

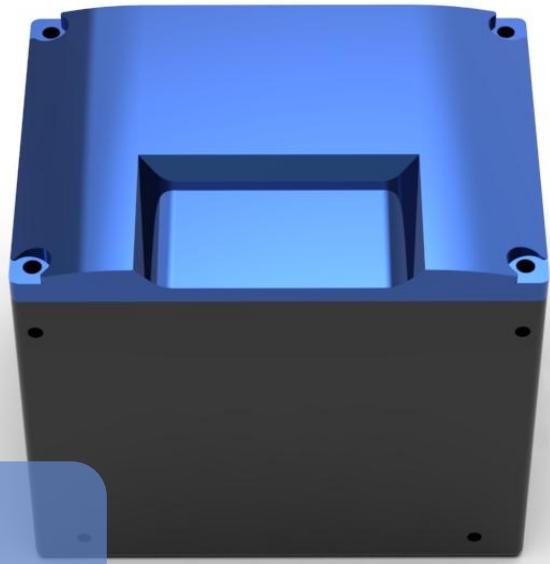
2D/3D LIDAR- WR LIDAR SERIES

WR/WS-2D/3D Lidar Product Manual



深圳市机智人科技有限公司出品

WITTY ROBOTICS 2D/3D LIDAR



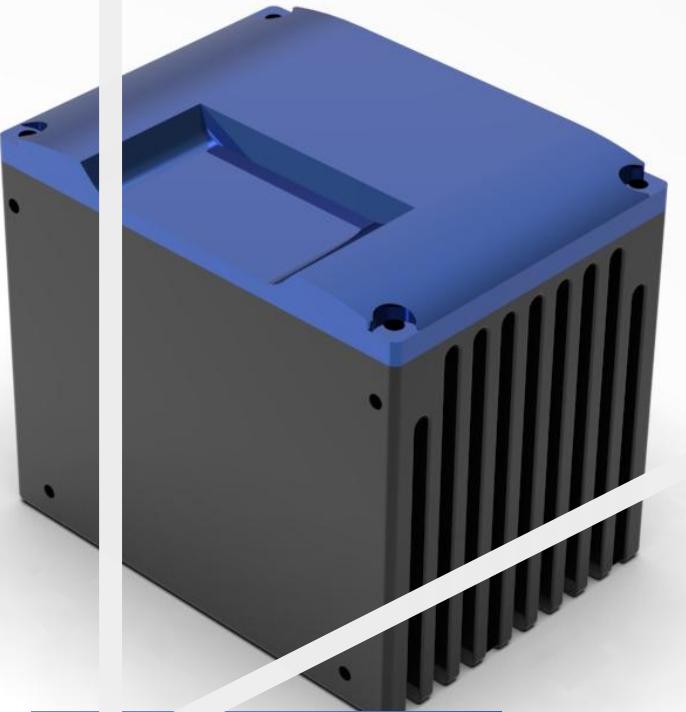
WS-30PCD-ET3 3D LiDAR

机智人®全固态面阵激光雷达

Witty Robotics 3D LIDAR / Witty Sensor

- WR (Witty Robotics) Lidar:
- Ranging lidar, radar data accuracy and data frequency are high. The latest long-range radar products can achieve a detection range of 50 meters, an angular resolution of 0.33, and a maximum of 540,000 point cloud density output per second. It is IP67 and has passed various variations and rigorous tests. The operation interface is simple, the product is easy to use and easy to operate, the short-range data is clear and reliable, the boundary is clear, the radar data is stable, and there is no obvious noise.
- 测距型激光雷达，雷达数据精度和数据频率较高。最新长距雷达产品可以做到50米检测范围，0.33角分辨率，每秒最高540,000点云密度输出。通过IP67，通过各种变化各种严苛测试。操作界面简单，产品使用方便易操作，近距离数据清晰可靠，边界清晰，雷达数据稳定，无明显噪声。

3D LIDAR- WR LIDAR SERIES



性能优势

2万小时工业级使用寿命时间，纯固态结构,产品品质稳定，可靠性高，抗震动抗干扰强，减少产品故障率。较高精度、高分辨率、高速测量。激光建图常见的拖尾、噪点能够得到有效抑制，减少人工时间与人力成本，方便程序员操作和维护保养。操作界面简单，产品使用方便易操作，可拆卸窗口设计，有划伤情况时，免于整机的报废，极大提高产品的使用率和减少购买成本。

20,000 hours of industrial-grade service life, stable product quality, high quality reliability, strong anti-vibration interference, and reduce the time cost and the cost of product maintenance. The detachable window design eliminates the scrapping of the whole machine when there is scratching, which greatly improves the utilization rate of the product and reduces the purchase cost.

