Central Office Switch. (FXO & FXS)
- Hot Line (FXS-FXS).
- 2 Wire and 4 Wire, E&M applications.
- 15W, sine-wave, 75VRMS / 86VRMS 20Hz / 25 Hz Ringer for FXS and Hot-line (FXS-FXS) interfaces.

~Data Interfaces:-

- RS232
- G.703 @ 64 Kbps, co-directional
- iDSL @ 128 Kbps
- V.35, n X 64 Kbps
- V.36, n X 64 Kbps
- X.21, n X 64 Kbps
- RS530, n X 64 Kbps
- 10BaseT - Ethernet Bridge
- 10BaseT - Router
- Fractional E1 (Framed and un-Framed)
- Analog I/O Card
- Digital I/O Card
- Universal Data Interface Card

Technical Specifications - E1 Interface (Main Link)

Number of Interfaces	2
Conformity (Electrical)	G.703
Frame Structure	As per ITU (CCITT) G.704
Signaling	Channel Associated Signaling
PCM Sampling Rate	8000 Samples / sec
Encoding Law	A Law as per ITU (CCITT)
Bit Rate	2048 Kbps \pm 50 ppm
Code	HDB3
Nominal Impedance	120 Ω balanced / 75 Ω unbalanced (75 Ω option)
Peak Voltage of a mark	
For 120 Ω Balanced interface	3.0 V \pm 0.3 V
75 Ω Unbalanced interface	2.37 V \pm 0.237 V
Peak Voltage of a space	
for 120 Ω Balanced interface	0 V \pm 0.3 V
75 Ω Unbalanced interface	0V \pm 0.237 V
Nominal Pulse Width	244 ns
Pulse Mask	as per ITU (CCITT) Rec. G.703
Output Jitter	< 0.05 UI (in the frequency range of 20Hz to 100 KHz)
Permissible Attenuation	6 dB at 1 MHz
Return Loss at:	
51.2 KHz to 102.4 KHz	> 12dB
102.4 KHz to 2048KHz	> 18dB
2048KHz to 3072 KHz	> 14dB
Jitter Tolerance	As per ITU (CCITT) G.823
Loss and recovery of frame alignment :	As per clause 3 of ITU (CCITT) G.732
Loss and recovery of multiframe alignment :	As per clause 5.2 of ITU (CCITT) G.732

2 Wire / 4 Wire - Voice Frequency Interface(s)

Number of Channels per Card	2
Interface Type	FXO, FXS, 2W / 4W E&M
Maximum Number of Channels	30
Transmission performance	Fully Compliant to ITU (CCITT) G.712 specification
Line Impedance	600 Ω (900 Ω optional)
Voice Channel Frequency	300Hz-3400Hz
Insertion Loss	-2.0dB Nominal (User adjustable)
Idle Channel Noise	\leq -65dB
Return Loss	300Hz - 600Hz - \geq 12dB 600Hz - 3400Hz - \geq 15dB
Longitudinal Balance	\geq 46dB between 300Hz to 3400Hz
Ring Frequency	25 Hz (20Hz, Optional)
Ring Voltage	\geq 75 volts RMS into a load of 5 R.E.N. with a 0.30 Erlang traffic pattern
Subscriber Loop Current	\geq 23mA into a subscriber loop of 1000 ohms
Overload Level	+3.14dBm \pm 0.5dBm
Battery Reversal	All channels
Dial Pulse Speed	8-12 pps - Pulse Dialing / DTMF Dialing

Low Speed Data Interface RS232

Interface	RS232
Number of Interfaces per Card	2
Maximum Number	30
Conformity	RS232
Mode	Asynchronous
Bit Rate	50 Kbps to 19.2 Kbps
User Interface	DCE
Character Length	5 / 6 / 7 / 8 (Auto-Select)
Stop Bits	1 / 1.5 / 2 (Auto-Select)
Parity	Even / Odd / 0's / 1's / none (Auto-Select)

Low Speed Data Interface RS232 / 485

Interface	RS232 / 485
Number of Interfaces per Card	2
Maximum Number	30
Conformity	RS232 485
Mode	Asynchronous
Bit Rate	50 Kbps to 19.2 Kbps
User Interface	DCE
Character Length	5 / 6 / 7 / 8 (Auto-Select)
Stop Bits	1 / 1.5 / 2 (Auto-Select)
Parity	Even / Odd / 0's / 1's / none (Auto-Select)

G.703 @ 64kbps, Synchronous Data Interface

Interface	G.703 @ 64 Kbps
Number of Interfaces per Card	2
Maximum Number	30, G.703, 64Kbits / sec. Interface
Conformity	To (CCITT) Rec. G.703
Mode	Synchronous, Co-directional
Bit Rate	64Kbps

Digital I/O Interface Card (EPCB-1419)

Description: This interface Card provides 8 digital I/O's which may be used to either extend Digital I/O's (logic high / low) signals between any two E1 Multiplexers, or operate switches remotely (using logic high / low) signals between any two multiplexers. Drivers / Sense Logic operates using External Voltage and Ground references).

Digital I/O's - Type I

Number of Digital I/O's per 64 Kbps time-slots / per Interface Card	8 Digital In/8 Digital Out/ (Logic High / Low) Interfaces
Digital Drivers (current source type)	8
Max Source current	100 mA
External Ref Voltage Range	5 Volts to 30 Volts DC
External Reference Voltage	Required
Minimum Load Resistance @ 5V	50R
Minimum Load Resistance @ 30V	300R
Digital Sensor (current sink type)	8
Maximum sink current	30mA
Voltage Range	5 Volts
External Ground Reference	Required

OR

Digital I/O's - Type II

Digital Drivers (Current sink type)	8
Maximum sink current	100mA
Voltage Range	5 Volts to 30 Volts DC
External Ground Reference	Required
Digital Sensor (current source type)	8
Maximum sink current	30mA
Voltage Range	5 Volts to 30 Volts DC
External Ground Reference	Required

Analog I/O Interface Card (EPCB-1420)

Description: This interface Card provides 8 Analog I/O's which may be used to extend either Dry Relay Contacts (Relay Normally-Open or Relay Normally-Close), or operate switches remotely (using 2A Dry Relay Contacts) between any two Multiplexers using a 64 Kbps time-slot. The Dry Relay Contacts are rated at maximum 2 Amps, 30 Volts DC.

