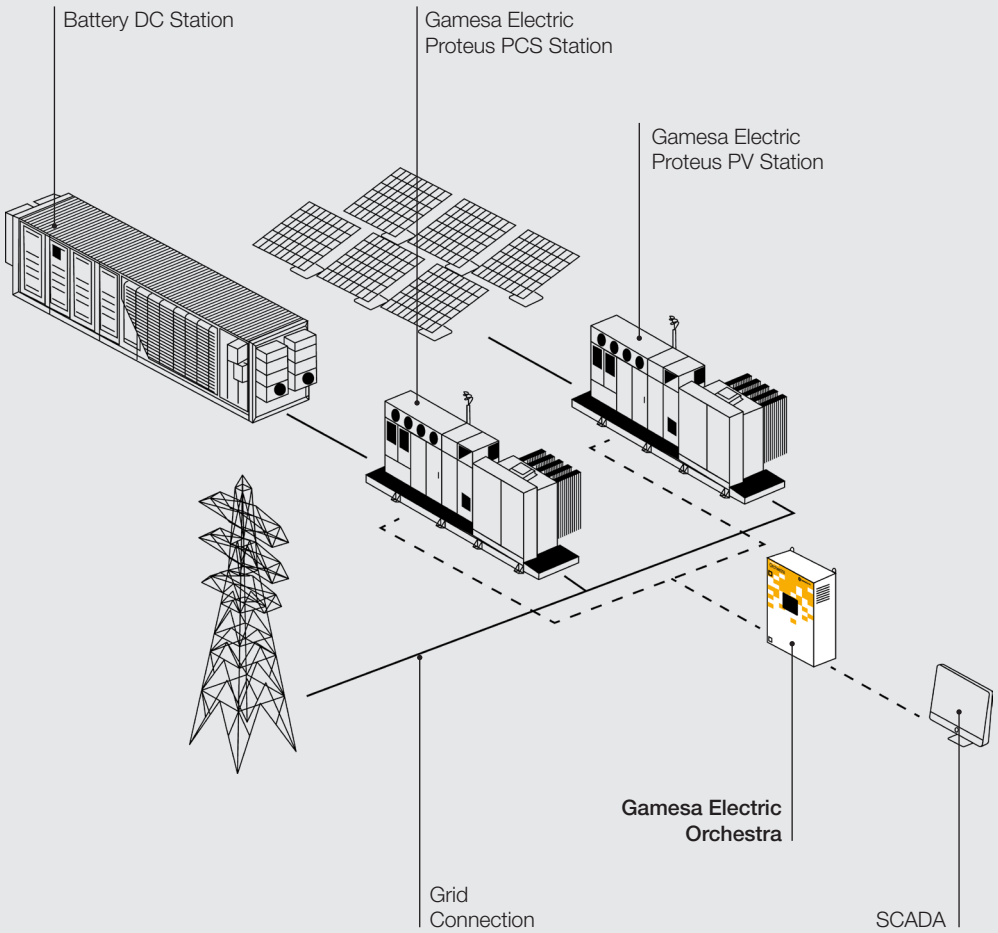
GamesaElectric

Gamesa Electric Orchestra

Power Plant Controller for PV and Storage

2024 | Datasheet



Gamesa Electric Orchestra

Power Plant Controller for PV & BESS

Broad & flexible functionality	Flexible plant configuration: - Photovoltaic generation - BESS stand alone - Hybrid solar + storage	Multiple applications: Fast frequency response (FFR), voltage regulation, active/reactive power control, ramp-rate, power oscillation damping (POD)...	Local and remote control and monitoring compatible with different users: plant operator, grid operator, plant owner, service team
Grid connection robustness	Extensive grid code knowledge based on wind, solar and BESS experience in more than 54 countries.	Grid code compliance proven in the most demanding markets including Europe, Australia, Mexico, USA and others	Advance functionalities as optional: Grid forming based on VSM algorithms (on-grid and off-grid modes), black start, synchronization of grids, support of external grid outage.
Scalability and connectivity	Scalability from small to large utility scale projects	Multi-PCS and multi-PV inverter coordination for maximum performance. Optimized state of charge (SOC) recovery algorithms	High communication speed and conectivity capacity, fast plant response.

