

专注于室内定位导航与环境感知解决方案
FOCUS ON INDOOR NAVIGATION AND
ENVIRONMENT PERCEPTION SOLUTIONS

深圳乐动机器人有限公司
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Who are we

专注于机器人及人工智能解决方案

深圳乐动机器人有限公司位于深圳市南山高新科技产业园区，是一家专注于机器人及人工智能技术研发和全球销售的高科技企业，目前已实现机器人运动控制、环境感知、地图构建、自主导航、物体识别、机器学习等技术的产业化。

公司拥有成熟的清洁机器人自主定位与导航的整体解决方案（算法板+控制板+雷达等各类传感器），其整体解决方案已多版本迭代，并均已实现批量投产，市场销售量超过1百万台。销售产品包括LDS-SLAM与V-SLAM算法模块，可定制开发的控制单元，激光雷达、3D TOF深度摄像头、RGB全景摄像头、结构光测距、光流等传感器、标准红外+条码回充模块。乐动拥有从优越性能到低廉成本的清洁机器人灵活丰富的产品配制方案，可以根据客户的目标市场定位为客户量身定制最优性价比的产品。同时，公司具备模组和清洁机器人的全流程在线检测和整机功能测试系统的开发与调试能力。

乐动拥有数百项人工智能和机器人系统专利，拥有一支高素质的研发与管理团队，我们一直致力于智能机器人领域的传感器、算法、大数据等环境感知与导航技术的研究开发和方案落地。

Located in Nanshan High tech Industrial Park, Shenzhen LDROBOT Co., Ltd. is a high-tech enterprise focusing on the research and development of robot and artificial intelligence technology and global sales. At present, it has realized the industrialization of robot motion control, environmental perception, map building, autonomous navigation, object recognition, machine learning and other technologies.

The company has a mature overall solution for autonomous positioning and navigation of cleaning robots (algorithm board + control board + radar and other sensors). Its overall solution has been derived in multiple versions, and has been put into volume production, with a market sales volume of more than 1 million units. Sales products include lds-slam and v-slam algorithm modules, customizable control units, lidar, 3D TOF depth camera, RGB panoramic camera, structured light ranging, optical flow and other sensors, standard infrared + barcode recharge module. LDROBOT has a flexible and rich product solutions from superior performance to low cost cleaning robot, which can customize the best cost-effective products for customers according to their target market positioning. At the same time, the company has the ability to develop and debug the whole process online detection and whole machine function test system of module and cleaning robot.

With hundreds of patents of artificial intelligence and robot system, and a high-quality R&D and management team, we have been committed to the research and development of sensor, algorithm, big data and other environmental sensing and navigation technologies in the field of intelligent robot and the implementation of solutions.

Where are we going

领行科技 服务大众



愿景/VISION

用创新创造价值，用科技改善生活。
Create value with innovation and improve life with technology.



使命/MISSION

- 1、以极大的热情全力以赴帮助客户成功；
 - 2、成为智能机器人领域最具竞争力的环境认知与智慧移动解决方案提供商。
- 1、With great enthusiasm to help customers succeed;
 - 2、Become the most competitive environmental awareness and intelligent mobile solution provider in the field of intelligent robots.



价值观/VALUE

诚信敬业，开拓创新，开放包容，成就客户。
Honest and dedicated, pioneering and innovative, open and inclusive, to serve customer .

Our advantages

产品价值链整合优势

1、供应链整合

依托公司强大的开发能力、强大的品牌客户资源、产品市场投放量以及与芯片方案商的战略合作，乐动采用Full consign模式既保证了产品的稳定性，也大大降低了采购成本、缩短了采购周期。

1.SUPPLY CHAIN INTEGRATION

Relying on the company's strong development ability, strong brand customer resources, product market volume and strategic cooperation with chip solution providers, LDROBOT adopts the full-consignment mode to ensure the quality the quality stability of products, greatly reduce the cost and shorten the procurement cycle.

2、方案标准化

通过先入优势和机器人深度学习，带来超出行业竞争对手的精细化方案与产品更高的性能与可靠性表现，从而实现方案标准化。帮助客户大大缩短新产品开发周期。

2.SOLUTION STANDARDIZATION STANDARDIZATION

With first-mover sense and advanced robot deep learning technology, it brings more refined solutions and higher performance and reliability performance of products than competitors in the industry, so as to realize the standardization of solutions. Help customers greatly shorten the development cycle of new products.

3、客户设计指导

基于乐动研发团队的项目开发经验，逐渐整理出一套为客户传感器选型、结构优化以及外观设计等系统化的指导手册，帮助客户提升其产品开发一次成功率与产品的性能稳定性。

3.CUSTOMER DESIGN GUIDE

Based on the project development experience of LDROBOT R&D team, a set of systematic instruction manuals for customer's sensor selection, structure optimization and appearance design has been gradually sorted out to help customers improve their one-time success rate of product development and product performance stability.

4、生产系统开发

机器人生产测试系统也是非常庞大的一块产业化开发工作，乐动可以帮助客户实现全生产系统的定制开发与服务，助力客户快速实现产业化。

4.PRODUCTION SYSTEM DEVELOPMENT

The robot production test system is also a very large piece of industrialization development work. LDROBOT can help customers realize the customized development and service of the whole production system, and help customers quickly realize industrialization.

5、售后服务支持

乐动在提高机器人全套解决方案的同时，也提炼总结出了一套完善的售后服务手册，可以供终端客户解决各种智能设备的疑难杂症。此项工作也大大减少了品牌客户的售后服务成本与提升了售后服务效率。

5.AFTER SALES SERVICE SUPPORT

while improving the robot's complete solution, LDROBOT has also refined and summarized a set of perfect after-sales service procedure, which can be used by end customers to solve the problems of various intelligent devices. This works also greatly reduces the after-sales service cost of brand customers and improves the after-sales service efficiency.

What are we doing

精雕细琢 层层把关

乐动共有近100名员工，其中70%以上属于研发人员，85%以上人员拥有本科学历，50%以上拥有硕士研究生学历。

公司围绕人工智能、传感器、机器人环境感知与定位导航技术领域展开了充分的专利布局，目前已经申请的专利数量为131个，其中包括：93个发明专利，已经获得的授权专利数超过30项。同时乐动在欧美分别申请了相应的发明专利！

There are nearly 100 employees in LDROBOT, more than 70% of them are R&D personnel, more than 85% of them have bachelor's degree and more than 50% have master's degree.

The company has launched a full patent layout around the fields of artificial intelligence, sensors, robot environment perception and positioning navigation technology. At present, 131 patents have been applied for, including 93 invention patents and more than 30 authorized patents. At the same time, Le Dong applied for corresponding invention patents in Europe and America!



