



SHENZHEN HONGDIAN TECHNOLOGIES CO., LTD.

Mobile Data Communications

User Manual

Galaxy Mobile Router
(H7921)

MOBILE DATA COMMUNICATIONS

Galaxy Mobile Router
(H7921)

User Manual

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M80-792101-01



Release 1.0.1

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Abbreviations

APN	Access Point Name
APP	Application
ATM	Asynchronous Transfer Mode
ATM	Auto Table Machine
AuC	Authentication Centre
BG	Border Gateway
BGP	Border Gateway Protocol
BSC	Base Station Controller
BSS	Base Station System
BSSGP	BSS GPRS Protocol
BTS	Base Transceiver System
CDMA	Code Division Multiple Access
CDR	Call Detail Record
CGF	Charging Gateway Function
CLI	Command Line Interface
CSD	Circuit Switch Data
DDN	Digital Data Network
DHCP	Dynamic Host Configuration Protocol
DMZ	DeMilitarized Zone
DNS	Domain Name System
DSC	Data Service Center
DTU	Data Terminal Unit
EDGE	Enhanced Data Rate for GSM Evolution
EGP	External/Exterior Gateway Protocol
EIGRP	External/Exterior Internet Group Routing Protocol
EMC	Electro Magnetic Compatibility
ESP	Electro Static Precautions
ETSI	European Telecommunications Standards Institute
GGSN	Gateway GPRS Support Node
GMSC	Gateway MSC
GMSK	Gaussian Minimum Shift Keying
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communications
GSN	GPRS Support Node
GTP	GPRS Tunneling Protocol

GTP-id	GTP Identity
HLR	Home Location Register
HSCSD	High Speed Circuit Switch Data
IGMP	Internet Group Management Protocol
IGRP	Internet Gateway Routing Protocol
IN	Intelligent Network
IP	Internet Protocol
IPv4	IP version 4
IPv6	IP version 6
IPSEC	IP Secure Protocol
ISDN	Integrated Services Digital Network
ISP	Internet Service Provider
L2TP	Layer 2 Tunneling Protocol
LA	Location Area
LAC	L2TP Access Concentrator
LLC	Logical Link Control
LNS	L2TP Network Server
MAP	Mobile Application Part
MDNS	Mobile Domain Name System
MDTU	Mobile Data Terminal Unit
MIB	Management Information Base
MS	Mobile Station
MSC	Mobile Switching Center
MT	Mobile Terminal
MTBF	Mean Time between Failures
MTTR	Mean Time to Recovery
N/A	Not Applicable
NAS	Network Access Server
NAT	Network Address Translation
NTP	Network Time Protocol
O&M	Operations & Maintenance
OSPF	Open Shortest Path First
PAP	Password Authentication Protocol
PDP	Packet Data Protocol
PDN	Packet Data Network
PDSN	Packet Data Serving Node
PLMN	Public Land Mobile Network
POS	Point of Sales
PTM-G	Point-to-Multipoint Group Call

PTM-M	Point-to-Multipoint Multicast
QoS	Quality of Service
RA	Routing Area
RADIUS	Remote Authentication Dial In User Service
RIP	Routing Information Protocol
RSC	Register Service Center
RTOS	Real Time Operating System
RTP	Real-time Transport Protocol
RTU	Remote Terminal Unit
RSVP	Resource reSerVation Protocol
SCADA	Supervisory Control and Data Acquisition
SGSN	Serving GPRS Support Node
SIM	Subscriber Identify Module
SMS	Short Message Service
SMSC	Short Message Service Center
SNMP	Simple Network Management Protocol
STK	SIM Tool Kits
TCP	Transmission Control Protocol
TDMA	Time Division Multiple Access
TFTP	Trivial File Transfer Protocol
TMN	Telecommunication Managed Network
UDP	User Datagram Protocol
UIM	User Identify Module
UMTS	Universal Mobile Telecommunication System
USSD	Unstructured Supplementary Service Data
UTK	UIM Tool Kits
VLR	Visitor Location Register
WAN	Wide Area Network
WAP	Wireless Application Protocol
WDDN	Wireless Digital Data Network

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Chapter 1 Introduction

This chapter introduces the Galaxy H7921 Mobile Router general descriptions, features and philosophy.

1. General
2. System Features
3. Specifications
4. Typical Applications
5. Types Description

1.1 General

2.5G mobile communication technology (GPRS/EDGE/CDMA 1x) has become widely used of industrials and utilities in recent years and many customers are seeking reliable, flexible and cost-effective data channel to build their information system. Many applications such as ATM, POS, SCADA and surveillance system will require data channels covered all country; this brings a bright future for GPRS/EDGE and CDMA 1x data networks applications.

Requirements towards information system are varied because of different features of numerous industrial applications. Mobile telecom service providers are required to provide industrial application solutions not only meeting common specifications and also individual special ones. Hence, Hongdian co-operates with mobile service providers to design products and network configurations suitable to industrial end users' individualized applications. Hongdian has developed embedded, advanced and reliable Galaxy mobile (GPRS/EDGE /CDMA 1x) router for the applications.

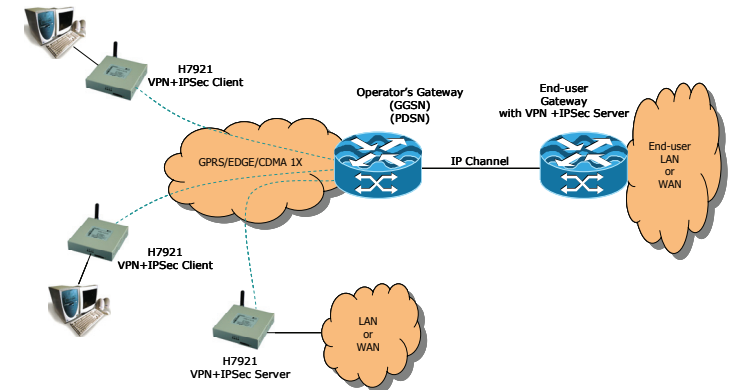


GPRS network theoretically can provide a maximum bandwidth 171.2Kbps, actually; it works at 40~100Kbps bandwidth (it depends on service provider's operation policy). As we know, GPRS is packet based network which provides TCP/IP communication channel.

EDGE stands for Enhanced Data Rate for GSM Evolution, it is capable of offering data rates of 384 kbps and, theoretically, of up to 473.6 kbps. A new modulation technique and error-tolerant transmission methods, combined with improved link adaptation mechanisms, make these EGPRS rates possible. This is the key to increased spectrum efficiency and enhanced applications, such as wireless Internet access, e-mail and file transfers.

Same as GPRS/EDGE network, CDMA 1x network can provide a maximum bandwidth up to 300Kb/s and actual transmitting and receiving bandwidth reaches 100Kb/s.

Typical center to multipoint system configuration plan is as below.



Requirements are different from customer to customer; below paragraphs will describe the typical applications.

Since Hongdian has many years experience of mobile data communication, it proves that Hongdian products are widely applied and work stably. Galaxy router is a dedicated ideal data transmission channel for industrial applications. The manual explains setup procedure of H7921 router and provides the system operation guide.

1.2 System Features

Basic Features

- GPRS/EDGE Part
 - Support dual band GSM/GPRS/EDGE
 - Complies with ETSI GSM Phase 2+Standard
- CDMA Part
 - Support 800/1900MHz band
 - Complies with FCC/SAR and CDG 1/2&3

- Real time clock

Enhanced Features

- Support multiple protocol conversion
- Support data center and network management
- Online detection and redial
- Online/Offline control
 - Online/Offline controlled by user's equipment
 - Online/Offline triggered by user's data
 - Timing online/offline
- STK/UTK card special function configuration
- Support Ethernet and RS-232/485 interface
- Synchronize with CDMA network
- Self-diagnostic
- Optimize EMC design

Advanced Features

- Built-in DHCP server
- Firewall and NAT
- Support OSPF
- Support RIP (Routing Information Protocol)
- Support VPN Client and Server (PPTP, L2TP + IPSec)
- Support IPSec Encryption
- Support DMZ host
- Support Dynamic DNS
- Support packet filtering
- Support radio network data envelope counting
- Support CLI operation
- Support BTS testing
- Ethernet or dial-up network routing (Backup)
- WEB/Telnet management interface
- Support Multi-language (i.e. Chinese, English, Spanish)
- Local/remote firmware upgrade
- Local/remote TFTP firmware upgrade
- Local/remote profiles backup and retrieve
- Urgent event alarm via SMS (Optional)

1.3 Specifications

GALAXY router specifications:

GPRS/EDGE data

- GPRS/EDGE Class 2~10
- Code plan: CS1~CS4
- Complied with SMG31bis specifications

CDMA 1x data

- Support IS 707 data service
- Support 153kbps packet data
- Support Class 2.0 Group 3 facsimile
- CDMA 2000 spread spectrum
- Complied with IS-95A, IS-95B CDMA interface

Interface

- Antenna: 50Ω/SMA Female
- SIM/R-UIM: 3V

- Serial port (DB9): RS-232(DCE) or RS-485 (Optional)
- Serial port data rate: 300~115,200 bits/s
- Ethernet interface: 10/100BaseT/RJ45 (Auto sense)
- Configuration: WEB/Telnet or RS-232

Power

- Voltage: +5VDC(+7.5~24VDC Optional)
- Consumption
 - Max. current: 780mA@+5VDC
 - Standby: 50mA@+5VDC

Others

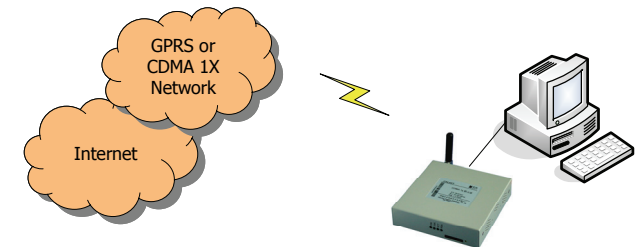
- Measurement: 98x100x23 (not including antenna and fixed parts)
- Weight: 320g
- Operation temperature: -10~+50°C
- Store temperature: -20~+75°C
- Relative humidity: 95%(non-condensing)

1.4 Typical Applications

Galaxy router typical applications are described as below.

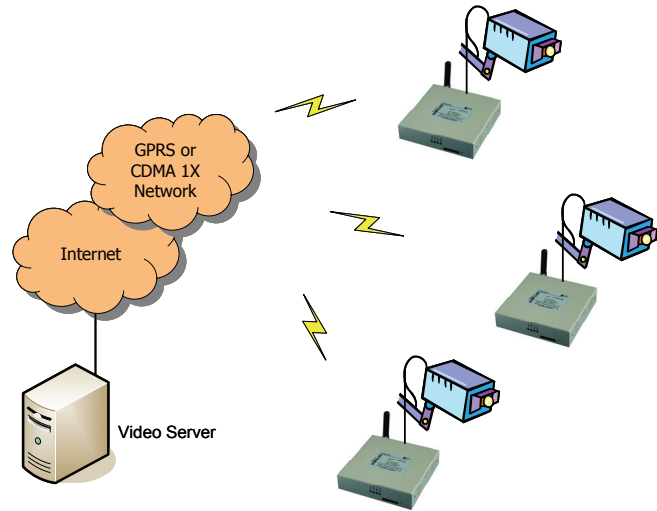
Application 1: Direct connection

Refer to following diagram, connect Galaxy router to your terminal.



Application 2: Center to multipoint

For industrial applications, it requires a device to collect information from discrete remote sites. The application show as below diagram is a typical video surveillance configuration. You can connect Galaxy router to a net-camera and then setup the Data Service Center (DSC) IP address or domain name at Galaxy router.



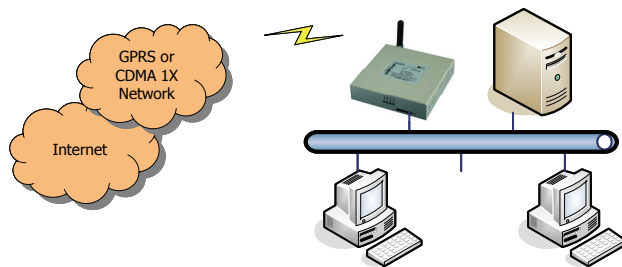
Application 3: Ethernet connection

Galaxy router can be configured as following network applications.

- ✓ Ethernet/Mobile network routing.
- ✓ Serial port/Ethernet converter.
- ✓ Serial port/Mobile network transmission.

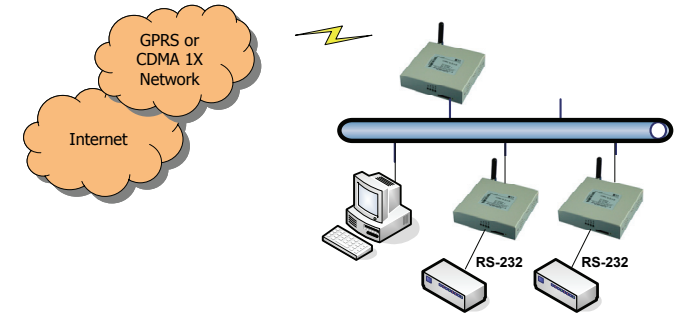
Ethernet/Mobile network routing

By connecting your LAN and mobile network (WAN), you can share the GPRS or CDMA 1x access to your LAN by built-in NAT (Network Address Translation) technologies. Therefore, multiple IP terminals or PCs can share the Internet access via Galaxy router.



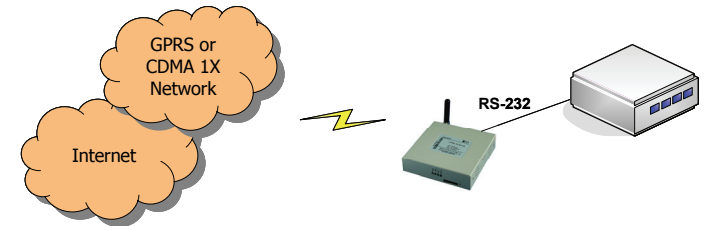
Serial port/Ethernet converter

For many non IP traditional terminals, you can also connect your non IP terminals to Galaxy router via RS232/485 interface. After then, your non IP terminal will become standard TCP/IP 10/100BaseT interface network equipment. It is possible to connect many non IP terminals to IP network at same place.



Serial port/Mobile network transmission

It is the solution to convert and transmit non IP device data over TCP/IP based mobile data network (GPRS/CDMA 1x). Connect the non IP device to the Galaxy serial port.



