

WAGO Equips Power Stations for the Smart Grid

Intelligent local network stations can avoid the construction of new, more expensive power lines. WAGO controllers assume the key role in new systems.

The intelligent expansion of the electrical grid, along with the integration of renewable energy sources and electromobility, is placing new challenges on energy suppliers and the industry. And this expansion has massive implications for local network substations. Primary and secondary technologies, i.e., transformers and switchgear units on the one side and protective devices on the other, have to integrate – two technologies that have long been separate. Together with the Pfeffer engineering firm in Rödermark, WAGO has developed a future-proof solution for these challenges, a turnkey and compact intelligent local network station (iONS).

Just like conventional local network stations, the iONS connects the medium- and low-voltage networks. Unlike its less advanced counterparts, the new substation also records measurement data and allows this data to be read remotely. The standard-compliant iONS station was constructed by Betonbau GmbH & Co. KG, the low-voltage distribution cabinet by Driescher Moosburg/Eisleben, the medium-voltage switch cabinet by Driescher Wegberg, and the controllable local network transformer by SGB and MR. All automation within the intelligent substation is controlled by WAGO components: a PFC200 XTR Controller on the medium-voltage side, a PFC200 Controller for the low-voltage side side and an e!DISPLAY panel for visualizing the measurement and control data is located directly at the substation. WAGO also provided all electrical connections.

The WAGO Controllers, which are freely programmable via CODESYS, collect all data from the substation's various systems via digital and analog signals (e.g., via Modbus RTU)



The path to making a smart grid: The intelligent local network station from the engineering firm Pfeffer enables measuring, controlling, regulating and remote control using components from WAGO

These controllers then translate the data into supplier-required communication protocols (e.g., IEC 60870-5-101/ -104 or IEC 61850). Data is then transmitted to the control center via data line. In the opposite direction, the control center can access the substation's systems (e.g., medium-voltage switch cabinet, protective devices, measurement systems from different manufacturers) via the WAGO Controllers. The WAGO Controllers protect the data flow in two stages: first by encrypting the data using TLS1.2; next, the controllers transmit data via specially secured connections, like IPsec or OpenVPN according to the BDEW white paper