Edgecom Energy

NeuraCharge™
Vertical EMS

Secure, Reliable Distributed Energy
Resource Management and Optimization

Technical Brochure

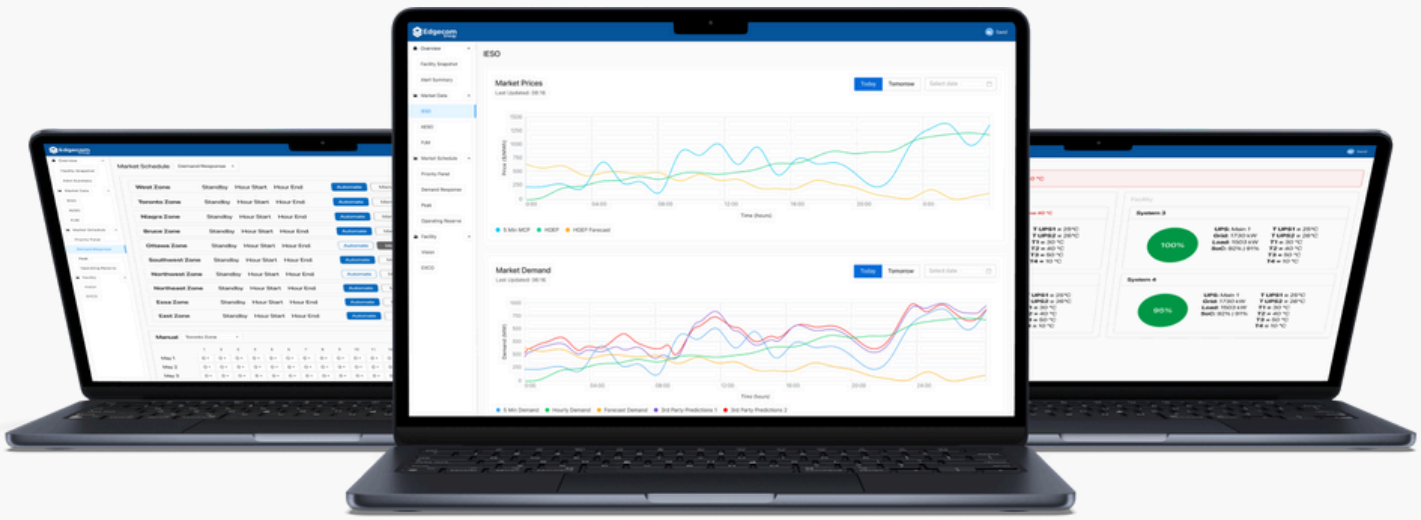
Version 1.0

2025

Introduction to NeuraCharge™

NeuraCharge™ is an advanced AI-driven vertical EMS designed for the management and optimization of Distributed Energy Resources (DERs). It enables real-time asset control, monitoring, and optimization to enhance energy efficiency, reduce operational risks, and maximize financial benefits through intelligent participation in grid programs.

Developed by Edgecom Energy, NeuraCharge™ leverages expertise in data science, AI, and energy storage systems to deliver actionable insights, automation, and cost-saving solutions for modern energy management.



Introduction to NeuraCharge™

Key Features & Capabilities

Technology-Agnostic & Scalable

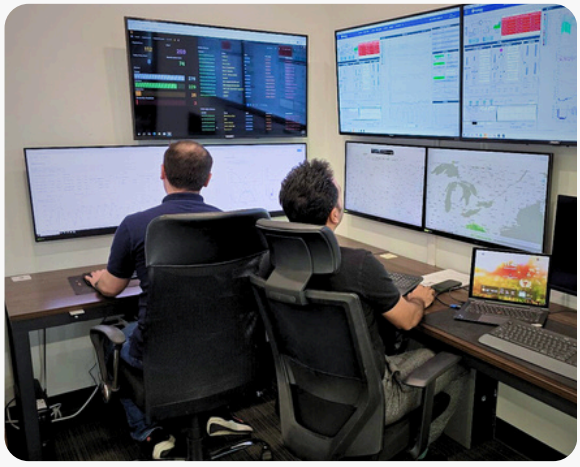
- Flexible architecture supports Photovoltaic (PV), BESS, generators, and other controllable loads.
- Turnkey controls with full-stack software for Energy Management System (EMS), Supervisory Control and Data Acquisition (SCADA), and Model Predictive Control (MPC).
- Modular design enables control of multiple sites, offering a holistic portfolio view.
- Control, visibility, and optimization of microgrids.

Advanced Monitoring & Real-Time Control

- 1 Second and sub-second data granularity for precise operational insights.
- Custom alerts and warnings for system anomalies.
- Real-time dashboards for market participation and asset performance.

Alarms & Warnings

- Over/under-temperature and voltage deviations.
- Inverter & BMS malfunctions.
- Ground faults, loss of communication, and unauthorized access alerts.
- Interlocking mechanism activations (e.g., racks, DC isolation switch).
- HVAC and fire suppression system warnings.