Relay Specifications (Drivers)

Maximum Number of Relay Ports	8
Maximum Switching Power	60 W
Maximum Switching Voltage	30 VDC
Maximum Switching Current	2 Amps
Typical Number of Operation	> million

Dry Contacts Sensors:

Maximum Number of Dry Contact Sensors	8
Maximum Current	30 mA
Typical Current	30 mA
Reference Source Voltage	3.3 Volts

Sub-Rate Multiplexer:- Optional Extra

Optional: To be used with 64 Kbps G.703 co-directional data interface card.

Number of Interfaces per 64 Kbps channel	6
Interface Type	RS232
Mode	Asynchronous
Bit Rate	9.6 Kbps, 8 bits 1 stop bit
Parity	None

BRI ISDN 2B+D

"U" Interface	Meets ANSI T1.601-1992 requirements
Line Rate	160 Kbits/s
Frame Format	2B+D as per CCITT Rec.1.430
Line Code	2B1Q as per CCITT Rec.G.961
Accepted Line Attenuation	42dB at 40 KHz
Pulse Shape	As per CCITT Rec.G.961
Multiplexer Emulation	LT Emulation / NT Emulation (User Selectable)
Impedance	135 Ohms at 40KHz

iDSL - ISDN DSL

"U" Interface	Meets ANSI T1.601-1992 requirements
Line Rate	160 Kbits/s
Frame Format	2B as per CCITT Rec.1.430
Line Code	2B1Q as per CCITT Rec.G.961
Accepted Line Attenuation	42dB at 40 KHz
Pulse Shape	As per CCITT Rec.G.961
Multiplexer Emulation	LT Emulation
Customer Premises Equipment	NT Emulation
Impedance	135 Ohms at 40KHz

Maximum Distance : 5KM (4 miles) on 0.5 mm twisted Pan. Distance may vary with cable gauge
 For distance using various cable guages please refer to chart below.

Distance in Kms. (Miles)				
Data Rate (Kbps)	Wire Gauge (AWG/mm)			
	19 (.9mm)	22 (.6mm)	24 (.5mm)	26 (.4mm)
128 / 144	17.4 (10.8)	11.6 (7.2)	8.1 (5.0)	5.5 (3.4)

High Speed Synchronous “n X 64” Data Interface Type: V.35

Interface	V.35
Number of Interfaces per Card	1, (“N” x 64KBits/sec. per Card)
Bandwidth	(“N” x 64 Kbits / sec. Interface maximum value of “N” =30) - User Selectable
Conformity	V.35
Mode	Synchronous
Bit Rate	64 Kbps to 1984 Kbps
User Interface	DCE

High Speed Synchronous “n X 64” Data Interface Type: V.36

Interface	V.36
Number of Interfaces per Card	1, (“N” x 64KBits/sec. per Card)
Bandwidth	(“N” x 64 Kbits / sec. Interface maximum value of “N” =30) - User Selectable
Conformity	V.36
Mode	Synchronous
Bit Rate	64 Kbps to 1984 Kbps
User Interface	DCE

High Speed Synchronous “n X 64” Data Interface Type: X.21

Interface	X.21
Number of Interfaces per Card	1, (“N” x 64KBits/sec. per Card)
Bandwidth	(“N” x 64 Kbits / sec. Interface maximum value of “N” =30) - User Selectable
Conformity	X.21
Mode	Synchronous
Bit Rate	64 Kbps to 1984 Kbps
User Interface	DCE

High Speed Synchronous “n X 64” Data Interface Type: RS530

Interface	RS530
Number of Interfaces per Card	1, (“N” x 64KBits/sec. per Card)
Bandwidth	(“N” x 64 Kbits / sec. Interface maximum value of “N” =30) - User Selectable
Conformity	RS530
Mode	Synchronous
Bit Rate	64 Kbps to 1984 Kbps
User Interface	DCE

Universal Data Interface: High Speed Synchronous “n X 64” Data Interface Type

Interface	V.35, V.36, X.21, RS442, RS530
Number of Interfaces per Card	1, (“N” x 64KBits/sec. per Card)
Bandwidth	(“N” x 64 Kbits / sec. Interface maximum value of “N” =30) - User Selectable
Conformity Mode	Universal User - Configurable as above
Mode	Synchronous
Bit Rate	64 Kbps to 1984 Kbps
User Interface	DCE / DTE

High Speed Synchronous “n X 64” Data Interface Type: 10BaseT Ethernet Bridge

Interface	10BaseT (Bridge)
Number of Interfaces per Card	1, (“N” x 64KBits/sec. per Card)
Bandwidth	(“N” x 64 Kbits / sec. Interface maximum value of “N” =30) - User Selectable
Conformity Mode	10BaseT Ethernet Bridge
Mode	Synchronous
Bit Rate	64 Kbps to 1984 Kbps
User Interface	10BaseT

High Speed Synchronous “n X 64” Data Interface Type: 10BaseT Ethernet Router

Interface	10BaseT (Router)
Number of Interfaces per Card	1, (“N x 64”KBits/sec. per Card)
Bandwidth	(“N” x 64 Kbits / sec. Interface maximum value of “N” =30) - User Selectable
IP routing	RIP-I, RIP-II, static routing, IP filters, BootP client and relay, DHCP relay
IPQoS	Bandwidth management (CBR, VBR), Prioritization (6 levels), RTP auto detection, DiffServ/TOS support
Bandwidth Optimization	SW Compression (optional), MLPPP and Bandwidth on Demand, Connection on Demand and IPX spoofing
Interoperability Supported RFCs	PPP 1058, 1213, 1315, 1332, 1334, 1389, 1471, 1472, 1473, 1474, 1490, 1493, 1519, 1542,1573, 1604, 1631, 1638, 1661, 1662, 1722, 1723, 1724, 1812, 1850, 1962, 1974, 1990

PROTECTION

Central Office Terminal and Remote Terminal are protected against power surges and transients occurring from lightning and electric induction as per CCITT Rec. Table I/K-20 towards line side

Clock

Timing Options	Internal Clock, Loop-Timed Clock
Synchronization Sources	Internal Clock, span clock timing derived from incoming HDB3 links (Loop Timed)
Default Option	Internal Clock

Management Interface

Local Management Interface

RS232, operating @ 9.6 Kbps CLI (text) based Interface, Hyper Terminal (VT-100 Emulation).

