HI-CLOUD TLS360 Portable 3D Laser Scanner User Manual

Contents

HI-CLOUD TLS360 Portable 3D Laser Scanner

Statement

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Equipment Maintenance

Please do not try to disassemble the hardware equipment by yourself. You may suffer electric shock or damage the equipment. Please contact the technicians of Wuhan Hi-Cloud Technology Co., Ltd. for all maintenance work.

Customer Support

If the performance index, product structure, installation method and precautions of the equipment change, users can call Wuhan Hi-Cloud Technology Co., Ltd. after-sales service hotline to obtain the latest manual.

Obligation

All precautions are informed in this statement. If you find any errors or other circumstances, please contact your local branch or dealer. We reserve the right to modify this manual due to printing or technical errors.

Chapter	Title	Content Description
Chapter 1	Product Overview	Brief introduction of HD TLS360 system and its main technical para meters.
Chapter 2	Product Hardware Comp osition	The overall structure, interface definition and use constraints of HD TLS360 system are introduced in detail.
Chapter 3	Equipment Installation & Disassembly	Explain the installation and disassembly methods of various compo nents of HD TLS360 system.
Chapter 4	Equipment Operation	Introduction of the operation method of HD TLS360 system.
Chapter 5	Data Copy	Introduction of the data copy process of HD TLS360 system.

Preface

This preface describes the manual content, organization, user type, icon meaning and reference documents of this manual.

Manual Content
The manual mainly discusses how to install and use the hardware equipment of HD TLS360 3D laser measurement system (hereinafter referred to as HD TLS360 system).

Organization
This document mainly consists of the following parts:

User Type
This manual is mainly for users who understand 3D laser measurement and relevant personnel responsible for field data acquisition. Readers are required to be familiar with the following knowledge:

- Traditional surveying and mapping technology
- 3D laser measurement technology
- GPS related knowledge

Icon Meaning

Icon	Meaning
	Prompt the user to pay special attention during the installation or use of HD TLS3 60 system
	Represents additional descriptive information provided to the user

Reference Documents
The reference documents involved in the use of HD TLS360 system include:
<<HD TLS360 3D Laser Measurement System Product Manual>>(This document)

Warning: before using HD TLS360 system equipment, please read the manual carefully to avoid electric shock or damage to the equipment due to misoperation.

Product Overview

Product Introduction
HD TLS360 is a portable 3D laser measurement system independently developed by Wuhan Hi-Cloud Technology Co., Ltd. It takes lightweight and humanization as the design concept, integrates multi-line LiDAR, image acquisition, GNSS and other technologies, and integrates high-precision laser scanner, angle measuring instrument and other sensors. Supported by the time synchronization technology of independent intellectual property rights and integrated multi-sensor integration technology, it can simply and efficiently complete the scanning and acquisition of 3D data. The main applications of HD TLS360 laser measurement system include but are not limited to house facade measurement, accident site investigation, stacking volume calculation, interior decoration, plane planning drawing, digital park and other fields.
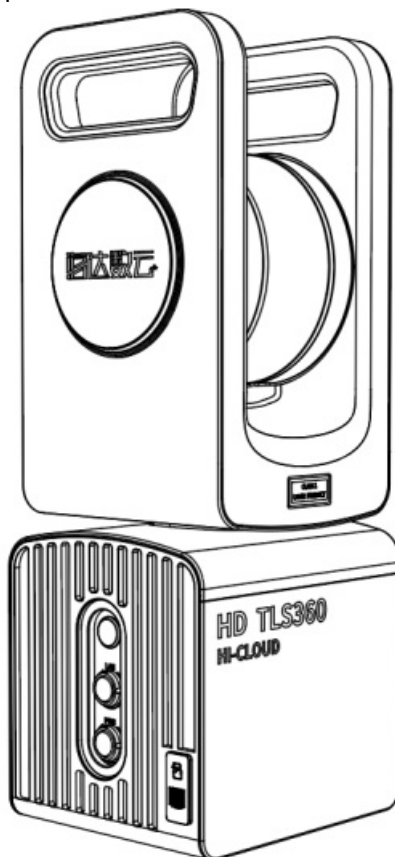

Figure 1-1 HD TLS360 system

Main technical parameters of the product
The main technical parameters of HD TLS360 laser measurement system are shown in the table below:

Table 1-1 Main technical parameters of HD TLS360

Index Item	Index parameters
Maximum Ranging	150m
Minimum Ranging	0.2m
Ranging Accuracy	3cm
Scanning Point Frequency	320000pts/s
FoV Vertical	280°
FoV Horizontal	360°
Scanning Speed	4°/s~9°/s
Panoramic Resolution	18Megapixels(optional external camera)
Duo Axis Tilt Compensation	±5°
Data Storage	250GB(mSATA Hard disk)+128GB(TF Card)
Data Transmission	GigE/TF Card
Operation Mode	Remote control by mobile terminal
Battery Life	About 4h
Dimension	364mm*139.5mm*122mm
Net Weight	About 4kg

Product Hardware Composition

HD TLS360 system is mainly composed of host, battery, power line and data line, battery compartment, panoramic camera assembly, RTK fixed assembly, carbon fiber tripod, etc.

