1. Introduction

ZigBee is a specification based on the IEEE 802.15.4 standard for wireless personal area networks (WPANs). ZigBee operates in the ISM radio bands and its focus is to define a general-purpose, inexpensive, self-organizing, mesh network that can be used for industrial control, embedded sensing, medical data collection, smoke and intruder warning, building automation, home automation, and domotics, etc.

At present, the ICP DAS ZigBee converter ZB-2550 and ZB-2551, supports the RS-232 and RS-485 interfaces. The main design goal is limited data communication using wireless transmission, so may provide a better solution for environments where wiring is difficult.

1.1 More Information

The ZB-2550 and the ZB-2551 are small-sized wireless ZigBee converters based on the IEEE 802.15.4 standard. They allow RS-485/RS-232 interfaces to be converted to a ZigBee wireless network. Only one ZB-2550 (Host) is allowed in a ZigBee network and is used to initialize and manage the data transmission routes. The ZB-2551 (Slave) ZigBee router is responsible for transmitting/receiving data from its child/parent router or the host. ICP DAS ZigBee products are designed for low data rates. The main benefit of ICP DAS ZigBee products is that they can be used to define a general-purpose, self-organizing mesh network, which can be highly advantageous for industrial control.

The typical transmission range of the ICP DAS Zigbee ZB-2550/ZB-2551 converter is 100m, and the ZB-2550P/ZB-2551P is 700m.

The transmission frequency range of the ZigBee converter is between 2.405 GHz and 2.48 GHz, separated into 5 MHz sectors, and provides 16 channels, and 65536 Pan IDs (65535 network groups can be set).

The ZigBee converter includes a repeater module that can be used to increase communication range or prevent data loss if the connection is interrupted or becomes unstable. Please refer to ZigBee converter other document for more information as following links:

http://ftp.icpdas.com/pub/cd/usbcd/napdos/zigbee/zigbee_converter/

1.2 Pin Assignment

ZB-2050(P)/ZB-2051(P)
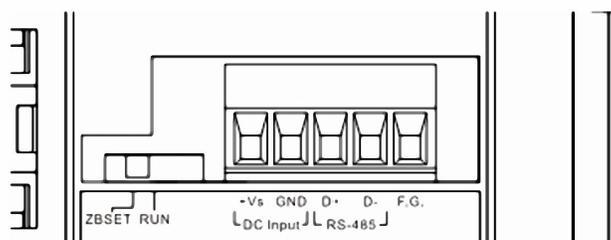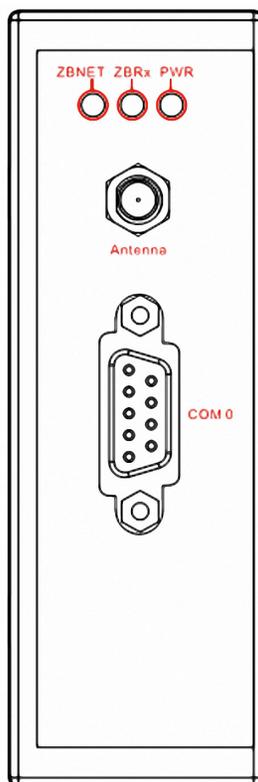
1.3 Specifications

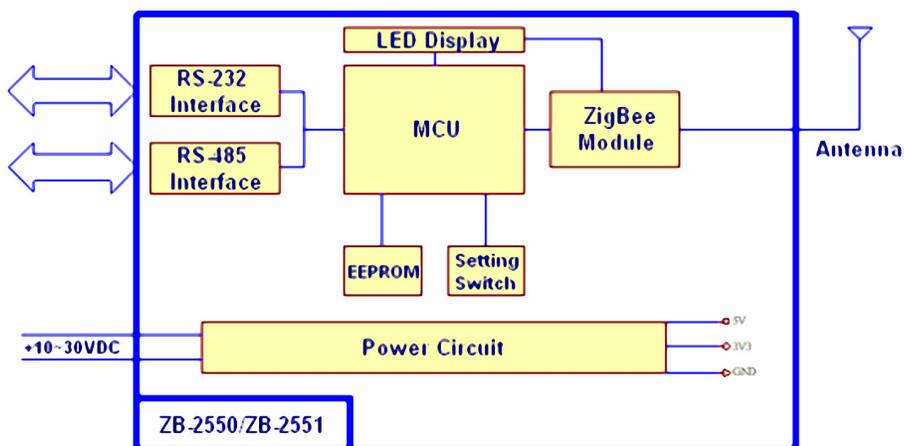| Models	ZB-2550	ZB-2550P	ZB-2551	ZB-2551P
Wireless				
RF channels	16			
Receive sensitivity	-102 dBm			
Transmit power	12 dBm			
Network Topology support	Star, Mesh and Cluster tree			
Certification	TUV(ZCP)			
Antenna	2.4GHz - 3dBi Omni-Directional antenna			
Transmission Range	100m	700m	100m	700m

