

VCL-TP, Teleprotection Equipment

Introduction:

VCL-TP, Teleprotection Equipment is an extremely reliable and flexible product that is available with various interface options including E1 (2.048Mbps), G.703 Co-Directional @ 64Kbps, C37.94 (Optical), IP/MPLS, IEC-61850 GOOSE over IP/MPLS, IEC-61850 GOOSE over E1 and IEC-61850 GOOSE over C37.94 (Optical) Interfaces. Additionally, it also provides the options of 1+1 Redundant Optical Link (C37.94), 1+1 Redundant Power Supply and 8/16, Digital Trip Counter Display Panel with 8 user configurable External Relay Alarm outputs.

VCL-TP, Teleprotection Equipment may be used independently, in a standalone point-to-point application, or as an integral extension of the VCL-MX Version 6, E1 Voice and Data PDH Multiplexer solution to provide Teleprotection over SDH, PDH or IP /MPLS data networks.

VCL-TP, Teleprotection Equipment is extremely reliable and flexible product that offers up to 8, 2-way independent command channels, operated selectively or simultaneously over a wide choice and a variety of transmission interfaces.

Network Side (Transmission) interface options

- E1, 2.048Mbps, G.703 interface option for transmission over E1 links
- 64Kbps, G.703.1 Co-Directional interface
- IEEE C37.94 compliant Multi-Mode optical fiber interface for transmission over short-reach multi-mode optical fiber links
- IEEE C37.94 compliant Single-Mode optical fiber interface for transmission over long-reach, single-mode optical fiber links (≤ 40 KM, ≤ 80 KM, ≤ 120 KM, ≤ 150 KM, ≤ 180 KM)
- IEEE C37.94 1+1 redundant optical path protection / route protection
- Teleprotection over IP/MPLS 10/100BaseT (Electrical) or 100BaseFX (Optical) Ethernet Interface to provide Teleprotection over IP / MPLS link
- IEC 61850 GOOSE over IP / MPLS
- IEC-61850 GOOSE over E1 Interface
- IEC-61850 GOOSE over C37.94 (Optical) Interface.

Sub-Station Side Interface Options

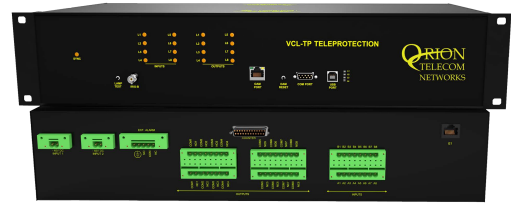
- Bi-directional Transmission of 8 command Inputs and 8 command Outputs.
- 48V DC, 110V DC and 250V DC command voltage and switching voltage options.
- IEC-61850 GOOSE.

Performance

- Less than 2ms command transfer time
- Less than 5ms relay operating time
- Less than 6ms back-to-back operating time (including relay operating time) in 2.048Mbps, E1 interface mode
- Less than 6ms back-to-back operating time (including relay operating time) in IEEE C37.94 Optical mode
- Less than 6ms back-to-back operating time (including relay operating time) in IP/MPLS mode
- Less than 3ms back-to-back operating time (including relay operating time) in IEC 61850 GOOSE mode.

Flexibility and User Programmability

- User programmable parameters for "Input" command sampling time and "Output" command holding time
- Input Sampling Time - Sets the "Sampling Time" of the INPUT Commands
- Output Holding Time - Sets the "Holding Time" of the OUTPUT Commands. i.e. the "Minimum Deactivation Time" of the OUTPUT Commands.



Front and Back View

Event and Alarm Logging

- Time-Stamped Alarm Logging
- Time-Stamped Event Logging
- IRIG-B time synchronization option to synchronize time-stamps with GPS. (E1 and C37.94 Interface models)
- NTP time synchronization option to synchronize time-stamps with NTP Server (E1 and C37.94 Interface models)
- NTP or PTP time synchronization option to synchronize time-stamps with NTP Server / IEEE 1588v2 PTP Grandmaster (IP / MPLS models).

Features and Benefits

- Compact, standard 19-Inch rack-mountable, 2U high chassis
- Distance Teleprotection applications
- Compliant with Direct Tripping, Permissive Tripping and Blocking Protection Schemes
- Compliant with IEC 60834-1 and IEC 834-1 specifications and standards for reliability
- Optical Interface fully compliant with IEEE C37.94 for error resistant transmission
- Use in a Standalone, Point-To-Point applications
- Use as an integrated part of the VCL-MX Version 6 E1 Voice & Data Multiplexer solution over an SDH or PDH data network
- Bi-directional Transmission of 8 command Inputs and 8 command outputs
- IRIG-B Time Synchronization
- NTP and IEEE 1588v2 PTP Time Synchronization
- Available with Trip Digital Display Counters (8/16) with 8 user configurable External Relay Alarm outputs
- Full Duplex Operation
- Available with 24V DC, 48V DC, 110V DC, 220V DC and 250V DC command and switching voltage options
- Option of 1+1, Redundant Power Supply
- Available with 24V DC, 48V DC, 110V DC, 220V DC and 250V DC power supply options
- Immunity to Voltage Dips, Short Power Supply Interruptions and Voltage Variations as per IEC 61000-4-11 specifications.

Trip Counter Display Panel

- 8, Dry contact external alarm relay to connect external alarms on an annunciator panel to extend audio and / or visual alarms - Optional
- 8/16 Trip Counter Display - Optional.