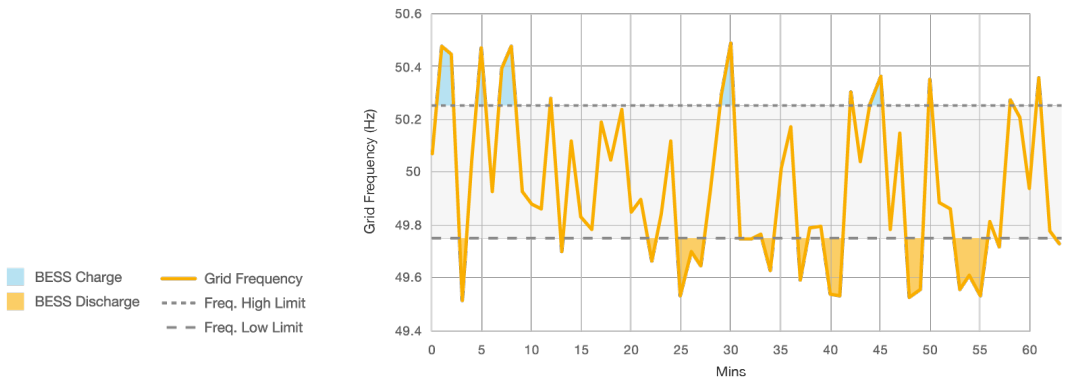
Gamesa Electric Orchestra brings intelligence to the PV & storage system optimising resources and maximising performance.

Gamesa Electric Orchestra Functionalities & Applications

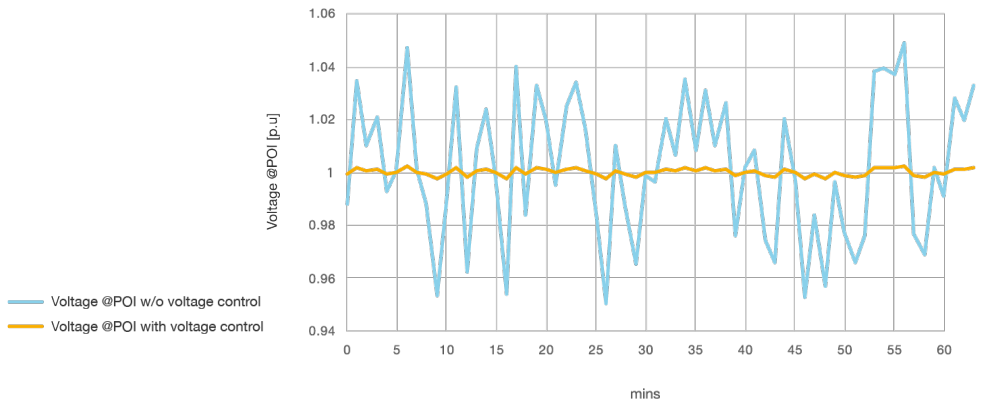
Power Quality

	PV Plant	BESS Stand alone	Hybrid PV + BESS
Grid code compliance	✓	✓	✓
Primary frequency response (P-f droop)	✓	✓	✓
Synthetic Inertia	✓	✓	✓
Voltage control	✓	✓	✓
Power factor, reactive power control	✓	✓	✓
Ramp rate (active/reactive power)	✓	✓	✓
Power oscilation damping (POD)	✓	✓	✓
Q-V droop, P-V droop	✓	✓	✓
Q-P droop, PF-P droop	✓	✓	✓

Frequency control



Voltage Control



Gamesa Electric Orchestra Functionalities & Applications

Energy management [1]

	PV Plant	BESS Stand alone	Hybrid PV + BESS
External P, Q set-points	✓	✓	✓
Secondary and tertiary response	✓	✓	✓
Energy arbitrage (trading)		✓	✓
Peak shaving (load shedding)		✓	✓
PV Energy Shifting			✓
Plant Curtailment	✓	✓	✓

