VCL-2140

Serial & Ethernet Data Encryption Equipment

Introduction:

VCL-2140 is a low data rate serial and ethernet data encryption equipment with integrated firewall capabilities that may be installed to secure and protect ethernet and RTU data (Remote Terminal Data) in critical infrastructure such as Sub-Stations, Smart Grid Distribution Systems, Oil and Gas Infrastructure and Railway Signalling Networks. The VCL-2140 may be used to secure RTU data and protect it from being compromised or accessed by hostile elements.

The VCL-2140 Data Encryption Equipment may be installed in point-to-point applications and used to provide to secure communications between the RTU Terminals and their corresponding IEC -101, -104, DNP, MODBUS protocol central server(s) located in Load Dispatch Centre(s) / SCADA Management Centre(s) and Rail Traffic Control Room(s).

The VCL-2140 also protects the data against hostile MitM (Man-In-the-Middle) attacks.

Protocols supported:

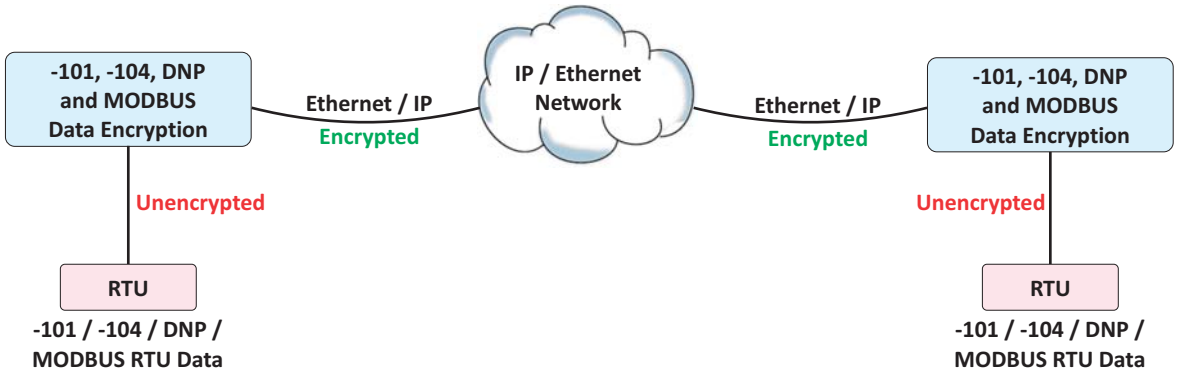
- IEC 60870-5-101 (IEC 101): RS-232 and RS-485 ports
- IEC 60870-5-104 (IEC 104): 10/100BaseT Ethernet Port
- DNP (Distributed Network Protocol):
  - RS-232 and RS-485 ports
  - 10/100BaseT Ethernet Port
- MODBUS RTU and MODBUS TCP/IP:
  - RS-232 and RS-485 ports
  - 10/100BaseT Ethernet Port

Access to the VCL-2140 Data Encryption Equipment is password protected with advanced firewall capabilities that meet and exceed NERC and CEA recommendations to provide secured access and password protection and control. VCL-2140 Data Encryption Equipment can optionally be managed centrally from a RADIUS Server to provide enhanced levels of access security and centralized password authentication, management, and control.

Data Encryption Protocols:

- IPSec. OpenVPN

Application Diagram:



Versions and Technology Deployment:

VCL-2140 Data Encryption Equipment:

- High-Security Data Encryption Equipment
- Point-to-Point -101, -104, DNP, MODBUS Protocol RTU Data Encryption equipment. The VCL-2140 is designed to be used only in point-to-point applications.
- Encrypting RTU data between two Terminals

Applications:

- Utilities: Electric generation, transmission, and distribution
- Smart Grid Distribution Systems
- Oil & Gas production, pipelines
- Remote nodes in SCADA networks
- Railway Signalling Infrastructure: Rail Traffic Control Room(s)
- All distributed data networks consisting of a central server and multiple edge locations.

