

ZigBee Converter User's Manual

Warranty

All products manufactured by ICP DAS are warranted against defective materials for a period of one year from the date of delivery to the original purchaser.

Warning

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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.

ICP DAS provided **ZB-2570(Host)** and **ZB-2571(Slave)**. At present supports **RS-232**, **RS-485** and **Ethernet** three kind of communication interfaces, its main design goal is the limited data communication by wireless way transmission, so may to provide one kind of better solution for the wiring difficult environment,

ZigBee converter provided **six** operating modes, please refer to the [tenth](#) page.

Transmission frequency range of ZB-2570 and ZB-2571 between 2.405GHz and 2.480GHz, separates by each 5MHz, provided **16 Channels** for user. And provide **65535 PANID** for user to set the Network group.

We also provides the **Repeater** modul, when broke the communication rage of ZigBee converter, you can use the repeater modul to increase the communication rage of ZB-2570 and ZB-2571.

2. Specifications

Features:

- ✧ ISM 2.4 GHz operating frequency
- ✧ Full compliant 2.4G IEEE802.15.4 / ZigBee specifications.
- ✧ Wireless transmission range up to 100M(Line of sight).
- ✧ DIN-Rail mount.

Specifications:

Core	
CPU	80186,80MHz or compatible
SRAM	512 Kbytes
Flash Memory	512KBytes; Erase unit is one sector (64K bytes);100,000 erase/write cycles
EEPROM	16K bytes (8 blocks, each block has 256 bytes); Data retention > 40 years;1,000,000 erase/write cycles
Communication Interface	
COM0(ZB-2570)	RS-232 (TXD, RXD, GND);D-SUB9 Female, Non-isolation RS-485 (D+, D-;self-tuner ASCII inside); Non-isolation
COM0(ZB-2571)	RS-232 (TXD, RXD, GND);D-SUB9 Male,Non-isolation RS-485 (D+, D-;self-tuner ASCII inside); Non-isolation
Ethernet Port	10/100 Base-TX (Auto-negotiating, Auto_MDIX, LED indicators)
LED Indicators	Power (Red) ZigBee Rx (Yellow) ZigBee Net State (Green)
COM0 Setting	
Baudrate	1200~115200 bps
Data bit	7, 8
Parity	Even, Odd, None
Stop bit	1

Power	
Protection	Power reverse polarity protection
EMS Protection	ESD, Surge, EFT
Required Supply Voltage	+10 to +30VDC
Power consumption	2.5W
Connection	5-Pin 5.08mm Removable Terminal Block
Dimensions	
Case	Plastic
Flammability	UL 94V-0 materials
Dimensions	33mm×107mm×78mm (W×H×D)
Installation	DIN-Rail
Environment	
Operating Temperature	-25°C to +75°C
Storage Temperature	-40°C to +80°C
Relative Humidity	5% to 95% Non-condensing

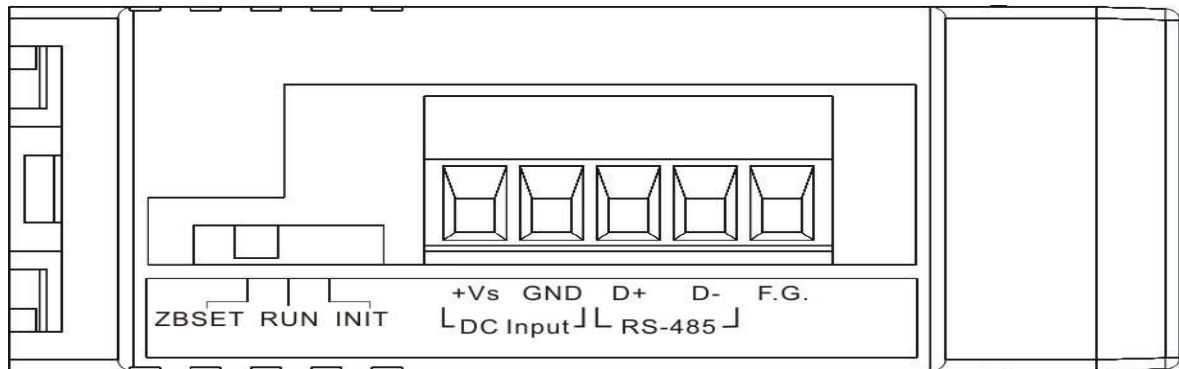
Wireless:

✧ RF channels	16
✧ Receive sensitivity	-102 dBm
✧ Transmit Power	12dBm
✧ Data encryption	AES CTR
✧ Network Topology support	Star, Mesh and cluster tree
✧ Certification	TUV
✧ Antenna	2.4GHz – 3dBi Directional antenna.

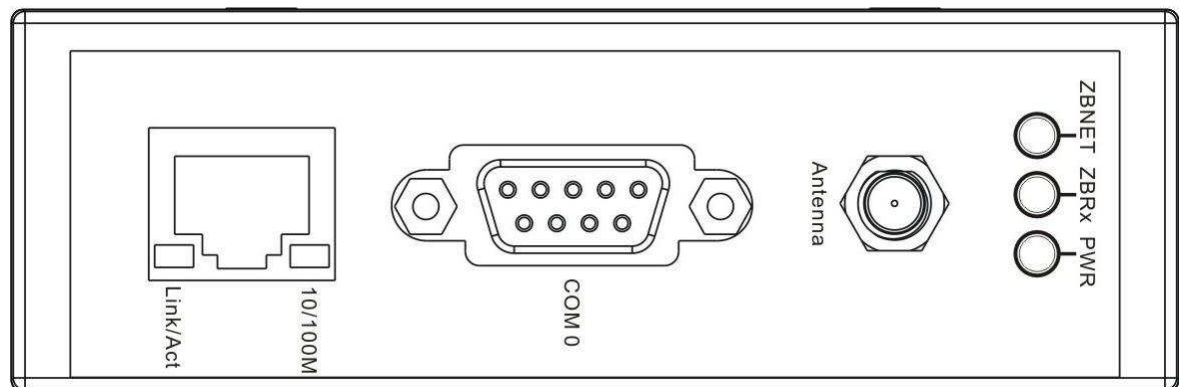
3. Product Description

3.1. Pin assignment

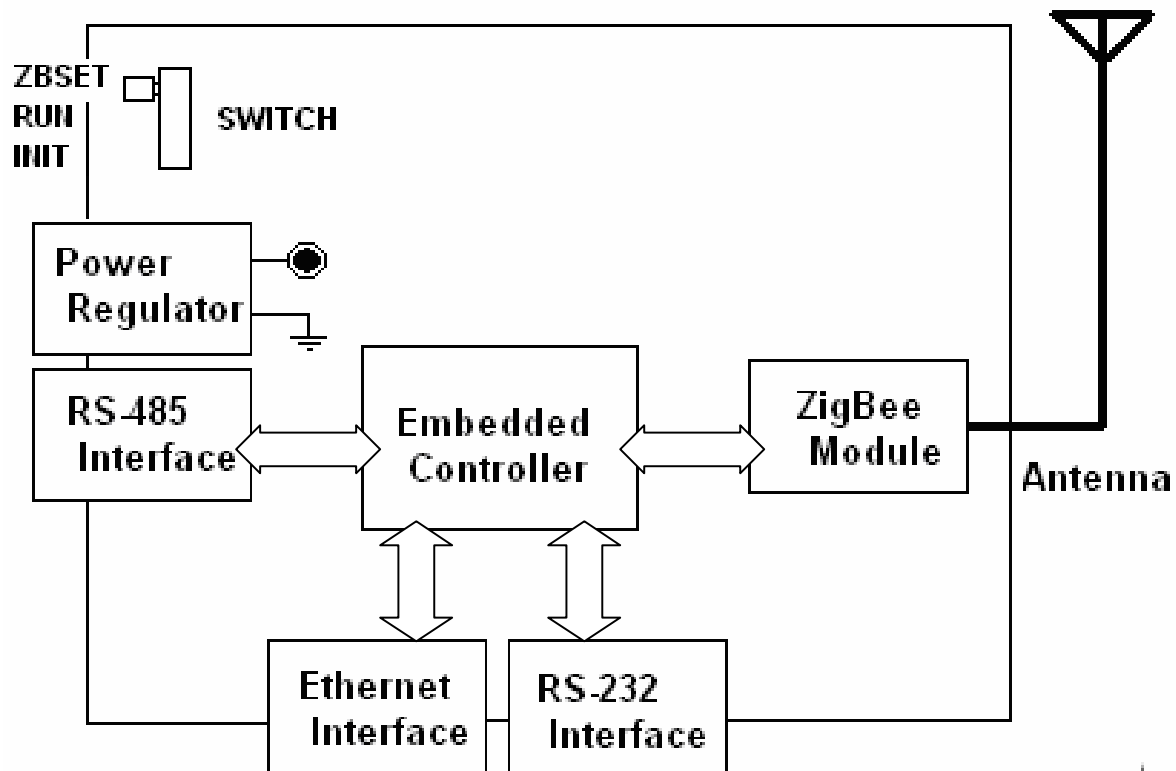
Bottom View :



Front View :



3.2. Block diagram



The ZigBee converter have three communication interface to use, they are **RS-232**, **RS-485** and **Ethernet**, and communication with ZigBee by embedded contronller controls.

When you want to configure the ZigBee converter, you need to adjust the switch to the **ZBSET**, and then make its power on .

When you want to work the ZigBee converter, you need to adjust the switch to the **RUN**, and then make its power on .

4. Applications

4.1. Application Introduction

Interface	Operating Modes	
Serial Port (RS-232/RS-485)	Operating Mode 1	Transparent without addressable Refer to Serial Port Mode 1
	Operating Mode 2	Transparent with addressable Refer to Serial Port Mode 2
	Operating Mode 3	Modbus RTU Refer to Serial Port Mode 3

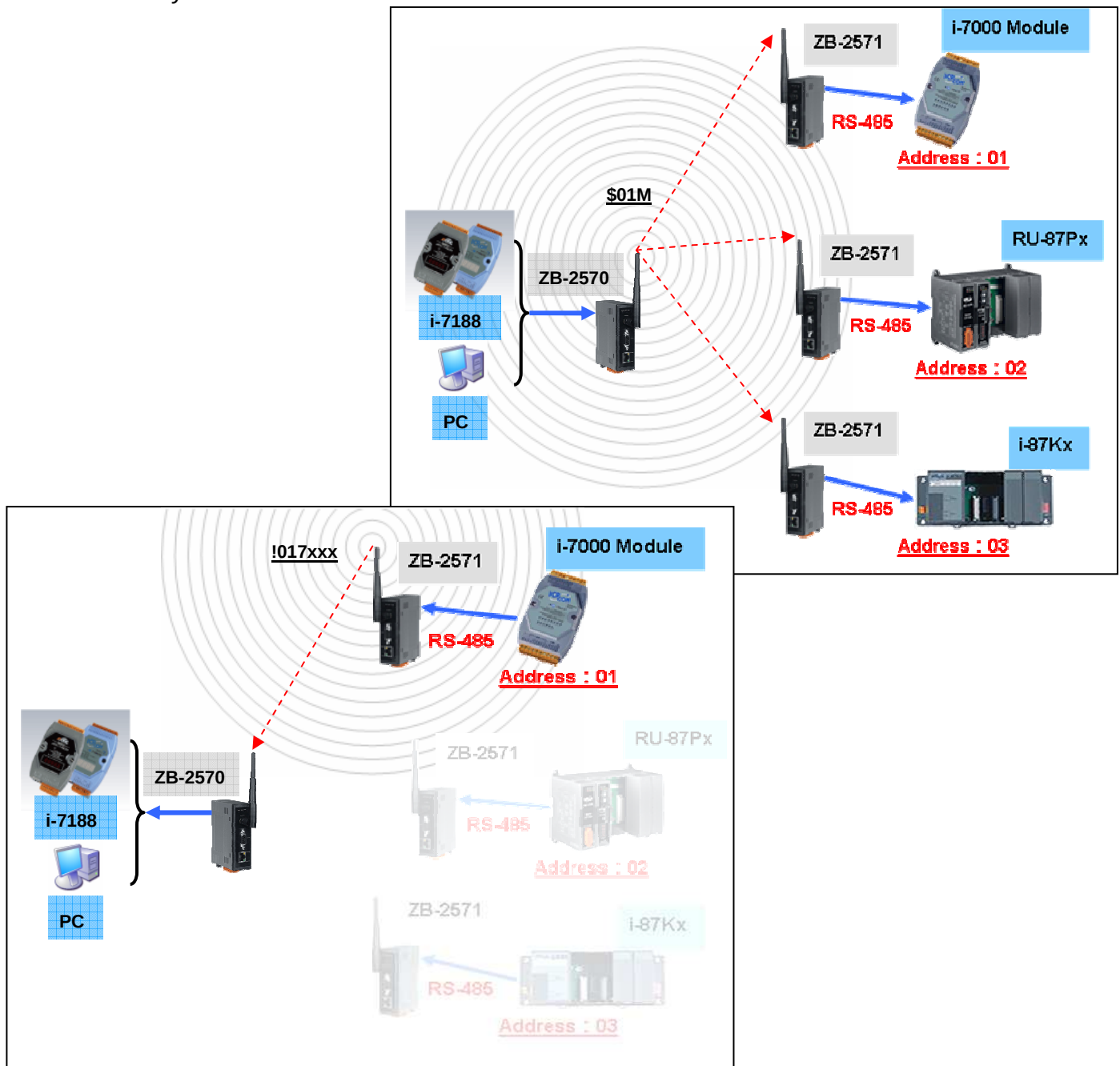
Interface	Operating Modes	
Ethernet (RS-45)	Operating Mode 1	Transparent without addressable Refer to Ethernet Mode 1
	Operating Mode 2	Transparent with addressable Refer to Ethernet Mode 2
	Operating Mode 3	Modbus TCP Refer to Ethernet Mode 3

◆ [Refer to chapter 5 for further setting argument information.](#)

4.2. Application Example

1. Serial Port Operating Mode1 :

When you want to convert the RS-232/RS-485 interface into to ZigBee and the device is addressable such as ICPDAS I-7000/M-7000/I-87k remote I/O modules, you can use our ZB-2571 (slave) to connect to these I/O modules and use the ZB-2570 (host) to connect to your controller or PC.

