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RemoDAQ-8554A GPRS DTU

User's Manual

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Chapter 1 Introduction

This chapter introduces RemoDAQ-8554A GPRS DTU descriptions, features and installation.

1 Brief Introduction

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1.1 Brief Introduction

Based on years of experience of providing mobile data's industrial application solutions and service operator's network configurations, BeiJing GemoTech has designed RemoDAQ-8554A GPRS DTU which works at an advanced platform with individualized feature options to meet different requirements. Along with mobile communication technology's development, the GPRS data networks have covered all country; this brings a bright future for industrial applications.

Figure1.1 RemoDAQ-8554A GPRS DTU

GPRS network theoretically can provide a maximum bandwidth 171.2Kbps, actually, it works at 40~100Kbps bandwidth (it depends on service provider's operation policy). As we know, GPRS is packet based network which provides TCP/IP communication channel.

RemoDAQ-8554A GPRS DTU provides industrial end-user a virtual private data network of high speed, always online, and transparent data transmission. It can be widely used at area power system, industrial supervision, automatic traffic control, weather station, environment protection, pipe supervision, finance and

securities, etc.

1.1.1 Measurement

RemoDAQ-8554A GPRS DTU outside measurement and installation position:

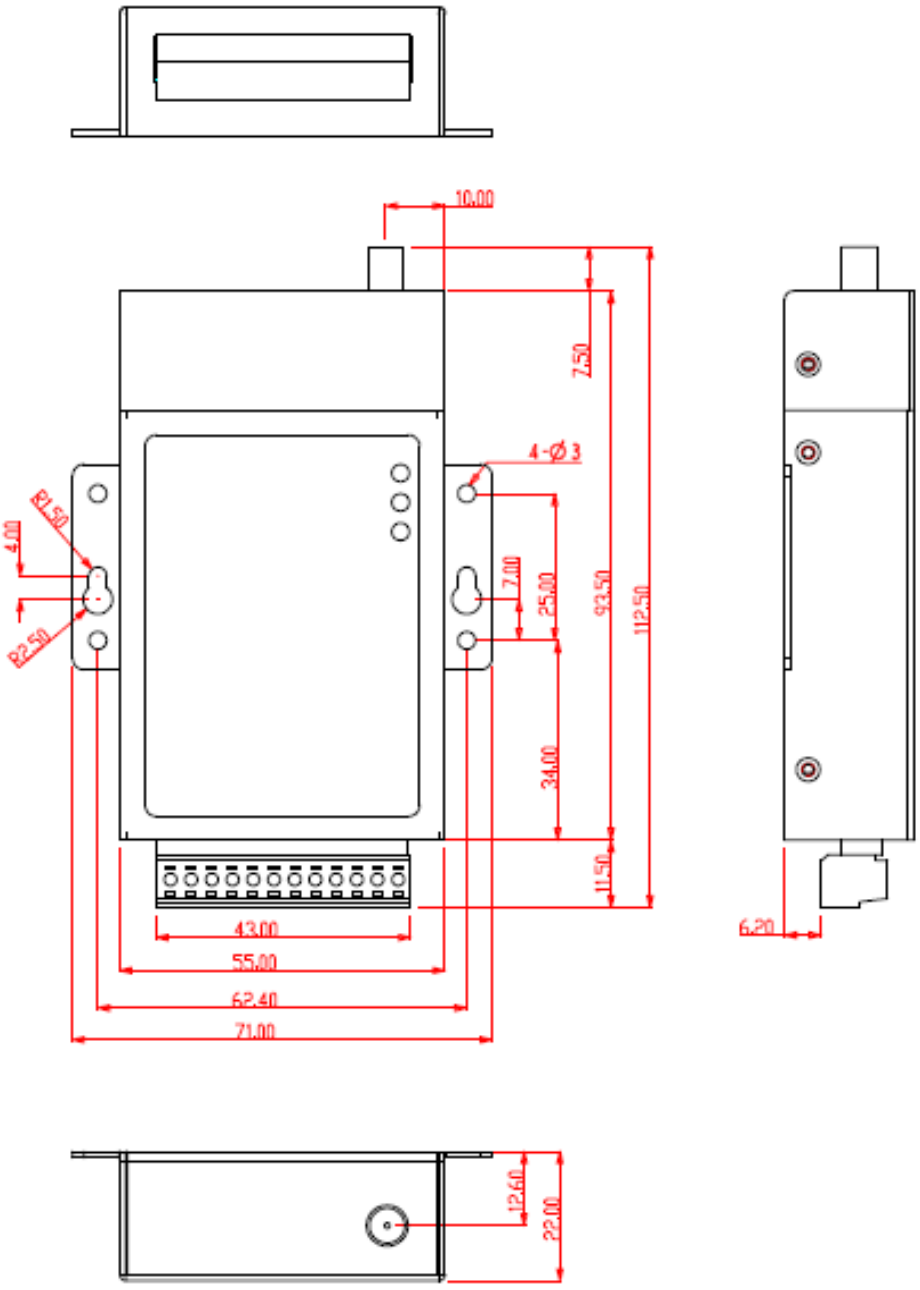


Figure1.2 product shape size

1.1.2 Open Box

In order to protect products during shipment, RemoDAQ-8554A GPRS DTU has

been packed properly. You may need to keep the packing materials for reshipping after you open the pack box.

