

Phoebus

Industrial Delivery Robot Platform

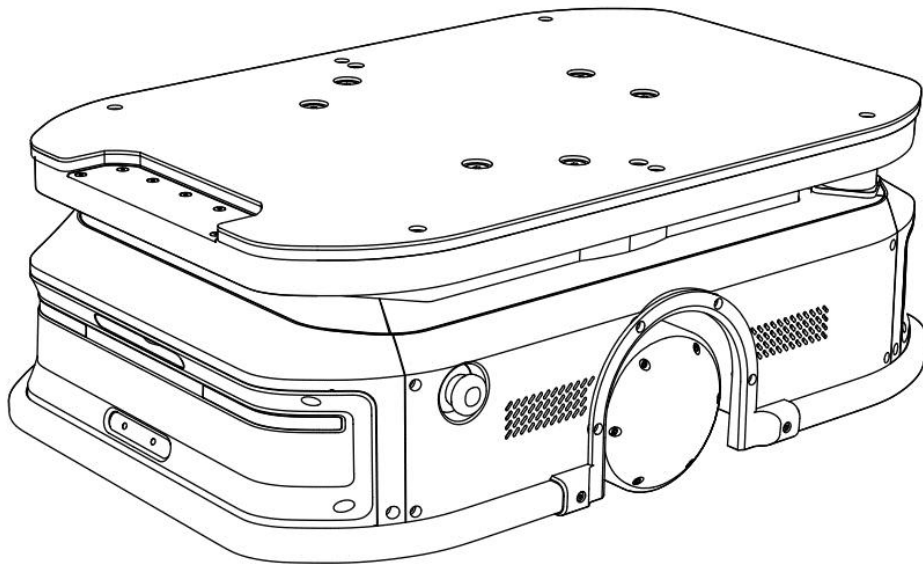
User Manual

Model: P4M11/P4M21

Easy to use, light deployment/minimal maintenance

Maximum load capacity 300KG

Multi-sensor fusion for 360-degree protection



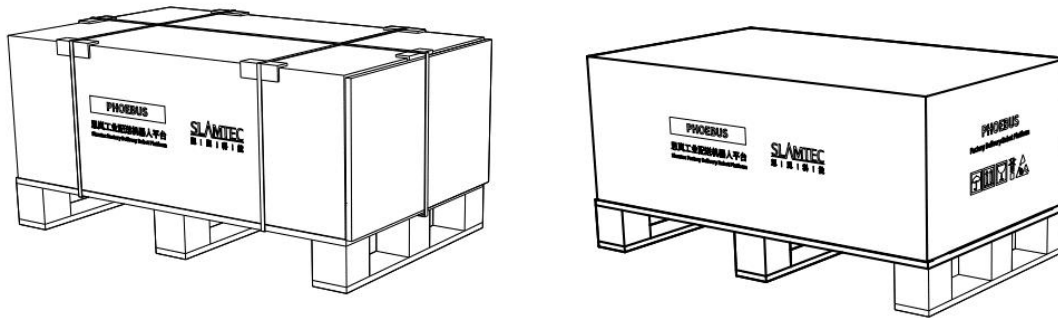
Phoebus is a small and medium-sized ,scalable industrial delivery robot platform developed by SLAMTEC, designed for small to medium-sized factories. It provides efficient, simple, and reliable automated smart industrial transport solutions, helping end-users improve production processes, enhance productivity, and achieve intelligent transformation and upgrades.

Product list

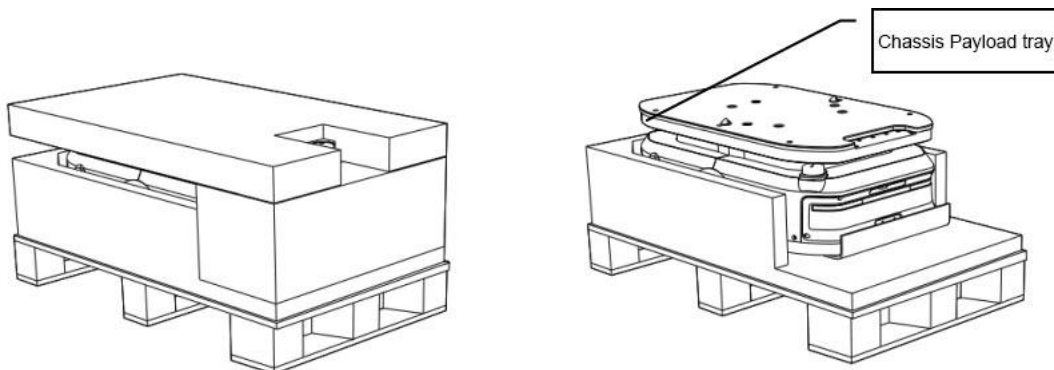
Name	Number	Remarks
Robot platform body	1	Phoebus chassis body
Charging station	1	Phoebus chassis matching charging station
Charging station power supply cable	1	Attached to the charging station packaging box, this cable needs to be used to connect the charging station to the 220V power supply before using the charging station
Charging station emergency charging cable	1	Attached to the Phoebus charging station packaging box, use this cable to connect the Phoebus chassis to the charging station when emergency charging is needed
Gate machine	Optional	Select procurement according to the actual application needs of the scene
Pager	Optional	Select procurement according to the actual application needs of the scene
Elevator control	Optional	Select procurement according to the actual application needs of the scene

Unpack

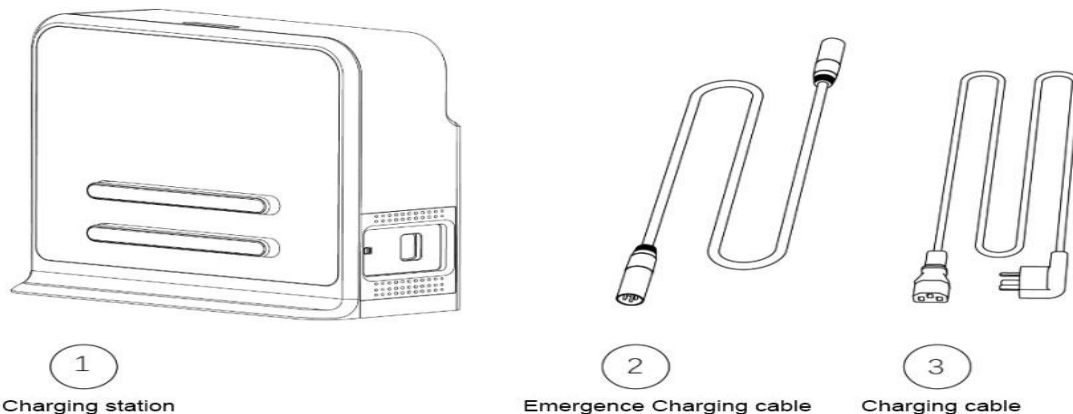
After receiving the Phoebus robot, please check whether the packaging box is intact as shown in the left picture below, and whether the product name of the outer box is Phoebus. If the whole package is intact, please cut the packing straps through and remove all of them, as shown in the following right figure.



Open the box and the inside is shown in the following left figure, please take the large top protective EPE out of the box and then hold the payload tray to lift the robot base out of the box.



Please take out the charging station and related cables out the charging station box.



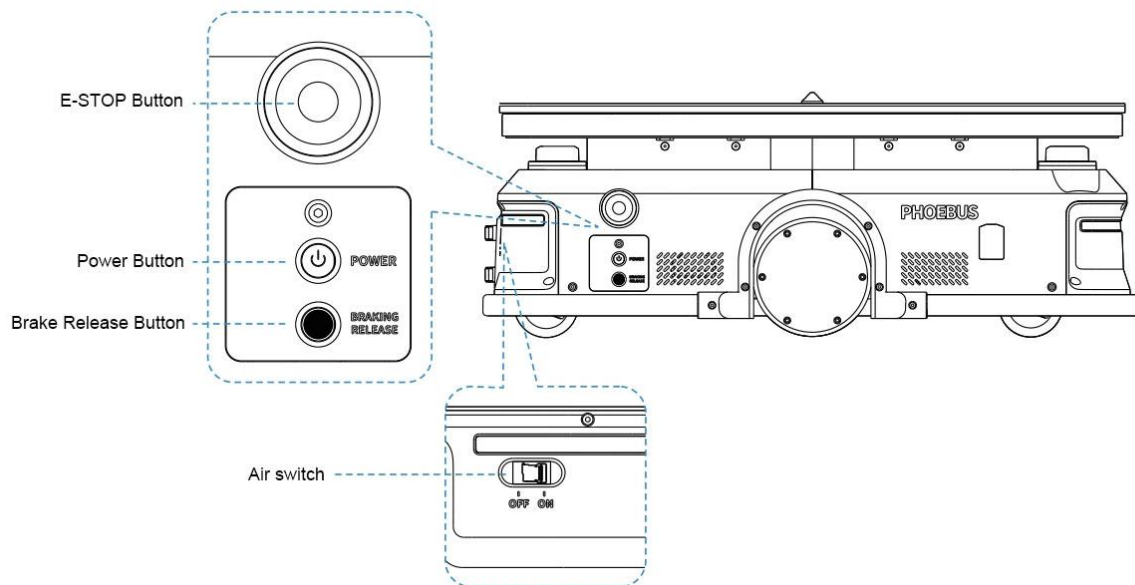
1
Charging station

2
Emergency Charging cable

3
Charging cable

User Button Usage

Phoebus has air switch, power button, emergency stop button, and brake release button, as shown in the following figure.



