VALIANT COMMUNICATIONS

VALCOMM

◀ C37.94 over E1 / SDH ▶

VCL-2709, IEEE C37.94 to E1 Converter

VCL-2709, IEEE C37.94 to E1 Converter is a ruggedized, sub-station-hardened protocol converter that converts the IEEE C37.94 Interface to an E1 Interface to allow transmission of IEEE C37.94 over an E1 / SDH network.

The VCL-2709 supports point-to-point applications.

Provided high-precision clock recovery and clock re-generation functions which allows error free transmission of IEEE C37.94 channels over an E1 / SDH network.

The most common application for the VCL-2709 converter is for inter-connecting IEEE C37.94 Differntial Protection Relays over an E1 / SDH network between two sub-stations. By installing a VCL-2709 converter, the existing IEEE C37.94 interfaces from protection relays can be converted to and inter-connected over an E1 / SDH network without incurring large capex, or without the tiresome task of having to replace or rewire the IEEE C37.94 Relays which need to be interconnected to the far end substations over E1 (SDH) transmission links.

VCL-2709 is available in DIN Rail mount version as well as a 1U high, standard 19-inch rack mount version.

IEEE C37.94 Interface Specifications Option #1:

- Interfaces per unit: 1 (1Tx, 1Rx)
- Standards: IEEE C37.94
- Optical Connector: ST
- Optical Transmitter: LED
- Optical: 820nm / 850nm Multi-Mode

Power Supply:

- Internal: 48V DC (input range 18V DC to 60V DC)
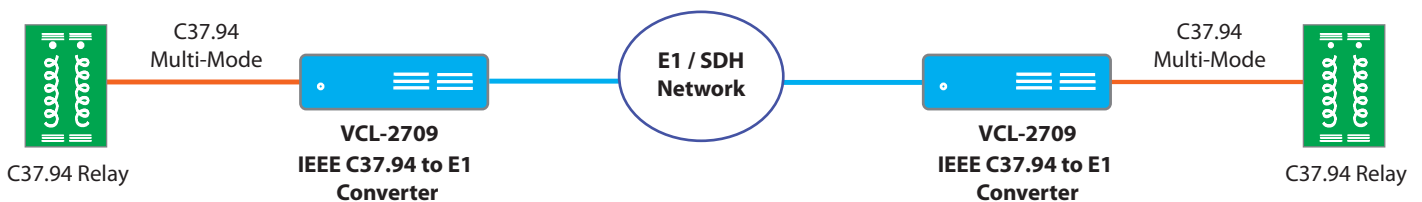- External Adapters: 110V DC, 220V DC, 100~240V AC

IEEE C37.94 Interface Specifications Option #2:

- Interfaces per unit: 1 (1Tx, 1Rx)
- Standards: Modulation as per IEEE C37.94
- Optical Connector: LC (SFP)
- Optical Transmitter: Laser
- Optical: 820nm/850nm Multi-Mode and 1310nm/ 1550nm Single Mode

E1 Interface Specifications:

- Number of ITU-T G.703 E1 (2.048 Mbit/s) interfaces: 1
- Conformity: G.703
- Connector: RJ45 (F) / BNC (F)

Application Diagram:

C37.94 Relay

C37.94 Multi-Mode

VCL-2709 IEEE C37.94 to E1 Converter

E1 / SDH Network

VCL-2709 IEEE C37.94 to E1 Converter

C37.94 Multi-Mode

C37.94 Relay

C37.94 over Optical

VCL-2710, IEEE C37.94 Multi-Mode to Single Mode Optical Converter

VCL-2710, IEEE C37.94 Multi-Mode to Single Mode Optical Converter is a ruggedized, sub-station-hardened converter that converts an IEEE C37.94 Multi-Mode to Single-Mode Optical signal. The equipment is designed to extend IEEE C37.94 multi-mode channel over extended single-mode optical fiber spans. The VCL-2710, IEEE C37.94 Multi-Mode to Single Mode Optical Converter provides clock synchronization and clock re-generation functions which allows it to transmit the IEEE C37.94 multi-mode signal over extended single-mode optical fiber link of up to 62dB optical link loss budget (i.e., a typical of optical spans of upto 155 miles / 250 Kms).

VCL-2710 is designed for use in point-to-point applications. The VCL-2710 meets and complies with sub-station hardened EMI, EMC, Surge and temperature specifications making it suitable for sub-station installations to provide uninterrupted service even in the most demanding and harsh environments.

The most common application of the VCL-2710 is to allow the user to transmit the existing IEEE C37.94 multi-mode interface over a single-mode optical fiber link without the need to install any additional multiplexers or transmission equipment, which would otherwise be required to inter-connect the IEEE C37.94 Relays between near-end and the far-end substation.

VCL-2710 is available in DIN Rail mount version as well as a 1U high, standard 19-inch rack mount version.

Features:

- Complies with IEEE C37.94 standards
- Single Mode Power Budget 13dB to 50dB
- Single and 1+1 redundant power supply options

Power Supply:

- 48V DC (18V DC to 60V DC)
- 110V DC, 220V DC, 100~240V AC, 50/60Hz
- Redundant 1+1 power supply options available only in 19-inch rack mount chassis.

