

Introduction:

The VCL-Gigabit Optical Add-Drop Multiplexer is a unique Gigabit multi-service optical fiber transport solution which transmits both Gigabit Ethernet (Gigabit Wire-Speed) data along with upto 16 E1 (TDM) channels over an optical fiber link. This product provides up to 4 x Gigabit interfaces with rate-limiting option on each port (with user selectable bandwidth allocation on each Gigabit port).

1+1 optical fiber redundancy is also available for minimizing the possibility of transmission loss due to an optical link failure. The Gigabit (Wire-Speed) Ethernet traffic along with 16 E1's are multiplexed into 1.25Gbps optical link to provide a compact, high performance, high throughput and cost effective broadband network access solution.

Features:

- 1U height, 19-Inch standard rack-mountable chassis
- Optical line bit rate 1.25 Gbps
- 1+1 Gigabit Optical WAN ports
- 1 x Gigabit Optical and 3 x Gigabit Electrical Ethernet ports with **data rate limiting feature**
- 1 Gbps data throughput for aggregate Ethernet traffic
- E1 and Gigabit Ethernet Add-Drop Function to use the equipment in Add-Drop and Chain networking
- Wire-Speed Gigabit Ethernet traffic with 16 E1 data are transported simultaneously
- Supports jumbo frame size (upto 9720 bytes) transmission
- Supports 1+1 optical link protection and APS with less than 50ms switching time
- MSA compliant SFP (Small Form-Factor) based design for improved and easy serviceability. SFP based design provides the flexibility to the customer to change service distance and support different types of optical fiber
- MSA standard compliant SFP (INF-8074i, ITU-T G.695 and FC-PIV2.0)
- Supports Automatic Laser Shutdown (ALS) option for added safety
- Performance analysis of optical ports Optical Transmission Failure, Loss of Optical Link, Loss of Frame and Errors (E-3 / E-6)
- E1 port complies to ITU-T G.703 and G.704
- Jitter tolerance, jitter transfer characteristic and jitter generation fully comply with ITU-T G.823 and G.742 recommendations
- Performance analysis of E1 ports Loss of Signal and Code Violation
- Performance Analysis of GigE port
- Remote access and management over TCP-IP Telnet and SNMP
- Supports SNMP V2 monitoring and traps
- Supports Command Line Interface (CLI) based on RS232 (COM Port) and TCP-IP (Telnet)
- Remote Power Down detection (RPD) alarm. Allows the local end to detect if the remote unit is unavailable due to optical link failure or due to power down.
- Remote software ungradable
- AC and DC power redundancy {-48V DC (-18V to -72V) , 100-240V AC options available}
- Complies to electrostatic discharge immunity (ESD) IEC 61000-4-2 level 2
- RoHS and EMI/EMC compliant.



Highlights

- Gigabit (Wire Speed) data transmission
- Gigabit multi-service fiber optic transport solution - Transmits both E1s and Gigabit Ethernet data over an optical fiber link / or over 1+1 redundant optical fiber links for added protection against link failures
- Compact, high performance, high throughput and cost effective broadband network access solution
- SFP based design for customer convenience, flexibility to change services distance and serviceability
- Optical distance support for 550m, 10Kms, 20Kms, 40Kms, 80Kms and 120Kms without Optical Repeaters
- Supports remote power down detect function
- Ethernet data port complies to IEEE 802.3, IEEE 802.3u, IEEE 802.ab, IEEE 802.3x recommendations
- Ethernet data port supports auto-negotiation function and can work in 10M full/half duplex, 100M full/half duplex, 1000M full duplex mode (1000M half duplex is not supported)
- Ethernet Transmission media is Category 6 UTP, RJ-45 connector (electrical) for Gigabit Ethernet channel with upto 1000Mb/s data rates
- Ethernet Transmission media is optical fiber pair, LC connector (optical), for Optical Gigabit Ethernet with up to 1000Mb/s bandwidth
- Supports Command Line Interface (CLI) for configuration and management
- Supports TELNET for remote configuration and management
- Supports SNMP V2
- GUI for easy configuration
- Network Management System for monitoring multiple units from a single, central location
- Supports multiple type of alarm notifications
- Supports E1 and optical loop back configuration, etc.
- 1U (44mm) high 19 Inch Rack Mount standard rack design
- Low power consumption (Less than 15W)
- Provides E1's with 120 Ohms (RJ-45) or E1's with 75 Ohms (BNC) connections - optional
- E1 G.703, G.703 channels support all protocols sent over it, e.g. SS7 signaling, PRI for PABX interconnection
- Support for Base Station backbone development for CDMA, GSM, 3G and other applications where E1 G.703 channels and Gigabit Ethernet data are required to send over the same fiber link.