1. Air Switch

The air switch is located at the rear of the robot, which can turn on and off the power of the chassis.

2. Power on&Power off

Manual power-on: Press the power button. The button indicator lights up indicates the startup command is successfully triggered. When the robot base front light belt lights up, the robot base is successfully powered on.

Manual power-off: Press and hold the power button until the power button indicator is off, indicating that the shutdown command is successfully triggered. When the robot base front light belt lights off, the robot base is successfully shut down.

Automatic power-on: If the charging station of Phoebus is connected to the 220V power supply, please push the robot base to the charging station and make sure the electrodes of them connected well, then the robot base will automatically power on, and the power button light will turn on automatically.

Note: When the robot base is connecting with the charging station, it cannot be powered on

3. Emergency Stop Button

When the emergency stop button is pressed, the emergency stop function is triggered.

At this time, the robot base stops moving and does not respond to any motion control command and it cannot be manually pushed to move. Press the emergency stop button again, the button springs up, the emergency stop function is restored, and the robot base be restored to normal state.

4. Break Release Button

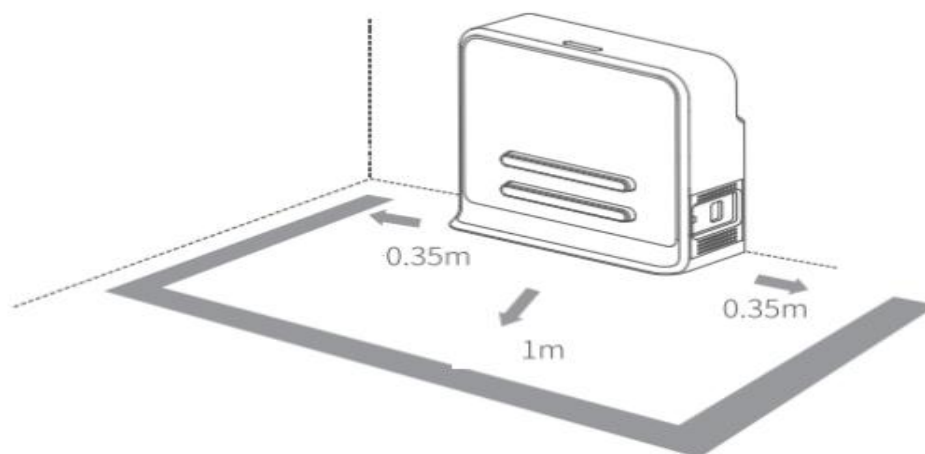
When the brake release button is pressed, the brake release function is triggered, and the robot base stops moving and does not respond to any motion control command. At this time, the robot base can be pushed manually. When the brake release button is pressed again, the button will spring up and the brake function will recover, and the robot base can return to normal state.

Charging Station Configuration and Usage

1. Charging Station Configuration

Phoebus realizes automatic return charging function through the charging station, so the placement and deployment of the charging station will affect the automatic return charging function. When the robot base returns to the charging station, it will generate a driving force, so it is recommended that the charging station be placed against the wall, and the wall meets the following conditions:

- a. The charging station should fit the wall closely and there are no obstacles between them. The wall with skirting line is not recommended.
- b. The wall should not be made of transparent material like mirror or glass.
- c. The wall should be at least three times the width of the charging station.
- d. The wall should be a straight wall instead of a curved one.
- e. There should be more than 0.35 meters left on both sides and more than 1 meter in front of the charging station;



The charging station requires a 220V power supply and its external power supply wire is 1.5m in length. So it's better that there is a power port on the wall for the charging station (the power board is not recommended since it may cause danger due to massy wires).

The ground in front of the charging station should meet the following requirements:

- a) Open. There are no obstacles in front of the charging station (with the charging station as the center and within a radius of 2 meters from the center).
- b) Horizontal. There is no slope on the ground.
- c) There is no soft carpet on the ground which leads Phoebus sinking into it more than 2cm.

Please always launch chassis from the charging station to ensure that it can recharge itself properly.

Note: if the charging station is moved to a different place when using chassis, user should reset the position accordingly when loading the map. Please refer to the detailed interfaces description in our SDK document.

2. Charging

There are two ways to charge Phoebus battery: Automatic charging and emergency charging. Before charging Phoebus, please connect the charging station with 220V power supply with the power cable.

➤ Automatic Charging

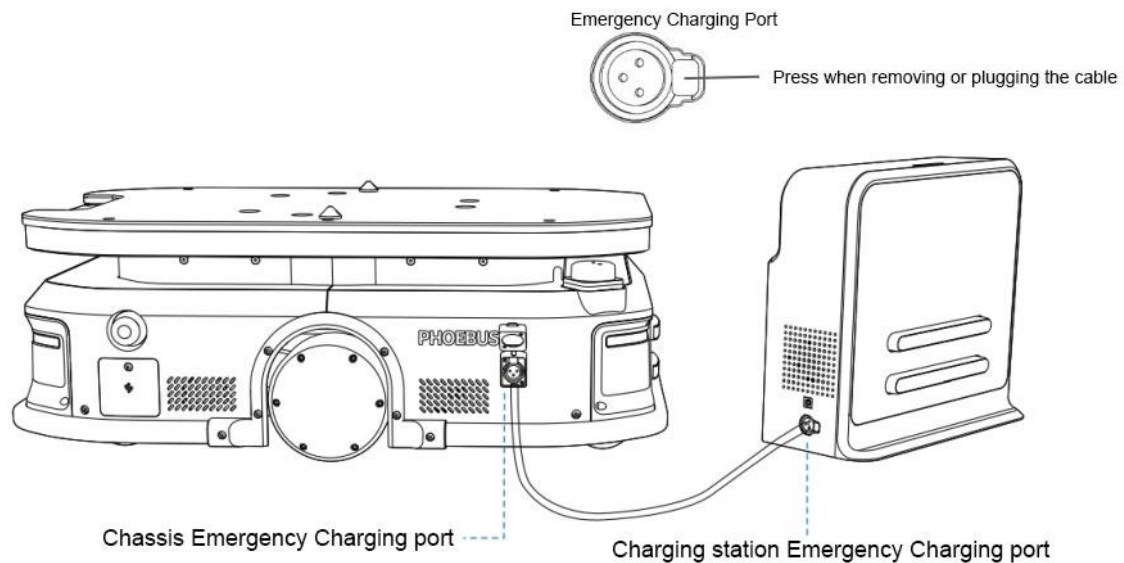
If using Phoebus for the first time, please press the brake release button after the robot base is power on, then push it to the front of the charging station, and ensure their electrodes connecting well. At this time, the indicator on the top of the charging station breathes green, indicating Phoebus is in charging status. Once Phoebus is fully charged, the indicator is turns into steady green.

The Phoebus robot base supports automatic recharging function. When the upper side system is developed and the automatic recharging interface is successfully invoked, the robot base will automatically go back to the charging station and start charging automatically.

➤ Emergency Charging

In some unexpected situations, like Phoebus cannot recharge itself temporarily, user can use emergency charging cable to charge Phoebus. The emergency charging of Phoebus is shown in the following figure. Please use the emergency charging cable to connect the emergency charging port on the charging station and the charging port on Phoebus. The indicator on the top of the charging station breathes yellow indicates the

charging station starts charging for Phoebus. Once Phoebus is fully charged, the indicator is turns into steady yellow.



Note: please do not use the charging station to charge any devices which are not authorized by SLAMTEC.