RemoDAQ-8554A GPRS DTU package includes:

RemoDAQ-8554A GPRS DTU *1 piece*

User Manual *1 copy (CD-ROM)*

Qualified & Repair Card *1 piece*

Test Cable *1 piece*

Optional Accessories:

Standard Antenna

Vehicle Antenna

Directional Antenna

After you open the box, you should count it carefully with your purchase order.

1.1.3 Constitutive

32bits Philips MPU

GPRS Module SIM300C

1.1.4 Specifications

RemoDAQ-8554A GPRS DTU's main specifications:

GPRS Data

GPRS Class 10

Coding Scheme: CS1 - CS4

Complies SMG31bis Specifications

Interface

Antenna *50/SMA/Female*

SIM *3V*

Serial Port

Interface *RS-232/RS-485*

Data Rate *300~115,200bits/s*

Terminal *3.5mm Pluggable Terminal, 12pin*

Power	
Voltage	*+12~30VDC*
Ripple	*<300mV*
Consumption	
Idle Current	*30mA@+12VDC*
Work Current	*50~140mA@+12VDC*
Others	
Measurement	*112.5x70x22 (Not include antenna, installation pack and connector)*
Weight	*160g*
Work Temperature	*-20~+55C*
Store Temperature	*-25~+70C*
Relative Humidity	*95%(non-condensing)*

1.2 Function Features

- Support RS-232/RS-485 data interface
- Using conveniently, flexibly, reliably
- Data terminal always online, support data service center dynamic IP address and domain name
- Transparent data transmission and protocol conversion, operation mode selection
- Software / hardware watchdog, EMC/EMI design
- Support UGI based remote configuration and maintenance, integrated with data service center
- System maintenance and configuration interface
- Support SMS Channel
- Support the virtual private data network
- Power management for wide range power input
- Industrial class pluggable terminal for signal connections designed with customer specified options

1.3 Installation

RemoDAQ-8554A GPRS DTU should be installed and configured properly before putting it in service.

Attention:

Do not install RemoDAQ-8554A GPRS DTU or connect/disconnect its cable when it is power on.

1.3.1 SIM Card Installation

Open top SIM protection cover, and then insert SIM from left-top side. SIM card conductors should face downside and the gap face to outside. The SIM card also need to be inserted properly and then cove back the SIM protection cover in order to prevent the SIM card from dropping out during shipping. Slide the SIM card by your finger to take out the SIM card.

Attention:

RemoDAQ-8554A GPRS DTU will not work and display “No SIM card, Please insert SIM!” if you do not insert the SIM card to the end position. In order to prevent this problem, please put back the SIM cover after you insert the SIM card, and screw it tight.

1.3.2 User Data and Power Cable Installation

RemoDAQ-8554A GPRS DTU signals and power supply is connected by industrial class pluggable terminals, 3.5mm, 12Pin, and 14~24AWG outlet cable is recommended. Each line definition refers to the following diagrams and tables. Also, you can find outlet cable definition table at top of RemoDAQ-8554A GPRS DTU cover.

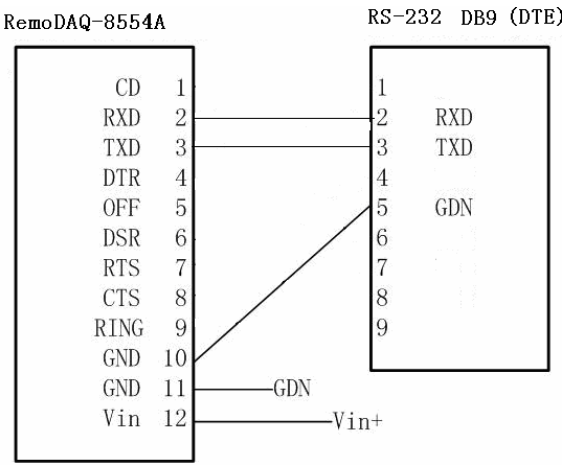
As shown in the following diagrams and tables, peel off the cable end about 7mm and connect each terminal and cable (14~24AWG cable recommended). Make sure that you have connected the terminals without any mistake.

Attention:

1. The power cable should be connected correctly. We suggest double check before switch it on. Wrong connections may destroy the equipment.

2. Power terminals: Pin 11 and Pin 12; Here: Pin 11 is “GND”, Pin 12 is power input “Vin+” (+12~+30VDC).

RemoDAQ-8554A GPRS DTU RS-232 interface and power supply illustration:



RS-232 signal definition

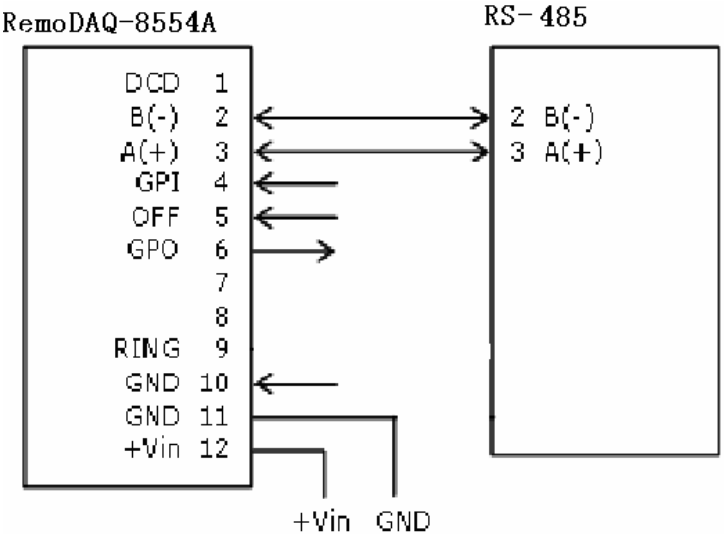
Pin	Signal	Description	Note
1	DCD	Carrier Detection	Function reserved
2	RXD	Receive Data	
3	TXD	Transmit Data	
4	DSR	Data Set Ready	Function reserved
5	OFF	DTU Power Control	Function reserved
6	DTR	Data Terminal Ready	Function reserved
7	CTS	Clear to Send	Function reserved
8	RTS	Request to Send	Function reserved
9	RING	Ring Indicator	Function reserved
10	GND	System Ground	
11	GND	Power “-”	
12	VIN	Power “+“	

