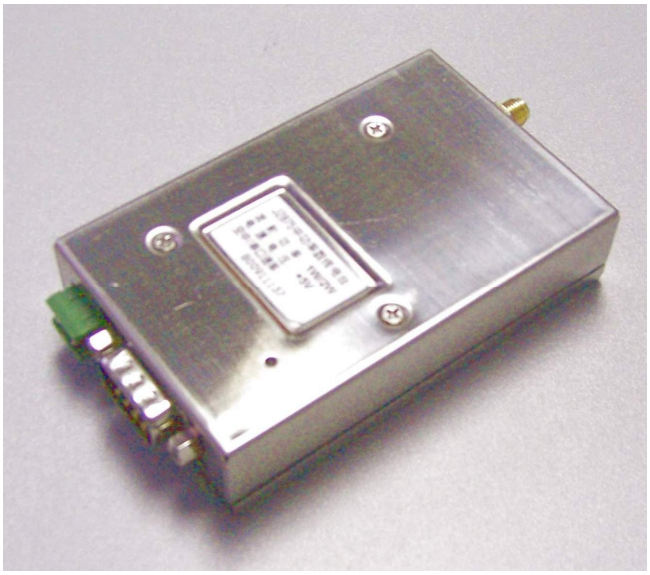
ATC-875 Mini-Power Wireless Module

User's Manual



SHENZHEN ATC TECHNOLOGY CO., LTD

Before using the product, please read the user's manual carefully. Any question in technical, you can contact us. Tel: +86-755-83452531，83453318.

● Features of ATC-875:

1. Transmission Power

The standard transmit power 2W/1W, users can set it, High receiving sensitivity: -123dbm

2. Working Frequency

Carrier Frequency: 433MHz, options of 402-470MHz.

3. Low power consumption,

DC5V Power, Receiving current <50mA, transmitting current <1.5A/2W (<1A/1W); Sleeping current ＜ 1mA.

4. Working Temperature

The real industrial product, the working temperature is -40℃~+85℃

5. Output/ Input Interface

It can provide RS-232, RS-485, and TTL.

6. Power control

One sleeping model: awaken from hardware

7. Circuit Structure

Radio adopts chip integration, the conversion time for transceiver is short <20 ms, all indications consistency, and better performance.

8. High Anti-Interference and Low BER (Bit error Rate)

Based on the GFSK modulation mode, it adopts the efficient communication protocol. The actual bit error rate is 10^{-5} ~ 10^{-6} when channel bit error rate is 10^{-2}.

9. Long transmission distance

Within the range of visibility, the reliable transmission distance can be 2km-10km when place the antenna higher than 3m.

10. Transparent data transmission

Transparent data interface is offered, which can be fit for nonstandard user protocol. Any false data generated in the air can be filtrated automatically (What has been received is exactly what has been transmitted). The change time for receiving and sending <10ms.

11. Multi-channel and speed

ATC-875 provides various baud rate 1200, 2400, 4800, 9600, 19200 and 38400bps. The wireless transmission speed and the connection baud rate are proportional, to satisfy the customer's equipment.

12. High speed wireless communication and big data buffer

When the RF baud rate is bigger than the COM baud rate, it can transmit unlimited data at one time, and when the RF baud rate is smaller than or was equal to the COM baud rate, may transmit 512 bytes data.

13. Intelligent data control and the user doesn't need to prepare excessive programs

Even it's half duplex, the user doesn't need to prepare excessive programs, only receiving/transmitting the data from the interface. ATC-875 will automatically complete the other operations, such as transmission/receiving conversion in the air, control, etc.

14. High reliability, small and light

Single chip radio frequency integrated circuit and lessened peripheral circuits, high reliability, and low failure rate.

15. Watchdog monitor

Watchdog monitors the inner function, so it can change the traditional product structure and improve the product reliability.

