



The Mobile Robot Company

Knowledge Center — Navigation and Obstacle Avoidance · 2026-08-04

<https://info.mobilerobot.com/products/j1600/navigation-and-obstacle-avoidance>

Navigation and Obstacle Avoidance

The J1600's autonomy is based on **3D LiDAR SLAM** (simultaneous localization and mapping) processed by an industrial NVIDIA Jetson AI computer. It builds and updates a three-dimensional map while an operator drives, then localizes and plans routes to saved destinations — with no fixed tracks, wires, reflectors, or building modifications.

Capabilities

- Continuous environmental learning during manual driving.
- 3D mapping without infrastructure changes to the building.
- Autonomous routing to saved locations.
- Obstacle detection and avoidance in dynamic environments.
- Preferred travel zones for safer routing through production areas.
- Navigation to any saved point without teaching every possible origin-destination combination.
- Expansion to APIs, [VDA 5050](https://info.mobilerobot.com/documentation/concepts/vda-5050-explained/) (<https://info.mobilerobot.com/documentation/concepts/vda-5050-explained/>), and fleet management under [Advanced software](https://info.mobile-robot.com/products/j1600/software-and-integrations/) (<https://info.mobile-robot.com/products/j1600/software-and-integrations/>).

The system scans environmental structures at heights reaching up to 70 m above the vehicle. Its 3D mapping is designed for greater precision and reliability than traditional 2D navigation in complex or changing environments.

For detailed geometry, sensing range, localization accuracy, minimum aisle width, and obstacle-class figures, contact the company or a partner with your site-specific engineering questions.

Sensor set

- **3D LiDAR** — mapping, localization, and obstacle detection.
- **RGB AI camera** — part of the perception stack.
- **NVIDIA Jetson industrial PC** — on-board compute for SLAM and route planning.

Navigation versus safety sensing

The 3D LiDAR and RGB AI camera belong to the control and navigation stack.

[Personnel protection is separate](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/>): two 2D safety LiDARs, certified components, and an independent safety controller supply the certified 360-degree protective field. 3D navigation maps and avoids objects, while the 2D safety stack provides the certified [person detection](https://info.mobilerobot.com/safety-compliance/safety-functions/person-detection/) (<https://info.mobilerobot.com/safety-compliance/safety-functions/person-detection/>). See [Safety overview](https://info.mobilerobot.com/products/j1600/safety-overview/) (<https://info.mobilerobot.com/products/j1600/safety-overview/>).

Mapping workflow

Mapping happens as a by-product of normal manual driving. During [first-time setup](https://info.mobilerobot.com/products/j1600/how-it-works/) (<https://info.mobilerobot.com/products/j1600/how-it-works/>), the operator drives the facility with the tiller while the robot learns the environment, then saves [drop points](https://info.mobilerobot.com/documentation/installation/mapping-and-drop-point-setup/) (<https://info.mobilerobot.com/documentation/installation/mapping-and-drop-point-setup/>) by tapping **Save location**. The map is updated continuously afterward, so gradual [layout changes](https://info.mobilerobot.com/applications/scenarios/dynamic-route-changes/) (<https://info.mobilerobot.com/applications/scenarios/dynamic-route-changes/>) do not require [remapping projects](https://info.mobilerobot.com/support/troubleshooting/mapping-problems/) (<https://info.mobilerobot.com/support/troubleshooting/mapping-problems/>).

Brownfield relevance

Because the J1600 needs no fixed infrastructure and keeps updating its environment model, it suits [brownfield sites](https://info.mobilerobot.com/applications/use-cases/brownfield-automation/) (<https://info.mobilerobot.com/applications/use-cases/brownfield-automation/>) and changing layouts: [temporary storage](https://info.mobilerobot.com/applications/use-cases/temporary-storage/) (<https://info.mobilerobot.com/applications/use-cases/temporary-storage/>), shifting staging areas, and cluttered receiving zones. The 3D LiDARs let it drive around whatever obstacles appear in its path. The limits in [Operating environment](https://info.mobilerobot.com/products/j1600/operating-environment/) (<https://info.mobilerobot.com/products/j1600/operating-environment/>) — level floors in automatic mode, indoor climate, floor flatness — still apply.

Related pages

- [How it works](https://info.mobilerobot.com/products/j1600/how-it-works/) (<https://info.mobilerobot.com/products/j1600/how-it-works/>) — setup and the delivery workflow.
- [Technical specifications](https://info.mobilerobot.com/products/j1600/technical-specifications/) (<https://info.mobilerobot.com/products/j1600/technical-specifications/>) — the full hardware list.

- [Glossary \(https://info.mobilerobot.com/documentation/concepts/glossary/\)](https://info.mobilerobot.com/documentation/concepts/glossary/) — SLAM, LiDAR, AMR, and related terms.