In-band Management Interface for Remote Terminals

RS232, operating @ 9.6 Kbps CLI (text) based Interface, Hyper Terminal (VT-100 Emulation).

Out-of-Band Management Interface - Optional

10 / 100 BaseT - User Assigned IP Address

ENVIRONMENTAL

Temperature and Humidity	0°C to + 50°C, 90% R.H. (Non Condensing)
Altitude	upto 9,000 feet

Power Supply

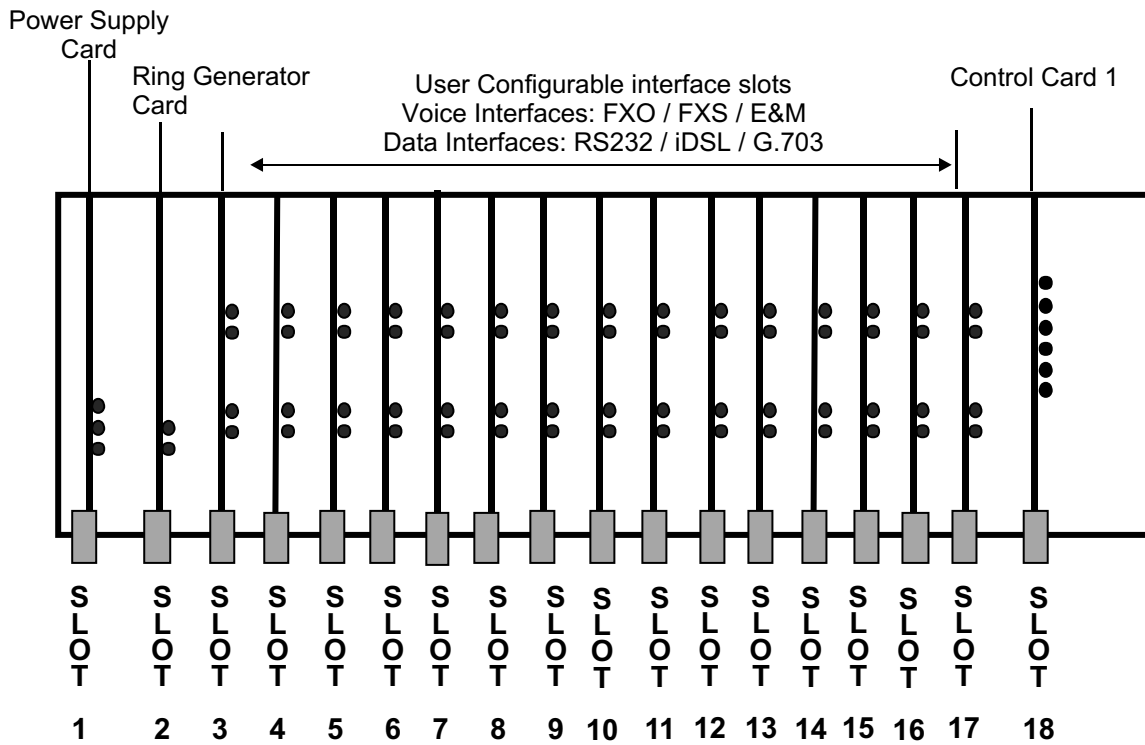
Input DC voltage	-48V DC (nominal)
Range of input	-40V to -60V DC
Output voltages	+5V, -5V, filtered -48V (for term. cards)
Full Load Output Current	8A at +5V, 0.5A at -5V
Input Voltage Reversal Protection	Provided in the Card
Over Current Protection	10A for +5V, 1.0A for -5V
Short Circuit Protection	Current limit - 6A. Recovers on removal of short
Efficiency at full load	>86%
Ripple at full load	<5mVrms
Spike at full load	<50mV

Power Consumption

VCL-MX (Version # 1)	24 watt (with all 30 Voice Circuits)
VCL-MX (Version # 2)	25 watt (with all 30 Voice Circuits)
VCL-MX (Version # 3)	25 watt (with all Voice & Data Circuits)
VCL-MX (Version # 4)	35 watt (with all Voice & Data Circuits)

VCL-MX is Available in Four Versions

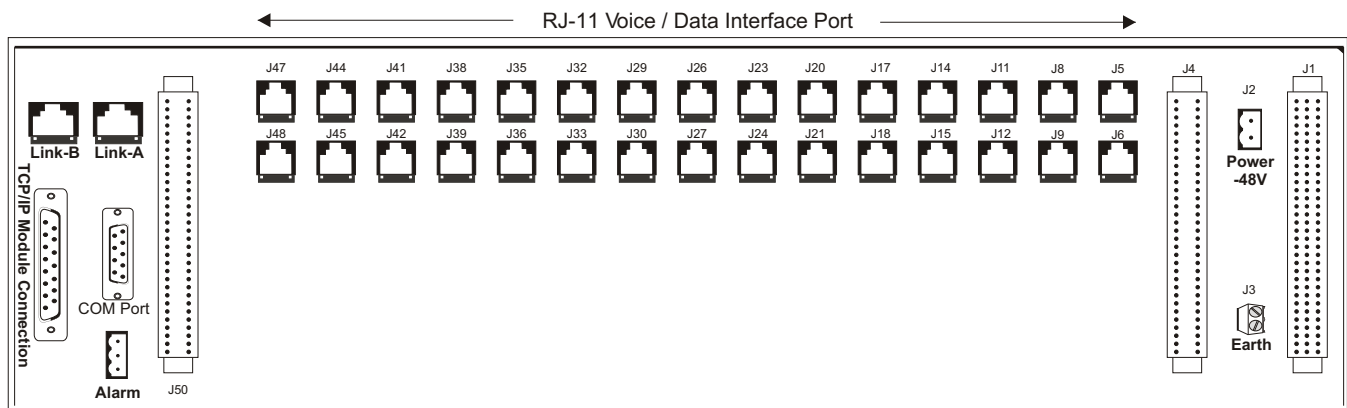
VCL-MX-Version # 1 - Voice and Data Drop-Insert Multiplexer without In-band Management Interface