1.5 Types Description

Galaxy router is a product designed at Hongdian platform with customer specified application options. It complies with the different industrial applications and different service provider mobile data network. In order to identify different products, we explain the type name as below:

Galaxy router type: H7921-XYZn

H7921	X-Data interface	Y-Mobile network	Zn- Radio Module Manufacturer*
Hongdian Galaxy mobile router H7921 platform	R-Router	C-CDMA network E-EDGE network G-GPRS network	A-AnyData B-BenQ E-Sony Ericsson H-Huawei L-Bellwave M-Motorola S-Siemens W-Wavecom Z-ZTE

* Z=Radio Module Manufacturer, n=Radio Module (can be null), i.e.: M2=Motorola G20

For Example: H7921-RGM2 -- Galaxy GPRS Router, built-in with Motorola G20 radio module.

Chapter 2 Installation

This chapter describes the Galaxy router installation procedures, power on and initial setup.

1. General
2. Open Box
3. Installation and Cable Connection
4. Grounding
5. Power Supply
6. Check the Mobile Network

2.1 General

Galaxy router should be installed and configured properly before putting it in service. The installation and configuration should be done or supervised by Hongdian qualified engineer.



Attention:

Do not install Galaxy router or connect/disconnect its cable when it is power on.

2.2 Open Box

In order to protect products during shipment, Galaxy mobile router has been packed properly. You may need to keep the packing materials for reshipping after you open the packing box.

Galaxy mobile router package includes.

- Galaxy mobile router 1 (packed according order)
- +5V power adapter 1 (+12V power adapter Optional)
- Fixed part 1 pair
- CAT-5 UTP cable 1
- User manual 1 (CD-ROM)
- Qualified & Repair Card 1

Optional accessories

- Standard antenna
- Vehicle antenna
- Directional antenna
- Coaxial feeder (SMA interface)

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

2.3 Installation and Cable Connection

Installation requirements

- A PC with Ethernet interface and TCP/IP protocol
 - IE5.0 or up Internet browser
 - 1024x768 monitor
- A valid GPRS SIM card or CDMA 1X UIM card (Depends router type)

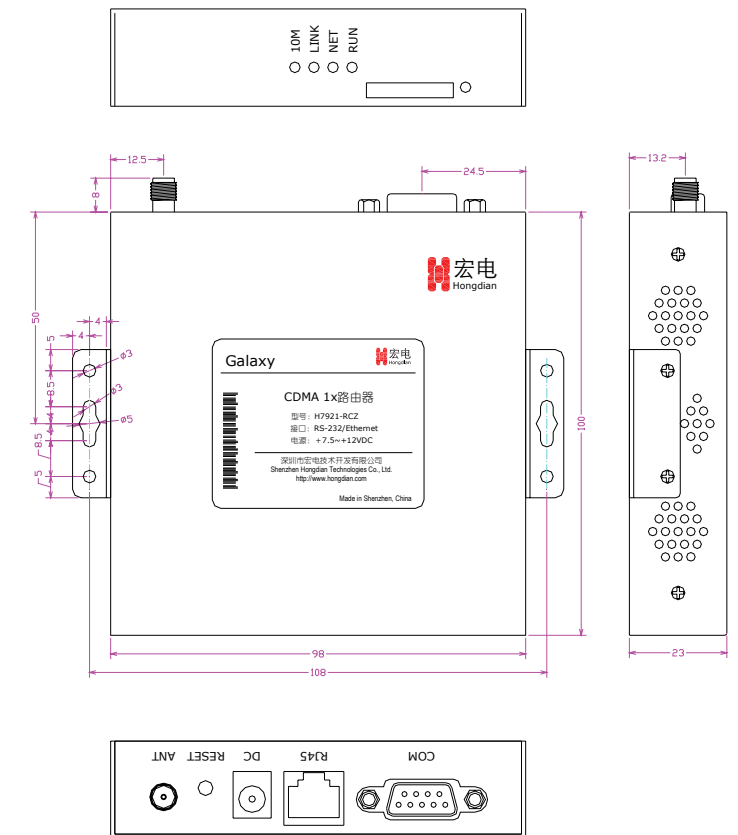
Galaxy router should be placed on desktop, wall or any other fixed place. There is no special requirement for wiring and heating dispersion. However, it is required to place Galaxy router apart from:

- Heating device
- Dusty and moist environments
- Interference source, such as metal wall, microwave oven

The antenna should be installed at correct place and angle to ensure the GPRS or CDMA 1x signal receiving. Do not install antenna inside of metal cabinet.

Measurement

The below diagram is Galaxy router outside and installation measurement.



Panels

- Front Panel



Galaxy H7921 Router Front Panel

LED description:

- ✓ 10M: 10BaseT LED, lights up when connected with 10M link.
- ✓ LINK: LAN LED, lights up when connected.
- ✓ NET: Radio network LED, flinking during login, lights up when logged in (Depends on network, check the definitions at Online Help).
- ✓ RUN: Galaxy router LED, flinking means normal operation.

The SIM or UIM card can be inserted and released by pressing the SIM/UIM card drawer button.

- Rear Panel

All Galaxy router connectors are located at the rear panel.



Galaxy Router Rear Panel

Connectors' description:

- ✓ COM: Serial port (RS-232/485), serial data port or console port.
- ✓ RJ45: 10/100BaseT auto sense Ethernet interface.
- ✓ DC: DC power supply interface (+5VDC, +7.5V~+24VDC optional, check the label before power on.)
- ✓ RESET: Reset button, press and hold for 5 seconds to reset the Galaxy router back to its default factory configurations.
- ✓ ANT: Antenna interface (SMA female), standard, vehicle antenna, directional antenna optional.



Click "Start" -> "System Tools" -> "Default Setting" to reset the Galaxy router back to its default factory configurations. If you have forgotten the login password, press and hold RESET button for 5 seconds.

The Galaxy router will be back to the factory default configurations if the RESET button is pressed up to 5 seconds.

Management webpage address: 192.168.8.1

Login name: admin, Password: hongdian

Interface and cable connection

COM – Serial Port

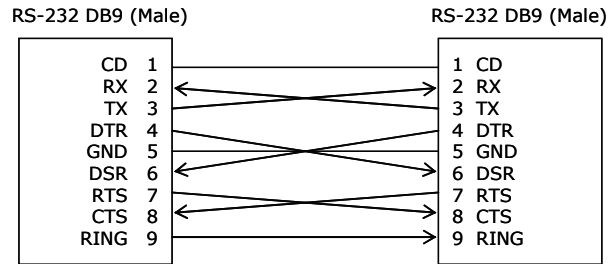
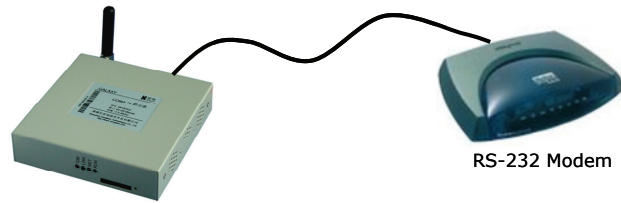
COM serial port is standard, DB9 (Female) RS-232(DCE) interface (RS-485 optional); it can be assigned to CONSOLE port or data port.

RS-232(DCE) connector PIN definition:

DB-9 connector (DCE-Female)				
PIN	Signal	Description	Direction	Note
1	CD	Carrier Detect	-->	
2	RXD	Received Data	<--	
3	TXD	Transmitted Data	-->	
4	DTR	Data Terminal Ready	<--	
5	GND	Signal Ground		
6	DSR	Data Set Ready	-->	
7	RTS	Request To Send	<--	
8	CTS	Clear To Send	-->	
9	RI	Ring Indicator	-->	

For CONSOLE mode, the PC serial port that connects the Galaxy router should be configured to 57600, 8, N, 1; and then you can start a Hypertext Terminal at the PC, type commands to manage Galaxy router.

Galaxy router has a feature of the dial-up backup routing. Customer can connect a dial-up modem to the router COM port. A special cable will be required. The detail cable wiring is shown at the below diagram.



RJ45 – Ethernet

It is standard 10/100BaseT Ethernet interface (Auto sense).

DC – Power

DC power supply interface (+5VDC, +7.5V~+24VDC optional, check the label before power on.)

The power adapter output current should be not less 2A; Power supply ripple should be less 300mV.

ANT - Antenna

Standard 50Ω/SMA RF connector (Female)

For outdoor use, lightning should be considered. We propose to install an arrester between antenna and the ANT interface.

2.4 Ground

To ensure a safe, stable and reliable Galaxy mobile router operation, DTU cabinet should be grounded properly. Connect the Galaxy mobile router cabinet to site ground wire.

2.5 Power Supply

Galaxy router is designed with advanced power management technologies; it can operate standalone. The input DC power voltage is +5VDC (+7.5V~+24VDC optional). You should check the Galaxy router label before power on.

The power adapter output current should be not less 2A; Power supply ripple should be less 300mV.



Attention!

- Normally, the power supply is +5VDC, +7.5V~+24VDC is optional. You should check the Galaxy router label before power on.
- Galaxy router should be powered by the AC adapter supplied by Hongdian. Hongdian will not guarantee Galaxy router performance if it is powered by any other unqualified AC adapter.
- Connect antenna properly before power on.

2.6 Check the Mobile Network

Connect all signal and power cables, and double check it, connect antenna, insert a valid SIM or UIM (depends your router type and network) and switch on power. Galaxy H7921 router "RUN" LED will light up. If "RUN" LED is flashing, it means the Galaxy is working normally. If the "LINK" LED is flashing, it means there are data stream input/out over router data port. If the "NET" LED lights up, it means that the Galaxy router has found and logged on mobile network.

(More information refer to Chapter 4)



- All cables should be connected correctly before switch on.
- Antenna should be connected properly before switch on, otherwise it may cause radio module problem.

Chapter 3 Router Configuration

This chapter describes the Galaxy router parameters configuration before putting it in service.

1. Connection
2. Configurations

Thanks to the built-in web technology, Galaxy router can be easily configured and managed. User may be required to configure associated parameters before putting it in service. User can change settings and update firmware if it is necessary.

By the Galaxy router management web pages, you can configure and manage the router parameters. Refer to following description for details.

3.1 Connection

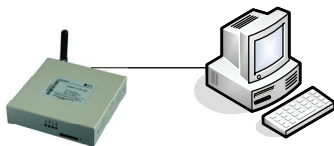
Normally, Galaxy router parameters should be configured through a PC. The PC should meet the requirements:

- ✓ Hardware PC with Ethernet interface, 1027x768 monitor
- ✓ Software Windows 95/98/Me/NT/2000/XP operation system
IE 5.0 or up Internet browser

Two suggestions you can select accordingly.

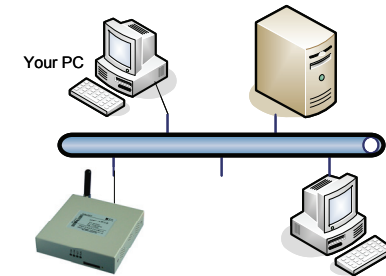
Direct Connection

Connect Galaxy router RJ45 interface with PC Ethernet interface by the supplied CAT-5 UTP cable, and then set up the PC's IP address/subnet to start the configurations.



LAN Connection

It is possible to connect Galaxy router to a hub or switch port at your the LAN environment. Therefore, any PC at the LAN can access the router and manage it.



Setup Correct Network Settings

You may be required to configure your PC IP address and associated parameters after connecting the PC and router. You can set PC IP address "Obtain an IP automatically" or set it manually. Refer to below descriptions for details.

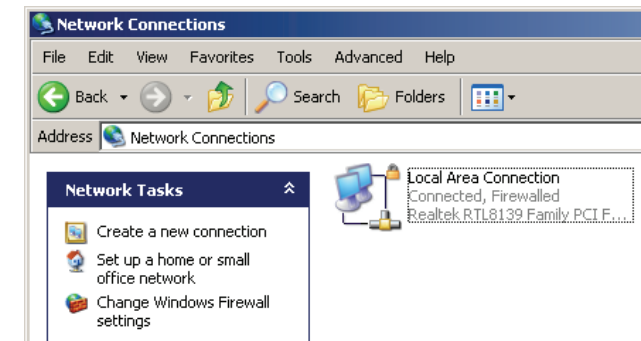
Below is Galaxy router factory default setting; you can modify it accordingly.

IP Address: 192.168.8.1
 Netmask: 255.255.255.0
 Management Webpage IP address: 192.168.8.1
 Login name: admin
 Password: hongdian

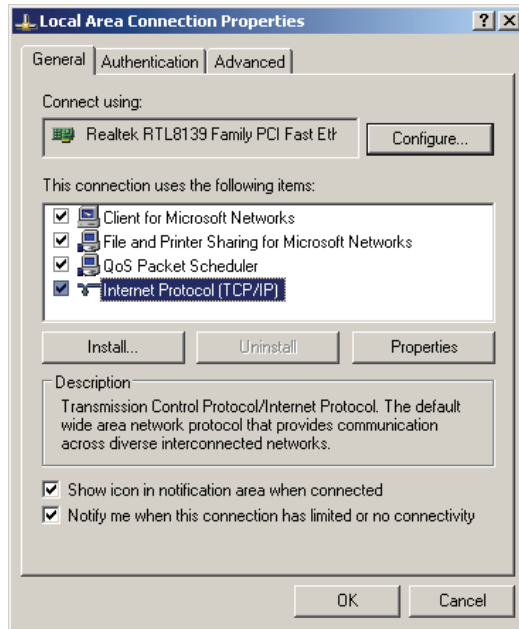
The parameters in manual are Galaxy router default setting.
 Pictures in this manual are captured at Windows XP and IE 6.0 platform.

Before Configuration – Setup your PC IP address

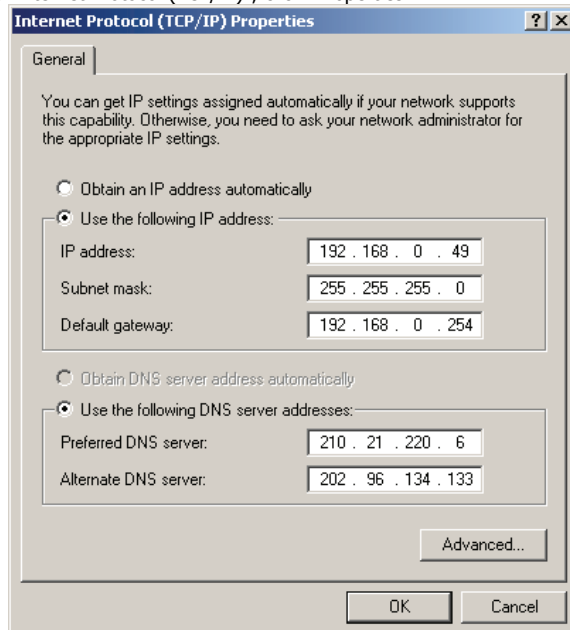
Double click "Network and Dial-up Connections" icon on the PC control panel, you can find the Local Connection which is connected with Galaxy router (Direct Connection) or the Local Connection that is connected with the LAN (LAN connection).



