VALIANT COMMUNICATIONS

(Gigabit Ethernet over STM-4)

VCL-Gigabit Ethernet over SDH (GigE)

Introduction:

Valiant's Gigabit Ethernet over SDH (STM-4) Equipment is a compact and high-performance Gigabit Ethernet to STM-4 converter (with VLAN TAG function), which offers three Gigabit Ethernet interfaces (2 Electrical and 1 Optical Ethernet interfaces) and 2 x STM-4 interfaces.

The solution complies to ITU-T G.7041 and G.7042 EoSDH (Ethernet over SDH) technology. All VC4 / STM-1 (1~8) are user configurable and may be mapped to a single VCG (single Ethernet Port), when both STM-4 interfaces are independent. 3 x Gigabit Ethernet interfaces can share up to 1112Mbps (8 Vc4).

Gigabit Ethernet over SDH (STM-4) – Available bandwidth on a single Ethernet port on an STM-4 link is 622Mbps (up to 1000Mbps on 2 x bonded STM-4 links).

This equipment offers low power consumption, high integration and supports point-to-point application. This is a cost-competitive solution for applications such as network access, transparent LAN services and LAN extension.

Optical Interface

- Two STM-4 optical interfaces, LC type SFP module, hot-pluggablee
- Line Bit Rate is 622Mb/s (transmission distance depends on the SFP module)
- SFP MSA (INF-8074i), ITU-T G.695, FC-PI V2.0 standards
- Supports Automatic Laser Shutdown (ALS) function
- Supports Remote Power down Detect (RPD) function.

Features:

- 19-Inch Rack with 1U height
- Provides 4 E1s and upto 1000 Mbps wire-speed Ethernet
- **Timing mode**
  - Internal timing source, complies with ITU-T G.813 standard
  - STM-4 optical line timing source (T11, T12)
  - Timing sources can be switched over according to alarms, SSM values, frequency offset, and the preset priority of the sources, or forced switch over.
- **Path Protection**
  - Supports 1+1 path protection and 2+0 non-protection mode
  - Supports 1+1 path protection with the recovery time less than 50ms
  - 1+1 linear unidirectional / bidirectional Multiplex Section Protection (MSP)
  - Supports automatic protection switch and manually protection switch
- **Virtual concatenation**
  - Supports 1~8 VC4 virtual concatenation
  - The maximum differential delay is 252ms
  - Provides both LCAS and Non-LCAS modes
- **Compliant to ITU-T standards**
  - GFP-F encapsulation, compatible with ITU-T G.7041 recommendation
  - Virtual Concatenation (VCAT) and Link Capacity Adjustment Scheme (LCAS) recommendation G.7042

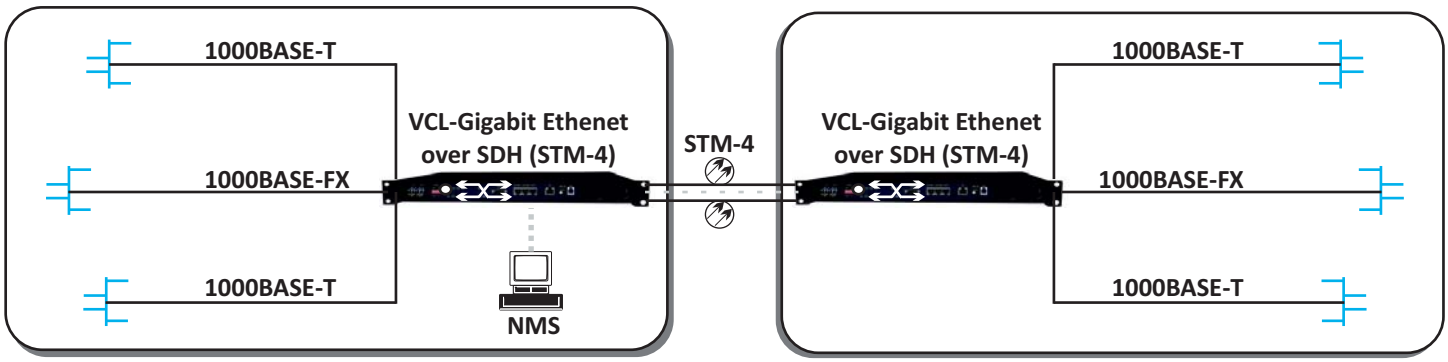
Power Supply Options

DC Mains Input	- 48VDC (range -36V DC to -75V DC)
AC Main Input	100V AC to 240V AC, 50 / 60 Hz
Power Protection	1+0 (AC, DC), 1+1 (AC+AC, AC+DC, DC+DC)
Power Consumption	< 10 Watts

