

RD06 WIFI data protocol

1 Data communication

1. Set RD06 RTC time :

After a connection is established between the device and the server, the device sends a data message to the server. The server sends the following information to the device to change the RTC time. It is recommended that the server set the RTC time each time when the device connects to the server.

Set the RTC time Format: **@UTC,yyyy-MM-dd HH:mm:ss#**

For example: **@UTC,2021-11-24 02:56:43#**

***please note the time setting should be UTC +0 time**

C# code:

```
byte[] utcBytes = System.Text.Encoding.Default.GetBytes(string.Format("@UTC,{0}#",  
System.DateTime.UtcNow.ToString("yyyy-MM-dd HH:mm:ss")));
```

```
_NetStream.Write(utcBytes, 0, utcBytes.Length);
```

2. Set ACK reply:

After a connection is established between the device and the server, each time the machine sends a piece of data to the server, the server must reply with an ACK message to the machine, otherwise the machine will continue to send duplicate data.

Reply ACK Format: **@ACK,Packet index (Hex converted into decimal)#**

For example: **@ACK,0035#**

C# code:

```
byte[] ackBytes = System.Text.Encoding.Default.GetBytes(string.Format("@ACK,{0}#",  
serial));
```

```
_NetStream.Write(ackBytes, 0, ackBytes.Length);
```

2 Data parsing

RD06 WIFI data is hex format.

The format of hex code:

Format: Start symbol(2byte) + Packet length(2byte) + Protocol type(2byte) + Hardware type(2byte) + Firmware version(4byte) + IMEI(8byte) + RTC time(6byte) + Reserved(2byte) + Extension(A) + State data length(2byte) + Alarm type(1byte) + Terminal information(1byte) + Reserved(2byte) + Battery voltage(2byte) + Power voltage(2byte) + Extension(B) + TAG information data length (2byte) + TAG type(1byte) + Number of the TAG(1byte) + Length of per TAG(1byte) + TAG information(X byte) + Extension(C) + Extension(D) + packet index(2byte) + Check code(2byte) + Stop symbol (2byte)

Here below is a table which informs more detailed information about the protocol.

Data block	Number of bytes	Data Content	Meaning
Start symbol	2	'TZ'	Header of every packet
Packet length	2	Variable	The packet length range from the protocol type to the Check code (include the protocol type and the Check code)
Protocol type	2	'\$\$'	
Hardware type	2	04H 06H	
Firmware version	4	Variable	i.e. 02H 00H 00H 00H means Firmware version is 2.00
IMEI	8	Variable	BCD format, i.e.06H 41H 88H 49H 07H 90H 00H 01H means IMEI is 641884907900001
RCT time	6	Variable	The RTC time when packet The sequence is Year Month Day Hour Minute Second i.e. 12H 0CH 0DH 02H 1DH 11H means 2018/12/13/ 02: 29: 17
Reserved	2	00 00	Always is 00 00
Extension	A=0		For future extending the protocol use, currently, has nothing, do not possess any byte
Status data length	2	Variable	The status data length, if this part is 00H 00H means no status data.
Alarm type	1	Variable	AAH Interval data 10H Low battery Alarm 60H Begin Charge

			61H End charge
Terminal information	1	Variable	Bit7: 1-connect to power 0-not connect to power Bit6: 1-This packet is the last packet of this packet index 0- This packet is not the last packet of this packet index Bit 5-0 :reserved
Reserved	2	00 00	Always is 00 00
Battery voltage	2	Variable	Unit:10mv, MSB first i.e. 01H 9FH=415, 415*10=4.15V
Power voltage	2	Variable	Unit:10mv, MSB first i.e. 04H D0H=1232, 1232*10=12.32V
Extension	B=0		For future use, currently, this part has nothing, do not have any byte
TAG information data length	2	Variable	The length of tag data area, 00H 00H means no tag data
TAG type	1	Variable	00-TAG06/06B 03-The TAG06/06B contains the RTC
Number of the TAG	1	Variable	The number of tag in this packet
length of per TAG	1	0BH	The length of per Tag
TAG information	X	Variable	per tag data format: ID + status + battery voltage + temperature + humidity + RSSI ID(4byte):62180983 Status(1byte): bit7: Battery voltage status, 1-low Voltage, 0- Voltage normal; bit6: Temperature alert status, 1-Temperature alert, 0- Temperature normal, bit4:Whether an ACK reply is required 1-Need, 0-Neen't, bit3:Whether RTC time is included 1-Contains, 2-Doesn't contains bit5/bit2-0:reserved; battery voltage(2byte):Unit: 1mv, MSB first, i.e. 0EH 33H means voltage is 3.635V;

