



## ORION TELECOM NETWORKS INC.

# VCL-Ethernet over E1 10/100 Base-T / E1/100Base-FX to E1 Interface Converter

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## Product Brochure & Data Sheet

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## VCL-Ethernet over E1 10/100 Base-T / E1/100Base-FX to E1 Interface Converter

### Description

Orion's Ethernet over E1 converter allows the user to send Ethernet data, between two points, over an E1 link. E1 interface is 120 Ohms. Ethernet interface options may be ordered as 10/100 Base-T Electrical Ethernet or 100Base-FX Optical Ethernet over 850nm/1310nm/1550nm single mode optical fiber interfaces.

The equipment be always installed and used in pairs, with one terminal being installed at either end of the E1 link.

The VCL-Ethernet over E1 Converter is an Ethernet extension device utilizing TDM telecom infrastructure (the telecom network of E1s, on PDH, SDH or E1/E3/SDH microwave etc. carrying E1s). It converts the Ethernet data into E1 frame format for transmission over the existing TDM (E1) links and then re-converts the E1 back into Ethernet data the far-end terminal, to BRIDGE two Ethernet LANs over the existing E1-based telecom network. The device can effectively utilize the existing TDM network to transport Ethernet data with low investment.

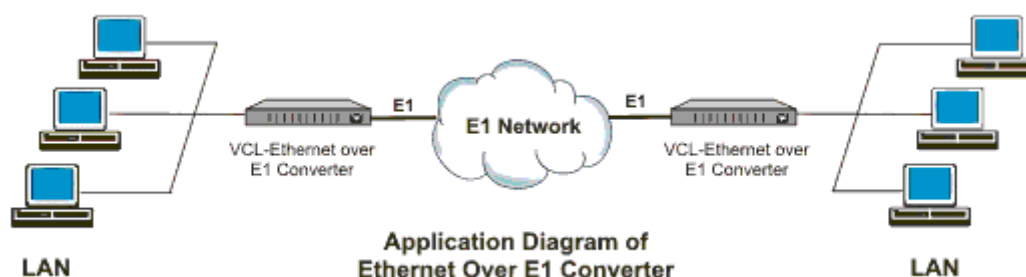
### Application

The equipment may be used for the following purposes:

1. Bridging Ethernet LANs over existing TDM (E1) telecom network.
2. Extending Ethernet networks utilizing TDM (E1) landline based telecom infrastructure.
3. Using telecom network of E1s/PDH/SDH microwave etc. carrying E1s to transport Ethernet data.

In all cases the equipment be always installed and used in pairs, with one terminal being installed at either end of the network.

### Typical Application



## Technical Features

- The maximum transmission rate of Ethernet data over E1 links is 2.048Mbit/s
- E1 supports three working modes of transmission. Un-Framed/Transparent, Framed (CCS) and Multiple Framed (CAS/PCM30) format
- 10/100 IEEE 802.3 Ethernet MAC (MII and RMII) half/full duplex with automatic flow control
- Supports X.86, LAPS and HDLC transmission protocols
- Committed information rate controller provides fractional allocations in 512 Kbps increments
- Available with MAC address list filtration, learning, and updating functions
- A large external SDRAM buffering for handling data bursts
- Equipment supports two clock synchronization modes. Internal clock and Network clock (Loop-Timed clock)

## E1 Interface Specifications

Number of E1	1
Line Rate	E1 (2.048 Mbps $\pm$ 50 bps)
Line Code	HDB3
Framing	Un-Framed /PCM 30 /PCM 31
Frame Structure	As per ITU-T (CCITT) G.704
Electrical	As per ITU-T G.703
Jitter	As per ITU-T G.823
Impedance	120 Ohms
Nominal Pulse Width	244ns
Connector	RJ-45 (F)

## Ethernet Interface Specifications – 10/100BaseT (Electrical)

Interface Types	10/100BaseT
Standards Compliance	IEEE 802.3
Transmission Bit Rate	10/100BaseT limited to Max. 2.048 Mbps
Connectors	RJ-45 (10/100 BaseT Electrical)

**Ethernet Interface Specifications – 100Base FX (Optical) – 850nm Multi Mode****Transmitter Optical Characteristics**

<b>Parameter</b>	<b>Minimum</b>	<b>Typical</b>	<b>Maximum</b>
Data Rate		125Mb/s	
Centre Wavelength	830nm	850nm	860nm
Output Spectral Width (RMS)			0.85nm
Average Output power	-10dBm		-3dBm
Output optical Eye	Complaint with ITU-T G.957		
Connectors	SC		

**Receiver Optical Characteristics**

<b>Parameter</b>	<b>Minimum</b>	<b>Typical</b>	<b>Maximum</b>
Data Rate		125Mb/s	
Receive Sensitivity	-24dBm		
Maximum Input Power			-3dBm
Operating Wavelength		850nm	
Connectors	SC		

**Ethernet Interface Specifications – 10/100Base FX (Optical) – 1310nm Single Mode****Transmitter Optical Characteristics**

<b>Parameter</b>	<b>Minimum</b>	<b>Typical</b>	<b>Maximum</b>
Data Rate		125Mb/s	
Centre Wavelength	1260nm	1310nm	1360nm
Output Spectral Width (RMS)			6nm
Average Output power	-15dBm	-12dBm	-8dBm
Output Optical Eye	Complaint with ITU-T G.957		
Connectors	SC		

