

# Lierda Science & Technology Group Co., LTD

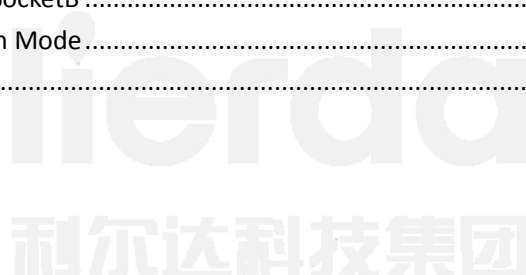
---

## User's manual



---

1	Product Overview .....	1
1.1	Features .....	1
1.2	Parameters.....	1
1.3	Applications .....	1
2	Hardware Overview .....	2
2.1	Appearance.....	2
2.2	Product structure size .....	2
2.3	Distribution Pin Description.....	3
3	Functional Description.....	6
3.1	Networking features .....	6
3.1.1	AP Networking .....	7
3.1.2	AP Networking .....	7
3.2	Passthrough mode .....	7
4	Instructions for use .....	7
4.1	Network Connection.....	7
4.1.1	Serial Port Configuration.....	8
4.2	Creating Socket .....	8
4.2.1	Creating a SocketA .....	8
4.2.2	Creating a SocketB .....	9
4.2.3	Passthrough Mode.....	10
5	Warning .....	10



# 1 Product Overview

LSD4WF-3211I5SS is LSD Technology Co., Ltd. developed ultra-low-power embedded WiFi module, using the industry's lowest power, high-performance embedded processors WiFi network. Integrated hardware module within the MAC, radio transceiver unit, power amplification unit, developed for users to use M4 core units supports 802.11b / g / n protocol standards; LSD4WF-3211I5SS modular low-power WiFi module, can help customers achieve product upgrade wireless network communication to the basic serial communication.

## 1.1 Features

- Supports 802.11 b / g / n protocol standards, WPA / WPA2 encryption;
- support Smart config configuration and AP key configuration;
- integrated TCP / IP protocol stack, reducing the programming burden;
- contain Cortex M4 core, friendly development environment;
- Simply link provide network programming library and M4 core driver library;
- provide a rich peripheral interfaces, UART / SPI / I2C / I2S / PWM, etc.
- low power consumption, HIB, the operating current 4ua;
- Under LPDS mode, the operating current 2ma;
- ultra-small size of 23 \* 32mm, surface mount package;
- Easy to use IAR / CCS compiler environment;

## 1.2 Parameters

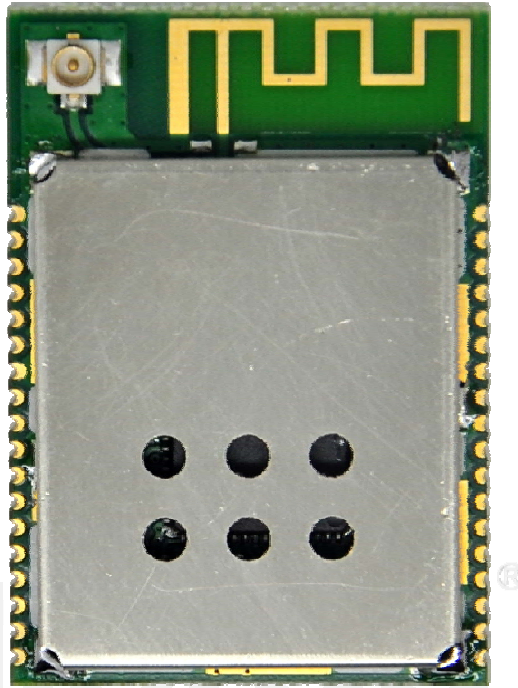
- optional external interface UART / SPI / I2C / I2S
- own internal network MAC
- network protocol standard 802.11 b / g / n
- 2.4G network operating frequency
- transmit power: 802.11b 16.5dbm  
802.11g 13dbm (54M@OFDM)  
802.11n 11.5dbm (MCS7)
- Receiving sensitivity: 802.11b -94.5dbm (8% PER)  
802.11g -73dbm (10% PER 54M@OFDM)  
802.11n -70dbm (10% PER MCS7)
- Under current--HIB mode: 4ua;
- Under current--Idle Connect mode: 2ma (DITM = 1);
- hardware encryption: WEP, WPA, WPA2;
- antenna configurations: on-board PCB antenna and external antenna on board;
- module pin count: 48pin;
- module size: 23.1 \* 32.8mm;

