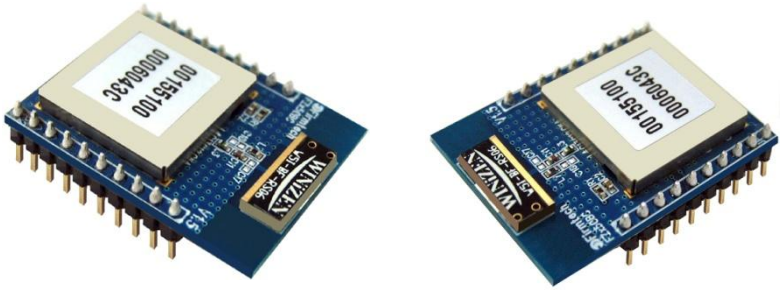
FZ750BC/FZ750BS

Quick Guide

TinyBee™

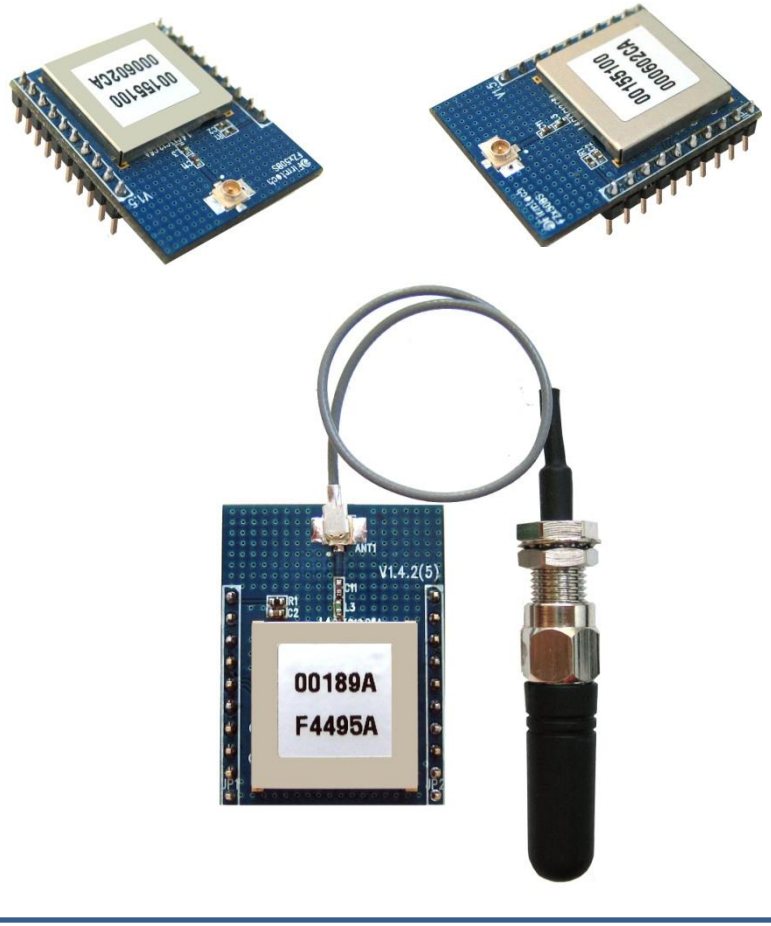
Features of FZ750BC / 750BS

TinyBee™



< FZ750BC >

TinyBee™



< FZ750BS >

< Features of Zigbee >

- **It meets International Standard specifications with the aim of achieving Low power consumption/Low cost/Low capacity**

- **It uses 2.4GHz ISM (Industrial, Scientific, Medical) Band which doesn't require any permission to use.**

- **It has 16 channels in 2.4GHz band**

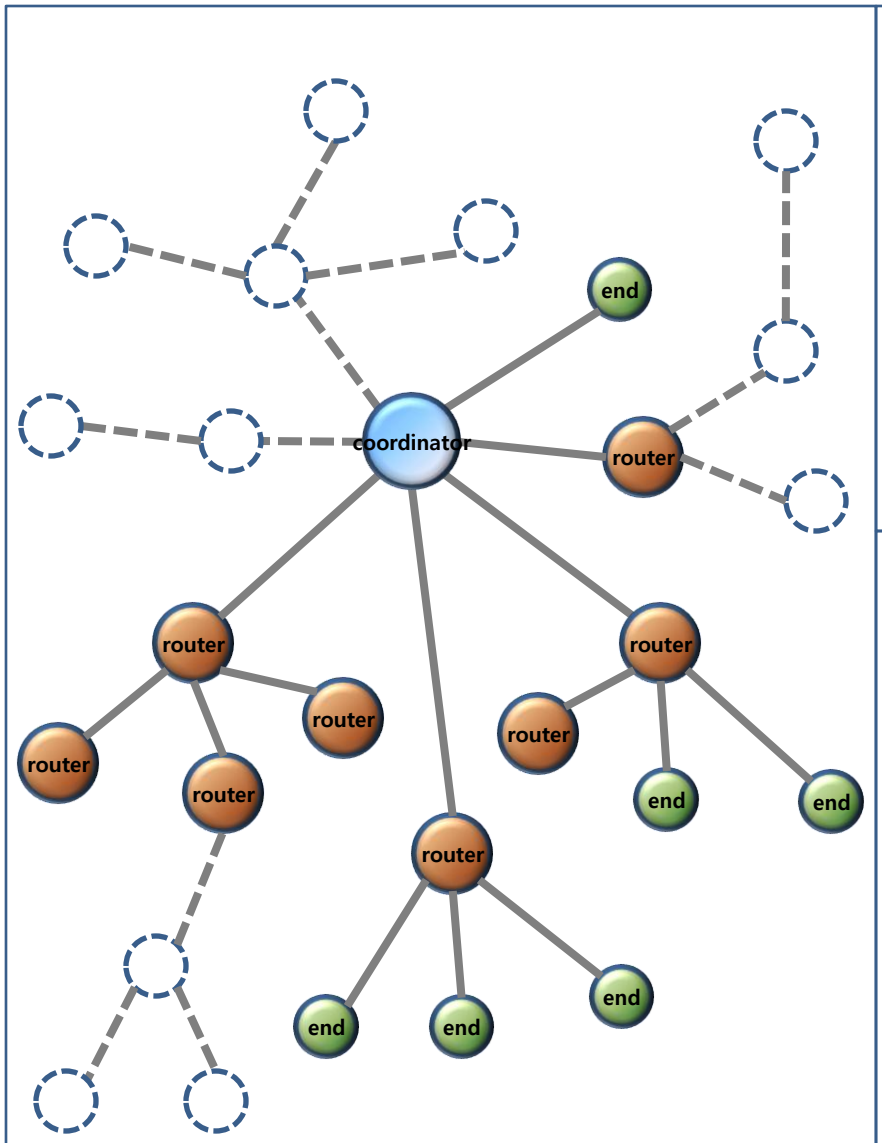
- **Wireless transmission rate : 250Kbps**

- **It configures the ZigBee Network using Coordinator, Router and End Device**

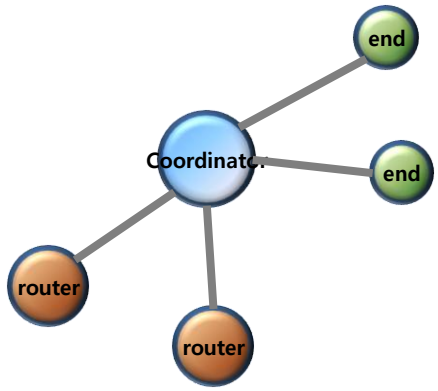
- **By using ACK, whether the data is successfully transmitted can be assured.**

