SZ2161

ZIGBEE wireless wide-range illumination sensor

Product Overview

SZ2161 wide range of illumination ZIGBEE wireless sensor light sensor type, standard MODBUS-RTU protocol, multi-point while monitoring, networking and remote. Applicable to a variety of places, especially for agricultural greenhouses, urban lighting and other places.

In order to facilitate networking and industrial applications , the module uses MODBUS-RTU communication protocol widely used in industry to support secondary development. Users only need to use any serial communication software module data query and set according to our protocol .

Illumination available illuminometer measured directly. Illumination unit is lux lux is the English transliteration can also be written as lx. Uniform illumination of the light object in the area of   1 m2 is obtained by a lumen flux when it is 1 lux illumination . Sometimes, in order to fully utilize the light source in the light source is often an additional reflection means , so that the direction can be more certain of the flux to increase the illumination of the illuminated surface . Such as car headlights , flashlights, photographic lights.

The following are the various environmental illuminance values   : Unit lux. Night 0.001 0.02 ; Moonlight 0.02 - 0.3 ; cloudy indoor :5   -50 ; cloudy outdoor :50 -500 ; sunny indoor :100 -1000 ; illumination under the summer sun at noon : about 10 * 6 th ; the required illumination when reading books :50 -60 ; standard home video camera illumination: 1400 .

Parameters

Parameter	Technical indicators
Illuminance measurement range	0-20 0000lux
The maximum permissible error	$\pm$ 7%;
Repeat the test	$\pm$ 5%;
Temperature characteristics	$\pm$ 0.5% / ℃
Baud Rate	9600
Communication port	Zigbee Wireless
Radio frequency	2.4G ISM band global free (ZigBee)
Network Type	Star network
Network Capacity	65,535 network nodes
Power supply	Bus-powered, DC6V-24V 1A
Power Consumption	2W
Storage Temperature	-40 - 85 ℃
Operating Environment:	-40 - 85 ℃ -40 ℃ ~ +85 ℃
Dimensions	115 × 96 × 30mm ³

ORDERING INFORMATION

| Type	Order No.
SZ2161	SZ2161

Package dimensions
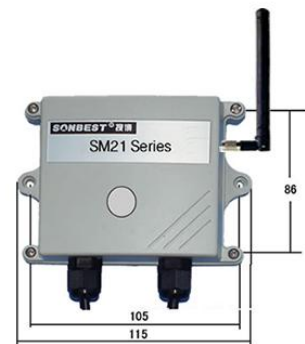
ZIGBEE Introduction

Zigbee is based on IEEE802.15.4 standard low -power personal area network protocol. Under the agreement stipulated technology is a short-range , low-power wireless communication technology . The name comes from the character dancing bees , because bees (bee) is by flying and "buzz " (zig) shake wings " dance " to transfer pollen where location information with their peers , that bees rely on this way constitute a group communication network. Its characteristics are close , low-complexity , self-organizing , low power, low data rate , low cost . Mainly suitable for automatic control and remote control in the field , can be embedded in a variety of devices . In short , ZigBee is a cheap , low-power short-range wireless network communication technology.

ZigBee is a low-speed short-range transmission of wireless network protocols. ZigBee protocol , respectively from the bottom to the physical layer (PHY), media access control layer (MAC), the transport layer (TL), the network layer (NWK), the application layer (APL) and the like. Which the physical layer and MAC layer follow IEEE 802.15.4 standard. ZigBee network is mainly characterized by low power, low cost , low rate , supporting a large number of nodes , supports a variety of network topologies , low complexity, fast, reliable and secure. ZigBee coordinator can be divided into network devices (Coordinator), aggregation node (Router), sensor nodes (EndDevice) , three roles.

A distance farther

zigbee supports up to 15 hops, between points furthest 2KM, can support large distance networking.
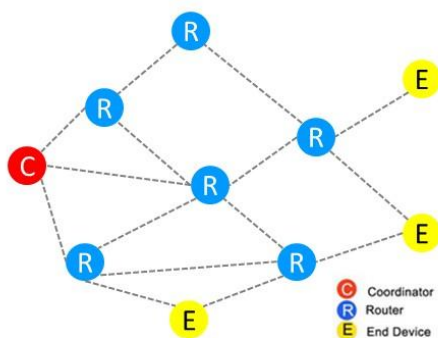

Second, more powerful equipment

Flexible node types, for the center, relay, terminal, multi-node, more convenient and easier

Third, anti-interference ability

Channel detection allows data to reduce collisions

Complex code sequence using DSSS Direct Sequence Spread Spectrum technology, with high rates of pseudo-noise code sequence information code sequence motif with two plus (waveform multiplied) to control the phase of the carrier after a direct sequence spread spectrum signal is obtained, the higher the upcoming original power, with a more narrow frequency becomes low power wideband frequency to obtain satisfactory anti-noise performance in the wireless communications field.