## 1.3 Applications

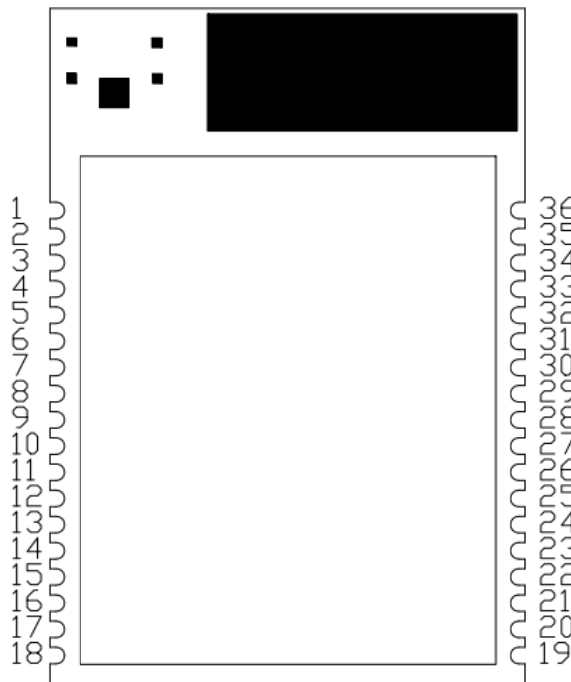
- Smart Home Applications
- white goods
- handheld network devices
- wireless networking applications
- remote equipment monitoring

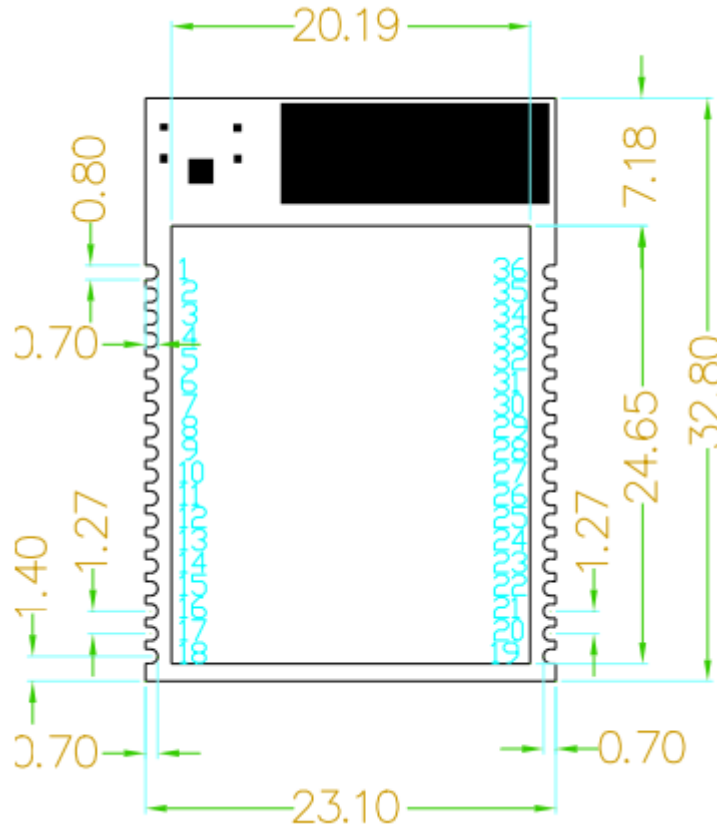
## 2 Hardware Overview

### 2.1 Appearance



### 2.2 Product structure size





## 2.3 Distribution Pin Description

NO.	Network label	Distribution	Remark
1	GND	GND	
2	EXRESET	The external reset pin	
3	SOP2	Sense-On-Power 2	
4	SOP0	Sense-On-Power 0	
5	VDD	3.3V	
6	VDD	3.3V	
7	GND	GND	
8	GND	GND	
9	GPIO30	General-Purposes/O	
		UART0 TX Data	
		I2S Audio PortClock O	
		I2S Audio PortFrame Sync	
		Timer CapturePort	
10	GPIO0	General-Purposes/O	
		UART0 Clear ToSend Input	
		I2S Audio PortData 1 (RX/TX)	

