CE30-D Solid-State Array LiDAR

Operation Manual

Table of Contents

1. CE30-D introduction

CE30-D is a solid-state array LiDAR developed based on the TOF theory. Compared with single-channel scanning

LiDARs, there is no any mechanical rotating component, so it can run steadily and reliably for a long time, able to get a wider range of vertical detection.

At the top, bottom, left, right and back, CE30-D has mounting location holes provided, through which it can be fixed with peripheral devices reliably. See Figure 1 for the positions and spacing of the mounting holes subject to the size of M3.
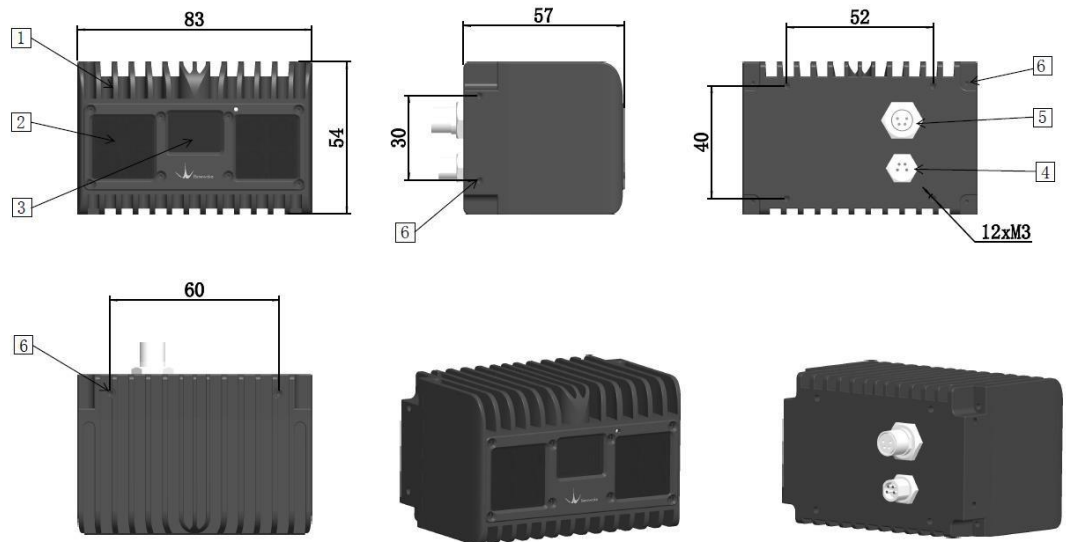
1. Enclosure
2. Emitting panel (working area , cannot be covered)
3. Reception panel (working area , cannot be covered)
4. Power
5. Ethernet interface (M8 aerial plug)
6. Equipment installation hole (M3)

Figure 1 DELIADAR CE30-D outer dimensions

2. Operation of Display Program

CE30-D has provided a complete SDK based on Linux and Windows systems for customers' fast development and use. Please log on to our GitHub open source community to get the SDK source code and the corresponding documentation.

GitHub open source community: https://codincodee.github.io/ce30_driver

This display program is used to process and display the output data of CE30-D LiDAR under the Windows operating system. Before using this display program, please confirm that the local folder of the display program contains complete documents necessary for operation:

Figure 2: Display program and documents necessary for its operation

2.1 Connection
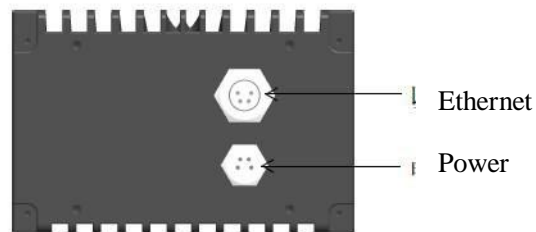
Figure 3 CE30-D aerial plug wiring instructions

a. Use the two aerial plug cables attached in the package (including one power supply plug cable and one network port plug cable) to connect the LiDAR with the aerial plug cables as illustrated in Figure 3; connect the power interface to the adapter DC 12V (≥3A), DC 5.5*2.5mm; connect the aerial plug network port (RJ45) to the computer.

b. Set the Ethernet IP address and subnet mask in the directory "*Control panel*\Network and

Internet*Network Connections*"as shown in *Figure 5*.