Right click the "Local Area Connection" icon, select "Properties".

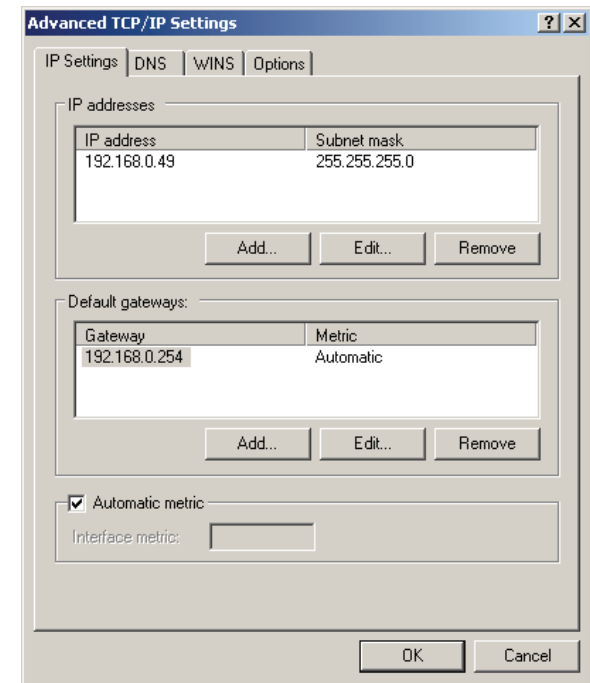


Select "Internet Protocol (TCP/IP)"; click "Properties".

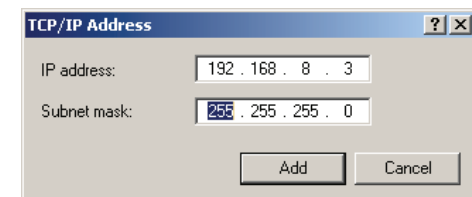


Here, you can select "Obtain an IP automatically" or "Use the following IP address". If Galaxy router is connected to your PC directly, it is possible to select "Obtain an IP automatically". Galaxy router built-in DHCP server will assign an IP address to the connected PC. Sometimes, the PC may be required to restart.

At LAN connection situation, the PC may be already assigned a LAN address (Show as above picture). In order to keep this communication without any interrupt, you can add a new IP address and subnet for Galaxy router configuration. Click "Advanced (V)" button. (The "Default Gateway" is the access to Internet for the PC. If you are not going to change the access to Internet, keep the setting. If you are going to change the access to Internet via Galaxy router, fill-in the router LAN address at "Default Gateway" setting, i.e. 192.168.8.1).



Click "Add" button at "IP Address (R)" item, fill-in the address which will add in the PC.



The new add address should be limited at the subnet same as the Galaxy router, i.e. 192.168.8.xxx (xxx is the number from 2 to 254). Subnet mask should be 255.255.255.0; and then click "Add (A)" button to add the address and subnet into your PC. Your PC will be configured at the IP address "192.168.0.xxx" and "192.168.8.xxx". Click "OK" to complete configuration.

Before Configuration – Check your PC Settings

You can type "ping" command at DOS prompt to check the setting and connection.

```
ping 192.168.8.1
```

If below information appears,

```
Pinging 192.168.8.1 with 32 bytes of data:
Reply from 192.168.8.1: bytes=32 time=2ms TTL=64
```

It indicates the connection between PC and Galaxy router is success; you can start the configuration.

By typing "ipconfig" command at DOS prompt to check the IP address setting.

```
C:\>ipconfig
```

```
Windows IP Configuration
```

```
Ethernet adapter Local Connection:
```

```
Connection-specific DNS Suffix . . :
IP Address . . . . . : 192.168.8.48
Subnet Mask . . . . . : 255.255.255.0
IP Address . . . . . : 192.168.0.48
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 192.168.0.254
```

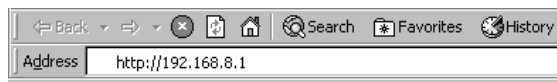
3.2 Configurations

Galaxy router can be managed via web interface or Console. The web interface is an easy way to manage it. It will be described in details at following paragraphs.

WEB Mode

With the built-in web server, Galaxy router can be easily managed via Internet Explorer locally and remotely.

Open IE on your PC, type a URL address.

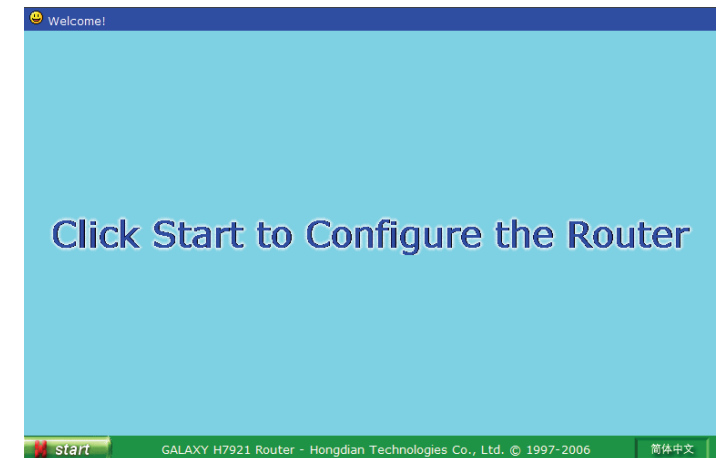


The picture will appears.



Input user name: "admin" and password: "hongdian"

It will display the main page "Welcome" if it is correct user name and password. Click "Start" button to continue the management.



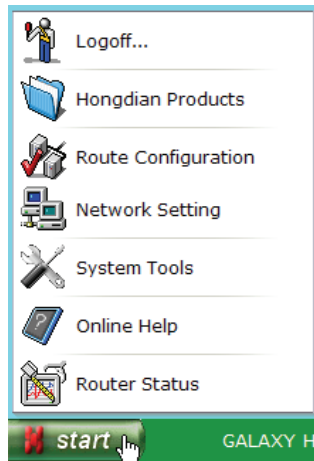
The default operation interface language is English. By clicking the right-bottom word, the different language interface can be switched-over between them.



Due to the reason of IE browser setting, the menu may not change when you have clicked the language switch button. Click the "Refresh" button at IE browser to solve the problem.

Click the "Start" button to display main menu.

Main Menu



Router Status: Display major parameters configuration and operation information.

Online Help: Provide online help.

System Tools: Provide a set of tools for the router management, such as modifying password, remote management, profile backup, hardware & software information, log and restart tool.

Network Setting: Provide LAN interface, DHCP, mobile network parameters setting and dynamic DNS configuration.

Route Configuration: Set up NAT, DMZ, VPN and the route paths.

Hongdian Products: Browse Hongdian Products catalogue.

Logoff: Exit router management pages.

**Notice:**

Galaxy router should be configured properly; the "Network Setting" is the basically and necessarily settings. We recommend customer should configure this parameter first. Meanwhile, we suggest customer reads paragraph 3.2.4 before setting.

As mentioned before, the router configuration works should be performed via a PC that is configured. The relative descriptions refer to paragraph 3.1.

Galaxy router factory default setting:

LAN IP Address: 192.168.8.1
 Subnet Mask: 255.255.255.0
 Login Name: admin
 Password: hongdian

You can modify above settings accordingly; and you may need to modify the PC IP address settings if the router settings have been changed.

Press and hold the "RESET" button for 5 seconds to restore the default setting.

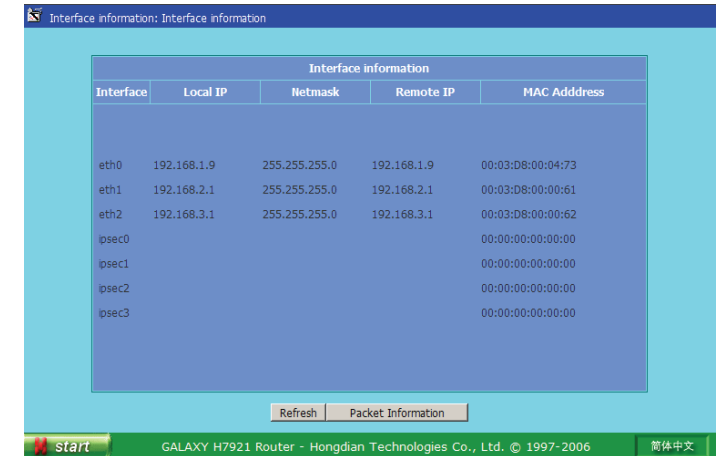
Galaxy router is designed for industrial application and it works at dial mode. However, at the beginning step, the router may not be inserted a valid SIM/R-UIM card or configured incorrectly. The router will try to dial and connect mobile network until establish the communication channel. If it fails 3 tries, the router will restart automatically. It will interrupt your configuration work. Therefore, we recommend set dial mode to "Manual" by clicking "Start"->"Network Setting"->"PPP Setting".

Console Mode

The Galaxy router RS-232 interface can configured for a data communication port or a Console port. The Console port is only used for factory testing and trouble shooting.

3.2.1 Router Status

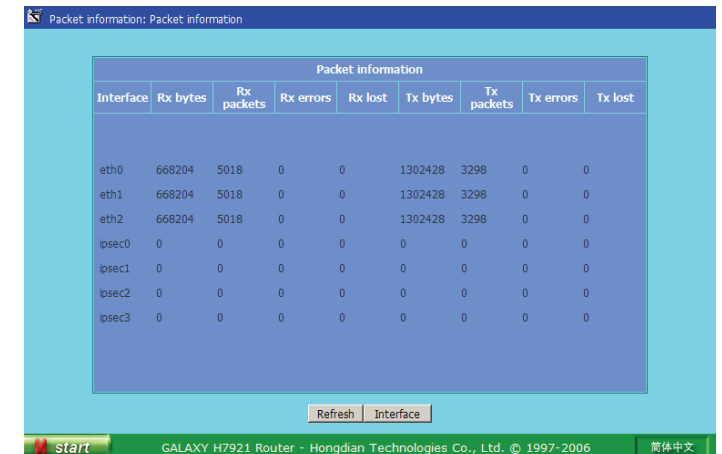
Click "Start"->"Router Status" menu, the Galaxy router general operation information will be displayed.



The page displays the router interface IP and MAC address information:

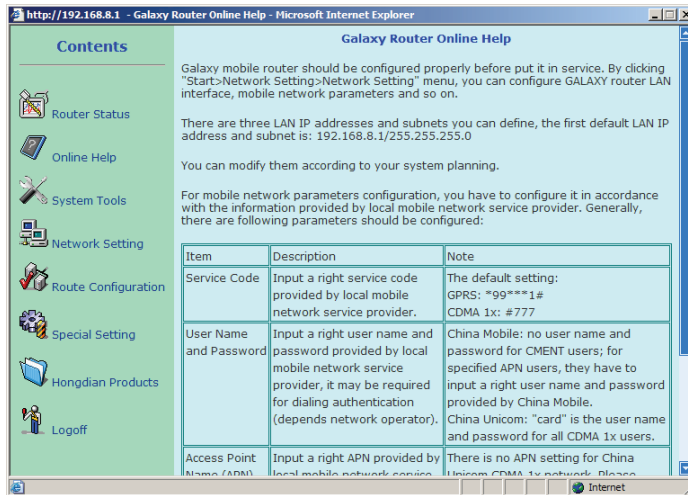
- eth0~eth2: the Ethernet interface IP and MAC address
- IPsec0~IPsecN: the IPsec VPN channel information

By clicking the "Packet Information" button to view the interface traffic.



3.2.2 Online Help

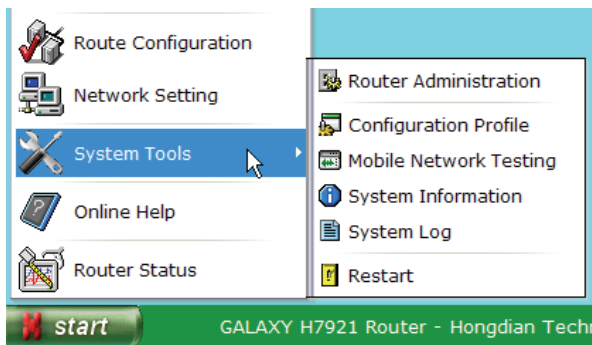
Click "Start"->"Online Help", a new windows will be opened, and the below webpage picture appears.



This is the detail operation instructions; all configuration and setting procedures have been described in the Online Help file. Additionally, clicking the item "Online Help" on the left of Help page, Galaxy router will connect to Hongdian website to check updates.

3.2.3 System Tools

Click "Start"->"System Tools", the below picture will appear.



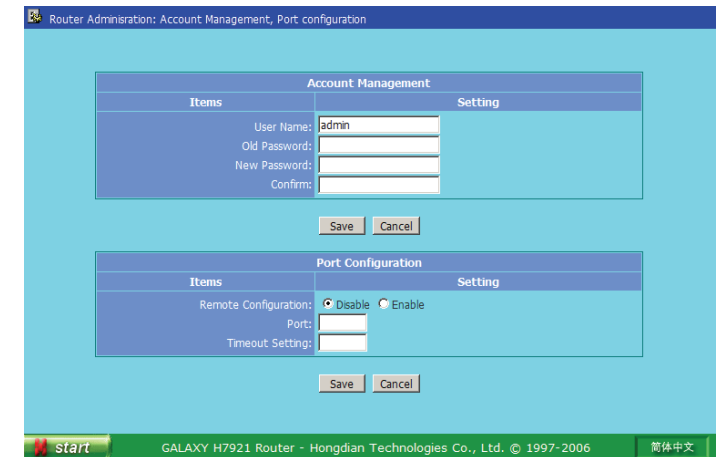
There are six sub-menus at "System Tools".

