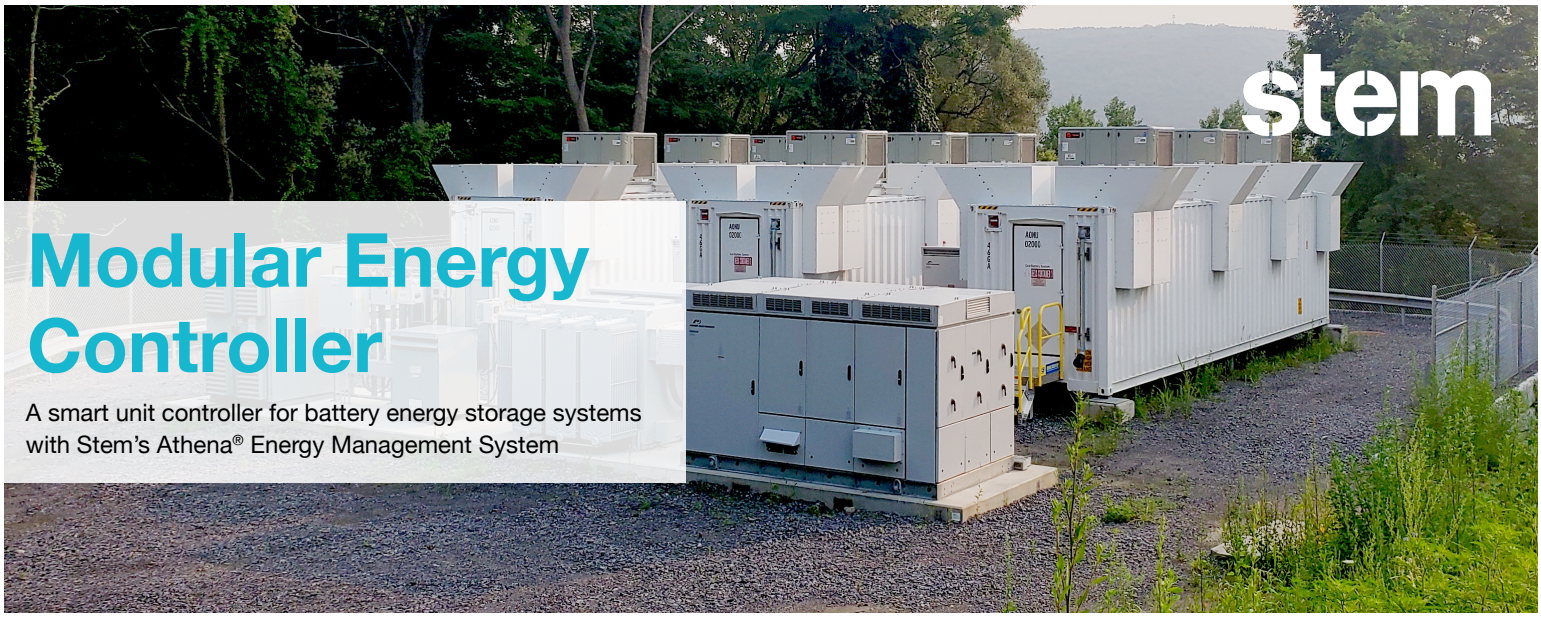


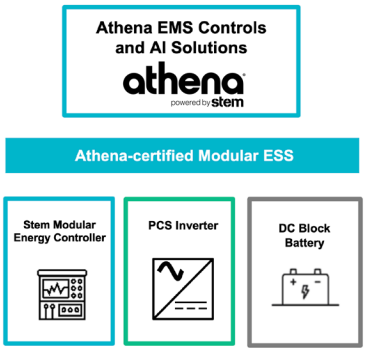
Modular Energy Controller

A smart unit controller for battery energy storage systems with Stem's Athena® Energy Management System

The Modular Energy Controller (MEC) is a critical component of Stem's innovative Modular Energy Storage System (ESS) designed to address the growing demand for efficient and sustainable energy usage at the Battery Energy Storage System (BESS) unit level.

The MEC software architecture, characterized by its hardware-agnostic nature, incorporates abstraction layers for the Inverter/Power Conversion System (PCS), Battery/DC block, and integration of the Energy Management System (EMS). This framework establishes a standards-based interface facilitating communication between the MEC and upstream monitors and controls entities, while also supporting downstream monitoring and control.

The MEC boasts an intelligent and user-friendly user interface (UI), along with web access for monitoring system behavior and strategically planning controlled maintenance processes over the anticipated 15-20 year lifespan of the BESS. The system features diagnostics to assess battery health and projected battery lifespan, a factor that typically determines the optimal timing for modernization investments.



Highlights

- Hardware- & technology-agnostic: interoperable with Top Tier Battery and PCS Suppliers
- Scalable from 125kW to 400MW
- Configures, Monitors, and Controls
- Easily installed by an EPC

Control Features

- Real Power
- Reactive Power
- Power Factor
- Volt-Var
- Freq-Watt
- Volt-Watt Curve
- LVRT, HVRT, LFRT, HFRT

Features

- Unit Controller for Stem's Modular ESS
- Modular structure for optimal performance and system redundancy
- User-friendly UI and remote web interface
- Validated with Real-Time Hardware in the Loop Simulator
- Available with 30min UPS
- Local data storage of 1 second interval for 30 days; Cloud data of 1 minute interval for 2 years
- Ethernet TCP/IP, CAN bus, and RS-485
- Operating Temperature: -20°C to 55°C
- Relative Humidity: Up to 95%, non-condensing
- Ingress Protection: 4X/IP66
- Reduces commissioning time
- Bring-Your-Own-Hardware (Battery and PCS)

For more information, contact sales@stem.com.

stem

Technical Specifications

Electrical

Input voltage range	100 – 240 VAC
Input power	2.8A @ 120VAC
Input Frequency	50 – 60HZ
Protections	Thermo-magnetic CB 1-pole 16A

Configure, Monitor, Control

Local/Cloud UI	Athena Edge UI
Default view	Charge mode, system voltage, active alarms
Languages	English
Alarms	Configurable relays, E-mail, SNMP traps
Remote user interface	Web interface
Maximum number of devices	Up to 100 (contact Stem for more details)

System Features

Functional Real Power Modes	Real power setpoint ramping Charge and Discharge rate limiting Open loop control Closed loop control SoC Balancing SoC Limiting Grid Forming SoC control
Functional Reactive Power Modes	Reactive power setpoint ramping Open loop control Closed loop control Grid Forming
Log data	Local: 30 days at 1 second intervals Cloud: 2 years at 1 minute intervals
Available Data	Active power, Reactive power, Voltage, Avg Current, Power Factor, DC Voltage, SoC, kWh

Communication Ports

LAN	8x10/100 Ethernet, RJ-45 connector

Mechanical

Dimensions (L x H x W)	25.04 x 35.35 x 11.81in
Weight	70 lbs

Uninterruptible Power Supply

UPS duration	30min

Applicable Standards

Environment	Operation: ETS 300 019-2-3 cl T3.2 Storage: ETS 300 019-2-1 cl T1.2
Safety	UL 508A

Environmental

Cooling	Natural convection
Operating temperature	-25°C / +55°C
Storage temperature	-40°C / +70°C
Humidity	95% (relative humidity, non-condensing)

Connections

Digital Inputs	4x
Dry Contact	Stop, Fire Alarm, Islanding, Manual Grid Tie
Digital Outputs	4x Stop, Fire Alarm, System Offline, System Standby
Digital Outputs Max	10A 250VAC

5 YEAR WARRANTY