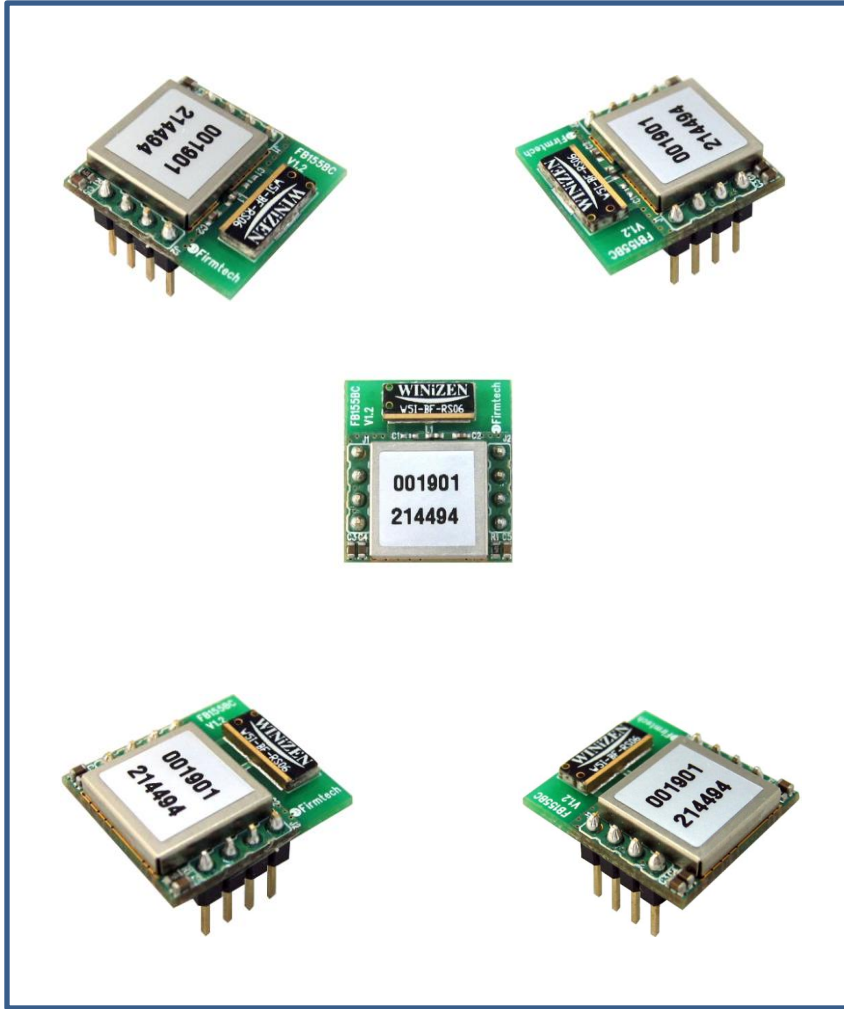# FB155BC/FB155BS

Quick Guide

# Features of FB155BC / 155BS

< FB155BC >

< FB155BS >

* Before Getting Started...

◆ **Bluetooth is an international standard specification for near-distance /low-electricity/ high-reliability/low-price wireless communication**

◆ **Bluetooth uses the internationally permitted 2.4GHz ISM band(Industrial,Scientific,Medical).**

◆ **Bluetooth uses a 1Mbps ~ 3Mbps wireless transmission speed**

◆ **Bluetooth consists of Master/Slave configuration as the relation between Master and Servant and one bluetooth device can be connected to Maximum 7 devices on the basis of ACL.**

(ACL : Asynchronous **C**onnection**l**ess**)**

◆ **Bluetooth guarantees a stable wireless connection even in much noise environment by using Frequency Hopping Method.**

* Features of FB155BX

FB155BC (Chip Antenna)

8pin Header Type

FB155BX

FB155BS (Helical Antenna)

8pin Header Type
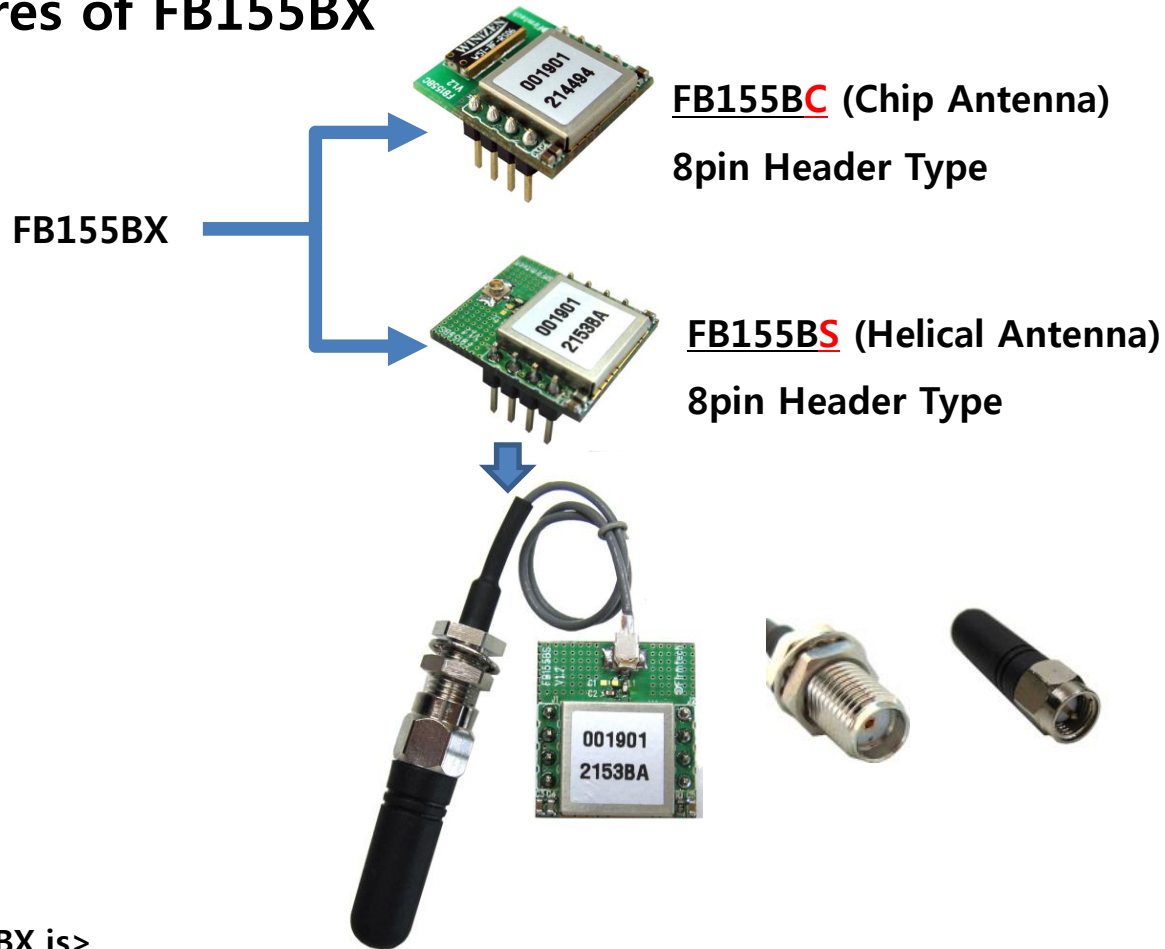
< FB155BX is>

- **Based on Bluetooth Specification 2.1**
- **Supports AT command and AT command based control available**
- **Connects Bluetooth PDA, Bluetooth USB Dongle etc available & smoothly**
- **Supports stable data transmission & reception**
- **1:1 exclusive communcation**

* Functions of interface Board 1

Support of TTL Level Conversion Function

Note : UART : **U**niversal **A**synchronous **R**eceiver **T**ransmitter
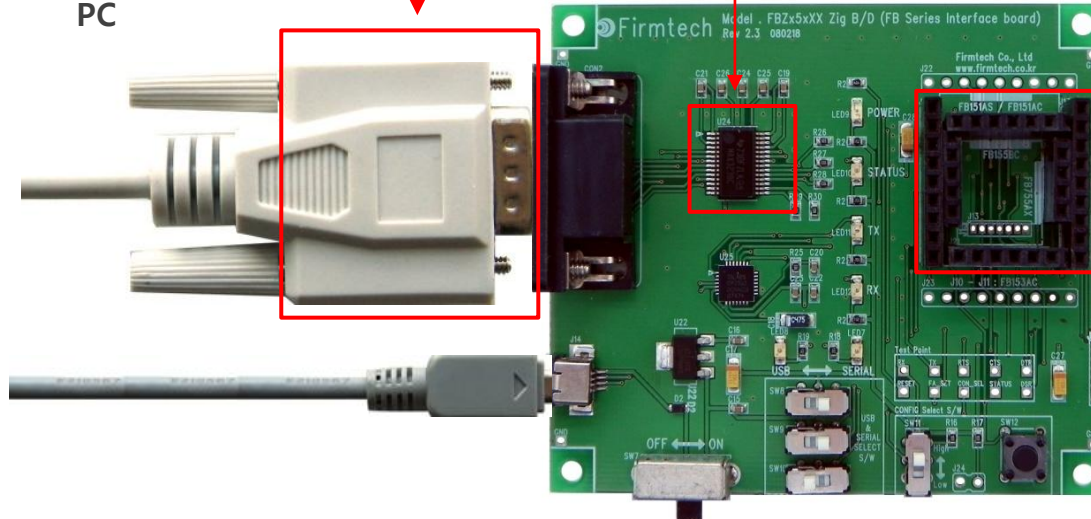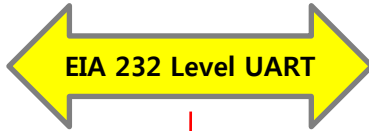
EIA-232 Level⟺ TTL Level

Dedicated Driver IC
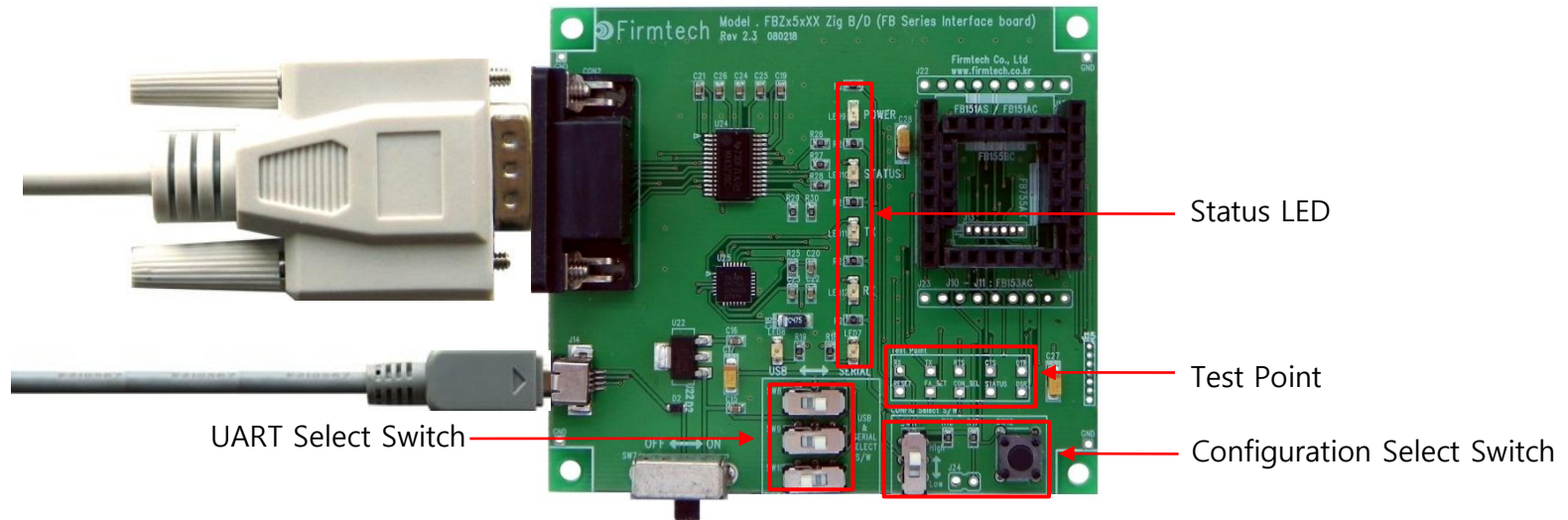
For Level Conversion

(예) MAX3238, MAX3232 등

EIA 232 Level UART

TTL Level UART

PC

Application Device

FB155BC
FB155BS

FB755AC
FB755AS

Interface Board (FBZx5xXX)

* Functions of interface Board 2

Setup of **FB155BX** Environment and Monitoring & Basic Function Test of **FB155BX**

Status LED

Test Point

Configuration Select Switch

UART Select Switch

Interface Board (FBZx5xXX)

UART Select Switch	**Switch for UART Interface selection**
Status LED	LED that displays overall status
Test Point	Allows users to directly check the control signal line with an oscilloscope etc.
Configuration Select Switch	Entry-switch for environment setup

< "FB155BX Quick Guide"…>

1. Consists of eight chapters in total.

2.   Even though it is divided into eight chapters, in some chapters it uses the setup values that were used in previous chapters.

3. In other words,the progressive method of this "FB155BX Quick Guide" guides the user in order from the start.

4. Thus, if you read this guide for the first time, you need to proceed chapter by chapter in order to correctly understand its meaning.

5. It is better for a user to understand the overall functions of the FB155BX first and migrate to subsequent chapters to refer to the functions necessary for each chapter.

< Table of Contents >

[0] Product Content

&

Installation

1. FB155BX Content

(1) Product Content in One Set of FB155BX - FB155BC-Type (1 Set)
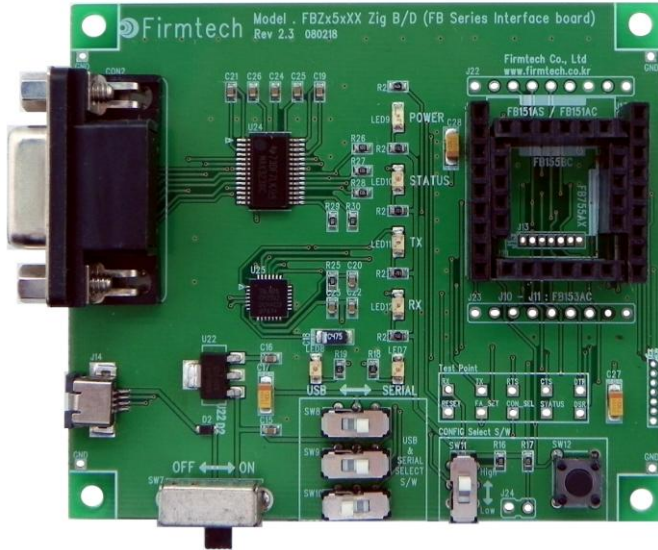
< **Product Content in One Set** >

- **FB155BC**
- **Interface Board**
- **USB Power Cable**
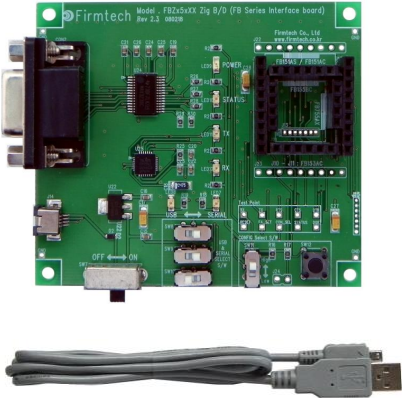- **Serial Cable**

