

## Shenzhen Hi-Link Electronic CO.,Ltd

# HLK-RM60 User Manual

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### **1. Product Introduction**

### 1.1. Overview

HLK-RM60 is a high-performance embedded WIFI6 module launched by Hilink Electronics.

The module complies with IEEE standard 802.11a/b/g/n/ac/ax. The module integrates a

2.4G/5.8G radio frequency transceiver with a transmission rate. High characteristics.

### **1.2. Product Features**

- Compatible IEEE 802.11 a/b/g/n/ac/ax
- Dedicated high performance 32-bit RISC CPU
- Support 20/40MHz in 2.4G, Support 20/40/80MHZ in 5G
- Support 2.4g/ 5.8 GHz ,Data rate up to 573+1201 Mbps
- Support STA/AP
- Built-in TCP/IP protocol stack
- Support Wireless upgrade (OTA)
- 3.3V Single power supply

### 2. Diagram



Figure 1 . HLK-RM60 diagram

### 2.1. Specification

Items	Parameter	Notes
Model Number	HLK-RM60	
Main Chipset	MT7621	
Kernel	MIPS1004Kc	
Main frequency	880MHz	
RAM	DDR2 128MB	
Flash	16MB	
Temperature	Ambient temperature: -20°C~60°C	
Humidity	Using: 10~95% (Non-condensing) Stock: 5~95% (Non-condensing)	
Size	90mm×60mm	

### 2.2. Number of interfaces

Interface	Quantity	Default firmware Support
WiFi Standard	IEEE 802.11b/g/n/a/ac/ax	Support
Ethernet Interface	5* 100M/1000M (Adaptive)	1*WAN、4*LAN
UART	2	2*UART
SDIO	1	Not Support
SPI	1	Not Support
I2C	1	Not Support
USB3.0	1	Not Support
USB2.0	1	Not Support

### **2.3. Technical specifications**

Module	Model Number	HLK-RM60		
	Package	In-line		
	Wireless standard	IEEE 802.11 a/b/g/n/ac/ax		
	Frequency Range	2.412GHz-2.484GHz 5.180GHz-5.825GHz		
		802.11b: +20 +/-2dBm (@11Mbps)		
		802.11g: +20 +/-2dBm (@54Mbps)		
	Transmit power	802.11n: +19 +/-2dBm (@MCS7)		
		801.11ac:+17 +/-2dBm (@MCS9)		
Wireless		802.11ax: +16 +/-2dBm (@MCS11)		
parameters		802.11b: -88.4 dBm (@11Mbps ,CCK)		
		802.11g: -75.7dBm (@54Mbps, OFDM)		
	Dessitive considiates	802.11n: -73.6dBm (@HT20, MCS7)		
	Receiving sensitivity	802.11a: -75.0 dBm (@MCS7)		
		802.11ac: -75.0 dBm (@MCS9)		
		802.11ax: -73.0 dBm (@MCS11)		
	Antenna Type	External : 4*I-PEX Connector		
	Hardware interface	UART, IIC, PWM, GPIO, SPI		
	Network port	5*Full Gigabit Ethernet port		
	USB	1*USB3.0+1*USB2.0		
	Work Voltage	3.3V		
Hardware	GPIO Drive capability	Max: 12ma		
parameters	Work Current	Keep sending=>average: ~800mA,Max: 1000mA		
		Operating temperature : -20°C~+60°C		
	Temperature	Storage temperature: -40°C~ +85°C		
	Size	90*60mm		
	Wireless network type	STA/AP		
Software	Firmware Upgrade	Web Upgrade		
parameters	Network protocol	IPv4, TCP/UDP		
	User configuration	Web configuration		

Table 1. Technical specifications



### 2.4. Application field

- Smart home;
- Instrumentation;
- Wi-Fi Remote monitoring/control;
- Toy field;
- Color LED control;
- Intelligent integrated management of fire protection and security;
- Smart card terminals, wireless POS machines, handheld devices, etc.

### 3. Electrical parameters

### **3.1. Working voltage**

Parameter	Parameter Smallest		Max	Unit
Working voltage	3	3.3	3.6	V
I/O Voltage	3	3.3	3.6	V
Peak module current	1000mA	800		mA
Supply current requirements		≥1500		mA
Power supply ripple requirements		≤50		mV

