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HLK-RM04 User Manual

ETHERNET

WIFI

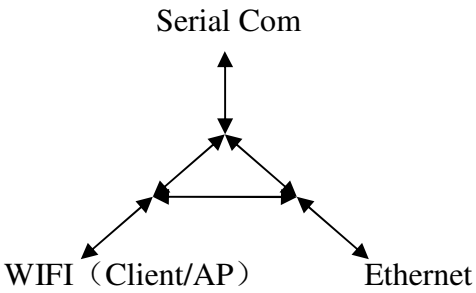
Full Function Serial Network/Wireless Module

1 Brief Introduction

HLK-RM04 is a new low-cost embedded UART-ETH-WIFI module (serial port - Ethernet - Wireless network) developed by Shenzhen Hi-Link Electronic co., Ltd

This product is an embedded module based on the universal serial interface network standard, built-in TCP / IP protocol stack, enabling the user serial port, Ethernet, wireless network (wifi) interface between the conversions.

Through the HLK-RM04 module, the traditional serial devices do not need to change any configuration; data can be transmitted through the Internet network. Provide a quick solution for the user's serial devices to transfer data via Ethernet.



Picture1.F-structure

2 Summarize

2.1 Technical Specifications

Table2-1Technical Specifications

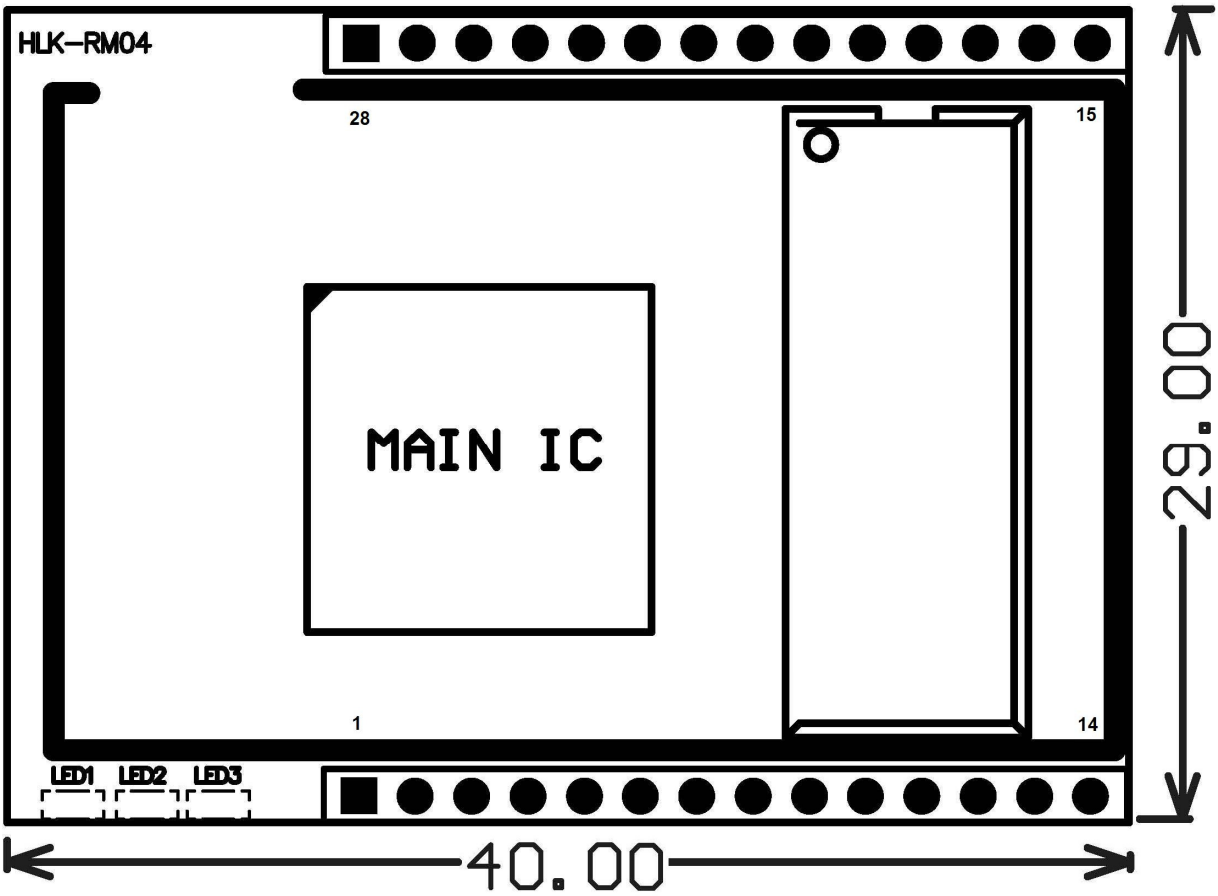
Network standard	wireless：IEEE 802.11n、IEEE 802.11g、IEEE 802.11b
	wired：IEEE 802.3、IEEE 802.3u
Wireless transmission rate	11n: maximum up to 150Mbps 11g: maximum up to 54Mbps 11b: maximum up to 11Mbps
Tracks number	1-14
Frequency range	2.4-2.4835G
Emission power	12-15DBM
Interface	1 个 10/100Mbps LAN/WAN multiplex interface、interface
Antenna	
Antenna type	Onboard antenna / External Antenna

Functional Parameters	
WIFI work mode	Client/AP/Router
WDS Function	Support WDS wireless bridge connection
Wireless security	Wireless MAC address filtering
	Wireless security function switch
	64/128/152 bit WEP encryption
	WPA-PSK/WPA2-PSK、WPA/WPA2 security mechanism
Network management	Remote Web management
	Configuration file import and export
	WEB software upgrade
Serial to Network	
Maximum transmission rate	230400bps
TCP connection	Max connection number>20
UDP connection	Max connection number>20
Serial baud rate	50~230400bps
Other Parameters	
Status indicator	Status indicator
Environmental standard	Operating temperature：-20-70℃
	Operating humidity：10%-90%RH（結露なし）
	Storage temperature：-40-80℃
	Storage humidity：5%-90%RH（結露なし）
Additional properties	Frequency bandwidth optional：20MHz、40MHz，自動