- Router Administration

- Configuration Profile
- Mobile Network Testing
- System Information
- System Log
- Restart

Router Administration

Click "Start"->"System Tools"->"Router Administration" menu to start this setup page.



- Change Password

The system administrator login name: admin;
Default password: hongdian

The default password should be modified and you need to input the original one to modify it.

Press "RESET" button on router rear panel no less than five 5 seconds to reset the password to factory default (hongdian).

- Remote Configuration

GALAXY router is a web based controlling and management system. At normal situation, operate it via LAN interface. Same as local LAN interface operations, operator can certainly manage the router via mobile network at remote site. For security reason, the default remote configuration function is disabled. It can be enabled, and the access web port can be changed.

Type in Galaxy router connection URL at IE browser, then operator can remotely manage Galaxy router. (It requires specifying the port if the webpage access port is not 80. For example: <http://220.192.11.22:8080>)

The remote management port can be changed, and also the timeout period can be specified. When the webpage access port is changed, LAN side management webpage access port is changed as well.

- Clock (N/A at this version)

The function of GALAXY router built-in with real time clock, it will be automatically synchronized with clock sources when it is powered on.

For CDMA version, Galaxy router will be locked at CDAM network clock source.

For GPRS version, Galaxy router will be synchronized to an Internet clock source (NTP) when it has been connected to GPRS network. There is an option to enable or disable NTP client; and also the NTP server can be specified accordingly.

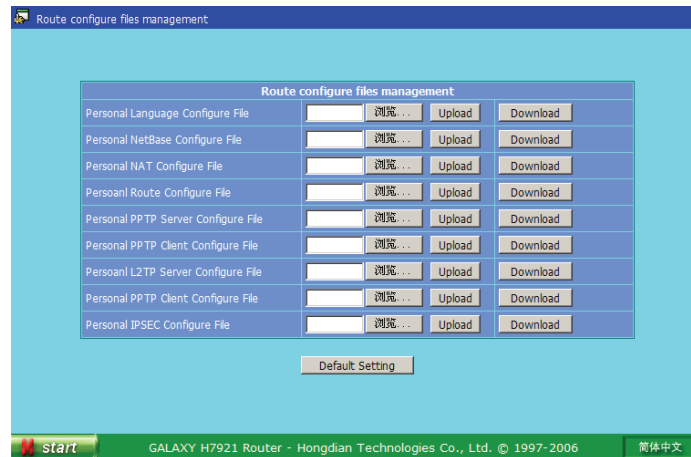
When the clock is synchronized to an Internet clock source, there is a drop list to select the time zone accordingly. Also there is an option to enable or disable NTP client; and also the NTP server can be specified accordingly.

Press "Synch" button to synchronize the router manually.

Once router restarts, the clock may be reset to the initial time and then re-synchronize after the GPRS network is connected.

Configuration Profile

Click "Start"->"System Tools"->"Configuration Profile" menu to start this setup page.

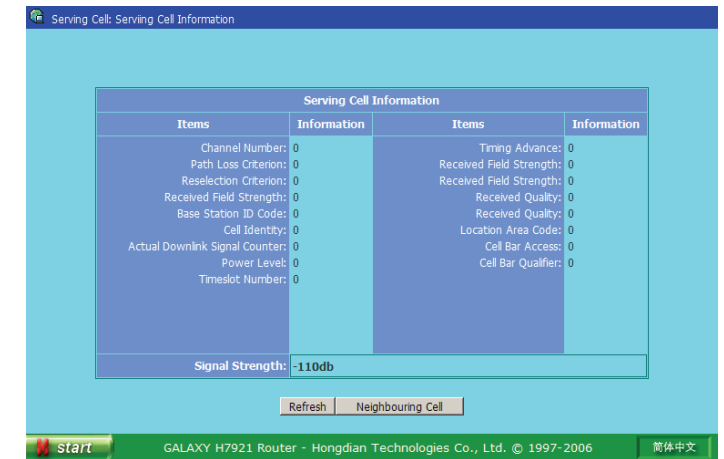


The configuration profiles can be retrieved and backed up individually, by pressing associated "Browse" button to locate the configuration file and pressing the "Upload" button to retrieve the configuration, and pressing the "Download" button to backup the configuration.

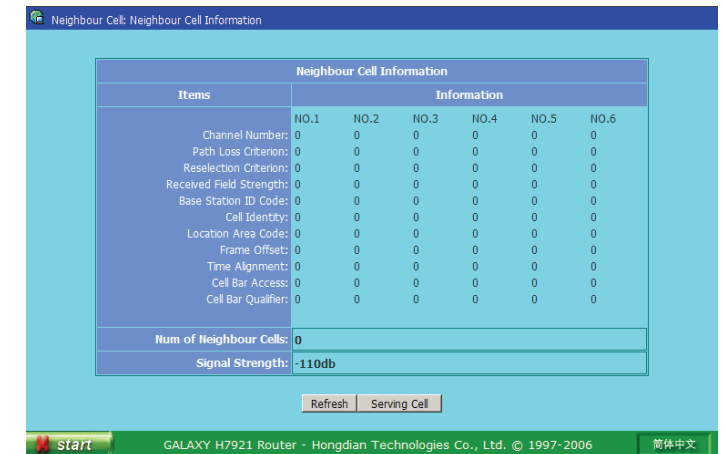
Press "Default Setting" button to restore router to default factory setting.

Mobile Network Testing

Mobile network testing function is a useful troubleshooting tool to locate the problem on mobile network. It can test the cell information where the router working and the neighbor cells information.



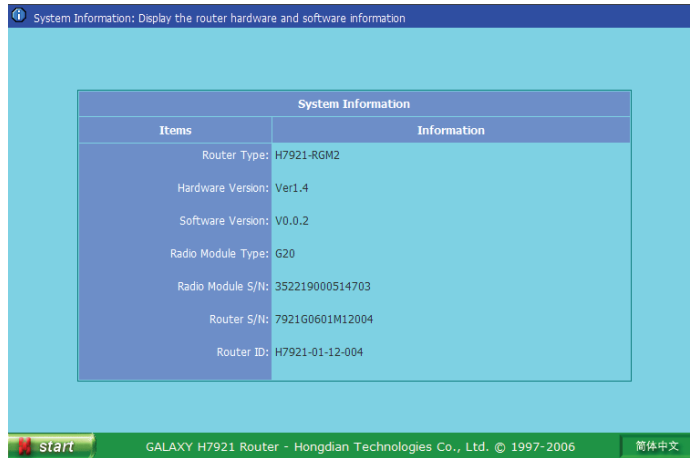
Click "Neighbouring Cell" button to view the neighboring cells information (Consult with the local mobile network operator for more information):



Only the H7921-RGH type supports the Mobile Network Testing function at present version.

System Information

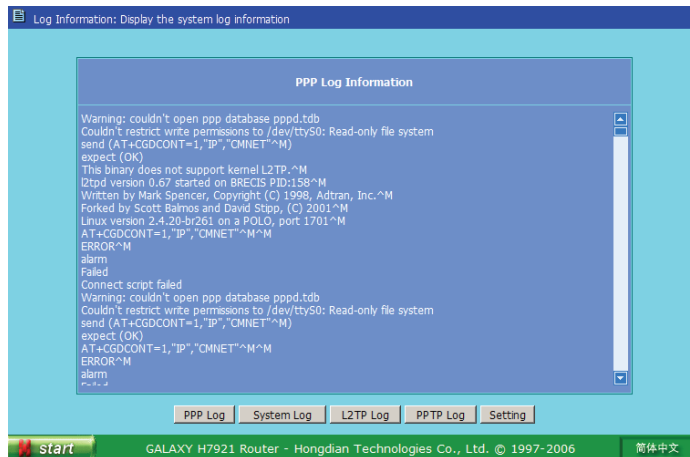
Click "Start"->"System Tools"->"System Information" menu to start this page.



There are reference information for router software upgrading and maintenance. The page displays router type, hardware and software version, RF module type and series number, router series number and so on.

System Log

Click "Start"->"System Tools"->"System Log" menu to start this page.



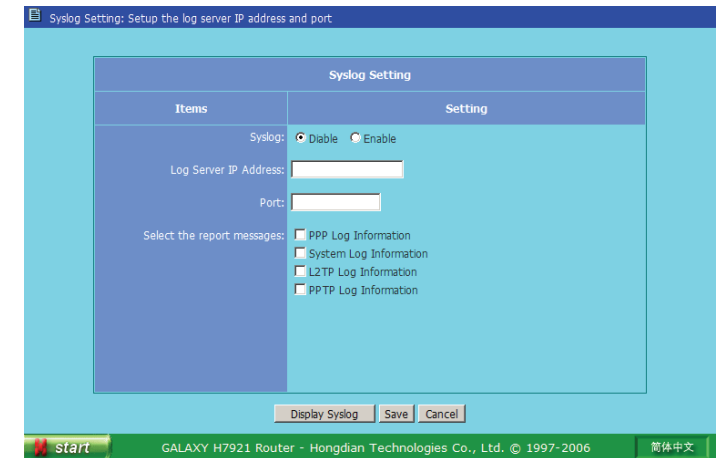
The operation log can be recorded at four categories:

- PPP Log
- SYSTEM Log
- L2TP Log

- PPTP Log

Click correspondence button to view the detail log information. Click the "Setting" button to customize the log functions.

In order to save the system resources, the log default setting is disabled. It can be enabled at the Syslog Setting page. Meanwhile, there are four options to customize the log function, i.e. tick the PPP log Information to record the PPP dial-up information.



The log file can be sent to a log server by specifying an IP address and port. By Typing in the log server IP address and port to enable this function.

Restart

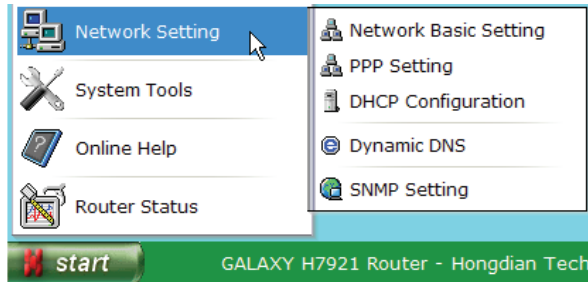
Click "Start"->"System Tools"->"Restart" menu to restart Galaxy router.

3.2.4 Network Setting

Galaxy router should be configured with proper parameters. Network setting is the basic and necessary configuration. Generally, LAN interface, mobile access parameters and dial mode should be configured.

The router LAN interface, IP address and netmask can be modified if necessary. At the initial phase, the PC that will connect to Galaxy router should be configured as same as the router's IP subnet mask (192.168.8.x/255.255.255.0, here x=2 to 254). For more information regarding the PC IP address setting, refer to this manual Paragraph 3.1. Once your PC is set up properly, open IE browser and input Galaxy router LAN IP address to start the configuration.

Click "Start" > "Network Setting", the below picture will be displayed.

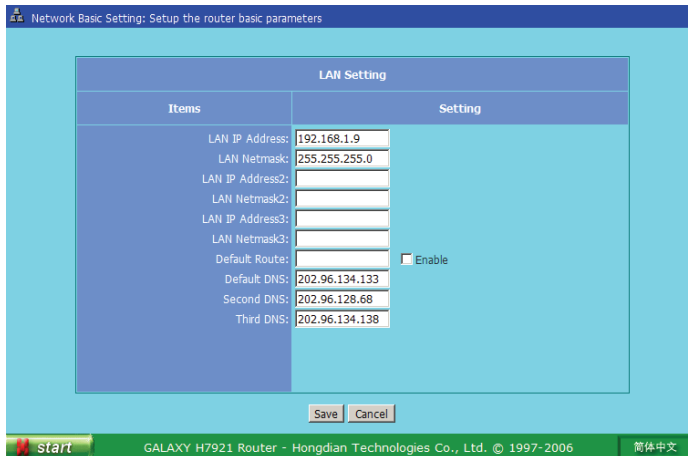


There are five sub-menus at "Network Setting".

- Network Basic Setting
- PPP Setting
- DHCP Configuration
- SNMP Configuration
- Dynamic DNS

Network Basic Setting

Click "Start"->"Network Setting"->"Network Basic Setting" menu to start this setup page.



LAN Setting

There are three LAN IP addresses and netmasks that can be utilized. However, the host (or PC) that connect with Galaxy router should be configured at the same netmask as one of the three LAN addresses setting.

- First LAN IP address (default): 192.168.8.1
- LAN Netmask: 255.255.255.0
- Default Route: Configure the default data transmission path.

- Default DNS: Configure the DNS server IP address, there are three DNS server can be defined.

It can be modified in accordance with application requirement.

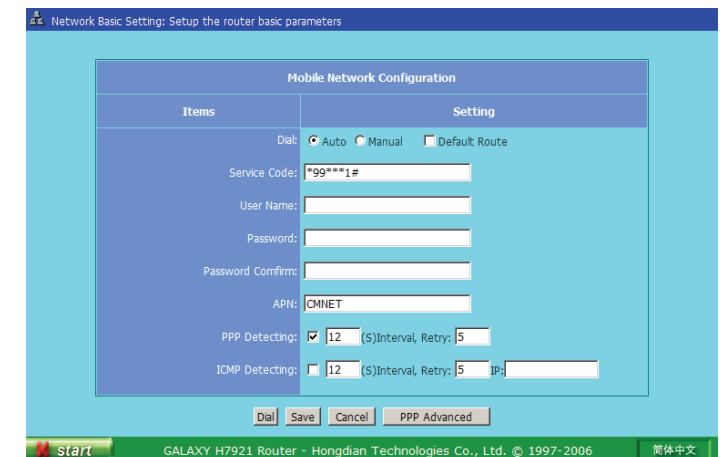
Press "Save" button to store the modification.

Reconnecting the host (or PC) after its IP address has been modified successfully.

PPP Setting

Those parameters should be configured in accordance with the information provided by local service provider.

Click "Start"->"Network Setting"->"Network Basic Setting" menu to start this setup page.



- Dial

It controls the RF module dialup mode; the default setting is "Auto".

When it is set to "Auto" mode, Galaxy router will automatically dial mobile network and will re-dial if the mobile link fails. After 3 failed dialing, Galaxy router will automatically restart RF module. When it is set to "Manual" mode, the timing work mode for special setting may not be active.

Tick the "Default Route" option to route data via GPRS/EDGE or CDMA path.