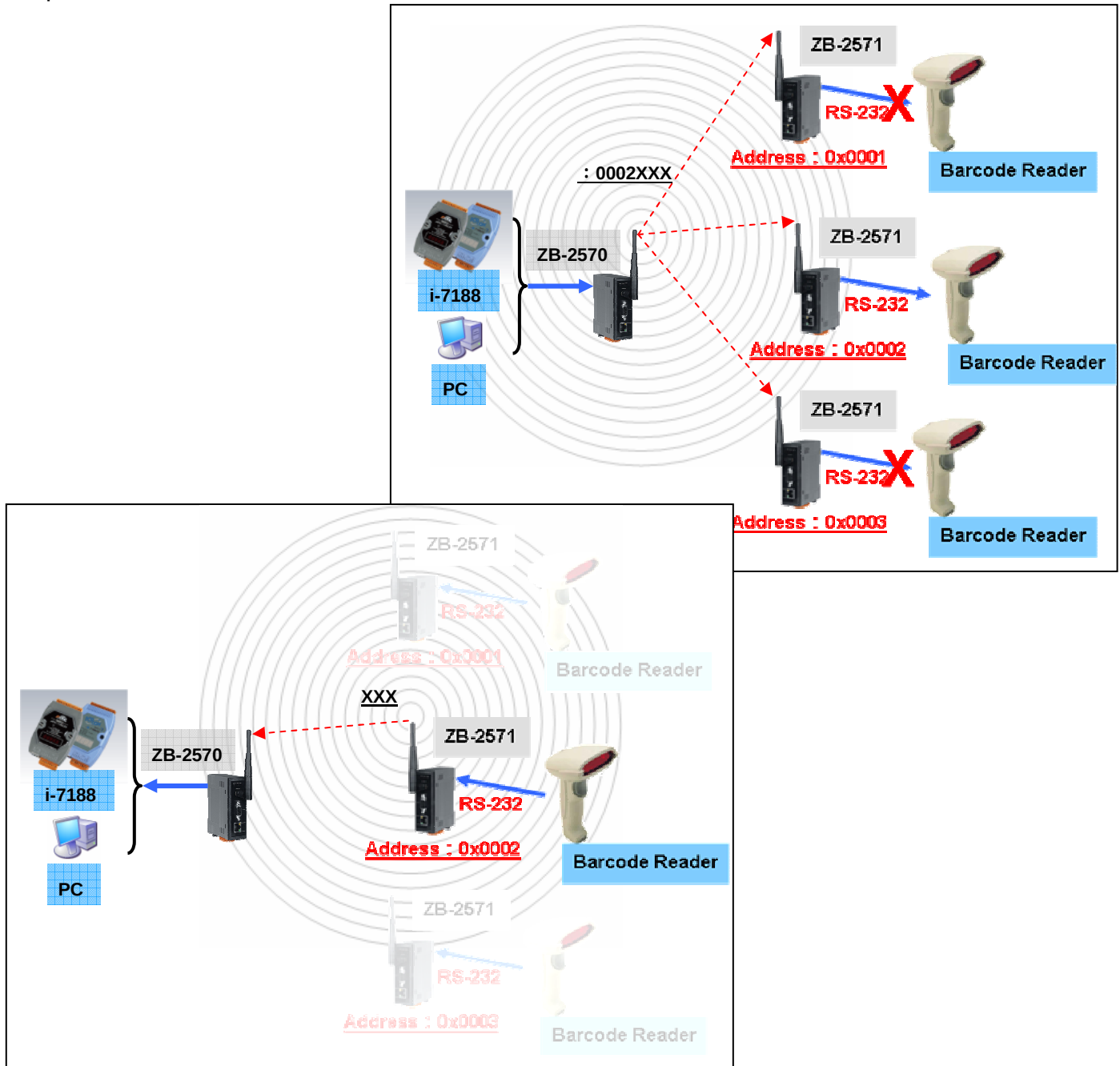


In some applications that the host controller needs to broadcast the data to all RS-232/RS-485 devices and these devices receive data only (no response), you can also use this mode.

◆ [Refer to ZigBee Converter Serial Port Setting for further setting argument information.](#)

2. Serial Port Operating Mode2 :

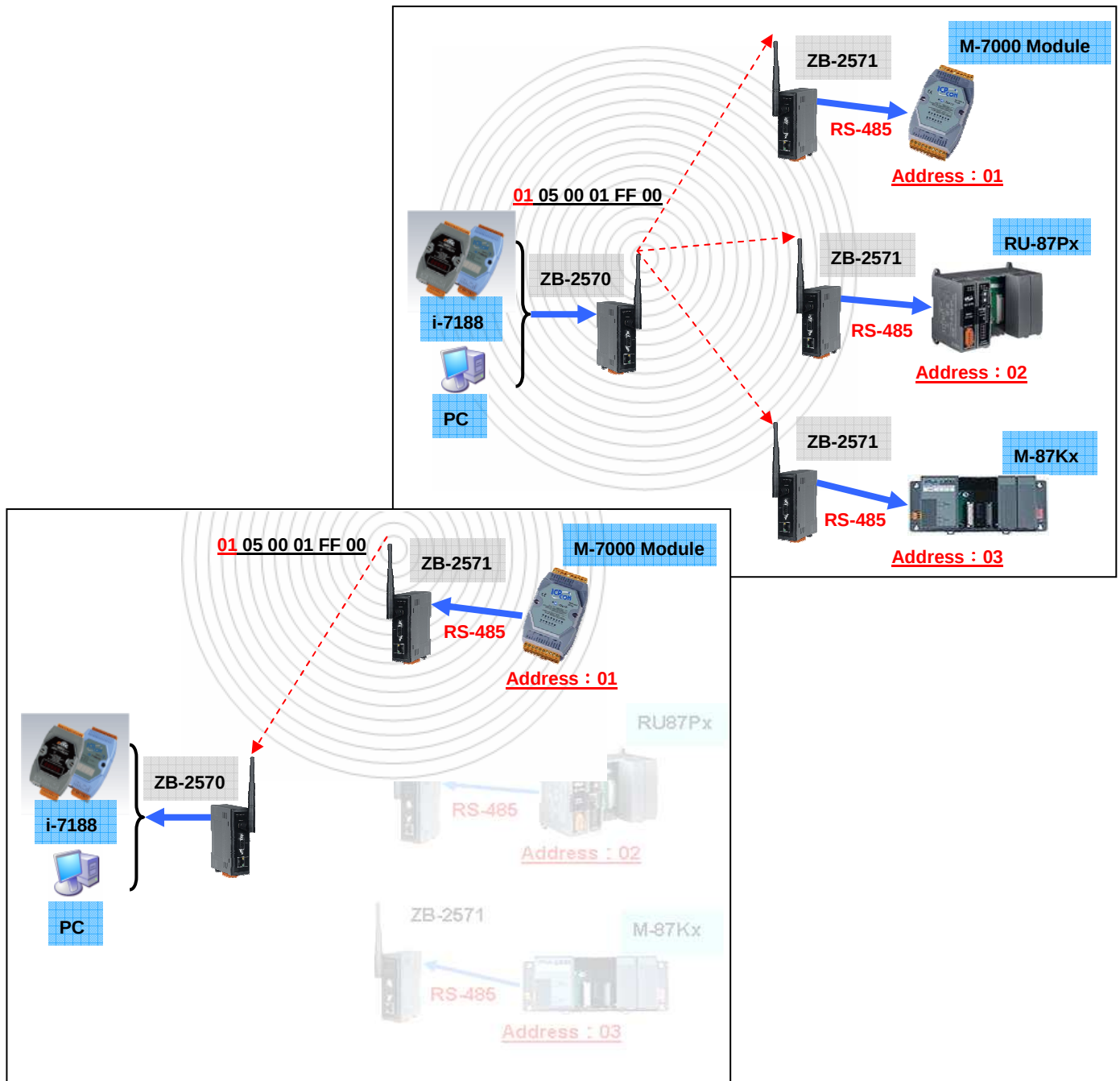
If the RS-232/RS-485 interface modules aren't addressable, you can use mode 2 to set an address to the ZB-2571 from 1~0xFFFF (ZB-2570 is always set as 0). Add 5 ASCII characters to the header of your controller's original request data, then the remote device that is the correct address will responses it. This mode is similar as ICPDAS I-752N products.



◆ [Refer to ZigBee Converter Serial Port Setting for further setting argument information.](#)

3. Serial Port Operating Mode3 :

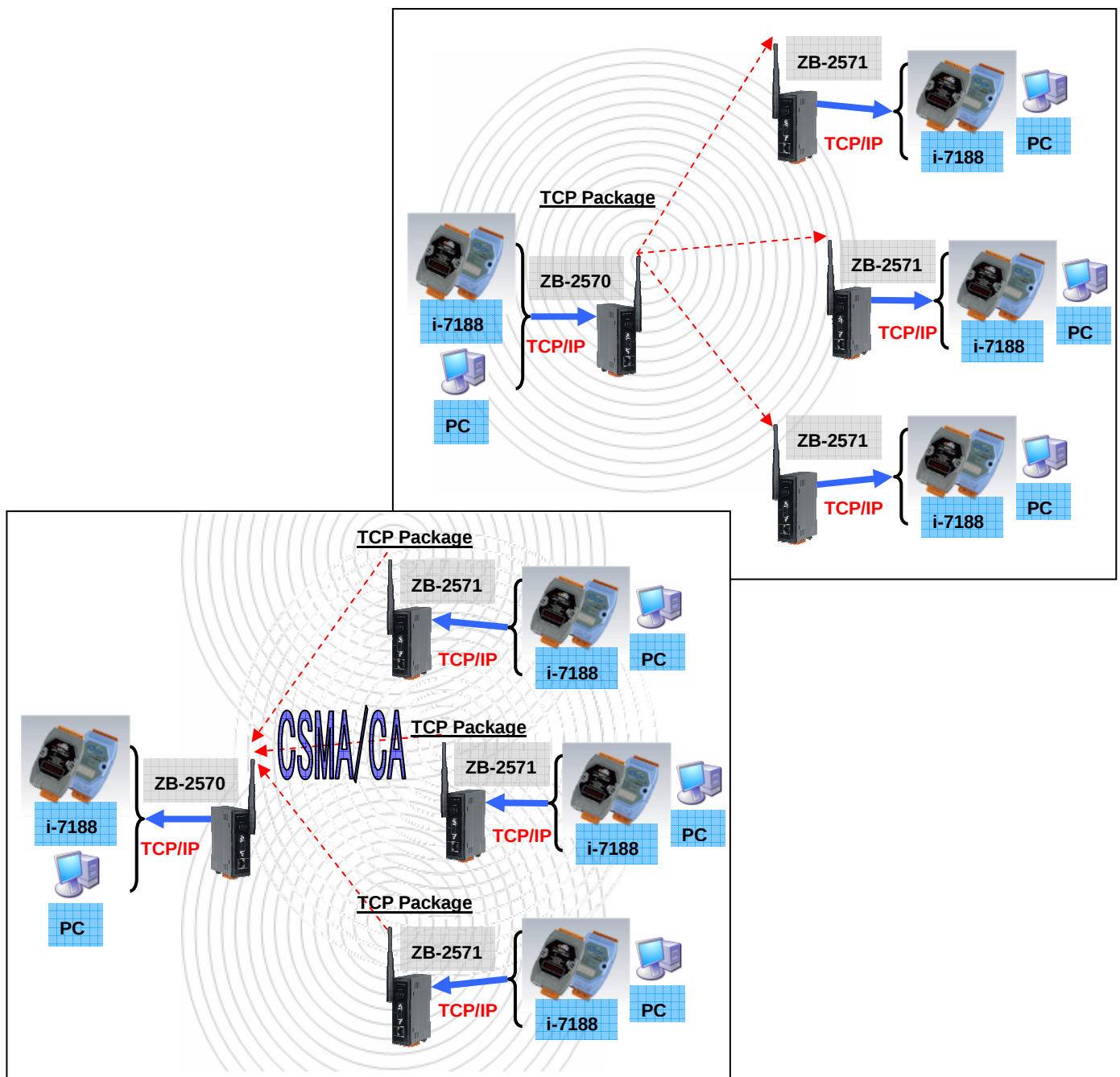
This is specific mode for Modbus RTU devices.



