Wireless Data Transmission Solution!

Wireless M2M Solutions!

GPRS Data Transfer Unit

GPRS DTU

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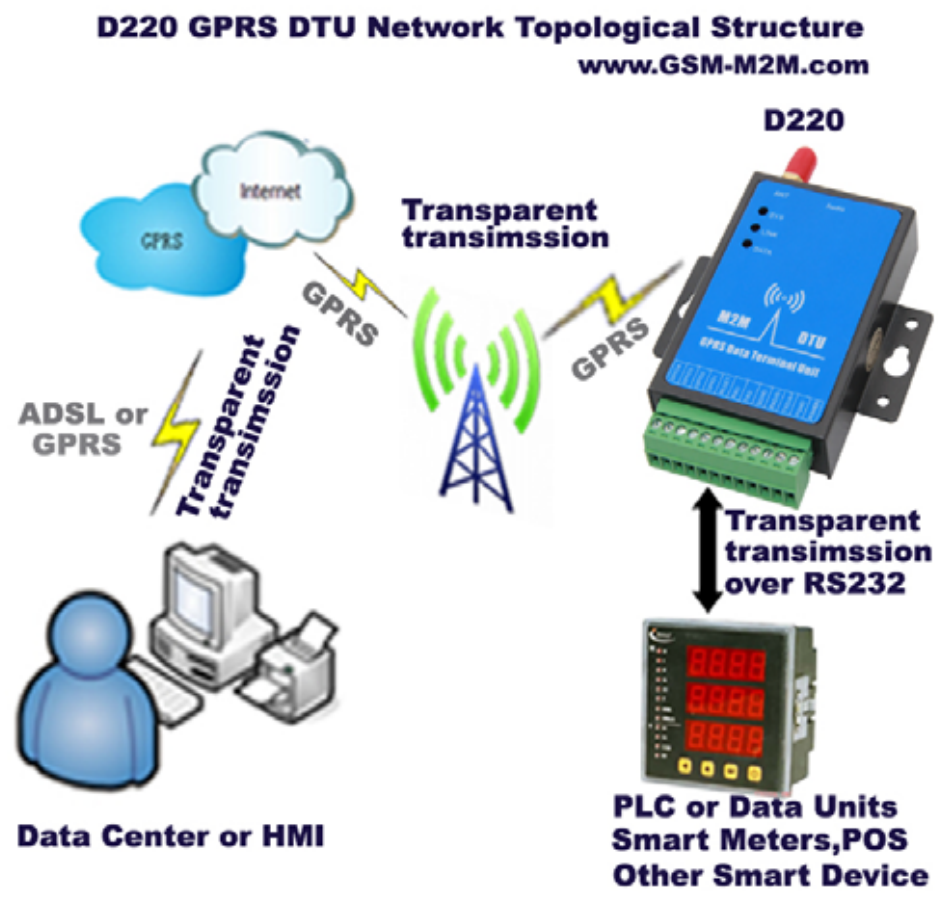
KING PIGEON



User Manual

Ver 1.0

D220 D221

Date Issued: 2013-10-12

www.GSM-M2M.com

Table of Contents

This handbook has been designed as a guide to the installation and operation of GPRS DTU D220 and D221. Statements contained in the handbook are general guidelines only and in no way are designed to supersede the instructions contained with other products.

We recommend that the advice of a registered electrician be sought before any Installation work commences.

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1. Brief introduction

The GPRS DTU is a wireless data transfer unit that embedded with High reliable ARM9 MCU and industrial GPRS Engine inside. The GPRS DTU is special for transparent transferring data between RS232 port and internet over GPRS wireless network. The GPRS wireless communication has become widely used of industrials and utilities and many customers are requiring reliable, flexible and cost-effective data channel to build their information system. Many applications such as Remote device monitoring, remote automatic metering system, ATM, data logging system, POS, SCADA and surveillance system will require data channels covered all country.

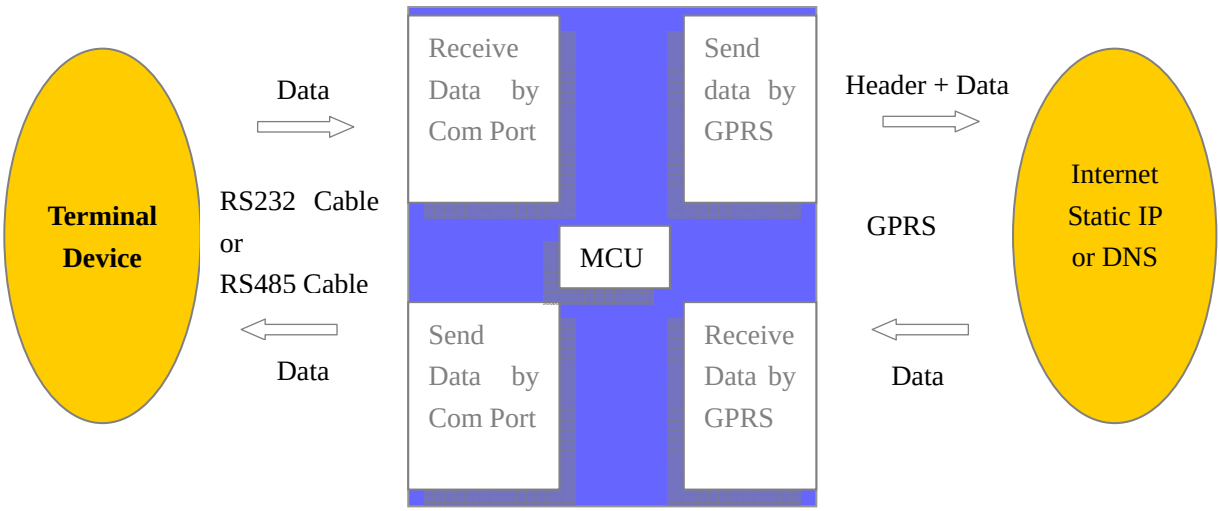
GPRS DTU is an ideal solution for factory automation, environmental monitoring and remote device management for M2M industry. Meanwhile, it is supplied with simple and user friendly PC Configurator to configuration, easy to installation.

Model List Table

Model No.	Name	GSM Frequency	Interface
D220	GPRS DTU,	850/900/1800/1900MHz	RS-232
D221	GPRS DTU	850/900/1800/1900MHz	RS-485

How Does the GPRS DTU works?

The GPRS DTU with dynamic IP address, if you want to create the connection between the server and GPRS DTU, must using call, SMS or Com port to activate the GPRS DTU firstly. Then the GPRS DTU will create the connection to the Server to build the tunnel, so the server can communicate to the GPRS DTU. The GPRS DTU with the heartbeat, it can keep the connection tunnel online all the time. Once the connection disconnected, the GPRS DTU will auto redial to create the connection. The server must with static IP address or DNS.



Under TCP/UDP mode, when the data length exceeds a fixed length or within the fixed time no new data received, the GPRS DTU will start to process the received data, packing the data then send to the specified IP address and Port or DNS and Port. Or unpack the data packets from the internet then transfer to the com port according to the baud rate.