Technical Specifications

Gigabit Optical (Network Transmission Side) Interface options (SFP options)

Wave Length	Distance	SFP Standards
850nm-LD	550m	1. Supports 1.25Gbps bit rate. 2. Connector type is LC 3. MSA (INF-8074i) Compliant and SFF-8472 v9.3 4. IEEE802.3z Gigabit Ethernet 5. DDM, RoHS & WEEE 6. International Class 1 laser safety certified (IEC 60825) 7. Complied to GR-468-CORE 8. Complied to ITU-T G.695 9. Complied to FC-PI V2.0 Standard
1310nmFP-LD	10km	
1310nmDFB-LD	20km	
1550nmDFB-LD	40km	
1550nmDFB-LD	40km	
1550nmDFB-LD	80km	
1550nmDFB-LD	120km	

E1 Interface Specifications

Electrical Interface	E1
Channel capacity	16 E1
Bit rate	2.048 Mbps \pm 50 ppm
Line code	HDB3
Frame Structure	As per G.704
Electrical Interface	As per G.703
Nominal impedance	120 Ohms balanced / 75 Ohms unbalanced (optional)
Jitter character	ITU-T G.742, G.823 compliant
Connectors	RJ-45 connectors (120 Ohms balanced) Or Male DB37 interface with BNC coaxial connectors (75 Ohms unbalanced)

Electrical Ethernet Interface Specification: 10/100/1000BaseT

Number of Interfaces	3
Interface Types	10/100/1000BaseT
Ethernet Mode	Half/Full for 10 and 100BaseT, Full for 1000BaseT
Standard	IEEE802.3ab 1000Base-T /IEEE802.3u 100Base-TX /IEEE802.3 10Base-T
MDI/MDI-X Support	Yes
MAC address Table	4K
MAC address Table aging time	12S / 300S
VLAN	Port based and 802.1Q
Minimum Frame Size	64 bytes
Maximum Frame Size	1518/2000/9720 bytes
Transmission Bit Rate	10/100/1000 Mbps
Connectors	RJ-45 Electrical
802.1Q MAC packet transparent transmission supported	

Power Supply

Power Input	AC, DC, AC + DC
DC Power	DC - 48V (Input range 18~72V)
AC Power	AC 100~240V, 50/60Hz
Power Consumption	< 15 Watts

Optical Ethernet Interface Specification: 1000BaseX

Number of Interfaces	1
Interface Types	1000BaseX
Ethernet Mode	Full
Standard	SFP MSA (INF-8074i) SFF-8472 v9.3 IEEE802.3z 1000Base-LX/SX standard ITU-T G.695 FC-PI v2.0
MAC address Table	4K
MAC address Table aging time	12S / 300S
VLAN	Port based and 802.1Q
Minimum Frame Size	64 bytes
Maximum Frame Size	1518/2000/9720 bytes
Transmission Bit Rate	1000 Mbps
Connectors	SFP Optical Module
802.1Q MAC packet transparent transmission supported	

Configuration, Maintenance and Management Interfaces

- Serial Management Port – RS232 interface (COM Port)
- TCP/IP – 10/100BaseT for remote management over a LAN / TCP/IP network
- SNMP V2 (MIB File provided with the equipment)
- Telnet – CLI (Command Line Interface)
- Windows XP and Windows 7 compatible Graphical User Interface (GUI)
- Network Management System (to monitor multiple units from a single central location).

