

Delivering Automated Battery Assembly and Test Systems for Next-Generation Ride-Share Vehicles



The Challenge:

When a global motion technology company won a high-profile program to supply battery packs for an autonomous EV ride share company, they needed an automation partner capable of delivering advanced assembly and testing systems while also being flexible enough to adapt to constant change.

The Solution:

Leveraging our deep expertise in battery module/pack assembly and test and our proven project management excellence framework, we designed both a prototype line and a full-scale automated assembly and test system for this client, ensuring reliable, scalable production despite receiving multiple engineering change requests during the project.

Today, electrification and autonomy are redefining mobility, pushing suppliers to rethink how vehicles are powered and built. For one global motion technology company, winning a contract to supply battery packs for a next-generation autonomous ride-share vehicle meant they needed to quickly develop new advanced manufacturing capabilities. To meet this challenge, the company partnered with Convergix to design and deliver state-of-the-art prototype and production assembly and test lines for the high-capacity battery modules.

Proven Expertise for Advanced Battery Module Assembly

At the heart of this new autonomous EV is the innovative battery system. Each vehicle houses two large battery packs that provide more than 130 kWh of energy, enabling operation for 15+ hours on a single charge. This dual-battery configuration not only extends service life but also offers redundancy, ensuring reliable performance throughout the day.

To support production of battery modules, the client needed advanced automation to assemble and test the battery modules that make up the battery packs. After visiting one of our facilities and seeing our proven experience in battery pack automation in action, they selected our team to design and deliver a state-of-the-art assembly and testing solution. This new system needed to be engineered to handle cylindrical cells and integrate them into rectangular modules that then form the building blocks of the high-capacity packs that power the vehicles.

Flexible Solutions for a Rapidly Evolving Project

While winning this battery assembly program was a major milestone for this client, it came with critical challenges. Most notably was that the battery design continued to evolve in parallel with our development of the assembly and test lines, resulting in multiple engineering change requests (ECRs) in less than a year.

While this level of uncertainty can typically threaten delivery schedules and inflate costs, especially with a high-profile customer applying pressure to maintain an aggressive timeline, we were able to leverage our proven project management excellent framework to navigate the frequently shifting requirements as smoothly as possible. This is because our project management excellence approach provides a disciplined yet agile structure that leverages the following tools:

- Standardized project execution maps that define clear stages and deliverables to ensure alignment at every step while maintaining visibility into scope and progress
 - A suite of digital project management tools, including live dashboards that track budget, schedule, risk, and scope in real time.
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More specifically, for this project, an example of our flexibility came when a late-stage process change was requested to reduce contamination risk. To prevent cardboard packaging from entering sensitive downstream processes, our team engineered an automated system that removes and reroutes the material into a separate room.

Advanced Solutions from Prototype to Production

To reduce risk and accelerate validation, we first delivered a smaller-scale prototype line. This system provides the customer with proving ground to test early design versions, confirm cycle times, and identify potential issues before full-scale production. By resolving challenges upfront, the prototype line became an essential steppingstone in the product's evolution and gave the customer confidence in both the design and the manufacturing approach.

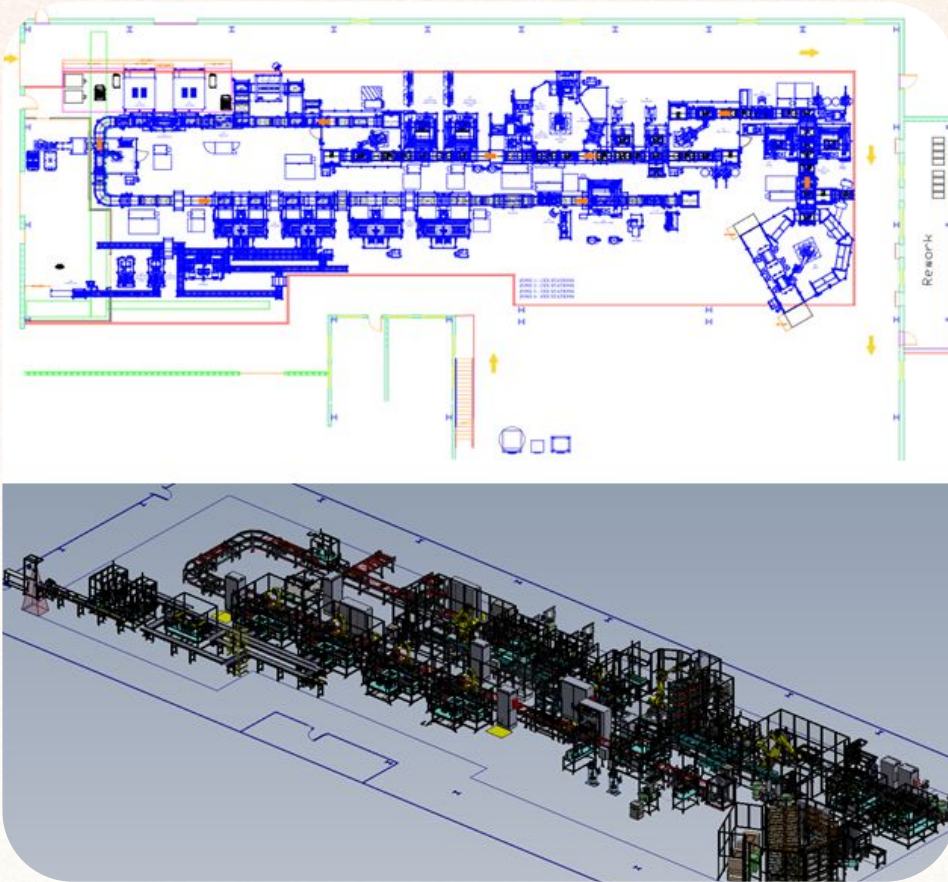


The prototype system used as a proving ground for this automated system.

Building on this foundation, our team engineered the full automated assembly and test system that integrates multiple advanced processes, including:

- Fluids dispensing and adhesives.
- Laser welding
- Automated testing at every stage to ensure consistency and reliability.

Together, these capabilities resulted in a robust, scalable manufacturing system designed to deliver safe, high-performance battery modules for a demanding EV application.



A 2D drawing and 3D illustration of the full automated assembly and test system.

What's Next?

While this portion of the project is wrapping up, our role as a trusted partner for this client is continuing to grow. For this facility, the company is currently working on the specs for an automated material handling system that uses a fleet of autonomous mobile robots (AMRs) to transport battery modules throughout the facility for subsequent processing and then to final pack-out. By reducing manual handling, this system will enhance both safety and efficiency.

Beyond this project, our team is also seeking additional automation partnership opportunities for the client's broader electrification roadmap, including opportunities for more EV battery and module assembly work and projects involving modular hybrid transmissions, e-axes, and electronic control modules (ECMs).

Turn complexity into confidence. Scale with automation that adapts as fast as you do.