ORION TELECOM NETWORKS INC.

VCL-Gigabit Ethernet over SDH (GigE)
(Gigabit Ethernet over STM-4)

Product Brochure

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Product Overview

Orion'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.

Gigabit Ethernet over SDH (STM-4)

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.

Features

- 19-Inch Rack with 1U height
- Provides 4 E1s and upto 1000 Mbps wire-speed Ethernet
- 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
- 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
- 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.

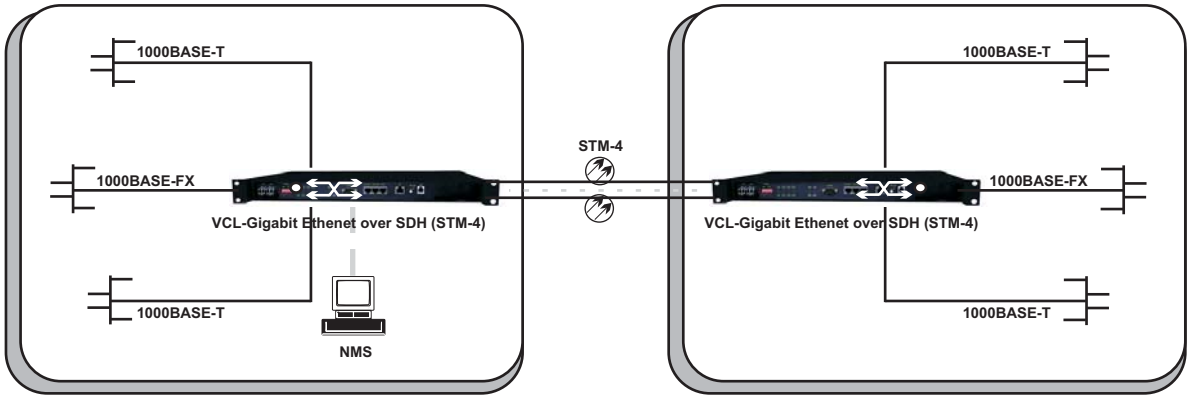
Features

- 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
- Redundant power supply with power consumption of less than 10W
  - 48V DC single power supply
  - -48V DC double power supply
  - 220V AC single power supply
  - 220V AC double power supply
  - -48V DC+220V AC double power supply

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
- SNMP Diagnostic and Monitoring

Network Application



Point to point network

Technical Specifications

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 - Technical Specifications

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. 5)
Receive sensitivity	* See **STM-4 SFP Options** (Page No. 5)

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)

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

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	

Ethernet port Performance Analysis

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

NMS

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

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

Operating Conditions

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

Mechanical Specifications

Rack Mounting	Standard 19 Inch. DIN Rack
Height	44 mm.
Depth	256 mm.
Width	440 mm.
Weight	3.25 kg

Ordering Information

A VCL-Gigabit Ethernet over SDH (STM-4) Common Equipment

S. No.	Part	Description	Remarks

1	VCL-0322-GigE-o-SDH622	VCL-Gigabit Ethernet over SDH (GigE)
		19-inch 1U High Rack Mount version
		Supports:
		- 3 x Gigabit Ethernet Port
		  - 2 x Electrical Ports [RJ45 (F)]
		  - 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: SNMP, EMS, NMS
		* Add Power Supply Option from below (B)
			CORE UNIT without PSUs

B Power Supply Options

S. No.	Part	Description	Remarks
1	AC220	1 x 100-240V AC Power Supply Input	Any one option.
2	DC048	1 x (-) 48V DC Power Supply Input	
3	ACDC	1 x 100-240V AC Power Supply Input 1 x (-) 48V DC Power Supply Input	
4	AC220R	2 x 100-240V AC Power Supply Input [Redundant]	
5	DC048R	2 x (-) 48V DC Power Supply Input [Redundant]	

C Gigabit SFP Options

S. No.	Part	Description	Remarks
1	VCL-EMOD 0231	1.25Gbps SFP Transceiver Duplex LC, 1310nm, 15Km, SMF	Maximum 1 SFP for optical ethernet
2	VCL-EMOD 0255	1.25Gbps SFP Transceiver Duplex LC, 1310nm, 40Km, SMF	
3	VCL-EMOD 0256	1.25Gbps SFP Transceiver Duplex LC, 1550nm, 80Km, SMF	

D STM-4 SFP Options

S. No.	Part	Description	Remarks
1	VCL-EMOD 0139	622Mbps SFP Transceiver, SDH/STM-4, SONET/OC-12, Fast Ethernet, S-4.1, Duplex LC, 1310nm, 15Km, SMF, +3.3V	Maximun 2 SFPs per CORE Unit
2	VCL-EMOD 0140	622Mbps SFP Transceiver, SDH/STM-4, SONET/OC-12, Fast Ethernet, L-4.1, Duplex LC, 1310nm, 40Km, SMF, +3.3V	
3	VCL-EMOD 0253	622Mbps SFP Transceiver, SDH/STM-4, SONET/OC-12, Fast Ethernet, L-4.2, Duplex LC, 1550nm, 80Km, SMF, +3.3V	
4	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

S. No.	Part	Description	Remarks
1	VCL-HRNS 1229	Optical Patch Cord Connectorized Cable [2LC-2LC, 3m, SM]	As per Site Require ment.
2	VCL-HRNS 1238	Optical Patch Cord Connectorized Cable 2LC-2LC, 10m, SM]	
3	VCL-HRNS 1242	Optical Patch Cord Connectorized Cable [LC-FC, 10m, SM]	
4	VCL-HRNS 1243	Optical Patch Cord Connectorized Cable [2LC-2FC, 10m, SM]	
5	VCL-HRNS 1239	Optical Patch Cord Connectorized Cable [LC-SC, 10m, SM]	
6	VCL-HRNS 1258	Optical Patch Cord Connectorized Cable [2LC-2SC, 10m, SM]	
7	VCL-ECON 1172	Connector (Attenuator LC-LC (10 db.))	
8	VCL-ECON 1173	Connector (Attenuator LC-LC (20 db.))	
9	VCL-ECON 1186	Connector (Attenuator FC-FC (10 db.))	
10	VCL-ECON 1187	Connector (Attenuator FC-FC (20 db.))	
11	VCL-ECON 1197	Connector (Attenuator SC-SC (10 db.))	
12	VCL-ECON 1198	Connector (Attenuator SC-SC (20 db.))	

Note:

Technical specifications are subject to changes without notice.
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