Zigbee RS-232/DI/DO/AI Adapter

User manual for ZA-L2 and ZA-H5 models

ZA-L2	Adapter Model	ZA-H5
Low Power		**High Power**
External 2 dBi Dipole Antenna		**External 5 dBi Dipole Antenna**
	 **Comparison**	

1 .Packing Contents

1.1 ZA-L2 Package Contents:

- RS-232 adapter x 1
- Battery power or signal line x 1
- User manual x 1
- USB Cable x 1
- 2dBi External Dipole Antenna x 1pc

Package Photo:

White Box Dimension: 10 x 5.5 x 5 cm

Abbreviation in the label on the box:

LP: Low power

C: Coordinator

R: Router

D: End device

1. Packing Contents

1.1 ZA-H5 Package Contents:

- RS-232 adapter x 1
- Battery power or signal line x 1
- User manual x 1
- USB Cable x 1
- 5 dBi External Dipole Antenna x 1

(The antenna is out side of the box.)

Package Photo:

White Box Dimension: 10 x 5.5 x 5 cm

Abbreviation in the label on the box:

LP: Low power

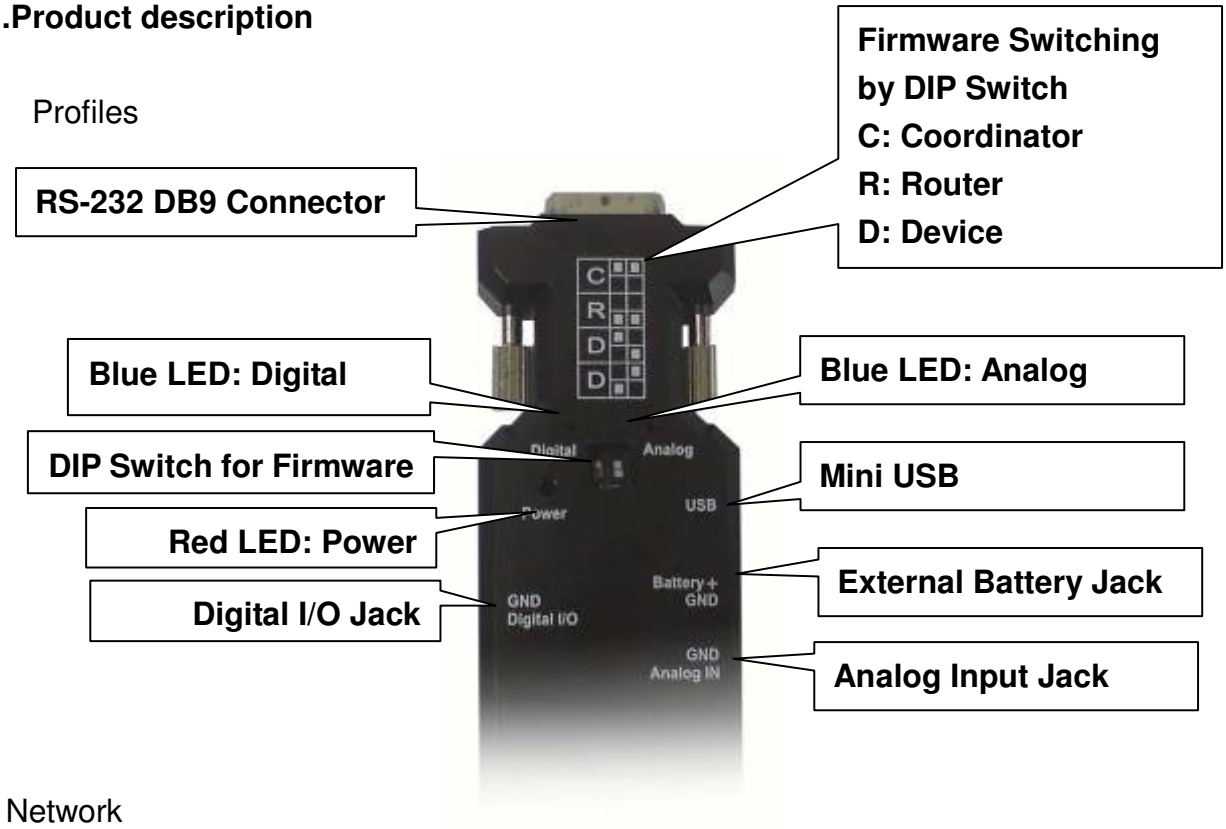
C: Coordinator

R: Router

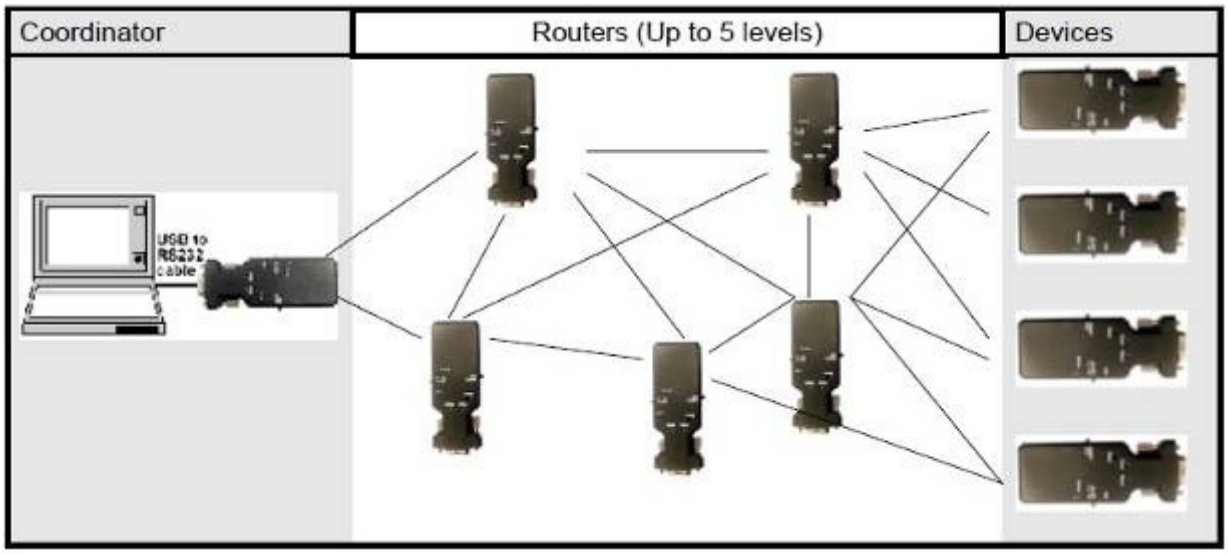
D: End device

2 .Product description

2.1 Profiles



2.2 Network



Remark:

(1) Low Power: 30~50 meters (Open Space)

(2) High Power: 500~800 meters (Open Space)

(3) Up to 5 levels or 20 nodes in one level

3 . Quick Guide