(2)) Product Content In One Set of FB155BX - FB155BS-Type (1 Set)
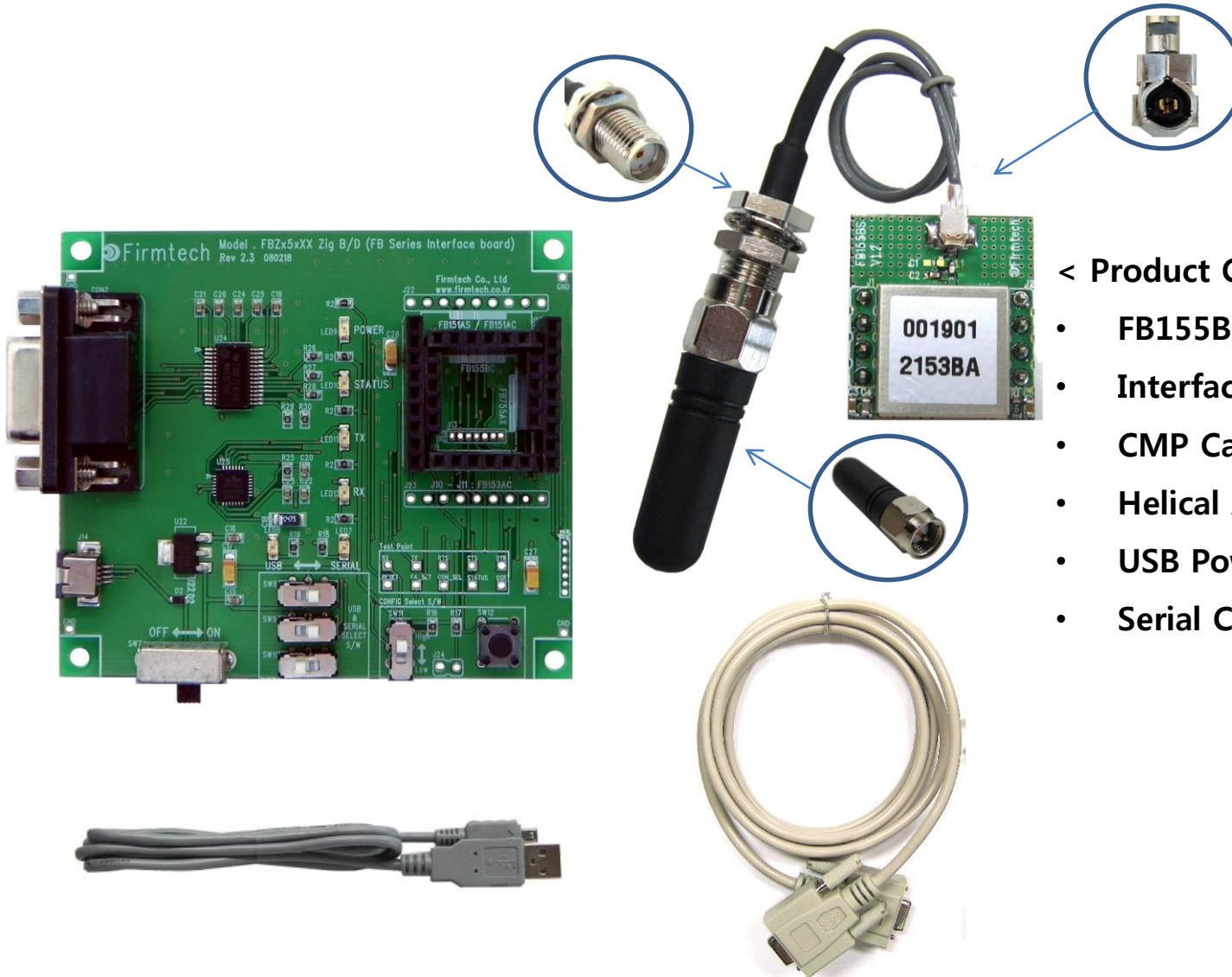
< **Product Content in One Set** >

- **FB155BS**
- **Interface Board**
- **CMP Cable**
- **Helical Antenna (1 dBi Gain)**
- **USB Power Cable**
- **Serial Cable**

(3) Configuration Using 2 Sets

1 Set for Master Setup

1 Set fppr Slave Setup

- "FB155BX Quick Guide" uses two devices for explanation purpose.
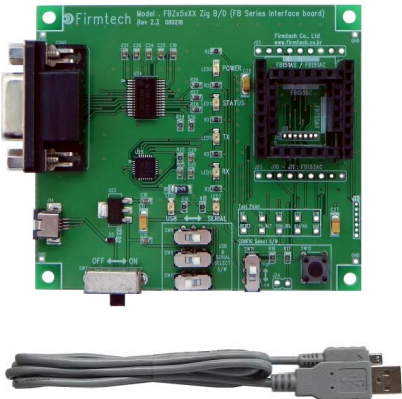
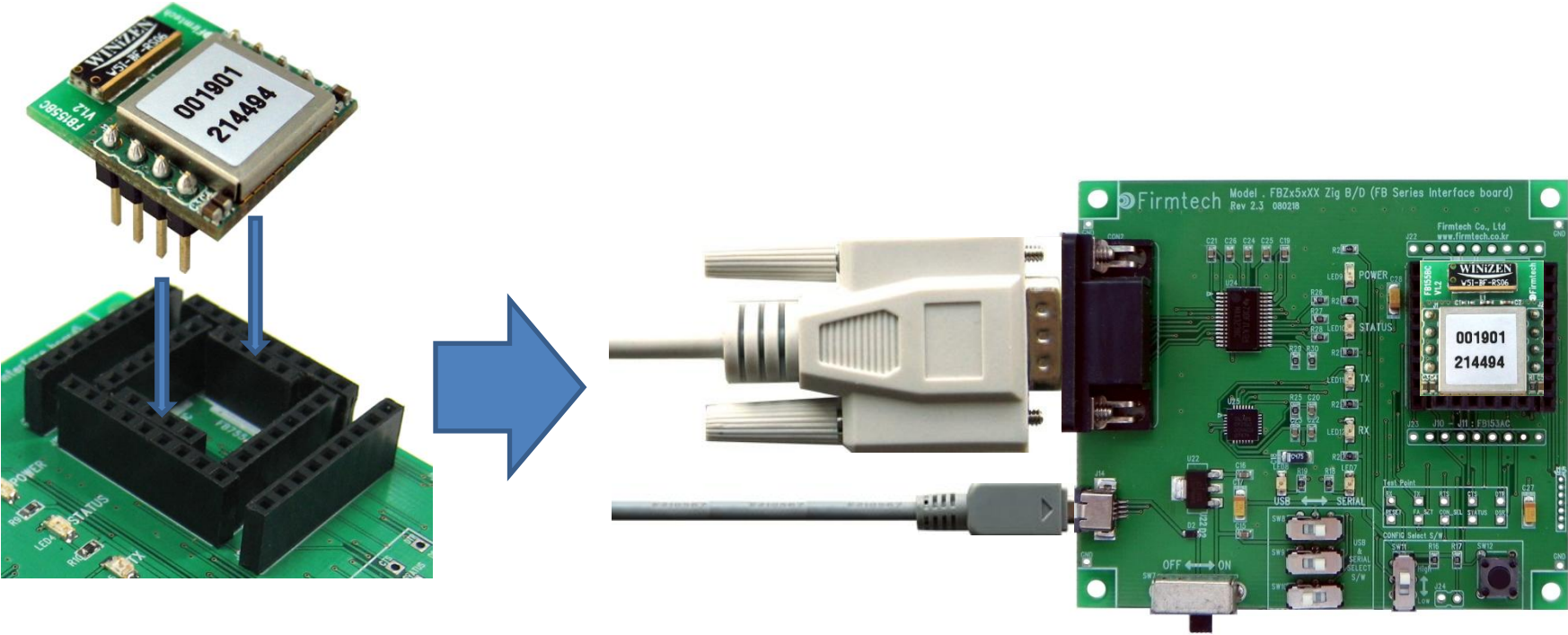## 2. Checking Items Before Installing the FB155BX Product Content

(1) UART Selection Switch
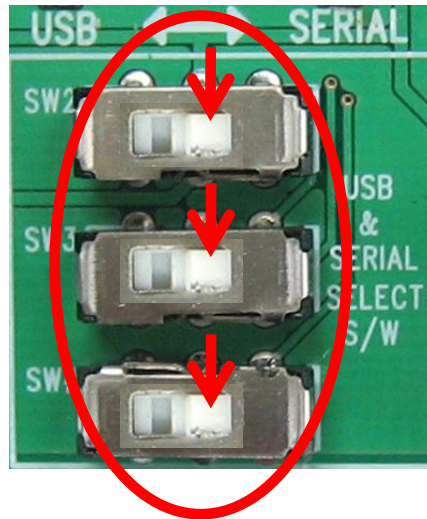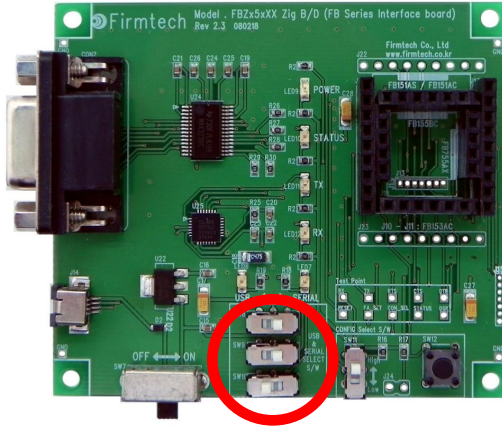
- Position the UART selection switch to Serial.

- Do the switch selection as above for all two Interface Boards.
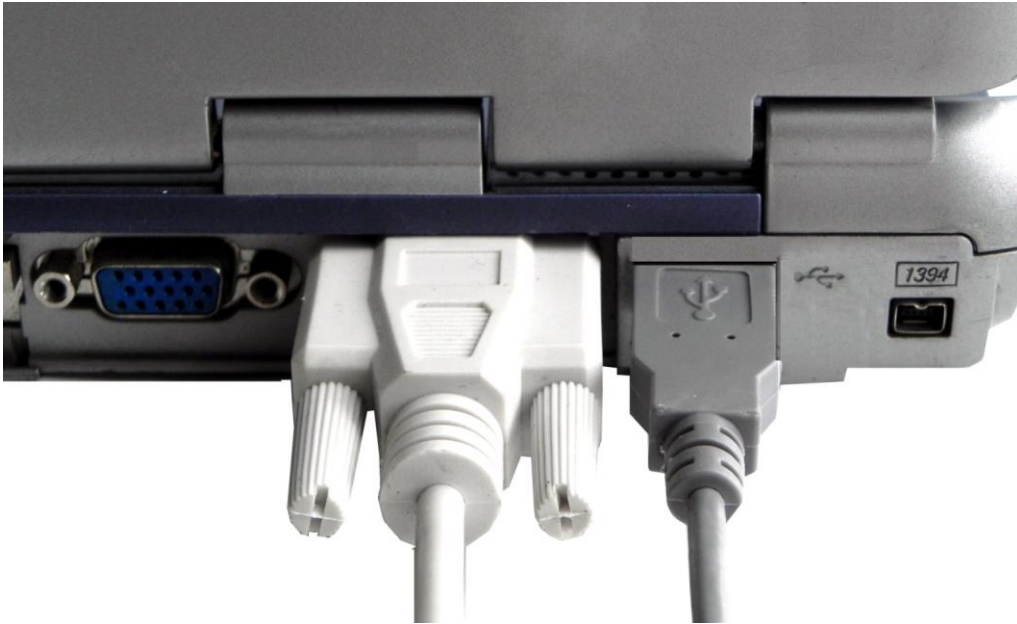
3. Installing the Product Content

(1) FB155BX + Interface Board

(2) Interface Board + USB Power Cable & Serial Cable
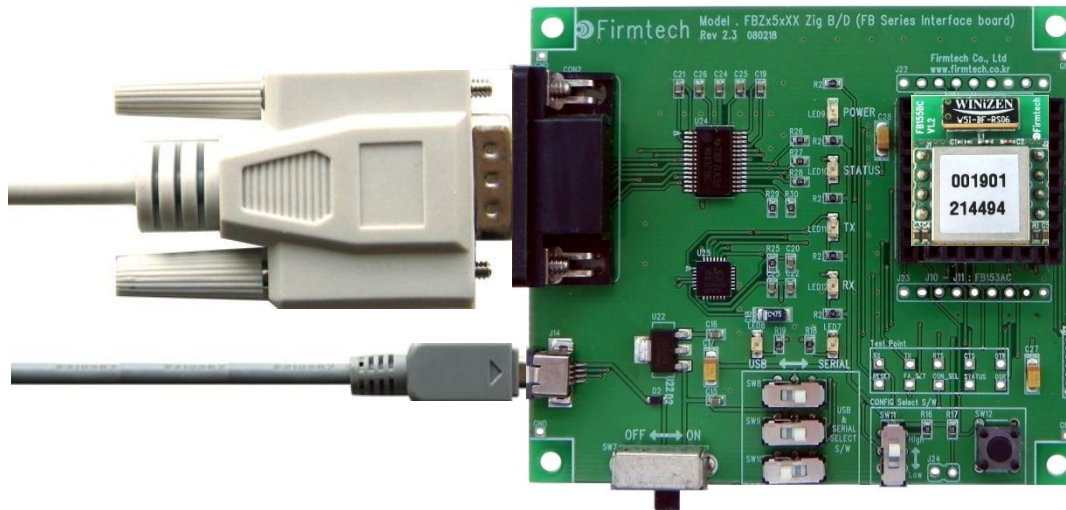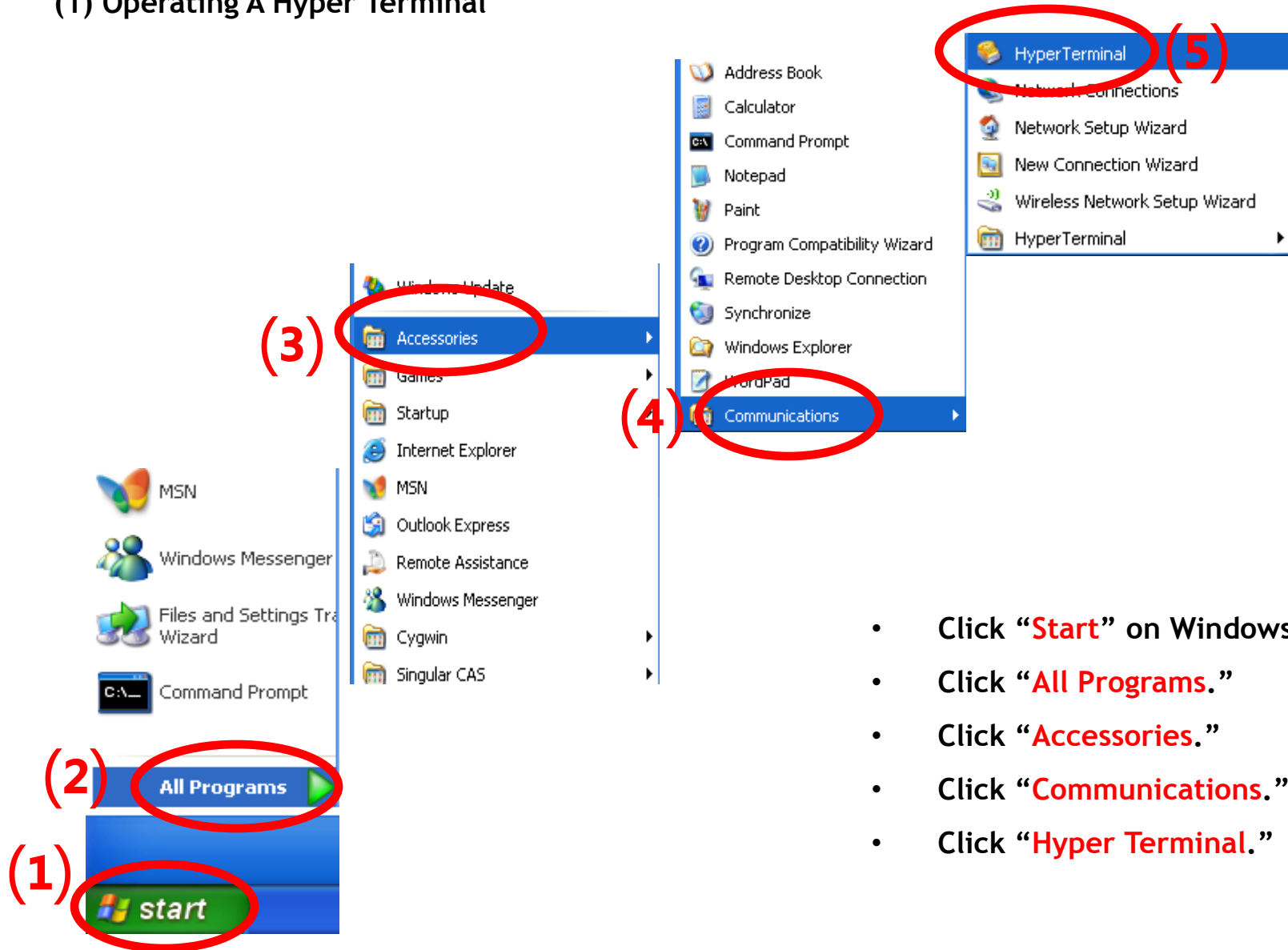
(3) PC + USB Power Cable & Serial Cable

- Connect all two FB155BX to a PC.

