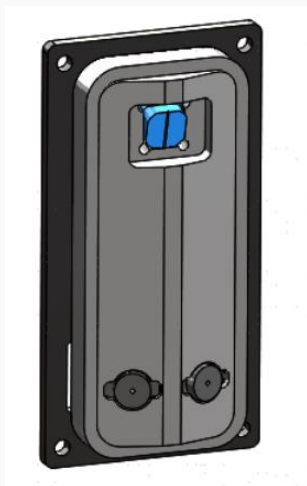


YDLIDAR GS5 USER MANUAL



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1 YDLIDAR GS5 LIDAR DEVELOPMENT KIT

The development kit of YDLIDAR GS5 lidar (hereinafter referred to as GS5) is an accessory tool provided for performance evaluation and early development of the GS5. Through the GS5 development kit, and with the evaluation software, users can observe point cloud data scanned by GS5 on your environment or development on the SDK.

1.1 Development Kit

The GS5 development kit has the following components:



GS5 LiDAR



USB Type-C Cable



USB Adapter Board

FIG 1 YDLIDAR GS5 DEVELOPMENT KIT

CHART 1 YDLIDAR GS5 LIDAR DEVELOPMENT KIT DESCRIPTION

Item	Qty.	Description
GS5 lidar	1	Standard version of the GS5 lidar.
USB Type-C Cable	1	Use with USB adapter board to connect GS5 and PC. USB cable is both a power supply cable and a data cable
LiDAR Extension		Connect the GS5 to the USB adapter Both power supply cable and data cable
USB Adapter Board	1	Realize the function of USB to UART, which is convenient for the fast interconnection between GS5 and PC

Note: USB Adapter board has two USB TYPE C interface: USB_DATA, USB_PWR.

USB_DATA: Data powered interface. In most cases, this interface can be used to meet power and communication requirements.

USB_PWR: Auxiliary power supply interface. The USB interface of some development platforms has weak current drive capability. At this time, auxiliary power supply can be used.

2 USAGE UNDER WINDOWS

2.1 Device Connection

When evaluating and developing GS5 under windows, GS5 and PC needed to be connected. The specific process is as follows:

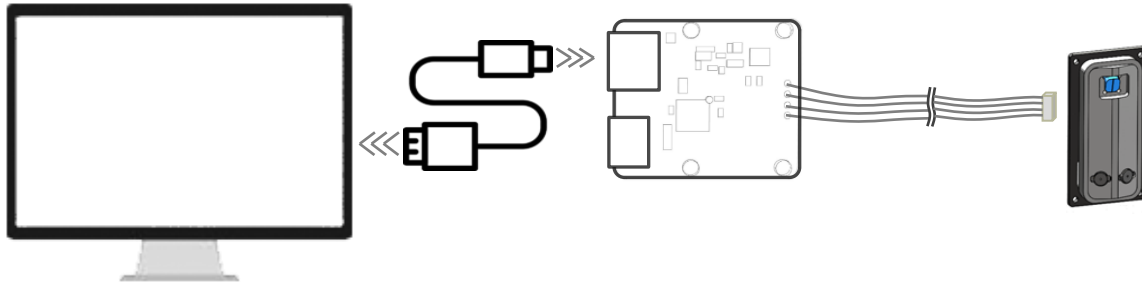


FIG 2 YDLIDAR GS5 DEVICE CONNECTION

Connect the adapter board with GS5 first, then connect the USB cable to the USB port of the adapter board and the PC. Note that the Type-C interface of the USB cable is connected to the USB_DATA of the USB adapter board.

The drive current of USB interface of some development platforms or PC is not sufficient. GS5 need to be connected to the auxiliary power supply of +5V, otherwise the lidar will be abnormal.

