

Product Overview

Valiant's 'VCL-E1oP' E1 over Packet (2/8E1 Port IEEE-1588v2 Version) TDM over IP equipment supports transmission of up to 2/8 x E1 links over IP / Ethernet, MEF or MPLS Packet Switched Networks (PSNs) and synchronization using IEEE-1588v2 protocol. IEEE-1588 packet synchronization mechanism provides frequency and time-of-day synchronization for all points of the network to a common, single (GPS) source.

Highlights

- Switching Capacity upto 9 Gbps, non-blocking
- 4 x GigE Network Ports Copper, Fiber, or Copper plus Fiber
- Optical SFP based (1000Base-FX) and Electrical (10/100/1000Base-T) Ethernet port options
 - 4 x 10/100/1000BaseT Copper Ports
 - 4 x 1000BaseFX Optical Fiber Ports
(*may use a combination / mix of any 4 Copper or Fiber Ports*)
- Less than 4ms latency on the E1 channels
- Synchronize ToD (Time of Day) and Frequency of all nodes to a centralized / common GPS Receiver
- IEEE-1588 packet synchronization mechanism provides frequency and time-of-day synchronization for all points of the network to a common, single source.

Includes the following inputs:

- 1 PPS Input from GPS Receiver (BNC Connector)
- 1 x NMEA Input from GPS Receiver (DB9 Connector)

Includes the following outputs:

- 1 x 1 PPS Output / 1 x IRIG-B Output (50 Ohms, BNC Connector)
- 1 x NMEA Output from GPS Receiver (DB9 Connector)
- 1 x 2.048Mbits Synchronized Clock Output (RJ45 Connector)

E1 Clock recovery and synchronization techniques

- Synchronize to a GPS Input
- IEEE-1588v2 Clock Recovery, IEEE-1588v2 Master / Slave, BCMA (Best Master Clock Algorithm)
- Synchronization to an External Clock (ECLK)
- Adaptive Clock Recovery (ACLK)
- Recovered Clock (RCLK) / Loop-Timed Clock
- Asymmetrical (One-Clock and Two-Clock) Clock
- Synchronization to an Internal Clock
- Automatic clock priority selection with fall back
- Plesiochronous Clocking.

Key Features - E1 and E1 over Packet Engine

- Supports 2/8 independent E1 interfaces
- Supports CESoPSN, SAToP, IETF-PWE3 (Pseudo-wire) transport mechanisms.
- Supports IP, MPLS and MEF8 (Metro Ethernet) tagging.
- Supports three E1 framing modes - Framed, Unframed and Multi-Framed with CAS signaling.
- Supports point-to-point, point-to-multipoint and drop and insert applications.
- Jitter and Wander exceeds G.812, G.823 / G.824 and G.8261 and TDM specifications.
- RJ45 - 120 ohms balanced E1 interfaces. Optional 75 Ohms BNC interface
- E1 Local and Remote Loop-back (RLOOP) facility for testing and diagnostics.

Key Features - Ethernet / IP Network Interface

- Point-to-point, point-to-multipoint applications based on IP addressing. Supports drop and insert applications.
- Port Control Ingress Rate Limiting.
- 1+1 Ethernet link redundancy
- Rapid Spanning Tree Protocol.
- Ethernet Port Trunking.
- ITU-T G.8032.
- User configurable MTU (E1oP payload) packet size up to 1800 Bytes.
- Configurable payload size for each bundle.
- Switch supports jumbo frame sizes of up to 9728 Bytes.
- Supports 802.1Q based QoS, 802.1p based packet priority.
- Port Based Priority (Classifying Services).
- DSCP and 802.1Q / 802.1p based packet tagging and prioritization.
- Flow Control in an Ethernet Packet Networks (Regulating Traffic)
- Port / Customer based bandwidth allocation (Port Rate Limiting)
- Separate IP Address for TDM traffic and equipment management.
- VLAN tagging for TDM traffic and equipment access / management.
- Single / Double 802.1 VLAN tagging (Q in Q VLAN Tagging) - User configurable.
- Synchronizing traffic management
- Broadcasting Network and Broadcast equipment synchronization.