- **It can reset the route for data transmission in the ZigBee network by using the function of data re-transmission**

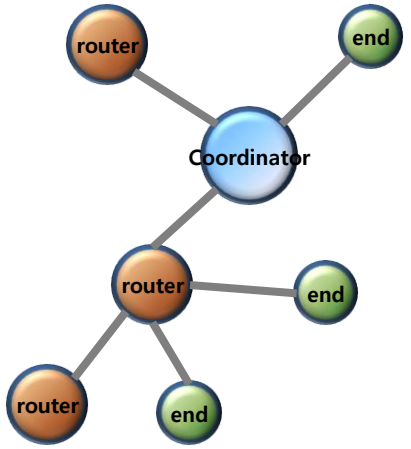
• An Example of ZigBee Network configuration



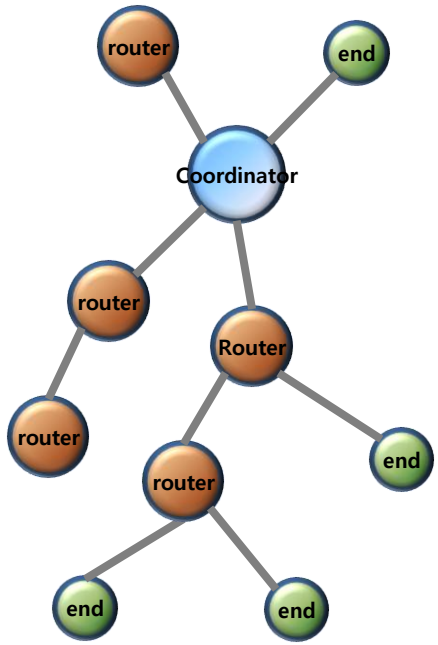
An example of ZigBee Network configuration



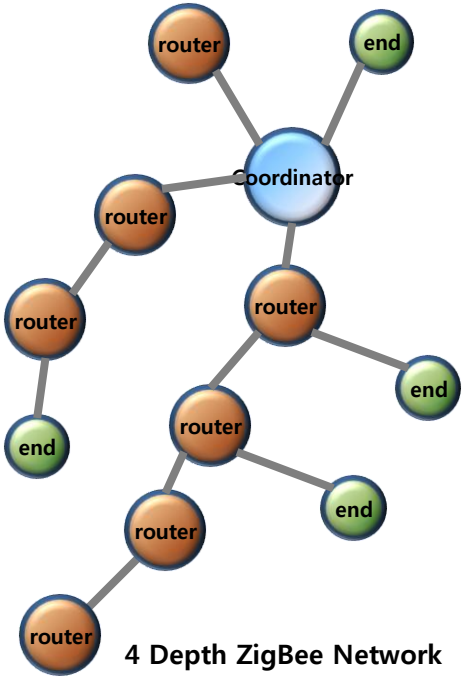
1 Depth ZigBee Network



2 Depth ZigBee Networks



3 Depth ZigBee Network



4 Depth ZigBee Network

* Features of FZ750BX

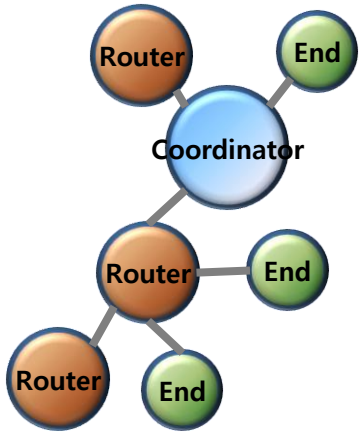
FZ750BX

FZ750BC (Chip Antenna)

20pin Header Type

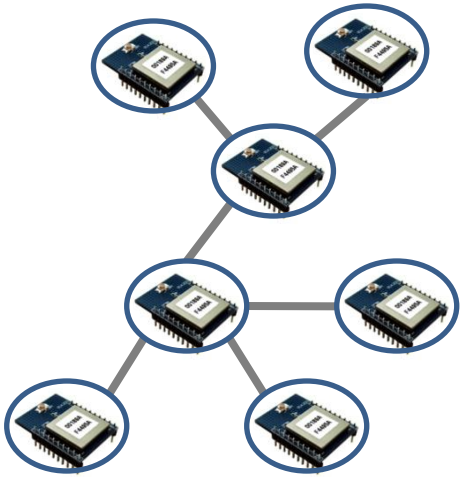
FZ750BS (Helical Antenna)

20pin Header Type

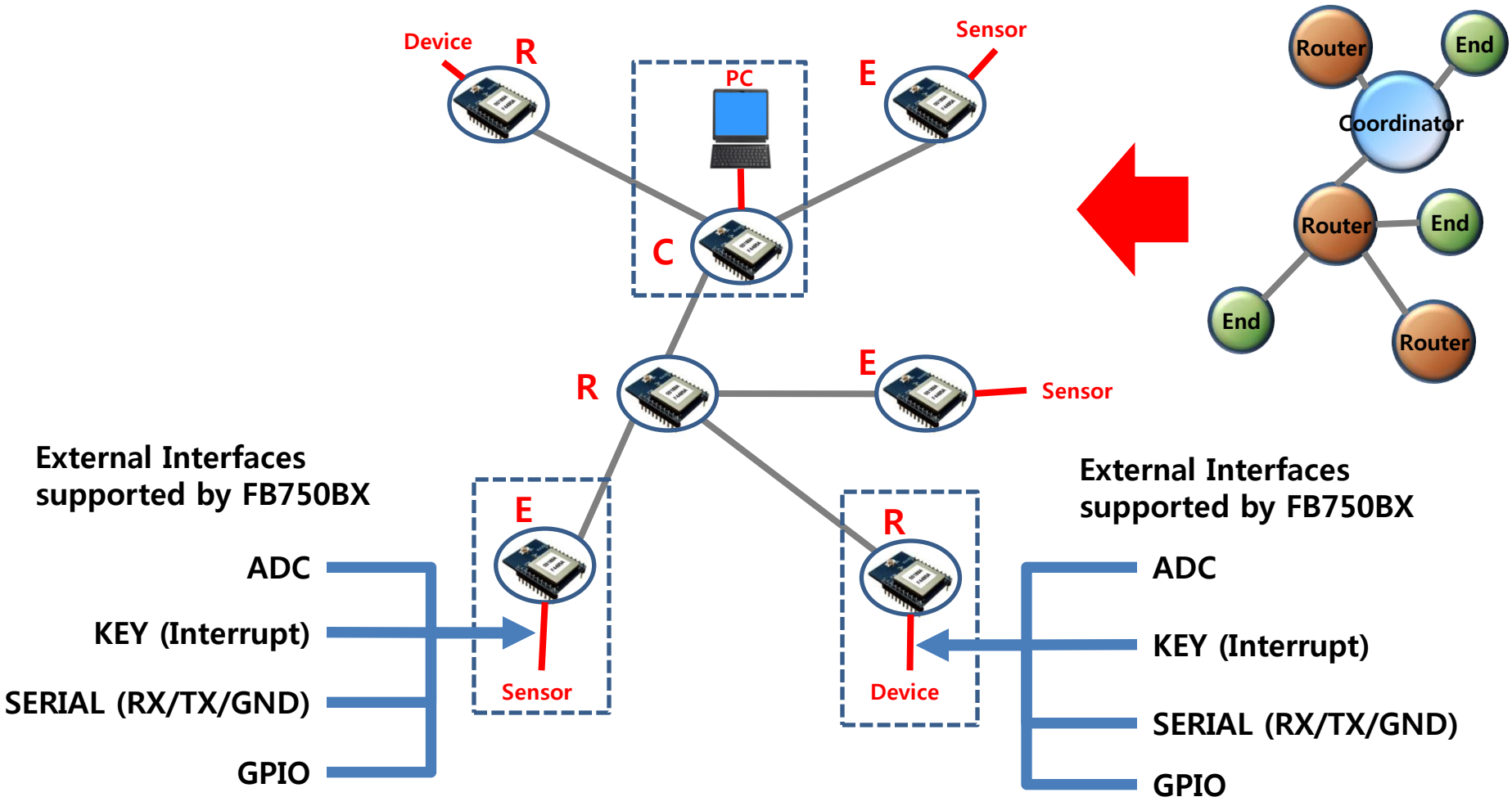


< FZ750BX >

- Can be freely set up as Coordinator, Router, or End device.
- Supports Mesh Network.
- Configured with 20Pin Header Type.
- Supports UART, ADC, KEY, and GPIO Interface.
- Controlled by AT Command
- Supports low power consumption mode in case of End Device.
- Supports ACK function when data is transmitted.
- Provides function of data re-transmission and re-setting route.



