



ORION TELECOM NETWORKS INC.

VCL-SafeComm™ 16 T1 Links (48 T1 Ports) (1+1 Automatic Protection Switch)

Product Brochure & Data Sheet

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Product Description:

The VCL-SafeComm™, 16 T1 Links (48 T1 Ports), 1+1 Automatic Protection Switching Equipment may be used to protect upto 16 T1 Links (48 T1 Ports), point-to-point links and provide an alternate communication route to each T1 Link between any two T1 points. In the event of the failure of the primary (Main) T1 communication route, the VCL-SafeComm, 16 T1 Links (1+1 Automatic Protection Switching Equipment) automatically switches the T1 traffic to a secondary (standby) T1 route. The VCL-SafeComm, 16 T1, 1+1 Automatic Protection Switching equipment is available in a 2U high chassis which may be mounted in any DIN standard, 19-Inch rack.



**VCL-SafeComm, 16 T1 Links (48 T1 Ports)
1+1 Automatic Protection Switching (APS)**

Application:

This product allows the user to design 1+1 (protected) redundant T1 routes on similar (fiber-fiber), or complementing (fiber-radio) transmission mediums. Please see Figure # 1 for a graphical illustration for this application.

This product may also be used to design 1+1 redundant (protected) T1 rings on PDH networks, which otherwise would not be possible with PDH technology. Please see Figure # 3 for a graphical illustration for this application.

The criterion for switching between the primary (main) and the secondary (protected/ standby) routes is user programmable. Criterion for switching between the primary (main) and the secondary (protected/standby) routes may be Loss-Of-Signal on T1 links, or AIS (All-Ones AIS alarm) condition. The criterion for switching time and recovery time between the primary (main) and the secondary (protected/standby) routes is user programmable.

Data transported on the T1 Links is transparent and protocol independent.

Features & Highlights:

- High density protection switching equipment (upto 16 T1 Links i.e. 48 T1 Ports)
- To provide an independent point-to-point, protected T1 Link between two "T1 USER PORTS" on similar (example fiber-fiber), or dissimilar (fiber-radio) mediums
- To provide 1+1 T1 redundancy support to higher order multiplexers e.g. E2,E3
- System configuration and management interface through "CLI" text based commands
- TransportA-bis Interface on redundant T1 links
- Provide 1+1 Protection /Alternate Routing Path between BSC and BTS
- May be used in a point-to-point configuration to provide 1+1 Protected / Alternate Routing Path between any two locations (as shown in Figure # 1)
- May be used in a point-to-multipoint configuration to provide 1+1 Protected / Alternate Routing Path between one location and multiple locations (as shown in Figure # 2)

Features & Highlights:

- May be used to design 1+1 resilient / alternate routing (protected) T1 rings over PDH networks, which otherwise would not be normally possible with PDH technology (as shown in Figure #3)
- These ensure that mission critical voice, data, control and management traffic are properly supported and maintained even during T1 backhaul facility outages. When the primary (working) link fails, the T1 traffic is automatically switched to the standby (secondary) link to ensure maximum uptime.
- Through the comprehensive remote configuration and alarm management capabilities of the VCL-SafeComm, 16 T1, 1+1 Automatic Protection Switching Equipment the product may be used to improve network reliability and control
- Traffic Protection
- Alternate Facility Advantages
- Service Differentiation Agreements
- Increased Network Reliability Resilience
- Media and Path Diversity
- Remote Management
- Alarm logging and monitoring.
- Dual -48V DC Power Inputs. Allows the User to power the equipment from redundant (two) -48V DC power sources.