性能优势

WR (Witty Robotics) 3D LiDAR:

Strong structure, high quality and reliability, anti-vibration interference, reduce the time cost and labor cost of product maintenance and repair. The unique heat dissipation mechanical design structure can extend the service life of the product. The unique window design effectively improves the ability to resist dirt.

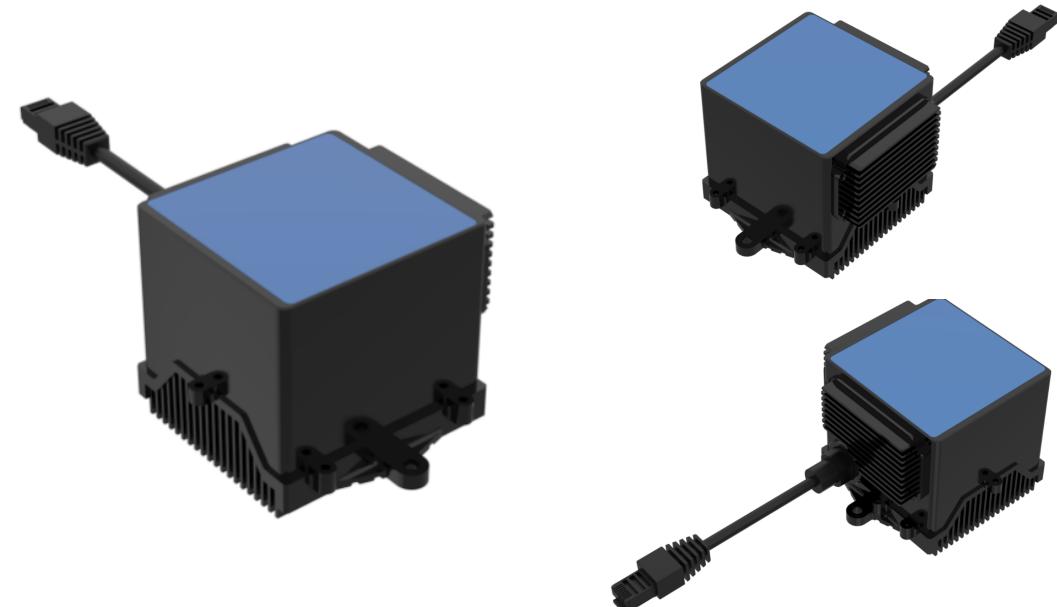
纯固态结构，品质可靠性高，抗震动干扰强，减少产品的维护保养和维修的时间成本和人力成本。独有的散热机械设计结构，能延长产品的使用寿命，独特的窗口设计，有效提高抗脏污的能力。

