LSD series Viewer-User-Guide

Software

User Manual

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Preface

This user manual contains the introduction, use and maintenance of 2D LiDAR. Please read this manual carefully before formal use, and strictly follow the steps described in the manual during use to avoid product damage, property loss, personal injury or/and violation of product warranty terms. If you encounter problems that cannot be solved during use, please contact SentiAcu staff for assistance.

Contact Details

Official website: www.sentiacu.com

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Disclaimer

The product is constantly being improved, and its specifications and parameters will undergo iterative changes. Please refer to the official website for latest version.

1. Safety Notices

1.1 Applicanble Environment Caution

- The sensor may sense incorrect or unusable under steam, smoke,dust and particles in air.
- Qualified technician check the connection and installation is correct or not at regular intervals is required.
- The maximum lifetime of the sensor is 10 years, after which it must be replaced, otherwise the required performance requirements may not be met.
- The sensor should be inspect and clean at regular intervals.
- This product is only allowed to be used within the specified limits and specified technical parameters and operating conditions at any time.

1.2 Wiring Environment Caution

- Do not connect the power supply reversely or connect it to a voltage higher than the maximum working voltage, otherwise the sensor will be damaged.
- The power supply is lower than the minimum working voltage, which will cause the sensor to fail or work abnormally.
- Please follow the instructions of the manual for wiring, otherwise the sensor may not be able to detect the input signal correctly.
- Do not exceed the load capacity of the sensor when the output signal terminal is connected to the device, otherwise it will cause the sensor fault.

1.3 Debugging Environment Caution

- Only qualified and authorized person are allowed to connect, install, debug and set up the laser sensor.
- Confirm that the peripheral equipment associated with the sensor is in a reliable shutdown state.
- Confirm debugging technician is in a safety environment.
- Confirm other people or object are out of the range of equipment.

2. Product Specifications

The following specifications are based on the final product received by the users and are subject to change without notice.

Ranging Principle	dToF
Wavelength	905nm
Horizontal Field of View	270°
Measurement Range	≥10m@70%reflectivity ≥20m@70%reflectivity ≥5m@10%reflectivity ≥10m@10%reflectivity ≥2m@1.8%reflectivity ≥3m@1.8%reflectivity
Scan Frequecy	10Hz; 15Hz; 20Hz; 25Hz; 30Hz
Data Sample Rate	22.5kHz
Horizontal Resolution	0.16°(10Hz), 0.24°(15Hz), 0.32°(20Hz) 0.4°(25Hz), 0.48°(30Hz)
Accuracy(Typical)	±2cm
Interface	
Data Protocol	RS485-MODBUS
Digital Channels	4 Digital Inputs , 4 Digital Outputs
Digital Outputs	4 NPN (or PNP), *Iout* ≤ 100mA
Response Time	33ms(30Hz)
Start Time	<15s
Detection Output Time	0 ~ 1000ms
Detection Holding Time	0 ~ 1000ms
Laser and Electrical	
Laser Safety	Class 1 eye safe
Ambient Light Immunity	< 100000 lux
Rated Voltage Range	9 ~ 36V
Power Consumption(Typical)	2.5W
Other Parameters	
Dimension	(D × W × H) 55mm × 55mm × 51mm

Operating Temperature	-25°C ~ 60°C
Storage Temperature	-40°C ~ 75°C
Ingress Protection	IP66

