MiR600 specifications

Date: 2024-10-02

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 7011 / Iron Gray
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	240 kg | 529.1 lbs
Ground clearance	25–27 mm | 1.0–1.1 in
Drive wheel diameter	200 mm | 7.9 in
Caster wheel diameter	100 mm | 3.9 in

Payload

Maximum payload	600 kg | 1 322.8 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	500 kg | 1 100 lbs

Performance

Maximum speed (with maximum payload on a flat surface)	2.0 m/s (7.2 km/h) | 6.6 ft/s (4.4 mph)
Maximum acceleration	No payload: 0.41 m/s^2 | 1.34 ft/s^2 Maximum payload: 0.37 m/s^2 | 1.34 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

[1]The 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.

|	
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.

|	
Operational corridor width [1]	With default setup: 1 800 mm | 70.9 in
	With minimized footprint and muted Protective fields: 1 200 mm | 47.2 in
Operational corridor width for a 90° turn [2]	With default setup: 1 850 mm | 72.8 in
	With minimized footprint and muted Protective fields: 1 550 mm | 61 in
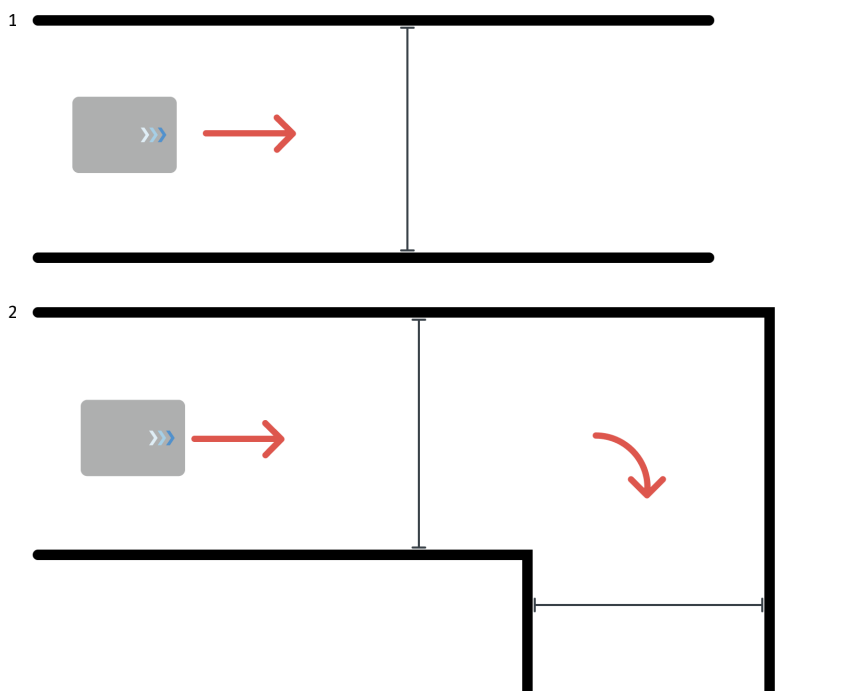
Operational corridor width for a U-turn [1]	With default setup: 1 850 mm | 72.8 in
	With minimized footprint: 1 550 mm | 61 in
Operational corridor width for two robots passing [2]	With default setup: 3 500 mm | 137.8 in
	With minimized footprint and muted Protective fields: 2 700 mm | in 106.3 in
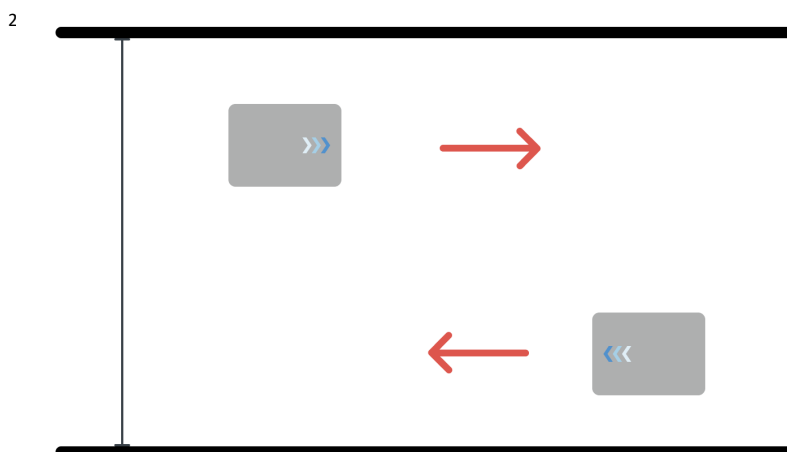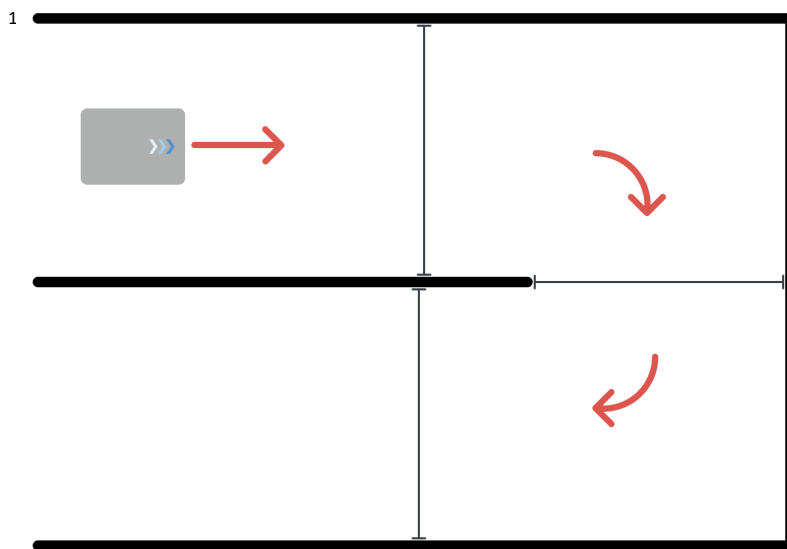
Operational width for pivoting [1]	With default setup: 2 300 mm | 90.6 in
	With minimized footprint and muted Protective fields: 1 850 mm | 72.8 in
Operational doorway width [2]	With default setup: 1 650 mm | 65 in
	With minimized footprint and muted Protective fields: 1 200 mm | 47.2 in
Minimum distance between charging stations [3]	1 100 mm | 43.3 in

