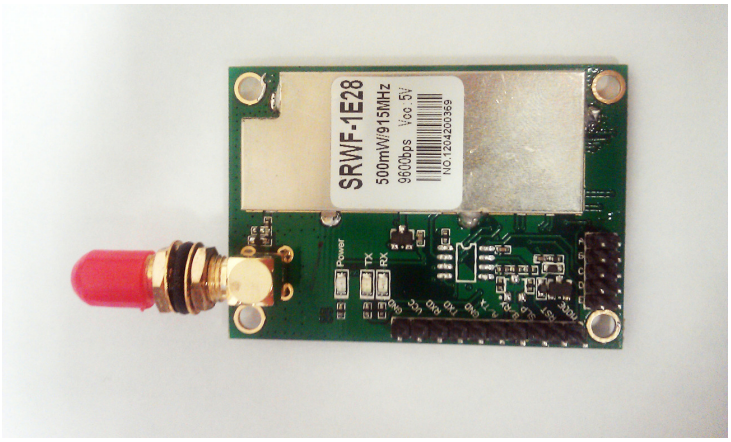
SRWF-1E28 Wireless Transceiver Data Module User Manual (915 MHz)



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1. Module introduction

SRWF-1E28 is low power wireless data transceiver modules. It can be used for any standard or nonstandard user protocol.

The below are SRWF-1E28 main features:

1. Transmitting power 500mW (915MHz)
2. High anti-interference and low BER (Bit Error Rate)
   Based on GFSK/FSK modulation, the high- efficiency forward error correction channel encoding technology is used to enhance data's resistance to both burst interference and random interference
3. Multi-Channel and channel selection available
   Channel can be configured by both hardware and software. The default is by hardware
   You can configure 16 channels by hardware or 32 channels by software which meet the multiple communication combination modes.
4. Two interface modes: TTL and RS-485
5. Serial port baud rate configuration by software
   Baud rate set to below value by software:
   1200/2400/4800/9600/14400/19200/38400/57600 bps
6. Serial port data format definition
   Serial port data format can be configured by both hardware and software, the default is by hardware; it support eight bit data(8N1,7E1,7O1 and so on) and nine bit data(9N1, 8E1,8O1 and so on) and the default is nine bit data.
7. Capable of transmitting data frame with unlimited length for more flexible programming for users
8. High integration and high reliability
   Single chip radio - frequency integrated circuit and single chip MCU are used for less peripheral circuits, high reliability, and low false bit rate.
9. The user can also choose any antenna to match the modules.
10. Long transmitting distance with stable and reliable communication
11. Communication mode: semi duplex

2. Introduction

SRWF-1E28 series modules can be used for below applications:

1. AMR-Automatic Meter Reading
2. Remote control in industry
3. Wireless solutions for weighing scale
4. Data collection of production line
5. Automation and control of medical/electronic equipment
6. Data communication in railway, oil well and wharf
7. Wireless smart control of lighting system
8. Wireless alarm and security system
9. Car alarm, tire pressure monitoring and four-wheel orientation
10. Wireless POS and PDA smart terminals
11. LED display screen for lane buoy or temporary station in open field
12. Automated non-stop billing system on freeway
13. Wireless sensor network
14. Bank queuing management system
15. Automatic control of medical equipment and electronic instruments
16. Warehouse management system