3.1 For ZA-H5 model, fasten the external antenna to the adapter

3.2 Power input: Mini USB cable (Default) or DB9 connector Pin 9 (VCC, 5VDC, 1.5A Max.) or external battery (3~3.7 VDC Li-Polymer Battery or 3 units standard A, AA or AAA battery)

3.3 Using the USB cable provided in the package, plug the mini USB connector into the Zigbee RS-232 adapter then connect it to the power adapter with USB or PC

3.4 The red LED is bright when the power is on

3.5 Connect the adapter with PC or NB via RS-232 interface.

3.6 If the PC or NB doesn't equip with the RS-232 DB9 connector, you will need the USB to RS-232 converter. Please install the driver for the converter installed before the COM port work.

3.7 The coordinator will connect the end device automatically and works for cable replacement function via RS-232. No software or setting is necessary. If you need to link the mesh network or router, please check section 7 and 8.

3.8 If the connection is failed, please check the section 9 to recover the default setting.

3.9 I/O interface

3.9.1 Digital I/O

Remote control logic high (MIN 2.4V), low (MAX 0.5V).

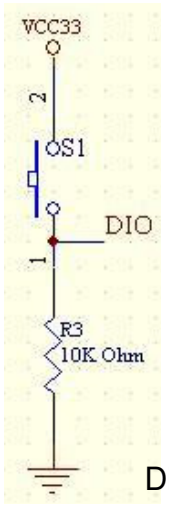
Output drives capability 20mA.

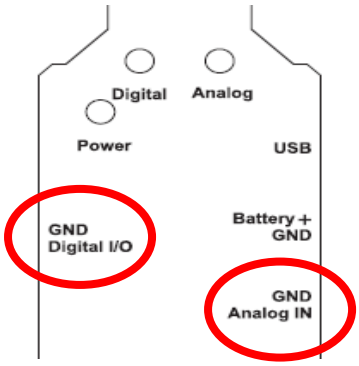
Max Voltage 3.3V.