◆ [Refer to ZigBee Converter Serial Port Setting for further setting argument information.](#)

4. Ethernet Operating Mode1 :

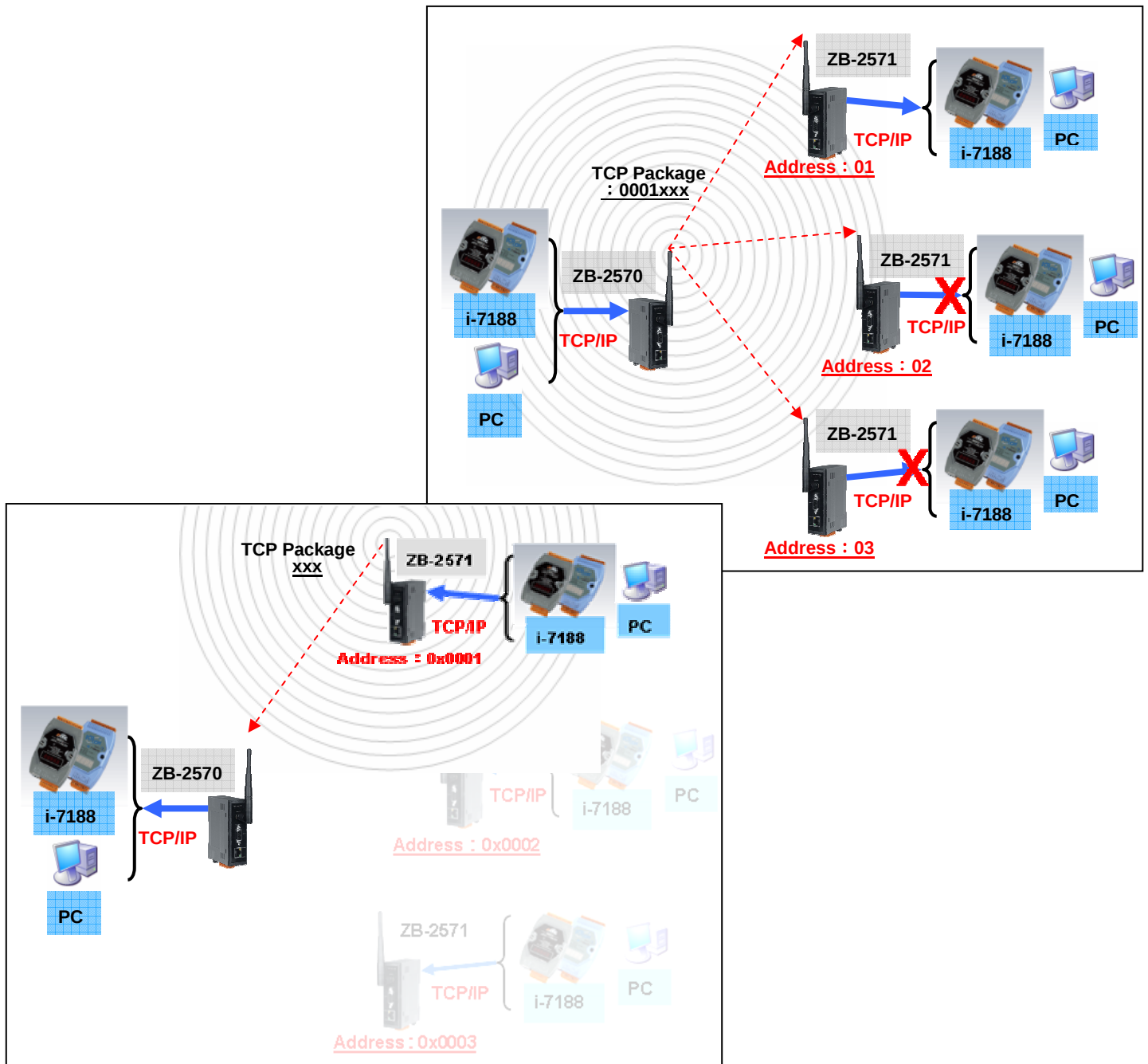
This mode is similar as serial port operating mode 1 but connect to the Ethernet devices. You should create a socket with ZB-2570 instead of remote device at controller side. The ZB-2071 will create a socket connection to the rear device (you should set the connection IP and port number via our utility software before you use it.). When the controller sends a TCP package to ZB-2570, the ZB-2570 will broadcast it. When the ZB-2571 receives the data from ZB-2570, it will forward it the rear device. If the device responses data, the ZB-2571 will only send the TCP package to the ZB-2570. Then your controller will receive the data that is forwarded from ZB-2570.



◆ [Refer to ZigBee Converter Ethernet Setting for further setting argument information.](#)

5. Ethernet Operating Mode2 :

This mode is similar as serial port operating mode 2 but connect to the Ethernet devices.

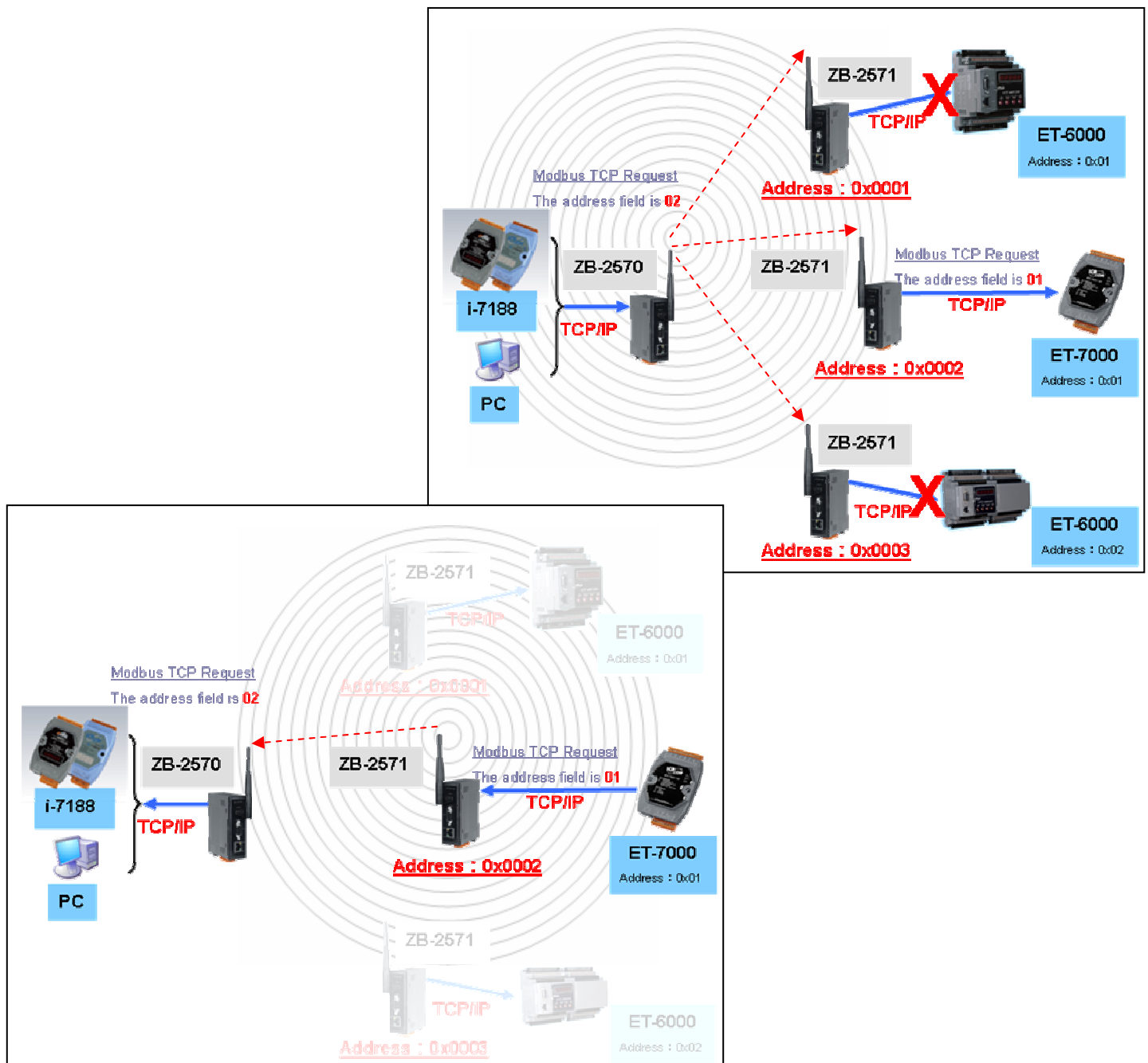


◆ [Refer to ZigBee Converter Ethernet Setting for further setting argument information.](#)

6. Ethernet Operating Mode3 :

This is specific mode for Modbus TCP devices. You should set a mapping address to the Modbus TCP device in the ZB-2571 via our utility software. Then you can send an Modbus TCP request command from your SCADA software or your own software via our ZB-2570, then the device that is correct address will response it.

For example, if your Modbus TCP device's default address is 1 and you set the mapping address of the ZB-2571 to address 2, then at your software you should send a Modbus TCP request command with the address filed is 02 to request the data.

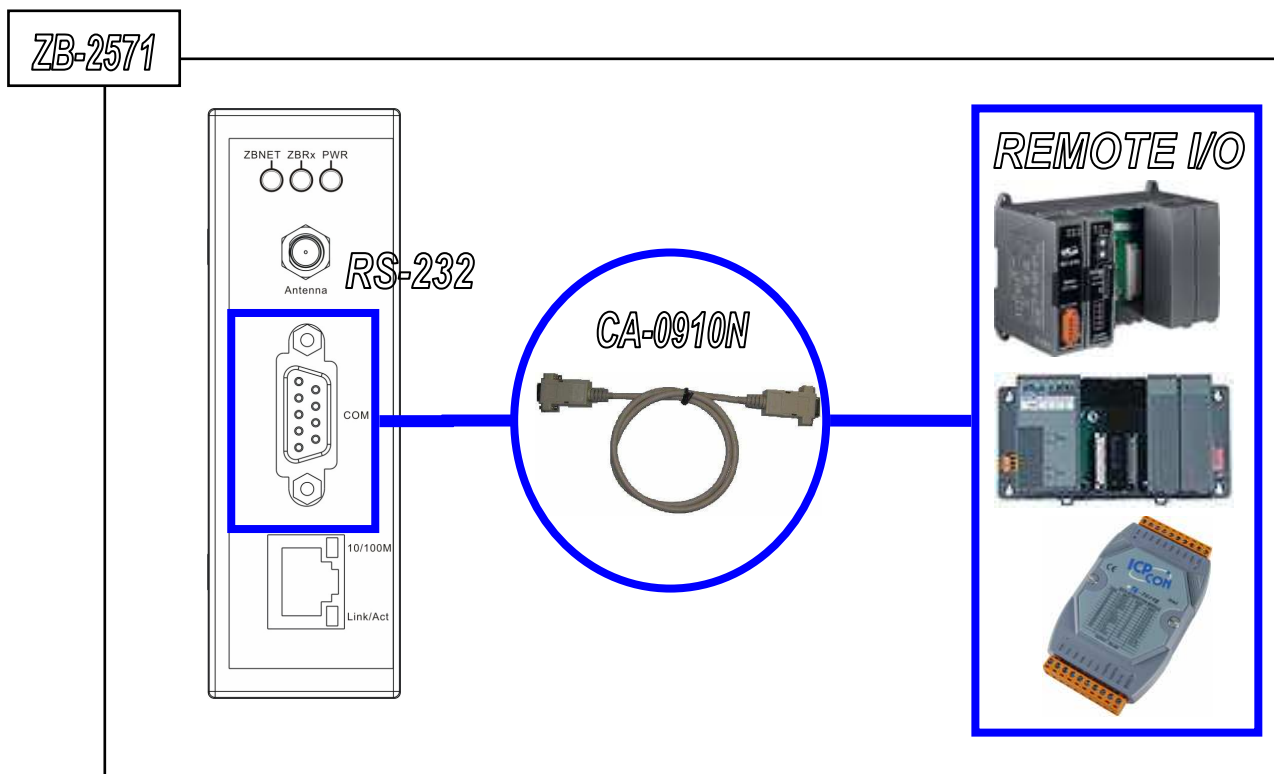
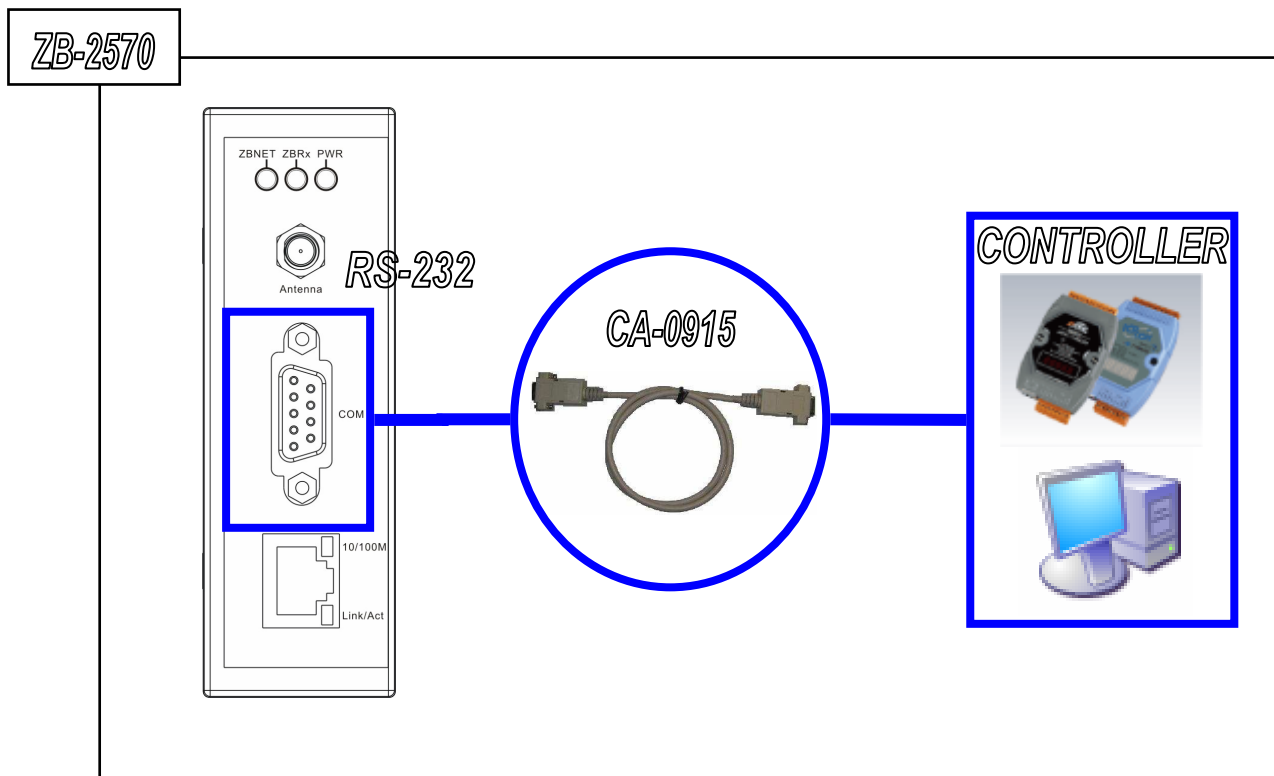


◆ [Refer to ZigBee Converter Ethernet Setting for further setting argument information.](#)