Our main products

智能扫地机SLAM定位导航完整解决方案



SLAM建图定位

激光雷达360°精确扫描，结合SLAM人工智能算法，同步无人驾驶技术，即时生成房间地图，科学规划清扫路线。

电子虚拟墙

使用磁条既破费，又不美观，国内率先提出APP设置电子禁区，不让去的地方绝不乱跑。

保存地图

国内首创，地图保存记忆功能；清扫完成，地图保存，再次清扫，直接调用之前地图，不再每次清扫都重新建图。

指哪扫哪

轻触地图，便可设置目标点，扫地机自动规划路径到目标点，进行深度清扫，手掌之间，指哪扫哪。

地毯识别

AI机器学习算法，爬上地毯智能识别，自动增大吸力，深度清洁，开启人工智能新时代。

Slam mapping and positioning

Laser radar 360° precise scanning, slam artificial intelligence algorithm, synchronous driverless technology, real-time space mapping, scientific planning cleaning route.

Electronic virtual wall

The use of magnetic stripe is not only cost-effective, but also inaeasthetic. It is the first one in use app to virtualize the forbidden zone, and never step into places without permission.

Map memory

LDROBOT is the first one build in Map memory function into robot system, and no longer rebuild the map every time.

Spot Cleaing

Tap the map, you can set the target point, the sweeper automatically plans the path to the target point, carries out deep cleaning,

Carpet recognition

Advanced AI machining algorithm for Carpet recognition,, automatically increase suction, deep cleaning, open a new era of artificial intelligence.

浩瀚智汇 量身定制



01 可定制自主定位导航清洁机器人主控单元 CUSTOM MCU_LD

温馨提示：可定制开发主板 / Warm Tip: Customized Development Motherboard

采用接口资源丰富的主芯片，支持接入各种传感器（雷达、悬崖、霍尔、沿墙、红外、碰撞、超声波、陀螺仪、加速度计、磁力计、RGB摄像头、3D深度摄像头等传感器）和各类机械开关；可驱动与控制不同规格参数的电机（主动轮、风机、边扫、中刷、水泵等），满足自主定位导航清洁机器人各种个性化功能定制需求。

1. We use platform which has rich interface resources to support access to various sensors (Lidar, Cliff, Hall, TOF, IR, Collision, Ultrasonic, Gyroscope, Accelerometer, Magnetometer, RGB camera, 3D depth camera and other sensors) and various mechanical switches.





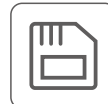


2. It can drive and control motors with different specifications (driving wheel, fan, side sweep, middle brush, water pump, etc.) to meet the requirements of various personalized functions of the autonomous positioning and navigation cleaning robot.

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| 激光雷达扫描 Laser Radar Scanning | SLAM定位导航算法 SLAM Location Navigation Algorithm | 电机驱动控制 Motor Drive Control | APP定制开发 APP Customization Development | OTL软件升级 OTL Software Upgrade | PCT海外专利布局 PCT Overseas Patent Layout |

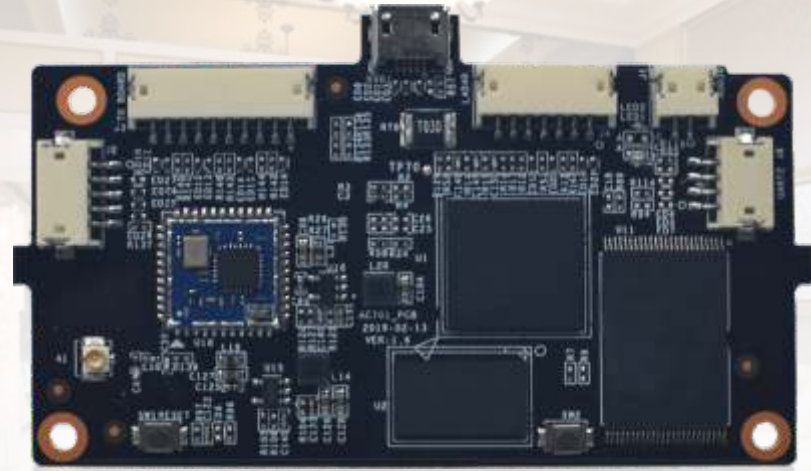
不同凡响 唯我掌控

02 乐动第二代自主定位导航清洁机器人算法模块 SLAM CLEANPACK_LD02

- | | |
|--|---|
| 1、实时定位与重定位/路径规划/高精度地图/自主避障/自动回充/智能禁区/地毯识别/区域清扫/全局清扫/记忆续扫 | 1.real time positioning and Relocation / path planning / high-precision map / autonomous obstacle avoidance / automatic recharge/Smart forbidden area / carpet recognition / area cleaning / global cleaning / memory continuous scanning |
| 2、市场投放量：300,000+ | 2.Market volume: 300000+ |
| 3、清洁覆盖率：85% | 3.Cleaning coverage: 85% |
| 4、定位精度：≤8cm | 4.Positioning accuracy: ≤ 8cm |
| 5、回充方式：支持红外/扫码 | 5.Recharging method: support infrared / scanning code |
| 6、支持预约功能 | 6.Support appointment function |
| 7、集成WIFI模组，兼容2.4G | 7.Integrated WiFi module, compatible with 2.4G |
| 8、支持定制 | 8.Support customization |
| 9、快速整合激光雷达与清洁/服务机器人底盘控制系统 | 9.Rapid integration of lidar and chassis control system of cleaning / service robot |

| | | | | | | |
|--|--|--|--|--|--|--|
|  |  |  |  |  |  |  |
| 实时定位与重定位 Real Time Location Relocation | 自主避障 Autonomous Obstacle Avoidance | 自动回充 Automatic Recharge | 智能禁区 Intelligent Forbidden Zone | 记忆续扫 Memory Scan | 路径规划 Path Planning | 高精度地图 High Precision Map |





包容万象 智享科技

03 乐动第三代自主定位导航清洁机器人算法模块 SLAM CLEANPACK_LD03

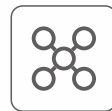
温馨提示：可定制开发主板 / Warm Tip: Customized Development Motherboard