2.2 Hardware Explanation

2.2.1 Mechanical Dimensions

HLK-RM04 Mechanical Dimensions is shown in the following picture：



Picture2.Dimensions Unit:mm

2.2.1.1 Contact Pin Interface

The Pin of this product as shown above is defined as follows:

Table2-2 module pin interface

No.	Function	Direction	Explanation
1	VCC5V	A	Supply Voltage, 5V+/-10%
2	GND	GND	Analogue Ground
3	WIFILED	O	WLAN Activity LED
4	VO3.3	I	3.3V Output (Suuport Atmost 300mA)
5	LINK1	I/O	10/100 PHY Port #1 activity LED
6	N/A		Reserved
7	N/A		Reserved
8	GPIO0		General GPIO Reserved
9	GPIO1		General GPIO Reserved
10	ES/RST	I/O	Exit transparent transmission mode/Restore factory

			value
11	TXOP1	I/O	10/100 PHY Port #1 TXP
12	TXON1	I/O	10/100 PHY Port #1 TXN
13	RXIP2	I/O	10/100 PHY Port #2 TXP
14	RXIN2	I/O	10/100 PHY Port #2 TXN
15	RXIN1	I/O	10/100 PHY Port #1 RXN
16	RXIP1	I/O	10/100 PHY Port #1 RXP
17	TXON2	I/O	10/100 PHY Port #2 OXN
18	TXOP2	I/O	10/100 PHY Port #2 OXP
19	GPIO2	I	General GPIO Reserved
20	UART_RX	I	UART RXD.
21	UART_TX	0	UART TXD.
22	GPIO3	I	General GPIO Reserved
23	LINK2	I/O	10/100 PHY Port #2 activity LED
24	GPIO4	0	General GPIO Reserved
25	WPS/RST	I	WiFi Protected Setup /Restore factory value
26	GPIO5	0	General GPIO Reserved
27	VO1.8	Power Out	1.8V Output (Suuport Atmost 300mA)
28	VCC5V	Power In	Supply Voltage, 5V+/-10%

3 Quick Start

3.1 Restore factory settings

In order to ensure that all of configuration process is correct, bringing the module to restore the factory settings firstly. Factory mode, the module can skip this step. Above 5V (500mA) to power the module on the power, wait about 2.5 minutes for the system to start, after the start completion, pulled ES / RST pin down and make it surpass Trst, release ES / RST pin, the system will automatically restart. After rebooting, the system is already in Factory mode.

3.2 Configurate network parameter

Set the PC to static IP mode and then connect it with the module via Ethernet or wifi. The IP address is set to 192.168.16.100/255.255.255.0, gateway 192.168.16.254. The (wifi default ssid and the default password, see this document.) open the browser http://192.168.16.254, enter the web

configuration page, default user name and password is admin / admin. Modify the network parameters through the web. Now, the module's IP address is 192.168.16.254. Configuration details can be seen in 5.1.

3.3 Configurate serial network parameter

Opens the browser **http://192.168.16.254/ser2net.asp**, enter the serial-to-network web configuration page. Configure the serial-to-network parameters as needed through a web page. Configuration details can be seen in 5.2.

4 Parameter configuration direction

The module provides two ways for the configuration parameters：

1.Web page；

2. Serial AT command.

Access to WEB configuration page requires the confirmation of the module's IP addresses, as well as the user name and password that authenticated by WEB.

Configurating parameters through the serial port AT command needs to make the module into the AT command mode first.

5 WEB configuration

Through the correct module address,you can access to the WEB configuration page.

5.1 WEB network configuration

Detailed information can refer to**<<HI-LINK Router User manual>>**

5.2 WEB serial configuration

Serial Web configuration page:192.168.16.245/ser2net.asp is as follows：

Serial Settings

	Current	Updated
Serial Configure:	115200,8,n,1	115200,8,n,1
Serial Framing Lenth:	64	64
Serial Framing Timeout:	10 milliseconds	10 milliseconds (< 256, 0 for no timeout)
Network Mode:	client	Client
Remote Server Domain/IP:	192.168.11.245	192.168.11.245
Locale/Remote Port Number:	8080	8080
Network Protocol:	udp	UDP
Network Timeout:	0 seconds	0 seconds (< 256, 0 for no timeout)
		Submit

Current shows the current configuration , **Updated** shows the current revision parameters。**Submit** submit the revision.

Serial Configure：Serial configuration. fomat：Baud rate, data bits, parity bit, stop bit.
For example：“115200, 8, n, 1”.

Serial Framing Lenth：The Lenth of Serial Framing

Serial Framing Timeout：The time of Serial Framing

Network Mode：choose Client、Server or none。

Remote Server Domain/IP：Remote Server Domain/IP address
For exmpale：192.168.11.245.

Locale/Remote Port Number：The specified parameter is not the same under the different network modes. Client specifies the port number on the remote, Server specified local port number.

