G-NiceRF

SK200-1W

LoRa spread spectrum anti-jamming industrial grade
Single wireless switch control module

Product Specification

Catalogue

Note: Document Revision History

Historical version number	release time	Modify content
V1.0	2018-7	Initial release

1. Overview

SK200-1W is an industrial grade remote wireless single-channel switch control module. It consists of the transmitter module SK200-TX-1W and the receiver SK200-RX with a transmission power of 1W. The design adopts LoRaTM spread spectrum modulation frequency hopping technology, which has high receiving sensitivity and superior anti-interference performance. Its communication distance and receiving sensitivity far exceed FSK and GFSK modulation. The module provides a single signal input and a single control output interface. It has the characteristics of simple interface and reliable operation. Users can configure the internal parameters of the modified module in combination with our PC interface. Many pairs of simultaneous communication will not interfere with each other, and the use is flexible and convenient. The system can easily replace the original wired environment with wireless control, which greatly reduces the cost of manual wiring and is widely used in industry.

2. Features

- Transmitter power 1W
- Transceiver frequency can be freely configured
- Multiple working modes are available

- LoRa Modulation mode
- Sensitivity up to -132 dBm
- range of working temperature：-40 ~ +85 ℃

3. Application

- Switching remote control
- security system

- Wireless remote control
- Pump wireless control

4. Performance parameter

The electrical parameters of the SK200-TX-1W module are as follows：

Parameter	Minimum	Typical	Largest	Unit	Condition
Working conditions					
Operating voltage range	3.3	5.0	6.5	V	
range of working temperature	-40	25	+85	℃	
Current consumption					
Quiescent Current		< 16		mA	@5V
TX current		< 600		mA	@5V
Transmit power range	+ 24	> 29.5	+ 31	dBm	@5V,@433MHz / 490MHz
	+ 21	> 27	+ 28.5	dBm	@5V,@868MHz / 915MHz

The electrical parameters of the SK200-RX module are as follows:

Parameter	Minimum	Typical	Largest	Unit	Condition
Working conditions					
Operating voltage range	5	12	30	V	
Relay load		< 10		A	@220V
Radio frequency parameter					
Receiving current		< 10		mA	@12V
Receiving sensitivity		-132		dBm	

5. Working mode

The input signal of the module is in the form of a standard dry node. The user simply shorts the input port to the ground GND, and the relay of the receiving end module will become the pull-in state accordingly; the built-in pull-up and input inside the module When the terminal signal is disconnected or a high level (3.3V) is given, the relay of the receiving module will return to the disconnected state.

version	Transmitter input IO port status	Output relay status
A	1 (connected to high level or left floating)	disconnect
A	0 (short to GND)	Pick up
B	1 (connected to high level or left floating)	Pick up
B	0 (short to GND)	disconnect

Note: After the power-on reset of the receiving end, the relay is disconnected by default (if you need to pick up the state, you can contact our company to modify the version)

1) Normal working mode

There are several modes for the module to choose from in order to cater to the needs of different customers. Users can configure which working mode to work in via PC software:

➢ **Instant control mode (default factory version)**

After the transmitter detects that there is a change in the IO input, it will send data to the receiver (3 consecutive transmissions). After receiving the wireless signal, Module B will update the status of the relay synchronously.

In addition, the transmitting end sends a synchronization signal to the receiving end every 1

minute. If the receiving end does not receive the synchronization signal from the transmitting end for 3 consecutive times, it is considered that the communication fails and the receiving terminal relay is automatically disconnected.

➢ **Power saving control mode**

The transmitting end is normally in a dormant state. When the IO input changes, the transmitting end automatically wakes up and sends data to the receiving end (continuously transmitting 3 times). After receiving the wireless signal, module B will update the status of the relay synchronously. After the transmitter transmits the data, the automatic switching will sleep.

Note: There is no communication failure indication in this state.

➢ **Timing control mode**

Regardless of whether the IO input of the transmitting end changes, the transmitting end sends a synchronization signal to the receiving end according to the set time (default 2s). If the receiving end does not receive the synchronization signal from the transmitting end for 3 consecutive times, it is considered that the communication fails, and the receiving terminal relay is automatically disconnected.

2) **Parameter configuration mode**

In the parameter configuration mode, the user can read or modify the relevant parameters of the module through the USB adapter board and the PC, including the network ID, RF rate, communication channel and working mode. The wireless parameters of the module must be consistent to communicate with each other. After the PC software is opened, click to open the corresponding COM port (can be viewed under the device manager), the PC will read the parameter information of the connected module and display the corresponding model and version information in the window, and display in the status bar below. "Device Found!" information. When the device is unplugged or there is no response, the status bar below displays the message "Device Not Found!", and the product information box above becomes gray invalid. The PC interface after the module is successfully connected is shown below:

After the module is properly connected, the module is in the "settable parameters" state. The user can modify the relevant parameters of the module through the PC interface, such as: working frequency, air communication rate, transmission power; working mode, timing transmission interval; NET ID, NODE ID, key, etc., and then click the [SET] button to set the module. After each parameter is successfully changed, the "OK" message will be returned. After the PC software receives the OK response, it will pop up a prompt dialog box for successful operation; otherwise, the output "ERROR" will pop up a dialog box for the operation error, such as after the PC sends the command. If there is no response within 0.5s, a communication error will occur and a dialog box for the operation error will pop up. These set parameters can be saved after power down. When the user

clicks the [READ] button, the module will return all parameter information of the current module. The user clicks the [DEFAULT] button to set the module's parameters to the factory defaults. (**The relevant parameters of the serial port and wireless part in the above PC interface are the factory default values**)

✧ **NET ID**

This parameter is 4 bytes, which is the network ID of the module. Modules with the same parameter set to communicate with each other。

✧ **NODE ID**

This parameter is 2 bytes, which is the module's own address ID. Used in serial control mode.

✧ **MODE**

Work mode selection. A total of three modes are available, namely, LowBattery, RealTime, and Timing.

✧ **TX INTERVAL**

Transmission interval in timing mode, optional from 1s to 255s。

✧ **FREUENCY**

The operating frequency of the module. The frequencies at both ends of the transceiver must be consistent to communicate.

Note: The frequency setting needs to be within the range of the frequency band ordered to ensure the module achieves the best communication performance.。

Band	433MHz	490MHz	868MHz	915MHz
Frequency	413~453MHz	470~510MHz	848~888MHz	895~935MHz

✧ **RF RATE**

This parameter is the air rate for wireless transmission. The default is 656. The lower the rate, the longer the communication distance and the longer the response time.

✧ **POWER**

Transmit power, 0~7, 7 is the maximum power. The greater the power, the farther the communication distance。
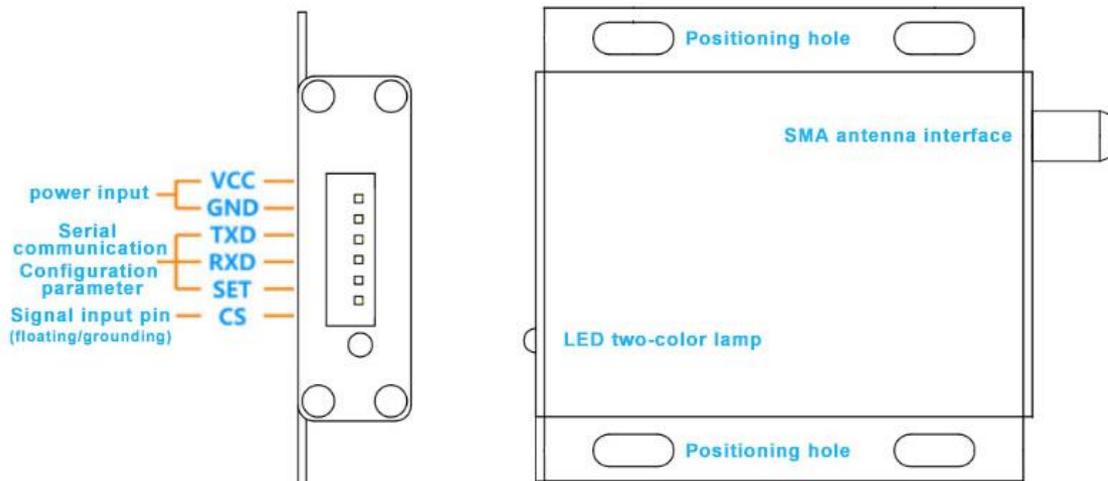
✧ **ENABLE ENCRYPTION**

AES encryption enabled

✧ **KEY**

This parameter is 16 bytes, AES encryption key. Need a key to communicate。

6. Interface definition description

a) The interface description of the transmitter module SK200-TX-1W is shown in the figure below.：

Pin number	Pin definition	Description
1	VCC	Positive power supply
2	GND	Power ground
3	TXD	Serial port transmission / configuration mode parameter setting
4	RXD	Serial Receive / Configuration Mode Parameter Settings
5	SET	Configuration parameter enable (low to enable parameter configuration, default high level output)
6	CS	Switch signal input pin (internal pull-up, floating or ground)

b) The interface description of the receiving module SK200-RX is as shown below：
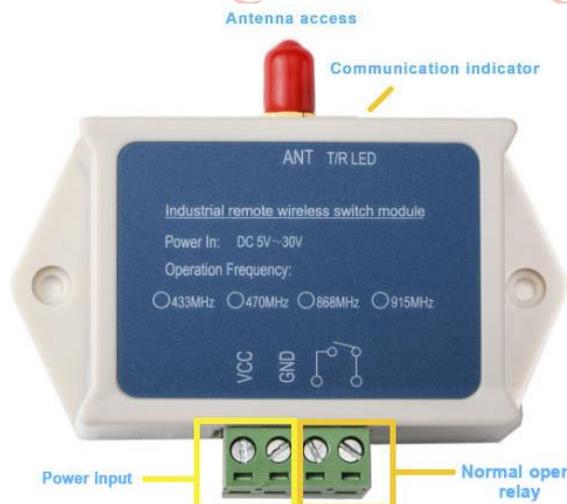
7. Peripheral accessories

1) Antenna

Antenna is an important part of the communication system. Its performance directly affects the indicators of the communication system. The antenna impedance required by the module is 50 ohms. The universal antenna has straight/elbow/folded rod shape, small suction cup, etc. Users can purchase the antenna according to their own application environment. In order to make the module in the best working condition, it is recommended to use the antenna provided by the company.