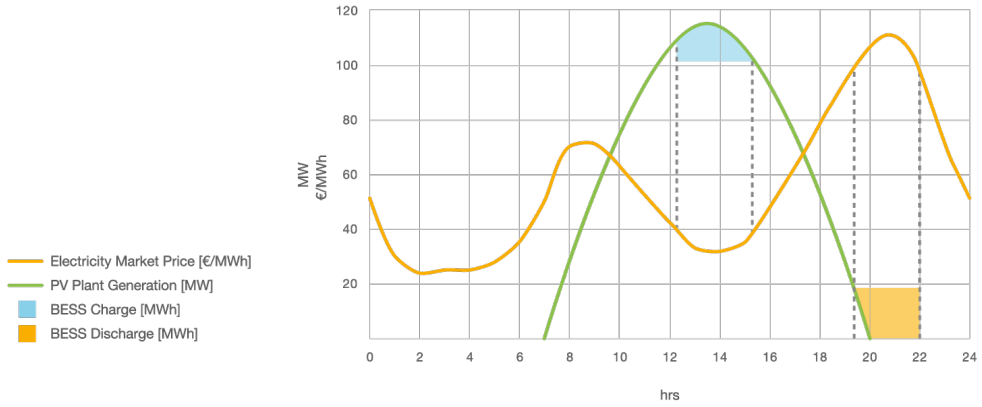
[1] Energy Management Functionalities executed through an extrenal P/Q reference

Advanced functionalities

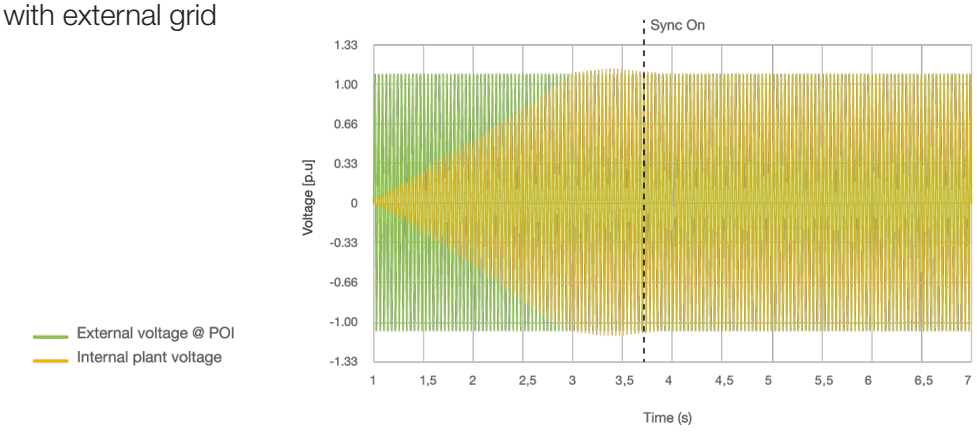
	PV Plant	BESS Stand alone	Hybrid PV + BESS
Grid forming (off-grid mode)		✓	✓
Black Start		✓	✓
Grid forming (on-grid mode)		✓	✓
Synchronization internal/external grid		✓	✓

[1] Consult Gamesa electric for advance functionalities in PV plants without batteries.

