

Gigabit Ethernet, Voice and Data IP Multiplexer

Product Overview

The VCL-MX, Gigabit Ethernet, Voice & Data IP Multiplexer may be used to provide legacy Voice, Data and C37.94 Teleprotection Channels over Gigabit Ethernet / IP / MPLS networks with Stratum level timing precision. The VCL-MX uses IEEE-1588v2 PTP synchronization technology to provide time-of-day and frequency synchronization to a single central GPS source with 0.5 micro-second (500 nanosecond) accuracy.

Features and Highlights

- Gigabit Ethernet, Voice & Data IP Multiplexer
- 19-inch rack mountable, 7U high construction
- May be used in a Point-to-Point, Point-to-Multi point, Add-Drop (drop-insert), Tree and Star topology
- Uses E1 over Packet / TDM over IP / E1 over Ethernet / technology to transport legacy Voice, Data, IRIG-B Time Code and Teleprotection Channels over Gigabit Ethernet / IP links.
- <2ms latency for E1 / T1 transmission.
- Delivers error free transmission of E1, 2-wire and 4-wire Voice, Synchronous and Asynchronous Data, C37.94 Teleprotection and IRIG-B time over Ethernet / IP / MPLS networks with Stratum 1 (GPS Synchronized) or Stratum 3E level of accuracy.
- Integrated IEEE C37.94 Teleprotection Interfaces.
- Integrated, 4 x IRIG-B interfaces for RTU time-of-day synchronization to a single central GPS source with 0.5 micro-second (500 nanosecond) accuracy.
- Uses IEEE-1588v2 PTP synchronization technology.
- 2.048 MBits and Phase-Locked 2.048 MHz Frequency Outputs for accurate synchronization clock distribution.
- Suitable for Smart Grid applications.
- LED indication for individual interface cards
- Multiple user side Fast Ethernet, Power over Ethernet (PoE) and Gigabit Ethernet Port options for audio or video conferencing applications.
- 1+1 Network Link Protection / Network Port Redundancy on both 'East' and 'West' side.
- 1+1 E1 Link Redundancy. MAIN link IP/Ethernet & STANDBY link can be SDH / E1 Radio.
- 1+1 Control Card Redundancy
- 1+1 Timing (Synchronization Clock) Redundancy. User selectable synchronization priority
- The transmission medium can be either of the following:
 - Optical Fiber (1000Base-LX or 1000Base-FX Optical Gigabit)
 - Copper (10/100/1000BaseT Ethernet)
 - Wireless (Ethernet / IP Radios).
 - Satellite



Power Supply Options

- Dual Redundant Power Supply Options
- 1+1 DC (-48V) power (40 to 72V DC).
- 1+1 DC 110-125V power (90 to 135V DC) - Using external DC-DC Converter.
- 1+1 AC power (100 to 240V AC, 50/60 Hz) - Using external AC-DC Converter.\
- Power Consumption < 200 watts
- EMI/EMC compliant.

Network and User Interfaces

Uplink Network Interface (Any 4 user selectable ports)

- 4x10/100/1000BaseT
- 4x1000Base SX / LX (SFP based, supports 850 / 1310 / 1550nm, Multi-mode / Single Mode fiber)

User Side Interface

- 4x10/100BaseT Ethernet Ports plus 4x10/100BaseT PoE (Power over Ethernet) Ports
- 8x 100BaseFX Optical Ethernet Ports (SFP)
- 8x E1/T1 Interface
- 4x IRIG-B outputs

Voice Interface

- 16 Port FXO, 16 Port FXS, 8 Port E&M (2-Wire and 4-Wire).
- 16 Port Hot-line, Ring Generator (75V RMS).