The GPRS RTU suitable for below applications:

◆The Electricity Power Industry

1. Remote Meter Reading
2. Power monitoring
3. Streetlight monitoring
4. Meter monitoring
5. Control Room monitoring
6. Power distribution automation remote control systems

◆Automatic monitoring system

◆Vending Machines,ATM,POS

◆The traffic Industry

1. Traffic instructions
2. Vehicle Park Guide
3. Expressway monitoring
4. Traffic lights control and photograph transmission

◆Water Industry

1. Water Monitoring
2. Water Meter Reading
3. Real-time transmission of the water supply network monitoring

◆Environment , meteorology, oil and other industries

1. Environmental protection of key pollution sources monitoring
2. Environmental monitoring
3. Meteorological monitoring

◆The noise real-time monitoring

◆Oilfield monitoring

◆Heating network monitoring

◆Coal monitoring

◆Seismic monitoring

◆All kinds device with RS232 serial port of the PLC, RTU wireless data transmission.

In one word, the GPRS DTU suitable for transferring data from device to internet, and transferring data from internet(Monitoring center or server) to device.

2.Safety Directions

Safe Startup
Do not use GSM unit when using GSM equipment is prohibited or might bring disturbance or danger.

Interference
All wireless equipment might interfere network signals of GSM unit and influence its performance.

Avoid Use at Gas Station
Do not use GSM Gate Opener at a gas station. Power off GSM unit when it near fuels or chemicals.

Power it off near Blasting Places
Please follow relevant restrictive regulations. Avoid using the device in blasting places.

Reasonable Use
Please install the product at suitable places as described in the product documentation. Avoid signal shielded by covering the mainframe.

Use Qualified Maintenance Service
Maintenance can be carried out only by qualified maintainer.

3. Standard Packing List

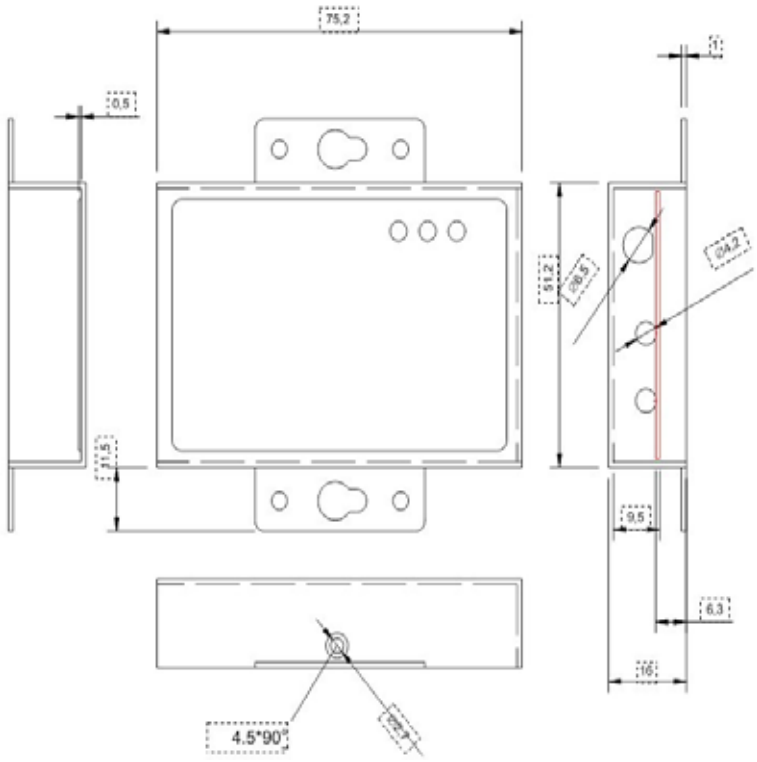
GPRS Data Terminal Unit X1, GSM ANT X1, User Manual and Configurator X1(CD).

4. Mainly Features

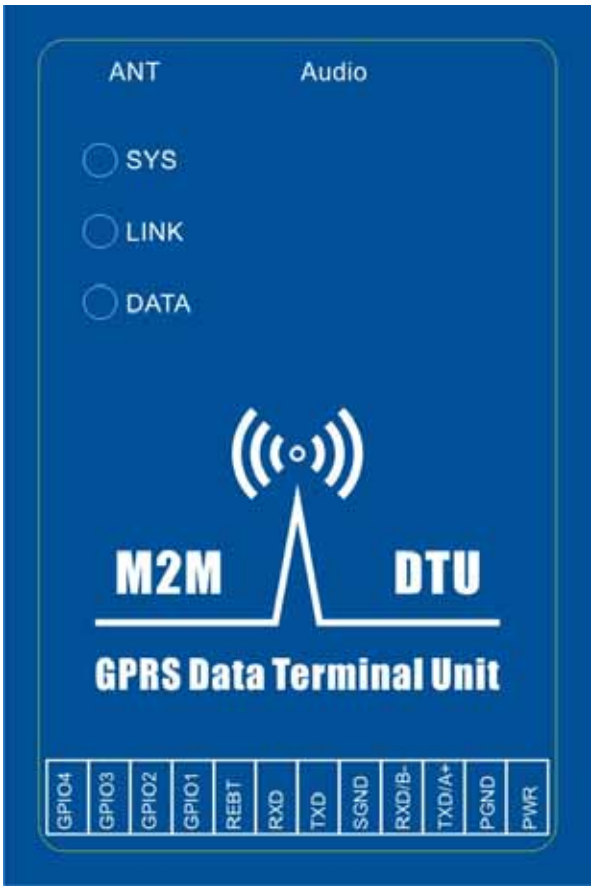
√ GPRS Data Transmission, no distance limitation;
√ Real-time online data transfer;
√ Three-wire serial (RXD, TXD, GND) , ± 15KV ESD protection;
√ Baud rate adjustable from 1200~115200bps;
√ Build-in protocol, support TCP/UDP/IP/PPP network protocol;
√ Embedded 32 bit ARM9-MCU with real-time operating system;
√"Plug and Play" solution can realize data transmission between com port and internet;
√ It provides a secure, high speed, reliable wireless internet connection for customers;
√ Adopt smart online keeping technology to make sure that DTU is always online;
√ Support transparent data transfer and protocol conversion;
√ Supports point-to-point , Point–to–Multipoint, Multipoint-to-Multipoint Communication Mode;
√ Heartbeat function and autodial to ensure the device online;
√ Supports DNS and static data service center IP address;
√ Supports wakeup by SMS, Call and Com port and strategy and timing;
√ Two serial ports for command transmission and data transmission separately;
√ Built in hardware Watch Dog Timer to ensure it reliable and stable;
√ Industrial class design suitable for long time work applications.
√ Size: (L x B xH): 75mm x 50mm x 16mm(5.3"x3.7"x1.4")

5. Physical Layout and Installation Diagram

5.1 Control Unit physical layout



5.2 Interface Instructions for installation



Interface Instruction

12pin Connector Interface Definition	
GPIO4	Reserved for future
GPIO3	Reserved for future
GPIO2	Reserved for future
GPIO1	Reserved for future
RESET	Reset
RXD	Command Serial port RXD, RS232 used for configuration and control only
TXD	Command Serial port RXD, RS-232 used for configuration and control only
SGND	Signal GND
RXD/B-	Data serial port, RXD for RS232(D220), Data/B- for RS485(D221)
TXD/A+	Data serial port, RXD for RS232(D220), Data A+ for RS485(D221)
PGND	Power GND
POWER	Power, DC12V 1A
Audio and GSM Interface	
Audio	Reserved for future

