DOOSAN GRIDTECH® SOLUTIONS

Distributed Energy Resource Optimizer® (DG-DERO®)

A **field-proven distributed energy resource management system** (DERMS), providing control, monitoring and optimization of distributed energy resources (DER). Be it a single energy storage system or a fleet of thousands of devices, **DG-DERO® works to maximize the value of DERs** through a flexible, modular, and configurable set of applications.

BENEFITS AT A GLANCE

Optimizes Value

Multiple applications are optimized on intra-hour, hourly, or daily time horizons as conditions change.

Simplifies Fleet Management

Serves as a central hub for all DERs – no need for multiple custom portals as DERs proliferate.

Scales as the Fleet Grows

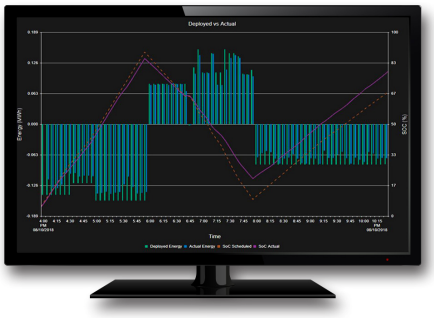
Modular, flexible architecture allows for scaling to 1,000's of devices.

Lowers Risk

Embrace of open-standards both lowers the cost and time for DER integration and preserves flexibility to add or swap components in the future.

FEATURES & FUNCTIONALITY

- Dispatch and scheduling interface for both system-wide and individual asset control.
- Optimization considers both the bulk power market – energy, capacity, and frequency services - and local grid operations – voltage support and congestion management.
- Integrated forecasting capability for load and prices.
- Web-based interface with detailed reporting functionality to monitor fleet performance.
- User-configurable secure system access – read-only users, users, and administrators – ensures the right level of access for every stakeholder.
- Standardized communication and control of aggregated resources through a common interface, avoiding custom interface confusion.
- Standards-based communication protocols (e.g., DNP3, MODBUS) aligned with DER open standards-based information models (MESA, SunSpec, and OpenADR).
- Architecture designed to interface with existing utility IT systems (e.g., market trading systems, historians, etc.).
- NERC-CIP compliant, Windows server-based software to minimize cybersecurity risks.



APPLICATIONS FOCUSED ON VALUE CREATION

DG-DERO® has an ever-expanding suite of value creating applications. Applications are optimized according to the relevant time-horizons. Value creation is maximized with optimization occurring every five minutes in response to changing conditions. Applications can be configured to meet each customers' unique needs.

Energy Arbitrage: 1 – 5 day look ahead, once per day

Renewable forecast variance: Looks ahead 60 mins; every 60 mins

Energy Imbalance Mitigation: Looks ahead 5-60 mins; every 5 – 10 mins

Peak Load Reduction: Looks ahead 5 mins - 6 hours, every 5 mins

Real-time Price Dispatch: Looks ahead 5 mins - 6 hours, every 5 mins

Congestion management: Looks ahead 5 mins - 6 hours, every 5 mins

SOC Correction: Every 5 mins, behind the scenes

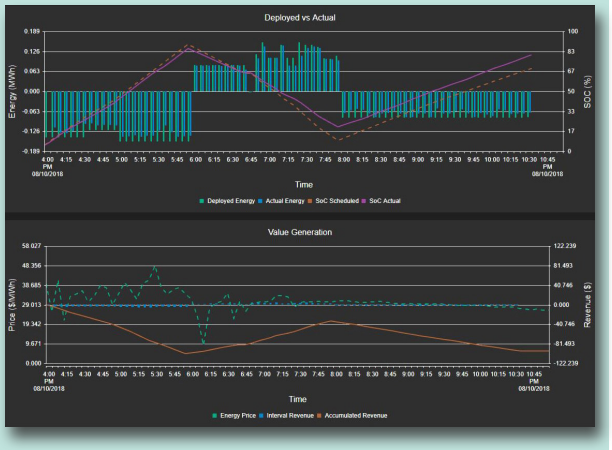
Voltage Support: Every 1-5 minutes

Real-Time — *Hour-ahead* — *Day-ahead*

Ability to be Nimble ⟷ **Ability to Plan Ahead**

CUSTOMERS HAVE BENEFITED FROM DG-DERO® IN MULTIPLE USE CASES

- Distribution utility automatically dispatches energy storage to mitigate wind forecast variance – avoiding expensive purchases of power from the spot market.
- Unexpected deviations from a utility's load forecasts are avoided automatically by charging or discharging a fleet of ESSs – avoiding charges from the balancing authority.
- Distribution utility dispatches a set of behind-the-meter ESSs to minimize transmission system demand charges.
- Distribution utility engages a combination of ESS and solar photovoltaic (PV) resources to provide voltage support services on circuits with high penetration of rooftop PV.



MESA Open Standards for Energy Storage · SUNSPEC ALLIANCE · openADR ALLIANCE · dnp Distributed Network Protocol

At Doosan GridTech®, we believe that enduring economic growth and environmental healing start with a resilient, low-carbon power grid. We are a multi-disciplined team of power system engineers, software developers, and turnkey energy storage specialists. We help utility-scale power producers evaluate, procure, integrate, control, and optimize energy storage, solar power, and other renewable power resources. Our battery storage experts in Seattle, Melbourne, and Seoul have designed and built over 35 installations in the Americas and Asian-Pacific regions – representing over 700 MWh of capacity.