- **An example of a ZigBee Network Configuration using FZ750BX , external devices and sensors.**



* Functions of Interface Board 1

It converts EIA Level to TTL Level or in reverse order

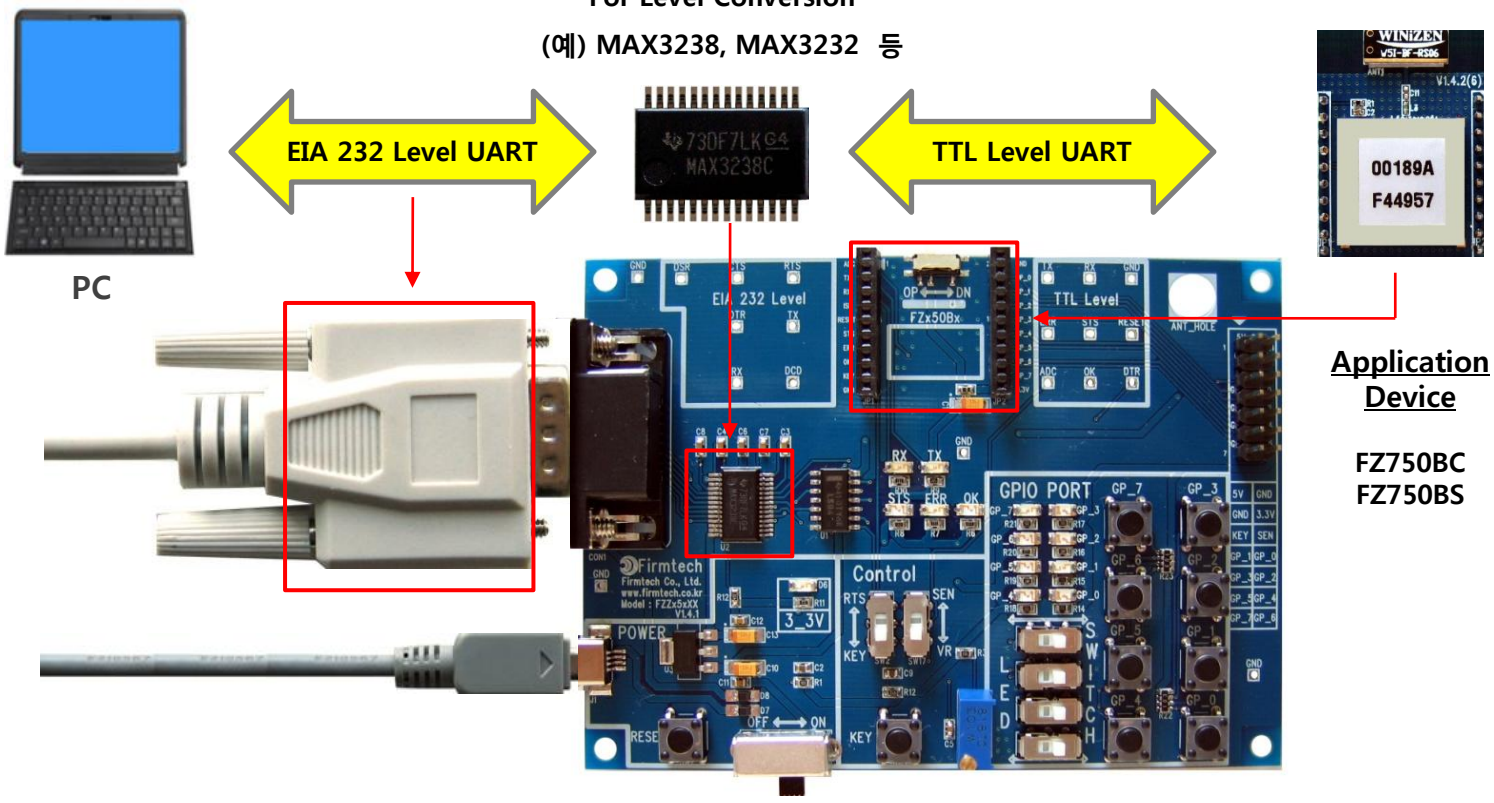
Note : UART : **U**niversal **A**synchronous **R**eceiver **T**ransmitter