			<p>temperature(2byte):unit:0.1°C, MSB first, bit15:tag normal or abnormal 1- abnormal 0- normal bit14:temperature positive(+) or negative(-), 0-positive, 1-negative, Bit13-0: temperature value i.e. 00H D4H means temperature is 21.2°C, 40H D4H means temperature is -21.2°C, 80H 00H means tag abnormal;</p> <p>Humidity(1byte):unit:%, if it is FFH means no humidity, i.e. 2DH means humidity is 45%.</p> <p>RSSI(1byte):unit: -dBm i. e. 2DH means RSSI is -45dBm Receive the TAG RTC time(6byte)(reserved): 13H 07H 1EH 08H 18H 04H Means 2019\07\30 08:24:04 ii. Note:TAG RTC time needs to be on at the tag, otherwise it will be off by default,TAG RTC time can be receive for RD06 firmware version 2.07 and above, and set for TAG06/06b firmware version 3.0 and above</p>
Extension	C=0		For future use, currently, this part has nothing, do not have any byte
Extension	D=0		For future use, currently, this part has nothing, do not have any byte
Packet index	2	Variable	The value range of this part is between 1 and 9999
Check code	2	Variable	The range is from Protocol type to Packet index(include Protocol type and Packet index),MSB first, can see the Check code calculate function CRC16 at document RS485 modbus protocol v1.1
Stop symbol	2	0DH 0AH	

For example:

RD06 WIFI data doesn't contains TAG RTC time(default):

54 5A 00 36 24 24 04 06 02 00 00 00 06 41 88 49 07 90 00 01 12 0C 0D 02 1D 11 00 00 00 08
AA C0 00 00 01 9F 04 D0 00 0E 00 01 0B 62 18 09 83 00 0E 33 00 D4 2D 2D 00 51 29 D3 0D
0A

Start symbol: 54 5A—‘TZ’;
Packet length: 00 36—54 bytes;
Protocol type: 24 24—‘\$\$’;
Hardware type: 04 06;
Firmware version: 02 00 00 00—2.00;
IMEI: 06 41 88 49 07 90 00 01—641884907900001;
RTC time: 12 0C 0D 02 1D 11—2018\12\13 02:29:17
Reserved: 00 00—2 bytes;
State data length: 00 08—8 bytes;
Alarm type: AA;
Terminal information: C0—connect to power, last packet
Reserved: 00 00—2 byte;
Battery voltage: 01 9F—4.15V;
Power voltage: 04 D0—12.32V;
TAG information data length: 00 0E—14 bytes;
TAG type: 00;
Number of the TAG: 01;
length of per TAG: 0B;
TAG information: 62 18 09 83 00 0E 33 00 D4 2D 2D
 ID:62180983
 status:00
 battery voltage: 0E 33—3.635V;
 temperature: 00 D4— 21.2°C;
 humidity: 2D—45%;
 RSSI: 2D— -45dBm;
packet index: 00 51—81;
Check code: 29 D3;
Stop symbol: 0D 0A

RD06 WIFI data doesn't contains TAG RTC time(default):

54 5A 00 4D 24 24 04 06 02 07 00 00 06 41 98 49 07 90 00 06 13 07 1E 08 18 36 00 00 00 08 AA
80 00 00 01 A3 04 CF 00 25 03 02 11 06 19 21 51 18 0F 0A 01 0E FF 37 13 07 1E 08 18 04 62 19
03 56 18 0E 56 01 0F 42 34 13 07 1E 08 18 09 01 22 C0 1C 0D 0A

Start symbol: 54 5A—‘TZ’;
Packet length:00 4D—77 bytes;
Protocol type: 24 24—‘\$\$’;
Hardware type: 04 06;
Firmware version: 02 07 00 00—2.07;
IMEI: 06 41 98 49 07 90 00 06—641984907900006;
RTC time: 13 07 1E 08 18 36 —2019\7\30 08:24:54;

Reserved: 00 00—2 bytes;

State data length: 00 08—8 bytes;

Alarm type: AA;

Terminal information: 80—connect to power

Reserved: 00 00—2 byte;

Battery voltage: 01 A3—4.19V;

Power voltage: 04 CF —12.31V;

TAG information data length: 00 25—37 bytes;

TAG type: 03;

Number of the TAG: 02;

length of per TAG: 11;

TAG information: 06 19 21 51 18 0F 0A 01 0E FF 37 13 07 1E 08 18 04

62 19 03 56 18 0E 56 01 0F 42 34 13 07 1E 08 18 09

TAG1: 06 19 21 51 18 0F 0A 01 0E FF 37 13 07 1E 08 18 04

ID:06192151

status:18

battery voltage: 0F 0A—3.85V;

temperature:01 0E— 27°C;

humidity: FF—无;

RSSI: 37— -55dBm;

Receive the TAG RTC time:13 07 1E 08 18 04—2019\07\30 08:24:04

TAG2: 62 19 03 56 18 0E 56 01 0F 42 34 13 07 1E 08 18 09

ID:62190356

status:18

battery voltage: 0E 56—3.67V;

temperature:01 0F— 27.1°C;

humidity: 42—66%;

RSSI: 34— -52dBm; ;

Receive the TAG RTC time:13 07 1E 08 18 09—2019\07\30 08:24:09

packet index: 01 22—290;

Check code: C0 1C;

Stop symbol: 0D 0A