



# **VCL-MX Version 6 DXC 80 T1, 120Mbps Digital Access Cross Connect Switch**

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## **System Guide**

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## Warranty

This Valiant product is warranted against defects in material and workmanship for a period of one year from the date of shipment. During the warranty period, Valiant will, at its discretion, either repair or replace products which prove to be defective. For warranty service or repair, this product must be returned to a service facility designated by Valiant. The buyer shall prepay shipping charges to Valiant and the company shall pay shipping charges to return the product to the buyer. However, the buyer shall pay all the shipping charges, duties and taxes for products returned to Valiant from another country.

## Limitation of Warranty

The foregoing warranty shall not apply to defects resulting from improper or inadequate maintenance by the buyer. The buyer-supplied firmware or interfacing, unauthorized modification or misuse, operation outside of the environmental specifications for the product or improper site preparation or maintenance.

## Exclusive Remedies

The remedies provided herein are the buyer's sole and exclusive remedies. Valiant shall not be liable for any direct, indirect, special, incidental, or consequential damages, whether based on contract or any legal theory.

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## Safety Warnings



The exclamation point within a triangle is intended to warn the operator or service personnel of operation and maintenance factors relating to the product and its operating environment, which could pose a safety hazard.

Always observe standard safety precautions during installation, operation, and maintenance of this product. Only qualified and authorized service personnel should carry out adjustment, maintenance, or repairs to this instrument. No adjustment, maintenance or repairs should be performed by either the operator or the user.

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## Product Overview

The VCL-MX Version 6 DXC – 80 T1, 120Mbps Digital Access Cross Connect is a modular switch which may be scaled from 8 T1 Ports to up to 80 T1 Ports. The VCL-MX Version 6, T1 DACS (T1 DXC) offers full cross-connect functionality to cross-connect between 64Kbps time-slots (DS-0s), "n"x64Kbps consecutive DS-0s and Fractional T1 channels to full T1 channels.

The VCL-MX Version 6 DXC – 80 T1, 120Mbps Digital Access Cross Connect Switch, occupies 6U high (264 mm) rack-space and is a complete 19-inch standalone unit that provides a 64Kbps time-slot (DS-0) cross-connect fabric for up to 80 T1 ports. This product offers 1+1 -48V DC Power Supply Redundancy, 1+1 Control Card and Processor Redundancy, 1+1 Cross-Connect (TSI) Redundancy, 1+1 Timing (Synchronization Clock Circuitry) Redundancy. This DXC offers "user selectable" clock / timing synchronization priority. The Dual Power Inputs allow the equipment to be powered from two separate power sources. AC input external adapter is an optional for AC mains operation.



## Key Features and Highlights

- 120Mbps, 80 T1 fully non-blocking cross-connect at 64Kbps (DS-0) level (1920 DS-0 – any to any time-slot cross-connect).
- Scalable from 8 T1 Ports to 80 T1 Ports.
- 1+1 Control Card Processor Redundancy.
- 1+1 Cross-Connect / TSI Redundancy.
- 1+1 Timing (Synchronization Clock) Redundancy.
- 1+1 -48V DC Power Supply Redundancy (Dual Power Input – allows the equipment to be powered from two separate -48V DC sources).
- Bit Error Rate (BER) monitoring – BER thresholds to generate BER alarms automatically whenever alarm limits are exceeded.
- Telnet remote access. SSH for secured remote access.
- SNMP traps.
- Maintains Access Security Log.
- USB and RS232, Interface for local connection through the serial interface to the "Network Control and Management Software".
- User Selectable Internal, External and Loop-timed clock synchronization priority options.
- Local and remote loopback facility.

## System Access, Control and Management Options

- Telnet
- SSH
- CLI Control Interface (HyperTerminal or VT100)
- SNMP V2 Traps (MIB File provided)
- GUI (Graphical User Interface)

## OAM: Operation and Management Ports

- RS232 Serial Port
- USB COM Port
- 10/100BaseT Ethernet for remote access.

## Security and Protection

- Secured Access via SSH V2
- Password Protection: Password Protection in compliance with the mandatory clauses of the GR-815-CORE-2 specifications for secured access control.
- Logging: Maintains a log of all successful and un-successful attempts. Logged information includes the ID and the IP address of the accessing entities. Alerts the administrator if the un-successful logging attempts exceed 3.
- Security Audit: All access logs for up to 30 days are maintained for security audit purposes.
- Security log entry of any request or activity including that user-ID (including IP address, if applicable), to establish user accountability
- Report Generation / Audit Trail
- Security Administration.