- In this "FB155BX Quick Guide," two FB155BX are connected to one PC for convenient explanation.

[1] Setup of Hyper Terminal

Checking received data using hyper terminals.

1. Running and Setup of Serial Communication Program (Hyper Terminal)

(1) Operating A Hyper Terminal

- Click "**Start**" on Windows Start menu.
- Click "**All Programs.**"
- Click "**Accessories.**"
- Click "**Communications.**"
- Click "**Hyper Terminal.**"

(2) Setup of Hyper Terminal – Name Setting

- Set up the hyper terminal connected to FB155BX to be set up to Master.

- Enter "Master" as a name.

- Click "OK" and proceed to the next step.

(3) Setup of Hyper Terminal – Port Setting

- Select a port to be connected to FB155BX set up to Master. (Assumed here as 'COM1')

- Click "OK" and proceed to the next step.

(4) Setup of Hyper Terminal – Communication Speed, etc.
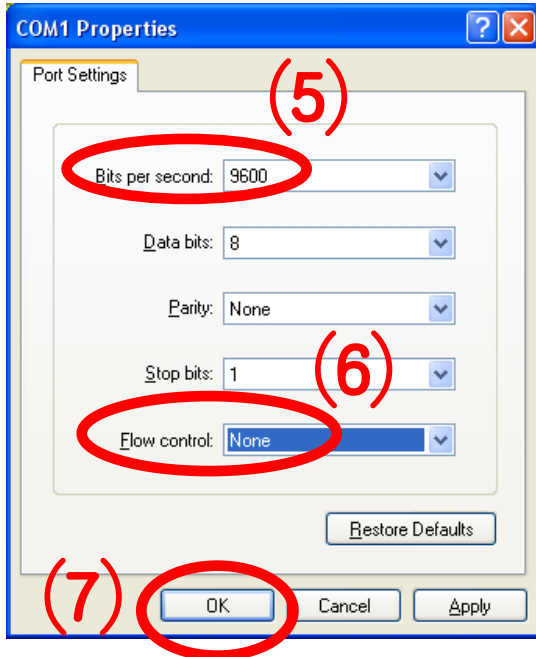
- Select "9600" for "Bits **P**er Second".

- Select "None" for "Flow Control"

- No change for other items.

- Click "OK."

(5) Setup of Hyper Terminal - Finish

master - Hyper Terminal

File   Edit   View   Call   Transfer   Help

- Setup of Hyper Terminal connected to the FB155BX to be set as Master is completed.

- Do the setting of the hyper terminal connected to the FB155BX to be set to slave in the same way and by connecting to "COM 3"

Connected 0:00:02   Auto detect   Auto detect   SCROLL   CAPS   NUM   Capture   Print echo
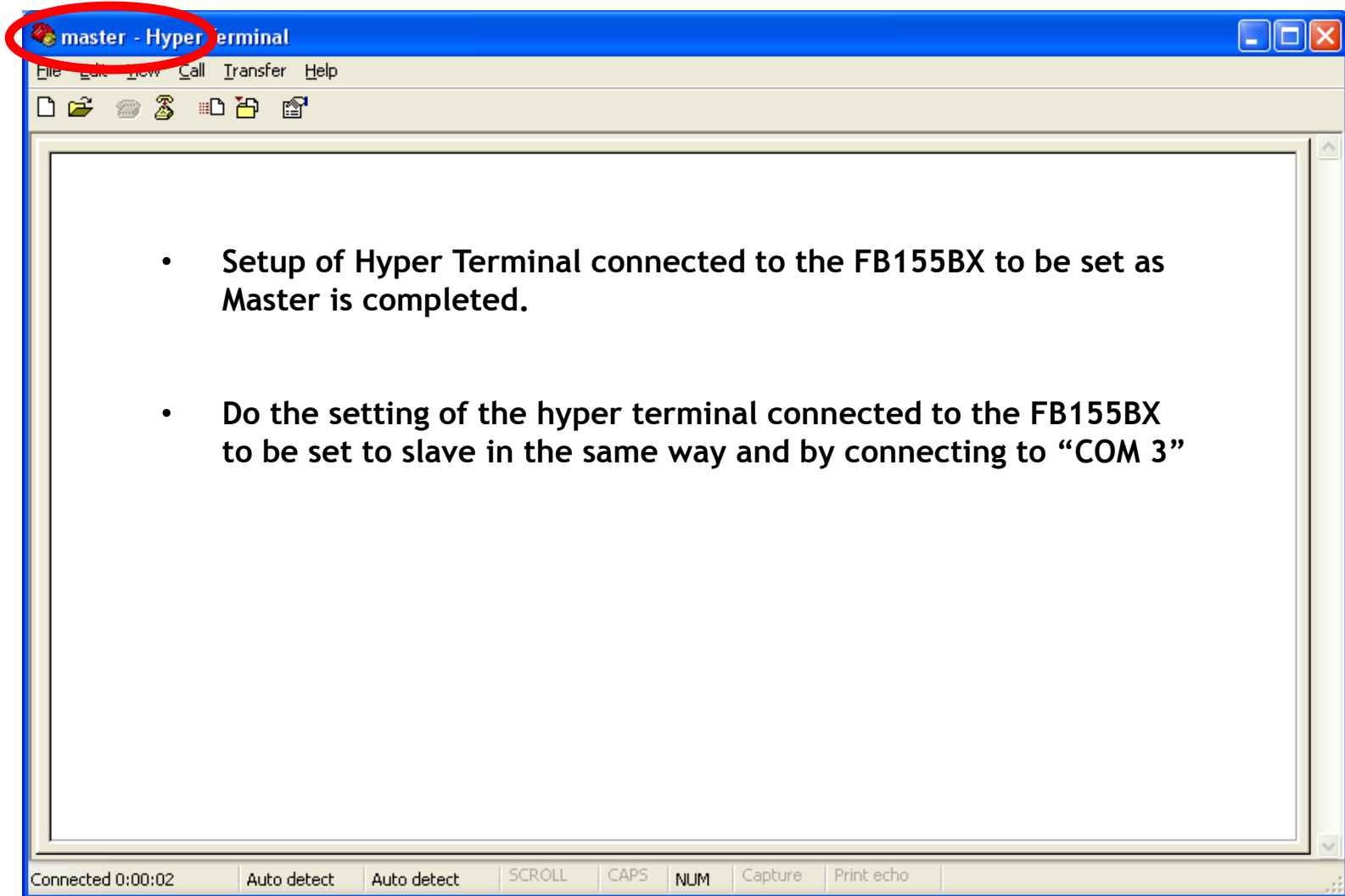
[2] Operating the FB155BX

1. Operating the FB155BX

(1) Powering On the FB155BX
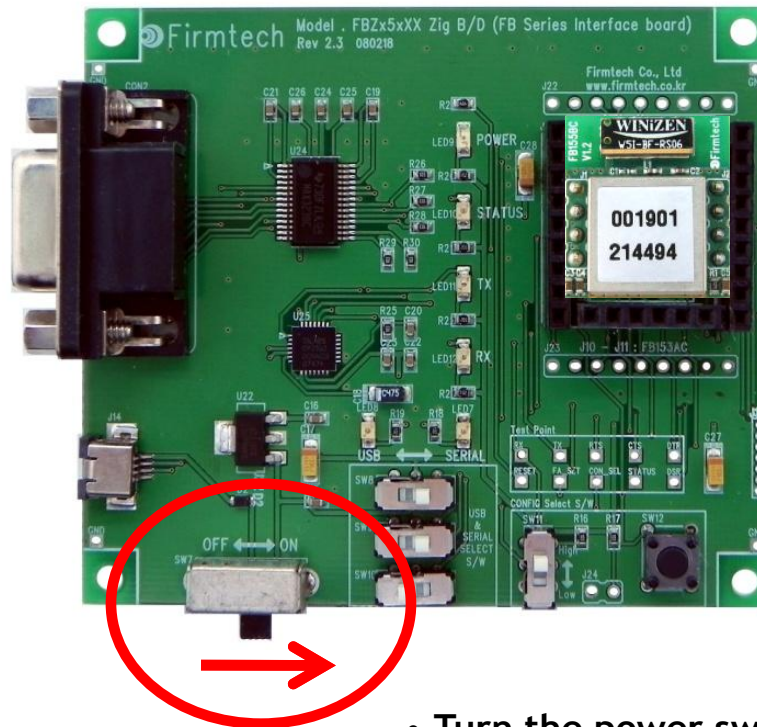
• Turn the power switch on.

(2) Hyper Terminal Output Screen
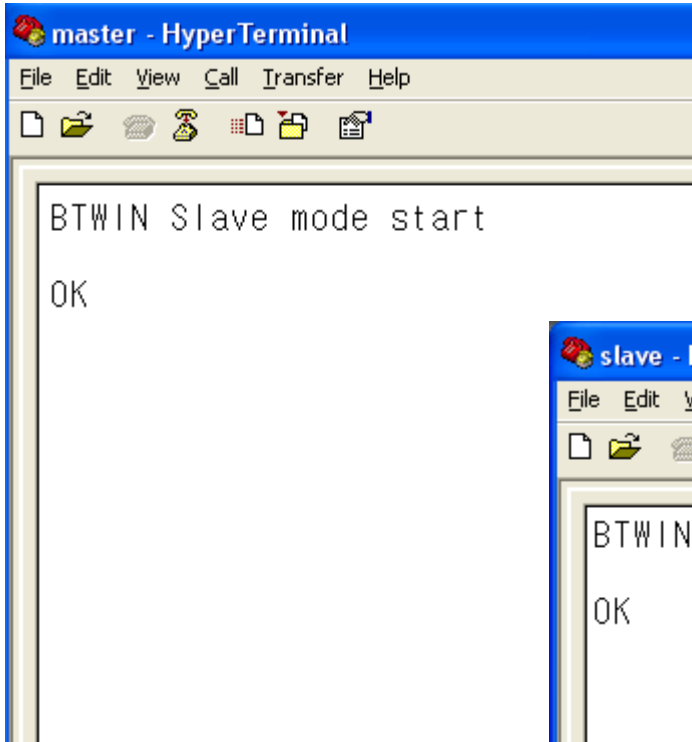
- Turn on the power switches of all two Interface Boards.

- You can see "BTWIN Slave mode start" displayed on the screen.

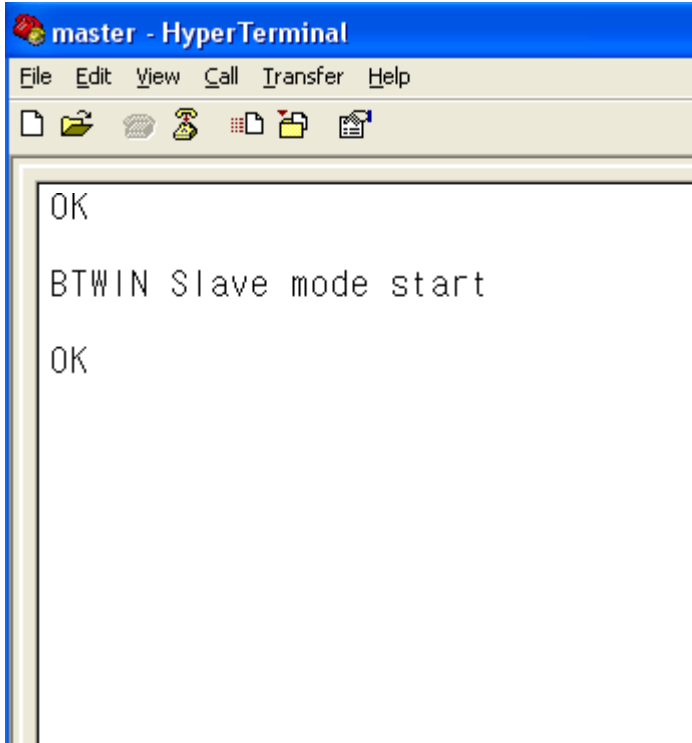- You can see "OK" message displayed on the screen.
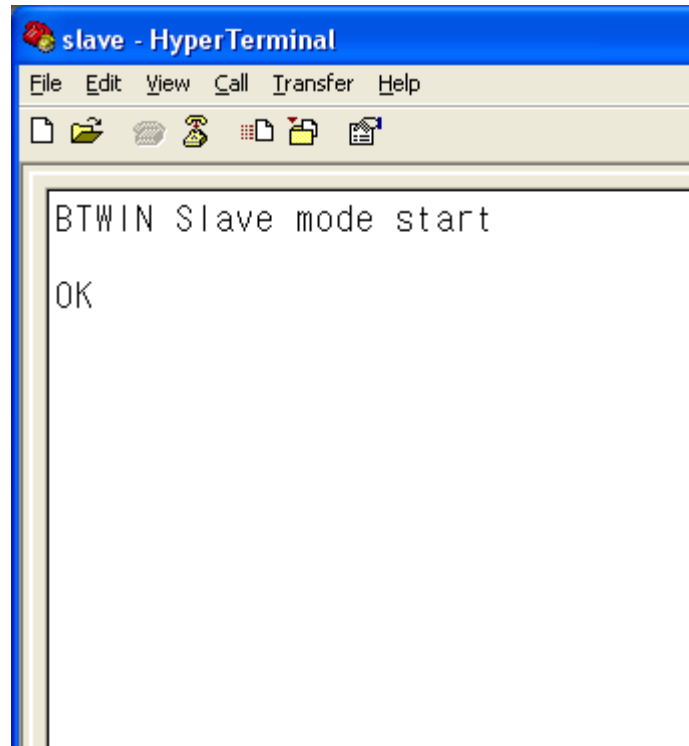
* Restarting the FB155BX
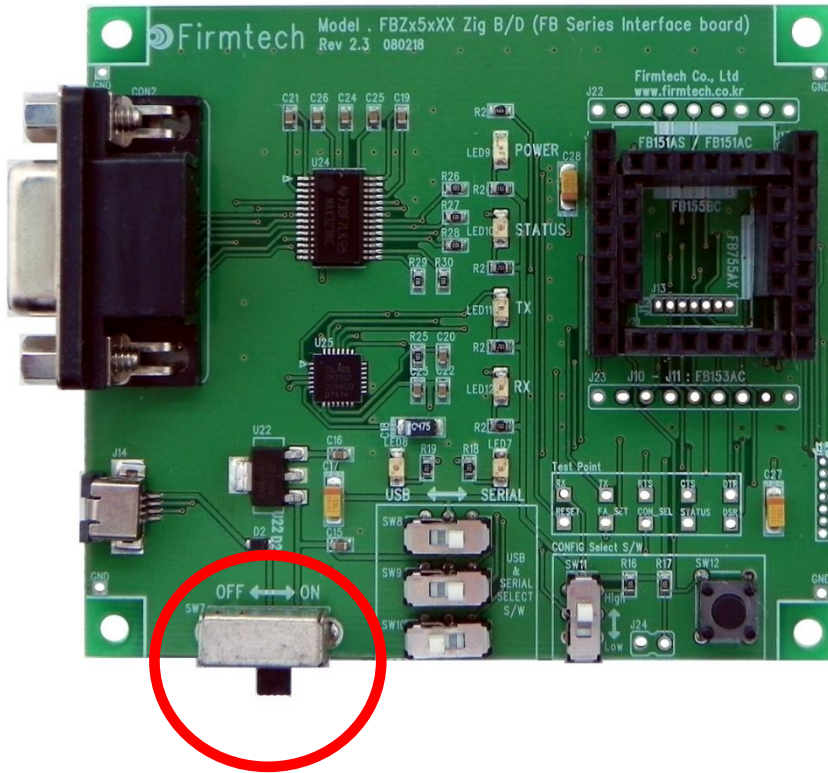
- If the FB155BX does not operate normally nor displayed any letter on the hyper terminal, restart the FB155BX.