Specifications: 30M

Standard Data Collection Type Lidar

CLASS 1 Witty Robotics

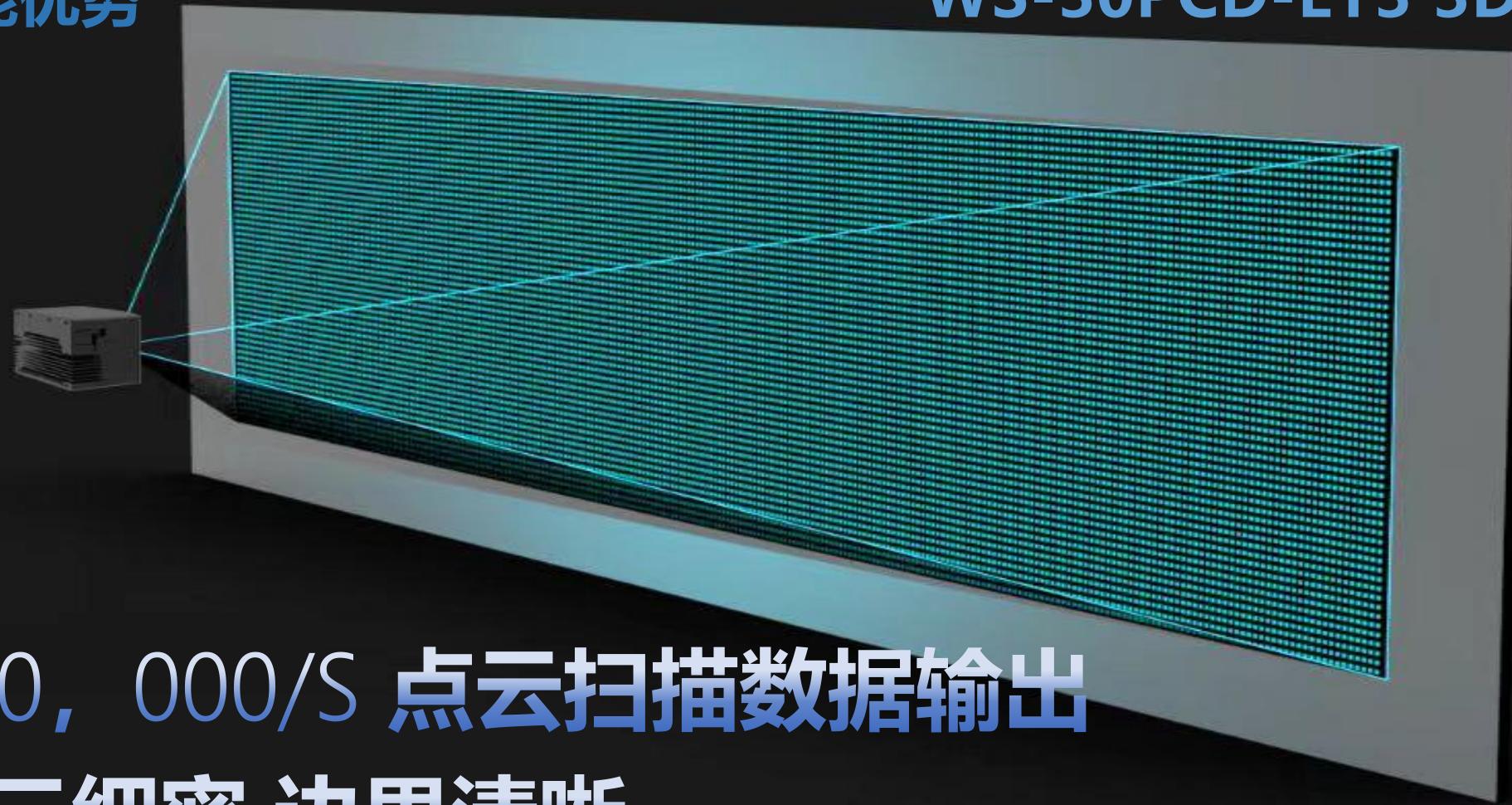
LIDAR PRODUCT



WS-30PCD-ET3 3D LiDAR

性能优势

WS-30PCD-ET3 3D LiDAR