		Timer CapturePort	
		General SPI ChipPort	
		General SPI ChipSelect	
		UART1 RequestTo Send O	
		UART0 RequestTo Send O	
		I2S Audio PortData 0 (RX/TX)	
11	GPIO6	General-PurposeI/O	
		UART0 RequestTo Send O	
		Parallel CameraData Bit 0	
		UART1 Clear ToSend Input	
		UART0 Clear ToSend Input	
		Timer Capture Port	
12	GPIO1	General-Purpose I/O	
		UART0 TX Data	
		Pixel Clock FromParallel CameraSensor	
		UART1 TX Data	
		Timer CapturePort	
13	GPIO2	General-Purpose I/O	
		UART0 RX Data	
		UART1 RX Data	
		Timer CapturePort2	
		ADC Channel 0Input (1.5V max)	
14	GPIO3	General-Purpose I/O	
		Parallel CameraData Bit 3	
		UART1 TX Data	
		ADC Channel 1Input (1.5V max)	
15	GPIO4	General-Purpose I/O	
		UART1 RX Data	
		Parallel CameraData Bit 2	
		ADC Channel 2 Input (1.5V max)	
16	GPIO5	General-Purpose I/O	
		Parallel CameraData Bit 1	
		I2S Audio PortData 1 (RX/TX)	

		Timer CapturePort 5	
		ADC Channel 3 Input (1.5V max)	
17	GPIO7	General-Purpose I/O	
		UART1 RequestTo Send O	
		UART0 RequestTo Send O	
		UART0 TX Data	
		I2S Audio PortClock O	
18	GPIO8	General-Purpose I/O	
		Interrupt from SDCard (Futuresupport)	
		I2S Audio PortFrame Sync	
		Timer Capture Port 6	
19	GPIO9	General-Purpose I/O	
		Pulse WidthModulated05	
		SD Cad Data	
		I2S Audio PortData (Rx/Tx)	
		Timer CapturePort 0	
20	GPIO10	General-Purpose I/O	
		I2C Clock	
		Pulse-WidthModulated06	
		UART1 TX Data	
		SD Card Clock	
		Timer CapturePort 1	
21	GPIO11	General-Purpose I/O	
		I2C Data	
		Pulse-WidthModulated07	
		Free Clock ToParallel Camera	
		SD CardCommand Line	
		UART RX Data	
		Timer Capture Port2	
		I2S Audio PortFrame Sync	
22	GPIO12	General-Purpose I/O	
		I2S Audio PortClock O	
		Parallel CameraVertical Sync	
		I2C Clock	
		UART0 TX Data	
		Timer CapturePort 3	
23	GPIO13	General-Purpose I/O	

		I2C Data	
		Parallel CameraHorizontal Sync	
		UART0 RX Data	
		Timer CapturePort 4	
24	GPIO14	General-Purpose I/O	
		I2C Clock	
		General SPIClock	
		Parallel CameraData Bit 4	
		Timer CapturePort 5	
25	GPIO15	General-Purpose I/O	
		General SPIMISO	
		I2C Data	
		Parallel CameraData Bit 5	
		Timer CapturePort 6	
26	GPIO16	General-Purpose I/O	
		General SPIMOSI	
		Parallel CameraData Bit 6	
		UART1 TX Data	
		Timer CapturePort 7	
27	GPIO17	General-Purpose I/O	
		UART1 RX Data	
		General SPI ChipSelect	
		Parallel CameraData Bit 7	
28	GND	GND	
29	VCC	3.3V	
30	GPIO22	General-Purpose I/O	
		I2S Audio PortFrame Sync	
		Timer Capture Port 4	
31	GPIO28	General-Purpose I/O	
32	JTAG_TDI	JTAG TDI	
33	JTAG_TDO	JTAG TDO	
34	JTAG_TCK	JTAG TCK	
35	JTAG_TMS	JTAG TMS	
36	GND	GND	

### 3 Functional Description

#### 3.1 Networking features

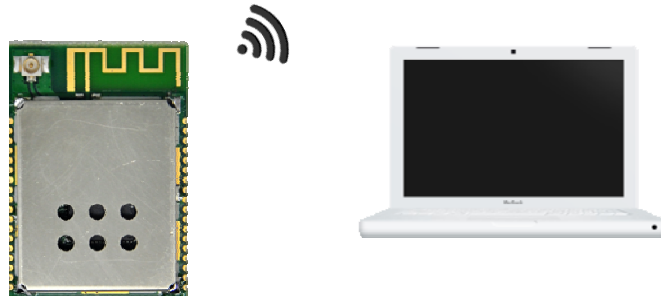
LSD4WF-3211I5S module can be configured to AP mode and STA mode, at the same time have a wireless network interface, but also includes some common wired interface methods, such as SPI interface, I2C interface, I2S interface, UART interface; the presence of these interfaces greatly expanded connection module, but also to enable



a user to more quickly and modules for docking, to achieve data transmission network;

### 3.1.1 AP Networking

AP the wireless access point is the center of a network; Generally, the router as AP, under certain circumstances, also some mobile phone terminals, PAD as AP; LSD4WF module can also be used as AP mode, for receiving the network. Connections as shown below:



### 3.1.2 AP Networking

STA is the wireless station, a wireless network terminal, typically to access the AP, the AP transmits data to the network via; LSD4WF as the next STA mode, can be connected with any of the AP, the wireless Internet module to achieve.



