ORION TELECOM NETWORKS INC.

E1 Protection (Fail-Over) Switch

Data Sheet & Product Brochure

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CAUTION
ELECTROSTATIC
SENSITIVE
DEVICES

DO NOT OPEN OR HANDLE
EXCEPT AT A
STATIC-FREE WORKSTATION

Product Overview

Orion 12 Port (4 E1 Links) E1 Protection (Fail-Over) Switch allows the user to connect upto four E1 lines from the telephone company to **"active",** as well as to **"standby"** terminal(s), such as data server(s) etc. at the customer premises.

E1 Protection (Fail-Over) Switch

In the event of the failure of the data server(s) / equipment connected to the **"A / active"** ports, the E1 Protection (Fail-Over) Switch shall automatically switch and connect the E1 line (s) from the telephone company to the data server(s) / equipment connected to **"B / standby"** ports.

This ensures minimum downtime-that would have otherwise occurred due to equipment failure.

Application Diagram


Features and Benefits

- Allows the users to connect upto 4 E1 lines from the Telephone Company to four active and four standby E1 terminals

- User configurable. May be used for a single E1 link and scaled upto 4 E1 links though user configuration

- Independent, user configurable switching parameters for each E1 link

- Built-in real-time clock / real-time logging maintains a history of all events

- Remotely accessible over a TCP-IP networks. Allows the user to access and carry out maintenance, or and E1 switch the links remotely, if required

- Allows the users to create and maintain active/standby/duplicate customer premises data networks/data servers, without requiring to bear the recurring $$$ expense of leasing additional expensive E1s lines from the telephone company

- Automatically switches the E1 link(s) from the Telephone Company between the **"active"** and **"standby"** E1 equipment at the customer premises, according to the customer-defined criterion

- Improves security. Allows the user to co-locate the "backup"/" standby" equipment in a different room/building and prevent data loss

- User programmable switching criterion independent for each E1 link

- Increases the reliability of the customer data/IT networks without the recurring additional cost of leasing additional E1 lines from the telephone company. The equipment may be used to create secondary/backup systems at the customer premises to provide virtually uninterrupted service.

User programmable criterion for switching between Active and Standby E1 Links at the customers premises:

Loss Of E1 Signal	The Loss of Signal condition in an E1 may occur due to: a) The failure of the E1 Port of the customer premises Equipment. b) Or due to loss of power to the customer premises equipment. c) Or due to the disconnection of the E1 Cable between the protection switch and the E1 Port of the customer premises equipment.
Loss Of Frame (LOF)	This alarm indicates unframed all ones being detected in the incoming pulses on the receiver of E1 Protection Switch.
Alarm Indication Signal (AIS)	This Alarm indicates that the E1 link error has occured.
CRC ERROR	This parameter is the number of CRC-4 errors (Cyclic Redundancy check errors) that occurred during the test period. The CRC-4 can be monitored either on-in-service or Out-of-Service E1 spans. Since the expected value of the CRC pattern can be anticipated, the received data can be compared to the expected results. Whenever the expected value does not equal the actual value a CRC error event is counted.

Application Diagram

Telco E1 link connected to Equipment-A

Working

E1 Link

Equipment - A

Network

Telco - E1

E1 Protection Switch

Standby
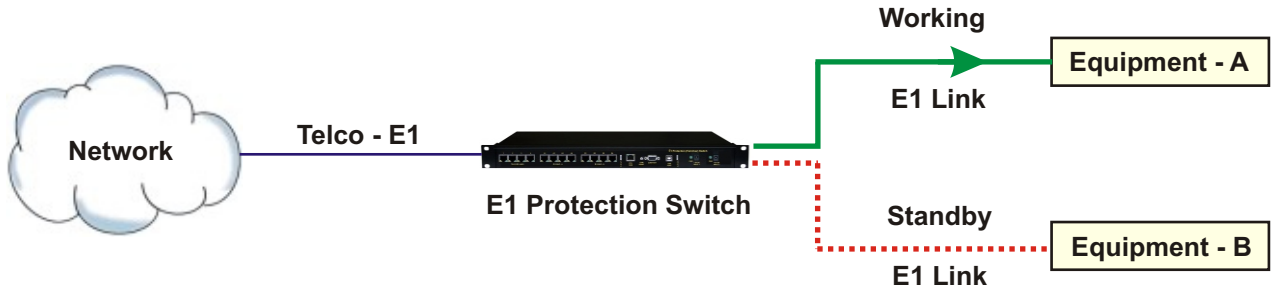
E1 Link

Equipment - B

Equipment-A fails – Telco E1 automatically switches to Equipment-B

Failed

Equipment - A

Network

Telco - E1

E1 Protection Switch

Equipment - B

Standby E1 Link connected to Equipment-B
automatically connects and becomes a working link