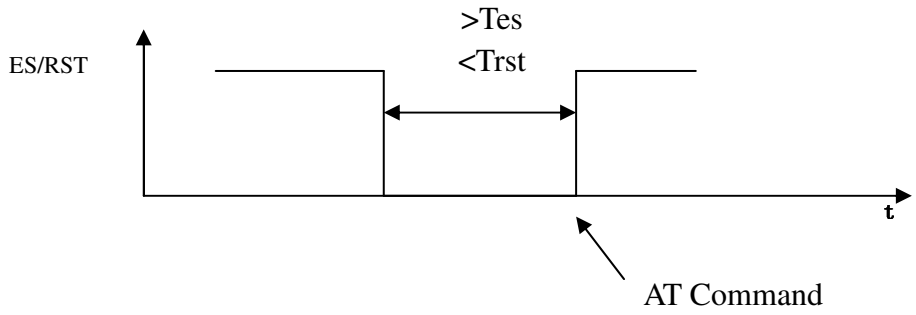
Network Protocol：Use tcp or udp Protocol

Network Timeout：Under the server network mode, no data transmission within the timeout period, the connection will be disconnected. 0 specifies never disconnected.

6 Serial AT command configuration

6.1 Access to AT command mode

Module in network fault, such as fault allocation situation will automatically exit the transparent transmission mode, enter AT instruction mode. In any condition, keep ES/RST feet low level of time but more than Tes and less than Trst, the module will enter AT instruction mode immediately.



6.2 AT Command

In AT mode, you can configurate the system parameters through the serial port AT instruction. Instruction format is as follows:

At+[command]=[value]\r

According to the different command, module will return a different return value.

For example: "at+remoteip=192.168.11.133\n" set remote ip address as 192.168.11.133.

For example: "at+remoteip=? \n" Inquiry remote ip address.

At command is as follows:

ver	The version of module
remoteip	Remote server domain name or IP address
remoteport	The local or distal port number

remotepro	Network Protocol type
timeout	Network timeout
mode	Network mode
uart	Serial port configuration
uartpacklen	Serial group frame length
uartpacktimeout	Serial framing time
save	Save the configuration and start service
reconn	Restart services

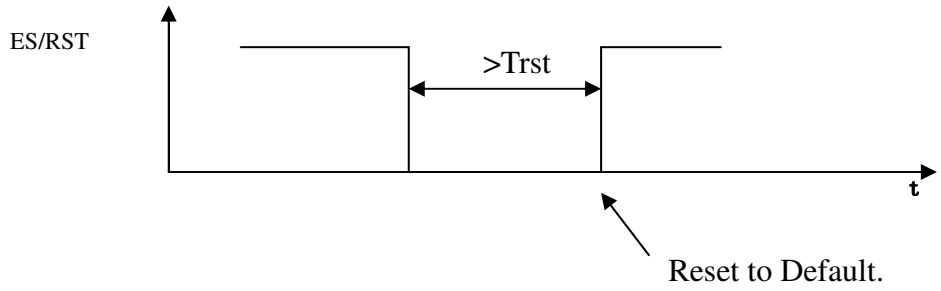
Parameter definition is consistent with the web configuration parameter.

7 Restore factory Settings

Support the following ways to restore the factory settings

1. Through the Web page.

2 By keeping the ES/RST pin low level time greater than Trst.



Factory setting parameter values, see the following list:

IP address	192.168.16.254
Web username/password	admin/admin
Wifi password	12345678
Serial Configure	115200, 8, n, 1
Serial Framing Lenth	64
Serial Framing Timeout	10
Network Mode	Server
Remote Server Domain/IP:	192.168.11.245
Locale/Remote Port Number	8080
Network Protocol	TCP
Network Timeout	0

Tes	100ms
Trst	5s

8 Firmware upgrade

1. Restore the factory value.
2. Pc can connect with module through Ethernet, ip: 192.168.16.123/255.255.255.0. Browser visits 192.168.16.254. Username / password: admin / admin.

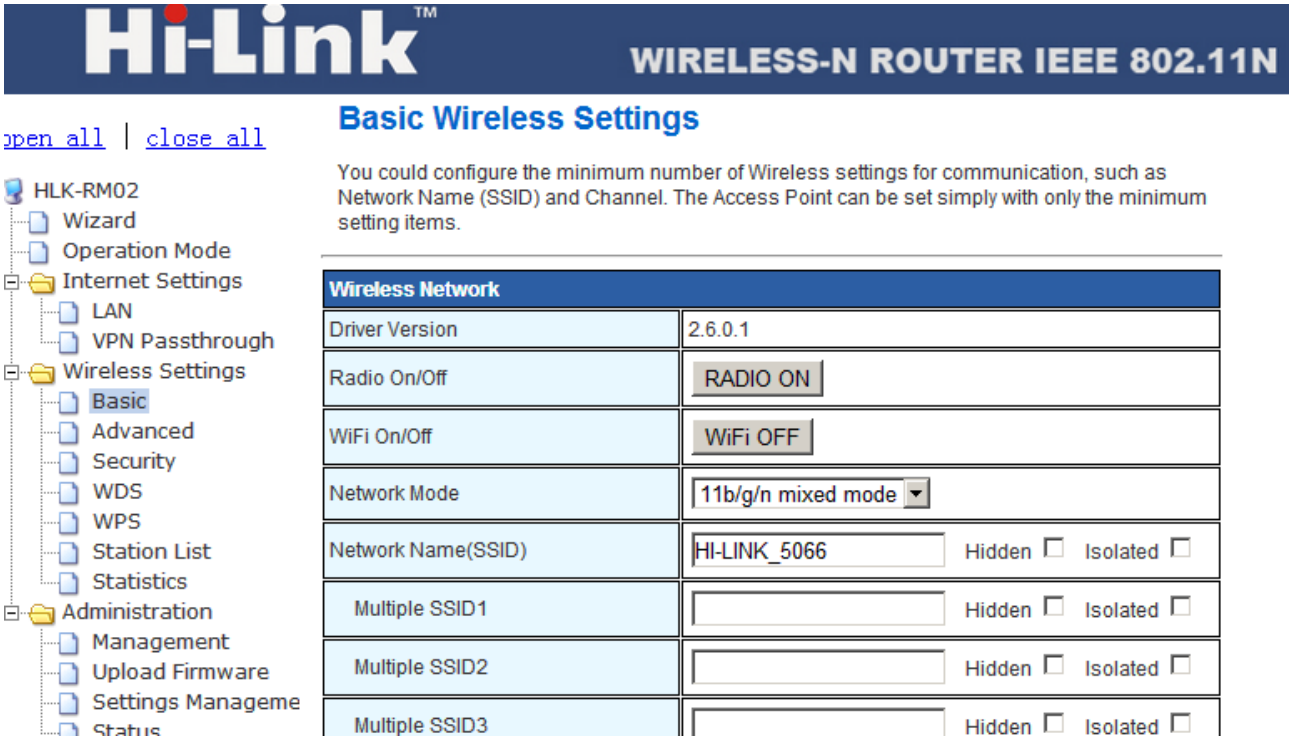
3. Open the following page. Select the appropriate firmware, click apply upgrades. Wait about 3 minutes. Can not cut out the upgrade process, otherwise it may cause damage to the module.