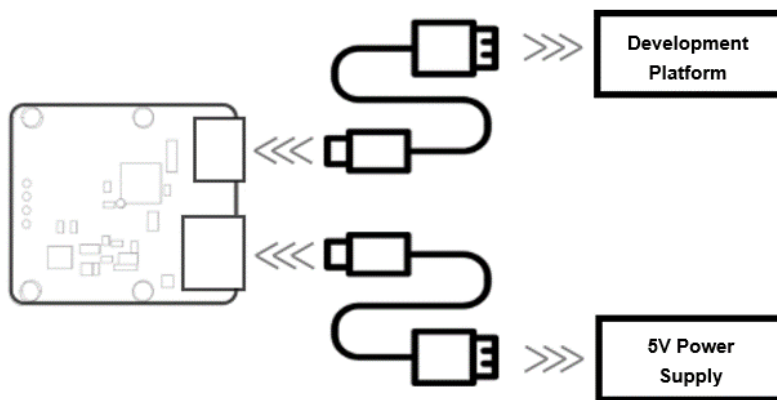


FIG 3 YDLIDAR GS5 AUXILIARY POWER SUPPLY

2.2 Driver Installation

To evaluate and develop the GS5 under Windows, the serial port driver of the USB adapter board. The USB adapter board need to be installed of this kit adopts CP2102 chip to realize serial port (UART) to USB signal conversion. Its driver can be downloaded from our official website or downloaded from the official website of Silicon Labs.

<https://www.ydlidar.com/dowfile.html?id=97>

<http://cn.silabs.com/products/development-tools/software/usb-to-uart-bridge-vcp-drivers>

After unzip the driver package, run the CP2102's Windows driver installation file (exe file under CP210x_VCP_Windows). Please select the 32-bit version (x86) or 64-bit version (x64) installation program according to the version of the windows operating system.

Name	Type	Size
x64	File folder	
x86	File folder	
CP210xVCPInstaller_x64.exe	Application	1,034 KB
CP210xVCPInstaller_x86.exe	Application	911 KB
CP2102 serial port driver installation.txt	文本文档	1 KB
dpinst.xml	XML Document	12 KB
SLAB_License_Agreement_VCP_Windows.txt	文本文档	9 KB
slabvcp.cat	Security Catalog	11 KB
slabvcp.inf	Setup Information	12 KB

FIG 4 YDLIDAR GS5 DRIVER VERSION SELECTION

Double-click the exe file and follow the prompts to install it.

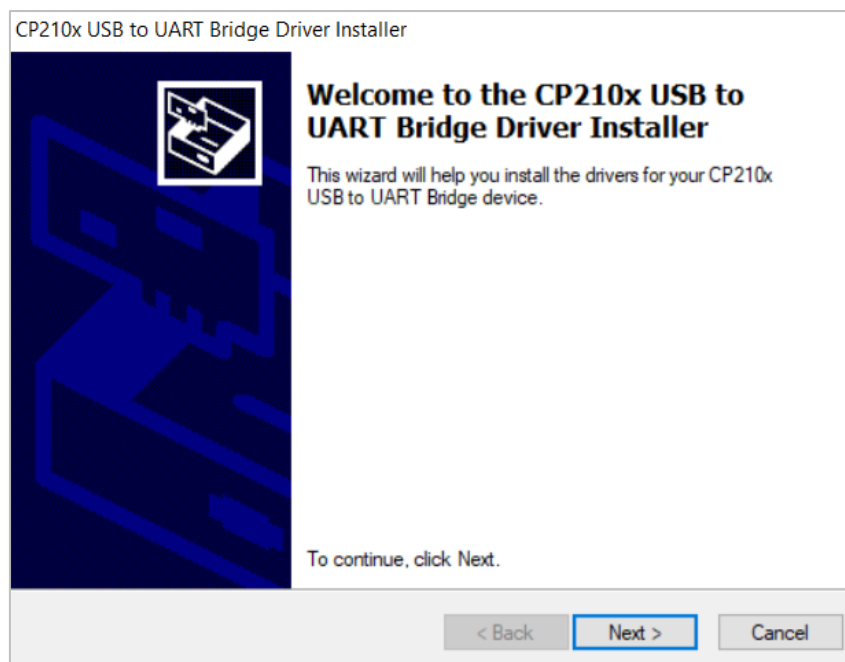


FIG 5 YDLIDAR GS5 DRIVER INSTALLING

After the installation is complete, right-click on [My Computer] and select [Properties]. On the open [System] screen, select [Device Manager] from the left menu to access the [Device Manager].

