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 independant.

Features and Highlights

- An independent point-to-point E1 link between two "**E1 USER PORTS**" on similar (example fiber-fiber) or dissimilar (filber-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 transfered 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
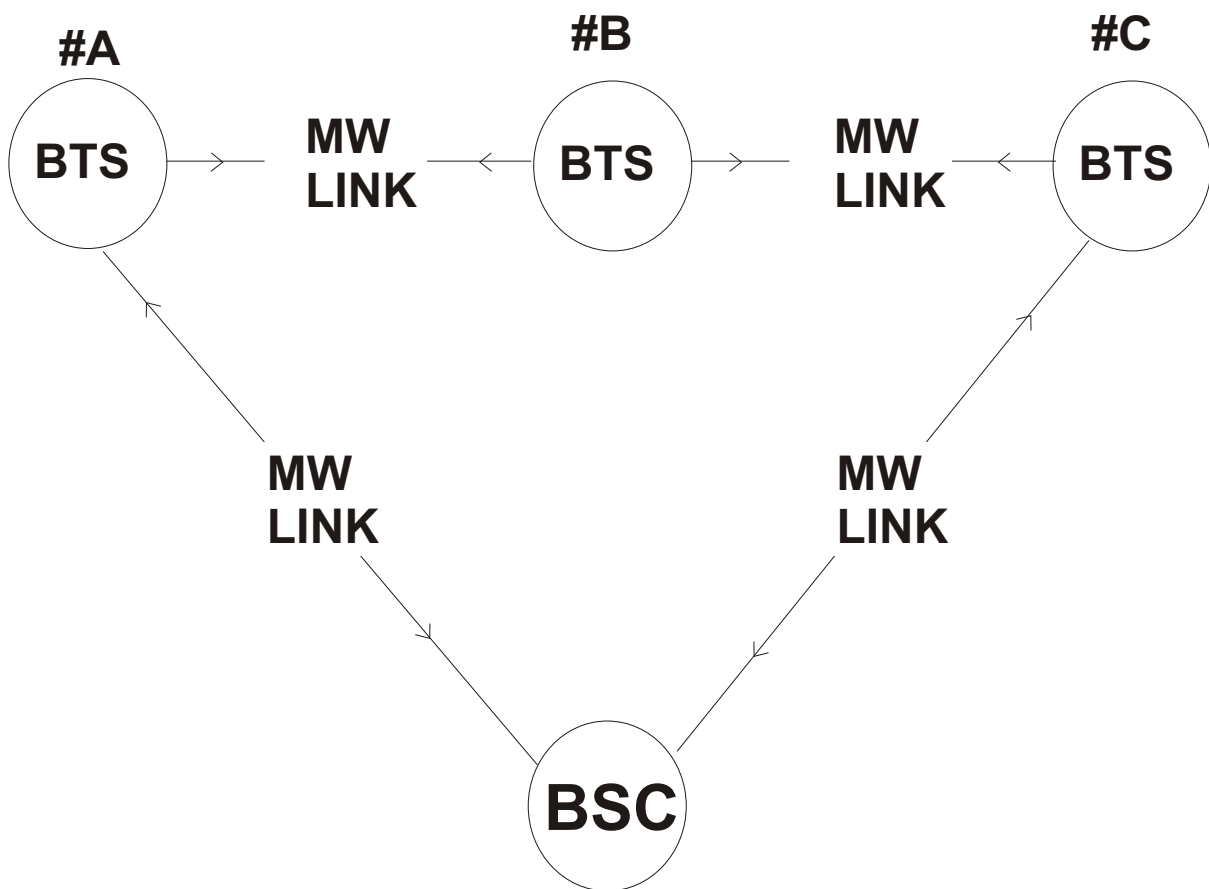2)   Critical Links/Critical Time-Slots

