HLK-RM08K User Manual

ETHERNET

WIFI

Full Function Serial Network/Wireless Module

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1. BRIEF INTRODUCTION

HLK-RM08K is a new low-cost embedded UART-ETH-WIFI module (serial port - Ethernet - Wireless network) developed by Shenzhen Hi-Link (HK) co., Ltd.

The product is a low power consumption WIFI module,supports EEE802.11b/g/n wireless protocol with small size and smart use,ully transparent transmission UART module, built-in TCP / IP protocol stack, enabling users short development cycle. It just needs host computer,WEB browser or APP to set up parameters, making the connection between UART and network.

HLK-RM08K has stable performance and flexible use, meeting kinds of requirements of users. and strong technical supports could be provided. Also, it could be customized,such as WEB interface ,mobile phone app and so on.
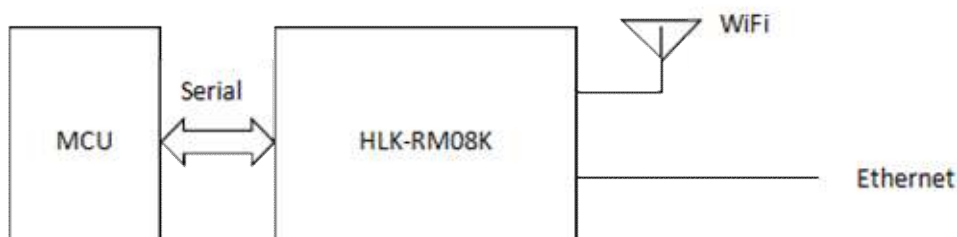

Diagram 1. Function structure

2. HARDWARE EXPLANATION

2.1 Meachanical Dimentsions

| Top view | Bottom view |

Note：pitch of holes 2.0mm, pitch of holes 0.7mm.

Dimensions：40mm(length）X 29mm(width) X 2.9mm(height)

2.2 Pin Definitions

No.	FUNCTION	DIRECTION	DESCRIPTION
1	CTS1/G0	I/0	CTS1
2	WDG	0	Watchdog
3	CTS0/G1	I/0	CTS0
4	RTS0/G2	I/0	RTS0
5	RES0	–	(Reserved)
6	RES1	–	(Reserved)
7	RES2	–	(Reserved)
8	GND	Power	GND
9	WLED_N	0	WiFi LED(activate low)
10	VDD_0	Power Out	3.3v OUTUP
11	EL4/G3	I/0	ETH 4 LED
12	RES3	–	(Reserved)
13	RES4	–	(Reserved)
14	RES5	–	(Reserved)
15	RES6	–	(Reserved)
16	ES0	I	ES0
17	TXN4/G4	A	TXN4
18	TXP4/G5	A	TXP4
19	RXP0	A	RXP0
20	RXN0	A	RXN0
21	TXP1/G6	A	TXP1
22	TXN1/G7	A	TXN1
23	RXP1/G8	A	RXP1
24	RXN1/G9	A	RXN1
25	RXP2/G10	A	RXP2
26	RXN2/G11	A	RXN2
27	TXP2/G12	A	TXP2
28	TXN2/G13	A	TXN2
29	TXP3/G14	A	TXP3
30	TXN3/G15	A	TXN3
31	RXP3/G16	A	RXP3

| 32	RXN3/G17	A	RXN3
33	RXP4/G18	A	RXP4
34	RXN4/G19	A	RXN4
35	TXN0	A	TXN0
36	TXP0	A	TXP0
37	INT	O	INTERRUPT （Reserved）
38	RX0	I	RX0
39	TX0	O	TX0
40	RX1/PWM0	I/O	RX1
41	ELED0	O	ETH 0 LED(activate low)
42	RST	I	Reset
43	ES1	I	ES1
44	TX1/PWM1	I/O	TX1
45	G20	I/O	GPIO20 （Reserved）
46	VCC	POWER	5V INPUT
47	EL1/G21	I/O	ETH 1 LED
48	EL2/G22	I/O	ETH 2 LED
49	EL3/G23	I/O	ETH 3 LED
50	GND	Power	GND
51	RES7	–	（Reserved）
52	RTS1/G24	I/O	RTS1

Note: reserved pin is currently not used,please hang!