★ The following principles should be followed during antenna use to ensure the best communication distance of the module.：
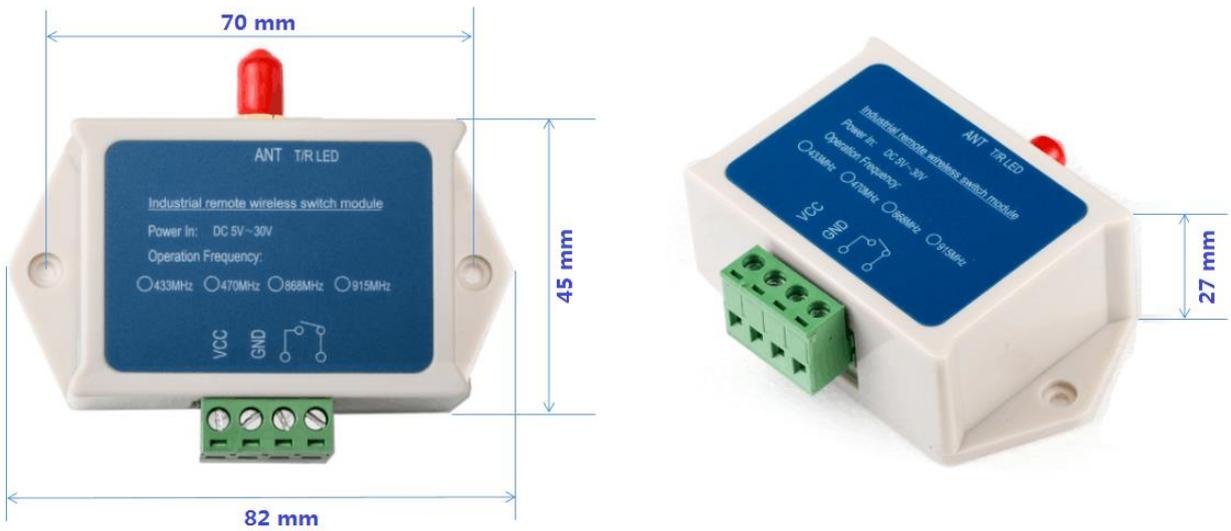
➢ Try not to be close to the ground surface of the antenna, and it is best to stay away from obstacles.；

➢ If the suction cup antenna is purchased, the lead wire should be straightened as much as possible, and the suction cup base should be attached to the metal object.；

8. Mechanical size (unit: mm)

a) Transmitter module SK200-TX-1W
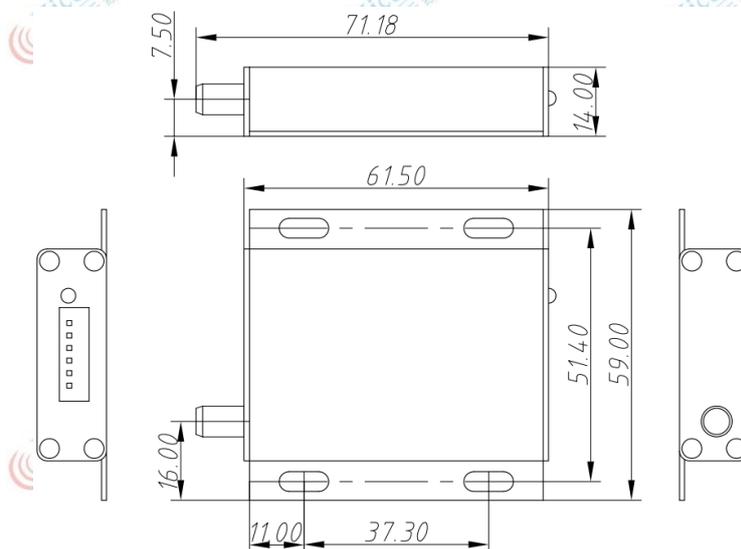
b) Receiver module SK200-RX

9. FAQ

a) Why the modules do not communicate properly？

    1) The power connection is incorrect and the module is not working properly；

    2) Check the frequency band and channel of each module are consistent；

    3) Is the module damaged (will the lamp be flashing after power-on?).

b) why the transmission distance is not far？

    1) Power supply ripple is too large；

    2) Antenna type does not match or is not installed correctly；

    3) Peripheral co-channel interference；

    4) The surrounding environment is bad and there is a strong interference source.