Asset Optimization

Performance Optimization & Analytics

Advanced Performance Metrics

- Battery Health Monitoring: State of charge, state of health, capacity cycles, and temperature.
- Operational Optimization: Reduce unnecessary ON/OFF cycles, optimize dispatch schedules, and maximize efficiency.
- Electrical Parameters: Voltage, current, system load, and interconnection details.
- Environmental Data: Humidity, temperature, and ambient conditions.

Comprehensive Integrations

Seamless integration with:

- EMS, SCADA, MPC, and BMS platforms.
- Batteries (UPS, PCS), generators, and dispatchable loads (e.g., HVAC, boilers, refrigeration, cold storage, and compressed air).
- Grid market data for informed dispatch decisions.

In-Depth Reporting

- Incident Reports: Capture system anomalies and operational deviations.
- Asset Performance Reports: Track DER utilization and efficiency.
- Market Participation Reports: Evaluate demand response and energy trading effectiveness.
- Financial Insights: Track cost savings, revenue streams, and operational expenses.

Asset Optimization

Optimized Market Participation

Customizable Program Priorities

Assign up to five energy program priority levels.

Flexible control options, including:

- Automated Market Participation: Seamless integration with Edgecom Energy's Network Operations Center (NOC)
- AI-Powered Forecasting: AI peak predictions up to 12 days of advance forecasts.
- Live Market Data Access: Ensure optimal participation in Coincident Peak Shaving, Demand Response, Arbitrage, and Ancillary Services.

dataTrack™ integration: granular understanding of primary energy-consuming equipment, accurate day-ahead load forecasting

Control & Dispatch Modes

- Remote Dispatch: Schedule or manually initiate dispatch via secure cloud access.
- Remote Utility Dispatch: Secure connection to the utility as an energy market requirement aligned to IEEE 1547
- Local Autonomous Response: NeuraCharge™ autonomously responds to voltage, frequency, and load variations.

Security & Configurations

Secure & Remote System Operations

- Built on ISO 27001, SOC II, and NIST 800-53 frameworks.
- Remote asset control, including switchgear, inverters, and contactors.
- Emergency Stop (E-Stop) and automated fire suppression deployment.
- Custom BOP control algorithms for enhanced optimization.
- Secure utility connection aligned to IEEE 1547.

Application Stacking & Customization

- Multi-layered applications operate concurrently and can be prioritized as a small microgrid.
- Asset Allocation Control: Assign a percentage of DER-rated power to different applications or ISO market programs.
- Custom Scheduling: Set hourly, daily, or yearly operational schedules.

Hardware Procurement & Installation Services

Edgecom Energy simplifies hardware deployment for NeuraCharge™, providing comprehensive procurement, installation, and commissioning services to ensure reliable, secure, and optimized performance.

- **Expert Hardware Selection:** Tailored recommendations to match your facility's specific requirements.
- **Competitive Procurement:** Leverage our relationships to secure high-quality hardware at competitive pricing.
- **Custom Hardware Production:** Capability to design and produce custom hardware solutions when off-the-shelf products aren't sufficient.
- **Rapid Installation & Commissioning:** Quick and seamless on-site installation by certified technicians to minimize operational disruption.
- **System Integration & Validation:** Full integration with existing energy infrastructure, including SCADA, BMS, and EMS, ensuring interoperability and data accuracy.
- **Compliance Assurance:** Hardware solutions designed with all relevant industry standards and regulatory requirements in mind (IEEE 1547, NERC, ISO standards).
- **Training & Support:** Comprehensive on-site training and ongoing technical support for your operations team.

Merchant Services & Market Programs

Revenue-Generating Applications

- Energy Arbitrage: Buy low, sell high.
- Spinning & Non-Spinning Operating Reserves
- Capacity Market Participation (Demand Response)

