

Hermes Pro Max

General Purpose Robot Platform

User Manual

- Small- to medium-sized robot development
- Highly adaptable and scalable
- Powerful optional functions

[Learn more >](#)



2024/06/28.rev.1.8

Shanghai Slamtec Co., Ltd

PLEASE READ THE USER MANUAL CAREFULLY BEFORE USE

Contents

1. INTRODUCTION	4
2. INTRODUCTION TO HERMES FEATURES	5
2.1Autonomous Path-Finding	5
2.2Robot Collaboration.....	5
2.3Cross-Floor Delivery	5
2.4Smart Obstacle Avoidance	5
2.5Comprehensive Safety	5
2.6Autonomous Recharging	5
3. HERMES PRO MAX SCHEMATIC DIAGRAM	6
4. HERMES PRO MAX CHARGING STATION	7
5. PARAMETERS	错误!未定义书签。
6. INSTRUCTIONS OF HARDWARE	14
6.1 Wire Instructions	14
6.2 Important Interfaces of Developing Board on RYD3588 (J3455)	16
6.3 Reference of Hardware Design	16
7. REFERENCE OF STRUCTURE DESIGN	17
7.1 Installing Interface of Host Computer	17
7.2 Instruction of Load Limit.....	19
7.3 Lidar Clearance Area	20
7.4 Deep Camera Clearance Area	21
7.5 Instruction of Transport Design	错误!未定义书签。
8. SETUP INSTRUCTIONS	23
8.1 Opening.....	23
8.2 Placing Charging station	23
8.3 Power ON/OFF	24
8.4 Charging	25

8.5 Emergency stop & brake and reset	25
8.6 Map Building and Upload	25
8.7 Host Computer Completes Startup and Loading The Map	29
9. CONNECTION TO COMPUTER.....	31
10. ADJUSTING TOOLS	34
10.1 RoboStudio	34
10.2 Web Management Backstage.....	34
11. DEVELOPER TOOLS.....	35
11.1 Start Using	35
11.2 Inter-system Adjusting Framework	35
11.3 Instructions of Each System	35
11.4 Demonstrations of Code.....	38
11.5 Details Of Robot API	40
SDK2.0 Common Interface Guide:	41
12. INTRODUCTION AND USE OF ELEVATOR CONTROL.....	42
12.1 Introduction.....	42
12.2 Features.....	42
13. SPECIAL NOTE.....	45
13.1 Charge point deployment.....	45
13.2 Restricted usage scenarios	45
13.3 Faults that cannot be handled temporarily.....	46
13.4 Notes	46
14. MAINTENANCE	48
15. COMMON FAULTS AND TROUBLESHOOTING	50
16. PRODUCT EXECUTIVE STANDARDS AND CERTIFICATES	52
16.1 Product executive standards.....	52
16.2 Certificate.....	52

1. Introduction

Developed by Slamtec, Hermes Pro Max is a scalable and low-cost robot platform capable of meeting the needs of small-to medium-sized robot application development in areas such as smart patrol robots, container transportation robots, hotel delivery robots, food delivery robots, and more.

Hermes Pro Max is an upgraded product launched by Slamtec in August 2023, which has upgraded the hardware configuration of the product, adopting Intel's industrialized computer as the main board, which improves the arithmetic power and overall performance. It supports multi-computer obstacle avoidance and comes standard with a large-capacity 35Ah battery.

Autonomous Localization and Navigation

The built-in SLAMCUBE autonomous localization and navigation system kit enables path-finding and localization and navigation features to help robots figure out where they are, where they should go, and the best way to get there. Hermes is capable of performing a variety of tasks across different commercial environments.

Multi-Sensor Data Fusion

Multi-sensor data fusion technology is an effective way to improve the sensing capability of robotic systems. Hermes uses multi-sensor data fusion technology to effectively realize high degrees of autonomy and awareness in unpredictable environments. Fitted with equipment such as lidar, magnetic sensors, depth cameras, and bumper sensors, Hermes can implement autonomous mapping, localization, and navigation by flexibly responding to complex and ever-changing operational environments.

2. Introduction to Hermes Features

2.1 Autonomous Path-Finding

The built-in SLAMCUBE autonomous localization and navigation system kit enables path-finding and localization and navigation features to help robots figure out where they are, where they should go, and the best way to get there. Hermes is capable of performing a variety of tasks across different commercial environments. Hermes is capable of autonomous localization and path-finding in accordance with task target points, implementing autonomous movement.

2.2 Robot Collaboration

Hermes supports multi-robot collaboration to meet the needs of multi-task operations in complex environments during peak periods. Hermes supports local area network (LAN) and cloud platform collaborative operations, along with the dynamic adjustment of both speed and delivery routes in accordance with the environment to realize efficient, safe, and reliable multi-point delivery.

2.3 Cross-Floor Delivery

The Smart Elevator Control 3.0 system provides accurate detection of elevator statuses along with call-control functionality to provide efficient and reliable solutions that help hotel delivery robots autonomously navigate elevators in cross-floor scenarios. Through our API interfaces, Smart Elevator Control 3.0, as a relatively independent set of solutions, can also be integrated with other smart devices or third-party applications to meet the differentiated customization needs of customers.

2.4 Smart Obstacle Avoidance

The multi-sensor fusion technology of Hermes provides rapid and accurate identification of surrounding active environments, enabling smart obstacle avoidance and greatly reducing the chances of safety incidents.

2.5 Comprehensive Safety

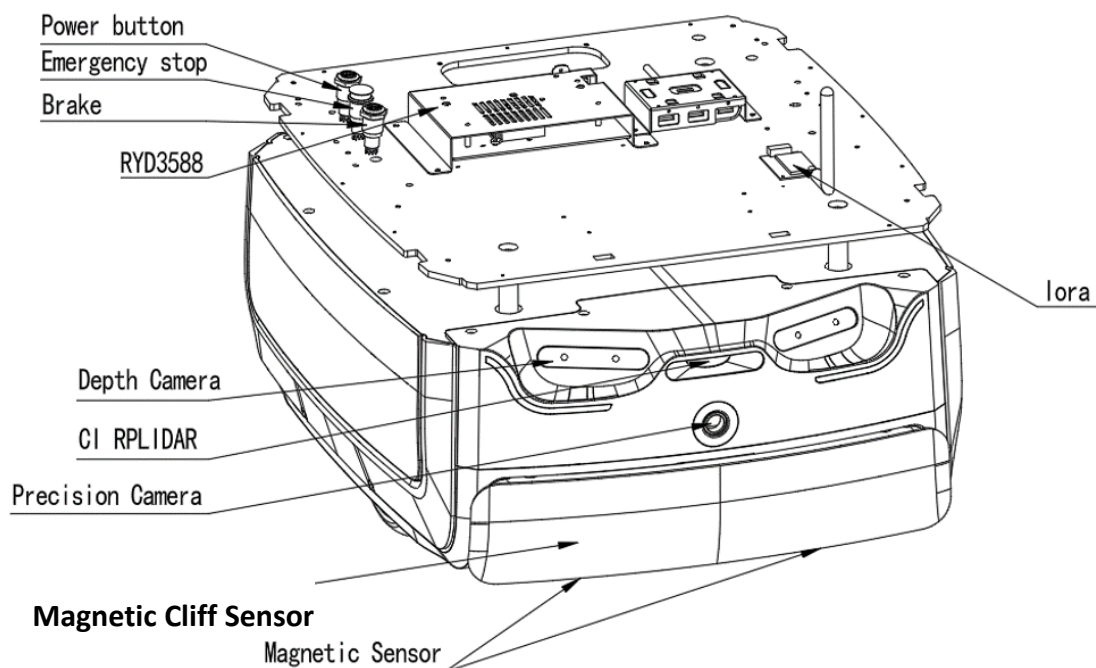
Hermes uses multi-sensor fusion methods such as dual-depth magnetic sensors, bumper sensors, and lidar to accurately identify and avoid both moving and static obstacles. The robot also supports fall avoidance, collision avoidance, and emergency braking functionality to ensure comprehensive safety during the move process.

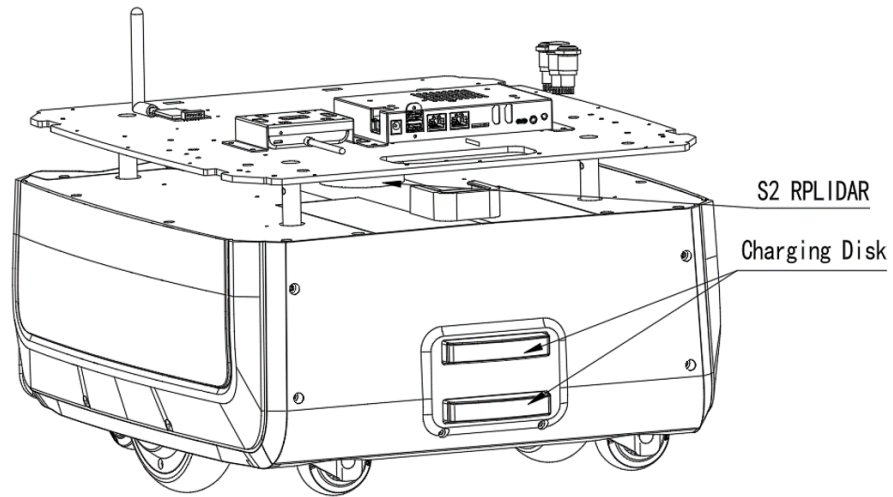
2.6 Autonomous Recharging

Sufficient power is ensured for Hermes to complete assigned tasks smoothly. Hermes automatically returns to the charging station when its battery charge falls below a configured threshold.

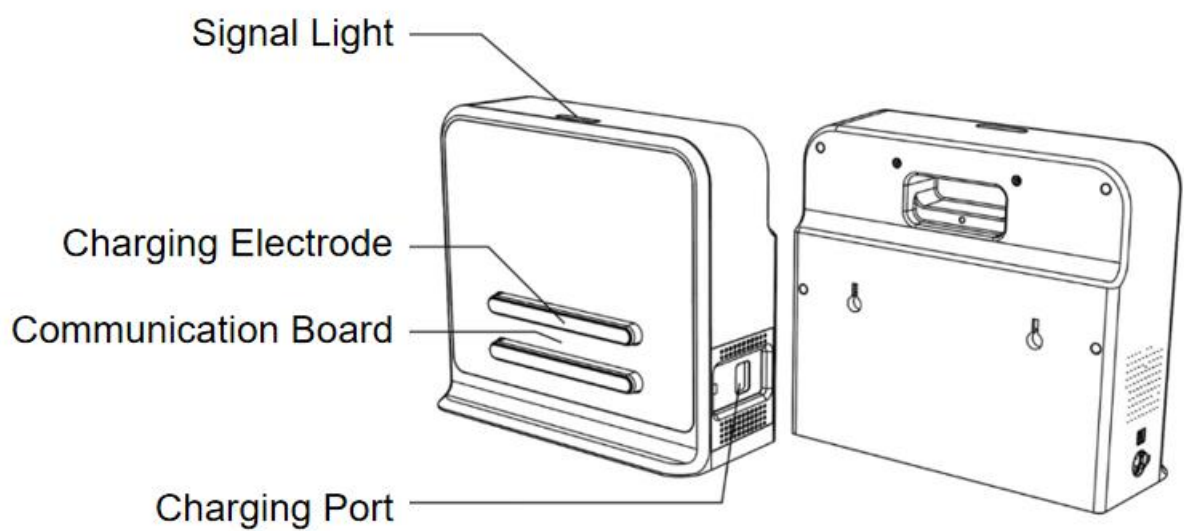
Special note: the automatic recharge function cannot be triggered only under the condition of that combined with upper machine with delivery and disinfection plug-in or customized models.

