NBL-W-LUX/Illumination sensorV3.0
Changsha Zoke Link Technology Co., Ltd.

NiuBoL

Product introduction

The illuminance sensor transmitter uses a high-sensitivity silicon blue photovoltaic detector as a sensor. Users can configure different measuring ranges according to different measuring places. It has the characteristics of wide measuring range, good linearity, good waterproofness, convenient installation, and suitable for long-distance transmission. It can be widely used in agricultural greenhouses, urban lighting and other places.

Technical Parameters

Measuring range: 0-200000Lux
Wavelength range: 380 nm-730 nm
Accuracy: ±7%
Power supply mode: □ DC 12V
　　　　　　　□ DC 24V
　　　　　　　□ Other
Output form: □ Current: 4～20mA
　　　　　　□ Voltage: 0～5V
　　　　　　□ RS485
　　　　　　□ Other
Instrument cable length: □ Standard: 2.5 meters
□Other
Load resistance: Voltage type: RL≥1K
Current type: RL≤300Ω
Working temperature: -10℃～70℃
Relative humidity: 0～80%RH
Product weight: 170 g

Calculation formula

Current type (4～20mA output):
$L=(I-4)/16 \times Lm$
(L is the measured illuminance value (Lux), I is the output current (mA), and Lm is the measurement range of the selected sensor)
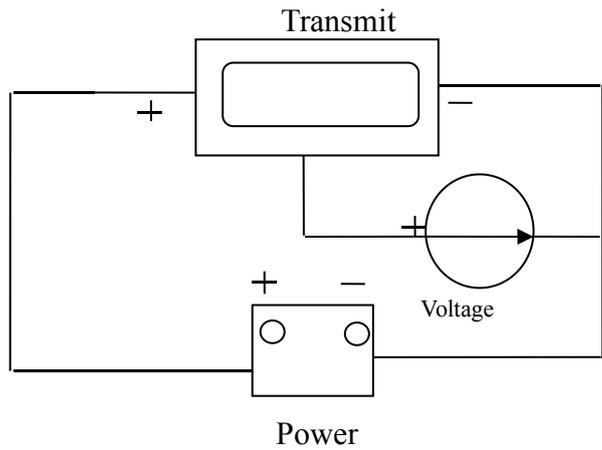
　Voltage type (0～5V output):
$L=V/5 \times Lm$
(L is the measured illuminance value (Lux), V is the output voltage (V), and Lm is the measurement range of the selected sensor)
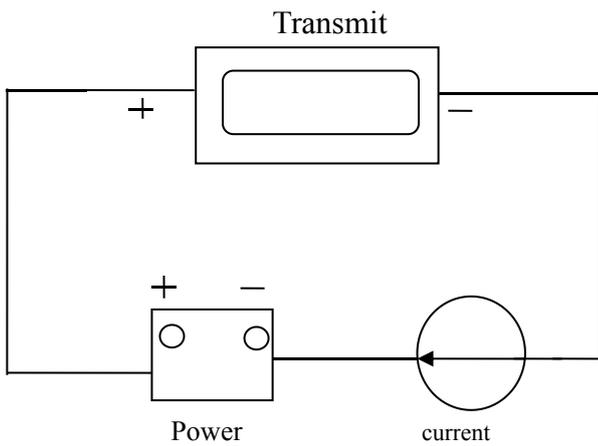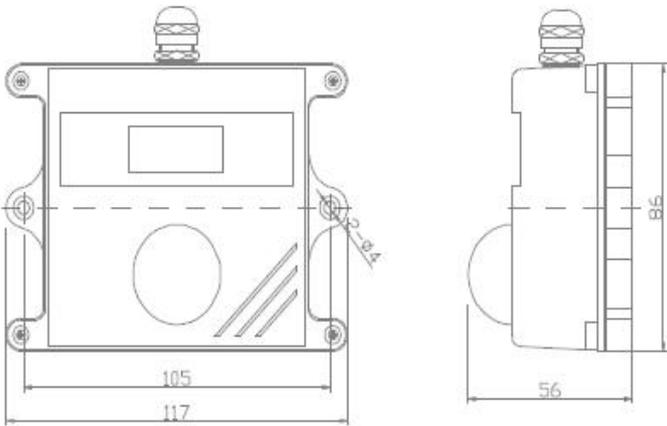
Connection method