Safety

- Class 1 Laser
- Auto Laser Shut Down (ALS) in the event of fiber break.

Alarm and Indicator Monitoring

- Power Indicator
- Current Status (integrity and activity) Indicator
- Optical Signal Loss Alarm Indicator
- Remote Device Power-Down (RPD) Indicator
- Ethernet Link Indicator
- Ethernet Speed Indicator
- E1 Signal Loss Alarm Indicator
- Frame Loss Indicator
- Optical Errors (E-3 / E-6) Indicator
- Optical Code Violation Indicator
- Code Violation History Indicator
- SNMP V2 Diagnostic and Monitoring.

Environment

Temperature	- 5°C ~ +55°C for operation - 40°C to +70°C for storage
Humidity	5% to 95% (35°C)

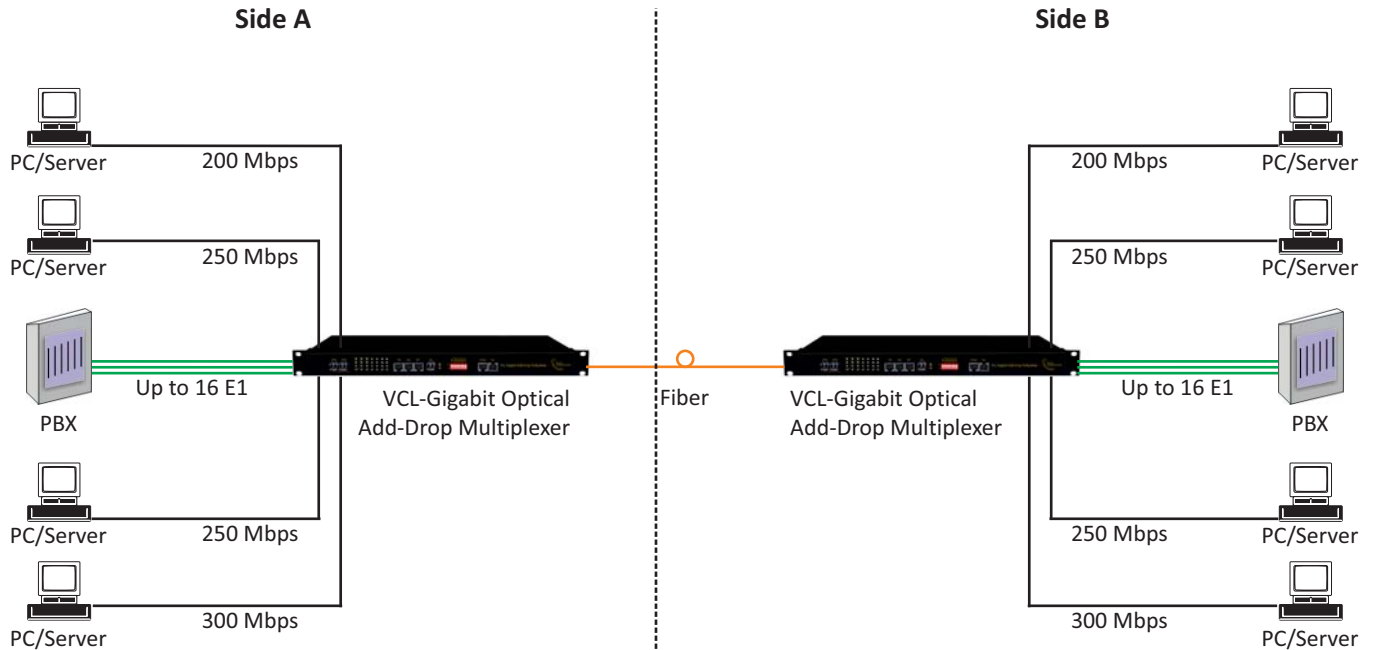
Mechanical Specifications

W x D x H	440 x 210 x 44 mm.
Weight	2.7 kg
Rack Type	EIA 19 inch

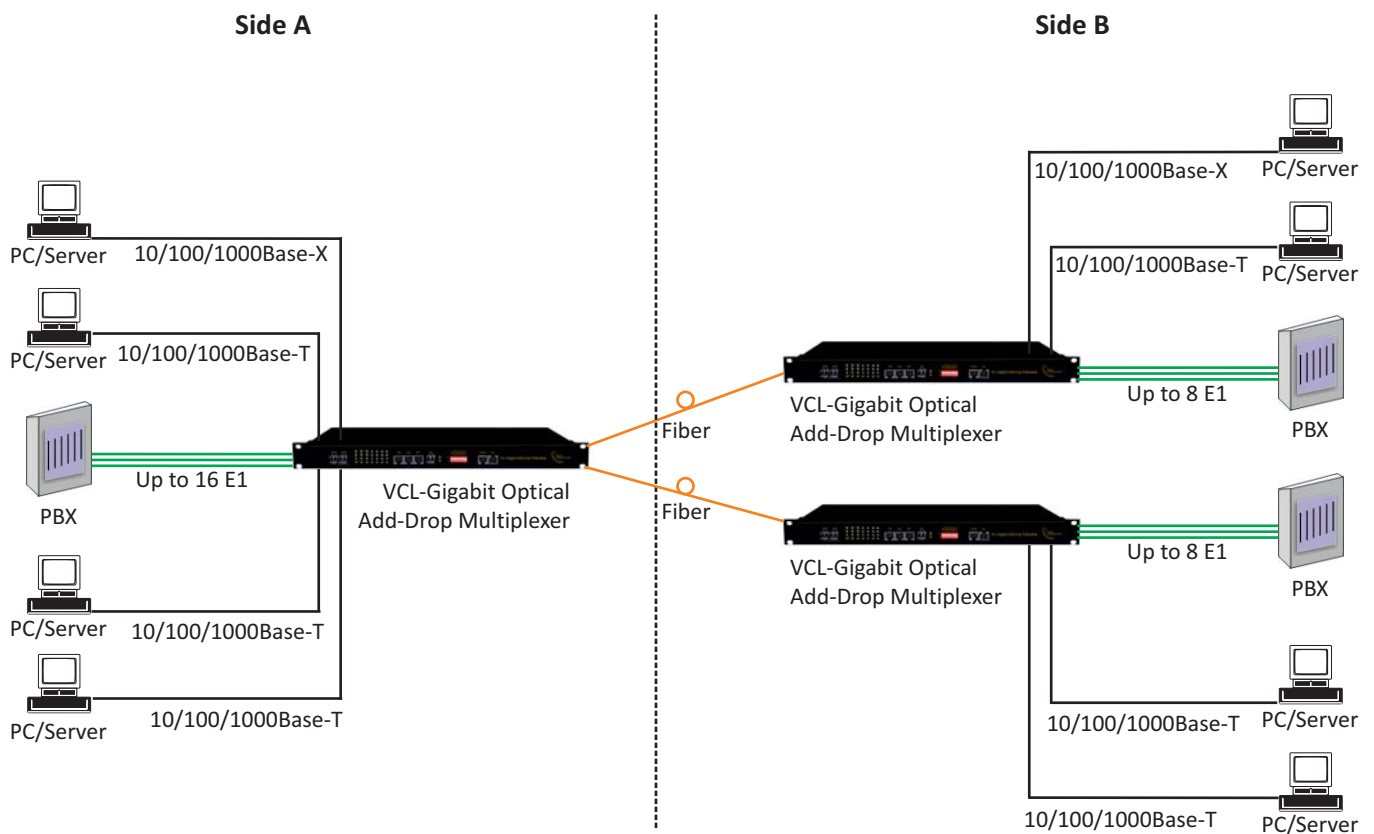
Application Diagrams

Application: Data Rate limiting feature

VCL-Gigabit Optical Add-Drop Multiplexer supports Rate Limiting feature. A user can divide 1000Mbps (total) bandwidth into four Gigabit Ethernet ports according to their requirement. A user can configure Gigabit Ethernet Rate Limit from 2Mbps to 1000Mbps for any of the Gigabit Ethernet ports through user configurable commands.

