NBL-W-SNOW Ultrasonic Snow depth sensor
Changsha Zoko Link Technology Co., Ltd.

NiuBoL

Measurement precision	±0.1%FS
length of cable	Standard 5 meters

By default, the NBL private protocol is used, and the baud rate is 9600bps. The protocol and baud rate can be customized.

Connection method

(1) If equipped with the collector produced by our company, directly connect the sensor to the corresponding interface on the collector using the sensor cable.
(2) If the sensor is purchased separately, the line sequence of the sensor supporting line is as follows:

Red wire: Power + (DC12V)
Black wire: Power -
Yellow line: 485+
Blue Line: 485-

Product introduction

The snow sensor is an intelligent snow depth sensor that uses ultrasonic telemetry technology to realize automatic and continuous monitoring of snow depth; it calculates the snow depth by transmitting 50KHz ultrasonic waves to measure the time difference from the process of transmitting to returning the signal.
This product can be widely used in the measurement of meteorology, airports, ports, laboratories, industry, agriculture and transportation.
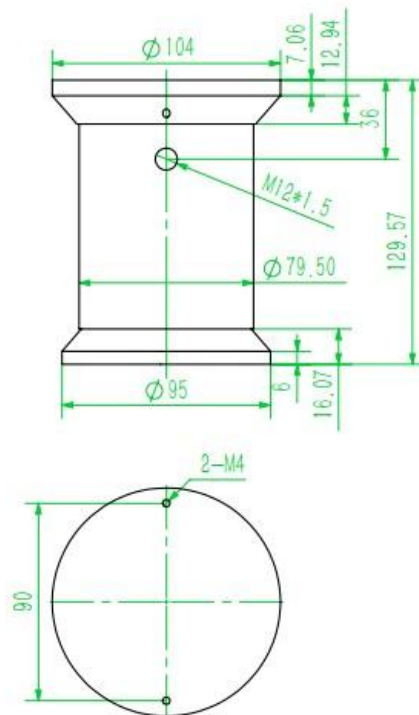
Parameters

Snow sensor parameters	
Power	City electricity
Voltage	DC 12V
communication	RS485
Power consumption	Normal temperature：180mW
	Low temperature (<5℃) turn on heating：3W
Baud rate	9600bps
Working environment	-40—50℃；≤100%RH
Storage environment	-40—65℃；≤100%RH
Measuring range	0—1000mm

Structural dimensions

NBL-W-SNOW Ultrasonic Snow depth sensor
Changsha Zoko Link Technology Co., Ltd.

NiuBoL

Communication protocol

Ⅰ Serial port format

Data bits 8 bits

Stop bit 1 or 2 bits

Check Digit None

Baud rate 9600 The interval between two communications is at least 1000ms

Ⅱ Communication format

【1】 Write the device address

Send: 00 10 Adress CRC (5 bytes)

Returns: 00 10 CRC (4 bytes)

Instructions: 1. The address bit of the read/write address command must be 00.

2. Adress is 1 byte, the range is 0-255.

For example: send 00 10 01 BD C0

return 00 10 00 7C

【2】 Read the device address

Send: 00 20 CRC (4 bytes)

Returns: 00 20 Adress CRC (5 bytes)

Description: Adress is 1 byte, the range is 0-255

For example: send 00 20 00 68

Return 00 20 01 A9 C0

【3】 Read real-time data

Send: Adress 03 00 00 00 01 CRC

Description: As shown in the figure below:

CODE	Functional Definition	Remark
Adress	Station number (address)	
03	Function code	
00　00	Start address	
00　01	Read points	
CRC	CRC Check code, low front and high back	

Return: Adress 03 02 XX XX CRC

Description:

CODE	Functional Definition	Remark
Adress	Station number (address)	
03	Function code	
02	Read unit bytes	
XX XX	Date （ low front and high back）	Hex
CRC	CRC Check code	

For example: send 01 03 00 00 00 01 84 0A
return 01 03 02 01 0E 38 10

Note: 01 0E converted to hexadecimal is 270, after data analysis, the measured value of snow amount is 27.0mm

Actual snow volume = installation initial height value - snow volume measurement value
The height difference between the two measurements is the snow amount in the measurement time period. (If the initial installation height is 1m, and the measured value is 0.9m after snowfall, then the actual snow volume is 0.1m at this time)

Steps to calculate CRC code:

1. The preset 16-bit register is hexadecimal FFFF (that is, all 1s). Call this register the CRC register;

2. XOR the first 8-bit data with the lower bits of the 16-bit CRC register, and place the result in the CRC register;

3. Shift the contents of the register one bit to the right (toward the lower bit), fill the highest bit with 0, and check the shifted out bit after the right shift;

4. If the shift out bit is 0: repeat step 3 (shift right one bit again)
   If the shift-out bit is 1: XOR the CRC register with the polynomial A001 (1010 0000 0000 0001);

5. Repeat steps 3 and 4 until the right shift is performed 8 times, so that the entire 8-bit data is processed;

6. Repeat steps 2 to 5 to process the next 8-bit data;

7. The final CRC register is the CRC code;

8. When the CRC result is put into the information frame, the high and low bits are exchanged, and the low bits are first.

NBL-W-SNOW Ultrasonic Snow depth sensor
Changsha Zoko Link Technology Co., Ltd.

NiuBoL

Instruction manual

1. After installing the sensor according to the wiring method and the instructions in the installation instructions, place it at the detection position of 1.3m ($\pm$0.1m), and open the protective cover of the snow sensor probe.

2. If equipped with the collector produced by our company, connect the system, open the protective cover of the snow sensor probe, and set the starting temperature of the snow sensor in the "Other Settings" → "Snow Settings" of the collector, the default setting The working temperature of the snow amount is T0 (the default is 5℃, which can be set by yourself). After setting the snow amount temperature, select "Snow Amount Detection", switch the "Stop" mode to "Start" mode, and click the "Confirm" button. The system will automatically detect the reference height of the sensor; (Note: If the height of the snow sensor is adjusted, you need to reset the reference height according to the above operation).

3. When the real-time temperature T>T0, the collector will automatically turn off the display value of the snow sensor. When the real-time temperature T<T0, the collector will display the test value of the snow sensor, and the snow volume information can be obtained.

Notice

1. Please check whether the packaging is in good condition, and check whether the product model is consistent with the selection;
2. Do not connect with live power. After the wiring is completed and checked, the power can be turned on;
3. The length of the sensor line will affect the output signal of the product. Do not arbitrarily change the components or wires that have been soldered when the product leaves the factory. If you need to change it, please contact the manufacturer;
4. The sensor is a precision device, please do not disassemble it by yourself, or touch the surface of the sensor with sharp objects or corrosive liquid, so as not to damage the product;
5. Please keep the verification certificate and qualification certificate, and return it together with the product during maintenance.

Contact us

Address:Room 102, District D, Houhu Industrial Park, Yuelu District, Changsha City, Hunan Province, China
Mobile and Whatsapp number:+8618073152920
Email: sales@niubol.com
Website: www.niubol.com