Interfaces - Terminal:

- Total Number of Ethernet Interfaces: 3
  - One, 10/100 RJ45 equipment interface for the local (trusted) LAN side
  - One, RS-232 interface
  - One, RS-485 interface
  - One 10/100 RJ45 network interface to the WAN (untrusted) network side
- Auto MDI/X (straight or crossover Ethernet cable correction)
- USB serial port for local access and configuration.

Data Encryption Algorithms:

- AES128, AES192, AES256

Encrypted Data Throughput:

- Compact, DIN-Rail Remote Data Encryption Terminal, Maximum Encrypted Data Rate, ≤ 12Mbps with AES256 Encryption Algorithm.

Network Support:

- IPv4 and IPv6 Routing
- Ethernet
- VLAN tag preservation
- MPLS tag preservation
- IPv4.

Monitoring and Access Control:

- Password Strength Monitor
- Device Management and Alarm Monitoring
- Command Line Interface – Telnet, SSH
- SNMPv2; SNMPv3 Alarm Monitoring
- Alarm condition detection and reporting (traps and SNMP alarm table)
- Syslog, Audit Log

Firewall - Features and Capabilities:

- Deep Packet Inspection
- Per-frame/packet authentication
- Firewall
  - Port (Soft) - based
  - MAC - based
  - IP Address - based
  - IP Domain - based
- White List and Black-List options
  - White-List Exception allowed and blocks all other traffic by default (system default mode)
  - Black-List Exception blocked and allows all other traffic by default
- Seamless scalability
- Infrastructure neutral
- Transparent to network and applications
- Easy installation and management

Firewall and Security:

- Secure Boot
- Firewall Security:
  - Inclusion Policy – Access Control based upon White-List IP addresses, MAC address and IP Domain
  - Exclusion Policy – Access Control based on Black-List
- Resistance to Denial of Service (DoS) Attack
- Encrypted Firmware Updates
- Non-volatile Access Log with capability to "fingerprint" all successful and failed log-in attempts and keep a log of the IP and MAC addresses of all successful and failed logins / login attempts
- SNMP trap generation, along with LED and external alarm indication
- Password Protection with password strength monitor
- RADIUS Password Authentication
- SSH (Secure Access Control) with encrypted Password Protection
- Auto key exchange mechanism between peers in Point-to-Point mode for added security.

MTBF:

- Compact DIN Rail Terminal: MTBF ≥ 280,000 hours @ 24C ambient with dual 48VDC power supply

CE Compliance:

- Immunity as per EN 60255-26
- Low voltage directive as per EN 60255-27

Other Regulatory Compliances:

- RoHS
- Meets CE requirements
- Complies with FCC Part 68 and EMC FCC Part 15
- Telcordia GR-1089 Surge and Power Contact.

Power:

- Power: 1+0 or 1+1 Power Supply Options
- 12V DC to 60V DC
- 85V DC to 250V DC
- 100~240V AC, 50/60Hz
- Power Consumption: 15W at maximum load

Physical:

- Compat DIN Rail Mount
- 1U, 19-Inch Rack Mount.

Environmental (Operational):

- Operating Temperature: -20C to +60C (-4F to 140F) – Terminal (Fanless, does not require any forced air cooling)
- Operating Temperature: 0C to +50C (32F to 122F) – Central Unit (Fanless, does not require any forced air cooling)
- Maximum Operational Humidity 95% R.H. (Non-condensing)

EMI, EMC, Surge Withstand and other Compliances:

Terminal Equipment

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 32 / EN55022 Class A (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 61000-4-3
IEC 61000-4-8 (Radiated Immunity)		IEC 61000-4-2
IEC 61000-4-10	IEC 61000-4-4	IEC 61000-4-11
Telcordia GR-1089 Surge and Power Contact		

Ordering Information:

Part #	Description
VCL-2140	- VCL-2140 Data Encryption Equipment IEC 60870-5-101, IEC 60870-5-104, DNP, MODBUS Protocol Encryptor - Suitable to work in Point-to-Point applications - 19 Inch Rack Mount Version - *Power Supply Options (add power supply option, as provided below)

*Power Supply Options:

LVDC	12V DC to 60V DC
HVDC	85V DC to 290V DC
AC V	90V AC~240V AC, 50/60Hz

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