

DIGITAL FACTORY now



Auto supplier needs to detect connection failure on AGV charging station

Highlights

- After a line failed over a weekend, an automotive manufacturer wanted a better way to monitor the voltages and currents in its facility
- The EMpro energy meters use Rogowski coils to measure this information and can also communicate via EtherNet/IP – two key features the manufacturer wanted
- The manufacturer can now catch failures before they occur, and this solution will help move the facility toward a digital transformation

With the improved visualization and quality, the manufacturer can now catch failures before they happen.

Customer profile

This Tier 1 automotive supplier has more than 160,000 employees and 300 facilities worldwide. This facility manufactures both interior and exterior component assemblies for cars and light trucks.

Challenge: Downtime is unacceptable

The customer uses automated guided vehicles (AGVs) on its production line. A pneumatic cylinder pushes a plug into the AGV to charge it. One of these AGV lines went down over a weekend. The average cost to shut down an automotive production line is \$50,000 per minute. One hour of downtime can cost an auto manufacturer up to \$3 million.

Due to product sequencing and the 30-minute JIT (Just-In-Time) buffer, failures are unacceptable. It was determined that the AGV failed due to insufficient charge in the batteries. The line originally relied on a plug-in style charging connector with no monitoring.

In addition to monitoring this specific application, the manufacturer wanted a “future-proof solution” to monitor existing and new equipment within the facility (weld cells, assembly cells, robotic cells, etc.)

The solution needed various communication protocols to communicate with both old and new control architectures. The customer also had a wide range of voltages and currents throughout the facility, so having the ability to use either current transformers (CT) or Rogowski coils was an advantage. In this case, the customer wanted to monitor the AC voltages and current on the battery charger. They also wanted to communicate to the existing machine PLC with Ethernet/IP.

Solution: Communication across multiple systems

The Phoenix Contact EMpro line of energy measuring devices was the perfect fit. With the EMpro, the customer can see both the current and voltage numbers and can also set

trigger limits. All of this can be done by communicating through EtherNet/IP. The EMpro product line is easy to configure and offers numerous capabilities. With the EMpro, the customer can detect any future failures and improve the quality of charge on the AGV batteries, which extends the life of the batteries.

More importantly in the long term, the customer wanted a solution that could communicate with all their existing and new machines within the facility, and the Phoenix Contact solution does this. The EMpros will improve the energy management of the entire facility.

The Phoenix Contact automotive team built this project based on the “Digital Factory Now” campaign, emphasizing the importance of IIoT and the digitalization of business.

Results: A path to digital transformation

The EMpro and improved visualization make it easy for the manufacturer to remotely monitor power consumption and watch for anomalies. They can now create consumption baselines or averages, so they can catch potential failures before they occur. The data lets them know if they need to shut down a cell or work area to reduce power consumption.

The EMpro and PLCnext technology easily integrated into existing systems. Because they are IIoT-capable, they create a framework to continue a digital transformation.

Because sister facilities within the company currently use PLCnext Technology in edge and IIoT applications, the customer sees this project as a path to a Digital Factory transformation.