Figure 4 Network Settings

使用下面的 IP 地址	Use the IP address below
IP 地址	IP address
子网掩码	Subnet mask
默认网关	Default gateway

c. Open the CMD command interface in the Windows running window; enter and execute the command to check whether the data connection is available:

ping 192.168.1.80 -t

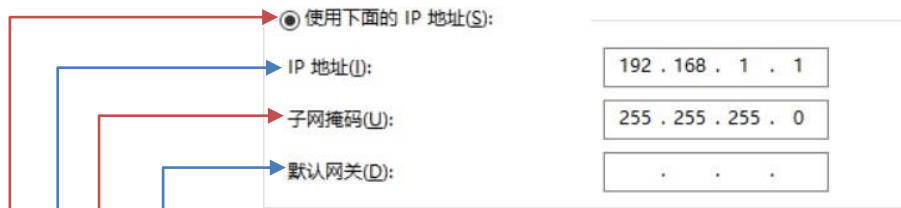If it prompts as shown in Figure 6, it indicates that the LiDAR is working normally with the data connection available. If no, it indicates that the data link suffers from ping failures. Please check as follows:

a) Check whether the indicators light up on the front panel of the LiDAR and whether the red lamp keeps normally on and flashing after startup;

b) Check whether the power supply is available and whether the voltage is 12V with the rated current ≥ 3A;

c) Check whether the computer network port is normally connected and whether the local Ethernet is identified;

d) Disconnect the power supply and wait for 5 seconds before reconnecting it.

正在 Ping 192.168.1.80 具有 32 字节的数据	Pinging 192.168.1.80 32-byte data
来自 192.168.1.80 的回复：字节=32 时间＜1ms TTL=64	Reply from 192.168.1.80: Byte=32 Time＜1ms TTL=64

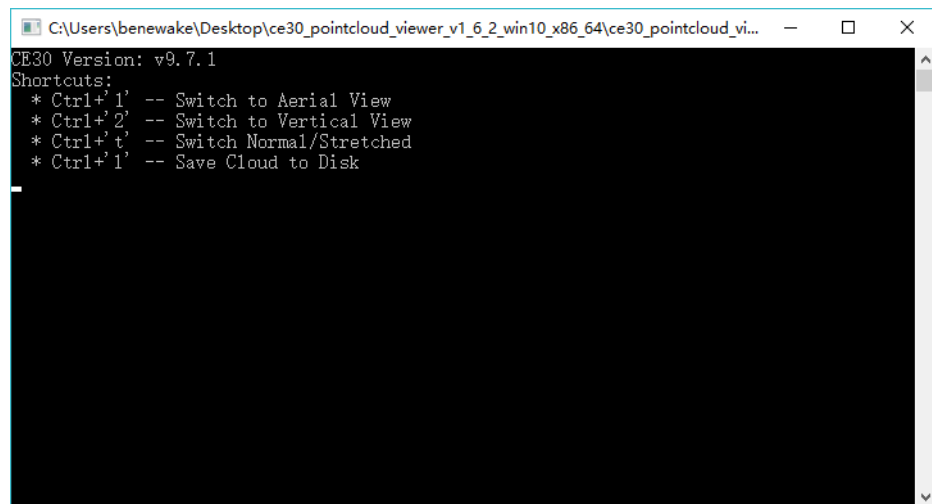*Figure 5 Data connection check*

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2.2. Display program window

Double click the program *ce30_pointcloud_viewer.exe* to open the display program and the prompt and point cloud image windows will appear as illustrated in Figure 6 for LiDAR version and operation shortcuts.