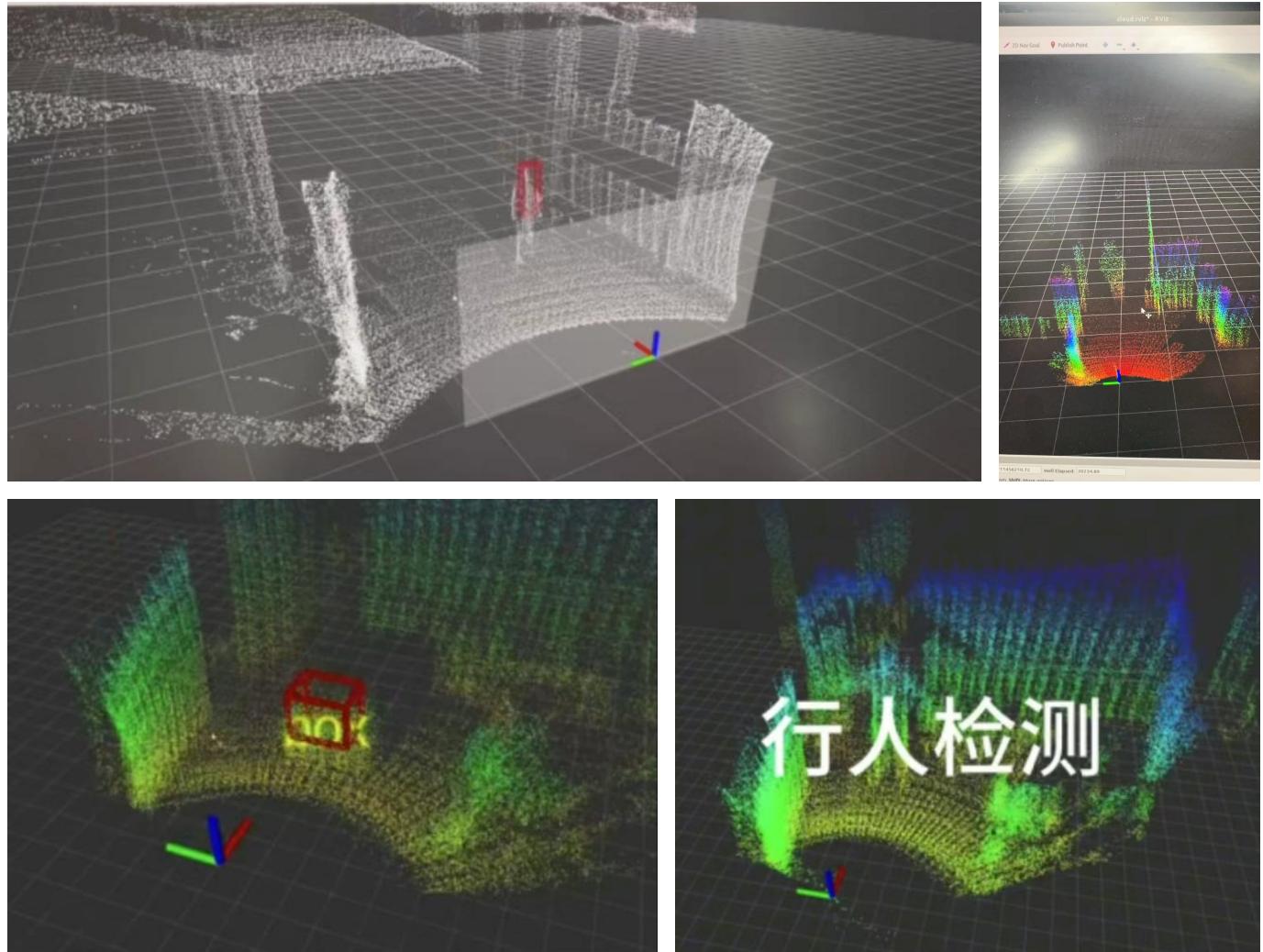
540, 000/S 点云扫描数据输出
点云细密 边界清晰

Product Advantages

WS-30PCD-ET3 3D LiDAR

3D雷达点云开发应用功能介绍

- 人物识别
- 物体识别
- 体积测量
- 避障绕障
- 异物监测
- 地图构建
- 导航定位



机智人WS-30PCD-ET3
应用场景示例：割草机器人

