

## STÄUBLI ELECTRICAL CONNECTORS | April 20, 2018

# Sophisticated charging systems for automated guided vehicles (AGVs)

**Industry 4.0 and Logistics 4.0 go hand in hand in tight synergy. New technologies will significantly revolutionize the logistics of the future. Automation, networking, decentralization, and real-time capability are no longer unfamiliar concepts. In both intralogistics and external logistics, the trend towards flexible systems is well underway, and its inexorable expansion will make goods handling even more efficient, safe, and economical. This evolution requires interfaces and connections for data, energy, and signals that ensure safe operation of the systems. Stäubli Electrical Connectors, the specialist for reliable, high-performance connectors, offers efficient standardized or tailored solutions for indoor and outdoor use. Its products are distinguished by their very high standard of safety and provable quality.**

In logistics, everything is constantly in motion. Goods move from the warehouse to shipping, are stocked when they arrive at the loading dock, and are relocated by transport vehicles. Electrically driven Automated Guided Vehicles (AGV) are an integral component of forward-looking logistics applications. Powered by batteries, they navigate through warehouses or container ports and

make a significant contribution to increasing efficiency and reducing costs in logistics processes. Furthermore, these vehicles allow for emission-free, environmentally friendly transport.

Automatic battery replacement systems and high-performance charging stations are used to keep the AGVs in constant motion and prevent workflow disruptions. An important factor to help avoid downtimes and keep costs down is rapid charging. The Swiss company Stäubli Electrical Connectors has perfectly tailored, powerful, safe solutions for nearly every challenge in charging applications.

### Simple, flexible connector solution

Automatic battery replacement is a robot-controlled process, so the power transmission connections must be pluggable and separable. Alignment errors up to a certain degree require compensation, and the connection solution must withstand a high number of mating cycles. The CombiTac modular connector system from Stäubli allows free configuration of the transferred media. For this application it is equipped with an additional frame to compensate for guidance inaccuracies. A selection of various contacts and high-densi-

ty contact bases is available; special last-mate-first-break contacts monitor and check the connection status, providing greater safety. A 10-Gbit module for industrial Ethernet applications meets the requirements of CAT6A and is suitable for real-time data exchange.

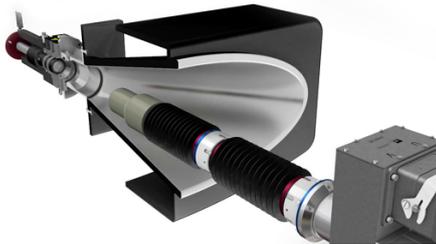
To tailor the connector solution to the individual application, Stäubli Electrical Connectors can draw on over 50 years of experience to develop customer-specific designs. Sales engineers and designers provide support throughout the entire process, which includes supplying 3D CAD models for easy integration into customer drawings, as well as one-to-one samples. The Stäubli Multilam contact technology is designed for very high numbers of mating cycles: Products from the automation technology range (Dockingline) guarantee both up to a million mating cycles and reduced-maintenance operation of the system.



Our broad industrial expertise allows us to design ideally tailored standard or special customer solutions.

### Automatic quick charging system

For automated logistics processes that run smoothly without operator intervention, power must also be supplied autonomously. In the process, the automatic charging system communicates not only with the vehicle, but also with the higher-level software that controls and monitors the entire charging process.



QCC – Automatic Rapid Charging Solution

There is a clear trend towards flexible systems that run without rails, tracks or guide markings, or whose guide markings can at least be modified without significant construction expense. Therefore, flexible charging systems that can be adapted to both the application and the existing infrastructure are in demand.

With the QCC (Quick Charging Connection) system, Stäubli Electrical Connectors offers a market-ready automatic connection solution that is already proving its worth in the field. Its core is the unique Multilam technology, in which the constant spring pressure of the Multilam louvers ensures that the connection between the

contact surfaces remains consistent through the entire lifespan, allowing constant high efficiency power transfer. Furthermore, the Multilam technology offers a self-cleaning effect with every mating. This allows high currents to be transferred continuously without additional cleaning or maintenance. These properties allow the shortest charging time for AGV batteries so as not to disrupt the work and schedule of the AGVs.

The charging rhythm can be adapted to the application. Regular, short charging cycles make it possible to keep the batteries that are used small, which has a positive effect on vehicle weight, on-board space requirements, and operating costs. Recharging occurs in scheduled pit stops or during reloading operations at charging stations along the route. Such brief interim charging, so-called “opportunity charging”, can be healthier on the batteries than full charging. This quick charging system from Stäubli is designed for over 100,000 mating cycles for many years of continuous operation.

The charging devices also have a patented mechanical guide with high tolerance compensation that can correct for positional inaccuracies and misalignments. An optional automatic self-cleaning system with compressed air removes possible foreign matter in the charging device in order to ensure reliable, low-maintenance operation – both indoors and outdoors. Thanks to its watertight design (IP55), this innovative system also prevents significant

contamination and water penetration, which could lead to dangerous short circuits.

Safety is also ensured: The Stäubli system is designed in such a way that all live parts are protected against direct contact in every situation, whether connected or disconnected. The power and signal contacts are not exposed until the connection is fully mated and the electronic release occurs to start the charging process. This complete contact protection up to the end of the connection process and the additional electronic release makes the system doubly safe. There are no exposed live parts such as overhead lines or power rails that could be touched.

**The safe, versatile, adaptable, powerful charging solutions from Stäubli will provide effective support for increasing the efficiency of logistics processes in the future.**