Valiant Communications Limited

Gigabit Ethernet (Wire Speed)
Optical Multiplexer with 16 E1
Product Brochure & Data Sheet

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Product Overview

Valiant’s 16 E1 + Gigabit Ethernet (Wire-Speed) Optical Multiplexer is a unique Gigabit multi-service optical fiber transport solution which transmits both Gigabit Ethernet (Gigabit Wire-Speed) data along with upto 16 E1 (TDM) channels over an optical fiber link.

1+1 optical fiber redundancy is also available for minimizing the possibility of transmission loss due to an optical link failure.

The Gigabit (Wire-Speed) Ethernet traffic along with 16 E1’s are multiplexed into 1.25Gbps optical link to provide a compact, high performance, high throughput and cost effective broadband network access solution.

Features

- 1U height, 19-Inch standard rack-mountable chassis
- Wire-Speed Gigabit Ethernet traffic with 16 E1 data are transported simultaneously
- Optical line bit rate 1.25Gbps
- 1 Gbps data throughput for aggregate Ethernet traffic
- Supports jumbo frame size (upto 2048 bytes) transmission
- Supports 1+1 optical link protection and APS with less then 50ms switching time
- MSA compliant SFP (Small Form-Factor) based design for improved and easy serviceability. SFP based design provides the flexibility to the customer to change service distance and support different types of optical fiber
- MSA standard compliant SFP (INF-8074i, ITU-T G.695 and FC-PI V2.0)
- Supports Automatic Laser Shutdown (ALS) option for added safety
- Performance analysis of optical ports Optical Transmission Failure, Loss of Optical Link, Loss of Frame and Errors (E-3 / E-6)
- E1 port complies to ITU-T G.703 and G.704
- Jitter tolerance, jitter transfer characteristic and jitter generation fully comply with ITU-T G.823 and G.742 recommendations
- Performance analysis of E1 ports Loss of Signal and Code Violation
- Performance Analysis of GigE port - All Received Packets, All Received Bytes, Received Broadcasts, All Transmitted Packets, All Transmitted Bytes, Transmitted Broadcasts, Received Error Packets
- Provides Engineering Order Wire (EOW)
- Remote access and management over TCP-IP Telnet and SNMP
- Supports SNMP V2 monitoring and traps
- Supports Command Line Interface (CLI) based on RS232 (COM Port) and TCP-IP (Telnet)
- Remote Power Down detection (RPD) alarm. Allows the local end to detect if the remote unit is unavailable due to optical link failure or due to power down
- Remote software ungradable
- AC and DC power redundancy (-48V DC (-18V to -72V), 110-230V AC options available)
- Complies to electrostatic discharge immunity (ESD) IEC 61000-4-2 level 2
- RoHS and EMI/EMC compliant.
**Highlights**

- Gigabit (Wire Speed) data transmission
- Gigabit multi-service fiber optic transport solution - Transmits both E1s and Gigabit Ethernet data over an optical fiber link / or over 1+1 redundant optical fiber links for added protection against link failures
- Compact, high performance, high throughput and cost effective broadband network access solution
- SFP based design for customer convenience, flexibility to change services distance and serviceability
- Optical distance support for 550m, 10Kms, 20Kms, 40Kms and 80Kms
- Supports remote power down detect function
- Ethernet data port complies to IEEE 802.3, IEEE 802.3u, IEEE 802.ab, IEEE 802.3x recommendations
- Ethernet data port supports auto-negotiation function and can work in 10M full/half duplex, 100M full/half duplex mode (1000M half duplex is not supported)
- Ethernet Transmission media is Category 6 UTP, RJ-45 connector (electrical) for Gigabit Ethernet channel with up to 1000Mb/s data rates
- Ethernet Transmission media is optical fiber pair, LC connector (optical), for Gigabit Ethernet electrical channel with up to 1000Mb/s bandwidth
- Engineering Order Wire (EOW)
- Supports Command Line Interface (CLI) for configuration and management
- Supports TELNET for remote configuration and management
- Supports SNMP V2
- GUI for easy configuration
- Network Management System for monitoring multiple units from a single, central location
- Supports multiple type of alarm notifications
- Supports E1 and optical loop back configuration, etc.
- 1U (44mm) high 19 Inch Rack Mount standard rack design
- Available with Single 110V-220V AC and / or -48V DC (18V to 72V) power supply
- Supports 110V-220VAC and -48V DC (18V to 72V) redundant power supply
- Low power consumption (Less than 11W)
- Provides E1’s with 120 Ohms (RJ-45) or E1’s with 75 Ohms (BNC) connections - optional
- E1 G.703, G.703 channels support all protocols sent over it, e.g. SS7 signaling, PRI for PABX interconnection
- Support for Base Station backbone development for CDMA, GSM, 3G and other applications where E1 G.703 channels and Gigabit Ethernet data are required to send over the same fiber link.