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

#A   **#B**   **#C**

BTS   MW LINK   **BTS**   MW LINK   **BTS**
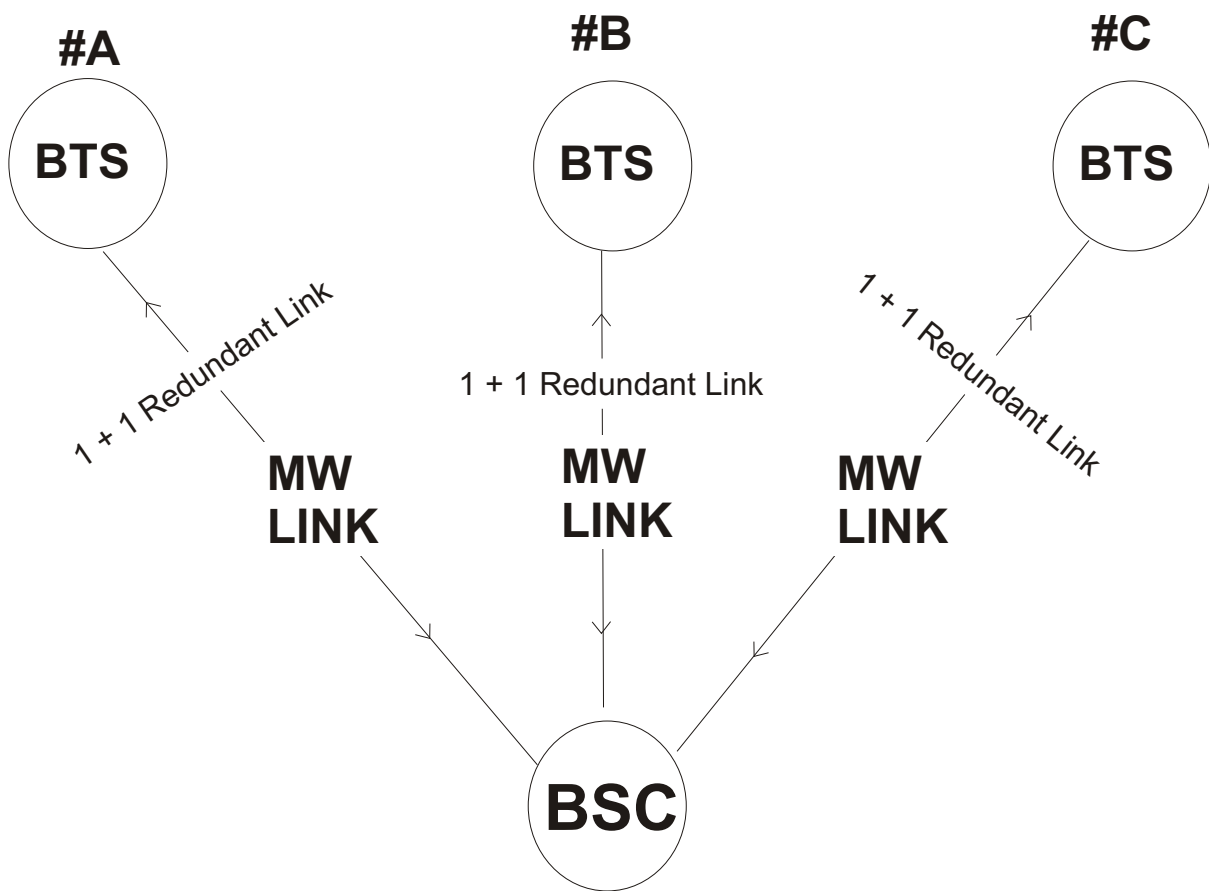
MW LINK   **MW LINK**

