3G WIRELESS ROUTER

- Built-in industrial wireless module
- Standard SIM slot & Multi network operation
- 802.11 b/g/n WI-FI, Ethernet LAN, Firewall
- Auto monitoring 3G, SIM, Network connection
- Auto /Manual configuring network profile
- Auto resetting 3G and recovering connection

User Manual

Contents

1. 3G wireless router

This user manual is made for MBD-R220H covering following models, a series of industrial 3G (WIFI) wireless router. These models are based on same firmware, different wireless modules.

MBD-R220H : HSUPA WIFI Wireless Router

1.1 Product introduction

MBD-R220H is the industrial class router with wireless module inside, supporting Dual Ethernet LAN connection, 802.11 b/g/n 150Mbps WIFI, firewall security, auto monitoring function, auto recovering function, mainly used for bridging 3G/GPRS wireless network to Ethernet network or WI-FI network where it's cost or impossible to use xDSL, fiber line, or other transmission way. For

example through MBD-R220H router you can create WI-FI hotspot or ethernet network at mountains, in galloping train or other vehicles, in a kiosk, IP camera, video collector, traffic monitoring system, network video server, ATM and so on,

Integrating mobile connection, WIFI and router functions, MBD-R220H will convert mobile network to WIFI network and Ethernet network, through which the terminals could access internet safe and conveniently. Based on industrial design of hardware and recovering design of software, MBD-R220H will keep the terminals always on line.

1.2 Main characteristics

- Detachable antenna with standard SMA connector
- Highly Efficient thermal design and easy fixing way
- Standard 6PIN SIM Card slot
- Wide voltage range from DC5V to DC36V, default DC12V
- Leds displaying status of PWR, 3G, SIM, (WIFI),LAN1,LAN2, WPS
- Dual 10/100Mbps auto-negotiation Ethernet LAN Ports
- Auto MDI/MDIX
- Internal industrial wireless 3G module (please see the transmission rate in product specification)

- Multi-network operation mode (please see the network phrase in product specification)
- Auto-roaming technology
- Auto-transferring between network phrases
- Broadband Wireless WIFI up to 150Mbps
- Downward compatibility 802.11 b/g/n
- 64/128-bit WEP encryption and WPA-PSK, WPA2-PSK encryption
- Hardware and software switches of WIFI wireless
- Auto adaptive WIFI channel
- WDS working operation
- WPS Quick setting for WIFI
- Virtual Server and DMZ, UPnP and port forwarding
- DDNS. QoS, SNTP and DHCP server mode
- Anti-Dos firewall, MAC/IP/content filter, URL blocking
- Multi-operation of bridge, gateway, Ethernet converter and AP client
- Updating firmware via WIFI or LAN connection locally
- Auto-configuring network and auto-dialing/connecting network
- Auto-monitoring wireless module, SIM card, 3G connection and network profile
- Auto-resetting wireless module and recovering 3G network connection

- System log, 3G tracing lost and troubleshot by command

1.3 Default settings

User name/Password	admin/admin
Accessing Web server	http://10.10.10.254(modifiable)
Web serve compatible	IE 6.0,Firefox 1.0 and above
Mobile 3G/GPRS	Default WAN connection
Ethernet interface	LAN connection
802. 11 b/g/n WIFI	ON and Unencrypted
SSID	Mobidata
IP address	10.10.10.1~10.10.10.253
DHCP server	10.10.10.100~10.10.10.200 (modifiable)
Virtual Server, DNS,DDNS	disable
Port forwarding	disable
Qos, filtering, URL blocking	disable
Configuring network profile	Auto/manual
Programming profile list	Effecting the latest item
Network connection	Auto
Monitoring function	Auto
Recovering connection	Auto
Tracing log	Auto

Updating firmware	Via local connection
Data backup	Enable

1.4 Accessories

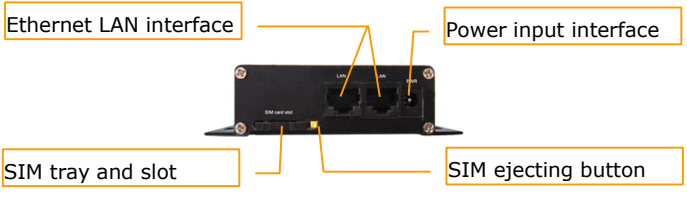
Standard packing list: one router, two antennas (For non-wifi version, there's only one antenna.), one power adapter, one Ethernet cable, CD USER MANUAL and QUICK START.

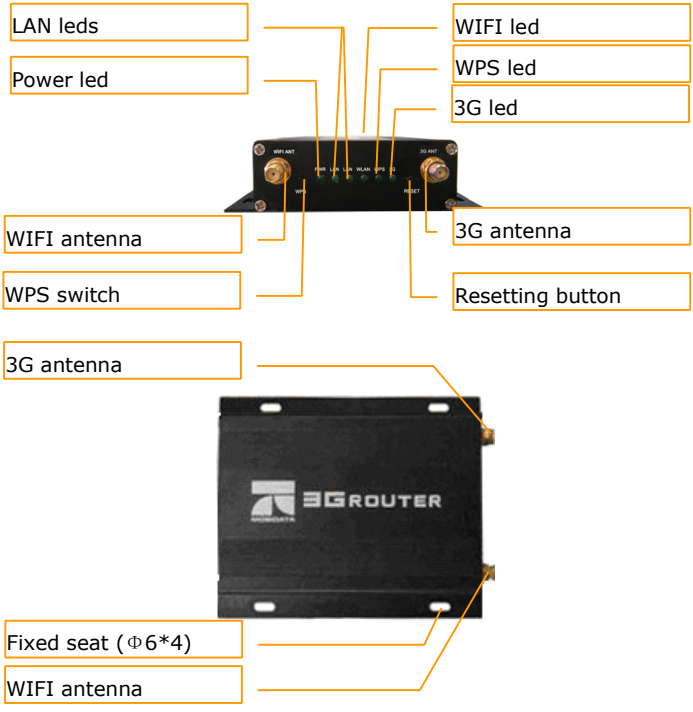
If plug pins in power adapter are different from the standard item in your country, please contact with the distributors or us (mobidata@mobidata.com.cn).