Expand [Port] to see the serial port name corresponding to the identified USB adapter, that is, the driver installation is successful. The following figure shows COM3. (Note that the port must be checked in case of GS5 and PC interconnection).

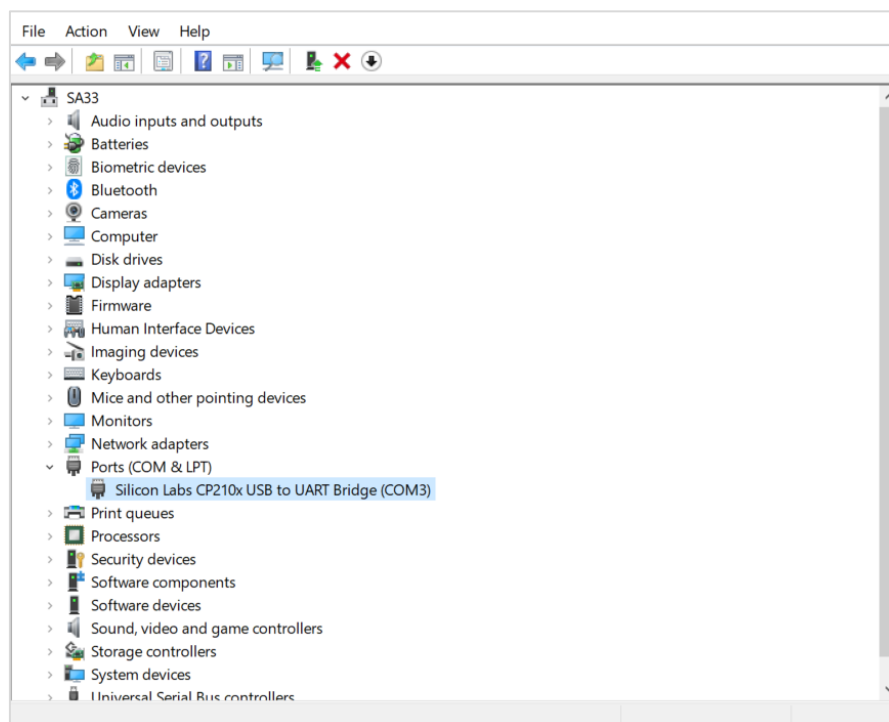


FIG 6 YDLIDAR GS5 DRIVER INSTALLATION CHECK

2.3 Evaluation Software Usage

YDLIDAR provides Point Cloud Viewer, a point cloud data visualization software EaiLidarTest.exe for GS5 real-time scanning. Users can intuitively observe the GS5 scanning effect chart. GDL real-time point cloud data and real-time scanning frequency are provided on YDLIDAR. At the same time, save the scanned data offline to an external file for further analysis.

Before using the YDLIDAR software, make sure that the GS5 USB adapter board serial port driver is installed successfully, and interconnect the GS5 with the USB port of the PC. Run the evaluation software: EaiLidarTest.exe.exe, select the corresponding serial port number and model number. Meanwhile, users could choose language on the top right corner.

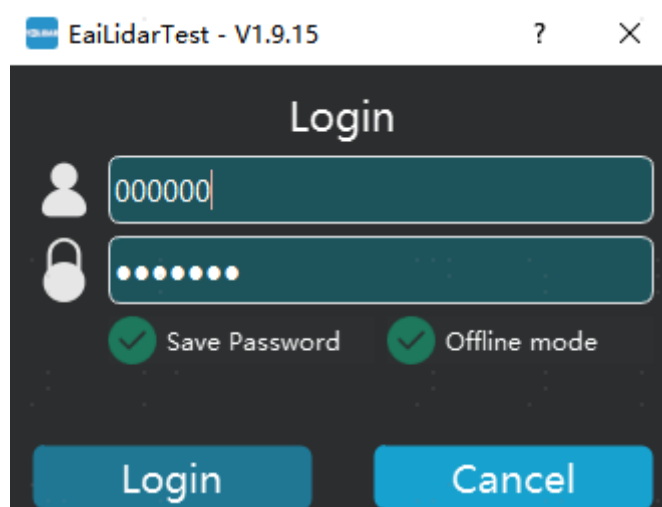


FIG 7 YDLIDAR GS5 EVALUATION SOFTWARE

If the connection is correct, users will see the following screen:

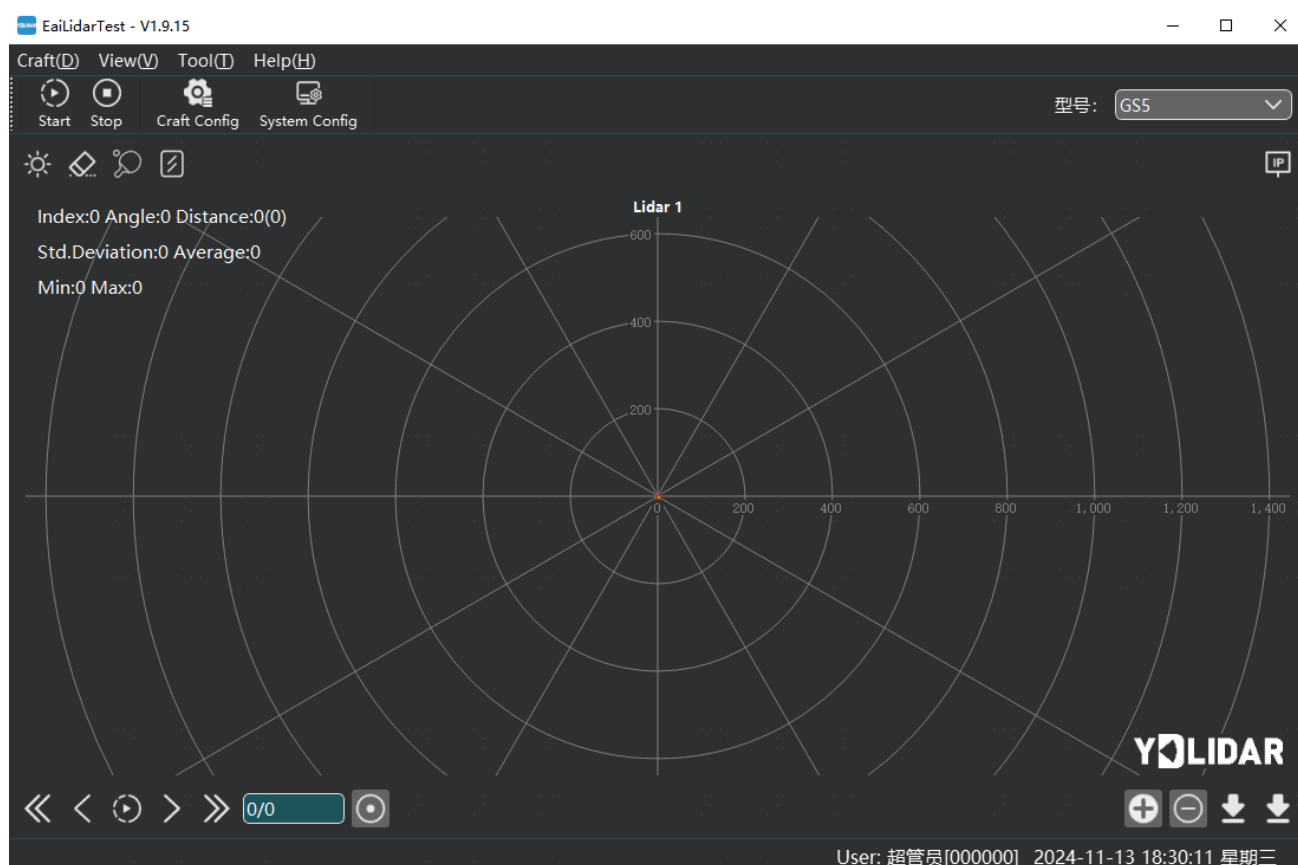


FIG 8 POINTCLOUD VIEWER INTERFACE

2.3.1 Start Scanning

Click “Start” to start scanning and display the environment point cloud, the upper left corner displays the angle & distance information of the red line position (unit: mm). Click “Stop” to stop it. as shown below:

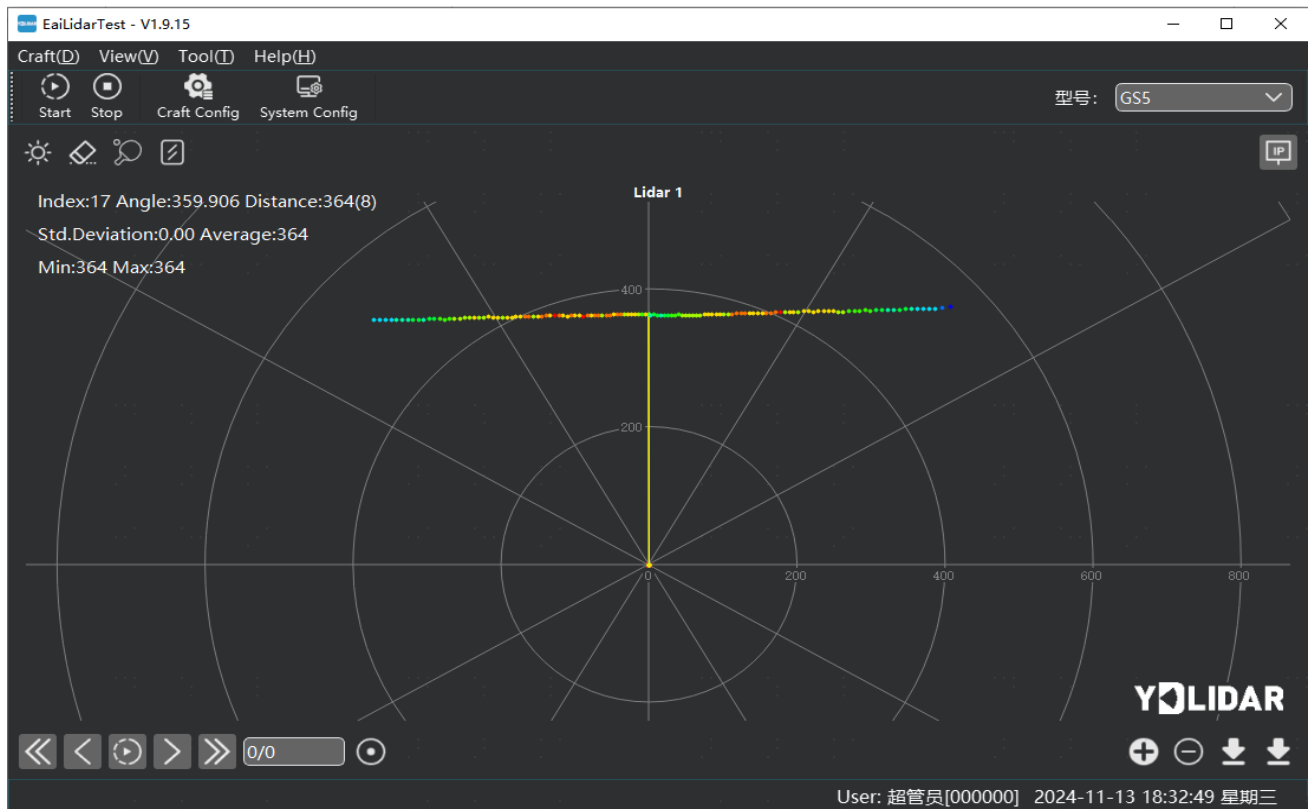


FIG 9 LIDAR SCANNING POINT CLOUD DISPLAY

2.3.2 Data Storage


During lidar scanning, click  in the Bottom right corner of the main window, select “Export data/Export data (sorted by angle)”, and save point cloud data according to the prompts. Then the system will save the point cloud information scanned in a circle.



FIG 10 SAVE DATA

2.3.3 Display Average and Standard Deviation

The standard deviation and average are displayed on the upper left of the single interface.