Host
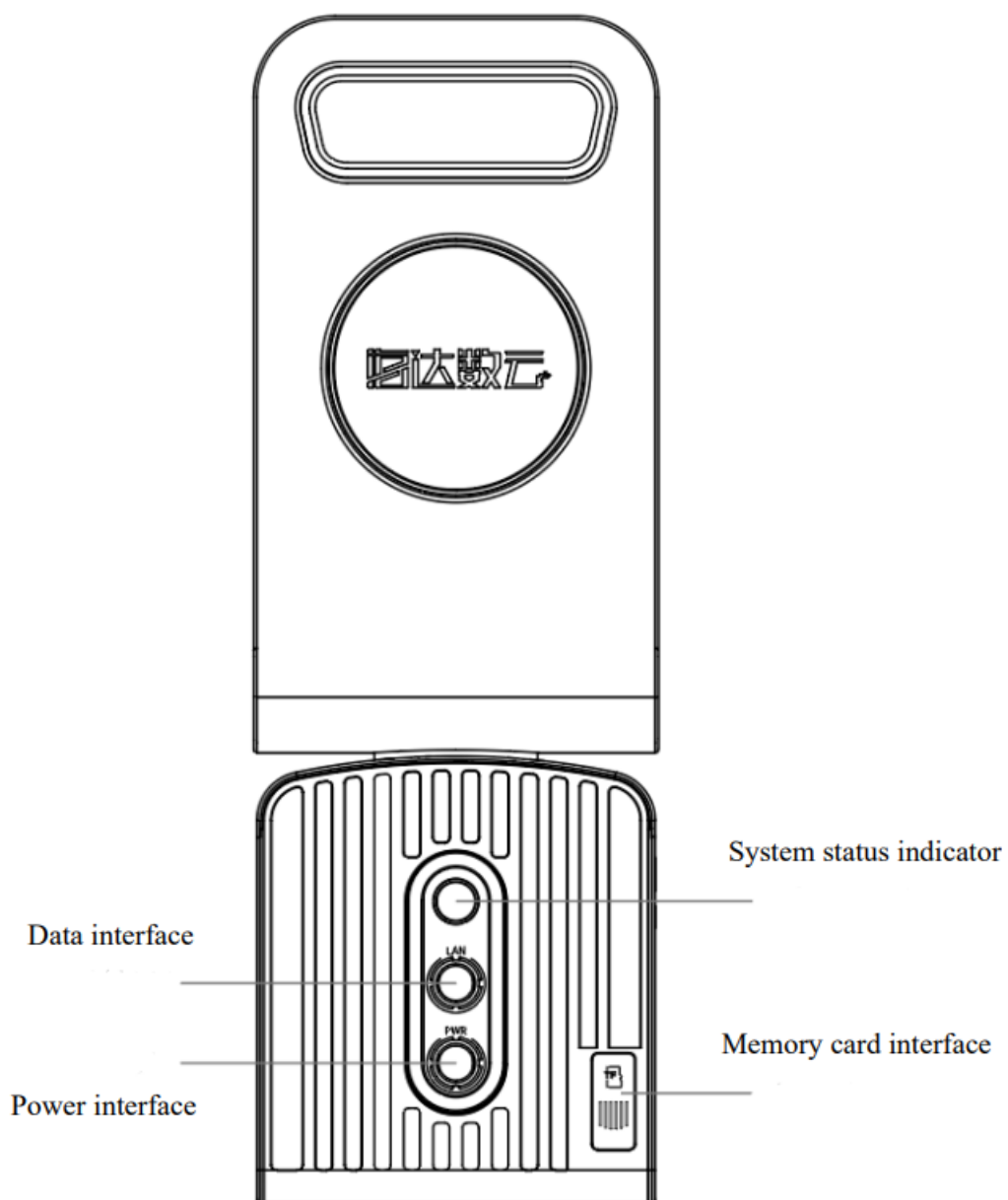The host and interface of HD TLS360 system are shown in the figure below.

Figure 2-1 Host and interface diagram of HD TLS360 system

Battery

HD TLS360 system is powered by lithium battery, as shown in the figure below.
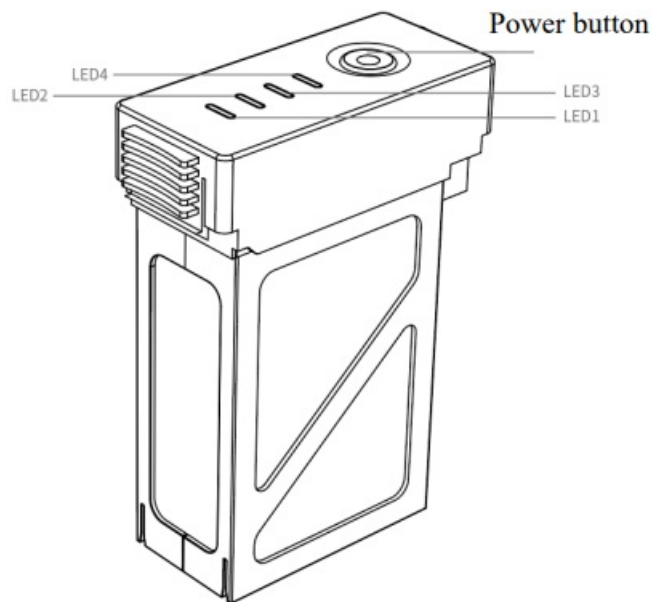
Figure 2-2 HD TLS360 system lithium battery

