PMS
PPC
Power Management Solutions

eks Energy PMS are based on our strong experience as energy integrators, adding a new vision by joining specially created control algorithms and the latest technology: Power Plant Controllers.

Ancillary Services and Large-Scale Plants are improved with new control options to obtain the best of each plant source. PMS are the best answer to the new challenges in hybridization and renewable power control. With quick dynamic response, featured to provide advanced active power management under highly demanding environments (HAWAII-HECO, Puerto Rico-LUMA/PREPA, California-CAISO, Australia-GPS, Chile, Mexico...)

What This Means for You
Unparalleled Renewable Power Management

With our PPC solution, you'll benefit from:

Grid Code Compliance
- Comply with the most stringent grid codes
- For any type of renewable power generation
- Meet tough interconnection requirements

Seamless Integration & Compatibility
- With power conditioning devices such as STATCOM and capacitor banks

Advanced Power Control Functions
- Ensure grid stability & reliability

Best Performance
- Maximize revenue while optimizing O&M costs
- Power balancing in BESS, being able to optimize ESS assets

Under the Hood
Powerful PPC

Reliability
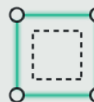Extra modules provide built-in redundancy for reliable operation.

Scalability
Adapted to diverse topologies of plants with different rated powers.

Flexibility
Multiple parameters, like client-configurable options, provide responsiveness to the grid code changes or updates.

Simplicity
A streamlined design ensures changes and upgrades are easy through the lifespan of the plant.

Modularity
Adaptable implementation of multiple control functions: voltage regulation, reactive power control, power factor control, etc.

eks
ENERGY

Controls at the PoI

- **Control time step (1):** Configurable, up to 50 ms. (2)
- **Active Power Control:** Power curtailment, Power ramp rate constraint
- **Frequency Stability:** Active power injection/absorption due to f. variations (over/under frequency)
- **Voltage Control**: Voltage reference closed-loop control
- **Q Control:** Reactive power closed-loop control
- **Power factor control:** Power factor closed-loop control
- **Clipping reduction:** Stores clipping losses in BESS and export it when needed/scheduled
- **Energy management:** Manages energy flow from different power generators (BESS, PV, diesel,...), to meet the most demanding grid codes and optimize power generation.
- **Error/Alarm Handling:** Monitoring and notification of error and alarms
- **Grid Code Auto Check functionality:** In order to verify the Grid Code Compliance, it implements automatic validation profiles that can be carried out during the Site Acceptance Test.
- **Black-start:** Plant controls remain online during an outage but the plant ceases backup
- **Islanding operation:** Connected loads (previously defined) will draw all power from the power plant

Supported power plant features

Topology of the Power Plant	Configurable: Number of MV loops, Connection topology and rated power
Controllable Equipment	Configurable: • Inverters : eks, Schneider, SMA, Ingeteam, Huawei, Santerno, others • BESS: SAFT, Samsung, LG, Kokam, NARADA, POWIN, others • STATCOMs and capacitor banks
Power Analyzers (3)	• Number: Configurable (standard: up to 4) • Installation: Inside or outside the PPC cabinet • Manufacturers: SATEC, Schneider (ION), Carlo Gavazzi, ABB, others • Accuracy: Class 0.5S, Class 0.2C (high accuracy), other options • Sampling rate: 80ms, 100 ms, 1s, other options
Potential transducers (PT)	• PT ratio: 1.0-6500 (configurable, other options are possible) • PT output range: 1-999.0V (other options are possible) • PT input range: Depends on each application • Burden: Depends on manufacturer (0.01VA via PT or 0.4VA direct connection) • Input fuse: Depends on manufacturer (standard 3P + N 2A)
Current transducers (CT)	• CT ratio: 1.0-50000.0(configurable, other options are possible) • CT output range: 0-5A (other options are possible, 0-1A) • CT input range: Depends on each application • Burden: Depends on manufacturer (standard < 0.15VA per phase)
Physical Ports (4)	Selectable by the client (Standard 3)
Protocols supported (5)	• Modbus TCP, Modbus RTU, DNP3 Serial, NTP, IEC 61850, others
Communications networks	• Configurable number of sub-networks: One sub-network for control and one sub-network for monitoring is successful for very fast requirements • Network architecture supported: Ring, Bus, Star (others options are possible)

Note: Specifications in the above table are design estimates only and are not guaranteed.
Contact eks for a project-specific estimate as final values depend on system design, location, and use case.
1 Time steps depends on the grid code requirements and the characteristics of the equipment (inverters, grid analyzer).
2 PPC can work faster than 50mS, but it is limited by systems as power analyzers or the communication speed of the power converters.
3 The power analyzer selected should work at sampling rate of 100mS at least and 0.2C class (very high accuracy)
4 Optical fiver interface is supported if required by the client.
5 PPC can work simultaneously with diferent protocols, as different communication protocols can exist in the plant.

Shaping the energy of tomorrow