VCL-RX, C37.94 Optical Repeater

Product Overview

VCL-RX, C37.94 Optical Repeater is an extremely reliable and flexible C37.94 transmission product that re-generates and re-times the C37.94 optical signals and removes any residual jitter and wander, thereby making it suitable for extending C37.94 signals over long optical fiber links.

The VCL-RX, C37.94 is available with 1+1 Optical Link Redundancy (C37.94), 1+1 Redundant Power Supply options.

Applications, Features and Benefits

May be used as a C37.94 Signal Converter - to convert an optical signal from IEEE C37.94 compliant 850nm Multi-Mode C37.94 Distance Protection Relay and transmit it up to a distance of 180 KM on Single Mode optical fiber.

Compatible with C37.94 Distance Protection Relays from all major manufacturers.

May be used as a C37.94 Optical Repeater to extend the reach of the VCL-TP, Teleprotection Equipment beyond the distance of 180 KM. The combined reach of the VCL-TP, Teleprotection Equipment with one mid-span VCL-RX, C37.94 Optical Repeater may be up to 360 KM.

Option of 1+1 Route / Path Protection for C37.94 Optical interface with less than 5ms link switching / link recovery time in the event of the working optical link failure.

IRIG-B Synchronization for time-stamped alarms.

Immunity to Voltage Dips, Short Power Supply Interruptions and Voltage Variations as per IEC 61000-4-11 specifications.

Transmission Interface options include:

IEEE C37.94 compliant 850nm (50 /125 um and 62.5/125um) Multi-Mode optical fiber interface for connecting to C37.94 Distance Protection Relays.

IEEE C37.94 compliant 1310nm / 1550nm (9/125 um) Single-Mode optical fiber interface for transmission over long-reach, single-mode optical fiber links to extend Teleprotection Signals over long optical fiber links ($\leq$ 40 KM, $\leq$ 80 KM, $\leq$ 120 KM, $\leq$ 150 KM and $\leq$ 180 KM).

Option of 1+1 redundant optical path protection / route protection.

Laser: Class I (for Single-Mode Optical Interface) - Eye-safe as per EN 60825-1 specifications.

Performance

Less than signal 1ms transfer time over a 180 KM optical span.

Error Detection and Coding

Line Code Violation Detection

LOS Detection

Signal Re-timing, Re-generation and Block Command Encoding as per IEEE C37.94 for reliable transmission.

Standards and Compliances

Compliant with IEC 60834-1 and IEC 834-1 specifications and standards.

Event and Alarm Logging

Time-Stamped Alarm Logging

Built-In (RTC) Real Time Clock

IRIG-B Time Synchronization option to synchronize the RTC time-stamps with GPS.

Management Interface

RS232 serial, USB serial interfaces for local terminal access.

10/100BaseT Ethernet Interface for remote access over an IP network.

Access and Monitoring

- Command Line Interface (English text commands).
- Telnet
- SSH
- SNMPv2 Traps.
- Encrypted Password Protection
- Maintains an access log of over 10,000 most recent entries for security audit.

Power Consumption

- < 15 Watts.

Other Regulatory Compliances:

- Meets CE requirements
- Complies with FCC Part 68 and EMC FCC Part 15.

Power Supply Options

- 24V DC
- 48V DC
- 110V DC / 125VDC
- 220V DC / 250V DC
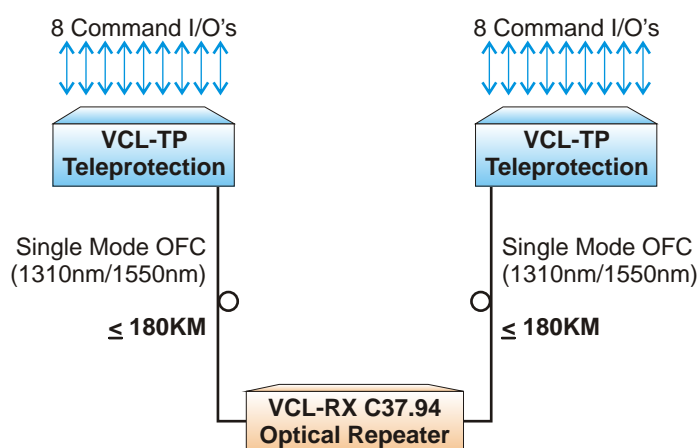- 1+1 Redundant Power Supply.

EMI, EMC, Surge Withstand and other Compliances

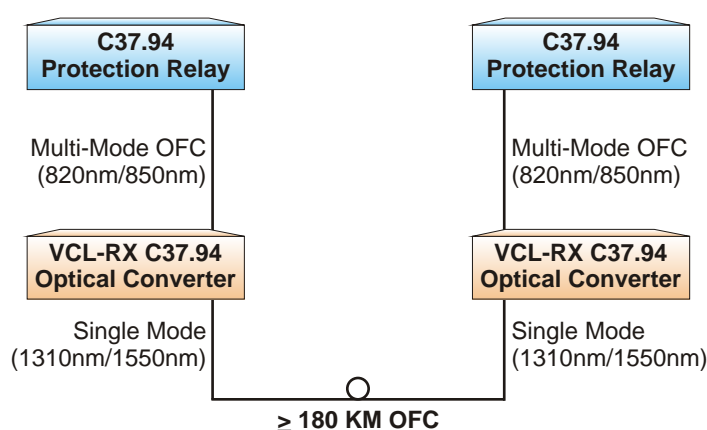| EN 50081-2	EN 50082-2	IEC 60068-2-29
IEC 61000-4-6 (Conducted Immunity)	IEC 60068-2-6	IEC 60068-2-2
IEC 60068-2-78	IEC 60068-2-1	IEC 60068-2-14
CISPR 22 / EN55022 Class B (Conducted Emission and Radiated Emission)		
IS 9000 (Part II Sec. 1-4, Part III Sec. 1-5, Part IV, Part 14 Sec. 1-3)		
IEC 60870-2-1	IEC 61000-4-5	IEC 61000-4-12
IEC 61000-4-3 (Radiated Immunity)	IEC 61000-4-8	IEC 61000-4-16
IEC 61000-4-2	IEC 61000-4-10	Telcordia GR-1089 Surge and
IEC 61000-4-4	IEC 61000-4-11	Power Contact

- ESD, Voltage and Surge Withstand: Meets and exceeds IEC 61000-4-2, IEC 61000-4-4, IEC 61000-4-5, Level 4 specifications.
- Immunity to Voltage Dips, Short Power Supply Interruptions and Voltage Variations meets and exceeds IEC 61000-4-11, Level 1 specifications.

Application Diagrams

VCL-RX, C37.94 Optical Repeater

VCL-RX, C37.94 Optical Converter

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