Table 2. Module power supply requirements



### 4. Pin introduction



Figure 2. Module pin sorting

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### HLK-RM60 深圳市海凌科电子有限公司

1:3.3VD	2:GND	39:ND_D2	40:ESW_TXVN_D_P1	77:I2C_SDA	78:GND
3:3.3VD	4:GND	41:ND_D1	42:GND	79:NC	80:ESW_TXVP_A_P4
5:3.3VD	6:GND	43:ND_D0	44:ESW_TXVP_A_P2	81:WDT_RST_N	82:ESW_TXVN_A_P4
7:3.3VD	8: ESW_TXVP_A_P0	45:ND_RB_N	46:ESW_TXVN_A_P2	83:ESW_P4_LED	84:ESW_TXVP_B_P4
9:3.3VD	10:ESW_TXVN_A_P0	47:ND_RE_N	48:ESW_TXVP_B_P2	85:ESW_P3_LED	86:ESW_TXVN_B_P4
11:NC	12:ESW_TXVP_B_P0	49:ND_CS_N	50:ESW_TXVN_B_P2	87:ESW_P2_LED	88:ESW_TXVP_C_P4
13:SSUSB_TX_P	14:ESW_TXVN_B_P0	51:ND_WP	52:ESW_TXVP_C_P2	89:ESW_P1_LED	90;ESW_TXVN_C_P4
15:SSUSB_TX_N	16:ESW_TXVP_C_P0	53:ND_CLE	54:ESW_TXVN_C_P2	91:ESW_P0_LED	92:ESW_TXVP_D_P4
17:SSUSB_RX_P	18:ESW_TXVN_C_P0	55:ND_WE_N	56:ESW_TXVP_D_P2	93:3.3VD	94:ESW_TXVN_D_P4
19:SSUSB_RX_N	20:ESW_TXVP_D_P0	57:ND_ALE	58:ESW_TXVN_D_P2	95:3.3VD	96:GND
21:NC	22:ESW_TXVN_D_P0	59:NC	60:GND	97:3.3VD	98:GND
23:USB_D_N	24:GND	61:USB2.0_DM	62:ESW_TXVP_A_P3	99:3.3VD	100:GND
25:USB_D_P	26:ESW_TXVP_A_P1	63:USB2.0_DP	64:ESW_TXVN_A_P3		
27:NC	28:ESW_TXVN_A_P1	65:RXD3	66:ESW_TXVP_B_P3		
29:ND_D7	30:ESW_TXVP_B_P1	67:TXD3	68:ESW_TXVN_B_P3		
31:ND_D6	32:ESW_TXVN_B_P1	69:TXD1	70:ESW_TXVP_C_P3		
33:ND_D5	34:ESW_TXVP_C_P1	71:RXD1	72:ESW_TXVN_C_P3		
35:ND_D4	36:ESW_TXVN_C_P1	73:D2DB_PORST_N	74:ESW_TXVP_D_P3		
37:ND_D3	38:ESW_TXVP_D_P1	75:I2C_SCLK	76:ESW_TXVN_D_P3		

### Table 3. Module pin sorting



#### Power pin description:

No.	Name	Туре	Function description	Default function
1				
3				
5				
7				
9	3.3VD	Р	3.3V Input, Current≥1500mA	Power Supply
93				
95				
97	97			
99				
2				
4				
6	GND P			
11				
21				
24		D	Ground	Dowar Supply
42		GND P Ground	Ground	rower Suppry
60				
78				
96				
98				
100				

#### USB3.0 Interface Description:

13	SSUSB_TX_P			
15	SSUSB_TX_N		LICD2 0	
17	SSUSB_RX_P	I/O	0583.0	LICD2 0
19	SSUSB_RX_N			0583.0
23	USB_D_N	1/0		
25	USB_D_P	I/O	USB 3.0 Interface HS/FS/LS Pin	

#### SPI Interface Description:

29	ND_D7		SPI_HOLD	GPIO#40
31	ND_D6		SPI_WP	GPIO#39
33	ND_D5		SPI_MOSI	GPIO#38
35	ND_D4	I/O	SPI_MISO	GPIO#37
47	ND_RE_N		SPI_CLK	GPIO#36
55	ND_WE_N		SPI_CS1	GPIO#35
49	ND_CS_N		SPI_CS0	GPIO#34

#### SDIO Interface Description:

51	ND_WP		SD_WP	GPIO#41
45	ND_RB_N		SD_CLK	GPIO#42
57	ND_ALE		SD_CMD	GPIO#44
53	ND_CLE	L/O	SD_CD	GPIO#43
43	ND_D0	1/0	SD_DATA0	GPIO#45
41	ND_D1		SD_DATA1	GPIO#46
39	ND_D2		SD_DATA2	GPIO#47
37	ND_D3		SD_DATA3	GPIO#48

#### USB2.0 Interface :

61	USB2.0_DM	1/0	Liek2.0 Interface	Usk2 0 Interface
63	USB2.0_DP	1/0	USD2.0 Interface	USD2.0 Interface

#### Serial Interface:

65	RXD3	Ι	RXD3/GPIO#8	Seciel 2
67	TXD3	0	TXD3/GPIO#7	Serial 5
69	TXD1	0	TXD1/GPIO#1	Conict 1
71	RXD1	Ι	RXD1/GPIO#2	Senai 1