Power button

Figure 2-2 HD TLS360 system lithium battery Warning: 1. It is forbidden to immerse the battery in liquid (such as water,
seawater, etc.), and the battery should be placed in a cool and dry environment when not in use; 2. It is forbidden to keep and use the battery near high-temperature sources (such as fire, heater, etc.); 3. It is forbidden to knock, weigh, throw or step on the battery; 4. If the battery is bulging or deformed, do not continue to use it; 5. The battery is equipped with a special battery charger. Do not replace other models of chargers.

Battery On

When the battery is off, briefly press the power button once, and then long press the power button for more than 2 seconds to turn on the battery. When the battery is turned on, the power indicator is red and always on, and the battery indicator shows the current battery power.

Battery Off

When the battery is on, briefly press the power button once, and then long press the power button for more than 2 seconds to turn off the battery. After the battery is turned off, the indicator lights are off.

Power cable & Data cable

HD TLS360 system is equipped with 1 power cable and 2 data cables, as shown in the figure below.

Figure 2-3.1 Power cable

Figure 2-3.2 Network cable

Figure 2-3.2 Camera data cable

Power cable: used to connect the power port of HD TLS360 host to the battery compartment.
Network cable: used to connect the LAN port of the HD TLS360 host and the network port of the computer.
Camera data cable: used for the connection between camera USB3.0 interface and computer USB port.
Notice: 1. The above cables are directional connecting wires, and the
positioning pin (the position marked by the red dot of the connector) faces upward during connection.
Warning: 1. The above cables are special power cables and data cables for
the system. Do not mix or use other cables to connect equipment; 2. Connect cable gently to prevent excessive force from damaging the equipment.

Battery Compartment
HD TLS360 system is equipped with external battery compartment, as shown in the figure below.
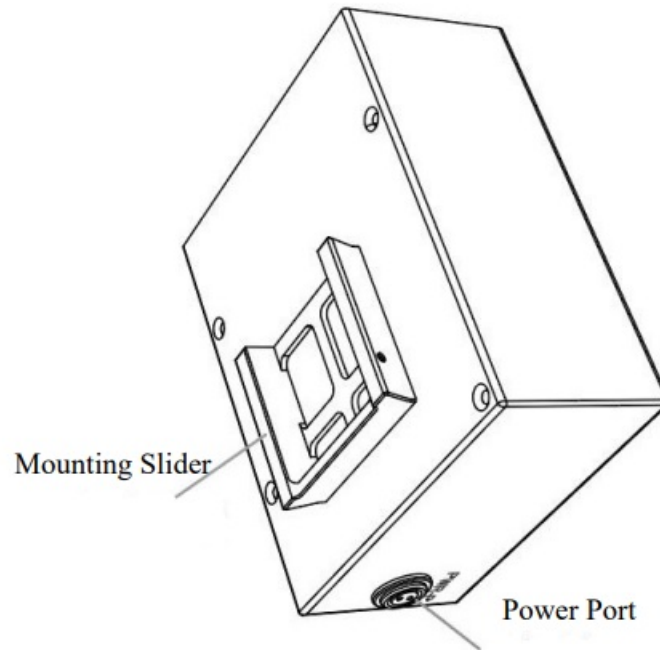
Mounting Slider Power Port

Figure 2-4 HD TLS360 system battery compartment

Panoramic Camera Component
HD TLS360 system is equipped with panoramic camera components, as shown in the figure below.
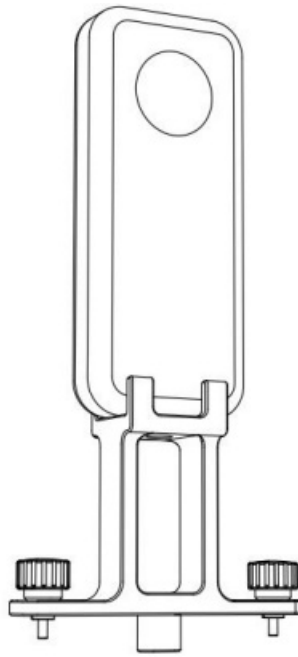
Figure 2-5 HD TLS360 system panoramic camera component