## System Overview and Architectural Details

VCL-MX Version 6 is a scalable DXC which may be used to cross-connect at DS-0 (64Kbps time-slot level) from 8 T1 Ports to 80 T1 Ports (120Mbps). The VCL-MX Version 6 DXC has a multi-slot chassis with TDM backplane. In the chassis, there are ten (10) T1 interface card slots. Each T1 Interface Card has 8 T1 Ports.

Two slots are reserved for 1+1 redundant control cards which includes the redundant cross connect, processor, TSI and clock synchronization / timing functions. One dedicated slot exists for an OAM card and two slots for 1+1 redundant power supply cards.

## Chassis / System Backplane

All connections are made at the rear of the chassis, providing interconnections between the various plug-in cards and to the network. VCL-MX Version 6 - 80 T1, 120Mbps Digital Access Cross Connect Switch supports high-density T1 interface cards.

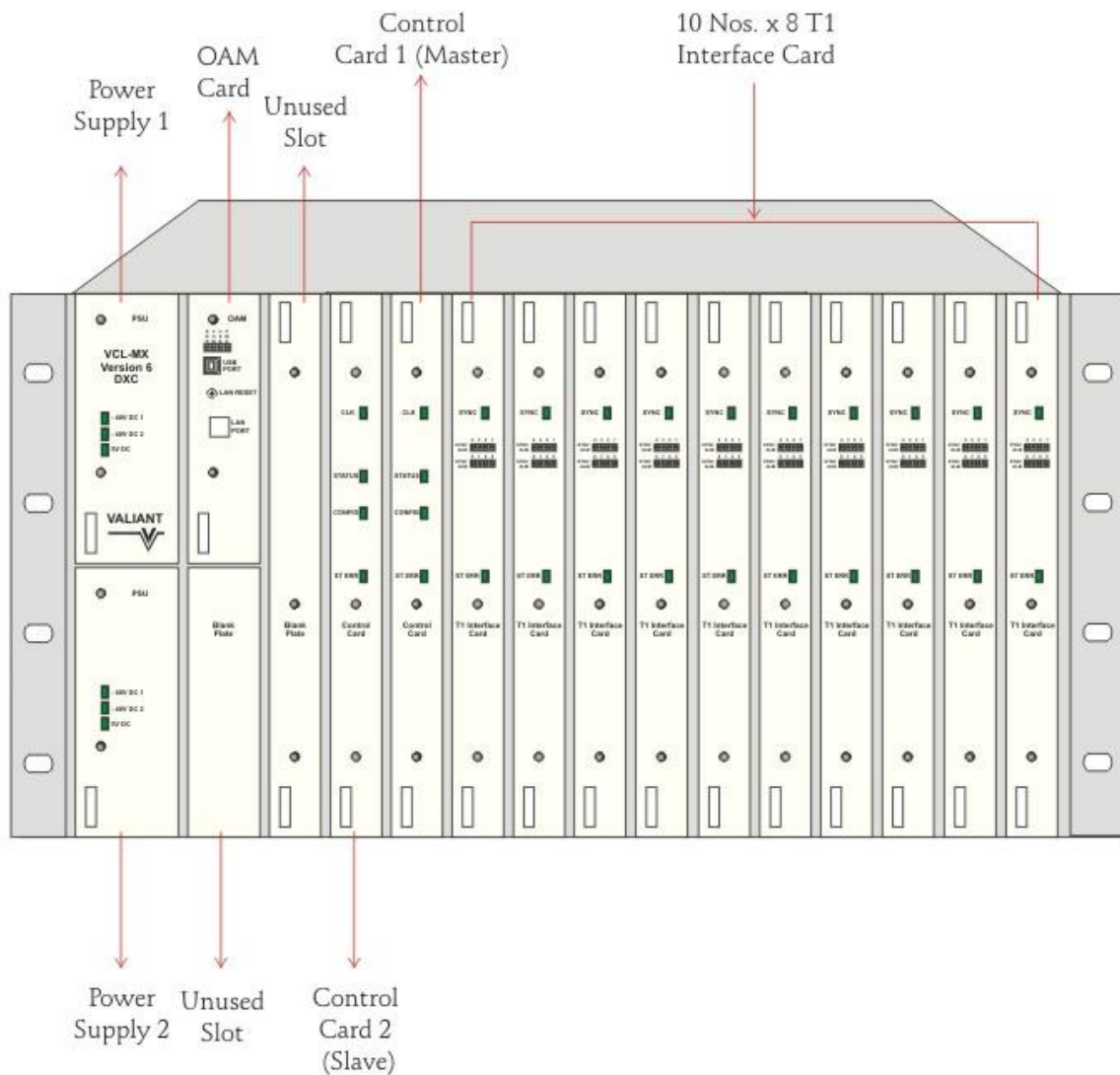
An extensive set of alarms, for easy maintenance, are provided in the system.