- 1、提供：实时定位与快速重定位/路径规划/高精度地图/自主避障/自动回充/智能禁区/地毯识别/区域清扫/全局清扫/记忆续扫/智能分区/自主脱困
- 2、清洁覆盖率：88%
- 3、定位精度：≤5cm
- 4、回充方式：支持红外/扫码
- 5、支持预约功能
- 6、支持语音包OTA更新
- 7、支持光流定位技术
- 8、集成WIFI模组，兼容2.4G/5G
- 9、支持定制
- 10、拥有快速重定位、智能分区与语音在线更新等新功能，是乐动旗下最受客户欢迎的产品型号，已投入量产，预计2019年度销售量突破400,000套。

1. Provide: real-time positioning and rapid Relocation / path planning / high-precision map / autonomous avoidanceBarrier / automatic recharging / intelligent forbidden area / carpet identification / area cleaning / global cleaning / memory continuous scanning/Intelligent partition / self rescue
- 2.Cleaning coverage: 88%
- 3.Positioning accuracy: ≤ 5cm
- 4.Recharging method: support infrared / scanning code
- 5.Support appointment function
- 6.Support voice package OTA update
- 7.Support optical flow positioning technology
- 8.Integrated WiFi module, compatible with 2.4g/5g
- 9.Support customization
- 10.It has new functions such as rapid relocation, intelligent zoning and online voice update, and is happy Mobile's most popular product model has been put into mass production and is expected to be sold in 2019 Sales exceeded 400000 sets.



支持光流定位技术
Support Optical Flow Location Technology



智能分区
Intelligent Zoning



清洁覆盖率高
High Cleaning Coverage



定位精准
Precise Positioning



支持语音包OTA更新
Voice Package Support OTA Update



地毯识别
Carpet Recognition

超强性能 无所不能

04 乐动第四代自主定位导航清洁机器人算法模块 SLAM CLEANPACK_LD04

温馨提示：可定制开发主板 / Warm Tip: Customized Development Motherboard

- 1、实时定位与快速重定位//路径规划//高精度地图//自主避障//自动回充//自主脱困//智能禁区//地毯识别//区域清扫//全局清扫//记忆续扫//场景识别//智能分区//安防监控//双导航系统
- 2、清洁覆盖率：88%
- 3、定位精度：<5cm
- 4、回充方式：支持红外/扫码
- 5、支持预约功能
- 6、支持语音包OTA更新
- 7、支持实时音/视频传输
- 8、支持VSLAM 定位技术
- 9、支持语义SLAM技术
- 10、支持语义地图技术
- 11、支持光流定位技术
- 12、集成WIFI模组，兼容2.4G/5G
- 13、支持定制

1. Real-time positioning and relocation // path planning // high-precision mapping // autonomous obstacle avoidance // automatic recharging // autonomous getting unstuck // intelligent forbidden area // carpet recognition // regional cleaning // global cleaning // memory continuation cleaning // intelligent partition// scene recognition // security monitoring // double navigation system.
2. Cleaning coverage :88%
3. Positioning accuracy: ≤5cm
4. Recharge mode: Support IR/Barcode scanning
5. Support reservation function
6. Support voice pack OTA
7. Support real-time voice and video transmission
8. Support semantic mapping technology
9. Support semantic SLAM
10. Support optical flow positioning technology
11. Integrated WIFI2.4G/5G
12. Support customization
13. The first powerful algorithm module with semantic mapping, fast scene recognition, intelligent partition and real-time video transmission is the new generation SLAM model of LDROBOT, this model will launch mass production in Q3, 2019.



地毯沿边技术
Carpet Edge Technology



双导航系统
Dual Navigation System



安防监控
Security Monitoring



支持语义地图技术
Support Semantics Map Technology



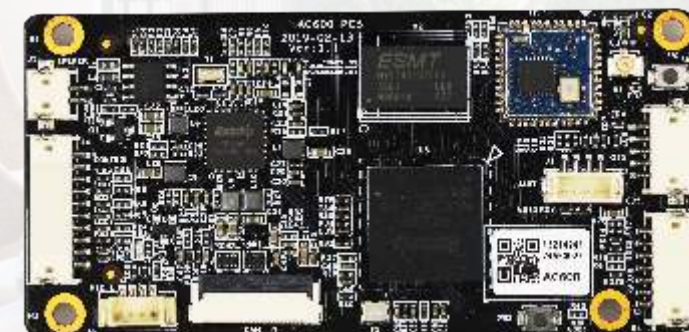
支持实时音视频传输
Real Timeaudio Supportvideo Transmission



支持VSLAM定位技术
Support VSLAM Location Technology



支持语义SLAM技术
Supportsemantics SLAM Technology





量身定制 引领行业

05 第5代乐动自主定位导航清洁机器人可集成算法模块 SLAM CLEANPACK_LD05

1. 提供扫地机器人的实时定位与重定位功能
2. 提供高效率路径规划能力
3. 支持智能分区与智能规划功能
4. 智能构图, 轻松覆盖300m²面积
5. 支持自主避障, 自动回充
6. 支持软件虚拟墙
7. 支持多边形分区清扫
8. 支持大型多次记忆续扫
9. 清扫覆盖率不小于85%
10. 定位精度小于5cm
11. 支持红外回充和扫码回充
12. 支持预约功能
13. 支持多张地图选择
14. 支持系统OTA
15. 支持在线语音切换
16. 集成2.4G WiFi, 兼容5G WiFi模块
17. 支持快速接入不同物联网平台
18. 支持高度定制

1. Provide real-time positioning and repositioning function of sweeping robot
2. Provide efficient path planning capability
3. Support intelligent zoning and intelligent planning functions
4. Intelligent composition, easy coverage of 300 m²
5. Support autonomous obstacle avoidance and automatic recharging
6. Support software virtual wall
7. Support polygon partition cleaning
8. Support multiple memory scanning of large house type
9. The cleaning coverage shall not be less than 85%
10. Positioning accuracy is less than 5cm
11. Support infrared recharging and scanning code recharging
12. Support appointment function
13. Support multiple map selection
14. Support system OTA
15. Support online voice switching
16. Integrated 2.4G WiFi, compatible with 5g WiFi module
17. Support fast access to different IOT platforms
18. Support highly customized

| | | | | | | |
|---|---|---|---|---|---|---|
|  |  |  |  |  |  |  |
| 实时定位 与重定位 Real Time Location Relocation | 清洁覆盖率高 High Cleaning Coverage | 定位精准 Precise Positioning | 路径规划 Path Planning | 清洁覆盖率高 High Cleaning Coverage | 自主避障 Autonomous Obstacle Avoidance | 自动回充 Automatic Recharge |

精益求精 小巧有型

06 2D 360°全景激光扫描雷达 LiDAR_LD00/LiDAR_LD09

1. 性能稳定的低成本激光雷达传感器
2. 市场投放量: 500,000+
3. 型号: ILD28TRI0
4. 测距半径: 8m
5. 测量频率: 2,300Hz
6. 角度分辨率: ≤1°
7. FDA: Class I
8. 此款传感器已广泛应用于SLAM、机器人导航、跟随与避障

