OHTS1122 Laser Snow Depth Transmitter

1 Product Overview

The OHTS1122 is a digital snow depth measurement sensor based on the phase-shift laser ranging principle, utilizing a 635nm semiconductor laser source and integrating a temperature compensation algorithm to eliminate the influence of laser temperature drift on measurement accuracy. The device features automatic tilt detection, supports data communication via RS485 interface using Modbus-RTU protocol, and can output snow depth data with 1mm resolution and ±1mm accuracy. The device is equipped with an automatic heating module that activates when ambient temperature falls below the set threshold, ensuring measurement stability in low-temperature environments. The enclosure features IP65 protection rating, suitable for long-term outdoor operation.

2 Applications

- Automatic weather station snow depth observation
- Road traffic safety snow accumulation monitoring
- Aircraft takeoff and landing snow monitoring
- Agricultural production snow cover monitoring
- Real-time snowfall monitoring networks

- Hydrometeorological observation stations
- Winter sports venue snow monitoring
- Power facility snow thickness monitoring

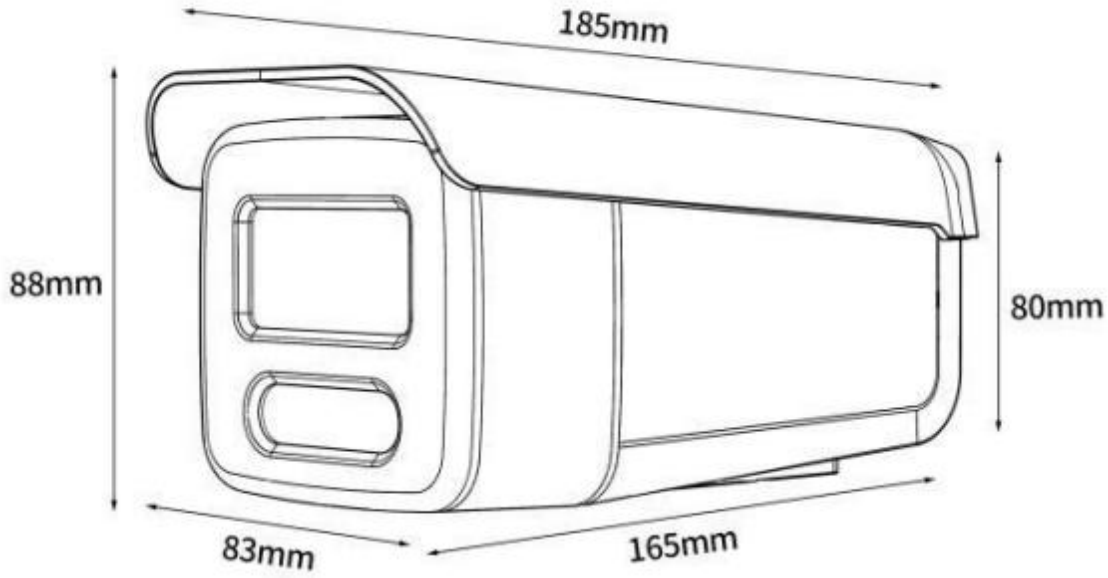
3 Features

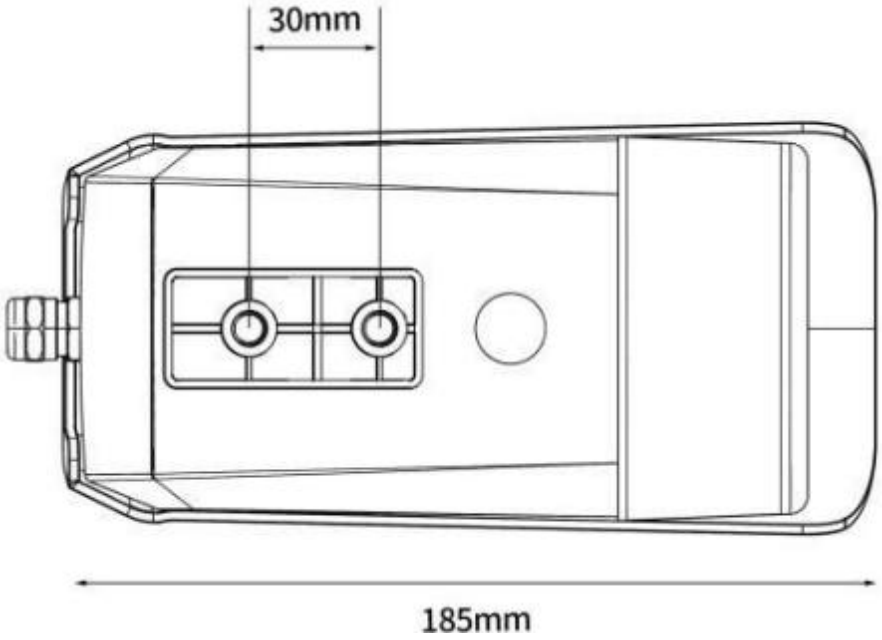
- Phase-shift laser ranging technology with 1mm measurement resolution and ±1mm accuracy
- Integrated automatic tilt measurement function; no additional angle calibration required during installation