3.9.2 Analog Input(ADC)

Max Voltage 3.3V

8bit- resolution

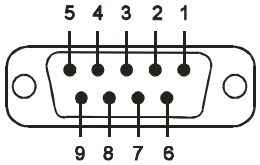




Digital Input Reference Circuit (External Switching Function)

3.10 RS-232 DB9 connector

3.8.1 Pin-out:



3.8.2 Signals:

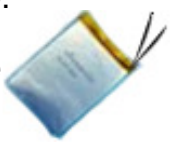
Pin	Signal	DTE Direction	DCE Direction	Description
1	CD	Input	Output	Not connected
2	TxD	Output	Input	Transmitted data
3	RxD	Input	Output	Received data
4	DSR	Input	Output	Contact manufacturer to set this
5	GND	N/A	N/A	Signal ground
6	DTR	Output	Input	Contact manufacturer to set this
7	CTS	Input	Output	Clear to send
8	RTS	Output	Input	Request to send (Default)
9	Vcc	Input	Input	Power supply (5VDC, 1.5A Max.)

4 .How to use external battery

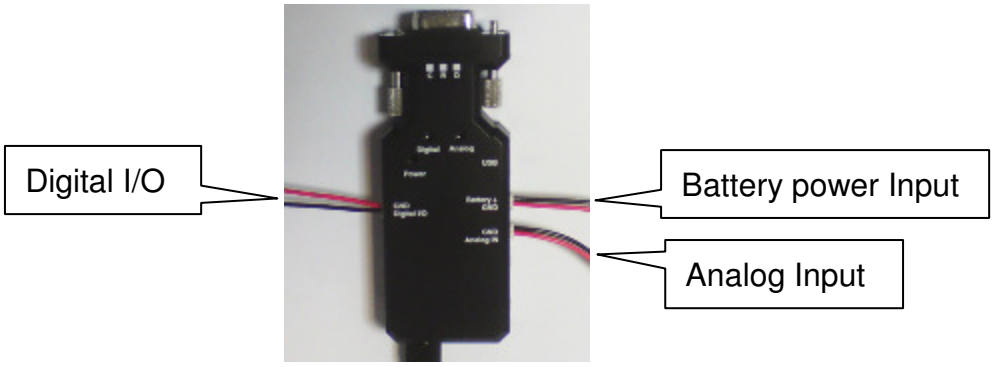
4.1 Options:

- Standard A, AA or AAA battery: 3 units for each model.

- Li-Polymer Battery: 3~3.7 VDC. The capacity depends on the applications. General working powe consumption: 100 mAh (for reference)



4.2 Example:



Remark: One power line is included in the package. If you need more cable for I/O connector, please call.

5. LED Status:

Status	Description
Power LED steadily ON (Red)	Power ON
Power LED blinking (Red, 0.5 sec.)	Low power (Battery)
Power LED OFF	Power OFF
Analog LED steadily ON (Blue)	Analog Input is available
Digital LED blinking when transmitting Blue)	Digital I/O is available

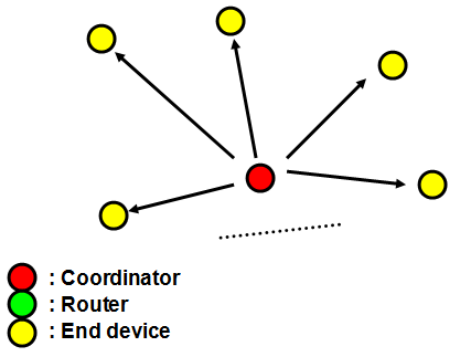
6. Control software

6.1 API: The adapter is built in the API for the software integration. Please check the API document.

6.2 Zigbee Manager software: The software contains the device management, RS-232 configuration, simple data transmission functions for testing. Please check the software on CD or website.

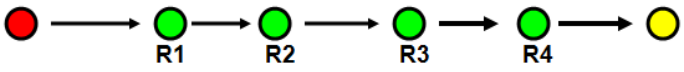
7. Transmission mode

7.1 Broadcast: The coordinator will transmit the data to all the end devices without the routers.



No Zigbee manager software necessary. Just power on the adapters with the same PAN ID and Channel no.. If you need to set multi network, please set the different PAN ID, channel no. and short address from section 8.3 and 8.5.

7.2. One by one via routers without short address: The coordinator will extend the range to the end devices.



No Zigbee manager software necessary. Please power on the adapters by the following procedures with the same PAN ID and Channel no..

Step 1: Power on the Coordinator and R1 for pairing and power off the other adapters

Step 2: Power off the Coordinator. Power on the R2 for pairing with R1. Please power off the other adapters.

