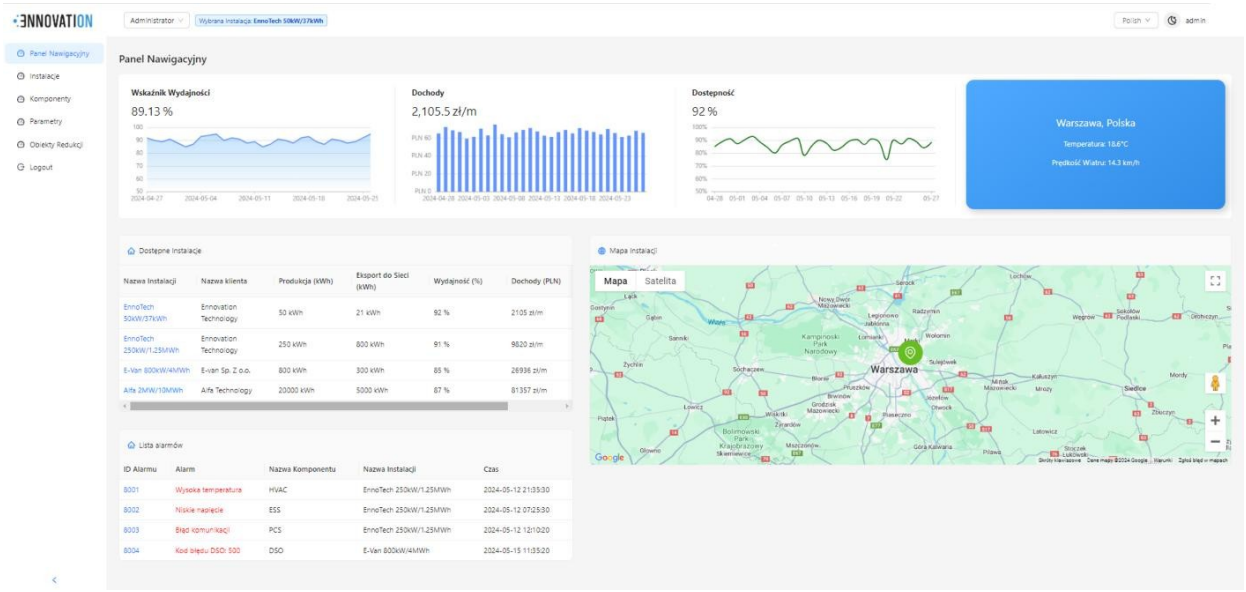
# ENNO-EMS

Energy Management System (EMS)




## Product information

**An EMS energy management system** to manage storage components and control energy flows to perform functionality specified and selected by the user.
Controls AC/DC converter modules.

Control of the system possible locally from a touch-screen operator panel located on the facade of the AC/DC bidirectional converter cabinet and remotely via Internet communication.

It allows control of individual system components (battery storage tank, bidirectional AC/DC converter, renewable energy sources) and communication with the superordinate supervisory system within a single tool.

Basic required functionality of the EMS system:

- User login with defined permission levels,
- Ability to remotely switch on/off energy storage via digital inputs,
- View operating status and alarm history with identification of event type (alarm, event, change attitude),
- Work on a time-based schedule,
- Work based on a forecast of electricity prices on the Commodity Exchange,
- Working on the basis of predictive weather data in a given location,
- Load-shifting - controlling the operation of consumers based on the available energy in the storage tank,
- Peak-shaving - giving up energy at times of increased demand,
- Power guard functionality on the network side,
- Reactive power compensation and tgφ factor control,
- Improving energy quality,
- On-grid operation,
- Off-grid island operation,
- UPS operation for isolated circuits,

- Configure task priorities,
- Integration of communications with renewable energy sources,
- Optimizing autoconsumption of energy from renewable sources,
- Possibility of bidirectional data transmission with the SCADA system of the local operator and remote control of energy storage operation,
- Automatic maintenance and optimization of battery tray consumption,
- Controlling the operation of the battery storage tank on the basis of strategy selection,
- Visualization states work storage energy i renewable sources energy through monitoring software available via the Internet,
- Communication via WI-FI network or GSM module for remote operations SERVICE,
- Menus and information in Polish.
- Visualization of the energy flow rose between renewable energy sources, energy storage, distribution grid and internal grid,
- Integrated monitoring of any renewable energy sources with visualization of operating states, energy flow direction, basic parameters and alarms, statistics and waveforms,
- Ability to generate waveforms and reports: energy production from RES, charging and discharging energy, energy consumed and returned to the grid, energy consumed by loads,
- Cumulative graphs of the performance of the entire system by energy source,
- Energy storage system data: energy storage operating status, battery parameters from the BMS, bi-directional AC/DC converter parameters, renewable energy source parameters, alarm history, aggregated data to support ESG reporting,
- Network analyzer function with data logging: current indications of voltage, current, network active power, network reactive power, network apparent power, THD of current, THD of voltage, with preview of historical data

For reasons of cybersecurity, the server on which the energy storage and power systems monitoring software will be installed is located in the European Union or NATO countries.

The system integrated with telemechanical equipment performs the following functions:

- Sending to the SSiN the measurements from the energy storage and from the point of connection of the line to the DSO network,
- Sending binary statuses of apparatus, security, alarms, etc. to SSiN,
- Execution of the command to change the mode of operation,
- Performing active and reactive power settings,
- accepts and sets the received limits of active power and power factor,
- Executes commands to control the energy storage switch,
- Allows remote activation and deactivation of EMS automation,
- remotely start or stop charging the storage battery