Models	ZB-2550	ZB-2550P	ZB-2551	ZB-2551P
General				
CPU	8-bit microcontroller			
EEPROM	128 KB (8 blocks, each block has 256 bytes);Data retention > 40 years; 1,000,000 erase/write cycles			
Module Type	Host	Host	Slave	Slave
Communication Interface				
COM 0	RS-232 (TXD, RXD and GND); D-SUB9 Female, Non-isolated		RS-232 (TXD, RXD and GND); D-SUB9 Male, Non-isolated	
	RS-485 (D+, D-; internal ASIC self-tuner); Non-isolated			
COM 0 Settings				
Data Bit	8			
Parity	Even, Odd, None			
Stop Bit	1, 2			

LED Indicators	
ZigBee Net State	Green
ZigBee RxD	Yellow
Power	Red

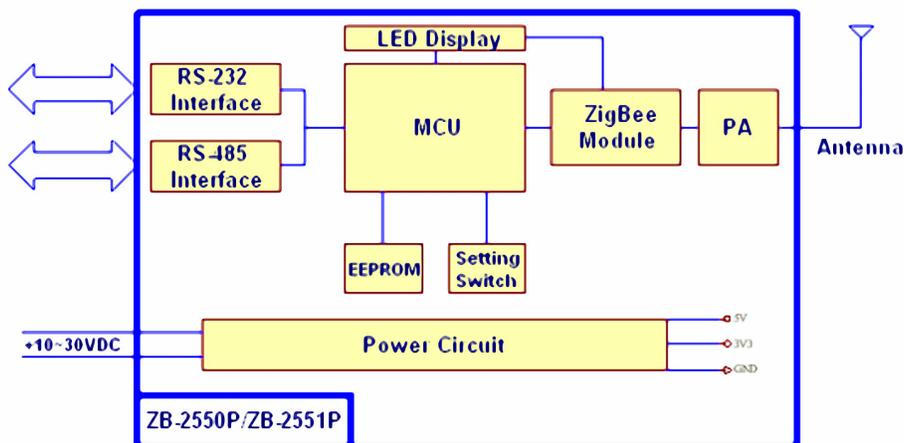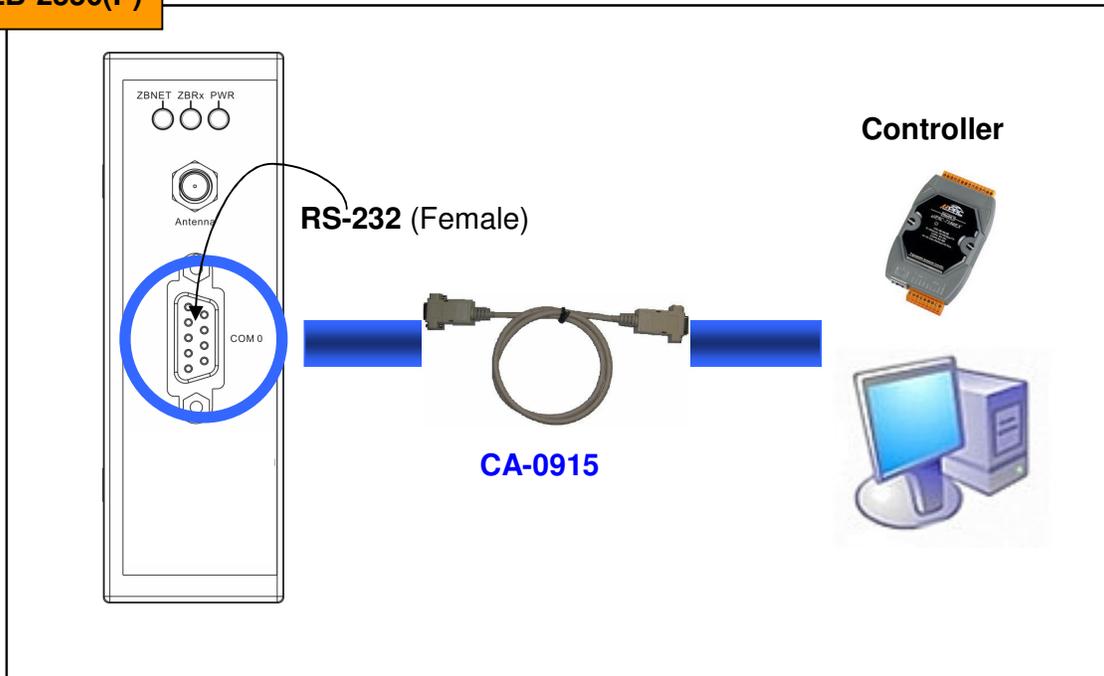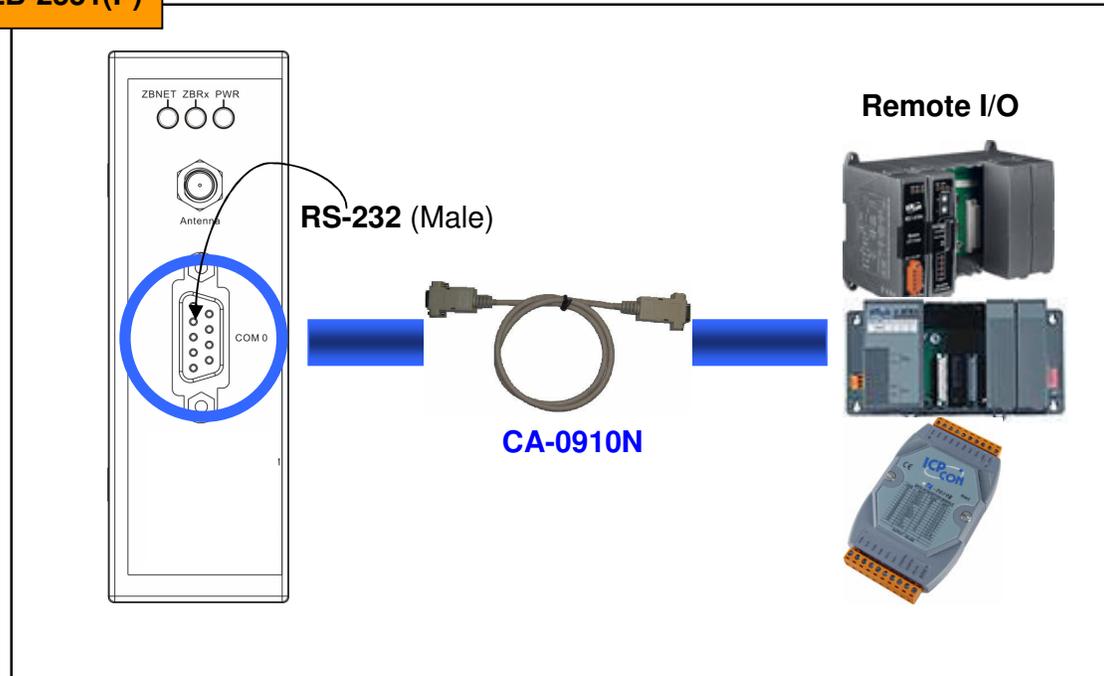| Models	ZB-2550	ZB-2550P	ZB-2551	ZB-2551P
Power				
Protection	Power reverse polarity protection			
EMS Protection	ESD, Surge, EFT			
Required Supply Voltage	+10 VDC ~ +30 VDC			
Power Consumption	0.5W	2W (max)	0.5W	2W (max)
Connection	5-Pin 5.08 mm Removable Terminal Block			
Mechanical				
Casing	Plastic			
Flammability	UL 94V-0 materials			
Dimensions	33 mm x 78 mm x 107 mm (W x L x H)			
Installation	DIN-Rail			
Environment				
Operating Temperature	-25 °C ~ +75 °C			
Storage Temperature	-40 °C ~ +80 °C			
Relative Humidity	5 ~ 95% RH, non-condensing			

