



ORION TELECOM NETWORKS INC.

E1 Automatic Protection Switching Solution (1+1 E1 Redundancy Switch)

Product Brochure & Data Sheet

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Product Description

The VCL-MegaConnect-Jr-APS offers 16 E1 solution with APS (1+1 Automatic Protection Switching). This equipment is offered as an integrated 19-Inch rack mountable 2U high box.

This product allows the user to design 1+1 (protected) redundant E1 routes on similar (fiber-fiber), or complementing (fiber-radio) transmission mediums. Additionally, it also allows the selection of only the critical time-slots of the primary route to be re-routed on the E1/T1 link on the redundant/standby route in the event of the failure of the primary route, if the total carrying capacity of the stand-by redundant route is smaller than that of the primary route.

For Example: This product shall allow the user to select and specify the time-slots from multiple E1/T1 links in the "primary route", which may be considered "critical" in nature and be re-routed to the "redundant/standby route" of a smaller carrying capacity, in the event of the failure of the "primary route".

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 E1 links, AIS (All-Ones AIS alarm condition), or excessive CRC-4 errors etc. As stated above, the criterion for switching between the primary (main) and the secondary (protected/standby) routes is user programmable.

Data transport on the E1s is transparent and protocol independent.

Features and Highlights

- An independent point-to-point E1 link between two “**E1 USER PORTS**” on similar (example fiber-fiber) or dissimilar (fiber-radio) mediums
- Provides 1+1 E1 redundancy support to higher order multiplexers eg. E2,E3
System configuration & management interface through "CLI" text based commands
- Transport A-bis Interface or E1's
- Provide 1+1 Protection Routing/Path between BSC and BTS
Provide following interfaces at BSC/BTS Over E1 links:
 - i) E1/A-bis Interface
 - ii) 10BaseT Ethernet Bridge over E1 links
 - iii) RS232 Async Serial (for site monitoring)
 - iv) NO/NC Relay/Alarm Extensions (extend alarms originating on dry relay contacts)
- Optional-128ms Echo-Cancellation and VQE features at BSC
- Maximize mobile operator service availability and network resiliency through VCL-MegaConnect-Jr. Path-Protection enabled facility
- These ensure that mission critical voice, data, control and management traffic are properly supported and maintained even during T1/E1 backhaul facility outages. When the working link fails, the protection link becomes active
- During normal Operation, VCL-MegaConnect-Jr sends duplicate traffic across both the working and dedicated protection E1/T1 facilities while continuously maintaining the performance of both links to determine which link shall be utilized.

Features and Highlights

- Through the comprehensive digital access cross-connect and remote management capabilities integrated within VCL-MegaConnect-Jr, backhaul T1/E1 facilities can be optimally groomed to reduce both capital expenditure and improve network reliability
- In the event of a failed or degraded T1/E1 link, the traffic is automatically transferred from the previously working link to the duplicate protection link in accordance with the pre determined operating parameter programmed by the network operator
- During normal Operation, VCL-MegaConnect-Jr APS passes traffic independently across both the working and protection E1/T1 facilities while continuously maintaining the performance of both links to determine which to utilize for critical traffic
- Traffic Protection
- Alternate Facility Advantages
- Service Differentiation Agreements
- Increased Network Reliability Resilience
- Media and Path Diversity
- Remote Management

Benefits

- Customer Relations
 - Competitive
 - Service Level
 - Back-haul Network
 - Technology Migration
- 1) User Programmable 1+1 Protection Parameters:
 - a) Loss of Signal
 - b) Loss of Frame
 - c) Loss of Multi-Frame
 - d) AIS
 - e) Excessive CRC4 errors
 - 2) Critical Links/Critical Time-Slots