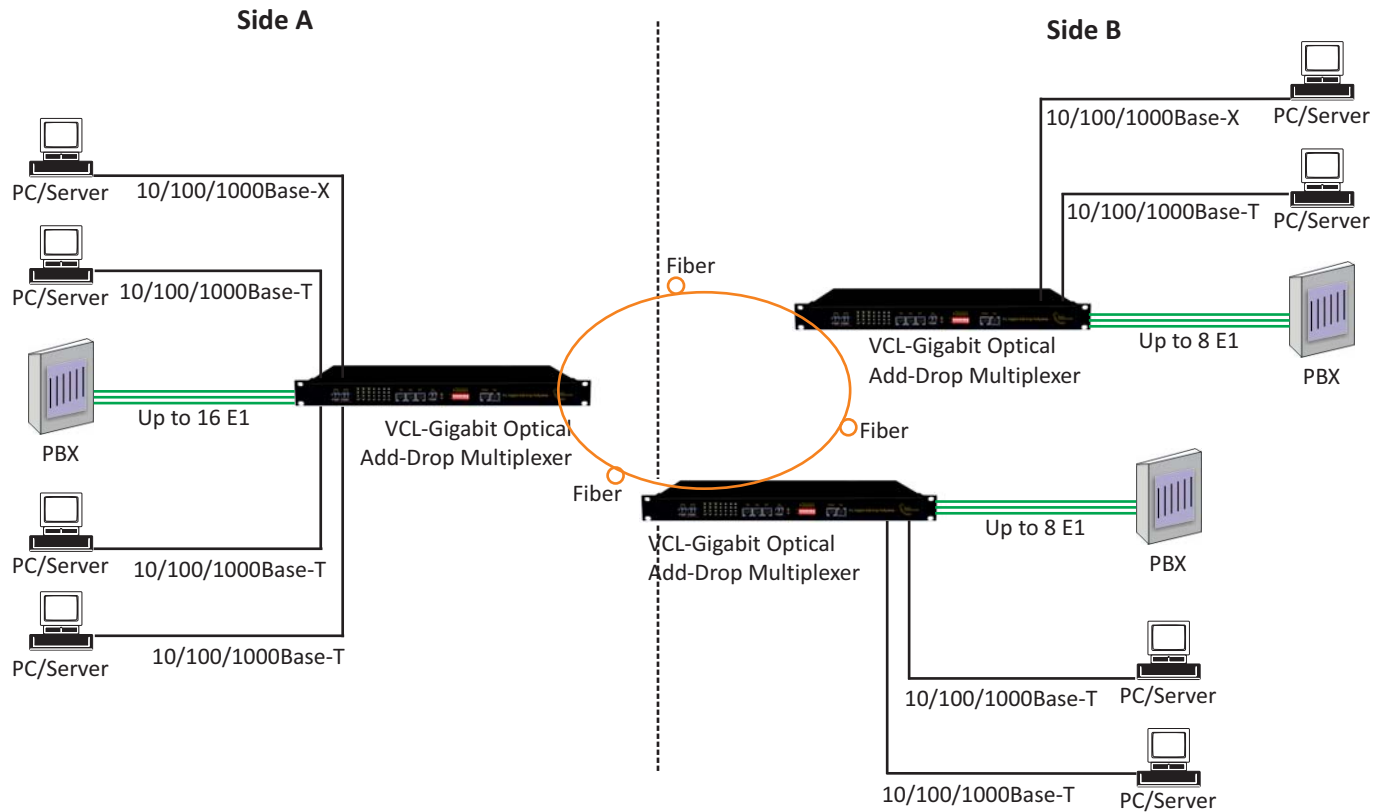


Application: Point-to-Dual Point

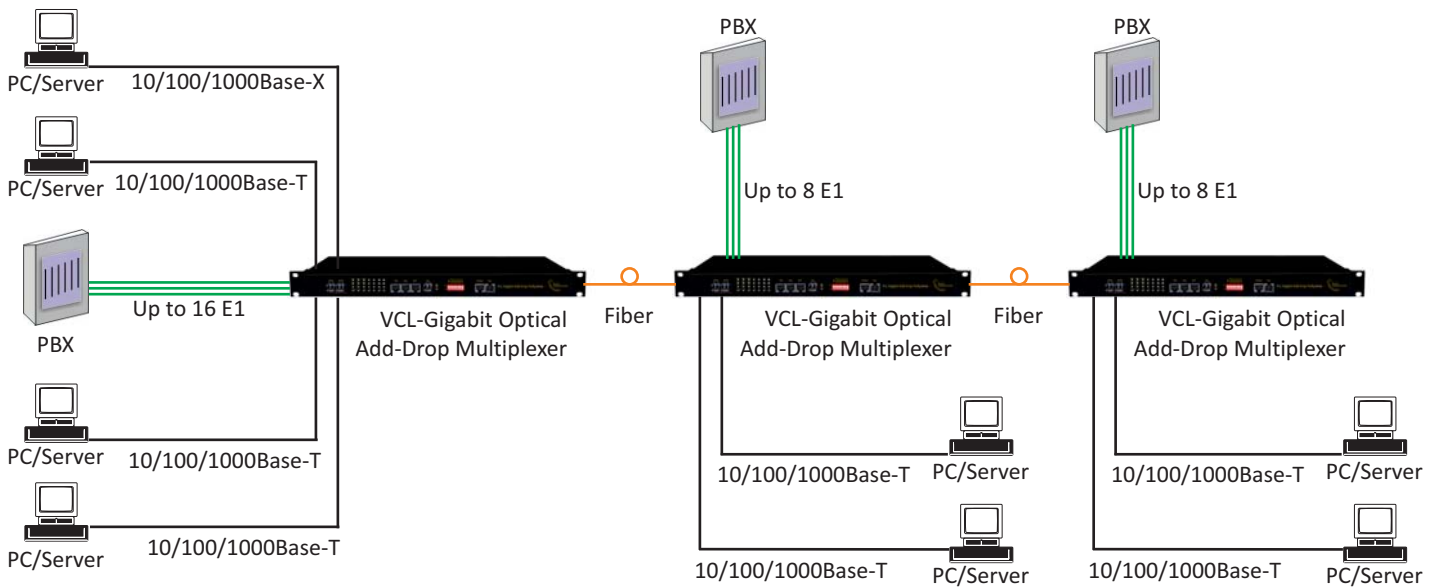


Application Diagrams

Application: Ring Network



Application: Chain Network



Ordering Information**Gigabit Optical (Network Transmission Side) Interface options (SFP options)**

Part#	Description
16E1-120-4GigE	VCL-Gigabit Optical Add-Drop Multiplexer 19" Metal box / case 1U High Rack Mount Version Supports : - 16 x E1 Ports [120 Ohms RJ45F] - 4 x Ethernet Ports (1000Mbps, Gigabit) [3 x Electrical RJ45F Port and 1 x Optical Port (Gigabit, SFP based / without SFP)] - Customer Side - 2 x Optical Ports [Gigabit, SFP based / without SFPs] - Network Transmission Side - SNMP, NMS & Telnet for management
16E1-075-4GigE	VCL-Gigabit Optical Add-Drop Multiplexer 19" Metal box / case 1U High Rack Mount Version Supports : - 16 x E1 Ports [75 Ohm DM37 (M) / BNC (F)] - 4 x Ethernet Ports (1000Mbps, Gigabit) [3 x Electrical RJ45F Port and 1 x Optical Port (Gigabit, SFP based / without SFP)] - Customer Side - 2 x Optical Ports [Gigabit, SFP based / without SFPs] - Network Transmission Side - SNMP, NMS & Telnet for management