RTK Fix Component

HD TLS360 system is equipped with RTK fix components, as shown in the figure below.
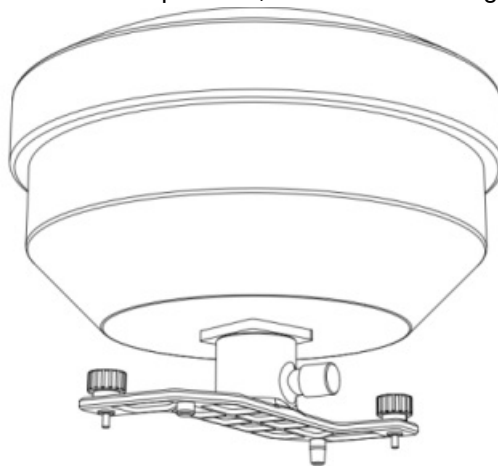

Figure 2-6 HD TLS360 system RTK fix component

Carbon Fiber Tripod

HD TLS360 system is equipped with carbon fiber tripod, as shown in the figure below.
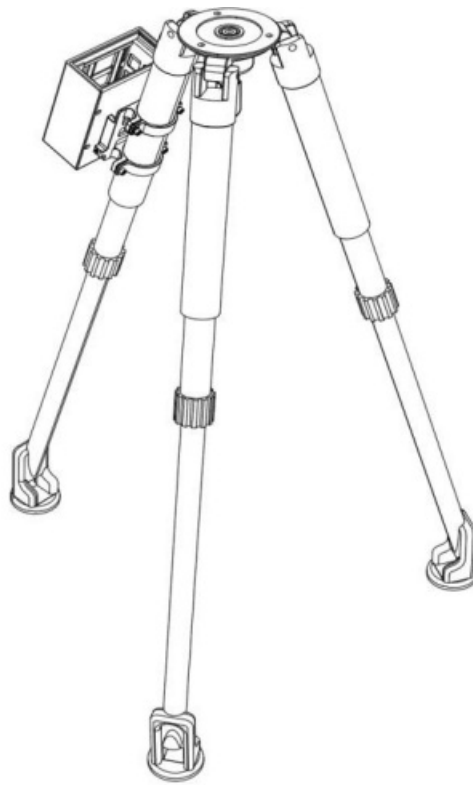
Figure 2-7 HD TLS360 system carbon fiber tripod

Equipment Installation & Disassembly

Preparation before Installation

Before installing HD TLS360 system, please check whether the equipment is complete according to the equipment packing list.

Table 3-1Equipment List

Type	Order No.	Part Name	Unit	Quantity
Device	1	HD TLS360 system Host	PCS	1
	2	Battery	PCS	2
	3	Battery Charger	PCS	1
	4	Battery Compartment	PCS	1

	5	Panoramic Camera Component	PCS	1
	6	RTK FIX Component	PCS	1
	7	Carbon Fiber Tripod	PCS	1
Cable	1	Power Cable	PCS	1
	2	Network Cable	PCS	1
	3	Camera Data Cable	PCS	1
Others	1	Card Reader	PCS	1
	2	Dongle	PCS	1
	3	Software U-Disk	PCS	1
	4	HD TLS360 System Product Manual	PCS	1
	5	HD TLS360 System Product Packing List	PCS	1
	6	Certification	PCS	1
	7	Warranty Card	PCS	1

Notice:
The above list is only an example. Please refer to the packing list attached to the equipment.

HD TLS360 System Equipment Installation and Disassembly
Warning: 1. When installing HD TLS360 system equipment, please handle it
carefully to protect the equipment; 2. When installing or disassembling a power supply device, ensure
that the power supply device is turned off to avoid damage to the device when it is powered on. 3. After
disassembling the equipment, put the parts back into the packing box according to their positions and check
whether the parts are complete.

Battery Installation
Please ensure that the battery is turned off according to the steps described in section 2.2.2. Install the battery
into the battery compartment of HD TLS360 system in the direction shown by the arrow in the figure below, and
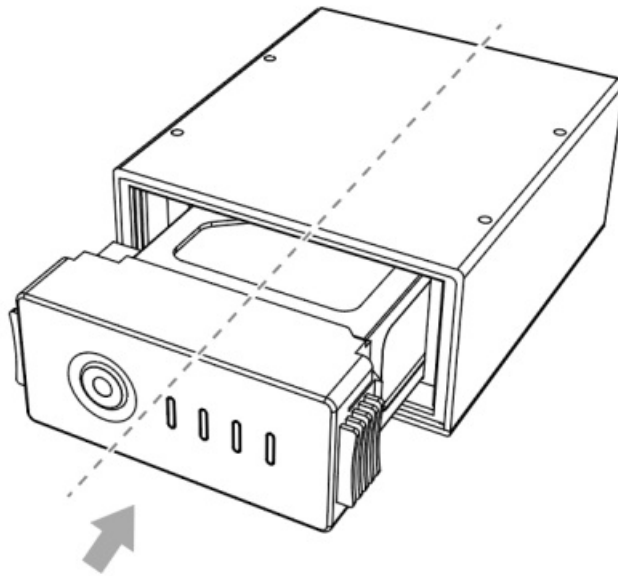gently push it inward until the buckle is fastened.

