



GOODS-TO-PEOPLE TREND IS DRIVING MINIATURIZATION NEEDS

The warehouse industry estimates that half of its labor costs are spent on the picking process — the act of pulling out the right products from a shelf or box to fulfill a customer’s order. And about 50% of that cost goes to paying workers to walk through the warehouse to find the right products. To help cut labor costs and improve picking efficiency, more warehouses are turning to low-payload autonomous mobile robots (AMRs) that bring the goods to the pickers, drastically reducing walking time.

“Warehouse operators need more AMRs to move boxes and shelves, but they do not want them to have a large footprint,” says Daniel Walldorf, strategy and business development manager at TE Connectivity (TE). “As a result, robot manufacturers are being asked to design smaller but more powerful AMRs. And that is where TE comes in.”

Make It Smaller, But Mightier

Now more than ever, robotics manufacturers need greater capabilities in ever-shrinking components that are still sturdy enough for rugged industrial environments. From relays and sensors to circuit boards and connectors, every aspect of the small-footprint, mobile robotics package requires sturdy, miniaturized components.

“Smaller AMRs mean smaller motors, which mean smaller motor controllers, which mean smaller connectors and relays,” Walldorf says.

Another important need for warehouse operators is the electrification of AMRs and other warehouse vehicles, which offers even more benefits — reduced noise pollution, lower carbon emissions, and energy and cost savings. However, one of the biggest challenges of electric technology is solving charging downtime.

Manufacturers can choose traditional lead-acid battery technology (which requires more time, extra warehouse space, and possible battery swaps) or newer lithium-ion battery technology (which reduces downtime by charging batteries without needing to completely replace them, so the batteries survive many charging cycles). ▶

DID YOU KNOW?

Another TE specialty area for small-footprint robot manufacturers is our sensor portfolio, including avalanche photodiodes (APDs).

APDs are highly sensitive semiconductor devices that transform optical signals into electrical signals. They are used in the laser scanners on AMRs and other low-payload mobile robots to help with mapping, navigation, and object detection.



WHAT DOES IT TAKE TO MAKE A LOW-PAYLOAD ROBOT?

As highly specialized automated warehouses take on more diverse capabilities, it will be critical to employ reliable interfaces to secure the growing volumes of data and power by using interconnect solutions that are as compact and space-saving as possible.

TE offers an extensive portfolio of connectors and components to do just that, including:

- M8/M12 connector system
- Heavy Duty Connectors (HDC)
- Industrial RJ45 connectors
- Mini I/O connectors
- Circular Plastic Connectors (CPC)
- Dynamic Mini Series connectors
- RITS connectors
- Terminal blocks
- Relays



“Rather than waiting hours for a battery to charge, lithium-ion technology gives a constant supply of currents and the right amount of voltage for fast charging capabilities,” Walldorf says. “We are also seeing more opportunistic charging, where the battery charges whenever the vehicle has a short amount of downtime.”

New battery technologies and frequent charging call for more sophisticated battery management systems, increased charging power, and a higher number of charging cycles for the charging infrastructure. There are also additional requirements for AMRs to be charged autonomously at docking stations.

Reliable and compact battery and charging solutions, as well as higher efficiency drive technology, are TE's primary focuses for electric technology in the warehouse. TE's broad portfolio of board connectivity and relay products helps robotics manufacturers stay ahead of miniaturization trends, rugged connectivity solutions, and increasing data requirements.

Are you interested in learning more about TE Connectivity's expertise in rugged industrial robotics connectivity?

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