

Working humidity	0-95%RH
length of line	2.5m
IP rate	IP65



Product introduction

Fruit Growth Sensors are highly accurate electronic measuring instruments with automatic temperature compensation.

The instrument can be used to easily monitor the influence of environmental factors on the growth of plant fruits and stems. The data collector or computer measures the daily growth and long-term growth changes of the plant in real time through the signal change of the caliper bridge tension probe.

Technical Parameters

Model No.	NBL-W-FGS
Voltage	DC12-24V
Signal output	RS485/4-20mA/0-5V
Measuring range	A:0-50mm
	B:0-100mm
	C:0-150mm
	D:0-250mm
Communication	MODBUS
Baud Rate	9600
Average Power Consumption	0.3W
Lifetime	大于 1000000 次
Accuracy	±1%
Movable length	Maximum measuring range +3mm
Working temperature	-40-80°C

Installation

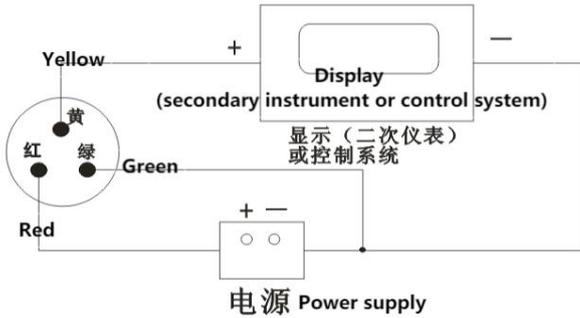


Wiring method

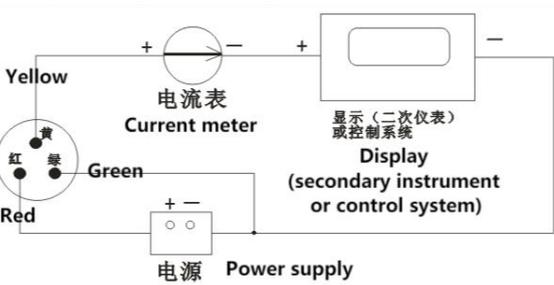
- (1) If equipped with the collector produced by our company, directly use the sensor line to connect the sensor to the corresponding interface on the collector.
- (2) If the transmitter is purchased separately, the wiring sequences of the transmitter supporting lines are as follows:

Line color	output signal		
	voltage	current	communi cation
Red	+	+	+
Black (Green)	-	-	-
Yellow	Voltage signal	Current signal	A+
Blue			B-

- (3) Transmitter voltage and current two output wiring methods:



(Wiring in voltage output mode)



(Wiring in current output mode)

Calculation formula

Voltage type:

Example: 0-100mm range, 0-5V output

Calculation formula:

$$L = (V/5 * M) \text{mm}$$

(L is the measurement indication, V is the output voltage, M is the measurement range)

Current type:

Example: 0-100mm range, 4-20mA output

Calculation formula:

$$L = (I - 4) * M / 16$$

(L is the measurement indication, I is the output current, M is the measurement range)

MODBUS Communication Protocol

1. Serial port format

Data bit 8 bits

1 or 2 stop bits

Check digit None

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

2. Communication format

【1】 Write device address

Send: 00 10 Address CRC (5 bytes)

Return: 00 10 CRC (4 bytes)

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

2. Address is 1 byte, ranging from 0-255.

Example: send 00 10 01 BD C0

return 00 10 00 7C

【2】 Read device address

Send: 00 20 CRC (4 bytes)

Return: 00 20 Address CRC (5 bytes)

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

Example: Send 00 20 00 68

return 00 20 01 A9 C0

【3】 Read real-time data

Send: Address 03 00 00 00 01 CRC

Description: As shown in the figure below:

Code	Functional Definition	Remark
Address	Station number (address)	
03	Function code	
00 00	Start address	
00 01	Read Points	
CRC	CRC Check code, front low and back high	

Return: Address 03 02 XX XX CRC

Description:

Code	Functional Definition	Remark
Address	Station number (address)	
03	Function code	
02	Read Unit Bytes	
XX XX	Data (High front and low back)	Hex
CRC	CRC Check code	

Steps to calculate CRC code:

1. The preset 16-bit register is hexadecimal FFFF (that is, all 1). Call this register the CRC register;
2. XOR the first 8-bit data with the low bit of the

- 16-bit CRC register, and put the result in the CRC register;
3. Shift the content of the register to the right by one bit (towards the lower bit), fill the highest bit with 0, and check the lowest bit;
 4. If the lowest bit is 0: repeat step 3 (shift again)
If the lowest 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 8 times, so that the entire 8-bit data has been 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 putting the CRC result into the information frame, exchange the high and low bits, with the low bits first.

◆ **Electrical Connection Precautions**

In order to ensure safety, the electrical connection should be done by professionals. Because static electricity can damage the internal electronic components of the instrument, the performance of the instrument will be reduced or damaged. The manufacturer recommends the following measures to prevent the instrument from being damaged by static electricity:

Discharge static electricity from your body before touching any of the meter's electronic parts, such as printed circuit boards and the components on them. This can be done by touching a grounded metal surface of an instrument case, or a metal conduit or pipe;

To reduce static buildup, avoid excessive movement. Ship static-sensitive components in an antistatic container or packaging;

To discharge static electricity from the user's body and keep static electricity dischargeable, wear a wrist static arrestor connected to a

grounded wire;

Use an antistatic floor or bench liner if possible.

Instrument maintenance

◆ **Maintenance schedule**

Maintenance task	Cycle	Remark
Clean the sensor	Weekly	Cleaning frequency can be determined according to the specific application
Check the sensor for damage	Monthly	
Calibrate the sensor		3D calibration has been done before leaving the factory, and users do not need to calibrate. In special cases, it can be carried out according to the maintenance schedule required by the competent authority.

◆ **Clean the sensor**

Clean the outer surface of the sensor with water. If debris remains, wipe it with a damp soft cloth or gently brush it with a soft brush.

Do not place the sensor where it will be exposed to direct sunlight or through reflection.

After-sales service

- The device has no moving parts and does not require complex routine maintenance on site.
- If the user opens the device by himself or damages the safety seal on it, he will no longer enjoy our quality assurance and guarantee.
- If there is any problem with the equipment, you can contact the company's staff to analyze and answer the problem;

If the equipment needs to be returned, please carefully pack the instrument according to the original packaging and mail it to our company, and attach the detailed fault instructions of the instrument.

Contact Us

Contact: +8615367865107/+8618073152920

Zip code: 421000

Email:sales@niubol.com

Email: sales@niubol.com

Website: <http://www.niubol.com>

Address: Room 103, Area D, Houhu Industrial Park, Yuelu District, Changsha City, Hunan Province,China