Data Interface

- Synchronous: 8 Port G.703 & 4 Port V.35 / V.36 / X.21 / RS530 / V.24 / V.11 / V.28.
- Asynchronous: 8 Port RS232 & 4 Port RS232 / RS485 / V.24 / RS422 / V.28
- Other: 16 Port Relay I/O (Dry Contact)

Teleprotection: 4 Port C37.94 Interface

Teleprotection Support with external 8 command Input / Output Digital Teleprotection for:

- E1
- G.703 co-directional
- C37.94
- IP/MPLS

Synchronization

- IEEE-1588v2 Frequency and Time-of-Day synchronization.
- IEEE-1588 Clock synchronization to a GPS clock source, or within the network in a Master / Slave mode, Internal Clock, External 2.048 Mbits Clock (120 Ohms Bits clock).
- User Selectable PTP IEEE-1588v2, Internal, Adaptive, Loop-Timed and External clock synchronization. User defined clock priority options.

Management Features

- RS232 serial console port,
- USB console port.
- In-band Ethernet (Telnet, SSH and TFTP) management.
- Automatic updating of RTC (Real Time Clock) time - RTC shall update itself at user defined intervals from a GPS PTP Grandmaster or from an NTP Server (the user shall define the IP address of the NTP server).
- Supports command line interface with predictive command completion.
- Supports IEEE802.1x security,
- Password Protection.
- SNMP V2 Traps.
- GUI (Graphical User Interface)
- EMI, EMC, Surge Withstand and other Compliances

External Alarms

- Dry Contact Relay.

EMI, EMC, Surge Withstand and other Compliances

EN 50081-2	EN 50082-2	IEC 60068-2-29
IEC 61000-4-6 (Conducted Immunity)	IEC 60068-2-6	IEC 60068-2-2
IEC 60068-2-78	IEC 60068-2-1	IEC 60068-2-14
CISPR 22 / EN55022 Class B (Conducted Emission and Radiated Emission)		
IS 9000 (Part II Sec. 1-4, Part III Sec. 1-5, Part IV, Part 14 Sec. 1-3)		
IEC 60870-2-1	IEC 61000-4-5	IEC 61000-4-12
IEC 61000-4-3 (Radiated Immunity)	IEC 61000-4-8	IEC 61000-4-16
IEC 61000-4-2	IEC 61000-4-10	Telcordia GR
IEC 61000-4-4	IEC 61000-4-11	1089 Surge and Power Contact

- ESD, Voltage and Surge Withstand: Meets and exceeds IEC 61000-4-2, IEC 61000-4-4, IEC 61000-4-5, Level 4 specifications.
- Immunity to Voltage Dips, Short Power Supply Interruptions and Voltage Variations meets and exceeds IEC 61000-4-11, Level 1 specifications.

Other Regulatory Compliances

- Meets CE requirements
- Complies with FCC Part 68 and EMC FCC Part 15

Mechanical Specification

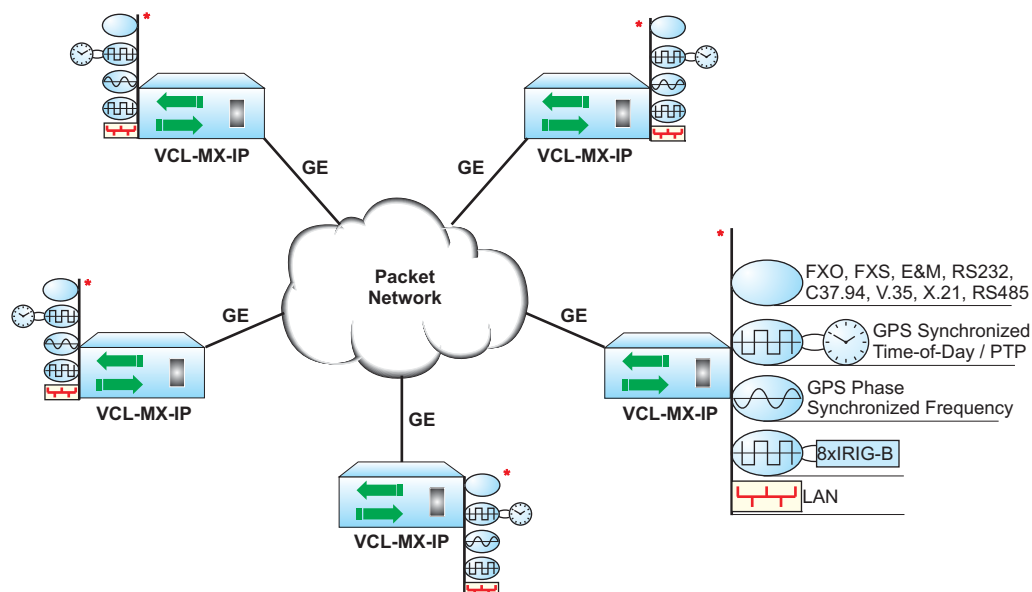
- (HxWxD): 310 x 485 x 271mm
- Weight: 12.5Kgs.