Equipment-A recovers – Telco E1 automatically switches to Equipment-A

Working

Equipment - A

Network

Telco - E1

E1 Protection Switch

E1 Link
recovers

Standby

E1 Link

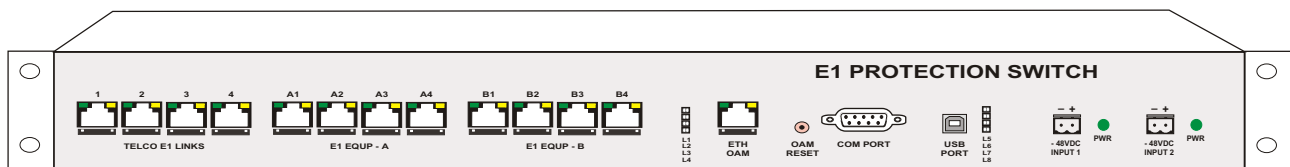Equipment - B

E1 Protection (Fail-Over) Switch

Shelf Description

The E1 Protection (Fail-Over) Switch is fitted in a 19-inch 1U shelf that provides access to all external interfaces.
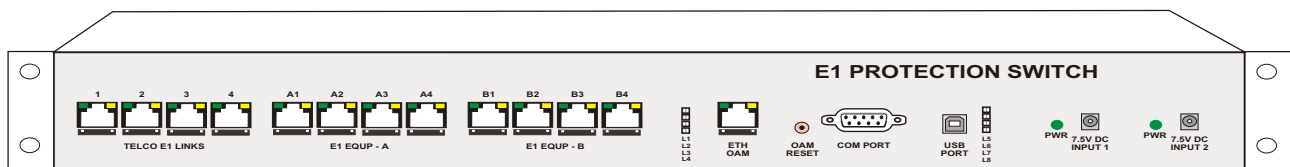
The E1 interfaces, power input, access and Management Ports (RS232) and 10/100BaseT Ethernet interfaces) are accessible from the front panel. The external alarm extension are accessible at the rear panel.

Front View

DC Version

AC Version

E1 Protection (Fail-Over) Switch LED Indications

The LEDs indicate the following:

L1 - (Green) - Indicates equipment Port A "In Use" for at least one of the four (enabled) links

L2 - (Red) - Indicates equipment Port B "In Use" for at least one of the four (enabled) links

L3 - Unused

L4 - Unused

L5 - (Green) + 3.3 V Present in OAM Card

L6 ~ L8 - Unused / For factory use only

7.5 V DC Input 1 - (Green)   7.5V DC Input Present

7.5 V DC Input 2 - (Green)   7.5V DC Input Present

7.5V OFF - Indicates no power is connected

Technical Specifications

Network Interface

Number of Interfaces	4 Telco E1 Links (common link/Telco E1s)
	4 Active E1 Links (for Equipment-A)
	4 Standby E1 Links (for Equipment-B)
Line Rate	E1 - 2.048 Mbps $\pm$ 50ppm
Line Code	HDB3
Frame Structure	As per ITU (CCITT) G.704
Jitter Tolerance	As per ITU-T G.823
Output Jitter	< 0.05 UI (in the frequency range of 20 Hz to 100 KHz)
Nominal Line Impedance	120 Ohms Balanced RJ-45
Nominal Pulse Width	244 ns
Pulse Mask	As per ITU (CCITT) Rec. G.703
Loss and recovery of frame alignment	As per clause 3 of ITU (CCITT) G.732
Loss and recovery of multiframe alignment	As per clause 5.2 of ITU (CCITT) G.732

AC Power Supply Specifications

Output voltage of AC Adapter	100 - 240 Volt AC
Range of input AC voltage	100 V to 240 V AC, 50Hz / 60Hz.
System Input voltage	7.5 V DC to 9.0 V DC, DC input polarity protection.
Maximum full load output current	2.5 A at 7.5 V DC / 9.0 V DC
Input voltage reversal protection	Provided in the Card
Efficiency at full load	>86%

DC Power Supply Specifications

Input DC voltage - Dual Input	-48V DC (nominal)
Range of input voltage	-18V to -72V DC
System voltage	3.3V
Input voltage reversal protection	Provided in the Card
Short circuit protection	Provided
Power Consumption	$\leq$ 8W

Mechanical Specifications

Rack mounting	Standard 19-Inch. DIN Rack
Height	44.00 mm.
Depth	260.00 mm.
Width	477.00 mm.
Weight	3.5 kg.