- Built-in temperature compensation circuit ensuring measurement stability within -40°C to +50°C range
- Automatic heating function that activates in low-temperature environments to maintain optical window cleanliness and measurement performance
- IP65 protection rating, adaptable to harsh outdoor climatic conditions
- Supports Modbus-RTU communication protocol with default baud rate of 4800 bit/s
- Laser source wavelength 635nm, output power <1mW, safety Class II

4 Technical Specifications

Parameter	Specification
Supply Voltage	DC 10V~30V
Static Power Consumption	≤0.8W
Heating Power Consumption	≤3.5W
Operating Temperature	-40°C~+50°C
Operating Humidity	0%RH~95%RH (non-condensing)
Measuring Range	0.05m~2.5m
Resolution	1mm
Measurement Accuracy	±1mm
Laser Wavelength	635nm
Laser Power	<1mW
Laser Safety Class	Class II
Single Measurement Time	0.05s~1s
Spot Size (Point Spot)	5mm@10m
Spot Size (Line Spot)	3mm×150mm@10m
Communication Interface	RS485
Communication Protocol	Modbus-RTU
Data Format	8 data bits, no parity, 1 stop bit
Default Baud Rate	4800 bit/s
Configurable Baud Rates	1200 bit/s, 2400 bit/s, 4800 bit/s, 9600 bit/s, 19200 bit/s, 38400 bit/s, 57600 bit/s, 115200 bit/s
Protection Rating	IP65
Device Address Range	1~254 (factory default: 1)

5 Physical Specifications





Item	Specification
Mounting Method	Bracket fixed installation
Installation Angle	45°~60° angle with horizontal plane
Recommended Installation Height	2.5m~3.0m