- Restart the FB155BX by cycle-power(off and then on) on the Interface Board.

- Check the communication speed and other connection parameters as well.

* Normal Operating Status of POWER LED & TX LED
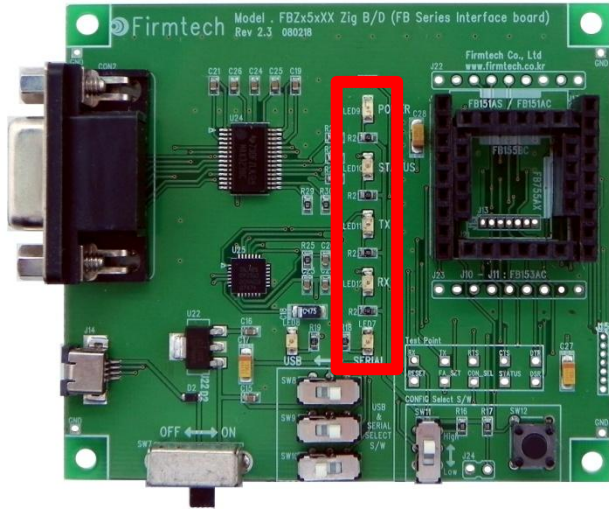
- If the electricity power is supplied normally, POWER LED remain to be ON.

- If operated normally, the TX LED blinks when a message is made from the FB155BX.

* Factory Reset Progress

```
master - HyperTerminal
File  Edit  View  Call  Transfer  Help

OK

BTWIN Slave mode start

OK
```

Instructions Quick Guide is based on factory reset value.

If it is already used or in customized setting, go to factory reset process as follows.

- After entering "AT&F" on the hyper terminal, press enter-key.

- "OK" output is made from the FB155BX.

- FB155BX restarts

- "BTWIN Slave mode start" output is made from the FB155BX.

- "OK" output is made from the FB155BX.

- Factory reset process is now completed.

# [3] Setup of Master & Slave

1. Setup Progress Using AT Command

(1) FB155BX master setup
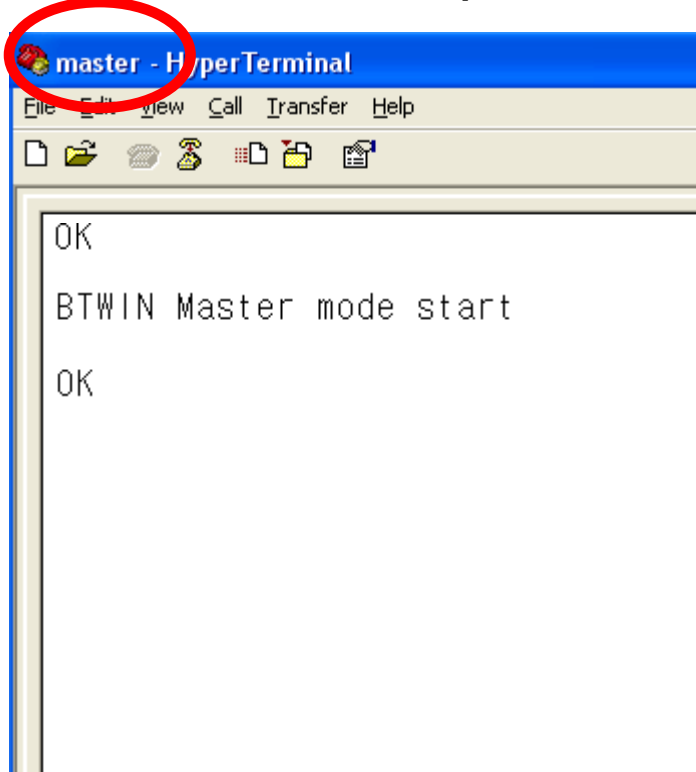
```
master - HyperTerminal
File  Edit  View  Call  Transfer  Help

OK

BTWIN Master mode start

OK
```
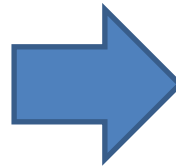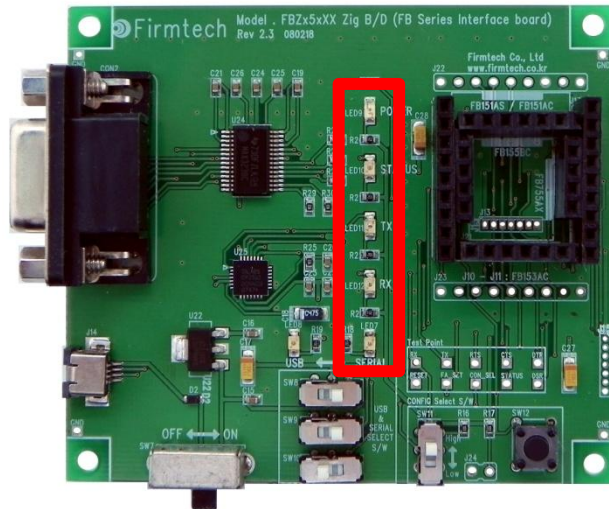
Enter the following on the hyper terminal connected to the FB155BX set up to **Master**.

- After entering "AT+BT**ROLE=M**" on the hyper terminal, press enter-key.

- "OK" output is made from the FB155BX.

- After entering "ATZ" on the hyper terminal, press enter key.

- FB155BX restarts.

- "BTWIN Master mode start" output is made from the FB155BX.

- "OK" output is made from the FB155BX.
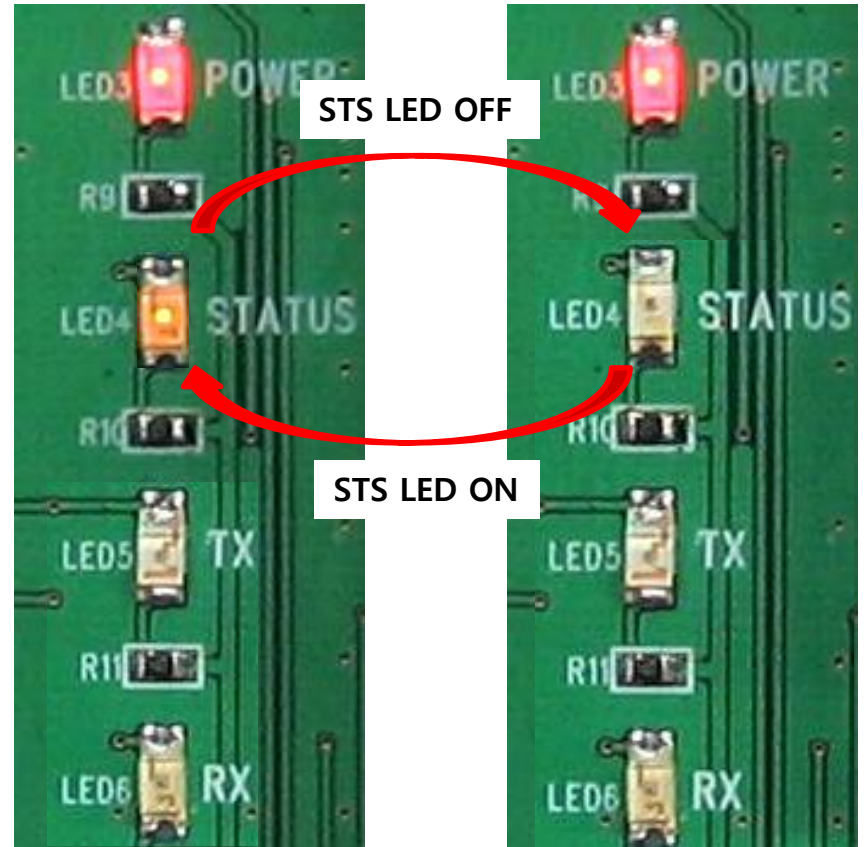
- **Master** setup is finished.

(2) FB155BX slave setup
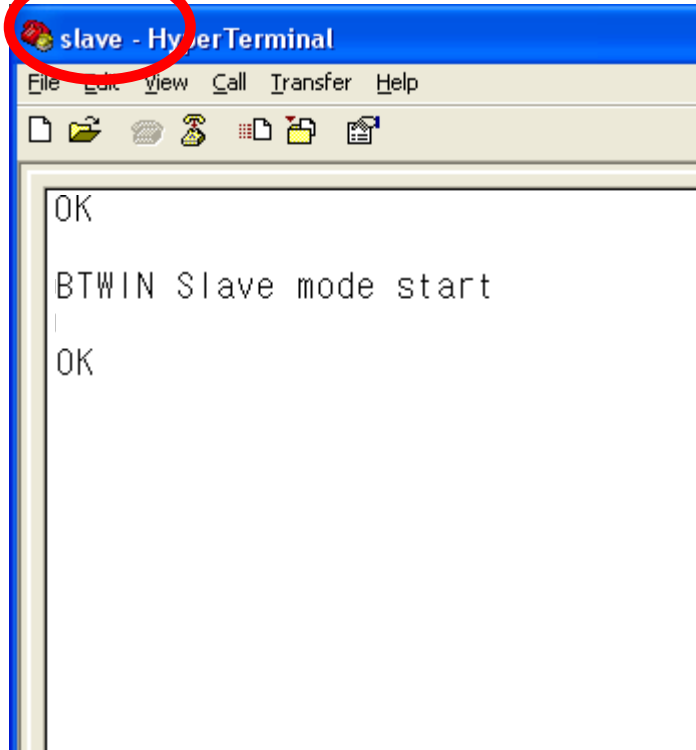
Enter the following on the hyper terminal connected to the FB155BX set up to slave.

- After entering "AT+BT**ROLE=S**" on the hyper terminal, press enter-key.

- "OK" output is made from the FB155BX.

- After entering "ATZ" on the hyper terminal, press enter-key.

- FB155BX restarts.

- "BTWIN Slave mode start" output is made from the FB155BX.

- "OK" output is made from the FB155BX.

- Slave setup is finished.

In case of factory reset value, slave is basically setup(No need to be changed here).

* RX LED Condition

- RX LED blinks when a serial data (AT Command) input is made from FB155BX.

# [4] Scan & Inquiry & Connect

1. AT Command using opertion progress

(1) Slave Scan Start
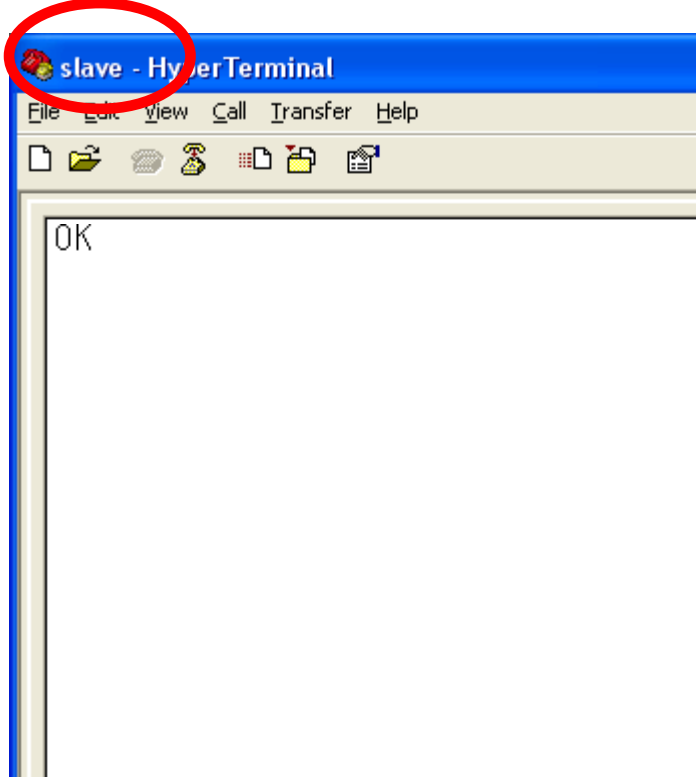
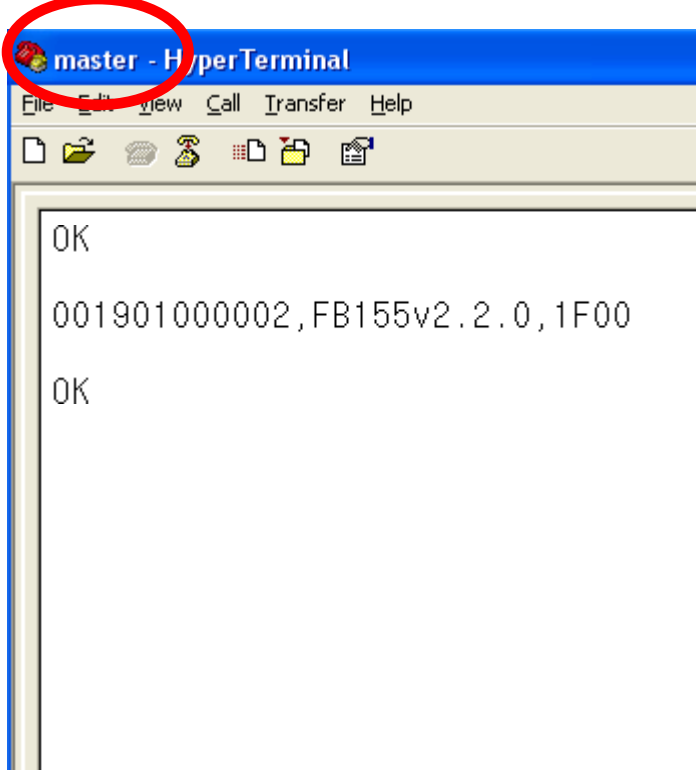**Enter the following on the hyper terminal connected to the FB155BX setup to slave.**

- After entering "AT+BTSCAN" on the hyper terminal, press enter-key.

- "OK" output is made from the FB155BX.

- Slave setup FB155BX transmits its information when a master scans.