3. Hermes Pro Max Schematic Diagram





4. Hermes Pro Max Charging Station



5. Parameters

Model		Hermes Pro Max Robot Base	
Core Feature		SLAMWARE™ Localization and Navigation	
Features		Metric	Value
Dimension and Weight		Length × Width	465mm*545mm
		Height	276mm (excludes controller)
		Net Weight	40kg (excludes controller)
		Rated Load	50kg
		Max Load (Flat Concrete Surface)	80kg
	LIDAR	Model	RPLIDAR S2P (Dtof)
Sensor Performance		Scanning Radius	0.05-50m (90% reflectivity, white objects) 0.05-10m (10% reflectivity, black objects)
		Distance Accuracy	±30mm
		Quantity	2 (can add1)

	Depth Camera	Detection Range	0.3m –2m
		Field of View (FOV)	H:117±3°; V:70±3°
	Low Obstacle & Cliff Detection Sensor	Quantity	1
		Minimum Detection Height for Low Obstacles	>3cm
	Precise Docking of Cameras	Docking Accuracy	±1.5cm
		Docking Angle	±1.0°
	Magnetic Sensor	Quantity	2
		Max Detection Range	35mm
	Bumper	Quantity	2
		Trigger Mode	Physical Collisions
		Trigger Distance	0.3-0.5cm
		Detectable Minimum Force	8N
Mapping performance		Map Resolution	15mm

		Max Mapping Area	500m x500m (5cm map resolution) 350m x350m (1.5cm map resolution)
Motion Performance		Maximum Moving speed	1.2m/s (Customizable to 1.5m/s)
		Default Moving Speed	1m/s
		Max Cross Slope	10° Slope: Max slope angle of chassis: 10°; Slope = 18% × Ramp; The height of the full-machine mass center is within 18 cm, and the safety ramp within 10°. (A 100% slope means a 45° ramp, whose height difference for 100 m is 100 m.)
		Vertical Crossing Height	20mm (Full-load)
		Horizontal Crossing Width	40mm (Full-load)
		Min Path Width (robot base)	750mm
		Alignment Accuracy (AVG)	±2cm
		Alignment Accuracy (MAX)	±4cm
		Min Point to Point Angle	±1.0°

		Multi-Robots Obstacles Avoidance	Supports up to 3 robots in the same scene
			LORA Module (Standard)
Wheelset		Wheelset Parameters	7NM 6.5 Inch In-Wheel-Motor*2 2.5 Inch Industrial Universal Wheel*2; 3 Inch Auxiliary Wheel*2 (Front)
User Interface	Hardware Interface	Power Connector	DC 24V 10A
		4G	Support 4G module (paid customization)
		HDMI	1*HDMI
		Audio	1 × 3.5mm headset socket;
			1 × LINE_out audio jack
	Network Interface	Ethernet	Ethernet; 2*RJ45 Gigabit Ethernet port
		Wi-Fi	2.4GHz/5GHz
	Software Interface	SLAMWARE™	HTTP APIs support different programming languages and platforms, such as Windows, iOS, Android, and Linux
Ethernet		Wi-Fi	Network environment without authentication
		4G	Supports 4G SIM cards from domestic and international




		carriers (customized according to needs)
Battery and Capacity	Capacity Specification	24V 30AH Lithium Iron Phosphate Battery (Standard)
	No-load Operating Time	>20H (No-load)
	Full-load Operating Time	12 H
	Charging Time	3~3.5h (Fast charging station)
	Battery Life	2000times
Power Consumption	Standby Power Consumption	48W(No-load)
	Full-load Rated Power Consumption (80kg)	78W (Full-load)
	Max Power Consumption with External Load	240W
Noise	Operating Noise Level	≤60db
Operating Environment	Operating Temperature	0℃ ~ 40℃
	Transport and Storage Temperature	-25-+55℃





	Operating Humidity	20 ~ 90%rh (No condensation)
	Operating Altitude	≤2000m

Charging station	
Overall Dimensions	W360mm*D150mm*H320mm
Color	White
Rated Input	100-240V 50/60Hz 3A MAX
Rated output	DC 25.5V 10A

6. Instructions Of Hardware

6.1 Wire Instructions

Interface s	Picture	Index	Function	Note
Power ON/OFF		--	Power switch of the entire system. Short press until the indicator light turns on power-on, long press until the indicator light turns off power-off.	--
Shut Down		--	Effectively control Hermes in an emergency. After pressing, Hermes will immediately shut down.	It is a switch that must be designed according to rigid regulations. If the switch is not designed, Hermes will refuse to run.
Brake		-- uiii	When robot is energized, press this switch to release the brake and	Invalid if the robot is not turned on

			you can push the robot freely; press it once again to brake, and the robot will not be able to push it freely.	
24V Power		Rated Voltage 24V Maximum current 10A	Maximum output power is 240W, can be used to supply power to external devices	No overload
Depth Camera Interface		USB3.0	Connected to the RYD3588 development via USB3.0 to obtain information.	Need to pay attention to the left and right sequence.
Docking Camera		USB2.0	Connected to the RYD3588 development to obtain information of code scanning camera.	Assist precise docking.
USB-BASE wire		USB3.0	Used for communication between RYD3588 and Cube2RR.	Connect to Hub3.0

6.2 Important Interfaces of Developing Board on RYD3588



6.3 Reference of Hardware Design

Notice:

- (1) Before starting, please read the manual carefully to avoid product damage caused by misoperation;
- (2) The working temperature of the main board is 0°C to +40°C, 30%-70%RH, in order not to damage the product due to excessive cold/heat or moisture;
- (3) Do not make strong mechanical movement of this product, and operate this product before static protection is done;
- (4) Please turn off the power before installing any external cards or modules;
- (5) Please ensure the external power supply is DC 12V to avoid damage to the main board;

6.3.1 Product Description

RYD-3588 is an ARM-based multi-function board powered by Rockchip RK3588 ARM Quad-core Cortex-A76+Quad-core Cortex-A55 high-performance processor. It

suuprots 6.0 TOPS NPU, and 8K display resolution and 8K video decoding. It also provides a Mini-PCie and SIM card slot for 4G/5G connectivity. RYD-3588 also provides rich interfaces, such as LVDS, EDP,HDMI,8 x USB, 4 x UART,2 x 10/100/1000M Ethernet and 5 x GPIO.

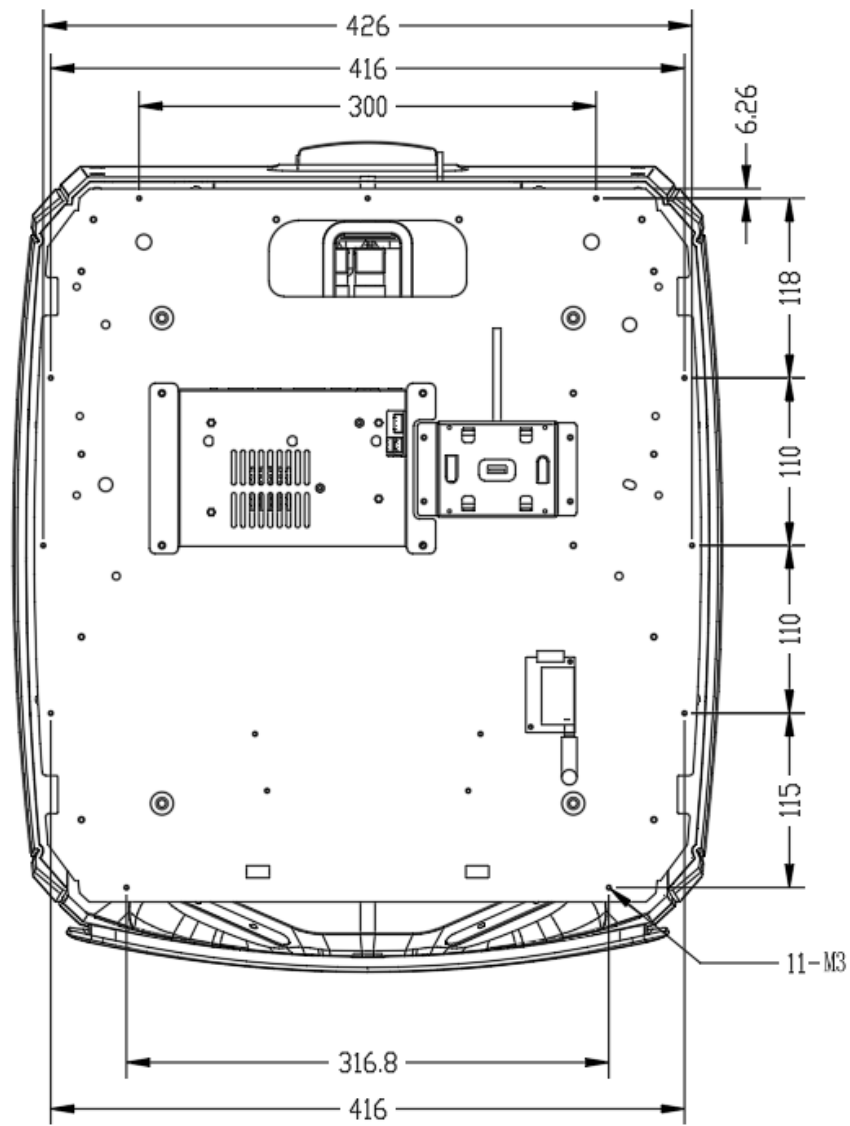
6.3.2 Product specifications

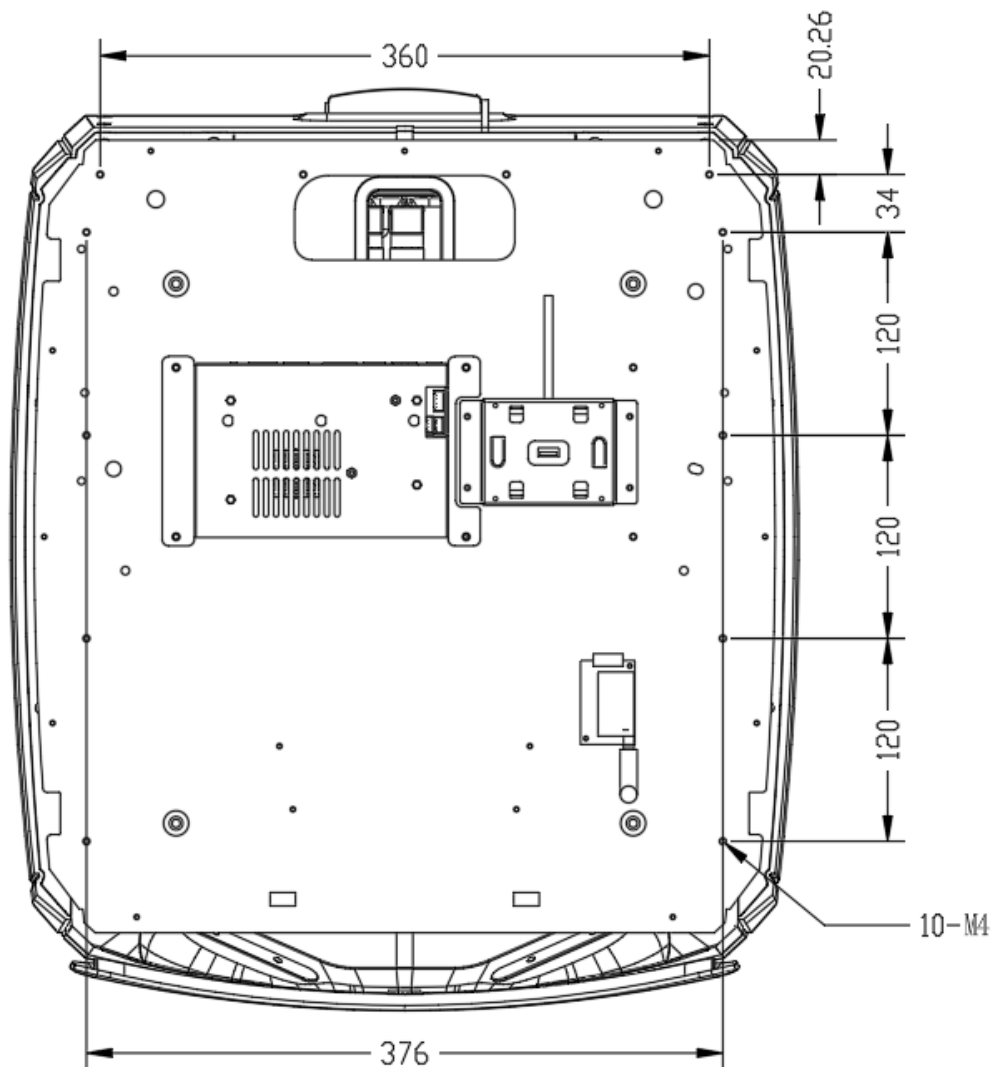
(1) Hardware Specification Sheet

Processor	CPU	RK3588 Quad-core Cortex-A76+Quad-core Cortex-A55 @2.4GHz
Memory	DDR	8GB LPDDR4,8G/16G/32G(optional)
	Flash	32GB eMMC Flash(Default),16GB/32GB/64GB/128GB(optional)
	SD	1xTF card socket
	SATA	1
	M.2 SSD	1
Multimedia	H/W Video Codec	Encoder: H.264/ H.265 8K@30Hz Decoder: MPEG-1, MPEG-2, MPEG-4, H.263, H.264, H.265, VC-1, VP9, VP8, MVC, AV1 , 8k@60Hz
Network	Ethernet	2x10/100/1000 Mbps
	WiFi+BT	Optional,IEEE 802.11a/b/g/n/ac/ax 2.4G/5G/Wi-Fi 6,Supports BT5.1,BLE
	4G	Mini-PCie/M.2 4G/5G module interface
Graphics	eDp	1,max 4K@60
	LVDS	1xDual Channel LVDS,max 1920x1200
	MIPI	1,max 1080p
	HDMI	1xHDMI Type A,max 7680x4320@60Hz
	The display interface can meet diversified combinations, and can support four-screen different display output	
Video input	HDMI Input	1xHDMI, 3840x2160p@30Hz
	MIPI	2xMIPI CSI,(optional)
Other	Support RTC function and timing boot, can be connected to CR2032 RTC battery; support system Watchdog	
I/O	USB	1xTYPE C,2xUSB3.0,6xUSB 2.0
	Audio	1 x audio output (3.5mm audio port), support left and right channel output,2*5W8R
	Serial Port	4 x RS232,1 x RS-485 reused by pin header
	CAN	1
	GPIO	5 x GPIO (3.3V TTL level)
	I2C	1 x I2C(2.0mm-6pin),Can be connected to I2C touch screen
	1 x upgrade button (interface side), 1 x reset button (inside the board)	
	1 x power button socket, 1 x working status indicator socket	
Power	Power Supply Voltage	12V/24V DC-IN,5.5*2.1mm,The board can be connected to 4pin-2.5mm power socket
	Power Type	DC-IN or power socket (optional)
Environment	Operating Temperature	0 ~60° C
	Operating Humidity	5% ~ 95% relative humidity,non-condensing
Mechanical	Radiating	Standard 40mm*40mm*10mm
	Dimensions (W x D)	146 mm x 100 mm
Operation System	Android/Debian/Ubuntu/Open Harmony OS	