## Timing (Clock) Synchronization

Timing Options	Internal Clock, Loop-Timed Clock, External Clock. User selectable synchronization priority
Synchronization Sources	Internal Clock, span clock timing derived from incoming T1 links (Loop-Timed), External Clock, 75 Ohms (TTL), 1.544 Mbps (100 Ohms Bits clock)
Default Option	Internal Clock

## System Management

VCL-MX Version 6 - 80 T1, 120Mbps Digital Access Cross Connect Switch offers a variety of management options. The equipment may be configured using CLI (English text) commands, or a GUI (Graphical User Interface). The management and configuration commands may be executed from a VT100 terminal, Windows HyperTerminal, any DOS based system, Linux or UNIX based system, or Telnet (remote configuration and management).



The equipment provides a wide choice of access ports for connecting to and executing management and configuration commands through its OAM Card.

The OAM card provides:

- a) COM Port (RS232 Serial Port).
- b) USB Port
- c) 10/100BaseT Ethernet Port (each multiplexer may be assigned an IP address and connected to a LAN / IP network for remote access and management through the 10/100BaseT Ethernet Port for out-of-band configuration, management, and access).

The OAM card supports:

- a) Telnet
- b) SSH
- c) SNMP, V2
- d) Additionally, a Windows based GUI (Graphical User Interface) for easy configuration, management, and access.

The VCL-MX has an effective, CLI (text) and GUI based "Network Management Interface", which may be used for configuring and monitoring multiple systems from a single central location.

**Status Monitoring**

- Synchronization Clock Selection.
- Status of alarms.
- Enabled/Disabled status of 1.544 Mbps T1 ports.
- Monitoring the 80 Port T1 DACS status and configuration.
- Monitoring of T1 Link status: LOS, LOF, AIS, RA.

**Alarm status and monitoring**

- Loss of incoming signal at all 1.544 Mbps T1 Ports
- Configuration error alarm.

**LED indications**

- 1 to 80 T1 Ports LED indicators
- 5V DC present
- -48V DC present
- Configuration error.

**External Alarm - Contact Closures**

- 1 Alarm relay Type - form "C"

**Technical Specifications:**

**DACS Control Card - Processor, Timing and TSI Card: (Part No. VCL-MX-1500-DXC-T1)**

Control Card Redundancy	Yes
Processor	1+1 Redundant ARM7 Self Learning Self Healing Automatic Fail-Over and Recovery
Timing and TSI	1+1 Redundant Self Learning Self Healing Automatic Fail-Over and Recovery

**OAM - Management Interface Card (Part No. VCL-OAM-2104-5.0-v6-DXC)**

- COM Port (RS232 Serial Port)
- USB Port
- 10/100BaseT Ethernet Port - Each multiplexer may be assigned an IP address and connected to a LAN / IP network for remote access and management through the 10/100BaseT Ethernet Port for out-of-band configuration, management, and access
- Telnet
- SSH
- SNMP, V2
- Windows based GUI (Graphical User Interface) for easy configuration, management, and access.

**T1 Interface Card (Part No. VCL-MX-1520-T1-5.0-DXC)**

Maximum number of interfaces	80 T1 Interfaces with full capability to cross connect at DS-0, 64Kbps time-slot level, as well as to inter-connect to voice and digital data services between 80 incoming T1 Ports (i.e., 80 separate T1 Links, 1920 DS-0 – any to any time-slot cross-connect)
Number of Interfaces per T1 Interface Card	8 T1 Interfaces with full capability to cross connect at DS-0, 64Kbps time-slot level as well as to inter-connect to voice and digital data services between 80 incoming T1 Ports (i.e., 80 separate T1 Links)
Connectors	DB-25 / RJ-45 / RJ-48C
Conformity (electrical)	ITU-T G.703
Frame Structure	As per ITU (CCITT) G.704
Framing Options	D4, ESF (Selectable)
Line Coding	AMI, B8ZS (Selectable)
Line Rate	1.544 Kbps ± 50 ppm
Nominal Impedance	100 Ohms
Jitter Tolerance	ITU-T G.823, ITU-T 1.431
Monitoring Connection Line Quality	Loss of Signal (LOS), Loss of Frame (LOF), All Ones Alarms (AIS), RA (Remote Alarm).