9 Typical application network settings

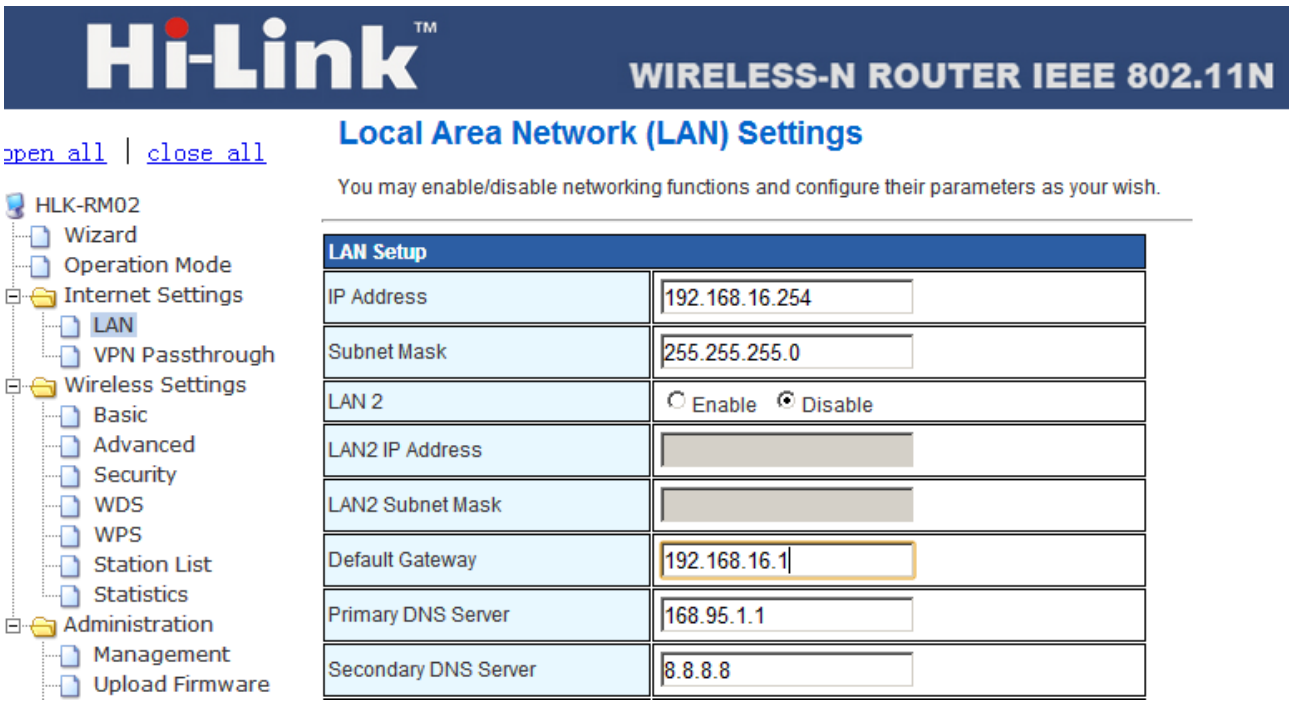
This section will give some simple examples to use the different functions of a typical configuration.

9.1 Serial to Ethernet

1. Restore factory value setting.
2. Pc can connect with module through Ethernet, ip: 192.168.16.123/255.255.255.0. Browser visits 192.168.16.254. Username / password: admin / admin.
3. Open the following page, click on the RADIO OFF button to turn off wifi function, shown as below. Clicks APPLY to take effect.



4. Open the following page. This page allows you to modify the the LAN port parameters. Set Ethernet ip address, gateway, dns server information, click apply to take effect.