1. Low cost lidar sensor with stable performance
2. Market volume: 500000+
3. Model: ild28tri0
4. Ranging radius: 8M
5. Measurement frequency: 2300hz
6. Angular resolution: ≤1°
7. FDA: Class I
8. This sensor has been widely used in slam, robot navigation, following and obstacle avoidance



测量精度高
High Measurement
Accuracy



使用寿命长
Long Service Life



角度分辨率高
High Angle Resolution



稳定可靠
Stable And Reliable





时尚轻巧 卓尔不凡

07 2D 360°迷你全景激光扫描雷达 LiDAR_LD03/LiDAR_LD08

- 1、LiDAR_LD00的瘦身版，体积缩小三分之一，大大减小测量盲区
- 2、型号：ILD28TRI3
- 3、测距半径：8m
- 4、测量频率：2,300Hz
- 5、角度分辨率：≤1°
- 6、测量盲区：≤12cm
- 7、FDA：Class I
- 8、迷你版本的激光雷达，是内部空间紧凑型机器人的首选激光雷达传感器

- 1.The slimming version of lidar_ld00 reduces the volume by one third, greatly reducing the measurement blind area
- 2.Model: ild28tri3
- 3.Ranging radius: 8M
- 4.Measurement frequency: 2300hz
- 5.Angular resolution: ≤ 1°
- 6.Measurement blind area: ≤ 12cm
- 7.FDA: Class I
- 8.The mini version of lidar is the first choice for compact robots in interior space Sensilla



精致小巧
Exquisite And Compact



测量精度高
High Measurement Accuracy



使用寿命长
Long Service Life



角度分辨率高
High Angle Resolution



测量盲区小
Small Measurement Blind Area



稳定可靠
Stable And Reliable

超高覆盖 纯享体验

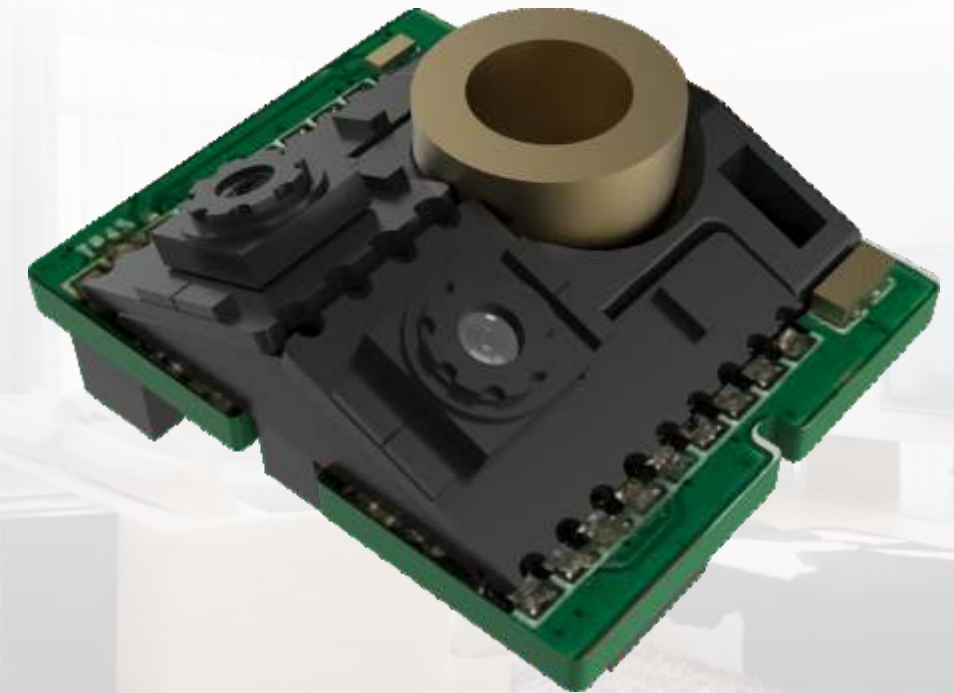
08 固态激光雷达 SOLIDLINE LIDAR

该装置可以实现90度FOV的激光测距，生成点云信息，广泛应用于机器人定位与建图、规划与导航、以及自主动态与细小障碍物避障等，极大地提高了机器人对细小障碍物的处理能力和用户体验。

Such device can realize laser rangefinding of 90-degree FOV and generate point cloud information. It is widely used in robotic positioning and mapping, planning and navigation, as well as autonomous dynamic and little obstacle avoidance, etc., which greatly improves the processing capacity and user experience of robots for small obstacles.

- 1、角度分辨率达到0.5°，可探测到5mm宽度的物体
- 2、覆盖90°视角的高度，可沿着5mm高度的障碍物行走
- 3、采用“复眼设计”，极大地提高了传感器的视场角

1. The angular resolution reaches 0.5°, and objects with a width of 5mm can be detected
2. 90°FOV coverage, which make the machine can walk along with 5mm obstacles
3. The "compound eye design" is adopted to greatly improve the field of view angle of the sensor



精致小巧 魅力无限

09 迷你 TOF 雷达 MINI TOF LIDAR

此款TOF雷达发布于2019年年底，可以显著提升机器人的测距能力，强光、黑墙等抗干扰能力，同时为客户节省产品的综合成本。

This TOF radar was released at the end of 2019, which can significantly improve the robot's ranging ability, strong light, black wall and other anti-jamming capabilities, while saving customers the comprehensive cost of products.