2. Sketch of router

Comparing with WIFI version, there's no WIFI antenna connector, WPS button, WIFI led, WPS led in NON-WIFI version.

2.1 Interfaces description



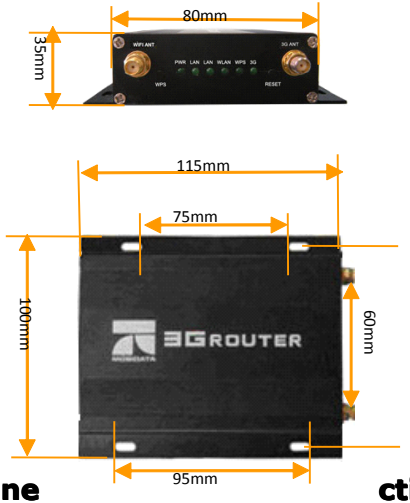


2.2 Leds indication

Power	on	Powered	3G	eg. MBD-R220H	
	off	No Power		Twinkle in green	3G network
LAN	on	Connected		Twist red& green	2G network

	twinkle	Transmitting data		Twinkle slowly	Idle status
	off	Disconnected		off or in red	Problem with SIM
WIFI	on	WIFI open	WPS	on	WPS open
	twinkle	Transmitting data		twinkle	Wait Connection
	off	WIFI closed		off	WPS closed

2.3 Dimension



2.4 Conne ction

After fixing router, please encrypt or close WIFI to make sure the safe network connection. If no need, please do not enable remote management and ping function, which might cause the network to

be attacked. In order to prevent unexpected attack please enable system security and firewall function.

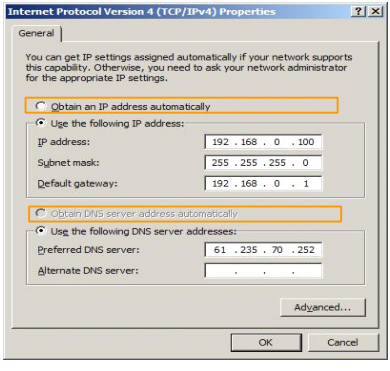
Through Ethernet connection or WIFI connection you can connect the terminals to router.

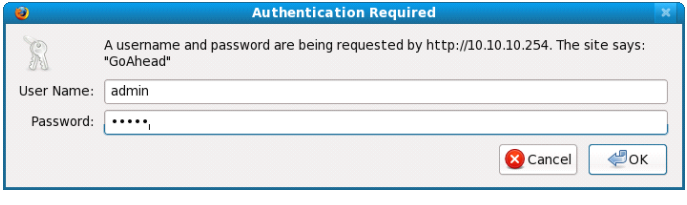
3. Web server of router

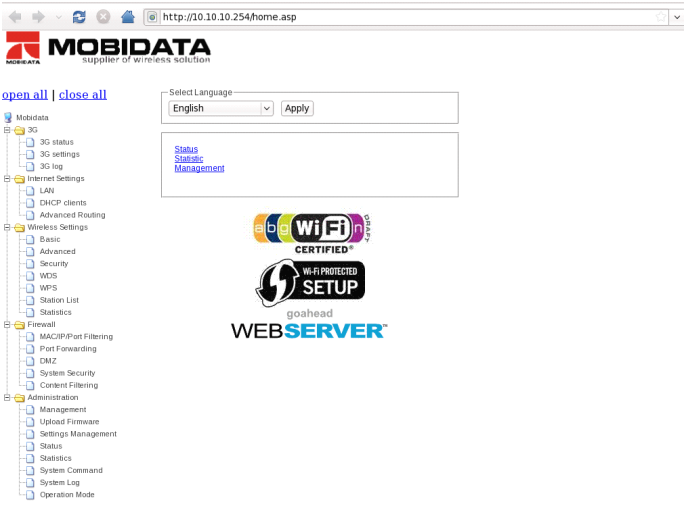
3.1 Accessing web server

After successful connection to MBD-R220H, please enter http://10.10.10.254 in the address bar of the OS browser such as IE or Firefox. And the default username and password is factory setting "admin". If you have ever modified the default setting and forget them, please reset router and then access by "admin".

If you are good at network configuration you can set the client IP manually, and the IP address could be from http://10.10.10.1 to http://10.10.10.253. While the router could support DHCP, you can set the terminal to obtain an IP address automatically.







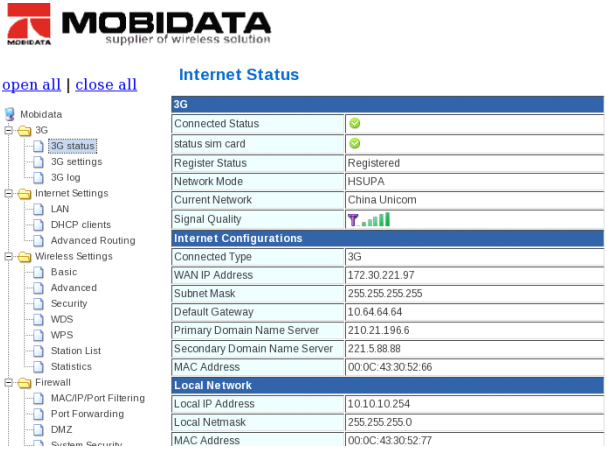
Remarks:

- After powering router, initially because of dialing mobile network there might be couple of disconnection.
- After accessing web server, if it is blank, please fresh the page.
- The default language is English, you can also change the system language.

