



Specification sheet

# GEMS Cloud Connect

Wärtsilä Energy Storage’s **GEMS Cloud Connect** provides centralised, real-time visibility into a global fleet of power plants, acting as the perfect companion to GEMS PPC.

GEMS Cloud Connect 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 PPC installed on site to enable the intelligent operation of renewable, thermal, energy storage, and hybrid power plant assets. Importantly, it is the gateway to access GEMS cloud products, like our intelligent bidding and optimisation solution and advanced cell-level data and analytics.

## Advantages

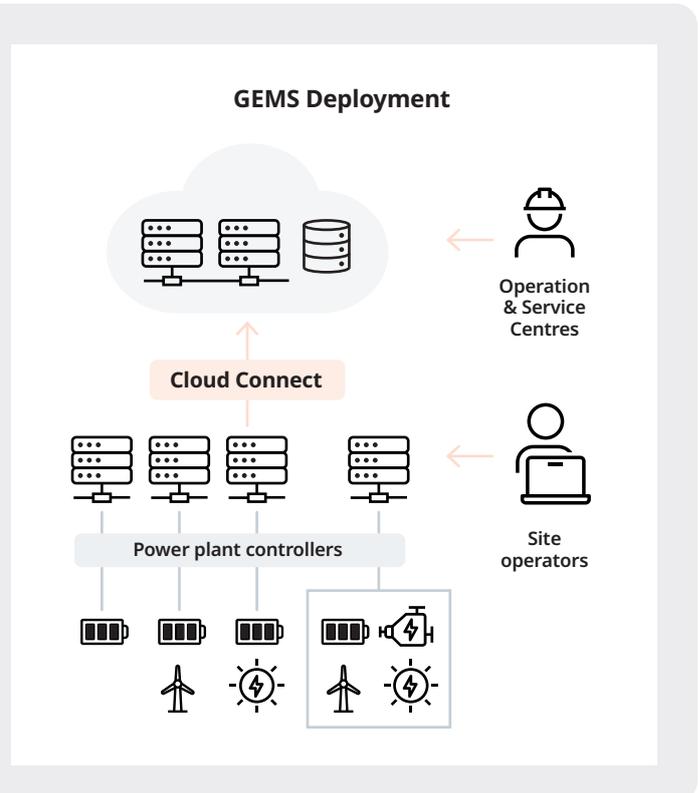
**Maturity:** GEMS Cloud Connect has been deployed at over 100 power plants worldwide.

**Performance and Scalability:** A single GEMS Cloud Connect installation provides visibility into all of your GEMS PPC-enabled power plants.

**Security:** GEMS Cloud Connect 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 Connect is SOC 2 Type 1 compliant.

**Cloud Hosting:** Wärtsilä provisions GEMS Cloud Connects 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 PPCs installed at power plants and GEMS Cloud Connect hosted in the cloud.

**Intelligence:** By leveraging Wärtsilä’s advanced machine learning and forecasting technologies, GEMS Cloud Connect allows sites to utilise intelligent operation dispatch through optional products like GEMS Bidcast.



## Advantages

**Experience:** Secure web-based user interface for real-time plant monitoring, historians, reports, manual plant control, and data download. GEMS Cloud Connect's UI mirrors GEMS PPC, 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 Cloud Connect Services, gain access to regular updates to the GEMS UI for your PPC and Cloud Connect, including new features and enhancements.

**Optional Data Diode:** GEMS Cloud Connect 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 Cloud Connect 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 (except during outages)
- **1-minute data** stored for a minimum of 26 weeks
- GEMS Cloud Connect can funnel the data into other GEMS product offerings for even longer-term storage.

## Security

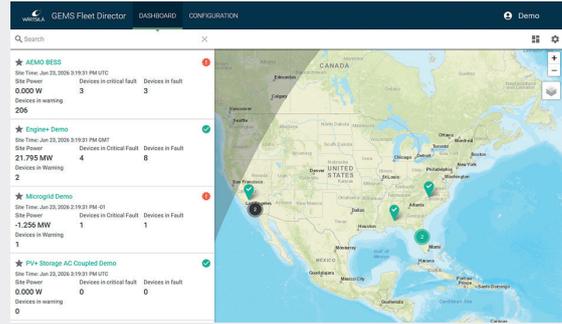
**User Management:** The central user management system provides authentication and authorisation for all connected power plants.

**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.)

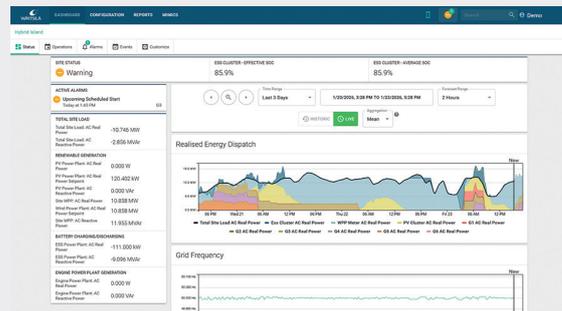
**Secure Sign-On:** GEMS Cloud Connect enforces Multifactor Authentication (MFA), which confirms your identity by requiring a second verification method, such as a code texted to your phone or generated by an authenticator app, greatly enhancing your business's digital security.

## System Integration

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



**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.

The screenshot shows the 'Alarms and Events' dashboard. It includes a table with columns for 'DESCRIPTION', 'STATUS', 'SEVERITY', 'START TIME', 'END TIME', 'ACKNOWLEDGED', and 'DETAILS'. The table lists several active and historic alarms related to system monitoring and safety.

DESCRIPTION	STATUS	SEVERITY	START TIME	END TIME	ACKNOWLEDGED	DETAILS
Influx Database Disconnected	Primary Controller System	00:01:47	Jan 30 2024, 6:04:12:743 PM	Jan 30 2024, 6:05:59:823 PM		
Chiller Not Running	GridSafe-Quantum Enclosure 010-01	00:00:01	Jan 13 2024, 3:42:34:538 PM	Jan 13 2024, 3:42:35:526 PM		
1-10 Detector Missing heartbeat	GridSafe-Quantum Enclosure 010-01	00:00:01	Jan 13 2024, 3:42:34:538 PM	Jan 13 2024, 3:42:35:526 PM		
Chiller Not Running	GridSafe-Quantum Enclosure 010-03	00:00:01	Jan 13 2024, 3:42:16:573 PM	Jan 13 2024, 3:42:17:574 PM		
1-10 Detector Missing heartbeat	GridSafe-Quantum Enclosure 010-03	00:00:01	Jan 13 2024, 3:42:16:573 PM	Jan 13 2024, 3:42:17:574 PM		
Chiller Not Running	GridSafe-Quantum Enclosure 010-02	00:00:01	Jan 13 2024, 3:42:16:581 PM	Jan 13 2024, 3:42:17:581 PM		
Chiller Not Running	GridSafe-Quantum Enclosure 010-02	00:00:01	Jan 13 2024, 3:42:16:589 PM	Jan 13 2024, 3:42:17:589 PM		

**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.