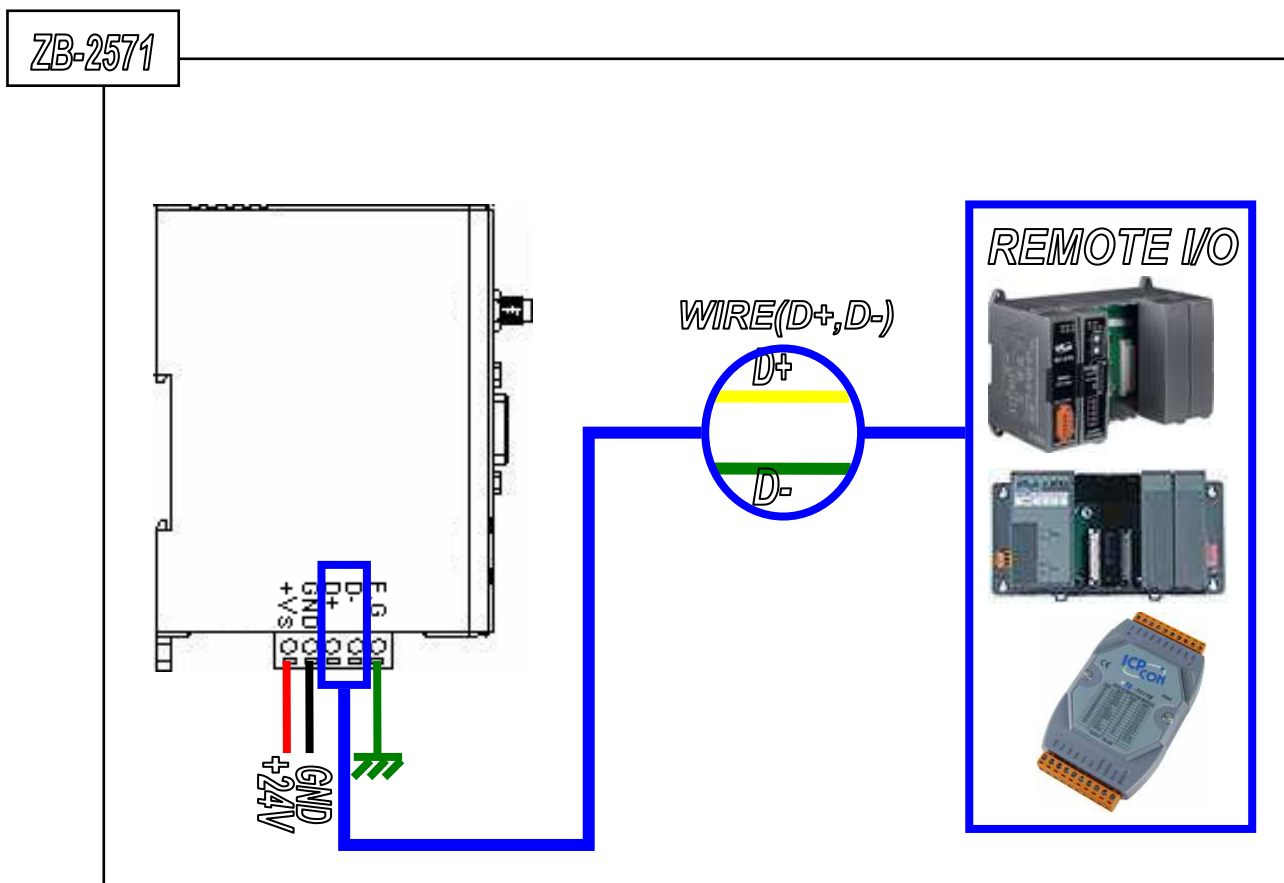
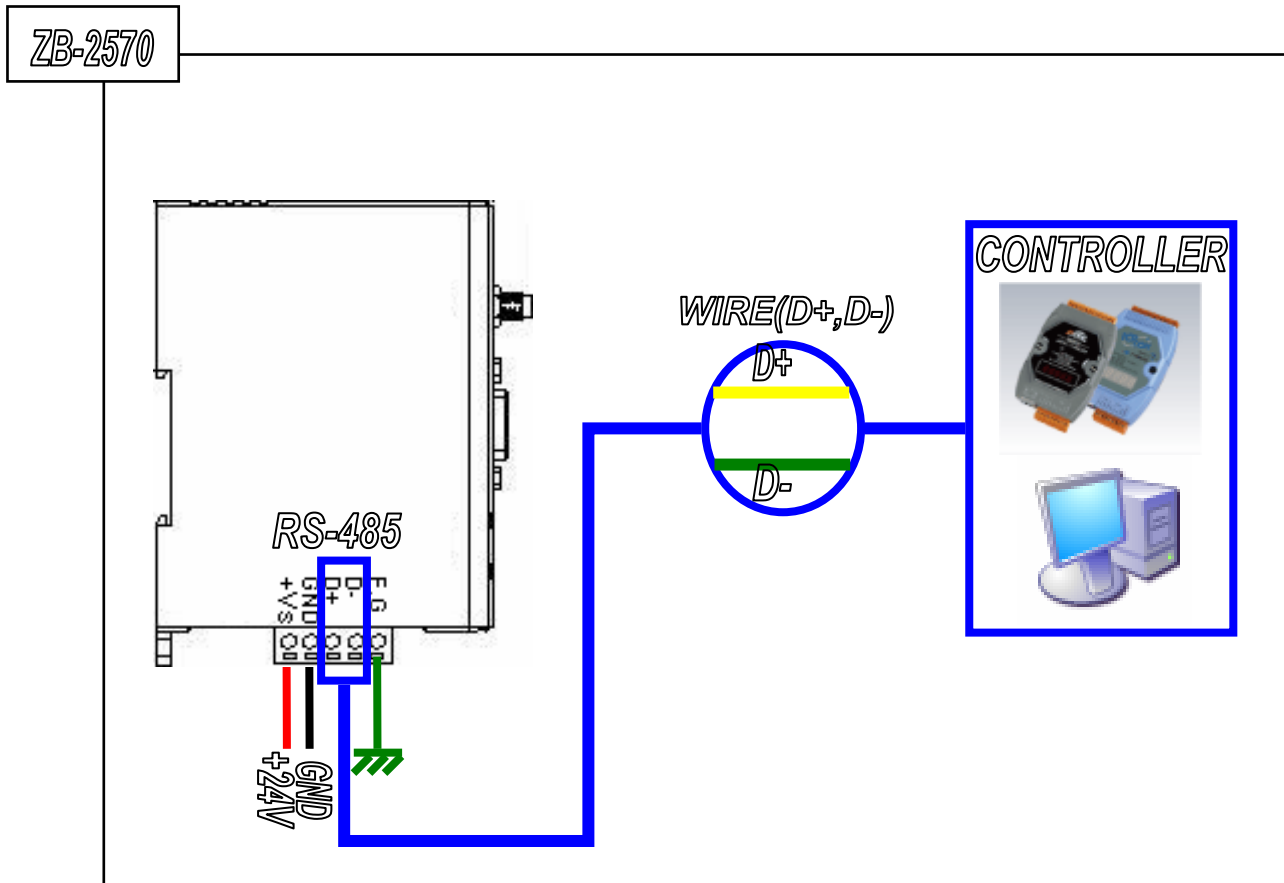
5. Quick Start for the ZigBee Converter

5.1. Installation the Hardware

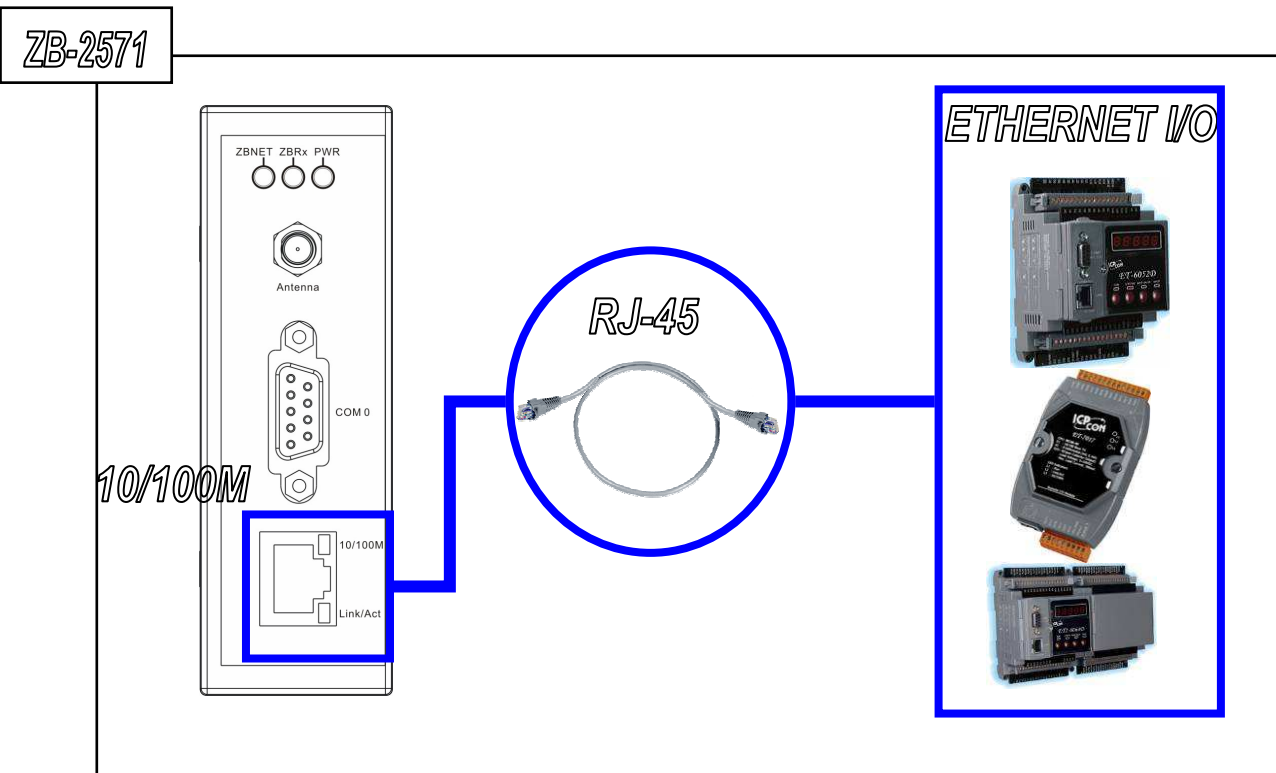
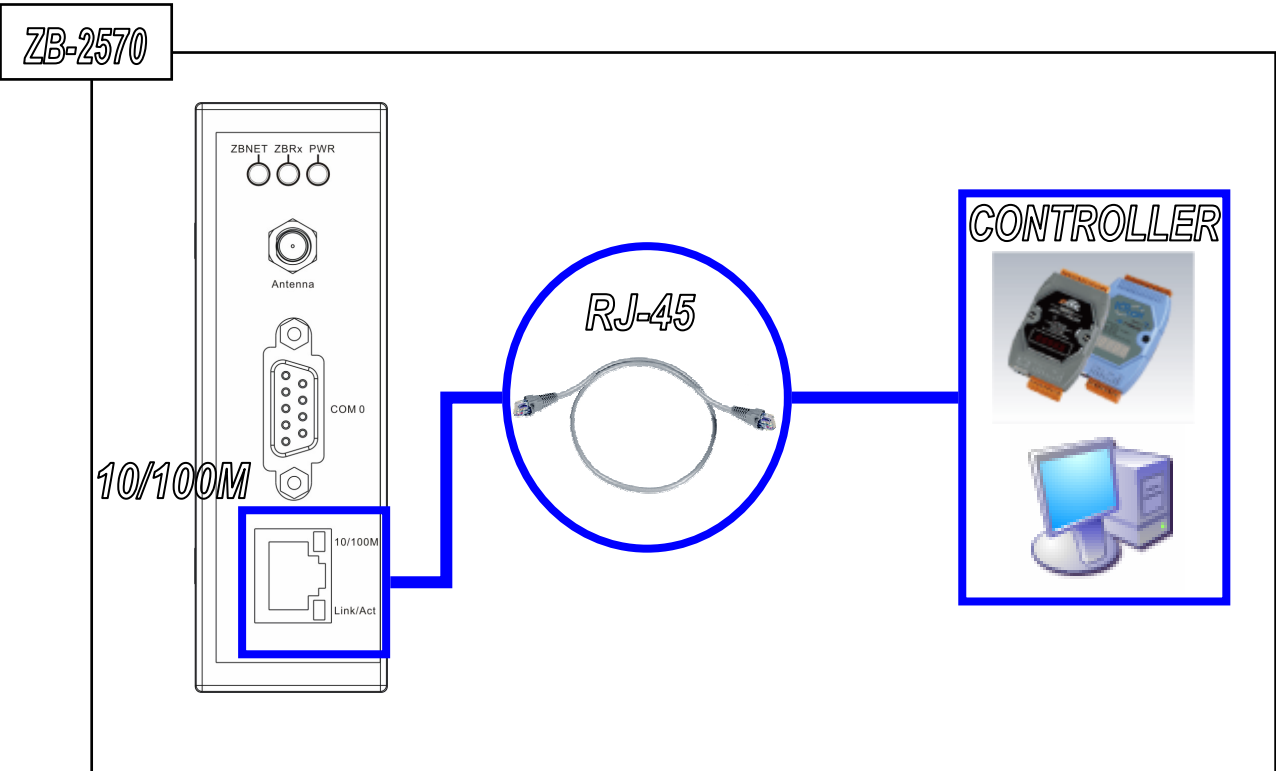
1. Serial Port - RS-232



