

ENERGY SUPPLY – SUSTAINABLE, ALWAYS AND EVERYWHERE

Bachmann M1 control energy storage systems of Qinous

There are many places in the world where a reliable energy supply can only be implemented by using diesel generators. This may be due to the absence of a supply grid, wars, armed conflicts and natural catastrophes, as well as the geographical factors such as islands. Photovoltaic installations and wind turbine plants provide alternative technologies for power generation. However, these are strongly dependent on the prevailing weather conditions. The Qinous »ESS« energy storage system combines diesel generators and power generators from renewable energy sources together in an island grid to ensure reliable operation – round the clock.



▲ Qinous energy storage system (ESS)



▲ Albert Schweitzer Hospital in the Artibonite valley, Haiti

The Hôpital Albert Schweitzer is situated in the Artibonite valley around 60 kilometers north of the capital, Port-au-Prince, in Haiti and provides medical care for 350,000 people. In order to maintain the running of the hospital, up to four diesel generators (2x 410 kW and 2x 210 kW) have been required for this so far. Connecting to the power supply grid in this region is not possible. The unstable power supply and poor power quality in Haiti make the extension of the grid to the Artibonite valley just as unattractive.

Power cuts, voltage drops or overvoltages in the power supply grid occur frequently. The electricity price of 0.40 US dollars per kWh is one of the highest in the world. However, diesel generators are also a rather poor alternative:

Operating them is not only expensive, they also considerably pollute the environment.

Fossil fuel consumption lastingly reduced

A 230 kWp photovoltaic installation was installed on the roof of the hospital in 2014. In the beginning of 2015, Qinous was given the order for the supply of a 200 kW energy storage system. This has to fulfill several tasks: The Qinous ESS not only stores energy that is not immediately required, but also handles the intelligent management of hybrid grids. »This ensures safe and stable operation at any time by enabling a diesel generator to start up only if there is no sun for a long period and the batteries are empty,« explains Steffen Heinrich, technical general manager at Qinous. »During



Qinous GmbH develops and sells standard plug and play energy storage solutions that are optimally tailored to hybrid grids. In this way, electricity produced from wind turbines or photovoltaic plants can be stored, thus enabling the use of diesel generators to be considerably reduced. Founded in 2013, the company has been running a 100 kW island grid demonstration site in Berlin since 2014. A total of 6.7 MWh of battery capacity is under construction or already in operation in five countries.

www.qinous.de



▲ Diesel PV battery hybrid system



The Albert Schweitzer Hospital (HAS) was founded in 1956 for the medical care of over 350,000 people in the Artibonite valley in Haiti. In Deschappelles, almost 60 kilometers north of Port-au-Prince, the HAS has a 131-bed hospital, where operations, internal examinations and rehabilitation programs are carried out. HAS Haiti also offers care services for mothers and children as well as laboratory tests. The «Swiss Partnership HAS Haiti» is an important partner organization of the hospital. It finances the children's department and provides logistic support. The organization also supports the solar project, accident surgery, the laboratory and social services.

www.hopitalalbertschweitzer.org

this time, however, the diesel generator can be completely switched off. Something that is absolutely unique in this rating class.« This saves around 30 % of the diesel fuel every year: »The equivalent of 130,000 liters,« Steffen Heinrich emphasizes. »The investment in a photovoltaic battery system with a slimline lithium-ion battery thus pays for itself within a few years.«

M1 at the core

Qinous uses long-life lithium-ion batteries and new aqueous hybrid ion batteries for its standard plug and play energy storage solutions. All the components required are housed in a container solution. In addition to the battery system, this also houses the power inverters for the battery as well as the energy management system. »This measures the grid variables and regulates the voltage and frequency of the converter in order to maintain the stability of the connected island grid and reliably supply all consumers with the required power,« explains Steffen Heinrich. »We use the M1 automation system from Bachmann as the central control unit.« The MX 213 processor module here runs with input/output modules, a CAN master and

an interface module. The processor module is thus provided directly with all the relevant data from different sensors, the energy meters, as well as the power inverters and batteries. Choosing a Bachmann system was a straightforward decision. »Our ESS are in operation in Southeast Asia, Africa, South America and Australia. And in places here that are unreachable or reachable only with great difficulty,« Steffen Heinrich says. »It was therefore all the more important for the automation to operate reliably.« However, the robustness of the Bachmann M1 controller is also a key reason: »Let's take Haiti, for example, which has a tropical climate. A temperature of

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Steffen Heinrich,
Technical general manager
at Qinous



▲ The Qinous team at the commissioning

over 30° C is present all year round. With two rainy seasons a year, the weather is also very humid. The average precipitation on the capital, Port-au-Prince, is 1,250 millimeters a year. The controller has to operate perfectly in spite of this. The Bachmann controller meets this requirement,« Steffen Heinrich confirms.

The decision-makers at Qinous also liked the high degree of flexibility that the automation system offers. »The wide range of telecontrol protocols already integrated is also very useful,« Steffen Heinrich continues. »This is a requirement that the operators often stipulate.«

Promising future

Qinous is extremely satisfied with the collaboration with Bachmann. We have a good line to Bachmann,« Steffen Heinrich confirms. Qinous will also be relying on Bachmann in the future: »We are currently looking at the GMP 232 for grid monitoring and protection. At present we are also evaluating the M1, with which we can replace our onsite visualization through modern and functional web visualizations,« Steffen Heinrich describes a possible option.

