



# The Mobile Robot Company

Knowledge Center — Safety Architecture · 2026-08-04

<https://info.mobilerobot.com/it-it/safety-compliance/safety-overview/safety-architecture>

# Safety Architecture

The J1600's safety architecture layers navigation, sensing, safety control, certified actuation, human confirmation, and physical override. This page lists every safety component and explains how the layers combine. For the high-level introduction, see [How J1600 safety works](https://info.mobilerobot.com/it-it/safety-compliance/safety-overview/how-j1600-safety-works/) (<https://info.mobilerobot.com/it-it/safety-compliance/safety-overview/how-j1600-safety-works/>).

## Safety components

- Independent safety controller
- Two 2D safety LiDAR scanners, mounted front and rear on the chassis
- Three emergency-stop buttons
- Belly button for stop and reverse
- [Load-detection sensor](https://info.mobilerobot.com/it-it/safety-compliance/safety-functions/load-detection/) (<https://info.mobilerobot.com/it-it/safety-compliance/safety-functions/load-detection/>).
- [Tiller-position switch](https://info.mobilerobot.com/it-it/safety-compliance/safety-functions/tiller-detection/) (<https://info.mobilerobot.com/it-it/safety-compliance/safety-functions/tiller-detection/>) for emergency stop
- Tiller-position switch for manual control
- Safety-certified driving-speed encoder
- Safety-certified driving-direction encoder
- Two safety-certified motor controllers

## The 360-degree protective field

The two 2D safety LiDAR scanners together cover the full perimeter of the vehicle, producing a 360-degree protective field that supports both forward and reverse autonomous travel — including certified safe reversing without specially marked target zones. The field is speed-dependent: it changes with travel speed and expands at higher speeds. Field-size adjustment is itself a certified safety function rated PL d — see [Safety-field adjustment](https://info.mobilerobot.com/it-it/safety-compliance/safety-functions/safety-field-adjustment/) (<https://info.mobilerobot.com/it-it/safety-compliance/safety-functions/safety-field-adjustment/>).

Blue floor light strips — three in total — display the current safety zone so people nearby can see the protected area. White light indicates manual mode.

## Certified motion control

Motion is supervised by the independent safety controller working with a safety-certified driving-speed encoder, a safety-certified driving-direction encoder, and two safety-certified motor controllers. These support the certified [braking](https://info.mobilerobot.com/it-it/safety-compliance/safety-functions/braking/) (PL d) and [speed monitoring and control](https://info.mobilerobot.com/it-it/safety-compliance/safety-functions/speed-monitoring/) (PL c) functions.

## Human confirmation and override

Two layers involve people directly:

- **Confirmation.** The operator must confirm entry into automatic mode with the physical start/resume button, and the robot instructs the operator to step away before starting. See [Manual and autonomous mode safety](https://info.mobilerobot.com/it-it/safety-compliance/safety-overview/manual-and-autonomous-mode-safety/) (https://info.mobilerobot.com/it-it/safety-compliance/safety-overview/manual-and-autonomous-mode-safety/).
- **Override.** Grabbing or moving the tiller enables immediate manual takeover; emergency stops halt the vehicle. See [Emergency stops and manual takeover](https://info.mobilerobot.com/it-it/safety-compliance/safety-overview/emergency-stops-and-manual-takeover/) (https://info.mobilerobot.com/it-it/safety-compliance/safety-overview/emergency-stops-and-manual-takeover/).

## Separation from the navigation stack

The 3D navigation LiDAR and RGB AI camera map the environment and route the vehicle around objects; the 2D safety stack supplies the certified personnel protection. The two systems are independent — see [Navigation sensors vs. safety sensors](https://info.mobilerobot.com/it-it/safety-compliance/safety-overview/navigation-sensors-vs-safety-sensors/) (https://info.mobilerobot.com/it-it/safety-compliance/safety-overview/navigation-sensors-vs-safety-sensors/).

## Performance levels

Each certified safety function carries an assigned Performance Level between PL b and PL d — for example braking, emergency stop, [person detection](https://info.mobilerobot.com/it-it/safety-compliance/safety-functions/person-detection/) (https://info.mobilerobot.com/it-it/safety-compliance/safety-functions/person-detection/), and safety-field adjustment at PL d. The full table is in [Performance levels](https://info.mobilerobot.com/it-it/safety-compliance/safety-functions/performance-levels/) (https://info.mobilerobot.com/it-it/safety-compliance/safety-functions/performance-levels/).

## What this architecture delivers — and its documentation limits

The layered design improves predictability and may [reduce workplace accidents](https://info.mobilerobot.com/it-it/applications/results/safety-improvements/) compared with manual pallet handling.

### **DEPLOYMENT DECISIONS NEED CURRENT DOCUMENTATION**

No accident-rate test data, safety-distance curves, stopping distances, validation reports, or [declaration of conformity](https://info.mobilerobot.com/it-it/safety-compliance/certificates/ce-declaration-of-conformity/) are published on this site. The January 2026 specifications are preliminary and subject to change; use current product documentation for deployment decisions.