Maintenance

- Manual Loop Test - This feature initiates a "Manual Loop-Test" of the transmission link that interconnects the "Local" Teleprotection Terminal and the "Remote" Teleprotection Terminal
- Automatic Loop Test - The Automatic Link Test feature automatically initiates "Periodic Loop Tests" at user programmed intervals of the transmission link that interconnects the "Local" Teleprotection Terminal and the "Remote" Teleprotection Terminal
- Delay Measurement - This feature automatically initiates an end-to-end "Delay Measurement Test" between the "Local" and the "Remote" Teleprotection Terminal through the interconnecting transmission link.

Access and Monitoring

- Command Line Interface (English text commands)
- Telnet, SSH
- SNMPv2 Traps.

Operation Management and Monitoring (OAM)

- RS232 serial, USB serial interfaces for local terminal access
- 10/100BaseT Ethernet interface for remote access over an IP network
- Encrypted Password Protection
- Maintains an access log of over 10,000+ most recent entries for security audit
- Telnet - Remote access over IP links
- SSH - Secured remote access using "Secure Shell Protocol" over IP links
- SNMP Traps and NMS for real time remote monitoring and management over an IP network.

Reliability

- Power Supply Immunity to withstand impulse surges and transients of up to 4kV
- High Quality Relays withstands voltage 10 kV between coil and contacts (1.2/50µps). Fully compliant with IEC 255 specifications
- Maximum Switched Relay Voltage and Current: 400V AC or 300V DC; 5 Amps continuous
- Minimum Relay Operations: 10,000,000 operations at 18,000 operations/hour)
- Optoisolated Command Inputs
- Optoisolated Relay Outputs.

Error Detection and Coding

- Line Code Violation Detection
- LOS Detection
- Block Command Encoding as per IEEE C37.94 for reliable transmission.

Time Clock

- Built-in real time clock (RTC)
- Synchronization with an external IRIG-B Input from GPS
- NTP Time synchronization option.

Transmission Standards and Compliances

- Electrical: ITU-T, G.703 for 64Kbps co-directional 4-wire data interface
- Electrical: ITU-T, G.703 for 2.048Mbps interface
- Optical: IEEE C37.94 compliant Multi-Mode optical interface
- Optical: IEEE C37.94 compliant modulation 1310nm Single-Mode optical interface
- Laser: Class I (for Single-Mode Optical Interface) - Eye-safe as per EN 60825-1 specifications
- 1 x 10/100BaseT (RJ45), IEC-61850-3 Compliant / 100Base-FX (SFP) Ethernet Interface.

Teleprotection Standards and Compliances

- Compliant with IEC 60834-1 and IEC 834-1 specifications and standards
- As per standard IEC 60834-1: Dependability, Transmission time, Recovery time, Alarm time, Security with sudden signal interruption, Security with burst disturbances, DC power supply interruption, Reverse polarity, Jitter and Insulation withstand (as per IEC 60060-1).

Power Supply Options

- 24V DC, range 18V DC ~ 32V DC
- 48V DC, range 36V DC ~ 70V DC
- 110V DC / 125V DC, range 80V DC ~ 140V DC
- 220V DC / 250V DC, range 80V DC ~ 300V DC.

Power Consumption

- < 18 Watts.

EMI, EMC, Surge Withstand and other Compliances

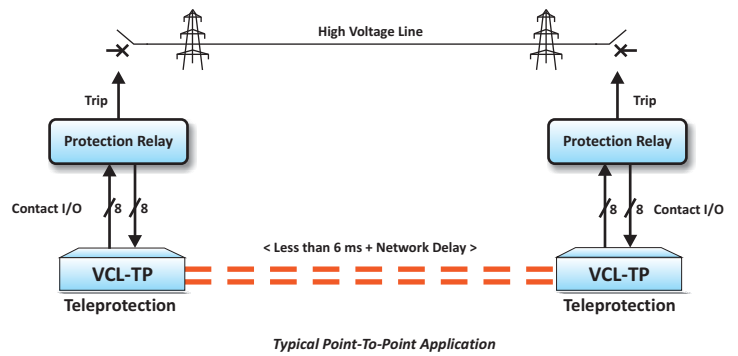
EN 50081-2	EN 50082-2	IEC 60068-2-29
IEC 61000-4-6 (Conducted Immunity)	IEC 60068-2-6	IEC 60068-2-2
IEC 60068-2-78	IEC 60068-2-1	IEC 60068-2-14
CISPR 22 / EN55022 Class B (Conducted Emission and Radiated Emission) IS 9000 (Part II Sec. 1-4, Part III Sec. 1-5, Part IV, Part 14 Sec. 1-3)		
IEC 60870-2-1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

- 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.

Other Regulatory Compliances

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

Application Diagram



Interface Options Supported

64Kbps, G.703 Co-directional	Over IP / MPLS
E1 (2.048Mbps)	IEC 61850 GOOSE over E1 or C37.94
C37.94 Optical	IEC 61850 GOOSE over IP / MPLS

Revision 1.9 – March 14, 2018

<p>Headquarters: Phoenix, Arizona</p> <p>Orion Telecom Networks Inc. 20100, N 51st Ave, Suite B240, Glendale AZ 85308 Phone: +1 480-816-8672 Fax: +1 480-816-0115 E-mail: sales@oriontelecom.com</p>	<p>Regional Office: Miami, Florida</p> <p>Orion Telecom Networks Inc. 4000 Ponce de Leon Blvd. Suite 470, Coral Gables, FL 33146 U.S.A. Phone: 1-305-777-0419, Fax: 1-305-777-0201 E-mail: sales@oriontelecom.com</p>
--	---