**Receiver Optical Characteristics**

Parameter	Minimum	Typical	Maximum
Data Rate		125Mb/s	
Receive Sensitivity	-32dBm		
Maximum Input Power			-15dBm
Operating Wavelength	1100nm		1600nm
Connectors	SC		

**Ethernet Interface Specifications – 10/100Base FX (Optical) - 1550nm Single Mode****Transmitter Optical Characteristics**

Parameter	Minimum	Typical	Maximum
Data Rate		125Mb/s	
Centre Wavelength	1480nm	1550nm	1580nm
Output Spectral Width (RMS)			4nm
Average Output power	-15dBm	-12dBm	-8dBm
Output Optical Eye	Complaint with ITU-T G.957		
Connectors	SC		

**Receiver Optical Characteristics**

Parameter	Minimum	Typical	Maximum
Data Rate		125Mb/s	
Receive Sensitivity	-32dBm		
Maximum Input Power			-15dBm
Operating Wavelength	1100nm		1600nm
Connectors	SC		

**Management and Control**

- Serial Management Port (RS232) - COM Port
- 10/100 BaseT Telnet Port

**Clock Selection Options**

Internal clock and Network clock (Loop-Timed clock)

**E1 RJ-45 (Female) pinout details**

<b>120 <math>\Omega</math> RJ45 (Female) pin-out</b>		
<b>PIN No.</b>	<b>Definition of function</b>	<b>Signal Direction</b>
1	TX+ (transmitted data +)	E1 Data Output
2	TX- (transmitted data -)	E1 Data Output
3	NC	
4	RX+ (received data +)	E1 Data Input
5	RX- (received data -)	E1 Data Input
6	NC	
7	NC	
8	NC	

**Ethernet RJ-45 (Female) pinout details**

<b>120 <math>\Omega</math> RJ45 (Female) pin-out</b>		
<b>PIN No.</b>	<b>Definition of function</b>	<b>Signal Direction</b>
1	TX+ (transmitted data +)	Data Output
2	TX- (transmitted data -)	Data Output
3	RX+ (received data +)	Data Input
4	NC	
5	NC	
6	RX- (received data -)	Data Input
7	NC	
8	NC	

**General****1. Power Supply (Optional)**

AC Mains Input 100V AC to 260V AC, 50/60 Hz (AC Mains Input Model)

DC Mains Input -48 V DC (DC input model)

Power Consumption ≤9W

**2. Service Conditions**Ambient temperature -20<sup>0</sup>C ~ +65<sup>0</sup>CRelative humidity ≤ 90% (at 35<sup>0</sup>C)**3. Mechanical Specifications**

Height	44 mm.
Depth	260 mm.
Width	480 mm.
Weight	4 kgs.

**Ordering Information**

<b>VCL-Electrical Ethernet over E1</b>		
<b>S No.</b>	<b>Part #</b>	<b>Product Description</b>
1	VCL-Ethernet over E1 DC-E	DC Input with Electrical Ethernet
2	VCL-Ethernet over E1 AC-E	AC Input with Electrical Ethernet

<b>VCL-Optical Ethernet over E1</b>		
<b>S No.</b>	<b>Part #</b>	<b>Product Description</b>
1	VCL-Ethernet over E1 DC-850	DC Input/850nm Optical Centre wavelength
2	VCL-Ethernet over E1 AC-850	AC Input/850nm Optical Centre wavelength
3	VCL-Ethernet over E1 DC-1310	DC Input/1310nm Optical Centre wavelength
4	VCL-Ethernet over E1 DC-1550	DC Input/1550nm Optical Centre wavelength
5	VCL-Ethernet over E1 AC-1310	AC Input/1310nm Optical Centre wavelength
6	VCL-Ethernet over E1 AC-1550	AC Input/1550nm Optical Centre wavelength



<b>VCL-Optical +Electrical Ethernet over E1</b>		
<b>S No.</b>	<b>Part #</b>	<b>Product Description</b>
1	VCL-Ethernet over E1 DC-850/E	DC Input/850nm Optical Centre wavelength+Electrical Ethernet
2	VCL-Ethernet over E1 AC-850/E	AC Input/850nm Optical Centre wavelength+Electrical Ethernet
3	VCL-Ethernet over E1 DC-1310/E	DC Input/1310nm Optical Centre wavelength+Electrical Ethernet
4	VCL-Ethernet over E1 DC-1550/E	DC Input/1550nm Optical Centre wavelength+Electrical Ethernet
5	VCL-Ethernet over E1 AC-1310/E	AC Input/1310nm Optical Centre wavelength+Electrical Ethernet
6	VCL-Ethernet over E1 AC-1550/E	AC Input/1550nm Optical Centre wavelength+Electrical Ethernet

**Note:** The equipment be always installed and used in pairs, with one terminal being installed at either end of the E1 link.

**Note:** Operation and maintenance of network equipment require professional knowledge and experience. We recommend the equipment to be managed only by qualified technicians. Should you require technical assistance please consult the provider, or contact our SUPPORT DESK at [support@oriontelecom.com](mailto:support@oriontelecom.com)

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Technical specifications are subject to changes without notice.  
Windows is the registered Trademark of Microsoft Corporation, USA.  
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