ES0 Function Introductions ：

1. After System boot, ES0 keep the lower level time 0.05s<t<6s, Serial 0 exit transparent transmission.

2. After System boot, ES0 keep the lower level time 6s<t<12s, client settings reset.

3. On electic ES0 is a lower level, the lower level time 6s<t<12s, client settings reset.

ES1 Function Introductions ：

1. After System boot, ES1 keep the lower level time 0.05s<t<6s, Serial 1 exit transparent transmission.

2. After System boot, ES1 keep thelower level time 6s<t<12s,factory reset.

Parameter storage :
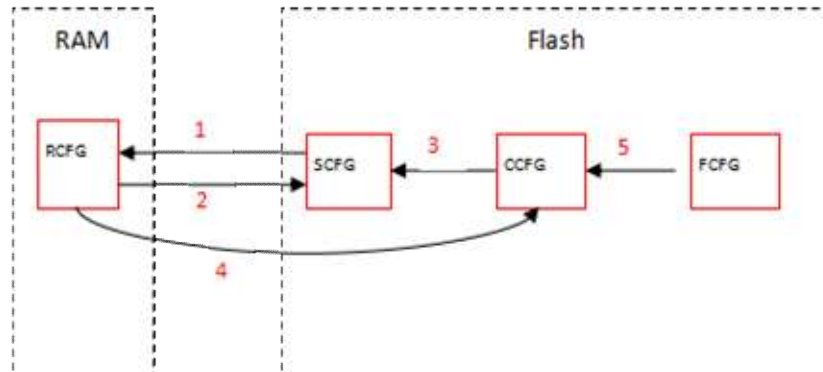
RCFG：The parameters in the memory.

SCFG：General parameters.

CCFG：Save To C Instructions to save parameters.
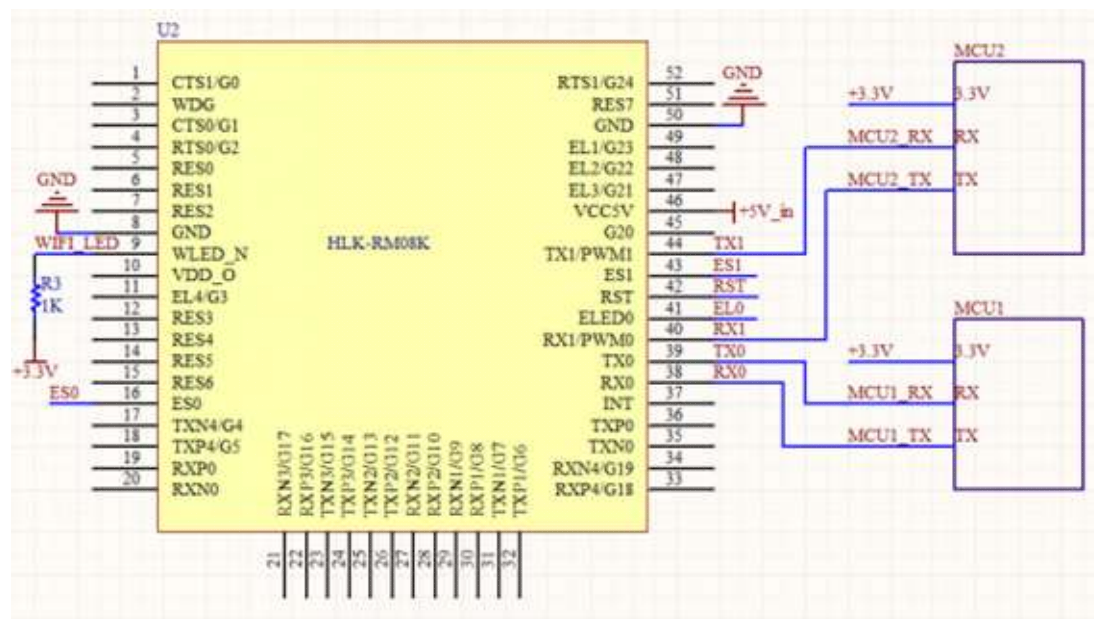
FCFG：Factory factory Settings. Users can't modify.

1. Power on，module read SCFG to RCFG from flash.
2. Save instructions RCFG to SCFG.
3. Restore settings，copy CCFG to SCFG.
4. Save To C Save instructions RCFG to CCFG.
5. Factory resetting，copy FCFG to CCFG.