1.4 Block Diagram

ZB-2050/ZB-2551

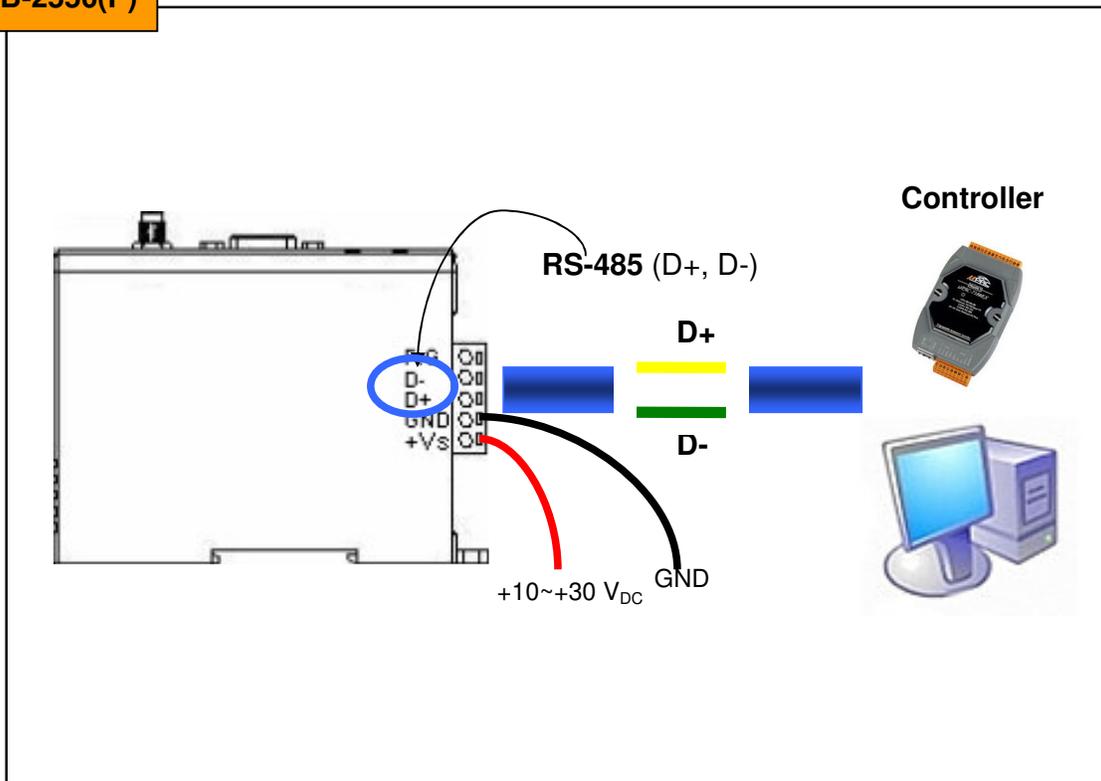ZB-2050P/ZB-2551P

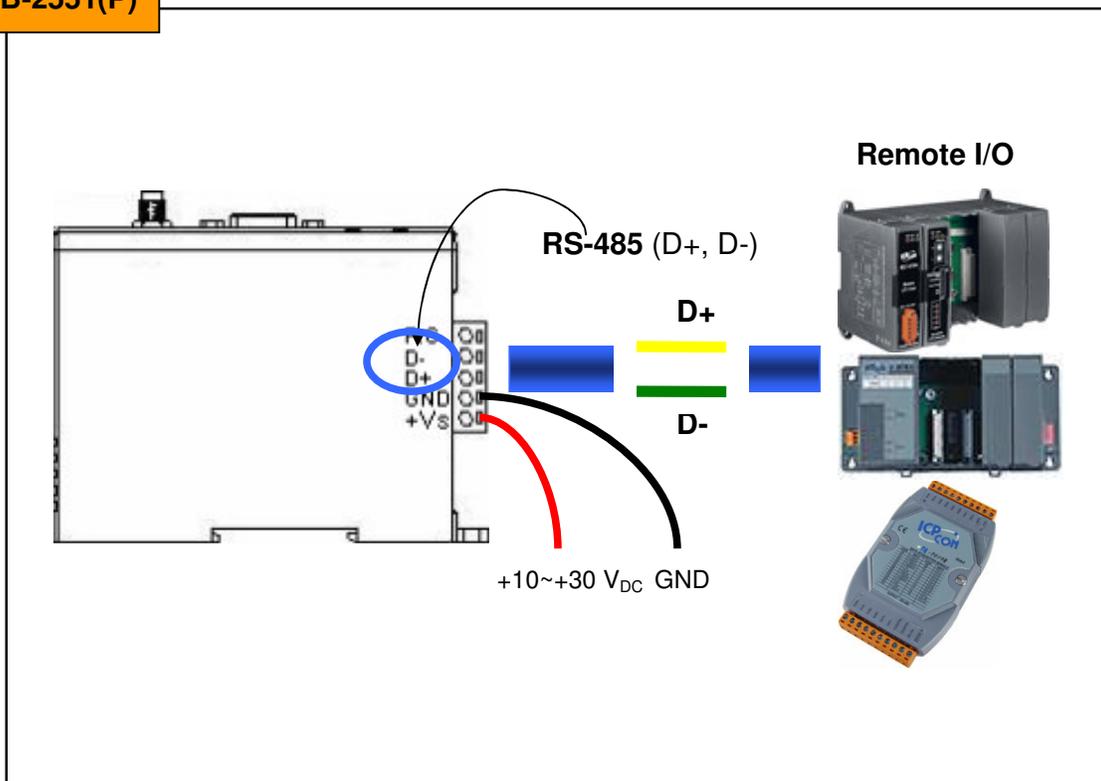# 1.5 Wire Connection

Serial Port - RS-232

ZB-2550(P)

Controller

RS-232 (Female)

COM 0

CA-0915

ZB-2551(P)

Remote I/O

RS-232 (Male)

COM 0

CA-0910N

Serial Port - RS-485

ZB-2550(P)

Controller

RS-485 (D+, D-)

D+

D-

+10~+30 V$_{DC}$ GND

ZB-2551(P)

