



The Mobile Robot Company

Knowledge Center — Navigation and Mapping · 2026-08-04

<https://info.mobilerobot.com/support/faq/navigation-and-mapping>

Navigation and Mapping

Common questions about how the J1600 finds its way, how you teach it locations, and where it can drive.

How does the J1600 navigate?

With **3D LiDAR SLAM** (<https://info.mobilerobot.com/products/j1600/navigation-and-obstacle-avoidance/>) (simultaneous localization and mapping) processed by an industrial NVIDIA Jetson AI computer. The robot builds and continuously updates a three-dimensional map of the facility while an operator drives it, then localizes itself in that map and plans routes to saved destinations. It scans environmental structures at heights reaching up to 70 m above the vehicle, and its 3D mapping is designed for greater precision and reliability than traditional 2D navigation in complex or changing environments.

Do I need to install tracks, wires, reflectors, or markers?

No. The J1600 needs no fixed tracks, wires, reflectors, or building modifications. It maps the facility as it is.

How do I create the map?

[Drive the robot manually through the facility](https://info.mobilerobot.com/documentation/getting-started/creating-the-first-map/) (<https://info.mobilerobot.com/documentation/getting-started/creating-the-first-map/>) with the tiller. It learns and updates its understanding of the environment continuously while you drive — there is no separate mapping procedure to run.

How do I add a destination?

Drive manually to the desired [floor-drop point](https://info.mobilerobot.com/documentation/installation/mapping-and-drop-point-setup/) (<https://info.mobilerobot.com/documentation/installation/mapping-and-drop-point-setup/>), tap **Save location** on the touchscreen, and

name it. Repeat for every destination you need. Operators add locations themselves; no automation expert or IT involvement is needed.

How many locations can I save?

There is no software limit on the number of [saved locations](https://info.mobilerobot.com/documentation/user-guides/location-management/) (<https://info.mobilerobot.com/documentation/user-guides/location-management/>). Practical limits come from the available warehouse space.

Do I have to teach every route?

No. Locations can be recombined freely. The robot navigates from wherever it is to any saved point — you do not demonstrate every possible origin-to-destination combination. This makes [multi-point flows](https://info.mobilerobot.com/applications/use-cases/multi-point-pallet-transport/) (<https://info.mobilerobot.com/applications/use-cases/multi-point-pallet-transport/>), such as [cross-docking](https://info.mobilerobot.com/applications/use-cases/cross-docking/) (<https://info.mobilerobot.com/applications/use-cases/cross-docking/>) practical. See [Pallets and loads](https://info.mobilerobot.com/support/faq/pallets-and-loads/) (<https://info.mobilerobot.com/support/faq/pallets-and-loads/>) for what it carries on those routes.

How does it handle obstacles and people?

The J1600 detects and avoids obstacles in dynamic environments and [routes around people and objects](https://info.mobilerobot.com/applications/scenarios/operation-in-crowded-environments/) (<https://info.mobilerobot.com/applications/scenarios/operation-in-crowded-environments/>) using its continuously updated 3D map. Personnel protection is handled by a [separate, certified 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/>) — two 2D safety LiDAR scanners and an independent safety controller — distinct from the navigation sensors. See [Safety](https://info.mobilerobot.com/support/faq/safety/) (<https://info.mobilerobot.com/support/faq/safety/>), and [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/>).

Can I control where it prefers to drive?

Yes. Preferred travel zones can be defined for safer routing through production areas.

Does it work in brownfield sites and changing layouts?

Yes. The J1600 is designed for [brownfield facilities](https://info.mobilerobot.com/applications/use-cases/brownfield-automation/) and changing layouts: 3D mapping handles dynamic environments, the robot drives around obstacles in its way, and operators [re-teach or add locations](https://info.mobilerobot.com/documentation/concepts/teach-and-repeat/) in minutes when the [layout changes](https://info.mobilerobot.com/applications/scenarios/dynamic-route-changes/).

What floor and environment conditions does it need?

Parameter	Requirement
Gradeability, automatic mode	0° / 0% — level floors only
Gradeability, manual mode	2.86° / 5% without load; 1.72° / 3% at full load
Maximum traversable bump	25 mm / 1 in
Maximum traversable gap	20 mm / 0.8 in
Floor flatness/levelness	TR34 FM3 (FF 25 / FL 20)
Operating temperature	5–40 °C / 41–104 °F
Relative humidity	20–80%, non-condensing
Ingress protection	IP21 — indoor use

Autonomous driving is an [indoor, level-floor application](https://info.mobilerobot.com/applications/planning/route-and-floor-suitability/). Steep dock plates and slopes remain manual tasks.

What are the navigation sensors, exactly?

A 3D LiDAR and an RGB AI camera feed the navigation and control stack, which runs on the NVIDIA Jetson industrial PC. No values are published for exact sensor geometry, range, accuracy, minimum aisle width, localization tolerance, or obstacle

classes. See the [technical specifications](https://info.mobilerobot.com/products/j1600/technical-specifications/) (<https://info.mobilerobot.com/products/j1600/technical-specifications/>) for the full hardware list.