The prompt window is used to display the LiDAR connection, shortcut prompts and other running information.

The point cloud image window displays the point cloud images in the LiDAR field of view calculated based on the depth map and projection relation. In this window, hold down the left mouse button and move the mouse to change the direction for viewing the point cloud images; use the mouse wheel and you can zoom in/out the point cloud image; hold down the mouse wheel and move the mouse to move the point cloud image horizontally.

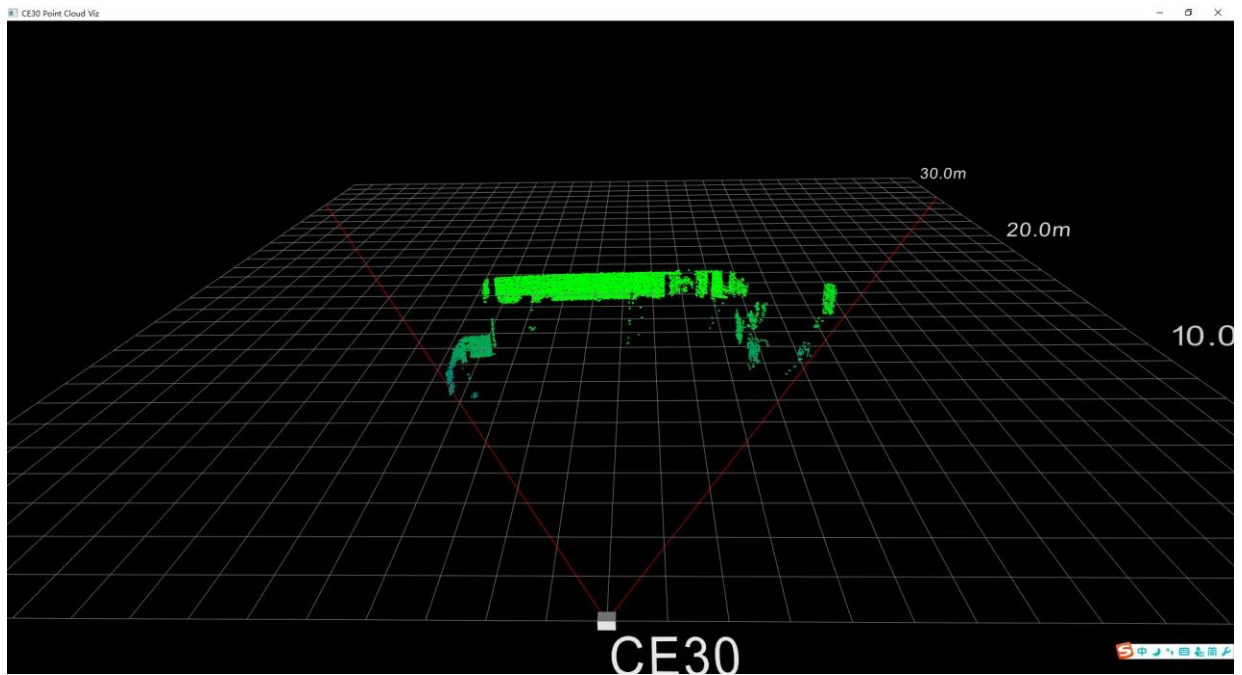*Figure 6 Information prompt window*

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Figure 7 Point cloud image window

When the program runs, it will display the following window for shortcut keys.

    a)   CTRL+1   Switch to Aerial View (normal);

    b)   CTRL+2   Switch to Vertical View;
    c)   CTRL+T   Switch to Normal/Stretched;
    d)   CTRL+L   Save the current frame data and press it again to stop.