3. Caution:

- a) Please do not use the charging station in humid environment;
- b) Please do not use the charging station in current unstable environment;
- c) Please do not use the charging station in the place near any inflammable and explosive article

Connect to Computer

1. Download and Install RoboStudio

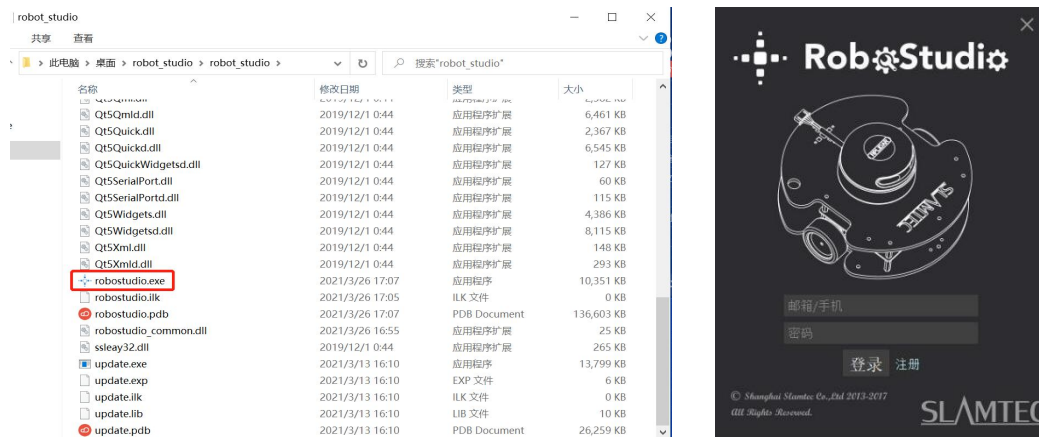
RoboStudio graphical tool is used for testing and controlling Phoebus. Please download it from our official website as below:

<https://www.slamtec.com/en/RoboStudio>



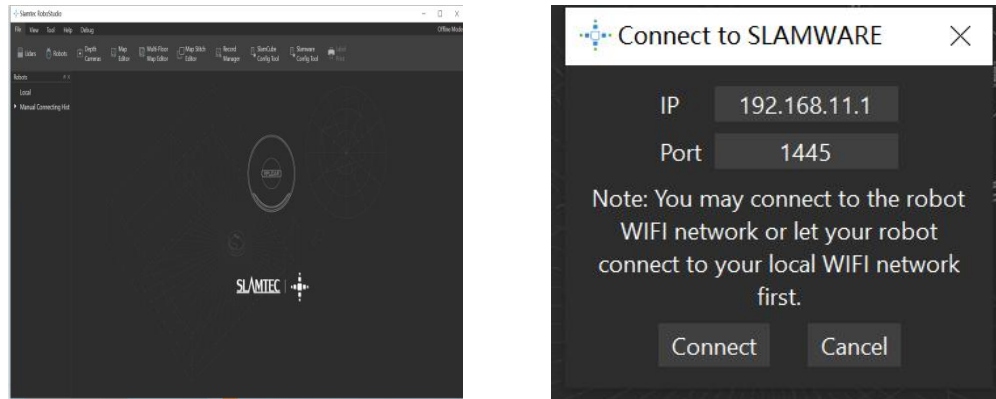
After downloading and installing Robostudio, please run "RoboStudio.exe" to

complete the account registration and login, as shown below.



2. Connect to Robot Base

Click "File-Robot" in the menu-toolbar area of RoboStudio, and a docking window named Robot will appear on the left side of the workspace, as shown below. The user can connect or disconnect to the robot base through this window.

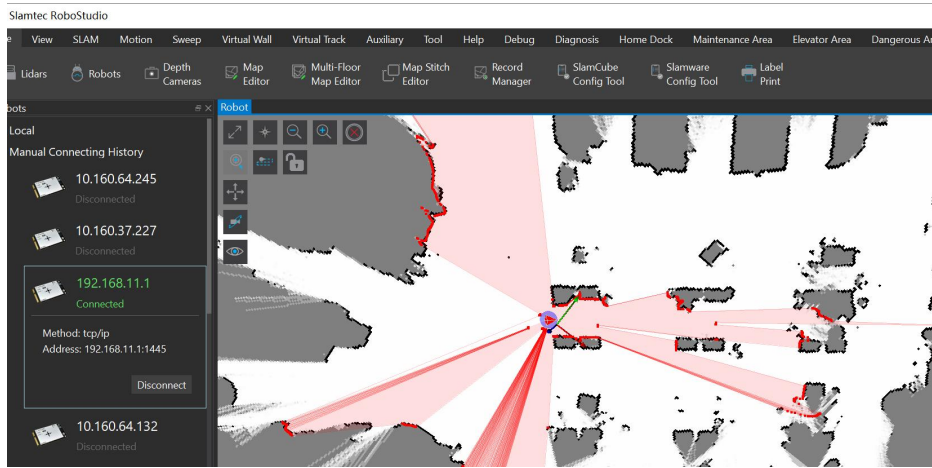


Right click the whitespace of the robot list, and enter the IP address and port number in the prompt dialog box as shown in the upper right corner.

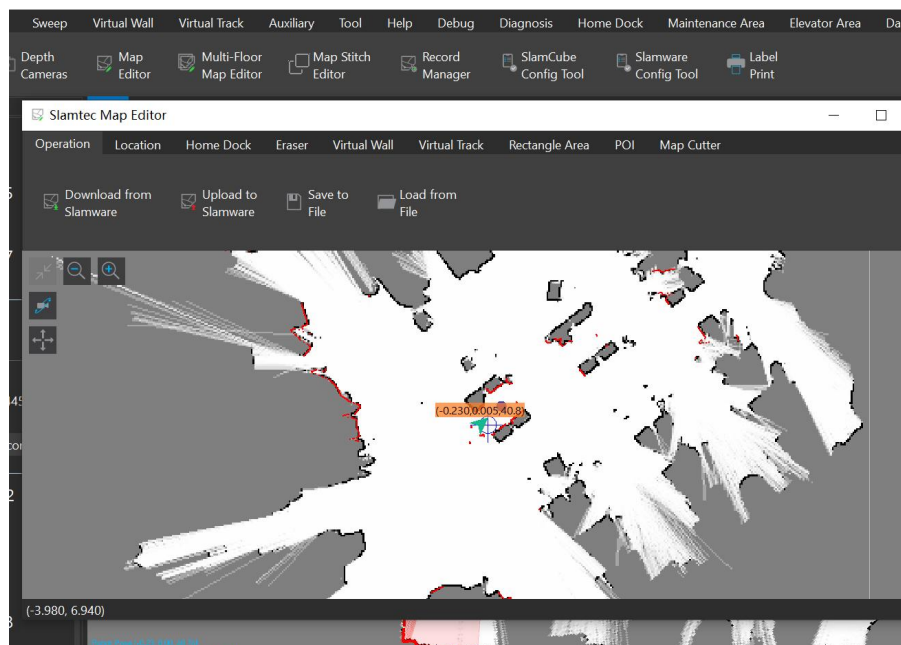
Connect the computer through a network adapter to the SSID of the Phoebus chassis mentioned above (the SSID can be viewed on the machine label). Enter the IP address 192.168.11.1 (note that your wireless network adapter IP address should be set to automatically obtain using DHCP) and 1445 Port Number in the pop-up dialog box by default. Then click "Connect" to connect to the chassis...

Build Map

Once connected successfully, the major work area will show the robot, map information and its status. The robot name will turn to green and the robot status will turn to Connected as shown in the following figure.



Left click a point in the area where you want to build the map and let Phoebus run and build it. After the map is completed, please click "File - Map Editor" and choose to save the file or upload it to firmware to save the map.



Upload Map By SDK

The following is a reference for how to use the SDK to complete the boot and load a specific map on the host computer

PUT /api/core/slam/v1/maps/stcm Set up a composite map ⌵

Set the map to the slamware system, and read the stcm file as the request body in binary mode.
[Attention] The map will not be saved persistently and will become invalid after restart.

Parameters Try it out

No parameters

Request body application/octet-stream ▾

Example values are not available for application/octet-stream media types.

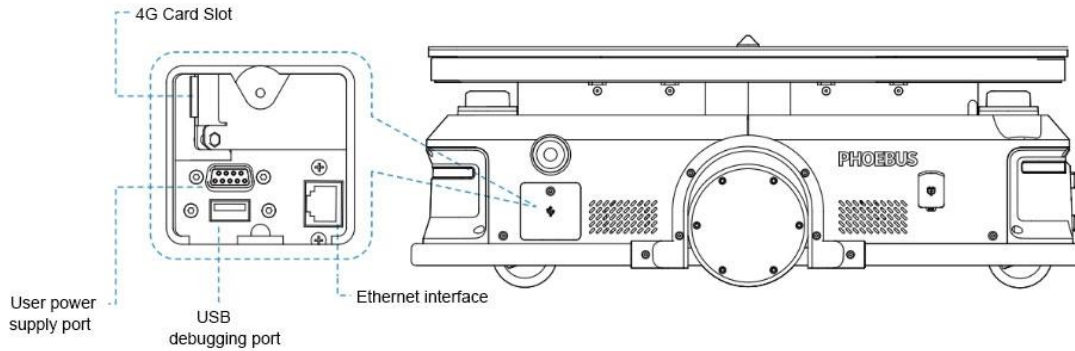
Responses

Code	Description	Links
200	OK	No links

For more usage methods, please refer to the official website RoboStudio and SDK documentation.

User Interface Description

Phoebus user interface has Ethernet interface, user power supply port, and USB debugging port. The three interfaces are located in the following positions on the chassis:



Interface name	Parameter	Function description	Remarks
Ethernet port	RJ45	Used to configure the network, connect to the host computer, and connect to the chassis.	
Debugging port	DB9	Three-in-one interface for jacking, can, and 485 debugging.	
USB debugging port	Standard TypeC, USB female socket	Used for internal algorithm board debugging or general USB function, connected to the chassis.	
4G card slot	Standard SIM card slot	Insert a 4G card to provide 4G internet access.	

