Shenzhen Hi-Link Electronic Co., Ltd.

HLK-B30 User Manual

802.11n+BLE 4.2 wireless module

Contents

1. Product description

HLK-B30 is a new low-consumption wifi control module from Hi-Link Electronics. The module has built-in wifi network protocol and BLE Bluetooth protocol stack, which can realize fast distribution network through BLE. The module is embedded with a low-power 32-bit CPU, 2Mbyte memory, 256KB RAM and a wealth of peripheral resources. Integrates all wifi mac and TCP/IP protocols.

1.1. Basic parameters

- Support 802.11b/g/n standard, integrates ARM9, WLAN MAC/Baseband/RF
- 80MHz and 120MHz frequency
- Built-in 256KB RAM/ 2MB FLASH
- Working voltage 3.0-3.6V
- 2.4G/1T1R wifi, BLE 4.2
- Support BLE fast distribution network
- Support Station, Soft AP, Station+Soft AP
- Support SmartConfig, Alink supports WPA/WPA2 security mode and supports STA/AP/STA+AP working mode
- Support 802.11b/g/n standard, HT-40
- 26 MHz and 32 KHz clock signal output
- Support AP, STA and BLE mixed mode
- Rich peripheral interface, 1*SPI,2*UART,6*PWM,19*GPIO
- Widely used in the Internet of Things
- Support multiple encryption methods WEP64/128, TKIP, AES, WPA, WPA2, WAPI

2. Main application areas

- Intelligent building
- Smart home / home appliances
- Smart socket, smart light
- Industrial wireless control
- Baby monitor
- Intelligent transportation

3. Product Overview

3.1. Technical specifications

Table 2-1 Product technical specifications

Network standard	Wireless standard: IEEE 802.11n, IEEE 802.11g, IEEE 802.11b
	Bluetooth standard: BLE 4.2
Wireless transmission rate	11n: up to 150Mbps 11g: up to 54Mbps 11b: up to 11Mbps
Channel	2.4g:1-14
Frequency	2412-2488MHZ
Transmit power	12-18DBM
Interface	2 serial port, 1 usb port(host/slave), GPIO
Antenna	External/ internal antenna
WIFI working mode	Wireless network card / wireless access point
Wireless security	Wireless MAC address filtering
	Wireless safety function switch
	64/128/152 bit WEP encryption
	WPA-PSK/WPA2-PSK, WPA/WPA2 security mechanism
Other parameters	
Status indicator	Status indication
Environmental standard	Working temperature: -20-85℃
	Working humidity: 10%-90%RH (Non-condensing)
	Storage temp: -40-30℃
	Storage humidity: 5%-90%RH (Non-condensing)
Other performance	Band bandwidth optional: 20MHz, 40MHz