2.3 TYPICAL REFERENCE DESIGN

2.3.1 UART TO ETHERNET
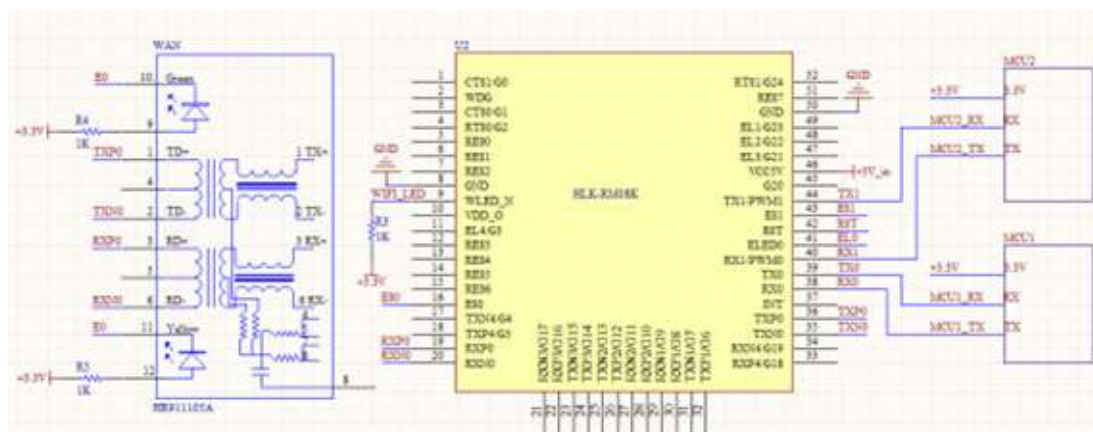
2.3.2 USRT TO WIFI（AP OR STA）

2.3.3 GATAWAY MODE OR REPEATER MODE

Please refer to diagram of test board.

3. TECHNICAL SPECIFICATION

Network standard	Wireless standard : IEEE 802.11n、IEEE 802.11g、IEEE 802.11b
	Wired standard : IEEE 802.3、IEEE 802.3u
Wireless transmission rate	11n:Max150Mbps
	11g:Max54Mbps
	11b:Max11Mbps
Channels	1-11
frequency range	2.4-2.4835G
Transmit power	8 -18DBM
Receive Sensitivity	-70DB
Connector	1WAN\4LAN\2UART
Antenna	
Antenna type	FPCB antenna（IPEX）
Function parameter	

WIFI working mode	STA/AP/Wireless Router	
Repeater mode	Support wireless bridge	
Wireless security	Wireless MAC address filtering	
	Wireless switch security function	
	64/128/152bit WEP encryption	
	WPA-PSK/WPA2-PSK、WPA-TKIP/WPA2-TKIPsecurity mechanism	
Network management	Web interface management	
	Configure file lead-in/out	
	WEB interface software upgrade	

UART to network

Dual UART transparent transmission,two uart ports work individually

TCP socket connection	Max connection number>20
UDP socket connection	Max connection number>20
Serial baud rate	1200—2500000bps (2500000/n 1<=n<=65535)

Power consumption

MODE	PC（mW）	NOTE
UART TO WIFI	110mA x 5V	AP or STA(all the net ports closed）
UART TO ETH	70mA x 5V	works only in WAN
Gateway mode（default mode）	160mA x 5V	Wifi both WIFI and five NET ports work
Repeater mode（bridge mode）	160mA x 5V	Wifi both WIFI and five NET ports work

Other parameters

Status light	Status indication	
Environmental standards	Working temperature：-20-55℃	
	Working humidity：10%-90%RH（NONCONDENSING）	
	Storage temperature：-40-80℃	
	Storage Humidity：5%-90%RH（NONCONDENSING）	
Other functions	Optional frequency bandwidth：20MHz\40MHz,AUTO	

4. DETAILED FUNCTIONS
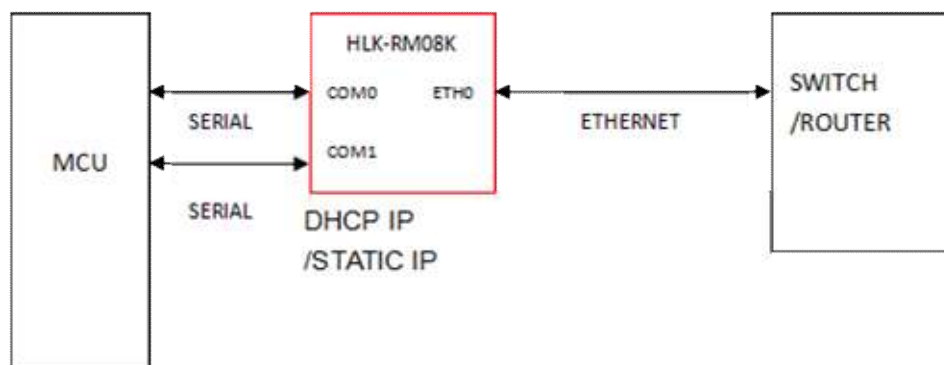
4.1 UART MODE

4.1.1 UART TO ETHERNET

Diagram 2. UART to ETH

In this mode，ETH0（WAN port）enabled.   Closed.