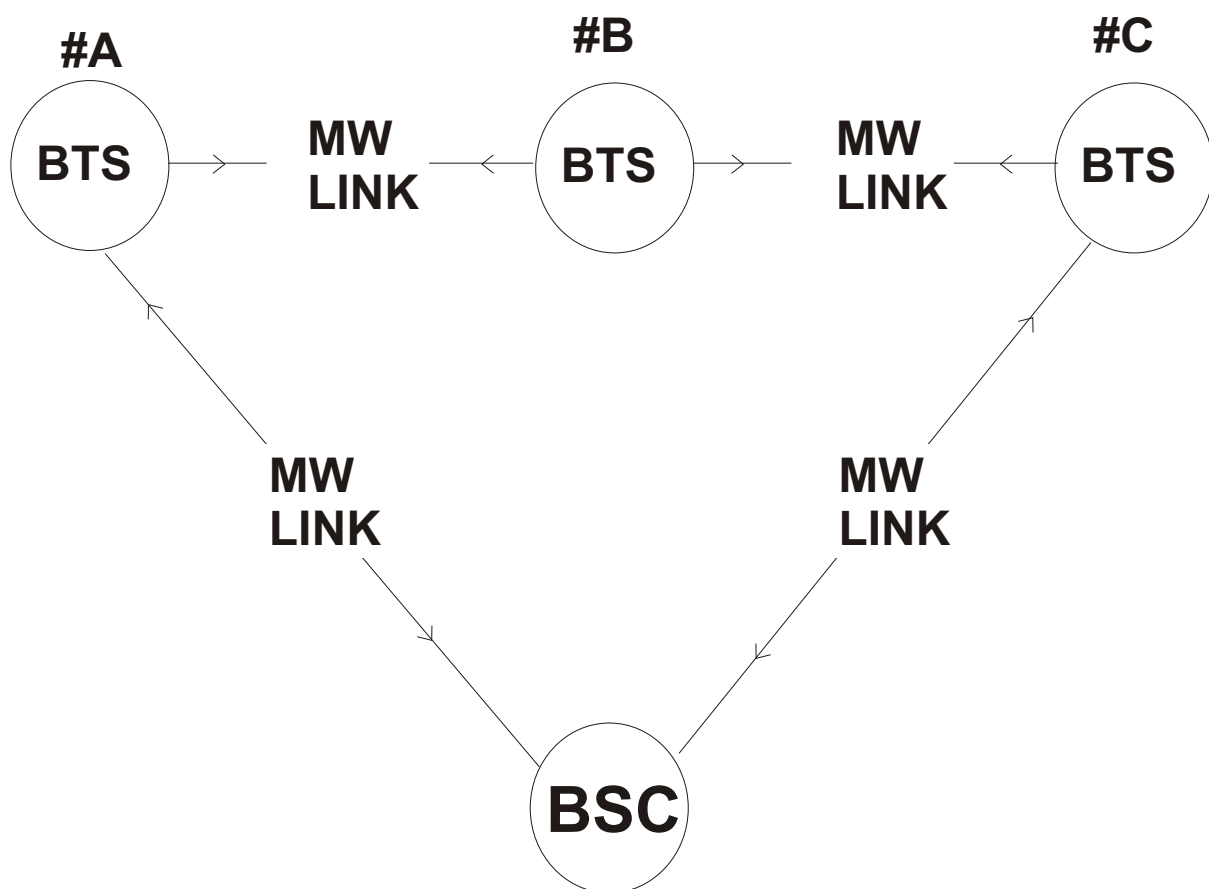
Applications

Providing 1+1 alternate paths between any two Transmission medium (active+standby). e.g:

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

Application Diagram

1+1 REDUNDANT RING CONFIGURATION



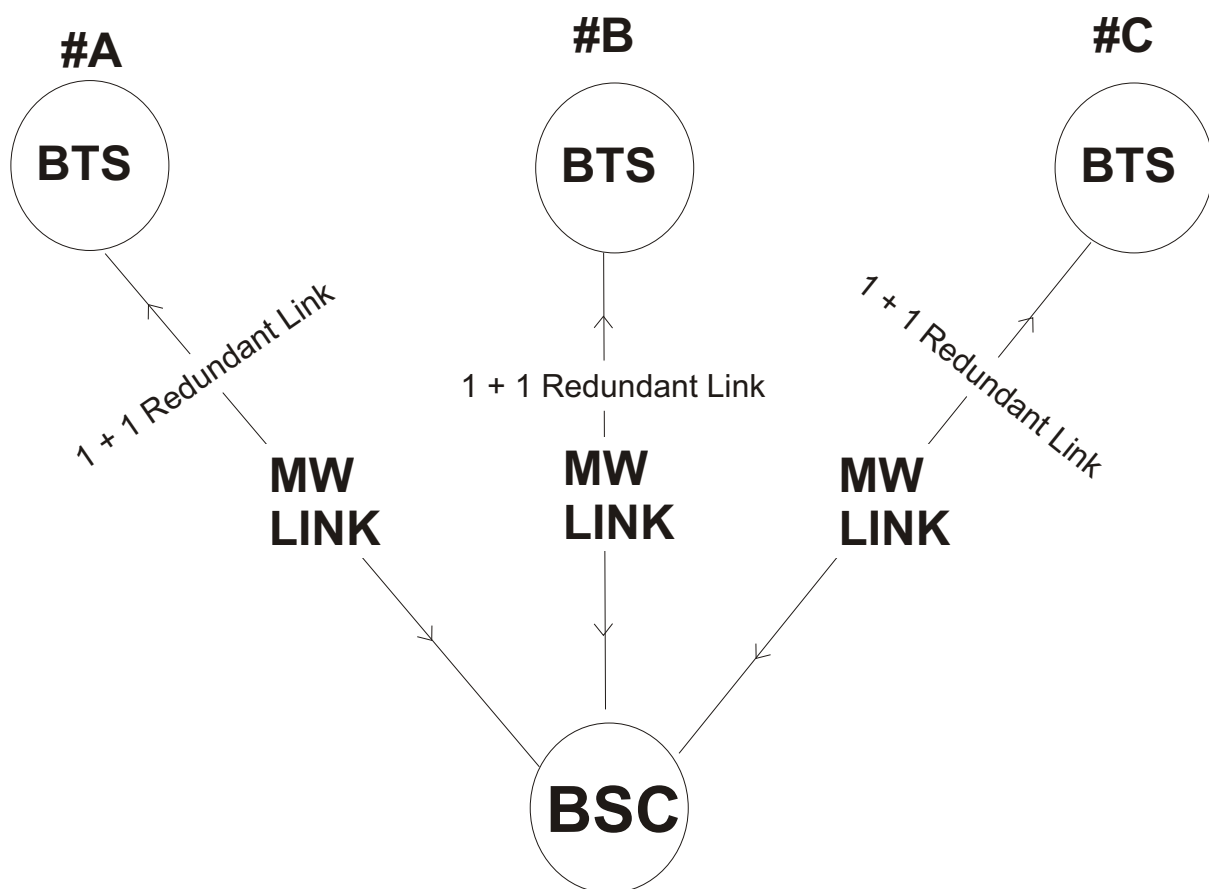
Application # 1

Application # 1

To provide 1+1 Protected Redundant E1 Link(s) between a BSC and Multiple BTS Installations.