PV Energy Shifting

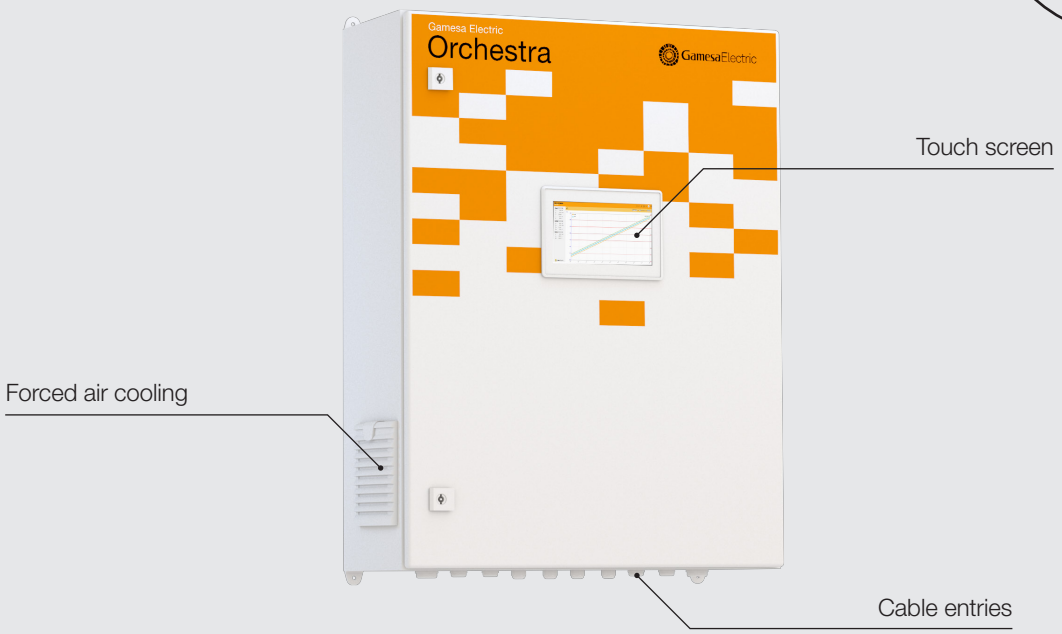


Black start / grid forming / Synchronization with external grid



Gamesa Electric Orchestra Specifications

Shaping New Energy



General Data	
Plant Configuration[1]	Photovoltaic / BESS Standalone / Hybrid PV + BESS
Inverter Compatibility	Gamesa Electric Proteus Series

Main characteristics	
Dimensions (H / W / D)	800 x 600 x 300 mm [31.5 x 23.6 x 11.8 inch]
Weight	45 kg [99.2 lb]
Standard Protection Class[1]	IP20
Power Supply[1]	250W, 1ph, 230Vac 50/60Hz
Cooling	Forced air
Mounting System[1]	Wall / Support structure mounted
Certification[2]	CE Marking

Environmental Conditions	
Temperature Range – Operation[1]	0ºC / +60ºC [32ºF / 140ºF]
Relative Humidity	5 – 95% (non-condensing)
Maximum Altitude[1]	2000 m
Corrosion Protection[1]	C4

Grid Metering	
Integrated Direct Analog Readings[3]	3 x CTs and 3 x VTs
Grid Analyzer	Optional

Communications	
Power Converters	Modbus TCP/IP
SCADA[1]	Modbus TCP/IP
Grid Operator[1]	Modbus TCP/IP
Webserver	Included