7. Reference of Structure Design

7.1 Installing Interface of Host Computer

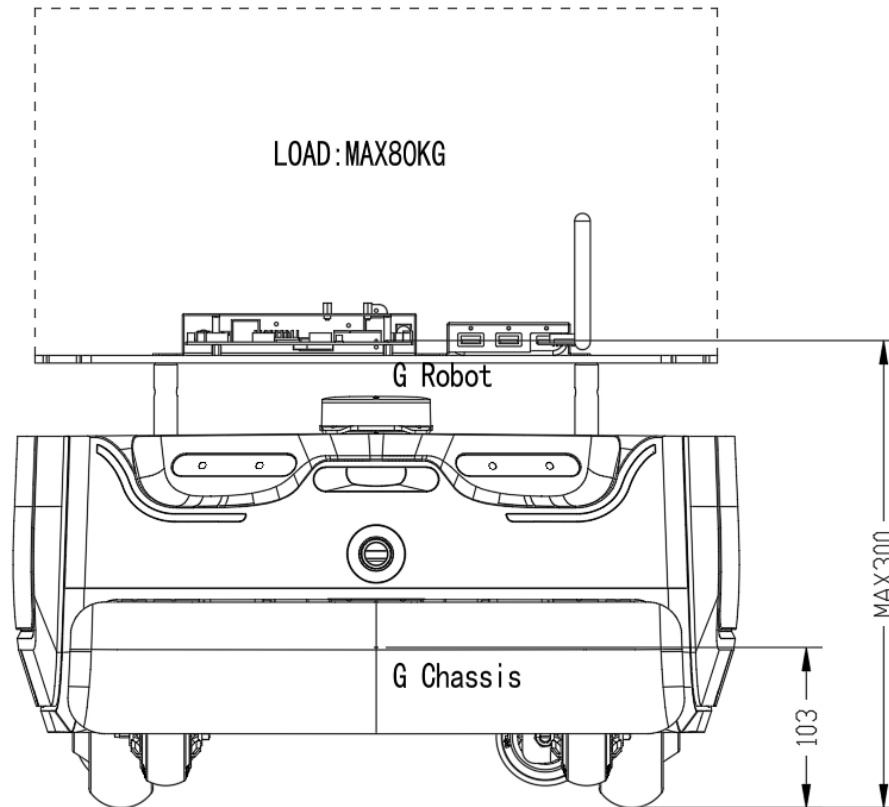




As shown in the figure above, there are a total of 11 M4 threaded holes for the installation and fixation of the host computer.

It is recommended to use M4 screws with spring washer and blue anti-loosening glue.

7.2 Instruction of Load Limit



(1) Maximum load of host computer is 80 kg , Rated load is about 50kg.

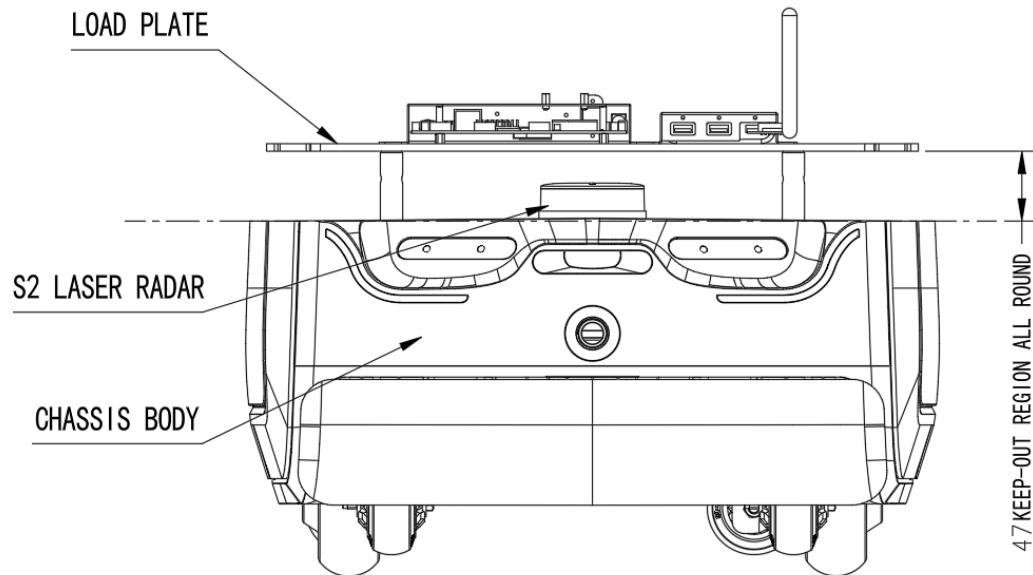
(2) * It is recommended that the center of gravity of the whole machine is not higher than 300mm from the ground during installation.

i. *The center of gravity of chassis is the one which Slamtec provides, the height is 103 mm;

ii. The center of gravity of the whole machine is the overall center of gravity of the chassis plus the robot;

iii. If the center of gravity of the whole machine exceeds 300mm, the slope-climbing and obstacle-crossing performance may be reduced.

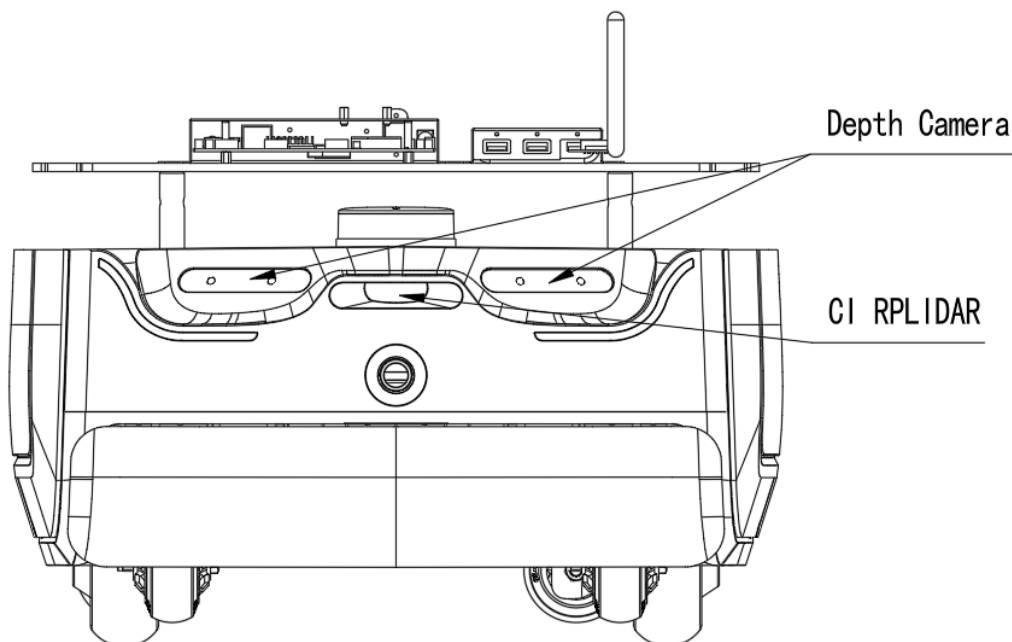
7.3 Lidar Clearance Area

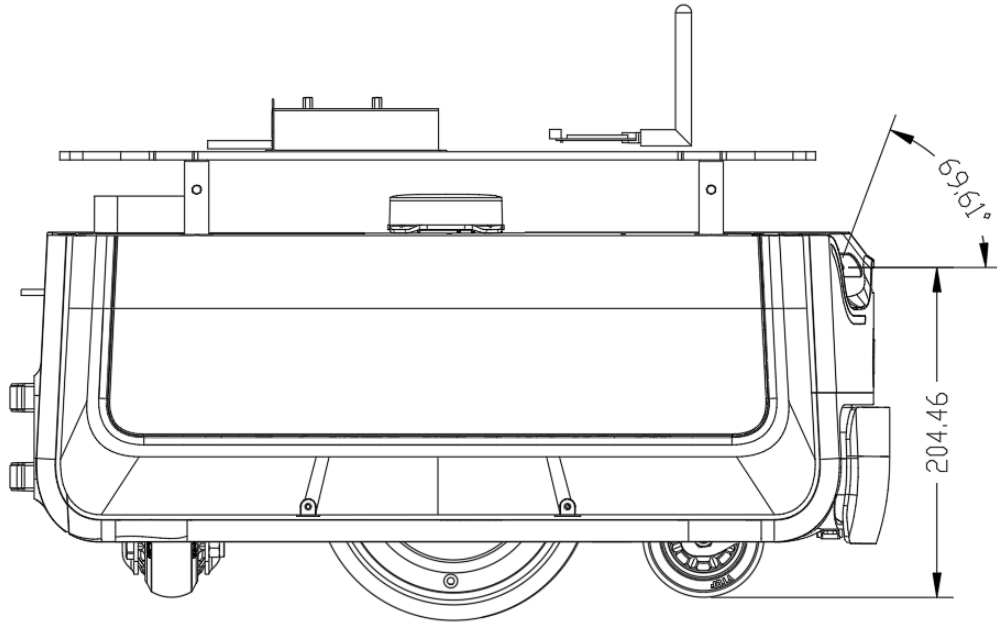


There is a lidar between the chassis body and the host computer, which requires a certain clearance area to avoid being shielded or interfered;

The boundary of the host computer cannot exceed the lower boundary line of the host computer as shown in the figure.

7.4 Deep Camera Clearance Area





There is a deep camera on the chassis, which requires a certain clearance area to avoid being shielded or interfered;

The host computer cannot exceed the clearance area as shown in the figure. Due to the angled layout of the dual cameras, the superimposed clearance area is larger than a single FOV.

8. Setup Instructions

8.1 Opening

1. After receiving the Hermes machine, please check whether the packing box is intact as shown in the left picture, and whether the box on the right side of the Hermes sample of the outer box is checked. After confirming that the packing is complete and the box contains Hermes, use packing pliers to cut the packing tape, remove all packing straps and paper corners, it should be shown as on the right picture.



8-1 Hermes unpacking

8.2 Placing Charging station

Hermes can be charged by returning to the charging station automatically, so the position of the charging station will affect the automatic return charging function of Hermes. When Hermes returns to the charging station, it will generate propelling force. Therefore, it is best to place the charging stand with its back against the wall. The wall must meet the following conditions:

a. The charging station must be attached to the wall, without no obstacle in the middle, try to avoid the wall with skirting, etc.

b. The wall material cannot be high-permeability materials, such as mirror or glass

c. The wall width needs to be at least three times wider than the width of the charging stand

d. The wall must be a straight wall, not a curved wall

The charging station needs to be connected to a 220V power supply. The length of the external power cord of the charging station is 1.5m. Therefore, it is necessary to ensure that there is a 220 V interface within 1.5m of the wall against which the charging station rests. The ground wiring harness is messy causing unnecessary trouble).

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

a. Open, with no obstacles within a radius of 2m in front of the charging stand as the center of the circle

b. Plane, no slope

c. The ground cannot be covered with soft carpet that causes Hermes to sink more than 2cm

To ensure that Hermes automatically returns to the charging function, it is necessary to ensure that Hermes always starts from the charging station.

Note: If you want to change the position of the charging stand, you need to set the corresponding setting according to the position you need when loading the map. For detailed operations, please see the SDK corresponding interface operation document.

8.3 Power ON/OFF

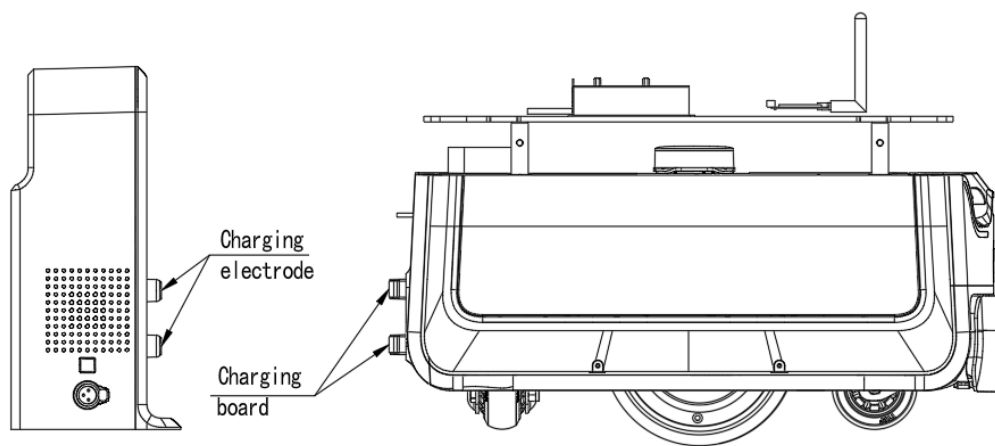
Power on: if the machine is not in the position of charging pile, long press the power switch until the power switch indicator lights up and release it. The machine system enters the startup process, the front light strip lights up, and the wheel hub is in the brake state, indicating that the startup is completed.