(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 transmitter is purchased separately, the matching line sequence of the transmitter is as follows:

Line color	output signal		
	Voltage	Current	Communications
Red	+	+	+
Black （Green）	-	-	-
Yellow	Voltage Signal	Current Signal	A+/TX
Blue			B-/RX

(3) There are two output wiring methods for transmitter voltage and current:

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Transmit

Voltage

Power

(Three-wire voltage output mode wiring)

Transmit

Power   current

(two-wire current output mode wiring)

Structural Dimensions

MODBUS-RTUCommunication 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 device address
Send: 00 10 Address CRC (5 bytes)
Returns: 00 10 CRC (4 bytes)
Instructions: 1. The address bit of the read/write address command must be 00.
2. Address is 1 byte, the range is 0-255.
For example: send 00 10 01 BD C0
return 00 10 00 7C

[2] Read device address
Send: 00 20 CRC (4 bytes)
Returns: 00 20 Address CRC (5 bytes)
Description: Address 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: Address 03 00 00 00 01 XX XX
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	
XX XX	CRC Check code, low front and high back	

Return: Address 03 02 XX XX XX XX
Description:

CODE	Functional Definition	Remark
Address	Station number (address)	
03	Function code	
01	Read unit bytes	
XX XX	Date（ low front and high back）	Hex

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| XX XX | CRC Check code | |

Note: After data analysis, with one decimal point, you need to divide by ten

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 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 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.

The reading value is expanded by 10 times, which is the illuminance value, and the unit is Lux.

RS485 Circuit

Installation Instructions

1. When the user installs, use M4 screws for the screw nut, and fix the sensor on the mounting bracket through the 2 mounting holes on the sensor;
2. Users should avoid disassembling the sensor during the installation process.

Instruction manual

Wire the sensor according to the instructions in the wiring method, then place it at the position where the light intensity is to be measured, turn on the power supply and the switch of the collector, and then the light intensity of the measurement point can be obtained.

Reference standard

1 unit of illuminance is about the brightness of 1 candle at a distance of 1 meter.
Illumination under strong light on a sunny day in summer is about: 100,000 Lux (30,000 to 300,000 Lux);
Cloudy light intensity: about 10,000 Lux;
Sunrise and sunset light intensity: 300-400 Lux;
Indoor fluorescent light intensity is about: 30 ~ 50 Lux;
Night: 0.3～0.03 Lux (under bright moonlight);
       0.003～0.007 Lux (dark night);
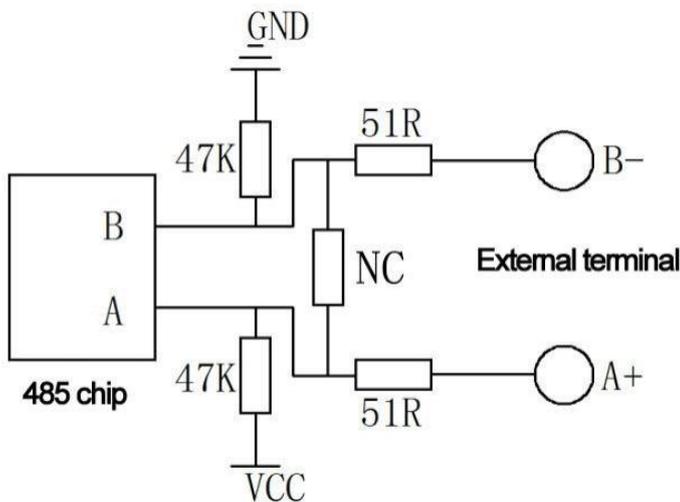
Notice

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 liquids, 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.

Trouble Clearing

1. During the analog output, the displayed value is obviously too large/small. Please check whether there is oil or other dirt on the glass cover, and wipe it off with a clean rag;

2. During analog output, the display device indicates that the value is 0 or not within the range. The collector may not be able to obtain information correctly due to wiring problems. Please check whether the wiring is correct and firm;

3. If not for the above reasons, please contact the manufacturer.

Selection table

No.	Power supply	output signal	explanation
-			Illumination sensor (transmitter)
	5V-		5V Power supply
	12V-		12V Power supply
	24V-		24V Power supply
		V	0-5V
		A1	4-20mA
		W2	RS485
For example: -12V-A1: Illuminance sensor (transmitter) 12V power supply, 4-20mA current signal output			