Reset pin:

73	D2DB_PORST_N	Ι	Hardware reset pin, active low	System reset
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#### I2C Interface:

75	75:I2C_SCLK	VO	I2C_SCLK/GPIO#3	GPIO#3
77	77:I2C_SDA	1/0	I2C_SDA/GPIO#4	GPIO#4

#### Network port P0 System reset:

8	ESW_TXVP_A_P0			
10	ESW_TXVN_A_P0			
12	ESW_TXVP_B_P0			
14	ESW_TXVN_B_P0		PORT0 Interface	Network port 0, Please leave it in the air if you don need it
16	ESW_TXVP_C_P0			
18	ESW_TXVN_C_P0			
20	ESW_TXVP_D_P0			
22	ESW_TXVN_D_P0			

#### Network port P1 Interface:

26	ESW_TXVP_A_P1		
28	ESW_TXVN_A_P1		
30	ESW_TXVP_B_P1		
32	ESW_TXVN_B_P1	DODTI Interface	Network port 1, Please leave it in the air if you don;t
34	ESW_TXVP_C_P1	PORTEInternace	need it
36	ESW_TXVN_C_P1		
38	ESW_TXVP_D_P1		
40	ESW_TXVN_D_P1		

#### Network port P2 Interface:

44 46 48 50	ESW_TXVP_A_P2 ESW_TXVN_A_P2 ESW_TXVP_B_P2 ESW_TXVN_B_P2	DODT2 Interface	Network port 2, Please leave it in the air if you don;t
54	ESW_TXVN_C_P2		
56	ESW_TXVP_D_P2		
58	ESW_TXVN_D_P2		



#### Network port P3 Interface:

62	ESW_TXVP_A_P3		
64	ESW_TXVN_A_P3		
66	ESW_TXVP_B_P3		
68	ESW_TXVN_B_P3	DOPT2 Interface	Network port 3, Please leave it in the air if you don;t
70	ESW_TXVP_C_P3	POK13 Interface	need it
72	ESW_TXVN_C_P3		
74	ESW_TXVP_D_P3		
76	ESW_TXVN_D_P3		

#### Network port P4 Interface:

80	ESW_TXVP_A_P4		
82	ESW_TXVN_A_P4		
84	ESW_TXVP_B_P4		
86	ESW_TXVN_B_P4	DODTA Interface	Network port 4, Please leave it in the air if you don;
88	ESW_TXVP_C_P4	POR14 Interface	need it
90	ESW_TXVN_C_P4		
92	ESW_TXVP_D_P4		
94	ESW_TXVN_D_P4		

#### Watchdog reset Pin:

81	WDT_RST_N	Ι	Function pin, active low	GPIO#18

#### Network port indicator pin:

83	ESW_P4_LED		Active low, drive capability 4ma	Network port P4 connection indicator
85	ESW_P3_LED		High level effective, drive capability4ma	Network port P3 connection indicator
87	ESW_P2_LED		Active low, drive capability 4ma	Network port P2 connection indicator
89	ESW_P1_LED	I/O	Active low, drive capability 4ma	Network port P1 connection indicator
91	ESW_P0_LED		Active low, drive capability 4ma	Network port P0 connection indicator



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#### Other Pins :

59	NC	Hang in the air	Hang in the air
79	NC	Hang in the air	Hang in the air
27	NC	Hang in the air	Hang in the air

#### Remark:

1, I-Input; O-Output; I/O-Number I/O; P-Power NC Hang in the air .

### 5. Size



Unit: (mm)





Figure 4Module interface description

### 6. Indicator light description

2G/5Gwifi indicator light: After turning on the wifi function, the module wifi indicator will flash, after turning off the wifi indicator, the module' s wifi indicator will go out.

Pwr indicator: power indicator, always on when power on.

Network port indicator: After plugging in the network cable, the corresponding LED indicator will flash.

### 7. Pin function description

D2DB\_PORST\_N:Hardware reset pin, Pull down time≥100ms WDT\_RST\_N: Software reset pin, Pull down time≥6000ms, The system will be restarted

### 8. Enter the configuration web interface

Connect the computer's network port and the module's LAN port, open the computer browser, enter

192.168.16.254, and you will enter the web login interface, enter the user name: root, password: admin, and

then click the Login button to enter the configuration interface.

