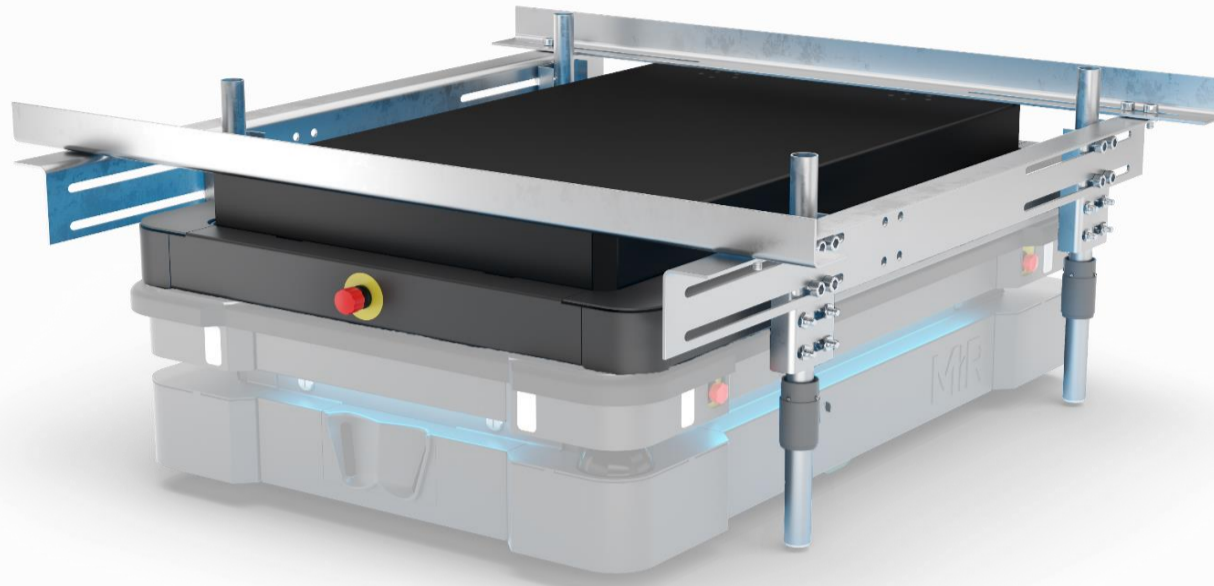


MIR 1350 Shelf Lift

Technical specification



General information	
Designated use	For internal transportation of goods and automation of internal logistics
Type	Autonomous Mobile Robot (AMR)
Color	RAL9005, Jet Black
Product design life	Five years or 20 000 hours, whichever comes first
Disclaimer	Specifications may vary based on local conditions and application setup
Dimensions	
Length	1 350 mm 53.1 in
Width	910 mm 35.8 in
Height	322 mm 12.7 in
Ground clearance	25 - 27 mm 1.0 - 1.1 in
Weight (without battery or payload)	233 kg 513.7 lbs
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
Payload	
Maximum payload	1 350 kg 2 976 lbs
Footprint of payload	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	
Maximum speed (with maximum payload on a flat surface)	1.2 m/s 3.9 fps
Operational corridor width for a 90° turn	240 cm 94.5 in
Operational corridor width for two robots passing	495 cm 194.9 in
Width for pivoting	275 cm 108.3 in