EIA-232 Level⇔ TTL Level

Dedicated Driver IC

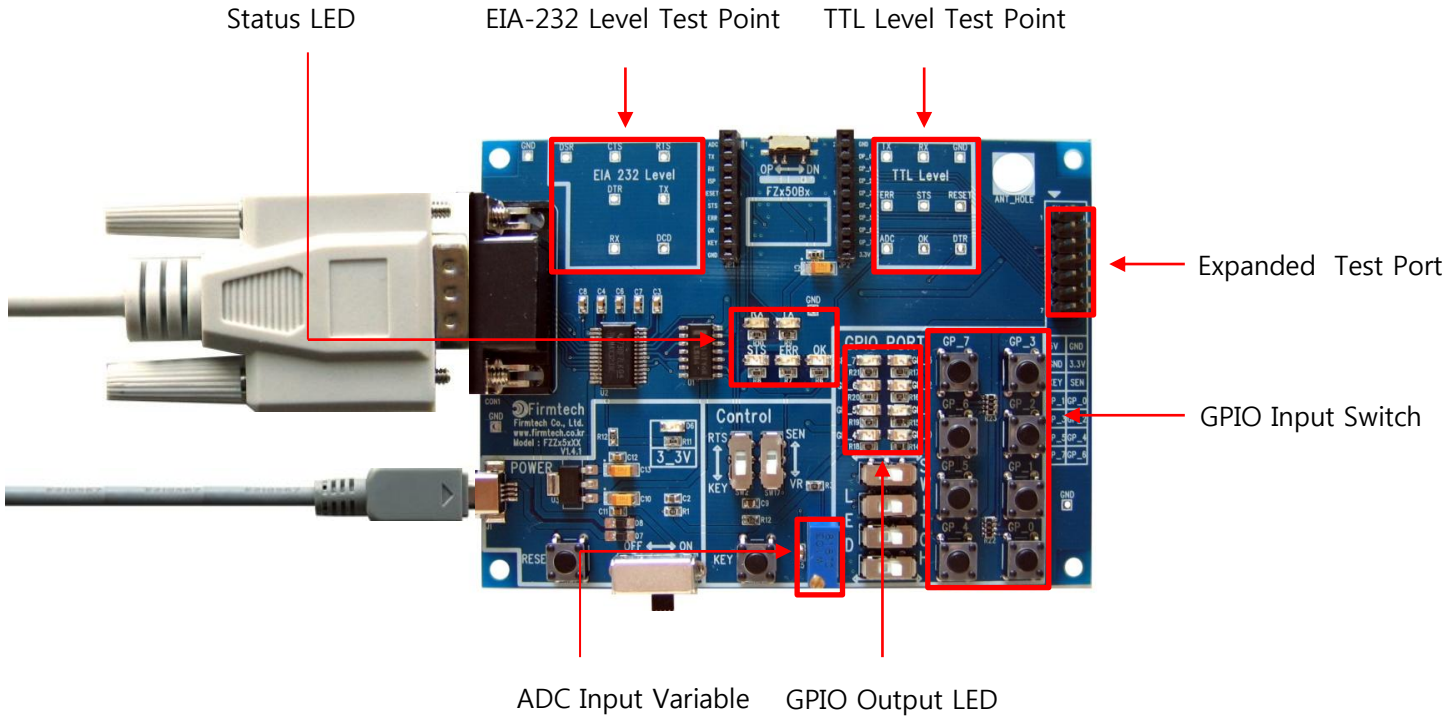
For Level Conversion

(예) MAX3238, MAX3232 등



* Functions of Interface Board 2

Setup of FZ750BX Environment and Monitoring & Basic Function Test of FZ750BX



Test Point	Allows users to directly check the control signal line with an oscilloscope, etc.
GPIO Input Switch	Switch for digital port input
GPIO Output LED	LED for digital port output
ADC Input Variable	Variable resistor for ADC data input
Status LED	LED that displays overall status
Expanded Port	Plays a role of expanding the main signal line to user board

< “FZ750BX Quick Guide”>

(1) It’s Composed of 14 chapters in total.

(2) Some previous setting value shall be continuously used on the next chapter.

(3) The “FZ750BX quick guide” proceeds in order

(4) Thus, we recommend you to follow all chapters in order if you are unfamiliar with FZ750BX.

(5) In order to understand the different functions of the FZ750BX, you can re fer to each respective chapter.

< List >

[0] Component parts

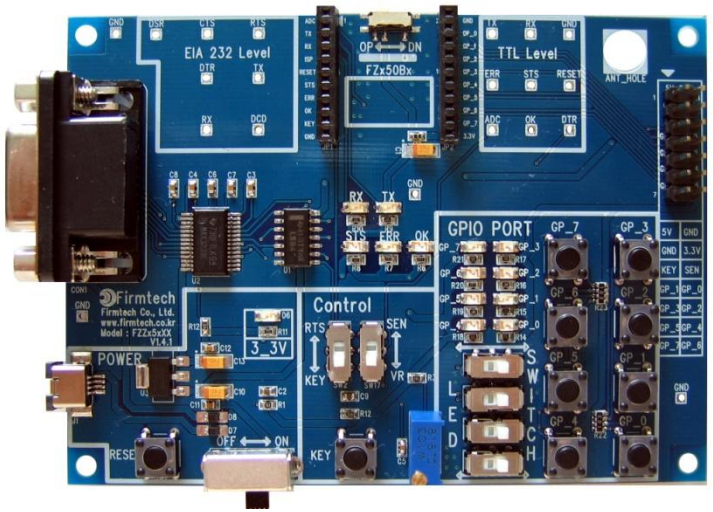
&

Hardware Installation

to operate FZ750BX

1. FZ750BX ZigBee Network components

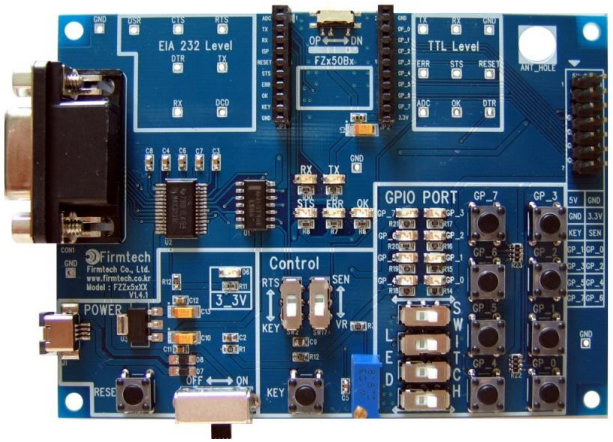
(1) Basic components to operate FZ750BX - FZ750BC-Type (1set)



< Basic components 1set >

- FZ750BC
- FZZx5xXX (Interface Board)
- USB Power Cable
- Serial Cable

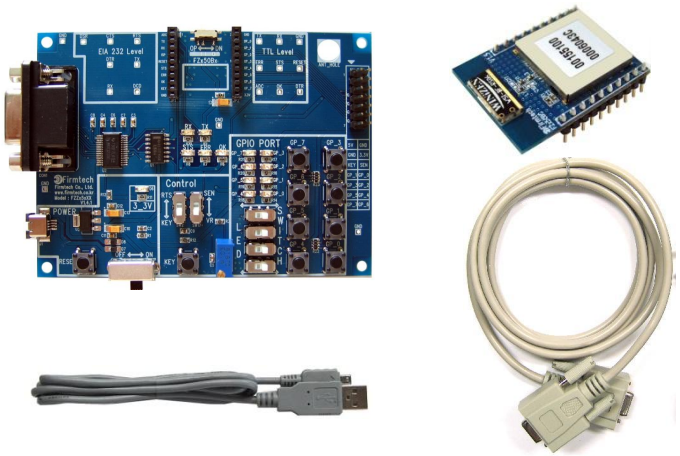
(2) Components to operate FZ750BX - FZ750BS-Type (1set)



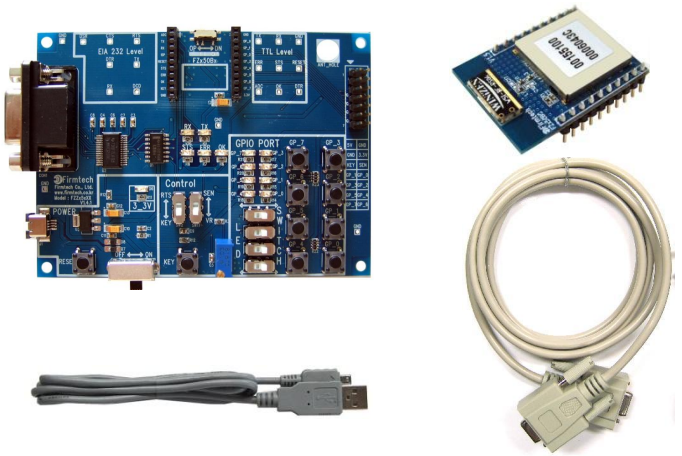
< Basic Components 1set>

- FZ750BS
- FZZx5xXX (Interface Board)
- Helical Antenna (1 dBi gain)
- CMP Cable
- USB Power Cable
- Serial Cable

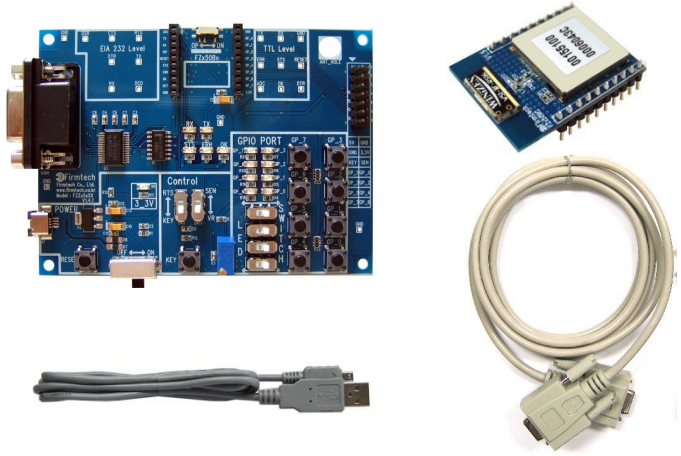
(3) Zigbee Network composition using 3sets



