HESAI

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Connection Box

for PandarXT Series
User Manual

HESAI Wechat

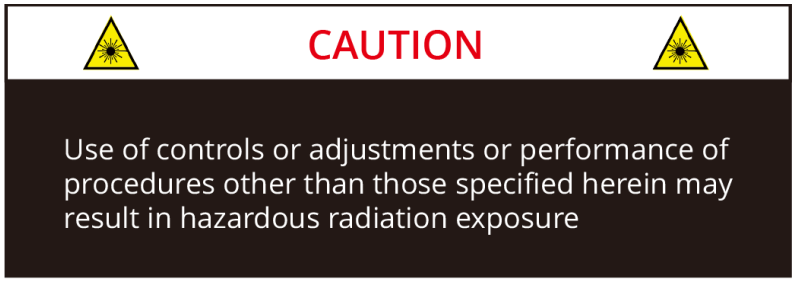
Contents

Safety Notice

PLEASE READ AND FOLLOW ALL INSTRUCTIONS CAREFULLY AND CONSULT ALL RELEVANT NATIONAL AND INTERNATIONAL SAFETY REGULATIONS FOR YOUR APPLICATION.

■ Caution

To avoid violating the warranty and to minimize the chances of getting electrically shocked, please do not disassemble the product. The product must not be tampered with and must not be changed in any way. There are no user-serviceable parts inside the product. For repairs and maintenance inquiries, please contact an authorized Hesai Technology service provider.



■ Safety Precautions

In all circumstances, if you suspect that the product malfunctions or is damaged, stop using it immediately to avoid potential hazards and injuries. Contact an authorized Hesai Technology service provider for more information on product disposal.

Handling

Improper handling such as dropping, burning, piercing, and squeezing may cause damage to the product.
In case the product is dropped, STOP using the product immediately and contact Hesai technical support.

Repair

DO NOT open and repair the product without direct guidance from Hesai Technology. Disassembling the product may cause degraded performance, failure in water resistance, or potential injuries to the operator.

Power Supply

Use only the cables and power adapters provided by Hesai Technology. Using off-spec or damaged cables and adapters, or supplying power in a humid environment can result in fire, electric shock, personal injuries, product damage, or property loss.

Hot Surface

During or after a period of operation, DO NOT touch the product's enclosure with your skin. Such direct contact with the hot surface can result in discomfort or even burns.

Vibration

Strong vibration may cause damage to the product and should be avoided. If you need the mechanical vibration and shock limits of this product, please contact Hesai technical support.

Radio Frequency Interference

Please observe the signs and notices on the product that prohibit or restrict the use of electronic devices. Although the product is designed, tested, and manufactured to comply with the regulations on RF radiation, the radiation from the product may still influence other electronic devices.

Medical Device Interference

Some components in the product can emit electromagnetic fields, which may interfere with medical devices such as cochlear implants, heart pacemakers, and defibrillators. Consult your physician and medical device manufacturers for specific information regarding your medical device(s) and whether you need to keep a safe distance from the product. If you suspect that the product is interfering with your medical device, stop using the product immediately.

Explosive Atmosphere and Other Air Conditions

Do not use the product in any area where potentially explosive atmospheres are present, such as high concentrations of flammable chemicals, vapors, or particulates (including particles, dust, and metal powder) in the air. Exposing the product to high concentrations of industrial chemicals, including liquefied gases that are easily vaporized (such as helium), can damage or weaken the product's function. Please observe all the signs and instructions on the product.

1 Introduction

This manual describes the specifications and installation of the connection box, which connects a LiDAR unit to a PC.
This connection box is an optional accessory for the PandarXT series LiDAR products.

This manual is under constant revision. To obtain the latest version, please visit the Download page of Hesai's official website, or contact Hesai technical support.

1.1 Specifications

Operating Voltage	DC 9 to 36 V	**Operating Temperature**	-20°C to 65°C
Power Consumption	< 0.5 W	**Supported LiDAR Models**	PandarXT series
Weight	0.15 kg		

NOTE Specifications are subject to change. Please refer to the latest version.

