



# ORION TELECOM NETWORKS INC.

## 16 E1 + Gigabit Ethernet (Wire-Speed) Optical Multiplexer

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### Product Brochure

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## Product Overview

Orion'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.



16 E1 + Gigabit Ethernet  
(Wire-Speed) Optical Multiplexer

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 than 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) , 100-250V 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, 1000M full duplex mode (1000M half duplex is not supported)
- Ethernet Transmission media is Category 6 UTP, RJ-45 connector (electrical) for Gigabit Ethernet channel with upto 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 100V-250V AC and / or -48V DC (18V to 72V) power supply
- Supports 100V-250V AC 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.

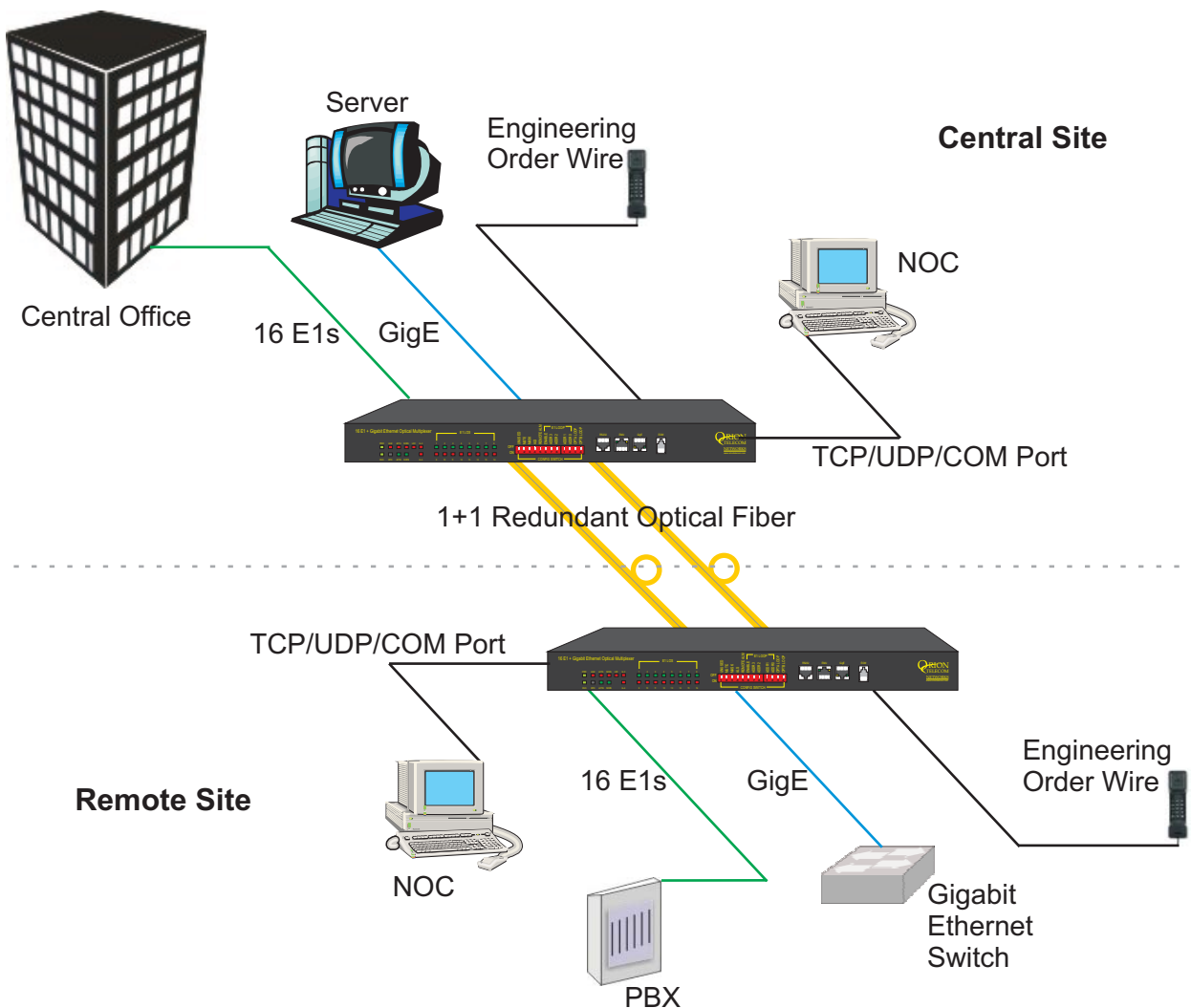
## Configuration, Maintenance and Management options

