Valiant’s STM-1 63 E1 (Optical / Electrical) Add-Drop SDH Multiplexer unit is a modular platform unit with two 155.52Mbps optical / electrical interfaces, which may be used in a point-to-point, chain or ring application to provide an ultra-compact, cost effective and flexible service platform.

63xE1 interfaces (120 Ohms [RJ-45] and 75 Ohms [BNC]) options 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 STM-1(SDH) Transmission Equipment provides full capability to cross-connect at E1 level between all tributaries.

The equipment can be used as Terminal Multiplexer (TM) or an Add-Drop-Multiplexer (ADM) to build a point-to-point, ring and chain (add-drop) transmission network.

## Features
- Supports up to 63 E1s
- 1U height, 19-Inch standard rack-mountable chassis
- 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
- Maximum 63 E1 interfaces compliant with ITU-T G.703
- 120 Ohms E1 and 75 Ohms E1 interfaces options available
- Provides complete diagnostics facilities to the user for monitoring optical ports and providing 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)
- 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
- Timing mode
  - Synchronization with STM-1 line timing
  - Synchronization with timing from any of the E1 interfaces
- 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
- Supports 1+1 Line Protection and Automatic Protection Switching (APS) with less than 50ms recovery
- All 63 VC12s can be mapped (east or west) in 1+1 protection mode
- Out of 63 VC12s, 21 VC12s (43-63) can be mapped to either direction (east or west) without protection (1+0)
- Supports point-to-point, ring and chain topology
- Local management and network-based management via a unified platform
- Supports Remote Power Down Detection and Auto Laser Shutdown
- Supports STM-1 and E1 loop-back for troubleshooting
- 850nm multi-Mode, 1310nm Single Mode and 1550nm Single Mode optical interface options offered
- Easy to operate
- 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 20W.

## 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
- Auto Laser Shutdown (ALS) Indicator
- Engineering Order-Wire (EOW) Indicator
- Dry contact via 9-pin, D-type male connector
- Buzzer Alarm
- SNMP Diagnostic and Monitoring.
Network Application

Point to point network application diagram

Chain network application diagram

Ring network application diagram
**Technical Specifications**

**Network Topology and Interface**

- **Network topology**: Point to point network, Ring and Chain
- **Service interfaces**: STM-1 SDH single optical or double optical ports (1+1 protection) supported or STM-1 SDH single electrical or double electrical ports (1+1 protection) supported - 63 E1 - 120 Ohms or 75 Ohms

**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**: Less than 50 ms switching / Protection recovery
- **Data rate**: 155.52 Mbps
- **Standard**: ITU-T G.957 compliant
- **Coding**: NRZ
- **Connector**: LC
- **Light source**: Class 1 Laser
- **Wave length**: 850nm/1310nm/1550nm
- **Transmit power**: (-11 dBm to -2.5 dBm - as may be ordered)
- **Receive sensitivity**: (-28 dBm to -34 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 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
- **Transmit power**: (optional) - 1310nm Std. S 1.1, L 1.1, L 1.2
- **Receive sensitivity**: (optional) - 1310nm Std. S 1.1, L 1.1, L 1.2
- **Automatic 1+1 line Protection**: Less than 50 ms switching / recovery
- **Automatic Laser Shut Down Option**: User selectable options

**Optical Interfaces**

<table>
<thead>
<tr>
<th>Type</th>
<th>Wavelength (nm)</th>
<th>Mean launched power (dBm)</th>
<th>Receiver sensitivity (dBm)</th>
<th>Receiver overload (dBm)</th>
<th>Connector</th>
<th>Configuration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Double fibers</td>
<td>1310</td>
<td>-8 ~ -12</td>
<td>-36</td>
<td>-3</td>
<td>LC</td>
<td>Standard (S1.1)</td>
</tr>
<tr>
<td>Two Direction</td>
<td>1310</td>
<td>0 ~ -5</td>
<td>-36</td>
<td>-3</td>
<td>LC</td>
<td>Optional (L1.1)</td>
</tr>
<tr>
<td>Single Fiber</td>
<td>1310/1550</td>
<td>-8 ~ -14</td>
<td>-30</td>
<td>-3</td>
<td>LC</td>
<td>Optional</td>
</tr>
<tr>
<td>One Direction</td>
<td>1310/1550</td>
<td>0 ~ -5</td>
<td>-30</td>
<td>-3</td>
<td>LC</td>
<td>Optional</td>
</tr>
</tbody>
</table>

**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)

**E1 Interface Specification - 120 Ohms**

- **Number of E1s (Max)**: 63 E1 Interfaces per system
- **Line Rate per E1**: (2.048 Mbps ± 50 bps)
- **Line Code**: HDB3
- **Framing Structure**: As per ITU (CCITT) G.704
- **Framing Options**: Un-Framed/PCM 30/PCM 31
- **Electrical**: As per ITU-T G.703
- **Jitter**: As per ITU-T G.823
- **Impedance**: 120 Ohms balanced
- **Nominal Pulse Width**: 244ns
- **Connector**: RJ-45 (F)