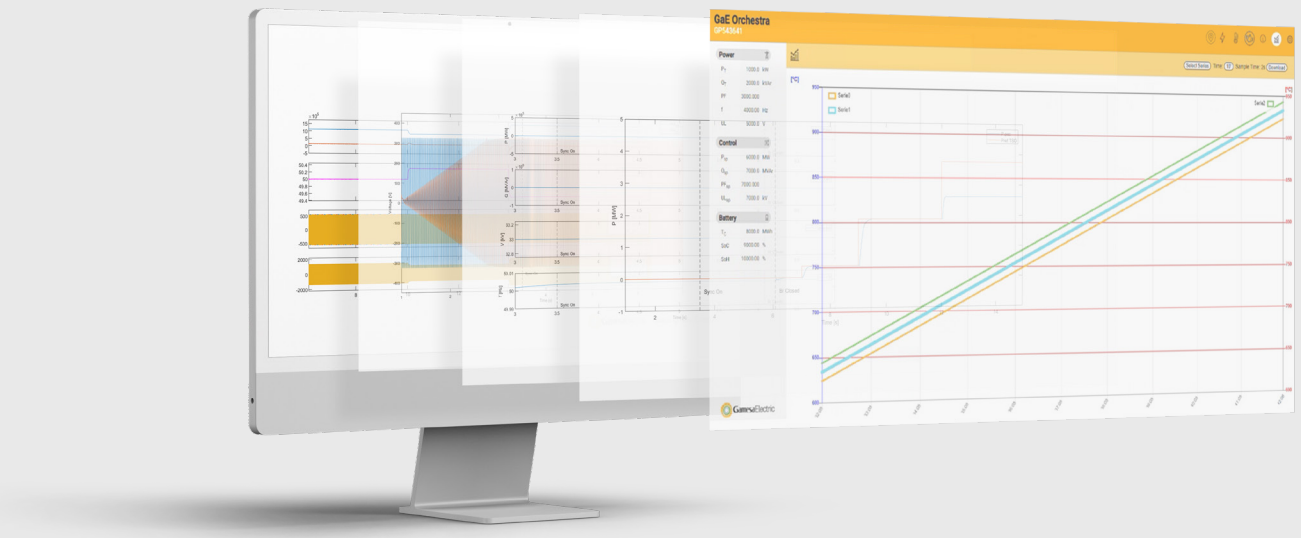
Optionals
Grid Analyzer
Touch screen
Auxiliary power supply at +24V
Low Temperature Kit up to -20 ºC [-4 ºF]
High Altitude Kit up to 4,000 [13,123 ft]
Protection Against High Corrosion C5
Power Supply Kit 250W, 120Vac, 1ph, 50/60Hz
Cold Swap Redundancy

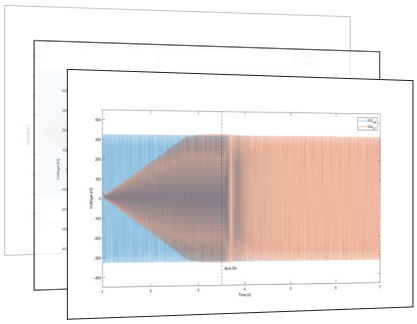
[1] Consult Gamesa Electric for a specific configuration

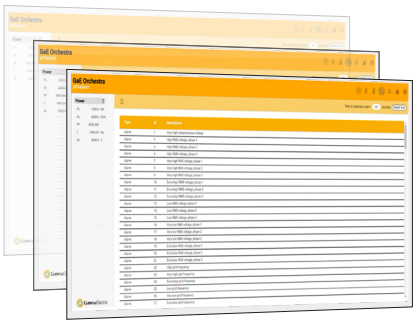
[2] Consult Gamesa Electric for different Standards/Directives

[3] Optimum for solutions where Orchestra is located in a near proximity of the POI measurement (<10 m [32.8 ft])

Gamesa Electric Orchestra Additional Services







Grid Code Analysis Support

- Grid code analysis by project
- Grid integration, grid impact and Grid Performance Standards (GPS) support
- PSS/E, PSCAD and DigSILENT models available upon request
- Certification of grid codes with HIL (hardware in loop)

Data Monitoring

- Plant performance at POI
- Battery performance
- Local & cloud based options
- Webserver

