

Introduction:

VCL-2142 Enigmatron Xcöde is low data rate encryption equipment with extremely advanced features that may be installed to secure and protect RTU data in critical infrastructure such as Sub-Stations, Smart Grid Distribution Systems, Oil and Gas Infrastructure and Railway Signalling Networks from being compromised or accessed by hostile elements.

The VCL-2142 Enigmatron Xcöde may be installed in point-to-point, as well as in point-to-multi-point applications in centrally managed networks consisting of multiple edge locations to provide secure communications between multiple RTU Terminals and their corresponding IEC 60870-5-104, MODBUS-TCP and DNP central server(s) located in Load Dispatch Centre(s) / SCADA Management Centre(s) and Rail Traffic Control Room(s).

Additionally, the VCL-2142 Enigmatron Xcöde also protects the RTU data against hostile MitM (Man-In-the-Middle) attacks.

Access to the VCL-2142 Enigmatron Xcöde is password protected with advanced firewall capabilities that meet and exceed NERC as well as CEA’s mandatory requirements of password protection and control. VCL-2142 Enigmatron Xcöde can optionally be managed centrally from a RADIUS Server to provide enhanced levels of access security and centralized password management and control.

Interfaces - Terminal:

- Total Number of Ethernet Interfaces : 5
 - Four 10/100 RJ45 equipment interfaces in the local (trusted) LAN interfaces
 - One 10/100/1000 RJ45 network interface to the WAN (untrusted) network interface
- Integrated four-port Ethernet switch
- Auto MDI/X (straight or crossover Ethernet cable correction)
- USB serial port for local access and configuration.



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.

Versions and Technology Deployment:

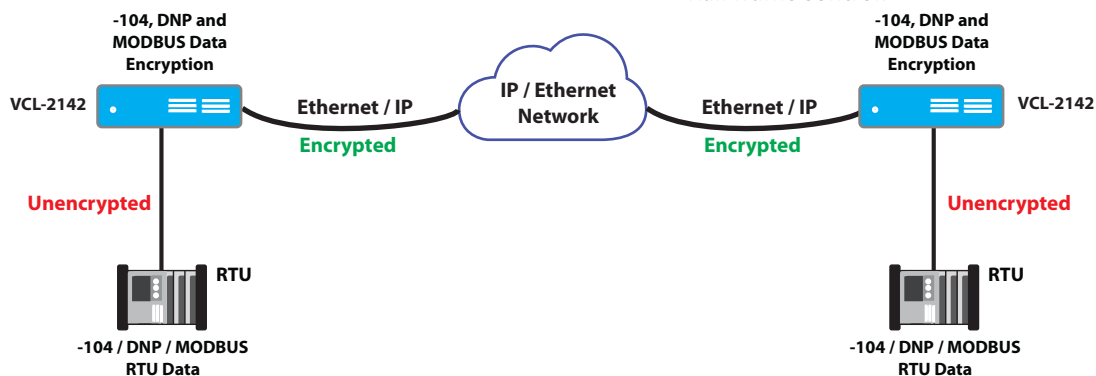
VCL-2142 Enigmatron Xcöde (Remote Unit)

- High-Security Data Encryption Equipment
- Encrypting RTU data between RTUs and SCADA Server.
- Point-to-Point -104 and DNP RTU Data Encryptor.
The VCL-2142 Enigmatron Xcöde can be used in “Point-to-Point” applications. The VCL-2142 Enigmatron Xcöde may also be used with VCL-5040 Enigmatron Equipment in “Point-to-Multi-Point” applications.

VCL-5040 (Central Unit)

- High-Security Data Encryption Equipment with integrated Firewall
- Designed to work in high data throughput, point-to-multi-point applications
- Supports a maximum of up to 500 x Enigmatron Xcöde (remote) units with a maximum combined data throughput of up to 1Gbps
- Encrypting data between multiple RTU Terminals and the IEC 60870-5-104, MODBUS-TCP and DNP server(s) located in Load Dispatch Centres / SCADA Management Centres and Rail Traffic Control.