Ethernet could configure as dynamic IP（DHCP）,also could configure as static IP(static).
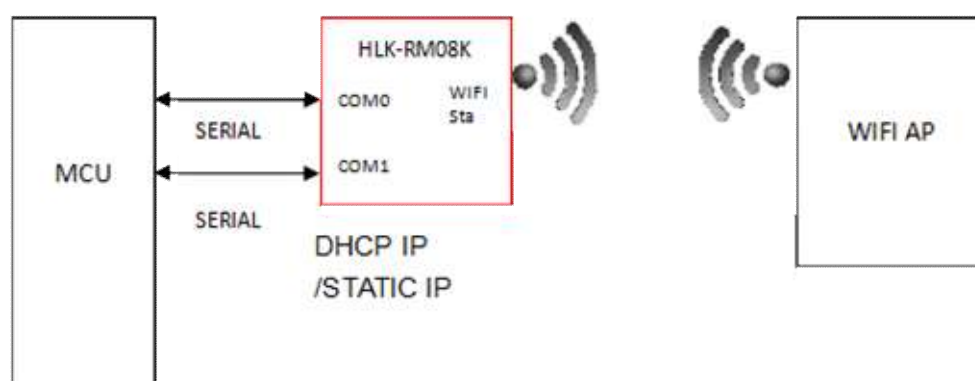
4.1.2 UART TO WIFI STA

Diagram 3. UART to WIFI STA

In this mode, WIFI enabled， working in STA mode, Ethernet closed.

WIFI STA could configure as dynamic IP (DHCP), also configure as static IP(STATIC).

4.1.3   UART TO WIFI AP

Diagram 4. UART TO WIFI AP

In this mode, WIFI enabled, working in AP mode, Ethernet closed.

In this mode, WIFI device could connect module, as one working in WIFI local area net.

4.2 NETWORK MODE
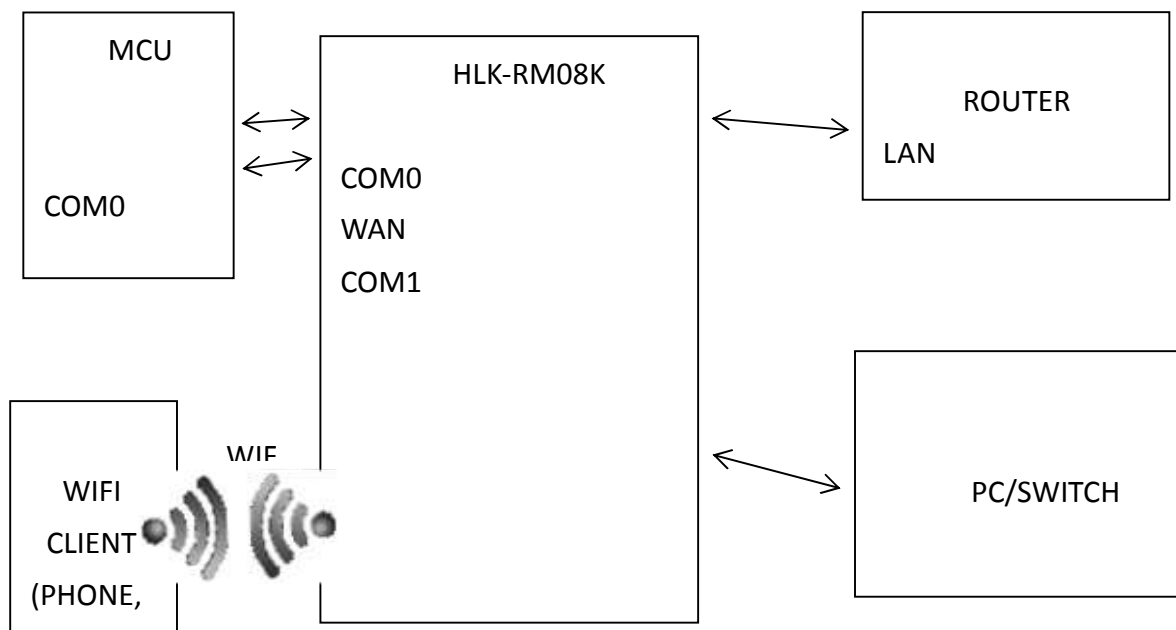
4.2.1 Gateway mode (defaul mode)

Diagram 5. Default mode

In this mode, module connects router by WAN, Module's WAN IP can be set to automatically obtain IP (static DHCP),