3.2. Hardware description

HLK-B30 dimension as below: (L*W)=16mm*25mm

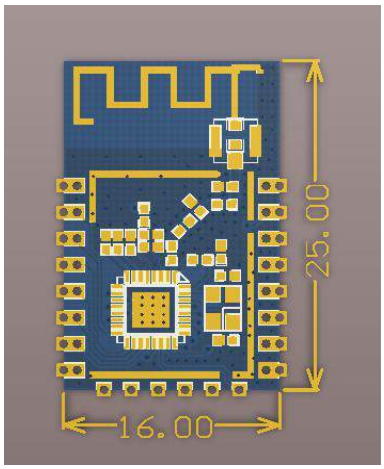


Figure 1 HLK-B30 Dimension

3.3. Block diagram

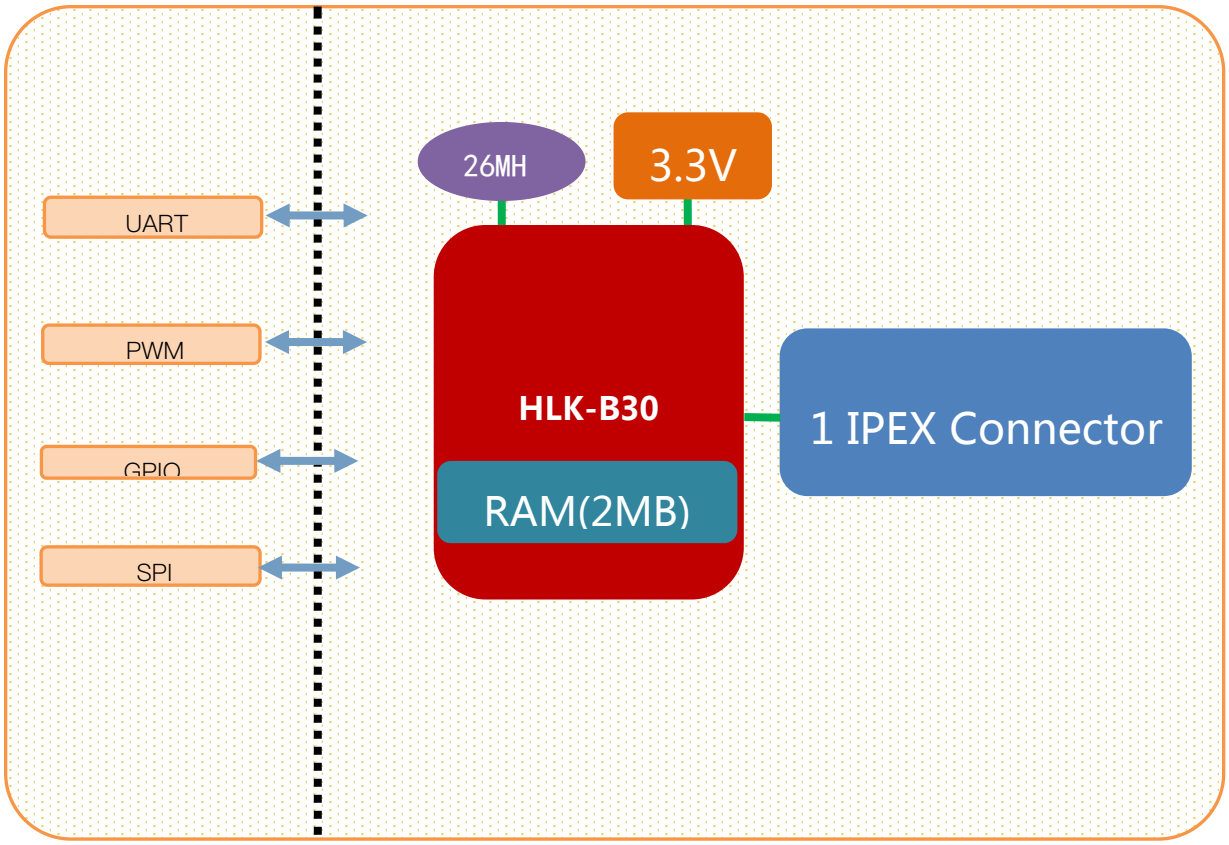


Figure 2 HLK-B30 Module architecture diagram

3.4. Power supply requirements

Power supply requirements	
Power input voltage	DC:3.3±0.3V
No-load operating current	130±50mA
Supply current requirement	≥1000mA

3.5. WIFI transmission power consumption

Wifi transmission power consumption			
Mode	Rate	Transmit power	Current(ma)
11b	11Mbps	17.5dbm	280
11g	54Mbps	11dbm	150
11n	MCS7	10dbm	130

3.6. WIFI Receive power consumption

Mode	Rate	Current(ma)
11b	11Mbps	100
11g	54Mbps	100
11n	MCS7	100.5

3.7. Power consumption in each working mode of WIFI

Status	Description	Average current (3v3)	Max current(3v3)	Unit
Wifi initialization	Turn off the RF, MCU full speed	45.2	46.3	ma
Keep wifi connection	Keep connected to the router	101	342	ma
Udp sends	Full-speed UDP packet delivery after connecting to the AP	93	363	ma
SoftAP	SoftAP networking status	100.5	193.7	ma
SmartConfig	Module distribution status	100.8	129.5	ma

