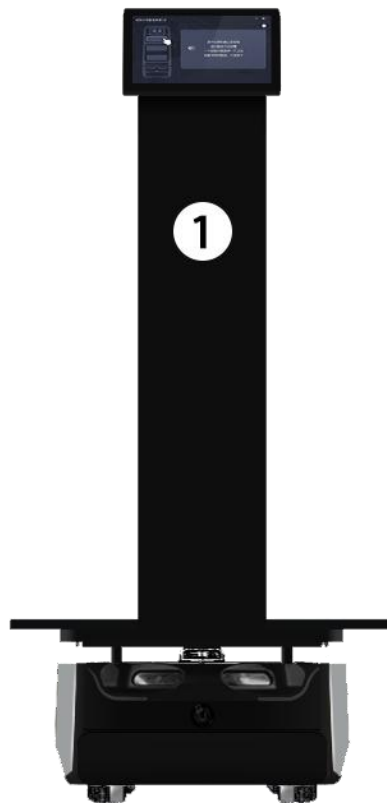


Intelligent Factory Delivery Robot

P3 Pro

Datasheet



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1.Product Introduction

In the factory delivery series, P3 Pro is a laser-guided mobile robot capable of carrying up to 50KG in a backpack-style carrier, suitable for material handling in industries such as semiconductor production lines, SMT workshops, electronics factories, and other material handling applications.

2.Function Introduction

2.1 Autonomous Navigation

The high-performance SLAM autonomous navigation and localization system suite built into the P3 Pro provides it with path planning and location navigation capabilities, truly solving the three major problems of "Where am I", "Where do I want to go", and "How do I get there" for robots. This enables it to carry different applications and work in various environments. The P3 Pro can automatically locate and plan its own path based on mission goals.

2.2 Collaborative Work

The P3 Pro supports multi-robot collaborative work to meet the demands of complex operating environments with high task loads. The P3 Pro supports two modes of collaborative work: local area network collaboration and cloud platform management collaboration. It can dynamically adjust its speed and distribution path according to the environment, achieving efficient, safe, and reliable multi-point delivery.

2.3 Intelligent Obstacle Avoidance

The P3 Pro uses multi-sensor fusion to quickly and accurately recognize dynamic interactive environments around it, achieving intelligent obstacle avoidance and greatly reducing the probability of safety accidents.