- | | |
|---|--|
| 1、体积小, L*W*H=38mm*38mm*34.3mm可以内置入机器人底盘 | 1、Mini size, L*W*H=38mm*38mm*34.3mm, this TOF LDS can be established inside the Robot Chassis |
| 2、同轴设计, 可加遮挡外罩, 提升防尘防水等级 | 2、Coaxial design, the outer cover can be added to reach high level of dustproof and waterproof |
| 3、盲区小, ≤1.5cm | 3、Smaller blind area, ≤1.5cm |
| 4、测距量程, 12m | 4、Measure range, 12m |
| 5、同轴无刷寿命长, 超过20000h | 5、Longer Life Cycle time of Brushless motor, over 20000h |
| 6、基于TOF原理的雷达无专利风险 | 6、No Risk of IP Infringement |



精致小巧
Exquisite And Compact



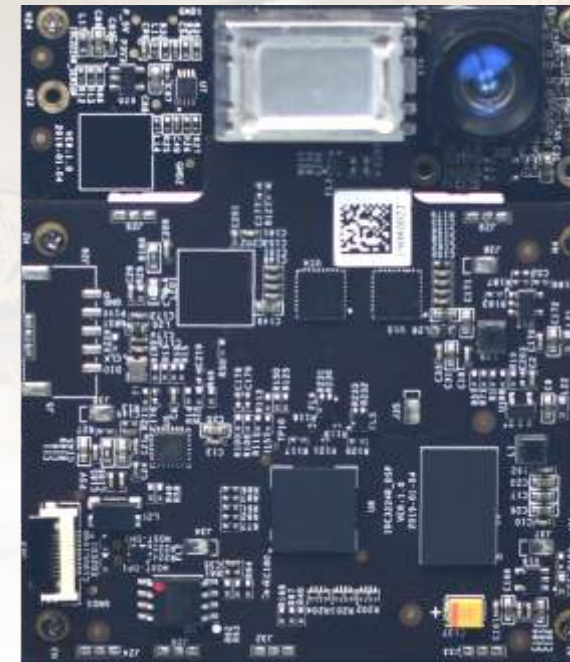
使用寿命长
Long Service Life



测量盲区小
Small Measurement Blind Area



测距半径远
Far Ranging Radius



智慧之眼 成就未来

10 3D TOF 高分辨率深度摄像头 TOF IDC3224R_LD01

- | | |
|--|--|
| 1.分辨率: 320*240像素 | 1.Resolution: 320 * 240 pixels |
| 2.测量范围: 0.2-4m | 2.Measurement range: 0.2-4m |
| 3.视场角: 90°X 75°X 60° | 3.Field angle: 90° x 75° x 60° |
| 4.最大帧率: 60fps | 4.Maximum frame rate: 60fps |
| 5.FDA: Class I | 5.FDA: Class I |
| 6.与TI团队深度合作开发的3D TOF深度摄像头传感器, 已为多家知名品牌服务机器人批量供货。可用于: 机器人精准定位与建图、导航与避障、人脸/肢体/物体识别、AR/VR等。 | 6.The 3D TOF depth camera sensor developed in-depth cooperation with TI team has been well known by manyBrand service robots are supplied in batches. It can be used for: robot precise positioning and mapping, navigation and avoidanceObstacle, face / limb / object recognition, AR / VR, etc. |



高精度
High-precision



抗干扰
Anti-interference



应用广
Widely Used



稳定可靠
Stable And Reliable

精彩时刻 有您相伴

11 3D TOF 高帧率深度摄像头 TOF IDC8060R_LD02

- 1. 分辨率:80*60像素
- 2. 测量范围:0.4-2m
- 3. 视场角:92°X 74°X 57°
- 4. 最大帧率:100fps
- 5. FDA:Class I
- 6. 高性价比3D深度探测传感器, 已为多家知名品牌服务机器人批量供货。避障性能高, 可以瞬间感知动态障碍物, 及时避障; 可用于机器人精准定位与建图、导航与避障、人脸/肢体/物体识别、AR/VR等。

- 1. Resolution:80X60
- 2. Detection range:0.4-2m
- 3. FOV:92°X 74°X 57°
- 4. FPS:100
- 5. FDA:Class I
- 6. High cost-effective 3D depth detection sensor has been supplied to many famous brand service robots in bulk High obstacle avoidance performance, can instantly sense dynamic obstacles and avoid obstacles in time; can be used for precise robot calibration Location and mapping, navigation and obstacle avoidance, face / limb / object recognition, AR / VR, etc.



高精度
High-precision



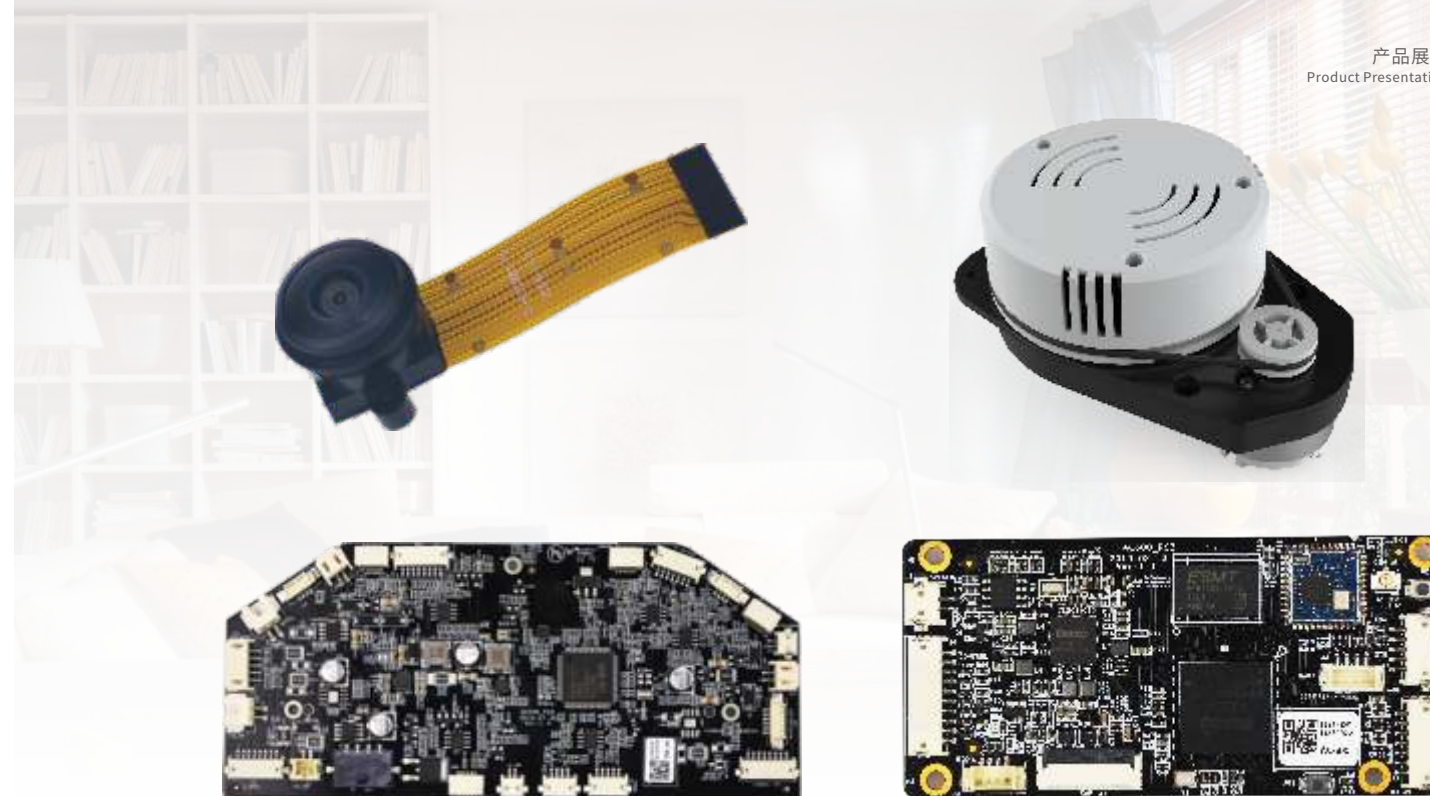
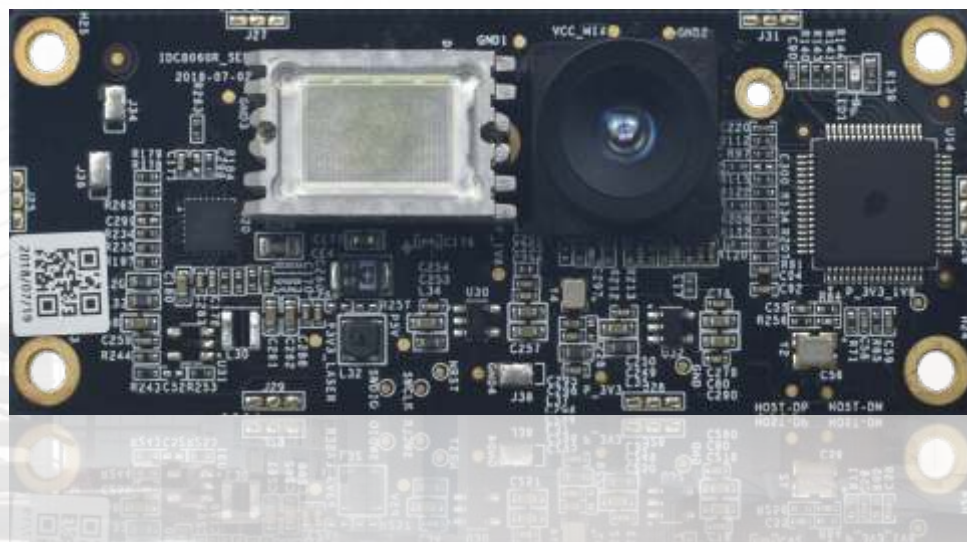
抗干扰
Anti-interference