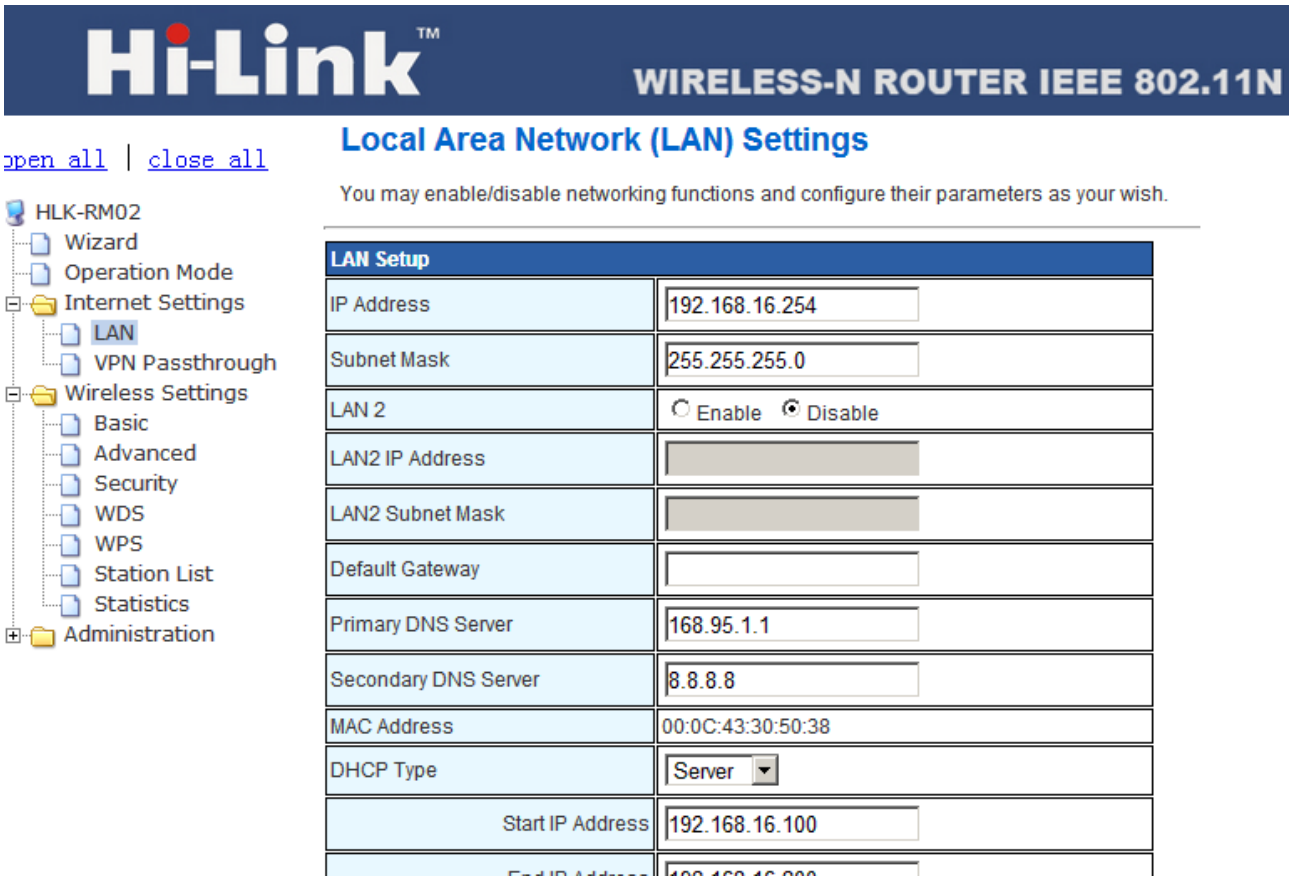
5. At this moment, you must use new ip address to access the web page.

9.1 Serial to wifi（ap）

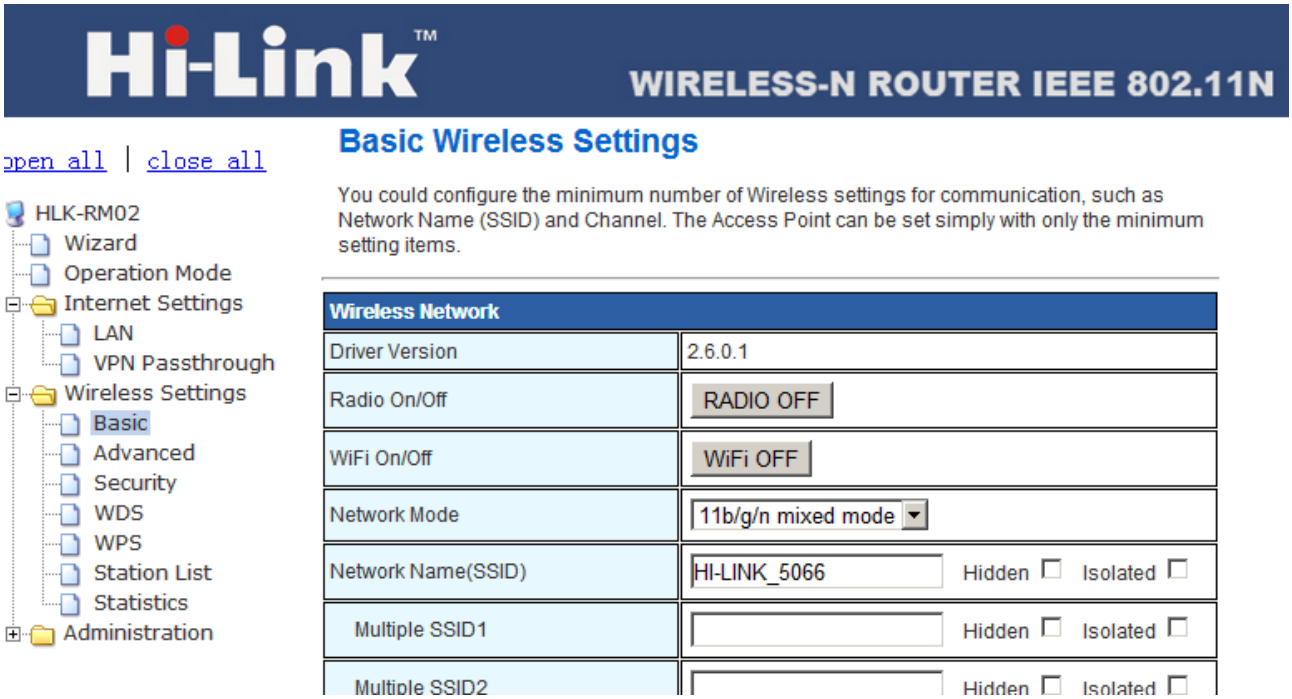
1. Restore factory value setting.

2. Pc can connect with module through Ethernet, ip: 192.168.16.123/255.255.255.0. Browser visits 192.168.16.254. Username / password: admin / admin.