Remote I/O

RS-485 (D+, D-)

D+

D-

+10~+30 V$_{DC}$ GND

1.6 Quick Start

1. Before configuring the ZigBee converter, adjust the switch to the ZBSET position then re-boot (power off/on) the module. After configuration is complete, adjust the switch to the RUN position then re-boot (power off/on) the module.
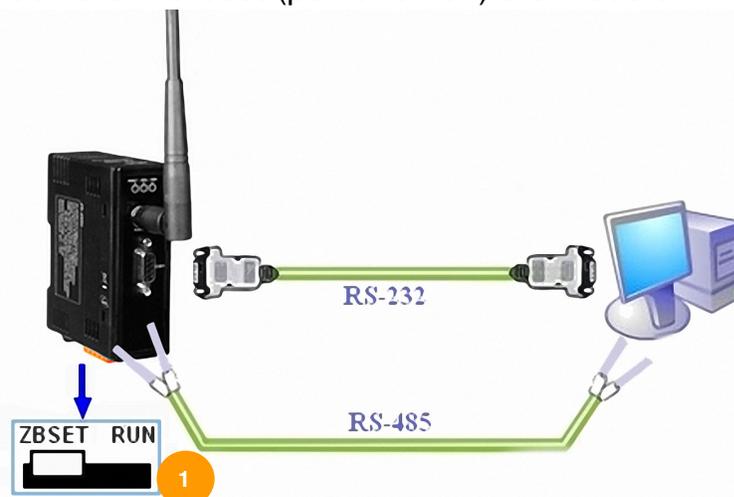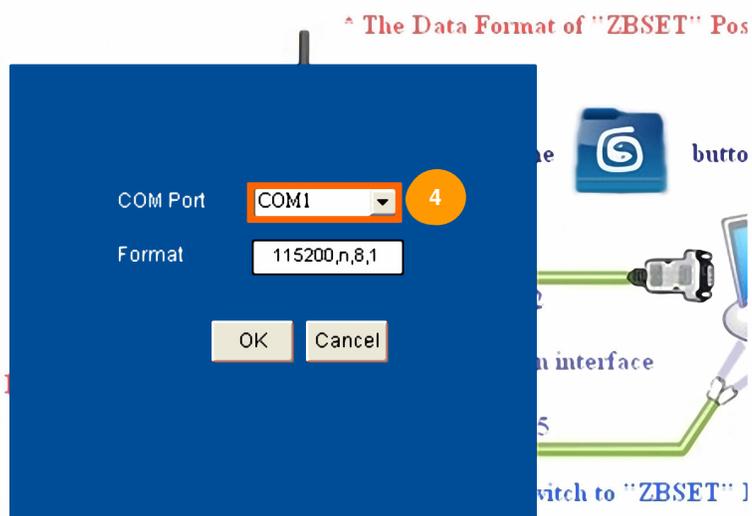