Step 3: .The rest may be deduced by analogy to the end device.

If you need to set multi network, please set the different PAN ID, channel no. and short address from section 8.3 and 8.5.

7.3 One by many: Please check the picture of section 2.2. The coordinator will transmit the data to the specific devices. The mode will need the short address for data transmission to the specific destinations.

Remark: There're two bytes of data which named the short the address in the Zigbee network assigned by the coordinator. You can set with or without the short address, please check the section 8.5.

8. Zigbee Manager Software

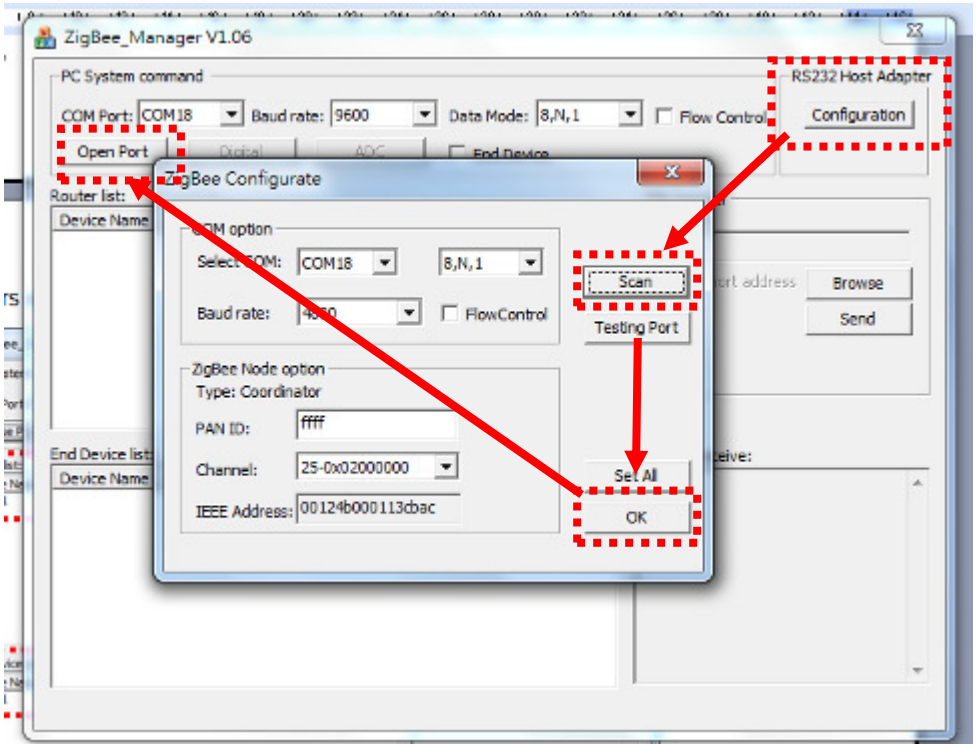
8.1 Setting the parameters of the devices for all the roles, coordinator, router and end device. Please plug the adapter with the PC via COM port individually.

8.2 The coordinator will assign the short address to all the routers or end devices when power on the adapter. The setting will take effect for the adapters which are in the same PAN ID and Channel.