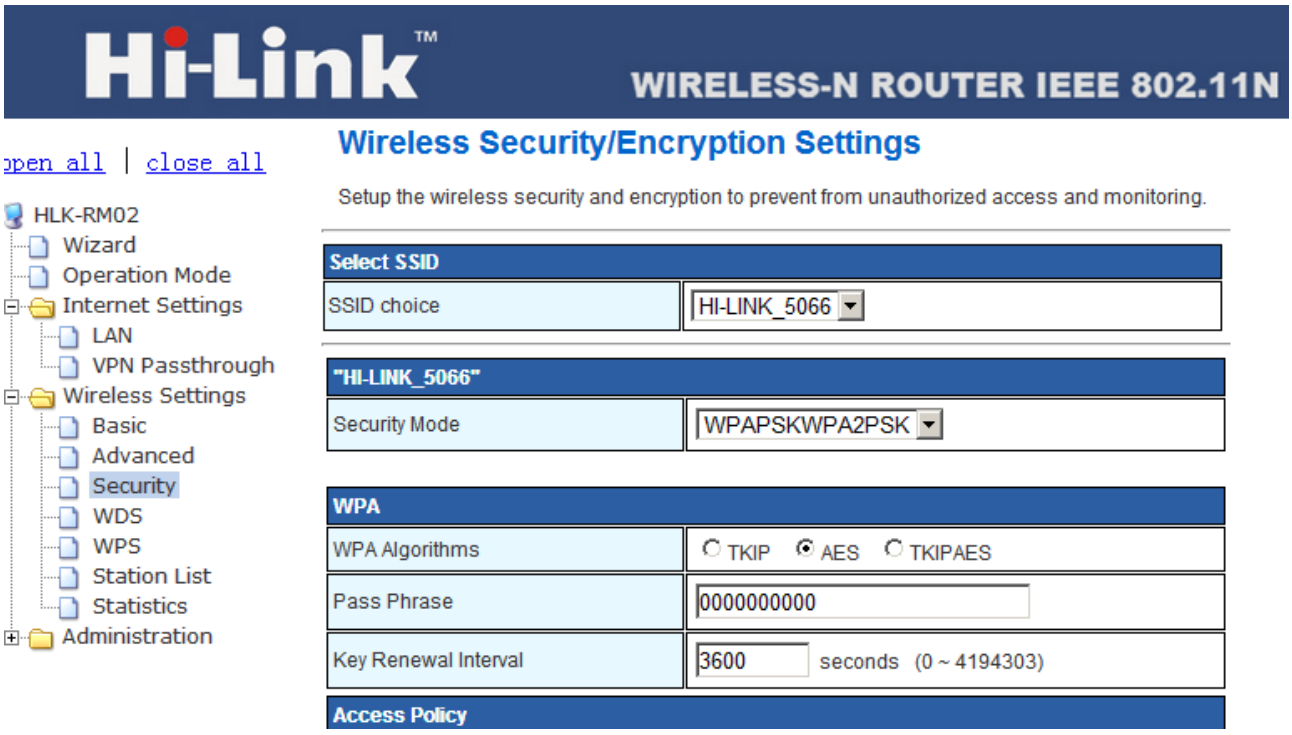
3. Open the following page, dhcp type opens the server function. Click APPLY enable. This page allows you to modify the the LAN port parameters.



4. Open the following page. Through this page, you can modify wifi basic configuration



5. Open the following page. This page can modify the wifi security related function. You can modify the wifi key. Clicks APPLY to take effect.



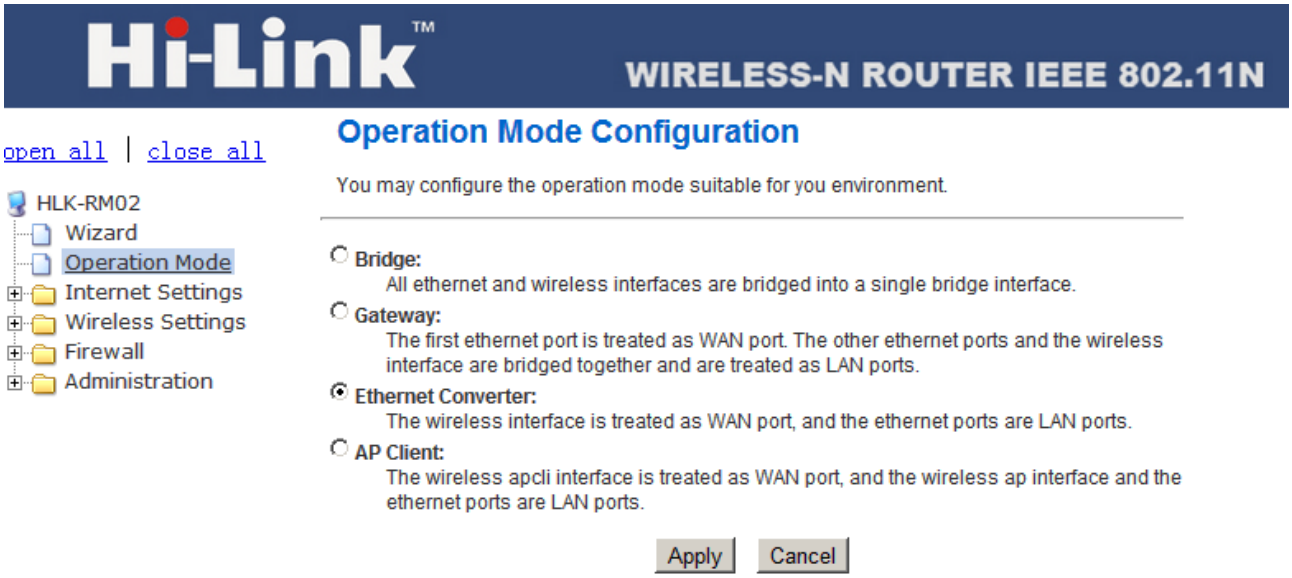
6. At this point, connected to the module by other wifi devices. Module IP: 192.168.16.254.