Chassis Indicator Light

	Name/Event	Light position	Status	Light color
Chassis	Power Off	All Chassis Lights	off	/
	Standby	Front or side light strip of chassis	Breathing light	Blue
	Operation	Front or side light strip of chassis	Solid	Blue
	Turning	Front or side light strip of chassis	Single Side Flashing	Blue
	Brake light (TBD)	(If available at the rear)	Flashing during braking, otherwise off	Red

	Charging	Front or side light strip of chassis	Flashing	Green	
	Fully charged	Front or side light strip of chassis	Solid	Green	
	Discharging	Front or side light strip of chassis	Solid	Yellow	
	Reverse	Front or side light strip of chassis	Flashing	Orange	
	Ambient light	/	/	/	
	Fault	Obstacles blocking passage	Front or side light strip of chassis	Flashing	White
		Machine starting	Front or side light strip of chassis	Solid	White
		User Non-Resolvable	Front or side light strip of chassis	Solid	Red
		Emergency stop activated	Front or side light strip of chassis	Solid	Red
		Brake release pressed	Front or side light strip of chassis	Flashing	Yellow
Charging station	Idle State	Top of Charging station	Solid	Orange	
	Charging	Top of Charging station	Flashing	Green	
	Fault	Top of Charging station	Solid	Red	

Charging Station Port

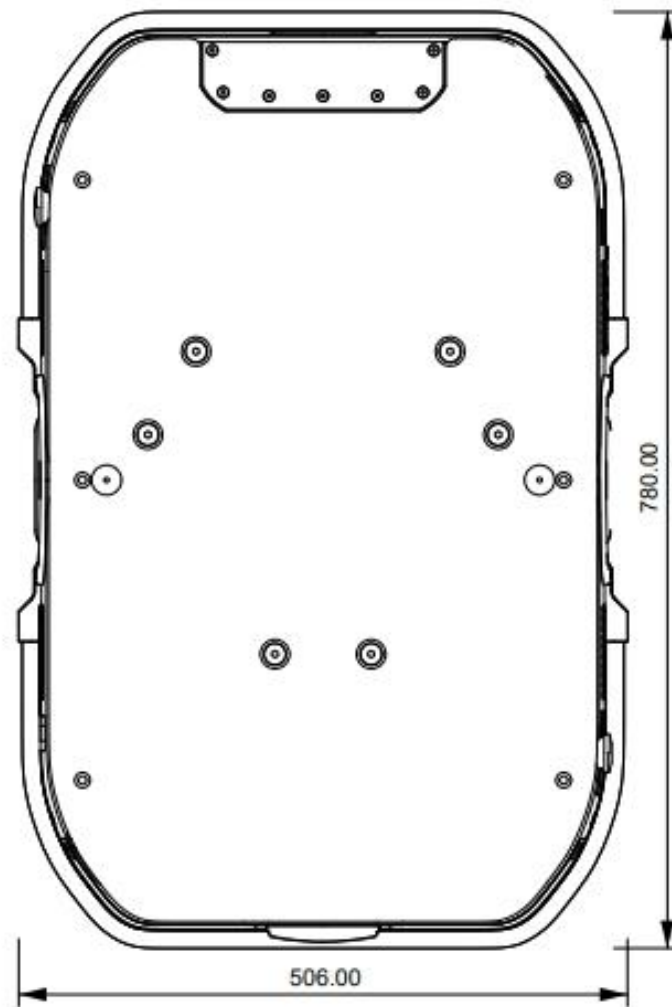
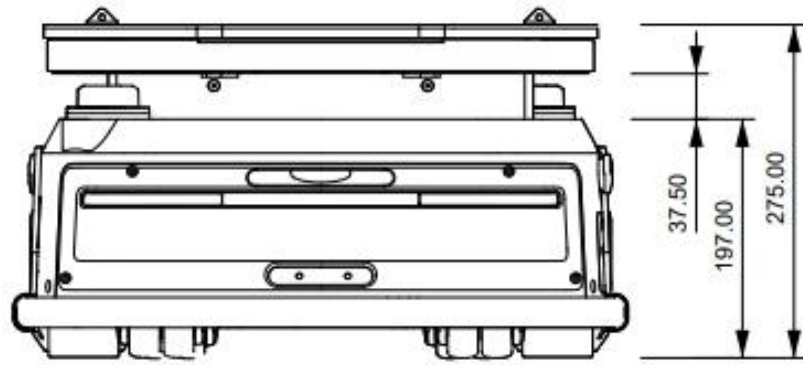
Port	Parameters	Description	Remark
Charging port	100-240VAC,50/60 Hz	Used for providing power supply for charging station	
Charging electrodes	25.5VDC 6A MAX	Used for contact charging of the chassis	
Emergency charging port	25.5VDC 10A MAX	Used to manually charge the chassis	
Firmware upgrade interface	Serial port (not open to the public)	Used to upgrade firmware for charging station, special tools need to be used for upgrade	

Charging station indicator light

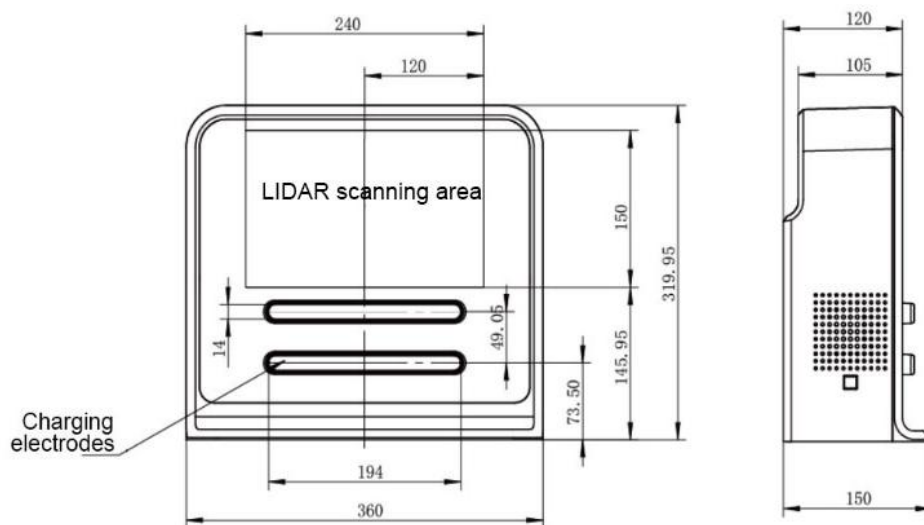
Process	Prefabrication condition	Indicator light status	Description
Power on and power off	Charging station power on	Red always bright	Indicates that the charging station is powered on normally
	Power off of charging station	Extinguished	Indicates that the charging station is disconnected from the power supply
Automatic charging	Charging station is charging the host	Green slow flash (Breath flickering)	Indicates that the host is charging at the charging station
	Low current charging	Constant green	Indicates that the charging station is charging the robot with a small current
Abnormal state	Charging station fuse abnormality	Red light flashing slowly	Self-recovery fuse ejected, need to press recovery
	Abnormal operation of charging station	Alternating red and green slow flashing	charging station abnormality or host abnormality (when the host is not in contact with the charging station, it indicates that the charging station is abnormal)
Process	Prefabrication condition	Red light flashing slowly	Description
Power on and power off	Charging station power on	Alternating red and green slow flashing	Indicates that the charging station is powered on normally