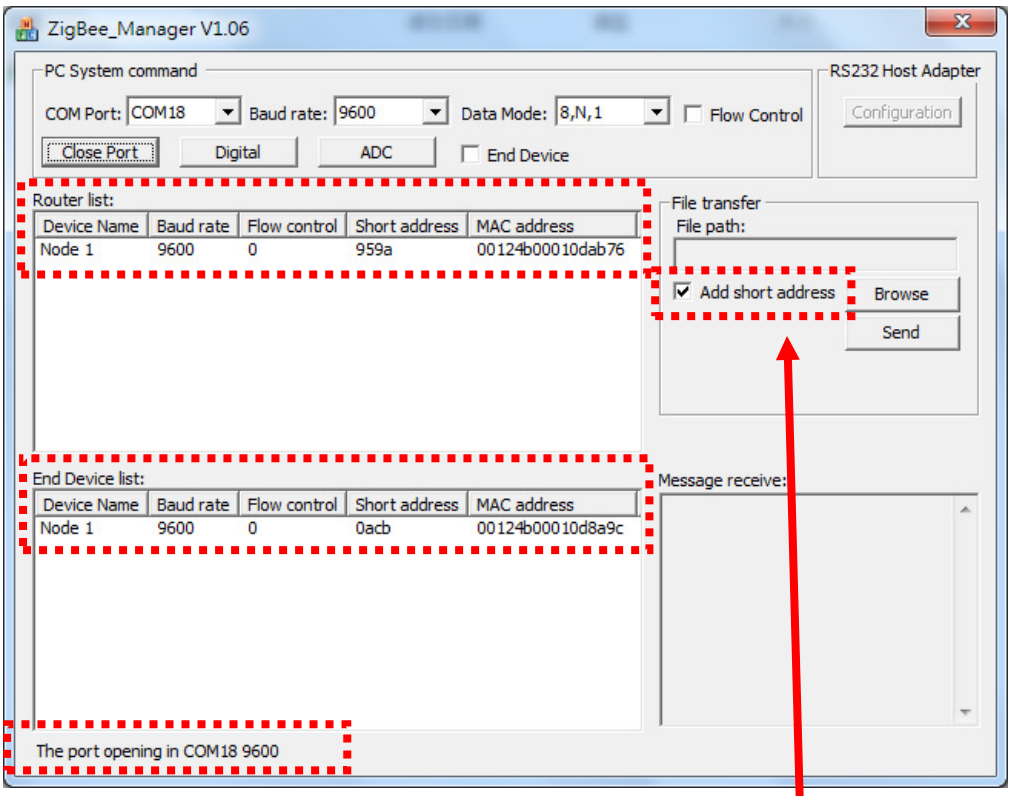
8.3 If you don't know the COM port, please check the following procedures.

Configuration → Scan → OK → Open Port

If you know the port number, you can get the parameters via the "Test Port" button.



8.4 The routers or end devices will be listed on the each window, please check the screen.

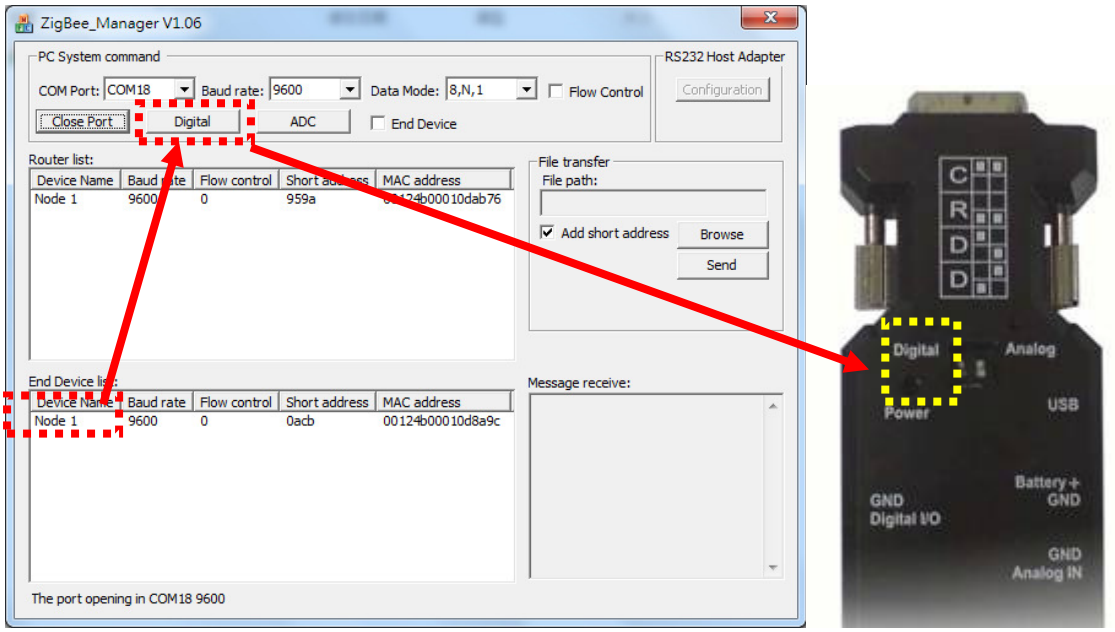


Be sure the COM port is opened successfully.

8.5 Short address: You can set the transmission with or without short address by click the box. Please power off the adapter after setting and new setting will be available after power on.

8.6 Simple test when link successfully.

- Choose one device via the list Window
- Click the “Digital” button, the green LED which is printed the “Digital” on the adapter will be turned on.