应用广
Widely Used



稳定可靠
Stable And Reliable



移动定位 实时监测

12 LDS SLAM + VSLAM 系统 LDS SLAM +VSLAM

LDS SLAM+VSLAM基于乐动成熟的LDS SLAM平台,增加视觉传感器, 不仅实现室内可移动监控功能, 还实现了雷达与视觉双定位系统。系统通过多传感器融合与算法处理, 大大提高了定位感知系统的鲁棒性, 提升定位的精确度, 让机器人拥有更为清晰的地图边界、杜绝了地图错乱等烦恼。

LDS slam + vSLAM is based on LDS slam platform, which is a mature product from LDROBOT. Vision sensor is added to realize not only indoor mobile monitoring function, but also radar and vision double positioning system. Through multi-sensor fusion and algorithm processing, the system greatly improves the robustness of the positioning sensing system, improves the positioning accuracy, makes the robot have a precise map boundary, and eliminates the map confusion and other troubles.

- 1. 低成本双导航精确定位高鲁棒性
- 2. 提供一路可移动的室内监控功能, 可实现远程监控, 方便用户看护家庭。
- 3. 激光雷达与摄像头双定位系统, 大大提升了机器人地图的稳定性。弥补了雷达或视觉传感器短暂失效导致机器人地图错乱的短板, 很好地提升了用户的体验。

- 1. Low Cost, Dual Navigation, Precise Positioning and High Robustness
- 2. The movable monitoring function can realize the remote monitoring, the user can look after the home remotely.
- 3. The double positioning system of LDS and camera greatly improves the stability of robot mapping, which improves the robot mapping accuracy caused by the temporary failure of lidar or camera and improves the user experiences.

高清摄像 全景漫游

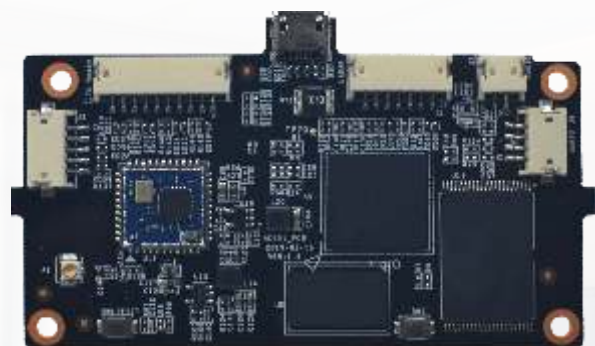
13 物体识别与3D精细避障系统解决方案 PRECISE 3D OBSTACLE AVOIDANCE SYSTEM

LDS+固态激光雷达精细避障系统基于乐动机器人成熟LDS方案。方案使用SLAM_CLEANPACK_LD03算法板与定制控制驱动板，搭配乐动自主研发的固态激光雷达传感器。利用固态激光雷达的精细测距功能，实现对低矮障碍物的识别与规避，提升扫地机器人在复杂环境下的生存率。同时，通过调整固态激光雷达的安装方式，可以实现对地毯的识别与标记，轻松应对拖地场景下冲入地毯的问题。

The LDS + SLR fine obstacle avoidance system is based on the mature LDS scheme of the robot. In the scheme, SLAM_CLEANPACK_LD03 algorithm board and customized control drive board are used, together with the solid-state lidar sensor independently developed by LDROBOT. Using the fine ranging function of solid-state lidar, we can recognize and avoid low obstacles, and improve the survival rate of sweeping robot in complex environment. At the same time, by adjusting the installation mode of solid-state lidar, we can recognize and mark the carpet, and easily deal with the problem of rushing into the carpet in the scene of dragging the ground.

