

Solution sheet

GEMS PPC

Valo's **GEMS Power Plant Controller (PPC)** conducts intelligent power control and optimised energy management operations in order to meet grid requirements and response times, charge and discharge the battery appropriately, and maximise project value. GEMS PPC manages power plants of all sizes and a diverse array of energy generation assets – solar, wind, energy storage, and thermal – as well as hybrid power plants that combine multiple types of energy resources.

Advantages

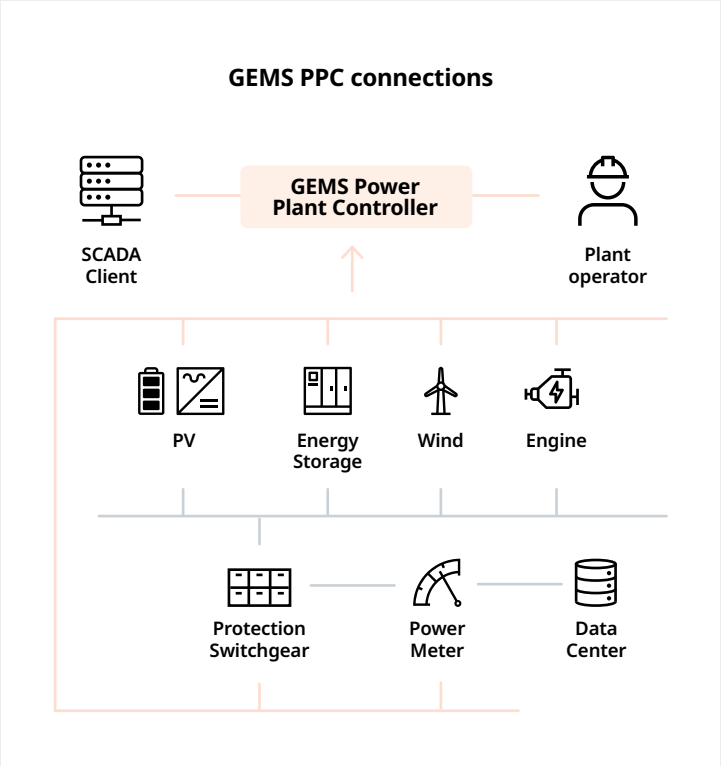
Maturity: Developed and refined over decades, GEMS PPC manages 100+ projects globally.

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

Intelligence: GEMS PPC comes with rich solution libraries encompassing both on-grid and off-grid applications. GEMS machine learning and rule engine technologies enable the intelligent dispatch and stacking of value streams to maximise plant performance and revenue.

Scalability: A single GEMS PPC can support thousands of devices and GWh-scale sites.

Future proof: With its mature software and hardware architecture, GEMS PPC can be extended with additional solutions, new applications, and communication channels which address new business challenges after commissioning.



Hardware

- **Control rack dimensions:** 800 x 1000 x 2000 mm
- **Rating:** IP10, NEMA1
- **Operating temperature:** 5°C to 40°C
- **Humidity:** 10% – 80%, non-condensing
- **Controller:** Redundant Hardware Servers, RedHat Enterprise Linux OS, 2 x Intel Xeon Gold 2.2 GHz processors, 128-GB RAM, 2 x 800-GB SSD and 2 x 1.6-TB SSD NVMe (RAID 1), 2 x 1-GB and 2 x 10-GB ethernet connections
- **Network:** Three security zones segmented by network switches and firewalls
- **Power budget:** 600-1300 W
- **UPS:** 20 – 220 minutes

Values measured under test conditions, actual values measured at site.

Equipment Support

GEMS PPC is hardware agnostic. Over the years, we have qualified, tested, and integrated many energy generation, power measurement, and grid protection devices from major manufacturers into GEMS PPC 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
- Engines
- Third party generators
- Wind farm controllers
- Microturbines
- Protection relays/switchgears
- Power meters
- Battery enclosure and battery balance of plant equipment
- HVACs

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

Cybersecurity

- GEMS PPC is designed to IEC 62443-4 standards
- SSL and IPSec VPN remote access support
- Security patch service available
- SOC 2 Type 1 Compliant (GEMS Cloud Connect)

Historical Data Retention

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

Control Latency

- <10 ms processing time