Mechanical Dimensions

1. Phoebus Mechanical Dimensions

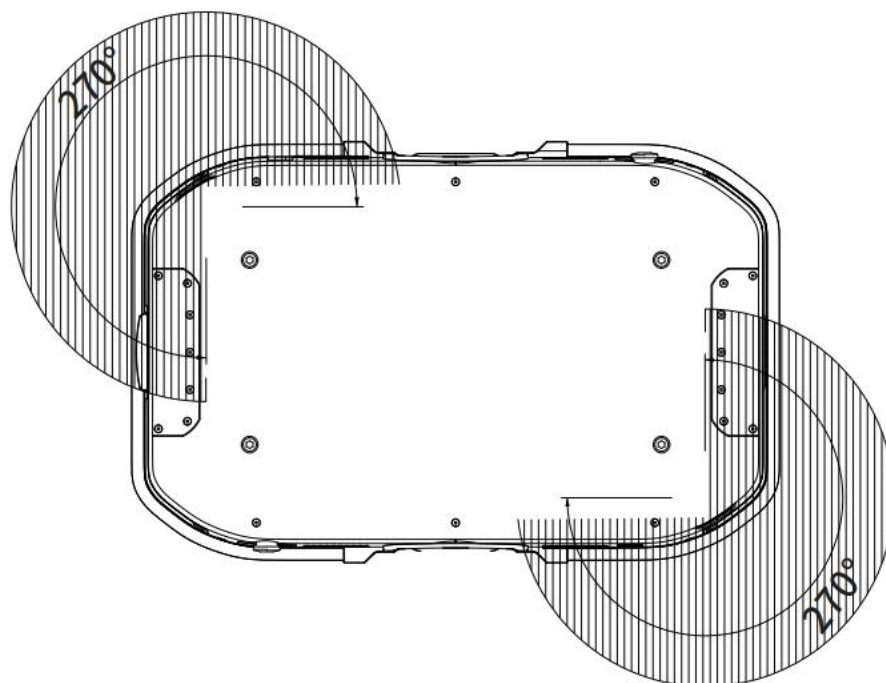


2. Charging station Mechanical Dimension

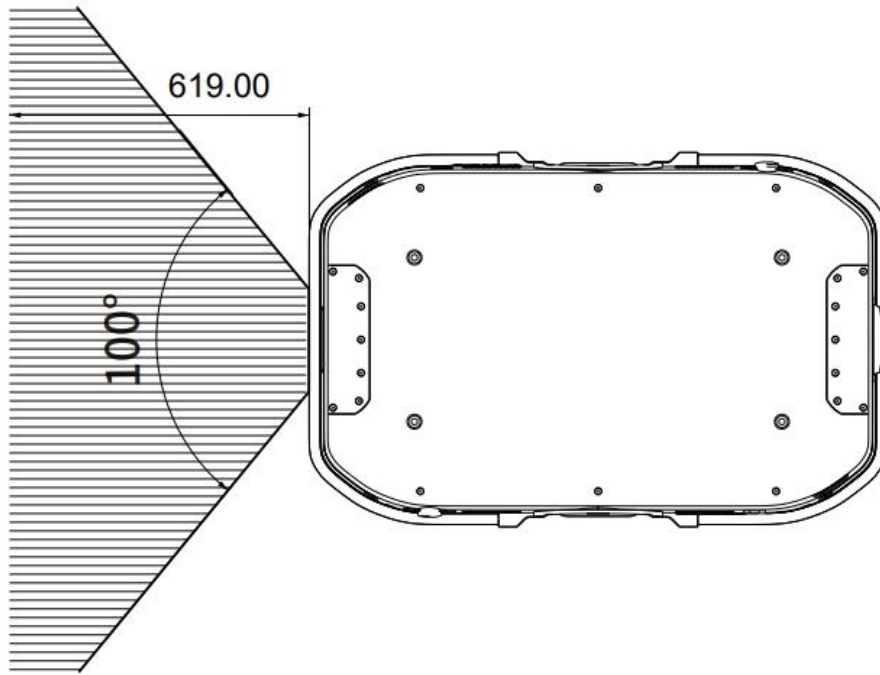


Sensor Coverage

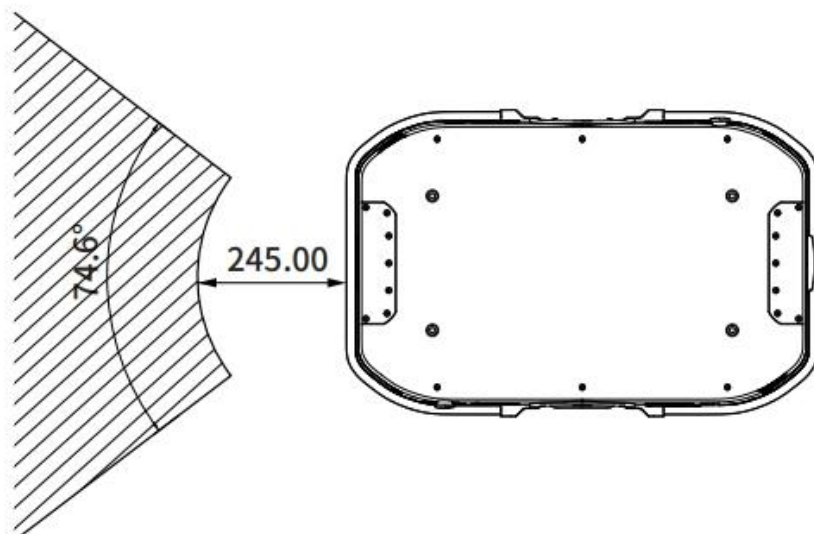
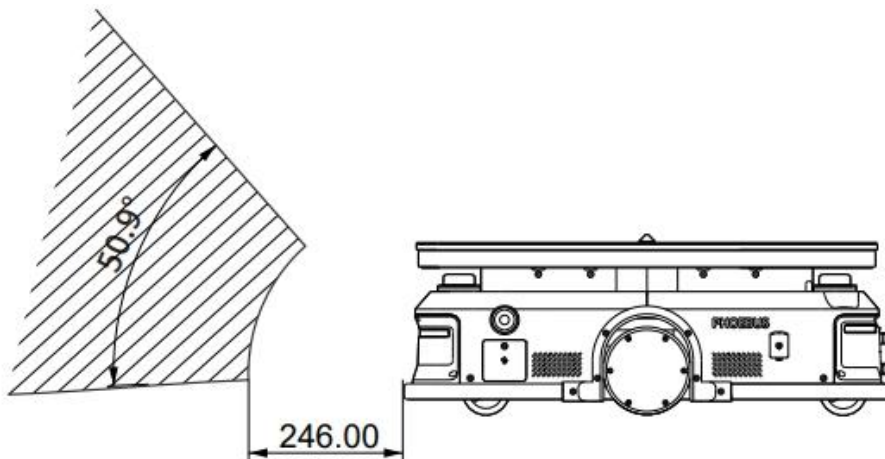
Mapping Lidar FOV



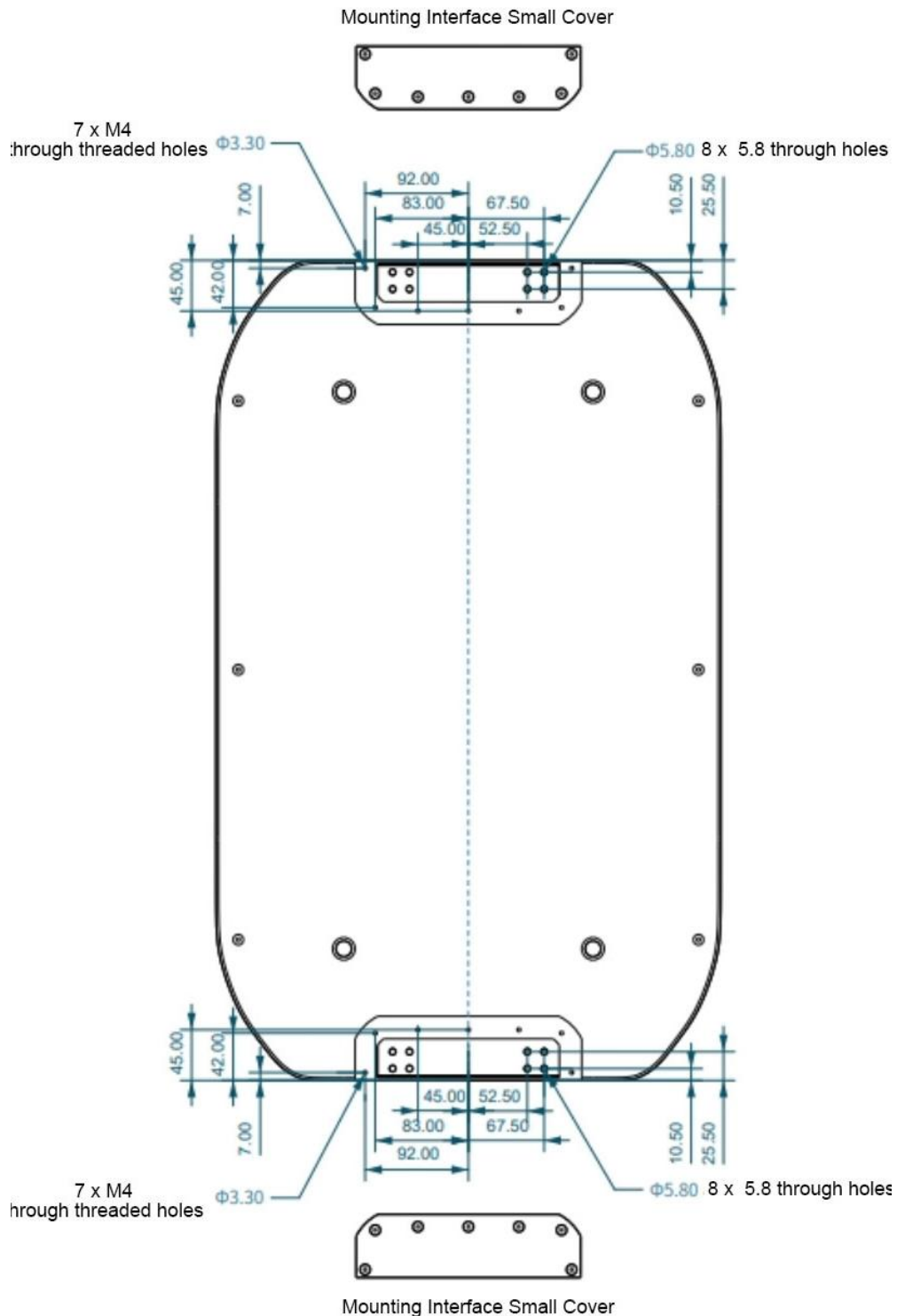
Low detection Sensor FOV



Depth FOV



Extended Platform for Upper Structure Design



As shown in the above figure, the Phoebus chassis is designed with a total of 7 x M4 and 8 x 5.8 through holes for the installation and fixing of the upper structure. It is recommended to use screws with spring pads and anti-turpentine glue.