Before using RS-485 interface, please adjust 8 bits DIP Switch which is inside the DTU. The number 1,2,3,4 are at OFF, and the number 5,6,7,8 are at ON.

RS-232/RS-485 the status of DIP Switch

	1	2	3	4	5	6	7	8
RS-232	ON	ON	ON	ON	OFF	OFF	OFF	OFF
RS-485	OFF	OFF	OFF	OFF	ON	ON	ON	ON

RemoDAQ-8554A GPRS DTU RS-485 interface and power supply illustration:



RS-485 signal definition

Pin	Signal	Description	Note
1	GPIO(DCD)	General Purpose Input Output	Function reserved
2	485-B(-)	485-B(-)	
3	485-A(+)	485-A(+)	

4	GPIO	General Purpose Input Output	Function reserved
5	PWRCON	DTU Power Control	Function reserved
6	GPIO	General Purpose Input Output	Function reserved
7	GPIO	General Purpose Input Output	Function reserved
8	GPIO	General Purpose Input Output	Function reserved
9	GPIO	General Purpose Input Output	Function reserved
10	GND	System Ground	
11	GND	Power “-”	
12	VIN	Power “+“	

1.3.3 Grounding

To ensure a safe, stable and reliable RemoDAQ-8554A GPRS DTU operation, DTU cabinet should be grounded properly. Connect the RemoDAQ-8554A GPRS DTU cabinet to site ground wire at the ground point

1.3.4 Power Supply

RemoDAQ-8554A GPRS DTU is designed with advanced power management technologies; it can operate standalone. The DC power is supplied via pluggable terminal Pin 11 (GND) and Pin 12 (Vin).

About Power Supply

When RemoDAQ-8554A GPRS DTU communicates with base station, surge current will exceed normal current. Therefore, margins 5 times over normal current may be required for external power supply.

Normally, RemoDAQ-8554A GPRS DTU input power supply is +12~+30VDC, in

most cases, 12VDC/1A is recommended. Power input of +5VDC can be ordered for specified application. Power supply ripple should be less 300 mV.

Chapter 2 DTU Setup

This chapter introduces the RemoDAQ-8554A GPRS DTU parameters configuration before putting it in service.

1 Setup Connection

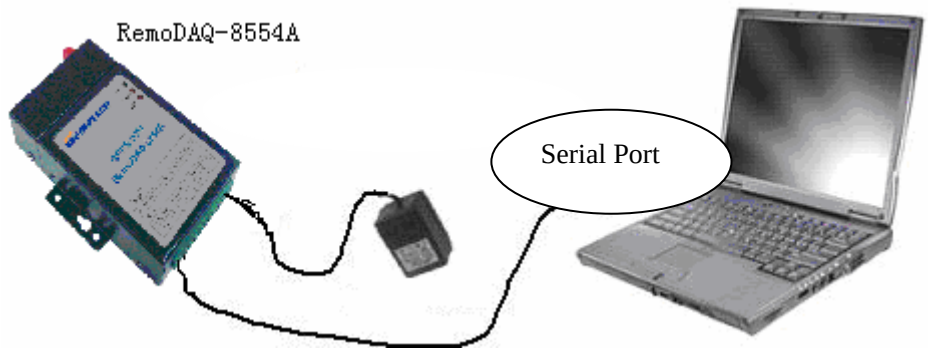
2 Parameters Configuration

3 Parameters Explanation

RemoDAQ-8554A GPRS DTU is built-in with a set of DTU Management Tools for DTU configuration, management and commissioning. Use the tools to configure DTU parameters before putting it in service and change the configurations during system commissioning. The tools can also be used to upgrade the DTU software.