Application Diagram

TYPICAL STAR CONFIGURATION

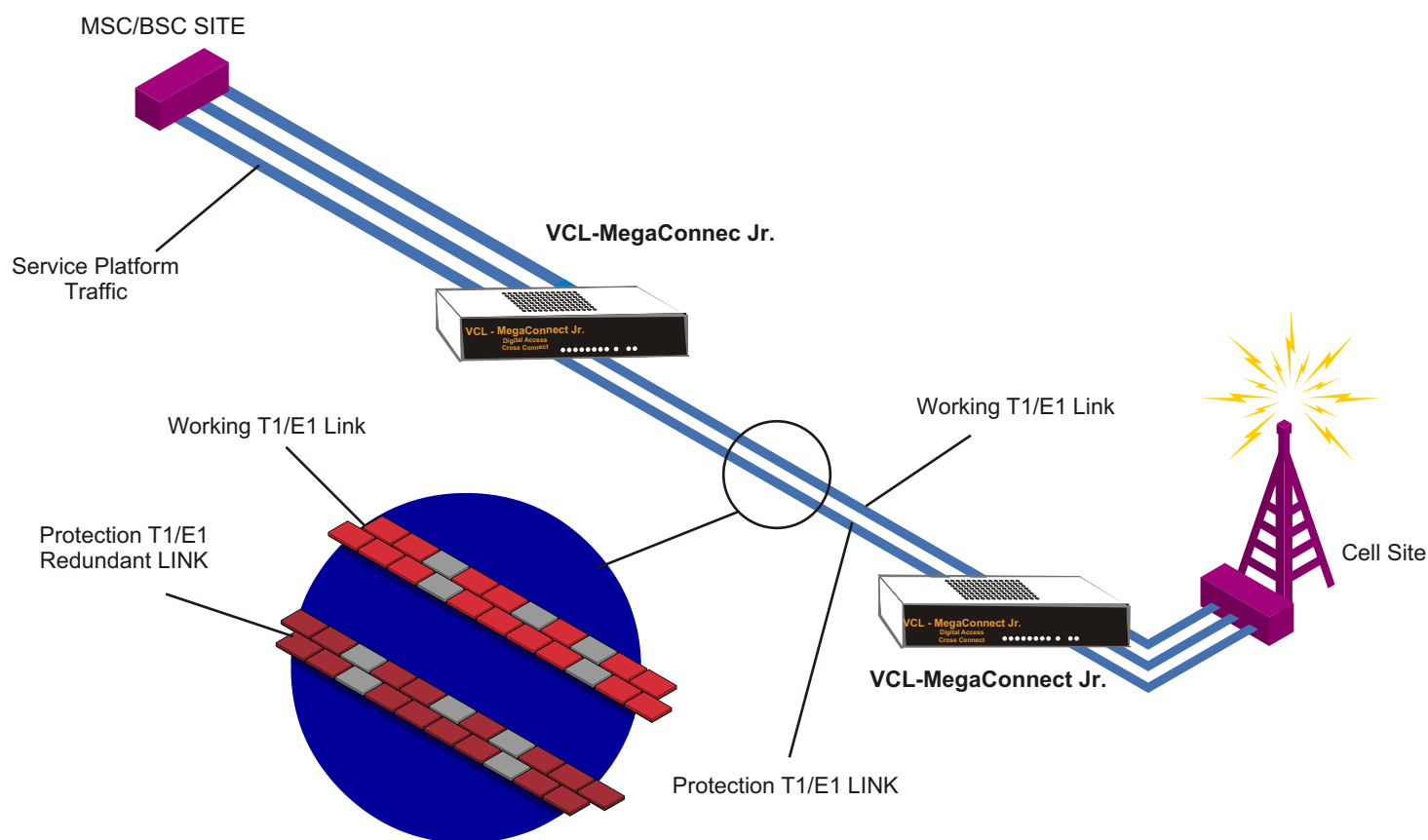


Application # 2

Application # 2

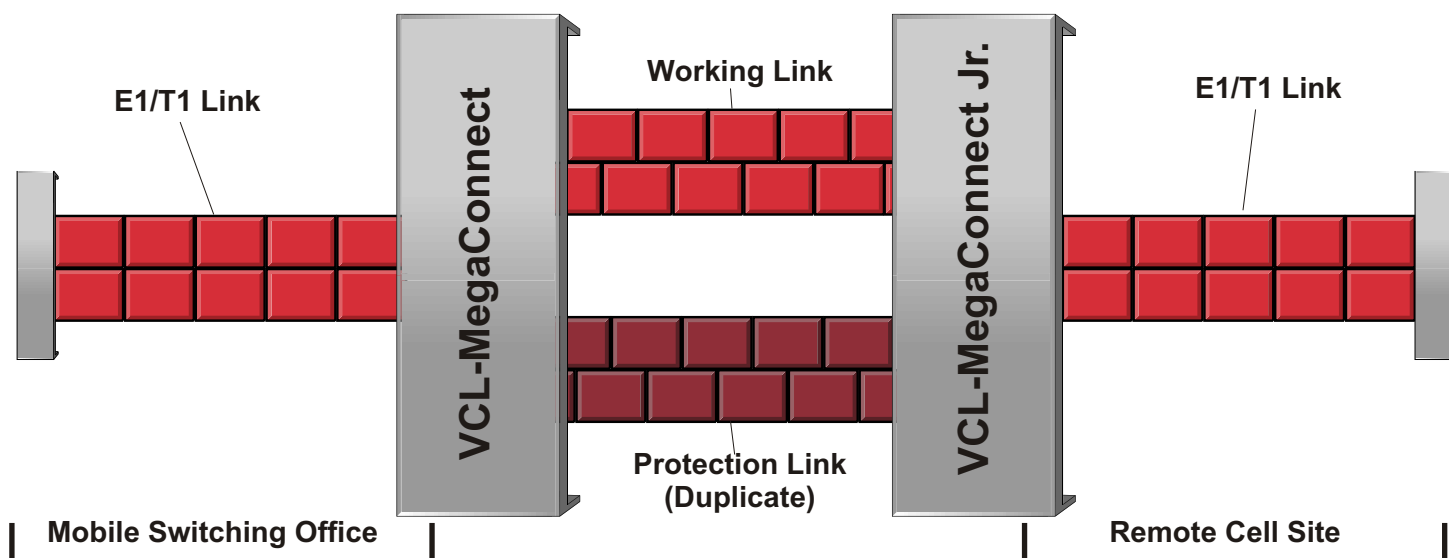
To provide 1 + 1 Redundant E1 Link(s) between BSC and BTS using diverse (complementary) E1 transport mediums.