- Service Code

Configure it with a correct service code provided by the service provider, the default setting:

- ✓ GPRS: *99***1# (for China Mobile)
- ✓ CDMA 1x: #777 (for China Unicom)

- User Name and Password

Input a correct user name and password provides by local mobile service provider; it will be required for dialing authentication:

- ✓ For China Mobile's GPRS CMNET user, no user name and password required. APN user should input correct information provide by service provider.
- ✓ For China Unicom's CDMA 1x user, user name is "card", password is "card".

- APN

APN is the abbreviation of access point name; user should apply for it from the service provider and then have it setup. For example, you can either input "CMNET"/"CMWAP" for China Mobile or keep it in null. For other service operators, please consult the local service provider.

- PPP Detecting

It can be enabled or disabled. Also the detecting interval (second) and retries can be specified accordingly.

The default setting is "Enable", "12" Second interval and "5" tries. With this setting, the router will detect the PPP link status at 12 Seconds interval for 5 tries. If it is failed continually, the router will re-dial the radio link automatically. When it fails redialing continually within 3 minutes, the router will be restarted.

- ICMP Detecting

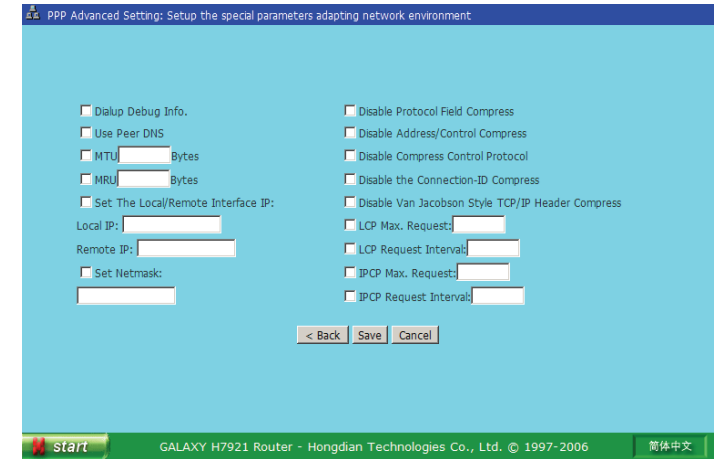
It is WAN side IP link status detecting; and it can be enabled or disabled. Also the detecting interval (second), retries and destination (host) can be specified.

The default setting is "disable" since this detecting packets may be charged.

If it is enabled and fails the detecting at the specified interval, retries and destination, the router will re-dial the radio link automatically.

- PPP Advanced

Considering the difference of mobile network authorization, the Point to Point Protocol connection should be compatible with different network. Advanced setting is used for the PPP special setting. Click "PPP Advanced" button to start settings.



Normally, it is not required to change the setting for most of networks and applications. If it is necessary, please consult with the local mobile operator and try different settings.

- Dial Debug Info

It is a useful tool to check detail dial-up information. Select this option if the router is unable to dial network, and send the dial-up information to Hongdian for trouble shooting.

To enable the "Dialup Debug Info.", it will generate the log information of full dialup progress.

- Use Peer DNS

It is the option to utilize mobile network gateway (GGSN or PDSN) DNS setting.

- MTU [] Bytes

It is the data envelop package size transmitting to GGSN or PDSN during PPP dialing.

- MRU [] Bytes

It is the data envelop package size receiving from GGSN or PDSN during PPP dialing.

- Set Local/Remote Interface IP

Specify local and remote IP address.

Local IP address is the Galaxy router IP address obtained from mobile network. Remote IP address is GGSN or PDSN IP address.

- Set Netmask

Specify the Netmask.

- PPP options

- Disable Protocol Field Compress
- Disable Address/Control Compress
- Disable Compress Control Protocol
- Disable the connection-ID Compress
- Disable Van Jacobson Style TCP/IP Header Compress

Try those settings to adapt mobile network.

- Others

Try other parameters to adapt mobile network.

DHCP Configuration

DHCP means Dynamic Host Configuration Protocol. With the built-in DHCP server at Galaxy router, it assigns IP addresses to the hosts that connect with the network.

Click "Start"->"Network Setting"->"DHCP Configuration" menu to start this setup page.

Items	Setting
DHCP Server:	<input checked="" type="radio"/> Enable <input type="radio"/> Disable
Start IP Address:	192.168.8.2
End IP Address:	192.168.8.254
Netmask:	255.255.255.0
Default Gateway:	192.168.8.1
Default DNS:	
Second DNS:	
Third DNS:	

There are following DHCP server settings.

- ✓ DHCP Server: Enable or Disable.
- ✓ Start IP Address/End IP Address: Specify DHCP server IP address range.
- ✓ Netmask: Specify DHCP server netmask (netmask 255.255.255.0 suitable for network within 256 hosts, 255.255.0.0 suitable for network within 65536 hosts).
- ✓ Default Gateway: It is a gateway for hosts connected to Galaxy router to communicate with outside network. You can setup its IP address as necessary. Normally, it is Galaxy router LAN interface IP address.
- ✓ Default DNS: Default main DNS, it should be configured with information provide by the local operator. The default setting is Shenzhen city DNS IP addresses.
- ✓ Second DNS: Alternative DNS; it could be null.
- ✓ Third DNS: Same as the above.

Dynamic DNS

As you know, there are many DNS server at Internet; it records and translates the domain name into corresponding IP address. However, normal DNS server only maps the domain name and static IP address.

Dynamic DNS service will map the specified domain name to a dynamic IP address. With the built-in client in Galaxy router, the dynamic IP address assigned by mobile network and the domain name applied from dynamic DNS service provider will be registered at Dynamic DNS server when the Galaxy router is connected. Meanwhile, the built-in client will update the operation information at the interval defined by the dynamic DNS server.

Click "Start"->"Network Setting"->"Dynamic DNS" menu to start this setup page.

Before enabling the dynamic DNS function, you should apply a valid account from a service provider in the drop list. Input the following information.

- ✓ Service Provider
- ✓ Host Name
- ✓ User ID/E-Mail
- ✓ Password/Key

You can get the information from dynamic DNS service provider after successful application.

Dynamic DNS service provider list will be added or deleted accordingly.

SNMP Configuration

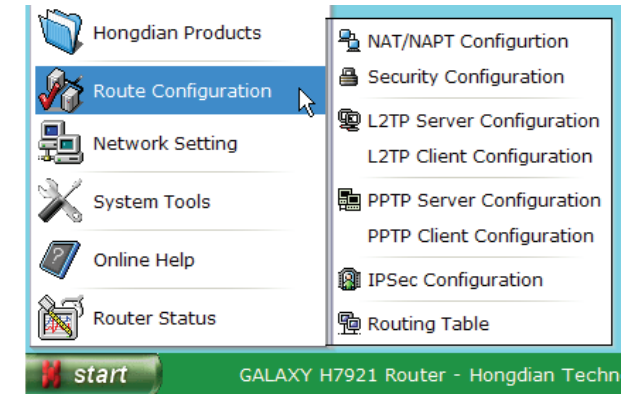
Click "Start">"Network Setting">"SNMP Configuration" menu to this setup page:

- SNMP: Enable or Disable, tick it to enable the SNMP function. It supports SNMP V1 and V2C (V3 ready) automatically.
- Set Community: Set the community name, such as "public".
- IP: Set the SNMP management IP address. Usually, it is the router LAN interface IP address.
- System Name: Set the router name that will display on the NMS.
- System Contact: Set the router contact name.
- System Location: Set the router location.

It may be required to save all settings and restart the router to affect it.

3.2.5 Route Configuration

Click "Start" > "Route Configuration", the below picture will be displayed.



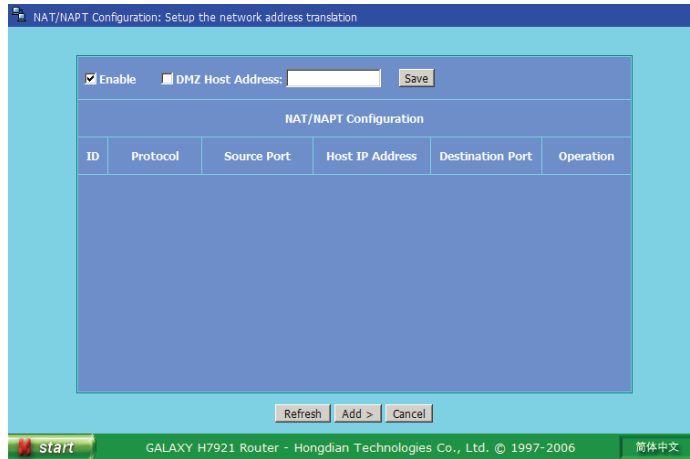
There are eight sub-menus at "Route Configuration".

- NAT/NAPT Configuration
- Security Configuration
- L2TP Server Configuration
- L2TP Client Configuration
- PPTP Server Configuration
- PPTP Client Configuration
- IPSec Configuration
- Routing Table

NAT/NAPT Configuration

NAT is the abbreviation of Network Address Translation. It maps the out side IP address to a host or terminal in your LAN. It isolates unidentified data envelops to guard the LAN against hacker's attack.

Click "Start"->"Route Configuration"->"NAT/NAPT Configuration" menu to start this setup page.



At default setting, the network behind Galaxy router is isolated from outside network to provide safety for the hosts. For SOHO application, you may need to setup your own WEB/FTP or other kinds of service; NAT (Network Address Translation) /NAPT (Network Address Port Translation) technology can meet your requirements.

With this setting, the outer source ports can be mapped to a specified a host at the LAN side. When the mapping scheme is defined, all the data traffic from/to those mapped ports will be transferred to the specified host only.

The TCP, UDP or both protocols can be mapped to the destination ports. If the destination port is not defined, it will be the same port as the source.

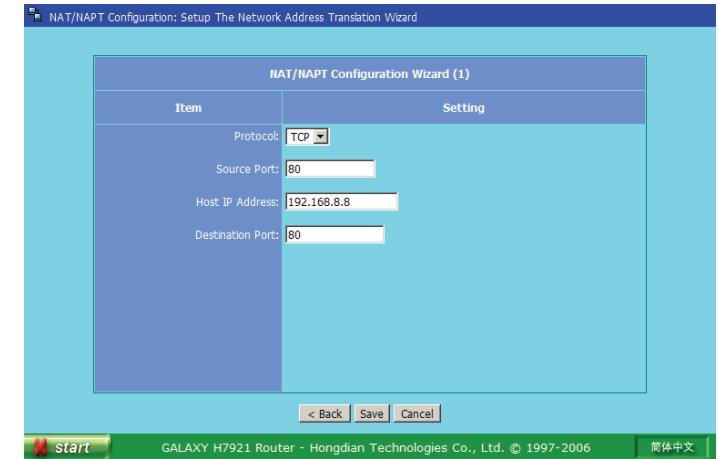
Additionally, there is a DMZ (DeMilitarized Zone) host that can be defined. NAT/NAPT ports mapping is in higher priority than DMZ is. In other words, if a port has been mapped to a host at the LAN, the data at this port will be transferred to this host, and not be transferred to the defined DMZ host.

Galaxy router can map up to 16 ports (hosts).

Example.

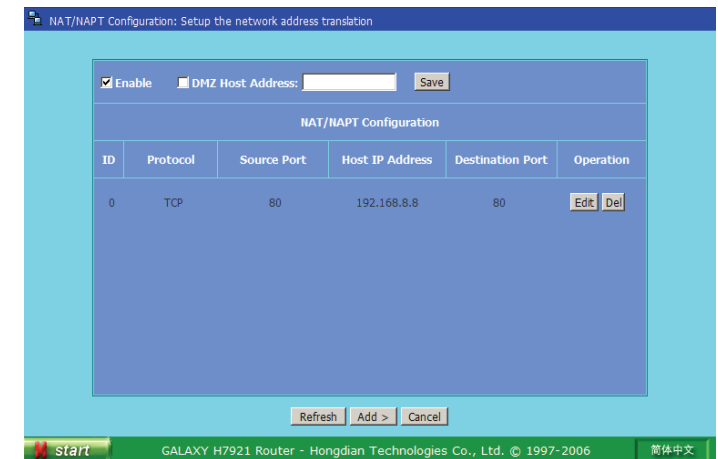
- ✓ WEB Server: maps port 80 to a LAN host address 192.168.8.8

Click "Add" button to add a port mapping policy:



- ✓ Protocol: The "TCP", "UDP" and both of them (ALL) can be specified.
- ✓ Source Port: It is the source data port.
- ✓ Host IP Address: It is the destination host IP address.
- ✓ Destination Port: It is the destination host post.

Press "Save" to store the port mapping.



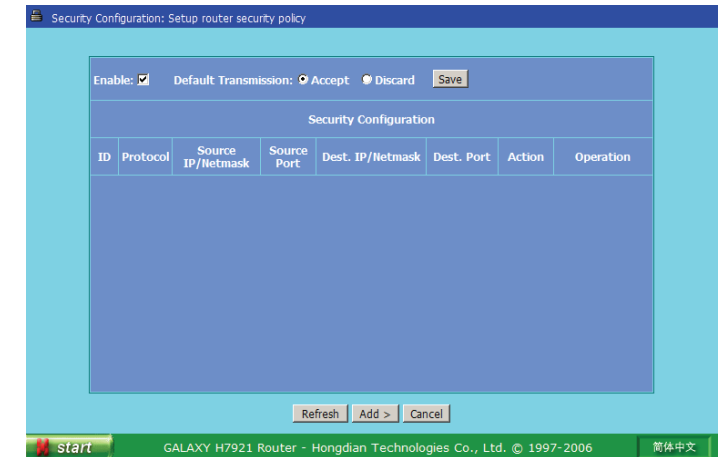
Common used ports list:

Protocol	Service	Port
TCP	AFP over TCP	548
TCP	AOL	5190~5194
TCP	BGP	179
UDP	DNS	53
TCP	FINGER	79
TCP	FTP	21
TCP	GOPHER	70
TCP	HTTP	80
TCP	HTTPS	443
UDP	IKE	500
TCP	POP3	110
TCP	PPTP	1723
TCP	Real-Media	7070
UDP	RIP	520
TCP	RLOGIN	513
TCP	SMTP	25
UDP	SNMP	161
TCP	IMAP	143
TCP	InterLocator	389
TCP	IRC	6660~6669
TCP	L2TP	1701
TCP	LADP	389
TCP	NetMeeting	1503 & 1702
UDP	NFS	111
TCP	NNTP	119
UDP	NTP	123
UDP	PC Anywhere	5631~5632
TCP	SSH	22
UDP	SYSLOG	514
UDP	TALK	517~518
TCP	TELNET	23
UDP	TFTP	69
TCP	X-WINDOWS	6000~6063
TCP	WAIS	210

Security Configuration

With the security configuration function, you can control data envelopes security in/out your network. All outbound envelopes are secured by this setting. Only envelopes to NAT or DMZ hosts toward inbound direction are secured.

