

# Frequently asked questions: automated lift trucks



Forget about difficult maintenance and disjointed integration. Yale Relay is lift truck automation reinvented, replacing past roadblocks with ease, affordability and reliability. How can your warehouse leverage this technology? This FAQ covers some of the questions we hear most. And our team, including our network of independent dealers, is here to answer any others, remove the friction and help you get started without a large capital outlay or hidden costs.

## BENEFITS

### WHY ARE WAREHOUSES INVESTING IN AUTOMATED LIFT TRUCKS?

Warehouse operations are investing in automated lift trucks to improve efficiency and productivity while lessening dependence on scarce labor. Automated lift trucks can also help reduce operating costs, accidents and avoidable damage, and high operator turnover.

### AREN'T AUTOMATED LIFT TRUCKS COMPLEX, TIME-CONSUMING AND LABOR-INTENSIVE TO INSTALL AND REPROGRAM?

Automating forklifts isn't new. However, it is still in a relative infancy stage, and some operations have been hesitant to adopt because of misconceptions or sub-optimal experiences with other providers. Yale Relay was developed in direct consultation with customers to overcome traditional shortcomings of automation with a simple, dependable solution. The automated lift trucks are backed by a long history of innovation and corporate stability.

### ARE AUTOMATED LIFT TRUCKS SAFE?

Yale Relay automated lift trucks are compliant with UL safety standards and adhere to the ANSI/ITSDF B56.5 safety standard and site-specific safety protocols. In addition to meeting all B56.5 standards, Yale Relay automated forklifts sense both ground level and suspended obstructions in the path of travel.

## REQUIREMENTS

### WHAT OPERATIONS ARE THE BEST CANDIDATES FOR AUTOMATED LIFT TRUCKS?

Warehouses operating with multiple shifts, dedicated headcount and frequent indoor horizontal transport tasks with repeatable paths, like point-to-point material transfers, are particularly good candidates for automated lift trucks.

### WHERE DO AUTOMATED LIFT TRUCKS WORK BEST?

Automated lift trucks are well suited for indoor applications with clean, flat floors with less than a 3% incline. They are compatible with single-temperature operations with temperatures above 32 degrees Fahrenheit.

### WHAT TYPE OF FLOOR SURFACE IS BEST FOR AUTOMATED LIFT TRUCKS?

Warehouse floors should be smooth concrete surfaces without any bumps. Any excessive joints or defects should be addressed with epoxy fill, although typical expansion joints are acceptable.

### DO I NEED TO MODIFY MY WAREHOUSE OR FACILITY INFRASTRUCTURE TO ACCOMMODATE AUTOMATED LIFT TRUCKS?

In many cases, no. Yale Relay uses infrastructure-free navigation technology so there is no need to install targets, ground wires or reflectors, or make other extensive modifications. However, in some unique situations, an automation specialist might suggest installing flags or reflective materials.

### DO AUTOMATED LIFT TRUCKS NEED TO BE MONITORED?

Yale Relay automated lift trucks are fully autonomous when performing programmed tasks. Individual trucks and fleets can be monitored through the cloud-based portal across multiple facilities. Large fleets might have the need for a fleet supervisor, and, for recovery situations, an on-site floor supervisor is required for support.



## TECHNOLOGY

### HOW LONG DOES AUTOMATED FORKLIFT IMPLEMENTATION TAKE?

The user-friendly Yale Relay drag-and-drop portal allows integration in as little as a day. Implementation, which includes network connection, mapping, route design and job logic creation, may extend up to a few weeks, depending on the scope of your project.

### HOW LONG DOES IT TAKE AUTOMATED LIFT TRUCKS TO MAP A FACILITY?

Yale Relay can map a facility in 2D within 15 minutes, with the specific time depending on the size of the building. With Yale Relay, mapping is as easy as navigating the truck through your warehouse several times. Once the warehouse is mapped by one automated lift truck, the map can be saved to all the units in your fleet.

### HOW DO AUTOMATED LIFT TRUCKS NAVIGATE?

Yale Relay automated lift trucks use a simultaneous localization and mapping (SLAM) algorithm to check their locations on their map of your warehouse. They are equipped with a LiDAR system that determines the trucks' locations and direction of travel.

### DO AUTOMATED LIFT TRUCKS INTERFACE WITH WMS AND ERP SYSTEMS?

Yale Relay integrates with basic warehouse systems such as fire alarms and interactive input boxes. Integration with warehouse management systems and programmable logic controls is in development.

### CAN I ADAPT THE AUTOMATED TECHNOLOGY TO AN EXISTING LIFT TRUCK?

No, automated lift trucks are available for factory order only. There is not an aftermarket option to convert manual lift trucks into automated lift trucks.

## ADOPTION + SAVINGS

### CAN I LEASE AUTOMATED LIFT TRUCKS?

Yes. The Yale Relay frictionless rental model provides financial flexibility and a clear return on investment, allowing you to deploy automated lift trucks in your warehouse without a large capital outlay or hidden costs.

### ARE AUTOMATED LIFT TRUCKS EXPENSIVE TO IMPLEMENT?

With available leasing programs, automated lift trucks can be implemented with little upfront cost and no hidden fees. Plus, you can start with as few as one or two trucks, so you can scale your automated lift truck investment to suit the requirements of your warehouse.

### HOW MANY AUTOMATED LIFT TRUCKS ARE NEEDED TO JUSTIFY THE SYSTEM?

ROI and the appropriate fleet size varies for each warehouse, but it is possible to see a return with as few as one or two automated lift trucks.

### HOW LONG DO AUTOMATED LIFT TRUCKS LAST?

In most cases, an automated lift truck can last longer than a standard truck due to the abuse often associated with manual trucks. Typically, automated lift trucks have a useful life of four to five years with proper maintenance.

## OPERATION

### IF A PATH CHANGE IS NEEDED, DOES A TRAINED SOFTWARE ENGINEER NEED TO MAKE THE ADJUSTMENT?

No. The Yale Relay drag-and-drop portal gives you the control to make path changes easily without the need for custom code or engineering.

### HOW DOES THE TRUCK SWITCH FROM AUTOMATED TO MANUAL MODE?

To take manual control, the operator can either push a button or step on the truck platform when the truck is parked. The 3D camera system on Yale Relay trucks automatically checks for operator presence and prevents the truck from moving in automated mode when there is a person in the operator compartment.

### WHO PROVIDES SERVICE FOR AUTOMATED LIFT TRUCKS?

Convenient service, training, parts and support for Yale Relay automated lift trucks is provided through the Yale® dealer network.

### WHAT HAPPENS WHEN THE BATTERY GETS LOW?

Yale Relay automated lift trucks are engineered to help your operation keep pace, including when it's time to recharge. When the battery gets low, the truck can automatically return to a wireless charging station and dock and charge on its own without the need for human intervention. You can program the truck to automatically return to a charging station when a certain threshold is met — for example, when the battery is depleted to 20% of its full charge. You can also opportunity charge the battery, allowing the truck to return to a charging station during lulls in the workflow. This reduces reliance on full-length charging sessions to maximize runtime throughout each shift. If automated charging is not selected, the truck stops where it is when the battery's state of charge drops below the threshold.

### WHAT HAPPENS IF OUR NETWORK GOES DOWN?

If your Wi-Fi network connection is interrupted, the truck drives to its next waypoint and stops. It resumes its job when network connectivity is restored.

For a deeper conversation about implementing automated lift trucks, contact a solutions expert at your [local Yale dealer](#).