3.2 Application of web server

3.2.1 Check router

(1) Check 3G connection

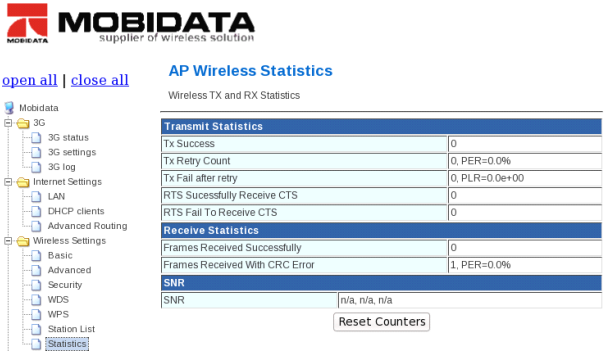


After accessing web server, please open the router menu via press"open all". In window of "3G status" you will see 3G network status, internet configurations and local network details. "Green led" for successful status and "Red led "for failure status, if you see it is failure status, please check the position of SIM card, the balance of SIM card, the validity of SIM card and the network profile in 3G setting. If all above is effective, please wait a moment,

the router will monitor these status and reset 3G module. If it is still failure status after 5mins, please power off and restart the router. Otherwise please contact with the distributors or us (mobidata@mobidata.com.cn).

If the predefined network profile is incorrect, please kindly contact us, we will modify and send you update to you.

(2) Check RX & TX statistics



Through the WIFI TX and RX statistics, you can optimize WIFI according to local radio environment. If you are not goods at the radio network, please do not modify the default WIFI parameter.

(3) Check router version

The 3G function is effective in gateway mode, and the default operation mode is gateway mode. When sending feedback to us, please also send the SDK version and software version.

System Info	
SDK Version	3.6.0.0
Software Version	2.1.3.2
System Up Time	1 min, 18 secs
System Platform	RT5350 embedded switch
Operation Mode	Gateway Mode

(4) Check IP details

In "3G status" and "LAN status" you can check and modify the IP configuration.

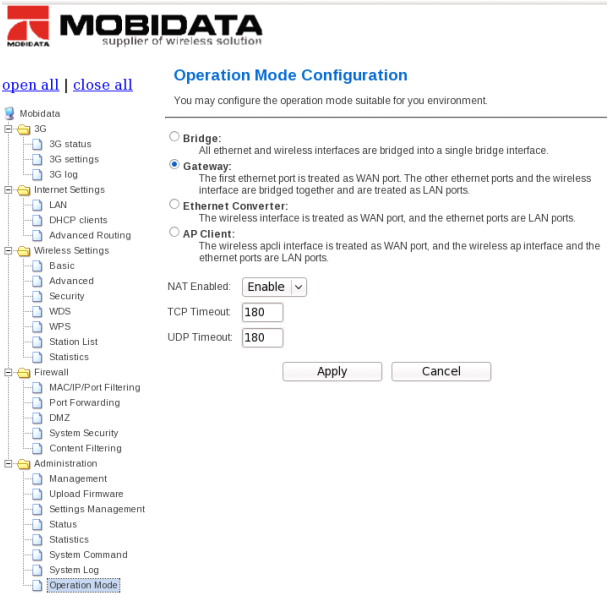
The default address of router is http://10.10.10.254, and which is modifiable. If not required, please make it default.

The client IP range is from 10.10.10.1 to 10.10.10.254 (the address 10.10.10.254 has been reserved for router, so you can only use 10.10.10.1~10.10.10.253). And DHCP IP pool is from 10.10.10.100 to 10.10.10.200, as could be modified in LAN settings.

(5) Check router statistics ans status

In statistics of administrator, you can see all the configurations of this router.

(6) Check operation mode



Besides the default operation mode gateway, MBD-R220H router also provides bride, Ethernet converter and AP client operation modes. Router under bridge operation mode is mainly used for connecting two or more same or different network IP segments to inter-transmit data.

Router under Ethernet converter is equivalent to a WIFI receiver with 4 Ethernet LAN ports.

WDS (Wireless Distribution System) is useful solution to extend WIFI wireless signal coverage, to enhance the WIFI wireless signal strength, to inter-communicate between different wireless stations. Taking advantaging of inbuilt WDS function, it's easy to work out the solution through one MBD-R220H with another MBD-R220H or wireless AP. However WDS is based on frame study, the subordinate MBD-R220H or wireless AP should be same wireless setting with master MBD-R220H, but different network segment. a wireless AP and MBD-R220H router, or effective to , as is Under Ethernet converter operation mode

Besides WDS, router under AP client mode could also work out network extension, which is equivalent to a repeater or a subordinate wireless station.

Remarks:

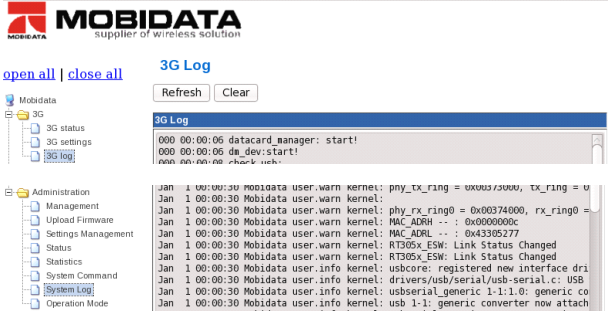
- After restart, MBD-R220H will work under new operation mode.
- Please enable NAT protocol.

(7) Check connected terminals

Please go to "DHCP clients" and "Station list" to check the connected terminals.

(8) Check tracing log

MBD-R220H router provides two kinds of tracing log, one is 3G log, the other is system log. Through 3G log the engineer can check the bugs of 3G network configuration. And through system log the engineer can check the routing configuration.