1set for Coordinator set-up (Essential)



1set for Router set-up (Essential)

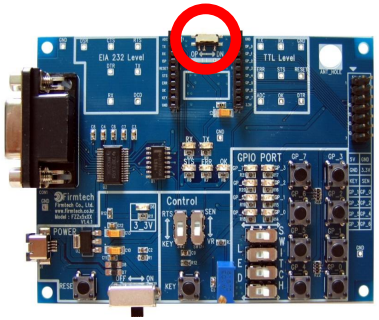


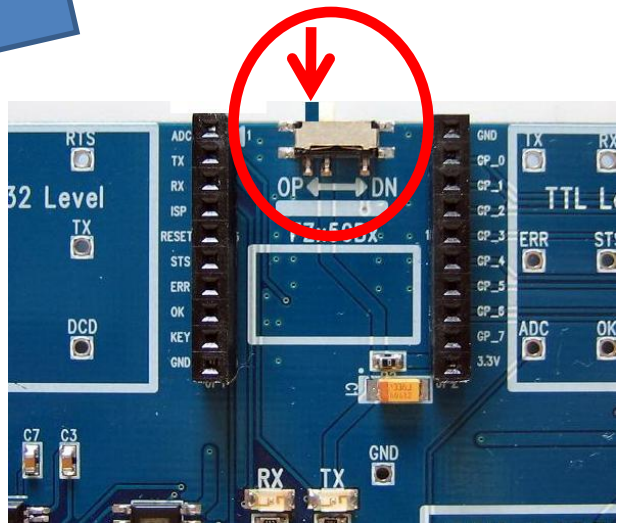
1set for End device (Optional)

* 3 devices are used in FZ750BX Quick guide for explanation.

2. Check list before you install FZ750BX

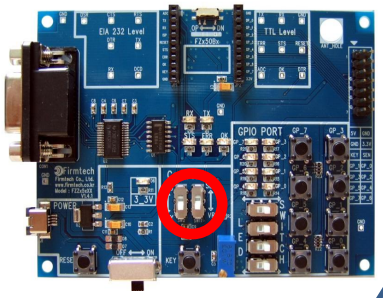
(1) ISP Selection switch check





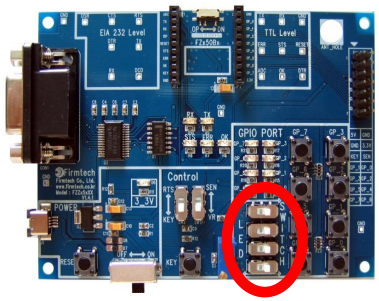
- Select OP on the OP / DN Selection switch
- Select all the 3 Interface Boards are the same way as above.

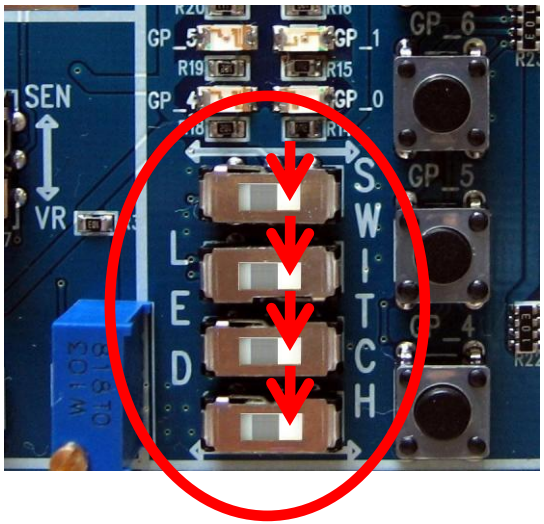
(2) Control Selection switch check



- **Select KEY on the RTS / KEY Selection switch.**
- **Select VR on the SEN / VR Selection switch**
- **Select all the 3 Interface Boards are the same way as above.**