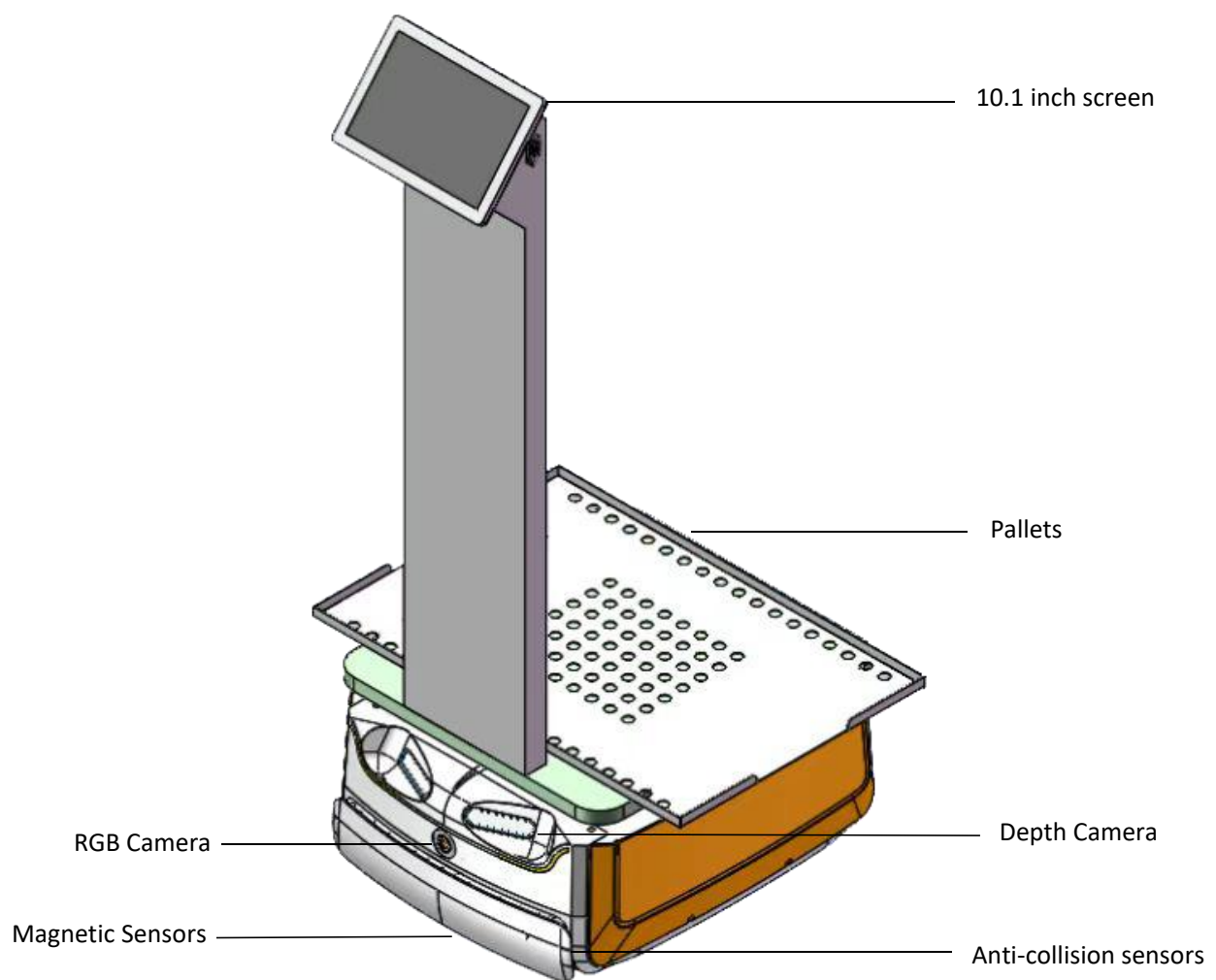
2.4 360° Protection

The P3 Pro uses multiple sensors such as dual depth cameras, collision sensors, and laser Lidar to accurately identify dynamic and static obstacles and avoid them. It also supports anti-fall, anti-collision protection, and emergency braking functions, ensuring 360° protection and safe travel during delivery.

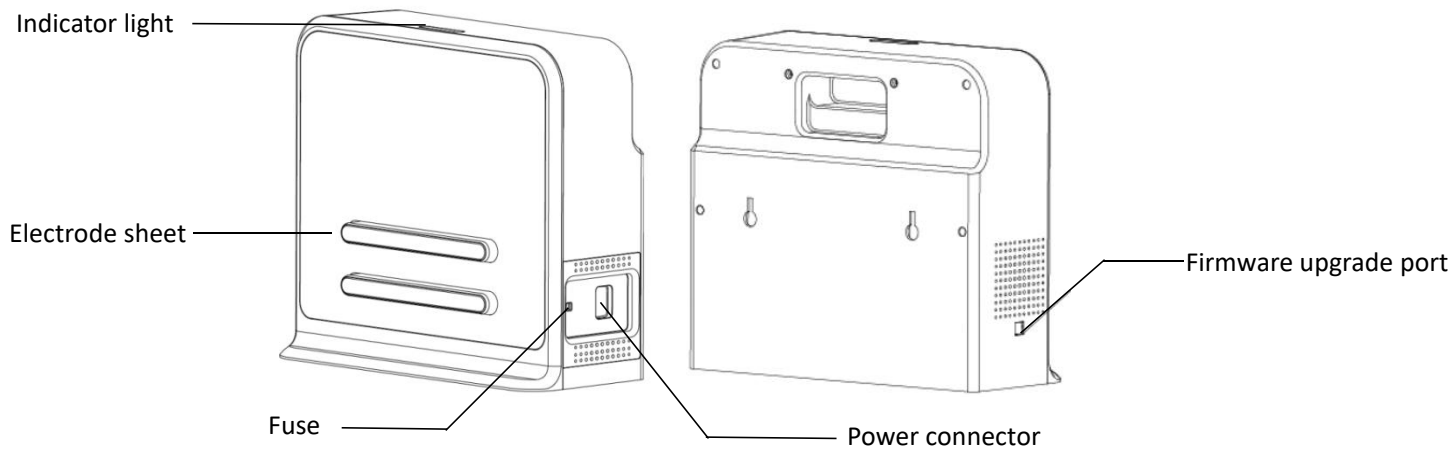
2.5 Automatic Recharge

To ensure that the P3 Pro has sufficient power to complete assigned tasks, it automatically returns to the charging station for recharging when the battery level falls below the set threshold during use. After the task is completed, the P3 Pro also automatically returns to the charging station for recharging.

