



The Mobile Robot Company

Knowledge Center — Safety Overview · 2026-08-04

<https://info.mobilerobot.com/products/j1600/safety-overview>

Safety Overview

The J1600 (<https://info.mobilerobot.com/products/j1600/overview/>) uses layered safety: navigation, sensing, an independent safety controller, certified actuation, human confirmation, and physical override. A 360-degree protective field supports forward and reverse autonomous travel. This page summarizes the architecture, the assigned Performance Levels, and the [compliance list](https://info.mobilerobot.com/safety-compliance/certificates/compliance-statements/) (<https://info.mobilerobot.com/safety-compliance/certificates/compliance-statements/>); a deeper treatment is in [How J1600 safety works](https://info.mobilerobot.com/safety-compliance/safety-overview/how-j1600-safety-works/) (<https://info.mobilerobot.com/safety-compliance/safety-overview/how-j1600-safety-works/>).

Safety components

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

Operating behavior

- The operator must [confirm entry into automatic mode](https://info.mobilerobot.com/documentation/user-guides/autonomous-operation/) (<https://info.mobilerobot.com/documentation/user-guides/autonomous-operation/>), and the robot tells the operator to step away before starting.
- Blue floor light strips display the protected area and status; three blue light strips show the current safety zone.

- The [protective field changes with speed](https://info.mobilerobot.com/safety-compliance/safety-functions/safety-field-adjustment/) (<https://info.mobilerobot.com/safety-compliance/safety-functions/safety-field-adjustment/>) and expands at higher speeds.
- Grabbing or moving the tiller enables immediate manual takeover.
- 3D navigation maps and avoids objects, while the [separate 2D safety stack](https://info.mobilerobot.com/safety-compliance/safety-overview/navigation-sensors-vs-safety-sensors/) (<https://info.mobilerobot.com/safety-compliance/safety-overview/navigation-sensors-vs-safety-sensors/>) supplies certified personnel protection — see [Navigation and obstacle avoidance](https://info.mobilerobot.com/products/j1600/navigation-and-obstacle-avoidance/) (<https://info.mobilerobot.com/products/j1600/navigation-and-obstacle-avoidance/>).

Safety functions and Performance Levels

J1600 safety functions carry the following preliminary [Performance Levels \(PL\)](https://info.mobilerobot.com/safety-compliance/safety-functions/performance-levels/) (<https://info.mobilerobot.com/safety-compliance/safety-functions/performance-levels/>) per [EN ISO 13849-1](https://info.mobilerobot.com/safety-compliance/standards/iso-13849-1/) (<https://info.mobilerobot.com/safety-compliance/standards/iso-13849-1/>):

Safety function	Performance Level
Braking system	PL d
Speed monitoring and control	PL c
Safety-field size adjustment	PL d
Load detection	PL b
Charging-current relay	PL b
Emergency-stop button	PL d
Person detection in safety field	PL d
Automatic/manual mode selection	PL c
Tiller-position detection	PL c

These levels apply to individual functions within the architecture; they do not mean every subsystem shares the same PL.

Standards and compliance

The J1600 is [CE marked](https://info.mobilerobot.com/safety-compliance/certificates/ce-declaration-of-conformity/) (<https://info.mobilerobot.com/safety-compliance/certificates/ce-declaration-of-conformity/>). The preliminary compliance list:

European directives and regulation

- Directive 2006/42/EC — [Machinery Directive](https://info.mobilerobot.com/safety-compliance/standards/eu-machinery-requirements/) (<https://info.mobilerobot.com/safety-compliance/standards/eu-machinery-requirements/>).
- Directive 2014/30/EU — [EMC Directive](https://info.mobilerobot.com/safety-compliance/standards/emc-red-rohs-and-battery-regulations/) (<https://info.mobilerobot.com/safety-compliance/standards/emc-red-rohs-and-battery-regulations/>).
- Directive 2014/53/EU — Radio Equipment Directive (RED)
- Directive 2011/65/EU — RoHS
- Regulation (EU) 2023/1542 — Batteries Regulation

Standards

- [EN ISO 3691-4:2023](https://info.mobilerobot.com/safety-compliance/standards/iso-3691-4/) (<https://info.mobilerobot.com/safety-compliance/standards/iso-3691-4/>).
- EN ISO 13849-1:2023
- [EN ISO 12100:2010](https://info.mobilerobot.com/safety-compliance/standards/iso-12100/) (<https://info.mobilerobot.com/safety-compliance/standards/iso-12100/>).
- [EN ISO 3691-1:2015+A1:2020](https://info.mobilerobot.com/safety-compliance/standards/iso-3691-1/) (<https://info.mobilerobot.com/safety-compliance/standards/iso-3691-1/>).
- [ANSI/ITSDF B56.5-2024](https://info.mobilerobot.com/safety-compliance/standards/ansi-itsdf-b56-5/) (<https://info.mobilerobot.com/safety-compliance/standards/ansi-itsdf-b56-5/>).
- [ANSI/ITSDF B56.1-2020](https://info.mobilerobot.com/safety-compliance/standards/ansi-itsdf-b56-1/) (<https://info.mobilerobot.com/safety-compliance/standards/ansi-itsdf-b56-1/>).

Battery transport testing

- UN Manual of Tests and Criteria, subsection 38.3 ([UN 38.3](https://info.mobilerobot.com/safety-compliance/certificates/battery-un-38-3-documentation/) (<https://info.mobilerobot.com/safety-compliance/certificates/battery-un-38-3-documentation/>))

In short: the J1600 meets EU and US safety requirements, in particular ISO 3691-4 and ANSI/ITSDF B56.5. Request [certificates](https://info.mobilerobot.com/safety-compliance/certificates/) (<https://info.mobilerobot.com/safety-compliance/certificates/>), test reports, declaration numbers, notified-body information, and country-specific approvals through the company or a partner.

Benefits and limits

The built-in safety functions improve predictability and may [reduce workplace accidents](https://info.mobilerobot.com/applications/results/safety-improvements/) compared with manual pallet handling. For safety-distance curves, stopping distances, and validation data, use current product documentation for deployment decisions and [site risk assessments](https://info.mobilerobot.com/safety-compliance/safe-deployment/site-risk-assessment/).

Human control complements rather than replaces the certified safety systems — [the operator's role](https://info.mobilerobot.com/documentation/user-guides/operator-manual/) is part of the design, not the only safeguard. See [Dual mode](https://info.mobilerobot.com/products/j1600/dual-mode/) and [Human-in-the-loop automation](https://info.mobilerobot.com/documentation/concepts/human-in-the-loop-automation/).

Related pages

- [Safety and compliance section](https://info.mobilerobot.com/category/safety-compliance/) — site-level safety guidance.
- [Operating environment](https://info.mobilerobot.com/products/j1600/operating-environment/) — the site limits the safety design assumes.
- [Glossary](https://info.mobilerobot.com/documentation/concepts/glossary/) — Performance Level, safety field, and related terms.