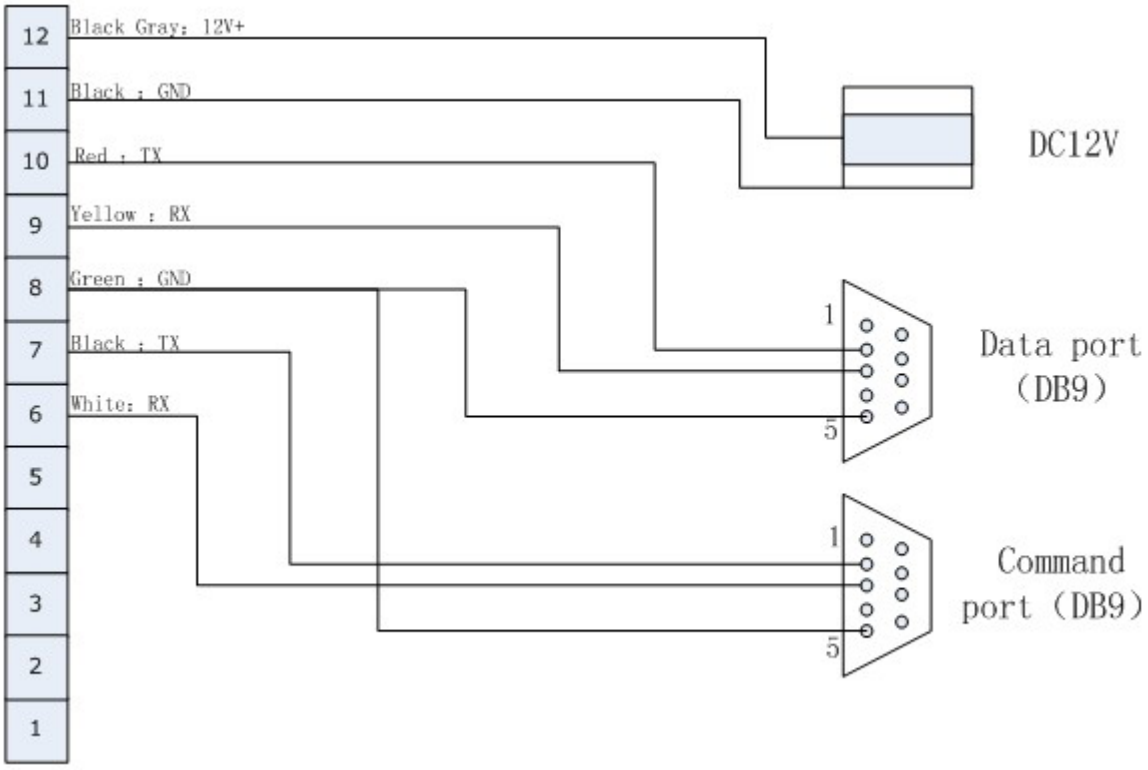
Antenna	GSM Antenna, 50Ω SMA female interface
LED Status Description	
SYS	OFF stands for power off; Always ON stands for anomaly; Flick stands for normally.
LINK	OFF stands for Sleep mode or socket offline; Flick stands for connecting GPRS network; Always ON stands for registering GPRS Network successful and online.
DATA	OFF stands for no data transmission over the Com port RS232/RS485; ON stands for transmitting data over Com port RS232/RS485.

Notice:

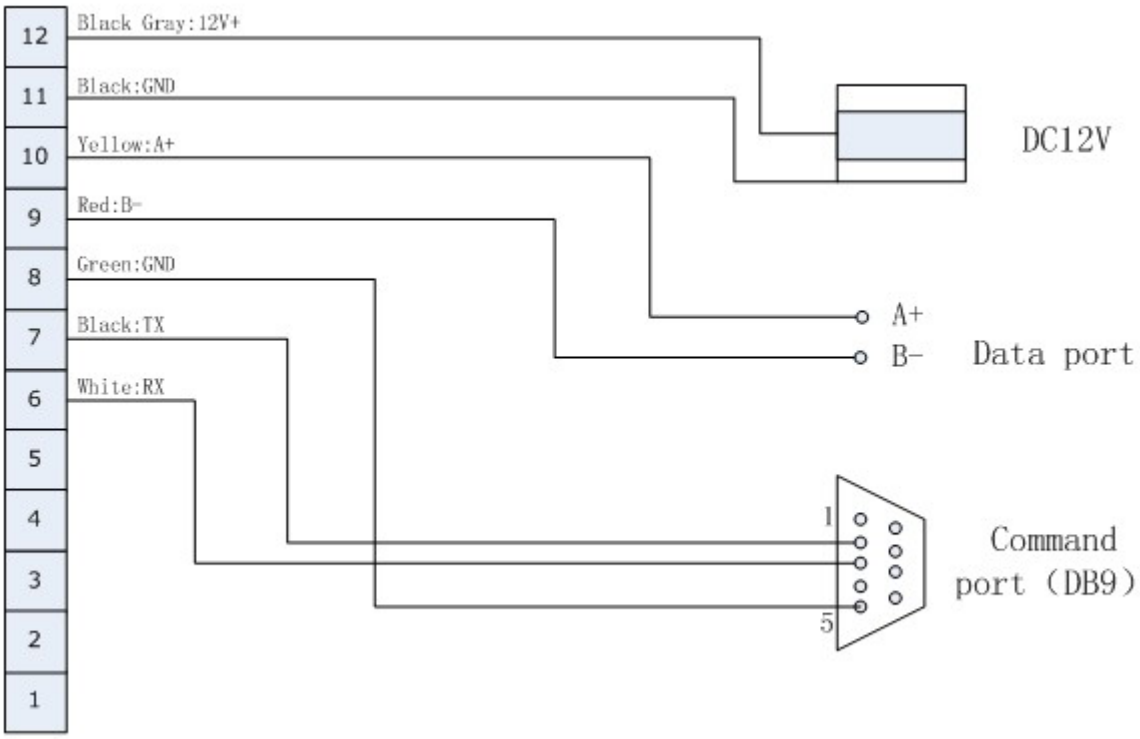
The Configuration Port only used for configuring the parameters of the DTU. The Data Port only used for data transmission.

5.3 RS232 and RS485 Cable Connections

The wiring diagram of connection DTU with RS232 data interface equipment, as follow:



The wiring diagram of connection DTU with RS485 data interface equipment, as follow:

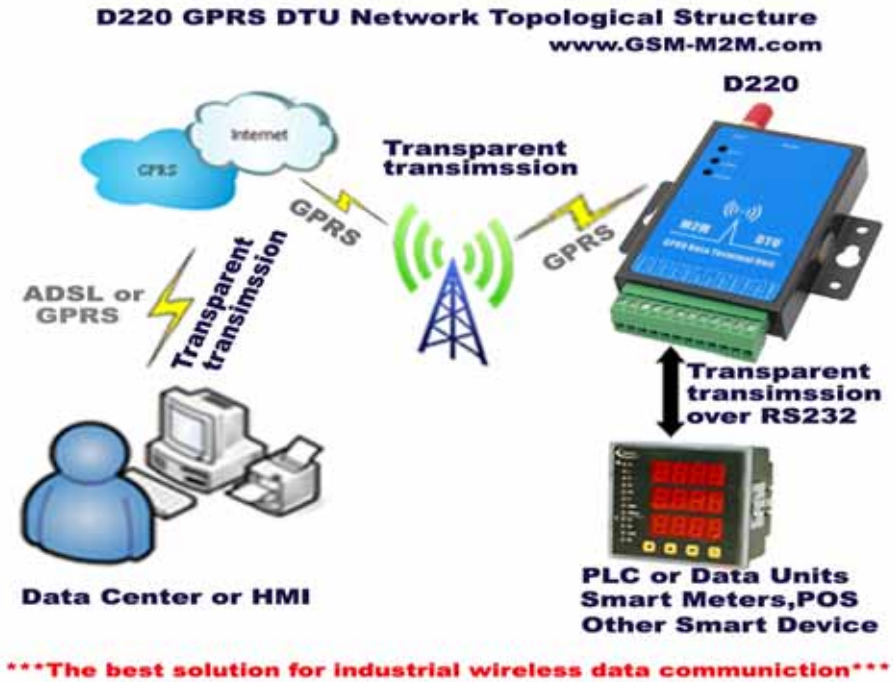


5.5 ***Power Connection***

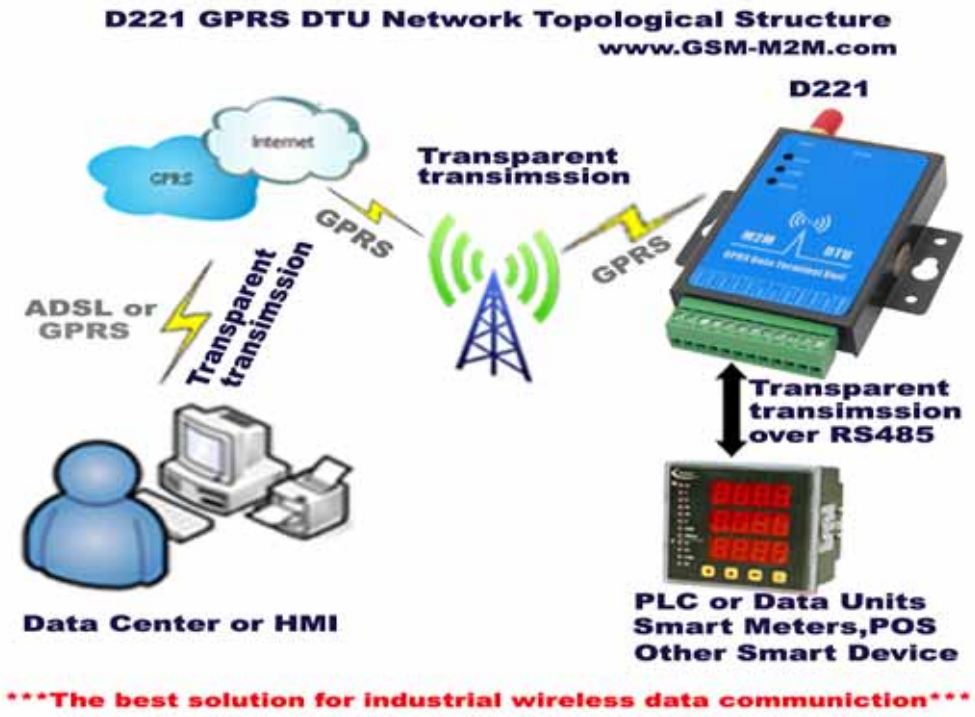
Power on the DTU(DC12V). please note: The PGND and SGND are separated.

6. Working Diagram

The DTU can be used as a wireless transparent data transmitter between equipments and Servers. Below is the D220 Network Topological Structure.



Below is the D221 Network Topological Structure.



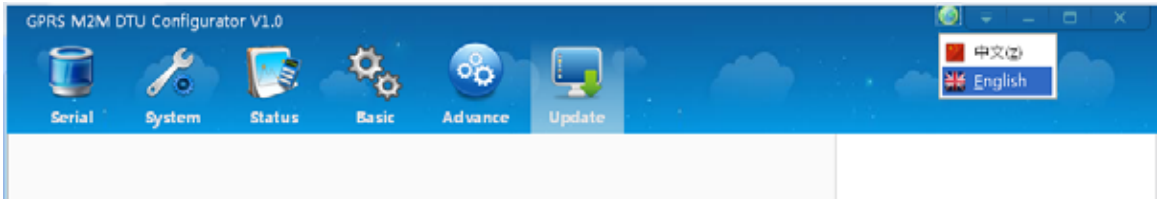
7. Programming and Operation

The DTU come with user friendly PC Configurator, please find out it in the CD or download from our website www.GSM-M2M.com

Notice: Both of the below mentioned files must be saved in the same root.

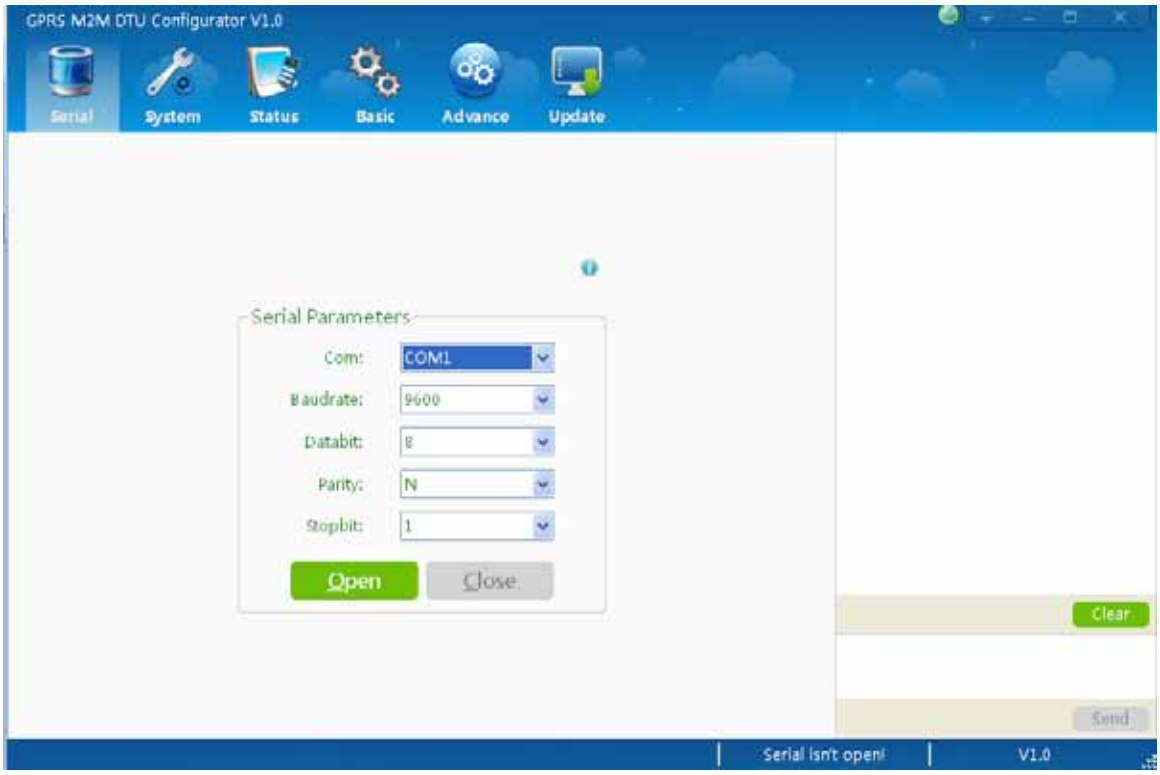
7.1 Change the Language

Running the Configurator, click the ball then you can choose the Chinese or English version. See below:

