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Brief Introduction

USR-GPRS232-730 is a GPRS DTU. User can realize the two-way data transparent transmission from the serial port to the network by simply setting it. USR-GPRS232-730 supports identity packages, heartbeat package, two Socket connections.

Features

- Supports GSM850/900, DCS1800/1900
- Supports GSM/GPRS/EDGE; Supports 2G flow of 2G/3G/4G SIM card
- Support two way Network connection simultaneously; Support TCP and UDP
- Every connection support 4KB Data Cache
- Supports sending network identity package
- Supports sending heartbeat package data to network or serial port
- Supports setting DTU parameters via SMS
- Supports 3 work modes: SMS transparent transmission mode, Network transparent transmission mode and HTTPD mode
- Supports sending CN/EN SMS via commands
- Automatic baud rate synchronization, can modify DTU serial parameters via network dynamically
- Support serial port RTS/CTS
1. Get Start

Product link: 
http://www.usriot.com/p/rs232-rs485-gsm-modems/
USR-GPRS232-730 setting software, download address: 
http://www.usriot.com/usr-gm3-setup-software/

![USR-GPRS232-730 Modem]

**RS232 / RS485 GSM GPRS Modem Supports SMS command**

USR-GPRS232-730 is a RS232/RS485 to GSM modem, which used for data transparent transmission based on 2G Network.

- 1 RS232 serial port and 1 RS485 serial port (not use simultaneously)
- Power: 5V~36V
- Quad-Band GSM/GPRS 850/900/1800/1900MHz
- Flow Control: CTS/RTS
- Work Mode: TCP/UDP Client

![Picture 1](Download Page)

If you have any question, please submit it back to customer center: [http://h.usriot.com](http://h.usriot.com)

1.1. DTU Application

1.1.1. Application Diagram

Data transmission diagram as follows:

![Figure 1 Application diagram]
1.1.2. Hardware Connection Diagram

![Hardware Connection Diagram](image)

**Figure 2 Hardware connection**

1.2. Module Default Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work mode</td>
<td>Network Transparent transmission mode</td>
</tr>
<tr>
<td>Server Address</td>
<td>test.usr.cn</td>
</tr>
<tr>
<td>Server Port</td>
<td>2317</td>
</tr>
<tr>
<td>Serial Parameters</td>
<td>115200, 8, 1, None</td>
</tr>
<tr>
<td>Heartbeat Package</td>
<td>Package Data: <a href="http://www.usr.cn">www.usr.cn</a></td>
</tr>
</tbody>
</table>

**Figure 3 Default parameters**

1.3. Basic Parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Wireless Parameters</strong></td>
<td></td>
</tr>
<tr>
<td>Wireless Standards</td>
<td>GSM/GPRS/EDGE</td>
</tr>
<tr>
<td>Standard frequency range</td>
<td>850/900/1800/1900MHz</td>
</tr>
<tr>
<td>Max. Transmitted Power</td>
<td>GSM900 class4 (2W)</td>
</tr>
<tr>
<td></td>
<td>DCS1800 class1 (1W)</td>
</tr>
<tr>
<td>GPRS Terminal Device Class</td>
<td>Class B</td>
</tr>
<tr>
<td>GPRS Multi-slot Class</td>
<td>GPRS Class 10</td>
</tr>
<tr>
<td>GPRS Coding Schemes</td>
<td>CS1 ~ CS4</td>
</tr>
<tr>
<td>Antenna</td>
<td>SMA Interface</td>
</tr>
<tr>
<td><strong>Hardware Parameters</strong></td>
<td></td>
</tr>
<tr>
<td>Data Interface</td>
<td>UART: 2400bps - 921600bps</td>
</tr>
<tr>
<td>Working Voltage</td>
<td>DC 9V ~ 24V</td>
</tr>
</tbody>
</table>

Jinan USR IOT Technology Limited
### 1.4. Hardware Introductions

Below is the hardware interface schematic diagram of USR-GPRS232-730:

![Hardware Interface Schematic Diagram](image)

Note: Two power interface can't be used simultaneously.