- **The slave doesn't send its information to the master unless the slave is in scannig. Namely, the master is not able to scan the slave-device in the condition.**

* Status LED condition of slave in scanning

STS LED OFF

STS LED ON
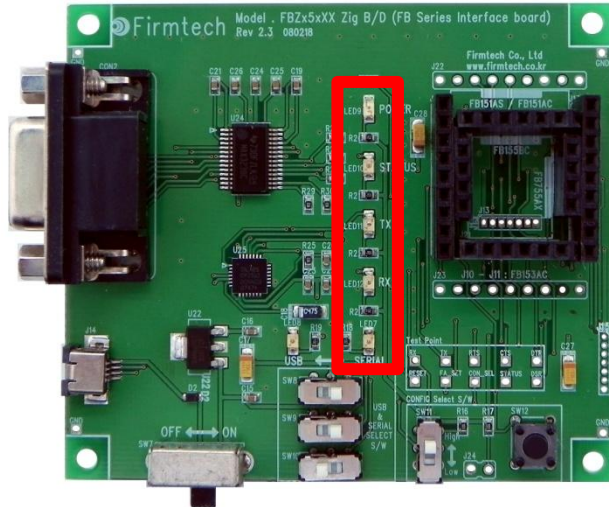
- **If FB155BX is scanning, the Satus LED blinks once in every one second.**

- **The Status LED blinks continuously until Scan command is cancelled.**

(2) Master Inquiry Start

```
master - HyperTerminal
File  Edit  View  Call  Transfer  Help

OK

001901000002,FB155v2.2.0,1F00

OK
```

Enter the following on the hyper terminal connected to the FB155BX set up to Master

- **After entering "AT+BTINQ?" on the hyper terminal, press enter-key.**

- **"OK" output is made from the FB155BX.**

- **Soon, information-output of Bluetooth slave devices located close is made from the FB155BX.**

- **"OK" output is made from the FB155BX.**

- **Output can be made from a various kinds of devices as cellular phone, PC,PDA etc.**

(3) Scan device output content
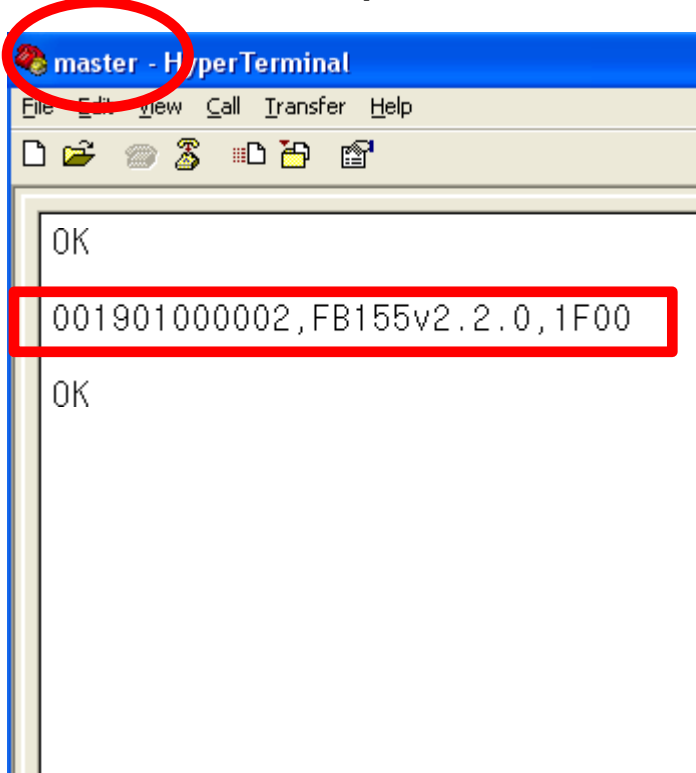
- **"001901000002" means address of scanned device.**

- **"FB155v2.2.0" shows a name of scanned device.**

- **"1F00" shows Class of Device.**

- **By using Bluetooth Address of "001901000002", the connection between devices can be progressed.**

- **Since device name, FB155v2.2.0 supports SPP, it is regarded as a device capable for SPP connection.**

- **Whether other devices can be connected to it or not depends on recognizing profiles that are supported by the devices.**

* Status LED condition of master in inquiring
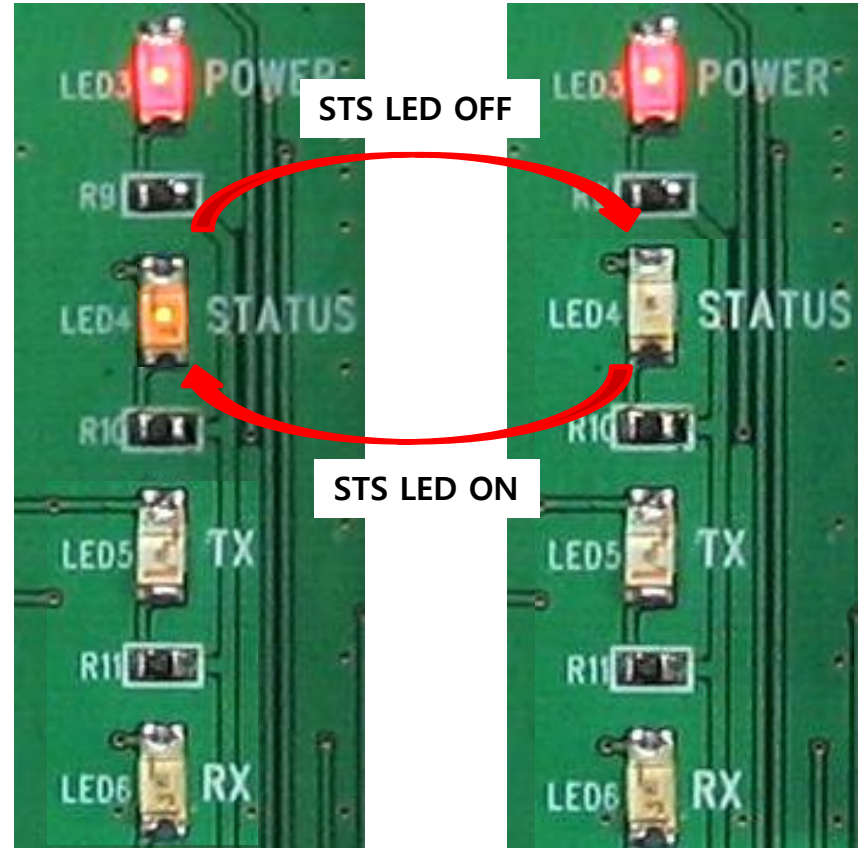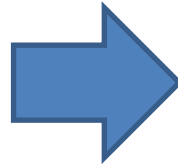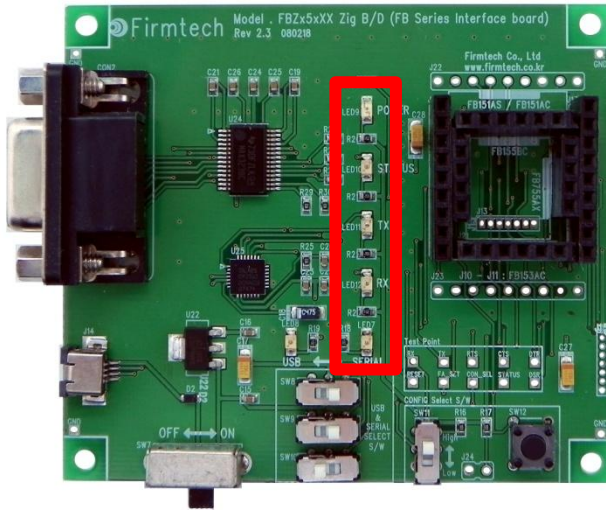
- **While FB155BX is inquiring, the status LED keeps blinking rapidly.**

- **Inquiry command is automatically cancelled after a certain time.**

- **When the inquiry command is cancelled, LED status keeps OFF.**
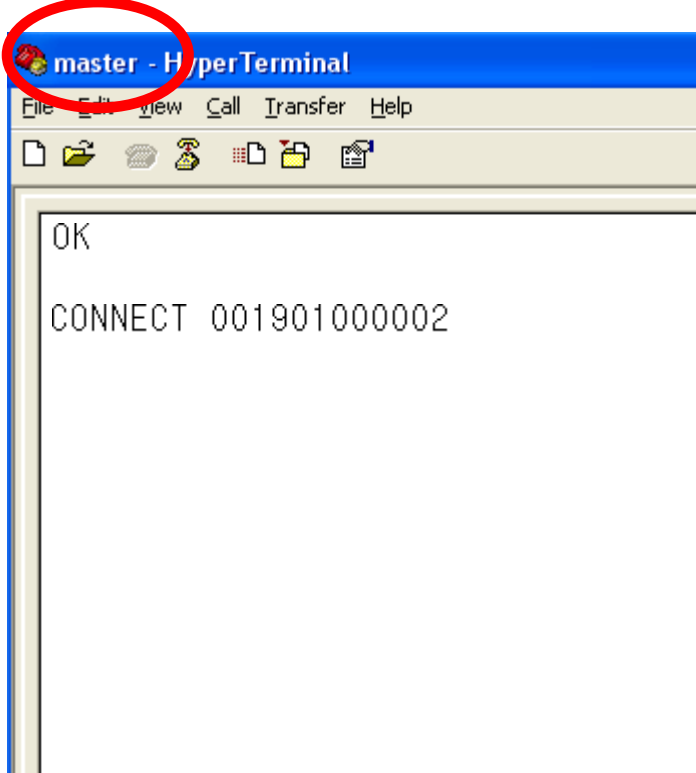
STS LED OFF

STS LED ON

(3) Connection

```
master - HyperTerminal
File  Edit  View  Call  Transfer  Help

OK

CONNECT 001901000002
```

Enter the following on the hyper terminal connected to the FB155BX **set up to master.**

- After entering "**ATD001901000002**" on the hyper terminal, press enter.

- **"OK" output is made from the FB155BX.**

- **"CONNECT 001901000002" output is made from the FB155BX.**

- **Bluetooth Address displays the connection with "001901000002"device**

- **master & slave connection is finished**

(4) slave Device Connect Message

| slave - HyperTerminal |
| File Edit View Call Transfer Help |

CONNECT 001901000001
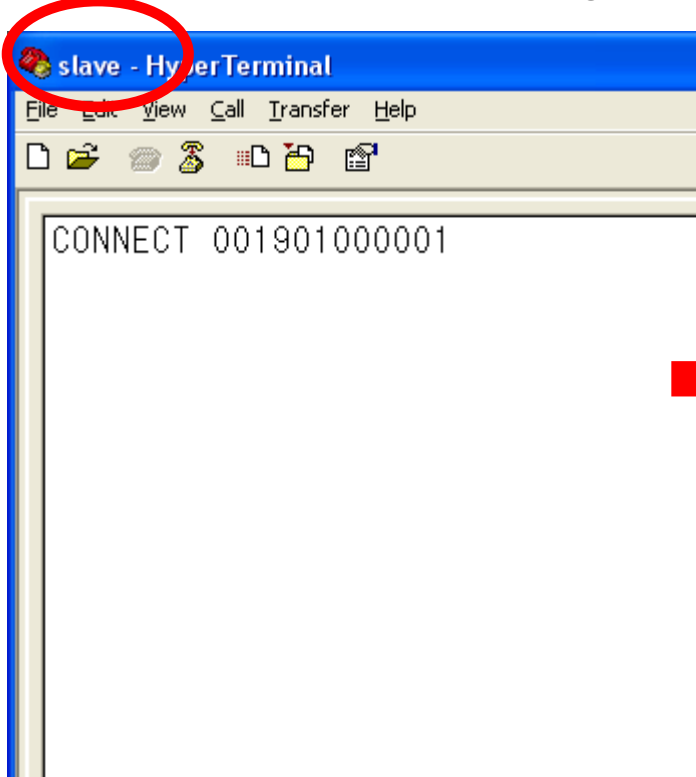
In case of master & slave connection, the follwing is displayed on the hyper terminals connected FB155BX **set up to slave.**

- **"CONNECT 001901000001"output is made from the FB155BX.**

- **Bluetooth Address displays the connection with "001901000001"device**

* Connectted Status LED Condition
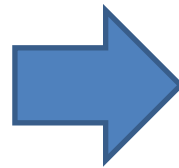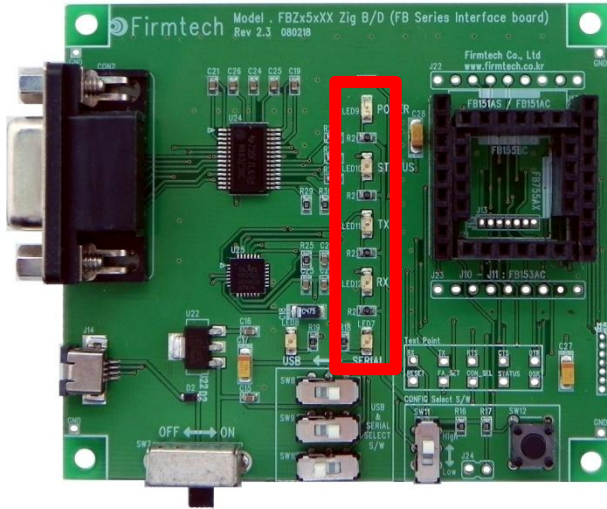
- **Status LED maintains ON condition when FB155BX master/slave is connected.**

[5] Serial Data Transmission

1. Serial Data Transmission

(1) Serial Data Transmission from master => Received by slave
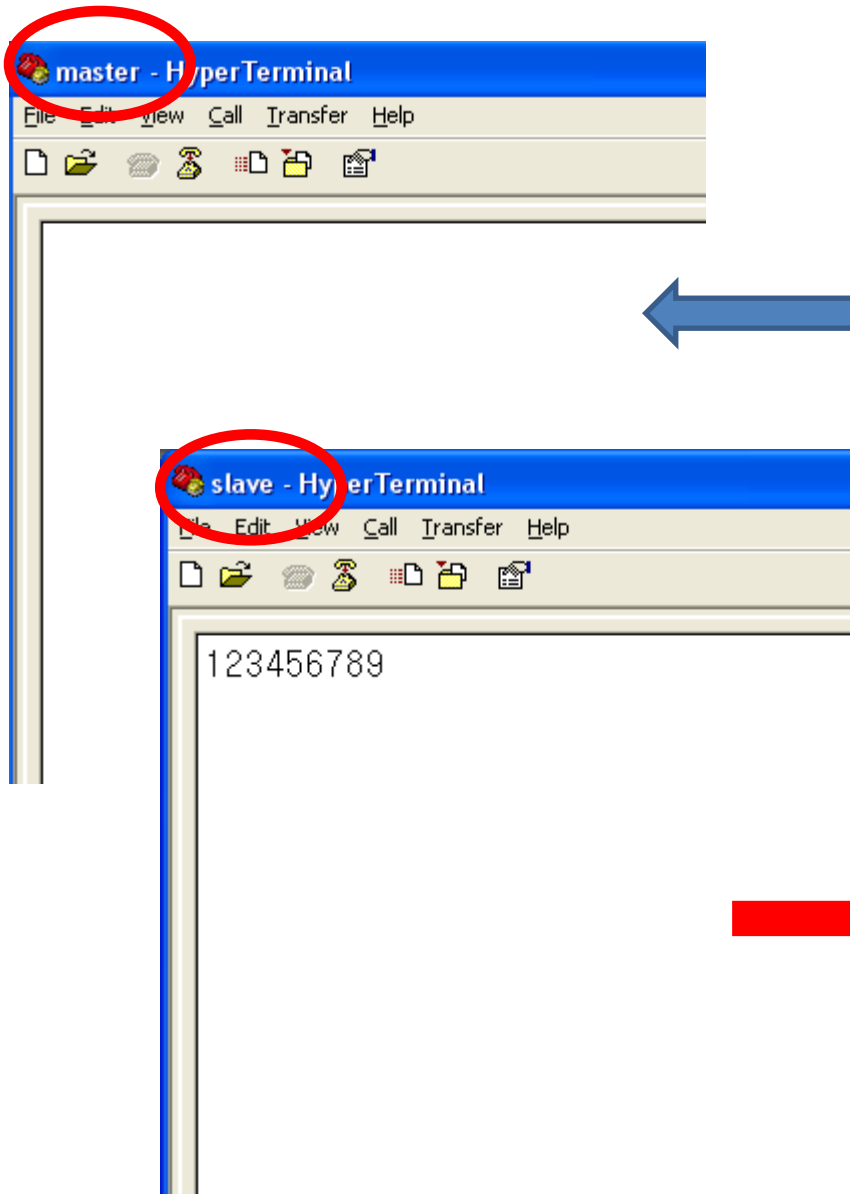
Enter as follows on the hyper terminal connected to the FB155BX set up to master

- **Enter "123456789" on the hyper terminal.**

- **Input data is not displayed on the screen of the hyper terminal.**

123456789

The following output is displayed on the hyper terminal connected to FB155BX set up to slave.