External Control and Monitoring Interfaces

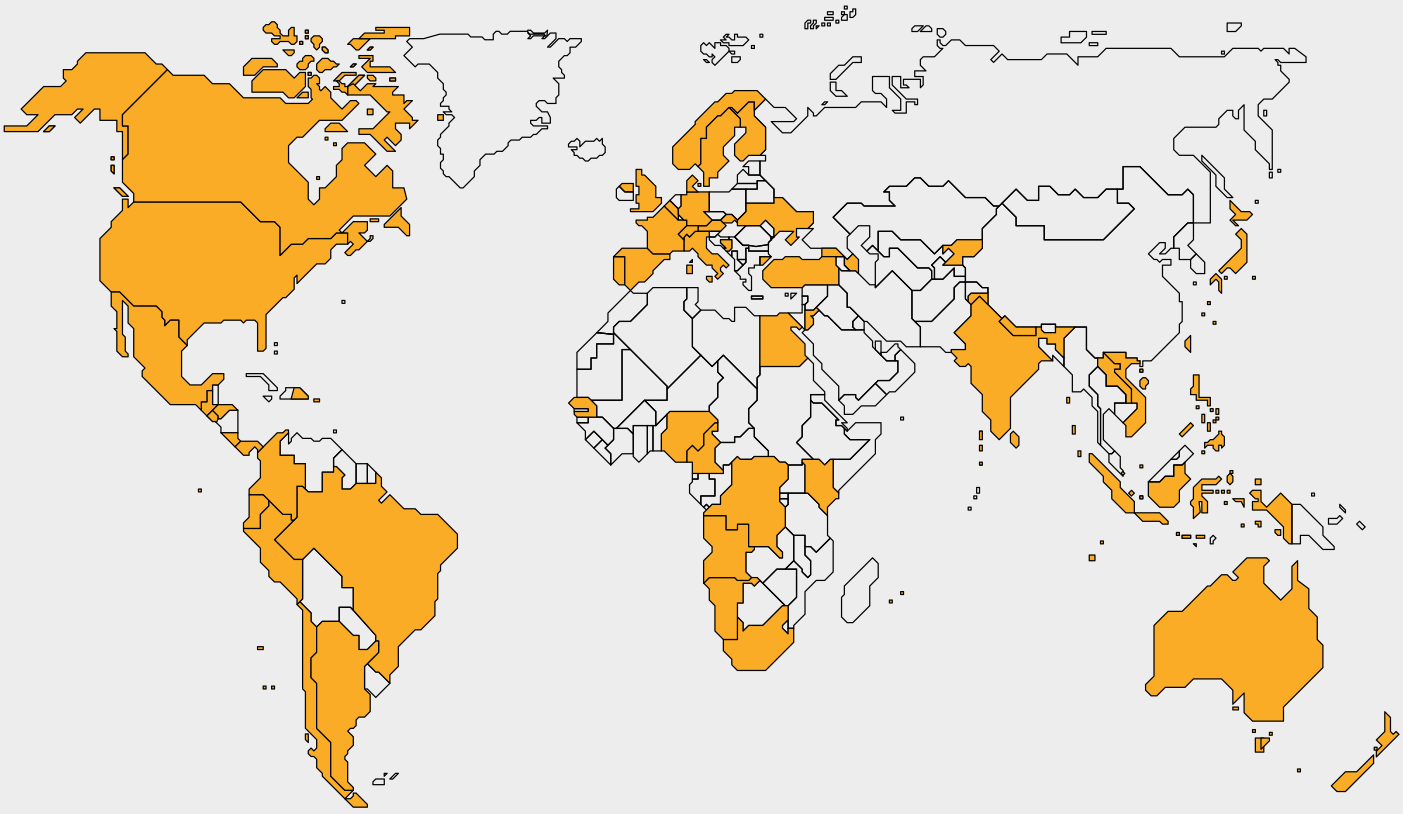
- Customer Control Centre
- O&M Support Centre
- Grid Operator / Dispatch Centre
- Asset Operator
- System Aggregator / Bidding Operator

GamesaElectric | Shaping New Energy

+8.5 GW SOLAR & STORAGE ENERGY

+62 GW WIND POWER

+60 COUNTRIES



Worldwide presence

Albania
Angola
Argentina
Australia
Austria
Azerbaijan
Belgium
Bosnia and Herzegovina
Brazil
Bulgaria
Cameroun
Canada
Chile
Colombia
Costa Rica
D.R. Congo
Denmark
Denmark (Faroe Islands)
Dominican Rep.
Ecuador
Egypt
El Salvador
Finland
France
Georgia
Germany
Guatemala
Honduras
India
Indonesia
Italy
Japan
Jordan
Kenya
Kyrgyzstan
Laos
Mexico
Namibia
Nepal
New Zealand
Nigeria
Norway
Panama
Peru
Philippines
Portugal
Rwanda
Senegal
Slovakia
South Africa
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Sri Lanka
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