- 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



## Technical Specifications

### E1 Interface Specifications

Electrical Interface	E1
Channel capacity	16 E1
Bit rate	2.048 Mbps $\pm$ 50 ppm
Line code	HDB3
Frame Structure	As per G.704
Electrical Interface	As per G.703
Nominal impedance	120 $\Omega$ balanced / 75 $\Omega$ unbalanced (optional)
Jitter character	ITU-T G.742, G.823 compliant
Connectors	RJ-45 connectors (120 $\Omega$ balanced) Or Male DB37 interface with BNC coaxial connectors (75 $\Omega$ unbalanced)

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

S. No.	Wave Length	Distance	SFP Standards
1	850nm-LD	550m	1. Supports 1.25Gbps bit rate. 2. Connector type is LC 3. MSA (INF-8074i) Compliant and SFF-8472 v9.3 4. IEEE802.3z Gigabit Ethernet 5. DDM, RoHS & WEEE 6. International Class 1 laser safety certified (IEC 60825) 7. Complied to GR-468-CORE 8. Complied to ITU-T G.695 9. Complied to FC-PI V2.0 Standard
2	1310nmFP-LD	10km	
3	1310nmDFB-LD	20km	
4	1550nmDFB-LD	40km	
5	1550nmDFB-LD	40km	
6	1550nmDFB-LD	80km	

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

Number of Interfaces	1
Interface	RJ-45 Ethernet 10/100/1000BaseT (auto sensing) Full / Half Duplex
Interface Rate	Upto 1000 Mbps Ethernet data transmission rate
Connector	RJ-45

## 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

Power Input	AC, DC, AC + DC
DC power	DC - 48V (Input range -18~-72V)
AC power	AC 100~250V, 50/60Hz
Power consumption	< 11 Watts

## Environment

Temperature	- 5°C ~ +55°C for operation - 40°C to +70°C for storage
Humidity	5% to 95% (35°C)

## Mechanical Specifications

Width	440 mm.
Depth	210 mm.
Height	44 mm.
Weight	2.7 kg
Rack Type	EIA 19 inch

## Ordering Information

### 16E1 + Gigabit Ethernet (Wire-Speed) Optical Multiplexer (Common Equipment)

S. No.	Part #	Description
1	16E1-120-GigEoOPT	16E1 + Gigabit Ethernet (Wire-Speed) Optical Multiplexer 19" Metal box / case 1U High Rack Mount Version Supports: <ul style="list-style-type: none"> <li>• 16 x E1 Ports [120 Ohm RJ45 (F)]</li> <li>• 1 x Ethernet Port [1000Mbps, Gigabit, Electrical RJ45 (F)] (Customer Side)</li> <li>• 2 x Optical Ports [Gigabit, SFP based / without SFPs] (Network Transmission Side)</li> <li>• 1 x System Core Cables, Installation accessories, Documentation, System User Manual / Disk etc (Set)</li> </ul>
2	16E1-075-GigEoOPT	16E1 + Gigabit Ethernet (Wire-Speed) Optical Multiplexer 19" Metal box / case 1U High Rack Mount Version Supports: <ul style="list-style-type: none"> <li>• 16 x E1 Ports [75 Ohm DB37 (M) with DB37 (F) to BNC (F)]</li> <li>• 1 x Ethernet Port [1000Mbps, Gigabit, Electrical RJ45 (F)] (Customer Side)</li> <li>• 2 x Optical Ports [Gigabit, SFP based / without SFPs] (Network Transmission Side)</li> <li>• 1 x System Core Cables, Installation accessories, Documentation, System User Manual / Disk etc (Set)</li> </ul>

## Power Supply Options

S. No.	Part #	Description
1	AC220	1 x 100-240V AC Power Supply Input
2	DC048	1 x (-) 48V DC Power Supply Input
3	AC220DC048	1 x 100-240V AC Power Supply Input 1 x (-) 48V DC Power Supply Input

## Gigabit SFP Options

S. No.	Part #	Description
1	VCL-EMOD 0231	1.25Gbps SFP Transceiver Duplex LC, 1310nm, 20Km, SMF, +3.3V, MSA, DDM, Internal Calibration, RoHS
2	VCL-EMOD 0255	1.25Gbps SFP Transceiver Duplex LC, 1310nm, 40Km, SMF, +3.3V, MSA, DDM, External Calibration, RoHS
3	VCL-EMOD 0256	1.25Gbps SFP Transceiver Duplex LC, 1550nm, 80Km, SMF, +3.3V, MSA, DDM, External Calibration, RoHS

**Cables and Accessories Options**

S. No.	Part #	Description
1	VCL-HRNS 1229	Optical Patch Cord Connectorized Cable [2LC-2LC, 3m, SM]
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.))

Technical specifications are subject to changes without notice.  
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