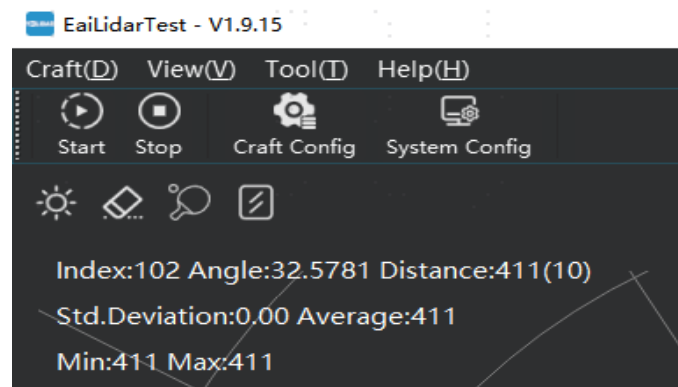


FIG 11 YDLIDAR GS5 DISPLAY MEAN AND STANDARD DEVIATION

Choose one according to needs, move the mouse to the test position, right-click the pop-up menu, and select [Lock Mouse Tracking].

2.3.4 Split Screen

Right-click the pop-up menu and select [Split Screen Display] to display up to 3 GS5 cascaded point cloud data.

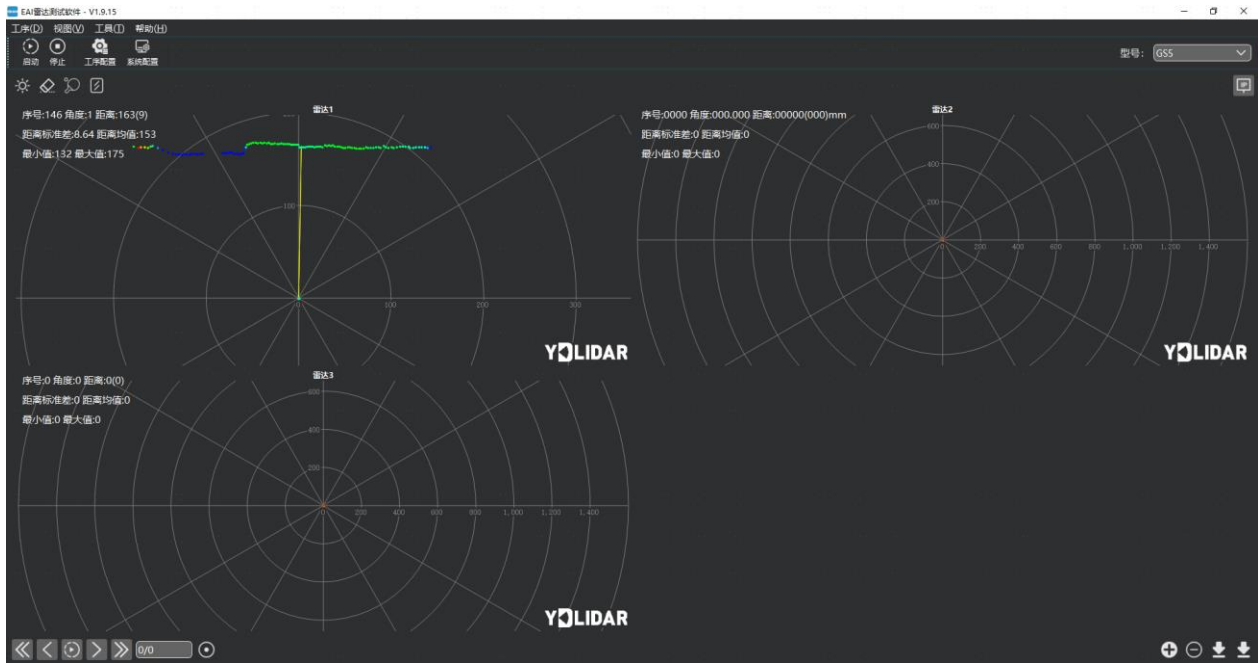


FIG 12 SPLIT SCREEN DISPLAY

Note: For more functions of EaiLidarTest.exe, please click [Help], select [More Information], and learn more about how to use it.

3 LINUX ROS OPERATION

There are many Linux versions, this article only uses Ubuntu 18.04, Melodic version ROS as an example.

3.1 Device Connection

Under Linux, the GS5 and PC interconnect processes are consistent with those under Windows. See [Device Connection](#).