Image: Organization         Image: Organization         X           Image: Organization         Image: Organization         X         Image: Organization           Image: Organization         Image: Organization         Image: Organization         X         Image: Organization           Image: Organization </th <th>68.16.254/cgi-bin/luci</th> <th>82 4</th>	68.16.254/cgi-bin/luci	82 4
『収藏 * 「 秀米智能 【2] linux ppp 【 一鍵力夫別 Hi-Link	- 送 注册 - 表 Constant Samba任能 - 短元 - 口海云 - MIK - 系統 N載	HLK
Authorization Re Please enter your username and p	password.	
Password		
D Login 🙆 Reset		
Powered by Hi-Link / Hi-Link_WiF	16	

Figure 5.Log in Web

Enter the configuration interface:

FIFLINK Status • System •	Services *	Network + WIFI + Logout
Status		
System		
Hostname		Hi-Link
Model		MediaTek MT7621 RFB (802.11ax,SNOR)
Firmware Version		LEDE Reboot 17.01-SNAPSHOT r0-0d430c6 / LuCl Master (git-20.358.39778-0d430cf
Kernel Version		4.4.198
Local Time		Thu Mar 25 03:10:00 2021
Uptime		0h 6m 35s
Load Average		0.01, 0.23, 0.16
Memory		
Total Available		167892 kB / 246812 kB (68%)
Free		164096 kB / 246812 kB (66%)
Buffered		3796 kB / 246812 kB (1%)
Network		
IPv4 WAN Status		

Figure 6 Status Page

### 9. Set the wifi name

After entering the web configuration interface, click WIFI, select WIFI configuration, enter the wifi

#### configuration interface

Hi-Link Status -	System - Services -	Network + WiFi + Logout
Status System		WiFi configuration Web Console EasyMesh
Hostname		Hi-Link
Model		MediaTek MT7621 RFB (802.11ax, SNOR)
Firmware Version		LEDE Reboot 17.01-SNAPSHOT r0-0d430c6 / LuCl Master (git-20.358.397
Kernel Version		4.4.198
Local Time		Thu Mar 25 03:12:15 2021
Uptime		0h 8m 50s
Load Average		0.00, 0.14, 0.13
Memory		
Total Available		167212 kB / 246812 kB (67%)
Free		163416 kB / 246812 kB (66%)
Buffered		3796 kB / 246812 kB (1%)

Figure 7 Enter the wifi setting interface

In this interface, you can see the WiFi name and mac address of 2.4g and 5.8g, click the config button to enter

the corresponding configuration interface

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### HLK-RM60 深圳市海凌科电子有限公司

Work mode: AP     Interface: rao [10pe: AP   SSID: Hi-Link_WIFI6] Channel: 6       BSID: 40 db 3c: 48 20 50   Mode: HE_2G mode     Disable       Interface: apcI0   Type: STA   Status: Disconnected     Enable	MT7915.1.1	Reload Config * Add
Solo do do a de a do la mode rite_do linde     Sinde do do la do	Work mode: AP  Interface: ra0   Type: AP   SSID: Hi-Link_WIFI6   Channel: 6  RSFID: 40.40.32.40.90.00   Mode. HE 32 mode.	Ø Disable Z Config Remove
MT7915.1.2  Work mode: AP	Interface: apcil0   Type: STA   Status: Disconnected     Wireless is disabled or not associated	Enable & Connect Config
	MT7915.1.2 Work mode: AP	🖉 Reload 🖉 Config 🚺 Add
al Interface: rax0   Type: AP   SSID: Hi-Link_WIFI6_5G   Channel: 36 BSSID: 42. d6 3c: 58:20:50   Mode: HE_5G mode	Interface: rax0   Type: AP   SSID: Hi-Link_WIFI6_5G   Channel: 36 BSSID: 42:d6:3c:58:20:90   Mode: HE_5G mode	Disable Z Config Remove
Interface: apcRx0   Type: STA   Status: Disconnected       Wrieless is disabled or not associated     Image: Connect in the status of the statu	Interface: apclix0   Type: STA   Status: Disconnected Wireless is disabled or not associated	Enable Sconnect Config
ad by HiLlink / HiLlink WFi6	ad by Hi-Link / Hi-Link_WiFi6	

Figure 8 Wifi Status page

After clicking the config button, you will enter the configuration interface of the corresponding ssid and

password		
	<b>Hi-Link</b> Status <b>→</b> System <b>→</b>	Services + Network + WiFi + Logout
	Interface Configurations - N Basic WPS WDS Sta	MT7915.1.1@ra0 ations
	SSID	Hi-Link_WIF16
	Auth Mode	WPA2PSK *
	Encryption	AES
	Key Renewal Interval	3600 second(s) (0 ~ 4194303)
	Key	12345678
	MFPC	8
	MFPR	
	MFPSHA256	
	Hidden	
	AP Isolation	

#### Figure 9 Wifi Setting Page

After the configuration is completed, click the following button to make the configured information take effect.





Figure 10 Save Button

### **Appendix A Document revision history**

Version	Revision scope	Date
V1.0	Original Version	20210508