BSC

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

#A

#B

#C

BTS

BTS

BTS

1 + 1 Redundant Link

1 + 1 Redundant Link

1 + 1 Redundant Link

**MW
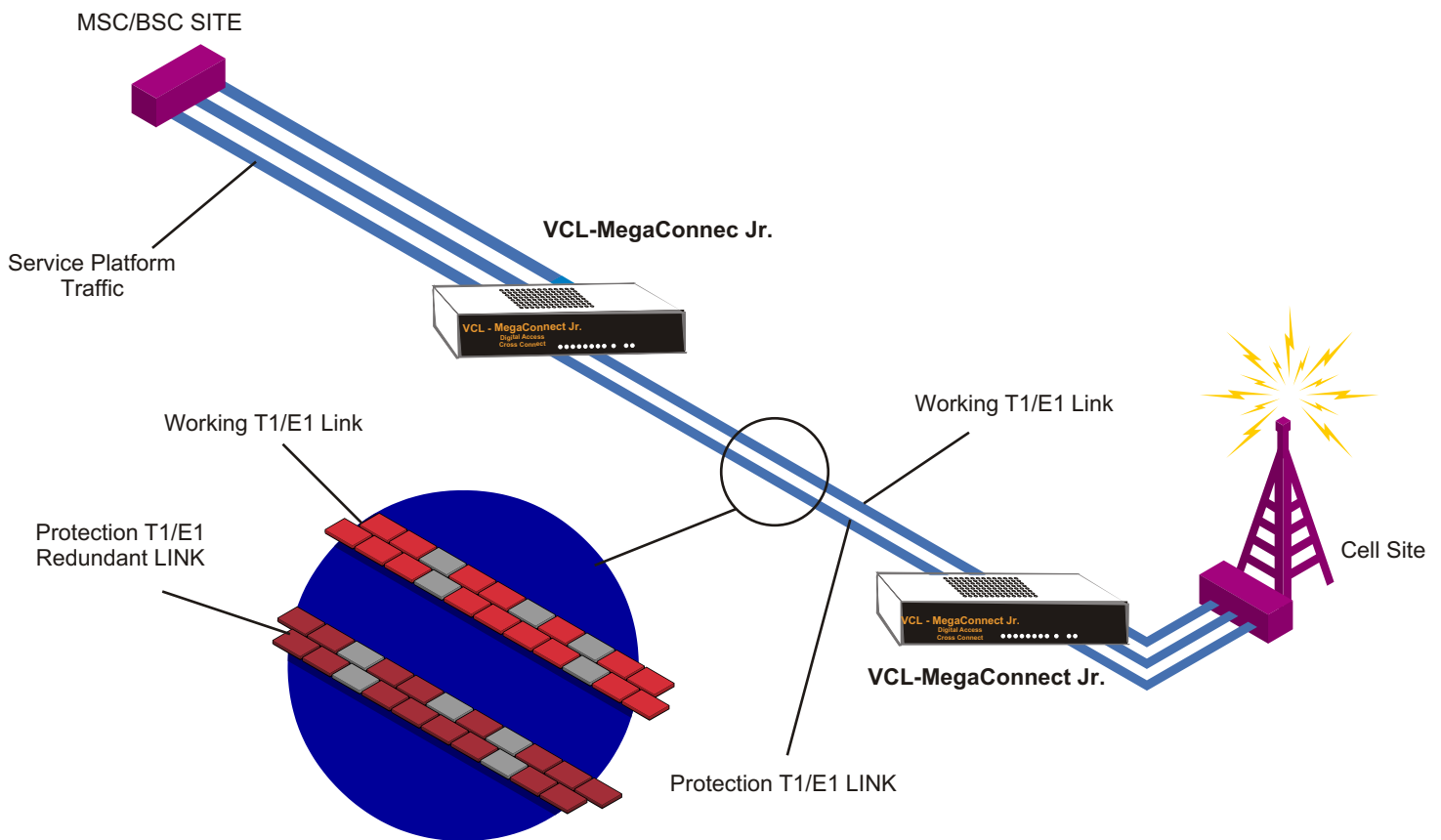LINK**

**MW
LINK**

**MW
LINK**
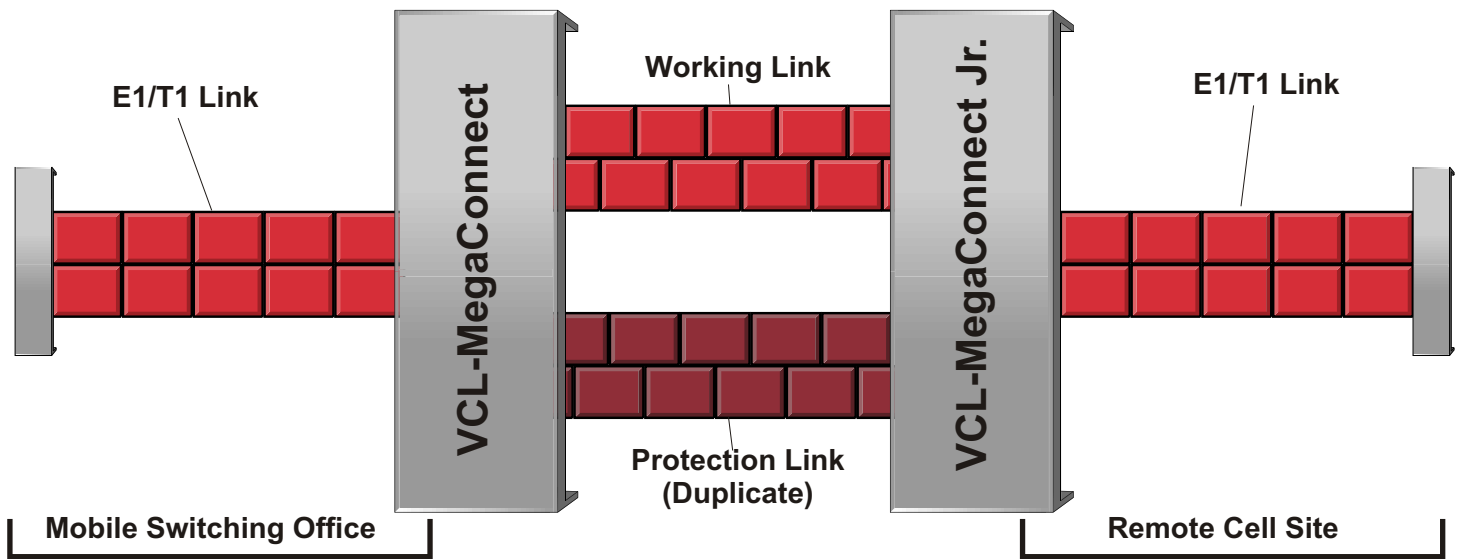
BSC

