Specification sheet

GEMS Grid Command & GEMS Rack

Wärtsilä Energy Storage's **GEMS Grid Command** conducts intelligent grid control and optimised power management for islanded grids of all sizes. It controls a diverse array of energy generation assets – solar, wind, energy storage, thermal – as well as hybrid power plants that combine multiple types of energy resources.

Advantages

Maturity: Developed and refined over decades, GEMS Grid Command is managing islanded grids across the world.

Hardware agnostic: GEMS Grid Command supports a wide range of devices from major manufacturers of renewables, energy storage, and thermal generation equipment.

Future proof: Built upon a software-as-a-service architecture, GEMS Grid Controller can be extended with additional solutions, new applications, and communication channels to address new business challenges after commissioning.

Intelligence: GEMS Grid Command comes with rich solution libraries encompassing standalone microgrids, grid-tied microgrids, and black- starting operations. GEMS machine learning and rule engine technolo-gies enable intelligent dispatch and forecasting to maximise microgrid performance and reduce fuel and maintenance costs.

Scalability: A single GEMS Grid Command can support thousands of devices and GWh-scale sites

Reliability

- Dual controllers, switches, and firewalls in hot standby with failover arrangement
- Remote software update capability via GEMS Grid Command
- Controller performance monitoring

GEMS Grid Command Connections
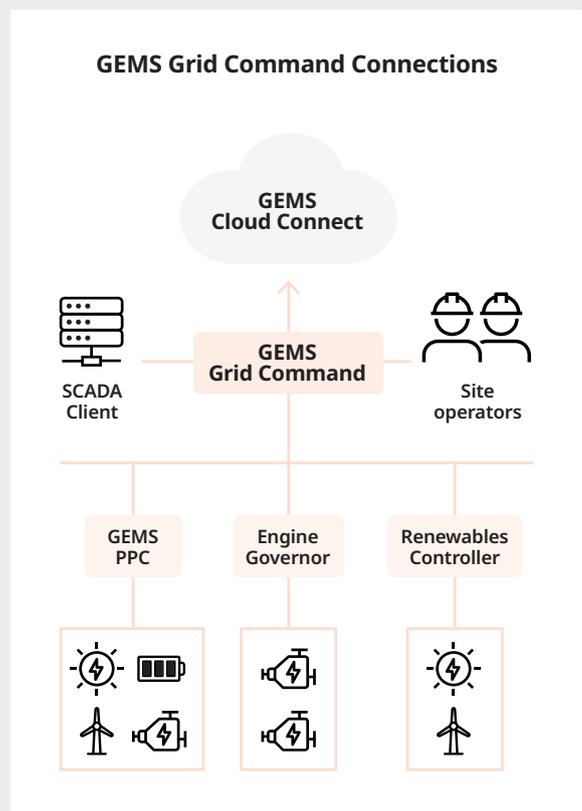
Equipment Support

GEMS PPC is hardware agnostic. Over the years, Wärtsilä has qualified, tested, and integrated many energy generations, power measurement, and grid protection devices from major manufacturers into GEMS Grid Command via a plug-and-play device driver architecture:

- Battery Management System (BMS) from all major vendors
- Power Conversion System (PCS) from all major vendors
- PV Inverters from all major vendors
- DC Combiners
- Wärtsilä engines
- Third party generators
- Wind farm controllers
- Microturbines
- Protection relays/switchgears
- Power meters
- Battery enclosure and battery balance of plant equipment
- HVACs

Cybersecurity

- GEMS Grid Command is designed to IEC 62443-4 standards
- GEMS Grid Command network adheres to the IEC 62443-3 standard
- GEMS Cloud Connect is SOC 2 Type 1 compliant
- SSL and IPSec VPN remote access support
- Security patch service available

Historical Data Retention

- Raw report-by-exception data retention: 2 weeks
- 1-minute downsampled data retention: 8 weeks

Customisation and Extension by GEMS Site Builder

- Power plant configuration
- SCADA interface configuration
- Rule Engine configuration
- User interface configuration
- Software version management
- Remote software update

Communication Media

- Ethernet
- Fiber optic
- Seria
- Wireless
- Analog and Digital I/O

Accessibilities

Web-based HMI for local Operator interface access

RESTful Web API and WebSocket Streaming API

- Data stream to GEMS Cloud Connect in the cloud
- Support for all major control and data acquisition SCADA protocols including Modbus, DNP3, IEC61850, and OPC UA
- Each interface's data points are fully configurable based on plant composition and functions

Control Latency

- <10 ms processing time

Supported Solutions

Island+ in combination with GEMS Grid Command
– Our AI-based grid dispatch solution manages complex island grids involving hybrid generation solutions with engines, storage, and renewables.

See Wärtsilä solution specification sheets for additional details.

Related GEMS Products

Wärtsilä GEMS PPC software
for generation asset control, local operation, monitoring, protection and data collection onsite installed in the GEMS Rack. GEMS Power Plant Controller and GEMS Grid Controller can be co-installed in the same GEMS Rack to work in unison.

Wärtsilä GEMS Cloud Connect
for central fleet management from the cloud.

Wärtsilä GEMS Virtual Plant Emulator
for testing, commissioning preparation and training

See GEMS product specification sheets for additional details.

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