Benefits:

Customer Relations

- Competitive
- Service Level
- Back-haul Network
- Technology Migration
- User Programmable 1+1 Protection Parameters:
 - a) Loss of Signal
 - b) AIS (All Ones Alarm)

Applications:

Providing 1+1 alternate paths between any two T1 Transmission mediums (active+standby). e.g:
Fiber/Fiber

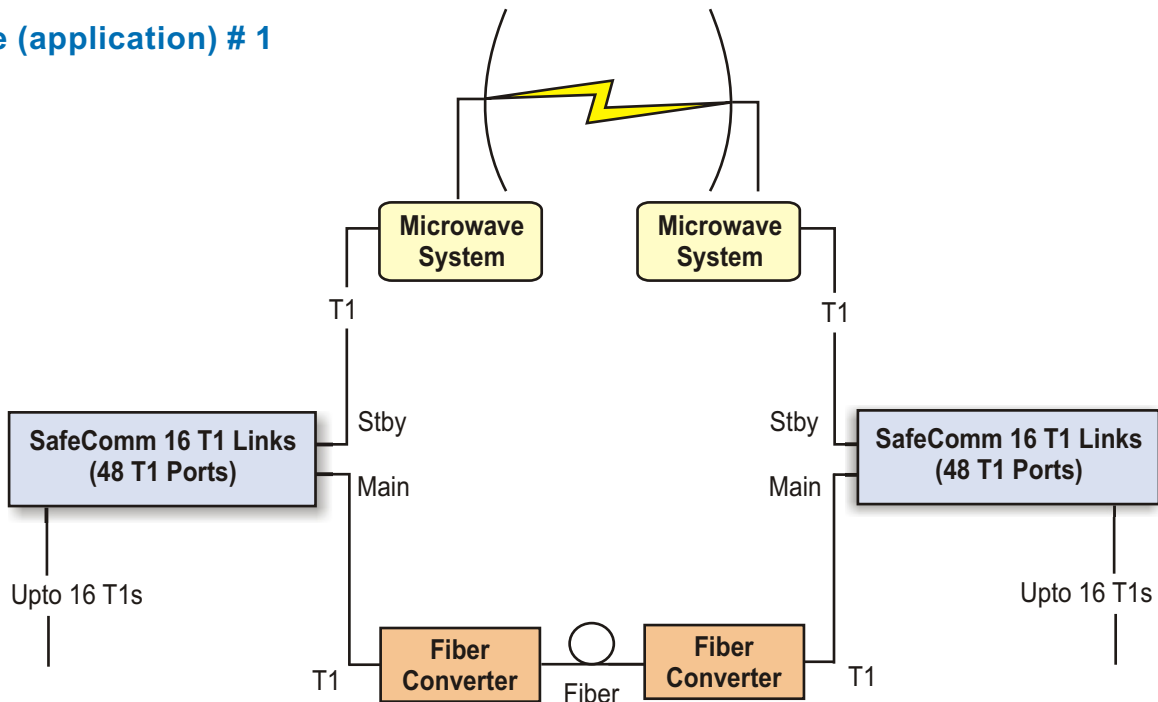
- Radio/Fiber
- Radio/HDSL
- Fiber/HDSL etc.

Example: The user may deploy the VCL-SafeComm, 16 T1, 1+1 Automatic Protection Switching Equipment to provide an alternate communication route between an optical fiber link and a radio link between any two points. In the event of the failure of the primary (optical fiber) link the T1 is automatically switched to the alternate route over the T1 radio, thus ensuring maximum uptime on all such 1+1 protected T1 Links.

Once the primary (optical fiber) T1 Link on the optical fiber is restored, the VCL-SafeComm, 16 T1, 1+1 Automatic Protection Switching Equipment automatically restores the communication to the primary (optical fiber) T1 Link. The switching time and restoration criterion is user programmable.