### 1.5. Dimensions

Below is the dimension figure of USR-GPRS232-730:
Figure 6 Dimension
2. Product Functions

This chapter introduces the functions of USR-GPRS232-730, as the following diagram shown, you can get an overall knowledge of it.

![Function Diagram]

Figure 7 function diagram

2.1. APN

Different operator has different APN (access point name). If you use the SIM card from the operator. You must know the APN. You can ask your SIM card operator for APN.

There are three parameters about APN. Those are APN, username and password. Sometimes only configure APN is enough.

2.2. Work Mode

2.2.1. Transparent Mode

Transparent Mode: What you sent to serial will be forward to network. The communication is bidirectional.
USR-GPRS232-730 supports 2 socket connections simultaneously: socket A and socket B, they are independent. This DTU only support working as TCP Client and UDP Client.

### 2.2.2. HTTPD Client Mode

HTTPD Client Mode: DTU will add the HTTP Header for every data from serial and transfer HTTP format data to Network. User needs to configure the HTTP Header before use this mode. User can use this mode transfer the serial data to HTTP server.
Figure 9 HTTPD Client Mode Diagram

<Note>:
DTU can't work as HTTP server.

2.2.3. SMS Mode

SMS Mode: Send serial data to mobile as SMS.

Figure 10 SMS Mode Diagram
2.3. Serial Port

2.3.1. Parameters range

<table>
<thead>
<tr>
<th>Items</th>
<th>Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Baud Rate</strong></td>
<td>1200, 2400, 4800, 9600, 14400, 19200, 38400, 57600, 115200, 128000, 230400, 460800, 921600</td>
</tr>
<tr>
<td><strong>Data Bits</strong></td>
<td>7, 8</td>
</tr>
<tr>
<td><strong>Stop Bits</strong></td>
<td>1, 2</td>
</tr>
<tr>
<td><strong>Parity Bits</strong></td>
<td>NONE, EVEN, ODD</td>
</tr>
<tr>
<td><strong>Flow Control/485</strong></td>
<td>NFC: None Flow Control</td>
</tr>
<tr>
<td></td>
<td>FC: Hardware Flow Control</td>
</tr>
<tr>
<td></td>
<td>485: When you use RS485, please choose this function</td>
</tr>
</tbody>
</table>

Figure 11 Serial parameters

2.3.2. Serial Package Methods

USR-GPRS232-730 adopts fixed Packaging time-200ms.

2.3.3. RS485

RS485 transfer time: For RS485 is half-duplex. It needs time to switch the status between sending & receiving. Switching period instructions:

<table>
<thead>
<tr>
<th>Baud Rate</th>
<th>Switching period(ms)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2400</td>
<td>100</td>
</tr>
<tr>
<td>4800</td>
<td>40</td>
</tr>
<tr>
<td>9600</td>
<td>20</td>
</tr>
<tr>
<td>19200</td>
<td>15</td>
</tr>
<tr>
<td>28800</td>
<td>15</td>
</tr>
<tr>
<td>33600</td>
<td>15</td>
</tr>
<tr>
<td>38400</td>
<td>15</td>
</tr>
<tr>
<td>57600</td>
<td>15</td>
</tr>
<tr>
<td>115200</td>
<td>2</td>
</tr>
<tr>
<td>230400</td>
<td>2</td>
</tr>
<tr>
<td>460800</td>
<td>2</td>
</tr>
<tr>
<td>921600</td>
<td>2</td>
</tr>
</tbody>
</table>

Figure 12 Switching period

2.3.4. Baud Rate Synchronization

When module works with USR devices or software, serial parameter will change dynamically according to
network protocol. Customer can modify serial parameter by sending data conformed to specific protocol via network. It is temporary, when restart DTU, the parameters back to original parameters.

2.4. Features

2.4.1. Identity Package Function

Identity Package is used for identify the device when module works as TCP client/UDP client. There are two methods for sending identity Package.

