

Factory Automation with Mobile Robots

A Natural Fit for Wireless Charging

Case study produced in cooperation with Wiferion

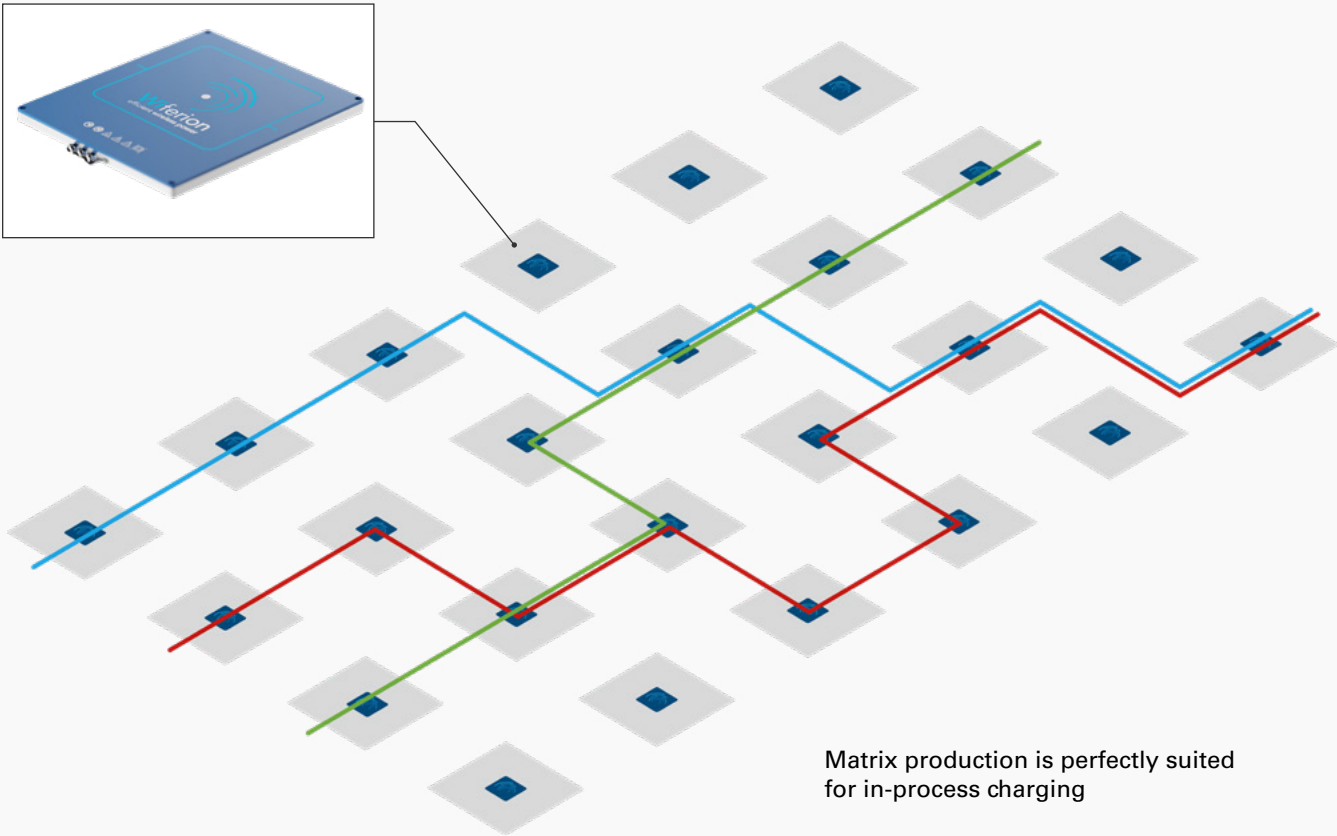


Factory Automation with Mobile Robots: A Natural Fit for Wireless Charging

The automotive industry is changing, and the automotive assembly plant is transforming with it. By 2024, the number of electric vehicle models is expected to double – to 134 different models – in the United States.¹ Not only are car manufacturers building different types of vehicles (electric vs. internal combustion) and different models, but the way they’re building them is changing.

With so many different models and increased demand, the assembly plant must become more efficient, more reliable, and more productive. One way automobile manufacturers are accomplishing this is by introducing matrix manufacturing systems (MMS) for the efficient production of their multi-variant production program and for the flexibility they bring to the assembly floor.

Matrix Manufacturing System



Matrix production is perfectly suited for in-process charging

¹ Sickels, D. "Electric car models projected to double by 2024." The Buzz - Electric Vehicle News. May 13, 2022.

Wireless AGVs – Efficient, Reliable, and Safe

A key component of automotive assembly plant makeovers is automated guided vehicles (AGVs) specially designed for use throughout the factory. AGVs are used to transport heavy materials throughout a factory because they are always available, highly efficient, and more reliable. They enable greater efficiency in an MMS plant due to their flexibility. Making them even more efficient, reliable – and safe – is wireless charging. With no wires for tripping, no chance of fire due to a bad connection, and no downtime due to the elimination of empty runs, wireless charging is proving to be the driving force in plant transformation.