Table 2.1: Product Parameter

3. Software Installation

3.1 Unzip the Package

Figure 3.1: Diagram of Unzipping the Software Package

3.2 Double Clicking the Application to Enter the Software Interface

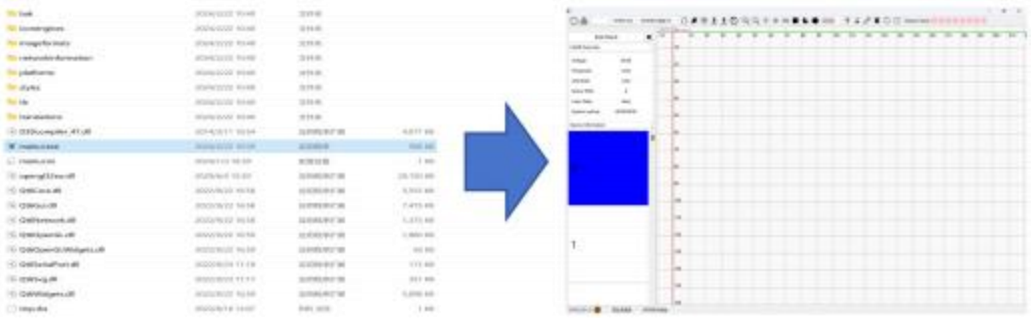

Figure 3.2: Schematic Diagram of the Viewer Entrance

4. Lidar Connection

4.1 Wire Definition

The sensor cable leads out with 14 cores, and the definition of the wire colors corresponds to the following table.

Wire Color	Signal	Function
Red	Sensor SupplyVoltage	SupplyVoltage(9 36V)
Black	GND	Ground
Yellow	RS485 sender	RS485A/RS232TX
White	RS485 receiver	RS485B/RS232RX
Purple	Common(NPN)	COM+
Orange	Input	IN1
Green	Input	IN2
Blue	Input	IN3
Brown	Input	IN4
Gray	Common(PNP)	COM-
White and Orange	Output	OUT1
White and Green	Output	OUT2
White and Blue	Output	OUT3
White and Brown	Output	OUT4