● Application of ATC-875

* AMR Automatic Meter Reading;
* Wireless alarm and security systems;
* Wireless conference voting system;
* Sports training & competition;
* Wireless dishes ordering;
* Electronic bus station and intelligent traffic;
* RF transmitter wireless electronic display screen and queuing machine;
* Point to multi-point wireless network, wireless on-the-spot bus and automatic data collection system

● How to use ATC-875

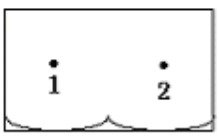
1. Power supply

ATC-875 uses DC power supply with voltage of +4.5V~+5.5V.

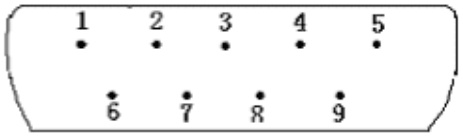
5V is the standard power supply.

The user can share power with other equipment, but should select the high quality power supply with desirable ripple factor. In addition, the reliable grounding must be used if there is other device in the system equipment. In case of failure to connect with the earth, it can form its own grounding but it must be absolutely separated from the municipal electric supply.

2. ATC-875 interface definition



Power Interface



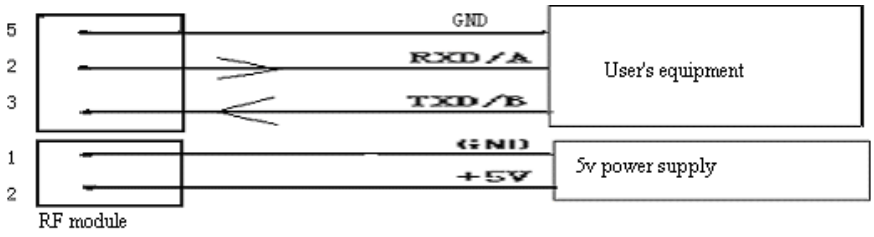
Modules Interface

ATC-875 can supply TTL、RS232、RS485, You must specify the interface when you order.

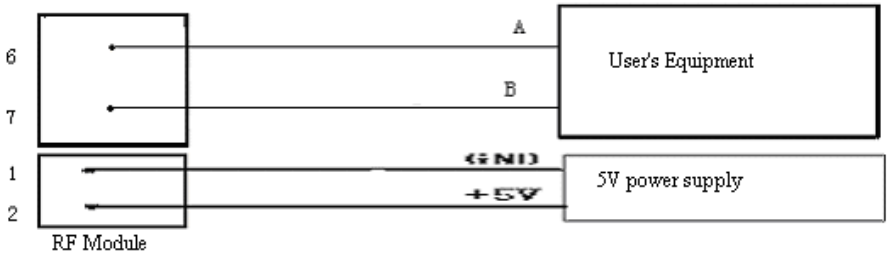
The Pin is as follows:

Module's Data Interface	Module 's PIN	Description	User's Terminal	Remarks
1	SLE	Outside sleep control (input)		Low level to sleep, High level awake (can be space)
2	TXD	TTL/RS232: data transmitting	User's PC receive	
3	RXD	TTL/RS232: data receiving	User's PC transmitting	
4				
5	GND	Connect to the ground	Connect to the ground	
6	A	RS-485/A		
7	B	RS-485/B		
8 / 9				
Module's Power Interface				
1	GND	GND	GND	
2	+5V	Power+	Power+	