1.2 Dimensions

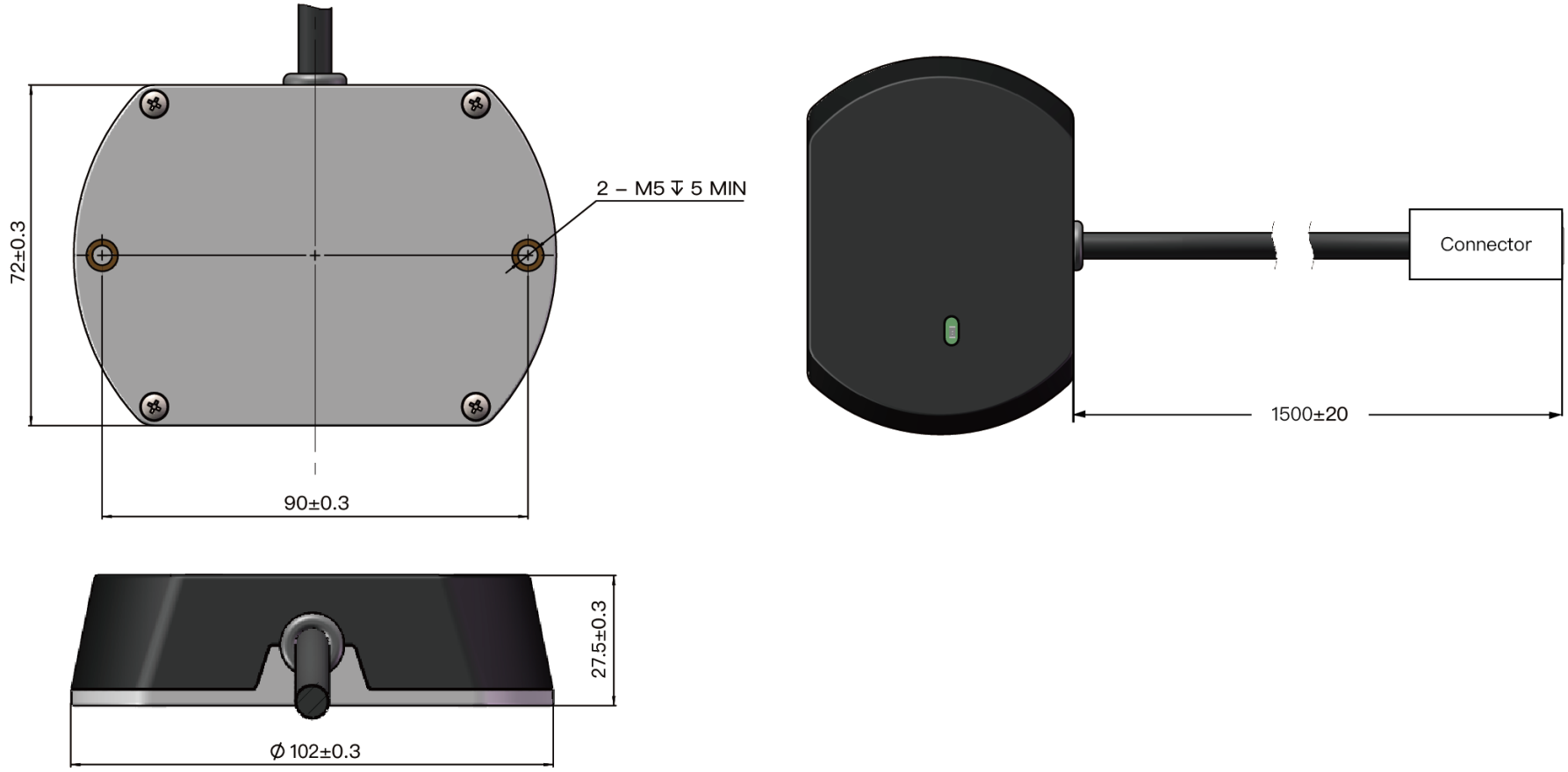


Figure 2.6 Connection Box (Unit: mm)

1.3 Interface

The connection box has a power port, a GPS port, and a standard Ethernet port.

Lemo part number: FGG.0T.309.CLAC50Z (male plug, on the connection box)

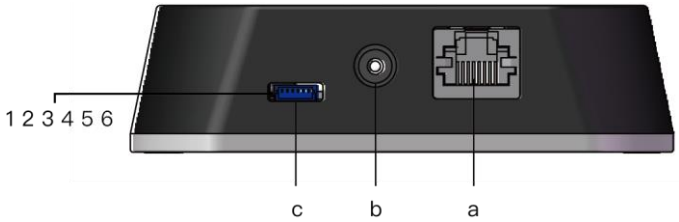


Figure 2.7 Connection Box (Front)

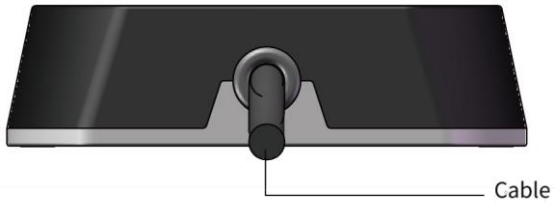


Figure 2.8 Connection Box (Back)

