



LIFE ON THE CUTTING EDGE: THE PI SYSTEM AND BLUE SOLUTIONS' NEW BATTERY TECHNOLOGY

Blue Solutions, a subsidiary of the French conglomerate Bolloré, is on a mission to change the future of electric power. They strive to produce innovative batteries and other electricity storage solutions that will outlast and outperform the majority of those on the market. Batteries, however, are notoriously difficult, expensive, and time-consuming to develop. To support and accelerate this complex development process, Blue Solutions relies heavily on the PI System™. With the PI System, managers can create daily and weekly dashboards that help them monitor production in real time. Such oversight allows managers to track important production parameters and quickly detect equipment problems so they can stay on target with their goals.

Blue Solutions began making paper for capacitors in the 1960s and has since grown into a major producer of electrical components for capacitors, holding over a third of the global market. The group also now produces batteries and electrical storage devices based on their unique solid-state Lithium Metal Polymer (LMP) design. Blue Solutions also produces a variety of products that use its batteries. Such projects include Blue Solutions' electric powered Bluecar, Bluebus, and Blueboat, as well as renewable energy storage solutions for individuals, businesses, and local governments. In 2011, Blue Solutions started using its electric vehicles to create a ridesharing service in Paris, which has since expanded to other cities in Europe, the United States, and Asia.

In its simplest form, a battery is made up of either one or many cells, each containing two electrodes (the anode and cathode), separated by an electrolyte. The electrolyte acts as a barrier between the electrodes, limiting electron movement within the cell. Many electric vehicles are powered by Lithium-ion batteries, most of which rely on a highly flammable liquid electrolyte to separate ions and electrons. Blue Solutions' batteries use a solid polymer electrolyte, which makes its batteries safer and more energy dense. "This battery today is the only battery in the world running with a solid electrolyte," said Jean-Luc Monfort, the CEO of Blue Solutions, during his presentation at PI World San Francisco 2017. Blue Solutions' batteries have a lifespan of more than 4,000 cycles

CHALLENGE

New battery technology is difficult, expensive, and time-consuming to develop.

SOLUTION

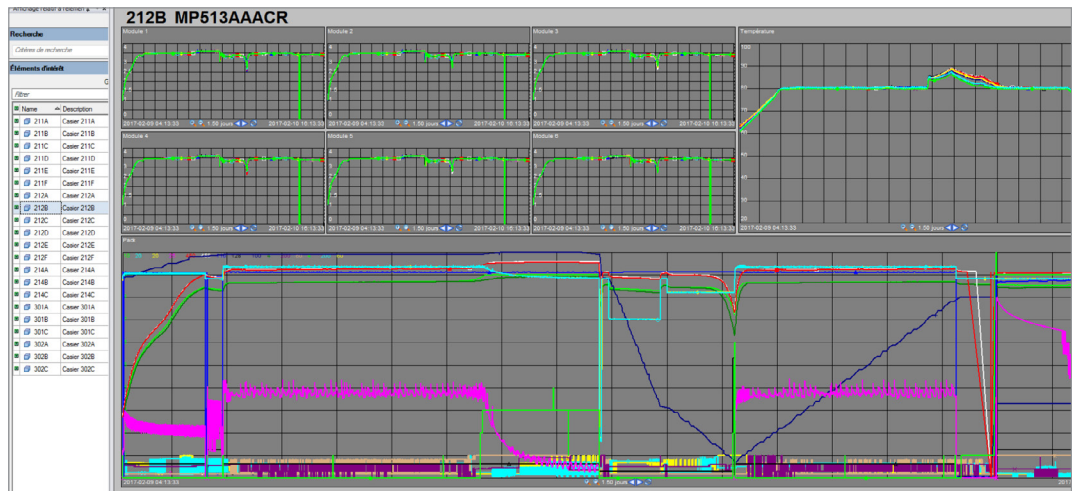
PI System visualization screens allow for real-time production oversight and monitoring of key production parameters.

BENEFIT

The PI System enables Blue Solutions to stay on top of production goals and accelerate development time.

BATTERY CYCLING MONITORING

Blue Solutions uses the PI System to monitor battery cycling data from 21 different bays.



(depending on the application) and maintain a constant capacity throughout the battery's lifecycle. They also contain no rare earth metals, cobalt, or solvents, making them easier to recycle and limiting the risk of local pollution.

The PI System plays a crucial role in the production of this solid polymer electrolyte. Production operators use the PI System to track the thickness of the polymer, an important characteristic for the functioning of the battery. "With the PI System, you have a very easy visualization of the points where the polymer has the right thickness so the profile can be adjusted in real time," Monfort explained.

The PI System has been helping Blue Solutions improve its production process at their production plants for over 15 years. Using the PI System's visualization tools managers have developed what they call "global process overview screens." The screens give engineers a complete visual overview of the manufacturing system. "It gives a nice view for a production manager," Monfort said. "You can see all the steps for production of the batteries monitored in real time."

Every Monday, Blue Solutions' management teams decide on the week's production targets. Plant operators use dashboards to keep track of where production is relative to these targets throughout the week. The PI System also allows operators to monitor yields and track machine downtime so operators can adjust their equipment as needed to stay on track. "This global view gives you the status of all the equipment," Monfort explained. "It's very useful to have in the morning and follow it throughout the day. If you're a production manager, you know exactly what's happening." Blue Solutions also uses the PI System to collect information about qualities like the discharge curve of each battery cell along with 300 other production parameters.

"If you want to accelerate the development of a new technology, you need to know in real time what the production parameters are," said Monfort. "You need data to determine where the defects are to optimize the performance of your product." This is why, he explained, the PI System is a key tool for helping those interested in producing cutting-edge technology.

For more information about Blue Solutions and the PI System, watch the full presentation [here](#).



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— Jean-Luc Monfort,
Chief Executive Officer
of Blue Solutions