3.8. Output power in each mode of WIFI

Parameter	Minimum value	Typical value	Maximum value	Unit
RF average output power, 802.11b cck Mode 11m	-	17.5	-	dBm
RF average output power, 802.11g OFDM Mode 54m	-	15	-	dBm
RF average output power, 802.11n OFDM Mode MCS7	-	13	-	dBm
Frequency error	-10	-	10	ppm

3.9. Receive sensitivity in each mode of WIFI

Parameter	Minimum value	Typical value	Maximum value	Unit
RF average output power, 802.11b cck Mode 11m	-	-91	-	dBm
RF average output power, 802.11g OFDM Mode 54m	-	-74	-	dBm
RF average output power, 802.11n OFDM Mode MCS7	-	-70	-	dBm

3.10. Default pin function

Number	Network name	Type	Function description	Default features
1	CEN	I	Chip enable, high efficiency	CPU Reset
2	P26_PWM5	I/O	P26, PWM5	GPIO, PWM
3	P24_PWM4	I/O	P24, PWM4	GPIO, PWM
4	P23_TDO_F_S0	I/O	P23, ADC3	GPIO, ADC
5	P22_TDI_F_SI	I/O	P22	GPIO
6	P21_TMS_F_CS	I/O	P21	GPIO
7	P20_TCK_F_SC	I/O	P20	GPIO
8	VBAT	P	3.3V power supply	Power
9	P28	I/O	P28	GPIO
10	P16	I/O	P16	GPIO
11	P17	I/O	P17	GPIO
12	P14	I/O	P14	GPIO
13	P15	I/O	P15	GPIO
14	P6_PWM0	I/O	P6, PWM0	GPIO, PWM
15	GDN	P	GND	GND
16	P7_PWM1	I/O	P7, PWM1	GPIO, PWM
17	P8_PWM2	I/O	P8, PWM2	GPIO, PWM
18	P9_PWM3	I/O	P9, PWM3	GPIO, PWM
19	P1_URAT2_RXD	I/O	P1,UART2	GPIO, UART
20	P0_UART2_TXD	I/O	P0, UART2	GPIO, UART
21	P10_UART1_RXD	I/O	P10, UART1	GPIO,UART
22	P11_UART1_TXD	I/O	P11, UART1	GPIO,UART

4. Test board description

The test board is mainly used to demonstrate the functions of the HLK-B30 module's lanterns, sockets and lights. Use the test board to demonstrate remote switch LEDs, color changes, brightness changes, relay switch lights, etc.