Load Limit Notice

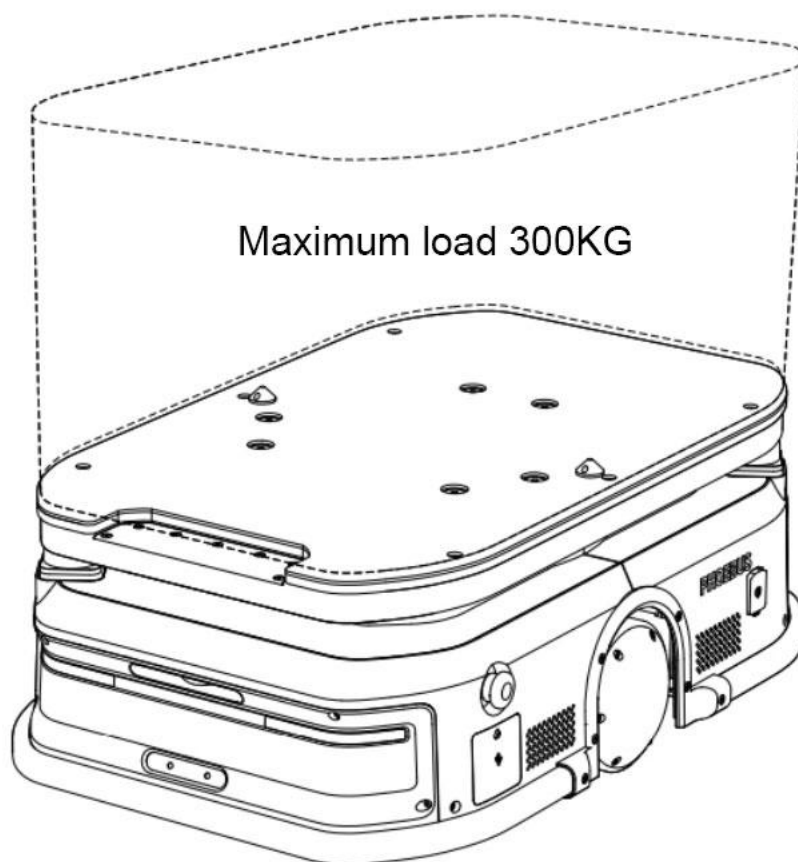
The maximum load of the upper structure is 300kg, and the rated load is about 250kg, as shown in the following figure

*It is recommended that the center of gravity of the robot be no higher than 600mm from the ground during installation.

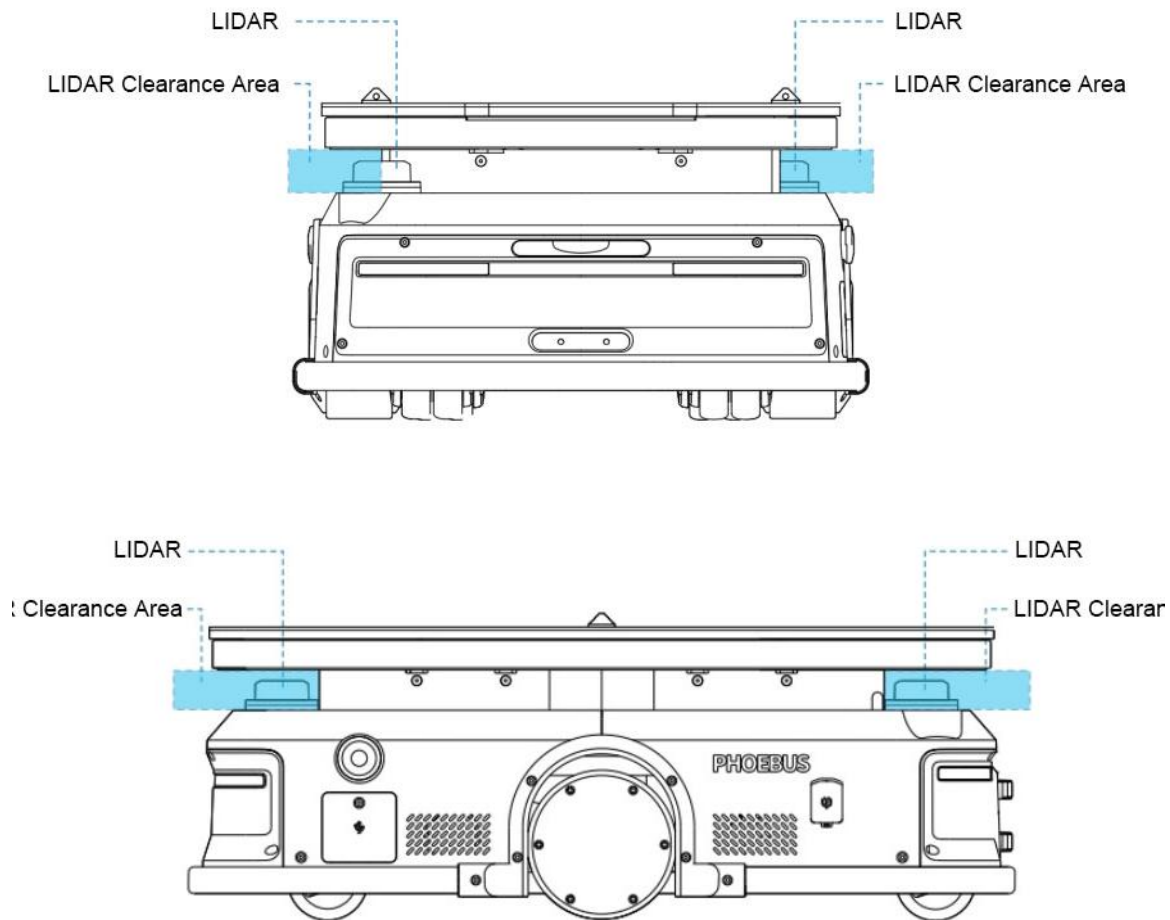
*The center of gravity of Phoebus provided by Slamtec is 150mm high;

*The center of gravity of the whole robot needs to be comprehensively considered after the overall design of the robot is completed

*If the center of gravity of the robot exceeds 600mm, there may be attenuation of climbing and obstacle crossing performance.