- **"123456789"is displayed on the screen of the hyper terminal.**

(2) Serial Data Transmission From Slave => Received by Master

slave - HyperTerminal

File Edit View Call Transfer Help
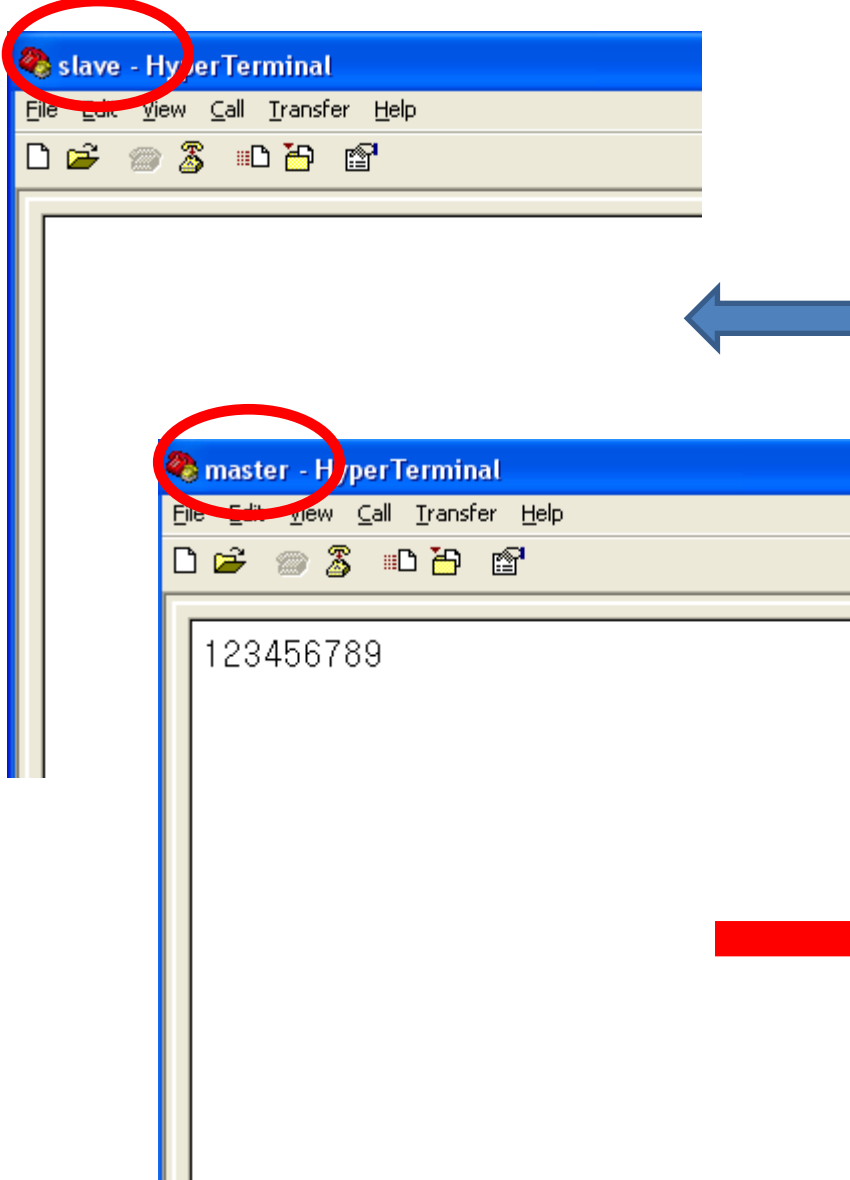
Enter as follows on the hyper terminal connected to the FB155BX set up to slave

- **Enter "123456789" on the hyper terminal.**

- **Input data is not displayed on the screen of the hyper terminal.**

master - HyperTerminal

File Edit View Call Transfer Help

123456789

The following output is displayed on the hyper terminal connected to FB155BX set up to master.

- **"123456789"is displayed on the screen of the hyper terminal.**

* TX/RX LED Status on data transmission & reception

<Serial Data Input>

<Serial Data Output>
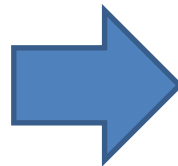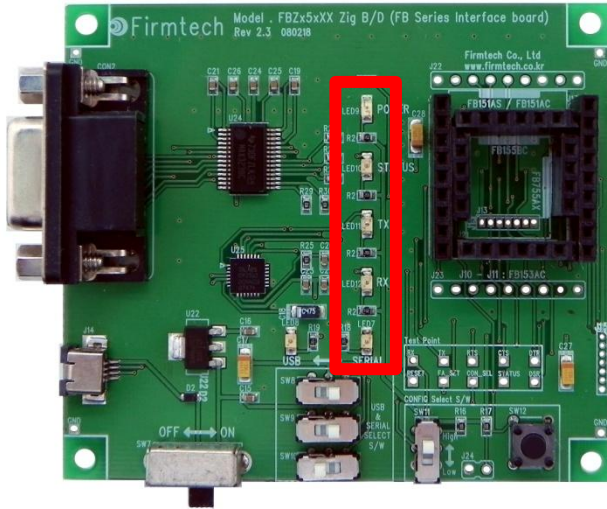
- **STATUS LED is OFF when master & slave are connected.**

- **FB155BX RX LED blinks when a real data is enterred.**

- **FB155BX TX LED blinks when a serial data is output.**

[6] Disconnect

(1) Operation Mode => AT Command Mode Conversion

master - HyperTerminal

File Edit View Call Transfer Help

OK

OK
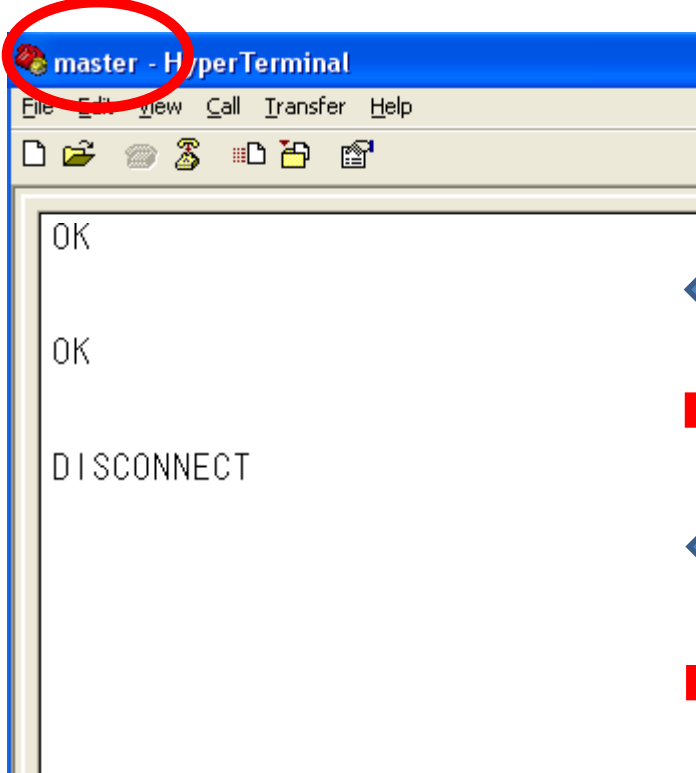
DISCONNECT

Enter as follows on the hyper terminal connected to the FB155BX **set up to master**

• Enter "+++" on the hyper terminal.

• "OK" output is made from the FB155BX.

• Enter "ATH" on the hyper terminal.

• "OK" output is made from the FB155BX.

• "DISCONNECT" output is made from the FB155BX.

• **Conversion from Operation Mode to AT Command mode is possible only at master.**

• **Connection-finish by using a command is possible only at master.**

(2) slave Device Disconnect Message

```
slave - HyperTerminal
File  Edit  View  Call  Transfer  Help

DISCONNECT
```
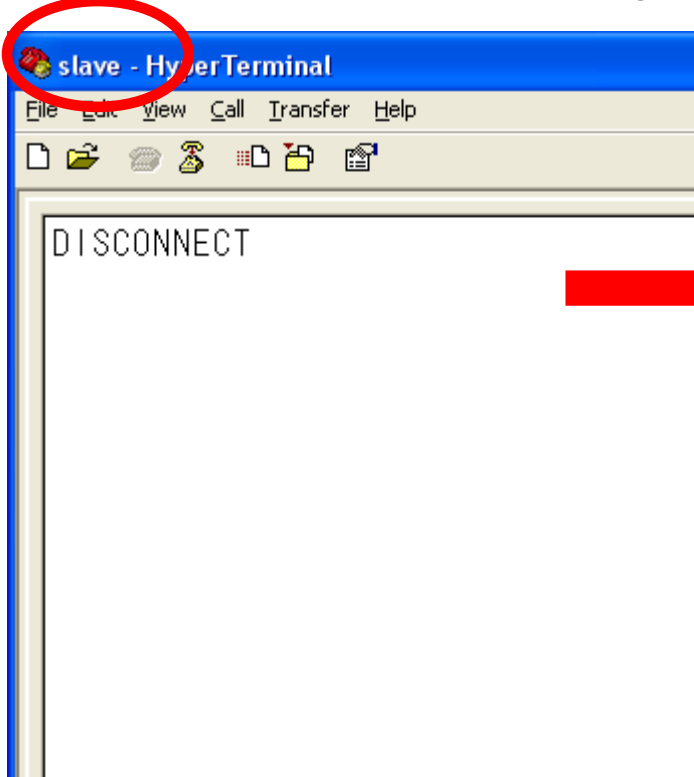
If master & slave connection is finished, the follwings are displayed on the hyper terminals connected FB155BX **set up to slave.**

- **"DISCONNECT"output is made form the FB155BX.**

- **Input data is transmitted to master device and a serial output is made out from master device when enter "+++" or AT Command on FB155BX set up to slave under the condition of master & slave connection.**

- **Slave device can not use AT command mode under the condition of master & slave connection.**

* Status LED Condition After Disconnect

STS LED OFF

STS LED ON
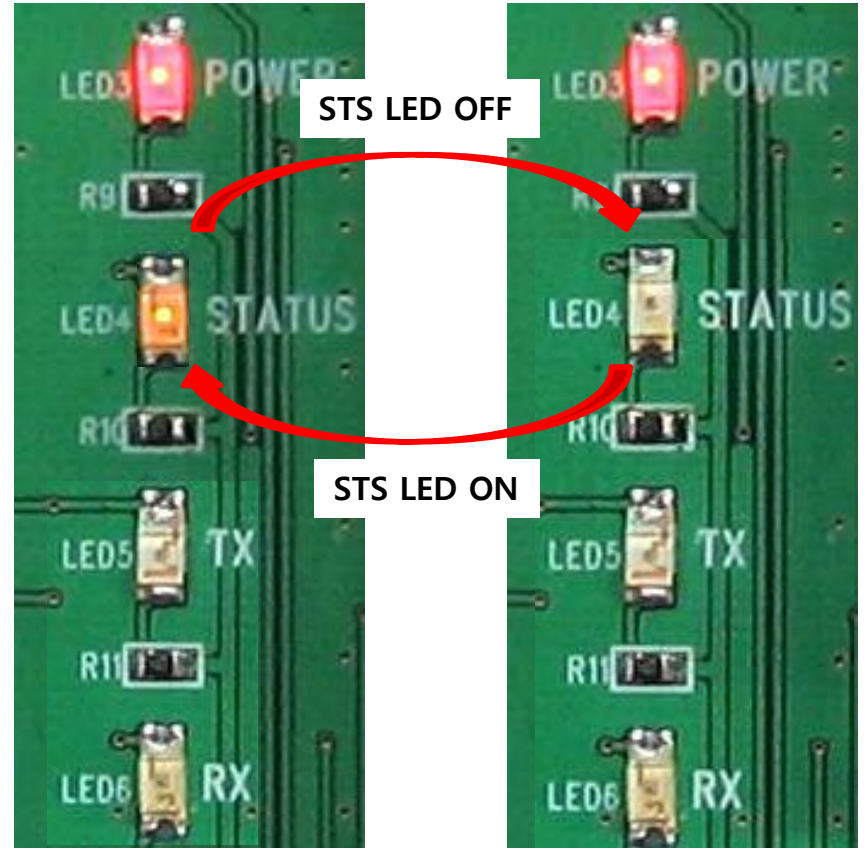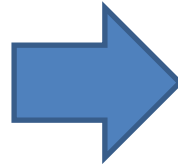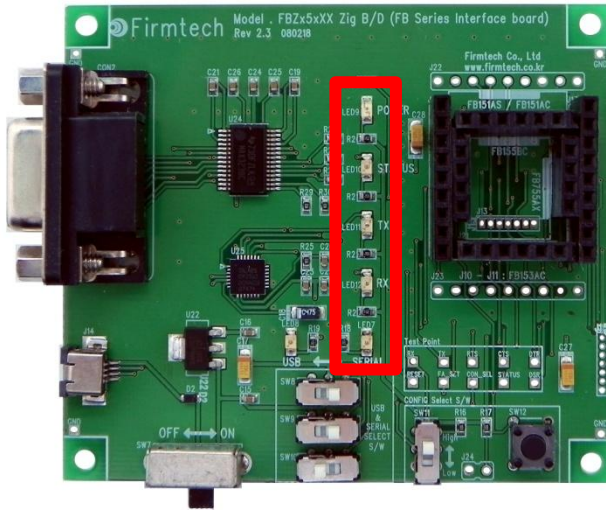
- **STATUS LED is OFF when FB155BX master is disconnected.**

- **Status LED blinks once in every one second when FB155BX slave is disconnected. (on operating a scan-command)**

< STATUS LED condition of slave device >

[7] Re-connect

(1) Re-connect

```
master - HyperTerminal
File  Edit  View  Call  Transfer  Help

OK

CONNECT 001901000002
```
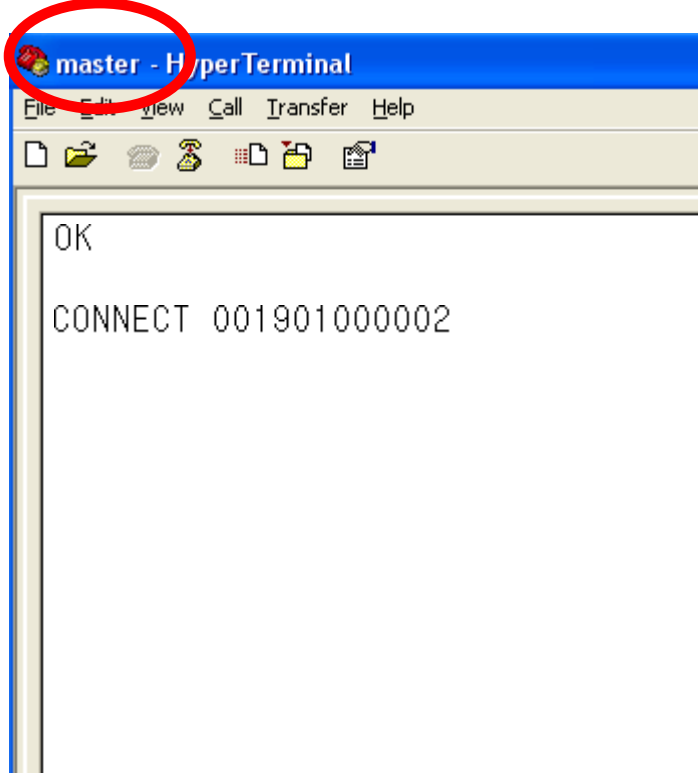
Enter the followings on the hyper terminal connected to FB155BX **set up to master,** in case of connecting previous connected device again.

- After entering "**ATD**" on the hyper terminal, press enter-key.

- **"OK" output is made from the FB155BX.**

- **"CONNECT001901000002" output is made from the FB155BX.**

- **Connected again with previous connected device**

In case of connecting with a device connected more than once previously, it keeps a memory of Bluetooth Address for previous lastly connected device.
In case of connecting with new device, please do progress a connection as explained the above. However, in order to connect (reconnection) with previous connected device, the connection with previously memorized Bluetooth Address is progressed.

For even more details, please refer to FB155BX user mannual.