Figure 3-2.1 Battery Installation

Battery Disassembly

Ensure that the HD TLS360 system host is turned off and turn off the battery power. Press the clips on both sides of the battery and pull the battery out of the battery compartment in the direction of the arrow.
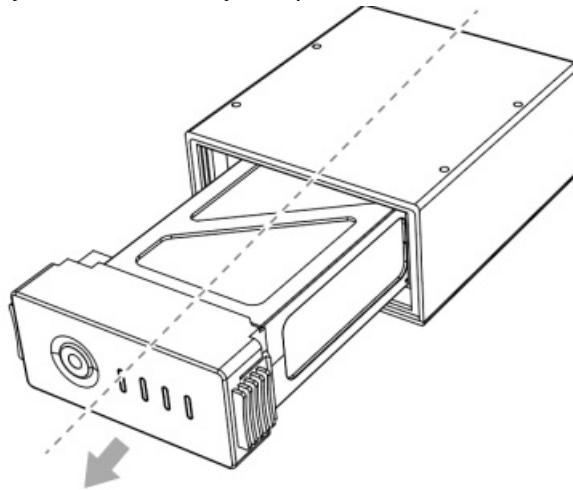

Figure 3-2.2 Battery Disassembly

Camera Installation

Ensure that the HD TLS360 system host is turned off. Install the camera component into the top of the host in the direction shown in the figure, and tighten the screws on both sides by hand.

Figure 3-2.3 Installation diagram of HD TLS360 system camera

Warning: Before using HD TLS360 equipment, please check whether the fastening screws of the camera are loose, so as not to affect the safety of the equipment.

Camera Disassembly
Ensure that the HD TLS360 system host is turned off. Loosen the screws on both sides of the camera component by hand, and take out the camera component in the direction shown in the figure.

Figure 3-2.4 Disassembly diagram of HD TLS360 system camera

Notice: After removing the camera, please cover the camera lens protection cover to prevent damage to the camera lens.

RTK Installation

Ensure that the HD TLS360 system host is turned off. Install the RTK components on the top of the host in the direction shown in the figure, and tighten the screws on both sides by hand.
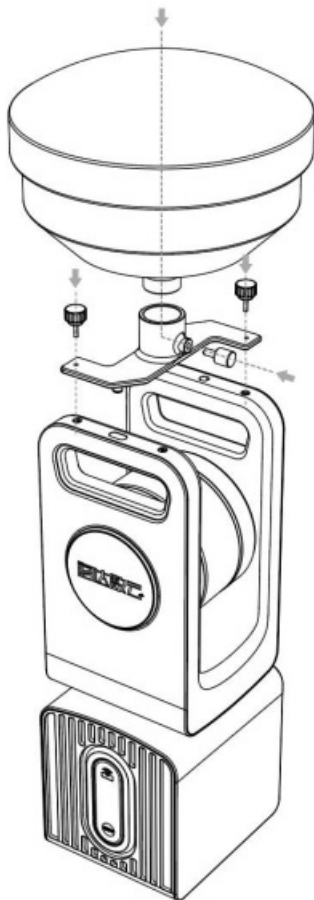

Figure 3-2.5 Installation diagram of HD TLS360 system RTK

Notice: Before using HD TLS360 equipment, please check whether the fastening screws of RTK components are loose, so as not to affect the safety of the equipment.

RTK Disassembly

Ensure that the HD TLS360 system host is turned off. Loosen the screws on both sides of RTK component by hand, and take out the RTK component in the direction shown in the figure.
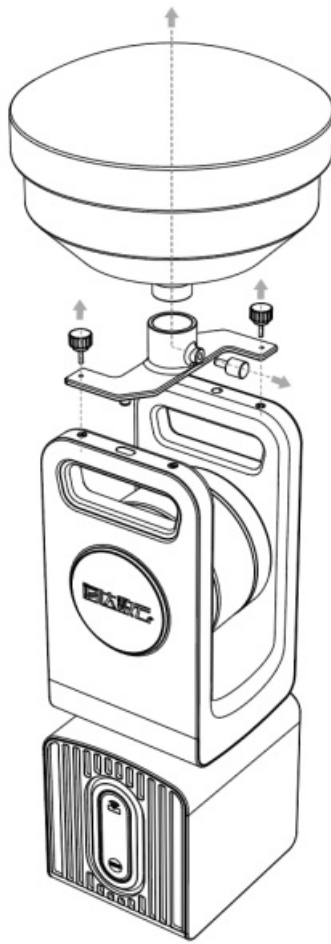
Figure 3-2.6 Disassembly diagram of HD TLS360 system RTK