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

MSC/BSC SITE

VCL-MegaConnec Jr.

Service Platform
Traffic

Working T1/E1 Link

Working T1/E1 Link

Protection T1/E1
Redundant LINK

VCL - MegaConnect Jr.
Digital Access
Cross Connect

Cell Site
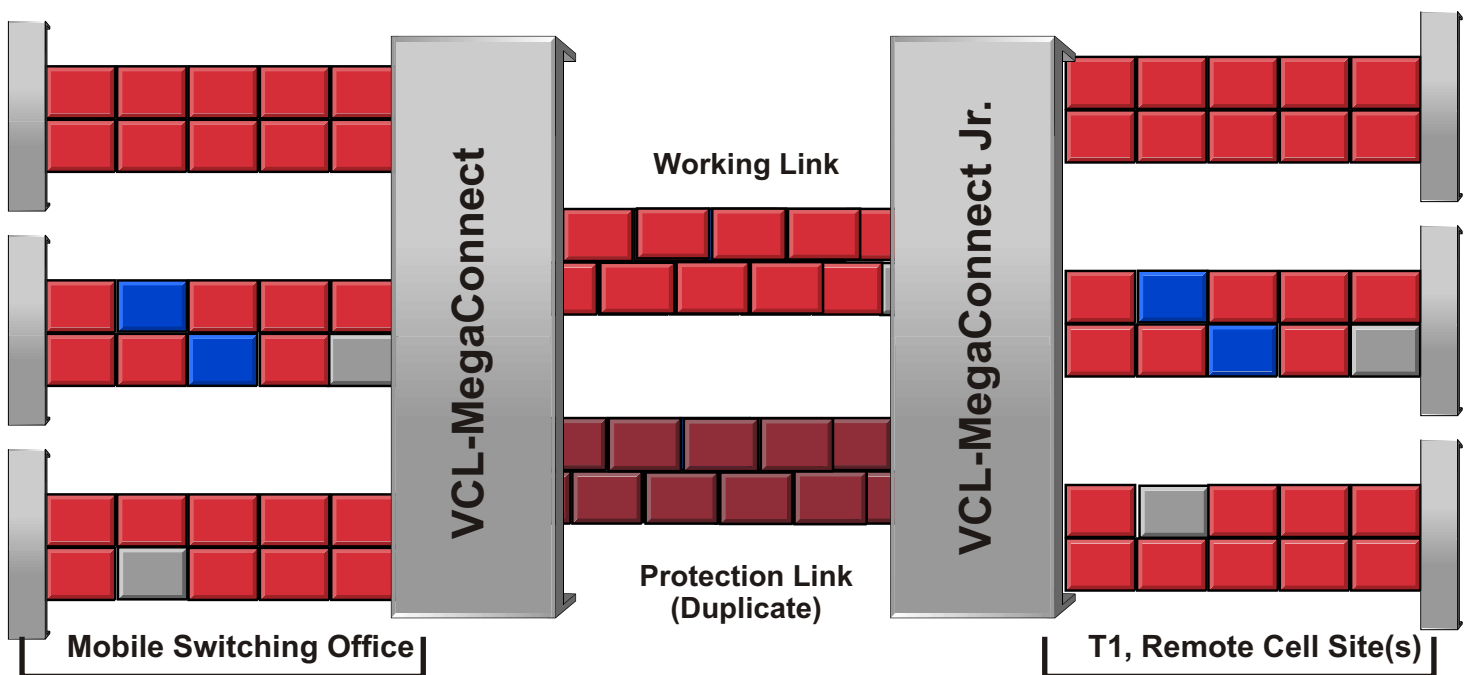
VCL-MegaConnect Jr.