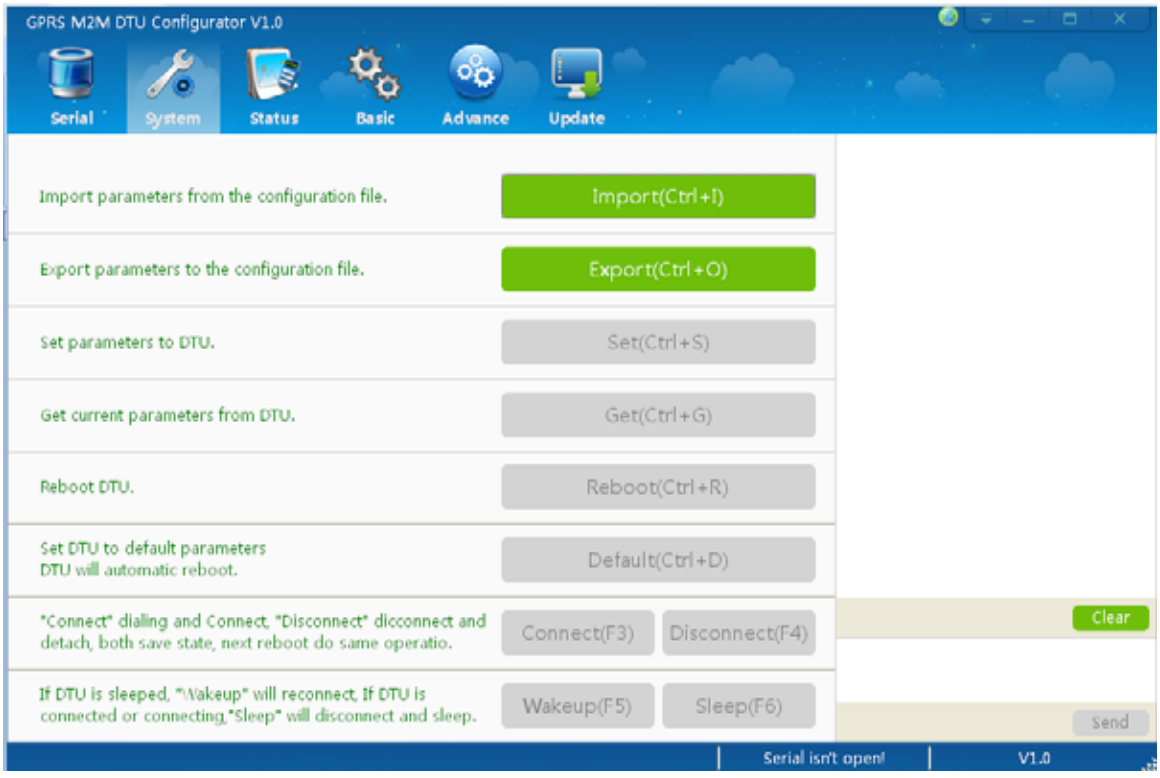


7.2 Running the Configurator on the PC

Connecting the RS232 Cable to the DTU Configuration Port according to the **12pin Connector Interface Definition**, click the  to run the configurator. Find out the COM Port at the computer's Device Manager. Select the correct com port to communication, then click Open COM Port.



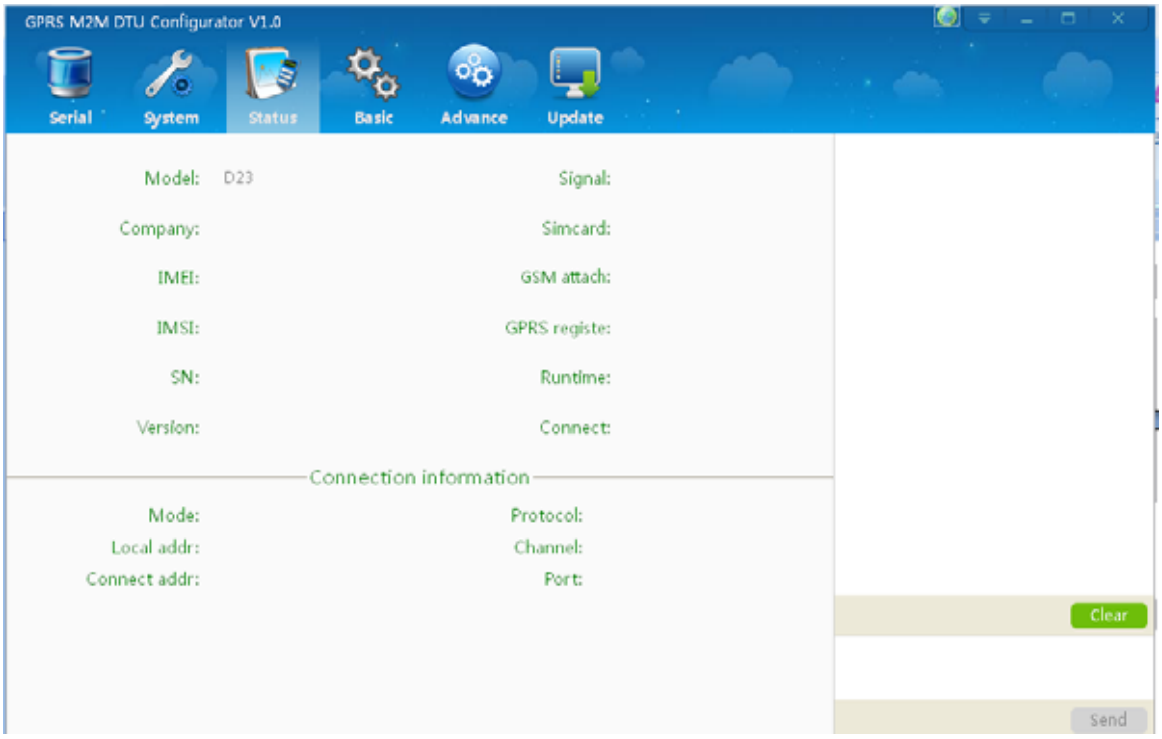
7.3 System functions of the DTU Configurator.



Tips: After Connect or Disconnect, the DTU will keep these status although reboot it. E.g.: click Connect, then reboot the DTU, the DTU will automatically execute the Connect Command.