If the machine is in the position of charging pile, short press the power switch until the power switch indicator lights up and then release it. The machine system enters the startup process, the front light strip lights up, and the wheel hub is in the brake state, indicating that the startup is completed.

Power off: long press the power switch until indicator light goes out, then release it, the machine enters the shutdown process, the light strip on the front of the machine goes out, and the machine can be pushed arbitrarily, indicating that the shutdown is completed.

8.4 Charging

As shown in the figure below, align the charging piece of the machine with the charging electrode of the charging pile. After waiting for 10 seconds, the front light strip of the robot lights up, the wheel hub enters the braking state, and the breathing light of the charging pile flashes, indicating that charging has started.



8-2 Hermes charging

8.5 Emergency stop & brake and reset

(1) Emergency stop button

Press the emergency stop button, the Hermes machine will stop immediately, stop and no longer respond to any motion control commands, and the manual push is blocked.

Release the "emergency stop button " and the machine can return to normal working conditions.

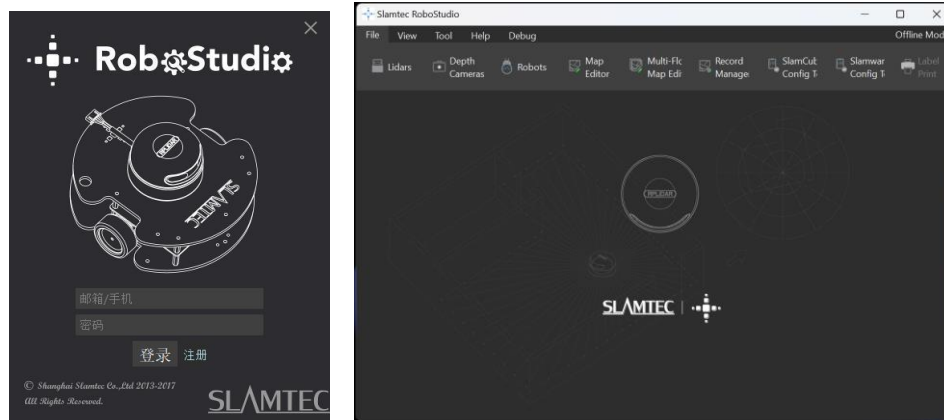
(2) Brake button

Press the "brake button", the Hermes machine will stop immediately, stop and no longer respond to any motion control commands. The machine can be pushed manually, such as pushing it to the charging pile.

Release the "brake button", the machine can return to normal working condition, and the manual push is blocked.

8.6 Map Building and Upload

Download and install the robot graphical control management tool Robot Studio from our official website <https://www.slamtec.ai/home/support/#tools> to adjust and use Hermes, sign up account and log in. In the menu-toolbar area, click "File-Robot" in turn, and a docking page named Robot will appear on the left side of the workspace, as shown in the figure below. The user connects/disconnects the robot through this page.



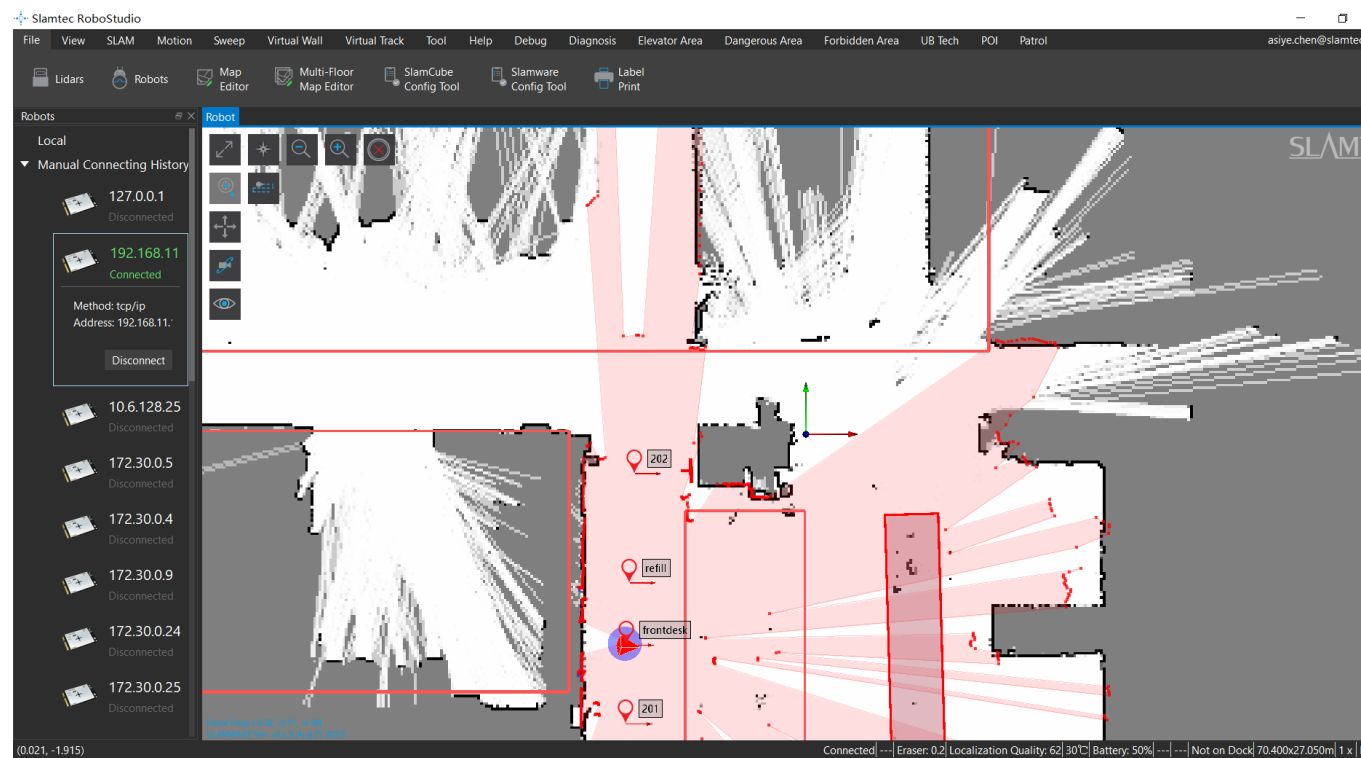
8-3 Rob Studio Robot page

Right-click the blank space of the robot list, click "Manually connect robots" in the pop-up menu, and the connect robot dialog box will pop up (as shown below). Enter the IP address and port number of the Hermes robot above and click the connect button to connect (This connection method is suitable for machines that have been assigned an IP address through the Web portal management backstage). When the computer has been connected to the SSID of the aforementioned Hermes robot through a network adapter (SSID can be viewed on the label of the machine), enter the IP address 192.168.11.1 by default (note that your wireless network adapter IP address should be set to automatically obtain it using DHCP).



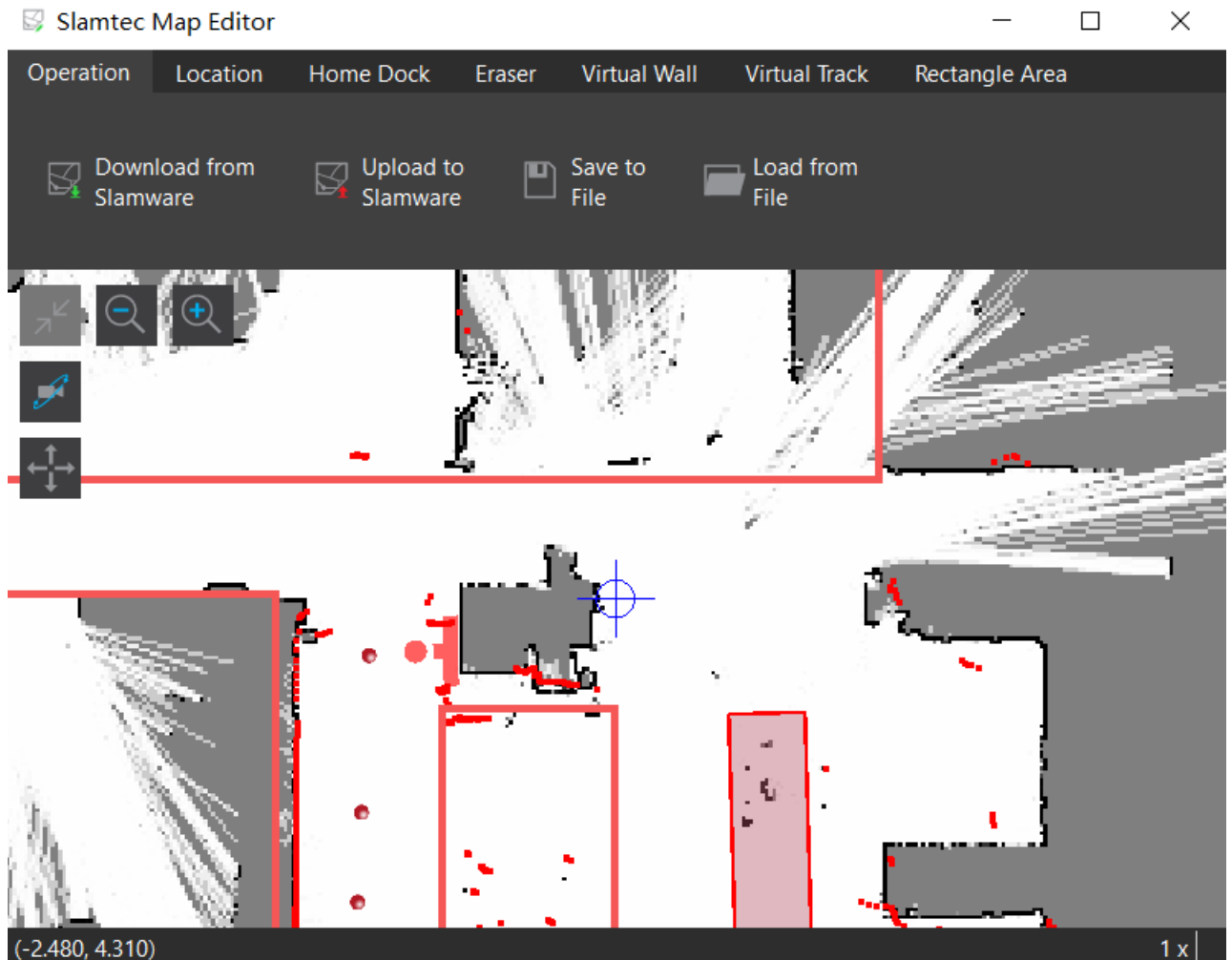
8-4 Rob Studio Robot connecting page

When finishing connecting, the work area will display the robot, map information, and status information. In the robot page, you will find that the name of the connected device turns green, and the status is "Connected", as shown in the figure below.



8-5 Rob Studio Robot connecting page

Left click the spot inside the map-building area, let Hermes build the map. When finishing, please use the virtual wall function to isolate the places that need to be isolated. Then click "File-Map Editor" in turn, choose to save the file or upload to the firmware to save the map.



8-6 Rob Studio Robot map-editing page

There is a difference between the functions of restricted areas and virtual walls.

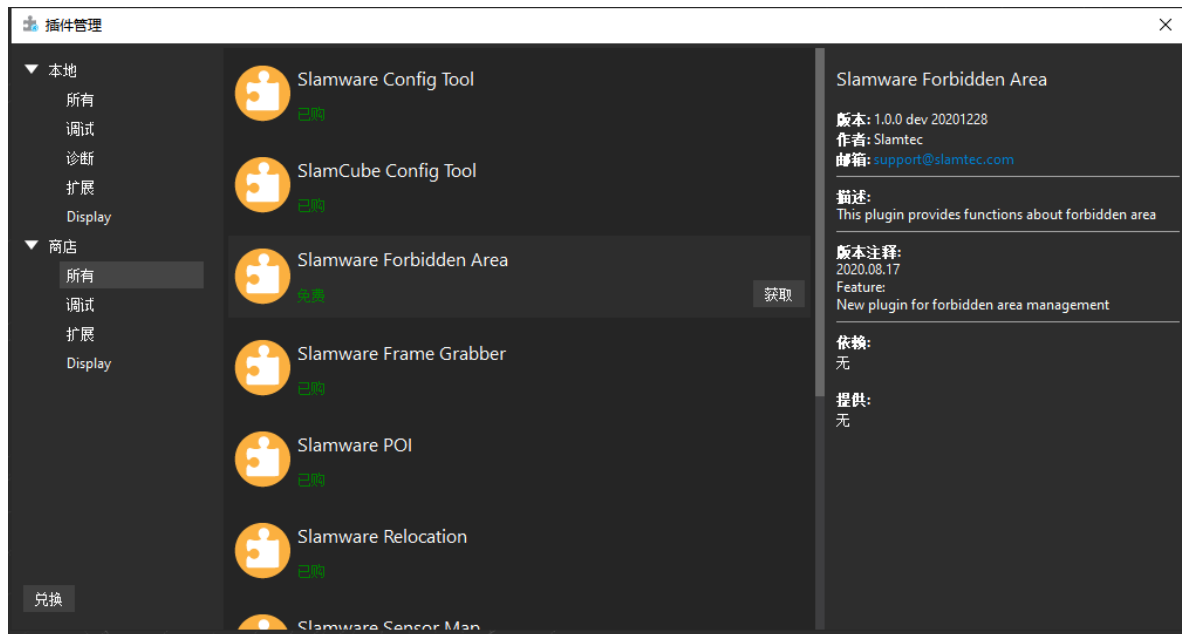
Restricted Area: When the Athena 2.0 is accidentally pushed into the restricted area, the Athena 2.0 machine can be automatically freed from the restricted area by giving a random point in RoboStudio.