(3) GPIO Selection switch check

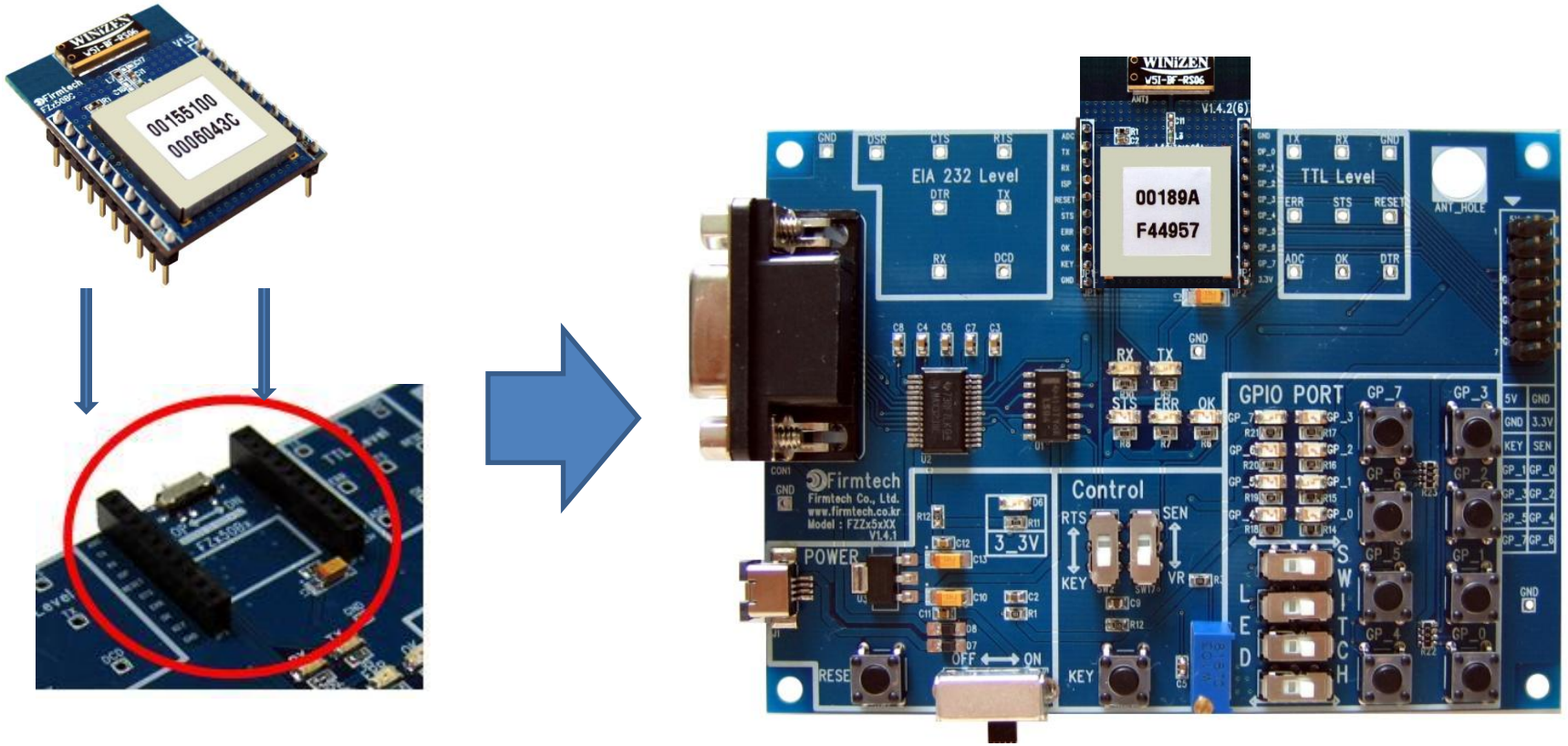




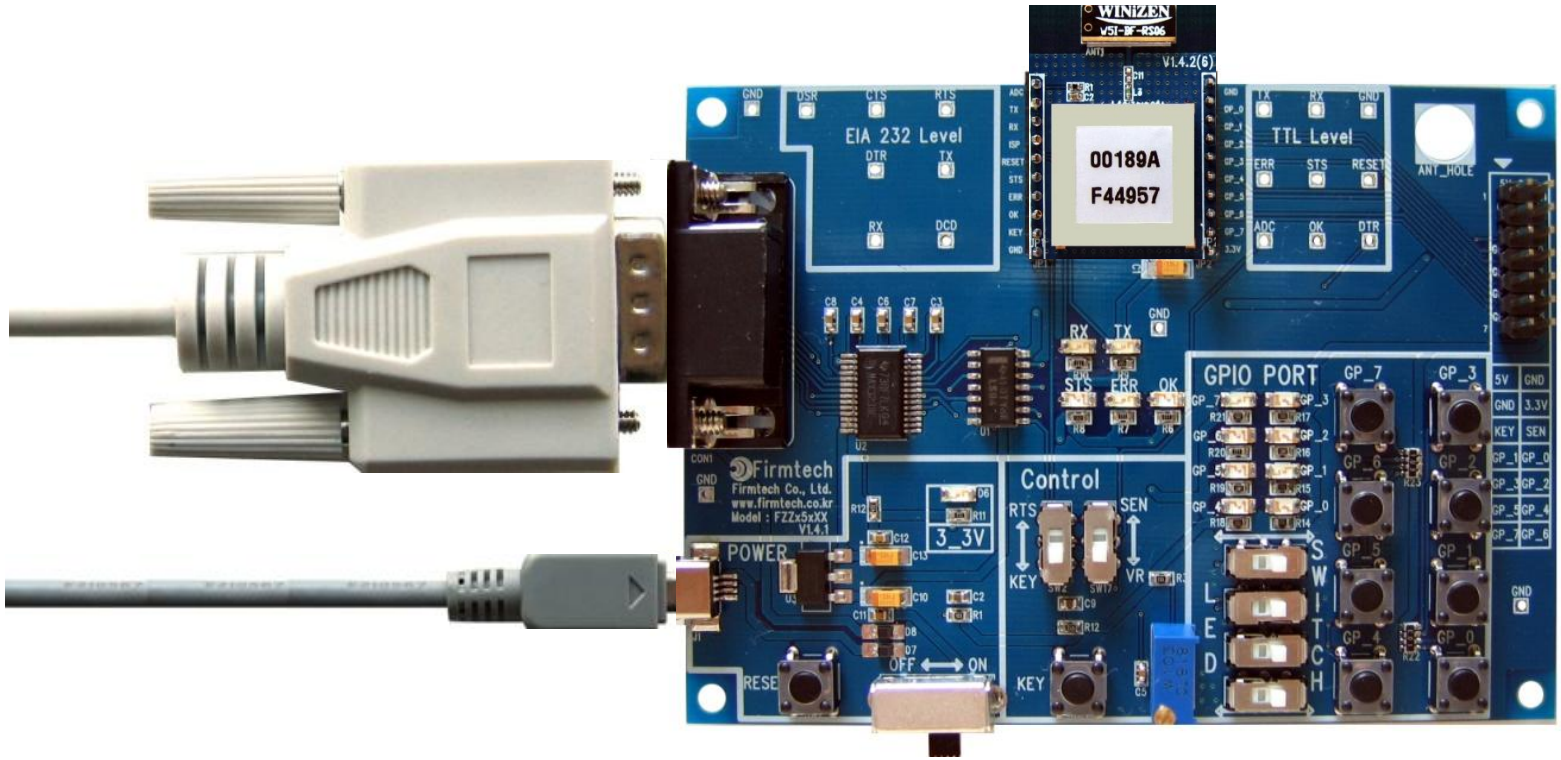
- **Set to SWITCH on LED / switch**
- **Select the 3 Interface Boards are the same as above.**

3. Compositions Attachment

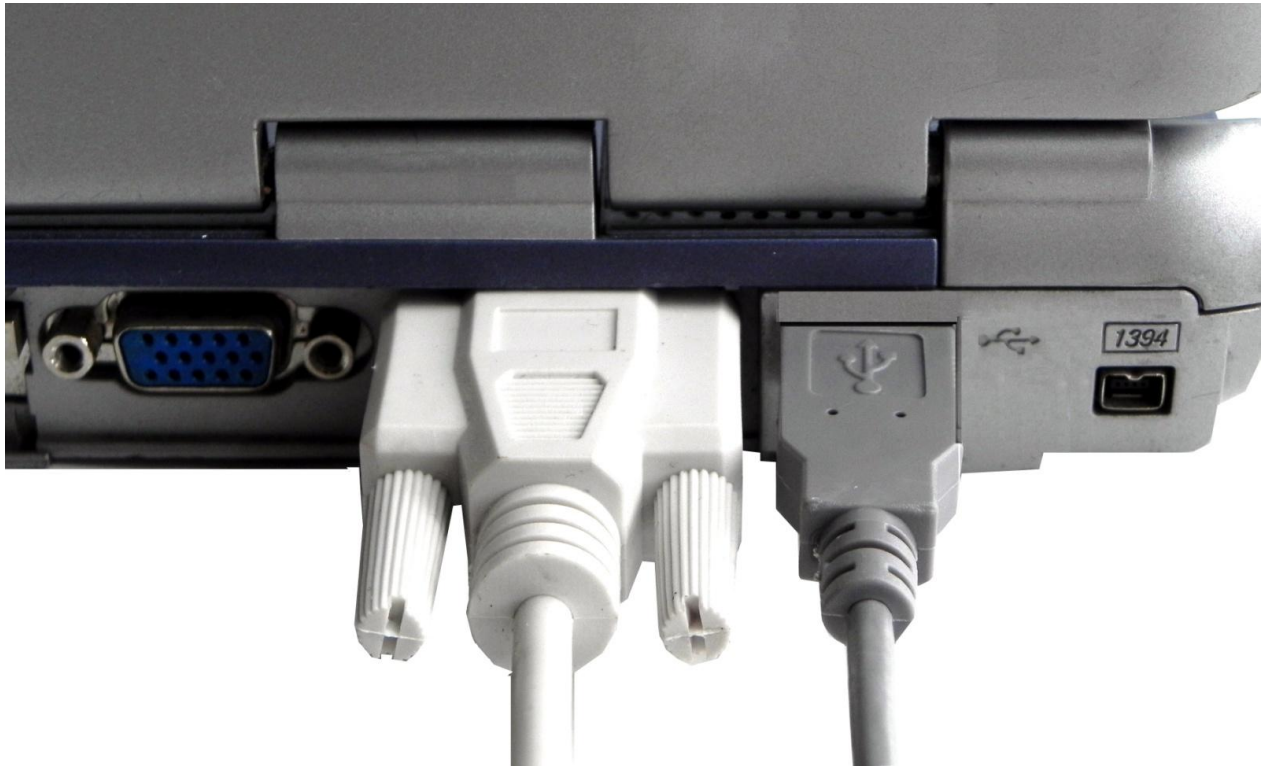
(1) FZ750BX + Interface Board



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

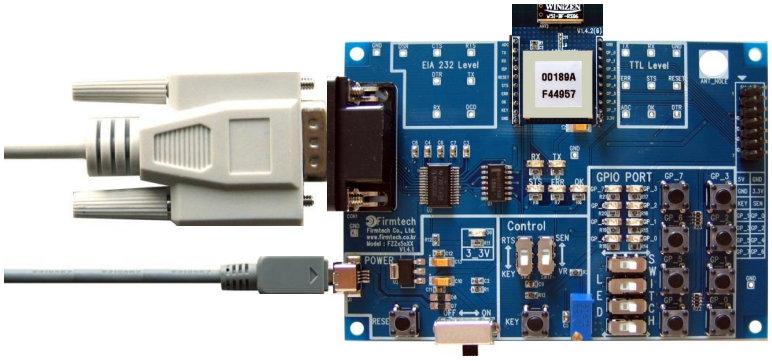


(3) PC + USB Power Cable & Serial Cable



(4) This is what it should look like when everything is connected

- Connect all 3 FZ750BXs to the PC
- “FZ750BX quick guide” explains how to connect 1PC to 3 FZ750BXs for convenience.



