



Specification Sheet

GEMS Fleet Director

Wärtsilä Energy Storage and Optimisation (ES&O)'s **GEMS Fleet Director** provides centralised, real-time visibility into a global fleet of power plants, acting as the perfect companion to GEMS Power Plant Controller.

GEMS Fleet Director is hosted in the cloud and allows for secure remote monitoring and control of real-time equipment status, operation history, and aggregated alarms at the fleet, power plant, and individual device levels. It works closely with GEMS Power Plant Controller installed on site to enable the intelligent operation of renewable, thermal, energy storage, and hybrid power plant assets.

Advantages

Maturity – GEMS Fleet Director has been deployed at over 100 power plants worldwide.

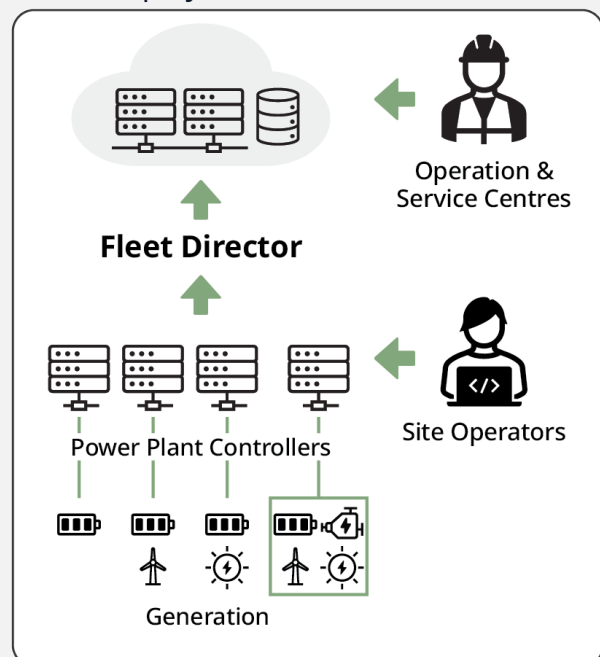
Performance and Scalability – A single GEMS Fleet Director installation provides visibility into all of your GEMS Power Plant Controller-enabled power plants.

Security – GEMS Fleet Director follows modern industry standards, such as OWASP, and includes security features like user authentication, role-based plant data access, data encryption, and audit trails.

Cloud Hosting – Wärtsilä provisions GEMS Fleet Director's hosting in the secure Google Cloud and manages its data storage, network security, and data replication to ensure high reliability, performance, and availability. Wärtsilä works with customers to establish a secure connection between GEMS Power Plant Controllers installed at power plants and GEMS Fleet Director hosted in the cloud.

Intelligence – By leveraging Wärtsilä's advanced machine learning and forecasting technologies, GEMS Fleet Director allows sites to utilise intelligent operation dispatch through optional products like GEMS IntelliBidder.

GEMS Deployments



Key Functions

User Experience – Secure web-based user interface for real-time plant monitoring, historians, reports, manual plant control, and data download. GEMS Fleet Director's UI mirrors GEMS Power Plant Controller, allowing for a unified experience when accessing the site locally or remotely.

Operator Alerts – Configurable event and alarm notifications to registered users via email and text messaging.

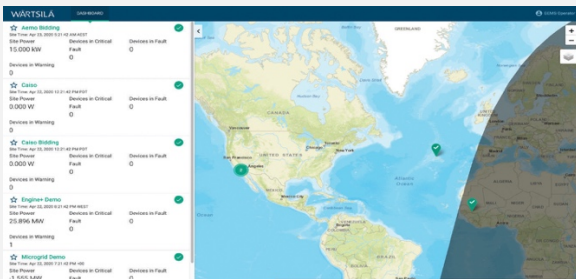
Remote Updates – Through an agreement for GEMS Fleet Director Services, gain access to regular updates to the GEMS UI for your Power Plant Controller and Fleet Director, including new features and enhancements.

Optional Data Diode – GEMS Fleet Director can optionally be connected via a data diode to further enhance your site's cybersecurity. This ensures that site telemetry is available remotely, but no data or commands can be sent back to the site.

Data Capacity and Retention – GEMS Fleet Director captures and stores over 100,000 data points per second per site, including battery module and cell-level data.

- **Raw data granularity** (report-by-exception) stored for a minimum of 8 weeks
- **Module data** stored for a minimum of 8 weeks (considering such module data cannot be provided in the event of an internet connection failure)
- **1-minute data** stored for a minimum of 26 weeks
- GEMS Fleet Director can funnel the data into other GEMS product offerings for even longer-term storage.

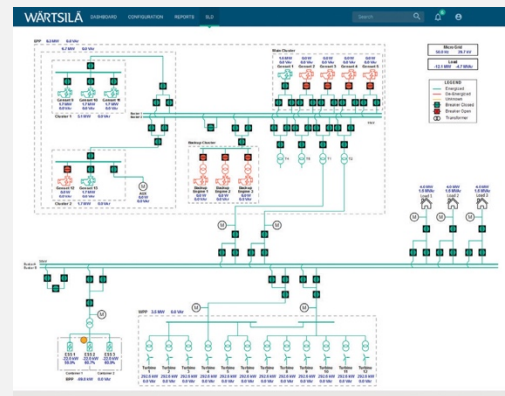
Web User Interface (UI) Features



Fleet View – Real-time and customisable high-level status and health of an entire power plant fleet on a world map.



Plant Dashboard – Customisable, detailed information illustrating the most important aspects of the power plant on a single view. This example shows the power contributions of co-located engine, wind, and battery assets, as well as grid frequency and battery state of charge.



Single-Line Diagram – Interactive equipment layout diagram showing the health of individual devices and operating status.

Site Dashboard Customisation – The GEMS UI allows deep customisation to fit customer needs.

O&M Features – Custom reports can be created and shared among GEMS users to show real-time and historic views of subsets of GEMS data points. Alarms and events are trackable in real-time as well as in historic views.

Data Export – All historical data can be exported from the GEMS platform for further data processing.

Security

User Management – The central user management system provides authentication and authorisation for all connected power plants.

Access Control – Access to power plants can be restricted per user group within an organisation. Each user group can be assigned specific access controls per power plant (such as direct device commands, operation control, site configuration, etc.)

Secure Sign-On – GEMS Fleet Director enforces Multifactor Authentication (MFA), which confirms your identity by requiring a second verification method, such as a code texted to your phone or generated by an authenticator app, greatly enhancing your business's digital security.

System Integration

Third party software systems can interact with GEMS Fleet Director via its built-in RESTful Web API to retrieve real-time data or send control commands.