4.2 Connect the Lidar

1. Use a 485 to USB converter cable to connect the computer to the lidar.

2. Select the corresponding port number.

3. Click the 'Open port' button, then click the 'Scan lidar' button on the right to connect to the lidar.

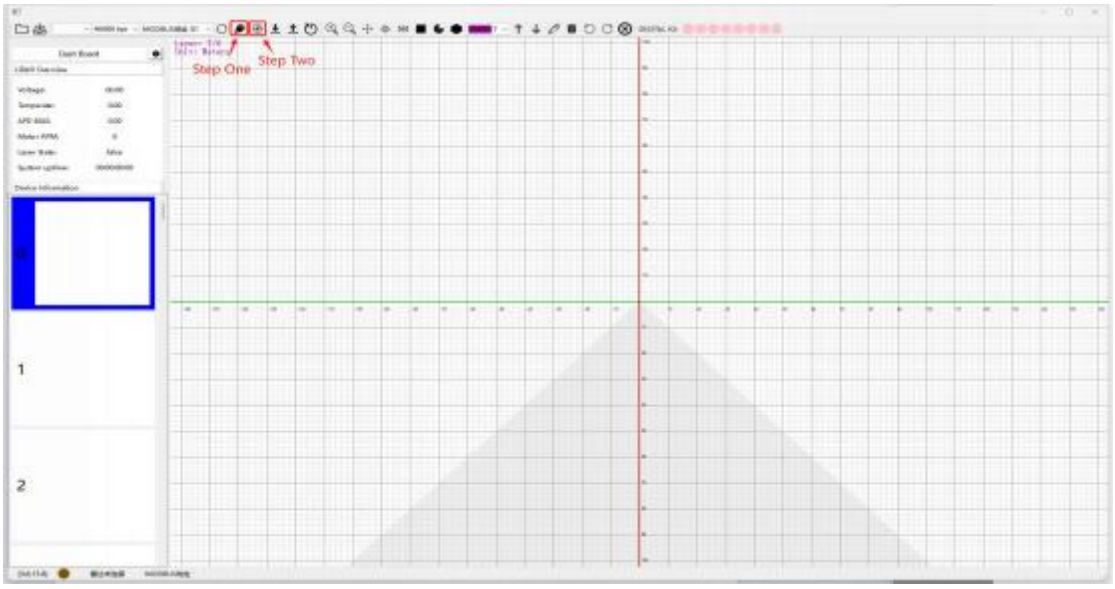

Figure 4.1: Lidar connection

4.3 Configure the Obstacle Avoidance Area

1. Select the rectangle, sector, or polygon icons to draw the obstacle avoidance area.

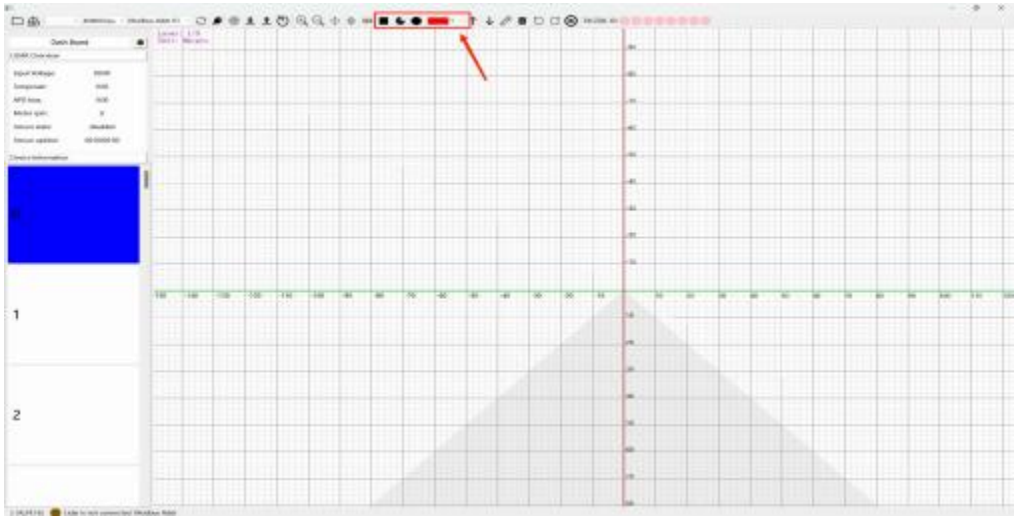

Figure 4.2: Lidar connection

2. Double-click the canvas with the left mouse button, and in the pop-up Graph Setting interface, adjust the IO output corresponding to the current obstacle avoidance area and the output mode (normally open/normally closed). In the lower part of the Graph Setting interface, you can adjust the X and Y coordinates of the boundary points of the obstacle avoidance area as well as the corresponding angles. Once the settings are complete, click OK to exit.

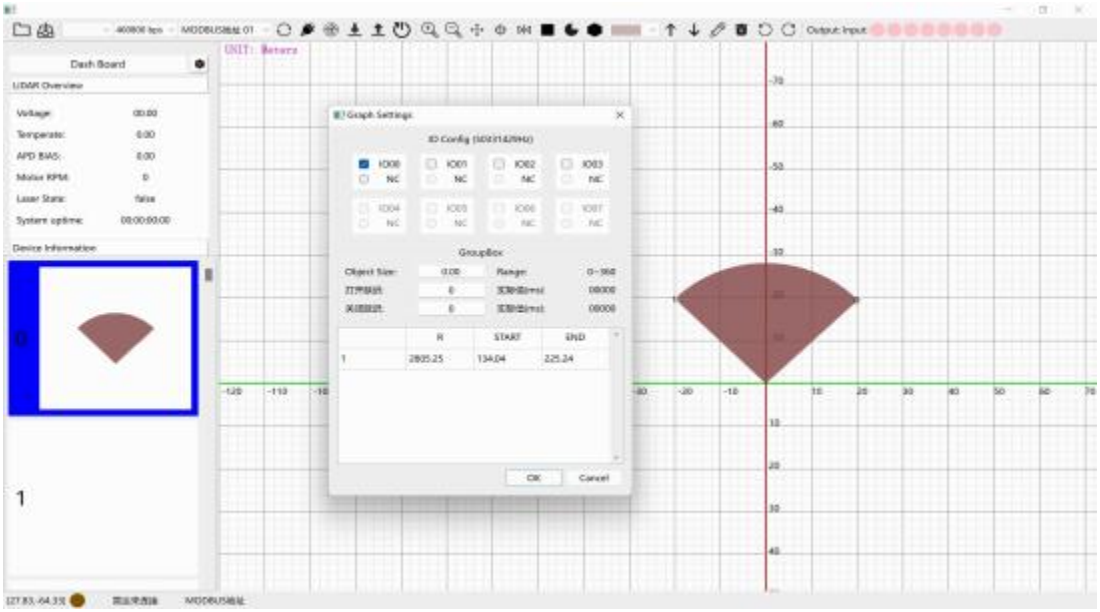

Figure 4.3: Lidar connection

3. Click 'Upload' to transfer the configuration information to the lidar's internal system.

Figure 4.4: Lidar connection

4. Open the 'Firmware Update' section in the ConfigBoard interface, select 'set' to restart the radar, thus completing the configuration of the obstacle avoidance area.