Mechanical Specifications

- H x D x W : 44 mm x 256 mm x 440 mm.
- Weight : 3.25 kg

Point to Point Network Application Diagram



Ethernet interface

- One Optical Gigabit Ethernet interface and two Electrical
- Gigabit Ethernet interfaces
- compliant to IEEE802.3 serial specification
- RJ45 connector Electrical Gigabit Ethernet interfaces, supports auto-negotiation, which can operate on 1000M full-duplex, 100M full/half-duplex, 10M full/half-duplex Mode
- The Optical Gigabit Ethernet interface uses 1.25G SFP module, which can work on 1000M full-duplex mode (transmission distance is optional and depends on the SFP Optical module)
- Supports unicast, multicast and broadcast frame
- Supports 802.3x flow control
- Supports broadcast storm filtering control
- 4K MAC address table, with optional 12s / 300s ageing time configurable, the default is 300s
- Supports MAC address dynamic learning function
- Accepts frames with lengths between 64 and 1518/2000/9720 bytes
- Supports port-based VLAN and IEEE802.1Q tag-based VLAN
- Supports QinQ (Double Tag VLAN)
- Supports port rate control
- Provides performance statistic for each Ethernet interface.

Alarm and Indicator Monitoring

- Power Indicator
- Current Status (integrity and activity) Indicator
- Urgent Alarm Indicator
- Minor Alarm Indicator
- Optical Signal Loss Alarm Indicator
- Remote Device Power-down Indicator
- Ethernet Card Status Indicator
- General Alarm Indicator for Ethernet Card (including Link down of Ethernet Port)
- Auto Laser Shutdown (ALS) Indicator
- Ethernet Link Indicator
- Ethernet Speed Indicator
- Dry contact via 9-pin, D-type male connector
- Buzzer Alarm

Technical Specifications

GigE - Ethernet Interface Specification

Number of Gigabit Interfaces	2 Electrical (Comply with IEEE 802.3ab)
	1 Optical - Optional (Comply with IEEE 802.3z)
Interface Types	10/100/1000BaseT or 1000Base-FX (LC)
MDI/MDI-X Support	Yes (Electrical port)
VCAT Compliance	ITU-T G.707
LCAS Compliance	ITU-T G.7042
GFP-F	ITU-T G.7041
Frame Size	1552 bytes
Transmission Bit Rate	10/100/1000 Mbps
Connectors	RJ-45 Electrical / LC - Optical
802.1Q MAC packet transparent transmission supported	
Ethernet data rate can be adjusted from 2M to 1000M	

Network Topology and Interfaces

Network topology	Point to point network
Service interfaces	STM-4 SDH single optical or double optical ports (1+1 protection) supported – 10/100/1000BaseT Electrical Gigabit Ethernet – 1000Base-FX Optical Gigabit Ethernet

STM-4 Optical Interface

Data Rate	622 Mbps
Standard	ITU-T G.957 STM-4/OC-12
Coding	NRZ
Connector	LC
Light source	Laser Diode
Wave length options	1310nm / 1550nm
Transmission type	Dual Fiber (standard) Single Fiber Bi-directional (optional)
Automatic Laser Shut Down Option	Provided - User selectable option
Transmit power	* See STM-4 SFP Options (Page No. 7)
Receive sensitivity	* See STM-4 SFP Options (Page No. 7)

STM-4 Monitoring and Performance Analysis

Performance Monitoring and Alarms	Error counts for B1, B2, B3
Performance Analysis	Error Seconds (ES), Several Error Seconds (SES), Unavailable Seconds UAS, Higher Order Virtual Container - Remote Error Indication (HOVC-REI), Higher Order Virtual Container - Pointer Justification Event (HOVC-PJE)