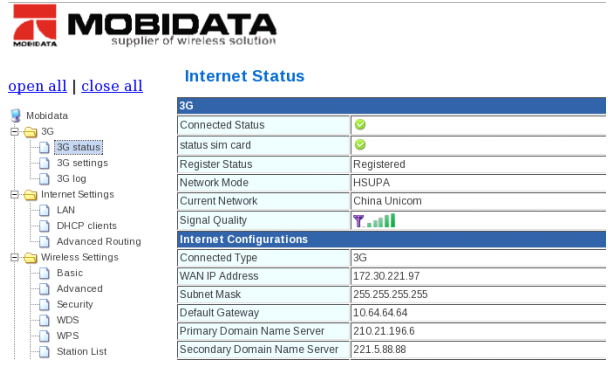
3.2.2 3G and LAN settings

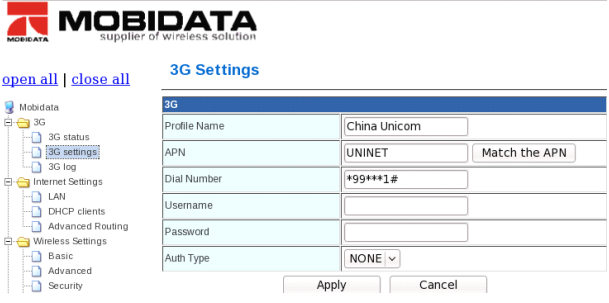
(1) Predefined network profile

The predefined profile list has covered most network operators around the world, so router will configure and connect mobile network automatically. And the current network profile has defined in the list, the profile will be displayed in the pages of "3G status" and "3G setting" as following picture.

For example, before using SIM card of China Unicom we have

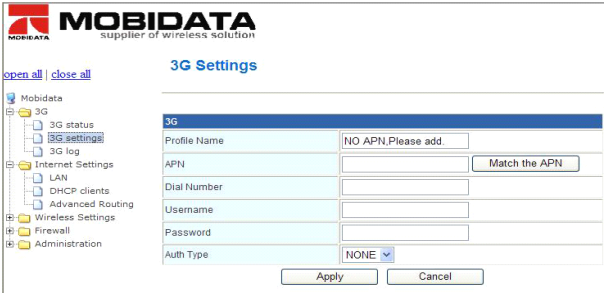
predefined the network profile of China Unicom in the profile list. Then the router will auto-configure and auto-connect network.





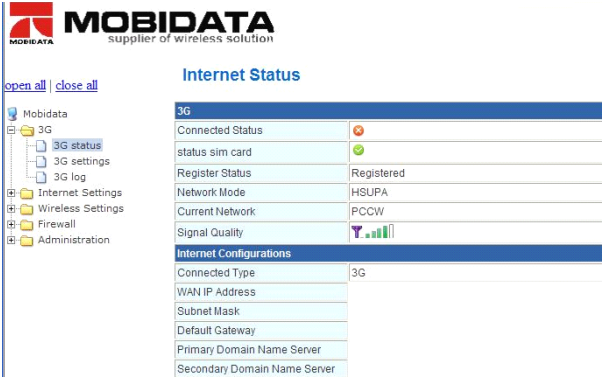
(2) Create new network profile

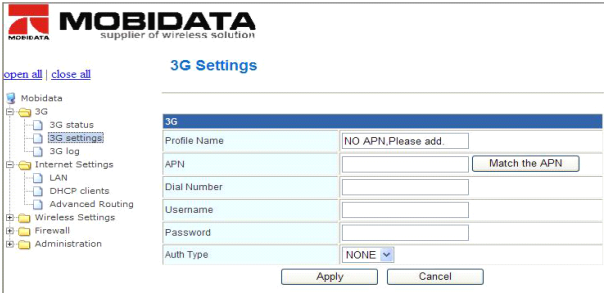
If there's no current network profile in predefined list, the router will display" ***NO APN, Please add***" as following picture.



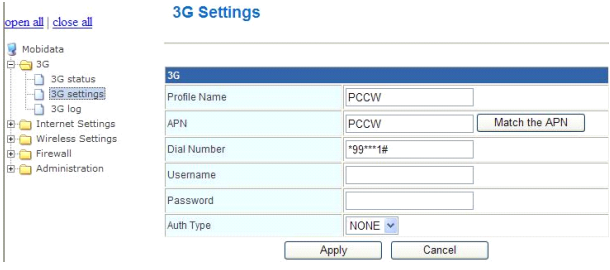
Then you need to create the network profile and apply the new network profile to this router manually as following picture.

For example, before using SIM card of HK PCCW, there's no network profile of HK PCCW in the predefined list,

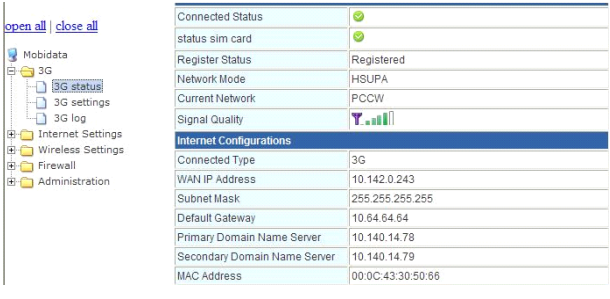




Create the network profile of HK PCCW manually.



After applying the profile, the router will auto restart 3G module to configure and connect wireless network.



(3) Modify incorrect network profile

Either no profile or incorrect profile cause failure connection to Internet.If the profile in predefined list is incorrect, please delete incorrect details and input correct details. After applying the router will use the new profile to configure network.

Remarks:

- If profile in the blank is incorrect, please match the APN, otherwise please modify them. It will be appreciated that you can send the correct profile to us.
- If there's no current network profile, the software will say "NO APN, please add" in black of profile name. Usually the authentication type is none; otherwise please refer to network operator's document.
- If it's correct setting, but failure connection, failure registering or no data volume, please check the balance of SIM card.
- Resetting will lose the setting you made manually, so after creating or modifying network profile please back up the settings. If you also reset other parameters, please also back up the new settings.
- Though MBD-R220H can support SIM hot swap, it is not suggested to plug out or change SIM card when router is powered.

