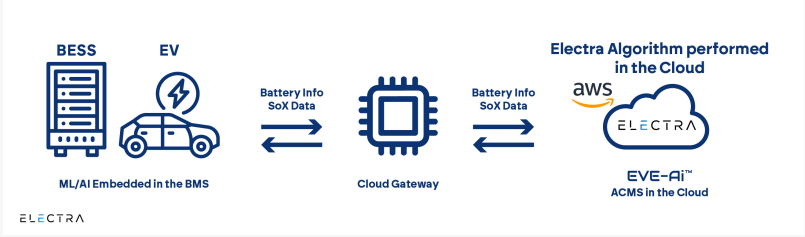
Electra Vehicles Validates Breakthrough AI-Driven Battery Management System Featuring an Embedded 'Brain' for Batteries

Electra announces a major milestone with the successful validation of its EVE□Ai™ Adaptive Controls platform, enabling AI-driven Battery Management System (BMS)



EVE□Ai™ Adaptive Controls

BOSTON, MA, UNITED STATES, January 28, 2026 /EINPresswire.com/ -- Electra Vehicles, the Boston-based leader in intelligent battery optimization, today announced a major milestone with the successful validation of its EVE□Ai™ Adaptive Controls platform—an embedded, real-time, AI-driven Battery Management System (BMS) that delivers unprecedented accuracy, adaptability, and intelligence to electrified systems.

> We've built a real brain for batteries. The intelligence doesn't just react; it evolves with the battery."
> *Fabrizio Martini - CEO and Co-Founder of Electra*

Developed initially for electric vehicle (EV) applications, Electra's platform is now scaling across energy storage, robotics, and critical infrastructure systems worldwide.

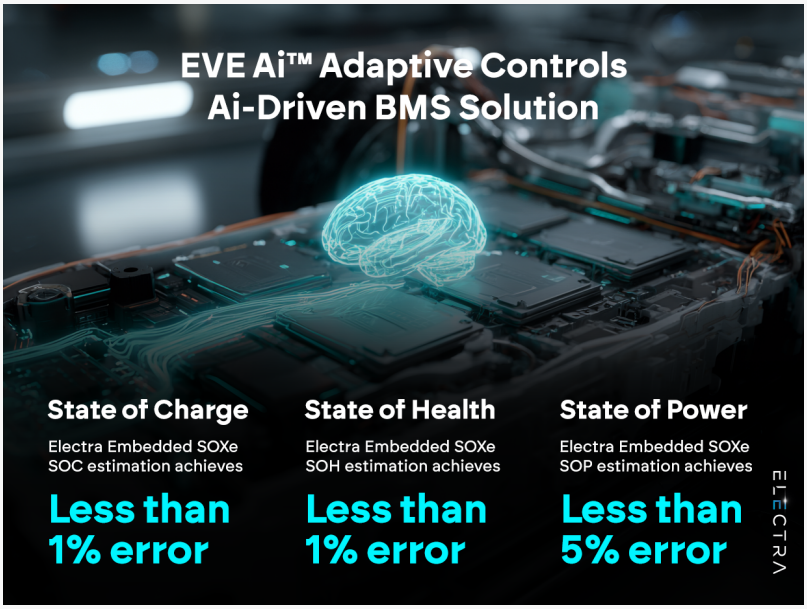
At the core of the platform is Electra's AI "brain" for Batteries—a tightly integrated combination of embedded hardware and physics-informed, agentic software that enables continuous monitoring, understanding, and optimization of batteries throughout their operational life.

What EVE-Ai Adaptive Controls Delivers

Electra's EVE-Ai™ Adaptive Controls – Embedded SoXe is an advanced AI platform that delivers high-precision, real-time estimation of State of Charge (SoC), State of Health (SoH), and State of Power (SoP). Embedded directly within the BMS, the system adapts to nonlinear battery behavior, temperature variation, chemistry evolution, and aging effects—achieving exceptional accuracy across the full battery lifecycle.

Combined with an AWS-based cloud infrastructure for continuous learning, updates, and fleet analytics, this embedded intelligence empowers OEMs and Tier 1s to:

1) Reduce battery-related costs
2) Extend battery life by up to 40%
3) Improve safety and reliability
4) Unlock intelligent, autonomous battery control at scale



EVE-Ai Adaptive Controls - AI-Driven BMS - Results/Outcome

Meeting Market Demand with AI That Thinks at the Edge
The global battery management market is scaling rapidly, driven by accelerating adoption of electric vehicles, battery energy storage systems (BESS), and autonomous platforms. Yet many legacy BMS solutions remain constrained by rule-based logic and static models, limiting their ability to adapt to real-world operating conditions.

