ORION TELECOM NETWORKS INC.

VCL-Ethernet over E1

10/100 Base-T / 100Base-FX to 4/8/16E1 Interface Converter

Product Brochure & Data Sheet

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VCL-Ethernet over 4/8/16E1
10/100 Base-T / 100Base-FX to 4/8/16E1 Interface Converter

Description

Orion's Ethernet over 4/8/16E1 Converter allows the user to send Ethernet data, between two points, over E1 links. E1 Interfaces are 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.

This equipment is available in 4E1, 8E1 and 16E1 port versions.

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 4/8/16E1 Converter is an Ethernet extension device utilizing TDM telecom infrastructure (the telecom network of E1s, or of PDH, SDH and 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.

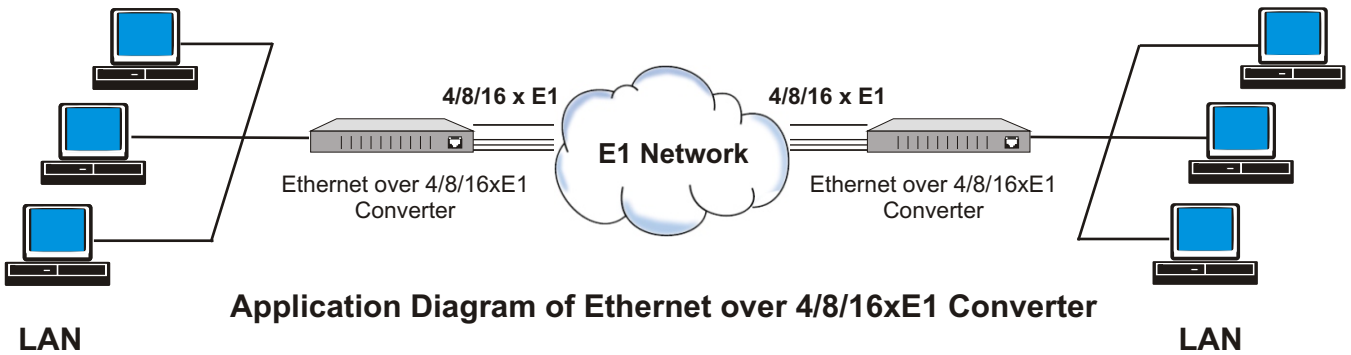
Application

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 must be always installed and used in pairs, with one terminal being installed at either end of the network.

Typical Application



Application Diagram of Ethernet over 4/8/16xE1 Converter

Technical Features

- The maximum transmission rate of Ethernet data over E1 links is 32.768Mbit/s using 16 E1 links
- E1 supports three working modes of transmission. Un-Framed/Transparent, Framed (CCS) and Multiple Framed (CAS/PCM30) format
- Supports VCAT (virtual concatenation) and LCAS (link capacity adjustment scheme) protocol, and complies with ITU-T G.7042 Specifications
- Mapping to E1 complies with ITU-T G.7043 and G.8040 specifications
- Supports differential delay of up to 120ms on E1 links
- Complies with IEEE 802.3 specifications
- Supports X.86, LAPS and HDLC transmission protocols
- Supports 100M full-duplex mode
- Configurable frame length 2036 bytes, maximum
- Supports GFP-F encapsulation complying with ITU-T G.7041
- Provide smooth adjustment of bandwidth
- Provides Loss of Frame alarms
- Provides error frame statistic
- Supports automatic removal and addition of E1 links
- Available with MAC address list filtration, learning, and updating functions
- A large external SDRAM buffering for handling data bursts
- E1 Interfaces support errors count
- Equipment supports two working modes, Internal clock and Network clock (Loop-Timed clock)

E1 Interface Specifications

Number of E1 interfaces	4/8/16 E1 interfaces (optional)
Line Rate	E1 (2.048 Mbps ± 50 bps)
Line Code	HDB3
Framing	Un-Framed / 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

Parameter	Minimum	Typical	Maximum
Optical Ethernet Data Rate		125Mb/s	
Center 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

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

Ethernet Interface Specifications 100Base FX (Optical) 1310nm Single Mode

Transmitter Optical Characteristics

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

Ethernet Interface Specifications 100Base FX (Optical) 1550nm Single Mode

Transmitter Optical Characteristics

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

Management Control

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

Clock Selection Options

Internal clock and Network clock (Loop-Timed clock)

E1 RJ-45 (Female) Pinout details

120 Ω RJ45 (Female) Pinout		
PIN No.	**Definition of function**	**Signal Direction**
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

120 Ω RJ45 (Female) Pinout		
PIN No.	**Definition of function**	**Signal Direction**
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	220V ± 20% (AC Mains Input Model)
DC Mains Input	-48V DC (DC Input Power Model)
Power Consumption	≤9W

General

2. Services Conditions

Ambient temperature	-20^{0}C ~ +65^{0}C
Relative humidity	$\leq$ 90% (at 35^{0}C)

3. Mechanical Specifications

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

Ordering Information

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

VCL-Optical + Electrical Ethernet over 8E1		
S.No.	**Part #**	**Product Description**
1	VCL-Ethernet over 8E1 DC-850/E	DC Input/850nm Optical Ethernet + Electrical Ethernet
2	VCL-Ethernet over 8E1 AC-850/E	AC Input/850nm Optical Ethernet + Electrical Ethernet
3	VCL-Ethernet over 8E1 DC-1310/E	DC Input/1310nm Optical Ethernet + Electrical Ethernet
4	VCL-Ethernet over 8E1 DC-1550/E	DC Input/1550nm Optical Ethernet + Electrical Ethernet
5	VCL-Ethernet over 8E1 AC-1310/E	AC Input/1310nm Optical Ethernet + Electrical Ethernet
6	VCL-Ethernet over 8E1 AC-1550/E	AC Input/1550nm Optical Ethernet + Electrical Ethernet

VCL-Optical + Electrical Ethernet over 16E1		
S.No.	**Part #**	**Product Description**
1	VCL-Ethernet over 16E1 DC-850/E	DC Input/850nm Optical Ethernet + Electrical Ethernet
2	VCL-Ethernet over 16E1 AC-850/E	AC Input/850nm Optical Ethernet + Electrical Ethernet
3	VCL-Ethernet over 16E1 DC-1310/E	DC Input/1310nm Optical Ethernet + Electrical Ethernet
4	VCL-Ethernet over 16E1 DC-1550/E	DC Input/1550nm Optical Ethernet + Electrical Ethernet
5	VCL-Ethernet over 16E1 AC-1310/E	AC Input/1310nm Optical Ethernet + Electrical Ethernet
6	VCL-Ethernet over 16E1 AC-1550/E	AC Input/1550nm Optical Ethernet + Electrical Ethernet

Note: The equipment must 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.

Note :

Technical specifications are subject to changes without notice.
All brand names and trademarks are the property of their respective owners.
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