

MiR1350 specifications

Date: 2024-08-01

The product specifications in English are the most recently updated on the Support Portal.

See the latest updates [here](#).

Specifications may vary based on local conditions and application setup.

General information

| | |
|---------------------|--|
| Designated use | Autonomous mobile robot (AMR) for internal transportation of heavy loads and pallets |
| Type | Autonomous Mobile Robot (AMR) |
| Color | RAL 9005 / Jet Black |
| Product design life | 5 years or 20 000 hours of active operation, whichever comes first |

Dimensions

| | |
|-----------------------|-------------------------------|
| Length | 1 350 mm 53.1 in |
| Width | 910 mm 35.8 in |
| Height | 322 mm 12.7 in |
| Weight | 244 kg 538 lbs |
| Ground clearance | 25–27 mm 1.0–1.1 in |
| Load surface | 1 304 × 864 mm 51.3 × 34 in |
| Drive wheel diameter | 200 mm 7.9 in |
| Caster wheel diameter | 100 mm 3.9 in |

Payload

| | |
|-----------------|----------------------|
| Maximum payload | 1 350 kg 2 976 lbs |
|-----------------|----------------------|

| | |
|---|--|
| Footprint of payload | Equal to robot footprint. Contact MiR if a bigger payload footprint is required. |
| Payload placement | Place center of mass according to directions in the user guide. |
| Maximum lifting capacity with a MiR EU-/US-lift installed | 1 250 kg 2 755 lbs |

Performance

| | |
|--|---|
| Maximum speed (with maximum payload on a flat surface) | 1.2 m/s (4.3 km/h) 3.9 ft/s (2.7 mph) |
| Maximum acceleration | No payload: 0.43 m/s ² 1.41 ft/s ² |
| | Maximum payload: 0.40 m/s ² 1.31 ft/s ² |
| Positioning accuracy (in controlled conditions) ¹ | Docking to L-marker: ± 3 mm 0.12 in on X-axis, ± 3 mm 0.12 in on Y-axis, ± 0.25° yaw |
| | Docking to VL-marker: ± 2 mm 0.08 in on X-axis, ± 3 mm 0.12 in on Y-axis, ± 0.25° yaw |
| | Docking to V-marker: ± 20 mm 0.79 in on X-axis, ± 20 mm 0.79 in on Y-axis, ± 2° yaw |
| | Docking to Bar-marker: ± 10 mm 0.39 in on X-axis, ± 5 mm 0.19 in on Y-axis, ± 0.75° yaw |
| | Moving to position: ± 100 mm 3.94 in on X-axis, ± 83 mm 3.27 in on Y-axis, ± 3.4° yaw |

¹The positioning accuracy is tested under the following conditions:

- Using a single robot without payload
- On a site that is within the environmental requirements for the robot with good localization and no or few dynamic obstacles
- On a flat, clean surface

The Bar-marker positioning accuracy is measured with two bar lengths: 400 mm | 15.75 in and 750 mm | 29.53 in, and with distances between the bars ranging from 750 mm | 29.53 in to 1 500 mm | 59.06 in.

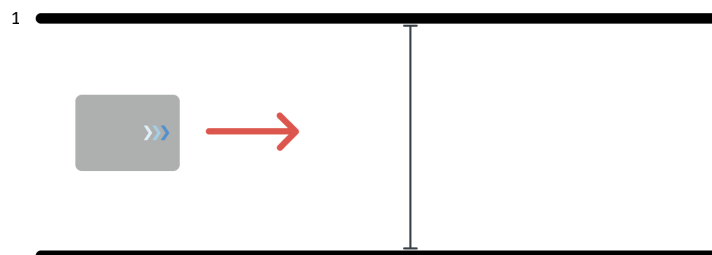
When docking to a V or a VL-marker the positioning accuracy is valid for X-offsets up to 1 200 mm | 47.24 in and Y-offsets up to 350 mm | 13.78 in.

| | |
|---|--|
| | Docking time: up to 12 s |
| Time used when docking to or undocking from a VL-marker | Undocking time: up to 7 s (Offsets used: -0.75 m 29.5 in on X-axis, 0.2 m 7.9 in on Y-axis, 0° yaw) |
| | Docking time: up to 39 s |
| Time used when docking to or undocking from a V-marker | Undocking time: up to 5 s (Offsets used: -0.75 m 29.5 in on X-axis, 0.4 m 15.7 in on Y-axis, 0° yaw) |
| Minimum size of detectable object | 30 x 30 x 30 mm 1.18 x 1.18 x 1.18 in (Object on floor in front of robot, default speed and default camera configurations) |

