SRWF-1021 (V1.1) Wireless Module User Manual

Shanghai Sunray Technology Co., Ltd

I. Product Introduction

SRWF-1021 series wireless modules are transparent modules which suit any standard and nonstandard user protocol.

a) It has maximum transmit power of 6dBm, working on carrier frequency of 433MHz.

b) High anti-interference ability and low bit error rate (BER): FSK modulation with enhanced forward error correction (FEC) encoding technology to ensure resisting ability against pulse interference and random interference.

c) Long transmission distance which can reach up to 150 meters (433MHz@9600bps) with AT-4 antenna placed two meters high from the ground in open field.

d) The standard configuration provides 8 channels.

e) Interface baud rate is optional 1200 /2400 /4800 /9600/19200bps.

f) With power supply by 5V DC, the receiving current is less than 30mA and the transmitting current is less than 38mA, the sleep mode current is 5±2uA;

g) Single chip RF integrated circuit and single chip MCU to simplify peripheral circuits and keep the dimension small which leads to high reliability and low failure rate.

h) Various antennas are available for different application environments

i) This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

II. SRWF -1021 Main Application Range

SRWF-1021, the low-power wireless transceiver module is used as the wireless transceiver in short-ranges, with the small size, weight and power consumption and good stability and reliability. Narrowband low power UHF wireless transmitters and receivers with channel spacing's as low as 50 KHz，this module is only trigger commands, data transmission not allowed.

a) Automated Meter controlling solution for water, electricity, gas and heat

system
b) Production line controlling
c) Medical treatments and electric instruments automation control
d) Wireless intelligent control for lighting system
e) Security alarm

III. Pins Description

SRWF-1021 (V1.1) provides a 9-pin plug (CON1) defined as below in Table 1.

Table 1

| Pin No.	Pin Name	Description	Level	Remarks
1	GND	Ground	0V	
2	VCC	power	+3.0---+5V	
3	RXD/TTL	TTL Series receiver	TTL	
4	TXD/TLL	TTL series transmitter	TTL	
5	SGND	Analog ground	0V	connect GND
6	ATXD	RS485 –A PORT/ RS232-TXD		No used
7	ARXD	RS485-B PORT/RS232-RXD		No used
8	Sleep	Sleep mode pin	TTL	Low level enable t>15ms
9	Reset	Reset pin	TTL	Negative pulse reset t>1ms

IV. Wireless Channels, Interface Mode, Testing Configuration and Version Information

a) SRWF-1021 is only a module, this module through the secondary development, just can use, after power ON , the module is receiving state, before using SRWF-1021; you have to make simple configuration of your

system parameter such as interface. There is a 5-bit short-circuit jumper (J1) on the bottom right corner of SRWF-1021 main board, defined as A/B/C/D/E respectively. Please refer to Figure 1. And then you can edit send command set module for transmission, transmission fully comply with 15.231
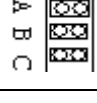
Figure 1 :
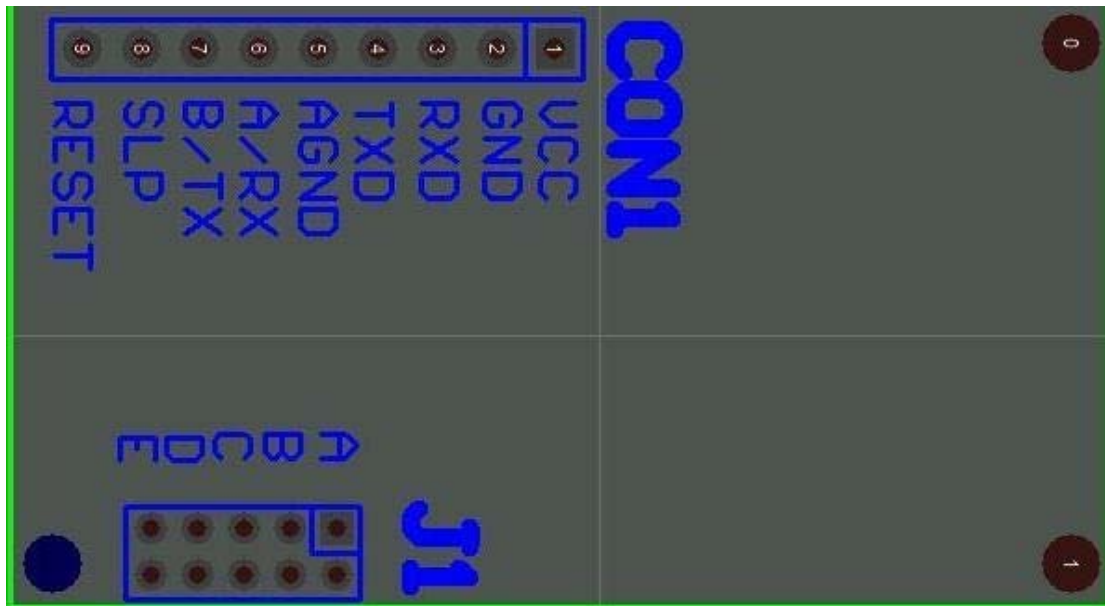
b) Channels Configuration