Environmental

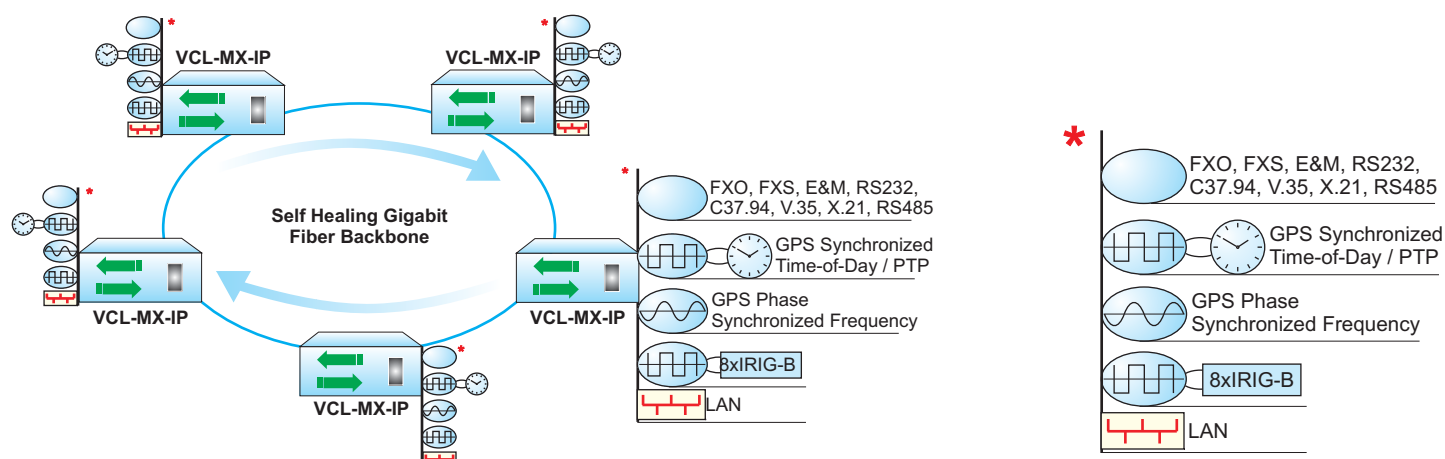
- Temperature: -10°C to +60°C
- Humidity: 95% R.H. (Non-condensing)
- Altitude: Upto 9,000 feet

Application Diagrams

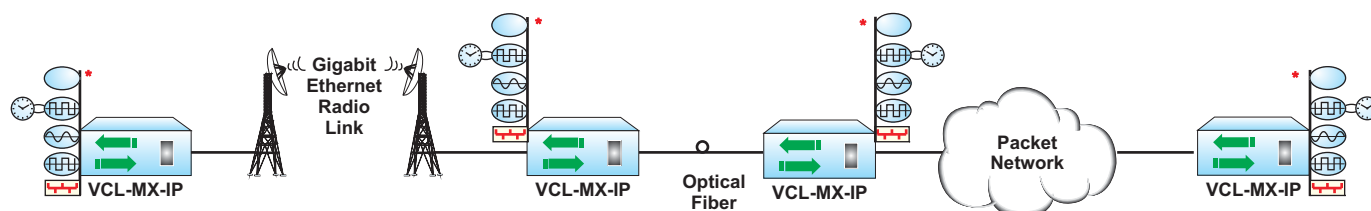
In an IP/Ethernet / MPLS Network



In a 1+1 Self-Healing Optical Fiber Ring (Rapid Spanning Tree Protocol)



Over a “Hybrid” wireless / Optical Network



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