

毫米波雷达 “微电” 系列测距应用

The ranging application of the "Micro Electric" series of millimeter-wave radar

120GHz 低功耗测距雷达

120GHz low-power ranging radar

LDRR15 产品规格书

Product Specification Sheet of LDRR15

专注于毫米波雷达产品设计研发

Specialized in millimeter wave radar product design and development.



本手册将描述我司“微电”系列测距雷达的技术参数，用于指导您详细了解并选择合适的雷达产品。为了您能更好、更全面的使用相关设备，在安装、使用前，请务必认真阅读此选型手册。

This manual will describe the technical parameters of our company's "Weidian" series ranging radars, to guide you in thoroughly understanding and choosing the appropriate radar products. In order for you to use the relevant equipment better and more comprehensively, please read this selection manual carefully before installation and use.

1、产品概述 Product Overview

LDRR15 太赫兹雷达适用于储罐、泵站、下水井、地下管网等多种测距应用场景。雷达集成微带天线、射频电路及信号处理电路，采用 FMCW 模式，非接触式安装设计，盲区小、精度高、抗干扰能力强。

The LDRR15 terahertz radar is suitable for various ranging application scenarios such as storage tanks, pumping stations, manholes, and underground pipe networks. The radar integrates a microstrip antenna, RF circuit and signal processing circuit, adopts FMCW mode, and features a non-contact installation design with a small blind zone, high precision and strong anti-interference ability.



图 1- 产品效果图

Figure 1- Product effect drawing

2、产品尺寸及接线定义 Product dimensions and wiring definitions

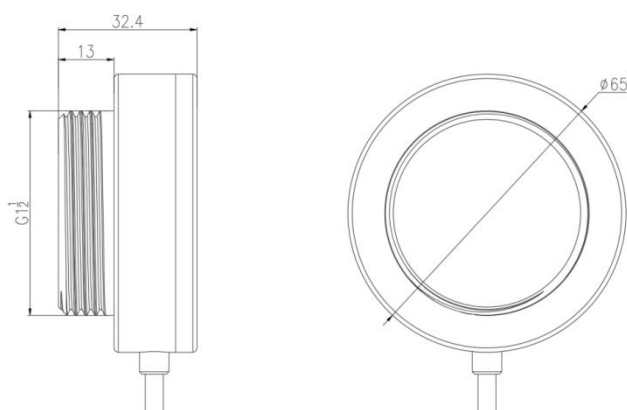
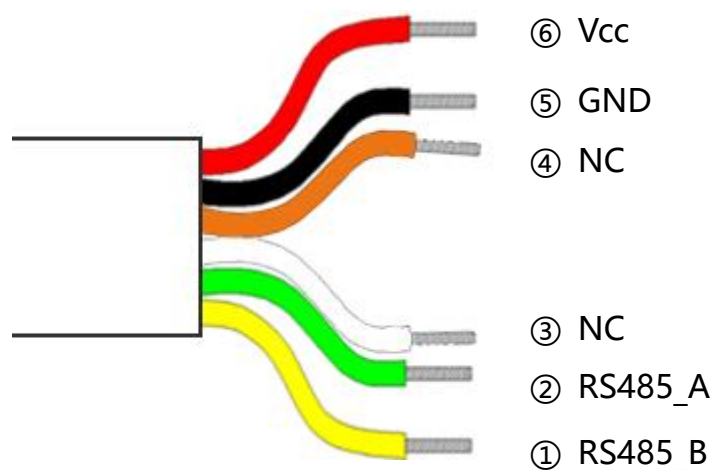


图 2- 产品尺寸图

Figure 2- Product size diagram



管脚 Pin	名称 Name	说明 Explanation	备注 Remarks
1	RS485_B	RS485_B (黄线) RS485_B (Yellow line)	RS485/TTL 可选，默认 RS485。 如需 TTL 输出请与客服进一步沟通。 RS485/TTL is available, with RS485 as the default. If you need TTL output, please communicate further with customer service.
2	RS485_A	RS485_A (绿线) RS485_A (Green line)	
3	NC		
4	NC		
5	GND	GND (黑线) GND (black wire)	
6	Vcc	9~24V (红线) 9 to 24V (red line)	