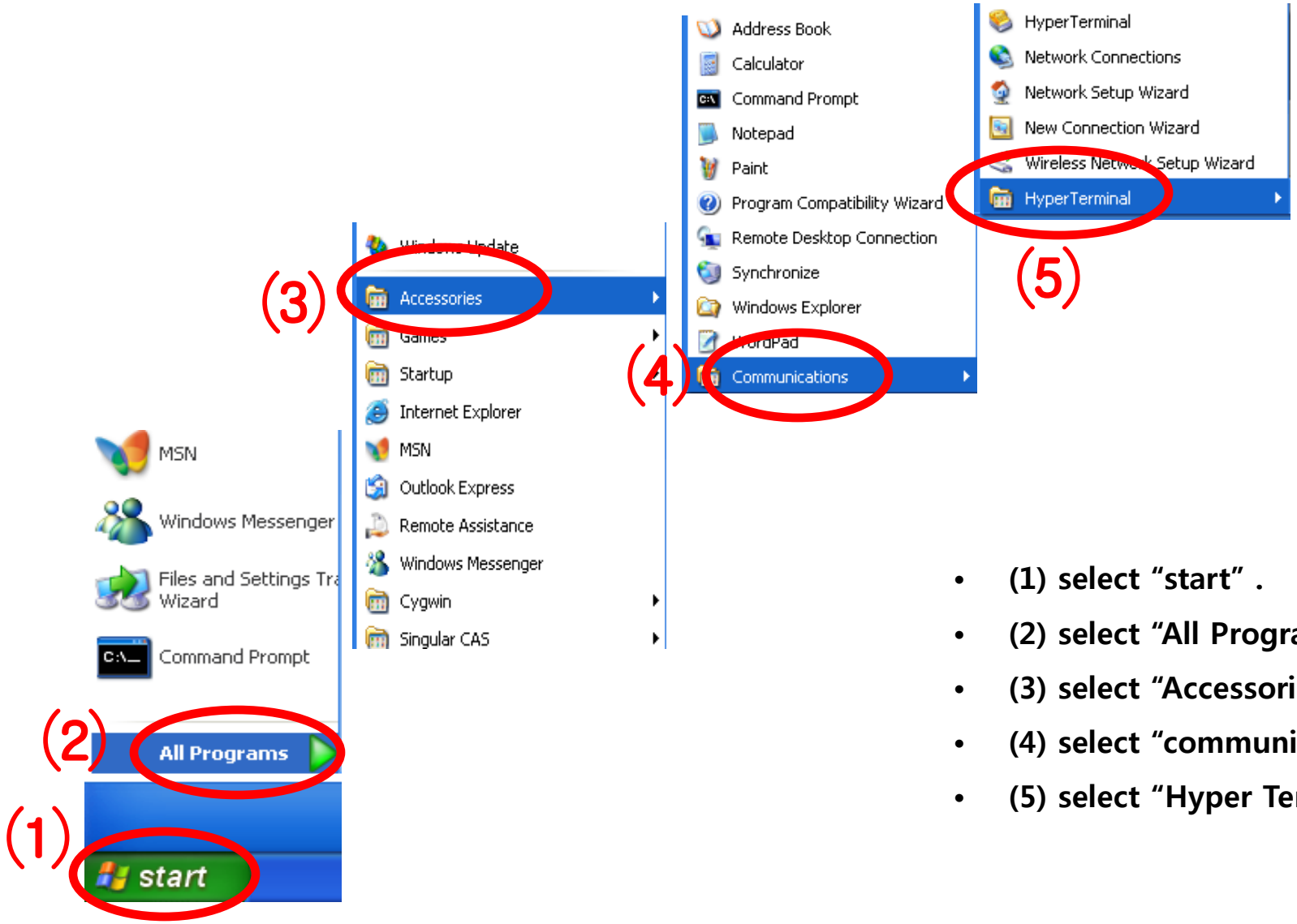
[1] Hyper Terminal

Set-up

Configuration setting with AT command

1. Serial Communications Program(Hyper Terminal) Execution & Set-up

(1) Hyper Terminal execute

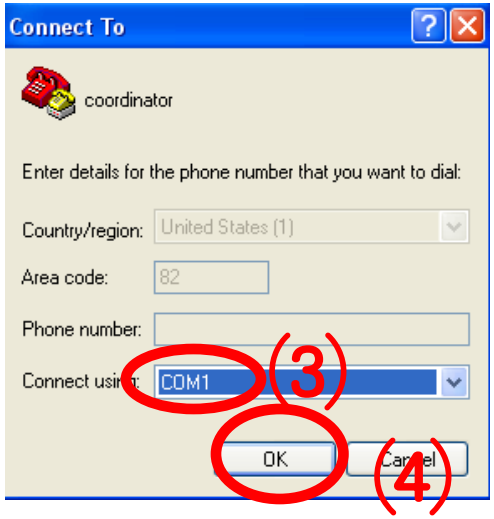


- (1) select “start” .
- (2) select “All Programs” .
- (3) select “Accessories” .
- (4) select “communications” .
- (5) select “Hyper Terminal”.

(2) Hyper terminal set-up – Name

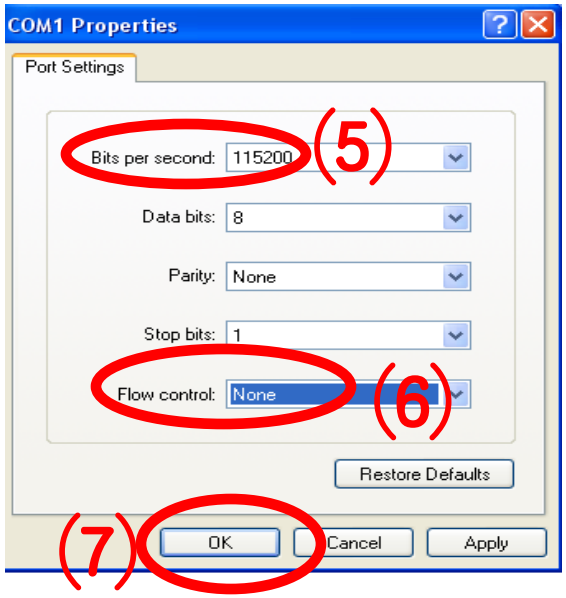
- Set up Hyper terminal connected with FZ750BX that is set to Coordinator
- Input “coordinator” in the “Name "space.
- Select “OK” and go forward.