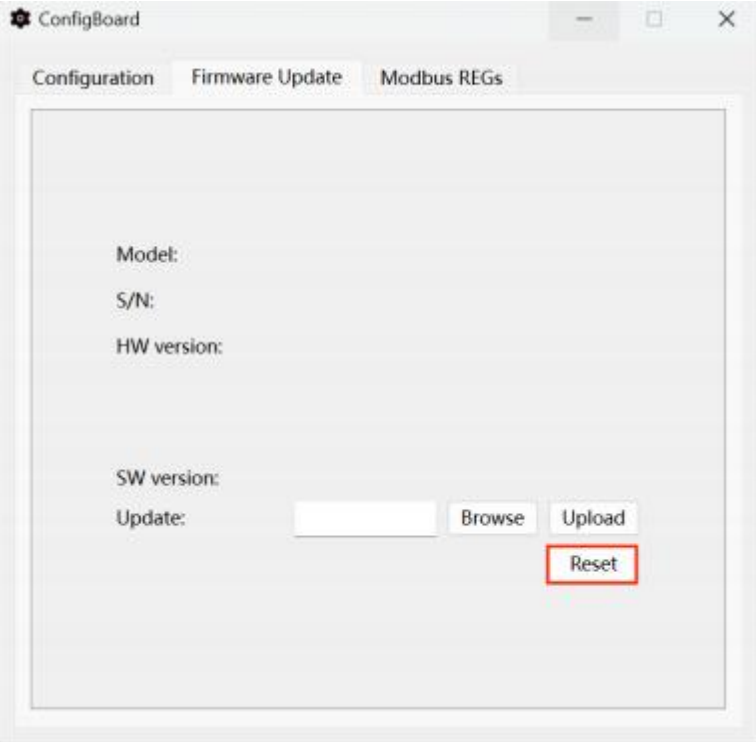

Figure 4.5: Firmware Update

5.1 Control Panel

5.1.1 Dash Board

Displays Lidar status information such as input voltage, core temperature.

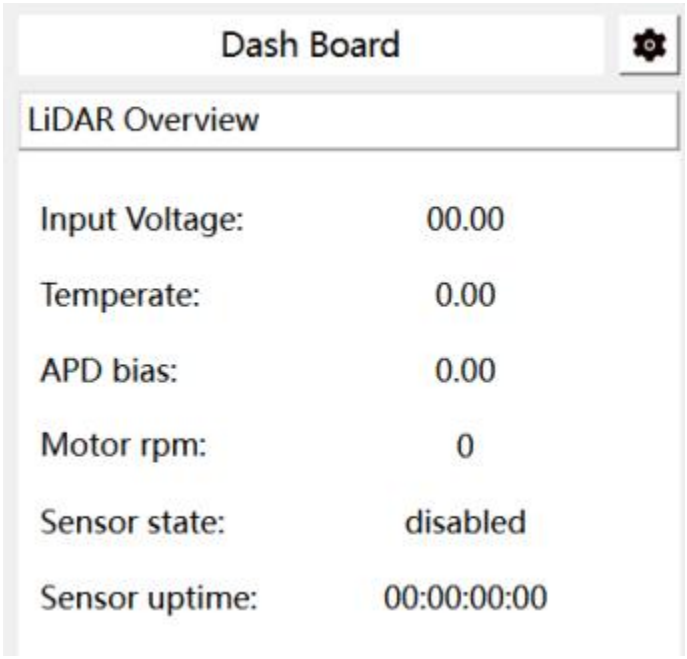

Figure 5.2: Dash Board

5.2 Device Information

Display product information such as lidar model, serial number, hardware version, etc.