图 3- 接线定义

Figure 3- Wiring Definition

3、性能指标 Performance indicators

参数 Parameter	符号 Symbol	最小值 Minimum	典型值 Typical	最大值 Maximu	单位 Unit	说明 Remark
发射机 Transmitters						
发射频率 Emission Frequency	f	120		125	GHz	
输出功率（EIRP） Output Power (EIRP)	P _{out}		13	20	dBm	
天线角度 Antenna Angle						
波束宽度（-3dB） Beam width (-3dB)	水平方向 Horizont		±25		°	
	垂直方向 Vertical		±25		°	
波束宽度（-3dB）外接透镜天线 External lens antenna with beam width (-3dB)	水平方向 Horizont		±3		°	
	垂直方向 Vertical		±3		°	
电源 Power supply						
工作电压 Working voltage	V _{CC}	9~24			V	
工作电流（DC12V） Operating current (DC12V)	I _{CC}	1.6	9		mA	
环境 Environment						
工作温度 Working temperature	T _{OP}	-45		+85	℃	
重量 Weight	130g					
外壳材质 Shell material	ASA					
防护等级 Protection grade	IP68					
测量指标 Measurement index						
测距范围 Ranging range	0.02~10m					
测量精度 Measurement accuracy	±1mm					
分辨率 Resolution	1mm					
刷新率 Refresh rate		0.1	10	10	Fps	
数字接口 Digital interface	RS485/TTL 可选，默认 RS485 RS485/TTL is available, with RS485 as the default					
启动时间 Start-up time	1s					

说明:

- (1) 雷达工作频段为 120GHz，测距范围最大 10 米。根据物体 RCS 的大小，探测距离的最大值会有偏差。
- (2) 客户如有全量程高精度要求，请将产品对标高精度产品测试，给出测试数据，我们可以根据测试数据进行标定，标定后可以达到。
- (3) 雷达出厂默认配置兼容 ASCII\MODBUS 两种协议，可自行根据相应指令切换协议模式（详细协议文件请向我司索取）。

Explanation

- (1) The radar operates on a frequency band of 120GHz and has a maximum ranging range of 10 meters. The maximum value of the detection distance may vary depending on the size of the object's RCS.
- (2) If the customer has full-range high-precision requirements, please test the product against high-precision products and provide the test data. We can calibrate based on the test data. After calibration, it can be achieved.
- (3) The default configuration of the radar at the factory is compatible with both ASCII and MODBUS protocols. You can switch protocol modes according to the corresponding instructions by yourself (for detailed protocol files, please request them from our company).