2. Serial Port - RS-485



3. Ethernet – RJ-45

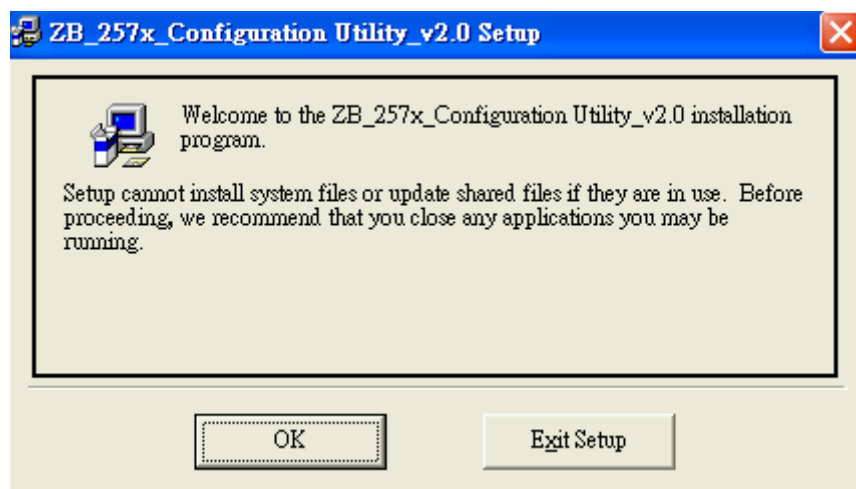


5.2. Installation the Configuration Tool

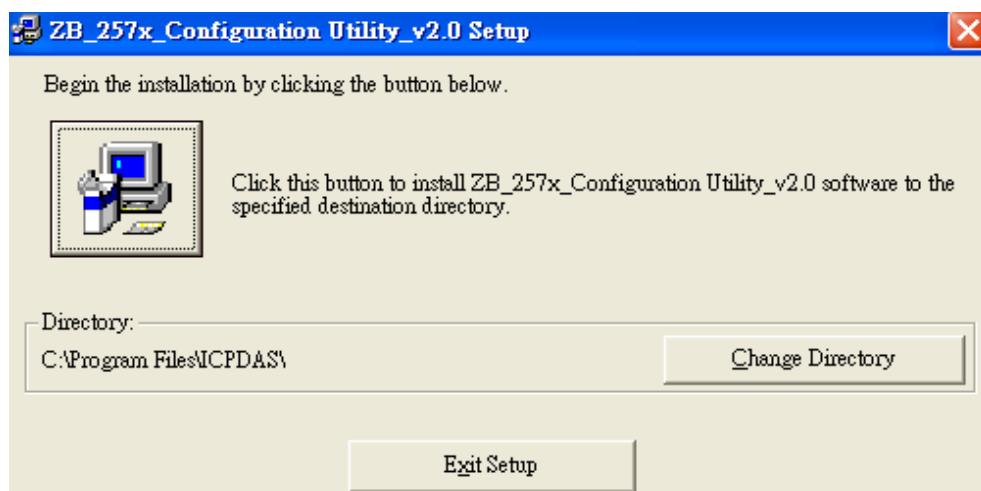
1. Please download the file from <http://ftp.icpdas.com/pub/cd/usbcd/napdos/zigbee/utility/>
2. Uncompress the file in your PC and double-click the **setup.exe** to install the configuration tool for ZigBee converter.



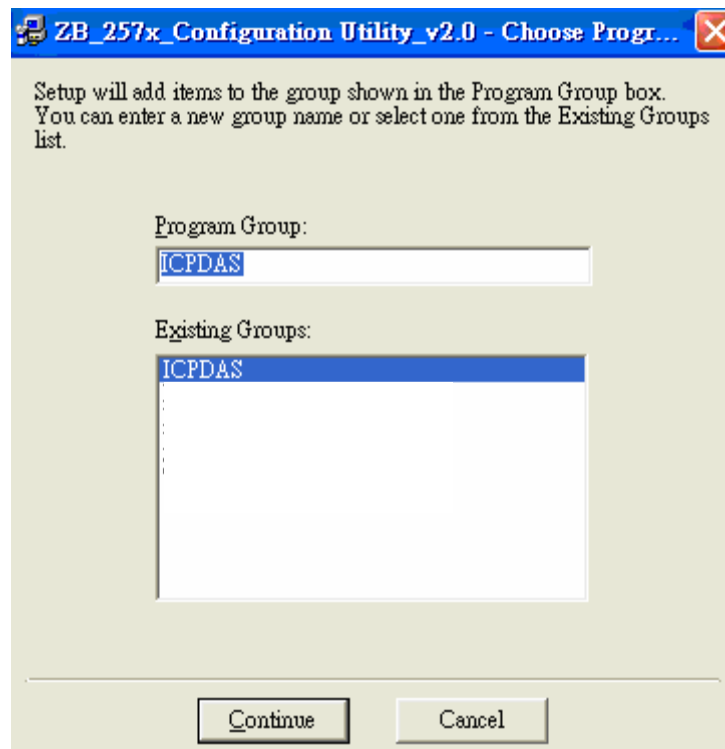
3. Click the **OK** button to start the installation when the following screen pops up.



4. When the following screen shows up afterwards, you can use our default directory or click **Change Directory** to change the installation directory in your PC. Click  to install the software or click **Exit Setup** to exit the installation.



5. Click ***Continue*** to complete the software installation or click ***Cancel*** to exit the installation.



6. Click ***OK***. And the installation is successfully completed.



5.3. Quick Start for ZigBee Converter Configuration Utility

1. When you configure the ZigBee converter, you need to turn the switch to the **ZBSET**(**Figure 1**), and then makes its power on, After configuration is done, you need to turn the switch to the **RUN**(**Figure 2**), and make the power on again.



Figure 1

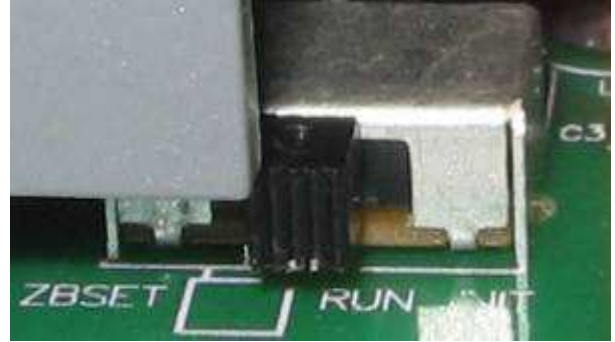
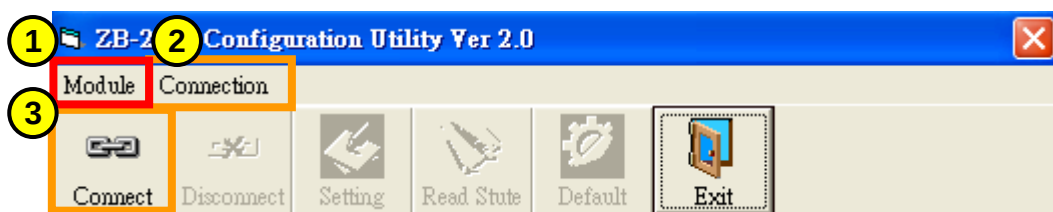


Figure 2

2. After you install the utility, you can find the executable file at **Start\Application file\ICPDAS\ZB_257x Configuration Utility v2.0**

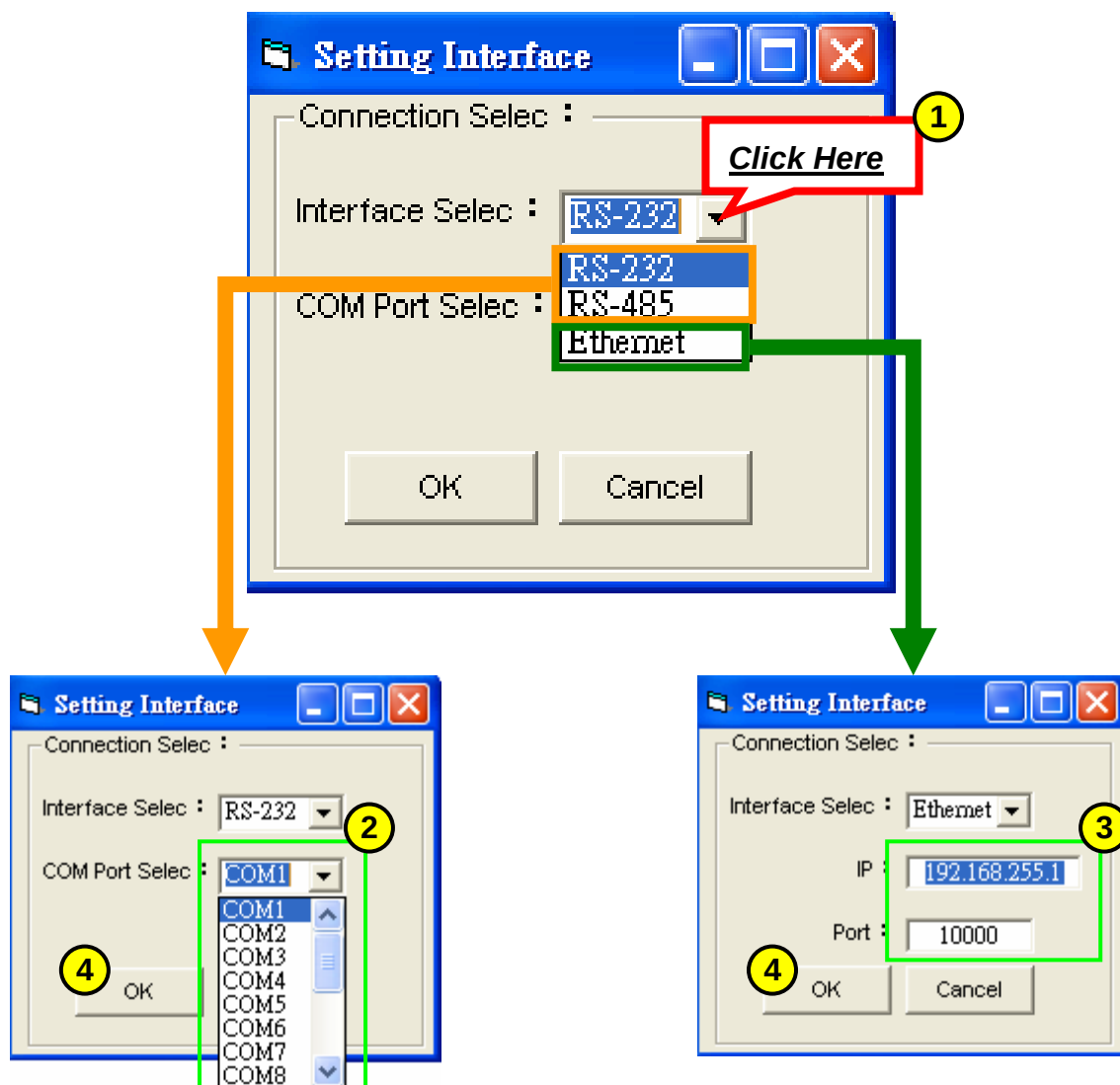


3. Connect one of the communication interface (RS-232, RS-485 or Ethernet; the default configuration interface is RS-232) and execute the utility.
4. When the following screen shows up:



- (1).Click **Module** to select the module which you want to configure (ZB-2570 or ZB-2571).
- (2).Click **Connection** to configure the ZB-2570 or ZB-2571.
- (3).Click **Connect** to configure the ZB-2570 or ZB-2571.

5. When the following screen shows up:



- (1) Click “**Click Here**” to select the interface that brings the PC and the ZigBee converter together.
- (2) If you use the **serial port** as the configuration interface, first select the port number of PC that connects to the ZigBee converter
- (3) If you use **Ethernet** as the configuration interface, enter IP and port of the ZigBee converter; the default IP is **192.168.255.1**, and the default port is **10000**.
- (4) Click **OK** to configure the ZigBee converter or Click **Cancel** to cancel connection.

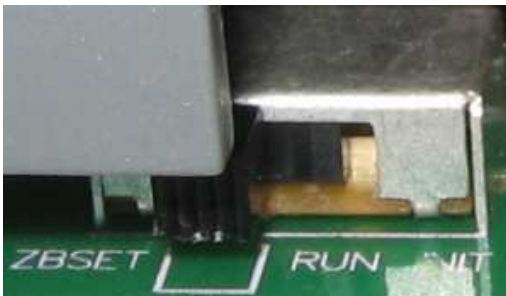
When the following screen displays, it means that connection succeeds, and click **OK** to continue the configuration.



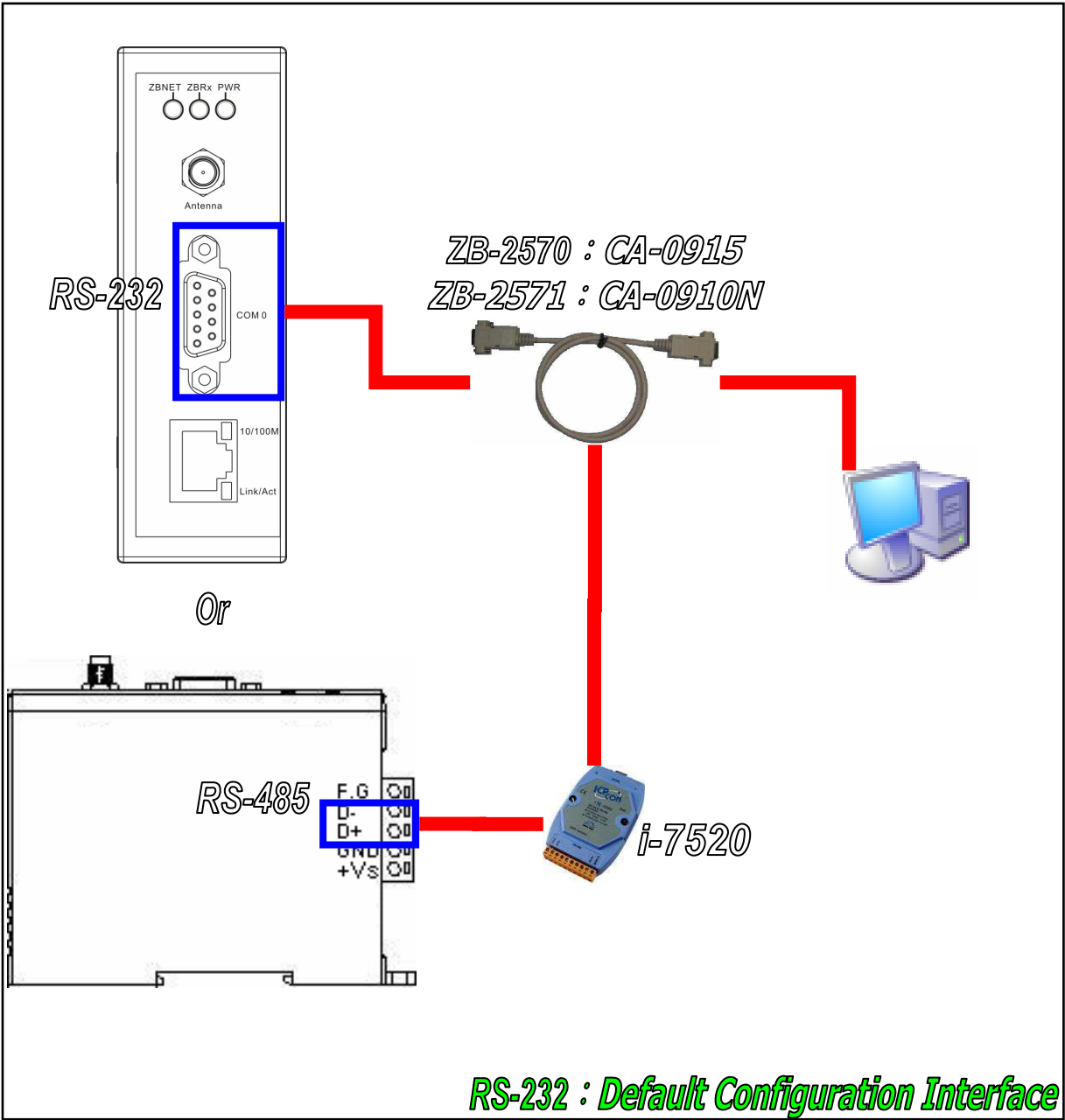
5.4. Configure the Serial Port of the ZigBee Converter

1. ZigBee Converter Serial Port Hardware

- I. you need to turn the switch to the **ZBSET**, and then make its power on.