Application : Lawn Mower Robot



Robotic Law



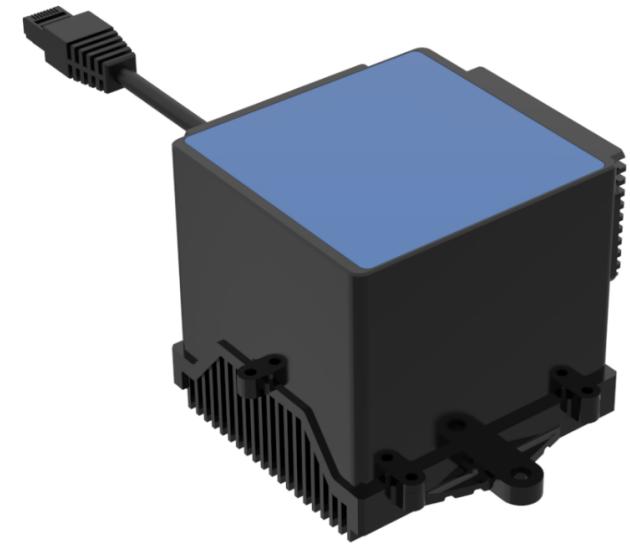
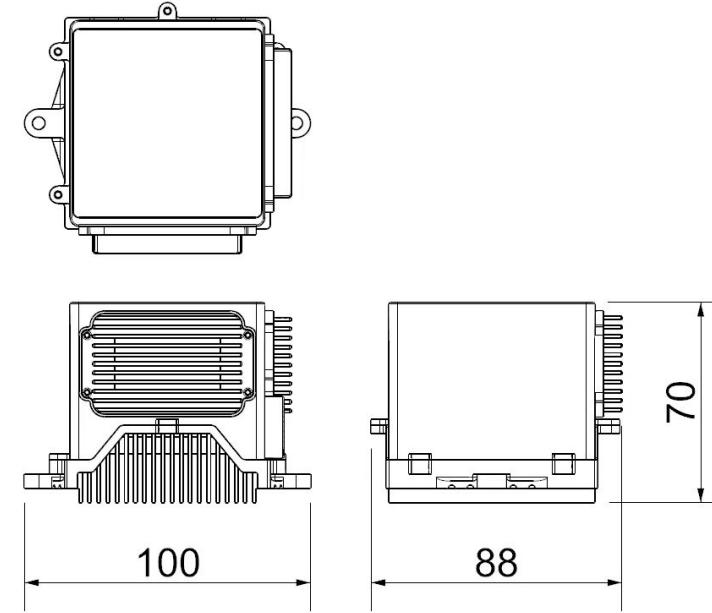
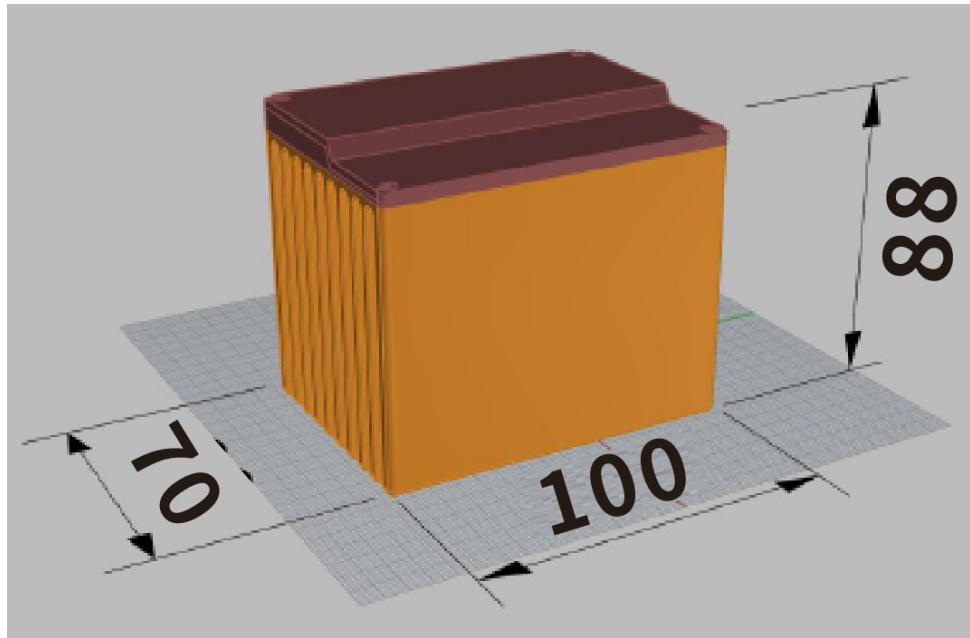
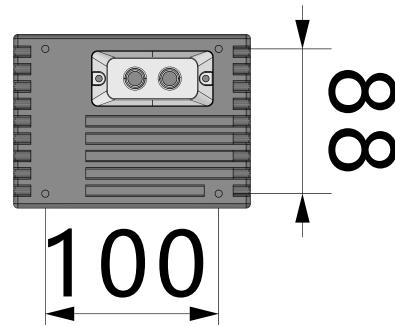
场景应用性能优势