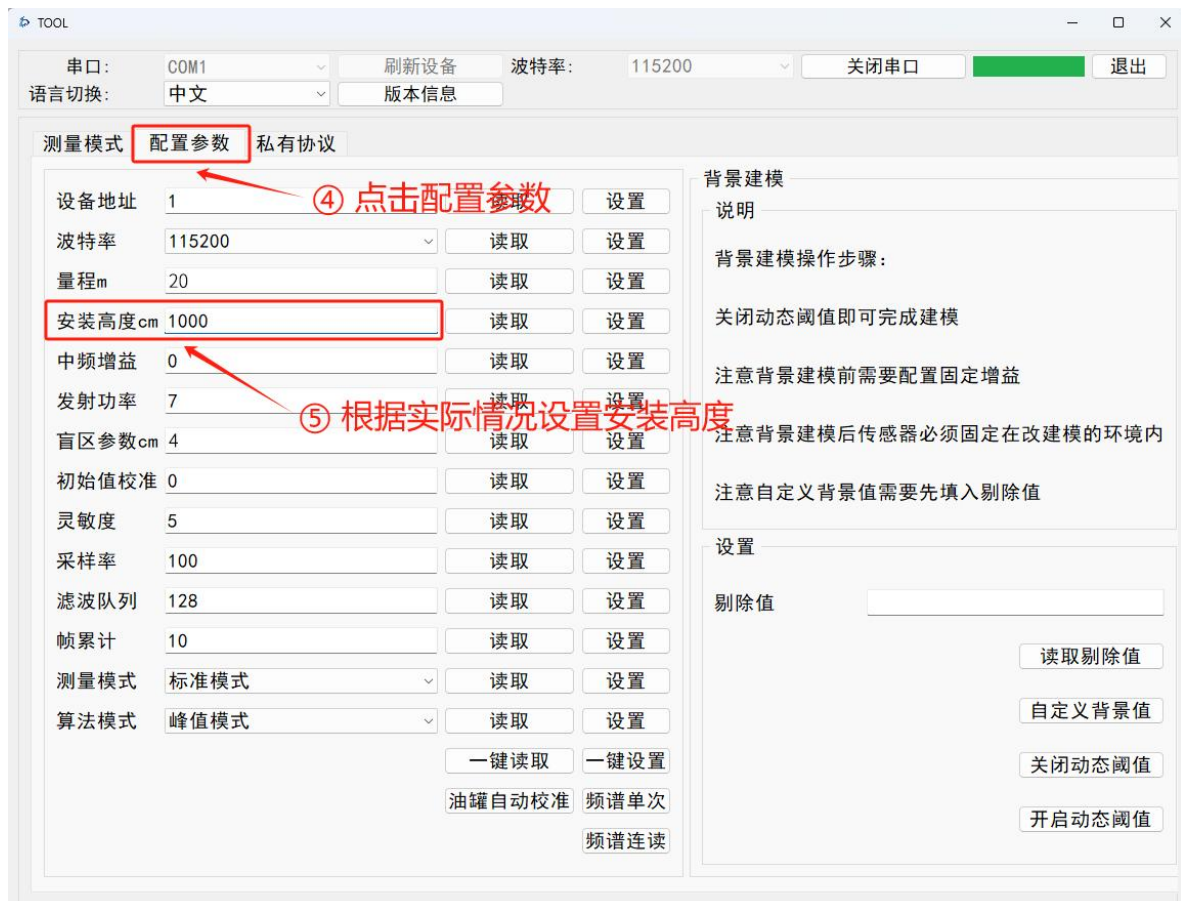
4、测试注意事项

- (1) 上位机连接雷达注意事项：确保波特率正确，出厂默认 115200；确保供电 9-24V，建议稳定在 12V；确保 485AB 接线正确。
- (2) 雷达正对且垂直被测介质（以下简称为介质）。
- (3) 介质选用高介电常数目标物，以下是首选：水，金属，混凝土墙面或地面。以下是禁忌：塑料，玻璃，纸张，陶瓷，非混凝土墙体（比如空心墙体）等低介电常数介质。
- (4) 雷达波传播路径，不能出现比介质更强反射信号的物体，原则上是要确保是空旷的。
- (5) 雷达与介质距离大于雷达盲区，理论上雷达盲区会随着介质介电常数的增加而增加。

Test Precautions

- (1) Precautions for connecting the upper computer to the radar: Ensure the baud rate is correct. The factory default is 115200. Ensure the power supply is 9-24V, and it is recommended to stabilize it at 12V. Make sure the 485AB wiring is correct.
- (2) The radar is directly aligned with and perpendicular to the medium being measured (hereinafter referred to as the medium).
- (3) The medium should be a target with a high dielectric constant. The following are the preferred choices: water, metal, concrete walls or floors. The following are contraindications: low dielectric constant media such as plastic, glass, paper, ceramics, and non-concrete walls (such as hollow walls).
- (4) The propagation path of radar waves should not have objects that reflect signals more strongly than the medium. In principle, it is necessary to ensure that it is open.
- (5) When the distance between the radar and the medium is greater than the radar blind zone, theoretically, the radar blind zone will increase with the increase of the dielectric constant of the medium.