II. How to Configure the Serial Port!

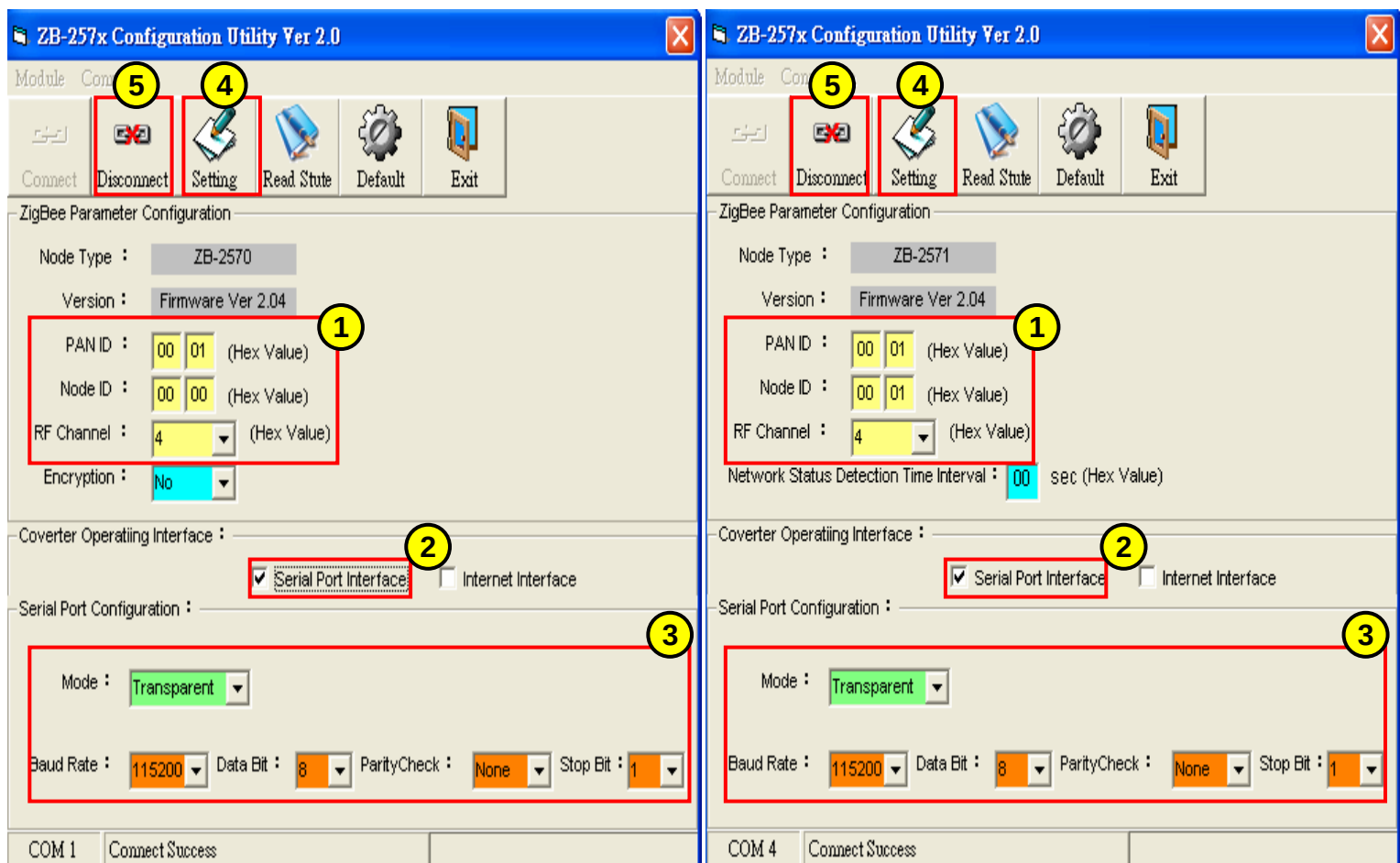


2. ZigBee Converter Serial Port Setting

I. Serial Port Operating Mode1 — Transparent :

- (1.) **ZigBee Parameter Configuration** : **PAN ID** and **Channel** must be the same as each other, ZB-2570's NodeID must be **00 00**, the range of ZB-2571's NodeID is **00 01 ~ FF FF**.
- (2.) **Converter Operating Interface** : check **Serial Port Interface**, then sets Serial Port Configuration.
- (3.) **Serial Port Configuration** : Mode chooses **Transparent**; Baudrate support 1200~115200 bps, Data Bit support 7 and 8, Parity Check support Even, None and Odd, Stop Bit support 1 and 2.
- (4.) Click **Setting** to configuration.
- (5.) When the window pops up like the picture , click **Disconnect** button in the "Configuration Utility" window.

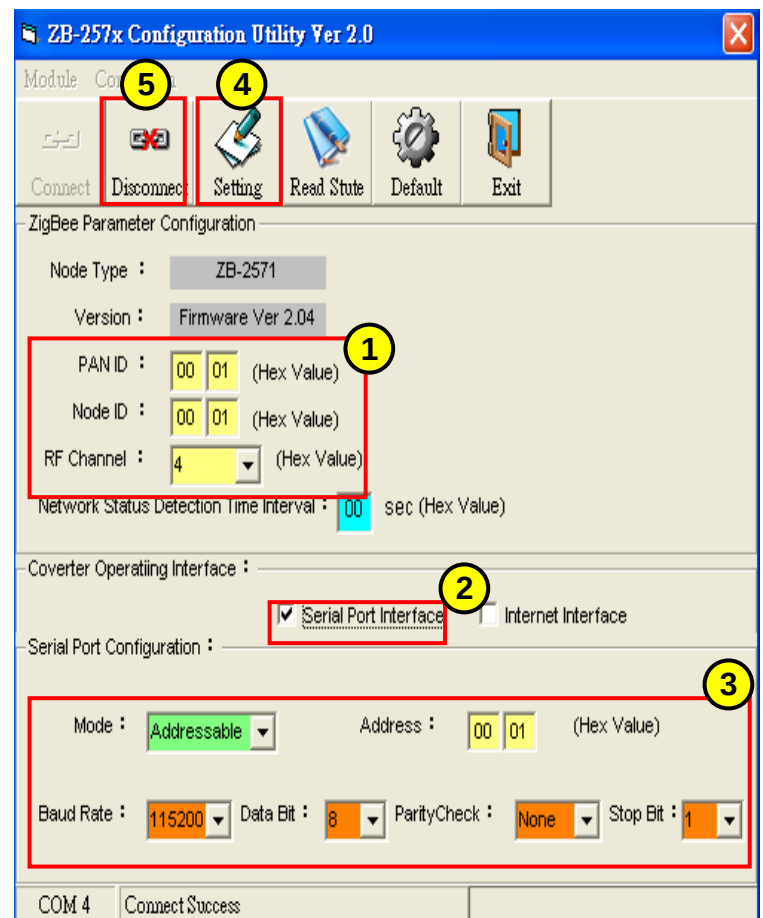
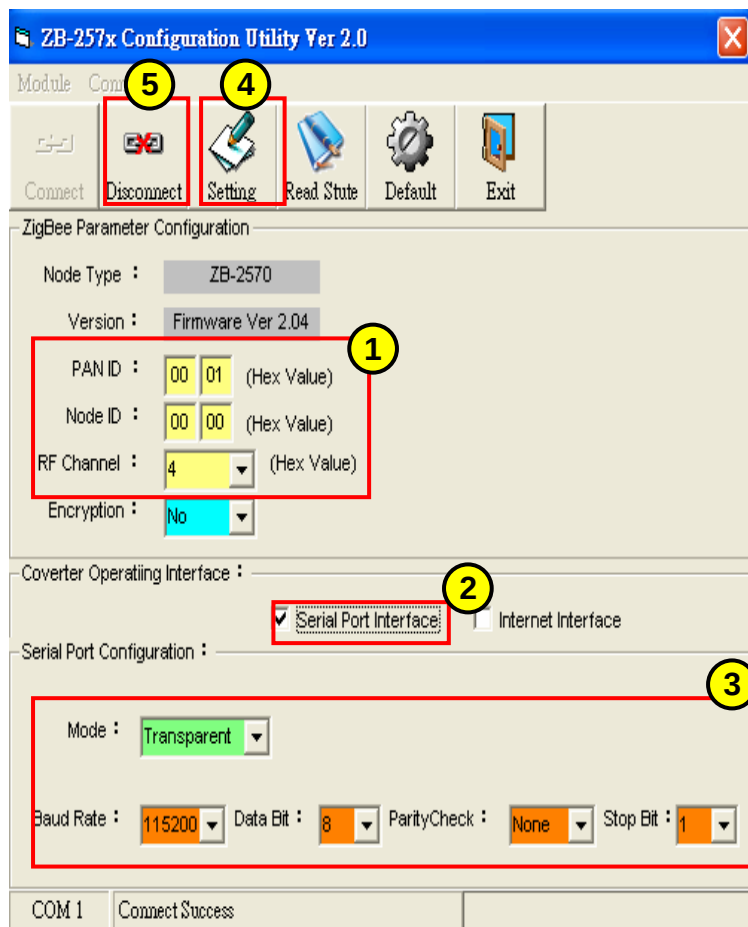
*Note : **Encryption** and **Network Status Detection Time Interval** refer to [Chapter 7](#).



II. Serial Port Operating Mode2 — Addressable :

- (1.) **ZigBee Parameter Configuration** : **PAN ID** and **Channel** must be the same as each other, ZB-2570's NodeID must be **00 00**, the range of ZB-2571's NodeID is **00 01 ~ FF FF**.
- (2.) **Converter Operating Interface** : check **Serial Port Interface**, then sets Serial Port Configuration.
- (3.) **Serial Port Configuration** : Mode chooses **Addressable**, the address is equal to NodeID; Baudrate support 1200~115200 bps, Data Bit support 7 and 8, Parity Check support Even, None and Odd, Stop Bit support 1 and 2.
- (4.) Click **Setting** to configuration.
- (5.) When the window pops up like the picture  , click **Disconnect** button in the “Configuration Utility” window.

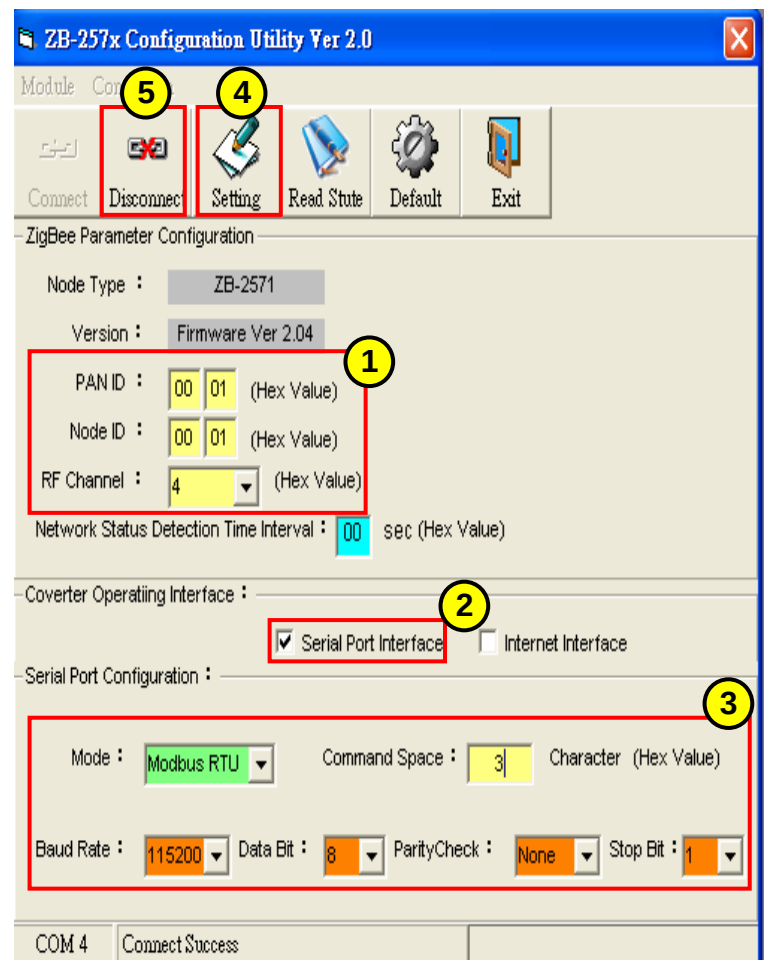
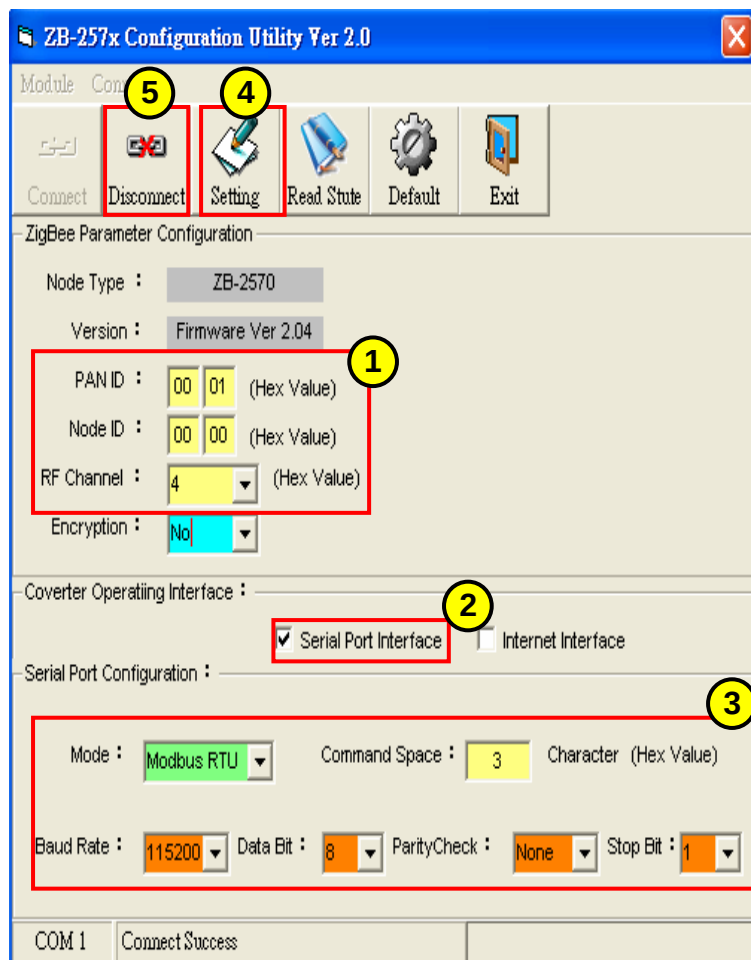
***Note** : **Encryption** and **Network Status Detection Time Interval** refer to [Chapter 7](#).