Space requirements

For an in-depth explanation of the performance specifications, see the guide *MiR600 and MiR1350 Space Requirements*. You can find this guide on [MiR Support Portal](#).

| | |
|---|--|
| | With default setup: 1 800 mm 70.9 in |
| Operational corridor width ¹ | With minimized footprint and muted Protective fields: 1 200 mm 47.2 in |



Operational corridor width for a 90° turn ¹

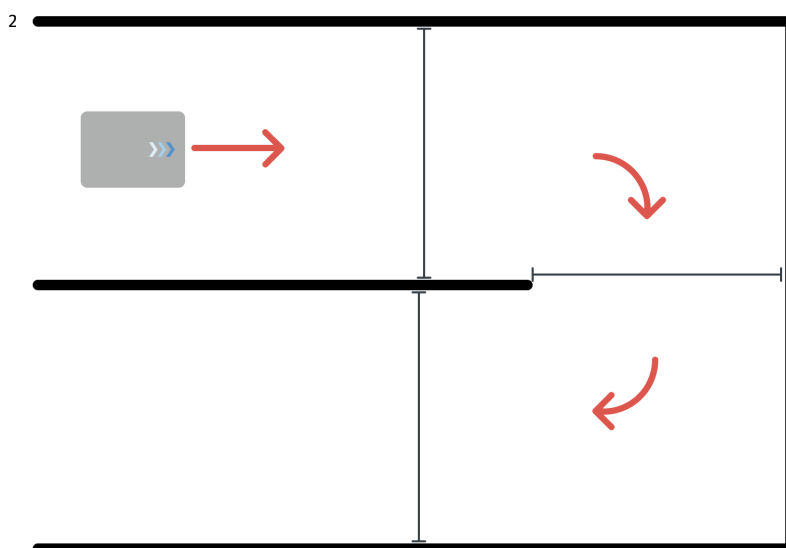
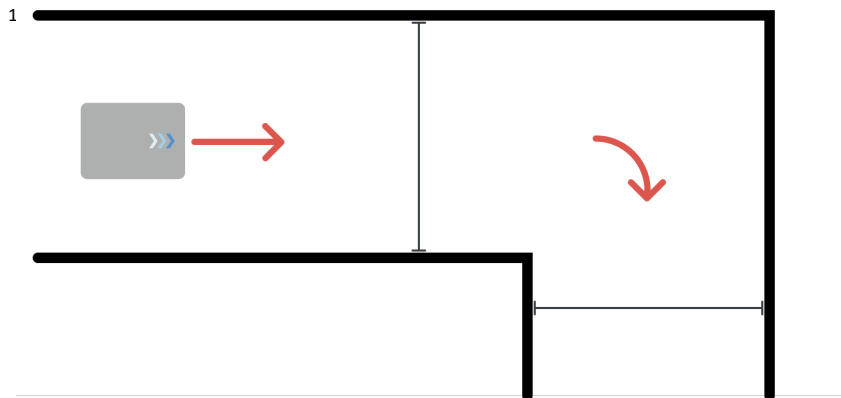
With default setup: 1 850 mm | 72.8 in