2. When the following screen is displayed, click on the OK button
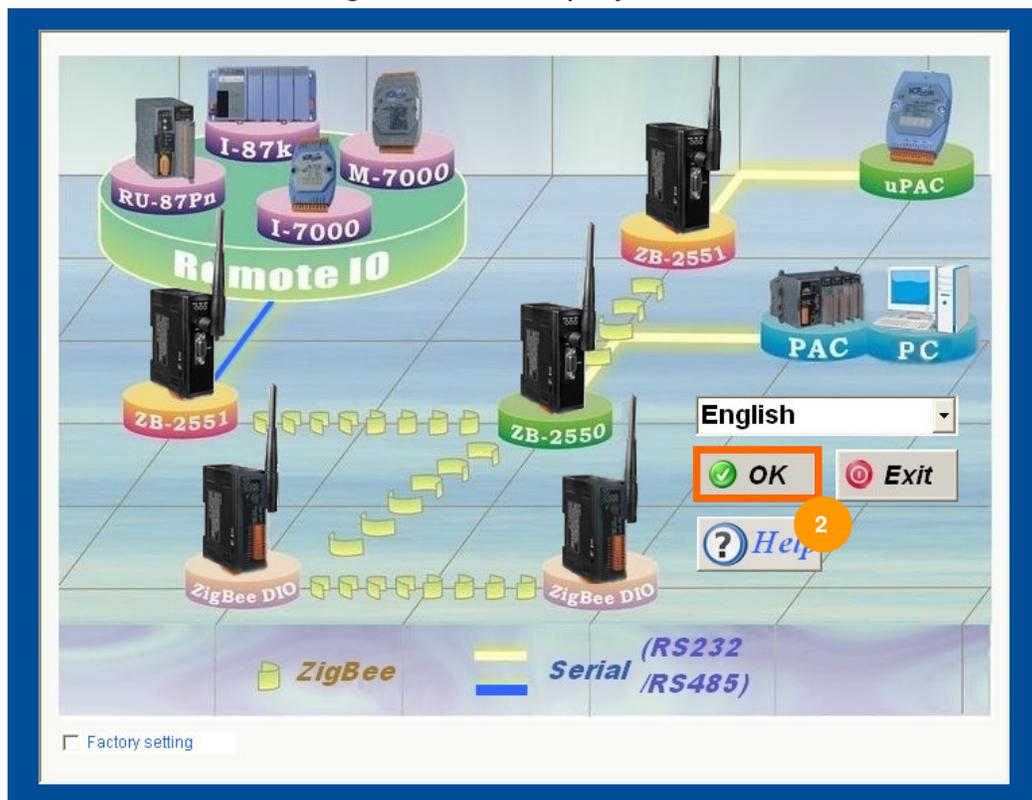
3. Click on the Connect button
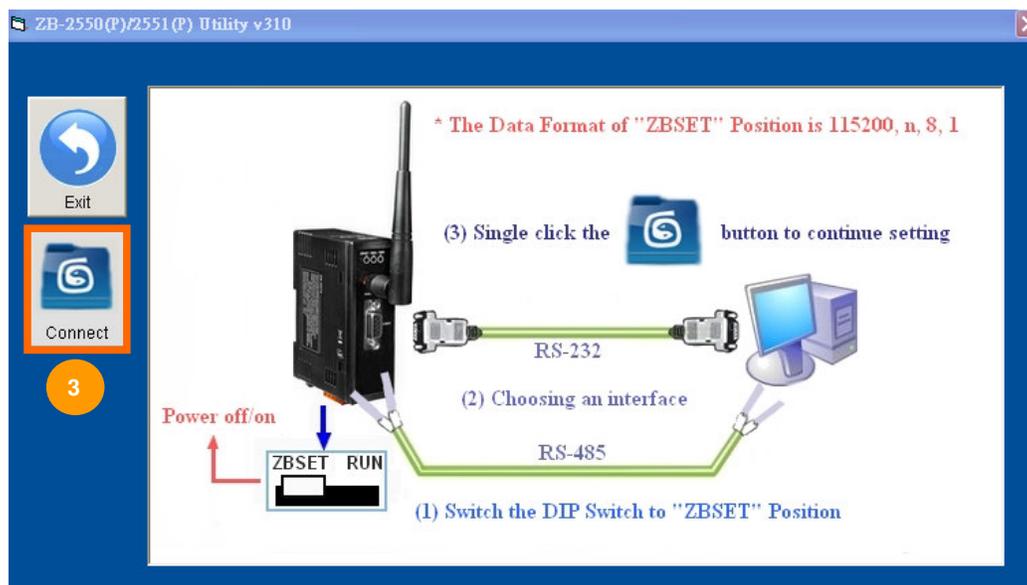
4. Please select the COM Port on your PC