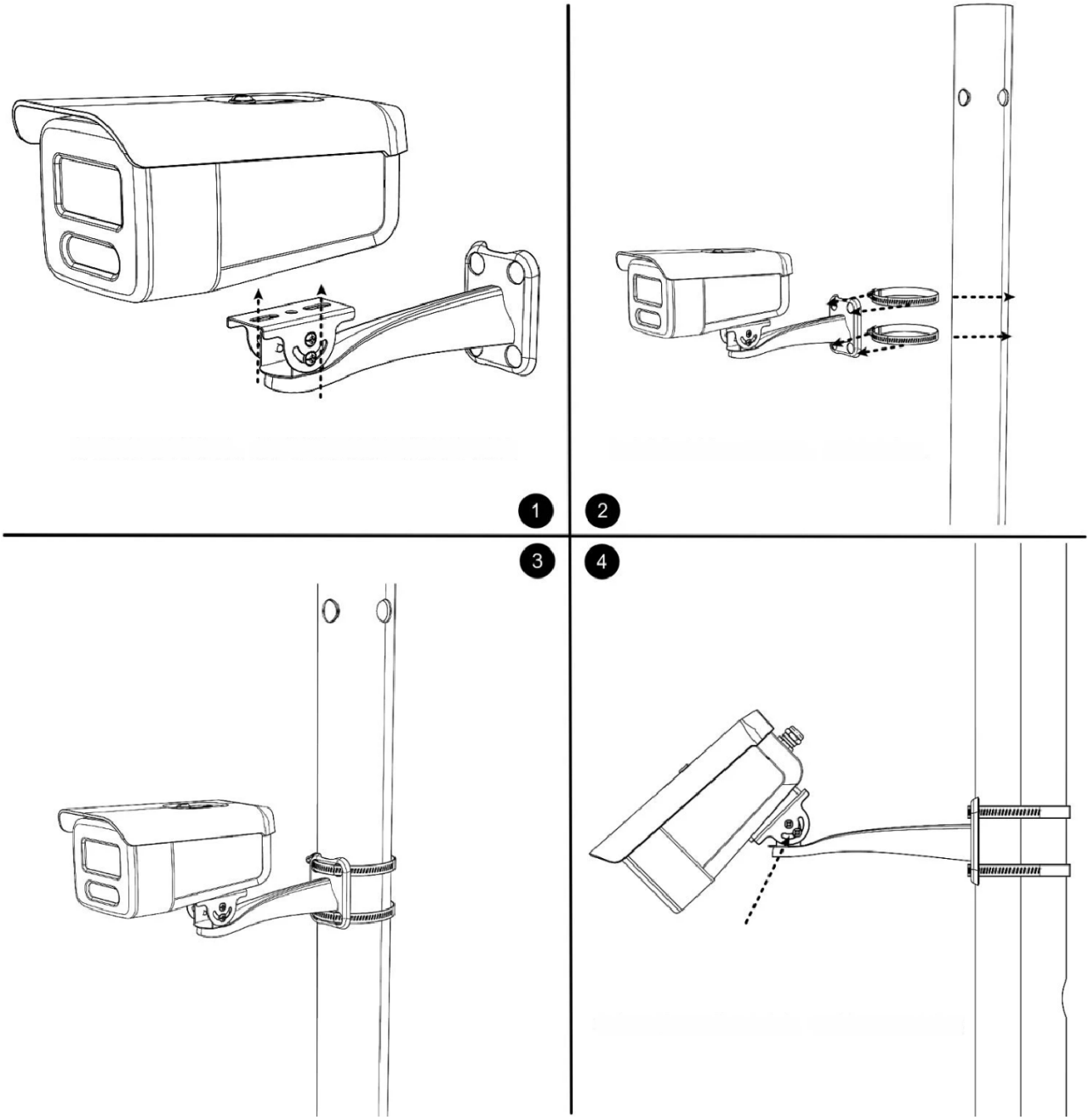
6 Installation

6.1 Pre-installation Inspection

Package contents include:

- OHTS1122 Laser Snow Depth Transmitter ×1
- Mounting Bracket ×1
- Mounting Hose Clamps ×2
- Certificate of Conformity, Warranty Card, and Technical Documentation

6.2 Installation Procedure



1. Pass the screw through the slotted hole of the bracket and use a screwdriver to tighten into the screw hole at the bottom of the device housing to secure.
2. Pass the hose clamps through the four circular holes on the bracket and secure to the vertical pole.
3. Adjust the device installation angle. It is recommended to set the sensor angle with the horizontal plane to 45°~60° and the installation height to 2.5m~3m. Tighten the screws to fix after angle adjustment is complete.

6.3 Zero Calibration

Zero calibration must be performed after device installation is complete. Press and hold the button at the bottom of the device for 3 seconds, then release after hearing the prompt tone; the device will automatically perform zero calibration. Upon successful zero calibration, the device emits a long beep; upon failure, it emits a double beep. Remote zeroing can also be performed by sending commands through RS485 configuration software.

7 Wiring Definition

Wire Color	Definition	Description
Brown	Power Positive	DC 10V~30V
Black	Power Negative	0V
Yellow	RS485-A	Differential Signal Positive
Blue	RS485-B	Differential Signal Negative

8 Communication Protocol and Data Conversion

8.1 Communication Parameters

Parameter	Setting
Encoding Format	8-bit binary
Data Bits	8 bits
Parity	None
Stop Bits	1 bit
Error Check	CRC-16 (Cyclic Redundancy Check)
Communication Protocol	Modbus-RTU

8.2 Data Frame Format

Master Inquiry Frame Structure:

Address Code	Function Code	Register Start Address	Register Length	CRC Low	CRC High
1 byte	1 byte	2 bytes	2 bytes	1 byte	1 byte

Slave Response Frame Structure:

Address Code	Function Code	Valid Byte Count	Data Area 1	Data Area 2	Data Area N	CRC
1 byte	1 byte	1 byte	2 bytes	2 bytes	2 bytes	2 bytes

8.3 Register Address Mapping

Register Address	PLC Address	Content	Function Code	Unit	Range/Description
0000H	40001	Snow Depth	03/04	mm	0~2500
0053H	40084	Snow Depth Offset	03/04/06/10	mm	-15000~15000
1001H	44098	Zero Height	03/04/06/10	mm	Write 1 to execute zero calibration
1040H	44161	Measurement Enable	03/04/06/10	-	Write 1 to enable, write 0 to disable
07D0H	42001	Device Address	03/04/06/10	-	1~254 (factory default: 1)
07D1H	42002	Device Baud Rate	03/04/06/10	-	0:2400, 1:4800 (Default), 2:9600, 3:19200, 4:38400, 5:57600, 6:115200, 7:1200

8.4 Data Conversion Formula

Snow depth data is represented as a 16-bit unsigned integer, where the value directly corresponds to the actual physical quantity:

$$D = R \times 1\,\text{mm}$$

Where:

- D: Actual snow depth (unit: mm)
- R: Register read value (converted from hexadecimal to decimal)

Example:
If reading register 0000H returns value 0064H (decimal 100), then:

$$D = 100 \times 1\,\text{mm} = 100\,\text{mm}$$

8.5 Communication Example

Reading Snow Depth (Address 0x01):

Inquiry Frame:

Address Code	Function Code	Start Address	Data Length	CRC Low	CRC High
0x01	0x03	0x00 0x00	0x00 0x01	0x84	0x0A

Response Frame (Snow depth 100mm):

Address Code	Function Code	Valid Byte Count	Snow Depth Value	CRC Low	CRC High
0x01	0x03	0x02	0x00 0x64	0xB9	0xEF

9 Precautions

- This device is strictly prohibited from being used as a safety device or emergency stop device, nor shall it be used for other purposes that may cause personal injury due to device failure.
- Technical documentation must be consulted before installation, operation, or maintenance; failure to follow these instructions may result in serious injury.
- Ensure the device is not moved after zero calibration to prevent data anomalies; if the device must be moved, recalibration is required.
- During zero calibration, ensure the snow depth monitoring surface is flat, avoiding pits or weeds that may affect laser measurement.
- Under adverse measurement conditions (excessive ambient light intensity, ambient temperature too high or too low, target reflection too weak or too strong, or target surface rough and uneven), reduced measuring range or increased measurement error may occur.
- The device employs an abnormal data filtering algorithm; abnormal data will only be updated if it persists. If suddenly large values appear when reading data, the data will not be updated immediately.
- After modifying device address or baud rate, power cycle the device to make settings take effect.
- The "Measurement Enable" register is for device debugging only and should not be manually enabled for extended periods; after testing, be sure to power cycle to restore normal operation.
- When there are too many devices or wiring is too long, provide local power supply, add RS485 repeaters, and install 120Ω termination resistors at the bus end.

10 After-Sales Guarantee & Support

The warranty period is 12 months from the date of purchase (subject to valid proof of purchase). During the warranty period, if problems with the device's mechanical parts, materials, or workmanship occur under normal use and maintenance conditions, free repair and parts replacement service will be provided upon verification.

After the warranty period expires, lifetime paid repair service is provided.

The following situations are not covered by warranty:

- Damage caused by incorrect installation, use, or operation of the product
- Disassembly, repair, modification, alteration, or replacement of internal components by unauthorized technicians
- Damage caused by negligent use or infiltration of water or other substances into the device
- Failures or damage caused by accidents or natural disasters
- Failures or damage caused by use beyond the operating parameters listed in product specifications

11 Manufacturer Information

Item	Content
Company Name	Shanghai OrangeHorse Electronic Technology Co., Ltd.
Address	Room 612, Building 1, No. 1355 Chengbei Road, Jiading District, Shanghai
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12 Revision History

Version	Date	Description
V1.0	-	Initial version released