**Power Supply (Part No. VCL-MX-1510-DXC)**

Input DC Voltage	-48V DC (nominal)
Range of Input	-36V to -72V DC
Output Voltage	5V filtered -48V (for terminal cards)
Full Load Current Rating	4A at 48V DC
Input Voltage Reversal Protection	Provided in the Card
Over Current Protection	4A at 48V DC
Short Circuit Protection	Current limit – 4A. Recovers on removal of short
Efficiency at Full Load	> 91%

**Power Consumption**

Maximum Power Consumption	90 watts
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**Environmental**

Temperature	-10°C to + 60°C
Humidity	95% R.H. (non-condensing)
Altitude	Upto 9,000 feet

**Dimensions**

Height	266 mm (19 “ 6U high)
Width	482 mm
Depth	270 mm
Weight	7 Kgs

**Regulation Compliance**

- Meets CE requirements.
- Complies with FCC Part 68 and EMC FCC Part 15 Class 2
- Safety - ULI 1459 Issue 2
- Operation ETS 300 019 Class 3.2
- Storage ETS 300 019 Class 1.2
- Transportation ETS 300 019 Class 2.3

**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.

**Ordering Information**

**VCL-MX Version 6, Up to 80 T1, 120Mbps DACS / DXC [Core / Common Equipment]**

Sr. No.	Part Number	Product Description	Qty.
1	VCL-MX-1500-DXC-T1	DACS Control Card Central processor, cross-connect and system control Card, may be used in a 1 + 1 redundant Configuration. <b>Note:</b> Please order 2 numbers for 1 + 1 redundancy.	1
2	VCL-OAM-2104-5.0-v6-DXC	Management Card [SNMP, Telnet (RJ45 Port) and Serial Port (USB and DB-9 COM Port)], OAM - Operations and Management Card for connecting the multiplexer to be managed in a LAN - allows the USER to assign a unique IP address to each multiplexer connected in a LAN to be managed from a single point. Telnet, SNMP (V2)	1
3	VCL-MX-1506-DXC	19" Shelf 6U High (Sub-rack) fitted with DB25F Connectorized Backplane Max. Ten (10) traffic slots meant for tributary cards (line cards)	1
4	VCL-MX-1510-DXC	(-) 48VDC Input Power Supply Card may be used in a 1 + 1 redundant Configuration. <b>Note:</b> Please order 2 numbers for 1 + 1 redundancy	1

**VCL-MX Version 6, Up to 80 T1, 120Mbps DACS / DXC [User Configurable Interfaces]**

Sr. No.	Part Number	Product Description	Qty.
1	VCL-MX-1520-T1-5.0-DXC	8 T1 Interface Card Full capability to cross connect at DS-0, 64Kbps time-slot level as well as to inter-connect to voice and digital data services between 80 incoming T1 Ports (i.e., 80 separate T1 Links, 1920 DS-0 – any to any time-slot cross-connect). (10 Cards / 80 Ports (Max) per Chassis)	10

**VCL-MX Version 6, Up to 80 T1, 120Mbps DACS / DXC [Cable & Accessories]**

Sr. No.	Part Number	Product Description	Qty.
1	VCL-1505-TER-DB37F-RJ45F-16PP-DXC	16xE1/T1, DB37 to RJ45 Termination Panel - 2 x DB37 (F) - 16 x RJ45 (F) 19", Rack Mount Version [DB37 / RJ45 cables not included]	0
2	VCL-1505-TER-DB37F-RJ45F-32PP-DXC	32xE1/T1, DB37 to RJ45 Termination Panel - 4 x DB37 (F) - 32 x RJ45 (F) 19", Rack Mount Version [DB37 / RJ45 cables not included]	1
3	VCL-1505-TER-DB37F-RJ45F-48PP-DXC	48xE1/T1, DB37 to RJ45 Termination Panel - 6 x DB37 (F) - 48 x RJ45 (F) 19", Rack Mount Version [DB37 / RJ45 cables not included]	1
4	VCL-HRNS 1264-4E1O-DXC	E1/T1 4 Port Connectorized Cable [DB25M-Open] [2 cables each 8 Port E1/T1 card]	0
5	VCL-HRNS 1268-16E1Y37M-DXC	E1/T1 8 Port Y Connectorized Cable [2xDB25M-DB37M] [1 cable each 8 Port VCL-1505-TER-DB37F-RJ45F-16PP]	10
6	UMIKitMXV6-DXC	System Core Cables, Blank Space Blocking Plates, Installation Accessories, Documentation, System User Disk, etc. [Set].	1

Technical specifications are subjects to changes without notice.  
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