Battery Compartment Installation

Install the battery compartment into the battery compartment chute of the carbon fiber tripod in the direction of the arrow shown in the figure below, and gently push it down and clamp it until you hear a "click".
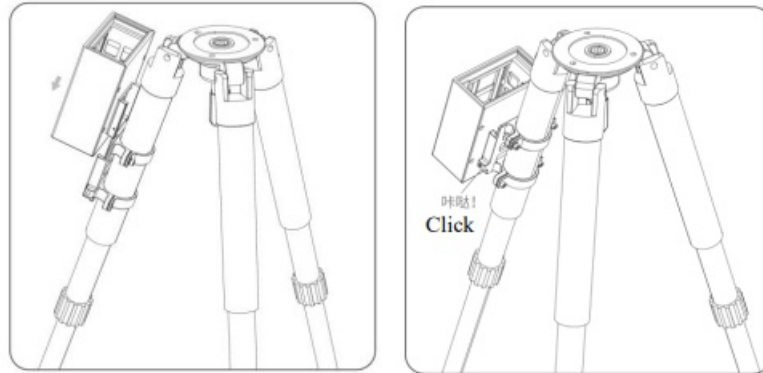

Click

Figure 3-2.7 Installation diagram of HD TLS360 battery compartment

Battery Compartment Disassembly

Gently push the bottom of the battery compartment in the direction of the arrow in the figure below to push the battery compartment out of the carbon fiber tripod battery compartment chute.
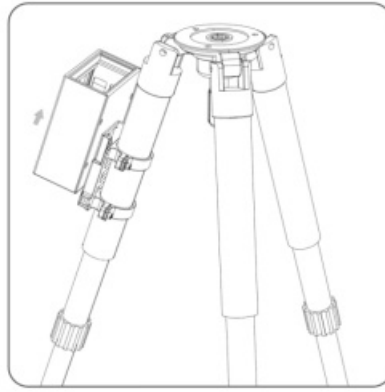
Figure 3-2.8 Disassembly diagram of HD TLS360 system battery component

Host Installation

Ensure that the HD TLS360 system host is turned off. Place the host on the top of the carbon fiber tripod, roughly align the center hole at the bottom of the host with the center hole of the tripod fixing platform, and then tighten the hand screw nut at the bottom of the tripod fixing platform to fix the host with the carbon fiber tripod.
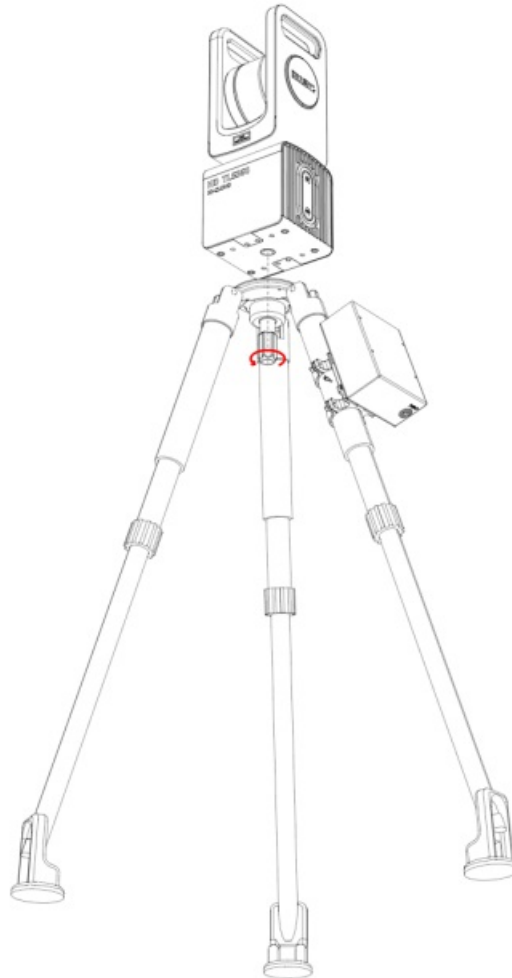
Figure 3-2.9 Installation diagram of HD TLS360 system host

the carbon fiber tripod is placed stably and reliably, so as not to affect the safety of the equipment.

Host Disassembly

Ensure that the HD TLS360 system host is turned off and unplug the external cable of the host. Loosen the hand screw nut at the bottom of the carbon fiber tripod fixing platform by hand, remove the host with both hands and place it in the packing box or other safe position.
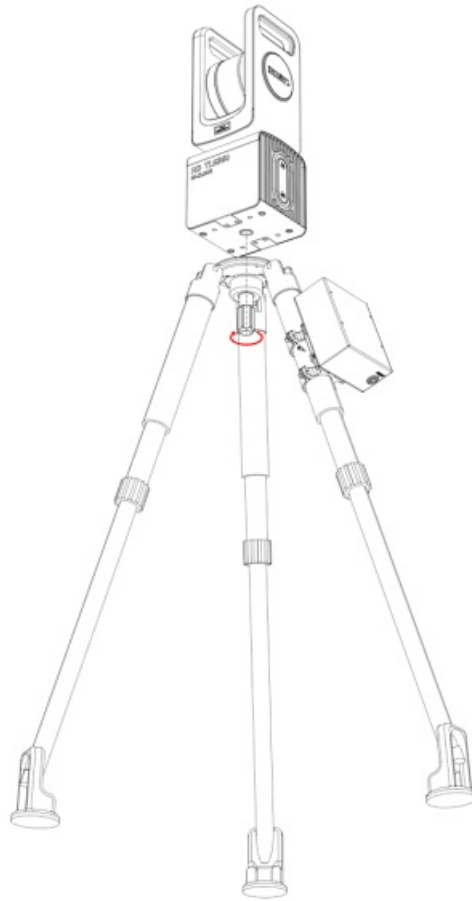
Figure 3-2.10 Disassembly diagram of HD TLS360 system host

Notice: HD TLS360 equipment needs to be held by hand during disassembly to avoid accidental falling of the equipment after loosening the fixing nut.