Extended distance applications using the VCL-9009, Optical (EDFA) Amplifier:

Provides up to 62dB optical-loss budget with Valiant's VCL-2710, IEEE C37.94 Multi-mode to Single-mode converter. Extend IEEE C37.94 links over a 1550nm, single-mode optical fiber pair up to 250 Kms (155 miles) without using any intermediate / mid-span optical repeaters.

Application Diagram:

SITE A — C37.94 Relay — C37.94 Multi-Mode — VCL-2710 A — IEEE C37.94 Multi-Mode to Single Mode Optical Converter — Single Mode — VCL-2710 B — IEEE C37.94 Multi-Mode to Single Mode Optical Converter — C37.94 Multi-Mode — C37.94 Relay — SITE B
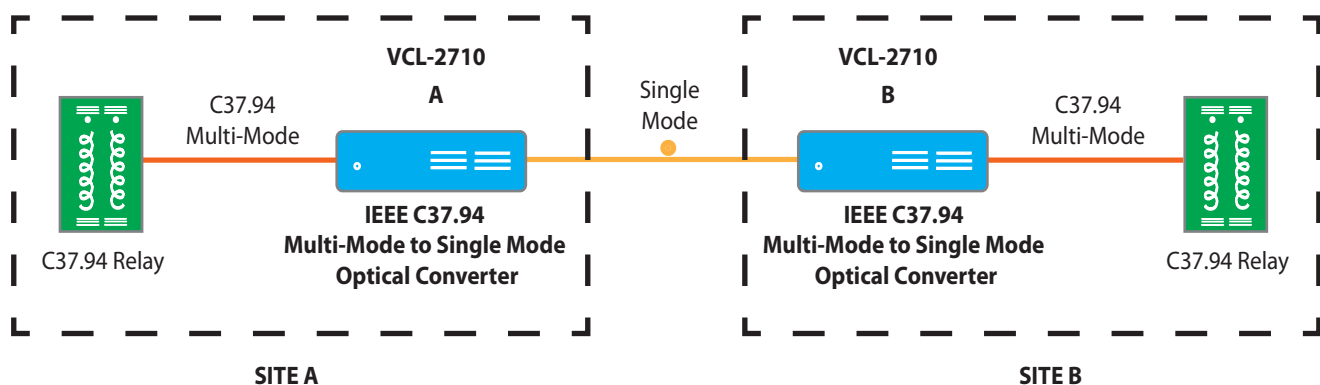
◀ C37.94 over IP-MPLS-TP ▶

VCL-2711, IEEE C37.94 over IP-MPLS / Ethernet / MPLS-TP Equipment

The VCL-2711, IEEE C37.94 over IP-MPLS / Ethernet / MPLS-TP Transmission Equipment is a ruggedized, robust and sub-station-hardened transmission equipment which converts and transmits up to four IEEE C37.94 Interfaces over an IP-MPLS / Ethernet / MPLS-TP link with "SDH / SONET like" performance. No bit-errors and almost "zero" jitter and wander due to its integrated GPS (ITU-T G.811) compliant "Primary Reference (PRC) Clock" synchronization options. The far-end VCL-2711 unit receives the Ethernet data stream and re-converts it back to the IEEE C37.94 Interfaces. The VCL-2711 units must be always used in pairs, with one unit installed on each end of the Ethernet / IP/MPLS / MPLS-TP link.

The VCL-2711, IEEE C37.94 over IP-MPLS / Ethernet / MPLS-TP equipment can be used in a point-to-point, or a point-to-multipoint topology with "zero" bit errors and SDH / SONET quality jitter and wander. This equipment is designed to enable sub-stations to seamlessly migrate from SDH / SONET transmission networks to more efficient IP-MPLS / MPLS-TP transmission networks without incurring a large capex or the tiresome task of having to replace and rewire the existing C37.94 Protection Relays which need to be interconnected to the far-end substations over IP-MPLS / MPLS-TP transmission links.

Features and Highlights:

- End-to-end transmission delay (latency) of less than 5ms on IEEE C37.94 links
- Symmetrical latency
- Zero transmission errors
- SDH / SONET quality "Jitter" and "Wander" control
- Multiple, integrated clock synchronization options include:
    - o   External 1PPS, 2.048MBits and 10MHz Clock options
    - o   GPS - Integrated GPS (ITU-T G.811) complaint Primary Reference Clock

C37.94 Interface Specifications:

- Number of C37.94 Interfaces: 4
- Standards: IEEE C37.94
- Optical Connector: ST
- Optical: 820nm / 850nm Multi-Mode
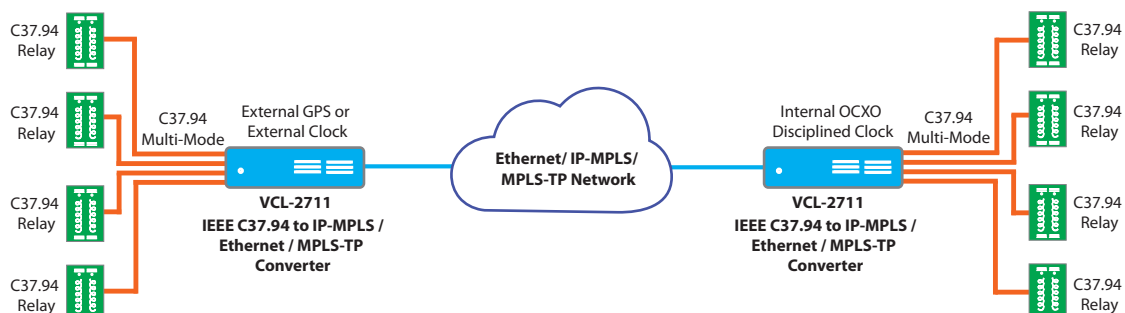- Optical Transmitter: LED

Power Supply:

- 1+1, Redundant
- 24V DC / 48V DC (input range 18V DC ~ 60V DC)
- 110V DC
- 220V DC

Network (Transmission) Interface:

- Number of 10/100BaseT Ethernet interfaces: 1 (RJ-45)

Application Diagram:

C37.94 over Quad E1

VCL-MX-1554-RAC, Quad IEEE C37.94 to Quad E1 Converter

VCL-MX-1554-RAC, Quad (4x) IEEE C37.94 to E1 Converter is a ruggedized and robust, sub-station-hardened protocol converter that converts up to 4 x IEEE C37.94 Interfaces to 4 x 2.048Mbps E1 and vice-versa. The VCL-MX-1554-RAC, IEEE C37.94 to E1 Converter supports point-to-point as well as point-to-multipoint applications.

Designed for inter-connecting IEEE C37.94 Differential Protection Relays over and E1/SDH network.

VCL-MX-1554-RAC, IEEE C37.94 to E1 equipment includes precise clock recovery and clock re-generation functions which allows the transmission of IEEE C37.94 channels over an E1/SDH network for error free transmission.

The most common application for the VCL-MX-1554-RAC, IEEE C37.94 to E1 Converter is for inter-connecting IEEE C37.94 Protection Relays over an E1 network.

By installing the VCL-MX-1554-RAC, IEEE C37.94 to E1 Converter, the existing IEEE C37.94 interfaces from protection relays can be transmitted over the E1 network without incurring large capex, or without the tiresome task of having to replace or rewire the IEEE C37.94 Relays which need to be interconnected to the far end substations over E1 (SDH) transmission links.

IEEE C37.94 Interface Specifications Option #1:

- Interfaces per unit: 4 (4Tx, 4Rx)
- Standards: IEEE C37.94
- Optical Connector: ST
- Optical Transmitter: LED
- Optical: 820nm / 850nm Multi-Mode

Power Supply:

- 48V DC (input range of 18V to 60V DC)
- 110V DC / 220V DC
- 100~240V AC, 50/60Hz

IEEE C37.94 Interface Specifications Option #2:

- Interfaces per unit: 4 (4Tx, 4Rx)
- Standards: Modulation as per IEEE C37.94
- Optical Connector: LC (SFP)
- Optical Transmitter: Laser
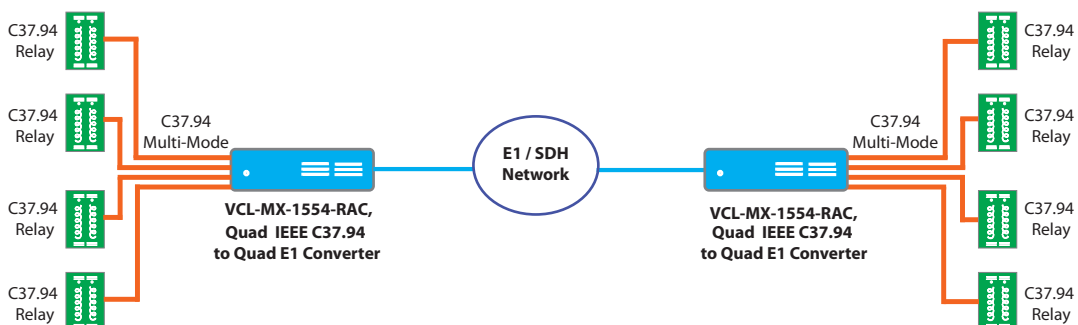- Optical: 820nm/850nm Multi-Mode and 1310nm/ 1550nm Single Mode

E1 Interface Specifications:

- Number of ITU-T G.703 E1 (2.048 Mbit/s) interfaces: 4
- Conformity: G.703
- Connector: RJ45 (F) / BNC (F)

Application Diagram: Point-to-Point

C37.94 Relay
C37.94 Relay
C37.94 Relay
C37.94 Relay

C37.94 Multi-Mode

VCL-MX-1554-RAC,
Quad IEEE C37.94
to Quad E1 Converter

E1 / SDH Network

VCL-MX-1554-RAC,
Quad IEEE C37.94
to Quad E1 Converter

C37.94 Multi-Mode

C37.94 Relay
C37.94 Relay
C37.94 Relay
C37.94 Relay

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