Application Diagram:

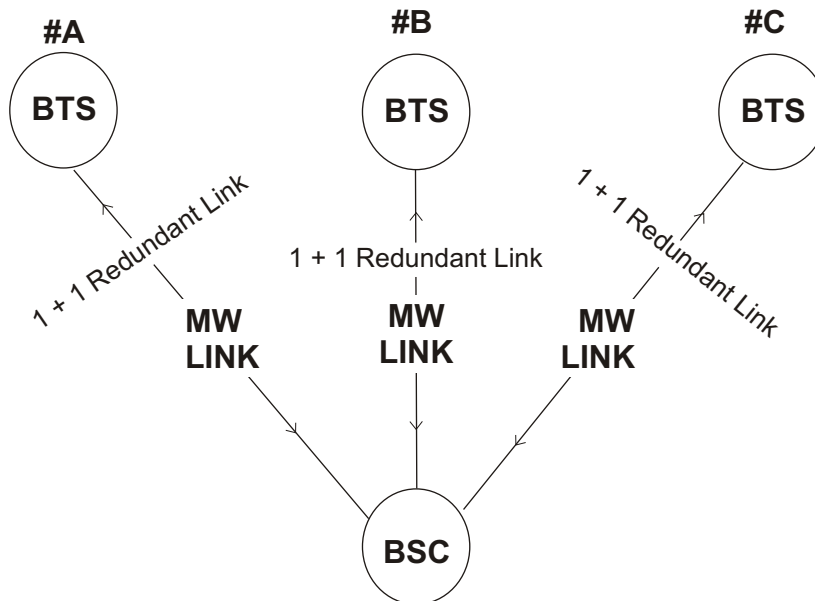
Figure (application) # 1



Point-to-Point Application: May be used in a point-to-point configuration to provide 1+1 Protected /Alternate Routing Path between any two points, using diverse (or similar) T1 transmission mediums.