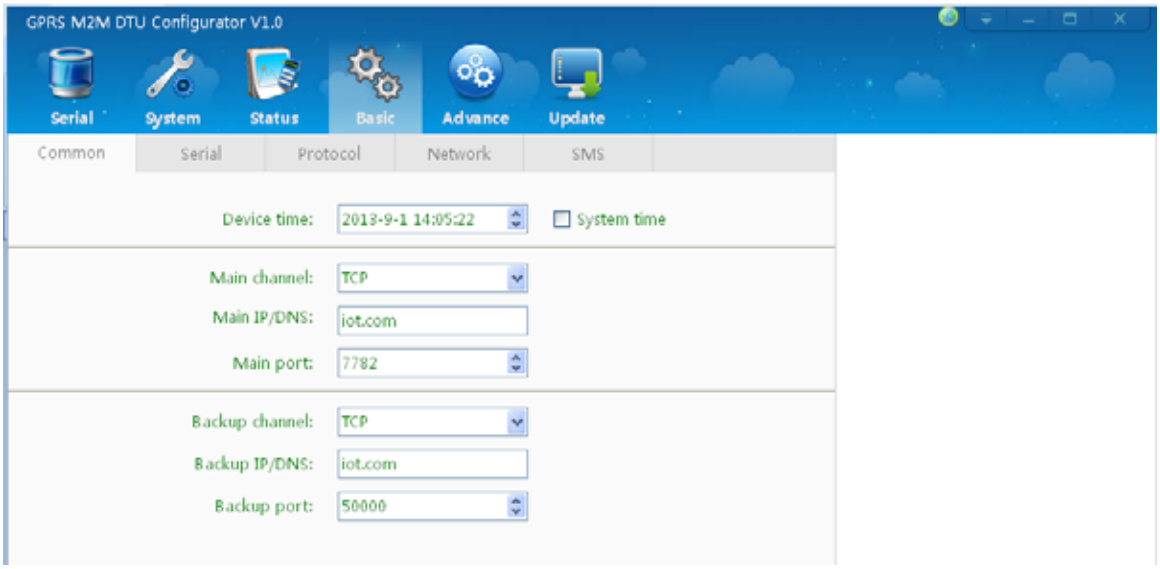
7.4 Status Information of the DTU

From the Status page, can get the basic information of the DTU.



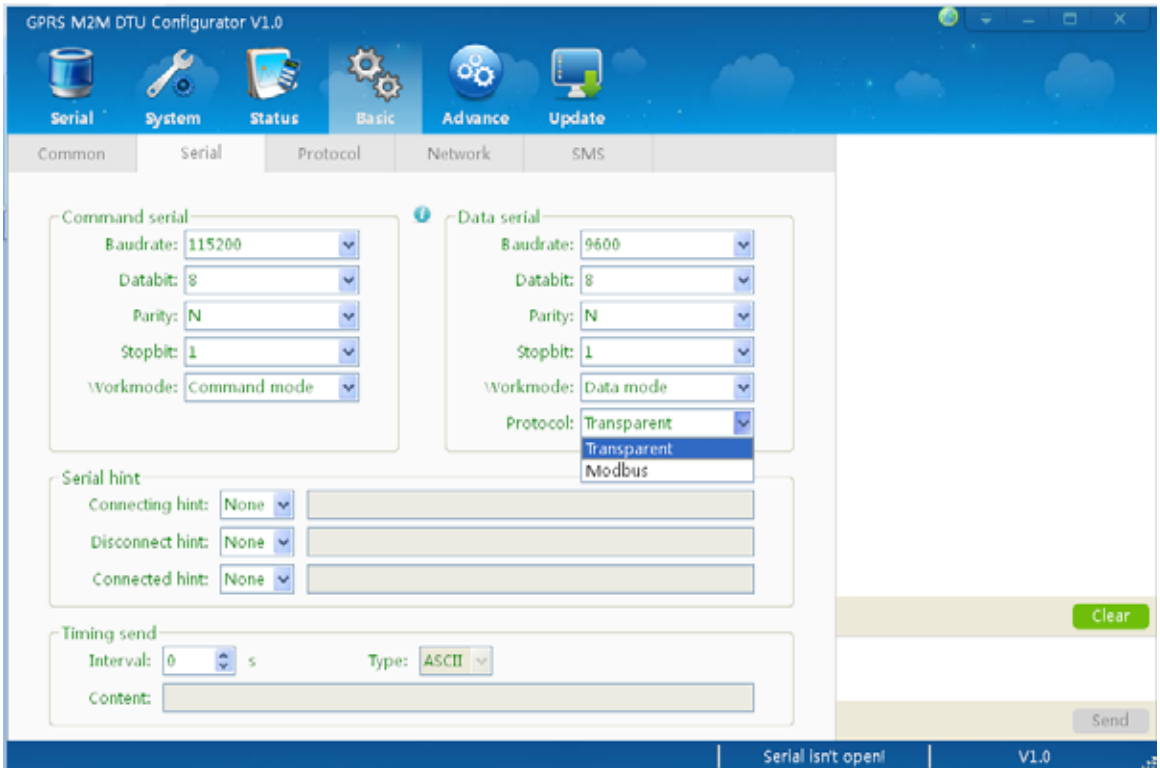
7.5 Basic Functions

1) Common: This is to setup the server parameters, e.g.: IP address, DNS or SMS receiver Number. It provides main server and backup server, when the main server working, the DTU will connect the main server only. Once the main server can not work, then the DTU will contact to the backup server automatically, and when the main server can work, the DTU will connect to the main server automatically again. It supports DNS, IP address or SMS Number as servers. if the server is DNS, the format is the same as below, no need the **www.** In the front of the DNS.

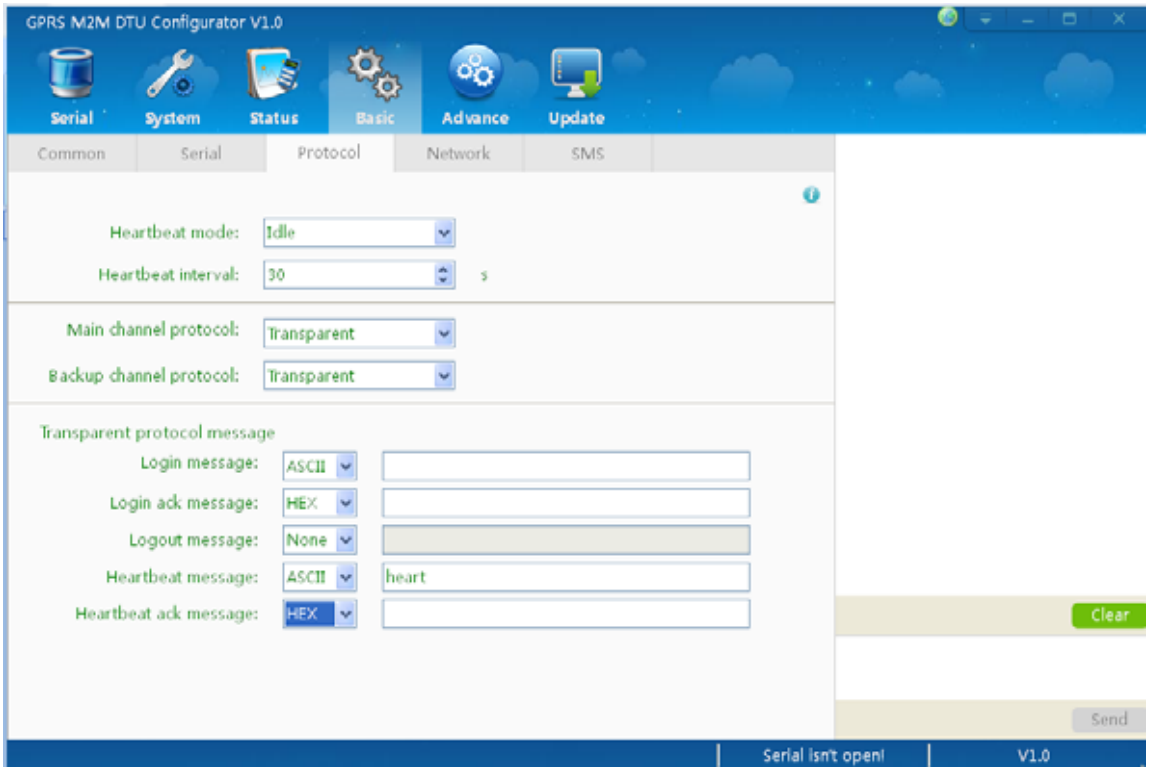


2) Serial: This is to setup the Command serial Port and Data Serial Port parameters for communication