III. Serial Port Operating Mode3 — Modbus RTU :

- (1.) **ZigBee Parameter Configuration** : **PAN ID** and **Channel** must be the same as each other, ZB-2570's NodeID must be **00 00**, the range of ZB-2571's NodeID is **00 01 ~ FF FF**.
- (2.) **Converter Operating Interface** : check **Serial Port Interface**, then sets Serial Port Configuration.
- (3.) **Serial Port Configuration** : Mode chooses **Modbus RTU**, range of **Command Space** is 1~FF; Baudrate support 1200~115200 bps, Data Bit support 7 and 8, Parity Check support Even, None and Odd, Stop Bit support 1 and 2.
- (4.) Click **Setting** to configuration.
- (5.) When the window pops up like the picture , click **Disconnect** button in the "Configuration Utility" window.

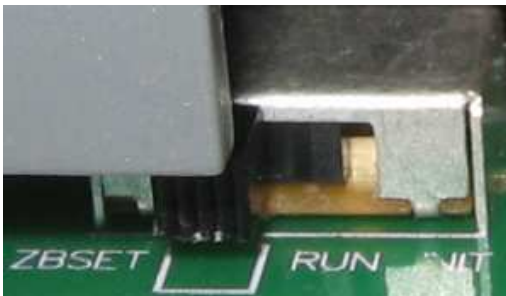
*Note : Encryption and Network Status Detection Time Interval refer to [Chapter 7](#).



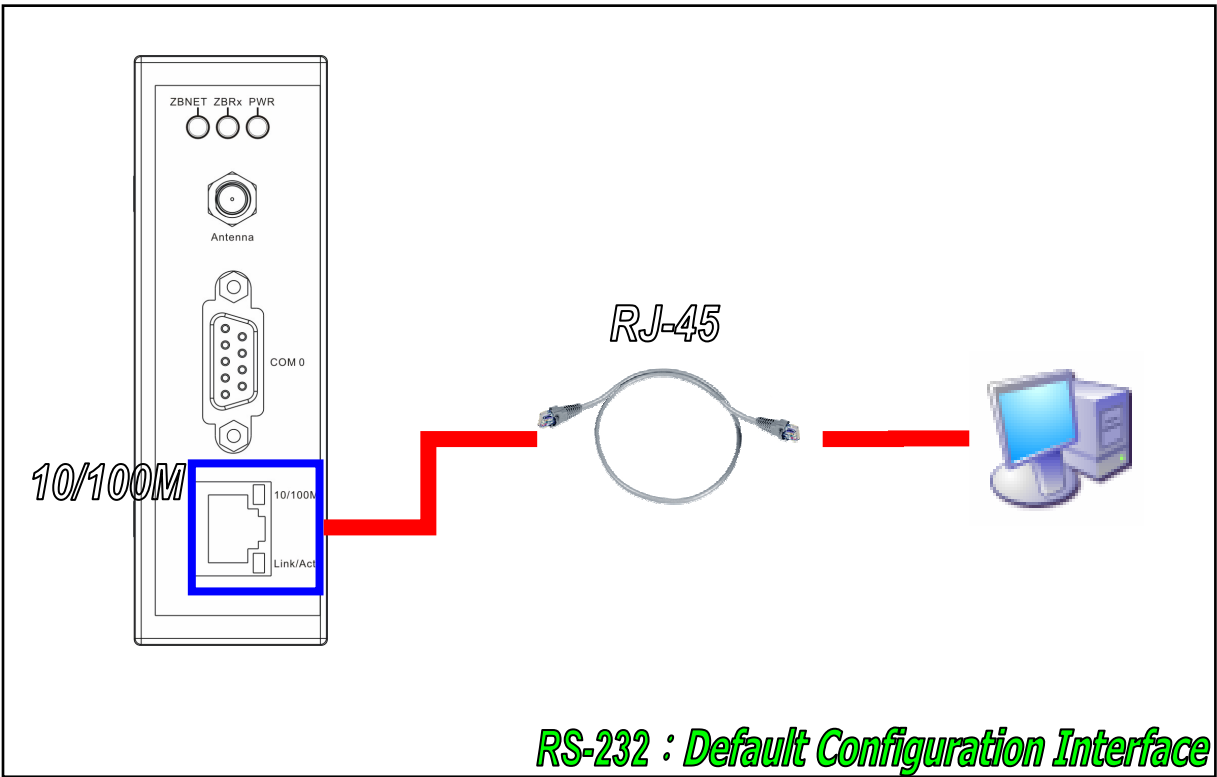
5.5. Configure the Ethernet of the ZigBee Converter

1. ZigBee Converter Etheret Hardware

- I. you need to turn the switch to the **ZBSET**, and then make its power on.



II. How to Configure the Ethernet!

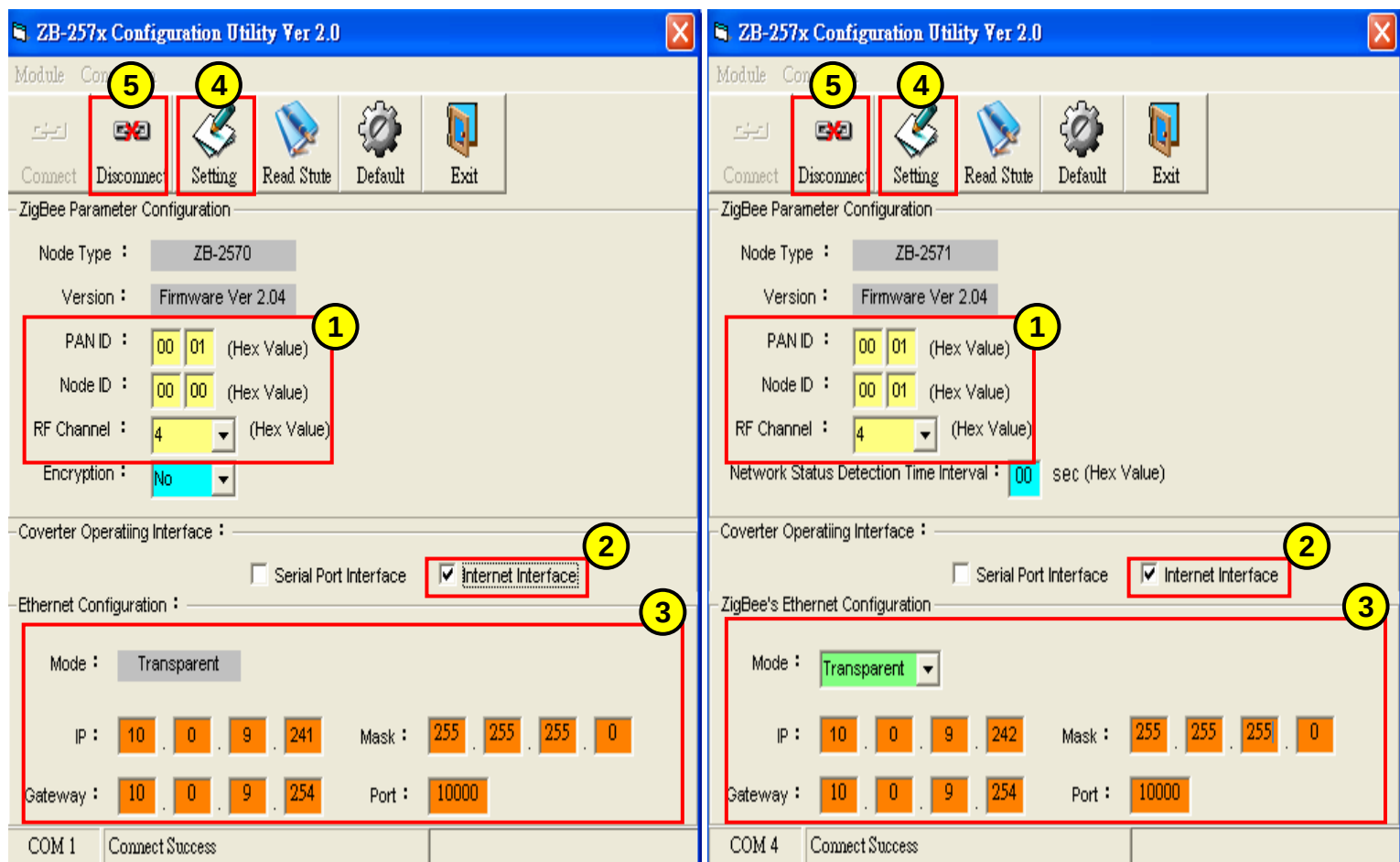


2. ZigBee Converter Ethernet Setting

I. Ethernet Operating Mode1 — Transparent :

- (1.) **ZigBee Parameter Configuration** : **PAN ID** and **Channel** must be the same as each other, ZB-2570's NodeID must be **00 00**, the range of ZB-2571's NodeID is **00 01 ~ FF FF**.
- (2.) **Converter Operating Interface** : check **Ethernet Interface**, then sets ZigBee's Ethernet Configuration.
- (3.) **ZigBee's Ethernet Configuration** : Mode chooses **Transparent** ; IP of the ZB-2571 must be not the same as the ZB-2570, the range of IP is 0~255.0~255.0~255.0~255, the range of mask is 0~255.0~255.0~255.0~255, the range of gateway is 0~255.0~255.0~255.0~255, the range of port is 1~32767.
- (4.) Click **Setting** to configuration.
- (5.) When the window pops up like the picture  , click **Disconnect** button in the “Configuration Utility” window.

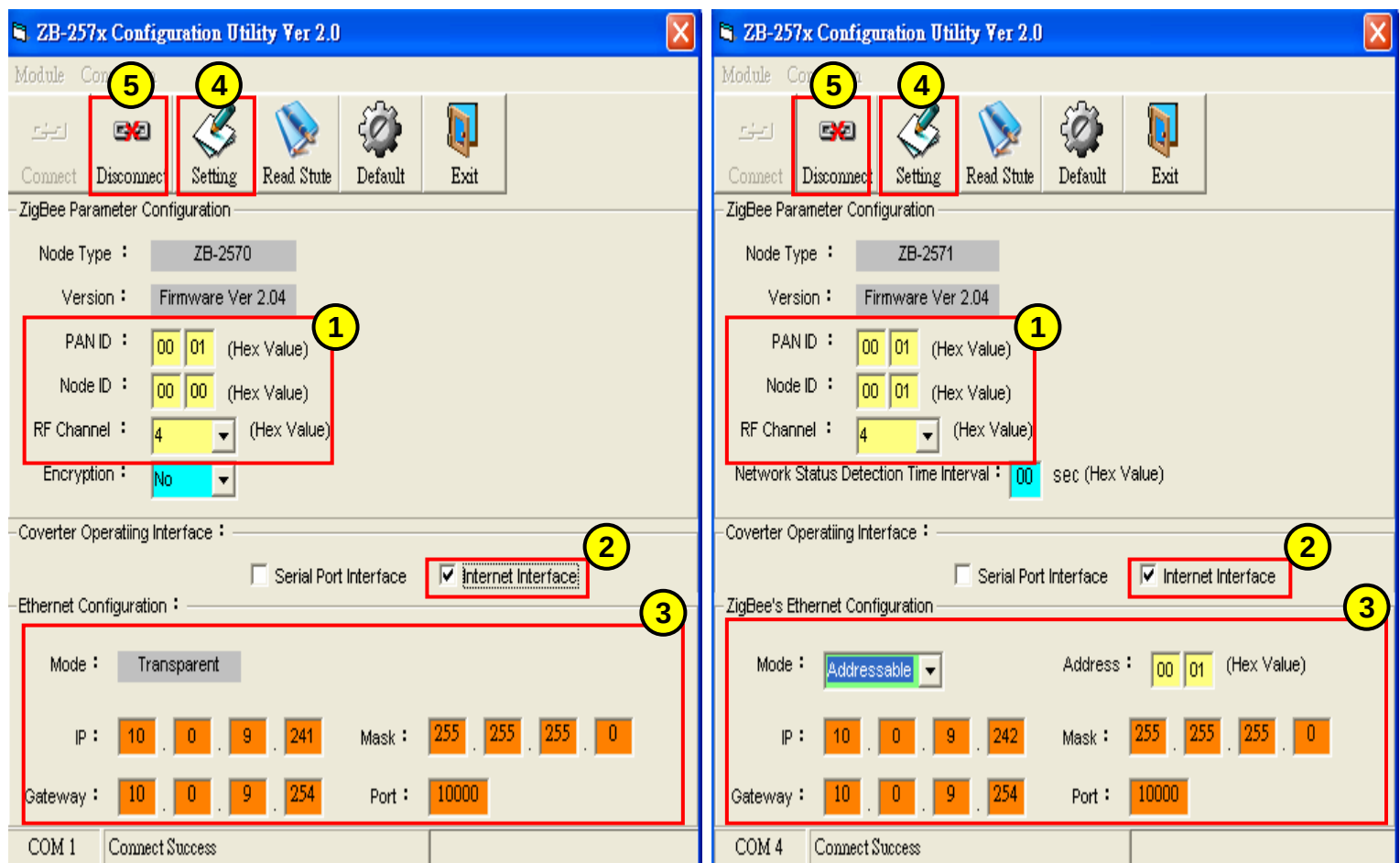
*Note : **Encryption** and **Network Status Detection Time Interval** refer to [Chapter 7](#).