高分辨率、高速测量激光雷达。脉冲激光光源稳定，光束均匀，点云数据形成的物体扫描边界清晰，抖动误差小，超低功耗，激光建图常见的拖尾、噪点能够得到有效抑制，减少人工时间与人力成本，方便程序员操作和维护保养。

High-resolution, high-speed measurement lidar. The pulsed laser light source is stable, the beam is uniform, the object scanning boundary formed by the point cloud data is clear, the jitter error is small, the ultra-low power consumption, the common tailing and noise of laser mapping can be effectively suppressed, reducing labor time and labor costs, and facilitating the operation and maintenance of programmers.

性能描述					
Laser Class 激光等级	1, (eye-safe)	Laser light source 光源	905nm	Ingress protection 防水性能	IP67
激光线束 Laser beams	150线	Frequency 扫描频率	10 Hz	Repeatability 重复精度	5cm
systematic Error 测量误差	10cm	Operation Range 操作量程	30m---0.2m	Max Range 最大量程	30m10%反射率 50m90%反射率
Horizontal FoV 水平视场角扫描范围	120°	Vertical FoV 垂直视场角扫描范围	50°	Output Data 输出数据内容	点云数据 Point Cloud Data
Ambient Light Immunity 抗光性能	100klux	Response time 反应时间	100ms/times 100毫秒/次	Frequency of data collection 数据采集频率	540, 000 data points/s
Echo mode 回波模式	Single echo 单回波	Echo Amplitude 回波强度	16位	The size of the spot 光点大小	直径3.2cm
Angular Resolution 角分辨率	0.33°	Supply Voltage 电源电压	DC10-16V	Power Consumption 功耗	<17W
output 接口类型	Ethernet UDP 以太网, UDP协议	Temperature 工作温度	Operating: 操作温度-20 ~ 55°C Storage: 储存温度-40 ~ 85°C	Moisture 工作湿度	Operating: 操作湿度 35%RH ~ 85%RH, Storage: 存储湿度 35%RH ~ 95%RH
Weight重量	360 g	size 尺寸	82*72*60mm	Power-on start time 起始时间	Typical value 8s 常规值8s

产品体积小巧便于安装
使用3D/2D尺寸图





WITTY ROBOTICS
& WITTY SENSOR

深圳市机智人科技有限公司
Shenzhen WittyRobotics Co., Ltd

深圳市机智人科技有限公司的核心团队在2014年底建立了中国最早期的机器人技术交流社区ROS维基技术交流社区 (www.roswiki.com)。基于对机器人技术的掌握，先后为多所大学、研究所等机构提供多款移动机器人。公司拥有独立的机器人开发能力和经验，所开发机器人相关产品供应给中科院、清华大学、同济大学、浙江大学和深圳大学等著名院校；与国际领先激光研究所深度合作进入激光雷达领域开发出WR (Witty Robotics)系列Witty Sensor激光雷达，并于2017年11月参与制定国内激光雷达标准初审制定，联合国际顶尖激光雷达企业，成为起草国家标准的发起代表企业。目前公司激光雷达产品已有三大系列，20多款成熟激光雷达产品型号已经广泛在机器人公司、AGV搬运和低速自动驾驶机器人等领域树立口碑。

2017年11月21日，机智人科技创始人沈天龙先生受邀参加第二届全国工业机械电气系统标准化技术委员会电敏装置工作组(SAC/TC231/WG6)第二次大会，会议主题讨论国内激光雷达标准制定初审等相关事宜。2019年公司获得欧盟TUV颁发的CE证书，产品质量获得国际认可。2020年11月23日深圳市机智人科技有限公司受邀作为中国电器工业协会《移动机器人振动与冲击试验条件制定方法》与《机器人控制部件可靠性强化试验方法》团体标准第二次工作组会议标准起草成员单位，成为机器人激光雷达行业质量安全领域的领先企业。



WITTY ROBOTICS

CE



Product Advantages

2D/3D LIDAR- WR /WS LIDAR SERIES

This LIDAR is available in and out of the room. It has good reflection effect on glass, smooth surface and black object. Can be used in ultra-low temperature, direct sunlight, dust environment, high magnetic environment.