Electra's EVE-Ai™ platform addresses this gap by combining physics-informed AI intelligence at the edge with cloud-enabled learning and fleet context. By uniting first-principles battery physics with advanced machine learning, the platform continuously adapts to usage patterns, thermal behavior, chemistry drift, and aging—delivering real-time optimization with accuracy that improves over time.

As battery systems grow more complex and performance expectations rise, this shift from traditional BMS to physical AI—spanning both embedded intelligence and cloud-scale learning—is becoming essential. Electra enables this transition, transforming battery management from static monitoring into predictive, adaptive intelligence built for scale.

"This platform was engineered so time-critical decisions operate at the edge, with automotive-grade robustness," said Brandon Jones, Head of Technology for Applied Engineering. "At the same time, cloud connectivity enables continuous learning and up-to-date health insights across the fleet."

Record-Breaking Accuracy Validated in Automotive Testing
Tested under vehicle-like conditions using LFP chemistries across both Beginning of Life (BOL) and Middle of Life (MOL), Electra's AI-BMS achieved:
1) Less than 1% error in State of Charge (SoC), vs industry standard:5% with peaks of 25%
2) Less than 1% error in State of Health (SoH), vs the industry standard of 7%-13%
3) Less than <5% error in State of Power (SoP) (average over charge/discharge cycles), vs industry standard of 9%-15%

These results significantly exceed typical industry benchmarks and demonstrate the platform's ability to deliver consistent, high-fidelity intelligence across the battery lifecycle.

Validation was completed in collaboration with a leading Tier-1 automotive partner under real-world vehicle operating conditions. Development and testing leveraged automotive-grade NXP hardware and additional platforms to ensure scalability, supported by a robust AWS cloud backbone for model training, diagnostics, and secure updates—reinforcing readiness for production deployment.

The Business Case: Solving Real Industry Pain Points
As electrification scales, the industry is moving beyond rule-based BMS toward AI-driven, physics-informed ("physical AI") battery intelligence to meet rising demands for safety, performance, and cost efficiency.

Electra delivers critical value to OEMs and Tier-1 partners by helping them:
1) Reduce system cost, weight, and oversizing. High-fidelity battery intelligence enables tighter design margins and more precise control strategies, reducing unnecessary pack oversizing and excess safety buffers. The result is lower BOM cost, improved energy density, and more competitive system designs.
2) Enhance safety, reliability, and warranty performance. Physics-informed AI detects early signs of degradation, imbalance, and thermal risk well before failures occur—supporting safer operation, higher reliability, and fewer warranty claims across deployed fleets.
3) Enable real-time, edge-based intelligence. Electra's models execute time-critical intelligence at the edge, while leveraging cloud connectivity for continuous learning, fleet-level insight, and refreshed health models. This enables faster response, greater system resilience, and deployment flexibility across vehicles, infrastructure, and industrial environments.
4) Differentiate platforms and accelerate time to market. By integrating AI-driven battery intelligence, Tier-1s can offer OEM customers smarter, more predictive systems—shortening development cycles, improving performance guarantees, and strengthening long-term customer relationships.

In a market defined by cost pressure, safety requirements, and performance expectations, Electra's physical-AI approach provides Tier-1 partners with the intelligence foundation needed to scale electrification with confidence.

Designed for EVs. Built to Scale.
While initially developed for automotive platforms, Electra's modular, scalable architecture is built to adapt across other high-impact applications:
- Battery Energy Storage Systems (BESS)
- Drones, robotics, and AI-powered mobility systems
- Data centers and mission-critical infrastructure

In every domain, Electra's embedded brain adapts to the specific battery

configuration—delivering high-precision control, continuous learning, and real-time autonomous optimization.

About Electra
Electra Vehicles is the leading AI-driven cleantech and B2B software company unlocking the full potential of battery technology. By combining Agentic AI and Physical AI, Electra delivers end-to-end intelligence across the battery lifecycle—fusing advanced AI/ML software with real-world battery systems to create the AI-Brain for batteries, an AI-BMS that enables batteries to sense, reason, and act.

Electra powers the next generation of energy operators—from grid-scale storage and renewables to data centers and battery manufacturers—as well as e-mobility leaders including automotive OEMs, Tier 1 suppliers, and fleet operators, and the emerging wave of robotics and autonomous systems, enabling a cleaner, more resilient, and fully electrified energy future.

Electra was co-founded in 2015 by Fabrizio Martini, who came to the idea while working as a Principal Investigator on a NASA project.

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