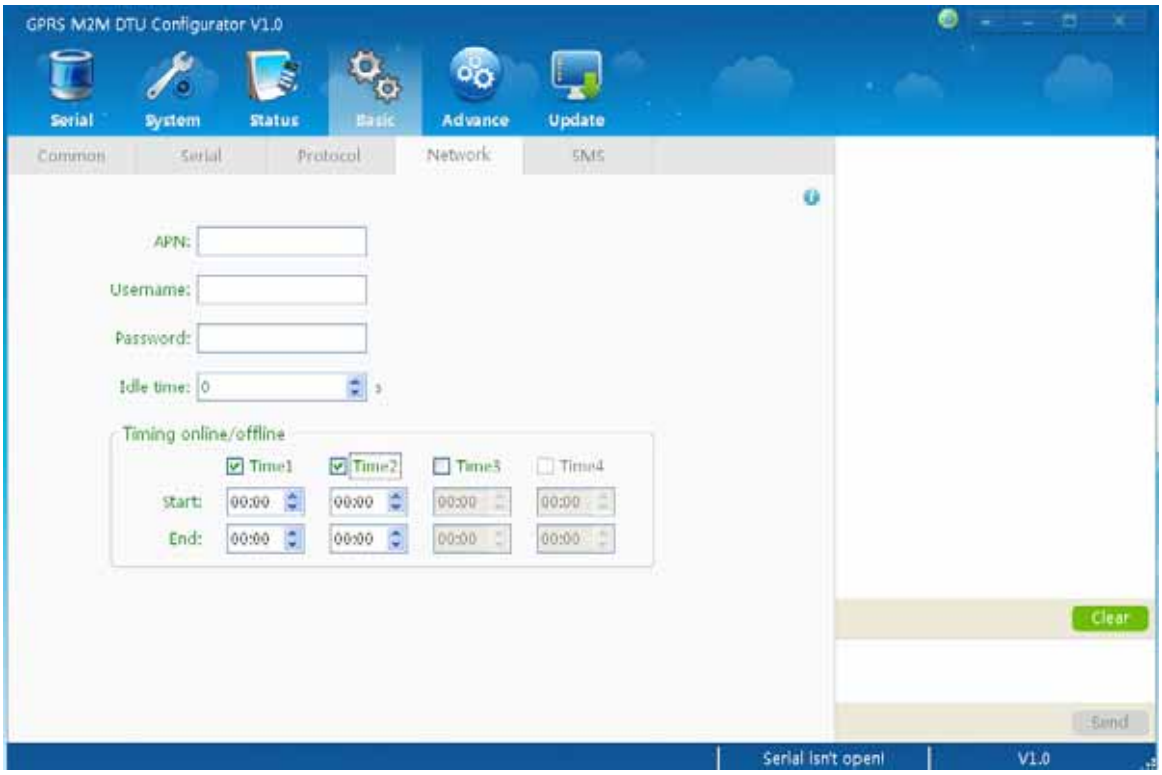
with its salves. The Data Serial Port can be used for Transparent Protocol transmission only, cannot support Modbus RTU protocol.



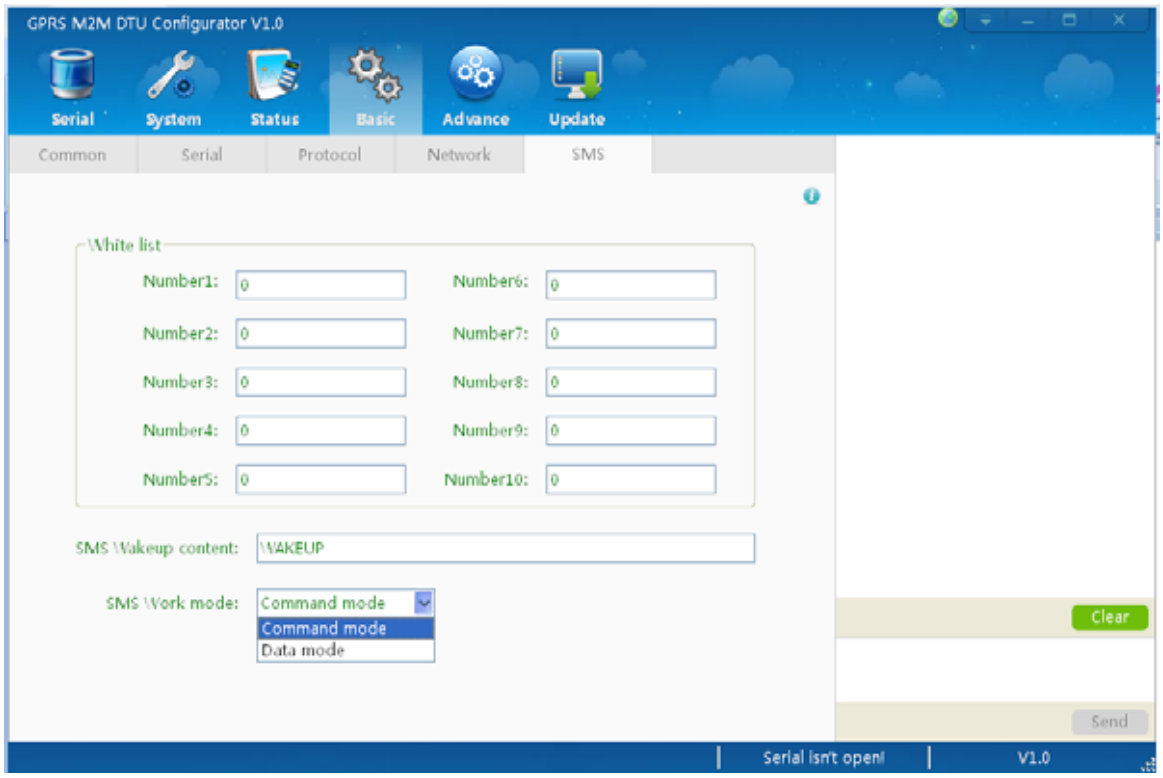
3) Protocol: This is to setup the protocol between the DTU and Server.



