

# RD06 4G data protocol

## 1 Data communication

### 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 Data parsing

**RD06 4G 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) + LBS data length(2byte) + LAC(2byte) + CELLID(4byte) + MCC(2byte) + MNC(2byte) + Extension(A) + State data length(2byte) + Alarm type(1byte) + Terminal information(1byte) + GSM signal strength(1byte) + GSM state(1byte) + 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 10H 00H 00H means Firmware version is 2.16
IMEI	8	Variable	BCD format, i.e. 08H 64H 99H 46H 36H 37H 41H 14H means IMEI is 8664994636374114
RCT time	6	Variable	The RTC time when packet The sequence is Year Month Day Hour Minute Second i.e. 14H 07H 1EH 02H 37H 08H means 2020/07/30/ 02: 55: 08
LBS data length	2	Variable	LBS's data length, if the value is 00H 00H, means no LBS data.
LAC	2	Variable	i.e. 27H B6H means LAC is 27B6
CELL ID	4	Variable	i.e. 11H FBH means CELL ID is 11FB
MCC	2	Variable	i.e. 04H 60H means MCC is 0460
MNC	2	Variable	i.e. 00H 01H means MNC is 0001
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 4G 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
GSM signal strength	1	Variable	CSQ value

<b>GSM status</b>	<b>1</b>	<b>Variable</b>	<b>Bit 7-6 :reserved</b> <b>Bit 5: 1-TCP\UDP connected</b> <b>0-TCP\UDP not connected</b> <b>Bit4: 1-4G network connected</b> <b>0-4G network not connected</b> <b>Bit3: 1-roaming</b> <b>0-not roaming</b> <b>Bit2: 1-GSM network connected</b> <b>0-GSM network not connected</b> <b>Bit1: 1-Detected SIM card</b> <b>0-no SIM card</b> <b>Bit0: 1-GSM module is on</b> <b>0-GSM module is off</b>
<b>Battery voltage</b>	<b>2</b>	<b>Variable</b>	<b>Unit:10mv, MSB first</b> <b>i.e. 01H 98H=408, 408*10=4.08V</b>
<b>Power voltage</b>	<b>2</b>	<b>Variable</b>	<b>Unit:10mv, MSB first</b> <b>i.e. 04H D6H=1238, 1238*10=12.38V</b>
<b>Extension</b>	<b>B=0</b>		<b>For future use, currently, this part has nothing, do not have any byte</b>
<b>TAG information data length</b>	<b>2</b>	<b>Variable</b>	<b>The length of tag data area, 00H 00H means no tag data</b>
<b>TAG type</b>	<b>1</b>	<b>Variable</b>	<b>00-TAG06/06B</b> <b>03-The TAG06/06B contains the RTC</b>
<b>Number of the TAG</b>	<b>1</b>	<b>Variable</b>	<b>The number of tag in this packet</b>
<b>length of per TAG</b>	<b>1</b>	<b>0BH</b>	<b>The length of per Tag</b>
<b>TAG information</b>	<b>X</b>	<b>Variable</b>	<b>per tag data format:</b> <b>ID + status + battery voltage + temperature + humidity + RSSI</b> <b>ID(4byte): 62190342</b>  <b>Status(1byte):</b> <b>bit7: Battery voltage status,</b> <b>1-low Voltage,</b> <b>0- Voltage normal;</b> <b>bit6: Temperature alert status,</b> <b>1-Temperature alert,</b> <b>0- Temperature normal,</b> <b>bit4:Whether an ACK reply is required</b> <b>1-Need,</b> <b>0-Neen't,</b> <b>bit3:Whether RTC time is included</b> <b>1-Contains,</b>

			<p>2-Doesn't contains bit5/bit2-0:reserved;</p> <p>battery voltage(2byte):Unit: 1mv, MSB first, i.e. 0DH B6H means voltage is 3.510V;</p> <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. 01H 12H means temperature is 27.4°C, 41H 12H means temperature is -27.4°C, 80H 00H means tag abnormal;</p> <p>Humidity(1byte):unit:%, if it is FFH means no humidity, i.e. 3AH means humidity is 58%.</p> <p>RSSI(1byte):unit: -dBm i. e. 2AH means RSSI is -42dBm</p> <p>Receive the TAG RTC time(6byte)(reserved): 14H 07H 1EH 04H 0DH 38H Means 2020\07\30 04:13:56 <b>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</b></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 data doesn't contains TAG RTC time(default):**

54 5A 00 45 24 24 04 06 01 04 00 00 08 65 47 30 33 61 81 36 11 08 1F 04 23 39 00 04 27 B6 11  
FB 00 08 AA C0 13 37 01 A6 04 E1 00 19 00 02 0B 62 16 00 93 00 0D 4F 40 E4 40 3E 62 16 03  
74 00 0C A1 01 13 34 46 00 D0 1F 74 0D 0A