The connection of ATC-875 and user's equipment: **TTL, RS-232**



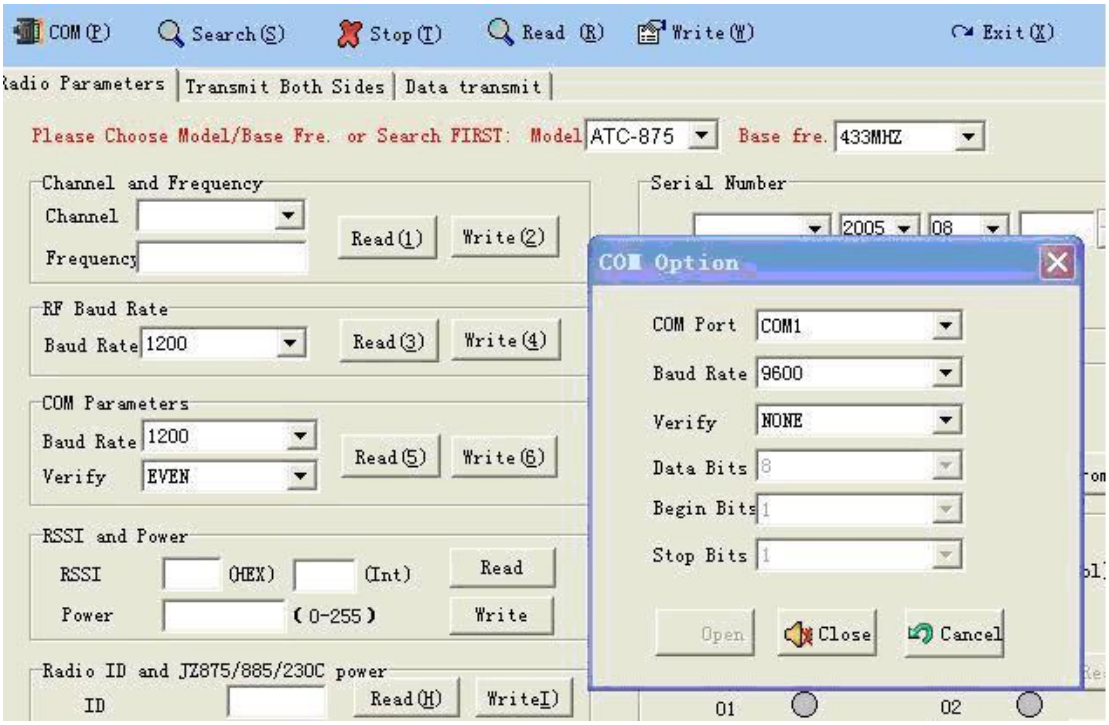
RS-485:



Note:

To avoid connect the COM Port (RS-232) reverse, please check and assure the voltage of 2 and 3 pin is exist by using multi meter. If there is one pin that has the voltage (generally is –6V to –9V), another hasn't voltage, which means the interface is connected reverse, please change the connection between pin 2 and 3.

3. How to use the software to search the radio and change the parameters



A. Connect ATC-875 with the Computer and power, and choose the COM ports.

B. Search the radio, when search it successfully (the software will clew it), then we can read and write the parameters.

C. To change parameters, you can choose the parameters you want to set, re-read after set it ok, then you can know whether the parameters is you want.

Note:

1. Two modules communicate or more modules, their frequency and RF baud rate should be the same.

2. Module communicate with User's Equipment, Their COM parameters should be the same.

The following table is ATC-875's channel and frequency:

Channel	Frequency	Channel	Frequency
1	430.2000MHZ	9	458.5250MHZ
2	431. 4288MHZ	10	459. 1250MHZ
3	431. 7360MHZ	11	459. 5250MHZ
4	430. 5072MHZ	12	460. 1250MHZ
5	434. 6940MHZ	13	460. 5250MHZ
6	434. 2332MHZ	14	461. 1250MHZ
7	433. 1580MHZ	15	461. 5250MHZ
8	433. 9260MHZ	16	462. 1250MHZ

4. Sleeping mode of ATC-875

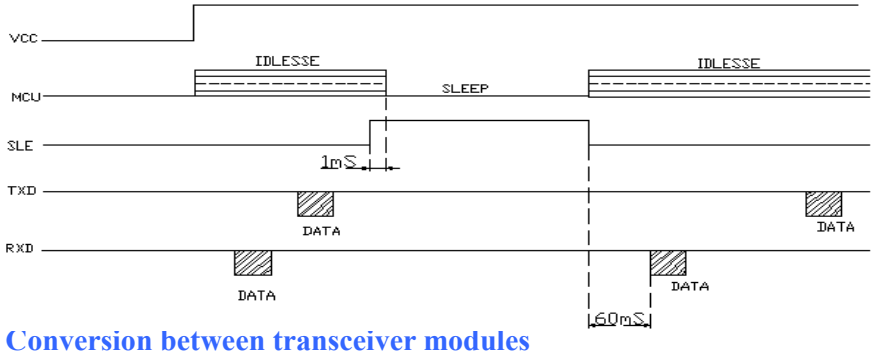
Awaken from Hardware: In this model, the current is under 1mA.