- 1、低成本，机器提高复杂环境生存率
- 2、门槛识别
- 3、地毯识别
- 4、低矮障碍物免撞
- 5、精细沿墙，适应低矮墙角

- 1. Low cost, the machine improves the survival rate of complex environments
- 2. Threshold identification
- 3. Carpet recognition
- 4. Minor obstacles avoid collision
- 5. Fine along the edge & low corners



网络监控 定制开发

14 RGB全景摄像头 RGB PANORAMA CAMERA

- 1、视场角:190°
- 2、分辨率:1280*960像素
- 3、帧率:30fps
- 4、感光段:可见光段
- 5、使用环境:室内干燥环境
- 6、工作环境温度范围:0~40摄氏度(°C)
- 7、包装要求:需要缓冲包装
- 8、存储环境温度范围:-5~60摄氏度(°C)
- 9、软件:应用软件可定制开发
- 10、功能:网络摄像监控,180°全景漫游
- 11、尺寸:40mmX22mmX13.4mm

- 1.Field angle: 190°
- 2.Resolution: 1280 * 960 pixels
- 3.Frame rate: 30fps
- 4.Sensitive section: visible section
- 5.Use environment: indoor dry environment
- 6.Working environment temperature range: 0 ~ 40 °C (°C)
- 7.Packaging requirements: cushion packaging is required
- 8.Storage environment temperature range: -5~60 °C (°C)
- 9.Software: application software can be customized
- 10.Functions: network camera monitoring, 180° panoramic roaming
- 11.Size : 40mmx22mmx13.4mm



高精度
High-precision



抗干扰
Anti-interference



应用广
Widely used



稳定可靠
Stable and reliable



智能感应 时刻掌控

15 回充模块 DOCKING MODULE

1. 回充成功率:99.5%
2. 红外近卫距离:<1m
3. 红外最远距离:5m
4. 红外信号覆盖范围:170°
5. 条码识别距离:1m
6. 支持红外、条码方案的组合
7. 专利覆盖/支持定制外观/从硬件、光学、结构、软件提供完整的解决方案/支持定制增强功能: 近卫沿墙、集尘器

- 1.Recharge success rate: 99.5%
- 2.Infrared close range: < 1m
- 3.Infrared maximum distance: 5m
- 4.Infrared signal coverage: 170°
- 5.Bar code identification distance: 1m
- 6.Support combination of infrared and barcode schemes
- 7.Patent coverage / support customized appearance / provide complete solutions from hardware, optics, structure and software Solution / support customized enhancements: near wall, dust collector



回充成功率高
High recharge
success rate



信号覆盖广
Wide signal
coverage



识别距离长
Long recognition
distance

远程操控 了如指掌

16 APP与云服务器定制开发 CUSTOM DESIGN ON APP AND CLOUD

- | | | | |
|-----------|------------------------------|----------|---------------------------|
| 1、登录/注册 | 1.Sign in / register | 15、音量调节 | 15.Modulation |
| 2、配网 | 2.Distribution network | 16、清扫记录 | 16.Cleaning record |
| 3、添加设备 | 3.Add device | 17、重置地图 | 17.Reset map |
| 4、区域扫 | 4.Area sweeping | 18、还原地图 | 18.Restore map |
| 5、定点扫 | 5.Fixed point sweeping | 19、耗材记录 | 19.Consumables record |
| 6、全图扫 | 6.Full scan | 20、呼叫扫地机 | 20.Call the sweeper |
| 7、主界面显示 | 7.Main interface display | 21、遥控器 | 21.Remote control |
| 8、回充 | 8.Recharge | 22、故障检测 | 22.Fault detection |
| 9、设置风力 | 9.Wind power | 23、产品指南 | 23.Product Guide |
| 10、地图手动分区 | 10.Map manual zoning | 24、账号管理 | 24.Account management |
| 11、预约清洁 | 11.Appointment cleaning | 25、地图管理 | 25.Map management |
| 12、预约勿扰 | 12.Appointment not disturbed | 26、收藏地图 | 26.Collection map |
| 13、设备管理 | 13.Device management | 27、自动分区 | 27.Automatic partitioning |
| 14、灯光调节 | 14.Lighting adjustment | | |





卓越品质 放眼世界

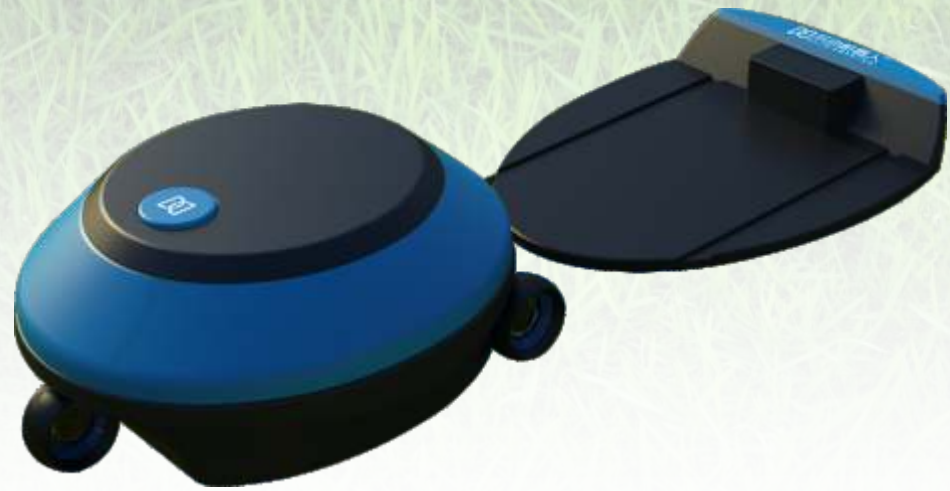
17 商业机器人系统 COMMERCIAL CLEANING ROBOT

继承消费类产品的可靠性和稳定性,同时引入针对商用场景的增强性优化,提供更长的探测距离,更强大的计算能力和存储能力,更大的建图范围,更强的可靠性。乐动机器人凭借在清洁机器人领域控制系统和算法的积累,以及稳定的商用传感器,在商用机器人领域具备了非常明显的竞争优势和特点。

This robot has inherited the reliability and stability of consumer robotics products and enhanced optimization for commercial scenarios, which can provide longer detection range, more computing power and storage capacity, greater mapping range, and greater reliability. With the accumulation of control systems and algorithms in the field of cleaning robots, as well as stable commercial sensors, LDROBOT has obvious competitive advantages and features in the field of commercial robots