Equipment Operation

Equipment Startup

1. After the equipment installation is completed according to the steps described in Section 3.2, the HD TLS360 system equipment can be used;
2. According to the steps described in Section 2.2.1, turn on the battery, wait for two seconds, and then press the power button of the HD TLS360. The indicator light is on and the equipment is started;
3. When the indicator light is on, you can use your mobile phone or computer to search for WiFi hotspots. When the WiFi access point named "HD TLS360" is searched, the system will start normally.
   Notice: Since it takes time (usually less than 1min) to initialize after the equipment is started, please wait patiently during the equipment system initialization.

Camera Operation
The model of HD TLS360 system camera is Insta360 ONE X. Please refer to the Insta360 ONE X operation manual or follow the instructions of our technicians.

Host Connection
HD TLS360 system provides two connection modes: wireless connection and wired connection. The two connection modes are described below.

Wireless Connection

1. Use your mobile phone or computer to search for WiFi hotspots and find a WiFi access point named "HD TLS360";
2. Use password "12345678" to join the HD TLS360 hotspot, and set the Wi-Fi IP obtaining mode to automatically obtain IP.

Wired Connection

1. Use the network cable to connect the LAN port of the equipment to the network port of the computer;
2. Change the IP address of the cable network adapter to a fixed IP address, as shown in Figure 4-3.2.
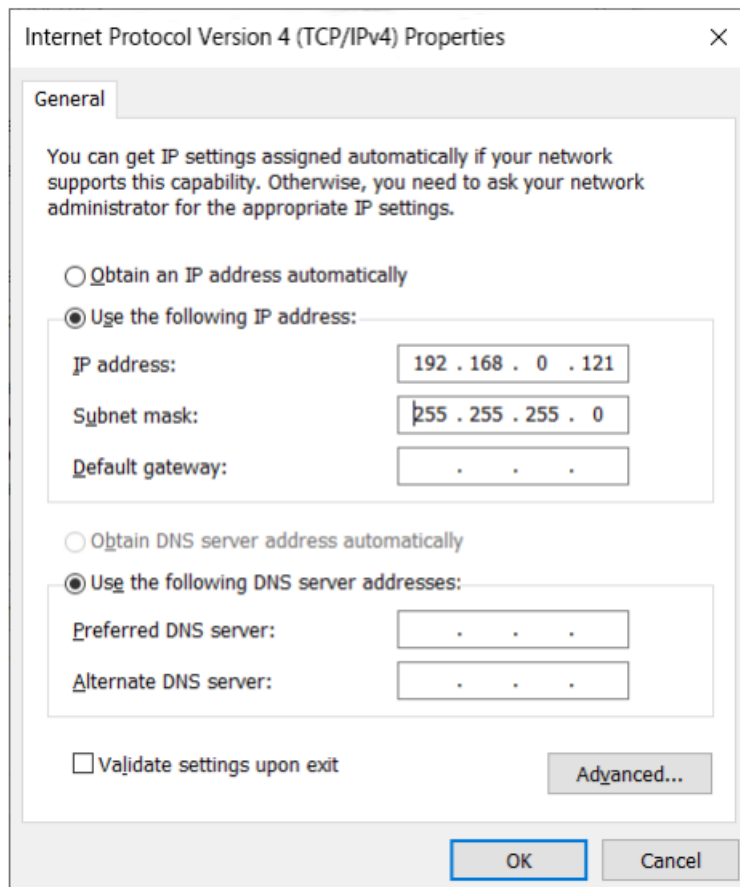
Figure 4-3.2Fixed IP settings

Reminder: 1. The IP address of the HD TLS360 is 192.168.0.196. 2. The fixed IP address of the wired network can be any IP
address from 192.168.0.2-192.168.0.254 except 192.168.0.196. The subnet mask is 255.255.255.0.

Host Shutdown

1. After the system stops collecting data and completes data transmission, click the "Turn Off Device" button through the operation software client to turn off the device, as shown in Figure 4-4;

Figure 4-4 Turn off the device

2. After the HD TLS360 host status indicator is off, power off the battery to complete the shutdown of the device host.

Warning:

1. To prevent device damage, do not power off the host before it is completely shut down.
2. When the equipment needs to be packed and transported after being shut down, please take the battery out of the battery compartment and place it in the battery slot of the special battery box or equipment packing box.
3. **Battery Charging**

    The lithium battery of HD TLS360 system equipment is charged with a special charger, as shown in Figure 4-5.

