# 1. MiR1350 specifications

Date: 2023-01-04

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

See the latest updates here.

## General information

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|---|---|
| Designated use | For internal transportation of goods and automation of internal logistics |
| Type | Autonomous Mobile Robot (AMR) |
| Color | RAL 9005 / Jet Black |
| Product design life | 5 years or 20 000 hours, whichever comes first |
| Disclaimer | Specifications may vary based on local conditions and application setup |

## Dimensions

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|---|---|
| Length | 1 350 mm \| 53.1 in |
| Width | 910 mm \| 35.8 in |
| Height | 322 mm \| 12.7 in |
| Weight | 247 kg \| 544.5 lbs |
| Ground clearance | 25–27 mm \| 1.0–1.1 in |
| Load surface | 1 304 x 864 mm \| 51.3 x 34 in |
| Wheel diameter (drive wheel) | 200 mm \| 7.9 in |
| Wheel diameter (caster wheel) | 100 mm \| 3.9 in |

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## Payload

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|---|---|
| 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-/Shelf-lift installed | 1 250 kg \| 2 755 lbs |

## Speed and performance

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| 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 $ft/s^2$<br>Maximum payload: 0.40 $m/s^2$ \| 1.31 $ft/s^2$ |
| Acceleration limits with maximum payload | 0.40 $m/s^2$ \| 1,3 $ft/s^2$ |
| Operational corridor width | With default setup: 2 150 mm \| 84.6 in<br>With minimized footprint and muted Protective fields: 1 200 mm \| 47.2 in |
| Operational corridor width for a 90° turn | in total length<br>With default setup: 2 200 mm \| 86.6 in<br>With minimized footprint and muted Protective fields: 1 550 mm \| 61 in |
| Operational corridor width for a U-turn | 2 300 mm \| 90.6 in<br>With minimized footprint: 1 550 mm \| 61 in |

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| Operational corridor width for two robots passing | With default setup: 4 250 mm \| 167.3 in<br><br>With minimized footprint and muted Protective fields: 2 700 mm \| in 106.3 in |
| Operational width for pivoting | With default setup: 2 850 mm \| 112.2 in<br><br>With minimized footprint and muted Protective fields: 1 850 mm \| 72.8 in |
| Positioning accuracy (in controlled conditions) | Docking to L-marker: ± 3 mm \| 0.12 in on X-axis, ± 3 mm \| 0.12 in on Y-axis, ± 0.25° yaw<br><br>Docking to VL-marker: ± 2 mm \| 0.08 in on X-axis, ± 3 mm \| 0.12 in on Y-axis, ± 0.25° yaw<br><br>Docking to V-marker: ± 20 mm \| 0.79 in on X-axis, ± 20 mm \| 0.79 in on Y-axis, ± 2° yaw<br><br>Docking to Bar-marker: ± 10 mm \| 0.39 in on X-axis, ± 5 mm \| 0.19 in on Y-axis, ± 0.75° yaw<br>ⓘ The positioning accuracy is tested under the following conditions:<br>• Using a single robot without payload<br>• On a site that is within the environmental requirements for the robot with good localization and no or few dynamic obstacles<br>• On a flat, clean surface |
| 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<br><br>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 |
| Operational doorway width | With default setup: 2 050 mm \| 80.7 in<br><br>With improved setup: 1 200 mm \| 47.2 in |

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| Minimum distance between chargers | 1 100 mm \| 43.3 in |
| Minimum distance between VL-markers | Fast docking where the robot docks the moment it detects the marker: 30 mm \| 1.18 in<br><br>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<br><br>Slow docking where the robot moves to the entry position before it docks to the marker: 220 mm \| 8.7 in |
| Minimum space around MiR Pallet Rack | Default setup: 70 cm \| 27.6 in to the sides of the rack, 270 cm \| 126.3 in in front of the rack<br><br>With minimized footprint: 30 cm \| 11.8 in to the sides of the rack, 240 cm \| 94.5 in front of the rack |
| Active operation time with maximum payload | 6 h 45 m |
| Active operation time with no payload | 9 h 50 min |
| Standby time (robot is on and idle) | 12 h 30 min |

## Power

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

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| Number of full charging cycles | Minimum 3 000 cycles<br>ⓘ The minimum number of full charging cycles before the battery capacity drops below 80% . |
| 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 for | With no payload<br>15 min charging = 3 h runtime (1:12 charging to runtime ratio)<br>30 min charging = 6 h 15 min runtime (1:12.5 charging to runtime ratio)<br>With maximum payload:<br>15 min charging = 2 h 15 min runtime (1:9 charging to runtime ratio)<br>30 min charging = 4 h 50 min runtime (1:9.6 charging to runtime ratio) |

## Environment

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| Environment | For indoor use only |

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| Ambient temperature range, operation | 5–40°C \| 41–104°F<br>ⓘ The following climatic conditions from ISO3691-4 section 4.1.2 apply to the robot:<br>• Maximum average ambient temperature for continuous use is 25°C \| 77°F<br>• Maximum ambient temperature for short term use (up to 1 h) is 40°C \| 104°F<br>• Lowest average ambient temperature for continuous use in normal indoor conditions is 5°C \| 41°F<br>• Lowest average ambient temperature for continuous use in cold (1–4 °C \| 33.8–39.2°F) indoor conditions is 1°C \| 33.8°F. |
| Ambient temperature range, storage | 0–50°C \| 32°F–122°F |
| Humidity | 10–95% non-condensing |
| IP rating | IP 52 |
| Floor conditions | No water, no oil, no dirt |
| Maximum altitude | 2 000 m \| 6 561 ft |

## Compliance

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|---|---|
| EMC | EN61000-6-2, EN61000-6-4, (EN12895) |
| Safety standards for industrial vehicles | CE, EN1525, ANSI B56.5, ISO3691-4, RIA15.08, ISO13849-1 |

## Safety

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| 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 top interface and joystick interface. |

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| Overspeed avoidance | Prevents the robot from driving faster than the predefined safety limit |
| 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

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| WiFi (internal 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 |
| Aux. safety functions | Yes |
| General purpose I/O | Yes |

## Top module

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| Power for top modules | Yes |

## Sensors

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| SICK safety laser scanners | 2 pcs, microScan3 (front and rear), give 360° visual protection around the robot |

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| 3D cameras | 2 pcs, 3D camera Intel RealSense™ D435<br><br>FoV height: 1 800 mm \| 70.9 in<br><br>FoV distance in front of robot: 1 200 mm \| 47.2 in<br><br>FoV horizontal angle: 114°<br><br>FoV minimum distance in front of robot for ground view: 250 mm \| 9.8 in |
| Proximity sensors | 8 pcs |
| Light conditions | Must comply with the requirements for the Intel RealSense D435 camera |

## Lights and audio

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|---|---|
| Audio | Speaker |
| Signal and status lights | Indicator lights on four sides, eight signal lights (two on each corner) |

## Maintenance

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| Maintenance | Maintenance hatches on four sides of the robot |
| Service intervals | 6 months or according to user guide |