- 1、掌握核心科技,超强的成本控制能力。凭借自研的导航与控制系统,以自研的商用激光雷达和其他传感器模组,对机器人核心部件性能、应用和发展趋势的把控能力非常强,能够在保证机器人性能稳定的同时有效降低整个系统的成本。
- 2、丰富的清洁机器人领域经验。拥有长达4年的清洁机器人相关的控制、算法系统以及核心传感器(例如:激光雷达和3D TOF)开发经验,在基本算法,细节把控,可靠性设计,系统测试等方面,均有完备的解决方案,能够有效降低整个系统的开发风险和开发周期。
- 3、完备的质量检测和跟踪体系。完善的质量检测和跟踪体系。乐动机器人拥有30多家国内外大型合作伙伴和国际品牌客户,与客户建立了多年的合作关系,我们根据丰富的市场和终端客户反馈建立了完整的测试标准、丰富多样的测试环境、测试设备与专业的测试夹具等。我们建立了大质量检测流程和跟踪管理程序,这些程序将整个供应链的核心模块与我们的成品生产全部结合在一起,将硬件和软件集成到我们的自主跟踪系统中。并且该套质量保证系统也在根据客户和市场需求进行不断完善和升级强化。
- 4、灵活多变的需求响应能力。乐动强大的技术能力与定制开发项目管理能力,能够快速响应客户的定制化需求,同时也能够协助客户评估筛选需求,确保产品功能与性能稳定的情况下,满足客户的个性化需求。
- 5、完备的云端和用户端接入能力。通过与阿里云和亚马逊AWS合作,能够实现用户端功能管理和数据分析能力在保障客户的数据安全的同时不断提升用户的体验。
- 6、多机联网,协同工作。乐动支持将多个清洁机器人进行联网,同时接入系统,并提供功能丰富的后台任务管理系统,可以灵活应对各种规模的环境需求。

1. Mastering the core technology, Proficient cost control ability. With self-developed navigation and control system and self-developed commercial Lidar and sensor modules, LDROBOT has strong abilities of controlling the robotics core components main features, appliances and development trends, which can effectively reduce the cost of the whole system as well as the stability of the robotics performance.
2. Extensive experiences in the cleaning robotics field. With up to 4 years' experiences in the development of control and algorithm systems, core sensor modules (e.g. LDS/3D TOF) related to the cleaning robot, we have complete solutions in basic algorithm, detail control, reliability design, system test and other aspects, which can effectively reduce the development risk and development cycle of the whole system.
3. Complete quality testing and tracing system. With more than 30 domestic and foreign large partners and international branding customers, LDROBOT has established partnership with the customers for many years, we have set up full test standards, varies of environment, testing equipment, professional testing jigs, and so on according our lavish market and end customers feedbacks. We have established the big quality and testing process and tracing management procedures, which procedures have combined the core modules full supply chain with our finish goods productions, integrated the hardware and software into our autonomous tracking system. This quality assurance system has been continuously improved and strengthen in subject to the customer and market voices.
4. Flexible demand response capability. With its strong technology demonstrations, customization development and project management capabilities, LDROBOT can quickly respond to customers' NPI requirements, and can also assist customers in evaluating and screening their expectations, so as to meet customers' product definition demands with stable product functions and performance.
5. Complete clouding and client access capabilities. Through cooperation with Aliyun Cloud and amazon AWS, we can realize the capability of client function management and data analysis to improve the user experience consistently as well as guarantee the data security of customers.
6. Multi-robot collaboration with network. LDROBOT supports multiple cleaning robots to be connected to the Internet and the operation system at the same time in one backstage task management system with rich functions, which can flexibly respond to the different environmental demands of various scales.



20 割草机器人 INTELLIGENT ROBOT MOWER

采用先进的RTK定位系统和激光雷达定位系统,能够适应各种不同的户外应用环境。结合软件虚拟墙,能够实现指定范围内的高精度定位工作。

The advanced RTK Positioning System and lidar positioning system can adapt to various outdoor application environments. Combined with software virtual wall, it can achieve high-precision positioning within the specified range.

- 1、RTK定位与激光雷达定位系统结合。能够实现RTK与LDS定位系统的互补协同工作能力,提高系统适应能力和可靠性。
- 2、高效的路径规划能力。能够高效地进行路径规划,实现环境内的充分覆盖,提高了设备使用效率。
- 3、多机联网,协同工作。乐动支持将多个机器人进行联网,同时接入系统,并提供功能丰富的后台任务管理系统,可以灵活应对各种规模的环境需求。
- 4、软件虚拟墙。完全摒弃了通过现场施工布线来限定工作范围的传统手段,采用软件虚拟墙来划定机器人的工作范围。
- 5、完备的云端和客户端接入能力。通过与阿里云和亚马逊AWS合作,能够实现用户端功能管理和数据分析能力在保障客户的数据安全的同时不断提升用户的体验。

1. RTK Positioning is combined with lidar positioning system. It can realize the complementary cooperative work ability of RTK and LDS positioning system, and improve the adaptability and reliability of the system.
2. Efficient path planning capability. The path planning can be carried out efficiently, the full coverage in the environment can be realized, and the utilization efficiency of the equipment can be improved.
3. Multi machine networking, collaborative work. LDROBOT supports the networking of multiple robots, simultaneous access to the system, and provides a background task management system with rich functions, which can flexibly meet the environmental requirements of various scales.
4. Software virtual wall. Instead of the traditional method of limiting the working range through the field construction wiring, the software virtual wall is used to delimit the working range of the robot.
5. Complete cloud and client access capabilities. Through cooperation with Alibaba cloud and Amazon AWS, it can realize the function management and data analysis capabilities of the user end, while ensuring the data security of the customer, it can continuously improve the user experience.

21 集尘宝专有设计 DUST COLLECTION STATION

该装置可以实现90度FOV的激光测距,生成点云信息,广泛应用于机器人定位与建图、规划与导航、以及自主动态与细小障碍物避障等,极大地提高了机器人对细小障碍物的处理能力和用户体验。

- | | |
|--------------|--|
| 1、四重密封,保证不漏尘 | 1. Quad seal for dust leakage |
| 2、尘盒单向阀 | 2. Dust one-way valve |
| 3、连接口硅胶密封 | 3. Connection port silicon seal |
| 4、尘袋口密封 | 4. Dust bag seal |
| 5、上盖硅胶密封 | 5. Cover silicon seal |
| 6、多种设计,保证吸得出 | 6. variety of designs for suction efficiency |
| 7、19000pa大吸力 | 7. 19000 PA suction power |
| 8、最短风道设计 | 8. Shortest Air tube |
| 9、人性化,易清洁 | 9. User-friendly Design |
| 10、专用尘袋设计 | 10. Dedicated dust bag |
| 11、三重过滤 | 11. Triple filtering |
| 12、不漏尘自封口 | 12. Self-sealing dust leakage |
| 13、尘满后自动提醒 | 13. Auto-reminding for full dust bag |
| 14、2.8L 超大容量 | 14. 2.8L Volume |
| 15、绿色无污染 | 15. Green and pollution-free |