**Start symbol:** 54 5A—'TZ';

**Packet length:** 00 45—69 bytes;

**Protocol type:** 24 24—'\$\$';

**Hardware type:** 04 06;

**Firmware version:** 02 10 00 00—2.16;

**IMEI:** 08 64 99 46 36 37 41 14—864994636374114;

**RTC time:** 14 07 1E 02 37 08—2020\07\30 02:55:08

**LBS data length:** 00 0A—10 bytes;

**LAC:** 25 32—2532;

**CELLID:** 06 11 F4 03—0611F403;

**MCC:** 04 60—0460;

**MNC:** 00 01—0001;

**State data length:** 00 08—8 bytes;

**Alarm type:** AA;

**Terminal information:** C0—connect to power, last packet

**GSM signal strength:** 18—24;

**GSM state:** 37—TCP\UDP connected;

**Battery voltage:** 01 98—4.08V;

**Power voltage:** 04 D6—12.38V;

**TAG information data length:** 00 0E—14 bytes;

**TAG type:** 00;

**Number of the TAG:** 02;

**length of per TAG:** 0B;

**TAG information:** 62 19 03 42 00 0D B6 01 12 3A 2A 00 7D 8C 28 0D 0A

**ID:**62190342

**status:**00

**battery voltage:** 0D B6—3.510V;

**temperature:** 01 12— 27.4°C;

**humidity:** 40—64%;

**RSSI:** 3E— -62dBm;

**TAG2:** 62 16 03 74 00 0C A1 01 13 34 46

**ID:**62160374

**status:**00

**battery voltage:** 0C A1—3.233V;

**temperature:** 01 13— 27.5°C;

**humidity:** 3A—58%;

**RSSI:** 2A— -42dBm;

**packet index:** 00 7D—125;

**Check code:** 8C 28;

**Stop symbol:** 0D 0A

### **RD06 data contains TAG RTC time:**

54 5A 00 51 24 24 04 06 02 07 00 00 08 62 05 70 44 27 62 09 13 07 1A 04 12 08 00 04 27 93 11  
3C 00 08 AA C0 1A 37 01 9C 04 D9 00 25 03 02 11 62 19 03 56 18 0E 56 01 02 3C 48 13 07 1A  
04 11 16 06 19 21 51 18 0E 56 00 F7 FF 4F 13 07 1A 04 11 20 00 7F 76 5B 0D 0A

**Start symbol:** 54 5A—‘TZ’;

**Packet length:** 00 51—81 bytes;

**Protocol type:** 24 24—‘\$\$’;

**Hardware type:** 04 06;

**Firmware version:** 02 10 00 00—2.16;

**IMEI:** 08 64 99 90 46 36 37 41—864999046363741;

**RTC time:** 14 07 1E 04 0D 38—2020\07\30 04:13:56;

**LBS data length:** 00 10—10 bytes;

**LAC:** 25 32—2532;

**CELLID:** 06 11—0611F409;

**MCC:** 04 60—0460;

**MNC:** 00 01—0001;

**State data length:** 00 08—8 bytes;

**Alarm type:** AA;

**Terminal information:** C0—connect to power,last packet

**CSQ:** 16—24

**GSM state:** 37—TCP\UDP connected;

**Battery voltage:** 01 9F—4.15V;

**Power voltage:** 04 D6—12.38V;

**TAG information data length:** 00 14—20 bytes;

**TAG type:** 03;

**Number of the TAG:** 01;

**length of per TAG:** 11;

**TAG information:** 62 19 03 56 18 0E 56 01 0F 38 0A 14 07 1E 04 0D 38

**ID:**62190356

**status:**18

**battery voltage:** 0E 56—3.67V;

**temperature:** 01 02— 25.8°C;

**humidity:** 3C—60%;

**RSSI:** 48— -72dBm;

**Receive the TAG RTC time:**13 07 1A 04 11 16—2019\07\26 04:17:22

**TAG2:** 06 19 21 51 18 0E 56 00 F7 FF 4F 13 07 1A 04 11 20

**ID:**06192151

**status:** 18

**battery voltage:** 0E 56—3.67V;

**temperature:** 01 0F— 27.1°C;

**humidity:** 38—56%;

**RSSI:** 0A— -10dBm;

**Receive the TAG RTC time:** 14 07 1E 04 0D 38—2020\07\30 04:13:56;

**packet index:** 02 26—550;

**Check code:** 6F F5;

**Stop symbol:** 0D 0A