II. Ethernet Operating Mode2 — Addressable :

- (1.) **ZigBee Parameter Configuration** : **PAN ID** and **Channel** must be the same as each other, ZB-2570's NodeID must be **00 00**, the range of ZB-2571's NodeID is **00 01 ~ FF FF**.
- (2.) **Converter Operating Interface** : check **Ethernet Interface**, then sets ZigBee's Ethernet Configuration.
- (3.) **ZigBee's Ethernet Configuration** : Mode chooses **Addressable**, the address is equal to NodeID; IP of the ZB-2571 must be not the same as the ZB-2570, the range of IP is 0~255.0~255.0~255.0~255, the range of mask is 0~255.0~255.0~255.0~255, the range of gateway is 0~255.0~255.0~255.0~255, the range of port is 1~32767.
- (4.) Click **Setting** to configuration.
- (5.) When the window pops up like the picture , click **Disconnect** button in the "Configuration Utility" window.

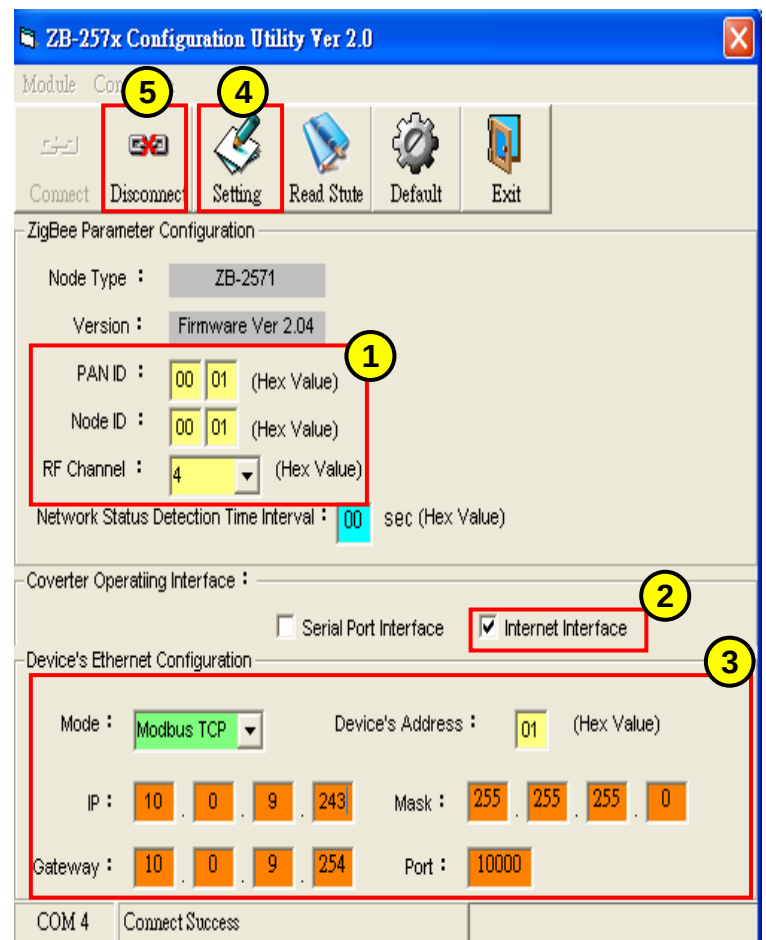
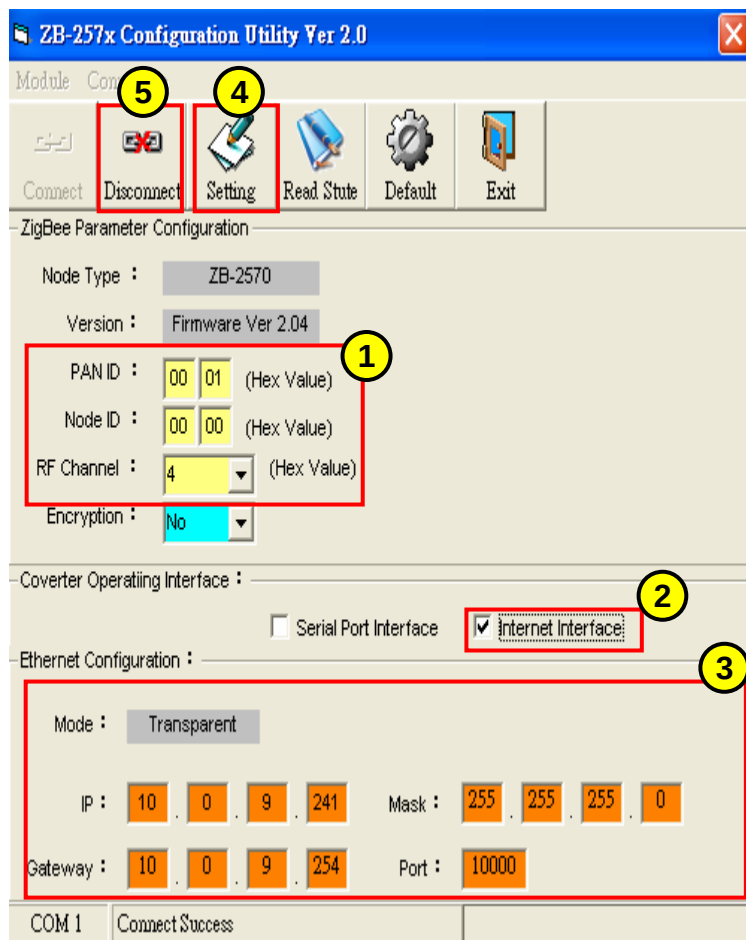
*Note : **Encryption** and **Network Status Detection Time Interval** refer to [Chapter 7](#).



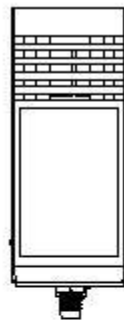
III. Ethernet Operating Mode3 — Modbus TCP :

- (1.) **ZigBee Parameter Configuration** : **PAN ID** and **Channel** must be the same as each other, ZB-2570's NodeID must be **00 00**, the range of ZB-2571's NodeID is **00 01 ~ FF FF**.
- (2.) **Converter Operating Interface** : check **Ethernet Interface**, then sets Device's Ethernet Configuration.
- (3.) **Device's Ethernet Configuration** : Mode chooses **Modbus TCP**; the range of IP is 0~255.0~255.0~255.0~255, the range of mask is 0~255.0~255.0~255.0~255, the range of gateway is 0~255.0~255.0~255.0~255, the range of port is 1~32767.
- (4.) Click **Setting** to configuration.
- (5.) When the window pops up like the picture
 , click **Disconnect** button in the “Configuration Utility” window.

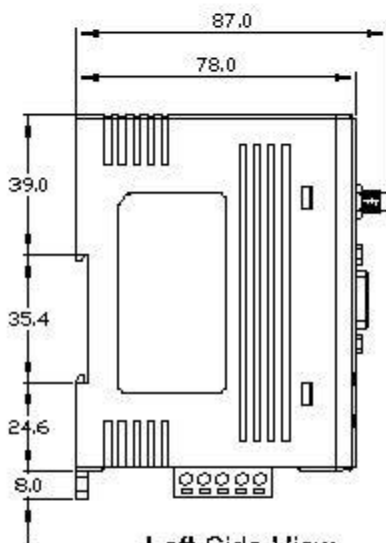
*Note : Encryption and Network Status Detection Time Interval refer to [Chapter 7](#).



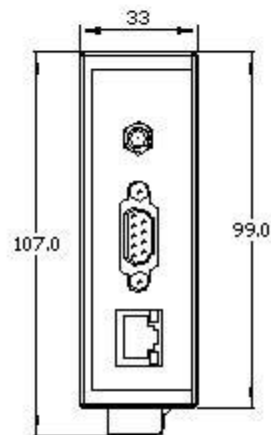
6. Dimensions



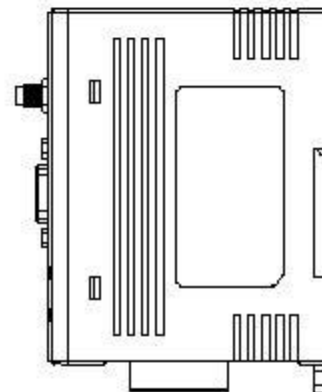
Top View



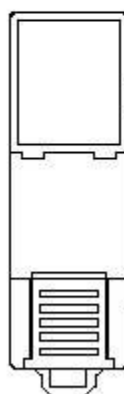
Left Side View



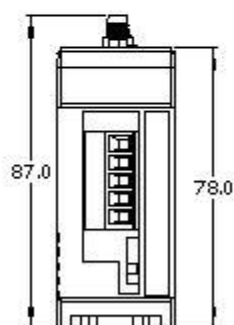
Front View



Right Side View



Back View



Bottom View

Unit:mm

7. Appendix

7.1. Download Setting Tool from Our Website :

<http://ftp.icpdas.com/pub/cd/usbcd/napdos/zigbee/utility/>

7.2. Download Document form Our Website :

<http://ftp.icpdas.com/pub/cd/usbcd/napdos/zigbee/manual/>

7.3. Introduction to ZigBee Series :

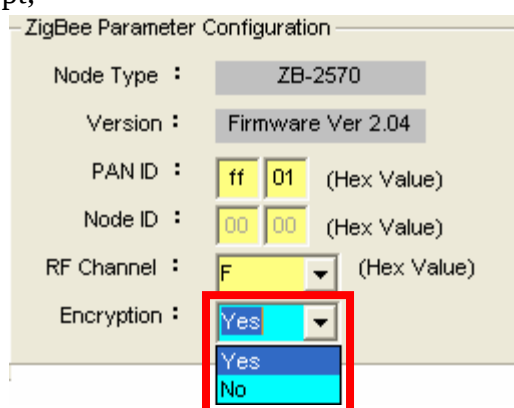
http://www.icpdas.com/products/GSM_GPRS/zigbee/zigbee_converter.htm

7.4. Technical Service:

If you have any questions, please send your problem to service@icpdas.com .

7.5. Encryption Setting :

If you select “Yes”, the data transmission will be encrypt; If you select “No”, the data transmission will be no encrypt;

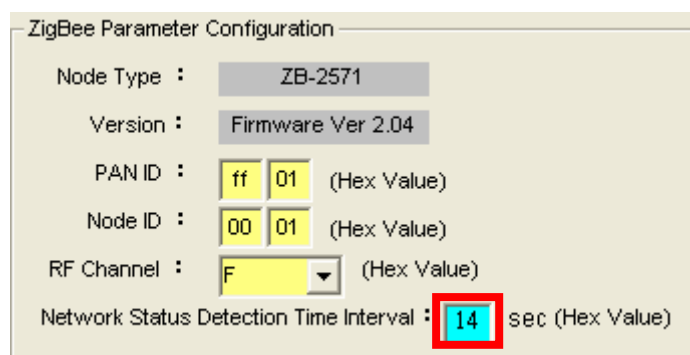


The screenshot shows the 'ZigBee Parameter Configuration' dialog box. The 'Encryption' dropdown menu is open, showing 'Yes' and 'No' options. The 'Yes' option is selected and highlighted with a red box.

Node Type :	ZB-2570	
Version :	Firmware Ver 2.04	
PAN ID :	ff 01	(Hex Value)
Node ID :	00 00	(Hex Value)
RF Channel :	F	(Hex Value)
Encryption :	Yes	

7.6. Network Status Detection Time Setting :

If the parameter is 0x14, it will detect network status every 20 second, If the parameter is 0x00, the mechanism will be disenable.



The screenshot shows the 'ZigBee Parameter Configuration' dialog box. The 'Network Status Detection Time Interval' is set to 14 sec (Hex Value). The value '14' is highlighted with a red box.

Node Type :	ZB-2571	
Version :	Firmware Ver 2.04	
PAN ID :	ff 01	(Hex Value)
Node ID :	00 01	(Hex Value)
RF Channel :	F	(Hex Value)
Network Status Detection Time Interval :	14	sec (Hex Value)

8. Realse Note

- 8.1. The Cannel chooses **4, 9, 14, 15** to avoid noise ,if the environment have WiFi, Bluetooth etc.
- 8.2. Please don't adjust the switch to the **INIT**, the function is used for ICP DAS engineer to program.
- 8.3. **Default setting of manufactory :**

ZB-2570	
Interface	RS-232
Mode	Transparent
PanID	00 01
NodeID	00 00
Channel	1
Data Format	115200, N, 8, 1
IP	192.168.255.1
Mask	255.255.0.0
Gateway	192.168.0.1
Port	10000

ZB-2571	
Interface	RS-232
Mode	Transparent
PanID	00 01
NodeID	00 01
Channel	1
Data Format	115200, N, 8, 1
IP	192.168.255.1
Mask	255.255.0.0
Gateway	192.168.0.1
Port	10000