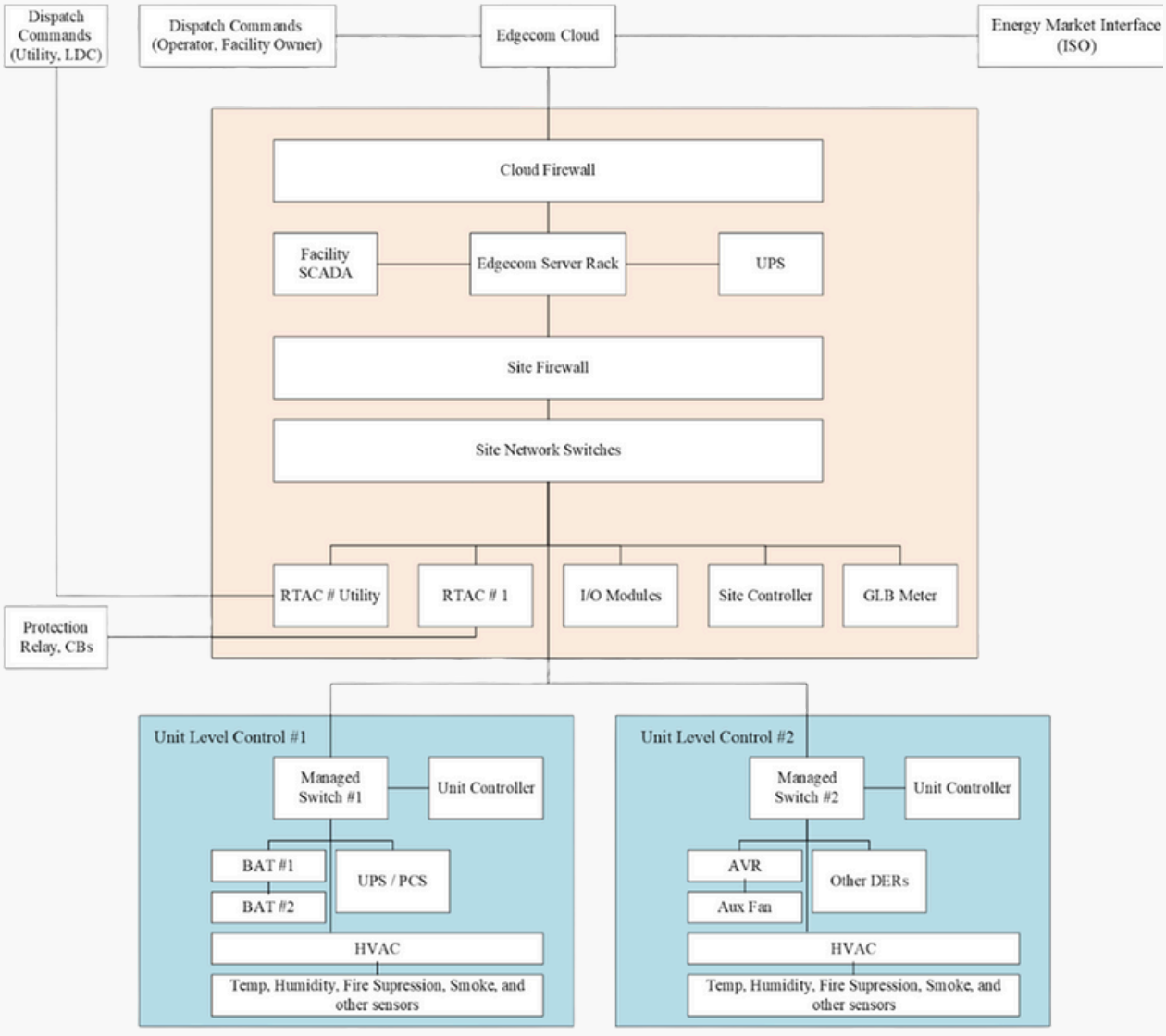
Renewable Energy Optimization

- Renewables Smoothing & Firming: Manage intermittent energy production in hybrid applications such as (solar+BESS) or (Wind+BESS).
- Clip Charging: Utilize excess solar energy efficiently.

Cost Reduction & Reliability

- Coincident Peak manages peak programs in the market, such as Global Adjustment in IESO and DTS in AESO.
- Non-coincident peak load shifting to manage utility demand charges.
- Demand Charge Mitigation: Optimize energy use patterns in a month to reduce the monthly charges, such as transmission connection/network (avoid transmission congestion charges) or distribution charges
- Resource Adequacy & Capacity Services.

Control Architecture



Frequently Asked Questions

What types of assets can NeuraCharge™ monitor and control?

NeuraCharge™ supports batteries (UPS, PCS), generators, and dispatchable loads.

What happens if an asset malfunctions?

NeuraCharge™ detects faults in real-time, alerts the user, and automatically initiates service calls.

Is NeuraCharge™ compliant with industry regulations?

Yes, NeuraCharge™ complies with ISO, NERC, and NIST cybersecurity and energy compliance standards.

Can NeuraCharge™ scale as my DER assets grow?

Yes, it is fully scalable, seamlessly integrating new batteries, generators, and loads without major reconfigurations.

How can I track my cost savings and revenues?

NeuraCharge™ provides detailed financial reports on energy cost reduction, revenue generation, and operational performance.

Is NeuraCharge™ accessible on mobile devices?

Yes, it features a fully responsive web interface for access on mobile, tablet, and desktop.

Can I customize my settings?

Yes, NeuraCharge™ allows full customization of control strategies, optimization settings, notifications, and reports.

How does NeuraCharge optimize energy arbitrage?

It analyzes market signals to shift energy use to low-cost periods and export surplus energy during peak-price windows.

Let’s Work Together

About Edgecom Energy

Edgecom Energy provides commercial and industrial facilities with an all-in-one energy management solution to outsmart rising energy costs. Our platform combines real-time facility and grid analytics to deliver advanced insights and enable better decision-making, reducing costs and emissions while maximizing grid incentives.

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