+ PSI Intelligent Grid Operator

PSI Intelligent Grid Operator
Grid management with artificial intelligence

Artificial intelligence reduces network development costs

+ Procedure without comprehensive grid data and measurement infrastructure
+ Adaptive grid structure and topology detection
+ Accurate forecast of the grid state based on intelligent algorithms
+ Using the smart meter information for grid analysis and state detection
+ Autonomous grid management for lookahead control in smart grids and micro grids
+ Multi-criteria optimization and decision support
+ Minimum number of grid interventions to resolve congestions
+ Consideration of asymmetrical situations and compensating currents
+ Virtualized solution for the control center or for hardened systems in the field

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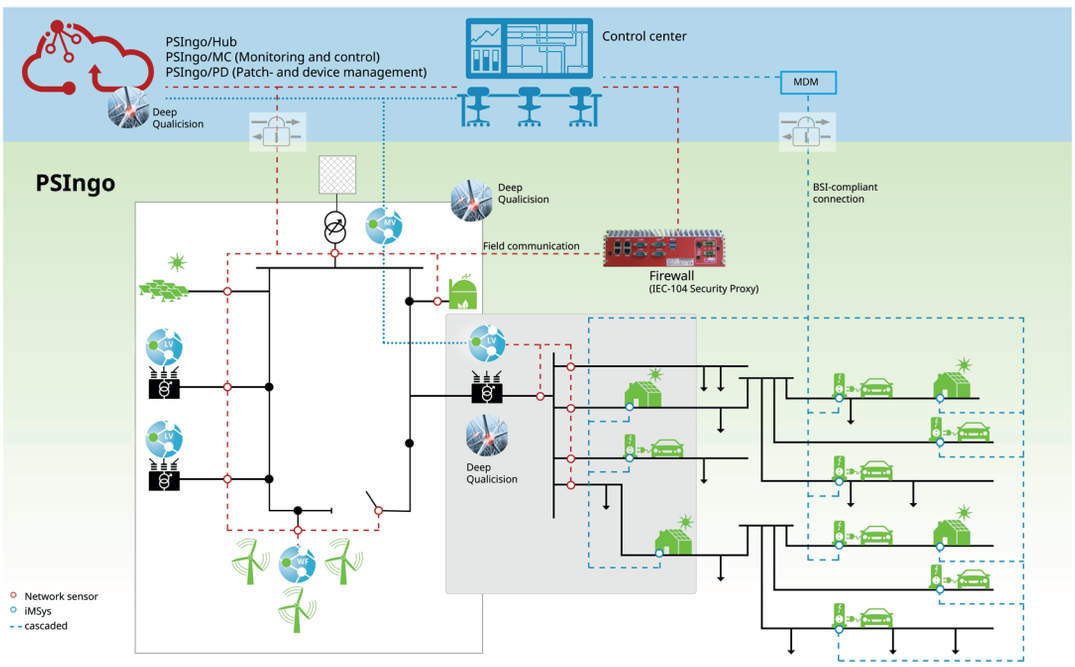

PSI Intelligent Grid Operator - PSIngo- Active grid management with artificial intelligence

Intelligent combination of neural networks and Deep Qualicision

Decarbonized, decentralized, digitized: in the last decade, the energy transition and the decarbonization have significantly changed the requirements for energy generation and distribution. While the rural electrical distribution grids have turned into collection grids for renewable energies, the urban grids face new challenges due to increased electro-mobility.

Our smart grid platform Intelligent Grid Operator (PSIngo) not only enables cost-efficient and sustainable integration of decentralized renewable energies into the distribution grids but also supports fast realization of high power charging infrastructures for the mobility transition.

PSI is starting to use self-learning algorithms in PSIngo in order to solve these tasks reliably and fast. Based on the experience with the Smart Operator Software and the unique combination of neural networks and Deep Qualicision, PSI has developed a learning method for AI-based grid state estimation which can work almost without predefined grid data as well as incomplete grid state information. It is based only on situational information and measurements in the grid (for example, from intelligent measurement systems or charging infrastructures) with location information. The behavior of the distribution grid based on major variables such as grid load, electricity consumption, and electricity generation in combination with additional external information such as weather forecasts is learned on an continuous basis. With this information, the system detects critical grid situations in time and determines the optimum decision from the available alternatives as well as the necessary control commands. Now grid operators can optimize the voltage regulation as well as avoid thermal overloads.

This enables PSIngo to operate with few or no measurements from the distribution grid which in turn allows fast, scaleable, and costefficient digitization of the distribution grids.

Furthermore, the innovative algorithms for grid control and artificial intelligence support immediate integration into the grid management and grid planning processes.

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