

FC-211/LP Data Radio

USER MANUAL



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I. Features:

1. ISM frequency band (433MHz),belong to license-Free frequency bands.

2. High anti-interference and low BER(Bit error Rate)

Based on the FSK modulation mode, using high-efficiency FEC channel encoding technology to improve the ability of data against burst interference and random interference.

3. Excellent transmission performance

Within the visible range and the location of antenna is high than 3m, the reliable transmission distance $\geq 2000\text{m}$ (BER= 10^{-6} /2400Bit/S).

4. Three kind of interface,convienient for setting and connecting.

FC-211LP can provide three transparent interfaces : TTL/RS232/ RS485 ,but user should customize only one of the above before making an order. Customer can set accordng to their demand of data rate (1200/2400/4800/9600Bit/s) and interface format (8N1/8E1/8O1).

5. Multi-channels.

The standard FC-211LP configuration provides 8 channels,meeting the demand of multiple communication combination mode of the user.

6. Huge data buffer cache.

During transmitting ,data frame can reach at least 750bytes one time,and then it can transimit more than 2000kbyte data frame one time when RF data rate is bigger than interface data rate.

7. Intelligent data control and transparent data transmission.

One of the Half-Dulpex equipment, the user doesn't need to prepare excessive programs but receive/transmit the data from the interface. FC-211LP will automatically complete the other operations such as transmission/receiving conversion in the air, control,etc.

8. Low power consumption

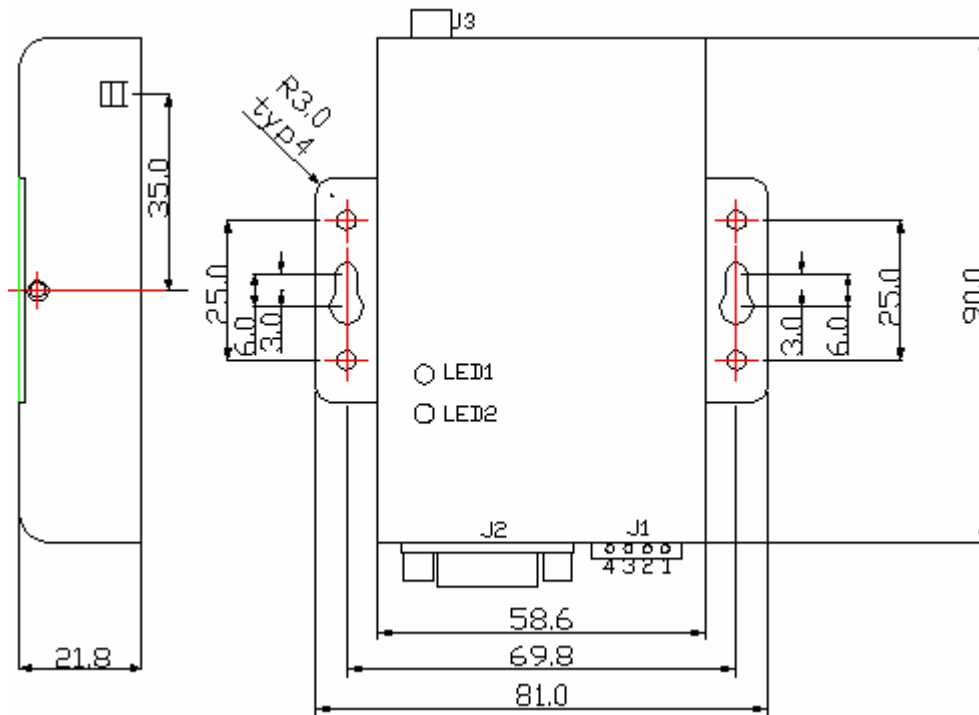
Receiving current is less than or equal to 30mA, transmitting current is lesss than or equal to 320mA, and sleep current is less than or equal to 3uA.(TTL interface used)

9. High reliability, compact design for convenient embedding.

Single chip RF integrated circuit and single chip MCU are used for lessened peripheral circuits, high reliability

II. How to use FC211LP

1. sketch map of overall size and structure



FC211LP sketch map of fixing direction

2. Dimension and weight

Dimension: 90mm×58.6mm×21.8mm

Weight: 150g (No including antenna)

3. Description of connector

Definition of J1 connector

- 1)、GND: Grounding
- 2)、VCC: 5 ± 0.5 VDC
- 3)、B: RS485 B
- 4)、A: RS485 A

Definition of J2 connector (DB9 Female)

- 2)、TXD: connect to the RXD of terminal system
- 3)、RXD: connect to the TXD of terminal system
- 4)、SLP: control pin of power-saved mode
- 5)、GND: signal grounding

Definition of J3 antenna connector

Standard SMA (50Ω)

LED1:

TX and RX indicator light: Red—indicate TX ,Green—indicate RX

LED2:

Working indicator light: Light on when it start to work

4. Schematic diagram of FC211LP connecting with terminal system

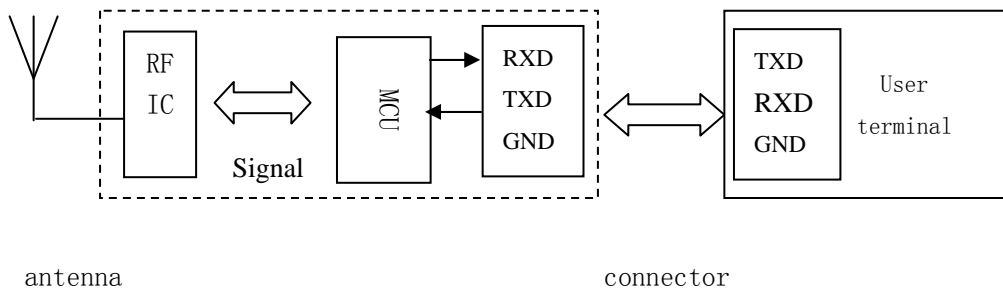


Diagram 1: schematic diagram of FC211LP application

(FC211LP provide three kind interface TTL/RS232/RS485, customer can choice one before purchase)

5. Setting of channel ,connector and data format

1) Setting and reading of parameters:

User can set or read the radio’s data rate, RF data rate , channel number and address code .
Parameter setting or reading can be done with software FC2211SP.EXE in our delivered CD.

Command frame format:

Commmand frame header	Frame lenght	Commmand word	Check sum
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Commmand frame header: 55H AAH

Frame lenght = commmand word leghth +1

Commmand word: less than 8 bytes

Check sum (2 bytes): Frame length +command data 1+...+command data n

All of the command word denoted in hex.

Table 2:

Commmand type	Frame header	Frame length	Commmand word	Check sum	Notes
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Channel setting	55 AA	06	07 XX 00 00 00		XX: 01-08
RF data rate setting	55 AA	04	20 05 XX		XX = 00: 2400; 20: 1200; 30: 4800; 40: 9600
Sleep mode setting	55 AA	04	58 00 XX		XX= 00: sleep mode 1 22: sleep mode2
Sleep mode reading	55 AA	04	59 00 00		return: 59 00 XX
Address code setting	55 AA	04	32 XX XX		XXXX : 4byte BCD 0000-9999
Interface data rate setting	55 AA	03	28 XY		X=0: No check; X=2: odd check ; X=3: even check; Y=0: 9600; Y=1: 4800; Y=2: 2400; Y=3: 1200; Y=4: 600; Y=6: 19200
Channel reading	55 AA	03	24 00		Return: 24 XX
RF data rate reading	55 AA	03	23 00		Return: 23 XX
Address code reading	55 AA	04	26 00 00		Return: 26 XX XX
Correct reply setting	55 AA	02	20	00 22	
Wrong reply setting	55 AA	02	21	00 23	

2) Channel and frequency

Table 3: Corresponding frequency of 1~8 channels

Channel No	Frequency	Channel	Frequency
1	432.8000MHZ	2	432.9000MHZ
3	433.0000MHZ	4	433.1000MHZ
5	433.2000MHZ	6	433.3000MHZ
7	433.4000MHZ	8	433.5000MHZ

6. Sleep Mode

When Sleep pin (User connector J2 pin4)at high level, the radio at the state of transmitting and receiving ;when sleep pin at low level , and up to 2 seconds no transmitting and reciving activity on sleep pin, then the radio will be sleep mode.

(1) When the radio at sleep model 1 , CPU is halt and peripheral RX circuit working intermittently, duty ratio is 200/1 . It can be awake by two way :

First: Once sleep pin is change to high level or receive data through interface, the radio will be awaked .and then it will send out awake commmand to other sleep radio.After finish sending it will be the state of transmitting or receiving data. About 20ms alternation ,interface can start to process all the data. The consume current is less than 5mA at sleep mode 1 .

Second : The radio can be awake by air-awake commmand, then it can be the state of transmitting or receiveing data immediately.

(2) when the radio at sleep mode 2, peripheral RX circuit is shut down and CPU is halt. Power consumption will be drop down at lowest point. If the radio receive data at interface or sleep pin at high level ,CPU can't receive the first 1byte data though it have out of low power consumption mode. In this case,once choicing this mode, to ensure data transmit correctly,it should send one of low pulse by RXD to awake CUP and resend about 10ms alternation. The consume current is less than 3 μ A at sleep mode 2

Note: Sleep pin will be set as high level and sleep mode be off ---this is factory default setting. please inform us in advance if you have special need .

III. Technical Specification

Table 1:

No	Specification	Parameter	Remark
1	Modulation	FSK	
2	Frequency	432.80~433.50MHZ	
3	RF Power	500mW	
4	Receiving sensitivity	-117dBm	
5	Sleep current	$\leq 3\mu\text{A}/\text{TTL}$, $\leq 15\text{mA}/\text{RS232}$, $\leq 15\text{mA}/\text{RS485}$	
6	RX current	$\leq 30\text{mA}/\text{TTL}$, $\leq 45\text{mA}/\text{RS232}$, $\leq 45\text{mA}/\text{RS485}$	
7	TX current	$\leq 330\text{mA}/\text{TTL}$, $\leq 350\text{mA}/\text{RS232}$, $\leq 350\text{mA}/\text{RS485}$	
8	Channel data rate	1200/2400/4800/9600Bit/s	User-defined
9	Interface data rate	1200/2400/4800/9600/Bit/s	User-defined
10	Interface data format	8E1/8N1/8O1	
11	Working power	5.0±0.5VDC	DC
12	Working temperature	-35°C~65°C	
13	Working humidity	10%~90% RH, non condensing	
14	Dimension	90mm×58.6mm×21.8mm	

IV. Factory default setting and accessories

Factory default setting :

Channel	CH1
Interface data rate	9600bps
RF data rate	2400bps
Check	none

Accessories:

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