(4) LAN configuration

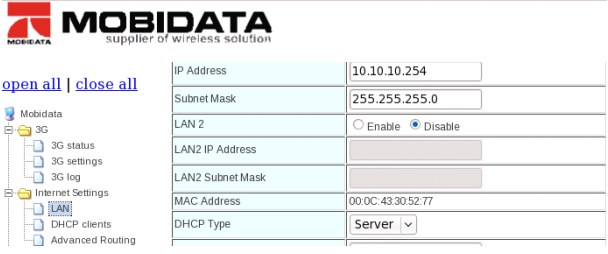
In this window you can modify the default configuration of accessing address, subnet mask and DHCP type which offers three ways to assign IP address, by DHCP IP pool, by lease time and by static assignation.

If you work out another different LAN network, please enable LAN2 to create VLAN.

If there're many bridging terminals, 802.11d Spanning Tree will make the MBD-R220H.

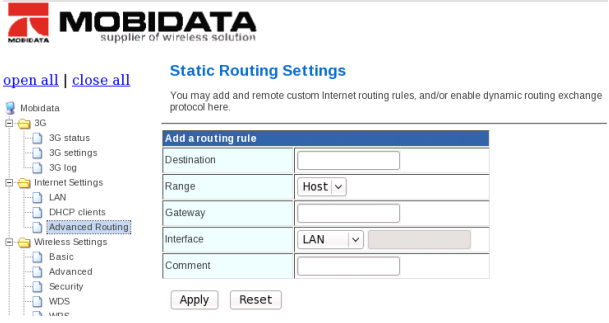
Through LLTD function, it's conveniently to check the network map. If there's problem with the connection, it's easy to find out on Windows Vista OS.

IGMP proxy, UPNP, PPPoE relay and router advertisement will make network users to share the network by approved accounts.



(5) Static routing settings

Besides dynamic routing, you can also add a static routing rule in work out the advanced routing for LAN or WIFI.



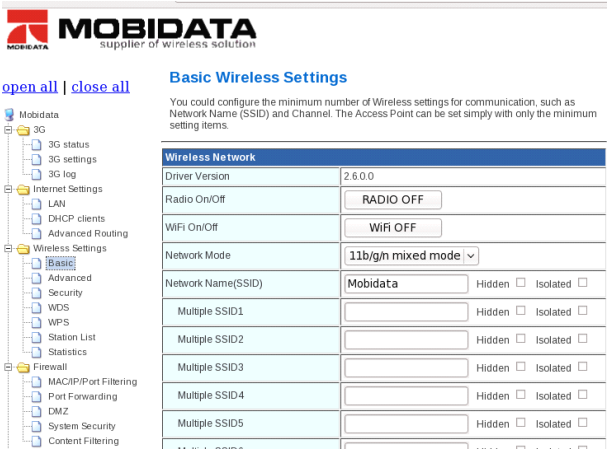
3.2.3 WIFI and WDS

(1) WIFI basic settings

MBD-R220H provides two ways to open and close WIFI. RADIO ON/OFF is based on bottom firmware, and the operation is equivalent to a hardware switch. WIFI ON/OFF is based on application software, and the operation is equivalent to enabling/disabling WIFI function. Based on multi network mode, 802.11b/g/n mixed mode is the default, while you can modify the network mode.

SSID (service set identifier) is a good function to distinguish

different WIFI network. And MBD-R220H provides multi-SSID operation, through which you can create different VLAN networks. Usually, the SSID function is enabled at default. HT physical mode is used for adjust the TX/RX, as is auto operation in MBD-220X.



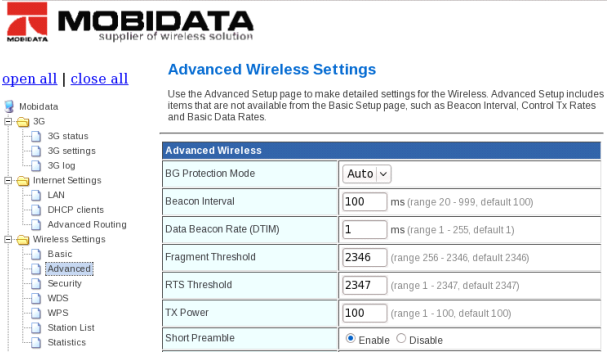
Remarks:

- 11b, 11g, 11b/g, 11n, 11b/g/n, these network modes conduct different transmission. Please make sure the terminals' network mode is same to MBD-R220H you set, otherwise the terminals could not receive the WIFI signal.
- Multi-SSID should be set in different name; different frequency and you can set 8 SSID at most on MBD-R220H. Through the function of hidden, Isolated, AP Isolation you can improve the security of VLAN network.

- If this function enabled, the users cannot visit each other.
- Usually it is not allowed to modify physical parameters.
- If you want to connect this router to a 802.11N network via WIFI connection, please set the router WIFI as "11g only" or "11b/g mixed mode", which will be used in WDS function.

(2) WIFI advanced settings

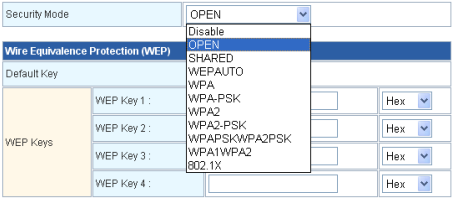
Advanced wireless is used for operation between two wireless stations, as is enabled in auto mode at default. Besides internet operation, MBD-R220H provides a WMM application, through which you can configure WMM with internet.

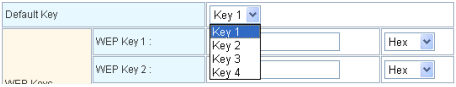


(3) WIFI security settings

In order to prohibit an unauthorized access or monitor to this router, it is suggested than you should enable the wireless encryption function and select a security mode to encrypt the wifi network. Before enabling the encryption, please select the SSID you set.