When the British sports car manufacturer, Lotus, decided to modernize its plant and final assembly hall in Hethel, Norwich (UK), it instructed CPM (provider of turnkey solutions for complete final assembly plants to the world's major car manufacturers) to build a flexible, innovative production line for car manufacturing. CPM turned to Wiferion to provide wireless charging systems that would supply power to ProFleet AGVs specially designed for use at the plant. Wiferion is a licensee of WiTricity's wireless charging technology.

ProFleet, manufactured by CPM, is a driverless transport system crucial to the assembly of the Lotus Emira. Thirty-four medium-sized AGVs transport body shells throughout the entire assembly hall in a stop-and-go process. They stop at a work station for precisely the time necessary to carry out the work that's needed and then travel to the next station until they reach the end of the loop. Each time they stop, they charge. No need to take time out of the day to go to a charger to get charged up. And because they charge wirelessly, there's no need for someone to walk onto the factory floor to plug them in. Production increases because capacity and availability increase. To meet the same demand, factories used to have 33% MORE AGVs as backups to go out on the assembly floor while other AGVs were charging. But not with wirelessly charged AGVs. Not only do savings occur due to production efficiency, but factories see immediate savings by not having to order additional vehicles.



ProFleet relies on Wiferion's etaLINK inductive charging system and modern lithium-ion batteries. The AGVs do not need to leave the AGV loop for power to be supplied so can carry out more jobs per hour, raising the productivity of the entire plant. AGVs carry out their tasks in a continuous 24/7 operation without needing to interrupt their transport work for charging breaks. This increases the productivity of a fleet of AGVs by up to 32% in comparison with traditional charging technologies.² Adding to the efficiency of the inductive charging is the AGV's ability to be supplied with large quantities of energy in a short period of time with a very high charging rate.


Wiferion's etaLINK



Maximum Efficiency Reduces Factory Expenses

Wireless charging on the factory floor is much safer than plug-in charging. Trips, slips, falls, and repetitive motion shoulder and back damage are the most common workplace injuries associated with conductive charging. With large, heavy charger cords at employees' feet, accidents are waiting to happen. Safer working conditions are realized by eliminating trip hazards and the need to continually plug and unplug chargers.

A major cost driver of plug-in chargers is charger maintenance, repair, and replacement due to improper plug management and constant wear and tear on the plug and receiver. From continual contact in and out of the AGV to simply dropping a cord, repair and replacement cut into a factory's budget. Also, because of the high failure rate of charger parts, plant managers face the choice of either a large cost associated with keeping inventory or weeks long charger down for replacement parts and repairs.

Wireless charging increases the productivity of a fleet of AGVs by up to **32%**  in comparison with traditional charging technologies.

² ["Inductive charging technology increases productivity by 32%." AJOT.com. February 22, 2023.](#)



Imagine a world where factories fitted with AGVs that charge wirelessly produce automobiles that charge wirelessly. Now that's the perfect future.

With wireless charging, factories don't have to think about charge management. When an AGV is parked – or waiting for a project to complete – it's charging. There's no need to worry about whether it is plugged in after a shift or before since charging starts as soon as the AGV is parked over the charging pad and stops when it's fully charged. Range is extended throughout the day with Power Snacking™ as is the battery's operational life. The result is a 24/7/365 factory with no downtime due to wirelessly charged AGVs.

What's more, Wiferion's technology at work in automotive factories is a proof case for the use of wireless charging for EVs themselves. Many of the same advantages – efficiency, reliability, and safety – apply to electric vehicles. And like AGVs charging themselves, wireless charging enables EV autonomy. There's no need for someone to plug in and charge the vehicle (or unplug when finished).

Imagine a world where factories fitted with AGVs that charge wirelessly produce automobiles that charge wirelessly. Now that's the perfect future.

About Wiferion

From inductive charging technology to energy management solutions, Wiferion offers a range of products that enable efficient energy supply to industrial trucks, automated guided vehicles (AGV) and autonomous mobile robots (AMR). The technology also includes retrofit projects for existing fleets. The flexible and scalable integration of Wiferion products enables users to sustainably increase their utilization and fleet efficiency by up to 32%. Using lean manufacturing principles, Wiferion redefines value stream mapping (VSM) by eliminating unnecessary machine downtime and plug-in charging that requires high maintenance and costs. The etaLINK series of inductive battery charging systems are award-winning and have received prestigious awards. Wiferion.com

About WiTricity

WiTricity is the pioneer in wireless charging for electric vehicles, leading the development and implementation of magnetic resonance technology across passenger and commercial vehicles alike. The company's products are backed by an extensive patent portfolio critical to ratified global EV wireless charging standards including SAE, ISO, and GB. Automakers and Tier 1 suppliers rely on WiTricity to help accelerate the adoption of EVs by eliminating the hassle of plug-in charging and setting the stage for future autonomy. Beyond EVs, WiTricity technology is indispensable to the wireless charging of all products, from consumer electronics to micro-mobility to robotics.