Click "Start"->"Route Configuration"->"Security Configuration" menu to start this setup page.

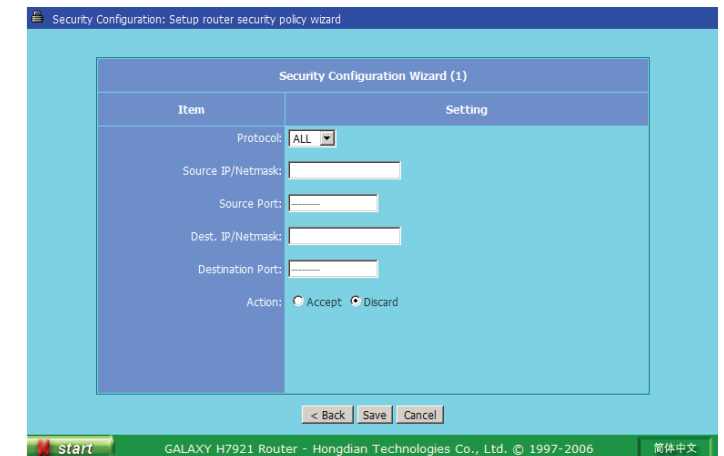


Selecting "Accept" or "Discard" action to protect the data envelopes.

- Accept: Accept data envelopes that match settings only.
- Discard: Discard all data envelopes that match settings.

There are 32 policies can be defined. Also the inbound and outbound data envelopes can be controlled.

Press "Add" button to add a new security setting:



For each policy, there are following items can be defined.

- Protocol: TCP, UDP, ICMP or All selectable.
- Source IP address/Netmask: Define source data envelops IP address and subnet.
- Source port: Define source data envelops port.
- Destination IP address/Netmask: Define destination data envelops IP address and netmask.
- Destination port: Define destination data envelops port.
- Action: Define the data processing method, there are two options, accept and discard.

It is possible to define the source and destination IP address with a subnet. Therefore, one IP address (i.e.: 4.3.2.1) or one range (i.e.: 4.3.2.1~4.3.2.254) IP address can be defined accordingly. Null netmask setting means all IP address.

The netmask is described by a decimal number 8, 16, 24 or 32.

8=255.0.0.0, 16=255.255.0.0, 24=255.255.255.0, 32=255.255.255.255

For example:

4.3.2.1/32=one IP address only

4.3.2.1/24=a range IP address from 4.3.2.1 to 4.3.2.254

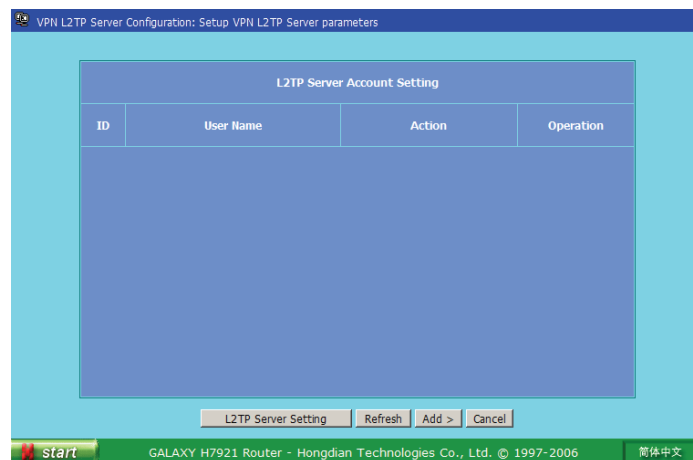
For source and destination port, you can specify one port (i.e.: 80) or one range (i.e.: 1000-1999) port. Meanwhile, it is possible to select the TCP and UDP protocol individually or both of them. Null port setting means all ports.

If "ALL" or "ICMP" protocol option is selected, the port setting will not be active.

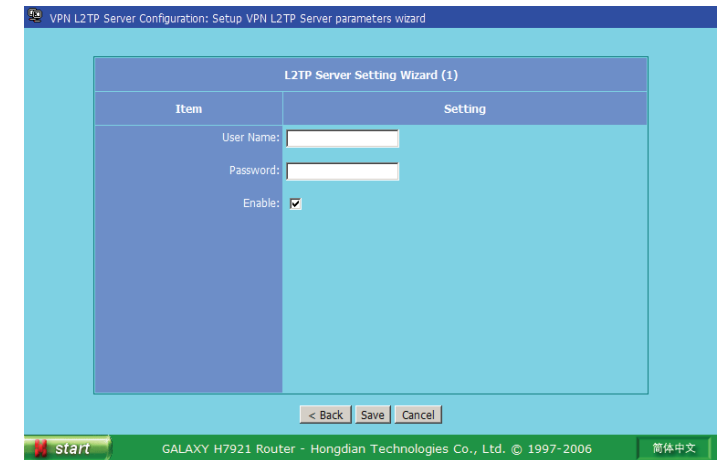
Save all the above settings.

L2TP Server Configuration

Click "Start"->"Route Configuration"->"L2TP Server Configuration" menu to start this setup page to setup VPN L2TP Server parameters.

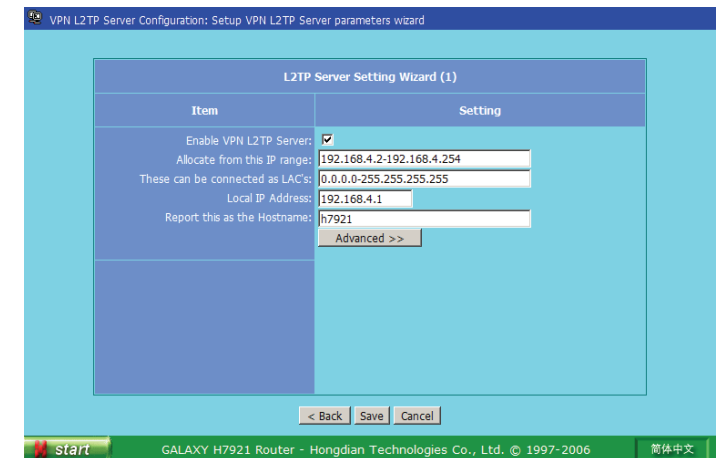


Press "Add" button to create a new account (username with password).



Type the account user name and password, tick the "Enable" option; and then save it to create and take effect the account.

Press "L2TP Server Setting" button to setup L2TP server operation parameters.



Press "Advanced" button to customize more settings.

Item	Setting
Enable VPN L2TP Server:	<input checked="" type="checkbox"/>
Allocate from this IP range:	192.168.4.2-192.168.4.254
These can be connected as LAC's:	0.0.0.0-255.255.255.255
Local IP Address:	192.168.4.1
Report this as the Hostname:	h7921
<input type="button" value="Advanced >>"/>	
Only permit one Tunnel per Host:	<input type="checkbox"/>
Except these hosts:	
This guy can't be connected:	
Use Hidden AVP's:	<input type="checkbox"/>
Use Length Bit in Payload:	<input type="checkbox"/>
Authentication:	<input checked="" type="checkbox"/> PAP <input checked="" type="checkbox"/> CHAP

- Enable VPN L2TP Server: Tick it to start L2TP server
- Allocate from this IP range: Define the server IP address assignment range for L2TP client.
- These can connect as LAC's: Define the IP address range for the L2TP client that can be connected.
- Local IP to use: The local IP address for the L2TP server.
- Report this as the Hostname: The L2TP server host name.
- Only permit one tunnel per host: Tick it to limit the tunnel connection.
- Except these hosts: Specify the host which can not be connected.
- This guy can't connect: Specify the L2TP client which can not be connected.
- Use Hidden AVP's: Tick it to hidden the AVP.
- Use Length Bit in Payload: Tick it to use the length bit in payload.
- Authentication: Tick it accordingly.

L2TP Client Configuration

Click "Start"->"Route Configuration"->"L2TP Client Configuration" menu to start this setup page to setup VPN L2TP Client parameters.

ID	LNS	Action	Operation
----	-----	--------	-----------

Press "Add" button to create a client setting.

Item	Setting
LNS:	
User Name:	
Password:	
Enable:	<input checked="" type="checkbox"/>
<input type="button" value="Advanced >>"/>	

Click "Advanced" button to setup more options:

Item	Setting
LNS:	<input type="text"/>
User Name:	<input type="text"/>
Password:	<input type="password"/>
Enable:	<input checked="" type="checkbox"/>
<input type="button" value="Advanced >>"/>	
Redial if disconnected:	<input checked="" type="checkbox"/> 30 (S)Interval, Retry: 10
User Hidden AVP's:	<input type="checkbox"/>
Local IP Address:	<input type="text"/>
Remote IP Address:	<input type="text"/>
Use Length Bit in Payload:	<input type="checkbox"/>
Authentication:	<input checked="" type="checkbox"/> PAP <input checked="" type="checkbox"/> CHAP
Default Route:	<input checked="" type="checkbox"/>

- LNS: the L2TP server IP address or domain name.
- User Name: the user account created at the L2TP server.
- Password: the account password.
- Enable: tick it to take effect the client setting.
- Redial if disconnected: tick it to switch on the redial function; and then setup the redial interval and retries.
- Use Hidden AVP's: tick it to hidden the AVP.
- Local IP Address: force the L2TP client local IP address to the specified IP address.
- Remote IP Address: force the L2TP client remote IP address to the specified IP address.
- Use Length Bit in Payload: tick it to use the length bit in payload.
- Authentication: Tick it accordingly.
- Default Route: tick it to route all data (except VPN tunnel) via default routing.

PPTP Server Configuration

Click "Start"->"Route Configuration"->"PPTP Server Configuration" menu to start this setup page to setup VPN PPTP Server parameters.

ID	User Name	Action	Operation

- Enable VPN PPTP Server: tick it on to start the PPTP server.
- Debug Enable: tick it on to enable the debug information and record it at Syslog.
- Speed: specify the traffic speed for the PPP daemon, the default value is 115200 bauds.
- Local IP Address: specify the PPTP server local IP address.
- Remote IP Address: specify the PPTP server remote IP address assignment range (i.e. 192.168.4.2-254)

Press "Add" button to create a PPTP client account at this server.

Item	Setting
User Name:	<input type="text"/>
Password:	<input type="password"/>
Enable:	<input checked="" type="checkbox"/>

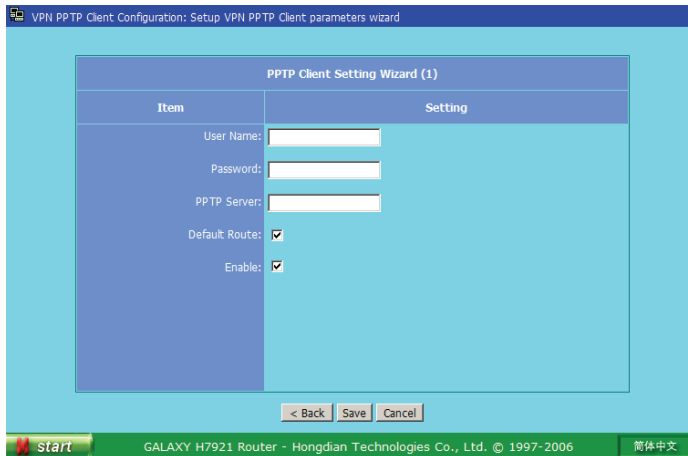
Type in the account user name and password, tick the "Enable" option; and then save it to create and take effect the account.

PPTP Client Configuration

Click "Start"->"Route Configuration"->"PPTP Client Configuration" menu to start this setup page to setup VPN PPTP Client parameters.



Press "Add" button to create a client setting.



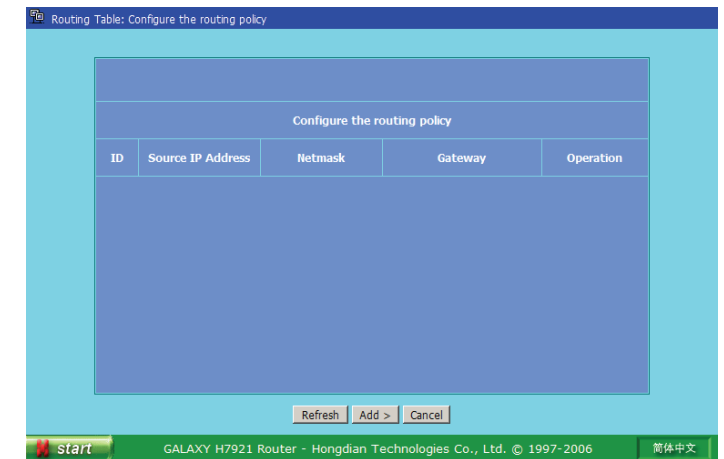
- User Name: the user account created at the L2TP server.
- Password: the account password.
- PPTP Server: type in the PPTP server IP address or domain name.
- Default Route: tick it to route all data (except VPN tunnel) via default routing.
- Enable: tick it to take effect the client setting.

IPSec Configuration (N/A for this version)

Click "Start"->"Route Configuration"->"IPSec Configuration" menu to start this setup page.