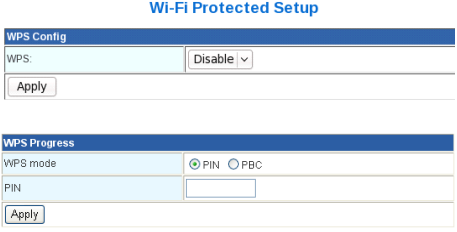
This router manager could support many different security way. Some of them can be set as group passwords, but you can not use the group passwords at the same time. Herein it is suggested that you might modify the passwords or security way in aperiodicity.





(4) WPS quick setting

1) **WPS** is a quick setting for wireless network. Usually there're two working mode, PIN and PBC.



a. **PIN Mode**

This mode used in creating connection by input generated PIN code of the router

First step: choose PIN mode, set down PIN code of the router, also can click <Generate> and generate new PIN code. As shown follow:

Second step: Open the network card software, choose PIN code to connect, and waiting for connecting after enter into the PIN code.

b. **PBC Mode**

This mode used in creating connection between router and network card by press the button.

First step: choose PBC mode, press the WPS button on network card, searching Wi-Fi signal.

Second step: press WPS button on router, and waiting for connection.

(5) WDS application

2) **WDS** means Wireless Distribution System, which can enlarge the coverage area of Wi-Fi signal. The function setting of WDS has main router and sub-router. Main router connects internet and Sub-router Bridge the main router so that enlarge the main router Wi-Fi signal. When the function of WDS set successful, either the main router or LAN/WAM on the sub-router or several ways of Wi-Fi can connect internet.

For example:

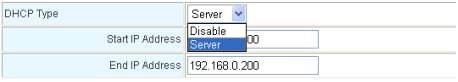
Note: maintain the parameter such as Wi-Fi channel, SSID, password be the same, when you set up the main router and sub-router.

a. Main router IP address: 192.168.0.1, enable DHCP, (shown as follows) select "repeat mode" on WDS mode, and fill sub-router MAC. (Shown as follows)

b. Sub-router IP address: 192.168.0.2, shut down DHCP (shown as follows), select "Repeat mode" on WDS mode, and fill main router MAC. (Shown as follows)

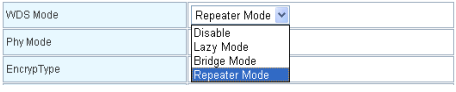
c. Other sub router, such as: Set up sub-n IP address: 192.168.0.n…

d. DHCP Open and Close: Access “Internet Settings”->”LAN”, open “Server”, and shut down “Disable”.



e. Set up main and sub-router MAC： Access “Wireless Setting”->“WDS”, shown as follows:

f. Router WDS mode selection, shown as follows:



g. Disable: shut down the function of router WDS

h. Lazy Mode: the main router need not set up sub-router MAC, sub-router set up the main router MAC only

i. Bridge Mode: this mode can be adopted by sub-router only, and enter into main router MAC

l. Repeater Mode: main router connects Internet, and enters sub-router MAC; sub-router enters into the main router MAC.

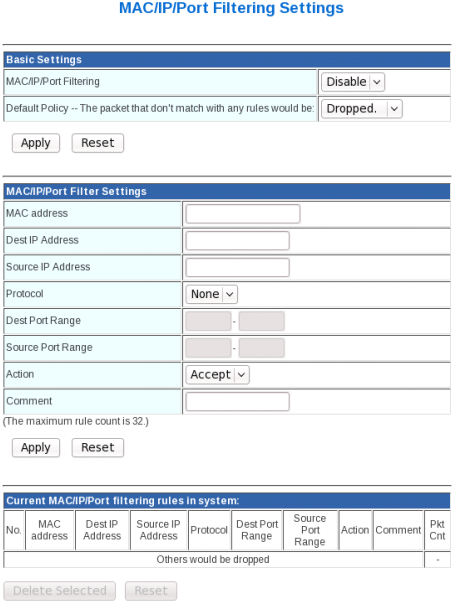
Remarks:

- When the connection succeed, you can connect by LAN/WAN or Wi-Fi three modes is belong to the same LAN network, and IP address will be distributed by main router

3.2.4 Firewall and router security

(1) MAC/IP/Port Filtering

Before setting you need to enable MAC/IP/Port Filtering function and select a filtering policy.



Remarks:

- Only choose one of the ways from IP address bar and MAC address bar, can not fill it at the same time.
- Source IP address: the computer IP address is controlled in LAN network, if none it means all computer of LAN.
- Destination IP address: IP address of WAN, stand for the whole WAN network if the text is empty
- Destination port: WAN control computer IP address for corresponding port server and input ports or port range

For example:

Forbidding IP 192.168.0.100 on the internet in computer

Enter 192.168.0.100 into IP address text box, after click <Apply>, the forbidding IP address will be shown on the table,

shown as follows:

Current MAC/IP/Port filtering rules in system:

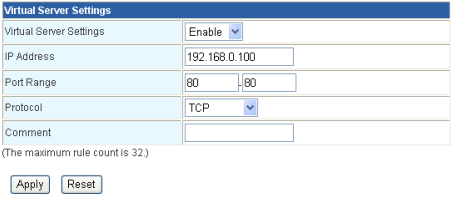
No.	MAC address	Dest IP Address	Source IP Address	Protocol	Dest Port Range	Source Port Range	Action	Comment	Pkt Cnt
1 ☐	-	-	192.168.0.100	-	-	-	Drop		-
Others would be accepted									-

Delete Selected Reset

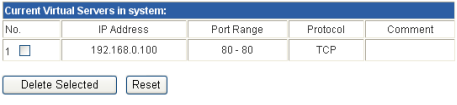
The conditions of above demonstration: firewall choose "Enable", filtering rule choose "Dropped", and the way of setting on MAC address and IP address must be the same, the form is: "00:00:00:00:00:00"