Application Diagram:



Supported Security Protocol:

- IPSec, OpenVPN

Supported Data Encryption Algorithms:

- AES128, AES192, AES256

Form Factor and Maximum Encrypted data throughput per VCL-2142 Enigmatron Xcöde terminal:

- Compact, DIN-Rail Remote Data Encryption Terminal
- Maximum Encrypted Data Rate = 10Mbps with AES256 data encryption

Network Support:

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

Monitoring and Access Control:

- Password Strength Monitor
- Device Management and Alarm Monitoring
- Command Line Interface – Telnet, SSH with clear text disable option (default)
- SNMPv2; SNMPv3 Alarm Monitoring
- Alarm condition detection and reporting (traps and SNMP alarm table)
- Syslog

Power:

- 15V DC ~ 60V DC (DIN Rail Mounting Version)
- 85V DC ~ 250V DC (External Adapter Option).
- 100~240V AC, 50/60Hz, (External Adapter Option).
- Power Consumption: 9W at maximum load (DC)
- Power Consumption: 15W at maximum load (AC, with external AC to DC adapters)

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

MTBF:

- **Compact DIN Rail Terminal:** MTBF = 215,000 hours @ 24C ambient with single 48V DC power supply

Physical:

- Compact DIN Rail Terminal
- Height x Depth x Width: 42 mm x 175 mm x 168 mm
- Weight: 0.6 Kgs

CE Compliance:

- Low Voltage Directive 2014/35/EU
- Electromagnetic Compatibility 2014/30/EU

Other Regulatory Compliances:

- RoHS
- CE Marking
- Complies with FCC Part 68 and EMC FCC Part 15

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 60068-2-78	IEC 60068-2-1	IEC 60068-2-14
CISPR 32 / EN55032 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 (Radiated Immunity)	IEC 61000-4-8	
IEC 61000-4-2	IEC 61000-4-4	

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
- Continuous monitoring of the TLS connection to nullify MitM attacks
- 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

Environmental (Operational):

- Operating Temperature: -20C to +60C (-4F to 140F) – Terminal
- Cold Start Temperature: -10C (14F) - Terminal
- Operating Temperature: 0C to +50C (32F to 122F) – Server
- Cold Start Temperature: 10C (50F) – Server
- Maximum Operational Humidity 95% R.H. (Non-condensing)

Ordering Information:

Part #	Description
VCL-2142-X-DIN-DC012060	VCL-2142 Enigmatron Xcöde High-Security Data Encryption Equipment IEC 60870-5-104 and DNP Protocol RTU Data Encryptor Suitable to work in Point-to-Point applications IEC 60870-5-104 and DNP Protocol Encryptor Compact DIN-Rail Terminal 1 x 15~60V DC Power Supply Input
VCL-5040	VCL-5040 (Central Unit) High-Security Data Encryption Equipment Suitable to work in Point-to-Multi-Point applications 19-Inch, 2U Rack-Mount Terminal 2 x 18-60V DC Power Supply Inputs Or 2 x 90VAC~240VAC, 50/60Hz AC Power Supply Inputs (Optional)

© Copyright: Valiant Communications

Technical specifications are subject to changes without notice.

Revision 2.5 – March 10, 2023

U.K.

Valiant Communications (UK) Ltd
Central House Rear Office,
124 High Street, Hampton Hill,
Middlesex TW12 1NS, United Kingdom

E-mail: gb@valiantcom.com

U.S.A.

Valcomm Technologies Inc.
4000 Ponce de Leon Blvd.,
Suite 470, Coral Gables,
FL 33146, U.S.A.

E-mail: us@valiantcom.com

INDIA

Valiant Communications Limited
71/1, Shivaji Marg,
New Delhi - 110015,
India

E-mail: mail@valiantcom.com