[x] USB2Serial Driver Installation

1. USB2Serial Driver Installation

(1) Step 1

(1)

CP210x_VCP_Win_XP_S2K3_Vista_7.exe ➡️ **Doubleclick driver execution file.**
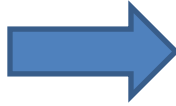
(2)
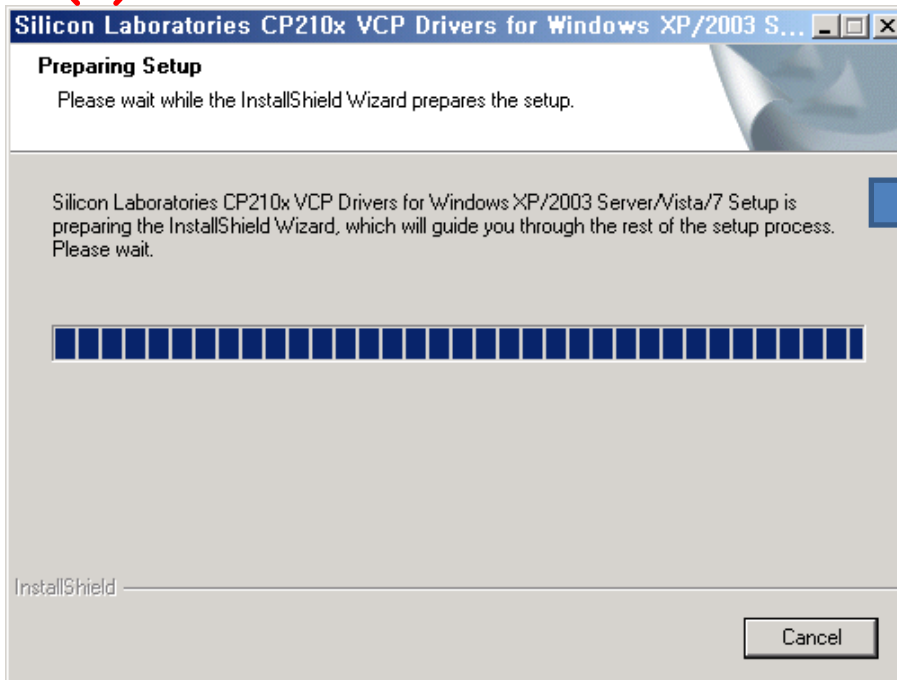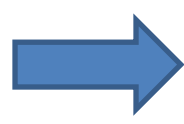
Reset for driver-setup is progressed

(2) Step 2
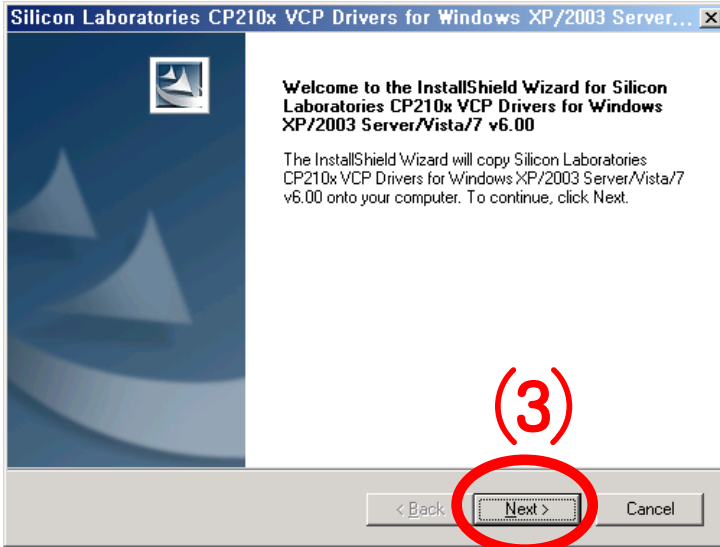
Click Next.
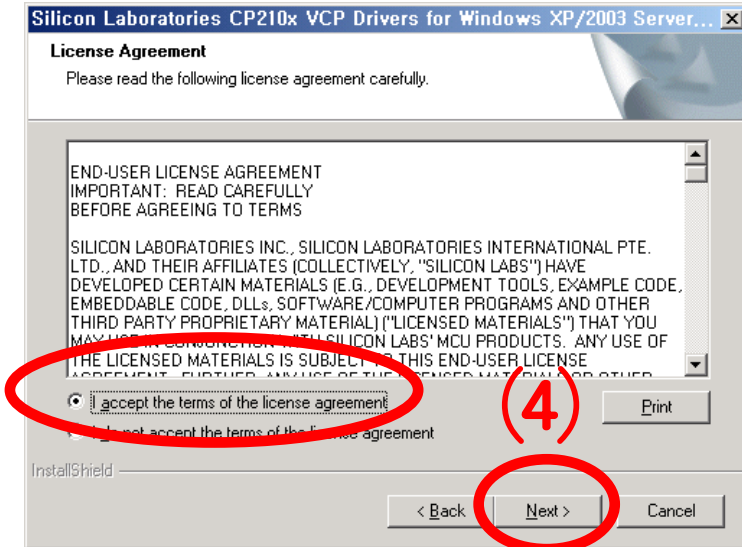
Click next and choose Accept.

And then, Click Next.

(3) Step 3
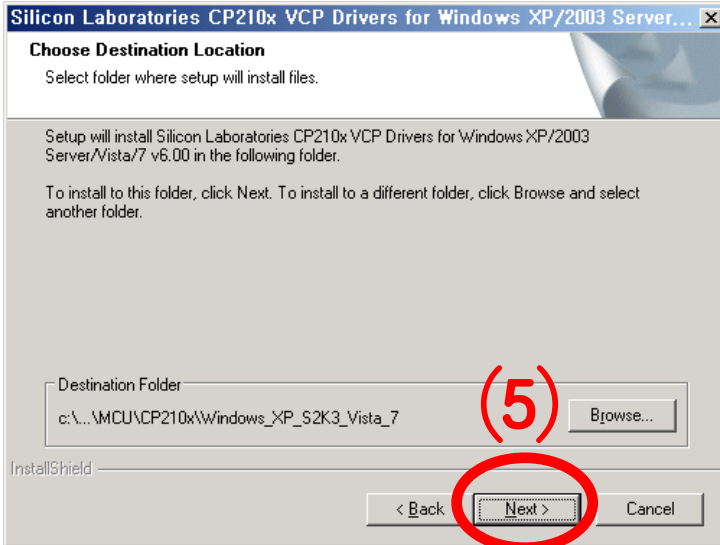
Click Next.
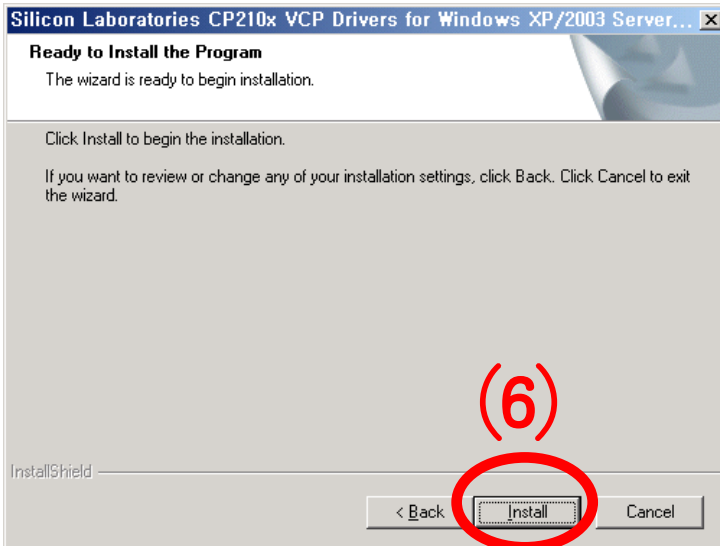
Click Install.

(4) Step 4
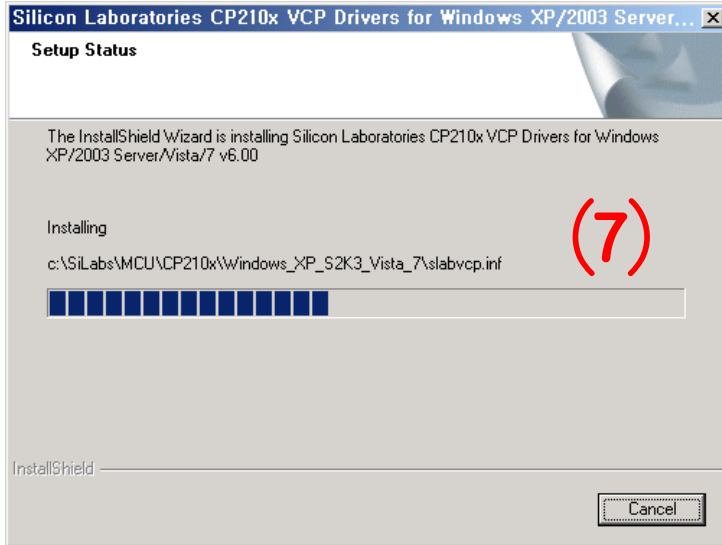
Install is progressing.
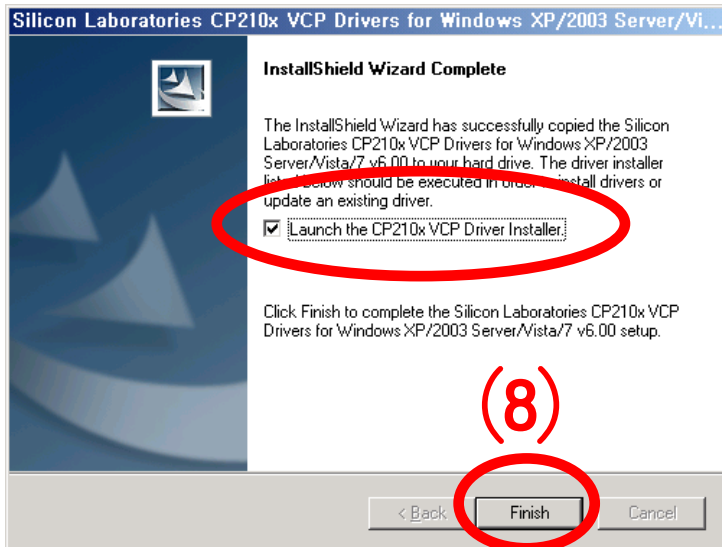
After checking Launch the CP210x VCP Driver Installer, click Finish.

(5) Step 5

Click Install.
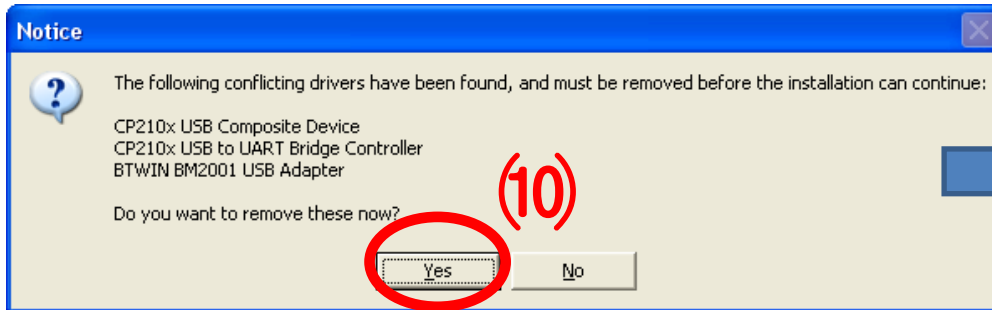
The left message is maded if the driver is already existed.

Click "Yes". (the left message may not be made.)

It may takes some time on deleting the existing driver.
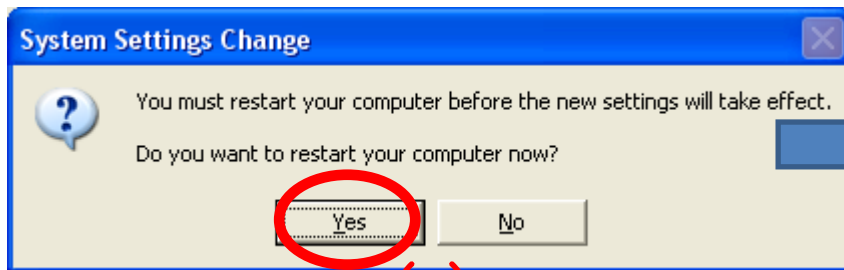
Window System-restart is progressed by clicking "Yes".

2. USB2Serial Driver Confirmation Method

(1) Interface Board Setup and Power-Supply ON
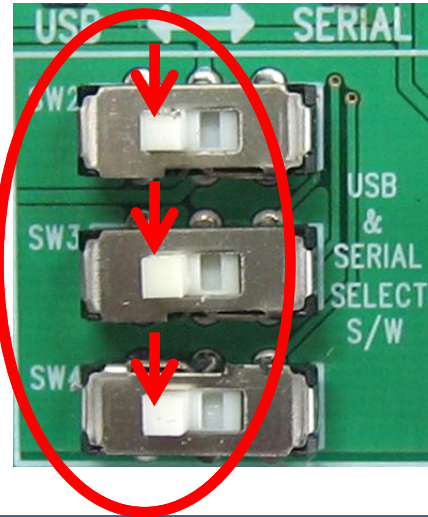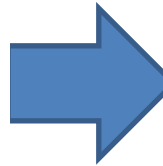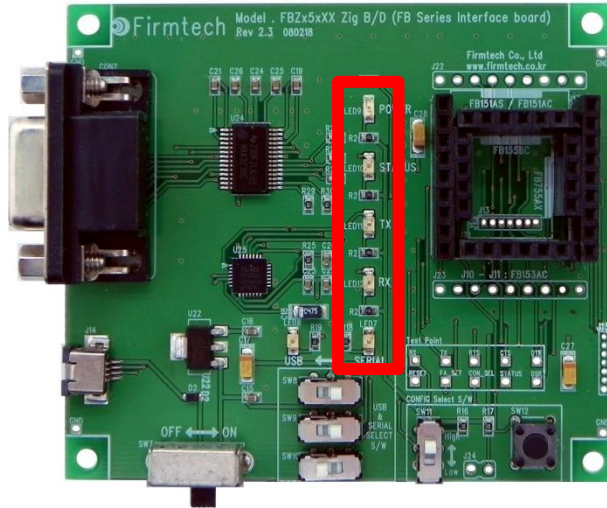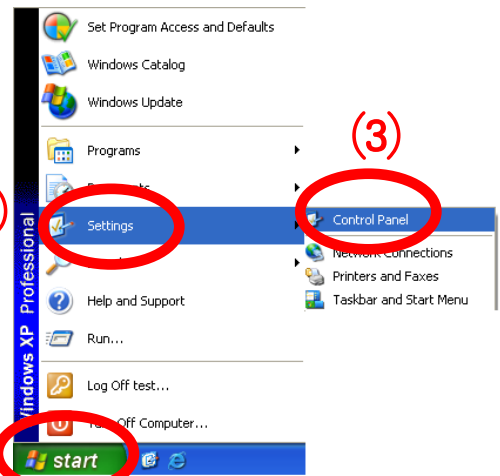
- Select USB as UART select switch.
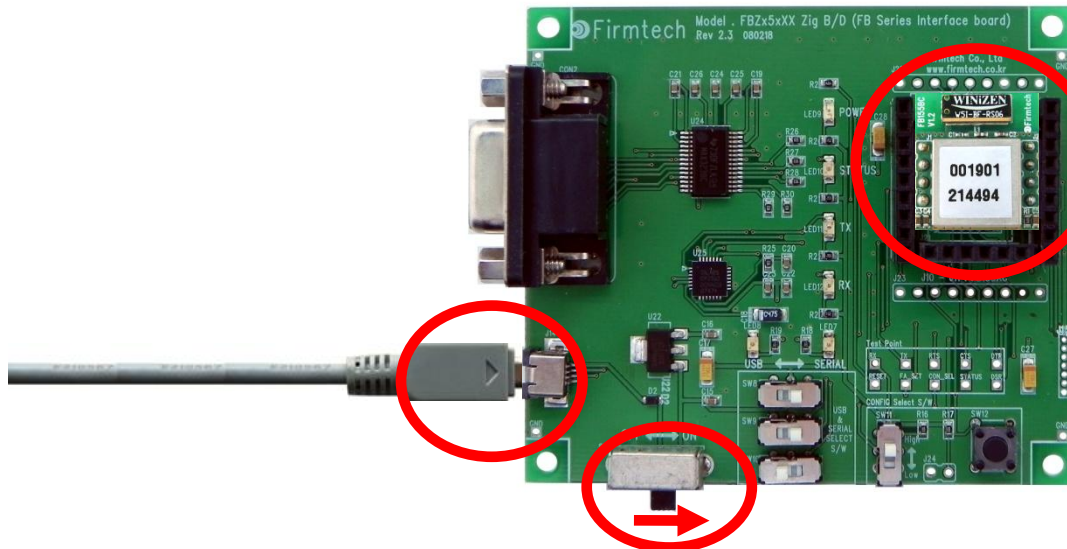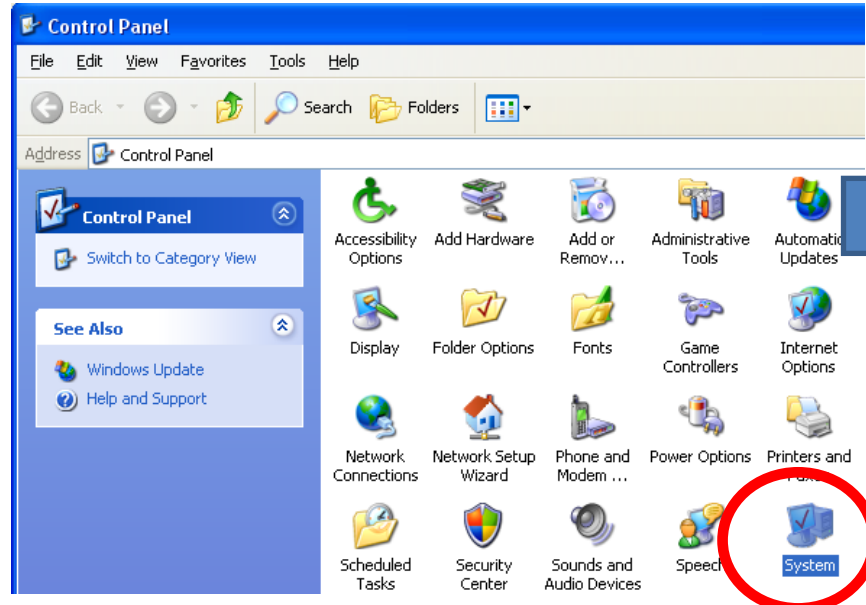
- Build a module.
- Build USB cable.
- Connect PC with USB cable.
- Power Supply ON of Interface Board

(2) "Control Panel" & "System" Execution

- Click "Start" on Windows Start menu.
- Click "Settings."
- Click "Control Panel."