**Configuration, Maintenance and Management options**

- Serial Management Port – RS232 interface (COM Port)
- TCP/IP – 10/100BaseT for remote management over a LAN / TCP/IP network
- SNMP V2 (MIB File provided with the equipment)
- Telnet – CLI (Command Line Interface)
- Windows XP and Windows 7 compatible Graphical User Interface (GUI)
- Network Management System (to monitor multiple units from a single central location).
**Alarm and Indicator Monitoring**

- Power Indicator
- Current Status (integrity and activity) Indicator
- General Alarm Indicator (any alarm)
- Working Optical Link Indicator
- Optical Signal Loss Alarm Indicator
- Remote Device Power-Down (RPD) Indicator
- Ethernet Link Indicator
- Ethernet Speed Indicator
- E1 Signal Loss Alarm Indicator
- Frame Loss Indicator
- Optical Errors (E-3 / E-6) Indicator
- Audible Buzzer Alarm
- SNMP V2 Diagnostic and Monitoring.

**Application**

![Diagram](image-url)
Technical Specifications

E1 Interface Specifications

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Channel capacity</td>
<td>16 E1</td>
</tr>
<tr>
<td>Bit rate</td>
<td>2.048 Mbps + 50 ppm</td>
</tr>
<tr>
<td>Line code</td>
<td>HDB3</td>
</tr>
<tr>
<td>Frame Structure</td>
<td>As per G.704</td>
</tr>
<tr>
<td>Electrical Interface</td>
<td>As per G.703</td>
</tr>
<tr>
<td>Nominal impedance</td>
<td>120Ω balanced / 75Ω unbalanced (optional)</td>
</tr>
<tr>
<td>Jitter character</td>
<td>ITU-T G.742, G.823 compliant</td>
</tr>
<tr>
<td>Connectors</td>
<td>RJ-45 connectors (120Ω balanced)</td>
</tr>
<tr>
<td></td>
<td>Or Male DB37 interface with BNC coaxial connectors (75Ω unbalanced)</td>
</tr>
</tbody>
</table>

Gigabit Optical (Network Transmission Side) Interface options (SFP options)

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Wave Length</th>
<th>Distance</th>
<th>SFP Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>850nm-LD</td>
<td>550m</td>
<td>1. Supports 1.25Gbps bit rate.&lt;br&gt;2. Connector type is LC&lt;br&gt;3. MSA (INF-8074i) Compliant and SFF-8472 v9.3</td>
</tr>
<tr>
<td>2</td>
<td>1310nmFP-LD</td>
<td>10km</td>
<td>4. IEEE802.3z Gigabit Ethernet&lt;br&gt;5. DDM, RoHS &amp; WEEE&lt;br&gt;6. International Class 1 laser safety certified (IEC 60825)</td>
</tr>
<tr>
<td>4</td>
<td>1550nmDFB-LD</td>
<td>40km</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1550nmDFB-LD</td>
<td>40km</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>1550nmDFB-LD</td>
<td>80km</td>
<td></td>
</tr>
</tbody>
</table>

Gigabit Ethernet (customer side) Interface 10/100/1000BaseT (Electrical)

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Interfaces</td>
<td>1</td>
</tr>
<tr>
<td>Interface</td>
<td>RJ-45 Ethernet 10/100/1000BaseT (auto sensing)&lt;br&gt;Full / Half Duplex</td>
</tr>
<tr>
<td>Interface Rate</td>
<td>Upto 1000 Mbps Ethernet data transmission rate</td>
</tr>
<tr>
<td>Connector</td>
<td>RJ-45</td>
</tr>
</tbody>
</table>
Configuration, Maintenance and Management Interfaces

- Serial Management Port – RS232 interface (COM Port)
- TCP/IP – 10/100BaseT for remote management over a LAN / TCP/IP network
- SNMP V2 (MIB File provided with the equipment)
- Telnet – CLI (Command Line Interface)
- Windows XP and Windows 7 compatible Graphical User Interface (GUI)
- Network Management System (to monitor multiple units from a single central location).

Safety

- Class 1 Laser
- Auto Laser Shut Down (ALS) in the event of fiber break.