5、产品参数设定指示图 Product parameter setting indication diagram



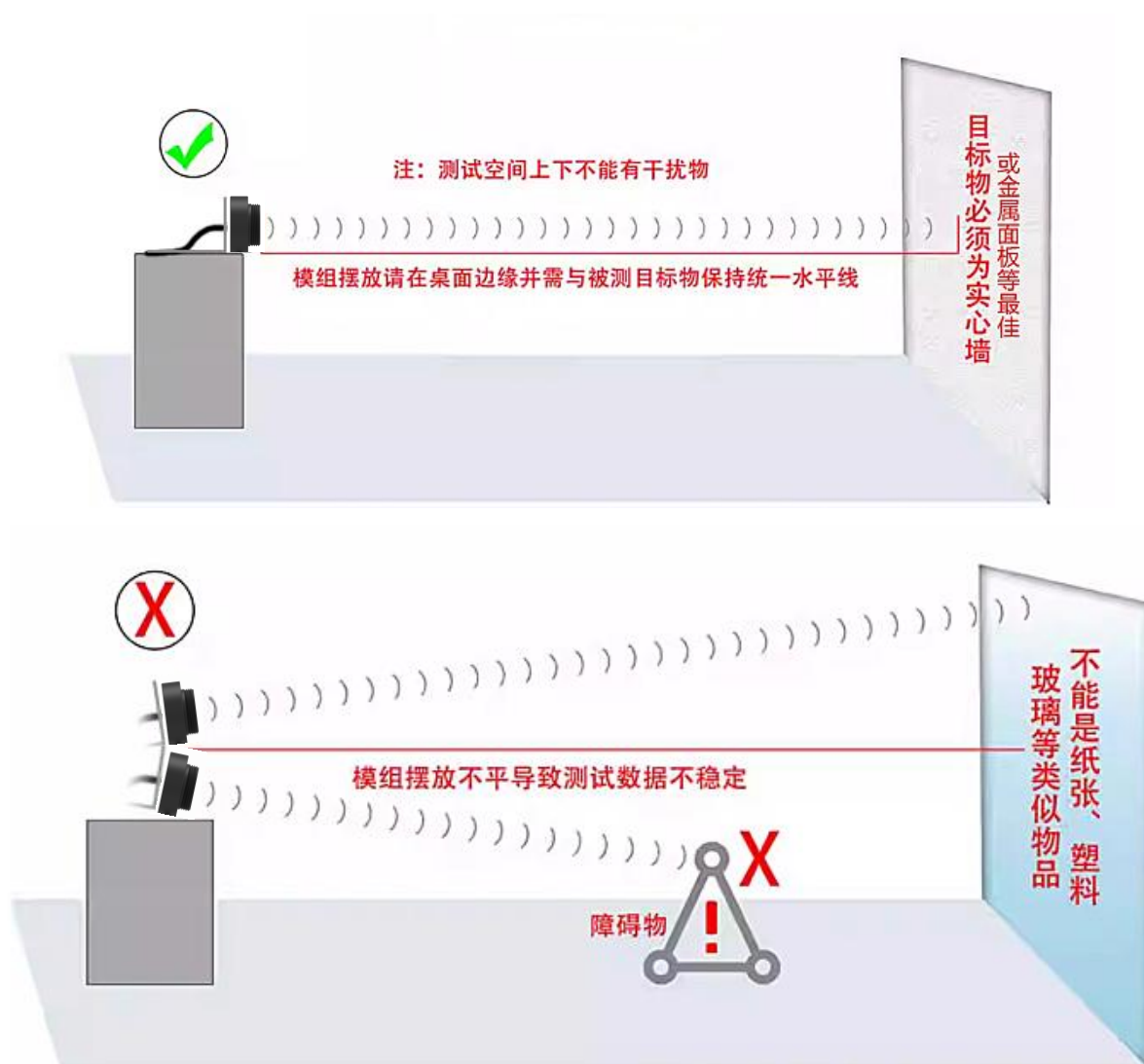
注意：安装高度为雷达垂直到水底的距离，读取水位时必须先设置安装高度，注意是雷达垂直到水底的直线距离，不是雷达安装的立杆高度。

以上 5 点依次操作完毕后，即可进行初步测试。如需更多详细参数说明文件请向我司索取。

Note: The installation height is the distance from the radar vertical to the bottom of the water. When reading the water level, the installation height must be set first. Note that it is the straight-line distance from the radar vertical to the bottom of the water, not the height of the radar installation pole.

After completing the above five points in sequence, the initial test can be conducted. If you need more detailed parameter description documents, please contact our company.

6、产品测试示意 Product test illustration



如您对该产品有任何疑问及建议，请与我们联系，我们将竭诚为您服务！

If you have any questions or suggestions about this product, please contact us and we will serve you wholeheartedly!

THANKS