Routing Table

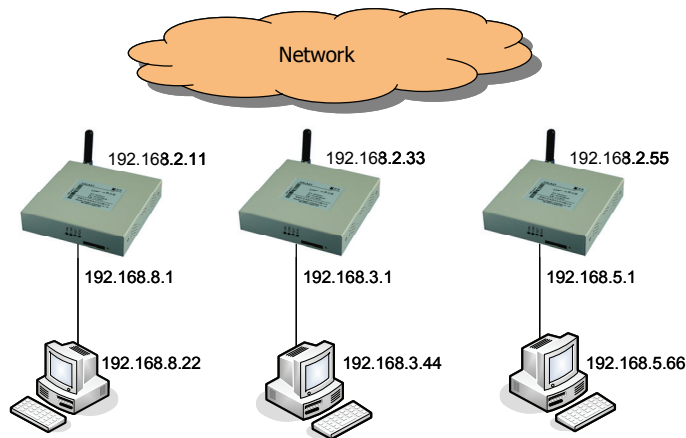
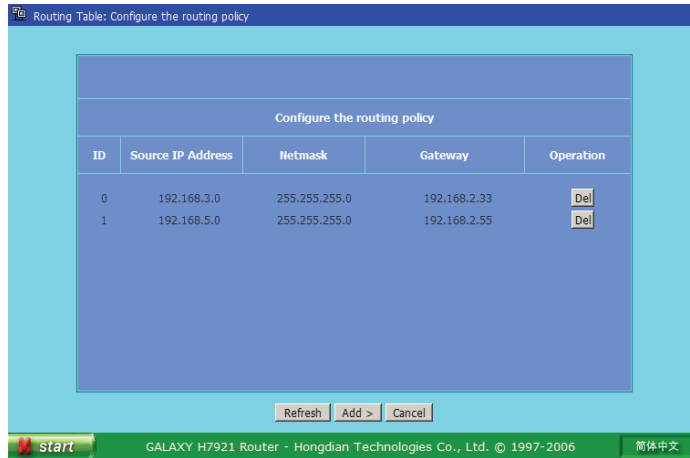
Click "Start"->"Route Configuration"->"Routing Table" menu to start this setup page.



Routing table defines IP data packages transfer paths. If there are more subnets and routers in the network, you have to define the correct data transmission paths to ensure that the data packages can be exchanged between subnets.

There are 16 routing policies can be defined for Galaxy router. Each of source IP address, subnet and gateway should be specified.

For Example:



With the route policy showing above picture, the data envelops must be transferred by gateway (192.168.2.33) if the transmitting data envelops are from host 192.168.8.22 to 192.168.3.44.

Similarly, the data must be transferred by the gateway (192.168.2.55) if the transmitting data envelops are from host 192.168.8.22 to 192.168.5.66.

Save the settings when it is completed.

Note: The IP addresses on the picture are not the real addresses; it is used for description only. Additionally, gateway IP address should be a static IP address at real engineering.

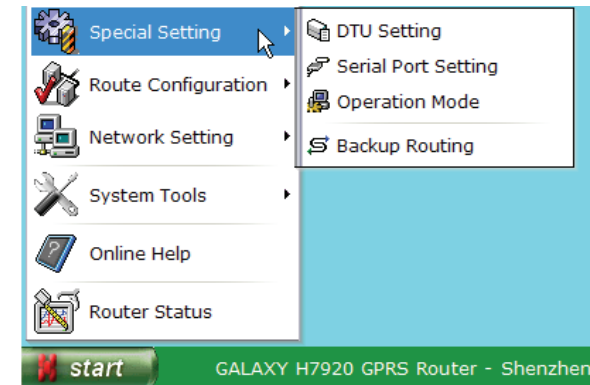
3.2.6 Special Setting (N/A for this version)

Galaxy router is not only integrated with router functionality, but also can be configured for many other applications. The Special Setting function is designed for industries and utilities. Several parameters can be configured accordingly. With the Special Setting, a non IP based device (such as RS-232 interface POS) data can be transmitted over Internet. There are many applications of center to multi-point infrastructure, such as video surveillance system and SCADA system, etc.



The Special Setting is designed for industrial application. It is not necessary to set up special parameters if you are planning to use only route features, and the default setting is "Disable". The Data Service Center and associated parameters should be configured properly if the Galaxy router is used for remote management and surveillance.

Click "Start"->"Special Setting", the below picture will be displayed.



There are four sub-menus in "Special Setting".

- DTU Setting
- Serial Port Setting
- Operation Mode
- Backup Routing

DTU Setting

Click "Start"->"Special Setting"->"DTU Setting" menu to start this setup page.

- Data Service Center (DSC)

DSC can be enabled or disabled. Default setting is "Enable".

- Transmission Mode

Select "Transparence" option to provide a transparent channel between Galaxy router serial port interface and your data service center.

Select "Protocol" option to provide a specified protocol channel between Galaxy router serial port interface and your data service center. It is a good method for traditional serial port device communication. To use this option, you have to develop a data server, which the necessary SDK can be provided by Hongdian.

- Protocol

There are TCP and UDP options for selection. Based on past experience, GPRS or CDMA 1x channel is not reliable due to radio propagation. UDP is recommended for transmitting real time information with data checksum, such as SCADA system. TCP protocol may be better for transmitting files.

- Main/Secondary DSC IP Address or Domain

Data Service Center (DSC) IP Address or Domain is the server address that receives data from serial port device connecting with Galaxy router. A main and secondary DSC can be defined for redundancy system infrastructure. It supports IP address or domain name.

- DSC Port

Defining Data Service Center communication port, it can be changed with the system planning. The default port is 5002.

- Heartbeat Interval

For many applications, it requires to keep the links always online. The heartbeat setting should be set to keep the links alive. However, the heartbeat is the data traffic packets and it may be charged (depends service provider). You have to set a right heartbeat interval in accordance with application. Normally, we suggest the 50 seconds heartbeat interval for most of applications.

- Registry ID and Password/Key

It is a Registry ID and Password/Key at your data service center. Set it as application system planning.

- Router ID

It is the router unique identity name at data service center. By the unique ID, you can transmit/receive data to/from remote site and also manage remote router. Set it according to the application system planning.

Serial Port Setting

Galaxy router can be used to connect non-IP based data terminal such as POS, RTU and PC Hypertext Terminal. The serial port should be configured properly before putting it in service.

Click "Start"->"Special Setting"->"Serial Port Setting" menu to start this setup page.

- Serial Port

There are "Enable" and "Disable" switches.

Default setting: Disable.

If the serial port is enabled, the DSC IP address or domain name must be specified.

- Interface

Select serial port interface type: RS-232 or RS-485; RS-485 is not available at this version hardware.

- Rate

Setup serial port interface data rate:
300/600/1200/2400/4800/9600/19200/38400/57600/115200(BPS)

- Parity

Select parity: None/Odd/Even

- Data Bits

Setup data bits: 5/6/7/8bits

- Stop Bits

Setup stop bits: 1 or 2bits

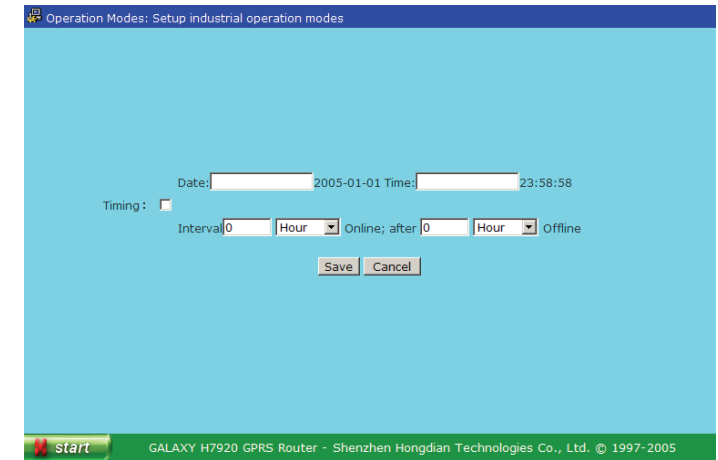
- Flow

Setup flow control: None/Hardware/Software (Xon/Xoff)

Operation Mode

For industrial applications, requirements may be different from customer to customer. There are five modes available in Chinese market. Presently, there is only one timing mode in English version available. Hongdian can design new customized operation modes for any other market.

Click "Start"->"Special Setting"->"Operation Modes" menu to start this setup page.



- Timing1

Online time: Galaxy router will dialup radio link and attach to GPRS or CDMA 1x data channel at the setting time.

Offline time: Galaxy router will close radio link at the setting time.

The function should be activated with a real-time clock system. It is recommended for CDMA network.

- Timing2

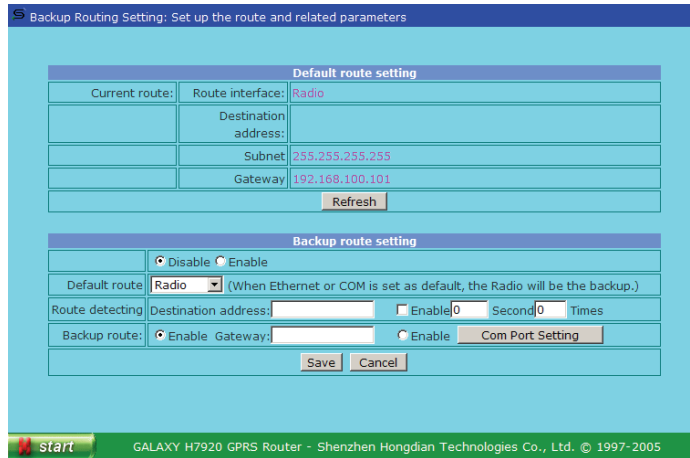
Online Interval: To setup Galaxy router online interval.

Online Length: To setup Galaxy router online length. The route will be offline by the end the length.

Backup Routing

For many applications, customer may require backup routings to protect their communication. There are two backup channel can be set up, customer can set the GPRS/CDMA 1x channel as the main channel, and set the Ethernet or dial-up channel as the backup route.

Click "Start"->"Special Setting"->"Backup Routing" menu to start this setup page.



This function can be "Enable" or "Disable".

When it is enabled, the "W-ICMP detecting" at the "Network Basic Setting" page will not effect.

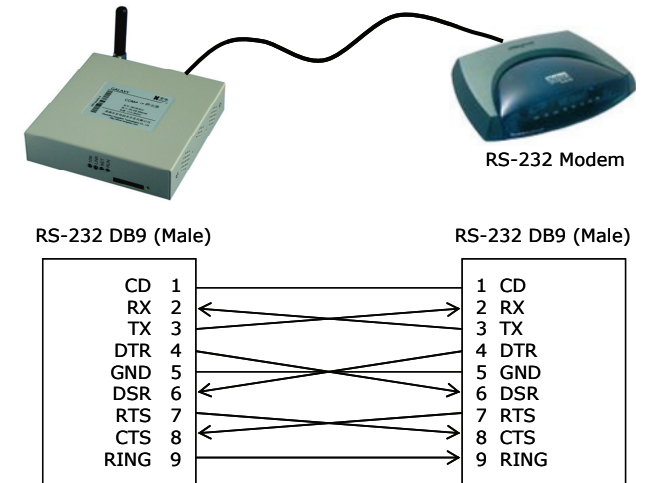
- **Default Route:** Select Galaxy router default routing, it is the main route. There are three types of route can be selected: Radio, Ethernet and COM (connecting with a dial-up modem). When Ethernet or COM is set as default, the Radio will be the backup.
- **Route Detecting:** Detecting the destination host IP address, if there is no response at the set time interval and times, the router will switch over to the selected backup route.
 - ✓ When the "Radio" is set to the default route and the backup routing function is enabled, we recommend setting the operator's gateway as the destination IP address for detecting.
 - ✓ When the "Ethernet" or "COM" is set to the default route, we recommend setting a reliable host in the Internet as the destination IP address.

Attention: The destination host should work reliable. Otherwise, it will cause the router switch over frequently.

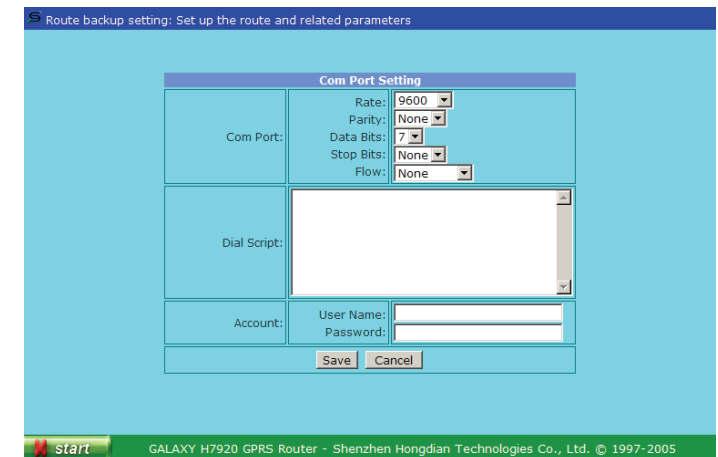
- **Backup route:** There are two options.
 - ✓ **Gateway** - When the "Enable Gateway" is enabled, the traffic will be routed to this gateway via the Ethernet interface if the default route failed. The gateway IP address is the network gateway IP address that Galaxy router is connected.
 - ✓ **COM** - When the "COM" port is enabled, the traffic will be routed to Galaxy router COM port if the default route failed, and then the connected modem will dial a number that specified at COM port setting.

- **COM Port Setting:**

Before enabling this function, it is required to connect a dial-up modem (ie. V.90 modem) to the Galaxy router's COM interface. A special cable will be needed. The cable wiring is showed at the below diagram.



Click the "COM Port Setting" button to this setup page.



At this page, set up the COM port interface and the dialup parameters. Because of the COM port may be connected with different types of modem, it provides a script filed to fill-out the dial-up number and modem initialization strings (AT command) in accordance with the associated modem.

For example, dial a number 83890677, fill in the below code at the "Dial Script" filed.

```
-----
"" at
OK atxxx
OK atd83890677
TIMEOUT 30
CONNECT ""
-----
```

atxxx is the modem extra command that may be used (depends on the connected modem). It should be filled in with the connected modem parameter.

All extra AT commands should be added before dialing. In other words, all extra AT commands should be added before the atd command.

If the telephone line is behind a PABX, it may be needed to dial a "0" and waiting the dial tone. The atd command should be:

```
atd0,83890677
```

The COM port will try to dial the backup channel. If it fails the connection for 3 times, the router will switch back to the default routing and try another sequence.

The route status will be displayed on the front panel LED.

- ✓ RUN LED, blinking in 1 second interval; it indicates Galaxy router works at default route (main route).
- ✓ RUN LED, blinking in 2 second interval; it indicates Galaxy router works at backup route.

3.2.7 Hongdian Products

Click "Start"->"Hongdian Products" menu, it displays more Hongdian products. For more information, click the links listed at this page.

Hongdian Products Catalogue

Shenzhen Hongdian Technologies Co., Ltd.

Hongdian is a company focused on GPRS and CDMA data communications for industries and utilities. Our products have been widely used for utilities, bank (branch office, POS, ATM), SCADA system and many other applications. We have three series of product.

