GS2
USER MANUAL

Shenzhen EAI Technology Co., Ltd.
CONTENTS

1 YDLIDAR GS2 LIDAR DEVELOPMENT KIT ........................................ 1
   1.1 Development Kit ........................................................................ 1

2 USAGE UNDER WINDOWS .................................................................. 1
   2.1 Device Connection ...................................................................... 1
   2.2 Driver Installation ..................................................................... 2
   2.3 Evaluation Software Usage .......................................................... 4
      2.3.1 Start Scanning ...................................................................... 5
      2.3.2 Data Storage ......................................................................... 6
      2.3.3 Display Mean and Standard Deviation ..................................... 6
      2.3.4 Play and Record ................................................................... 6
      2.3.5 Debug .................................................................................. 7
      2.3.6 Split Screen ......................................................................... 8

3 LINUX ROS OPERATION .................................................................... 8
   3.1 Device Connection ...................................................................... 8
   3.2 Compile and Install YDlidar-SDK ................................................. 8
      3.2.1 SDK compilation ................................................................... 8
      3.2.2 Run the SDK samples ......................................................... 9
   3.3 The use of ROS under Ubuntu ...................................................... 9

4 CAUTION ......................................................................................... 10
   4.1 Ambient Temperature ................................................................. 10
   4.2 Ambient Lighting ....................................................................... 10
   4.3 Power Supply ........................................................................... 10

5 REVISE ............................................................................................ 11
1 YDLIDAR GS2 LIDAR DEVELOPMENT KIT

The development kit of YDLIDAR GS2 lidar (hereinafter referred to as GS2) is an accessory tool provided for performance evaluation and early development of the GS2. Through the GS2 development kit, and with the evaluation software, users can observe point cloud data scanned by GS2 on your environment or development on the SDK.

1.1 Development Kit

The GS2 development kit has the following components:

![GS2 LiDAR](image)

![USB Type-C Cable](image)

![USB Adapter Board](image)

<table>
<thead>
<tr>
<th>Item</th>
<th>Qty.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GS2 lidar</td>
<td>1</td>
<td>Standard version of the GS2 lidar.</td>
</tr>
<tr>
<td>USB Type-C Cable</td>
<td>1</td>
<td>Use with USB adapter board to connect GS2 and PC. USB cable is both a power supply cable and a data cable</td>
</tr>
<tr>
<td>USB Adapter Board</td>
<td>1</td>
<td>Realize the function of USB to UART, which is convenient for the fast interconnection between GS2 and PC.</td>
</tr>
</tbody>
</table>

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 GS2 under windows, GS2 and PC needed to be connected. The specific process is as follows:
YDLIDAR GS2 DEVICE CONNECTION

Connect the adapter board with GS2 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. GS2 need to be connected to the auxiliary power supply of +5V, otherwise the lidar will be abnormal.

YDLIDAR GS2 AUXILIARY POWER SUPPLY

2.2 Driver Installation

To evaluate and develop the GS2 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

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

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 GS2 and PC interconnection).
2.3 Evaluation Software Usage

YDLIDAR provides Point Cloud Viewer, a point cloud data visualization software LidarViewer for GS2 real-time scanning. Users can intuitively observe the GS2 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 GS2 USB adapter board serial port driver is installed successfully, and interconnect the GS2 with the USB port of the PC. Run the evaluation software: LidarViewer.exe, select the corresponding serial port number and model number. Meanwhile, users could choose language on the top right corner.

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

Click 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 to stop it. as shown below:
2.3.2 Data Storage
During lidar scanning, click [File] in the main menu, select [Export to Excel], and save point cloud data according to the prompts. Then the system will save the point cloud information scanned in a circle in Excel format.

2.3.3 Display Mean and Standard Deviation
Click [Tools] in the main menu, then select [Mean And STD] - [View].

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 Play and Record
Click [Tools] in the main menu, then select [Record and Play].
RECORD AND PLAY

The main window is displayed as follows:

To record lidar data, click to start recording, and click to stop recording.

In non-scanning mode, click to start play.

The play process is as follows:

PLAY PROCESS

2.3.5 Debug

Click [Tools] in the main menu, and then select [DebugON] to output the raw lidar data to the "viewer_log.txt" and "viewer_log_err.txt" files.
2.3.6 Split Screen

Right-click the pop-up menu and select [Split Screen Display] to display up to 3 GS2 cascaded point cloud data.

Note: For more functions of LidarViewer, 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 GS2 and PC interconnect processes are consistent with those under Windows. See Device Connection under Window.

3.2 Compile and Install YDlidar-SDK

3.2.1 SDK compilation

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

In the build folder, run ydlidar_test:

$ cd build
$ cmake ..
$ make

$ ./ydlidar.test

It can be seen the following SDK Scanning information:

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 GS2 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 GS2 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 GS2 is indoor, and the indoor environment light (including no light) will not affect the work of GS2. However, please avoid using strong light sources (such as high-power lasers) to directly illuminate the GS2 vision system.

If the users need to use it outdoors, please avoid the GS2'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 GS2 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 GS2, the external power supply of the +5V to the GS2 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.
## REVISE

<table>
<thead>
<tr>
<th>Date</th>
<th>Version</th>
<th>Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>2022-01-19</td>
<td>1.0</td>
<td>Revision</td>
</tr>
</tbody>
</table>