2.1 Setup Connection

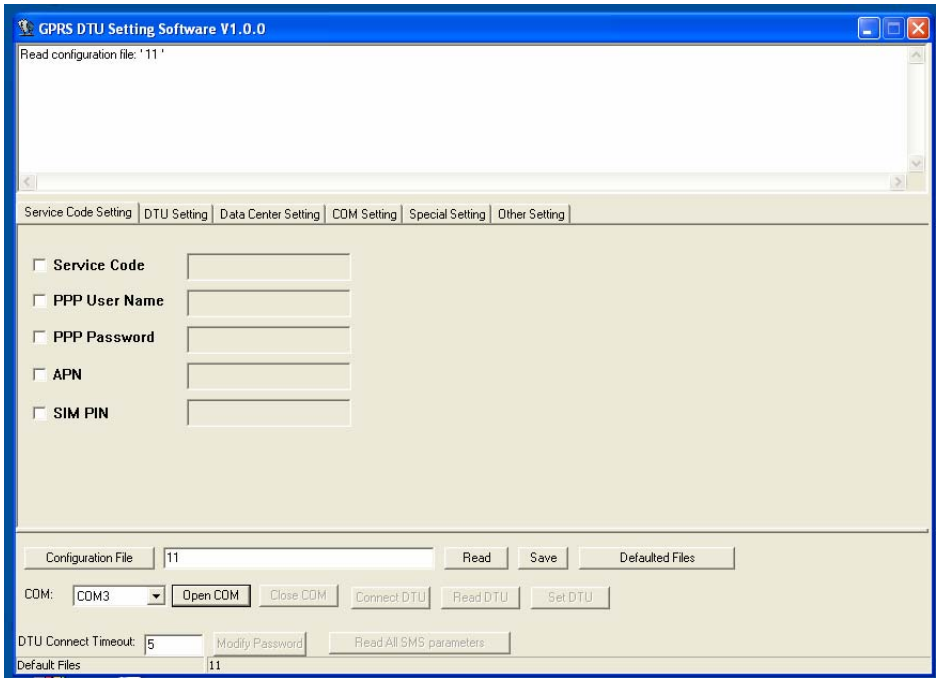
RemoDAQ-8554A GPRS DTU should be configured properly before putting into service. You can configure and manage DTU parameters by connecting DTU to your PC via a configuration cable. Also, it is possible to access the management tools via the user data interface. The below paragraphs are described at user data interface configuration.



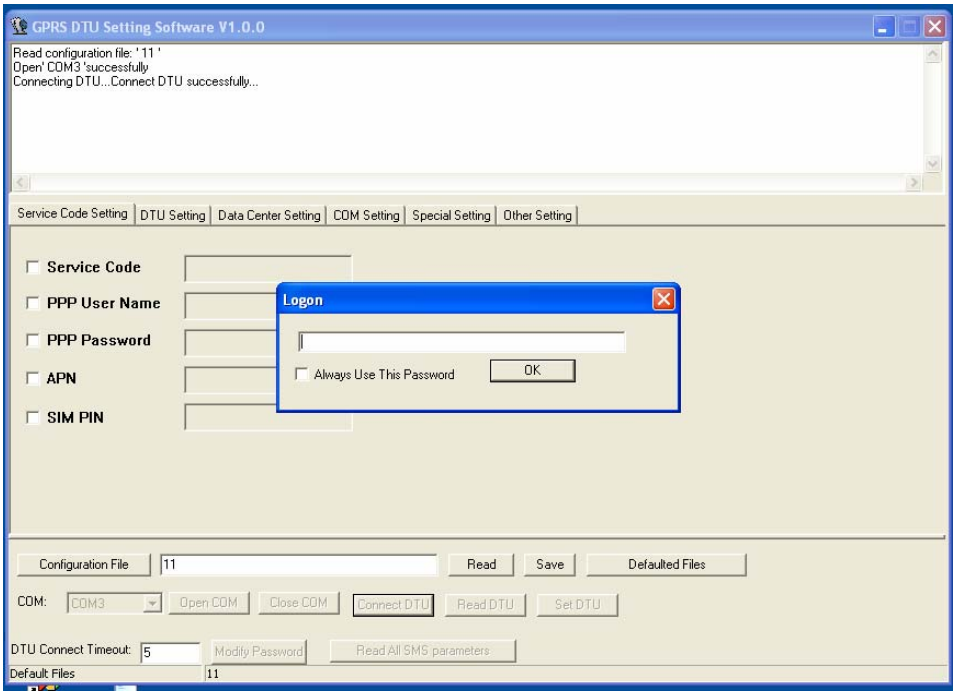
DTU Configuration Cable Connection

2.2 Parameters Configuration

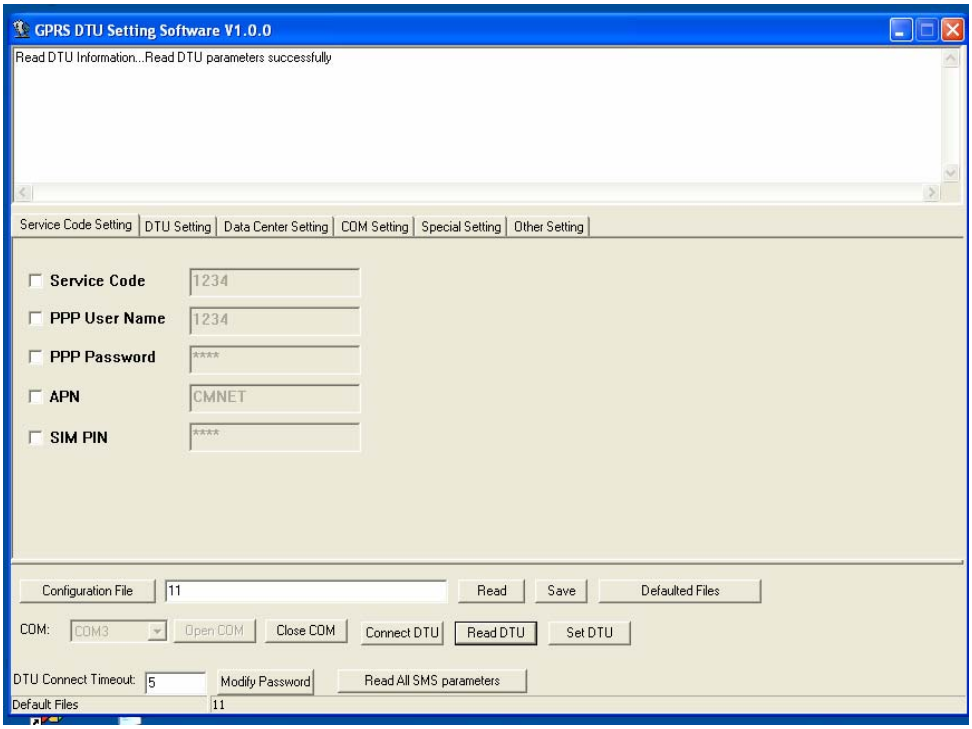
Run “GPRS DTU parameters configuration” software：



Select correct COM, then click “Open COM”; Click “Connect DTU”, then power DTU on



Enter password “ 0 ”，click “Read DTU”:



Make sure all necessary parameters are configured correctly, only this you can use DTU rightly.