Positioning accuracy (in controlled conditions)	Docking to L-marker: 3 mm 0.11 in deviation on X-axis, 3 mm 0.11 in on Y-axis, 0.25° yaw. Docking to VL-marker: 2 mm 0.09 in deviation on X-axis, 3 mm 0.11 in on Y-axis, 0.25° yaw. Docking to V-marker: 20 mm 0.8 in deviation on X-axis, 20 mm 0.8 in on Y-axis, 2° yaw. Docking to Bar-marker: 10 mm 0.5 in deviation on X-axis, 5 mm 0.18 in on Y-axis, 0.75° yaw
Minimum distance between chargers	1 100 mm 43.3 in
Traversable gap and sill tolerance	Gap: maximum 29 mm 1.1 in at maximum 0.5 m/s 1,64 fps ² , from all angles. Step: maximum 10 mm 0.4 in at maximum 0.5 m/s at maximum 40° angle with no payload, not recommended with maximum payload
Maximum acceleration	0.43 m/s ² (no payload), 0.40 m/s ² (maximum payload)
Minimum size of detectable object	Camera: 20 mm 0.8 in at 1.25 m 49.2 in. Scanner: 30 mm 1.2 in at 1.7 m 66.9 in or 2.3 m 90.6 in. 40 mm 1.6 in at 2.3 m 90.6 in or 3 m 118.1 in. 50 mm 2 in at 3 m 118.1 in or 3.5 m 137.8 in. 70 mm 2.8 in at 4 m 157.5 in or 5.5 m 216.5 in. Distances depend on scan cycle time (30 or 40 m/s 98.4 or 131.2 mps)
Active operation time with maximum payload	6 h 45 m
Active operation time with no payload	9 h 50 m
Standby time (robot is on and idle)	12 h 30 m
Acceleration limits with maximum payload	0.40 m/s ² . 1,3 fps ²
Power	
Charging time with cable charger (10-90%)	1 h 10 m (approximately)
Charging time with MiR Charge 48V (10 to 90%)	46 min at an ambient temperature of 22°C
Battery type	Li-ion
Battery voltage	47.7 V nominal, min 41 V, max 54 V
Charging current, MiR Charge 48V	Up to 35 Amp with MiR Charge 48V, depending on battery temperature and constant voltage ramping down towards end of charge cycle
Minimum number of full charging cycles	3 000 cycles
Battery capacity	1.63 kWh (34.2 Ah at 47.7V)
Charging ratio and runtime	15 m: 1:12 (3 h 00 m runtime, no payload) 30 m: 1:12,5 (6 h 15 m runtime, no payload) 15 m: 1:9 (2 h 15 m runtime, maximum payload), 30 m: 1:9,6 (4 h 50 m runtime, maximum payload)
Environment	
Ambient temperature, operation)	5°C to 40°C 41°F to 104°F
Ambient temperature, storage	0°C to 50°C 32°F to 122°F
Humidity	10 to 85% non-condensing
Maximum altitude	2 000 m / 6 561 ft
Floor conditions	No water, no oil, no dirt
Environment	For indoor use only
IP class	IP52
Compliance	
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	
Personnel detection safety function	Triggered by a human or other obstacle in the path of travel.
Emergency stop	Triggered by pressing the Emergency stop button.
Manual control in robot interface	Token-based system for accessing the manual control. The robot issues only one token at a time.
Safe load position	Triggered if the speed exceeds 0.3 m/s while the lift (if applicable) is not in the low position.
Overspeed avoidance	Prevents the robot from driving faster than the predefined safety limit
Communication	
Safety I/O connections	6 digital inputs, 6 digital outputs
WiFi (internal PC)	Router: 2.4 GHz and 5 GHz. Internal computer: WiFi adapter: 2.4 GHz and 5 GHz, 2 internal antennas.
Aux. emergency stop	Yes
Aux. power for top applications	Yes
Aux. safety functions	Yes
Ethernet	M12 plug, 4p. 10/100 Mbit Ethernet with Modbus protocol, adapter for external antenna
General purpose I/O	Yes

Sensors	
SICK safety laser scanners	Two pcs. microScan3 (front and back) 360° visual protection around 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
Proximity sensors	8 pcs
Light conditions	Must comply with the requirements for the Intel RealSense D435 camera
Lights and audio	
Audio	Speaker
Status lights	LED light band
Signal lights	8 pcs, 2 on each corner
Maintenance	
Maintenance	Maintenance hatches on four sides of the robot.
Service intervals	6 months or according to user guide

General information	
Designated use	For autonomous pick up and delivery of carts, shelves and other lift applications
Type	Shelf Lift for MiR500, MiR600, MiR1000, and MiR1350
Frame color	RAL 7011 - Iron Gray
Lift color	RAL 9005 - Signal Black
Disclaimer	Specifications may vary based on local conditions and application setup
Dimensions	
Frame length	1 304 mm 51.3 in
Frame width	910 mm 35.8 in
Lift length	1 174 mm 46.2 in
Lift width	710 mm 28 in
Total height in lowered position	94 mm 3.7 in
Total height in lifted position	156 mm 6.1 in
Lifting height	60 mm 2.4 in