Port #	Port Name	Description
a	Standard Ethernet Port	RJ45, 100 Mbps Ethernet
b	Power Port	Connects to a DC power adapter External power supply: 9 V to 36 V, at least 30 W
c	GPS Port	Connector part number: JST SM06B-SRSS-TB Recommended connector for the external GPS module: JST SHR-06V-S-B Voltage standard: RS232 Baud rate: 9600 bps

The GPS port pin numbers are 1 to 6 from left to right, defined as follows:

Pin #	Direction	Pin Description	Requirements
1	Input	PPS (pulse-per-second) signal for synchronization	TTL level 3.3 V/5 V Recommended pulse width: ⩾1 ms Cycle: 1 s (from rising edge to rising edge)
2	Output	Power for the external GPS module	5 V
3	Output	Ground for the external GPS module	-
4	Input	Receiving serial data from the external GPS module	RS232 level
5	Output	Ground for the external GPS module	-
6	-	Reserved	-

1.4 Connection

1.4.1 With GPS Clock Source

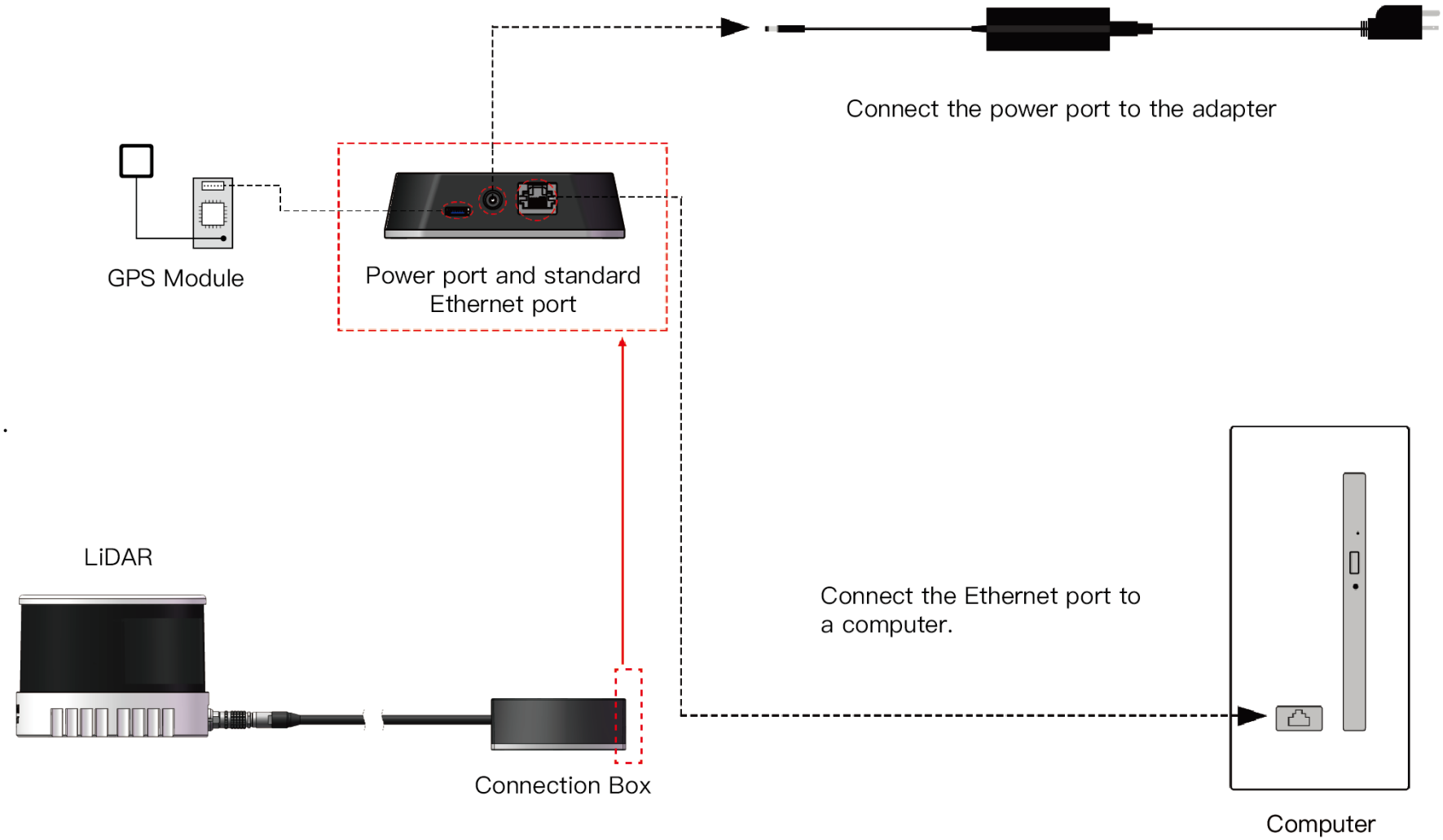


Figure 1.1 Connection Box - Connection (GPS)

1.4.2 With PTP Clock Source

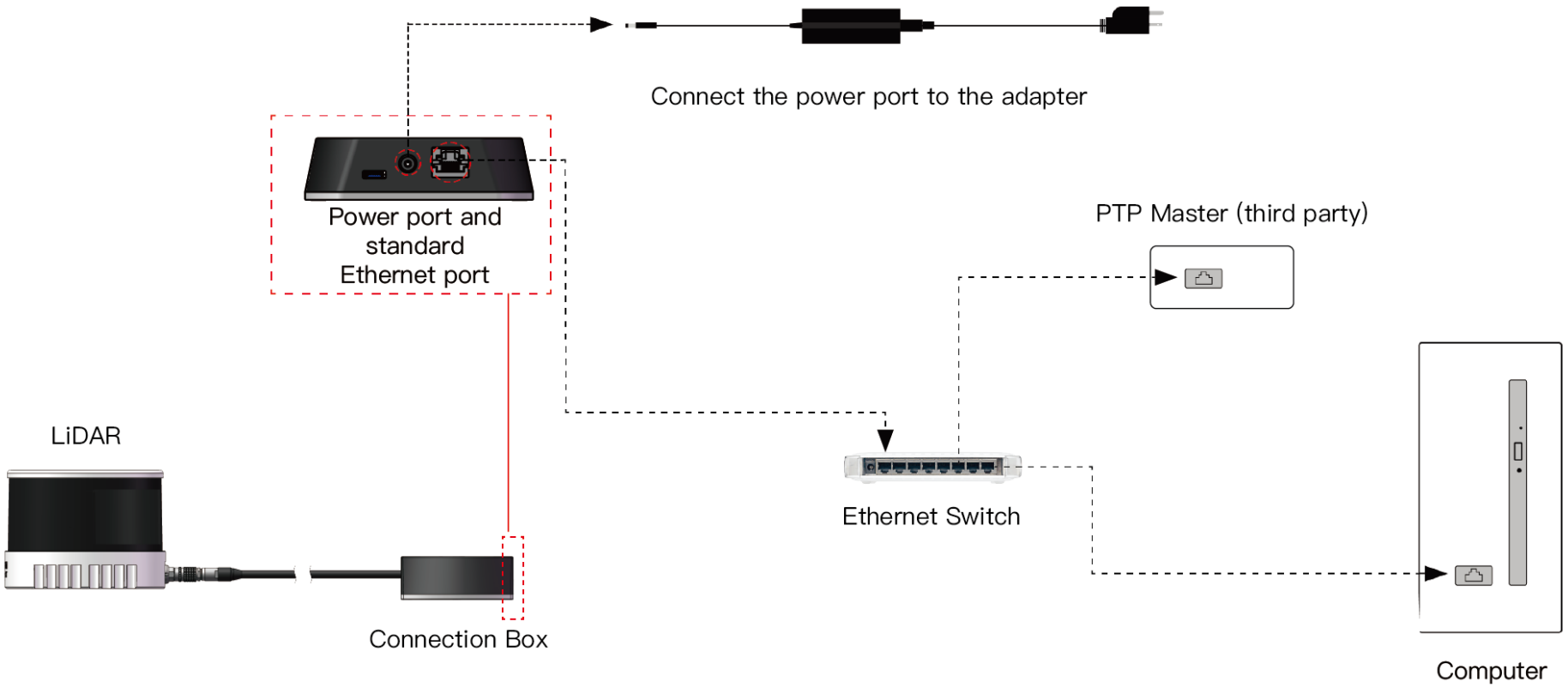


Figure 1.2 Connection Box - Connection (PTP)

2 Maintenance

■ Storage

We recommend storing the product in a dry, well ventilated place, under room temperature (23±5°C) and a relative humidity of 30% to 70%.

■ Transport

Package the product in shock-proof materials to avoid damage during transport.