Integrated 8 Port Electrical Ethernet Switch Card and 8 Port Optical Ethernet Switch Card (Optional)

- Plug-In 8 Port Electrical Ethernet Switch Card (Optional)
 - Electrical Ethernet Card provides 8 x 10 / 100BaseT full-duplex (RJ-45) Ethernet ports.
- Plug-In 8 Port Optical Ethernet Switch Card (Optional)
 - Optical Ethernet Card provides 8 x 100Base-FX Optical (SFP) Ethernet ports.
- Fully managed Layer2 Switches which offer QoS by implementing IEEE802.1p, 802.1Q VLANs and Differentiated Services (Diffserv) and packet priority classification protocols for traffic management and optimization
- The optional Substation Hardened Managed Switch cards are designed to operate in rugged environments even in extreme temperature conditions. No external fans or forced air cooling is required.
- IEC 61850-3 and IEEE 1613 complied.

Applications Cellular/Mobile

- Backhaul 2G and 3G/LTE services using a single Ethernet infrastructure
- Port based Priority feature allows the user to assign priority to the 2G and 3G/LTE traffic ports
- VLAN based Priority feature allows the user to assign priorities to different types of service traffic
- User can assign highest priority to TDM traffic to ensure un-interrupted transmission of E1 links even under heavy 3G traffic conditions
- User can configure a particular TDM link should be given preference over the other TDM links
- Flow Control feature allows Ethernet based flow to minimize link disruptions and lost packets due to data bursts
- Ingress Ethernet Rate Limiting allows to assign the bandwidth as per customer requirements
- Separating traffic by applications and classes by assigning 802.1Q based VLANs
- To synchronize cell sites:
 - Frequency synchronize all BTSs and BSCs with the MSC using IEEE-1588v2 phase synchronized frequency
 - Distribute Time-Of-Day across all nodes of the network with 500ns (0.5 micro-second) accuracy
 - Distribute 1 PPS across all nodes of the network
 - Distribute NMEA information across all nodes of the network.

Applications Power and Transportation

- Backhaul legacy voice, low speed legacy data and high speed Ethernet services using a single Ethernet infrastructure
- Frequency synchronization across the entire network with IEEE-1588v2 phase synchronized frequency
- Distribute Time-Of-Day across networks with 500ns (0.5 micro-second) accuracy
- Distribute IRIG-B time across the entire network for synchronizing all RTUs, **Synchrophasors** / PMUs and Protection Relays to a common network clock
- Distribute Time-Of-Day across all nodes of the network with 500ns (0.5 micro-second) accuracy
- Applications Include
 - Smart Grid
 - Air Traffic Control
 - Railways
 - Road Traffic Management

Hardware Highlights

- 19-Inch rack mountable
- Available in 3U form factor with various connector options
- 1+1 Redundant Power Supplies, AC and DC, or AC plus DC
- Extended Temperature Range: (-40° C to +60° C)
- EMI / EMC Complaint
- Real time battery backed clock

System Management, Monitoring and Alarm Interfaces

- NMS (Network Management System) to monitor multiple units from single Central Location
- External Alarm - Dry contact relay alarms are also available at rear of the system to connect the system to an external alarm
- Supports system temperature monitoring with High Temperature and Low Temperature alarms and SNMP Traps
- Supports SNMP V2 Monitoring and Traps
- Self-test for checking system errors upon system boot up
- Event Logging
- Clock Performance Alarms
- Network Performance Alarms
- Network Performance Monitoring and Diagnostics
- Online / remote upgrade of firmware

System Access, Control and Management Options

- Telnet
- CLI Control Interface (HyperTerminal or Vt100)
- SNMP V2 Traps (MIB File provided)
- Windows based GUI (Graphical User Interface) for easy configuration, management and access. Ability to monitor multiple units from a single NMS
- Password Protection
- Supports SSH and Radius for secured access control

OAM: Operation and Management Ports

- RS232 Serial Port
- USB COM Port
- 10/100/1000BaseT Ethernet Management for In-band remote access.

Power Supply Options

- Dual Redundant Power Supplies
- 1+1 AC power (100 to 240V AC, 50/60 Hz)
- 1+1 DC (-48V) power (40 to 72V DC)
- 1+1 DC (-24V) power (18 to 40V DC)
- AC or DC
- EMI/EMC compliant.