It has superior performance against direct sunlight, dust, magnetic and light. product performance is safe and stable, exported to many countries. Obtain CE certificate issued in accordance with EU TUV, compulsory certification safety, human eye safety. Performance through international certification standards to scan high frequency, stable Product quality and high cost-effective market recognition.

机智人单线激光雷达系列产品室内外通用，对玻璃、光滑表面和黑色物体都有良好的反射效果。可用于超低温、阳光直射、粉尘环境、高磁性环境中，抗阳光直射、灰尘、抗磁干扰都有优异的性能。

抗阳光直射、灰尘、磁干扰有优异的表现。产品性能安全稳定，出口到多个国家。获得欧盟强制认证安全，人眼安全。性能通过国际认证标准。扫描频率高、稳定的产品质量和高性价比得到市场认可。

WITTY ROBOTICS

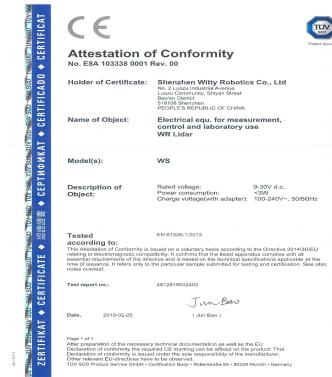


2D LIDAR- WR LIDAR SERIE

The domestic mass-Reduced Pulse TOF ranging-based mini Pulse Lidar in China, WR series Lidar can achieve 2-D Detection and outline scanning of 270° or 360° scanning range, with a radius of 6-120m.

High accuracy, high resolution, and wide the wide field of view gives the automated navigation robots fantastic environmental recognition capability; the compact design saves installation space; it is light and does not consume a high amount of power; it is not subject to light inference while can also work in the dark; it can measure from distance and does not have to contact the object measured.

CE



"A CE" sign is a security certification sign and is considered a passport that the manufacturer opens and enters the European market. CE represents European unity (CONFORMITE EUROPEENNE).

The "CE" mark" in the EU market is a mandatory certification mark, whether it is a product produced by an enterprise within the EU or a product produced in other countries, if it is to circulate freely in the EU market, it must be affixed with a "CE" mark "to show that the product conforms to the EU Basic requirements of the new approach to technical coordination and standardization directive. This is a mandatory requirement for products under EU law.

"CE"标志是一种安全认证标志，被视为制造商打开并进入欧洲市场的护照。CE代表欧洲统一 (CONFORMITE EUROPEENNE)。

在欧盟市场"CE"标志属强制性认证标志，不论是欧盟内部企业生产的产品，还是其他国家生 产的产品，要想在欧盟市场上自由流通，就必须加贴"CE"标志，以表明产品符合欧盟

《技术协调与标准化新方法》指令的基本要求。这是欧盟法律对产品提出的一种强制性要求。



Application occasions

The obstacle avoidance type is suitable for the anti-collision of mobile robots. Typical applications are automatic guided transport vehicles (AGV) and rail shuttle vehicles (RGV).

warning

- Read this manual carefully before wiring.
- Must be wired when power is off.
- Double insulation or reinforced insulation must be used between all input and output interfaces and dangerous voltage when the power is cut off, otherwise it may cause electric shock.
- WR cables must be far away from high-voltage wires and power lines. It is strictly forbidden for users to replace cables without authorization.
- It is strictly forbidden for the user to change the cable privately.
- After clarifying the signal meaning of all terminals, complete the connection.

Please read this manual carefully before wiring

Before using WR, read this manual carefully to understand the installation, operation and setting procedures and requirements.

WR should be selected, installed, overhauled and maintained by Professionals.

Professionals refer to those who have received Professional training and have obtained recognized qualifications, or those who have extensive knowledge, training and experience and have been proven to have the ability to solve such Emblems.

class 1 laser safety product (eye safety); the laser beam cannot be seen by the human eye.

Use of controls not specified in this manual, adjustment of devices, or execution of Reduces may result in hazardous radiation exposure.

To avoid the light path hitting the ground, the installation height of WR should be $\geq 200\text{mm}$.