Power Supply Options

Part #	Description
AC220	1 x 100-220V (Range: 100-240) AC Power Supply Input
DC048	1 x -48V (Range: 18-72) DC Power Supply Input
ACDC	1 x 100-220V (Range: 100-240) AC Power Supply Input 1 x -48V (Range: 18-72) DC Power Supply Input

Accessories

Part #	Description
VCL-HRNS 1229	Optical Patch Cord Connectorized Cable [2LC-2LC, 3m, SM]
VCL-HRNS 1238	Optical Patch Cord Connectorized Cable [2LC-2LC, 10m, SM]
VCL-HRNS 1242	Optical Patch Cord Connectorized Cable [LC-FC, 10m, SM]
VCL-HRNS 1243	Optical Patch Cord Connectorized Cable [2LC-2FC, 10m, SM]
VCL-HRNS 1239	Optical Patch Cord Connectorized Cable [LC-SC, 10m, SM]
VCL-HRNS 1258	Optical Patch Cord Connectorized Cable [2LC-2SC, 10m, SM]
VCL-ECON 1172	Connector (Attenuator LC-LC (10 db.))
VCL-ECON 1173	Connector (Attenuator LC-LC (20 db.))
VCL-ECON 1186	Connector (Attenuator FC-FC (10 db.))
VCL-ECON 1187	Connector (Attenuator FC-FC (20 db.))
VCL-ECON 1197	Connector (Attenuator SC-SC (10 db.))
VCL-ECON 1198	Connector (Attenuator SC-SC (20 db.))
UMIKit16E1GigEADM	System Core Cables, Installation Accessories, Documentation, System User Manual, System User Manual Disk etc (Set).

SFP Options

Part #	Description
VCL-EMOD 0206	1.25Gbps SFP Transceiver (Duplex LC, 850nm, 550m, MMF, +3.3V, MSA, DDM, Internal Calibration, RoHS)
VCL-EMOD 0205	1.25Gbps SFP Transceiver (Duplex LC, 1310nm, 10Km, SMF, +3.3V, MSA, DDM, Internal Calibration, RoHS)
VCL-EMOD 0231	1.25Gbps SFP Transceiver (Duplex LC, 1310nm, 20Km, SMF, +3.3V, MSA, DDM, Internal Calibration, RoHS)
VCL-EMOD 0255	1.25Gbps SFP Transceiver (Duplex LC, 1310nm, 40Km, SMF, +3.3V, MSA, DDM, External Calibration, RoHS)
VCL-EMOD 0155	1.25Gbps SFP Transceiver (Duplex LC, 1550nm, 40Km, SMF, +3.3V, MSA, DDM, External Calibration, RoHS)
VCL-EMOD 0256	1.25Gbps SFP Transceiver (Duplex LC, 1550nm, 80Km, SMF, +3.3V, MSA, DDM, External Calibration, RoHS)
VCL-EMOD 0293	1.25Gbps SFP Transceiver (Duplex LC, 1550nm, 100Km, SMF, +3.3V, MSA, DDM, External Calibration, RoHS)

Technical specifications are subject to changes without notice.

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U.K.

Valiant Communications (UK) Ltd
Central House Rear Office
124 High Street, Hampton Hill
Middlesex, TW12 1NS, U.K.

E-mail: gb@valiantcom.com

U.S.A.

Valcomm Technologies Inc.
4000 Ponce de Leon, Suite 470
Coral Gables, FL 33146
U.S.A.

E-mail: us@valiantcom.com

INDIA

Valiant Communications Limited
71/1, Shivaji Marg,
New Delhi - 110015,
India

E-mail: mail@valiantcom.com