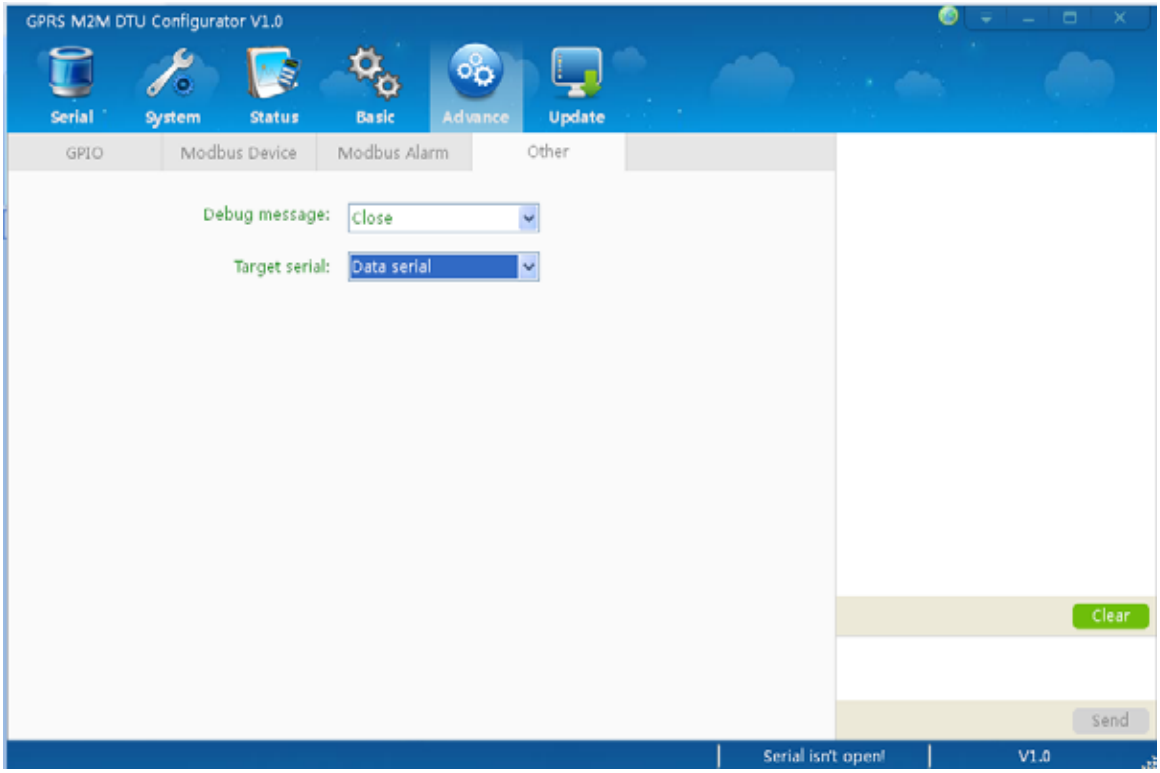
4) Network: This is to setup the GPRS Network Parameters and timing online/off line parameters.



5) SMS: This is to setup the white list, means which number can dial in to wake up the DTU online. Or send SMS to trigger the DTU online.

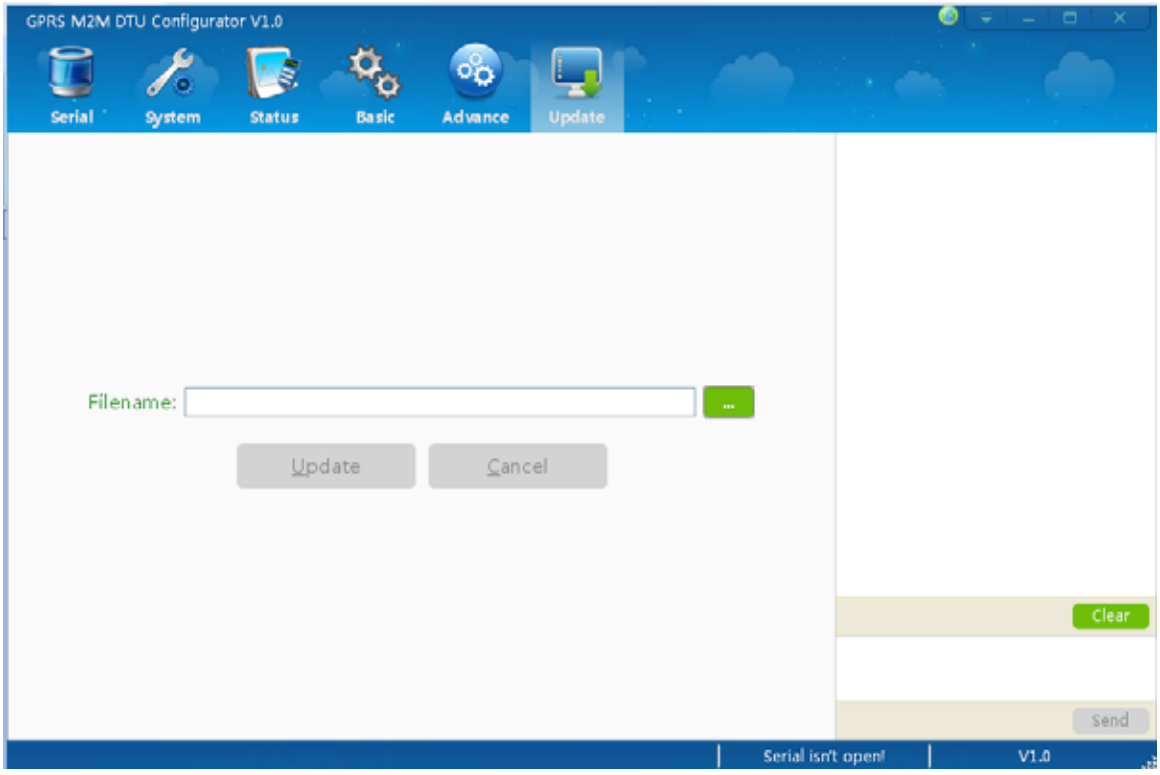


7.6 Advance:



7.7 Update:

The DTU supports update its firmware if we have new firmware version according to the requirements.



8. Technical specifications

Item	Specification
Working Voltage	normal mode: DC9V-32V , typical DC12V/1A
Power Consumption	Max:500mW, Standby:150mW , Average:180mW
GPRS Network	850/900/1800/1900 MHz; GPRS Class 2～10, CS1~S4
Protocol	TCP,UDP,PPP,
Theory bandwidth	171.2Kb/s;
actual bandwidth	20-30Kb/s;
SIMCARD	1.8V/3V
GSM Connector:	SMA antenna
Terminal Connector	3.5mm 12pin terminals
Receive Sensitivity	-102dBm
Working Temperature	Operation: -35～80℃ Restricted Operation: -35～-45℃
Storage temperature	-45～90℃
Related Humidity	＜85%(20±5℃),non-condense
Air Pressure	86～208Kpa
Audio	Reserved for future
Data Com Port	RS232 or RS485,Baud Rate optional 1200~115200bps,transparent data transferring mode.
Configure Com Port	RS232 Baud Rate optional 1200~115200bps
GPIO	Reserved for future
Electronic Compatibility	Class 3 Radio electromagnetism test
Dimension	DTU(L x B xH): 75mm x 50mm x 16mm(5.3”x3.7”x1.4”),
Weight	DTU N.W.: 200g, Packaging: 690g

9. Warranty

1) This system is warranted to be free of defects in material and workmanship for one year.
2) This warranty does not extend to any defect, malfunction or failure caused by abuse or misuse by the Operating Instructions. In no event shall the manufacturer be liable for any alarm system altered by purchasers.

10.Abbreviation and Terms

APN :Access Point Name
ATM :Asynchronous Transfer Mode
BTS :Base Transceiver System
CSD :Circuit Switch Data
DDN :Digital Data Network
DHCP :Dynamic Host Configuration Protocol
DNS : Domain Name System

DSC :Data Service Center
DTU :Data Terminal Unit
EMC :Electro Magnetic Compatibility
GPRS :General Packet Radio Service
GSM :Global System for MobileCommunications
IP :Internet Protocol
IPv6 IP:IP version 6
RTOS :Real Time Operating System
SCADA : Supervisory Control and DataAcquisition
SIM:Subscriber Identify Module
TCP :Transmission Control Protocol
UDP :User Datagram Protocol
VPN :Virtual Private Network
WAN :Wide Area Network

The End!

Any questions please help to contact us feel free.

Http://www.GSM-M2M.com