Two User selectable MegaConnect options are available for reliable networks operation



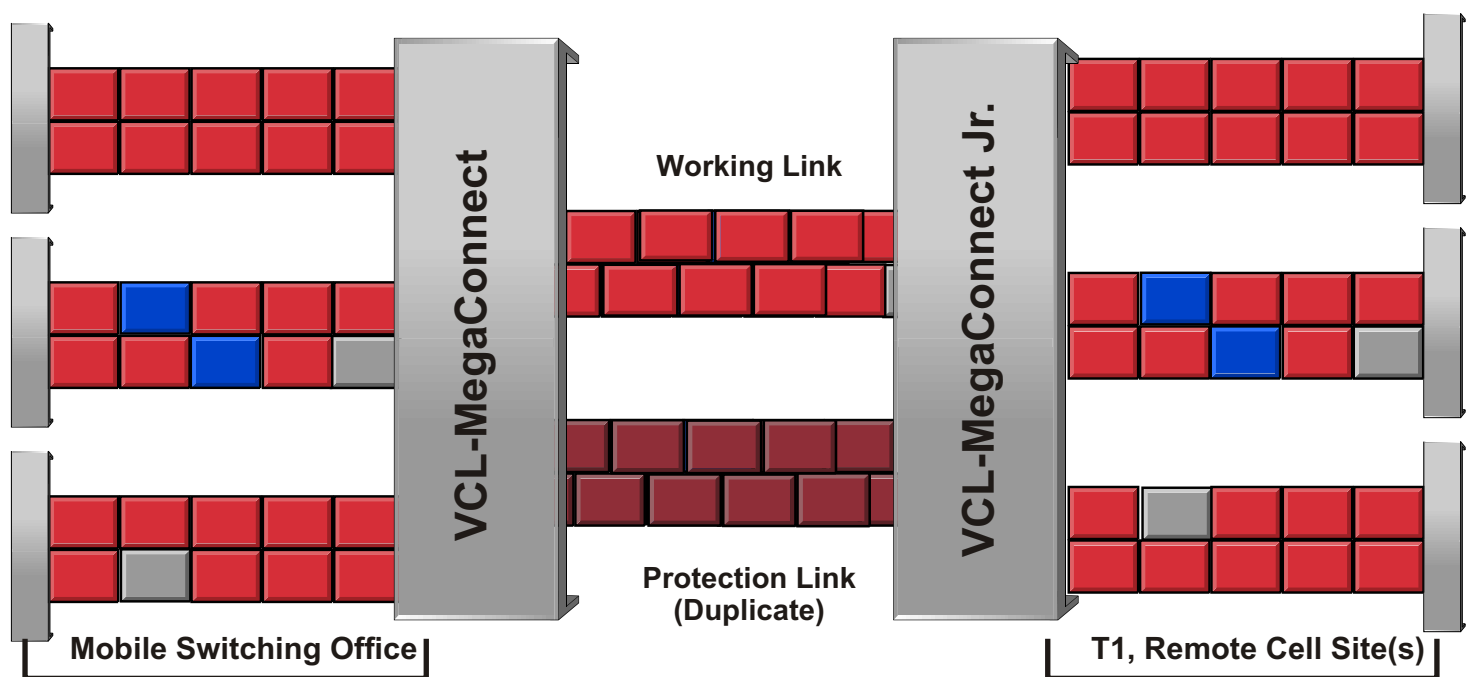
These ensure that mission critical voice, data, control and management traffic are properly supported and maintained even during T1/E1 backhaul facility outages. When the working link fails, the protection link becomes active.