Appendix I Power Supply Requirements

■ Input Voltage

To ensure that the input voltage at the LiDAR's Lemo connector is 9~36 V DC, please check the specifications of the power source and the voltage drop over cables.

We recommend using 26 AWG cables, which is the thickest wire gauge supported by the LiDAR

- Define the cable length from the power source to the LiDAR's Lemo connector as L (unit: m)
- When using 26 AWG cables, the estimated cable resistance is r = 0.3L (unit: Ω)
- Define the source voltage as U_in (V). The cable voltage drop of the LiDAR operating at 10 Hz under room temperature (23±5°C) can be estimated:

$$U_{drop}(V) = \frac{U_{in} - \sqrt{U_{in}^{2} - 40r}}{2}$$

Users may also estimate the cable voltage drop using the following lookup table.
When cable length exceeds 10 m, source voltage should be at least 24 V.

Estimation of Cable Voltage Drop

Cable Total Length L	Source Voltage $U_{in} = 12$ V	Source Voltage $U_{in} = 24$ V	Source Voltage $U_{in} = 36$ V
1.5 m	0.39 V	0.19 V	0.13 V
2 m	0.52 V	0.25 V	0.17 V
5 m	1.42 V	0.64 V	0.42 V
10 m	3.55 V (LiDAR's input voltage < 9 V)	1.32 V	0.85 V

NOTE When the LiDAR's input voltage approaches 36 V, make sure there is no additional overshoot in the external power system. Even a short period of overvoltage can cause irreversible damage to the LiDAR.

■ Power Consumption

The LiDAR's peak power consumption is below 30 W in all operating conditions.

- After a power-on in an ambient temperature of 0°C or below, power consumption typically remains around 15 W for a period of time.
- When setting the frame rate to 20 Hz, power consumption will also be higher than the typical value in Section 1.4 (Specifications).

In the above or similar conditions, we recommend providing at least 30 W of input power to the LiDAR.

■ Power Up/Down

During a power-up, the voltage requirements are charted in Figure IV.1

- The LiDAR's input voltage should remain under 1 V for more than 50 ms before ramping up
- During the ramp-up, the input voltage should climb to 90% of its designed value in less than 500 ms

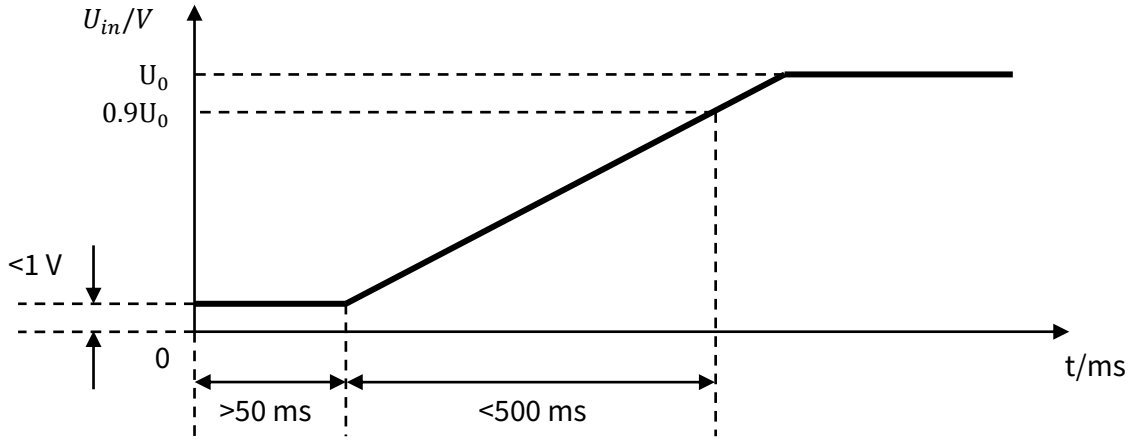


Figure I.1 Voltage Requirements during a Power-Up

During a power-down, the LiDAR's input voltage, after dropping below 1 V, should remain for more than 50 ms before the next power-up.

Appendix II Certification Info

This product is only suitable for industrial use.

■ FCC Declaration

FCC ID: 2ASO2CBPANDARXT

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.

Caution

The user is cautioned that 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 A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications.
Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Appendix III Support and Contact

■ Technical Support

If your question is not addressed in this manual, please contact us at:

service@hesaitech.com
www.hesaitech.com
https://github.com/HesaiTechnology

NOTE Please leave your questions under the corresponding GitHub projects.

■ Legal Notice

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