9.2 Serial to wifi（client）

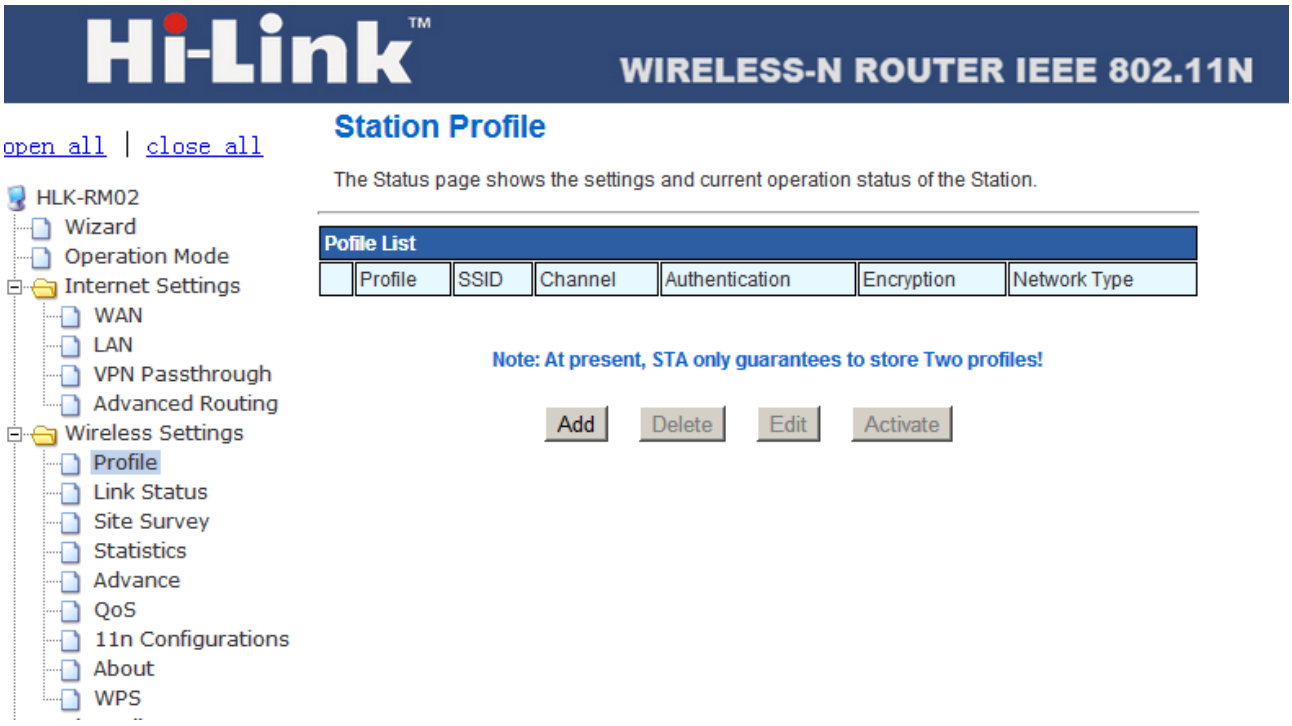
1. Restore factory value setting.

2. Pc can connect with module through Ethernet, ip: 192.168.16.123/255.255.255.0. Using Browser to access to 192.168.16.254. Username / password: admin / admin.

3. Open the following page, set to Ethernet Converter mode.Click on the APPLY to take effect.



4. Open the following page.Click APPLY to increase AP information.



5. Pop-up the following dialog box.Fill in SSID, encryption, key information.Click on the apply effect.

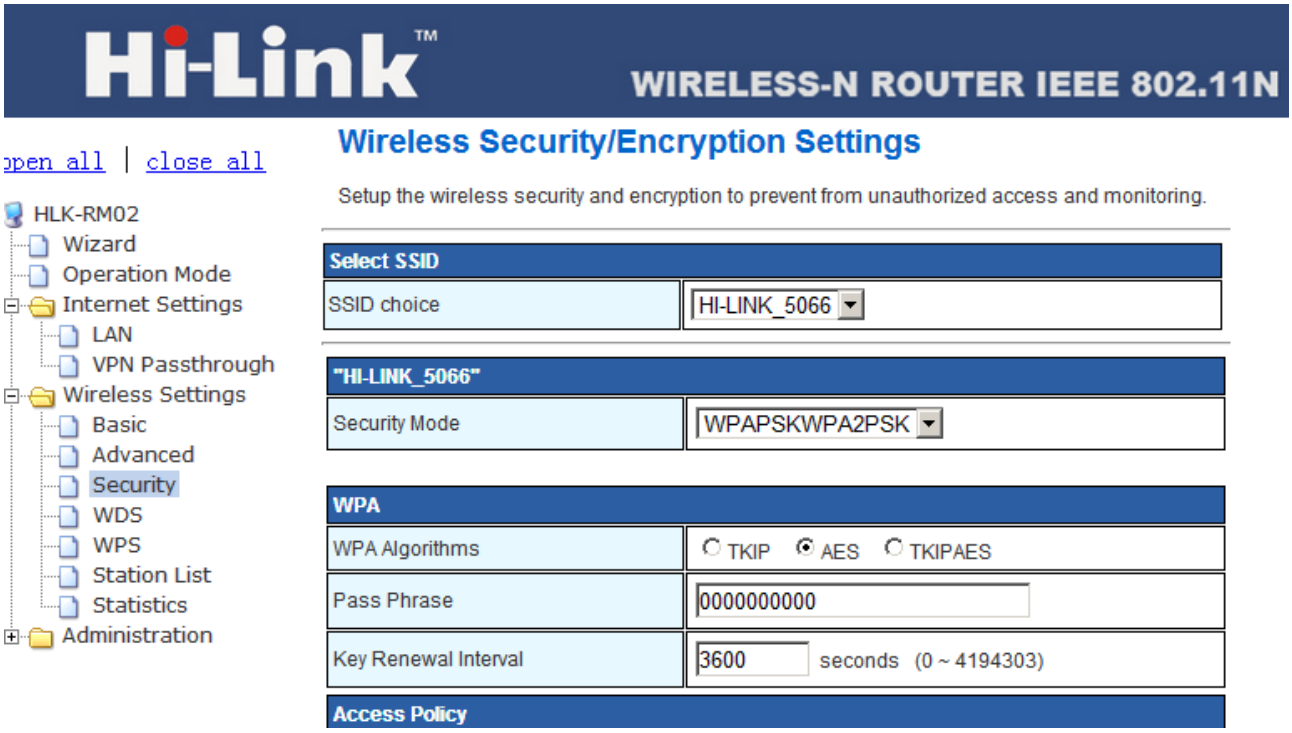
System Configuration	
Profile Name	PROF001
SSID	
Network Type	Infrastructure
Power Saving Mode	CAM (Constantly Awake Mode) Power Saving Mode
RTS Threshold	Used 2347 (range 1 - 2347, default 2347)
Fragment Threshold	Used 2346 (range 256 - 2346, default 2346)