- Identity data will be sent when connection is established. (Only for TCP client)
- Identity data will be add on the front of every data package. (TCP client and UDP client)

Type of identity data: ICCID, IMEI, CLOUD and USER.
- ICCID, the unique identifier of SIM card, suitable to the application based on SIM card identification.
- IMEI, the unique identifier of DTU, suitable to the application based on device identification.
- CLOUD, the identification code based on USR CLOUD platform. For more information about USR Cloud, please go to cloud.usr.cn/en/
- USER, You can use your own identity data.

2.4.2. Heartbeat Package Function

Heartbeat Package: Module will output heartbeat data to serial port side or network side periodic. User can configure the heartbeat data and time interval. Serial heartbeat data can be used for polling Modbus data. Network heartbeat data can be used for showing connection status and keep the connection.

Heartbeat Package is only in transparent mode.
2.4.3. Sleep mode

Users can use the AT commands to set module into Sleep mode. In Sleep mode, module serial port can't receive data but can transmit data; module can receive data from network or SMS. Even though module in Sleep mode can also keep TCP connection, but user can use short connection or close connection temporarily to make power dissipation arrive best status.

User can use AT commands, phone call or wake-up pin to wake up module.

2.4.4. Location Based Service

LBS function: User can acquire approximate location of module through operator’s network. Accuracy error is about 100 meters and user can acquire LBS information by AT commands.

2.4.5. LED Indicator

LED Indicators of USR-GPRS232-730 are POWER, WORK, GPRS, LINKA, LINKB.

<table>
<thead>
<tr>
<th>LED NAME</th>
<th>LED Status</th>
<th>Module Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>POWER</td>
<td>ON</td>
<td>Power on</td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>Power off</td>
</tr>
<tr>
<td>WORK</td>
<td>ON</td>
<td>Working</td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>Not Working</td>
</tr>
<tr>
<td>GPRS</td>
<td>ON</td>
<td>GPRS network is connected</td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>GPRS network is disconnected</td>
</tr>
<tr>
<td>LINKA</td>
<td>ON</td>
<td>Socket A is connected</td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>Socket A is disconnected</td>
</tr>
<tr>
<td>LINKB</td>
<td>ON</td>
<td>Socket B is connected</td>
</tr>
<tr>
<td></td>
<td>OFF</td>
<td>Socket B is disconnected</td>
</tr>
</tbody>
</table>

Figure 14 LED indicator

2.4.6. Reload by Hardware

User default settings: User can save the settings as User default settings.

Pressed Reload button for 3~15 seconds, module will reload user default settings.
3. Parameter Setting

There are 3 ways to use AT commands for configuring module and querying status. They are serial AT command, SMS AT command and transparent AT command. We provide the setup software based on serial AT command. You can download the setup software from [http://www.usriot.com/usr-gm3-setup-software/](http://www.usriot.com/usr-gm3-setup-software/).

![Setup software](image)

**Figure 15 Setup software**

3.1. AT Command

3.1.1. Serial AT Command

In transparent mode, SMS mode and HTTPD mode, you can enter serial AT command mode. Then you can send AT command to module. Setup software is based on this function. For entering AT command mode, please refer to this FAQ: [http://www.usriot.com/enter-serial-command-mode/](http://www.usriot.com/enter-serial-command-mode/).

3.1.2. Transparent AT Command

When module in transparent mode, you can use “Password,AT command” format to send AT command via serial or network. If you use transparent AT command, you needn't enter AT command mode.

3.1.3. SMS AT Command

You can configure module or query status by SMS AT command to remotely control your module in fields.

Note: SMS AT command can achieve sending more than one AT command by only one message after firmware version V3.0. User can achieve it by add “;” after each AT command.
4. Contact Us

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Tel: 86-531-88826739/86-531-55507297

5. Disclaimer

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6. Update History

2017-07-14 V1.0.0.0 Established.

2017-08-02 V1.0.08.01 updated based on Chinese version user manual V1.0.08. Replacing functional block diagrams, correcting grammar mistakes and updating 3.1.3.SMS AT Command.

2017-10-20 V1.0.14.01 updated based on Chinese version user manual V1.0.14. Replacing related hardware figures to latest hardware version figures and optimizing the overall arrangement.