- H6000 GPRS/CDMA Modem. It is an industrial class GPRS or CDMA 1x modem built-in with watch-dog, inter-control interface and protocol (RS-232 type only). It works with a host based device.
- H7000 GPRS/CDMA DTU. It is a data termination unit that works with GSM/GPRS or CDMA 1x radio network, built-in processor, RTOS, TCP/IP protocol stack and application software, etc. It works stand alone without any host based device to provide a RS-232, RS-422 or RS-485 serial port interface; it provides a transparent channel between remote sites and data center.
- Galaxy GPRS/CDMA Router. It is an embedded hardware and software designed with a fully integrated GSM/GPRS or CDMA 1x radio channel and full branch router functions, such as NAT, DMZ, routing table, DHCP, Dynamic DNS, firewall and so on; it also provides a RS-232 interface for non IP based device to access TCP/IP network via mobile communication network.

Co-operation and Innovation!

For more information, please visit Hongdian website: <http://www.hongdian.com>

Technical Support: <http://www.mdtu.com/bbs>

Email: support@hongdian.com

start GALAXY H7920 GPRS Router - Shenzhen Hongdian Technologies Co., Ltd. © 1997-2005

3.2.8 Logoff

Click "Start"->"Logoff" menu to exit router configuration & management pages.

You may be required to enter correct user name and password when you re-login.

3.2.9 Firmware Update

Galaxy router is capable to update by a special update tool. You can download the update tools and associate firmware at Hongdian website.

Visit Hongdian website at "Support"->"Software Update" section for full details;

Or

Enter Galaxy router's "Online Help" page, click "Online Help" item to check updates.

Or

<http://www.hongdian.com/en/download/update.htm>

There are two ways to update the router firmware:

- ✓ TFTP

- ✓ Hongdian Update tool

TFTP update

H7921 is built-in with a tftp client. Operator can update the firmware via a TFTP sever. The latest version H7921 firmware has the tftp feature included.

Download the tftp server at:

<http://www.hongdian.com/en/download/software.htm>

Start the tftp server at your PC, and copy the updated firmware at the same folder of your tftp server.

telnet and login H7921 router

```
tftp ipaddr
(The ipaddr is the tftp server IP address.)
```

```
get filename
(The filename is the firmware filename; it should be copied at the same
folder of your tftp server.)
```

It will transfer the firmware to H7921 router's RAM, and follow the prompt to save it into flash.

Save to flash? Press Y to save it.

Restart the router to take effect the update.



Attention!!! During the saving, please do not drop the H7921 power supply.

Hongdian Update Tool

The update tool instructions refer to Appendix 2.

Chapter 4 Operation Instruction

This chapter introduces Galaxy H7921 router operation instructions.

1. Panel Indication
2. Operation
3. Trouble Shooting

4.1 Panel Indication

There are four LEDs at Galaxy H7921 router front panel; it indicates the router and network operation status.

LED	Status	Description
10M	Blinking (data detected)	Connected 10BaseT device and data transmission detected
	Lights off	Connected 100BaseT device
LINK	Lights up	Ethernet connected
NET	Lights up/Blinking	Depends network & radio module (*)
RUN	Lights up	Router self test and initializing
	Blinking (1/2 second)	Router dialing
	Blinking (1 second)	Normal operation (default route)
	Blinking (2 second)	Normal operation (backup route)

(*) NET indication will depend on the type of radio module and network. The detail information will be updated on website. Click "Start"->"Online Help" at Galaxy router menu, and then click "Online Help"->"FAQ" at the help page for details.

Refer below table for H7921-RGH and H7921-RGM2 NET LED indication descriptions:

H7921-RGH

NET LED	Description	Note
Lights up	Radio Module Starting	
Lights off	No Power or sleeping (deeply)	
Blinking (1 second)	No SIM card or searching GSM network	
Blinking(1/4 second)	GPRS data transmitting	
Lights up	Calling	

H7921-RGM2

NET LED	Description	Note
Lights up	Logon GSM and normal operation	
Lights off	No Power or out of GSM service	

4.2 Operation

Galaxy router is an embedded hardware and software platform. Normally, it is working without any manual operation. It provides a reliable and flexible data channel for industrial applications.

Galaxy router should be installed at place with good radio signal receiving. For the cabinet and basement environment, we recommend to extend the antenna.



For outdoor use, lightning should be considered. We propose to install an arrester between antenna and the ANT interface. Contact Hongdian technical support department for details.

4.3 Trouble Shooting

Problem 1: All LEDs are not lights-up.

Check all cables that are connected to the router.

Check the power supply adapter output voltage.

If the power is correct and there is no LED lights-up, the router may be failed. Contact to Hongdian or reseller for repairing.

Problem 2: Router works not stable after long time operation.

Check router cabinet temperature, if it is overheating, place the router at the place with good ventilation.

Problem 3: Router does not run self-test when it is powered on.

Check the power adapter.

Problem 3: Update failed

System boot system and application program are stored at different memory allocation; failed update will not affect the router rebooting. Re-update the firmware until it is working.

Problem 5: time out when ping the router.

Pinging 192.168.8.1 with 32 bytes of data:
Request timed out.

It indicates that is something wrong during the installation, check following items:

- ✓ Check the Ethernet connection between your PC and Galaxy router.

(Note: Galaxy router's LINK and PC's Link should lights-up if it is connection).

- ✓ Check your TCP/IP setting.
(Note: If the Galaxy router LAN IP is 192.168.8.1, your PC local connection IP address should be 192.168.8.xxx).

For more checking, type "ipconfig" command at DOS prompt.

```
C:\>ipconfig
```

```
Windows IP Configuration
```

```
Ethernet adapter Local Connection:
```

```
Connection-specific DNS Suffix . . . :
IP Address . . . . . : 192.168.8.48
Subnet Mask . . . . . : 255.255.255.0
IP Address . . . . . : 192.168.0.48
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 192.168.0.254
```

(Type "ipconfig ?" Command for its help)

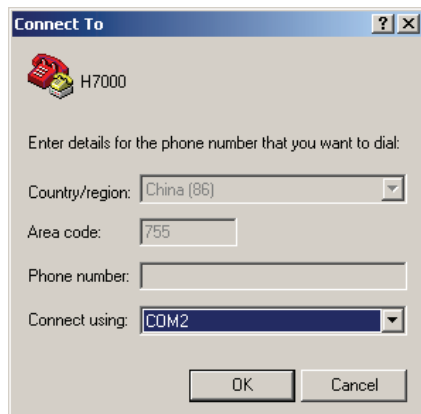
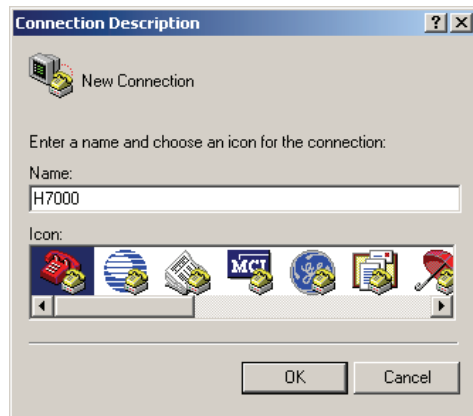
Appendix 1: Hypertext Terminal Setting

This Appendix introduces Microsoft Windows HyperTerminal setup instruction.

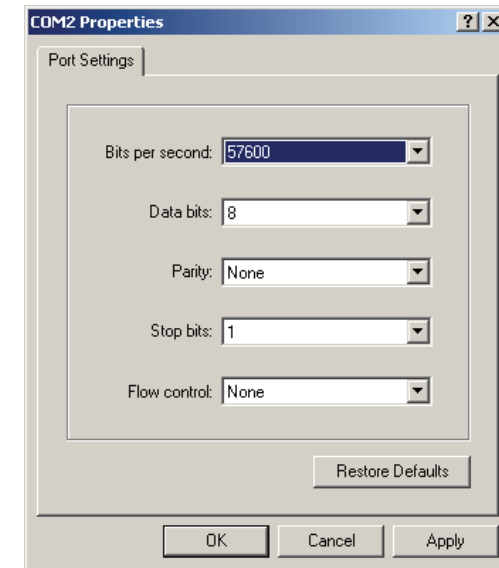
1. COM Port Setting
2. Properties
3. Codec Setting
4. ASCII Code

1. COM Port Setting

By Clicking Windows "Accessories"->"Communications"->"HyperTerminal" to create a HyperTerminal. Refer to below picture to continue the settings.



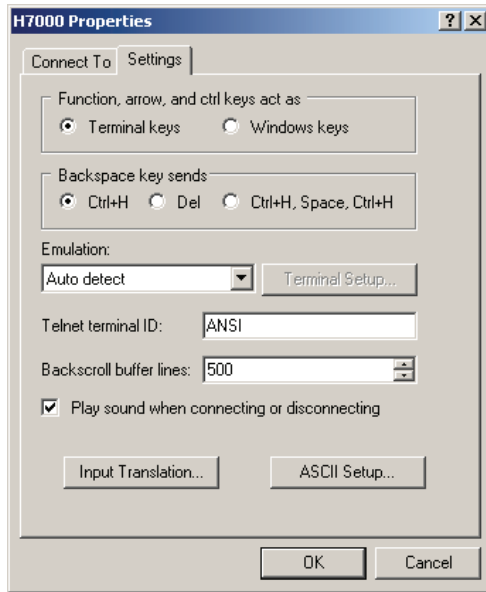
The COM port parameters should be specified. Select COM number (i.e. COM2), Bites per second, Data bits, Parity, Stop bits and and Flow control.



Notice: "Flow control" should be set to "None".

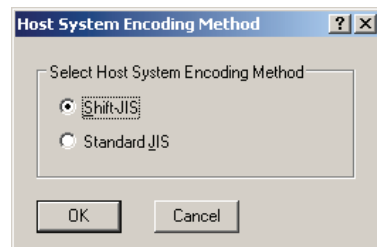
2. Properties

Start the created H7000 HyperTerminal connection. Click "File"->"Properties" menu, click "Settings" tab, set it as show as the picture.



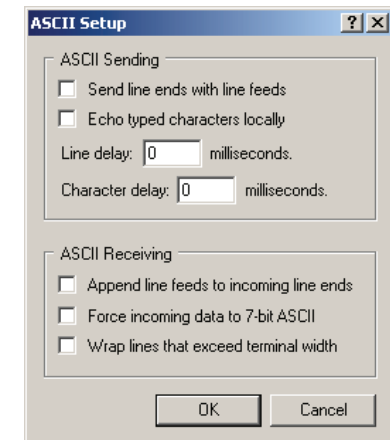
3. Host System Encoding Method

Click "Input Translation" button, set host system encoding method.



4. ASCII Setup

Click "ASCII Setup" button, set ASCII parameters.



Appendix 2: Firmware Update Tool

This appendix describes Galaxy router firmware update tool user instructions.

Galaxy H7921 Firmware Update Tool

Set up the PC IP address subnet same as the router that will be updated.

Copy the Router Update Tool to the PC and run it (Fig. 1):

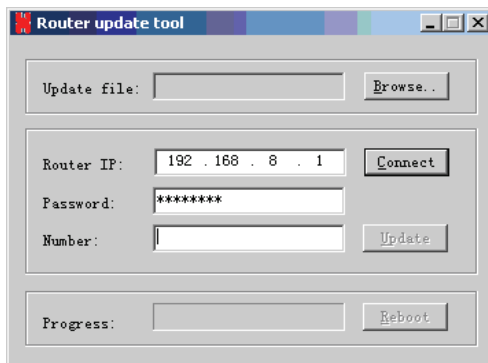


Fig. 1

Click "Browse" button to retrieve the .rom file (Fig. 2)

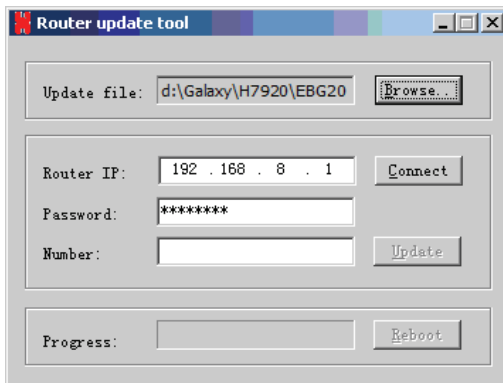


Fig. 2

Input Router IP, factory default IP is 192.168.8.1; the Router IP could be the LAN IP or WAN IP address (WAN IP is the address assigned by service provider gateway; normally it is a dynamic address). Type the correct password (this is the password you access router configuration web interface; factory default is hongdian). Press "Connect" button (Fig. 3), and waiting few seconds. If dialogue info appears (Fig. 4), it means the connection failed. Otherwise, it is successfully connected.

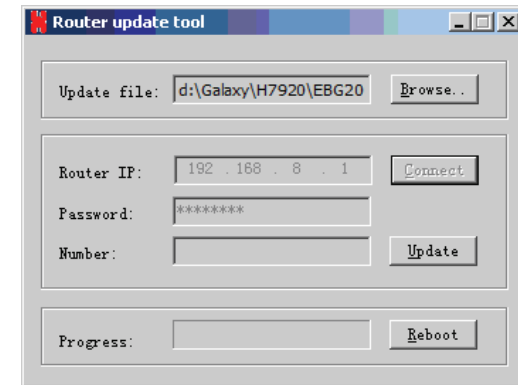


Fig. 3

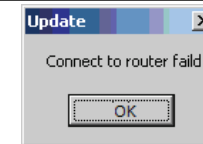


Fig. 4

Press "Update" button to update the router firmware (Fig. 5)

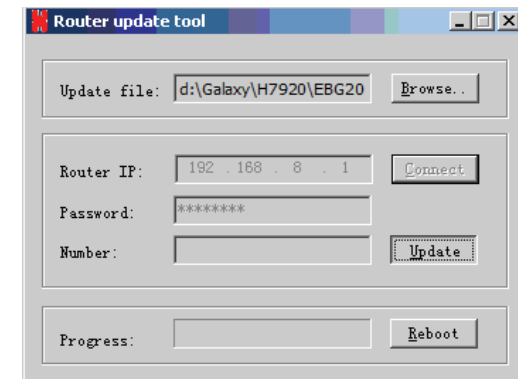


Fig. 5

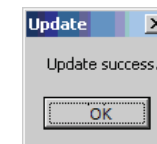


Fig. 6

Waiting about 20 seconds, "Update success" info will appear. It means the router has been update successfully, otherwise it fails.

Note: If you can not open the Galaxy router webpage after updating software, reconnect your PC local connection.



Warning

1. Do not disconnect or power off the router during firmware updating.
 2. Mobile network may be failed sometimes; it is a high risk to update firmware remotely.
-