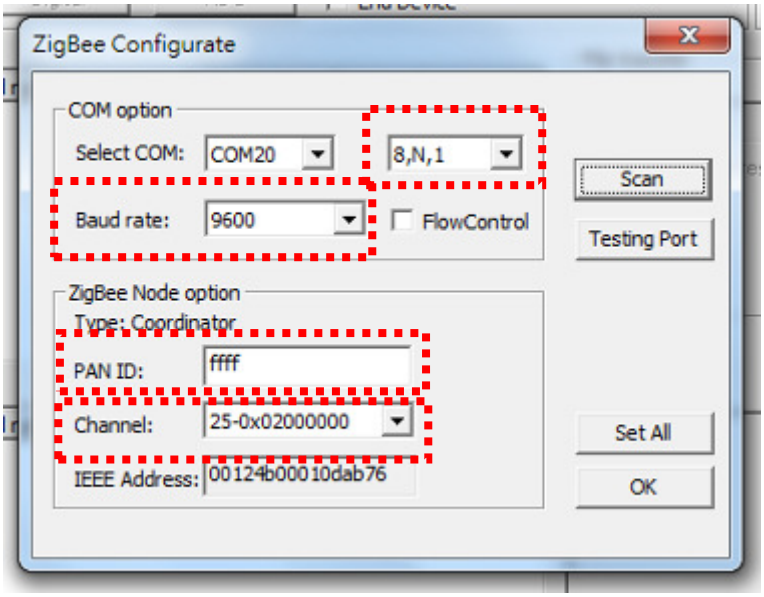
- The Zigbee Manager doesn’t support the digital input function, the user will program the software by Zigbee API and connect the external switch with the section 3.9.1.

9. Default Setting

9.1 The default setting for the devices:

- COM Port: 9,600 bps, 8,N,1 (8 data bits, None Parity, One Stop Bit)
- PAN ID: ffff, The different setting will set the private network which will not be connected by other Zigbee devices.
- Channel: 25 CH, The different setting will set the private network which will not be connected by other Zigbee devices.

The Zigbee manager will setup all the parameters. The scan function will search all the existing setting when you plug the adapter on the PC side via RS-232.



9.2 Recover to default setting:

- Power off all the Zigbee devices in the same Zigbee network.
- Change the role, C/R/D, via DIP switch on the top of the adapter.

- Change to role which is different to the existing setting and then power on the adapter. Be sure that turn off the other Zigbee devices.

10. Data transmission via RS-232 interface:

10.1 The reliable max. length of packet: 80 Bytes and the time interval between packets: 300 ms. The larger packet will need the longer time interval.

10.3 The length of the short address is 2 bytes in the front of the data from end device to coordinator. The short address will be configured, please refer to the section 8.5.

10.4 Buffer over flow: If the data transmission halt happen, please power off the coordinator and restart the network.

11. Internet of things

11.1 RS-232 to Ethernet converter (Optional)

- 10/100 Mbps Ethernet
- RS-232/422/485 Interfaces
- 7~40 VDC Power Input
- COM port Setup or firmware upgraded by web browser
- DB9 Pin 9 supplies 5 VDC for external Zigbee or Bluetooth RS-232 Adapters

(Model: IP-S)

11.2 Connection:

11.3 Virtual COM port via Internet: You can set the COM port via Internet. The controller will control the Zigbee mesh network remotely. Please contact us for more details.

Appendix 1: Specifications:

Specification	Low Power	High Power
Solution	TI CC 2530	TI CC 2530 + CC 2591
Coverage	30~50 m	500~800 m
Tx. Power	4.0dBm	18 dBm
Rx. Sensitivity	-95dBm (Nominal)	-95 dBm (Nominal)
Baud Rate	Supports 1.2/2.4/4.8/9.6/19.2/38.4/57.6/115.2/230.4 Kbps	
Connection	Point-to-Multi points	
UART Interface	TxD, RxD, GND, CTS/RTS	
RS-232 Interface	D_SUB 9-pin female	
Standard	2.4 GHz IEEE 802.15.4 / ZigBee Pro Stack	
Data rate	250Kbps	
Data Bit	8 bit	
Frequency	2.4GHz~2.5 GHz	
Modulation	DSSS	
Antenna	SMA female + external dipole antenna	
Antenna Impedance	50 ohm	
Power Supply	+5 to +6 V DC	
Current Consumption	TX: 35.5 mA @ +4.5 dBm, RX: 24 mA	
Operation Temperature	-20℃ to +75℃	
Dimensions	35 mm (W) x 45 mm (H) x 15 mm (D)	

Remark: All contents are subject to change without notice.

Appendix 2: Positioning functions

If you need the positioning functions, the IC will change to CC2430 solution, please call your distributors.