Figure 4-5 HD TLS360 charger

If you do not use the battery for more than 10 days, please discharge the battery to about 50% for storage.
If the battery is idle for a long time, charge and discharge it every three months to keep the battery active.

Data Copy

Point Cloud Data Copy

1. Power on the HD TLS360 host;
2. Use a network cable to connect the LAN port of the HD TLS360 host to the computer network port. Set the IP address of the computer network port by according to the steps described in Section 4.3.2.
3. Open "my computer" (computer) and type "\192.168.0.196" in the address box, as shown in Figure 5-1:
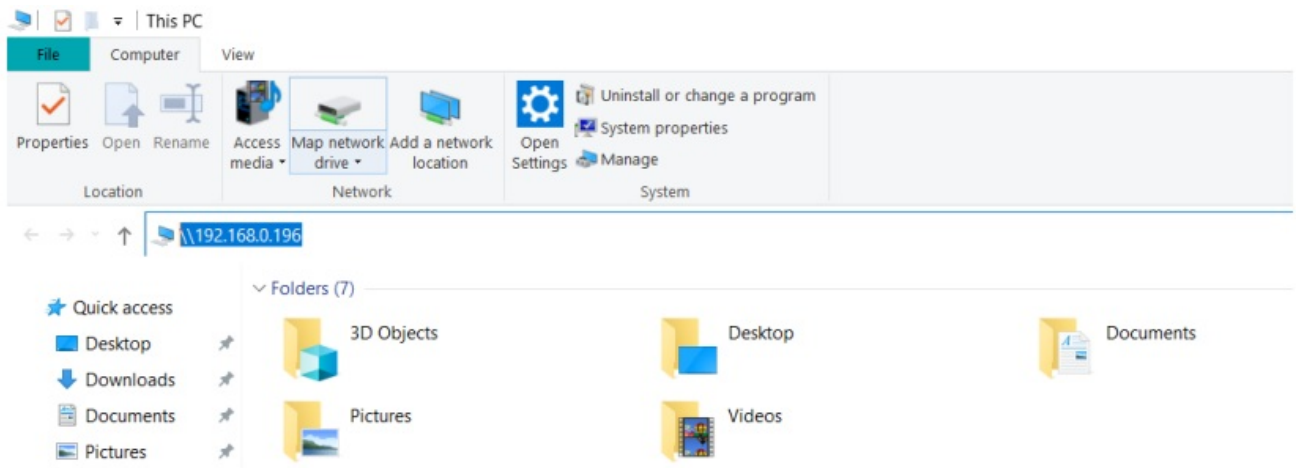
Figure 5-1 Data Copy

4. Enter the user name and password in the pop-up dialog box. The default user name and password for data copy is "root". After entering the system, the data is saved in the SD_Card/SD Card or SSD/DATA(Solid State Disk) folder according to the operation during the scanning. The data in the folder is the original data collected by the device.

Reminder: You need to input the user name and password when you connect the computer to the device for the first time. And you do not need the user name and password when you connect again.

5.2 Image Data Copy

The image copy is directly downloaded to the mobile phone through the Insta360 ONE X camera mobile phone APP. Please refer to the Insta360 ONE X operation manual or follow the instructions of our technicians.

Appendix

- **Common Fault Diagnosis**
- **Precautions for equipment use**
- In order to ensure the service life of the equipment and the accuracy of data acquisition, the following items need to be paid attention to when using the equipment:
- Wipe the equipment at the beginning and end of each acquisition to keep
- the equipment clean. After each acquisition, all connecting cables shall be sorted and placed.
- The equipment must be disassembled and put into the packing box during long-distance transportation.
- The equipment cannot collect data in harsh environments such as rain, fog, haze, snow and high temperature,etc.
- It is not allowed to open the equipment without the consent of the manufacturer.
- Be sure to handle the equipment with care during installation and disassembly.
- When the equipment is not used for a long time, put the equipment into the packing box and place desiccant in the packing box.

Reader Feedback

Dear Clients:

Thank you for your support and care for the products of Wuhan Hi-Cloud Technology Co., Ltd. Although we have conducted strict tests on the equipment, there may be some errors that have not been found. If you find any errors or defects in the process of using the equipment, please inform us in time. We will try to make corrections to make our equipment more suitable for your requirements. In order to provide you with better service, if you encounter any problems in the process of using this manual, or have any good suggestions, please call and write to us.

Address: Building 19, East District R&D Center, 27# Yangqiaohu Ave., Jiangxia Dist., Wuhan, Hubei, P.R.China
Tel027-59519039 Websitewww.hi-cloud.com.cn

Warning:
This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

Documents / Resources

T10 3D Laser Scanner Product Manual Wuhan Hi-Cloud Technology Co.,Ltd.	**HI-CLOUD TLS360 Portable 3D Laser Scanner** [pdf] User Manual T0, 2A8YS-T0, 2A8YST0, TLS360 Portable 3D Laser Scanner, TLS360, Portable 3D Laser Scanner, Portable Laser Scanner, 3D Laser Scanner, Laser Scanner, 3D Scanner, Portable Scanner, Scanner

References

- 愈融汇