Operations and Maintenance (OAM) Interfaces

- RS232 serial interface for local terminal access
- USB serial interfaces for local terminal access
- 10/100BaseT Ethernet Interface for remote access over an IP network.

Management and Monitoring

- RS232 serial, USB serial interfaces for local terminal access.
- 10/100BaseT Ethernet Interface for remote access over an IP network.
- Encrypted Password Protection.
- Telnet – Remote access over IP links.
- SSH – Secured remote access using Secure Shell Protocol over IP links.
- SNMP Traps and NMS for real time remote monitoring and management over an IP network.
- Automatic Link Test feature link testing at user programmable periodical intervals.
- Visual I/O status LED Display.

NMS Port Specification

Network interface	RJ-45 Ethernet 10BaseT or 100BaseT-TX (auto sensing)
Compatibility	Ethernet Version 2.0 IEEE802.3
Protocols supported	ARP, UDP/IP, TCP/IP, Telnet, ICMP, SNMP, SSH
LEDs	10Base-T and 100Base-TX Activity, Full/half duplex
Management	SNMP, Serial login, Telnet login, SSH
EMI Compliance	- Radiated and conducted emissions complies with Class B limits of EN55022:1998 - Direct and Indirect ESD complies with EN55024:1998 - RF Electromagnetic Field Immunity complies with EN55024:1998 - Electrical Fast Transient/Burst Immunity complies with EN55024:1998 - Power Frequency Magnetic Field Immunity complies with EN55024:1998 - RF Common Mode Conducted Susceptibility complies with EN55024:1998

Temperature

Operating	0^0C to 50^0C
Humidity	5% to 95% Non-condensing

Compliance/Regulatory

- EMC FCC Part 15 Class 2
- Operation ETS 300 019 Class 3.2
- Storage ETS 300 019 Class 1.2
- Transportation ETS 300 019 Class 2.3

Command Language

- Command Line Interface (English text commands)

Ordering Information

S. No.	Part No.	Product Description
1.	VCL-E1-PRO-1421-DLX-1AC220	E1 Protection Switch 4E1 Links (12 E1 Ports) Protection (Fail-Over) Switching Equipment 19" Shelf 1U High Mount Version Supports: - 12 x E1 [120 Ohms RJ45F] [4 for Common / TELCO E1, 4 for Active E1 / EQUP-A, 4 for Standby E1 / EQUP-B] - 1 x 100-240V AC Power Supply Input (Adapter Option) - 1 x System Core Cables, Installation accessories, Documentation, System User Manual, System User Manual Disk etc. (Set) - Management
2.	VCL-E1-PRO-1421-DLX-2AC220	E1 Protection Switch 4E1 Links (12 E1 Ports) Protection (Fail-Over) Switching Equipment 19" Shelf 1U High Mount Version Supports: - 12 x E1 [120 Ohms RJ45F] [4 for Common / TELCO E1, 4 for Active E1 / EQUP-A, 4 for Standby E1 / EQUP-B] - 2 x 100-240V AC Power Supply Input (Adapter Option) - 1 x System Core Cables, Installation accessories, Documentation, System User Manual, System User Manual Disk etc. (Set) - Management
3.	VCL-E1-PRO-1421-DLX-2DC048	E1 Protection Switch 4E1 Links (12 E1 Ports) Protection (Fail-Over) Switching Equipment 19" Shelf 1U High Mount Version Supports: - 12 x E1 [120 Ohms RJ45F] [4 for Common / TELCO E1, 4 for Active E1 / EQUP-A, 4 for Standby E1 / EQUP-B] - 2 x -48V DC Power Supply Input - 1 x System Core Cables, Installation accessories, Documentation, System User Manual, System User Manual Disk etc. (Set) - Management.

Notes :

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