Security Policy	
Security Mode	OPEN
Encryption Mode	NONE

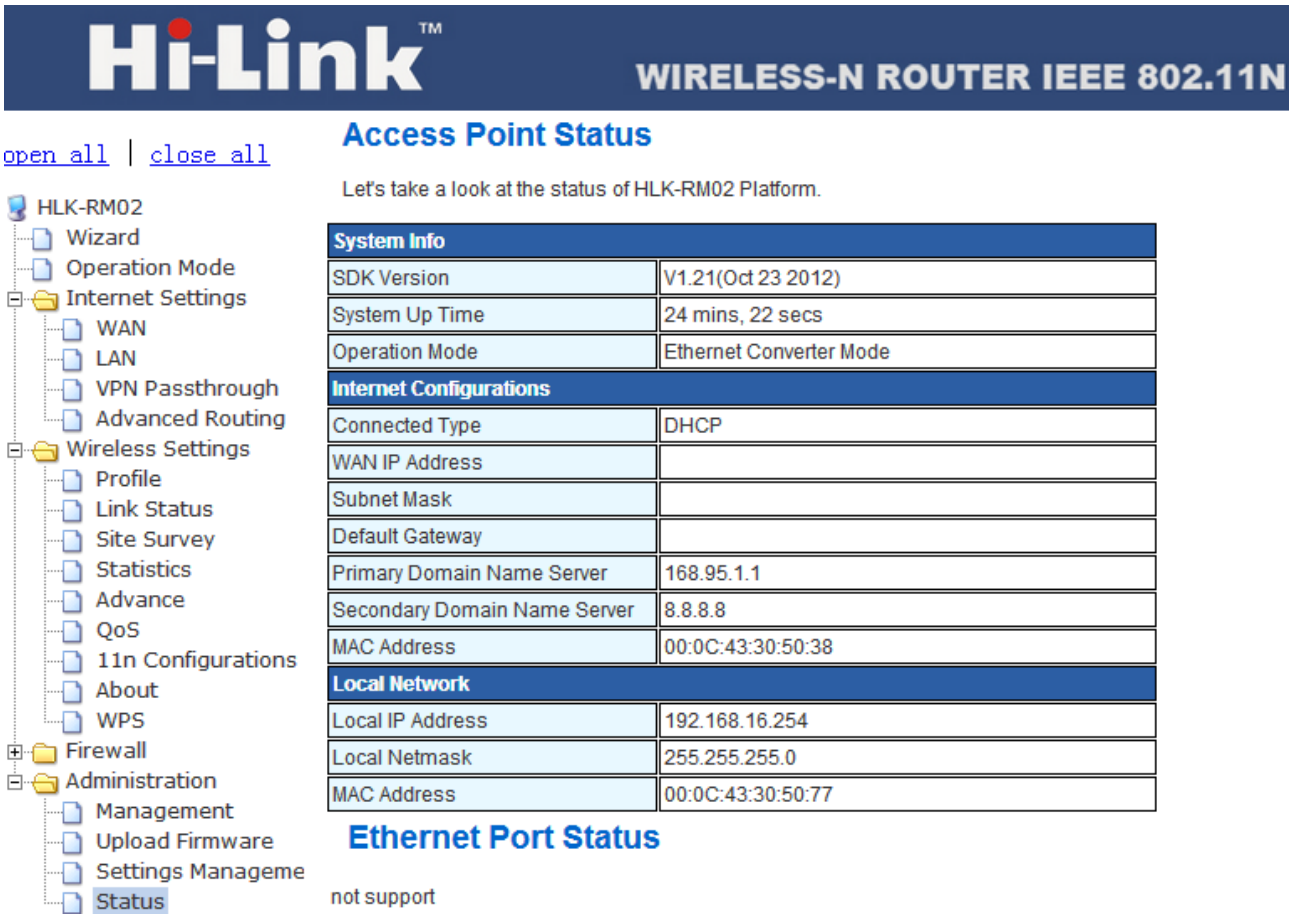
This is no any security. Are you sure to connect AP?

Apply Cancel

6. Open the following page.This page can modify the WiFi security related function.You can modify the WiFi key.Click on the APPLY effect.



7. Open the following page, view IP information of the module.Wan IP address is the ip.If no IP address appears, it means disconnected to AP.



Appendix A document revision record

Version number	Revision range	Date
1.00	Draft version	2012-9-10