Regulatory Compliance

- Safety - IEC60950
- CERoHS
- Complies to ANS/IEC standards
- Complies with Telecom Part 68, FCC Part 15 and CISPR 22 Class A
- EMC EN55022: 1998 + A1 and A2
- EMC EN55024,
- Operation ETS 300 019 Class 3.2
- Storage ETS 300 019 Class 1.2
- Transportation ETS 300 019 Class 2.3

NMS (with SSH / Telnet) OAM port Specifications

Network Interface	RJ-4510/100/1000BaseT (Auto sensing)
Compatibility	Ethernet Version 2.0IEEE802.3
Protocols supported	ARP, UDP/IP, TCP/IP, Telnet, SNMP
Management	SNMP, Serial login, Telnet login

External Alarms

- Dry Contact Relay - 2 Form C
- Rated upto 72V DC, 1Amp.

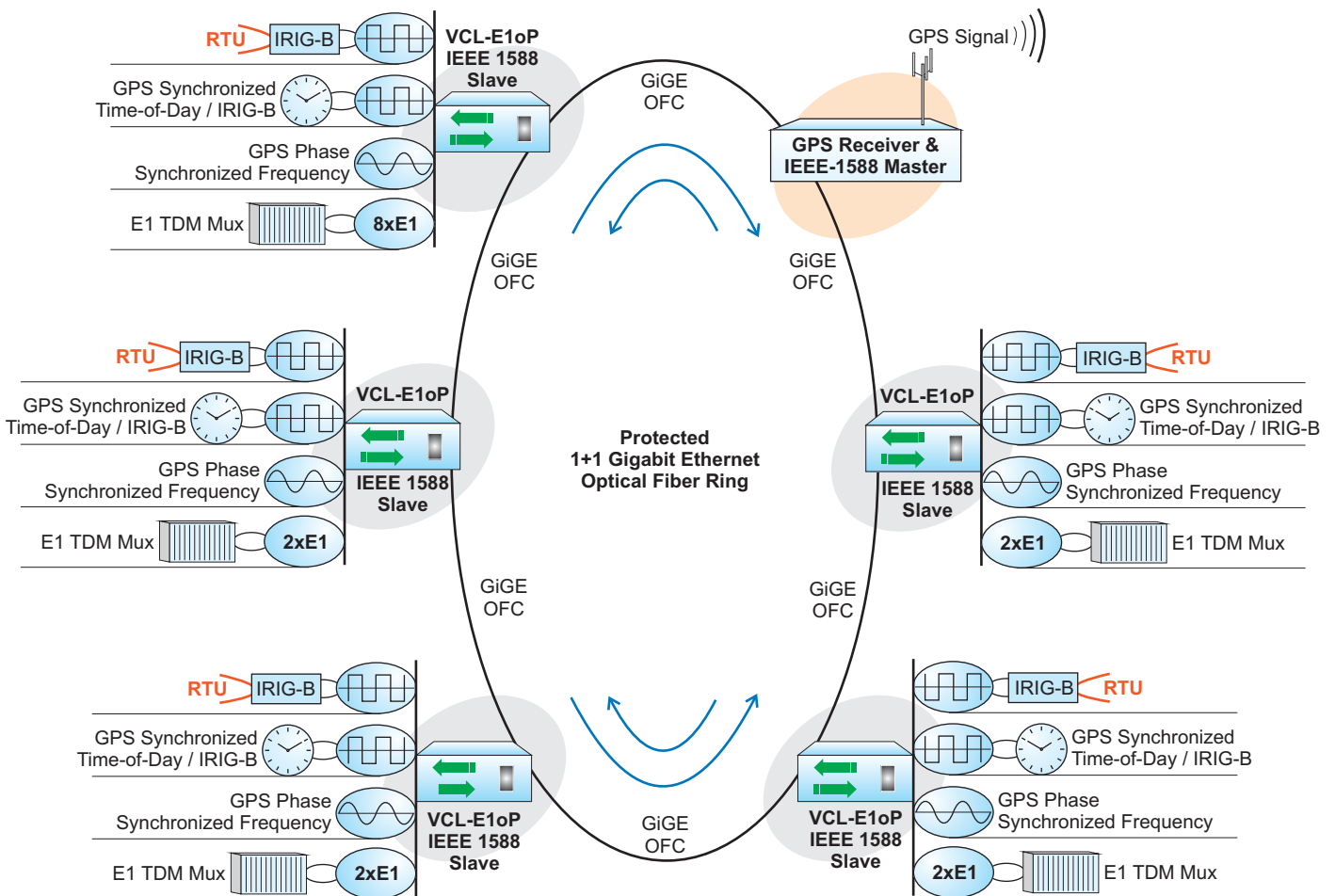
Chassis

- 3U High
- 19-inch rack-mounting

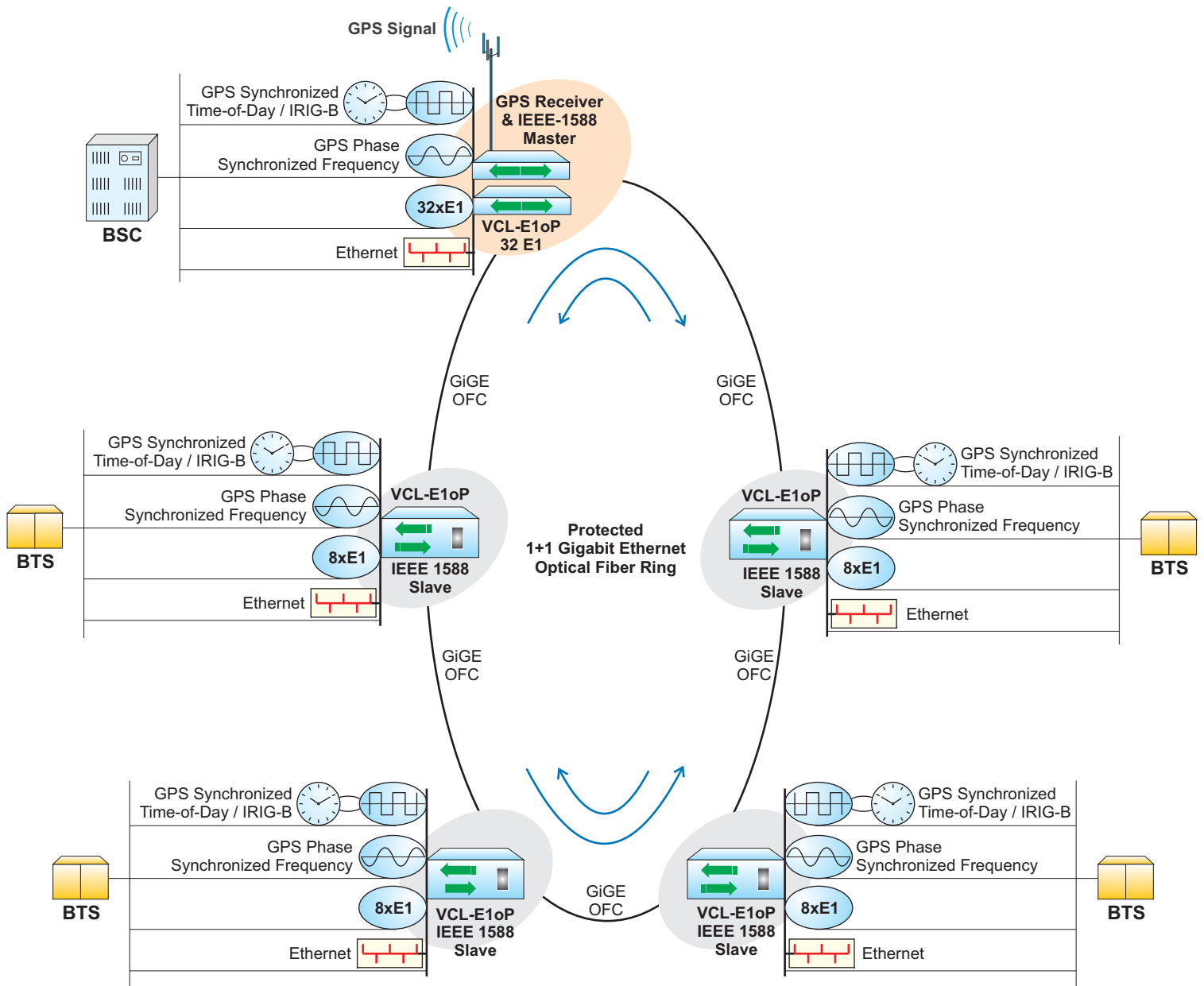
Mechanical Specification

Height	142 mm (3U)
Depth	260 mm
Width	480 mm (19 inch rack mountable)
Weight	5 Kgs.

Application Diagram for Power Utilities



Application Diagram for Cellular Networks



Technical specifications are subject to changes without notice.
 All brand name and trademarks are the property of their respective owners.

Revision 1.4 – September 17, 2018

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