Note: The shortcut keys are effective only in the point cloud window. Click the point cloud information window to activate it on the Windows interface.
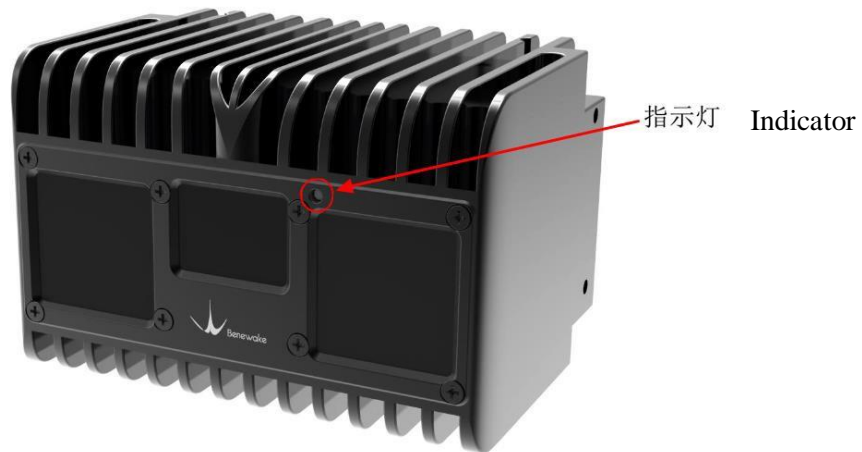
3. Indicator descriptions

指示灯　Indicator

Figure 8 Indicator position

1) Red and normally on: In the "Ready" state, it can be connected to work.

2) Red and flashing: It is working.
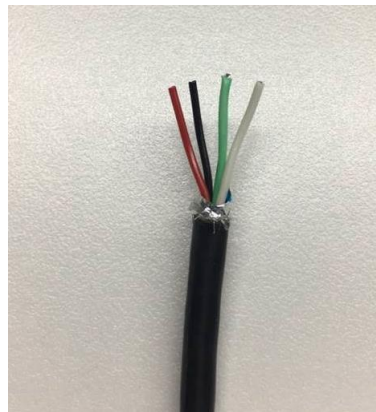
4. Line sequence descriptions

Figure 9 Line sequence at the power supply port: red - power positive, black - power negative

Note:

1. The current should be more than 3A for the power adapter;

2. When the LiDAR is powered on, it may be rarely possible to suffer from longer startup delay; if it doesn't start in 2 minutes, cut off the power and restart as recommended;

3. To have it stop working, first disconnect its power supply and then disconnect other connecting lines.
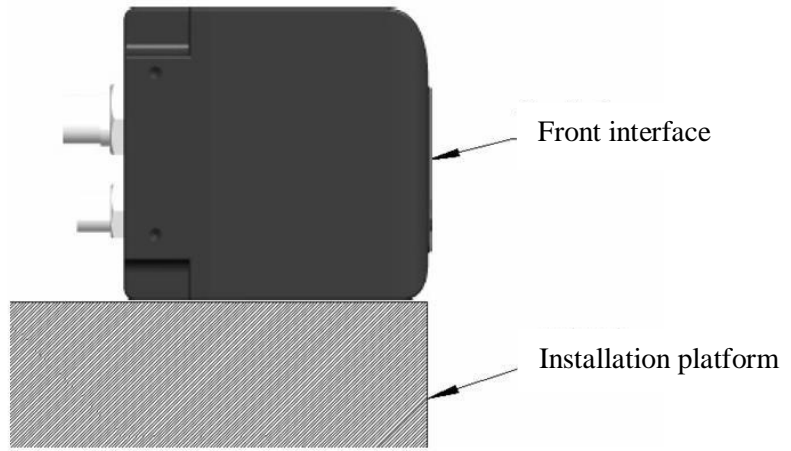
5. Installation diagram

Figure 10: Recommendation for LiDAR installation. The LiDAR front interface must extrude from (at least be aligned to) the front plane of the installation platform; otherwise, the data accuracy will be lower due to interference.