Sleeping status: Input low level at DB9 NO. 1 pin, it can sleep, don't transmit or receive data.

Normal working status: Input High level at DB9 NO. 1 pin, it become Normal working status, and can transmit and receive data in 10ms.

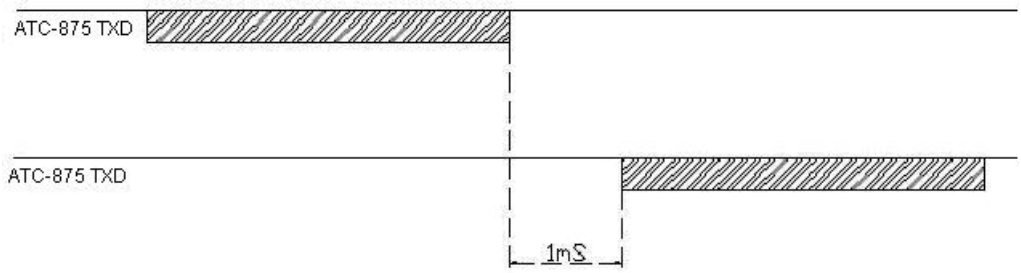
Note: if don't connect the NO. 1 pin, then ATC-875 is in Normal work status.

To change the module from awaken state to dormant state, only need to change the SLE low level to high level, the MCU will become dormant state in 1ms.
To change the module from dormant state to awaken state, only need to change the SLE high level to low level, the MCU will become working state in a few seconds, but to assure the stability for transmitting data, the user should begin transmitting data after 60ms.



5. The Conversion between transceiver modules

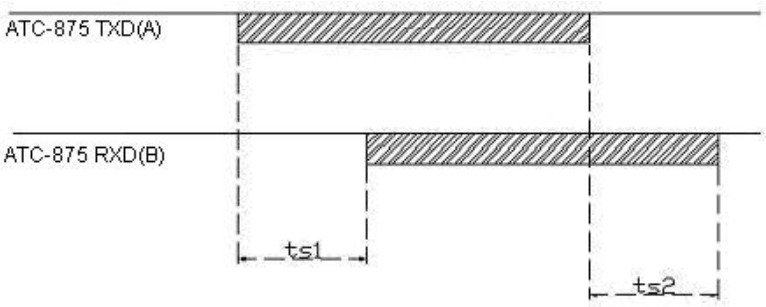
It needs 1 ms time delay after the user's equipment received the data and then transferred the send data.



6. Transmitting from A Module, received by B module

When transmitting data, the user should consider the time delay, in order to ensure the reliability of wireless communication; we joined the FEC (wrong before) and other coding rules. In that case, the communication delay is related to baud rate, the following is details:

COM baud rate (Bps)	Time tsl (ms)	RF baud rate (Bps)	Time ts1 (Ms)
38400	11	4800	43
19200	15	2400	83
9600	25	1200	140



7. Interoperable models

ATC-875 can communicate with all the JZ87 series models. Please kindly pay attention to the following points when transmitting:

A. Select all the modules the same channels.

B. All the modules with the same RF baud rate.

C. Connect the power supply and interface well.

8. Power instructions (Attached Figure appearance):

The transmitting power is 2W when the light is red

The transmitting power is 1W when the light is green

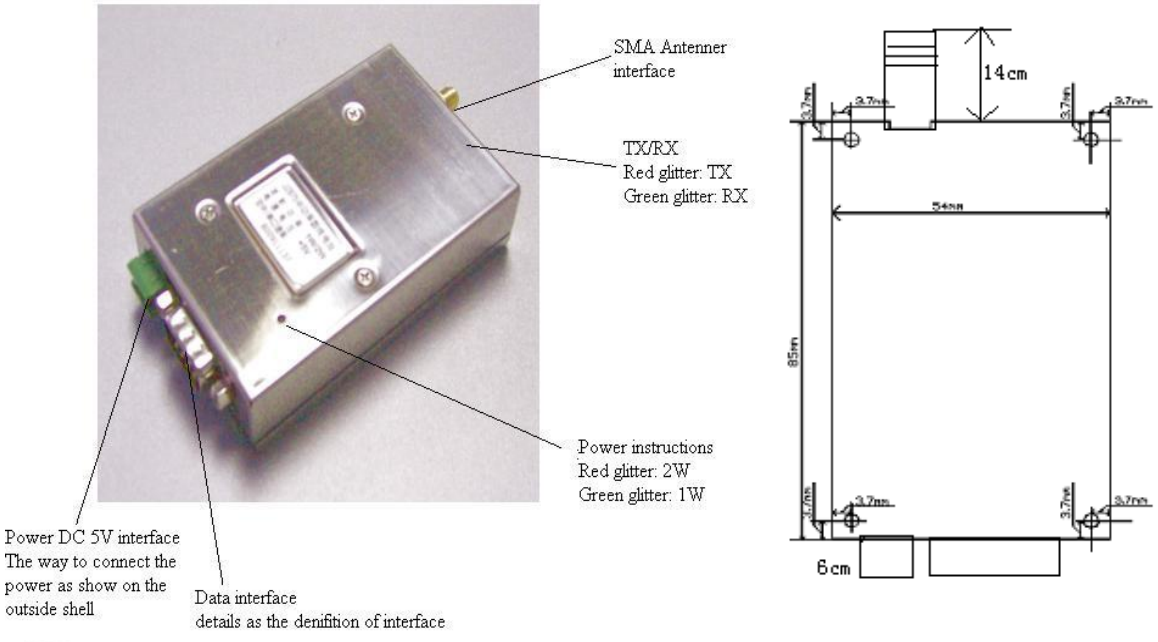
9. Lamp description of normal working

The module has a two-color work lights; the red lamp glitters twice when connect the power supply, the red lamp glitters when transmitting data, and the green lamp glitters when receiving data.

10. Installation methods

Users can use the module with the negative four screws to install (our company offer the screw).

Dimension: (mm)



11. Parameters default:

Channel：5
COM baud rate：9600bps
Interface verify：None verification
RF baud rate：9600bps

● Technical specification of ATC-875

Modulation mode: GFSK
Working frequency: 433MHZ
Transmission power: 2W/1W
Receiving sensitivity: -123dBm
Transmitting current: <1.5A
Receiving current: <50mA
Baud rate: 1200/2400/4800/9600/19200/38400Bit/s, User can set
Interface data format: 8E1/8N1/8O1
Power supply: DC5±0.5V（RS232/RS485）
Working temperature: -40℃~85℃
Working humidity: 10%～90% relative humidity without condensation
Dimension: 85mm*54mm*20mm
Interoperable models: ATC-871/ATC-873/ATC-875

Optional Antenna:

How to solve the trouble

Item	Trouble	Solve ways
1	Short distance	1. Check whether the environment is bad, the antenna is shielding or not, lead out the antenna or replace the antenna with higher gain. 2. Check whether the same frequency, power, strongly magnetic interference exist, change the channel or far away from the interference source. 3. Check whether the power, Voltage and current are matched or not.
2	Transmission unable	1. The power is bad connect. Check whether the red lamp glitter in the transmitter, re-connect the power line. 2. Signal line is bad connecting. Check whether the red lamp glitter in the transmitter or is the green lamp glitter in the receiver; 3. Check whether the Channel (frequency) and the RF baud rate between the two modules is the same, re-read and the set them; 4. Whether the Module and user's terminal or computer's level are matching or not (TTL/232/485 interface).
3	BER high	1. Check whether the green lamp glitter transmitting on the other side, that is, whether there is the same frequency interference. 2. Change the channel. Matching System is bad, check whether the line connect good; 3. COM or RF baud rate is not correct, re-set them; 4. Power's ripple is too big, replace the power