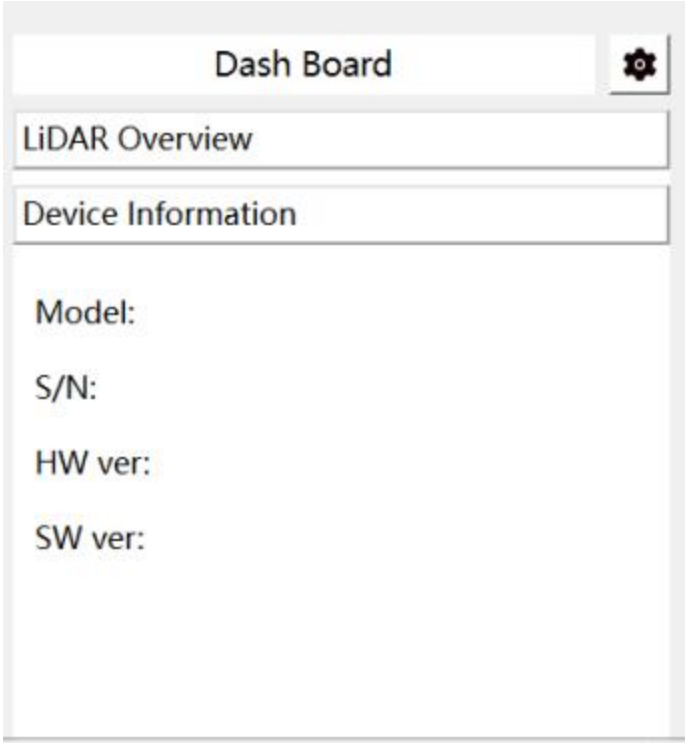

Figure 5.3: Device Information

5.2 Configuration Panel

5.2.1 ConfigBoard

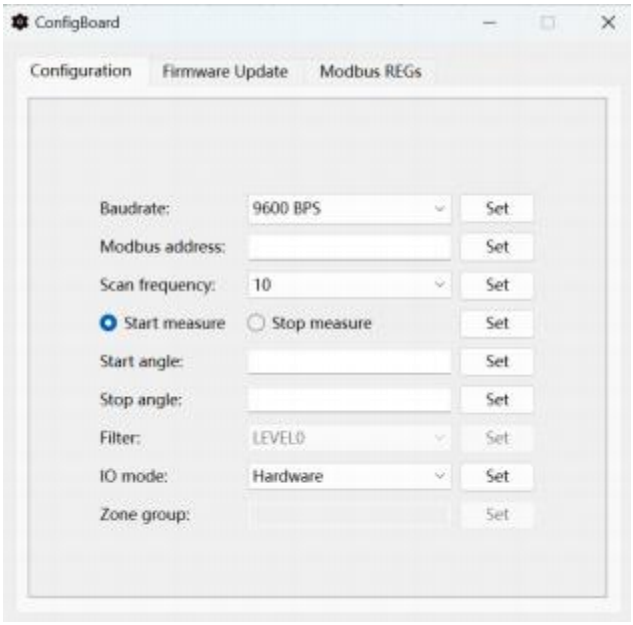

Figure 5.4: Configuration Information

Baudrate	Set baudrate
Modbus address	Set network communication protocol address
Scan frequency	Set scan frequency
Start measure	LiDAR starts working
Stop measure	LiDAR stop working
Start angle	Set start angle
Stop angle	Set stop angle
Filter	Set filtering level
IO mode	Switch IO mode
Zone group	Select group (Hardware mode is invalid)

Table 5.2: Configuration Information

5.3 Function Icon Area

Used to connect the lidar and configure obstacle avoidance areas.

	Open file		Auto scale
	Save to file		Center
	Select COM port		Mirror
	Select baudrate		Rectangle
	Configure modbus group		Sector
	Refresh port		Polygon
	Open port		Select layer
	Scan lidar		Previous layer
	Download figure		Next layer
	Upload figure		Edit
	Reboot lidar		Delet figure
	Zoom in		Undo
	Zoom out		Redo
	Cancel		

Figure 5.6: Function Icon Area

 **Open file**

Used to import configured obstacle avoidance area files.