MegaConnect (With Path Protection Switching) Normal Operation



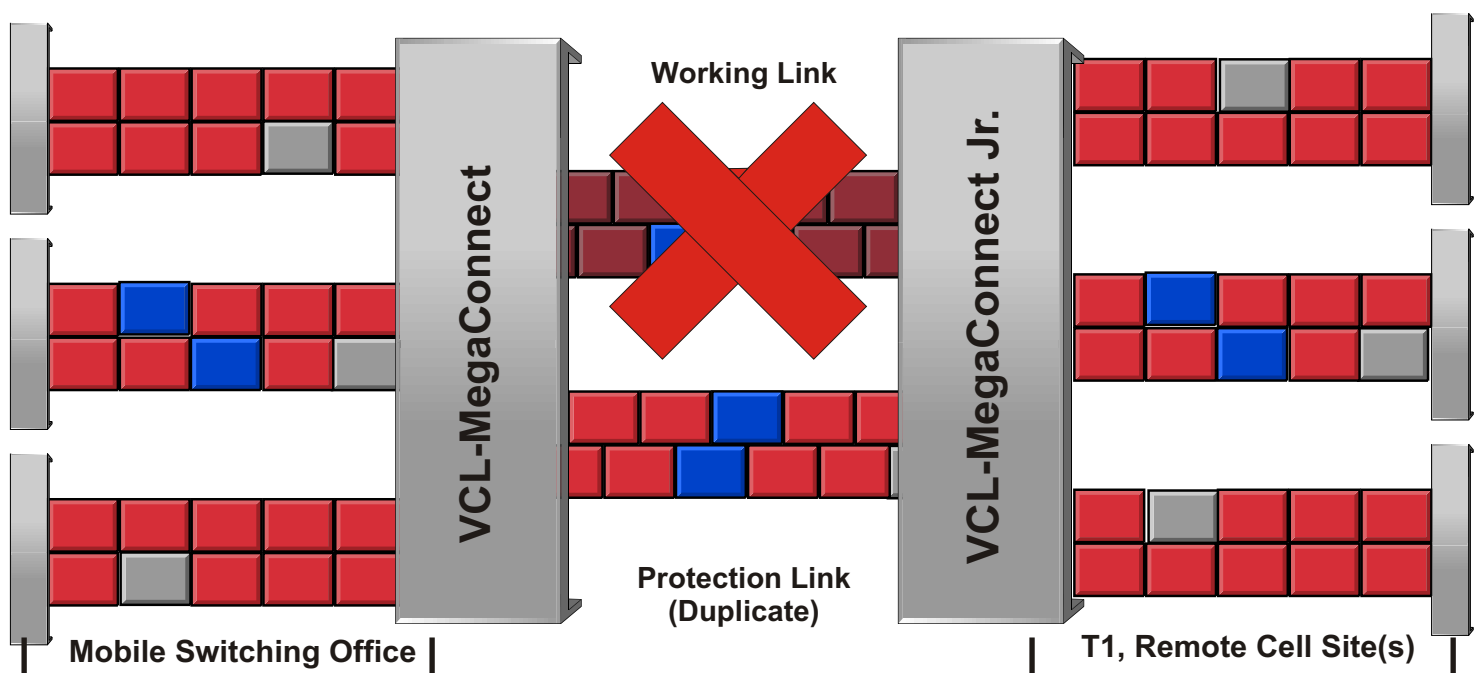
During normal operation, MegaConnect sends duplicate traffic across both the working and dedicated protection E1/T1 facilities while continuously maintaining the performance of both links to determine which link shall be utilized.

MegaConnect (With Path Protection Switching) Normal Operation



Through the comprehensive backhaul T1/E1 facilities can be optimally groomed to reduce both capital expenditure and improve network reliability.

MegaConnect (With Path Protection Switching) Working Link Fault



In the event of a failed or degraded T1/E1 link, the traffic is automatically transferred from the previously working link to the duplicate protection link in accordance with the pre-determined operating parameter programmed by the network operator.

Technical Specifications

E1 Interface

Number of Interfaces	16
Conformity (Electrical)	G.703
Frame Structure	As per ITU (CCITT) G.704
Bit Rate	2048 Kbps $\pm$ 50 ppm
Code	HDB3
Nominal Impedance	120 Ohms, balanced (75 Ohms - optional)
Peak Voltage of a mark for 120W balanced interface	3.0 V $\pm$ 0.3 V
Peak Voltage of a space for 120W balanced interface	0 V $\pm$ 0.3 V
Nominal Pulse Width	244 ns
Pulse Mask	As per ITU (CCITT) Rec. G.703
Output Jitter	< 0.05 UI (in the frequency range of 20Hz to 100 KHz)
Permissible Attenuation	6dB at 1MHz
Return Loss at: 51.2 KHz to 102.4 KHz 102.4 KHz to 2048KHz 2048KHz to 3072 KHz	> 12dB > 18dB > 14dB
Jitter Tolerance	As per ITU (CCITT) G.823
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

Time-slot selection

ANY-TO-ANY through an internal, best byte, non-blocking TSI Switch.

Clock

Internal	(Stratum 3 level)
Loop-Timed External	75 Ohms - 2.048 Mhz - 1.544 MHz

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

Input Voltage

Voltage -48V DC (Range from -40V DC to -60V DC)

Current 0.104 Amp at -48V DC

Ordering Information

Sr. No.	Product Description	Part No.
1.	16 E1 Port Automatic Protection Switching DACS. 19-inch Rack Mount, operates on - 48 V DC power input.	VCL-MegaConnect-Jr-APS-E1

Technical specifications are subject to changes without notice.

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