2.3 Parameters Explanation

2.3.1 Mobile Service Center Setup

1	*Service Code*
2	*PPP User Name*
3	*PPP Password*
4	*Access Point Name (APN)*
5	*SIM PIN*

1 PPP User Name

Function Reserved

2 PPP Password

Function Reserved

3 Access Point Name (APN)

CMNET is the public access point name provided by China Moblie. Please don't amend it before you acquire private APN from China Mobile. You can consult with the local mobile network operator for details.

2.3.2 Data Terminal Unit Setup

1	*DTU Identity Number*
2	*Local Port*
3	*Online Report Interval*
4	*Maximum Transmission Unit*
5	*Reconnect Interval*
6	*Debug State*
7	*Last Packet Idle Interval*
8	*Match Character*
9	*SMS Work Mode Select*
10	*SMS Center Number*
11	*SMS Receiver1*

1 Local Port corresponds with DSC setting. Normally, we do not recommend changing this setting.

2 Online Report Interval is the link maintenance parameter; it is a heartbeat package transmission interval. As we know, the mobile network will disconnect mobile terminal if it does not transmit traffic data for the specified period. Therefore, the DTU should send a heartbeat package to DSC periodically to keep it alive.

The heartbeat package is an UDP package, it may be charged. You should set a correct interval based on your application requirements. We recommend setting the interval at 40 seconds for always online application. Set it to 0 that means the interval unlimited, and DTU will not send heartbeat package.

Attention:

If DTU detects data traffic between DTU and DSC within the interval, DTU will not send heartbeat package during this heartbeat interval.

2.3.3 Data Service Center Setup

1	*DSC IP Address*
2	*DSC Domain Name*
3	*Domain Name Detect Interval*
4	*DSC Communication Port*
5	*Internet DNS IP Address*
6	*Auxiliary DSC IP Address*
7	*Auxiliary DSC Domain Name*

DSC IP Address and domain name should be configured in accordance with your network planning. If a static IP address is available at your server site, we recommend setting DSC IP Address at this IP address. If it is not, set a valid DSC domain name, and the DSC IP Address should be null (0.0.0.0). Meanwhile, the DNS IP Address should be configured.

2.3.4 Serial Port Setup

1	*Baud Rate*
2	*Data Bit*
3	*Parity Bit*
4	*Stop Bit*
5	*Flow Control*

1 Baud Rate

Baud rate means when DTU communicates with lower computer, the serial port's baud rate of DTU must be set the same as the lower computer's. The default baud rate is 57600bps

2 Date bit

Data bit means when DTU communicates with lower computer, the serial port's data bit of DTU must be set the same as the lower computer's. The default data bit is 8 bits.

3 Parity bit

Parity bit means when DTU communicates with lower computer, the serial port's parity bit of DTU must be set the same as the lower computer's. The default parity bit is 1 bits.

4 Stop bit

Stop bit means when DTU communicates with lower computer, the serial port's

stop bit of DTU must be set the same as the lower computer's. The default parity bit is none.

5 Flow Control

Function reserved

2.3.5 Special Setup

1 Terminal Type
2 Call Type
3 Call Interval
4 Offline Interval
5 DSC Identity Number
6 Transmission Mode
7 DSC Connection Mode

1 Terminal Type

Setting 0, DTU is in initialization.

Setting 1, DTU is on normal service.

Setting 8, DTU is at ageing state.

Setting 9, DTU will return the data send from DSC. This setting is used for network testing.

2 Call Type

Function Reserved

3 Call Interval

Function Reserved

4 Offline Interval

Function Reserved

5 DSC Identity Number

Function Reserved

6 Transmission Mode

Users can choose communication protocol according to concrete application. The default application protocol is DDP.

Transparent Transmission agreement refers to the standard of the TCP/IP protocol packing way.

DDP refers to the standard of the TCP/IP protocol packing way, but increases the protocol of GemoTech Company.

7 DSC Connection Mode

User can choose one of the four mode: UDP 、TCP 、TCP Stream、SMS Channel

Chapter 3 Operation

This chapter describes RemoDAQ-8554A GPRS DTU operation guidance and relative information.

1 Panel Indications

2 DTU Operation Guidance

3 Trouble Shooting

3.1 Panel Indications

There are three LEDs at RemoDAQ-8554A GPRS DTU front panel; it indicates the DTU and network operation status.

LED	Status	Description
PWR	light up	finding network
	1S on/ 1S off	working normally
DATA	flashing	data stream out over DTU data port
NET	off	SIM300 not working
	64mS on/ 800mS off	SIM300 not find network
	64mS on/ 3S off	SIM300 find network
	64mS on/ 300mS off	SIM300 GPRS data

3.2 DTU Operation Guidance

RemoDAQ-8554A GPRS DTU is an intelligent data terminal; it will operate itself to provide a reliable transparent data communication channel. Meanwhile, user can check DTU operation and modify the configurations by a GUI based program locally and remotely. This management program should be developed and integrated with the customer's application system.