(2) Port Forwarding

Enable the port service from one computer within the LAN, such as mail, FTP and so on; public network can visit the service directly, the setting shown as follows

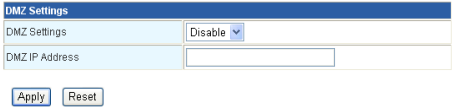


Shown as follows when add up:



(3) DMZ

After Set up DMZ in one computer on LAN, input router WAN IP address, the WAN can access this computer directly, and not affect other computers of LAN. If use this function, choose "Enable", input the IP address from one computer, it come into effect when click "Apply", shown as follows:

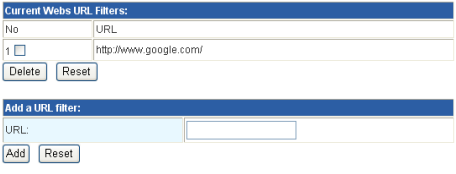


(4) Content Filtering

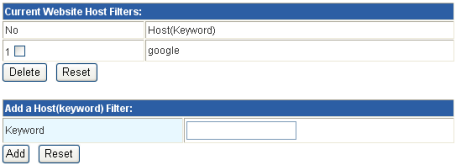
1） Plug-in programs Filtering. Filtering the contents on HTTP can prevent Proxy deputy, Java program, ActiveX components invading. Firewall can clean the contents away from the HTTP, and protect computers from aggressive plugins, program and some hidden virus.

Setting shown as follows, choose the contents to filter, and it will come into effect after click "Apply".

（2）Website Filtering. The web server could work on both HTTP and FTP.



3） Keyword Filtering.

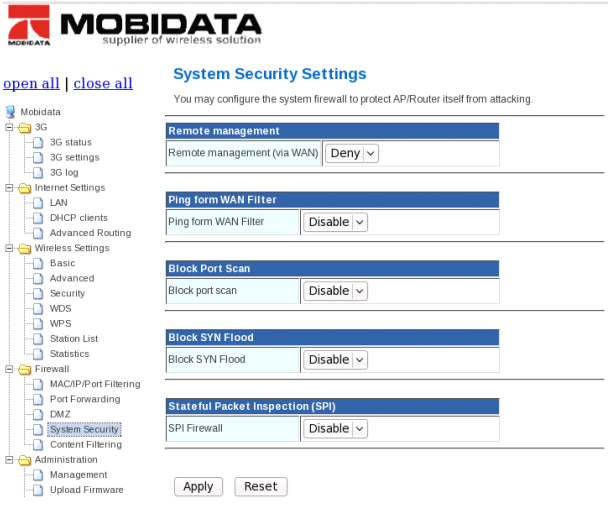


(5) Router security

1) **Remote management and Ping from WAN** are used for accessing router from WAN internet, as is not allowed in MBD-R220H router.

2) **Block port scan and SYN flood** are used for protect unexpected data lose, and the operation is disabled at default. If require, you can enable this function.

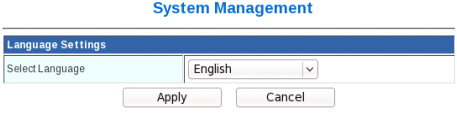
3) **SPI** is a router inspection function, which may affect the efficiency of data transmission.

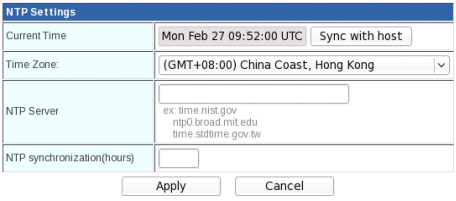


3.2.5 System Management

(1) Language and time

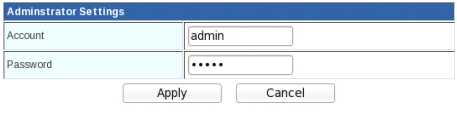
This web server can support English, simple Chinese and traditional Chinese. The default language is English.





(2) User name and password

In order to prevent an unauthorized access to this router, it is suggested please change a new user name and password before you create a sharing network. The default user name and password are admin.

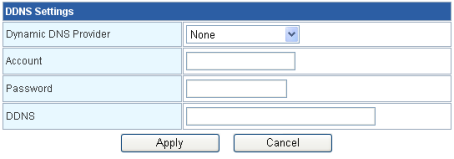


Remarks:

- If you forget the user name and password, please go to the rear side of the router and press the reset button to reset the router.
- Resetting function will load the factory settings, which will lost all parameters you set.

(3) DDNS

This router can support DDNS (Dynamic Domain Name Server) function, through which it is convenient to access the router from public network by fixed domain bound with the router IP address.



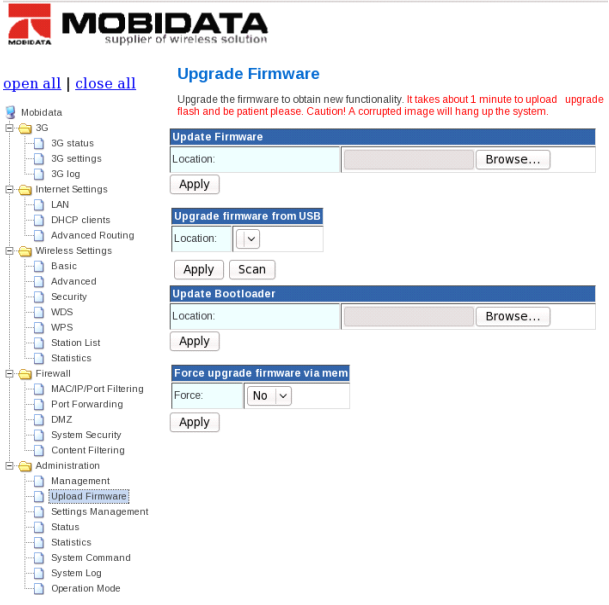
Remarks:

- Because the IP from the router is not fixed, so it is not convenient for public computers to visit the router by dynamic IP address. After fixed DDNS, it can be visited once put into domain, and the router can sent dynamic IP address to DDNS server and analyze.
- Router provides many DDNS providers, that is Dyndns.org, freedns.afraid.org, www.zoneedit.com, www.no-ip.com to choose.