 **Save to file**

Save the successfully configured lidar settings and obstacle avoidance areas to a specified folder.

com gv **Select COM port**

Select the COM port corresponding to the lidar, used for connecting to the lidar.

 Select baudrate

Select the baud rate corresponding to the lidar, typically 460800 bps.

 Configure modbus group

Configure the Modbus group.

 **Refresh port**

Refresh the LiDAR configuration interface.

 **Open port**

Connect the corresponding lidar port with the software.

 **Scan lidar**

Connect the software to the lidar. Once successfully connected, it will display the point cloud normally.

 **Download figure**

Download the currently configured obstacle avoidance area and settings into the lidar's internal system.

 **Upload figure**

Upload the currently configured obstacle avoidance area and settings to the lidar's internal system.

 **Reboot lidar**

Restart the lidar.

 **Zoom in**

Click to enlarge the canvas and point cloud proportionally.

 **Zoom out**

Click to reduce the canvas and point cloud proportionally.

 **Auto scale**

Adjust the canvas to a fit-to-screen position.

 **Center**

Adjust the center point of the lidar on the canvas to the center position of the canvas.

 **Mirror**

Mirror the point cloud along the Y-axis.

 **Rectangle**

Click to configure the lidar's rectangular obstacle avoidance area.

 **Sector**

Click to configure the lidar's sector-shaped obstacle avoidance area (requires counterclockwise configuration).

 **Polygon**

Click to configure the lidar's polygonal obstacle avoidance area.

 **Select layer**

Click to select the obstacle avoidance area.

 **Previous layer**

Click to select the previous obstacle avoidance area.

 **Next layer**

Click to select the next obstacle avoidance area.

 **Edit**

Add vertices to the polygon in the polygonal obstacle avoidance area.

 **Delet figure**

Delete the configured obstacle avoidance area; first select the obstacle avoidance area, then click delete.

 **Undo**

Return to the previous level.

 **Redo**

Return to the next level.

 **Cancel**

Cancel the previous action.

5.4 Input Channels

There are 16 input channels available for selection.

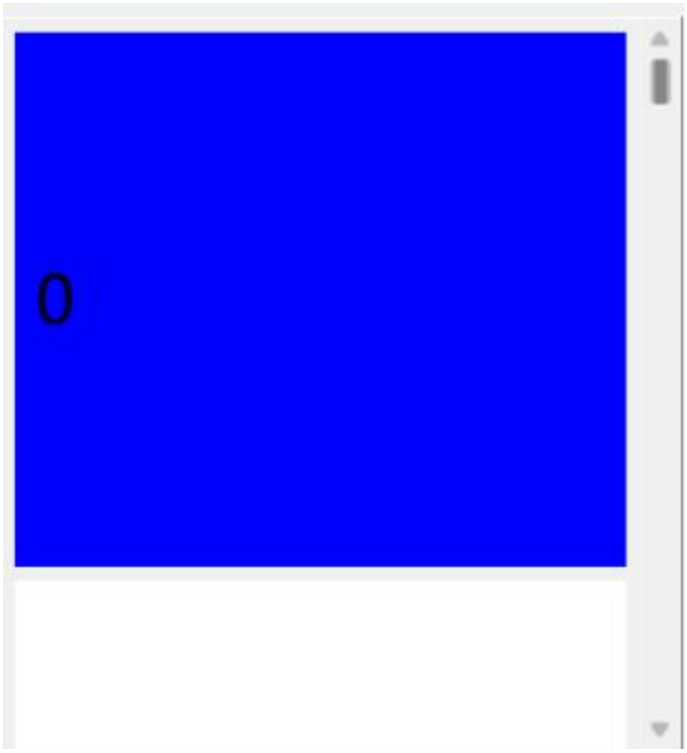

Figure 5.7: lidar channel

5.5 Coordinate Information

Display the current mouse position's coordinate information on the entire canvas, the lidar's operating status, and the MODBUS address.