## 3.2 Passthrough mode

LSD4WF supports serial transparent transmission mode, data from the serial transmission cable to transmit a wireless network; transparent transmission mode, so that the customer's products to the fastest and easiest way to implement the network. Users need only a simple configuration via the serial port can be networked and data transmission;

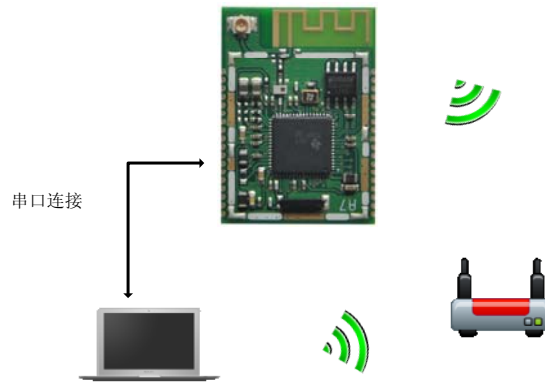
## 4 Instructions for use

WiFi module when using theneed to use two software;

- 1, SecureCRT serial debugging tools;
- 2, TCP Socket communication tools;

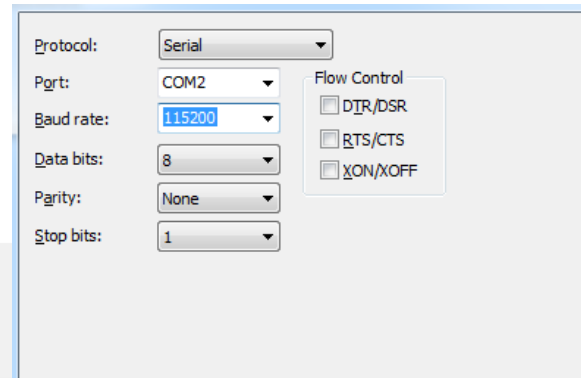
### 4.1 Network Connection

Configuration module in STA mode, and let the router connection; computer and router connection; module and a computer via a serial connection;



### 4.1.1 Serial Port Configuration

Open serial debugging assistant, a baud rate of 115200, 1 stop bit, no parity, as follows:



Press the reset button module, wait for some time, after the initialization is complete, you can receive AT command input;

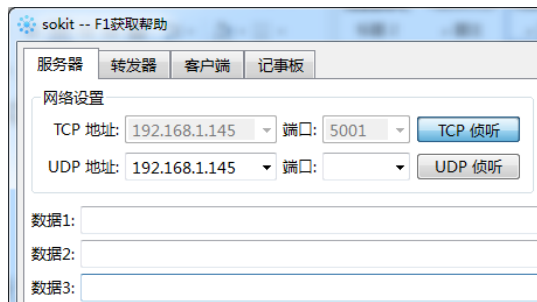
Enter AT + WKEY = AT + WSKEY = WPAPSK, AES, lierda18f <CR>, return + ok, which WPAPSK security type, AES data encryption, lierda18f secret key for encryption;

Enter AT + WSSID = Lierda18f <CR>, return + ok;

## 4.2 Creating Socket

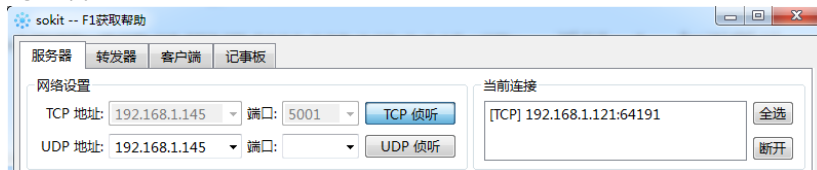
### 4.2.1 Creating a Socket A

Open socket tool, select the server mode, TCP address is 192.168.1.145, port number 5001, click the TCP listener, configured as follows:



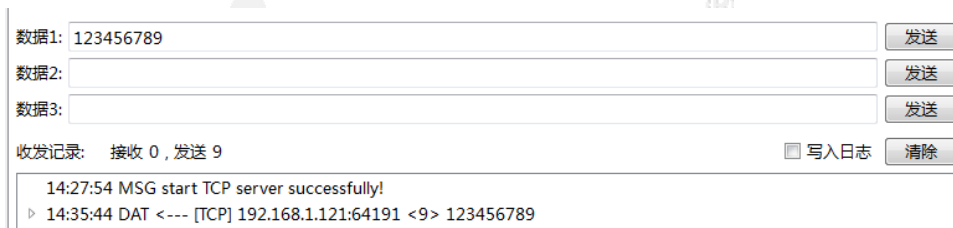
Serial port, enter AT + NETP = TCP, CLIENT, 5001,192.168.1.145 <CR>,return+ ok;  
EnterAT + TCPDIS = on <CR>,return+ ok;

Insokittool,a message appearsas follows:



Appear[TCP] 192.168.1.121:64191expressedsokitcreated successfully;

Click to select[TCP] 192.168.1.121:64191,then fillin thesendingareasokittoolataneeds to be sent, and click Send,receiveserialdatasent successfully, as follows:

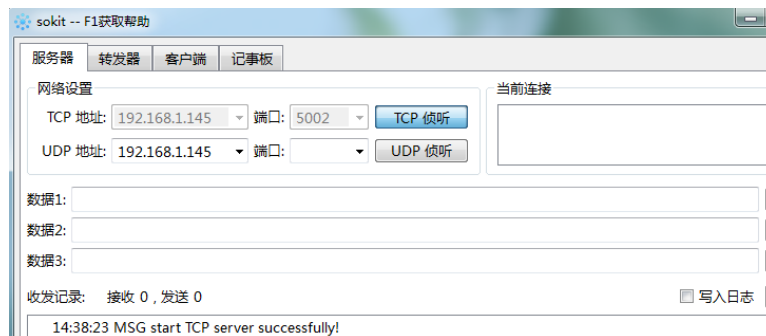


Serial dataobtainedare as follows:

123456789

## 4.2.2 CreatingSocketB

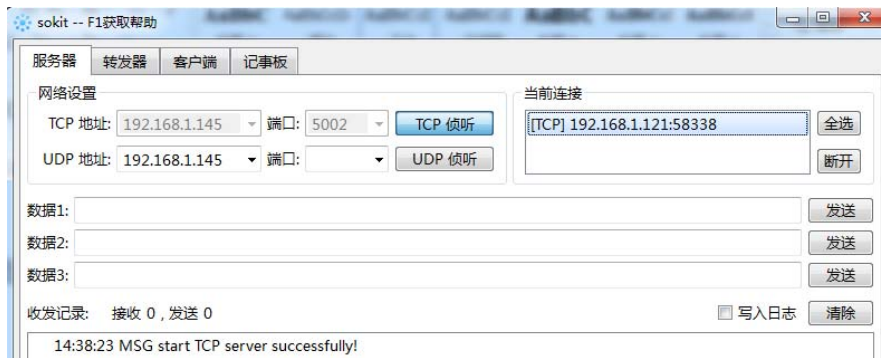
Opensokittool again, chooseserver mode, TCP address is192.168.1.145,the portis set to5002, click theTCP listener, as follows:



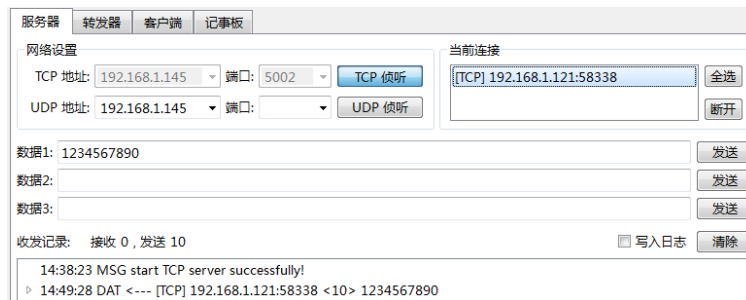
Serial port, enter AT + SOCKB = TCP, 5002,192.168.1.145 <CR>,return+ ok

Enter AT+TCPDISB=on<CR>, return +ok;

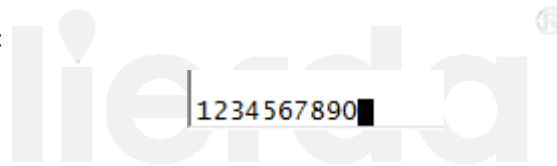
Information shown below appears in sokit tool, indicates socketB created successfully, as follows:



And create the first socket communications as a network to fill in the data transmitted by the data, such as 1234567890, click send, receive data appears in the serial, as follows:



The serial data is as follows:



### 4.2.3 Passthrough Mode

Enter the serial port of the AT + ENTM <CR>, so that the module enters the transparent mode.

## 5 Warning

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.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.