Available Interfaces:

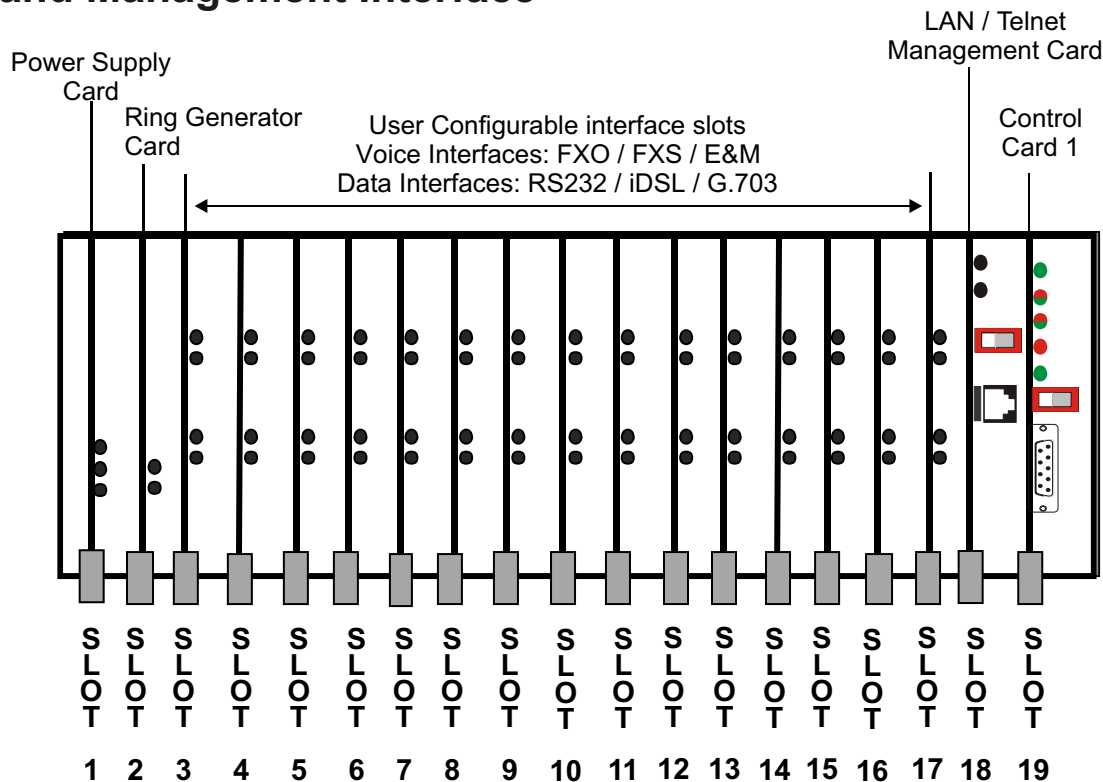
Voice Interfaces: FXO / FXS / E&M
 Data Interfaces: RS232 / iDSL / G.703

Rear View



Core System Composition	Description	Part No.
19-Inch Shelf 3U high	19- Inch Shelf and Backplane	VCL-MX-001
Slot 1	Power Supply Card	VCL-MX-010
Slot 2	Ringer Card	VCL-MX-040
Slot 3 to 17	15 User Configurable voice & data interface(s)	As per user requirement
Slot 18	Control Card 1	VCL-MX-015

VCL-MX-Version # 2 - Voice and Data Drop-Insert Multiplexer with In-band Management Interface

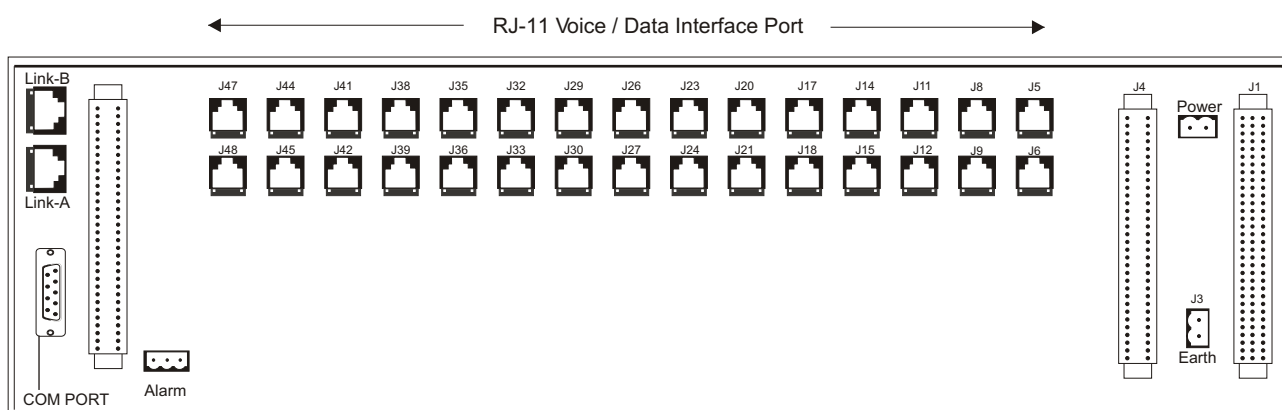


Available Interfaces:

Voice Interfaces: FXO / FXS / E&M

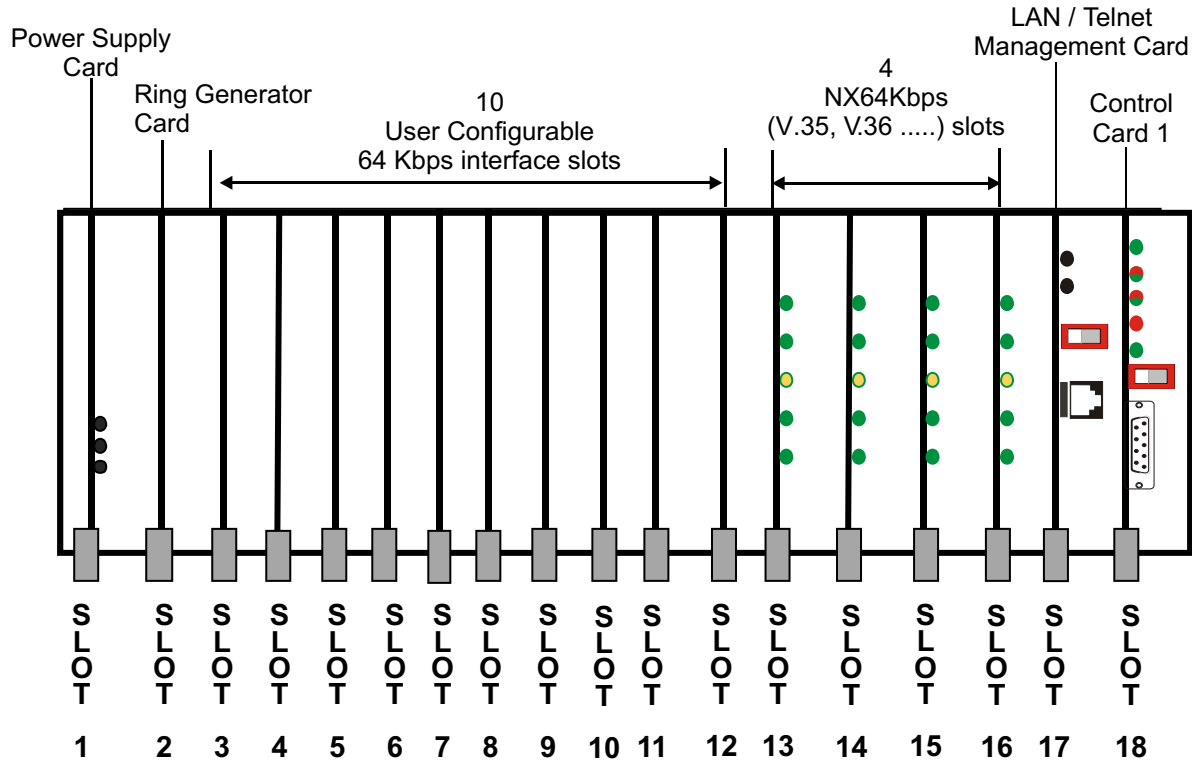
Data Interfaces: RS232 / iDSL / G.703

Rear View



Core System Composition	Description	Part No.
19-Inch Shelf 3U high	19- Inch Shelf and Backplane	VCL-MX-002
Slot 1	Power Supply Card	VCL-MX-010
Slot 2	Ringer Card	VCL-MX-040
Slot 3 to 17	15 User Configurable voice & data interface(s)	As per user requirement
Slot 18	LAN Card	VCL-MX-LAN
Slot 19	Control Card 1with In-Band Management Interface	VCL-MX-015-2

VCL-MX-Version # 3 - Voice and Data Drop-Insert Multiplexer with In-band Management Interface and “n” X 64 Kbps data options

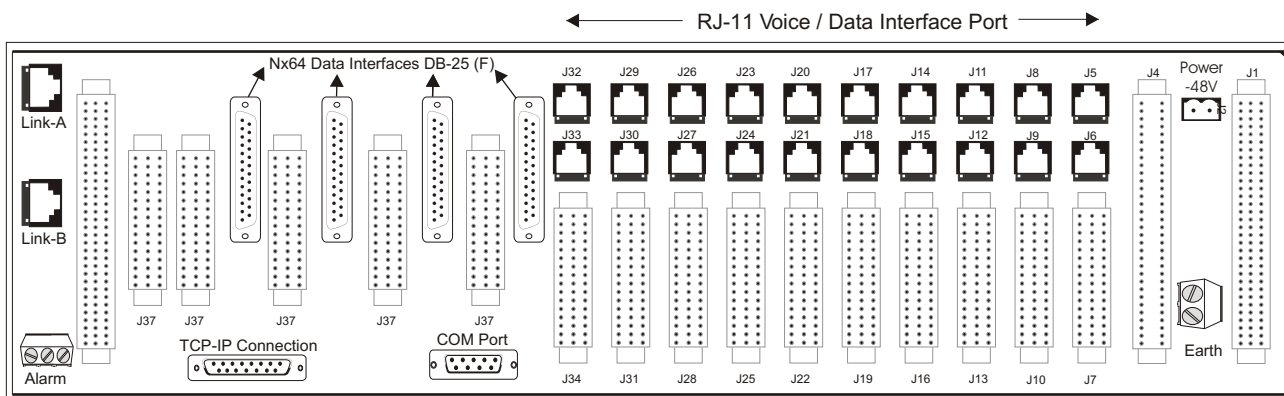


Available Interfaces:

Interfaces from slot 3 to 12: FXO / FXS / E&M / RS232 / iDSL / G.703

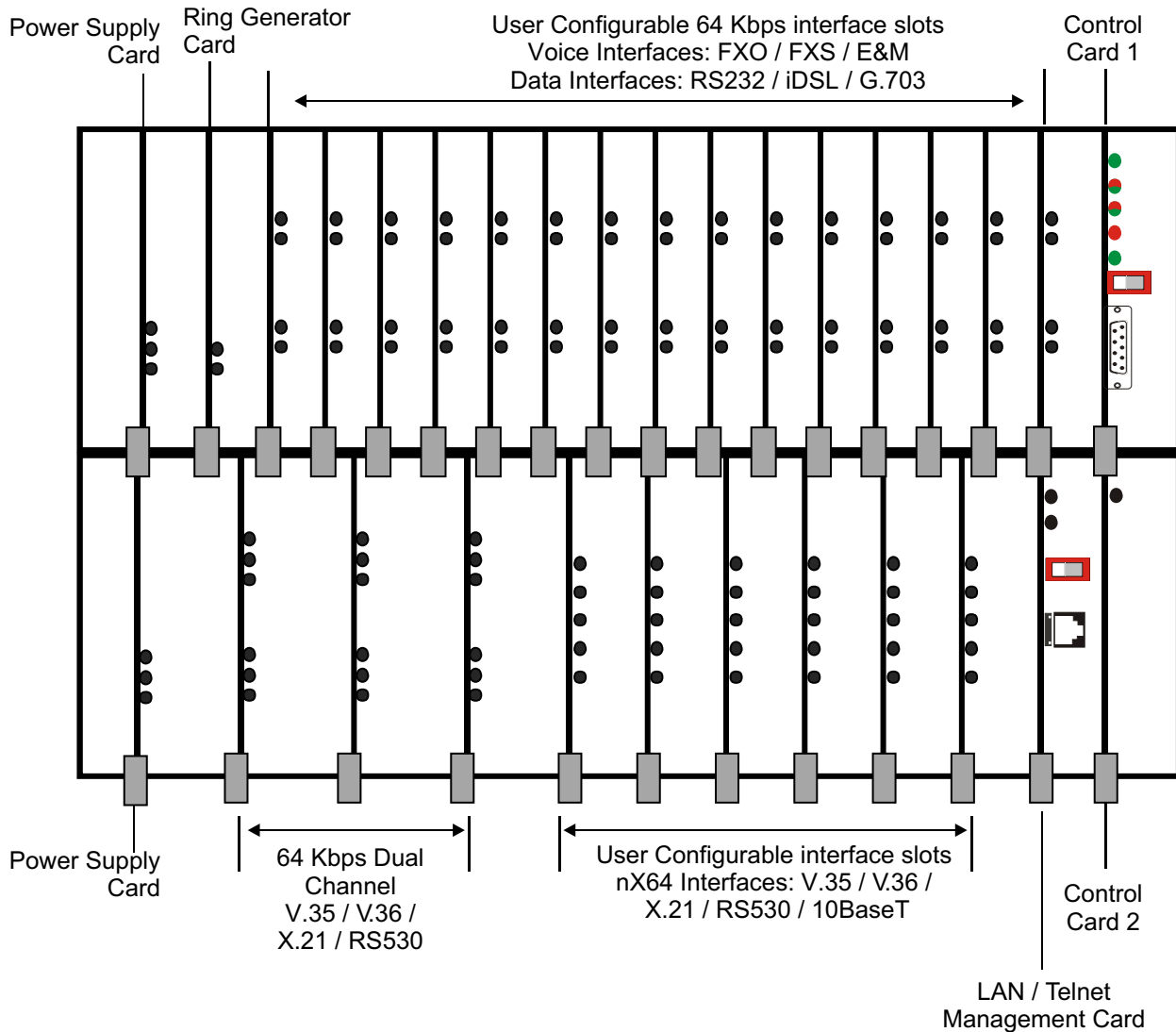
Nx64 Interfaces from slot 13 to 16: V.35 / V.36 / RS530 / X.21 / 10BaseT / Fractional E1 Framed and un-Framed / Universal Data Interface Card.

Rear View



Core System Composition	Description	Part No.
19-Inch Shelf 3U high	19- Inch Shelf and Backplane	VCL-MX-003
Slot 1	Power Supply Card	VCL-MX-010
Slot 2	Ringer Card	VCL-CB-040
Slot 3 to 12	10 User Configurable voice & data interface(s)	As per user requirement
Slot 13 to 16	“n” x 64kbps Interface Cards	As per user requirement
Slot 17	LAN Card	VCL-MX-LAN
Slot 18	Control Card 1 with In-band Management	VCL-MX-015-3

VCL-MX-Version # 4 - Voice and Data Drop-Insert Multiplexer with In-band Management Interface and “n” X 64 Kbps data options