With minimized footprint and muted Protective fields: 1 550 mm | 61 in

Operational corridor width for a U-turn ²

With default setup: 1 850 mm | 72.8 in

With minimized footprint: 1 550 mm | 61 in



Operational corridor width for two robots passing ¹

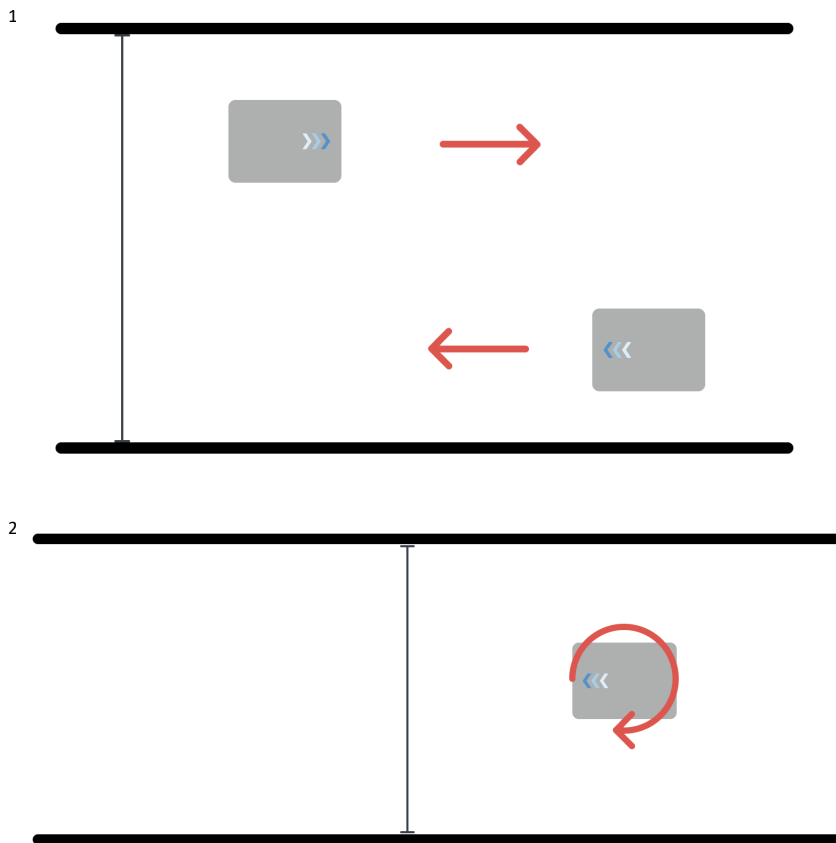
With default setup: 3 500 mm | 137.8 in

With minimized footprint and muted Protective fields: 2 700 mm | in 106.3 in

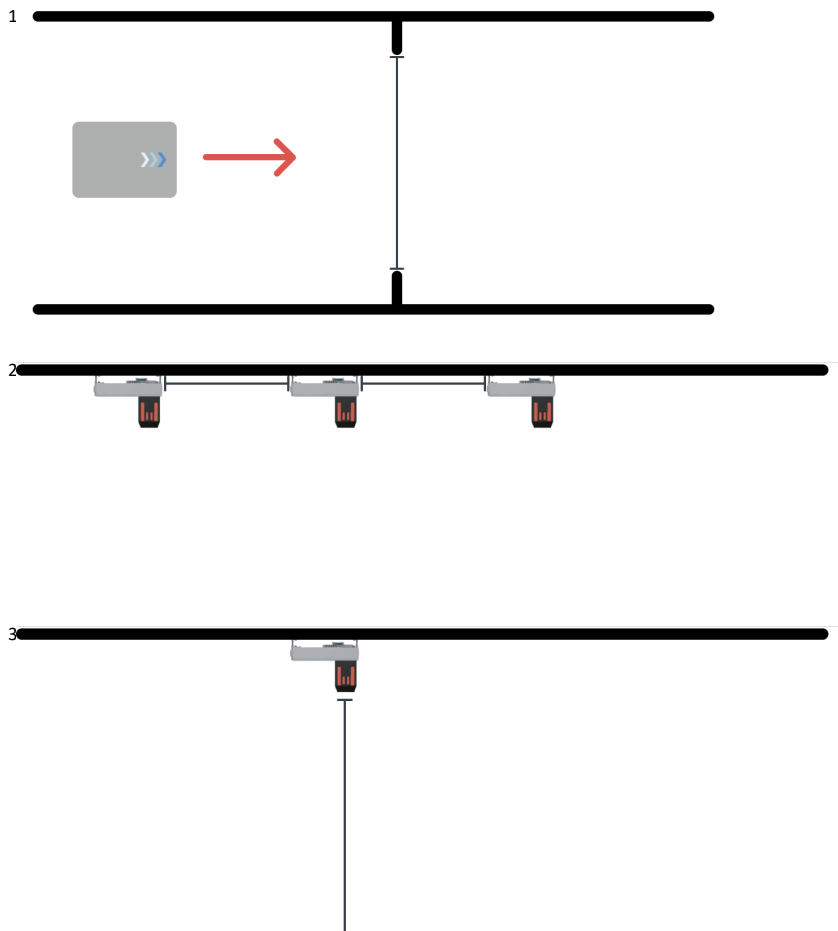
Operational width for pivoting ²

With default setup: 2 300 mm | 90.6 in

With minimized footprint and muted Protective fields: 1 850 mm | 72.8 in



| | |
|---|--|
| | With default setup: 1 650 mm 65 in |
| Operational doorway width ¹ | With minimized footprint and muted Protective fields: 1 200 mm 47.2 in |
| Minimum distance between charging stations ² | 1 100 mm 43.3 in |
| | With default protective fields: |
| Minimum space required in front of charging stations ³ | 2 800 mm 110.2 in |
| | With muted protective fields: |
| | 2 600 mm 102.4 in |