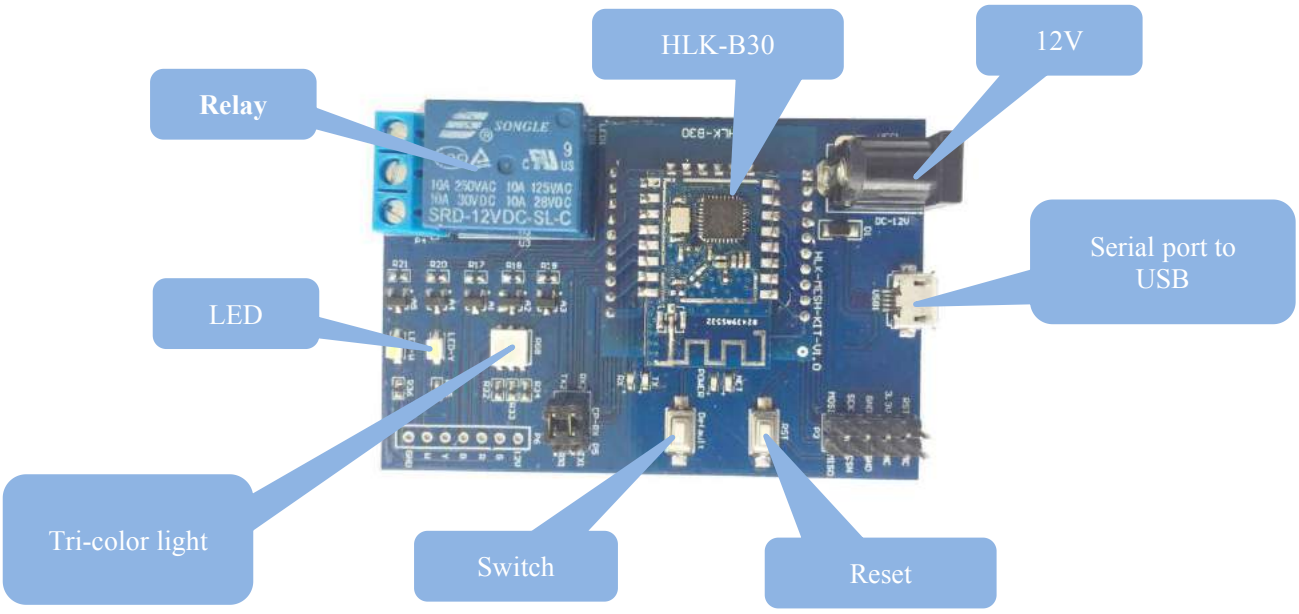


Figure 3 HLK-B30 Module test board

4.1. Switching light function description

Before testing the switch light function, you need to use the serial port to burn the firmware of the switch light function. The function of the switch lamp mainly realizes the on and off function of the LED_Y lamp. The function of turning on or off the LED_Y lamp can be controlled by the switch button.

4.2. Enter the distribution network mode

Power off the on the module six times continuously at a time interval of one second, and then waited 6 seconds, the NET led light will flash once every second, indicating that the module has erased the network configuration information and entered the distribution network. After the network configuration is successful, the NET led light will be on constantly, indicating that the router is successfully connected.

4.3. Using the app distribution network

Open the cloud smart app and open the distribution interface, as shown below:

Figure 4 HLK-B30 APP Distribution network interface

Then click Next to enter the distribution interface:

Figure 5 HLK-B30 Distribution network in progress

After the distribution network is successfully connected, the app will automatically enter the control interface directly:

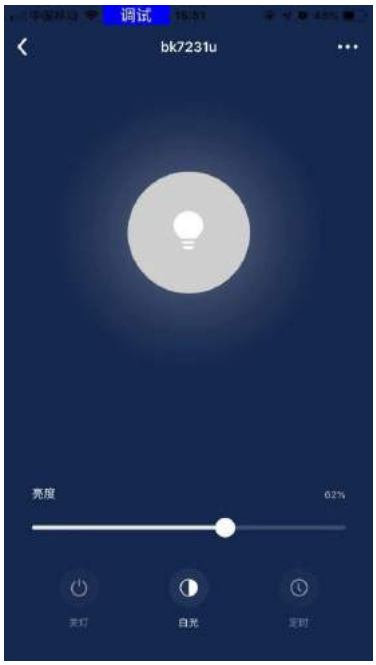


Figure 6 HLK-B30 Distribution network completed

4.4. Using the Tmall Elf distribution network

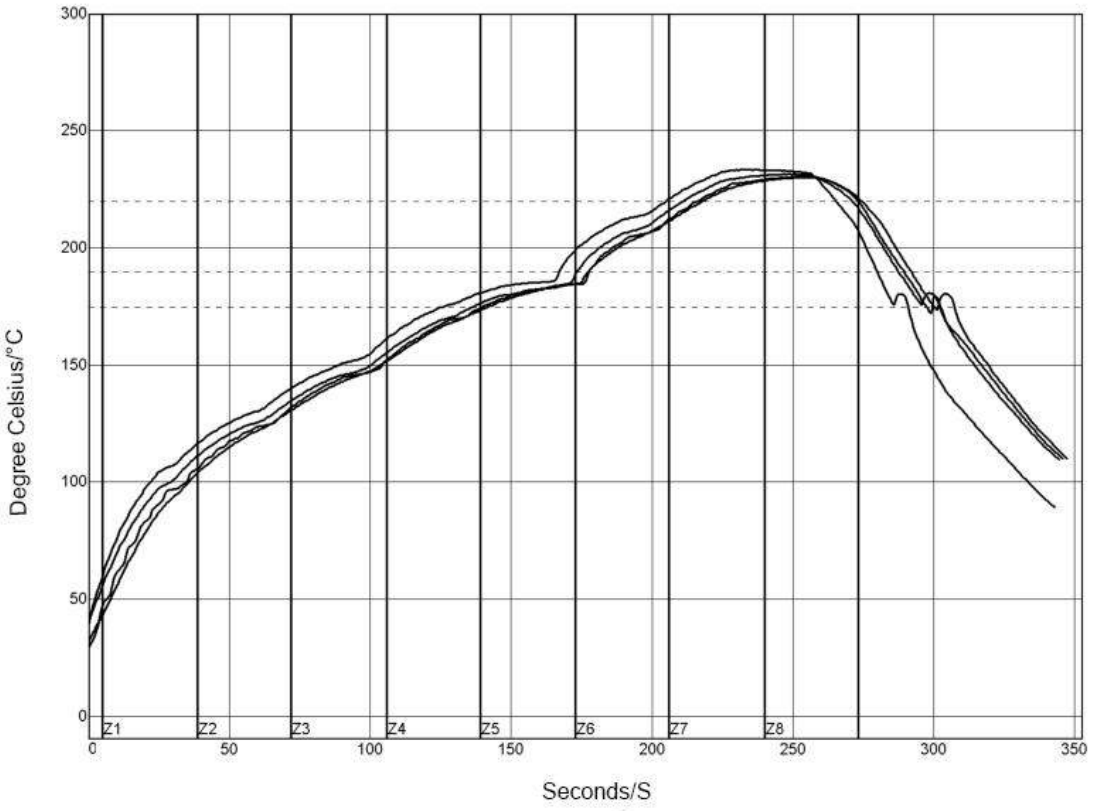
Before using the Tmall Elf to configure the network, you need to let the module enter the distribution mode, then say "Tmall Elf, find device" to the Tmall Wizard, and then follow the prompts of the Tmall Wizard to configure the device to the same router.

When the device is successfully connected, you can say "Tmall Elf, Turn On the Light" or "Tmall Elf, Turn Off the Light" to the Tmall Elf to turn on or off the LED_Y light of the device.

5. Reflow soldering temperature curve

When the module is over-fired, please strictly follow this temperature curve. If the temperature deviation of the reflow soldering is too large, the module will be damaged!

Temperature setting (degrees Celsius)									
Warm zone	1	2	3	4	5	6	7	8	
Upper temperature zone	125	135	155	185	195	225	240	230	
Lower temperature zone	125	135	155	185	195	225	240	230	
Conveyor speed: 70.0 cm/min									



PWI= 94%	Constant temperature time 175~190°C			Reflux time/220° C		Max temp.
<TC2>	35.53	-82%	55.58	-72%	230.28	-94%
<TC3>	37.66	-74%	58.66	-57%	230.56	-89%
<TC4>	41.52	-62%	60.63	-47%	233.62	-28%
<TC5>	37.07	-76%	60.44	-48%	231.67	-67%
Temp. difference	5.99		5.05		3.34	

Process boundary

Solder paste: **System Default for Reflow**

Statistic name	Minimum limit	Maximum limit	Unit
Constant temperature time 175~190 °C	30	90	S
Reflow time -220°C	50	90	S
Maximum temp.	230	240	°C

Appendix A Document Revision History

Version number	Revision Scope	Date
1.00		2019-4-15