Virtual Wall: When a human accidentally pushes Athena 2.0 into the virtual wall, the Athena 2.0 machine cannot automatically get out of the virtual wall and needs to be pushed out by a human at a random point in RoboStudio.

The Forbidden Area management function relies on the Slamware Forbidden Area plug-in. Slamware Forbidden Area is a public plug-in, the computer is connected to the Internet, after logging in RoboStudio, click Tools -> Plug-ins -> Shop -> All -> Slamware Forbidden Area -> Get -> Download -> Restart RoboStudio.

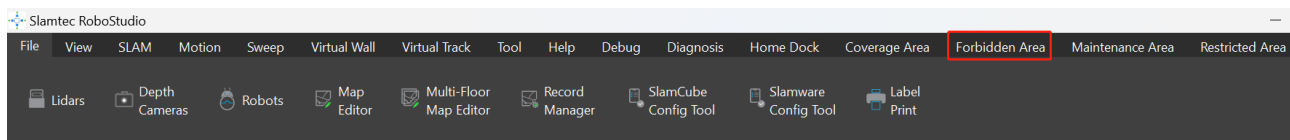
Public plug-in links:

<https://wiki.slamtec.com/pages/viewpage.action?pageId=56164379>)



8-7 Rob Studio Public plug-in

After the plug-in runs normally, connect to the machine, you can see the "Forbidden zone" toolbar in the menu bar.



8-8 Rob Studio Forbidden area

8.7 Host Computer Completes Startup and Loading The Map

Below is a reference example of how to use the SDK to complete the startup and loading of a specific map on the host computer.

```
1. /*
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47
48
49
50
51
52
53
54
55
56
57
58
59
60
61
62
63
64
65
66
67
68
69
70
71
72
73
74
75
76
77
78
79
80
81
82
83
84
85
86
87
88
89
90
91
92
93
94
95
96
97
98
99
100
101
102
103
104
105
106
107
108
109
110
111
112
113
114
115
116
117
118
119
120
121
122
123
124
125
126
127
128
129
130
131
132
133
134
135
136
137
138
139
140
141
142
143
144
145
146
147
148
149
150
151
152
153
154
155
156
157
158
159
160
161
162
163
164
165
166
167
168
169
170
171
172
173
174
175
176
177
178
179
180
181
182
183
184
185
186
187
188
189
190
191
192
193
194
195
196
197
198
199
200
201
202
203
204
205
206
207
208
209
210
211
212
213
214
215
216
217
218
219
220
221
222
223
224
225
226
227
228
229
230
231
232
233
234
235
236
237
238
239
240
241
242
243
244
245
246
247
248
249
250
251
252
253
254
255
256
257
258
259
260
261
262
263
264
265
266
267
268
269
270
271
272
273
274
275
276
277
278
279
280
281
282
283
284
285
286
287
288
289
290
291
292
293
294
295
296
297
298
299
300
301
302
303
304
305
306
307
308
309
310
311
312
313
314
315
316
317
318
319
320
321
322
323
324
325
326
327
328
329
330
331
332
333
334
335
336
337
338
339
340
341
342
343
344
345
346
347
348
349
350
351
352
353
354
355
356
357
358
359
360
361
362
363
364
365
366
367
368
369
370
371
372
373
374
375
376
377
378
379
380
381
382
383
384
385
386
387
388
389
390
391
392
393
394
395
396
397
398
399
400
401
402
403
404
405
406
407
408
409
410
411
412
413
414
415
416
417
418
419
420
421
422
423
424
425
426
427
428
429
430
431
432
433
434
435
436
437
438
439
440
441
442
443
444
445
446
447
448
449
450
451
452
453
454
455
456
457
458
459
460
461
462
463
464
465
466
467
468
469
470
471
472
473
474
475
476
477
478
479
480
481
482
483
484
485
486
487
488
489
490
491
492
493
494
495
496
497
498
499
500
501
502
503
504
505
506
507
508
509
510
511
512
513
514
515
516
517
518
519
520
521
522
523
524
525
526
527
528
529
530
531
532
533
534
535
536
537
538
539
540
541
542
543
544
545
546
547
548
549
550
551
552
553
554
555
556
557
558
559
560
561
562
563
564
565
566
567
568
569
570
571
572
573
574
575
576
577
578
579
580
581
582
583
584
585
586
587
588
589
590
591
592
593
594
595
596
597
598
599
600
601
602
603
604
605
606
607
608
609
610
611
612
613
614
615
616
617
618
619
620
621
622
623
624
625
626
627
628
629
630
631
632
633
634
635
636
637
638
639
640
641
642
643
644
645
646
647
648
649
650
651
652
653
654
655
656
657
658
659
660
661
662
663
664
665
666
667
668
669
670
671
672
673
674
675
676
677
678
679
680
681
682
683
684
685
686
687
688
689
690
691
692
693
694
695
696
697
698
699
700
701
702
703
704
705
706
707
708
709
710
711
712
713
714
715
716
717
718
719
720
721
722
723
724
725
726
727
728
729
730
731
732
733
734
735
736
737
738
739
740
741
742
743
744
745
746
747
748
749
750
751
752
753
754
755
756
757
758
759
760
761
762
763
764
765
766
767
768
769
770
771
772
773
774
775
776
777
778
779
780
781
782
783
784
785
786
787
788
789
790
791
792
793
794
795
796
797
798
799
800
801
802
803
804
805
806
807
808
809
810
811
812
813
814
815
816
817
818
819
820
821
822
823
824
825
826
827
828
829
830
831
832
833
834
835
836
837
838
839
840
841
842
843
844
845
846
847
848
849
850
851
852
853
854
855
856
857
858
859
860
861
862
863
864
865
866
867
868
869
870
871
872
873
874
875
876
877
878
879
880
881
882
883
884
885
886
887
888
889
890
891
892
893
894
895
896
897
898
899
900
901
902
903
904
905
906
907
908
909
910
911
912
913
914
915
916
917
918
919
920
921
922
923
924
925
926
927
928
929
930
931
932
933
934
935
936
937
938
939
940
941
942
943
944
945
946
947
948
949
950
951
952
953
954
955
956
957
958
959
960
961
962
963
964
965
966
967
968
969
970
971
972
973
974
975
976
977
978
979
980
981
982
983
984
985
986
987
988
989
990
991
992
993
994
995
996
997
998
999
1000
1001
1002
1003
1004
1005
1006
1007
1008
1009
1010
1011
1012
1013
1014
1015
1016
1017
1018
1019
1020
1021
1022
1023
1024
1025
1026
1027
1028
1029
1030
1031
1032
1033
1034
1035
1036
1037
1038
1039
1040
1041
1042
1043
1044
1045
1046
1047
1048
1049
1050
1051
1052
1053
1054
1055
1056
1057
1058
1059
1060
1061
1062
1063
1064
1065
1066
1067
1068
1069
1070
1071
1072
1073
1074
1075
1076
1077
1078
1079
1080
1081
1082
1083
1084
1085
1086
1087
1088
1089
1090
1091
1092
1093
1094
1095
1096
1097
1098
1099
1100
1101
1102
1103
1104
1105
1106
1107
1108
1109
1110
1111
1112
1113
1114
1115
1116
1117
1118
1119
1120
1121
1122
1123
1124
1125
1126
1127
1128
1129
1130
1131
1132
1133
1134
1135
1136
1137
1138
1139
1140
1141
1142
1143
1144
1145
1146
1147
1148
1149
1150
1151
1152
1153
1154
1155
1156
1157
1158
1159
1160
1161
1162
1163
1164
1165
1166
1167
1168
1169
1170
1171
1172
1173
1174
1175
1176
1177
1178
1179
1180
1181
1182
1183
1184
1185
1186
1187
1188
1189
1190
1191
1192
1193
1194
1195
1196
1197
1198
1199
1200
1201
1202
1203
1204
1205
1206
1207
1208
1209
1210
1211
1212
1213
1214
1215
1216
1217
1218
1219
1220
1221
1222
1223
1224
1225
1226
1227
1228
1229
1230
1231
1232
1233
1234
1235
1236
1237
1238
1239
1240
1241
1242
1243
1244
1245
1246
1247
1248
1249
1250
1251
1252
1253
1254
1255
1256
1257
1258
1259
1260
1261
1262
1263
1264
1265
1266
1267
1268
1269
1270
1271
1272
1273
1274
1275
1276
1277
1278
1279
1280
1281
1282
1283
1284
1285
1286
1287
1288
1289
1290
1291
1292
1293
1294
1295
1296
1297
1298
1299
1300
1301
1302
1303
1304
1305
1306
1307
1308
1309
1310
1311
1312
1313
1314
1315
1316
1317
1318
1319
1320
1321
1322
1323
1324
1325
1326
1327
1328
1329
1330
1331
1332
1333
1334
1335
1336
1337
1338
1339
1340
1341
1342
1343
1344
1345
1346
1347
1348
1349
1350
1351
1352
1353
1354
1355
1356
1357
1358
1359
1360
1361
1362
1363
1364
1365
1366
1367
1368
1369
1370
1371
1372
1373
1374
1375
1376
1377
1378
1379
1380
1381
1382
1383
1384
1385
1386
1387
1388
1389
1390
1391
1392
1393
1394
1395
1396
1397
1398
1399
1400
1401
1402
1403
1404
1405
1406
1407
1408
1409
1410
1411
1412
1413
1414
1415
1416
1417
1418
1419
1420
1421
1422
1423
1424
1425
1426
1427
1428
1429
1430
1431
1432
1433
1434
1435
1436
1437
1438
1439
1440
1441
1442
1443
1444
1445
1446
1447
1448
1449
1450
1451
1452
1453
1454
1455
1456
1457
1458
1459
1460
1461
1462
1463
1464
1465
1466
1467
1468
1469
1470
1471
1472
1473
1474
1475
1476
1477
1478
1479
1480
1481
1482
1483
1484
1485
1486
1487
1488
1489
1490
1491
1492
1493
1494
1495
1496
1497
1498
1499
1500
1501
1502
1503
1504
1505
1506
1507
1508
1509
1510
1511
1512
1513
1514
1515
1516
1517
1518
1519
1520
1521
1522
1523
1524
1525
1526
1527
1528
1529
1530
1531
1532
1533
1534
1535
1536
1537
1538
1539
1540
1541
1542
1543
1544
1545
1546
1547
1548
1549
1550
1551
1552
1553
1554
1555
1556
1557
1558
1559
1560
1561
1562
1563
1564
1565
1566
1567
1568
1569
1570
1571
1572
1573
1574
1575
1576
1577
1578
1579
1580
1581
1582
1583
1584
1585
1586
1587
1588
1589
1590
1591
1592
1593
1594
1595
1596
1597
1598
1599
1600
1601
1602
1603
1604
1605
1606
1607
1608
1609
1610
1611
1612
1613
1614
1615
1616
1617
1618
1619
1620
1621
1622
1623
1624
1625
1626
1627
1628
1629
1630
1631
1632
1633
1634
1635
1636
1637
1638
1639
1640
1641
1642
1643
1644
1645
1646
1647
1648
1649
1650
1651
1652
1653
1654
1655
1656
1657
1658
1659
1660
1661
1662
1663
1664
1665
1666
1667
1668
1669
1670
1671
1672
1673
1674
1675
1676
1677
1678
1679
1680
1681
1682
1683
1684
1685
1686
1687
1688
1689
1690
1691
1692
1693
1694
1695
1696
1697
1698
1699
1700
1701
1702
1703
1704
1705
1706
1707
1708
1709
1710
1711
1712
1713
1714
1715
1716
1717
1718
1719
1720
1721
1722
1723
1724
1725
1726
1727
1728
1729
1730
1731
1732
1733
1734
1735
1736
1737
1738
1739
1740
1741
1742
1743
1744
1745
1746
1747
1748
1749
1750
1751
1752
1753
1754
1755
1756
1757
1758
1759
1760
1761
1762
1763
1764
1765
1766
1767
1768
1769
1770
1771
1772
1773
1774
1775
1776
1777
1778
1779
1780
1781
1782
1783
1784
1785
1786
1787
1788
1789
1790
1791
1792
1793
1794
1795
1796
1797
1798
1799
1800
1801
1802
1803
1804
1805
1806
1807
1808
1809
1810
1811
1812
1813
1814
1815
1816
1817
1818
1819
1820
1821
1822
1823
1824
1825
1826
1827
1828
1829
1830
1831
1832
1833
1834
1835
1836
1837
1838
1839
1840
1841
1842
1843
1844
1845
1846
1847
1848
1849
1850
1851
1852
1853
1854
1855
1856
1857
1858
1859
1860
1861
1862
1863
1864
1865
1866
1867
1868
1869
1870
1871
1872
1873
1874
1875
1876
1877
1878
1879
1880
1881
1882
1883
1884
1885
1886
1887
1888
1889
1890
1891
1892
1893
1894
1895
1896
1897
1898
1899
1900
1901
1902
1903
1904
1905
1906
1907
1908
1909
1910
1911
1912
1913
1914
1915
1916
1917
1918
1919
1920
1921
1922
1923
1924
1925
1926
1927
1928
1929
1930
1931
1932
1933
1934
1935
1936
1937
1938
1939
1940
1941
1942
1943
1944
1945
1946
1947
1948
1949
1950
1951
1952
1953
1954
1955
1956
1957
1958
1959
1960
1961
1962
1963
1964
1965
1966
1967
1968
1969
1970
1971
1972
1973
1974
1975
1976
1977
1978
1979
1980
1981
1982
1983
1984
1985
1986
1987
1988
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
2037
2038
2039
2040
2041
2042
2043
2044
2045
2046
2047
2048
2049
2050
2051
2052
2053
2054
2055
2056
2057
2058
2059
2060
2061
2062
2063
2064
2065
2066
2067
2068
2069
2070
2071
2072
2073
2074
2075
2076
2077
2078
2079
2080
2081
2082
2083
2084
2085
2086
2087
2088
2089
2090
2091
2092
2093
2094
2095
2096
2097
2098
2099
2100
2101
2102
2103
2104
2105
2106
2107
2108
2109
2110
2111
2112
2113
2114
2115
2116
2117
2118
2119
2120
2121
2122
2123
2124
2125
2126
2127
2128
2129
2130
2131
2132
2133
2134
2135
2136
2137
2138
2139
2140
2141
2142
2143
2144
2145
2146
2147
2148
2149
2150
2151
2152
2153
2154
2155
2156
2157
2158
2159
2160
2161
2162
2163
2164
2165
2166
2167
2168
2169
2170
2171
2172
2173
2174
2175
2176
2177
2178
2179
2180
2181
2182
2183
2184
2185
2186
2187
2188
2189
2190
2191
2192
2193
2194
2195
2196
2197
2198
2199
2200
2201
2202
2203
2204
2205
2206
2207
2208
2209
2210
2211
2212
2213
2214
2215
2216
2217
2218
2219
2220
2221
2222
2223
2224
2225
2226
2227
2228
2229
2230
2231
2232
2233
2234
2235
2236
2237
2238
2239
2240
2241
2242
2243
2244
2245
2246
2247
2248
2249
2250
2251
2252
2253
2254
2255
2256
2257
2258
2259
2260
2261
2262
2263
2264
2265
2266
2267
2268
2269
2270
2271
2272
2273
2274
2275
2276
2277
2278
2279
2280
2281
2282
2283
2284
2285
2286
2287
2288
2289
2290
2291
2292
2293
2294
2295
2296
2297
2298
2299
2300
2301
2302
2303
2304
2305
2306
2307
2308
2309
2310
2311
2312
2313
2314
2315
2316
2317
2318
2319
2320
2321
2322
2323
2324
2325
2326
2327
2328
2329
2330
2331
2332
2333
2334
2335
2336
2337
2338
2339
2340
2341
2342
2343
2344
2345
2346
2347
2348
2349
2350
2351
2352
2353
2354
2355
2356
2357
2358
2359
2360
2361
2362
2363
2364
2365
2366
2367
2368
2369
2370
2371
2372
2373
2374
2375
2376
2377
2378
2379
2380
2381
2382
2383
2384
2385
2386
2387
2388
2389
2390
2391
2392
2393
2394
2395
2396
2397
2398
2399
2400
2401
2402
2403
2404
2405
2406
2407
2408
2409
2410
2411
2412
2413
2414
2415
2416
2417
2418
2419
2420
2421
2422
2423
2424
2425
2426
2427
2428
2429
2430
2431
2432
2433
2434
2435
2436
2437
2438
2439
2440
2441
2442
2443
2444
2445
2446
2447
2448
2449
2450
2451
2452
2453
2454
2455
2456
2457
2458
2459
2460
2461
2462
2463
2464
2465
2466
2467
2468
2469
2470
2471
2472
2473
2474
2475
2476
2477
2478
2479
2480
2481
2482
2483
2484
2485
2486
2487
2488
2489
2490
2491
2492
2493
2494
2495
2496
2497
2498
2499
2500
2501
2502
2503
2504
2505
2506
2507
2508
2509
2510
2511
2512
2513
2514
2515
2516
2517
2518
2519
2520
2521
2522
2523
2524
2525
2526
2527
2528
2529
2530
2531
2532
2533
2534
2535
2536
2537
2538
2539
2540
2541
2542
2543
2544
2545
2546
2547
2548
2549
2550
2551
2552
2553
2554
2555
2556
2557
2558
2559
2560
2561
2562
2563
```

```

m
e
s
3
.
*
/
4.  #include <iostream>
5.  #include <rpos\robot_platforms\slamware_core_platform.h>
6.  #include <rpos\robot_platforms\objects\composite_map_reader.h>
7.  #include <rpos\core\pose.h>
8.
9.  using namespace std;
10.
11. int main()
12. {
13.     try
14.     {
15.         string map_path = ".\\map.stcm"; //the path of map
16.         string Hermes_ip = "192.168.11.1"; //the ip of Hermes
17.         int Hermes_port = 1445; //the port of Hermes ,default is 1445
18.
19.         rpos::robot_platforms::SlamwareCorePlatform Hermes =
20.             rpos::robot_platforms::SlamwareCorePlatform::connect(Hermes_ip, Hermes_port);
21.         //connect to the Hermes
22.         rpos::robot_platforms::objects::CompositeMapReader cmapreader;
23.         //map reader
24.         rpos::core::Pose Hermes_pose = rpos::core::Pose(rpos::core::Location(0, 0, 0));
25.         //the Hermes pose in map(Hermes_pose should be the Hermes's real pose in new map)
26.         //using Hermes.getpose() to get the old Hermes pose
27.         auto map = cmapreader.loadFile(map_path);
28.         //load map
29.         Hermes.setCompositeMap(*map, Hermes_pose);
30.         //set compositemap
31.         rpos::core::Pose home_pose = rpos::core::Pose(rpos::core::Location(0, 0, 0));
32.         //the home pose in map(home_pose should be the home's real pose in new map)
33.         //using Hermes.gethomepose() to get the old home pose
34.         Hermes.setHomePose(home_pose);
35.         //set home pose
36.     }
37.     catch (rpos::robot_platforms::ConnectionFailException &e)
38.     {
39.         cout << "connect failed on " << e.what() << endl;
40.     }
41.     catch (rpos::system::detail::ExceptionBase &e)
42.     {
43.         cout << "failed on " << e.what() << endl;
44.     }
45.
46.     return 0;
47. }

