MIR250 Product Specification, 5th of March 2020

General information	
Type	Autonomous Mobile Robot
Designated use	Internal transportation of goods, automation of internal logistics.
Product design life	5 years
Standard covers color	RAL7011
ESD covers color	RAL9005
Top plate	Anodized aluminum, 5 mm

Dimension	
Dimensions (L x W x H)	800 x 580 x 300 mm
Weight	83 kg
Clearance from ground	30 mm
Wheel diameter (swivel wheel)	125 mm
Wheel diameter (drive wheel)	200 mm (conductive)
Load surface	800 mm x 580 mm

Payload	
Payload, max.	250 kg
Footprint of payload	Robot footprint. Contact MiR if a bigger payload footprint is required.
Payload placement	Positioning of center of mass will be defined in manual.
Acceleration limits with payload	1,0 m/s^2
Braking limits with payload	Depending on speed and payload. Will be adressed in manual.
Dimensions for mounting top applications	Robot footprint. Contact MiR if a bigger top application is required.

Driving and navigation	
Maximum speed (full payload, flat surface)	2.0 m/s
Acceleration (full payload, flat surface)	1,0 m/s^2
Maximum incline	5%. Speed and payload limitations are still to be determined.
Turning diameter, no obstacles	*To be determined.*
Turning diameter around obstacle	*To be determined.*
Minimum width, door (normal operation)	*To be determined.*
Minimum width, door (muted personnel detection)	800 mm
Minimum width, passage (0.5 m or longer)	*To be determined.*
Minimum width, two robots passing	*To be determined.*
Encoder resolution	64 periods sin/cos
Drive increments	< 0.03 mm
Precision, moving to position	*To be determined but minimum as good as MiR200*
Precision, docking to VL marker	+/- 5 mm.
Docking types	Forward docking & reverse docking (not currently available with shelf)
Minimum size of detectable object	*To be determined.*
Blind spots	*To be determined.*

Battery & charging	
Charging options	MiRCharge 48V & 48V cable charger
MiRCharge 48V	The robot communicates with MiRCharge 48V through CAN interface. Charging starts only when the robot connection is present.
Charging current, MiRCharge 48V	35 A
Charging time, MiRCharge 48V, 10% to 90%	1 hour
Charging current, cable charger	20 A
Charging time, cable charger, 10% to 90%	2 hours
Active operation time between charging (approximate)	10 hours (100% charged battery)
Standby time	*To be determined.*
Full charging cycles, minimum	1000 cycles
Battery voltage	48 V
Battery capacity	1,6 kWh (34.2 Ah at 48V)
Charging an empty battery	Follow instructions in manual.

This document contains confidential information and must not be handed out to externals.

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Environment	
Ambient temperature, operation	+5°C to 40°C
Ambient temperature, storage	-10°C to 60°C
Humidity	10-95% non-condensing
Environment	For indoor use only
IP Class	IP21
Floor surface minimum friction coefficient	*To be determined.*
Floor surface, maximum roughness	*To be determined.*
Maximum step height the robot can clear	*To be determined.*
Maximum hole depth the robot can clear	*To be determined.*
Vibrations and impact from handling	*To be determined.*
Dust density (particles/qbm?)	*To be determined.*

Safety & compliance	
Safety functions	*To be determined, but designed with same priciples as MiR500.*
Safety standards for industrial vehicles	Design in accordance with present standards.
EMC	Design in accordance with present standards.

Connectivity	
I/O connections	4 digital inputs, 4 digital outputs (GPIO) 1 Ethernet port. 1 Auxilery emergency stop.
Safety I/O connections	6 digital inputs, 6 digital outputs
WiFi connection	Router: 2.4 GHz and 5 GHz. Internal computer: WiFi adapter: 2.4 GHz and 5 GHz, 2 internal antennas.
WiFi protocol	Router: 2.4 GHz 802.11 g/n, 5 GHz 802.11 a/n/ac. Internal computer: 802.11 a/b/g/n/ac.
Power for top modules	48 V / 10 A 48 V Safe / 10 A 24 V / **TBD**

Sensors and cameras	
Laser scanners	2 pcs.: SICK Nanoscan3. FoV: 360°
3D camera	2 pcs.: Intel RealSense D435. FoV: Detects objects 1800 mm high at a distance of 1200 mm in front of the robot. 114° total horizontal view. Ground view, minimum distance from robot: 250 mm.
Proximity sensors	8 pcs

Lights and audio	
Audio	Speaker
Lights	Indicator lights on 4 sides, 8 signal lights (2 at each corner).

MiR 250 Shelf Carrier	
Dimensions (L x W x H)	800 x 580 x 378 mm
Weight with MiR 250 Shelf Carrier	113kg
Dimensions, top module only	804 x 560 x 83 mm
Payload	To be determined, but minimum 250kg.
Payload placement	Positioning of center of mass will be defined in manual.
Engagement time	*To be determined.*
Pins movement height	30 mm
Number of lift cycles (full load)	*To be determined.*

Maintenance	
Service interval	*To be determined.*