Module's 4 LAN port could connect PC directly, PC can directly obtain IP addresses from module;

Module acts as AP now, clients could connect its WIFI directly.
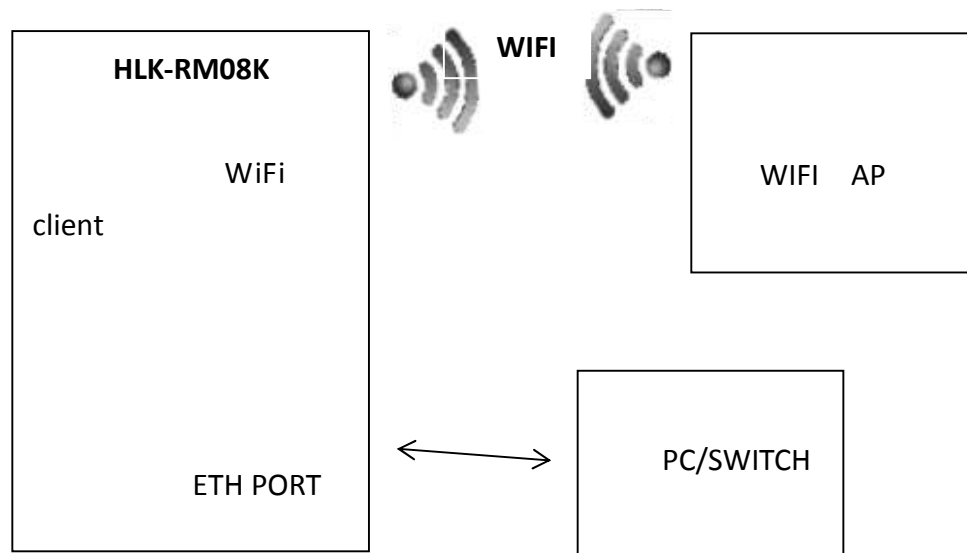
4.2.2 PEPEATAR MODE

Diagram 6. Repeater mode

In this mode, module connects AP with WIFI and emission WIFI itself, mobile phone and other clients could connect its WIFI directly. Meanwhile, five ETH ports are LAN, PC and other devices could connect module with Ethernet cable.

Note : The client(such as mobile phone,PC)'IP address is assigned by AP once connected module,

Module is functioned as PBX.

5.VERSION UPDATE INSTRUCTIONS

VERSION NO.	NOTE	MODIFIER	TIME
V1.0	USER MANUAL	KAVIN	2016.01.13

FCC Warning
This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE 1: Any changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

FCC Radiation Exposure Statement:
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance.

Note 1: This module certified that complies with RF exposure requirement under mobile or fixed condition, this module is to be installed only in mobile or fixed applications.

A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. Transmitting devices designed to be used by consumers or workers that can be easily re-located, such as wireless devices associated with a personal computer, are considered to be mobile devices if they meet the 20 centimeter separation requirement.

A fixed device is defined as a device is physically secured at one location and is not able to be easily moved to another location.

Note 2: Any modifications made to the module will void the Grant of Certification, this module is limited to OEM installation only and must not be sold to end-users, end-user has no manual instructions to remove or install the device, only software or operating procedure shall be placed in the end-user operating manual of final products.

Note 3: Additional testing and certification may be necessary when multiple modules are used.

Note 4: To ensure compliance with all non-transmitter functions the host manufacturer is responsible for ensuring compliance with the module(s) installed and fully operational. For example, if a host was previously authorized as an unintentional radiator under the Declaration of Conformity procedure without a transmitter certified module and a module is added, the host manufacturer is responsible for ensuring that the after the module is installed and operational the host continues to be compliant with the Part 15B unintentional radiator requirements. Since this may depend on the details of how the module is integrated with the host, Shenzhen HaiLingKe Electronic co., Ltd. shall provide guidance to the host manufacturer for compliance with the Part 15B requirements.

Note 5: FCC ID label on the final system must be labeled with "Contains FCC ID: 2AD56HLK-RM08K" or "Contains transmitter module FCC ID: 2AD56HLK-RM08K".

The OEM integrator is still responsible for the FCC compliance requirement of the end product, which integrates this module.