

Description:

The **VCL-9000-EMP** is an environmentally hardened data storage system that is specifically engineered to protect the stored data from intentional electromagnetic pulse (IEMP) attacks as well as survive high altitude (HEMP) attacks and naturally occurring EMP events, such as solar storms etc. **VCL-9000-EMP** is suitable for deployment by Banking, Financial Services and Insurance (BFSI) companies, in military installations, power substations and other critical infrastructure sectors to protect critical data from all types of EMP events.

The **VCL-9000-EMP** incorporates an enterprise-grade data storage system in a certified EMP shielded, electrically isolated enclosure with integrated, multi-level surge protection mechanisms to ensure uninterrupted data availability, reliable data integrity, operational continuity and compliance in critical applications through robust shielding, data redundancy to survive even post high-intensity electromagnetic events.

**for critical
infrastructure,
defense, or
financial
institutions
use**

Technical Specifications:

Category	Specification
Storage Capacity	240 TB (expandable to 1.2 PB, with expansion chassis)
Storage Type	Enterprise Grade / Industrial Grade HDDs and SSDs.
I/O Interfaces	4 x 10 Gb (Optical SFP), 8 x 1 GbE, 2 x USB 3.0, 4 x Open/Close Alarm Relays
OS Compatibility	Linux
Data Protection	AES-256 encryption, Immutable Snapshots, WORM support
Operating Temperature	-10°C to +45°C
Form Factor	4U Rack mount, 19-inch

EMP & Electrical Protection:

Feature	Details
EMP Rating	MIL-STD-188-125-1 compliant
Shielding Enclosure	Copper-Aluminium-Mu-metal Faraday cage (attenuation: 120 dB at 1 GHz)
Signal Filtering	Data and power lines filtered with Pi-filter networks
Data Isolation	Optically isolated data inputs and outputs
Power Isolation	Galvanically isolated power inputs
Surge Protection	IEC 61000-4-5 compliant, 10 kA surge suppression
Recovery Time	<60 seconds post-EMP event

Security & Resilience Features:

- Hardware Security Module
- Secure Boot & Firmware Signing
- Dual-redundant power supplies
- Hot-swappable HDDs and SSDs
- Time and Frequency Synchronization: Captive NTP Server with dual-band GPS+NaVic Receiver
- OCXO Holdover
- Redundant NTP Servers with automatic fallback
- Optically Isolated GNSS (dual-band GPS+NaVic) Antenna.
- Zero-trust ACL and multi-factor authentication
- Remote Management: Encrypted Web GUI, REST API, IPMI

Compliance Standards:

- MIL-STD-188-125-1 (High-altitude EMP Protection / HEMP)
- IEC 61000-4-5 (Surge Immunity)
- ISO/IEC 27001 (Information Security Management)

Management & Monitoring:

- Web-based GUI, SNMPv3, Syslog, and REST API
- External LCD control panel
- Remote Management System

Support & Warranty:

- 2-Year Standard Warranty (Extended Plans Available)
- Deployment Support: On-site setup for defence and utility sectors option available.

Use Cases:**1. Financial Institutions & Trading Floors**

- Time-stamped transaction logs, audit trails.
- Time synchronization using captive L1(GPS)/ L5(NaVic) band NTP Servers. Optically Isolated GNSS Antenna.
- MiFID II-compliant timestamping, 24/7 uptime.
- Maintains accurate time-stamping even if GPS/ GNSS signals are spoofed or jammed; supports compliance.
- Protects all stored financial and control data from corruption with minimum downtime in the event of an EMP attack.

2. Critical Infrastructure Facilities

- Real-time sensor data storage, environmental logs.
- Time synchronization using captive L1(GPS)/ L5(NaVic) band NTP Servers. Optically Isolated GNSS Antenna.
- Must maintain accurate time-stamping even if GPS/GNSS signals are spoofed or jammed; supports compliance.
- ISO/IEC 27001 and IEC 61000-4-5 compliance.
- Protects essential telemetry and control data from corruption or downtime during EMP.

3. Power Substations & Smart Grids

- PMU data archiving. Secure SCADA logs and protection relay data storage.
- Time synchronization using captive L1(GPS)/ L5(NaVic) band NTP Servers. Optically Isolated GNSS Antenna.
- Ensures data availability and timing post EMP events, ensuring grid resilience and stability.

4. Defence Installations

- Storage of mission-critical data, surveillance data storage, communications backup.
- Time synchronization using captive L1(GPS)/ L5(NaVic) band NTP Servers. Optically Isolated GNSS Antenna.
- Maintains accurate time-stamping even if GPS/ GNSS signals are spoofed or jammed; supports compliance.
- EMP immunity, classified data protection, secure boot.
- Prevents data loss during HEMP/IEMI attacks; supports secure operations continuity.

Drawing for the EMP-Protected Data Storage Equipment.**Key components of an EMP-Protected Cabinet to protect sensitive data storage equipment from EMP events:****Components of an EMP-Protected Cabinet**

Component	Function
Cabinet Enclosure	Conductive shield (typically copper, aluminium, mu-metal) designed to block external EMP fields.
EMP-Filtered Power Inputs	Surge-protected and filtered power inlets to suppress high-voltage transients.
Signal Line Filters	Pi-filters or low-pass filters on data lines to block high-frequency EMP energy.
Fiber-Optic Data Interfaces	Prevents galvanic coupling; provides complete electrical isolation for reliable communications
Shielded Ventilation Panels	Allows airflow while using honeycomb mesh to block electromagnetic interference.
Grounding System	Provides a low-impedance path to divert EMP energy safely to ground.
EMP-Hardened Power	Internal PSUs designed to tolerate EMP-induced surges and maintain output regulation.
Internal Shielded Cabling	Shielded and twisted pair cables to reduce intra-cabinet EMI effects.
Secure I/O Panel	Rear I/O with filtered connectors and gaskets to maintain shielding integrity.
Redundant Clock Source (GPS+NavIC)	Provides EMP-resilient time synchronization for accurate time-stamping of all transactions, alarms and events.

Technical specifications are subject to changes without notice.
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