Try to keep WR away from the vibration area when installing.

When the USB interface is opened, prevent moisture, dust, etc. from entering the WR.

In order to reach the IP65 protection level during use, please press the black sealing cap on the USB interface tightly.

WR should be used in places where the altitude is not less than 2000m.



Safety precautions

The following safety warning signs are used personal injury hazards, please follow all safety information with this symbol to avoid possible injury.

Please read this manual carefully before wiring

Wiring must be conducted when the power is cut off Double insulation or reinforced insulation must be used between all input and output interfaces and dangerous voltage. Otherwise, electric shock may be caused.

The cable of WR must be kept away from high-voltage wires and power lines It is strictly forbidden for users to replace the cable without permission Conduct correct wiring after defining the signal meanings of all terminals.

Applications

The protection object of WR must only detect the objects that go into the protection zone.

WR cannot detect transparent The size of objects that go into the protection zone must be greater than or equal to

Do not install WR in the following environment

Places outside the range of environment specified in the Operation Instructions (light, impact and vibration)

Places with flammable

Places with smoke, particles, corrosive substances .

Places that may generate direct light on the WR.

Safety precautions

Before using WR, please carefully carefullly to understand the procedures and requirements of installation, operation and setting

WR should be selected, installed, overhauled and maintained by Professionals people who have been Professionally tr accredited, or people who have a wealth of knowledge, training and experience problems.

To prevent the light from being installation height of WR should over or about 200mm.

Try to keep WR away from the vibration area during installation. When the USB interface is open should be prevented from entering the WR. In order to achieve the IP65 protection black seal cover on the USB interface

Do not drop WR.

WR should be used in accordance with local standards and laws and regulations

Users should establish rules and regulations for safe operation and management and implement effectively.



warning

接线前请仔细阅读本手册，请仔细阅读本手册，了解安装、操作和设置程序和要求。WR应由专业人员进行选择、安装、检修和维护。专业人员是指接受过专业培训并获得认可资格的人，或具有广泛的知识、培训和经验并被证明有能力解决这些标志人。一级激光安全产品（眼安全），人眼看不到激光束。使用本手册中未规定的控制装置、调整设备或执行减少措施，都可能导致危险的辐射暴露。为避免激光接地，安装高度请咨询技术人员。

联系方式：400-1515-230

Please read this manual carefully before wiring, please read this manual carefully to understand the installation, operation and setup procedures and requirements. WR should be selected, installed, overhauled and maintained by professionals. A professional is a person who has received professional training and a recognized qualification, or who has extensive knowledge, training and experience and has been proven to be able to address these signs. Class 1 laser safety products (eye safety), the laser beam is not visible to the human eye. The use of controls, adjustments to equipment, or implementation of mitigation measures not specified in this manual may result in dangerous radiation exposure. In order to avoid the laser touching the ground, consult a technician for the installation height.

Contact: 400-1515-230

在应用过程中，WR的保护对象只能检测到进入保护区的对象。不能检测完全透明物体，进入保护区的物体的大小必须大于或等于参数值，不得安装在操作说明书规定的环境范围之外的以下环境场所，以及有烟雾、颗粒、腐蚀性物质的易燃场所。

During application, the protected objects of the WR can only detect objects that enter the protected area. Completely transparent objects cannot be detected, and the size of the object entering the protected area must be greater than or equal to the parameter value, and it must not be installed in the following environmental places outside the environmental range specified in the operating instructions, as well as in flammable places with smoke, particles, corrosive substances.

在接线前，请仔细阅读本手册。在进行连接时必须断电时。断电时，所有输入输出接口和危险电压之间必须采用双绝缘或加强绝缘，否则可能造成触电。无线电缆必须远离高压电线和电力线。严禁用户私自更换电缆。在明确所有端子的信号含义后进行连接。

Please read this manual carefully before wiring. When the power must be cut off while the connection is being made. In the event of a power failure, double or reinforced insulation must be used between all input and output interfaces and the dangerous voltage, otherwise electric shock may be caused. Wireless cables must be kept away from high-voltage wires and power lines. It is strictly forbidden for users to replace the cable without permission. Connect after clarifying the signal meaning of all terminals.



www.wittirobotics.com
400-1515-230