```

Further motion deployment details, please see the SDK instruction document

9. Connection to Computer

【Step 1】 The hotspot of the computer connected to the chassis

HERMES's hotspot is auto-started by default, the hotspot format is:
SLAMWARE-XXXXXX

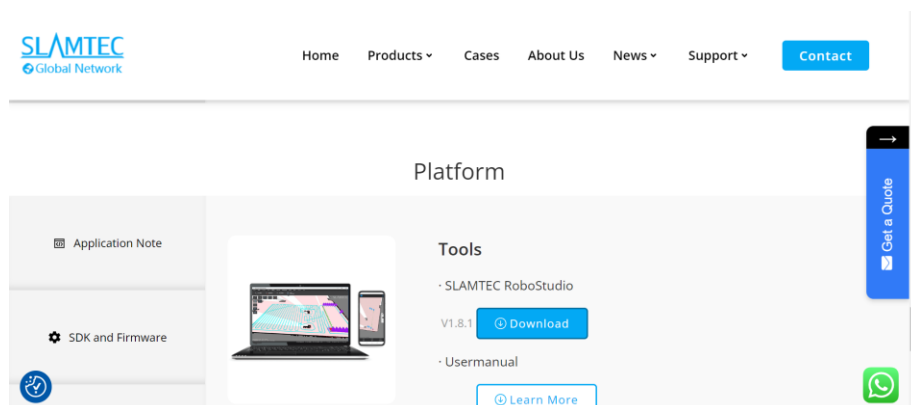
Hot spot identification method: query the last six digits of the SSID in the chassis label.



9-1 Chassis label SSID

For example, if the label SSID: Robot- E2A29E, the hot spot of this Chassis is
SLAMWARE- E2A29E

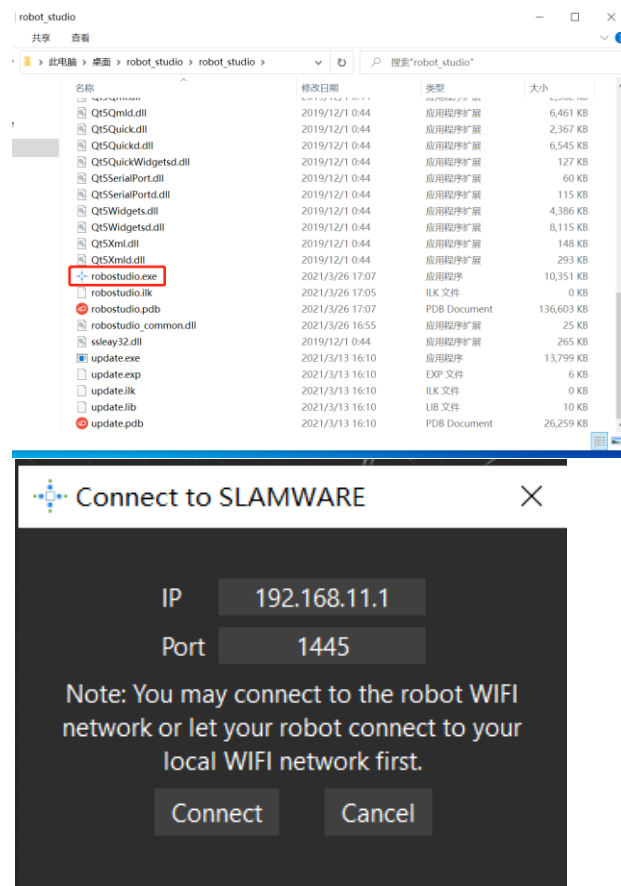
【Step 2】 Download and install Slamtec RoboStudio from the official website of Slamtec(<https://www.slamtec.ai/home/support/#tools>)



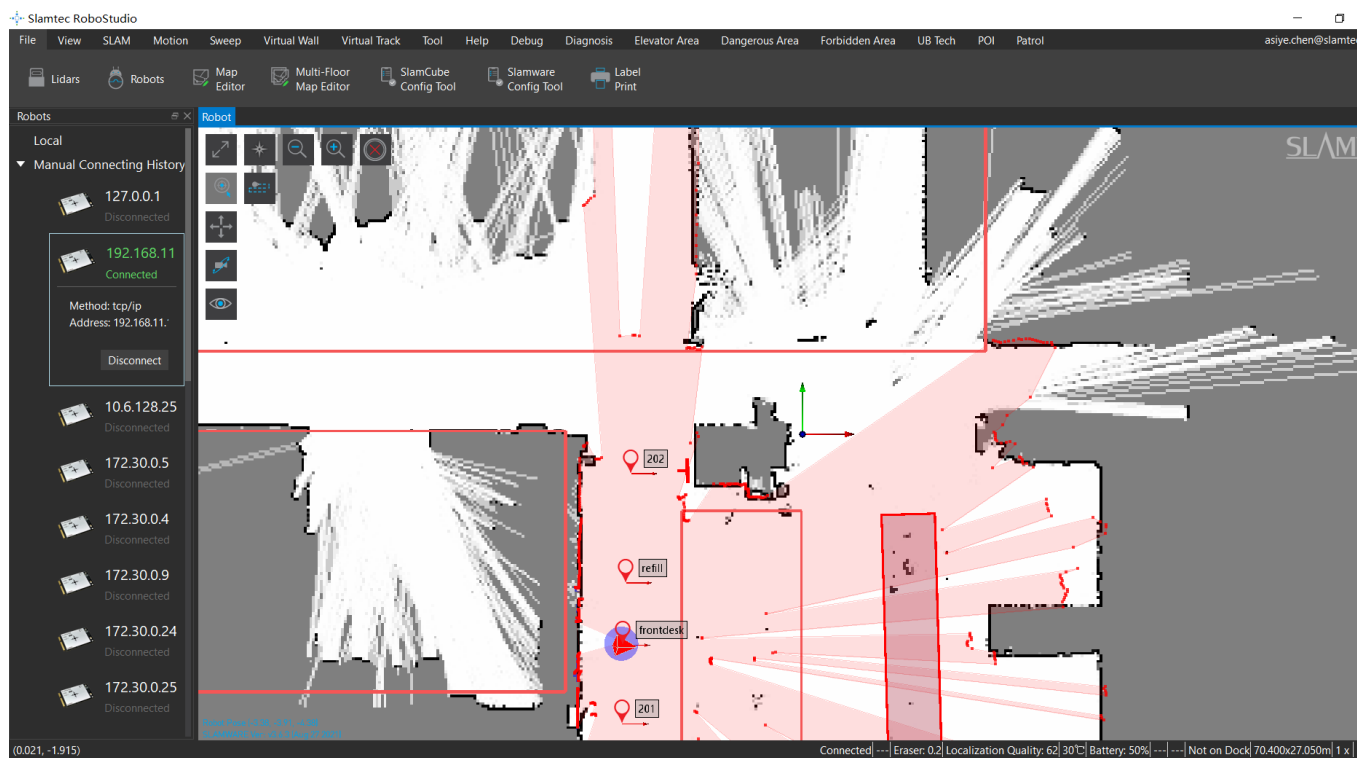
9-2 Official Slamtec RoboStudio

If you downloaded slamtec robostudio, After logging in to RS, click the "Robot" option and manually connect the robot with the right mouse button.

