

ENERGY MANAGEMENT SYSTEM GE-MICROGRID MANAGEMENT



GE-MICROGRID MANAGEMENT SOLUTION FOR COMPLEX HYBRID APPLICATIONS

The combination of conventional power generation systems, renewable energy sources and energy storage systems to hybrid decentralized power plants (micro grids) is an important business segment of the Kuhse Energy Group. Our energy management system continuously optimizes the operation of the micro grids with energy generation systems such as PV, wind turbines and battery systems and ensures maximum utilization of renewables, high profitability and economic sustainability.

APPLICATIONS

- Municipal energy supply
- Self-sufficient industry
- Data centers
- Telecommunications
- Island supply
- Resorts
- Mining

ADVANTAGES



Scalable Solutions

regarding type, requirements, composition and functionality of the hybrid power application



Improving the ecological footprint

of conventional power generation plants in terms of CO2 emissions and fuel consumption



Increasing the profitability of the energy generation plants

through modules to consider current energy costs and prices as well as fuel costs



Grid stability improvement for off-grid systems

flexible reserve power under consideration of maximum load impacts and optimal operating points



Power quality improvement for grid-tied systems

dynamic grid support (reactive power control; support of voltage and frequency control)

FUNCTIONALITIES

REALTIME

- Automation and optimization of electrical energy flows
- Active and reactive power control
- Support of power quality via voltage / frequency control
- Support of grid stability via peak load balancing
- Connection to national grid connection controllers (e.g. for VDE-AR-N 4110/4120)
- Reserve capacity management (gensets and storage)
- Load management incl. load sharing, fast load shedding and implementation of special loads as H2 electrolysis systems and heat pumps
- Planned / unplanned islanding and black start control

ADDITIONAL FEATURES

- Ecological optimization through maximum utilization of renewables
- Economic optimization via interfaces
 - to the balancing energy market (intraday electricity trading with SRL/MRL and day-ahead electricity trading)
 - to the local grid operator
 - for a dynamic CO2 emission trading (CO2 - ready)
- Day-Ahead scheduler (with 15min granularity) incl. interfaces
 - to customer load profiles
 - to solar and wind forecast engines
- Interface to superior systems (process control system, ERP system, etc.)

SYSTEM TOPOLOGY

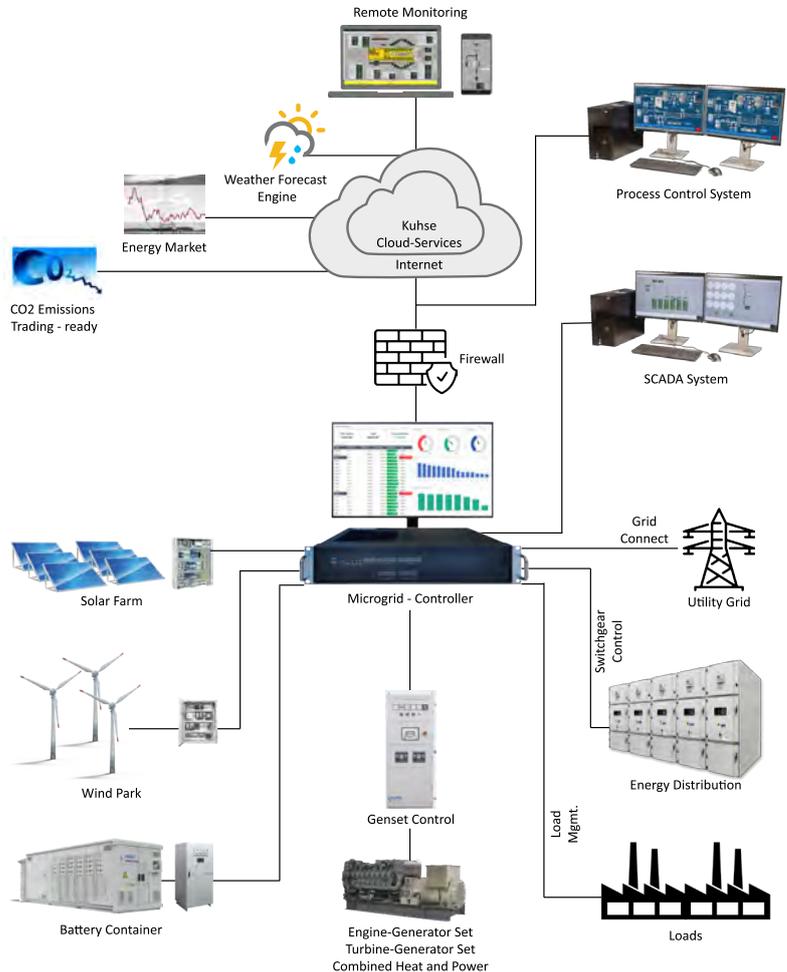
GE-MICROGRID MANAGEMENT SOLUTION

The *GE-MicroGrid Management solution* consists of a local real-time control device (the Microgrid Controller) for direct communication with the primary control systems and the interfaces for connecting energy markets, forecast systems and simulation environments.

The *GE-MicroGrid Management solution* control device contains those verified software modules that are selected and required for the respective project. In addition, individual customer-specific and special project-specific adaptations can be integrated into this control device as separate software modules.

Stored and archived operating and status data as well as day-ahead forecast simulations are available through customer-related cloud databases and cloud applications, also available locally on request.

Remote monitoring, remote optimization and remote support capabilities are also available via cyber-secure remote connections.



HARDWARE REDUNDANCY

- Hot-Standby Redundancy
- Hot-Swap Redundancy

CERTIFICATIONS

- IEEE1613: 2009
- UL
- CCC
- FCC class A
- IEC 61850-3 Client Edition 1 & 2 - KEMA certified; Server Edition 1 & 2
- IEC 60870-5-101/104 Server/Client - KEMA certified
- IEC62443-4-1 - Certified Secure Development Lifecycle (SDL)

SERVICES

- Simulation of *GE-MicroGrid Management* customer application
- Stability analysis
- Analysis tools as part of the remote monitoring of the system (optimization, condition monitoring, predictive maintenance, outlier detection)
- Remote support for troubleshooting and customizations
- “Cloud-enabled” management of operational data, day-ahead planning and optimization

KUHSE - YOUR PARTNER FOR THE ENTIRE HYBRID POWER CONTROL SYSTEM

We support our customers throughout the entire process from planning, verification to commissioning of the energy management system. In addition, we are your partner for the constant monitoring, analysis and optimization of the entire hybrid power system.

COMPANIES OF THE KUHSE ENERGY GROUP



M&S COMBUSTION TECHNOLOGIES GMBH

M&S Combustion Technologies is your partner for future-oriented and functionally reliable firing systems for power plants and industrial boilers as well as thermoprocessing plants in the power range 5-100 MW per burner. From engineering to commissioning, M&S offers all services from a single source.



KUHSE SECURE SYSTEMS GMBH

Kuhse Secure Systems delivers cyber secure digital solutions and remote services for critical infrastructures in the energy market. Cyber security packages for Kuhse control systems in critical infrastructures based on IEC 62443, the Cyber Security Act as well as the IT Security Act 2.0 ensure efficient commissioning, secure plant operation and optimal service support.



KUHSE POWER SOLUTIONS GMBH

Kuhse Power Solutions specializes in complex, high-availability control systems and instrumentation and control technology for power plants, emergency power systems, turbines, exhaust gas combustion and hybrid plants. As a system integrator, Kuhse offers complete individual system solutions - from EPLAN engineering to commissioning and maintenance - from a single source.

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