Minimum space required to the sides of charging stations

Minimum space to adjacent wall for a charging station

| | |
|--|--|
| Minimum space to adjacent wall for a VL-marker | With default protective fields: 750 mm 29.5 in With muted protective fields: 450 mm 17.7 in |
|--|--|

| | |
|-------------------------------------|---|
| Minimum distance between VL-markers | Fast docking where the robot docks the moment it detects the marker: 30 mm 1.18 in Slow docking where the robot moves to the entry position before it docks to the marker: 20 mm 0.79 in |
|-------------------------------------|---|

| | |
|------------------------------------|--|
| Minimum distance between V-markers | Fast docking where the robot docks the moment it detects the marker: 280 mm 11 in Slow docking where the robot moves to the entry position before it docks to the marker: 220 mm 8.7 in |
|------------------------------------|--|

| | |
|----------------------------------|---|
| Minimum space around Bar-markers | With default protective fields: 2 450 mm 96.5 in in front of the marker With muted protective fields: 2 200 mm 86.6in in front of the marker |
|----------------------------------|---|

| | |
|---------------------------------|--|
| Minimum space around VI-markers | With default protective fields: 500 mm 19.7 in to the sides of the marker, 3 250 mm 128 in in front of the marker With muted protective fields: 300 mm 11.8 in to the sides of the marker, 3 100 mm 122 in in front of the marker |
|---------------------------------|--|

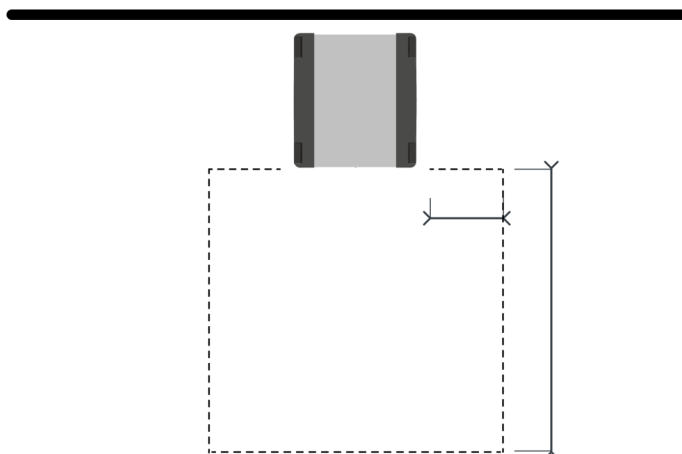
| | |
|--------------------------------|---|
| | With default protective fields: |
| | 750 mm 29.5 in to the sides of the marker, 3 000 mm 118.1 in in front of the marker |
| Minimum space around V-markers | With muted protective fields: |
| | 750 mm 29.5 in to the sides of the marker, 2 750 mm 108.3 in in front of the marker |

| | |
|---|--|
| | Default setup: 70 cm 27.6 in to the sides of the rack, 270 cm 126.3 in in front of the rack |
| Minimum space around MiR Pallet Rack ¹ | With minimized footprint: 30 cm 11.8 in to the sides of the rack, 240 cm 94.5 in front of the rack |

Power

| | |
|---|---------------------------|
| Battery type | Lithium-ion |
| Charging time from 10%–90% with MiR Charge 48V (at an ambient temperature of 22°C 72°F) | 10%–90%: 46 min 72°F |
| Charging time from 10%–90% with cable charger | 1 h 10 min |

1



| | |
|--|---|
| Charging options | MiR Charge 48V, Battery Charger 48V 12A, Cable Charger Lite 48V 3A |
| Charging current, MiR Charge 48V | Up to 35 A depending on battery temperature and constant voltage ramping down towards end of charge cycle |
| Battery weight | 11 kg 24.25 lbs |
| Battery dimensions | 545 mm length × 210 mm width × 75 mm height 21.5 in length × 8.3 in with × 2.9.5 in height |
| The minimum number of full charging cycles before the battery capacity drops below 80% | Minimum 3 000 cycles |
| Battery voltage | 47.7 V nominal, minimum 42 V, maximum 54 V |
| Battery capacity | 1.63 kWh (34.2 Ah at 47.7 V) |
| Charging ratio and runtime | With no payload |
| | 15 min charging = 3 h runtime (1:12 charging to runtime ratio) |
| | 30 min charging = 6 h 15 min runtime (1:12.5 charging to runtime ratio) |
| | With maximum payload: |
| Active operation time with no payload | 15 min charging = 2 h 15 min runtime (1:9 charging to runtime ratio) |
| | 30 min charging = 4 h 50 min runtime (1:9.6 charging to runtime ratio) |
| | 9 h 50 min |
| Active operation time with maximum payload | 6 h 45 m |
| Standby time (robot is on and idle) | 12 h 30 min |