[step 3] if you downloaded slamtec robostudio, run "robostudio.exe", enter the interface of slamtec robostudio, enter the IP address and port, click "connect", and RS login succeeds.

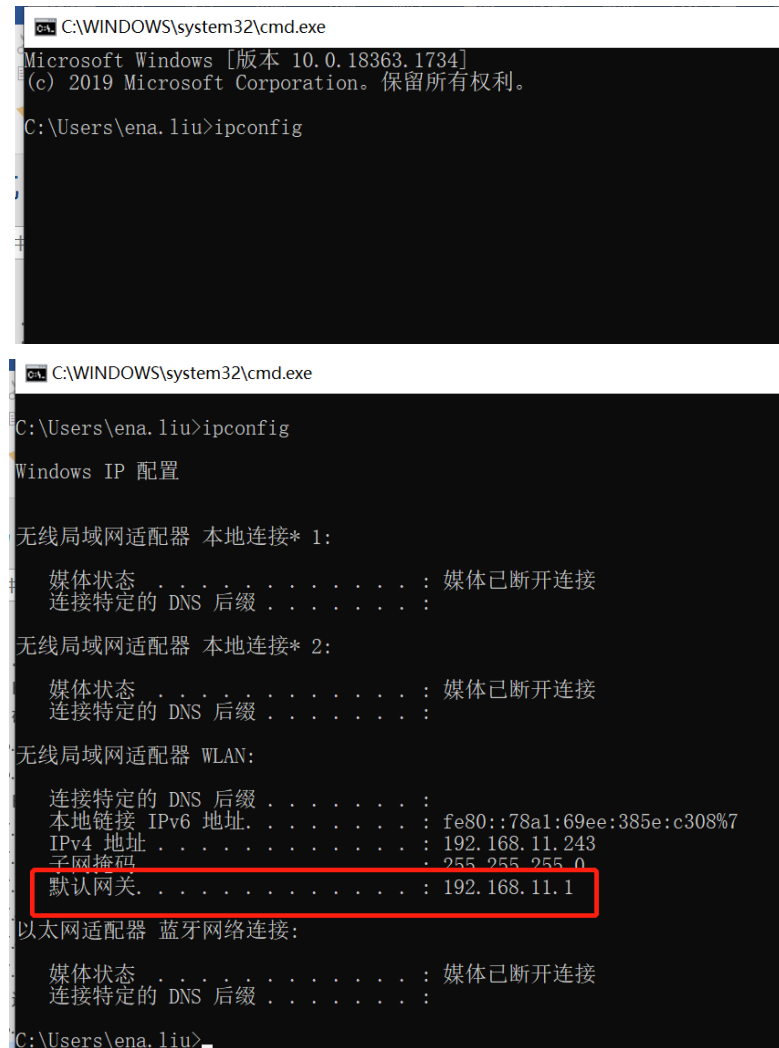


9-3 Robo studio login screen



9-4 Robo studio interface

Note : The method of IP address query is to press the shortcut key, Windows+R, and enter the code RYD3588onfig. Copy the IP of the default gateway and paste it into the IP address box of Slamtec RoboStudio. Click Connect to enter Slamtec RoboStudio.



The image consists of two screenshots of a Windows command prompt window. The first screenshot shows the command 'ipconfig' being entered at the prompt 'C:\Users\ena.liu>'. The second screenshot shows the output of the 'ipconfig' command, which displays network configuration details for various adapters. A red rectangle highlights the 'Default Gateway' (默认网关) for the 'WLAN' adapter, which is '192.168.11.1'.

```
C:\WINDOWS\system32\cmd.exe
Microsoft Windows [版本 10.0.18363.1734]
(c) 2019 Microsoft Corporation。保留所有权利。

C:\Users\ena.liu>ipconfig

C:\WINDOWS\system32\cmd.exe
C:\Users\ena.liu>ipconfig

Windows IP 配置

无线局域网适配器 本地连接* 1:

    媒体状态 . . . . . : 媒体已断开连接
    连接特定的 DNS 后缀 . . . . . :

无线局域网适配器 本地连接* 2:

    媒体状态 . . . . . : 媒体已断开连接
    连接特定的 DNS 后缀 . . . . . :

无线局域网适配器 WLAN:

    连接特定的 DNS 后缀 . . . . . :
    本地链接 IPv6 地址. . . . . : fe80::78a1:69ee:385e:c308%7
    IPv4 地址 . . . . . : 192.168.11.243
    子网掩码 . . . . . : 255.255.255.0
    默认网关. . . . . : 192.168.11.1

以太网适配器 蓝牙网络连接:

    媒体状态 . . . . . : 媒体已断开连接
    连接特定的 DNS 后缀 . . . . . :

C:\Users\ena.liu>
```

9-5 Method of obtaining an IP address

10. Adjusting Tools

10.1 RoboStudio

RoboStudio graphical tools are used to adjust and use Hermes, please download and install it from our official website:

<https://www.slamtec.ai/home/support/#tools>, and coming with manual to introduce those features.

10.2 Web Management Backstage

In the process of developing, adjusting and using SLAMWARE equipment, various operations can be performed on the equipment through the web management backstage, such as viewing basic information, updating the version, configuring WiFi, etc. (Default username: admin, default password: admin111)

Currently, web management backstage supports following functions:

1. Check basic information of the device
2. Restart the module
3. Update the firmware

Slamtec will regularly provide Hermes firmware updates and upgrades. You can easily upgrade the firmware for Hermes through the management backstage. Please obtain the latest firmware from sales or technical support personnel. The update process will last 5-10 minutes. The buzzer of Hermes will continue to sound during the update, and Hermes will automatically restart after the update. Before that, please make sure that Hermes has sufficient power.

4. Configuring WIFI
5. Start the SLAMWARE Core diagnostic mode
6. Modify the administrator password

More details on usages please refer to:

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

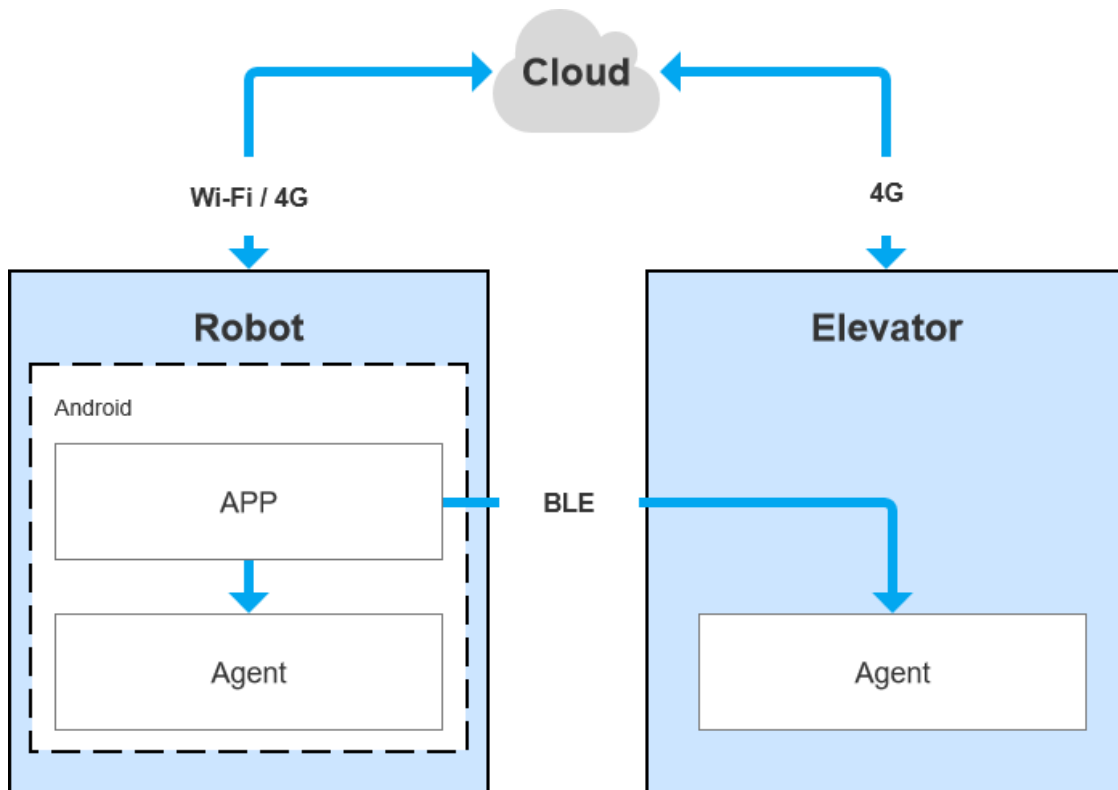
11. Developer Tools

11.1 Start Using

The Agent SDK of the Hermes chassis is developed based on the C++ language to reduce user access costs and improve the robustness of the SDK. At the same time, it has strong compatibility and supports multiple languages such as Java, C++, C, and Kotlin. The following is a detailed introduction to the relevant examples and usage guidelines of the Agent SDK call based on the Hermes chassis.

11.2 Inter-system Adjusting Framework

Robot App controls the robot's positioning, movement, and return to piles through communication; at the same time, Robot App sends instructions to the robot according to various business scenarios, and Robot Agent will provide data interfaces, task operation interfaces, and business services to Robot App.



11-1 COMMUNICATION BETWEEN EACH SYSTEM OF HERMES

11.3 Instructions of Each System

11.3.1 Robot Agent

Robot Agent is a service program running on the Hermes chassis, through which the cloud and the elevator control terminal communicate with the elevator control equipment. 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 function of Robot Agent is:

- ✓ Communicate with the Robot Cloud, Robot APP, send the Robot status and receive instructions

11.3.2 Elevator Agent

Elevator Agent is a service program running on the Linux system of the elevator control main control box. The cloud and the robot end communicate with the elevator control equipment through it. Inside the elevator control system, the Elevator Agent communicates with the Elevator Controller through UDP, sending elevator control instructions and obtaining elevator status.

The core function of Elevator Agent is:

- ✓ Communicate with the Robot Cloud, Robot APP, send the elevator status and receive instructions of elevator control
- ✓ Communicate with the Elevator Controller, receive the elevator status and send instructions of elevator control

11.3.3 Robot Cloud

Robot Cloud is a set of services provided to realize remote management, scheduling, and control of robots. It runs in the cloud and communicates with the robot at one end and the elevator control equipment at the other end. Therefore, elevator control is part of the function. Robot Cloud communicates with the Elevator Agent running on the main control box of the elevator control through the MQTT protocol.

Its core functions include:

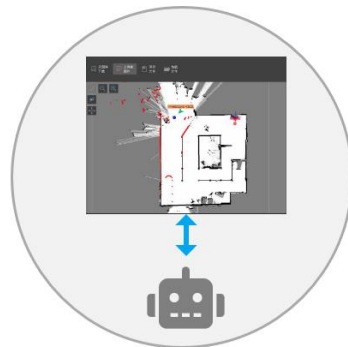
- ✓ Send instructions, control the elevator to the designated floor
- ✓ Send instructions, control the elevator to open the door
- ✓ Send instructions, control the elevator to close the door
- ✓ Receive the up/down status of elevator
- ✓ Receive the current floor of the elevator

11.3.4 Robot App

Open-Source application – Restaurant Delivery App

The restaurant delivery app is a service program running on the robot. The application scene is a restaurant. It draws a map and loads it to the robot's local area through RoboStudio graphical tools. It is a universal application for human-computer interaction to achieve multi-point task delivery.