3. Structure Diagram



4.Charge Station



5.Specification parameters

Machine name	Intelligent Factory Delivery Robot P3 Pro	
Application Scenarios	semiconductor production lines, SMT workshops, electronics factories, and other material handling applications.	
Function Description	<ol style="list-style-type: none"> 1. Multi-point delivery 2. Autonomous Navigation 3. Automatic charging 	
Location and navigation methods	SLAMWARE + RPLIDAR S2	
Wheel Type	Two-wheel differential drive	
Structure and weight	size	
	Length * width	545*465mm
	Height	1320mm
	Net weight	50kg
	Rated load	50kg
Handling method	Backpack	
Hardware Platform	SLAMWARE + Wi-Fi/Lora	
Motion Parameters	Moving speed	0.1-1.0m/s
	Crossing height	2cm
	Crossing width	4cm
Battery	Capacity specifications	16Ah
Autonomous Charging	Charge Station	DC25.5V 6A
	Full charge time	3-4h

Working Environment	Working temperature	0°~40°
	Storage temperature	-25°~55°
	Working humidity	30~70%rh
Optional description		1. Support pager configuration 2. Support local server deployment 3. Support 25AH battery option Note: Please contact customer service for more information on options

6. Deployment and Usage

6.1 Placement of charging station

The P3 Pro can charge automatically by returning to the charging station, so the placement of the charging station will affect the P3 Pro's automatic return-to-charge function. When the P3 Pro returns to the charging station, it generates pushing force, so it is best to place the charging station with its back against a wall that meets the following conditions:

- a. The charging station needs to be flush with the wall, with no obstacles in between, and avoid walls with baseboards if possible.
- b. The wall material cannot be highly transparent, such as mirrors or glass.
- c. The wall width needs to be at least three times wider than the width of the charging station.
- d. The wall needs to be a straight wall and cannot be a curved wall. The charging station needs to be connected to a 220V power source, and the external power cord of the charging station is 1.5 meters long. Therefore, it is necessary to ensure that there is a 220V power interface within 1.5 meters of the wall where the charging station is placed (it is not recommended to use an extension cord or power strip to provide power to avoid unnecessary clutter on the ground).

The ground in front of the charging station needs to meet the following conditions:

- a. Open, with no obstacles within a 2-meter radius in front of the charging station.
- b. Horizontal, without any slope.
- c. The ground cannot be covered with soft carpets that would cause the P3 Pro to sink

more than 2cm. To ensure that the P3 Pro's automatic return-to-charge function works properly, always make sure to start the P3 Pro from the charging station.

Note: If the charging station is moved halfway through, it needs to be placed according to the corresponding settings when loading the map.

6.2 Power On and Off Power On

(1) Power On

If the machine is not at the charging station position but at any other position, press and hold the power button until the power indicator light turns on and then release it. The machine system will enter the power-on process, the front light strip of the machine will light up, and the wheels will be in the braking state, indicating that the power-on process is complete.

If the machine is at the charging station position, press and release the power button until the power indicator light turns on. The machine system will enter the power-on process, the front light strip of the machine will light up, and the wheels will be in the braking state, indicating that the power-on process is complete.

(2) Power Off

Press and hold the power button until the power indicator light turns off, and then release it. The machine will enter the power-off process, the front light strip of the machine will turn off, and the machine can be pushed freely, indicating that the power-off process is complete.

7.Special Instructions

7.1 Charging station deployment

Considerations for selecting a location for the charging station:

(1) The charging station should be placed against a wall with at least 0.5 meters of clearance on each side and 1 meter of clearance in front.

(2) The charging station should be placed against a solid wall and not in areas with mirrored walls or hollowed-out backings.

(3) The charging station should not be placed on soft surfaces such as carpets as this may result in uneven surfaces and prevent charging.

(4) The charging station location in the scene needs to be marked to prevent incorrect

recovery after relocation.

7.2 Restrictions on Usage Scenarios

Please avoid using the P3 Pro chassis in the following scenarios to prevent chassis malfunctions or damage.

(1) Overload/oversize transport

Do not load items that exceed the maximum weight parameter value to avoid affecting the normal use of the P3 Pro. Please refer to the product parameter table for the maximum load-bearing parameter value.

(2) Overcoming obstacles

Ensure that there are no obstacles over 20mm in front of the P3 Pro, as the maximum obstacle height the P3 Pro can overcome is 20mm. During use, please try to avoid uneven ground or other environments with large height differences.

(3) Man-made collisions

Do not forcefully push or collide with the P3 Pro body during normal use.

(4) Temperature/humidity

Do not place the P3 Pro in high temperature, high humidity, or water-stained areas.

(5) Ground obstacles

Ensure that the ground is clean and free of obstacles and debris along the route where the P3 Pro travels.

(6) Outdoor use

Do not use the machine outdoors.

(7) Safe use at altitudes below 2000m.