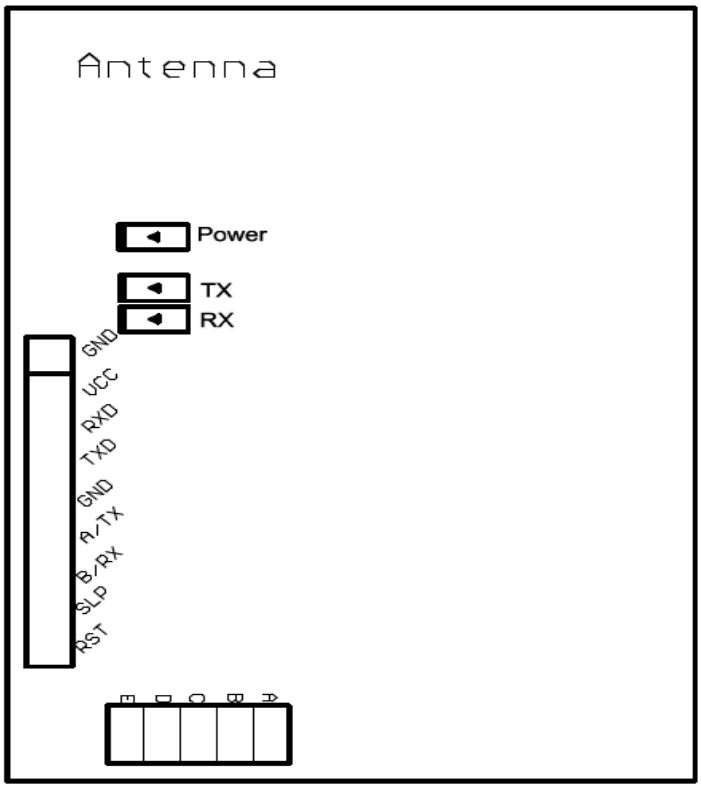
3. Technical specification of SRWF-1E28

	Item	unit	Min	Typical	Max	Remark
1	Working Temperature	℃	-40	25	85	
2	Working Humidity	% rh	10%~90% Relative humidity, no condensation			
3	Working Voltage	V	5V±10%			DC
4	Transmitting Frequency	MHz	915			
5	Transmit Power	dBm	25	26	27	
6	Transmitting Current	mA	500	550	600	
7	Receiving Sensitivity	dBm	-111	-115	-118	
8	Receiving	mA	100	110	120	

	Current					
9	Point-to-Point Communication Distance （20dBm）	m		1500		In the open area
10	Modulation Mode	GFSK				
11	Number Of Channels	32				
12	Dimension	mm	53*37*10			Included height of SMA socket

4. Interface definition

The below is the outline of SRWF-1E28



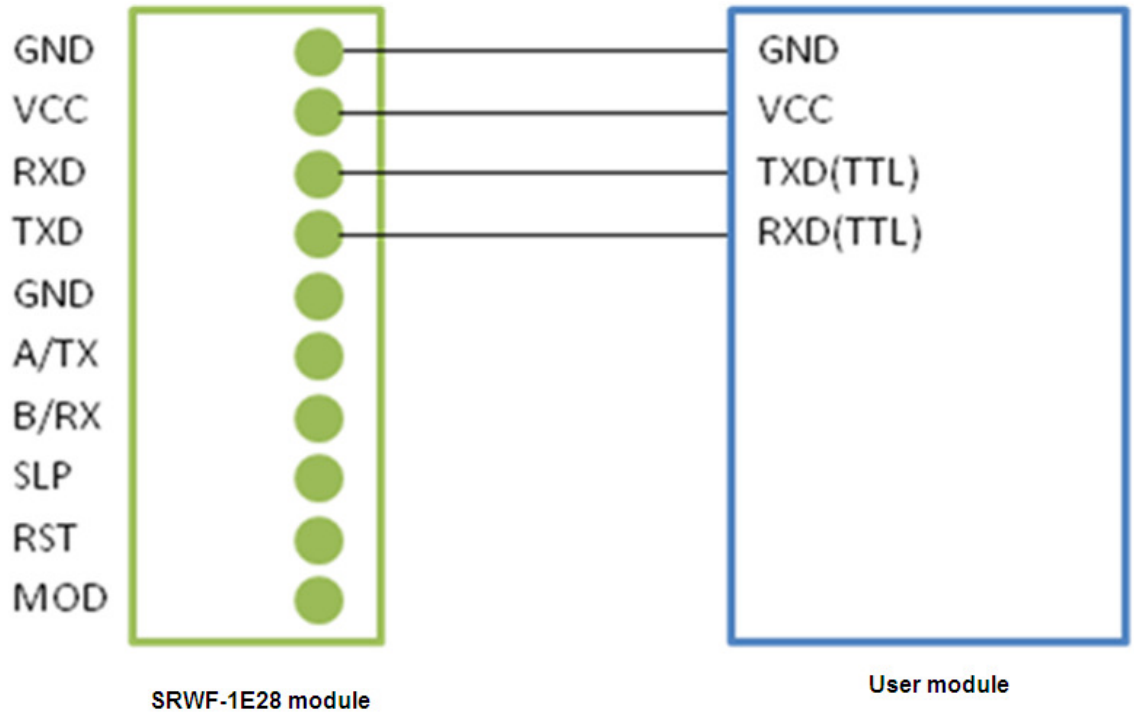
Single-row connector(2.54mm pitch, 10pin single row soldering hole) is vertically located in the left side of SRWF-1E28 board. The below is the pin definition:

	Signal type	Pins	Signal direction	Note
1	Power Supply	GND		
2	Power Supply	VCC		DC power supply ，5V±10%
3	Signal	RXD	I	UART receive
4	Signal	TXD	O	UART transmit
5	Power Supply	GND	I	Power ground
6	Signal	A/TX	I	A of RS485
7	Signal	B/RX	I	B of RS485
8	Signal	SLP	I	Low level(<0.6V) is available, note: low level last time>1ms
9	Signal	RST	I	Low level(<0.6V) is available, note: low level last time>1ms
10	Signal	MOD		hovering

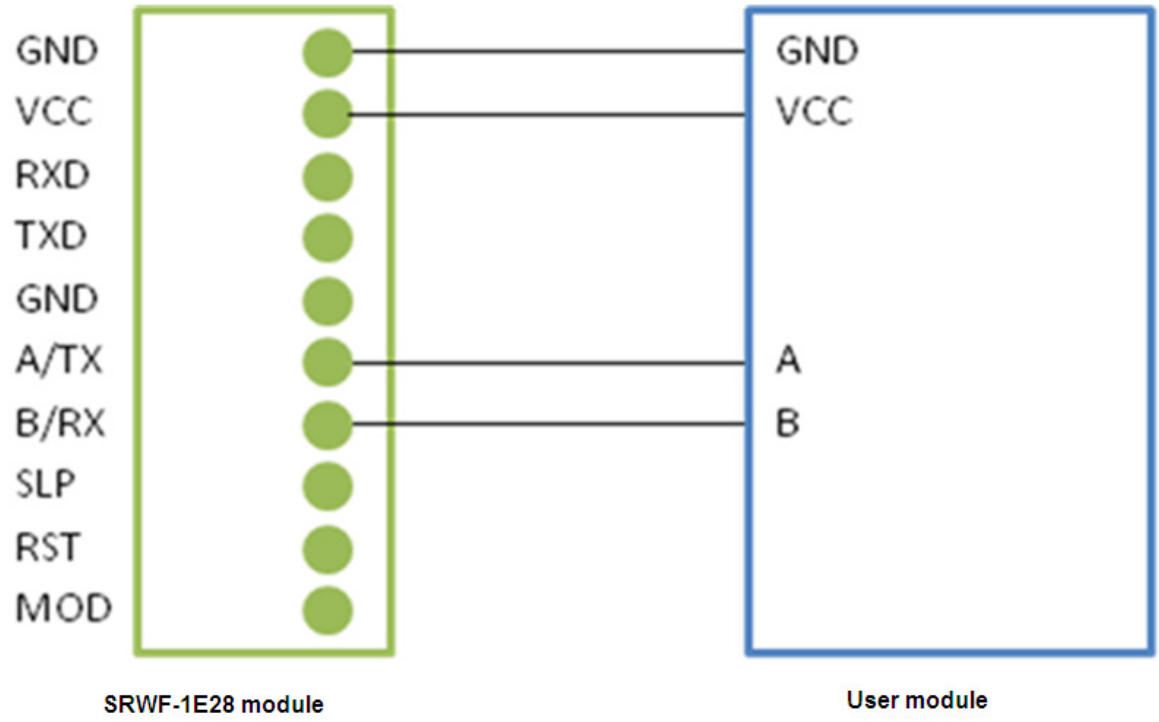
5. Operation

5.1 Communication interface selection

5.1.1 TTL interface



5.1.2 RS-485 interface connection application circuit



5.2 Parameter setting

The baud rate, data format, channel, transmitting power can be set; Baud rate, data format and channel can be set by both hardware and software; During hardware setting, software setting is invalid; During software setting, hardware setting are also invalid; Hardware setting and software setting can be switched by the serial port command.

