

# Hybrid EMS

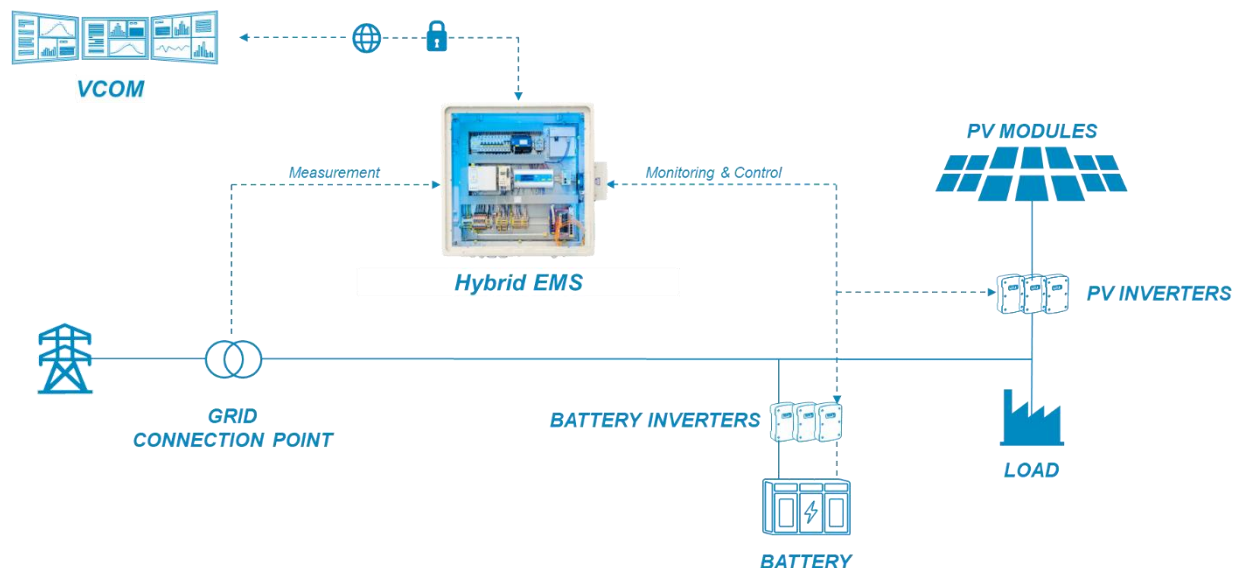


**BASED ON THE BLUE'LOG XC**

## **EFFICIENTLY MANAGE ENERGY FLOWS WITHIN YOUR SYSTEM**

The market for hybrid energy systems is expanding rapidly, driven by the integration of energy generation, storage, and consumption technologies into single, efficient systems. At the core of these systems is a central control unit that manages the complex energy flows – the Energy Management System (EMS).

meteocontrol provides a Hybrid EMS solution based on the blue'Log XC, specifically developed to meet the requirements of photovoltaic and battery storage applications in the commercial & industrial (C&I) and utility-scale sectors. The Hybrid EMS ensures seamless grid integration of all connected technologies.



*Example of a Hybrid EMS system layout*



## USE CASES

### PV self-consumption

*Increase self-consumption, reduce energy costs*

In the case of self-consumption optimization, the battery is used to store excess solar energy generated by the PV system. This stored energy is then used when self-consumption exceeds PV generation, such as in the evening or at night. This maximizes the amount of self-consumed electricity, reducing energy costs and increasing independence from the grid.

Hybrid EMS ensures that the PV power is first used to meet local demand and charge the battery, before any excess is fed into the grid.

### Zero Feed-In

*Comply with grid constraints, never inject power into the grid*

In areas with limited grid connection capacities, grid operators often require new plants to consume most or all of the electricity they generate. This restriction limits the amount of power that can be fed into the grid.

Hybrid EMS ensures compliance with this limit by charging the battery with excess PV power and curtailing PV only when the local load is covered and the battery is fully charged.

### Band shaving (e.g. peak shaving)

*Reduce peak loads, lower energy costs*

In commercial and industrial applications, power-based electricity prices can drive up the total cost of electricity. To guarantee low electricity costs, Hybrid EMS discharges the battery once the power at the grid connection point falls below a certain predefined threshold. Similarly, you can also manage the maximum feed-in power by configuring a threshold beyond which the battery will store excess PV power.

### Energy trading

*Profit from market price fluctuations, increase profitability*

A battery storage system can earn money by taking advantage of price fluctuations in both the Day-Ahead and Intraday markets. It charges when prices are low and discharges or sells when prices rise, capitalizing on both short-term and forecasted price differences. Energy traders can remotely control the battery storage system via the Hybrid EMS.



## Standalone battery

*Contribute to grid stability by providing ancillary services*

A battery storage system can participate in both the wholesale and ancillary services markets. Ancillary services, such as Frequency Containment Reserves (FCR) and Frequency Restoration Reserves (FRR), are vital for grid stability. The battery responds to grid fluctuations, providing an additional revenue stream. The Hybrid EMS aggregates market signals, prioritizes them with grid operator constraints, and implements frequency control.

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