Ethernet port Performance Analysis

- All Received Packets
- All Transmitted Packets
- Received Dropped Packets

Clock Synchronization options

- Synchronization with STM-1 line timing
- External timing source option - 120 Ohms 2MBps (External Bits Clock)
- External timing source - 120 Ohms 2MHz (External TTL Clock) - Factory Configurable
- Internal Clock - ITU-T G.813 internal oscillator (Stratum 3)
- The timing source can be auto-switched according to default or operator programmed settings

NMS

- Graphical User Interface (GUI) Windows XP / Windows Vista compatible
- SNMP V2 based NMS

Operating Conditions

Ambient temperature	-10^{0}C ~ +60^{0}C
Relative humidity	<90% (Non condensing)

Optical Interfaces

Type	Wavelength (nm)	Mean launched power (dBm)	Receiver sensitivity (dBm)	Receiver overload (dBm)	Connector	Configuration
Double fibers, Two Direction	1310	-8 ~ -12	-36	-3	LC	Standard (S1.1)
	1310	0 ~ -5	-36	-3	LC	Optional (L1.1)
Single fiber, One Direction	1310/1550	-8 ~ -14	-30	-3	LC	Optional
	1310/1550	0 ~ -5	-30	-3	LC	Optional

Ordering Information

A. VCL-Gigabit Ethernet over SDH (STM-4) Common Equipment (CORE UNIT without PSU)

Part#	Description
VCL-0322-GigE-o-SDH622	VCL-Gigabit Ethernet over SDH (GigE) 19-inch 1U High Rack Mount version Supports: – 3 x Gigabit Ethernet Port without – 2 x Electrical Ports [RJ45 (F)]PSUs – 1 x Optical Port [SFP based - without SFP] – 2 x STM-4 Ports (1+1) [SFP based - without SFPs] – 1 x System Core Cables, Installation accessories, Documentation, System User Manual/ Disk etc (Set) – OAM: EOW, SNMP, EMS, NMS *Add Power Supply Option from below (B)

B. Power Supply Options

Part#	Description
AC220	1 x 100-240V AC Power Supply Input
DC048	1 x (-) 48V DC Power Supply InputAny
ACDC	1 x 100-240V AC Power Supply Inputone 1 x (-) 48V DC Power Supply Inputoption.
AC220R	2 x 100-240V AC Power Supply Input [Redundant]
DC048R	2 x (-) 48V DC Power Supply Input [Redundant]

C. Gigabit SFP Options

Part#	Description
VCL-EMOD 0231	1.25Gbps SFP Transceiver Duplex LC, 1310nm, 15Km, SMFMaximum
VCL-EMOD 0255	1.25Gbps SFP Transceiver1 SFP Duplex LC, 1310nm, 40Km, SMFfor optical
VCL-EMOD 0256	1.25Gbps SFP Transceiver ethernet Duplex LC, 1550nm, 80Km, SMF

D. STM-4 SFP Options

Part#	Description
VCL-EMOD 0139	622Mbps SFP Transceiver, SDH/STM-4, SONET/OC-12, Fast Ethernet, S-4.1, Duplex LC, 1310nm, 15Km, SMF, +3.3V SFPs
VCL-EMOD 0140	622Mbps Transceiver, SDH/STM-4, CORE SONET/OC-12, Fast Ethernet, L-4.1, Duplex LC, 1310nm, 40Km, SMF, +3.3V
VCL-EMOD 0253	622Mbps SFP Transceiver, SDH/STM-4, SONET/OC-12, Fast Ethernet, L-4.2, Duplex LC, 1550nm, 80Km, SMF, +3.3V
VCL-EMOD 0254	622Mbps SFP Transceiver, SDH/STM-4, SONET/OC-12, Fast Ethernet, L-4.2, Duplex LC, 1550nm, 120Km, SMF, +3.3V

E. Cables and Accessories Options

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.))

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U.K.
Valiant Communications (UK) Ltd
Central House Rear Office,
124 High Street, Hampton Hill,
Middlesex TW12 1NS, United Kingdom
E-mail: gb@valiantcom.com

U.S.A.
Valcomm Technologies Inc.
4000 Ponce de Leon Blvd.,
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