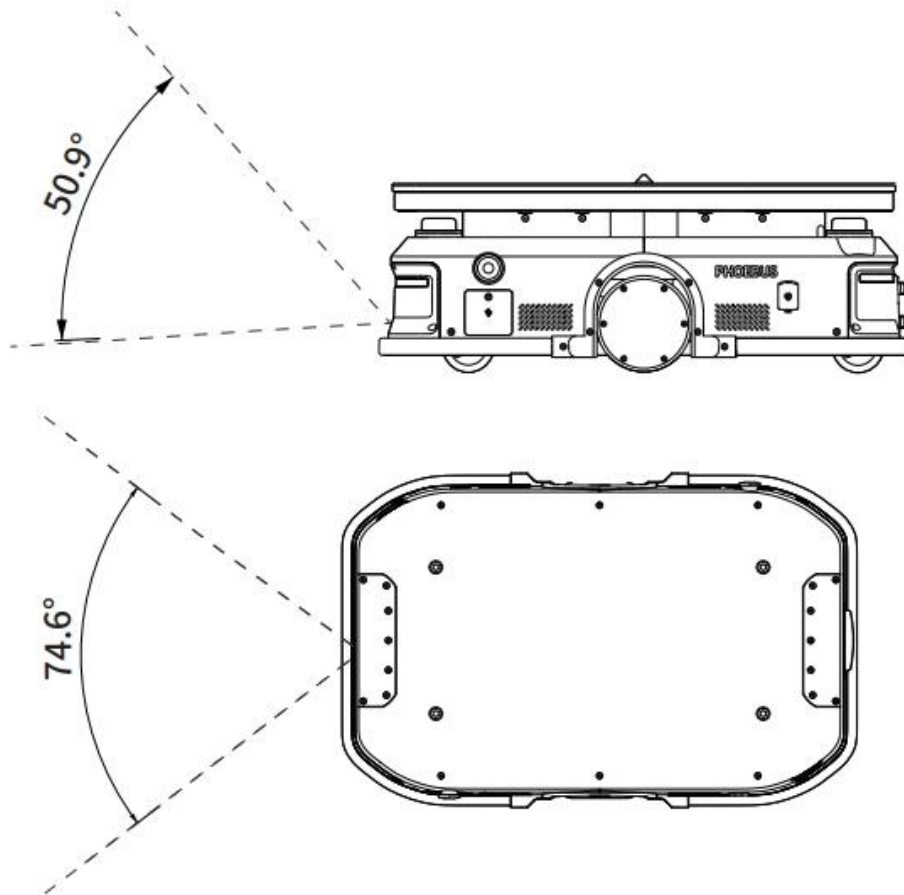
LIDAR Clearance Area



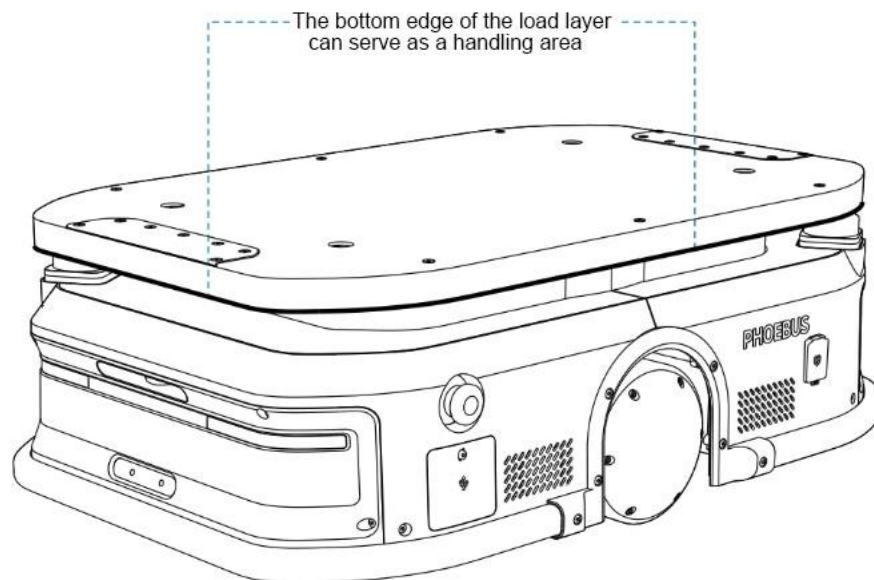
There is a LIDAR between the robot base and the upper side structure. When designing the upper side structure, please make sure that the LIDAR layer is 360 degrees free of obstructions; otherwise, LIDAR mapping and obstacle avoidance will be affected. The LIDAR layer is shown in blue in the above figure.

Depth Camera Clearance Area

There is a depth camera on the robot base and it has a FOV as shown in the following figure. When designing the upper side structure, please make sure that the above FOV is not obscured or interfered with.



Carrying Design Description



When moving the base, it can support the bottom edge area of the Phoebus load layer.

RoboStudio

RoboStudio graphical tool is used for testing and controlling Phoebus. Please download it from our official website as below:

<http://www.slamtec.com/en/RoboStudio>

In the same page, we also provide a document to introduce the usage of this tool.

Web Portal Tool

During developing, debugging and using SLAMWARE devices, various operations can be carried out on the device through the Web Portal tool, such as checking basic information, upgrading firmware and configuring WiFi. (Default username: admin. Default password: admin111).

Our Web Portal currently supports the following features:

1. Check the information of the robot;
2. Restart the SLAMWARE module;
3. Upgrade firmware

Slamtec provides Phoebus firmware renewal and upgrade regularly. Our users can upgrade firmware via the Web Portal tool. Please ask for the latest firmware from our support engineers or sales representatives. The upgrade progress lasts for 5~10 minutes. Phoebus will restart once the upgrade finished. Before that, please ensure that Phoebus has sufficient electricity.

4. WiFi configuration;
5. Start diagnosing SLAMWARE core;
6. Modify admin password;

For usage details, please refer to the following document:

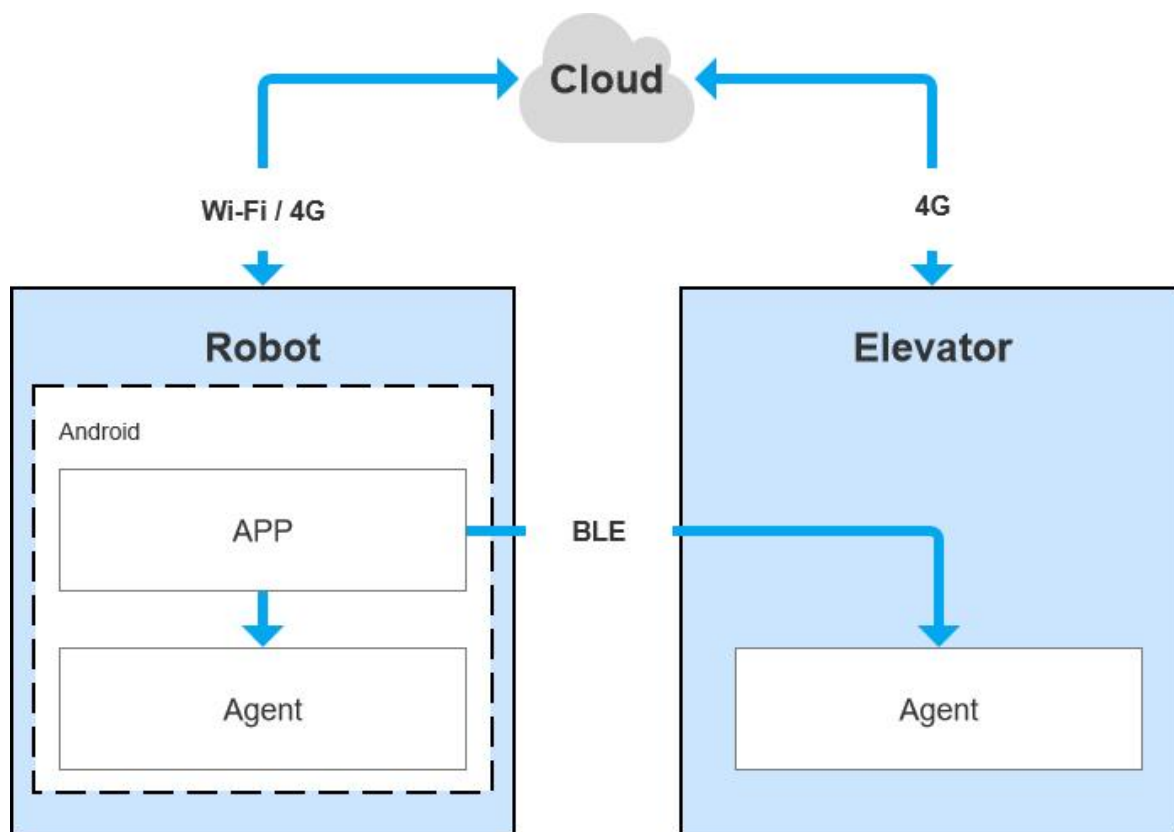
<https://wiki.slamtec.com/display/SD/SQ001+SLAMWARE+Web+Portal+Function+Overview>

Start

Phoebus Agent SDK is developing based on C++ language to reduce user access costs and improve the robustness of the SDK, while strong compatibility of supporting Java, C++, C, Kotlin and other languages. The following is a detailed introduction to the Agent SDK.

Framework between Systems

Robot App controls robot localization, movement and recharging through communication; It also sends commands according to different service scenarios. Robot Agent provides data interfaces, task operation interfaces, and service services to Robot App.



System Function Introduction

1. Robot Agent

Robot Agent is a service program running on the Phoebus, through which the cloud and elevator control terminal communicate with the elevator control device. Inside the Robot system, the Robot Agent communicates with the Robot App, receives instructions from the Robot App to control the Robot and sends the Robot status at the same time.

The core functions of Robot Agent are:

Communicate with Robo Cloud and Robot APP to report robot status and receive control commands

2. Elevator Agent

Elevator Agent is a service program running on the Linux system of the elevator control box, through which the cloud and robot communicate with the elevator control device. In the Elevator control system, the Elevator Agent communicates with the Elevator Controller through UDP to send elevator control commands and obtain elevator status.

The core functions of Elevator Agent are:

Communicate with Robo Cloud and Robot APP to report elevator status and receive elevator control instructions

Communicate down with the Elevator Controller to get the elevator status and send the elevator control command

3. Robot Cloud

Robo Cloud is a group of services provided to achieve remote management, scheduling and control of robots. It runs in the cloud and communicates with robots and elevator control devices, so elevator control is one part of the functions. The Robo Cloud communicates with the Elevator Agent running on the elevator control box through the MQTT protocol.

Its core functions include:

- a) Give instructions to control the elevator to the specified floor
- b) Give instructions to control the elevator to open the door
- c) Give instructions to control the elevator to close the door
- d) Obtain the status of the elevator
- e) Get the current floor information of the elevator

4. Robot App

Open-source application-food delivery App

The restaurant food delivery App is a service program running on the robot, and the application scene is the restaurant. It draws a map through the RoboStudio graphic tool and loads it to the local robot, which applies human-computer interaction in general and realizes multi-point task delivery.