5.2.1 Parameter setting by software

Input the command in serial port to set the parameters (See appendix one for detailed command); SRWF-1E28 will output “S” to serial port if setting succeed; If the SRWF-1E28 is in the status of hardware setting, it need to be switched to the status of software setting and then command will work. For example, Current status is hardware setting, if software setting is needed, then input “SOFTSETCHAN” in the serial port, SRWF-1E28 is switched to software setting status if the serial port output “S”; then if “SETCHAN=01” is input in serial port, channel will be set to channel 1 and output S in serial port if software setting is succeed. If hardware setting is needed to set channel, the input “HARDSETCHAN”, the channel setting by hardware will succeed if the serial port output “S”.

5.3 Indicator LED function

When power on the module，TX and RX will flash once, it means the module is now output an version information to serial port ,then users can know the module’s basic information. For example:

1E28(V11)
C=00(H)(869.5)
D=024(S),9n1(H)

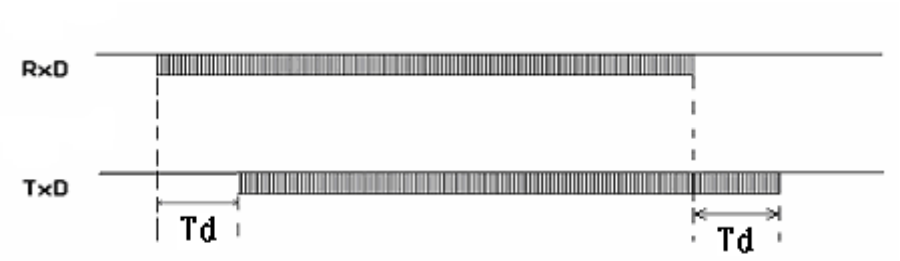
Note: 1E28 stands for module part number,（V11）means the module’s firmware version is V1.1
C means the channel. “00” means channel number，
(H) means channel selection by hardware is valid. 869.5 means the working frequency
D means the baud rate, 024 means that the current baud rate is 2400bps, (S) means baud rate set by software is valid
9N1 means the data bit is 9, (H) means the data format set by hardware is valid

When the module transmits data to the air, RX light will flash once.
When the module receives the data from the air, TX light will flash once.

5.4 Time delay diagram

When SRWF-1E28 (named A) transmit the received data from RXD, the other SRWF-1E28 receive the data and the output from TXD. There are time delay between the data one SRWF-1E28 received from RXD and the data the other SRWF-1E28 output in TXD. Different baud rate has different delay time. Please see the below table for the details.

Baud Rate(bps)	Time Delay(Td/ms)
1200	96
2400	48
4800	24
9600	12.2
14400	8.5
19200	6.3
38400	3.2
57600	3



6. Received signal strength indication (RSSI)

If you want to know RSSI, send READRSSI to serial port, the RSSI of previous frame of data will be output in serial port. The value of RSSI will be absolute value. For example, if the reading of this byte is 45, then RSSI shall be -69dBm, it can also be read by software.

7. Available antenna

Below are available antennas for SRWF-1E28:

AT-23 (2.15dBi) 80mm antenna

AT-24 (3dBi) 210mm antenna
(DEFAULT ANTENNA)

AT-25 (3dBi) 100mm antenna

AT-32 (2.15dBi) 53mm antenna

8. Technical support and after sales service

Sunray will provide free technical support for your application and secondary development. Sunray assures one-year warranty period and provides lifelong maintenance service.

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Appendix One: Command list for parameter configuration

Parameter	Function	Command	Remark
Channel	Switch to channel configuration by hardware	HARDSETCHAN	Switch channel configuration from software to hardware
	Switch to channel configuration by software	SOFTSETCHAN	Switch channel configuration from hardware to software
	Set channel by software	SETCHAN=XX	Valid in status of software configuration; XX is the channel number to be set and its range is 00-31
Baud rate	Set baud rate by software	DATARATE=XXX	XXX is baud rate to be set，012/024/048/096/144/192/384/576
Data format	Switch to data format configuration by hardware	HARDSETDATAFORMAT	Switch data format configuration from software to hardware
	Switch to data format configuration by software	SOFTSETDATAFORMAT	Switch data format configuration from software to hardware
	Set data format by software	DATAFORMAT=X	Valid in status of software configuration ;When X is 8, data format is 8bite; when 9, data format is 9 bite
RSSI	Read RSSI value	READRSSI	Output the absolute value of RSSI; If output is 0x32, RSSI is -50dBm
Version	Read version information	GETEDITION	See the details in 5.3

Appendix Two: Layout dimension