VALIANT COMMUNICATIONS

Gigabit Ethernet over SDH (STM-1)

Product Overview:

Valiant's Gigabit Ethernet over SDH (STM-1) Equipment is a modular platform unit with two pluggable 155.52Mbps optical / electrical interfaces, which may be used in a point-to-point application to provide a compact, cost effective and flexible solution to deliver multiple Ethernet channels.

- Gigabit Ethernet over SDH (STM-1) – Available bandwidth on a single Ethernet port on an STM-1 link is 137Mbps.

Gigabit Ethernet interface card along with Engineering Order Wire is available. The user removable / replaceable STM-1 Optical / Electrical interface option makes it easy to meet various and changing user requirements. Valiant's Gigabit Ethernet over SDH Transmission Equipment provides full capability to cross-connect at E1 level between all tributaries. The equipment can be used as Terminal Multiplexer (TM) to build a point-to-point SDH transmission network.

Service interfaces:

- 2 x STM-1 optical interfaces, MSA compliant SFP (pluggable) optical module (LC connector) based design, which supports onsite optical port replacement
- 2 x STM-1 electrical interfaces, SFP electrical module (Mini BNC connector) Optional
- GigE (Gigabit) Ethernet interface Options
  - 1 x Optical GigE (Gigabit) Ethernet interface, or
  - 2 x Electrical 1000BaseT (Gigabit) Ethernet Interface

Management and Maintenance interfaces:

- 10/100BaseT Ethernet management interface
- RS232 serial management interface
- Remote (Telnet) management interface
- Windows XP based Graphical User Interface (GUI)
- Windows 7 based Graphical User Interface (GUI)
- SNMP V2 Monitoring
- Engineering Order Wire (EOW) interface (RJ-11)
- NMS (Network Management System) for monitoring multiple units from a single / central location.

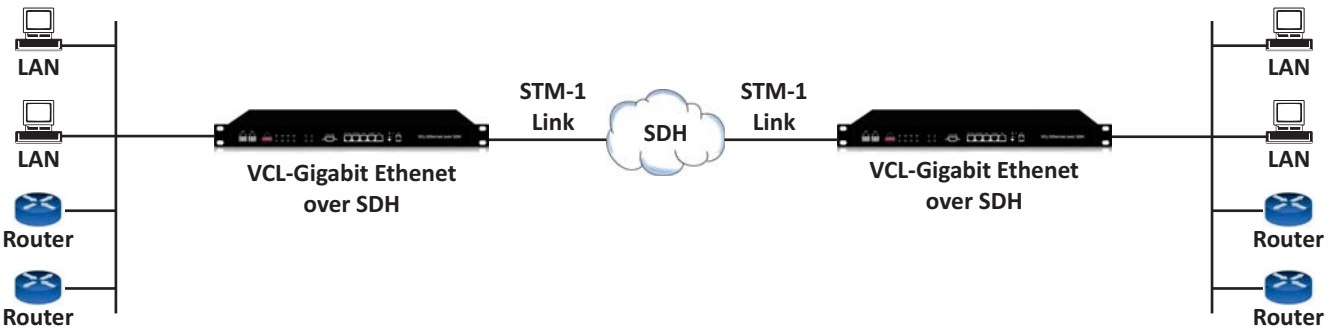
Features:

- 1U height, 19-Inch standard rack-mountable chassis
- Provides complete diagnostics facilities to the user for monitoring optical ports and provide reading of optical transmit power, optical receive power, laser temperature, bias current in voltage alarms etc.
- 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)
- Supports 1+1 Line Protection and Automatic Protection Switching (APS) with less than 50ms recovery
- Supports point-to-point
- Local management and network-based management via a unified platform
- Supports Remote Power Down Detection and Auto Laser Shutdown
- Supports STM-1 loop-back for troubleshooting
- 850nm multi-Mode, 1310nm Single Mode and 1550nm Single Mode optical interface options offered
- Ethernet mapping adopts GFP/VC-12 virtual concatenated technology; according with MSTP criterion
- Provides Gigabit Ethernet over SDH mapping through standard GFP and VC-12 virtual concatenation (VCAT)
- Ethernet bandwidth can be adjusted by the user between 2MBps ~126 Mbps (VC-12 mapping)
- Supports MAC Address list filtration, learning and updating function
- Easy to operate

Timing mode:

- 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

Application Diagram:



Ethernet Standards Conformity:

- Electrical Gigabit compliant with 802.3ab
- Optical Gigabit compliant with 802.3z
- Generic Framing Procedure GFP-F compliant with ITU-T G.7041
- VCAT compliant with ITU-T G.707 and LCAS compliant with ITU-T G.7042
- Ethernet flow control on WAN port and LAN port
- Large buffer size upto 410,000 bytes
- Maximum Frame length (MTU size):1552 bytes
- Auto MID/MID-X for Ethernet Interfaces
- Support 802.1Q based VLAN tagging
- Support Port based VLAN tagging

Performance Analysis:

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

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
- Engineering Order-Wire (EOW) Indicator
- Ethernet Link Indicator
- Ethernet Speed Indicator
- Dry contact via 9-pin, D-type male connector
- Buzzer Alarm
- SNMP Diagnostic and Monitoring

Power Supply Options:

- Redundant power supply card options AC+DC, DC+DC and AC+AC.
- 110V AC - 240V AC (50/60 Hz) power options available
- 48VDC power option available
- Power consumption less than 12W.

Technical Specifications:

Network Topology and Interfaces

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

STM-1 Electrical Interface

Data Rate	155.52 Mbps
Standard	ITU-T G.703 Compliant
Line Code	CMI
Physical Connector	Mini BNC
Automatic 1+1 line protection	Less than 50 ms switching / recovery

STM-1 Optical Interface

Data Rate	155.52 Mbps
Standard	ITU-T G.957 compliant
Bit rate	155.520Mbps
Coding	NRZ
Connector	LC
Light source	Class 1 Laser
Wave length	850nm/1310nm/1550nm (optional) - 1310nm Std.
Transmit power	S 1.1, L 1.1, L 1.2 (- 11 dBm to - 2.5 dBm - as may be ordered)
Receive sensitivity	S 1.1, L 1.1, L 1.2 (- 28 dBm to - 36 dBm - as may be ordered)
Automatic 1+1 Line Protection	Less than 50 ms switching / recovery
Automatic Laser Shut Down Option	User selectable options

STM-1 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)

GigE - Ethernet Interface Specification (Option 1)

Number of 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 100M	

GigE - Ethernet Interface Specification (Option 2)

Number of Interfaces	1 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 137M	

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

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

Operating Conditions

Ambient temperature	-10°C ~ +60°C
Relative humidity	<90% (Non condensing)

Engineering Order Wire (EOW)

- RJ-11 connector

NMS

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

Mechanical Specifications

- Rack Mounting: Standard 19 Inch. DIN Rack
- H x D x W: 44 mm x 256 mm x 440 mm.
- Weight: 3.25 kg

Ordering Information:

A. VCL-Gigabit Ethernet over SDH (STM-1) Common Equipment

Part #	Description
VCL-0320-GigE-o-SDH137	VCL-Gigabit Ethernet over SDH (STM-1) 19-inch 1U High Rack Mount version Supports: – 2 x STM-1 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 (E)

B. Gigabit Ethernet Options

Part #	Description
0223OE	Gigabit Ethernet Port (4VCG, 4 Channel, 100M bandwidth) – 2 x Electrical Port [RJ45 (F)] OR – 1 x Optical Port [SFP based - without SFP]
0319OE	Gigabit Ethernet Port (1VCG, 1 Channel, 137M bandwidth) – 1 x Electrical Port [RJ45 (F)] OR – 1 x Optical Port [SFP based - without SFP]

C. Gigabit SFP Options

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

D. STM-1 SFP Options

Part #	Description
VCL-EMOD 0193	155Mbps SFP Transceiver, SDH/STM-1, SONET/OC-3, Fast Ethernet, S-1.1, Duplex LC, 1310nm, 15Km, SMF
VCL-EMOD 0194	155Mbps SFP Transceiver, SDH/STM-1, SONET/OC-3, Fast Ethernet, L-1.1, Duplex LC, 1310nm, 40Km, SMF
VCL-EMOD 0217	155Mbps SFP Transceiver, SDH/STM-1, SONET/OC-3, Fast Ethernet, L-1.2, Duplex LC, 1550nm, 80Km, SMF
VCL-EMOD 0156	155Mbps SFP Transceiver, SDH/STM-1, SONET/OC-3, LR-2/LR-3, Fast Ethernet, L-1.2, Duplex LC, 1550nm, 120Km, SMF
VCL-EMOD 0243	155Mbps SFP Transceiver, SDH/STM-1, SONET/OC-3, L-1.2, Duplex LC, 1550nm, 150Km, SMF
VCL-EMOD 0195	155Mbps SFP Copper Transceiver, STM-1e (Es1) [Electrical], 75Ω DIN 1.0/2.3 female coaxial, MSA, Grounds Isolated, RoHS

E. 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]

F. 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-HRNS 1216	Mini-BNC-to-Big-BNC Connectorized Cable [3m]
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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