3.2 Compile and Install YDlidar-SDK

3.2.1 SDK Compilation

In the SDK directory, run the following command to compile the project:

```
$ cd build

$ cmake ..

$ make
```

3.2.2 Run the SDK Samples

In the build folder, run ydlidar_test:

```
$ ./ydlidar.test
```

It can be seen the following SDK Scanning information:

```
YDLIDAR

0. ydlidar2.2
Please select the lidar port:0
Baudrate:
0. 115200
1. 128000
2. 153600
3. 230400
4. 512000
5. 921600
Please select the lidar baudrate:5
YDLidar SDK initializing
YDLidar SDK has been initialized
[YDLIDAR]:SDK Version: 2.0.4
LIDAR successfully connected
LIDAR init success!
[YDLIDAR INFO] Current Sampling Rate : 5K
[YDLIDAR INFO] Now YDLIDAR is scanning .....
sample num 323
sync:83,index:0,moduleNum:1
send frameNum: 0,moduleNum: 1
Scan received[1643080791185268000]: 160 ranges is [33.783784]Hz
0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0.000000 113.
000000 113.000000 113.000000 113.000000 113.000000 113.000000 113.000000 113.000000 1
13.000000 113.000000 114.000000 114.000000 114.000000 114.000000 113.000000 114.00000
0 114.000000 114.000000 115.000000 115.000000 116.000000 116.000000 117.000000 117.00
0000 118.000000 118.000000 119.000000 119.000000 120.000000 121.000000 121.000000 122
.000000 123.000000 124.000000 125.000000 125.000000 124.000000 125.000000 126.000000 127.000000
128.000000 129.000000 130.000000 131.000000 133.000000 134.000000 135.000000 136.0000
00 138.000000 139.000000 139.000000 141.000000 142.000000 144.000000 145.000000 147.0
00000 148.000000 150.000000 152.000000 154.000000 155.000000 157.000000 159.000000 16
1.000000 163.000000 164.000000 166.000000 168.000000 170.000000 173.000000 175.000000
177.000000 190.000000 188.000000 185.000000 183.000000 181.000000 178.000000 176.000
000 174.000000 172.000000 169.000000 167.000000 165.000000 163.000000 161.000000 161.
000000 158.000000 156.000000 154.000000 153.000000 151.000000 149.000000 148.000000 1
45.000000 144.000000 142.000000 141.000000 140.000000 138.000000 137.000000 136.00000
0 135.000000 133.000000 132.000000 130.000000 129.000000 129.000000 128.000000 127.00
0000 126.000000 125.000000 124.000000 124.000000 123.000000 122.000000 121.000000 121
.000000 120.000000 120.000000 119.000000 119.000000 118.000000 118.000000 118.000000
117.000000 116.000000 116.000000 116.000000 116.000000 115.000000 115.000000 115.0000
00 115.000000 114.000000 114.000000 114.000000 114.000000 114.000000 113.000000 113.0
00000 113.000000 113.000000 113.000000 0.000000 0.000000 0.000000 0.000000 0.000000 0
.000000 0.000000 0.000000
```

3.3 The use of ROS under Ubuntu

The Ros driver package is under development.

4 CAUTION

4.1 Ambient Temperature

When the working environment temperature of GS5 is over high or over low, it will affect the accuracy of the distance measuring system. It may also damage the structure of the scanning system and reduce the service life of the GS5 lidar. Avoid using in high temperature (>50 degrees Celsius) and low temperature (<0 degrees Celsius) conditions.

4.2 Ambient Lighting

The ideal working environment of GS5 is indoor, and the indoor environment light (including no light) will not affect the work of GS5. However, please avoid using strong light sources (such as high-power lasers) to directly illuminate the GS5 vision system.

If the users need to use it outdoors, please avoid the GS5's vision system directly facing the sun, which may cause permanent damage to the vision system's photosensitive chip, which will invalidate the range finding.

The GS5 standard version will cause interference in the distance measurement under the conditions of strong sunlight reflection outdoors, please pay attention to it.

4.3 Power Supply

During the development process, since the drive current of the USB interface of each platform or the USB interface of the computer may be too low to drive the GS5, the external power supply of the +5V to the GS5 needs to be provided through the USB_PWR interface of the USB interface board. It is not recommended for use mobile phone power bank because the voltage ripple of power bank is too large.

5 REVISE

Date	Version	Content
2024-11-10	1.0	The 1 st release