Engineering Order Wire (EOW)

- EOW (Engineering Order Wire)- RJ11 Connector

Power Supply

<table>
<thead>
<tr>
<th>Power Input</th>
<th>AC, DC, AC + DC</th>
</tr>
</thead>
<tbody>
<tr>
<td>DC power</td>
<td>DC - 48V (Input range -18~72V)</td>
</tr>
<tr>
<td>AC power</td>
<td>AC 110~240V, 50/60Hz</td>
</tr>
<tr>
<td>Power consumption</td>
<td>&lt; 11 Watts</td>
</tr>
</tbody>
</table>

Environment

<table>
<thead>
<tr>
<th>Temperature</th>
<th>- 5°C ~ + 55°C for operation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- 40°C to + 70°C for storage</td>
</tr>
</tbody>
</table>

| Humidity          | 5% to 95% (35°C)             |

Mechanical Specifications

<table>
<thead>
<tr>
<th>Width</th>
<th>440 mm.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depth</td>
<td>210 mm.</td>
</tr>
<tr>
<td>Height</td>
<td>44 mm.</td>
</tr>
<tr>
<td>Weight</td>
<td>2.7 kg</td>
</tr>
<tr>
<td>Rack Type</td>
<td>EIA 19 inch</td>
</tr>
</tbody>
</table>
16 E1 + Gigabit Ethernet (Wire-Speed) Optical Multiplexer

Ordering Information

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Part #</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1      | 2016:1-16E1-GigE (Core System) | 16 E1 + Gigabit Ethernet (Wire-Speed) Optical Multiplexer  
- 19" Metal box / case 1U High Rack Mount Version  
- EOW (order wire), SNMP, NMS & Telnet for Management  
- User Manual & User Disk  
- 1 x Gigabit Ethernet (10/100/1000BaseT Electrical RJ45F) Customer Side  
- 16 x E1 Ports – 120 Ohms / 75 Ohms (Please specify E1 Impedance option)  
- 2 x Gigabit Optical (SFP based - without SFPs) Network Transmission Side (Please specify SFP option)  
- AC / DC / AC+DC (Please specify power option) |

E1 Impedance Options

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Part #</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1      | 16E1-75 Ohms | 16 x E1 Ports 75 Ohms [DB-37(M)]  
DB-37(M) to 16 BNC(F) Converter will be supplied with the System |
| 2      | 16E1-120 Ohms | 16 x E1 Ports 120 Ohms [RJ45(F)] - Std* |

Power Supply Options

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Part #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AC</td>
<td>1 x 110-220V (Range: 85-264) AC power input</td>
</tr>
<tr>
<td>2</td>
<td>DC</td>
<td>1 x -48V (Range: 36-72) DC power input - Std*</td>
</tr>
</tbody>
</table>
| 3      | AC+DC  | 1 x 110-220V (Range: 85-264) AC power input  
1 x -48V (Range: 36-72) DC power input |

Note: Std* denotes Standard configuration
### SFP Options

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Part #</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>GigE-850-550</td>
<td>1.25Gbps SFP Transceiver Gigabit Ethernet, 1000Base-LX, Duplex LC, 850nm, 550m, MMF, +3.3V, MSA, DDM, Internal Calibration, RoHS</td>
</tr>
<tr>
<td>2</td>
<td>GigE-1310-10</td>
<td>1.25Gbps SFP Transceiver Gigabit Ethernet, 1000Base-LX, Duplex LC, 1310nm, 10Km, SMF, +3.3V, MSA, DDM, Internal Calibration, RoHS</td>
</tr>
<tr>
<td>3</td>
<td>GigE-1310-20</td>
<td>1.25Gbps SFP Transceiver Gigabit Ethernet, 1000Base-LX, Duplex LC, 1310nm, 20Km, SMF, +3.3V, MSA, DDM, Internal Calibration, RoHS</td>
</tr>
<tr>
<td>4</td>
<td>GigE-1310-40</td>
<td>1.25Gbps SFP Transceiver Gigabit Ethernet, 1000Base-LHX, Duplex LC, 1310nm, 40Km, SMF, +3.3V, MSA, DDM, External Calibration, RoHS</td>
</tr>
<tr>
<td>5</td>
<td>GigE-1550-40</td>
<td>1.25Gbps SFP Transceiver Gigabit Ethernet, 1000Base-LX, Duplex LC, 1550nm, 40Km, SMF, +3.3V, MSA, DDM, External Calibration, RoHS</td>
</tr>
<tr>
<td>6</td>
<td>GigE-1550-80</td>
<td>1.25Gbps SFP Transceiver Gigabit Ethernet, 1000Base-LX, Duplex LC, 1550nm, 80Km, SMF, +3.3V, MSA, DDM, External Calibration, RoHS</td>
</tr>
</tbody>
</table>

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