Environment

| | |
|---|--|
| Environment | For indoor use only |
| Ambient temperature range, operation | 5–40°C 41–104°F (the maximum ambient temperature only apply up to 1 h) |
| Ambient temperature range, storage | 0–50°C 32°F–122°F |
| Humidity | 20–95% non-condensing |
| IP rating | IP 52 |
| Floor conditions | No water, no oil, no dirt |
| Traversable gap and step tolerance | Gap: maximum 29 mm 1.14 in at maximum 0.5 m/s 1.64 ft/s ² , from all angles Step: maximum 10 mm 0.39 in at maximum 0.5 m/s 1.64 ft/s ² at maximum 40° angle with no payload, not recommended with maximum payload |
| Floor to wheel frictional coefficient | 0.60–0.80 (recommended) |
| Drive wheel material | Polyurethane |
| Material the robots cannot detect reliably ¹ | Transparent, translucent, glossy, reflective, and light emitting |
| Optimal light conditions | Must comply with the requirements for the Intel RealSense D435 camera Even and steady lighting (strong directional light can cause the robot to detect non-existent obstacles) |
| Maximum altitude | 2 000 m 6 561 ft |

¹We recommend either avoiding these materials, covering them with opaque and matte material the robot can detect, or ensuring the robot does not operate in areas with these materials.

Compliance

| | |
|---|---|
| EMC | EN61000-6-4 |
| Designed to meet safety standards for industrial vehicles | ISO 13849-1— see the SISTEMA report here , ISO 3691-4 (except Clause 4.4, 4.9.4, 5.1, 5.2, 6, and Annex A), ISO 12100, ISO 13850, ITSDF B56-5, RIA R15.08-1 |
| TüV safety evaluation | ISO 13849-1— see the certificate here |

Safety

| | |
|-------------------------------------|--|
| Safety functions | 13 safety functions according to ISO 13849-1, certified by TÜV Rheinland. The robot stops if a safety function is triggered. |
| Personnel detection safety function | Triggered when obstacles or people are detected too close to the robot |
| Emergency stop | Four emergency stop buttons, one in each corner. Emergency stop connector in electrical interface and joystick interface. |
| Overspeed avoidance | Prevents the robot from driving faster than the predefined safety limit |
| Collision avoidance | Triggered by a human or other obstacle in the path of travel. |
| Manual control in robot interface | Token-based system for accessing the manual control. The robot issues only one token at a time. |
| Safe guarded stop | Yes |
| Safe load position | Triggered if the speed exceeds 0.3 m/s ft/s while the lift/carrier is being lowered or raised |

Communication

| | |
|------------------------|---|
| Wi-Fi (PC) | Internal computer: 2.4 GHz and 5 GHz, 2 external antennas |
| Safety I/O connections | 6 digital inputs, 6 digital outputs |

| | |
|---------------------------------|--|
| Ethernet | M12 plug, 4p. 10/100 Mbit Ethernet with Modbus protocol, adapter for external antenna |
| Aux. power for top applications | Yes |
| Ethernet switch | MikroTik switch. Connect to the switch through the RJ45 Ethernet port on the front-right corner cover. |
| Aux. safety functions | Yes |
| General purpose I/O | Yes |

Top module

| | |
|-----------------------|-----|
| Power for top modules | Yes |
|-----------------------|-----|

Sensors

| | |
|---|---|
| SICK safety laser scanners | 2 pcs, microScan3 (front and rear), give 360° visual protection around the robot |
| 3D cameras | 2 pcs, 3D camera Intel RealSense™ D435 FoV height: 1 800 mm 70.9 in FoV distance in front of robot: 1 200 mm 47.2 in FoV horizontal angle: 114° FoV minimum distance in front of robot for ground view: 250 mm 9.8 in |
| Minimum range for each safety laser scanner | 10 m 10.9 yd |
| Proximity sensors | 8 pcs |

Lights and audio

| | |
|-------|---------|
| Audio | Speaker |
|-------|---------|

Signal and status lights

Indicator lights on four sides, eight signal lights (two on each corner)