[4–127.'., Lia aris not connected, Moab us Aadr/

Figure 5.8: Coordinate Information

5.6 Editing Area

5.6.1 Canvas

Display the lidar point cloud and the planned obstacle avoidance area.

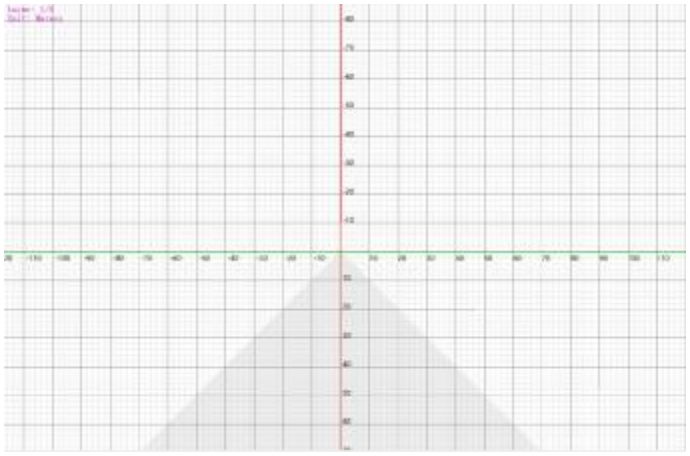

Figure 5.9: Editing Area

5.6.2 Coordinate Map Settings

Adjust the output signal: Check the corresponding IO output at the top of the page, and bind the planned obstacle avoidance area to the selected IO interface.
Adjust the output logic: By default, NC is normally closed. If adjustment to normally open is needed, change the NC checkbox to NO.

Adjust the setting delay: Set the values on the right for opening delay and closing delay.

Adjust the obstacle avoidance graphics: Directly click on the values in the table at the bottom of the Graph Setting interface to make changes.

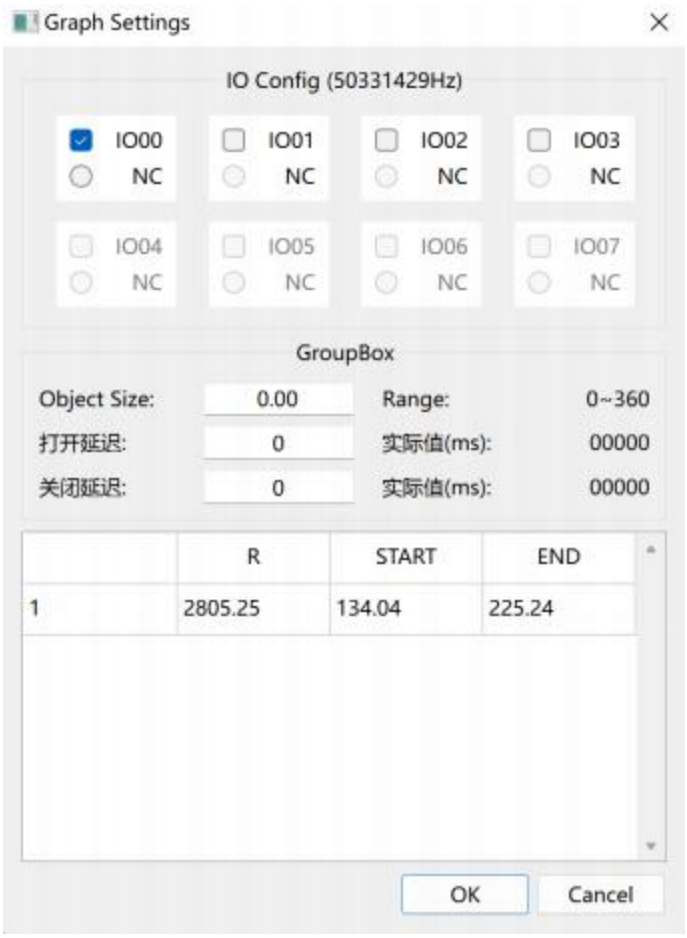

Figure 5.10: Coordinate Map Settings

Open Delay	The lidar delays the signal output after detecting an obstacle.
close Delay	The signal is delayed in turning off after the obstacle disappears from the avoidance area.

Table 5.4: Coordinate Map Settings