

Remote Monitoring EMS Software User Guide - Official Commercial BESS

Technical Overview & Datasheet

EXECUTIVE SUMMARY

This document constitutes the official commercial and technical overview of the Remote Monitoring EMS Software, a cloud-native energy management platform engineered for Tier-1 Commercial and Industrial (C&I) Battery Energy Storage Systems (BESS). Designed for seamless integration with modular outdoor storage cabinets and containerized assets, this software suite delivers real-time telemetry, intelligent dispatch orchestration, and fleet-wide operational analytics. The platform is purpose-built for EPCs, asset owners, and O&M providers seeking to maximize round-trip efficiency, extend asset lifespan, and unlock multiple revenue streams across peak shaving, demand response, and arbitrage applications.



SYSTEM ARCHITECTURE & SAFETY

The Remote Monitoring EMS Software operates on a secure, multi-tiered architecture comprising edge-level data acquisition gateways, encrypted cloud transmission layers, and a centralized user interface accessible via web portal and mobile application. Edge gateways communicate with BESS subsystems—including BMS, PCS, HVAC, and fire suppression controllers—using industry-standard Modbus TCP/IP, IEC 61850, and CAN bus protocols. All data is transmitted via TLS 1.3 encryption to the cloud infrastructure, which is hosted on ISO 27001-certified data centers.

The platform incorporates robust cybersecurity safeguards, including role-based access control (RBAC), multi-factor authentication (MFA), and automated audit logging. Safety-critical alarms—such as cell overvoltage,

thermal runaway precursors, and coolant leakage detection—are processed at the edge to ensure sub-second response times, independent of cloud connectivity.

KEY FEATURES

- Real-Time Fleet Telemetry: Monitor State of Charge (SOC), State of Health (SOH), voltage, current, and temperature across all connected assets with 1-second refresh rates.
- Intelligent Dispatch Engine: Configure peak shaving, load shifting, and demand response schedules based on time-of-use tariffs, grid signals, or facility load profiles.
- Predictive Maintenance Analytics: AI-driven anomaly detection identifies cell degradation trends, coolant flow irregularities, and PCS efficiency drift before failures occur.
- Multi-Site Aggregation: Manage geographically dispersed BESS installations from a single dashboard with drill-down capabilities to cabinet and rack level.
- Open API Integration: RESTful APIs enable seamless integration with SCADA, DERMS, and third-party VPP platforms.
- Customizable Reporting: Generate compliance, performance, and financial reports in PDF, CSV, or Excel formats.

COMPLIANCE & STANDARDS

The Remote Monitoring EMS Software is developed in accordance with globally recognized standards, including IEC 62443 for industrial cybersecurity, IEEE 2030.5 for smart energy profile communications, and OpenADR 2.0b for automated demand response signaling. The platform supports compliance with UL 9540 and UL 9540A system-level safety evaluations, as well as IEC 62619 for battery system functional safety. Data privacy and retention policies align with GDPR and CCPA requirements.

TECHNICAL SPECIFICATIONS

Parameter	Specification
Deployment Model	Cloud-native SaaS / On-premise optional
Supported Protocols	Modbus TCP/IP, IEC 61850, CAN bus, OpenADR 2.0b
Cybersecurity Standard	IEC 62443, TLS 1.3, RBAC, MFA
Data Refresh Rate	1 second (edge) / 5 seconds (cloud)
API Interface	RESTful JSON API
User Access	Web portal, iOS/Android mobile app
Reporting Formats	PDF, CSV, Excel
Compliance	UL 9540, UL 9540A, IEC 62619, IEEE

INDUSTRIAL DEPLOYMENT

The Remote Monitoring EMS Software is deployed across diverse industrial environments, including manufacturing facilities, commercial office parks, data centers, and renewable energy microgrids. Typical deployment involves installation of edge gateways within each BESS cabinet, network configuration via secure VPN tunnels, and user onboarding through the cloud portal. The software supports both behind-the-meter (BTM) and front-of-the-meter (FTM) applications, with configurable control modes for grid-following and grid-forming operation.

