stem

PowerTrack™ EMS Solution

Complete Monitoring & Control for Your Storage and Hybrid Solar + Storage Assets

- Real-time data monitoring with 99.99% average uptime
- Intuitive edge and cloud user interfaces
- DNP3, Modbus, OPC-UA, IEC 61850, and IEC 60870 compatible
- Configurable interfaces with Human-Machine Interface (HMI)
- Integrated Stem software solution for portfolio-wide management
- Centralized configuration for controls, data collection and storage
- Vertical scalability from individual unit to entire portfolio
- Hot-standby EMS/PPC with automatic failover
- Redundant communication paths eliminate single points of failure
- UPS-backed power supply for uninterrupted control during grid events
- SOC2 Type II / NIST 800-53 audited and NIS2-compliant

PowerTrack EMS Solution Architecture

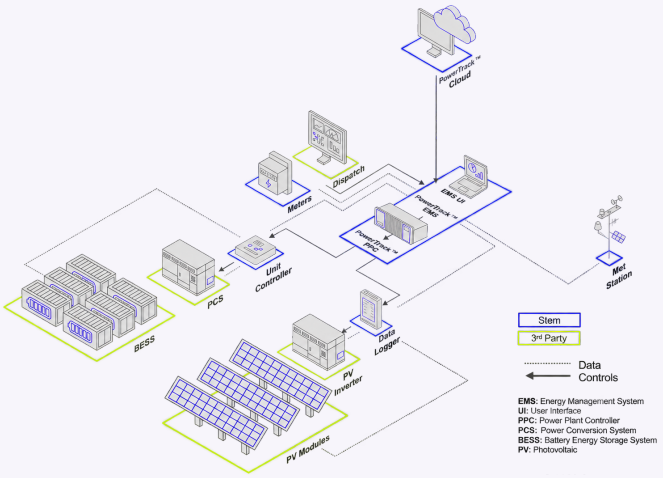
Example PV + BESS Hybrid Architecture

PowerTrack EMS connects your on-site equipment with cloud intelligence. We combine proven hardware, including Advantech and SEL, with transparent software, giving you complete visibility and control without vendor lock-in.

Technical Highlights

System Compatibility

- Integrated AC/DC battery block and modular Battery Energy Storage Systems (BESS)
- Comprehensive monitoring for hybrid assets (BESS & PV)
- Equipment monitoring: capacitor banks, switchgear, inverters, and trackers



Benefits for PV Hybrid Site Owners

Set priorities that maximize your revenue	Earn from multiple revenue streams simultaneously	Coordinated response to grid events and interconnection requirements	Integrate with any optimizers, immediately unlocking access to wholesale energy markets and ancillary services

Power Plant Controller (PPC) Control Modes

PowerTrack PPC's certified architecture puts the owner in control. Choose from a dozen specialized modes for grid services revenue: frequency response, voltage support, energy arbitrage, and more. Stack multiple revenue streams with proven grid code compliance.

Frequency Management	Voltage Management	Power Management	System Control
Fast Frequency Response (FFR) Frequency Containment Reserve (FCR) - Primary Frequency Control*	**Automatic Voltage Regulation (AVR)**	**Active Power Limiting** Active Power Curtailment	**Dynamic SOC Control**
Frequency Watt Control Primary Frequency Control or Frequency Response	**Volt-VAR Control** Reactive Power-Voltage Control or Q(U) Control	**Fixed Power Factor** Constant Cos φ Control	**Automatic Generation Control (AGC)** Manual Frequency Restoration Reserve (mFRR) - Tertiary Frequency Control
Power Oscillation Damping	**VAR Control** Reactive Power Control or Q Control	**Dispatch Regulation Reserve** Automatic Frequency Restoration Reserve (aFRR) - Secondary Frequency Control	**SOC Waypoint** SOC Scheduling

**EMEA Nomenclature*

PowerTrack™ EMS & PPC Technical Specifications

Stem integrates EMS and PPC functionalities within a unified computing platform. This architectural integration reduces signal latency, eliminates inter-device communication dependencies, and minimizes potential points of failure across the control chain.





Hardware	Advantech UNO-137	SEL 3355
Type	Industrial PC	Industrial PC
GENERAL		
Certification	CE, FCC, UL 61010-2-201, CCC, BSMI	CE, FCC, 47 CFR 15 B Class A, UKCA, UL
Dimensions	35 x 105 x 150 mm	133 x 288 x 465 mm 19″ 3U
Mounting	DIN-rail	Rack Mount
Power Requirements	10 – 36 Vdc	38 – 58 Vdc (LV) HV PS Available
Power Consumption	21 W Typical 47 W Peak	49 W Typical 69 W Peak
SYSTEM HARDWARE		
Processor	1.6 – 1.8 GHz	2.5 GHz
Memory	8 GB DDR3, 1600 MHz	4 - 16 GB DDR3, 1333 MHz
Storage	1 x 2.5″ SSD/HDD 1 x M.2 B key 2242 SSD	4 x Industrial SATA or 2 x Consumer SATA
I/O		
Serial Ports	2 x RS-232/422/485	2 x EIA – 232 Ports
LAN	2 x 10/100/1000 Mbps IEEE 802.3u (RJ45)	2 RJ45
USB	3 x USB 3.2 gen 1, 1 x USB 2.0	4 x Rear Panel USB 2.0 2 Front Panel USB 2.0
Isolated DI/O	8 x Digital Input Channels 8 x Digital Output Channels	
Displays	2 x DP 1.2, up to 4K @ 60 Hz	1 x DVI-I 1 x DVI-D 1 x DP 1.1, up to 1920x1200
Power Connector	1 x 2-pin terminal block	120/240 V Terminal Block
ENVIRONMENT		
Operating Temperature	-40 to 70 °C / -40 to 158 °F	-40 to 75 °C / -40 to 167 °F
Storage Temperature	-40 to 85 °C / -40 to 185 °F	-40 to 85 °C / -40 to 185 °F
Relative Humidity	95% RH @ 40 °C/104 °F Non-condensing	5% to 95% Non-condensing
Shock Protection	Operating, IEC 60068-2-27, 60G	IEC 60255-21-2:1988 Bump Class 1 Response Class 2
Ingress Protection	IP40	IP30