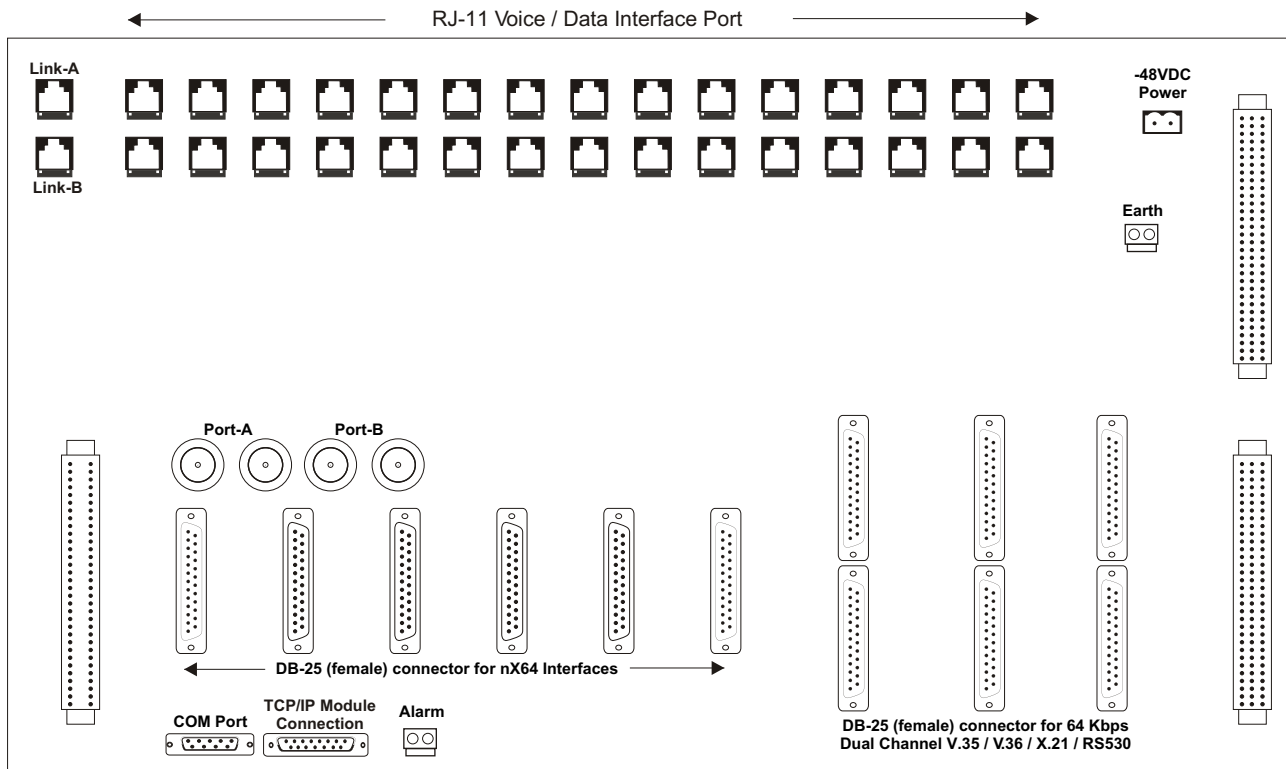


Available Interfaces:

Voice and Data Interfaces from slot 3 to 17: FXO / FXS / E&M / RS232 / iDSL / G.703

Nx64 Interfaces from slot 20 to 25: V.35 / V.36 / RS530 / X.21 / 10BaseT / Fractional E1 Framed and un-Framed / Analog I/O Card / Digital I/O Card / Universal Data Interface Card.

Rear View



Available Interfaces:

Voice and Data Interfaces from slot 3 to 17: FXO / FXS / E&M / RS232 / iDSL / G.703

Nx64 Interfaces from slot 20 to 25: V.35 / V.36 / RS530 / X.21 / 10BaseT / Fractional E1 Framed and un-Framed

Core System Composition	Description	Part No.
19-Inch Shelf 6U high	19- Inch Shelf and Backplane	VCL-MX-004
Slot 1	Power Supply Card	VCL-MX-010
Slot 2	Ringer Card	VCL-MX-040
Slot 3 to 17	15 User Configurable voice & data interface(s)	As per user requirement
Slot 18	Control Card 1	VCL-MX-015-4
Slot 19	Power Supply Card	VCL-MX-010
Slot 20 to 22	Three 64Kbps Dual Channel Card	As per user requirement
Slot 23 to 28	6 User Configurable “n” X 64 Kbps interface(s)	As per user requirement
Slot 29	LAN / Telnet Management Card	VCL-MX-LAN
Slot 30	Control Card 2	VCL-MX-020

Ordering Information

<u>VCL-MX E1 Core System (Common Equipment)</u>			
S No.	Part #	Product Description	Qty
1.	VCL-MX-015	Control Card 1, 30 Channel E1 Interface (Version - 1,2,3,4)	1
2.	VCL-MX-020	Control Card 2, 30 Channel E1 Interface (Version # 4)	1
3.	VCL-MX-LAN	10BaseT - LAN Management Card (Version # 4)	1
4.	VCL-MX-001	19" Shelf 3U High (Sub-rack) to accommodate 30 Voice & Data Channels fitted with Connectorized Backplane - (Version - 1,2).	1
5.	VCL-MX-003	19" Shelf 3U High (Sub-rack) to accommodate Voice, 64Kbps Data Channels PLUS "n" x 64Kbps Data Channels fitted with Connectorized Backplane - (Version # 3)	1
6.	VCL-MX-004	19" Shelf 6U High (Sub-rack) to accommodate Voice, 64Kbps Data Channels PLUS "n" x 64Kbps Data Channels fitted with Connectorized Backplane - (Version # 4)	1
7.	VCL-MX-010	(-) 48VDC Input Power Supply Card, Dual Supply 30 Channel Power Supply Card (+5VDC, -5VDC) - Compatible with (Version 1,2,3,4)	1

Ordering Information

VCL-MX, User Configurable Interfaces			
S. No.	Part #	Product Description	Qty
1.	VCL-CB-025	Dual Port VF, RT (FXS) Line Interface Card 2, 64Kbps/Sec. VF Channels per Remote Terminal Line Card 15 (max) per system	1
2.	VCL-CB-025-ext	Dual Port VF, RT (FXS) Line Interface Card 2, 64Kbps/Sec. VF Channels per Remote Terminal Line Card 15 (max) per system (programmable Tx and Rx level settings)	1
3.	VCL-CB-027	Dual Port VF, Hot-Line (FXS - Ring-Down) Line Interface Card 2, 64Kbps/Sec. Hot-Line Channels per Card 15 (max) per system	1
4.	VCL-CB-030	Dual Port VF, CO (FXO) Line Interface Card 2, 64Kbps/Sec. VF Channels per Central Office Line Card 15 (max) per system	1
5.	VCL-CB-030-ext	Dual Port VF, CO (FXO) Line Interface Card 2, 64Kbps/Sec. VF Channels per Central Office Line Card 15 (max) per system (programmable Tx and Rx level settings)	1
6.	VCL-CB-035	Dual Port , E & M Cards, 2 Wire / 4 Wire E & M Trunk Interface Card 15 (max) per system	1
7.	VCL-CB-035-ext	Dual Port , E & M Cards, 2 Wire / 4 Wire E & M Trunk Interface Card 15 (max) per system (programmable Tx and Rx level settings)	1
8.	VCL-CB-040	Ring Generator Card, Central Office Ring Generator Card 1 per system	1
9.	VCL-CB-045	Dual Port , RS232 Data Interface Card, Up to 19.2Kbps RS232 Asynchronous Data Interface Card, 2 Interfaces per Card 15 (max) per system	1
10.	VCL-CB-060	Dual Port, G.703, Co-Directional Data Interface Card 64Kbps Co-Directional G.703 Data Interface Card, 2 Interfaces per card 15 (max) per system	1
11.	VCL-CB-080	iDSL Modem Card Central Office / ISP Multiplexer Side - transports 128 Kbps on a single twisted copper pair upto 5 KM (ISDN DSL)	1
12.	VCL-MX-054	V.35, N x 64Kbps Synchronous Data Interface,TWO 64 Kbps, V.35 Interfaces per Card DCE	1