- Execute "SYSTEM" in control Panel.

(3) "Device Manager" & "Port" Selection

- Select "**Hardware**" tab in system Properties window.

- Select "**Device Manager.**"

- Select "**Port**" in Device Manager."

(4) Created Virtual Serial Port Confirmation
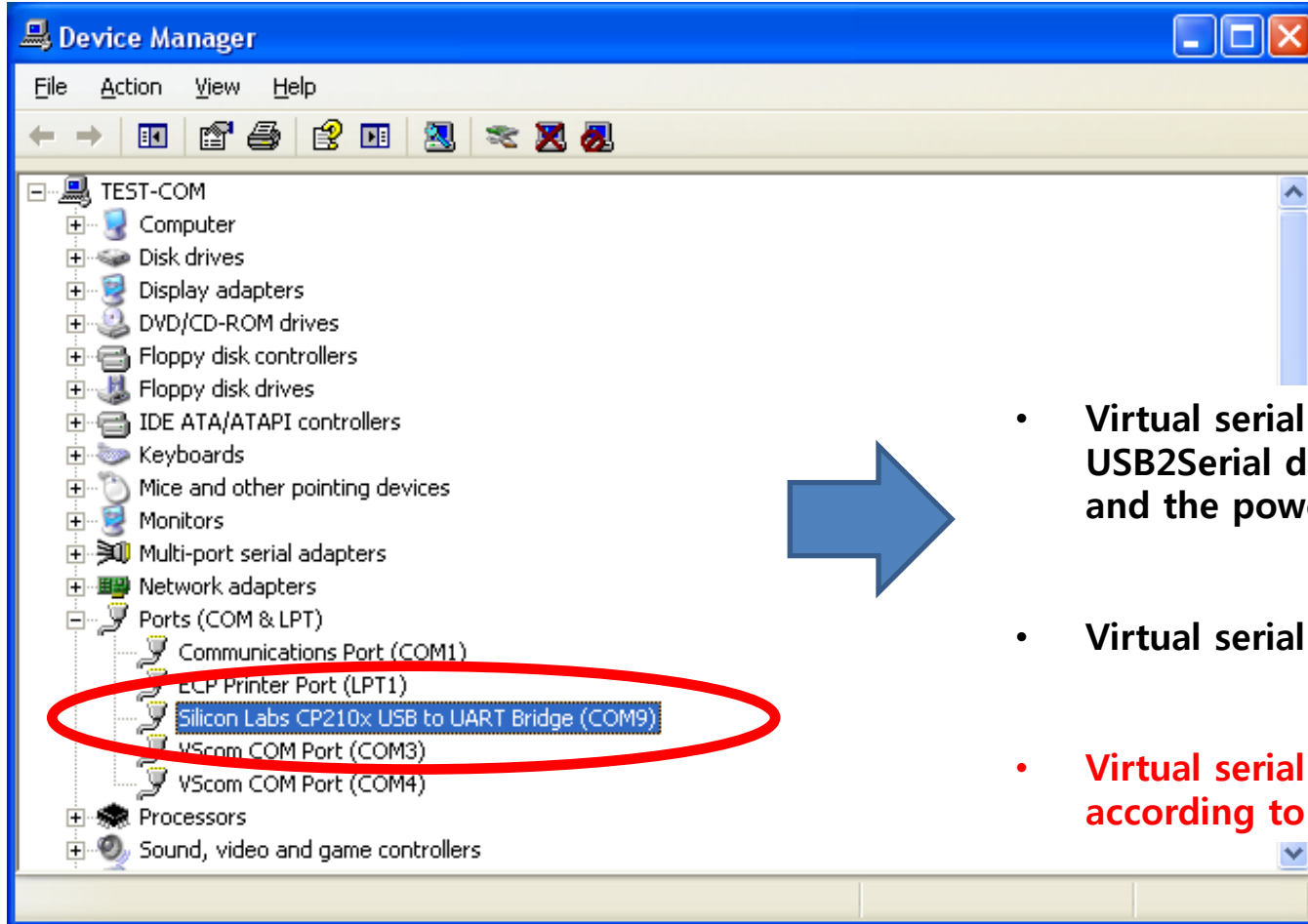
- **Virtual serial port is displayed if USB2Serial driver is installed normally and the power-supply is ON.**

- **Virtual serial port "COM9" is displayed**

- **Virtual serial port is made differently according to user's environment.**

[x] Virtual Serial Port

Usage matters to be attended to

1. The Creation of Virtual Serial Port

(1) Virtual Serial Port & Interface Board
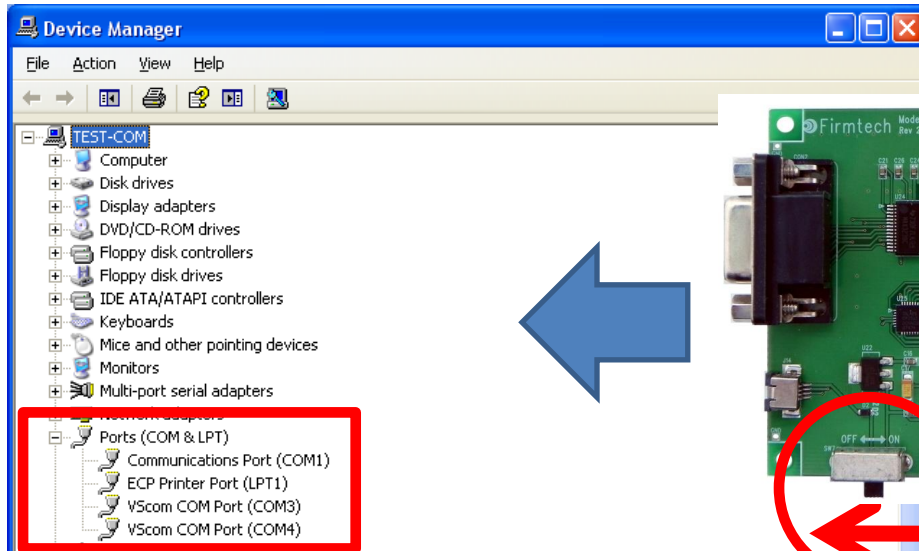
There is no a virtual serial port at "Port"clause if power-supply of interface board is OFF.
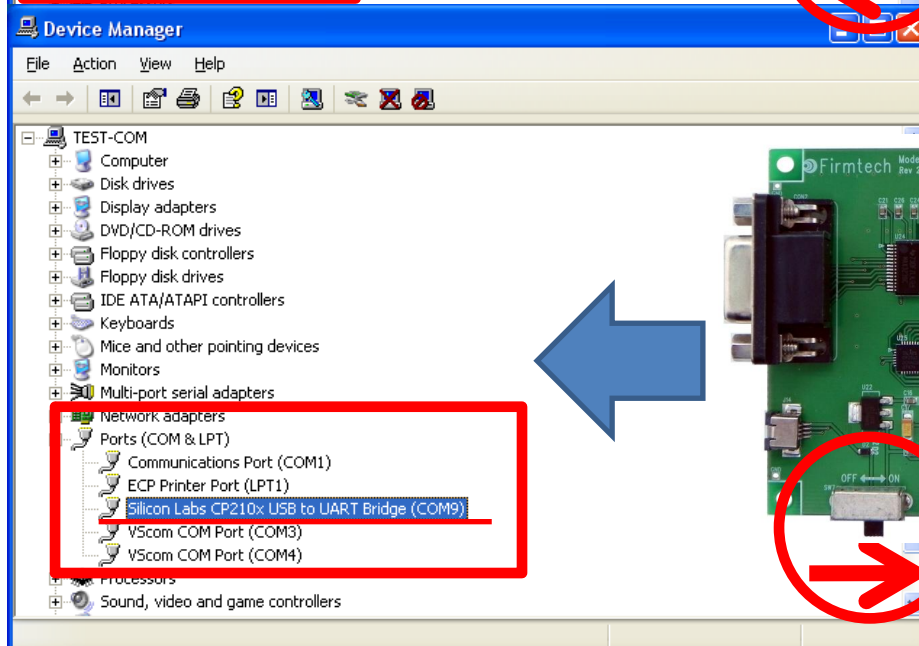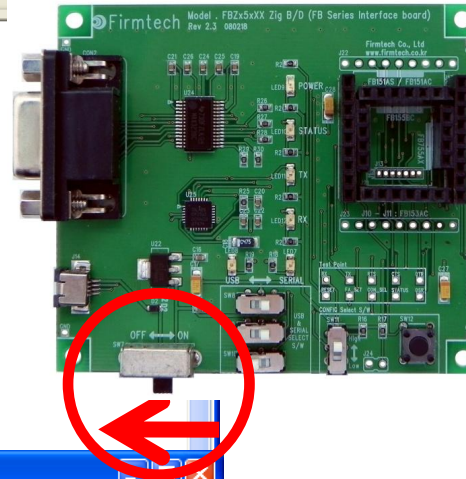
There is virtual serial port at "Port"clause if power-supply of interface board is ON.
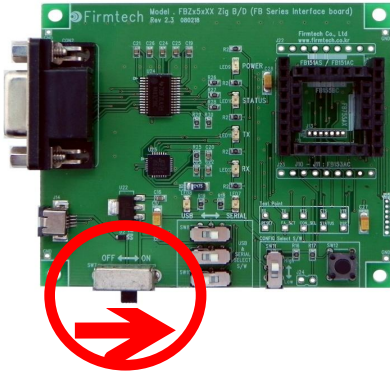
(2) Virtual Serial Port & Serial Communication Program

It is impossible for virtual port to be connectted to a serial program as hyper-terminal if there is no virtual serial port.
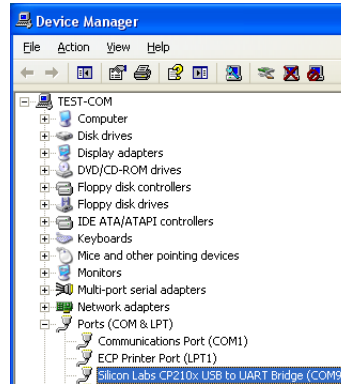
It is possible for virtual port to be connectted to a serial program as hyper-terminal if there is virtual serial port.

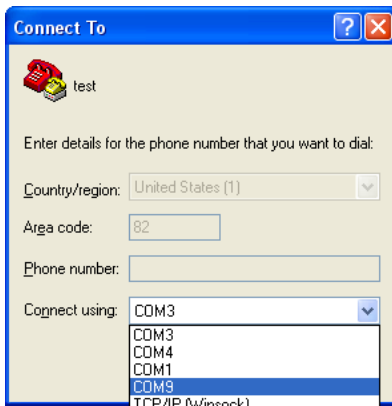## (3) Virtual Serial Port & Serial Communication Porgram & Interface Board
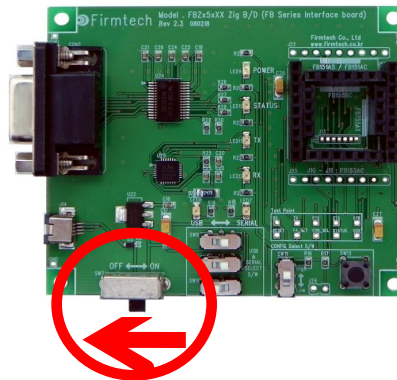
(1) Power Supply ON

(2) Virtual Port Creation

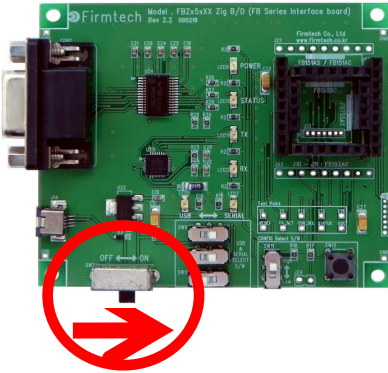### (3) Virtual Port OPEN

(4) Power Supply OFF

- A virtual port may be disappeared by power-supply OFF of interface board while using virtual serial port created at serial communication program.

- Even though a virtual serial port is disappeared by power-supply OFF of interface board, may not see virtual serial port disappearing at serial communication program.

- Communication is not available because of realistic port (Virtual port) disappearing even though serial communication program is operated normally.

- It may occur critical situation at OS if virtual port is disappeared under a serial communication program operating.

- Therefore, certainly, serial port communication should be finished before power-supply OFF of interface board. That is, the power-supply of interface board should be OFF under finishing virtual port.

(4) Virtual Serial Port & Bluetooth Module

(1) **Power-Supply ON**

### (2) **Message Output**

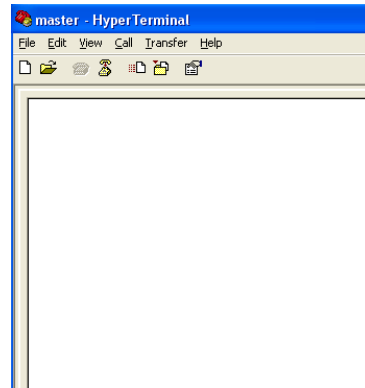### (3) **Virtual Port OPEN**

(4) **No Message**

- Start Message is made out by Bluetooth Module if power-supply of interface board is OFF.

- Virtual Port is created after power-supply of interface board is ON.

- Serial communication program is available after virtual port creation.

- Can not see operation-situation (Start Message etc) immediately just after ON of module power supply if serial communication program is used at virtual port.
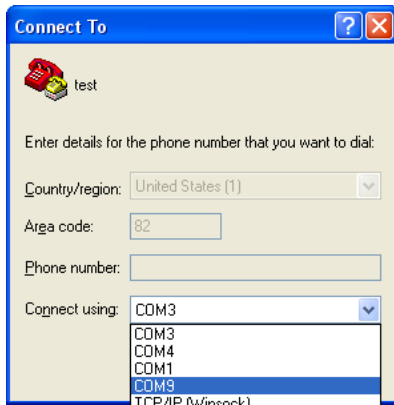
- In case of using virtual port, a user makes appropriate action (System reset etc by using "ATZ" command after Bluetooth operation) for seeing general operation situation of Bluetooth Module.