Table 2: Frequencies corresponding to Jumper A/B/C configuration

Jumping wire A/B/C	Channel No.	Program frequency 433MHz band (MHz)
A B C	0 (ABC remain open)	433.6128
A B C	1	433.7128
A B C	2	433.8128
A B C	3	433.9128

A ○○ B ○○ C ▨	4	434.0128
A ▨ B ○○ C ▨	5	434.1128
A ○○ B ▨ C ▨	6	434.2128
A ▨ B ▨ C ▨	7	434.3128

c)   Interface Mode and Installation

(1) We provide 9 pins connector and AT-4 antenna; you can very easy
   setup the antenna and the connector. Please see the below
   picture:

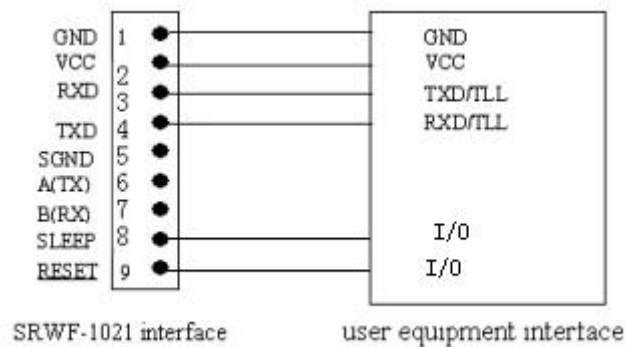
(2) SRWF-102 provides TTL interface.

Figure 2 TTL connection diagram

Note: please don't connect any wire on PIN6 and PIN7 to avoid interference.

(3) Interface rate setting

   The rate of SRWF-1021 is determined by hardware and software, to
   make sure the module rate is suit to your system.

(4) SRWF-1021 can support no parity and even parity mode of the serial communication UART, it can chose parity mode through E of J1.

E=0   (without jumper) even parity 9N1

E=1   (with jumper) no parity 8N1

(5) Timing Diagram

1.   The PIN8 'SLP' in CON1 is the signal of sleep control. In low power level, when the transceiver stays in sleep mode, the conversion from idle mode to sleep will be finished in 6ms. If the sleep signal arrives when the transceiver is transmitting, the module will enter sleep mode after finishing transmission. From sleep mode to transceiver mode, it takes when the RST signal comes.
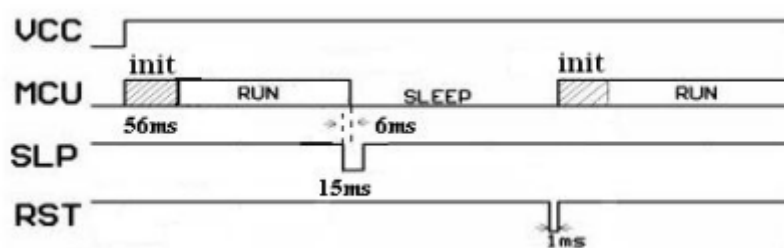

2.   The delay time (TC) of conversion between transmitting and receiving is less than 3ms.
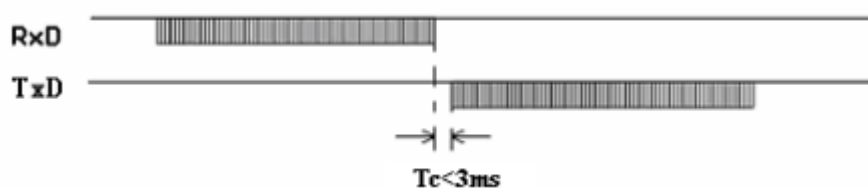
The delay time of transceivers between the first sent by TXD to the first bit received by RXD. Due to a processing will be made on user's command by SRWR-1021 transceiver using FEC(Forward Error Correction) or other correction algorithm, when RXD of a SRWF -1021 transceiver 'A' receives the command, then transmits it, the other one transceiver 'B' will have a delay(Td) to receive and transmit by TXD. Different RF command rate causes different delay

time. Please see the delay time below:

Baudrate(bps)	Delay Time(Td/ms)
1200	122
2400	58
4800	31
9600	16
19200	8
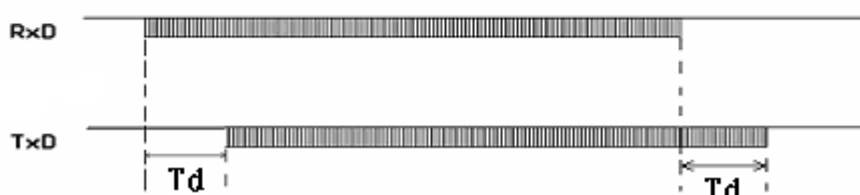
(6) Indicator function

When transmitting mode, the red indicator light will twinkle. (Only UART TTL)

When in receiving mode, the green indicator light will twinkle (Only UART TTL).

(7)   TX light will flash once when the module is powered on, meaning that the module is sending to serial port its version information by which we can judge some basic status about the module, for example:

SRWF-1021（V11）

C=00（433），9N1

Illustration：SRWF-1021 is module model，

（V11）indicates that module software version is V1.1

C=00(433), 00 means channel No., and 433 is carrier frequency.

8N1/9N1 means check mode.

V. Technical Specification

Item	Specification	Parameter	Notes
1	Modulation	FSK	
2	Working	433MHz	

	Frequency		
3	Transmit Power	6dBm	
4	Receiving Sensitivity	-109dBm	433MHz@9600bps
5	Channels	8	
6	Transmitting Current	<40mA	
7	Receiving Current	<33mA	
8	Baud Rate	1200/2400/4800/9600/19200bps	
9	Interface Mode	TTL	
10	Voltage Supply	+3.0-----+5VDC	
11	Working Temperature	-20℃~55℃	
12	Working Humidity	10%~90% (relative humidity without condensation)	
13	Dimension	70mm×50mm×22.7mm	
14	Reliable Transmission Distance	150m@ AT-4 antenna(height of 2m)	433MHz@9600bps

VI. Layout Dimension
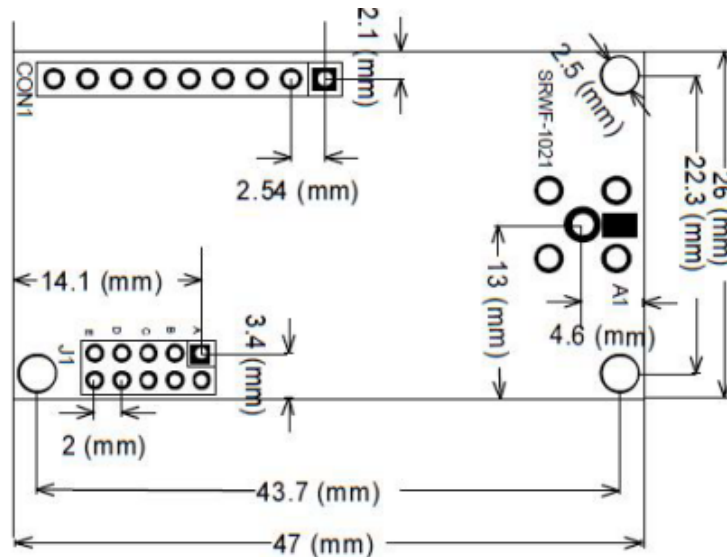
VII. Technical Support and After Service

We provide full technical support for our clients on applications and secondary development. Our products have one-year warranty and perpetual maintenance services.

If required by client, our products could be customized for smaller dimension and different shape

Note: Information to user

1. Please make sure the rated power is 3V-5V; the circuit and MCU will be burned if the power is higher than rated power.
2. When you use USB to test the module, the connection to USB interfaces has to be limited to USB 2.0 version or higher. The connection to so called power USB is prohibited and you must have one USB to TTL converter.
3. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
4. This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not

occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

• Reorient or relocate the receiving antenna.

• Increase the separation between the equipment and receiver.

• Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

• Consult the dealer or an experienced radio/TV technician for help.