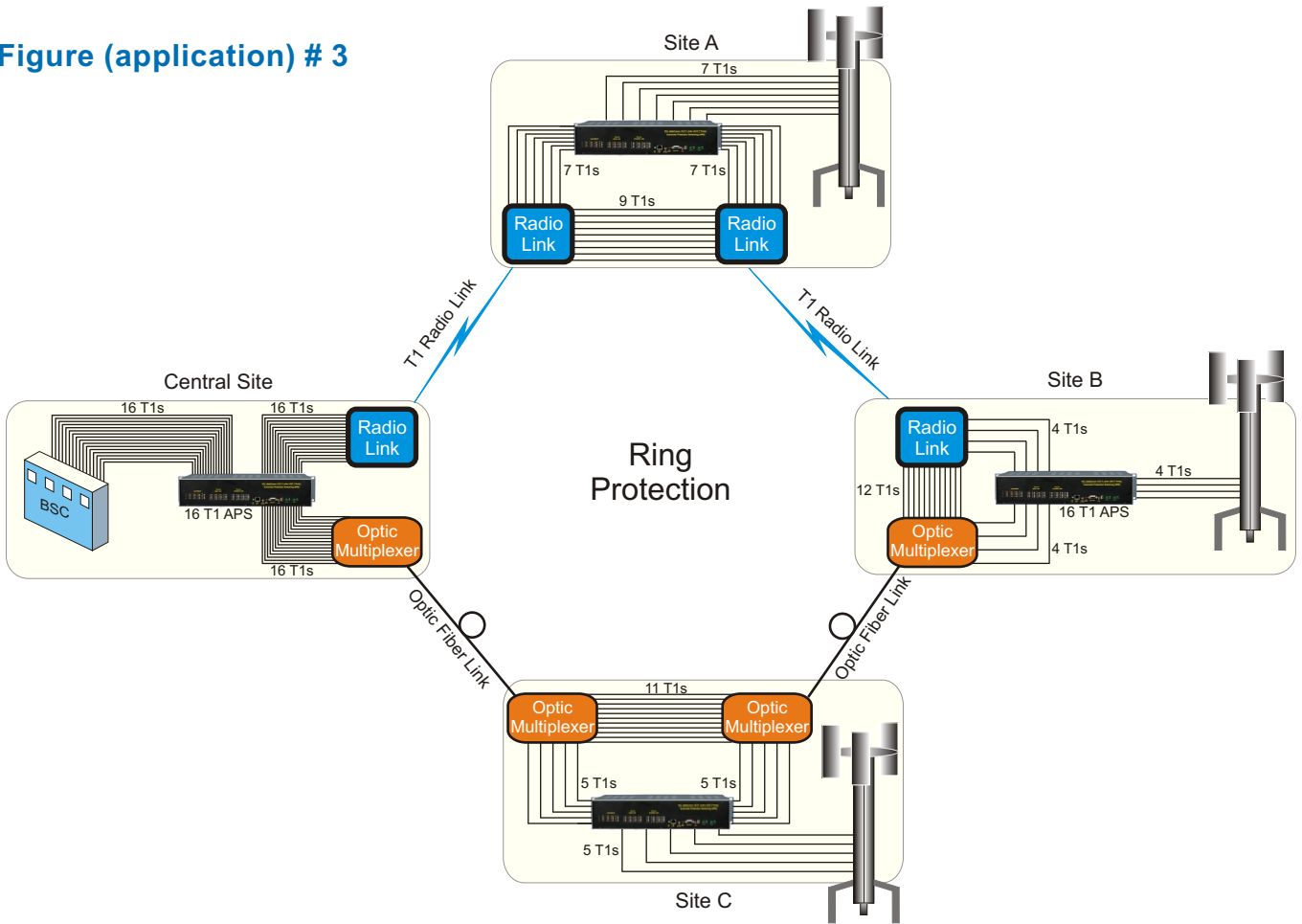
Figure (application) # 2

TYPICAL STAR CONFIGURATION



Point-to-Multipoint Application: To provide 1+1 Redundant T1 Link(s) between a single (BSC) location and multiple (BTS) locations using diverse (or similar) T1 transmission mediums.

Figure (application) # 3



Application to provide resilient (protected) T1 rings over PDH networks: The VCL-SafeComm may also be used in 1+1 redundant (protected) T1 rings on PDH networks using diverse (or similar) T1 transmission mediums.

How It Works - VCL-SafeComm™ (With Path Protection Switching)

During normal operation, VCL-SafeComm sends duplicate traffic across both the working and dedicated protection T1 facilities while continuously maintaining the performance of both links to determine which link shall be utilized.

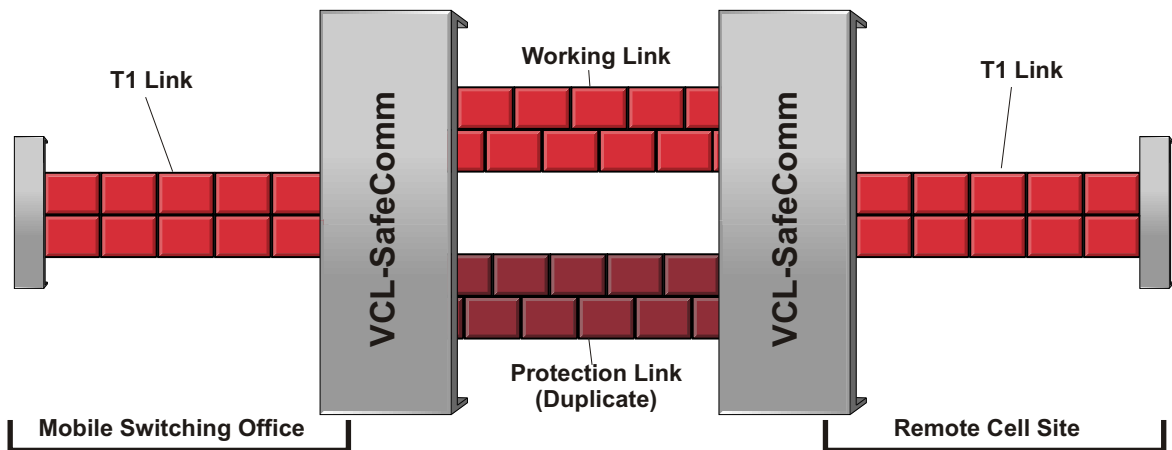


Figure 4

Technical Specifications

T1 Interface:

Number of Interfaces	Total 48 T1 interfaces 16 for Main T1 Links 16 for Primary T1 Links 16 for Secondary T1 Links
Line Rate	T1 1.544 Mbps
Line Code	B8ZS, AMI (User Programmable)
Frame Structure	SF, ESF (Automatic Selection)
Bit Rate	1544 Kbps ± 50 ppm
Jitter Tolerance	As per ITU-T G.823
Output Jitter	< 0.05 UI (in the frequency range of 20 Hz to 100 KHz)
Pulse Mask	As per ITU (CCITT) Rec. G.703
Conformity (electrical)	G.703
Nominal Impedance	100 Ohms, balanced

T1 Switching Criterion and Time:

Ti Switching Criterion	User Programmable 1+1 Protection Parameters a) Loss of Signal b) AIS (All Ones Alarm)
Minimum T1 Switching Time from Main Link To Standby Link	10 milliseconds to 3000ms (User Programmable)
Minimum T1 (Recovery) Switching Time From Standby Link to Main Link	10 seconds to 1000 seconds (User Programmable)

T1 Connectivity:

In the (**SSS) version the T1 re-connects the Equipment Port to the Main (Primary) Link Port in the event of power failure. The T1 link integrity is **always** maintained between the Equipment Main (Primary) Link Port even if the equipment power is removed / fails. Please see Ordering Information for details.

Clock:

Transparent between the two points of the T1 Links.

Management and Control:

- Serial Management Port (RS232) - COM Port
- 10/100 BaseT for Remote Management over a LAN
- 10/100 BaseT Telnet over a TCP-IP Network

Specification and Regulation Compliance:

- Meets CE requirements
- Complies with FCC, Part 68 and Part 15 subpart A specifications
- Safety - UL 1459 Issue 2

Command Language:

Command Line Interface (English text commands)

Alarm Contact Closures:

1 Alarm Relay,
Type - Form "C" relay

Temperature:

Operating 0°C to 50°C
Humidity 5% to 95% non-condensing

Dimensions and Weight:

Rack mounting	Standard 19-Inch. DIN Rack
Height	90.00 mm.
Depth	280.00 mm.
Width	480.00 mm.
Weight	4.20 kg.

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	> 90%

DC Power Supply Specifications:

Input DC voltage - Dual Input	- 48V DC (nominal)
Range of input voltage	- 40V to - 60V DC
System voltage	+ 3.3V
Input voltage reversal protection	Provided in the Card
Short circuit protection	Provided
Power Consumption	≤ 10W

Ordering Information:

S. No.	Product Description	Part No.
1.	<p>16 T1 Links APS - 48 T1 Ports Automatic Protection Switching</p> <p>Note: In this (**SSS) version the T1 re-connects the Equipment Port to the Main (Primary) Link Port in the event of power failure. The T1 link integrity is always maintained between the Equipment Main (Primary) Link Port even if the equipment power is removed / fails.</p> <p>19-inch Rack Mount, operates on - 48 V DC power input(s).</p>	VCL-SafeComm-APS-16T1-DC-SSS
2.	<p>16 T1 Links APS - 48 T1 Ports Automatic Protection Switching</p> <p>Note: In this (**SSS) version the T1 re-connects the Equipment Port to the Main (Primary) Link Port in the event of power failure. The T1 link integrity is always maintained between the Equipment Main (Primary) Link Port even if the equipment power is removed / fails.</p> <p>19-inch Rack Mount, AC mains power input.</p>	VCL-SafeComm-APS-16T1-AC-SSS

Technical specifications are subject to changes without notice.
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