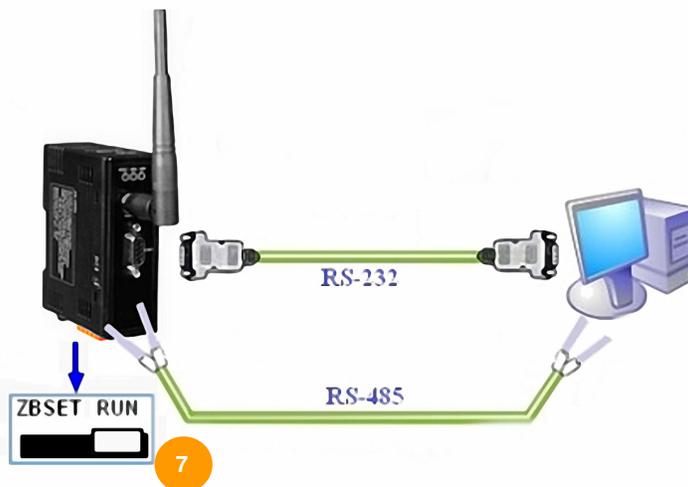5. Click on the Config button to configure setting for the ZigBee Converter - ZB-2550(P)/ZB-2551(P). e.g : ZB-2551(P)

6. Click on the Config button for set the new ZigBee setting.

7. After ZigBee module configuration has been successfully established. Now, adjust the switch to the RUN position then re-boot (power off/on) the module. Leverage the power of your data. Make it work for you.

8. Click Default button to load factory default parameters if you want to load factory default setting of ZigBee Module

Zigbee Addressing and Identifiers

● **Node ID (0x0000~0xFFFF)**

A 16-bit address that describes a Zigbee node

Randomly assigned during network join

ZB-2570(P)/ZB-2550(P) always uses 0x0000

ZB-2571(P)/ZB-2551(P) ranges 0x0001~0xFFFF

ZB-DIO/ZB-AIO ranges 0x0001~0x001F

Resolve by stack in case of collision

Included in all message to identify node

● **Pan ID (0x0000~0xFFFF)**

A 16-bit ID to identify the network

Included in every packet

A "logical" way to separate Zigbee networks running on same RF channel

Defined during network formation by ZB-2570(P)/ZB-2550(P)

ZB-DIO/ZB-AIO always uses 0xFF00 or 0xFF01

● **RF Channel**

1 of 16 RF channels

Defined during network formation by ZB-2570(P)/ZB-2550(P)

Note : A Work Network - Runing on the same Pan ID and RF Channel

● **Network Survival Detecting Time**

ZB-2551(P) will connect with Parent (ZB-2550(P)) periodically to confirm the survival of network. If it detects unsuccessfully, and it process initialize network again to find a new parent.

1.7 Default Settings

Default settings for the ZB-2550 are as follows：

ZB Node ID：	0x0000
ZB Pan ID：	0xFF00
ZB Channel (RF Channel)：	0x00
ZBSET Data Format：	115200,n,8,1
Operating Mode：	Transparent

Default settings for the ZB-2551 are as follows：

ZB Node ID：	0x0020
ZB Pan ID：	0xFF00
ZB Channel (RF Channel)：	0x00
ZBSET Data Format：	115200,n,8,1
Operating Mode：	Transparent
Network Survival Detecting Time：	20 second (0x14)

● **Technical Support**

If you have problems about using the ZB-2000 series modules,

please contact ICP DAS Product Support.
Email: Service@icpdas.com