7.3 Precautions

Storage:

- a. As the P3 Pro contains a battery, it should be stored in a cool and dry environment.
- b. For long-term storage (over 3 months), it is recommended to store the P3 Pro in an environment with a temperature of 10-25 degrees Celsius and no corrosive gas.
- c. During long-term storage, the P3 Pro should be charged every 6 months to ensure that each battery cell voltage is within the range of 3.6V-3.9V.

Packaging:

- d. The packaging material should have a certain strength and toughness to withstand slight vibrations, compression, friction, and collisions during transportation.
- e. There should be padding around the packaging to provide good cushioning.
Transportation and loading/unloading:
- f. Handle with care to prevent dropping, collision, dragging, or inversion.
- g. The stack should be built sturdy, compact, and level.

Other precautions:

- a. Do not treat the P3 Pro chassis violently (e.g. kicking, pushing, pulling).
- b. Do not spill liquid on the machine.
- c. Do not use the automatic recharge function on soft carpets with a depression greater than 2cm.
- d. It is recommended to start the device on the charging station.
- e. Do not modify the interior of the machine without authorization.
- f. Ensure that the load is within the specified parameter range.
- g. In environments with more transparent materials, please use auxiliary protection functions, such as virtual walls."

8.Maintenance

8.1. General Maintenance

- (1) Lidar cleaning: When the machine is turned off and not working, check around the Lidar to ensure there are no obstructions.
- (2) Omni-wheel cleaning: When the machine is turned off and not working, gently lift the chassis and use a soft dry cloth to wipe the omni-wheels and remove any debris around them.
- (3) Depth camera cleaning: Please use a soft dry cloth to wipe the lenses of the two depth cameras while the machine is in a powered-off state.
- (4) Charging station cleaning: Please use a soft dry cloth to wipe the charging station and charging electrodes while the machine is in a powered-off state.
- (5) Bumper cleaning: Please use a soft dry cloth to wipe the bumper while the machine is in a powered-off state and ensure there are no thread or paper debris stuck on the bumper.

8.2. Maintenance and Upkeep Period

For the main unit maintenance and upkeep, the main tasks include inspecting the lenses of the depth cameras, checking the bumper, ensuring clear space around the radar, inspecting for debris around the drive wheels and omni-wheels, and checking the charging station. The time intervals for maintenance cycles can be adjusted appropriately based on the machine's usage environment, frequency, intensity, and temperature.

Maintenance and Upkeep Period			Interval period		
NO.	Device	Level	Year	Month	Week
1	depth cameras	Wipe	--	--	1 time
2	bumper	Cleaning	--	--	1 time
3	space around the radar	Clear	--	1 time	--
4	omni-wheels	Cleaning	--	--	1 time
5	drive wheels	Cleaning	--	--	1 time
6	charging station	Wipe	--	1 time	--
7	robot	Inspection and repair	1 time	--	--

9.Common Malfunctions and Troubleshooting

If any abnormalities occur during the operation of P3 Pro, please refer to the following table or page prompts to troubleshoot the issue:

NO.	Abnormality Prompt	Troubleshooting Method
1	Abnormal Bumper	Please check if the bumper is jammed and gently tap it several times to reset it.
2	Low Battery	Press the brake release button and push the robot back to the charging station to charge it.
3	Charging Station Cannot Charge	Please check if the charging station power cord is plugged in and if the charging station indicator is lit properly.
4	Cannot Power On	Please check if the charging station is connected to the power source. If the charging station and P3 Pro are connected properly and the issue persists, please contact customer service.
5	Cannot Charge on the Station	Please try repositioning the robot on the charging station. If the issue persists, please contact customer service.
6	Cannot Return to the Station	1. Confirm if the charging station has been moved. If it has, please contact customer service. Confirm if there is any slope near the charging station. If there is, please contact customer service. Push P3 Pro back to the charging station and try to restart P3 Pro.
7	Intermittent Rotation of Omni-Wheels	Please check if there is any thread or card jammed around the omni-wheels and drive wheels. If there is, remove the debris.
8	Robot Cannot Move	Please check if the driver connection line is properly connected. If the issue persists, please contact customer service.
9	Robot LED Light Strip Not On	Please check if the LED light strip connection line is properly connected. If the issue persists, please contact customer service.

10.Product Execution Standards

GB 4943.1
 GB/T 15706
 GB/T 16855.1
 GB/T 37283
 GB/T 37284

*Please do not exceed the limitations of the user manual when using this product, as it may result in damage to the P3 Pro.

*Please refer to the actual product as our company reserves the right to update the product, and we will not be responsible for notifying you of any changes.