Ordering Information

<u>VCL-MX, User Configurable Interfaces</u>			
S No.	Part #	Product Description	Qty
13.	VCL-MX-055	V.35, N x 64Kbps Synchronous Data Interface, ONE Interface per Card - User Selectable Data Rate of "N" (1 thru 30) - DCE	1
14.	VCL-MX-056	V.36, N x 64Kbps Synchronous Data Interface, ONE Interface per Card - User Selectable Data Rate of "N" (1 thru 30) - DCE	1
15.	VCL-MX-057	RS530, N x 64Kbps Synchronous Data Interface, ONE Interface per Card - User Selectable Data Rate of "N" (1 thru 30) - DCE	1
16.	VCL-MX-058	X.21, N x 64Kbps Synchronous Data Interface, ONE Interface per 2 Card - User Selectable Data Rate of "N" (1 thru 30) - DCE	1
17.	VCL-MX-081	Fractional E1 - N x 64Kbps Data Interface, ONE Fractional E1 Interface per Card - User Selectable Data Rate of "N" (1 thru 30)	1
18.	VCL-MX-100BaseT	Integrated 100Base Bridge /Router . Installs in the VCL-MX slot. FULL Routing Functions. User Selectable ("n" x 64) bandwidth/ "n"=1 thru 30.	1
19.	VCL-MX-090	iDSL @ 64 / 128 Kbps - (Remote) Customer Premises Equipment with a synchronous V.35 data interface @ 64 / 128 Kbps with AC adapter	1
20.	VCL-MX-095-Netopia	iDSL @ 64 /128 Kbps -(Remote) Customer Premises Equipment with a 10BaseT interface. FULL Routing Functions.	1
21	VCL-MX-047	Analog I/O, This interface Card provides 8 Analog I/O's which may be used to extend either Dry Relay Contacts (Relay Normally-Open or Relay Normally-Close), or operate switches remotely (using 2A Dry Relay Contacts) between any two Multiplexers using a 64 Kbps time-slot. The Dry Relay Contacts are rated at maximum 2 Amps, 30 Volts DC.	1
22	VCL-MX-048	Digital I/O, This interface Card provides 8 digital I/O's which may be used to either extend Digital I/O's (logic high / low) signals between any two E1 Multiplexers, or operate switches remotely (using logic high / low) signals between any two multiplexers. Drivers / Sense Logic operates using External Voltage and Ground references).	1
22	VCL-MX-059	High Speed Synchronous "n X 64" Data Interface Type: Universal Data Interface. V.35, V.36, X.21, RS422, RS530. User Configurable - DCE / DTE	1
23	VCL-MX-046	Dual Port , RS232 / 485 Data Interface Card, Up to 19.2Kbps RS232 / 485 Asynchronous Data Interface Card, 2 Interfaces per Card 15 (max) Per system	1

Ordering Information

<u>Optional and Accessories</u>			
S No.	Part #	Product Description	Qty
1.	VCL-30-01048	Power Supply (External) AC to DC Converter Portable External Converter Universal AC Input [93VAC-276VAC, 47Hz-63Hz] to DC Output [(-) 48VDC] - Optional 1 (Supports 1 channel bank)	1
2.	VCL-30-01048 19-RK	Power Supply (External) AC to DC Converter External Converter] Universal AC Input [93VAC-276VAC, 47Hz-63Hz] to DC Output [(-) 48VDC] - Optional 2 (Supports up to 4 channel banks)	1
3.	VCL-30-75 -Conv	75 Ohms to 120 Ohms Converter , G.703 Transformer Module(Balun) with RJ-45 and Female BNC	1
4.	VCL-120 / 75-16 Converter	16 E1, 120 Ohm to 75 Ohm (BNC) Converter Panel - 19 inch Rack Mount version, RJ45 Connection on 120 Ohms / BNC (female) connection on 75 Ohms , with RJ45 cables	1
5 .	BNC to BNC Cables	BNC to BNC Cable	1
6.	Cables	RJ11 connectorized Cables for FXS / FXO Cards - RJ11 to RJ11 - 2 cables for each dual port interface card	1
7.	Cables	E&M Connectorized Cables -2 cables for each dual port interface card	1
8.	Cables	RS232 Connectorized Cables -2 cables for each dual port interface card	1
9.	Cables	V.35 (M34 - Winchester) - "n" x 64Kbps Connectorized Cable - 1 cable for each interface card	1
10.	Cables	V.36 / X.21 / RS530 - "n" x 64Kbps Connectorized Cable	1
11.	Cables	Fractional E1 Connectorized Cables	1
12.	Cables	G.703 Connectorized Cables	1
13.	Cables	iDSL Connectorized Cables	1
14.	Cables	E1 Interface - RJ45 Connectorized Cable (Straight-Through & Cross-Over Cable - 1, ea.)	1
15.	Cables	NMS Connectorized Cables	1
16.	Cables	LMS Cables	1
17.	Manual	Documentation User Manual & System Software Disks	1