Instructions for use
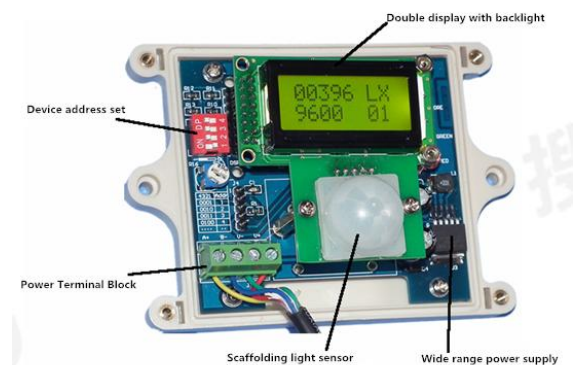
1. Wiring

There are two ways a user terminal,

a)   directly using the device comes with a lead, wiring according to the color tips

Wire Color	sign	Note
Red	V+	Voltage range: DC6-24V
Green	V-	Negative power
Yellow	A+	RS485 A+
Blue	B-	RS485 B-

b)   directly open the enclosure, power supply and RS485 direct connection wiring seat

sign	Note
V+	Voltage range: DC6-24V
V-	Negative power
A+	RS485 A+
B-	RS485 B-

2. Device address set

In practice, it is sometimes necessary to use multi-machine networking, networking devices in the address can not be the same, so the user changes the device address, the address range is 1-15. Change the device address of the device is an internal DIP switch to achieve. DIP switch to "ON" means "1", off the system in the following table 1-4 DIP switch S1 segment and the address shown below:

DIP switch				Device Address
Segment 4	Segment 3	Segment 2	Segment 1	
0	0	0	1	1
0	0	1	0	2
0	0	1	1	3
…	…	…	…	
1	1	1	1	15

The default device address is 1, DIP position as shown above.

Note: You must restart the new device address setting device (power) to enter into force

Figure 1 addresses

2 Display

As shown above, the display is divided into two rows, the upper display illumination value, the lower display shows the communication of information, 9600 baud rate, 01 for the device address, the address DIP switch when the device changes, the new device will also address automatically displayed on the monitor.

Communication protocol

Equipment operations or restore commands are all hexadecimal data . The default baud rate : 9600,8, n, 1.

The basic command format :

[Device Address] [Function code] [starting address : 2 bytes] [Data Length : 2 bytes] [CRC16 checksum]

Meaning is as follows :

A, Device Address : Device address range is 1-35 , 250 general-purpose query that 0xFA address, when I do not know the device address , the availability of generic query address queries.

B, function code : function code different needs of different applications , such as data input register 3 for the query .

C, the starting address : query or operation register start address.

D, Data length: the read length.

E, CRC checksum : CRC16 checksum , high front and low in the post.

1) Read data (function code 0x03)

[Device Address] [03] [starting address : 2 bytes] [Data Length : 2 bytes] [CRC16 checksum]

Note : illuminance sensor data length is 4 bytes.

Device response:

[Device Address] [Order] [Returns the number of bytes] [Data 1] [Data 2] [CRC16 checksum]

Response data meaning is as follows :

A, the number of bytes returned : indicates the number of bytes of data , the data value is 1,2 ... n of the n .

B, the data 1 ... N: measurement value of each sensor , each data occupies two bytes. Integer data , temperature and humidity reading out the true value divided by 100 .

For example : Query on the 1st device illumination sensor data :

Send : 01 03 00 00 00 02 [CRC low 8] [CRC high 8]

Response : 01 03 04 00 00 0B 1D [CRC low 8] [CRC high 8]

Reply data on patients : 01 1,04 meter data table address length is 4 bytes , because the measuring point data length is 4 bytes , such as the first one data 00 00 0B 1D, is folded into 10 hex : 2845 , that the actual value is 2845 lumens.

In the configuration software , the register table:

No. Name Description Register Address

An illumination register (high two bytes) 40001

2 Illumination register (lower 2 bytes) 40002

2) Change the device address (Function number : 0x06 Auxiliary Order No. : 0x0B)

Send command format :

[Device Address] [Order : 0x06] [Auxiliary Order No. : 0x0B] [00 00] [destination address : 1 byte] [CRC16]

Description :

A, destination address : values   range from 1-35 , with the current address of the destination address is not the same .

B, 00 00 hexadecimal number is a fixed value , can not be changed .

For example, the device addresses a change to 2, the command is: 01 06 B 00 00 02 A 2F

Equipment Response: 022501029006

Device response format : [Device Address] [query the device address command number] [Data Length : 1 byte] [random bytes : 1 byte] [CRC16]

For example : 02 25 01 18 11 CD showed that the more primary

current device address 02 .

3) to query the device address (Function No. : 0x25 Auxiliary Order : 0x02)

If you do not know the current address of the device , and only one device on the bus , you can query the current device address by this command.

Send command format :

[Device Address : 0xFA] [Order : 0x25] [Auxiliary Order : 0x02] [00 00 01] [CRC16]

Description :

A, the device is a generic device address 0xFA inquiry address .

B, 00 00 01 hexadecimal number is a fixed value , can not be changed .

For example, to query the current device address , command FA 25 02 00 00 01 99 FE

Device response : 02 25 01 18 11 CD

Device response format : [Device Address] [Order] [Data Length : 1 byte] [random bytes : 1 byte] [CRC16]

For example : 02 25 01 18 11 CD indicates that the device address is 02 .