Power

Battery type	Lithium-ion
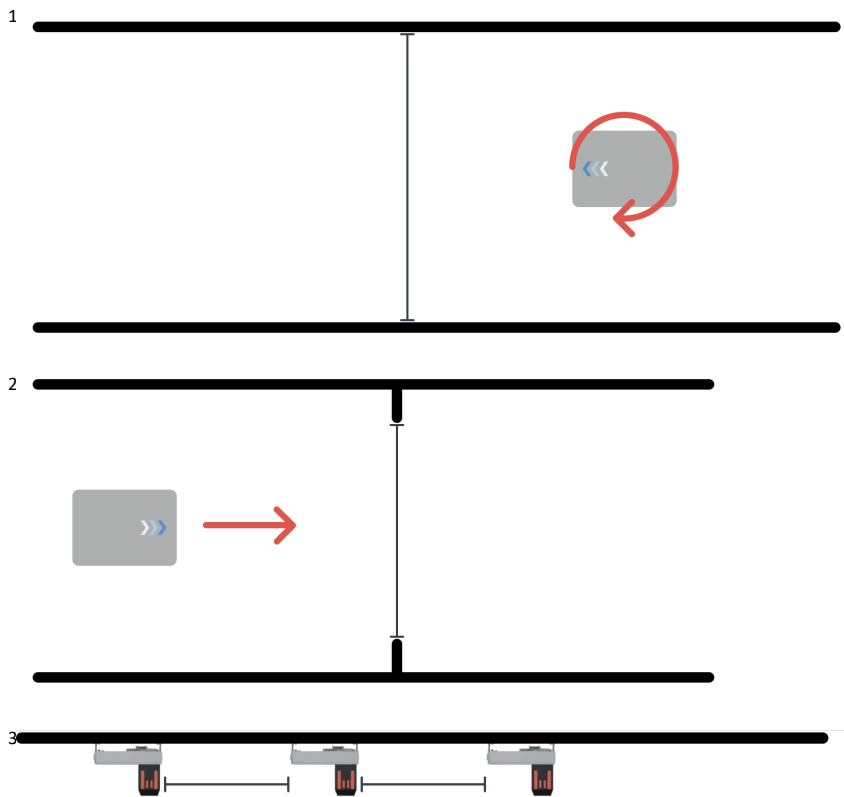
Charging time from 10%–90% with MiR Charge 48V (at an ambient temperature of 22°C | 72°F)	10%–90%: 45 min | 72°F
Charging time from 10%–90% with cable charger	1 h 10 min
Charging options	MiR Charge 48V, Battery Charger 48V 12A, Cable Charger Lite 48V 3A
Charging current, MiR Charge 48V	Up to 35 A depending 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	15 min charging = 2 h 45 min runtime (1:11 charging to runtime ratio) 30 min charging = 5 h 45 min runtime (1:12 charging to runtime ratio)
Active operation time with no payload	10 h 45 min
Active operation time with maximum payload	8 h 20 m
Standby time (robot is on and idle)	16 h 45 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)
Humidity	20–95% non-condensing
IP rating	IP 52
Floor conditions	No water, no oil, no dirt
Maximum incline/decline	± 3% at
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 |

[1]We 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 1	ft/s while the lift/carrier is being lowered or raised

Communication

Wi-Fi (robot computer)	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)