Core features are:

- a) Get device battery status
- b) Get device health information
- c) Get POI information
- d) Get operation password
- e) Create new action
- f) Get current action
- g) End current action
- h) Shutdown or restart robot

Program Examples

1. Use Robot APP to invoke Robot Agent interface to query battery status

GET <http://127.0.0.1:1448/api/core/system/v1/power/status>

The return data format is application/json

```
interface AgentApi {
    /**
     * get方式调用 value: 接口地址
     * PowerStatus: 接口返回json格式对应的bean格式的数据 class的值
     */
    @GET("/core/system/v1/power/status")
    fun queryPowerStatus(): Call<PowerStatus>
}

/**
 * batteryPercentage : 90电池电量百分比, 0 ~ 100
 * dockingStatus : 对桩状态
 * isCharging : 是否正在充电...
 */
data class PowerStatus(
    val batteryPercentage: Int, val dockingStatus: String, val isCharging: Boolean,
    val isDCConnected: Boolean, val powerStage: String, val sleepMode: String
)

/**
 * retrofit接口代理类
 */
object AgentServiceCreator {
    fun <T> create(serviceClass: Class<T>, timeout: Long): T =
        Retrofit.Builder().baseUrl("http://127.0.0.1:1448/api/")
            .addConverterFactory(GsonConverterFactory.create()).client(
                OkHttpClient.Builder().retryOnConnectionFailure(true)
                    .connectTimeout(timeout, TimeUnit.SECONDS)
                    .addInterceptor { chain ->
                        val originalRequest = chain.request()
                        val requestBuilder =
                            originalRequest.newBuilder().addHeader("Connection", "close")
                        chain.proceed(requestBuilder.build())
                    }.build()
            ).build().create(serviceClass)
}

// 查询电量, 返回值为powerstatus
val powerStatus = AgentServiceCreator.create(AgentApi::class.java, 1L).queryPowerStatus().await()
Result.success(powerStatus)
```

2. Use Robt App to invoke Robot Agent interface to realize robot cross-floor moving

POST <http://127.0.0.1:1448/api/core/motion/v1/actions>

The request data format is: application/json

```
{
  "action_name": "slamtec.agent.actions.MultiFloorMoveAction",
  "options": {
    "target": {
      "poi_name": "201" //表示前往名称为 201的poi
    }
  }
} // JavaScript Document
```

Robot API List

Function Module	API List
SLAM/Localization and mapping related functions	Get the robot pose
	Set the robot pose
	Get localization quality
	Whether to support positioning
	Start/Pause localization
	Reset localization status
	Mapupdate mode or localization mode
	Open/Pause mapping
	Get the location of the charging station
	Set the location of the charging station
	Get known area map
	Get the current map
	Get a composite map
	Set a composite map
	Clear the map
	Artifact / Manually map elements mark
Add virtual line segment	
Modify virtual line segment	
Clear a certain type of virtual line segment	
Delete a virtual line segment	
Get rectangular area	
Add rectangular area	
Clear a certain type of rectangular area	
Delete a rectangular area	
Get all POIs in the current map	
Add a POI	
Clear POI	
Find POI by ID	
Modify POI	
Delete POI	
Motion / Robot motion control	Get all supported actions
	Get current action

	Abort current action
	Create a new action
	Query action status
Firmware upgrade	Get firmware upgrade progress
	Get all custom installed apps
Android application management	Install an APP
	Uninstall an APP
	Move across floors
	Cross-floor back to charging station
	Get all floor information
	Get the current floor information of the robot
Multi-floor / Multi-floor map and POI management, elevator and other functions	Set the floor information of the robot
	Get POI information
	Upload the map to the robot
	Delete saved map
	Keep the current map even if restarted
	Reload the map
	Get operation password
	Set operation password
	Get configuration information
	Get delivery settings information
	Get all cargo information
	Get all box information of a cargo
	Get box information
	Operate box
	Query box operation results
	Get occupied cargos
	Query task information
Delivery / Delivery service related interfaces	Create a task
	Cancel all task
	Cancel task according to task ID
	Cancel task according to order ID
	Add order event
	Get current task status
	Pause/resume task
	Start picking up
	End picking up
	Get delivery event information
	Note: please contact our sales representatives for delivery APIs
	Get robot capabilities
	Get the robot power status
	Shutdown or restart the robot
System resource	Hibernate (stop lidar)
	Wakeup the robot
	Restart module
	Get device information
	Get device health status information

	Clear the error status information
	Get current laser scan
	Get system parameters
	Set system parameters
	Get network status
	Set network status
	Get routing information
	Set routing information
	Set Cube configuration

Details in <https://docs.slamtec.com/>

Restricted Use Scenarios

To avoid robot base failure or damage, please do not use the Phoebus in the following scenarios

(1) Over-limit/heavy transport

Do not put items exceeding the maximum weight on the base to avoid affecting the normal use of Phoebus. For details about the maximum load weight, please check the Phoebus datasheet.

(2) Overpass height

Please make sure that there are no obstacles higher than 20mm in front of the Phoebus. When driving the Phoebus, try to avoid rough ground or other environments with large height difference.

(3) Man-made impact

Do not push or strike the Phoebus while it is in normal use.

(4) Temperature/humidity

Do not place Phoebus in an area with high temperature, humidity, or water stains.

(5) Ground obstacles

For the places that the robot base will travel through, please ensure that the ground is clean and free of linear obstacles and debris.

(6) Outdoor

Do not use the robot base outside.

(7) Altitude

It is safe to use at altitudes below 2000m.

Emergency Handling for Temporary Malfunction

- (1) Please press the brake button;
- (2) Push the robot base back to the charging station;
- (3) The robot base can be forced to switch on.

* For emergency use only

Attention

1. Storage:

The robot base should be stored in a cool and dry place. If you are intend to keep the robot base for a long time (3 months or longer) without using it, it is recommended that the robot base should be stored under the dry environment with temperature during 10-25°C and without corrosive gas. And the robot base should be charged at least one time every six months to ensure the voltage of the battery is between 3.6V-3.9V.

2. Package:

Packaging material has a certain strength and toughness, can withstand the transport of slight vibration, extrusion, friction, and collision;

3. Transportation and handling:

Handle gently to prevent falling, collision, drag, inversion;

The stack needs to be solid compact, solid, stacked.

4. Miscellaneous Attention:

- Handle Phoebus base gently(do not kick, thrust or drag it).
- Do not spill any liquid on Phoebus.
- Do not use the recharging function of Phoebus when it is walking on a soft carpet which can sag more than 2cm.
- Ensure that Phoebus always starts on its charger.
- Do not change or replace anything in the machine without authorization.
- Ensure that the load of Phoebus meets the requirement of the specification.
- Do not use Phoebus under environment with too many highly transparent materials.

General Maintenance

- (1) Lidar cleaning: When the robot base is powered off and not working, check around the Lidar to ensure that there is no shelter.
- (2) Universal wheel cleaning: When the robot base is powered off and not working, gently lift the robot base, wipe the universal wheel with a soft dry cloth, and remove the surrounding foreign matter.
- (3) Depth camera cleaning: Please wipe the lenses of 2 depth cameras with a soft dry cloth when the robot base is powered off.
- (4) Charging station cleaning: Please wipe the charging station and charging electrodes with a soft dry cloth when the charging station is disconnected from power
- (5) Safety rim cleaning: Please wipe the safety rim with a soft dry cloth when the robot base is powered off and not working, and ensure that there is no silk, paper and other foreign matter stuck on the rim.

Maintenance cycle

For the robot base maintenance, it is mainly including the depth camera lens inspection, safety rim inspection, clearance inspection around the LIDAR, foreign matter inspection around the drive wheel and universal wheel, and charging station inspection. The interval of the maintenance cycle can be adjusted according to the environment, using frequency and temperature of the robot.

Phoebus Recommended Maintenance Schedule			Time interval		
NO.	Devices	Maintenance Level	Year	Month	Week
1	Depth Camera Lens	Wipe	--	--	1
2	Safety Rim	Wipe	--	--	1
3	LIDAR Layer	Tidy Up	--	1	--
4	Universal Whee	Tidy Up	--	--	1
5	Drive Wheel	Tidy Up	--	--	1
6	Charging Station	Wipe	--	1	--
7	Robot Base	Inspect	1	--	--

NO.	Trouble Description	Possible Cause	Solution
1	There are noisy points on the map built by Phoebus (laser points appear in a place of the map that has no obstacles in the related actual place).	There is dirt on the surface of the Lidar.	Please use microfiber cloth to clean the dirt on the Lidar.
		There are obstacles near the radar, such as wires.	Please remove the obstacles.
		Other causes.	Please contact SLAMTEC technical support for further help.
2	Phoebus cannot power on	The battery becomes low.	Charge Phoebus via emergency charging cable.
		The wire connection of build-in system switch or designed switch goes wrong.	Please check the Control Port Definition and connect related wires properly.
3	After launching Phoebus, you cannot control it moving via computer application.	The red emergency switch is pressed down (You cannot push Phoebus moving in this condition)	Pull up the red emergency switch.
		The release switch is pressed down (You can push Phoebus moving in this condition).	Recover release switch.
		Other causes.	Please contact SLAMTEC technical support for further help.
4	The range of Lidar on the map is less than its standard range and the laser light edge is in line. The range will go back to normal if uplifting the front of Phoebus.	The ground is not level or flat.	Please use Phoebus on a level and flat ground.
		Other causes.	Please contact SLAMTEC technical support for further help.
5	The Phoebus cannot go back to charge itself normally.	The charger is move to a different place.	Rebuild the map and do not move the charger.
		The charger position is not set in the map.	Set the position of the charger in the map
		The charger is disconnected to power.	Check whether the charger is properly connected to power.

Product Carried Standard

GB 4943.1

GB/T 15706

GB/T 16855.1

GB/T 37283

GB/T 37284

*Do not use the product beyond the instructions to avoid or cause damage to Phoebus.

*We reserve the right to update the product.

* User manual version V1.0.