DEPLOYMENT



1. Personnel sketching map and load to the Robot

DELIVERY PROCESS

业务中



2. Restaurant waiter sets menu into the Robot



3. Waiter enters designated table number



4. Robot send items to the destination



5. Robot informing customer "Here's your order!" when reaching destination



6. Robot returning to picking up point and wait for another order

11-2 RESTAURANT DELIVERY BUSINESS FLOWCHART

Its core functions include:

- ✓ Get device battery percentage
- ✓ Get health status info of the device
- ✓ Get POI info
- ✓ Get password of the action
- ✓ Create new action
- ✓ Get current action
- ✓ Stop current action
- ✓ Shut down of restart Robot

11.4 Demonstrations of Code

1. The following is an example of the Robot APP calling the Robot Agent interface to check the battery status

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

The format of the returned data 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 isDCCConnected: 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. The following is the Robot App calling the Robot Agent interface to make the robot move across floors

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

The request message 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

```

11.5 Details Of Robot API

FUNCTION OF MODULES	API LIST
Locate, map building-related functions	Get the Robot location
	Set the Robot location
	Get quality of location
	Whether support locating
	Start/Close locating
	Whether start map building
	Start/ pause map building
	Get location of power station
	Set location of power station
	Get current map
	Delete current map
Mark map elements manually	Get all virtual line segment
	Add virtual line segment
	Adjust virtual line segment
	Delete virtual line segment
	Delete virtual line segment
	Get all POI in current map
	Add POI
	Empty POI
	Find POI according to ID
	Modify POI
	Delete POI
Motion control of the Robot	Get all supported actions
	Get current action
	Stop current action
	Create new action
	Check action status
Firmware Upgrade	Get firmware upgrade process
Android application management	Get all custom installed apps
	Install APP
	Uninstall an APP
Multi-floor map and POI management, taking elevator, etc.	Move across floors
	Go back across floors
	Get all floor info
	Get floor info of floor of the robot

	Setup info of floor of the robot
	Get POI info
	Upload map to the robot
	Long-lasting save the map
	Reload the map
Delivery service-related interfaces	Get password of the action
	Set password of the action
	Get configuration info of the device
	Get setup info related to the delivery
	Check task info
	Create task
	Cancel all task
	Cancel some task
	Get current mission status
	Stop/ continue current mission
	Start picking up items
	End picking up items
	Get info of objects
	NOTE: delivery business please inform marketing department
Restaurant delivery service-related interfaces	Get the current battery percentage
	Get the health info of the device
	Get POI info
	Get password of the action
	Make up new actions
	Get current action
	Terminate current action
	Shut down or restart the robot

MORE DETAILS OF API: <https://github.com/slamtec/HermesSampleApp>

The Link of SDK 2.0: <https://docs.slamtec.com/#/>

SDK2.0 Common Interface

Guide:<https://wiki.slamtec.com/display/SD/SDK2.0+Common+Interface+Guide>

12. Introduction And Use Of Elevator Control

12.1 Introduction



12-1 INTELLIGENT ELEVATOR CONTROL DEVELOPED BY SLAMTEC

Intelligent elevator control, independently developed by Shanghai SLAMTEC CO., Ltd, can provide accurate detection of elevator status, program control call elevators, control elevators, combined with Mercury II hotel robots, helping the robots to take and exit the elevators autonomously. Providing reliable solutions to multi-floor operation scenarios. In addition to working with hotel robots, the product can be used as an independent set of solutions. Through the API interface we provide, this product can also interact with other smart devices or products to meet the different customization needs of customers. At the same time, the product can also be seamlessly connected to the Hermes chassis, to provide technical service support for more specific needs in other scenarios.

12.2 Features

12.2.1 Intelligence Elevator Control

The core function of this product is to help robots and other intelligent devices to control the elevator, such as calling the elevator, going to the designated floor, and controlling the elevator to open and close the door. This function greatly improves the business scenario of robots and breaks the previous limitation that robots can only work on the same floor.

12.2.2 Intelligence Status Detection

Through the built-in sensor and adaptive algorithm, this product can accurately detect the current floor, up and down status of the elevator, real-time to the millisecond level, with an accuracy of more than 96%, providing a very critical foundation so that the robot can enter and exit the elevator correctly and complete the work.

12.2.3 Elevator Diversity Adaption

The main control box has developed a variety of optimized filtering algorithms, so that this product is suitable for many different types of elevators, such as single-door elevators, double-door elevators, front and rear door elevators, etc. As it covers as many scenes as possible, this product can be used in most elevators at present. Users only need to simply calibrate and adjust through the APP provided after installing the equipment.

12.2.4 Multi-Level Network Adaption

Considering the limitations of the elevator network, how to ensure data interconnection and program interoperability is a very critical factor, and relatively it is also a difficult point. After continuous optimization iterations, we finally found a way to solve this problem. This product provides 4G, WIFI, BLE and other multi-level network communication methods to interact with robots and other smart devices to ensure the reliability of the communication link.

12.2.5 OTA Remote Upgrade

Support OTA remote upgrade of software and firmware, and batch deployment. At the same time, it provides support for VPN, which can remotely log in to the Linux system of this product for upgrades and other operations. Through the OTA function, real-time updates, upgrades and optimization can be done.

12.2.6 Interface Support

The intelligent elevator control provides a consistent API interface to the outside world, supports Bluetooth, MQTT, and HTTP communication protocols. Customers can control and interact with the elevator by writing their own program code. At the same time, it supports secondary development to meet the different customization needs of customers.

12.2.7 Swipe To Bypass

For some elevators that require a swipe card to ride, this product can also be easily supported. Just install the equipment we specify when installing the device, and

then turn on the swipe card to bypass it in the APP. In this way, even if there is a card reader, it can be easily bypassed and freely enter and exit the elevator.

12.2.8 Unified Management

The cloud platform provided by SLAMTEC can perform real-time monitoring of the status of all deployed products, batch upgrades, and further data mining through online management, information statistics, equipment monitoring, etc., to provide exclusive accurate data models for hotels or commercial buildings, to guide them to improve their overall operational capabilities and service quality.

To know more about the detailed solution of elevator control, obtain it from the marketing department. [Elevator control user manual->>](#)

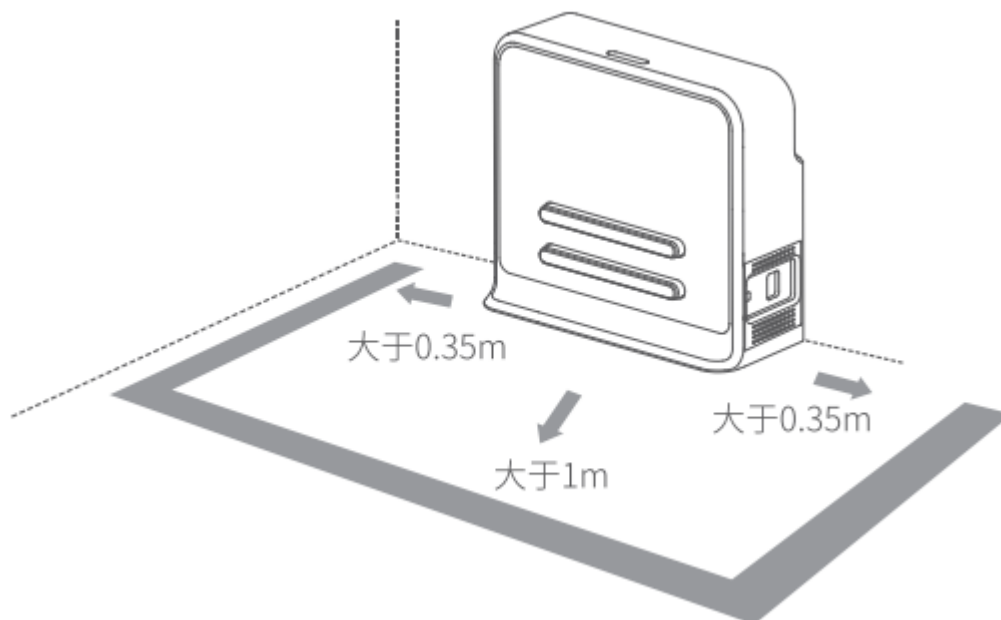
Note: This intelligent elevator control can only be used in China. For foreign customers, it needs R & D evaluation and customization.

13. Special Note

13.1 Charge point deployment

Precautions for the selection of charging pile location:

- (1) The charging pile should be placed on the wall with a space of more than 0.35 meters on both sides and more than 1 meter in front;
- (2) The charging pile shall be close to the wall, and shall not be placed in the mirror wall, back hollowed out and other areas, etc;
- (3) The position of the charging pile must not be placed on soft ground such as carpet, otherwise it will cause height difference and cannot be charged;
- (4) The position of the charging pile in the scene needs to be marked to prevent incorrect recovery after moving.



13.2 Restricted usage scenarios

Please avoid using Hermes chassis in the following scenarios to avoid chassis failure or damage.

- (1) Overrun/heavy transportation

Do not put in items that exceed the maximum weighing parameter value to avoid affecting the normal use of Hermes. Please refer to the information in the product parameter table for the maximum load-bearing parameter value.

(2) Sill height

Please ensure that there are no obstacles more than 20mm in front of Hermes, and the maximum height of Hermes over the sill is 20mm. During Hermes driving, please try to avoid passing through uneven ground or other environments with large height.

(3) Man -made impact

Do not forcefully push or hit the Hermes body when Hermes is in normal use.

(4) Temperature / humidity

Do not place Hermes in places with high temperature, high humidity or water stains.

(5) Ground obstacles

Please ensure that the ground is clean and free of wireless obstacles and sundries.

(6) Outdoor

Do not use the machine outdoors.

(7) It is limited to safe use below 2000m above sea level.**13.3 Faults that cannot be handled temporarily**

When the machine encounters a fault that cannot be handled temporarily, you can try the following operations:

(1) Please press the brake button;

(2) Push the machine back to the charging pile;

(3) The machine can be forced to switch on and off in any state after power- on.

*Use only in emergency situations.

13.4 Notes**Notes for storage:**

(1) Since the machine contains battery, it should be stored in a cool and dry environment;

(2) For long-term storage (more than 3 months), it is recommended to put it in a dry environment with room temperature of 10-25 °C and no corrosive gas;

(3) Hermes shall be charged every 6 months during long-term storage to ensure that the voltage of each battery unit is in the range of 3.6v-3.9v.

Packing notes:

(1)The packaging material must have a certain degree of strength and toughness, and can withstand slight vibration, extrusion, friction and collision during transportation;

(2)There should be padding around the package, which can play a good cushioning role;

Notes for transportation, loading and unloading:

(1)Please handle with care to prevent falling, collision, dragging and inversion ;

(2)Stacking needs to be built firmly, compactly, stably and neatly;

Other notes:

(1)Do not treat Hermes violently (such as kicking, pushing, pulling);

(2)Do not spill liquid on the machine;

(3)Do not use the automatic recharge function on the soft carpet with a subsidence of more than 2cm;

(4)It is recommended to start the equipment on the charging station;

(5)Do not change the inside of the machine without authorization;

(6)In environments with many high-transmittance materials, please use auxiliary protection functions, such as virtual walls.

14. Maintenance

1. General maintenance

(1) Lidar cleaning: When the machine is shut down and not working, check the surroundings of the lidar to ensure that there are no obstructions.

(2) Universal wheel cleaning: When the machine is shut down and not working, gently lift the chassis, wipe the universal wheel with a soft dry cloth, and remove the surrounding foreign matters.

(3) Depth camera lens cleaning: Please wipe the lenses of the two depth cameras with a soft dry cloth when the machine is powered off.

(4) Cleaning the charging pile: Please wipe the charging pile and charging electrode with a soft dry cloth when the power is off.

(5) Collision bar cleaning: Please wipe the collision bar with a soft dry cloth when the power is off, and ensure that there are no wires, paper scraps and other foreign objects stuck on the anti-collision bar.

2. Maintenance cycle

For the maintenance of the main engine, it mainly includes depth camera lens inspection, collision bar inspection, clearance inspection around the lidar, foreign matter inspection around the driving wheel and universal wheel, charging pile inspection, etc. The time interval of the maintenance cycle can be appropriately adjusted according to the environment, frequency, intensity and temperature of the machine.

Hermes maintenance schedule			Time interval		
NO	Name	Maintenance level	Year	Month	Week
1	Depth camera lens	Clean	--	--	1 time
2	Collision bar	Clean	--	--	1 time
3	Around the lidar	clearance	--	1 time	--
4	Universal wheel	Clean	--	--	1 time
5	Driving wheel	Clean	--	--	1 time
6	Charging pile	Clean	--	1 time	--
7	Machine body	Overhaul	1 time	--	--

14-1 Hermes Pro Max maintenance schedule

15. Common faults and troubleshooting

When an abnormality occurs during Hermes Pro Max operation, please refer to the following table or page tips to solve the problem:

NO	Fault prompt	Solutions
1	Collision bar abnormal	Please check whether the collision bar is jammed, and tap the anti-collision bar several times to return the anti-collision bar to its position.
2	Hermes battery low	Please press the brake release button and push the machine back to the charging point to charge.
3	The charging point cannot be charged	Please check whether the power cord plug of the charging point is inserted into the socket and whether the indicator light of the charging point is on normally.
4	Unable to power on	Please check whether the charging point is connected to the power supply. After the charging point and Hermes are connected normally, if it cannot be solved, please contact the after-sales service department.
5	Hermes cannot be charged on the pile	Please try again on the charging pile. If you cannot solve it, please contact after-sales service.
6	Unable to go back to the charging point	1. Please confirm whether the position of the charging point has been moved. If the position has been moved, please contact the after-sales department. 2. Please confirm whether there is a slope at the position of the charging point. If there is a slope, please contact the after-sales department. 3. Please push Hermes back to the charging point and try to restart Hermes.
7	Unable to get in / out of the elevator	1. Please confirm whether there are obstacles in the elevator. 2. Please confirm the internet signal near the elevator. 3. Please push Hermes back to the charging point and try to restart Hermes.
8	Universal wheels rotate intermittently	Please check whether there are any foreign objects such as threads, cards, etc. around the universal wheels and the driving wheels. If there are foreign objects, please clean them.
9	Machine can't walk	Please check whether the drive cable is connected normally. If it cannot be solved, please contact the after-sales service.
10	The light strip does not light up	Please check whether the connecting wire of the light strip is connected normally. If it cannot be solved, please contact the after-sales service.

16. Product Executive Standards and certificates

16.1 Product executive standards

GB 4943.1

GB/T 15706

GB/T 16855.1

GB/T 37283

GB/T 37284

*Please do not use this product beyond the limits of the manual to avoid or cause damage to Hermes.

*Please refer to the real object. We reserve the right to update the product without notice.

*Product manual version v1.0.

16.2 Certificate

Company name: Shanghai Slamtec Co., Ltd

Company Address: Unit 01, 2nd Floor, Building E, Shengyin Building, No.666 Shengxia Road, China (Shanghai) Pilot Free Trade Zone.

Contact information: (+86) 021 68581569