**E1 Interface Specification - 75 Ohms**

- **Number of E1s (Max)**: 63 E1 Interfaces per system
- **Line Rate per E1**: (2.048 Mbps ± 50 bps)
- **Line Code**: HDB3
- **Framing Structure**: As per ITU (CCITT) G.704
- **Framing Options**: Un-Framed/PCM 30/PCM 31
- **Electrical**: As per ITU-T G.703
- **Jitter**: As per ITU-T G.823
- **Impedance**: 75 Ohms unbalanced
- **Nominal Pulse Width**: 244ns
- **Connector**: BNC

**Engineering Order Wire (EOW)**

- **Engineering Order Wire (EOW)**: RJ-11 connector

**E1 Port (TU 12) Performance Analysis**

- Error Bits (EB)
- Error Seconds (ES)
- Several Error Seconds (SES)
- Unavailable seconds (UAS)
- Remote Error Indication (REI)
- Code Violation (CV)

**NMS**

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

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Part #</th>
<th>Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>VCL-STM-1-63E1-ADM-MUX</td>
<td>STM-1 63 E1 (Optical/Electrical) Add-Drop Multiplexer SDH transmission unit</td>
</tr>
<tr>
<td></td>
<td></td>
<td>19” Metal Box 1U High Rack Mount Version</td>
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</table>

### Please Specify Options

#### STM-1 Port Options

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Part #</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 x Optical SFP - 1310nm, 20KM S1.1 (LC)</td>
<td>OPT-1+0-1310-20KM</td>
</tr>
<tr>
<td>2</td>
<td>2 x Optical SFP - 1310nm, 20KM S1.1 (LC)</td>
<td>OPT-1+1-1310-20KM</td>
</tr>
<tr>
<td>3</td>
<td>1 x Optical SFP - 1310nm, 40KM L1.1 (LC)</td>
<td>OPT-1+0-1310-40KM</td>
</tr>
<tr>
<td>4</td>
<td>2 x Optical SFP - 1310nm, 40KM L1.1 (LC)</td>
<td>OPT-1+1-1310-40KM</td>
</tr>
<tr>
<td>5</td>
<td>1 x Optical SFP - 1550nm, 80KM L1.2 (LC)</td>
<td>OPT-1+0-1550-80KM</td>
</tr>
<tr>
<td>6</td>
<td>2 x Optical SFP - 1550nm, 80KM L1.2 (LC)</td>
<td>OPT-1+1-1550-80KM</td>
</tr>
<tr>
<td>7</td>
<td>1 x Optical SFP - 1550nm, 120KM L1.2 (LC)</td>
<td>OPT-1+0-1550-120KM</td>
</tr>
<tr>
<td>8</td>
<td>2 x Optical SFP - 1550nm, 120KM L1.2 (LC)</td>
<td>OPT-1+1-1550-120KM</td>
</tr>
<tr>
<td>9</td>
<td>1 x Electrical SFP (mini BNC)</td>
<td>ELE-1+0</td>
</tr>
<tr>
<td>10</td>
<td>2 x Electrical SFP (mini BNC)</td>
<td>ELE-1+1</td>
</tr>
<tr>
<td>1</td>
<td>63E1-120 63 E1 Card with 8 x DB-37 to 8 x RJ-45</td>
<td>63E1-120</td>
</tr>
<tr>
<td>2</td>
<td>63E1-75 63 E1 Card with 8 x DB-37 to 16 x BNC</td>
<td>63E1-75</td>
</tr>
</tbody>
</table>

### Power Supply Options

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Part #</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 x DC Mains Input - 48VDC (range 40V to 60V)</td>
<td>DC-1+0</td>
</tr>
<tr>
<td>2</td>
<td>2 x DC Mains Input - 48VDC (range 40V to 60V)</td>
<td>DC-1+1</td>
</tr>
<tr>
<td>3</td>
<td>1 x AC Mains Input 110Volts-240 Volts, 50Hz/60Hz</td>
<td>AC-1+0</td>
</tr>
<tr>
<td>4</td>
<td>2 x AC Mains Input 110Volts-240 Volts, 50Hz/60Hz</td>
<td>AC-1+1</td>
</tr>
</tbody>
</table>

#### Clock Synchronization Options

- Synchronization with STM-1 line Timing
- Synchronization with timing from any of the E1 interfaces (63 E1 tributary interfaces)
- 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

#### 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 - < 20 Watts

#### Operating Conditions

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

#### Mechanical Specification

- Rack Mounting Standard 19 Inch. DiN Rack
- Height - 44 mm.
- Depth - 256 mm.
- Width - 440 mm.
- Weight - 3.75 kg

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Technical specifications are subject to changes without notice.
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