Protection T1/E1 LINK

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

E1/T1 Link

Working Link

VCL-MegaConnect

VCL-MegaConnect Jr.

E1/T1 Link

Protection Link (Duplicate)

**Mobile Switching Office**

Remote Cell Site

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

VCL-MegaConnect

Working Link

VCL-MegaConnect Jr.

Protection Link (Duplicate)

Mobile Switching Office

T1, Remote Cell Site(s)

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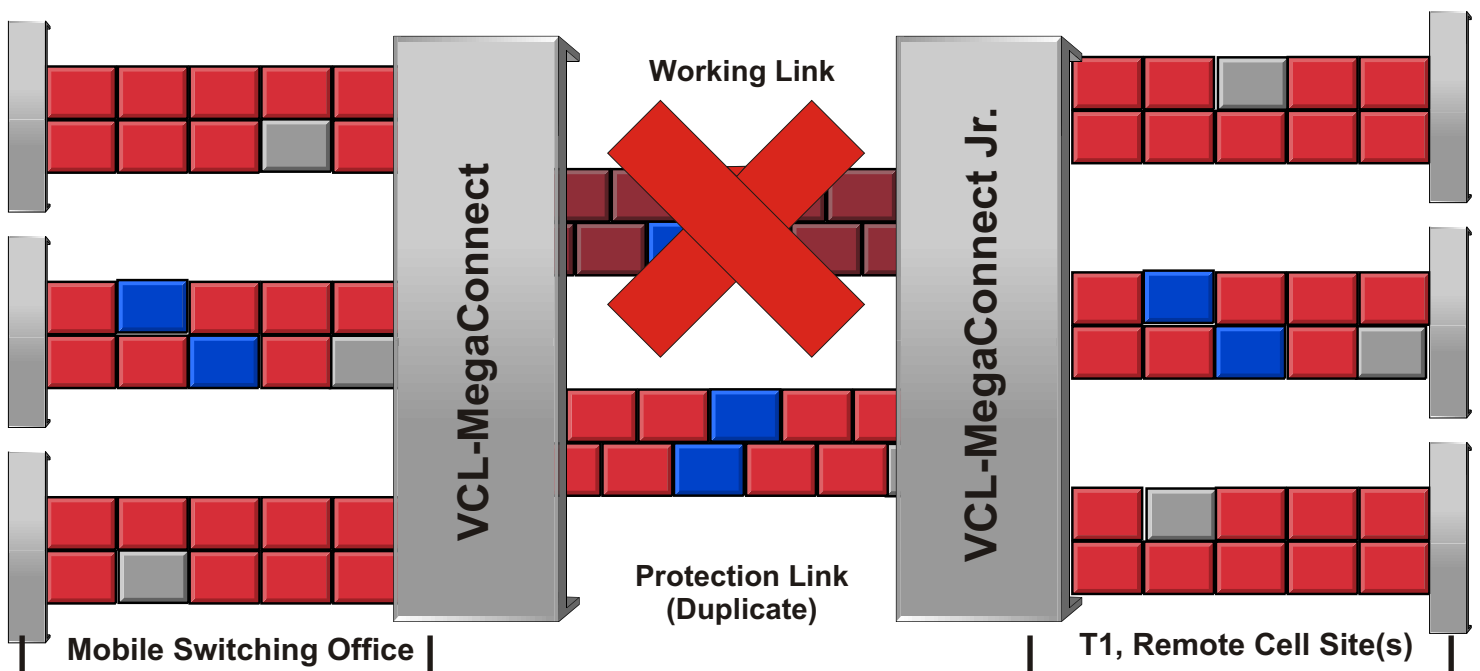
In the event of a failed or degraded T1/E1 link, the traffic is automatically transfered from the previously working link to the duplicate protection link in accordance with the pre-determined operating parameter programmed by the network operator.

Technical Specifications

E1 Interface

Number of Interfaces	16
Conformity (Electrical)	G.703
Frame Structure	As per ITU (CCITT) G.704
Bit Rate	2048 Kbps ± 50 ppm
Code	HDB3
Nominal Impedance	120 Ohms, balanced (75 Ohms - optional)
Peak Voltage of a mark for 120W balanced interface	3.0 V ± 0.3 V
Peak Voltage of a space for 120W balanced interface	0 V ± 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	> 12dB
102.4 KHz to 2048KHz	> 18dB
2048KHz to 3072 KHz	> 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 0^0C to 50^0C
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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