Attention:

1. To modify the DSC IP Address, you have to carefully configure it with a correct DSC IP Address or domain name, incorrect IP address or domain name will lose its communication.

2. RemoDAQ-8554A GPRS DTU should be installed at place with good radio signal receiving. For the cabinet and basement environment, we recommend to extend the antenna.

3.3 Trouble Shooting

Problem 1 All LEDs do not light up

Answers:

(1) Check all cables that are connected to the DTU.

(2) Check the power supply adapter output voltage.

(3) DTU works normally if the PWR LED flash at 1Hz frequency and it is in configuration status if the PWR LED lights up constantly.

Problem 2 NET LED does not light up

Answers:

NET LED will flash when RemoDAQ-8554A GPRS DTU logged in mobile network. If the NET LED does not light up, you should check the area receiving RF signal and check the SIM inserted correctly.

Problem 3 DATA LED does not light up

Answers:

DATA LED will flash when there is data transmitting over the interface.

Problem 4 All LED indications are normal, but it can not transmit traffic data.

Answers:

Consult with the local mobile operator, to confirm it is covered with GPRS service. Meanwhile, check the DSC IP Address and Communication Port setting.

Appendix Debug Case

Step 1 Establish Data Service Center

Assume that data service center (DSC) will be erected in a computer (PC1) in the LAN of a company, the LAN connects internet through router gateway. Company has the fixed IP address "219.142.188.132 “, fixed network solutions, as shown in figure - 1:

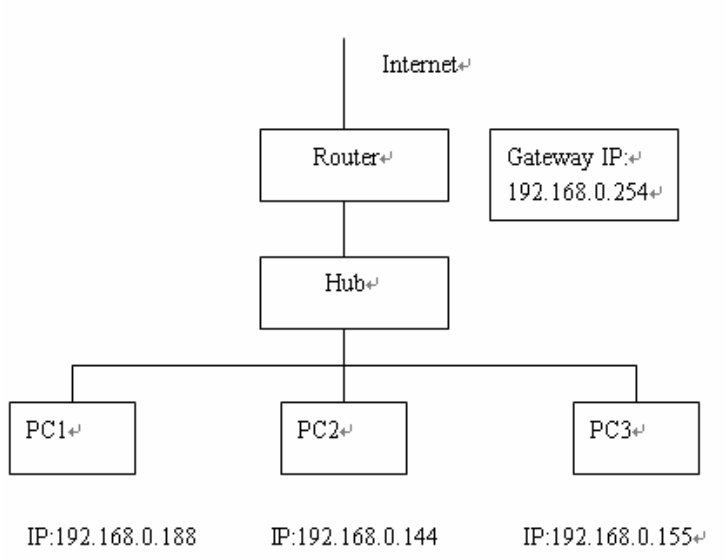


Figure-1

First, get to the router interface management for NAT Settings, map the 6800 port of DSC to PC1, operate GPRS DTU Test Software in PC1, set the service port as “6800” in GPRS DTU Test Software. Startup services , DSC has been established, as shown in figure – 2, figure –3:

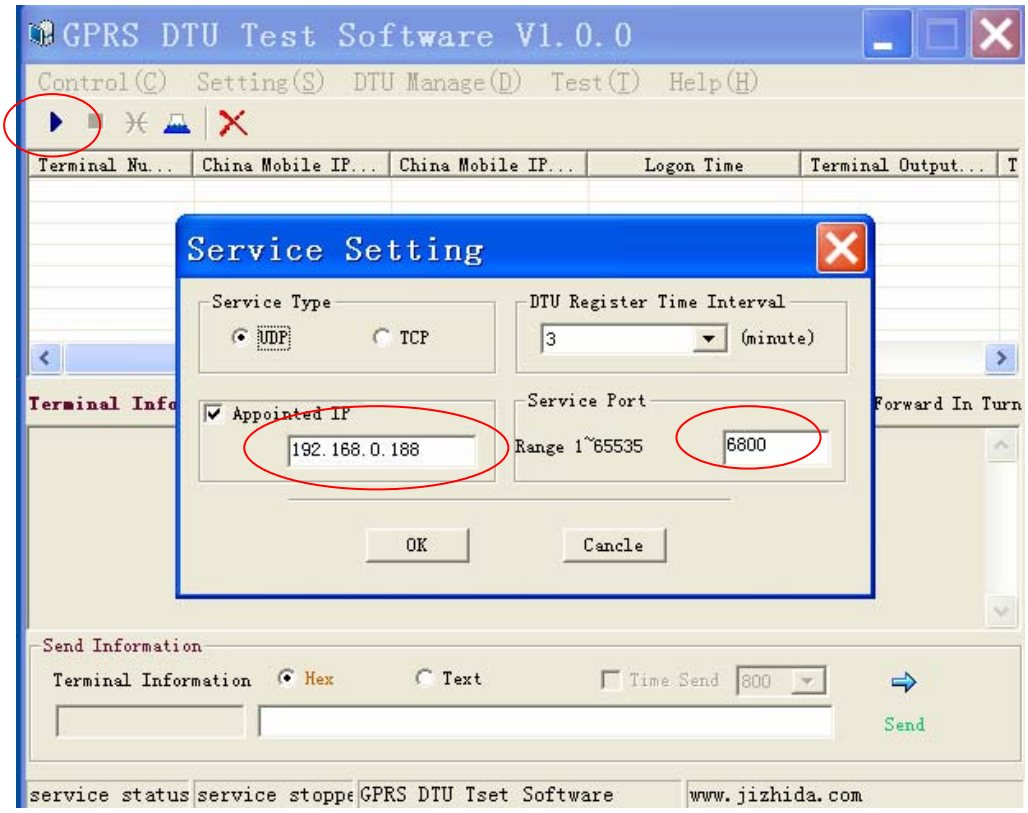


Figure-2

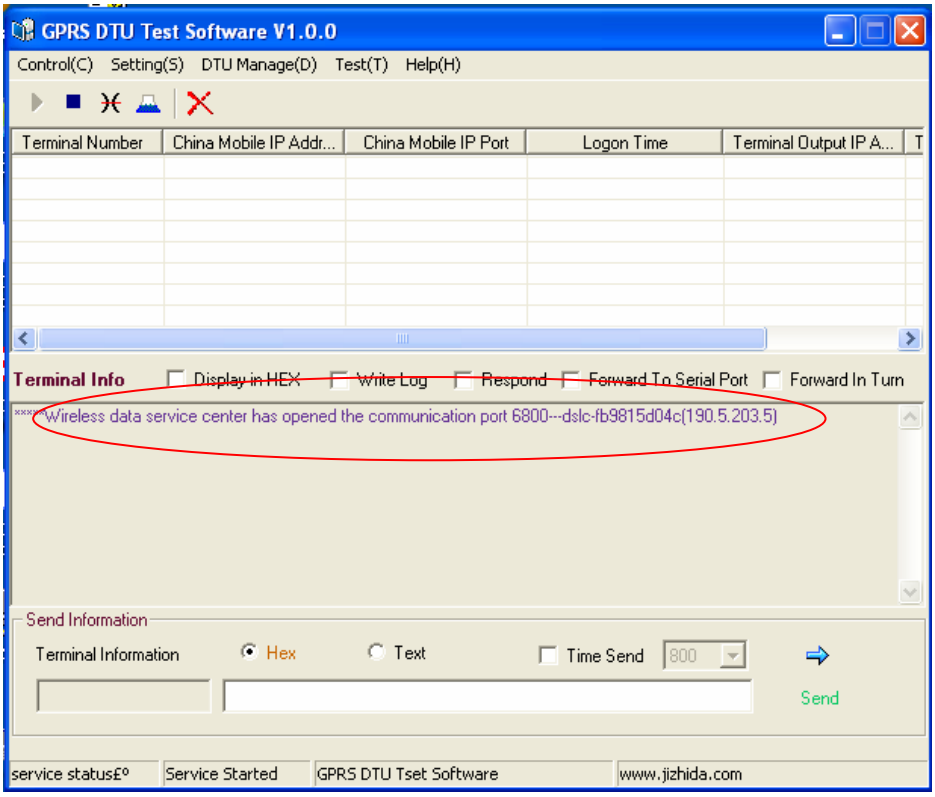


Figure-3

Step 2　Set DTU Parameters

According to chapter 2 set DTU parameters

1　DTU ID is set the same as SIM card number (such as: 13912345678) and make record.

2　DSC IP address is set as fixed IP address”219.142.188.132” of the public network.

3　DSC communication port is set for 6800, save after setting up completely.

Step 3　DTU communicates with DSC

Restart DTU，DTU will connect DSC IP automatically. Observe the working status of DTU. As shown below, it’s said DTU connects with DSC successfully. At this time DTU can communicate with DSC, as shown in figure – 4:

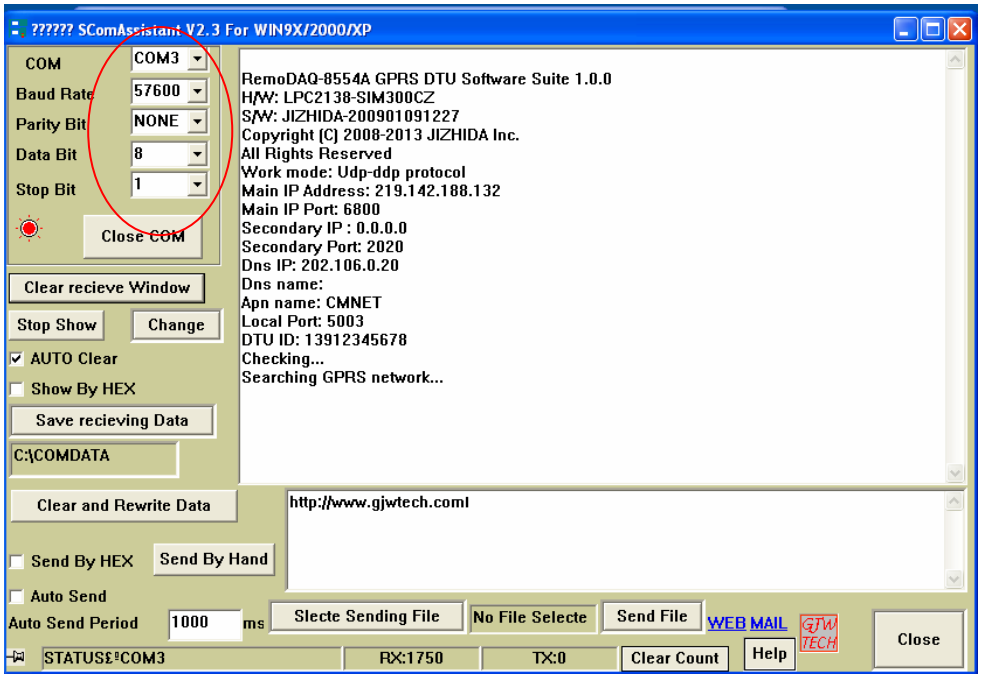


Figure-4

Step 4　DTU links to lower computer, then communicates with DSC

Assumption that the serial port of the lower computer attributes for:

Baud Rate: 57600 bps

Data Bits: 8

Stop Bit: 1

Parity Bit: none

Flow Control: none

Correspondingly, set the parameters of DTU serial port consistent with lower computer (terminal equipment), then save it. Set off the operation information, power DTU off, then connect the serial port of both DTU and lower computer. After the connection, power lower compute and DTU on. Once DTU registered successfully, DSC can communicate with lower computer, as shown in figure – 5, figure –6:

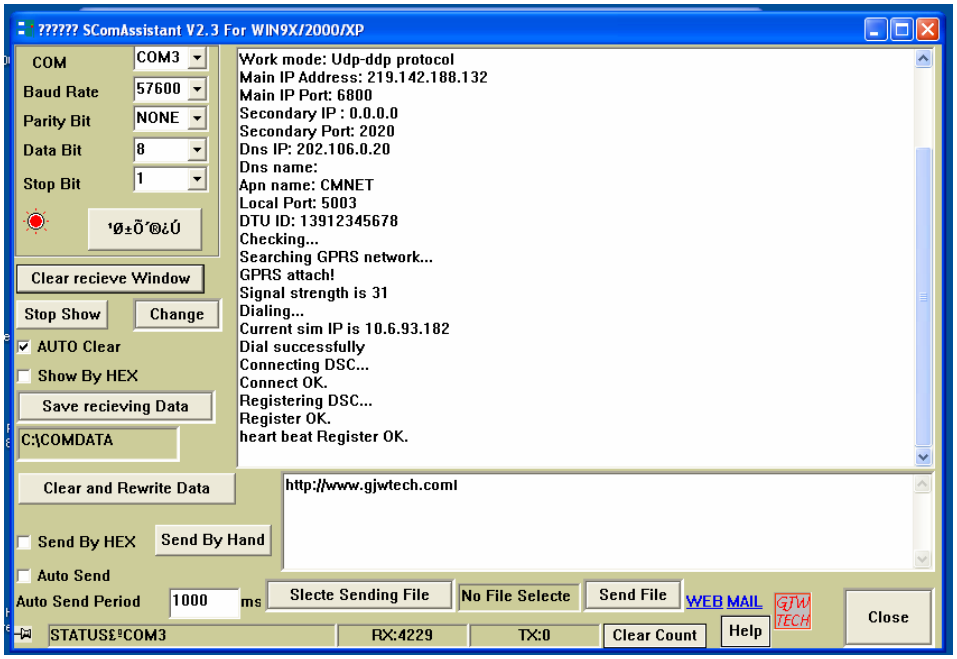


Figure-5

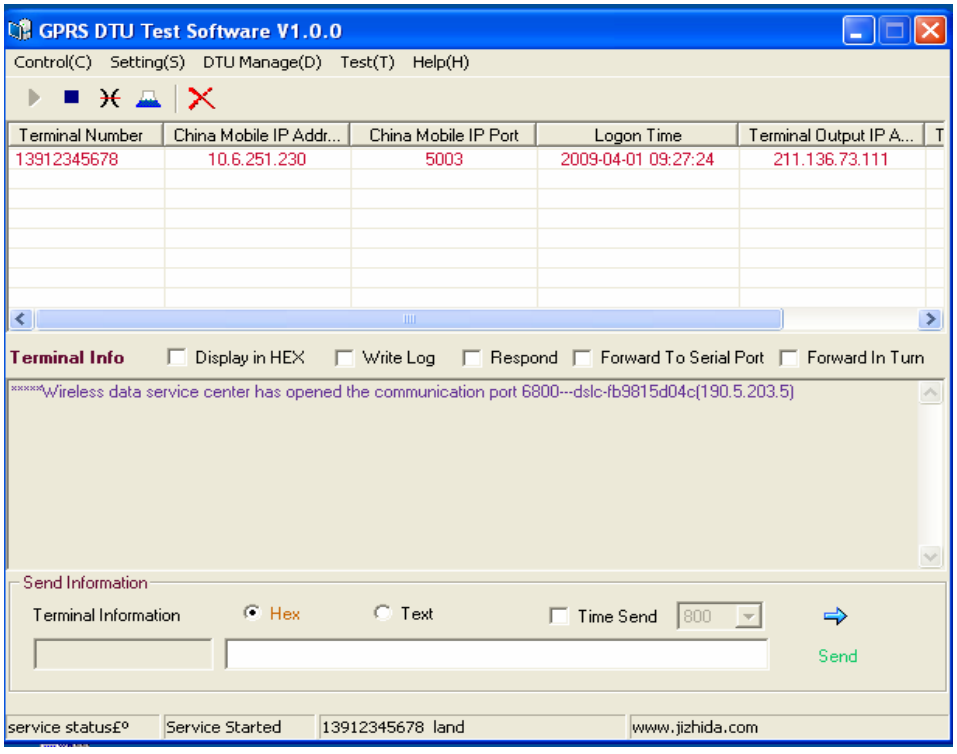


Figure-6