(4) Upload Firmware

There’re two interfaces for updating router, one is firmware update, and the other is boot-loader update. Boot-loader is the bottom firmware, which is not allowed to modify for end users. Just when

debugging router, the engineers will use the boot-loader update. If there's an update version of web server from the manufacturer, you can update the router via this firmware update interface. Please pay more attention on update; incorrect update will collapse the router.



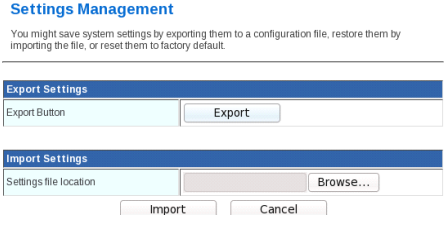
Remarks:

- Please make sure the update is correct version and official release.

- Update will lose all the parameters you set before, so if no need update, which is not suggested.
- During updating, please make sure the router works on uninterrupted power supply, otherwise sudden power-off will collapse the router.
- After select the update files, please don't "Apply" ceaselessly, otherwise the router might collapse.
- After update if the router collapses, please contact the distributors.
- MBD-R220H can not support X-WRT, so please do not upload the WRT firmware which will collapse the router.

(5) Bake up settings

Both resetting router and add new settings will lose the settings you made, so it is suggested that please back up the settings.



(6) Load factory defaults

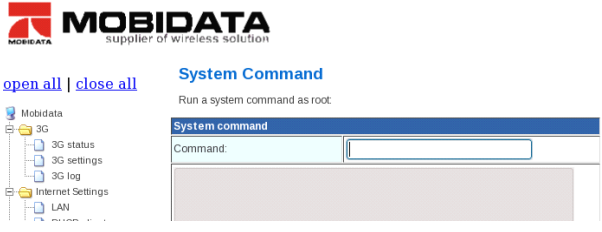
Choose "Load Factory Defaults" and press reset button at the back of router, the system will be restarted and recovered default settings,

(7) Troubleshot by command

Sometimes the industrial module doesn't work fine because of unexpected bug in system, and then you can check and reset the industrial module manually.

For example through below commands you will see the signal quality.

Serial_app /dev/ttyUSB1 AT+CSQ



Remarks:

- Unexpected commands operation, of unofficial commands may collapse industrial module. It's now allowed to use this command function, unless it is required.

3.3 Web server compatibility

The windows might be a little different when you access web server from different browser. So far the web server can be compatible with Microsoft Internet Explorer 6.0, and higher version, Firefox 1.0 and higher version, Opera 9.0 and higher version.

4. Appendix Q&A

1. No SIM card

Please plug out SIM tray and insert SIM card in correct way.

Please check whether the SIM card has been damaged or out of service.

Please reset the router.

2. SIM card recognized, no internet connection

Please check the network profile of 3G.

Please check the network signals.

Please check whether the SIM card support data service.

Please restart the software by web server.

3. Internet connected, no volume stream

Please check the balance of SIM card.

Please check whether the terminals have connected to router successfully.

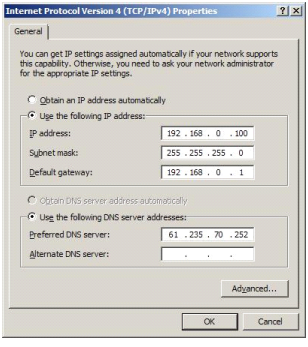
4. Limited LAN/WIFI connection, or no LAN/WIFI connection to router

Please sure the WIFI card and Ethernet card of terminals have been enabled.

Please check whether the Ethernet cable has been damaged.

Please sure the DHCP function of the router is enabled.

If DHCP server is enabled and the terminal is auto configuration, please reconnect the LAN or WIFI connection. Otherwise please fill the terminals IP address manually. When using fixed IP address, the terminal's IP address and the router's IP address must in same IP segment.



5. No WPS function

You need to install the quick setting software on your terminal.

6. Plugging out SIM card when router is working.

It's not allowed to take our SIM card when router is working, which might damage the router.

7. How many users he router can support?

Theoretically, the router could support 30 visitors online simultaneously, while as known too many users will sharply decrease the internet transmission rate. Usually if the visitor use router for browsing web pages, it is suggested 10 or less users

online simultaneously.

8. How to backup the web server and parameters?

available

9. Online update

Not available

10. Router working logs

Available

11. WAN ping function

Before sending ping command to router from public network computer, you need enable WAN ping in web server.

12. Remote web management

Before managing web servers remotely please enable remote management and WAN ping firstly, then enable DDNS server. By this fixed domain name you can visit the router remotely.

13. How to change the port of web management

Available

14. Trouble shot

Available

15. How to save new network profile

The new network profile you create or update will be stored in buffer. However after resetting router, all the parameters will be lost.

16. How to disconnect 3G connection manually

3G is the default connection. As long as SIM card available inside and powered, the router will be always online, unless you plug out

SIM card.

17. Reconnection function

When fail to connect internet or disconnect temporally, the router will reconnect automatically. However if there's no SIM card, the reconnection function will not work.

18. How to use wired WAN , PPPOE, L2TP, PPTP?

Not available

19. Telnet

Support

20. Fail to enter into Web server

Please check the connection to router.

Please reset router manually.

21. "UNKNOW" network operator

Please clear the buffer of IE, then reset the router manually.