(3) Hyper terminal set-up – Use Port



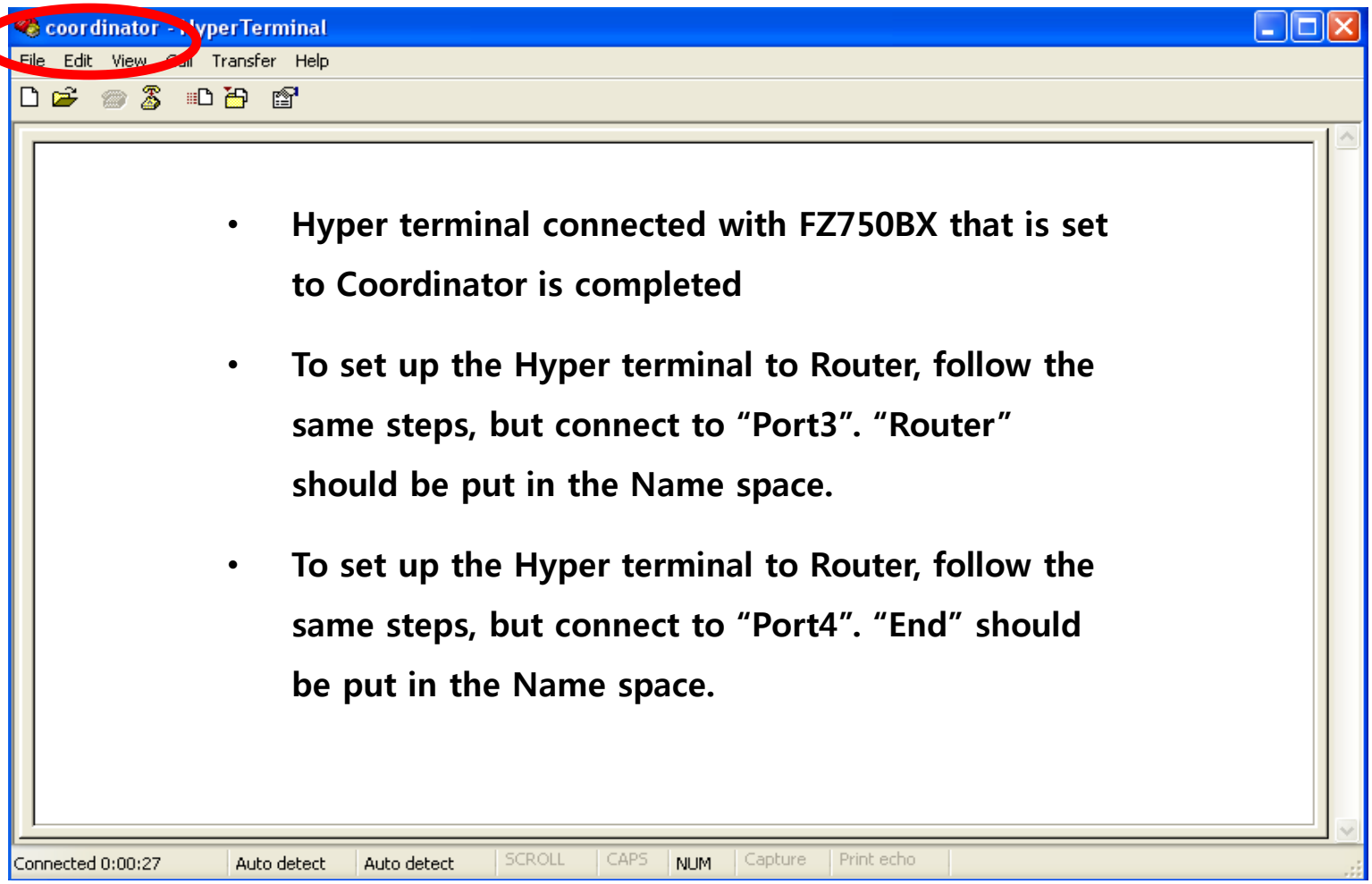
- Select the port connected with FZ750BX that is set to the Coordinator.
- Select “OK” and go forward.

(4) Hyper terminal Set-up – Signal Speed and etc

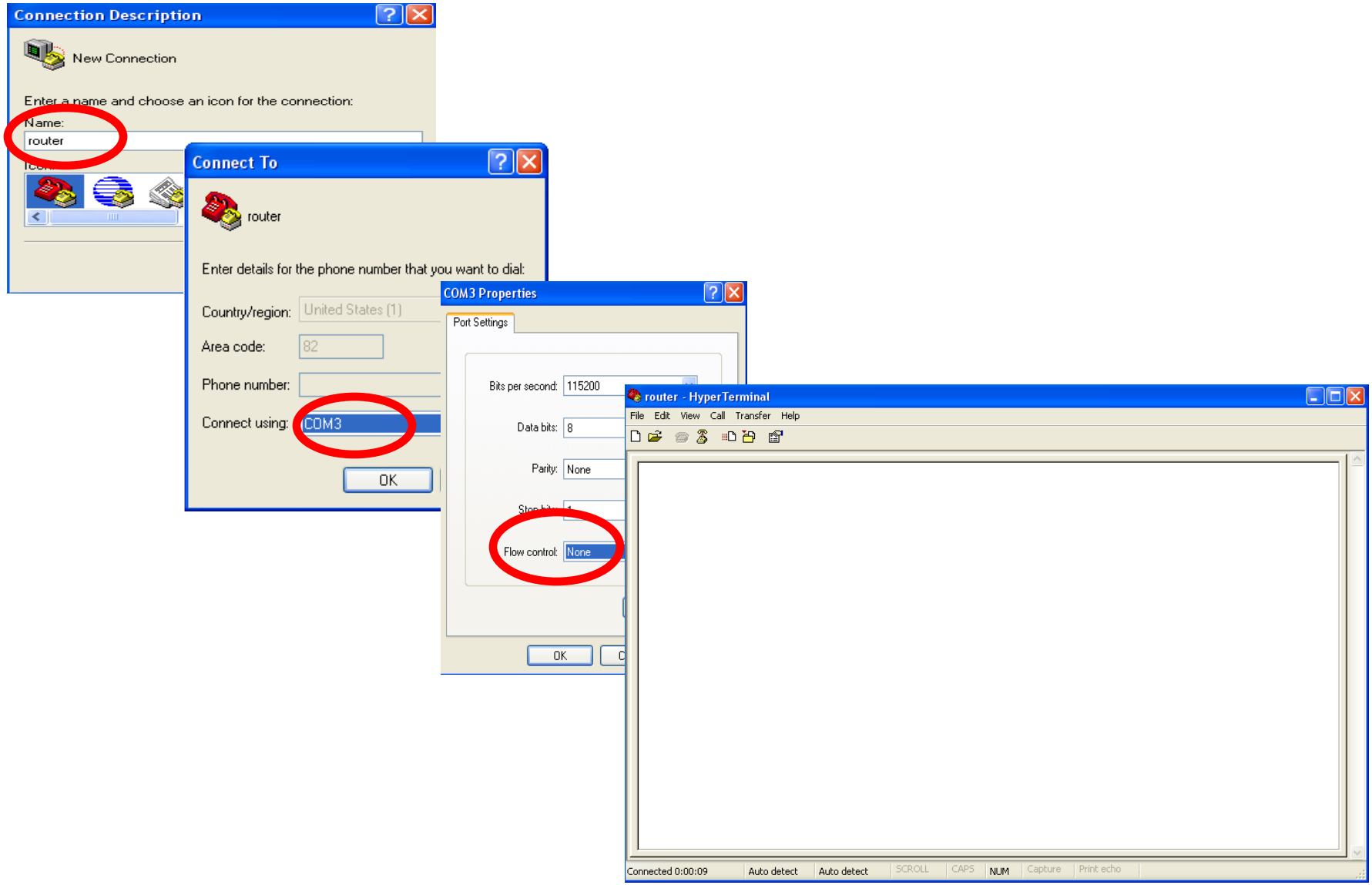


- (5) Set “115200” in the “Bit/Sec(B)” space
- (6) Set “None” in the “Flow control(F)” space
- (7) Do not change other requirements.
- (8) Select “OK”

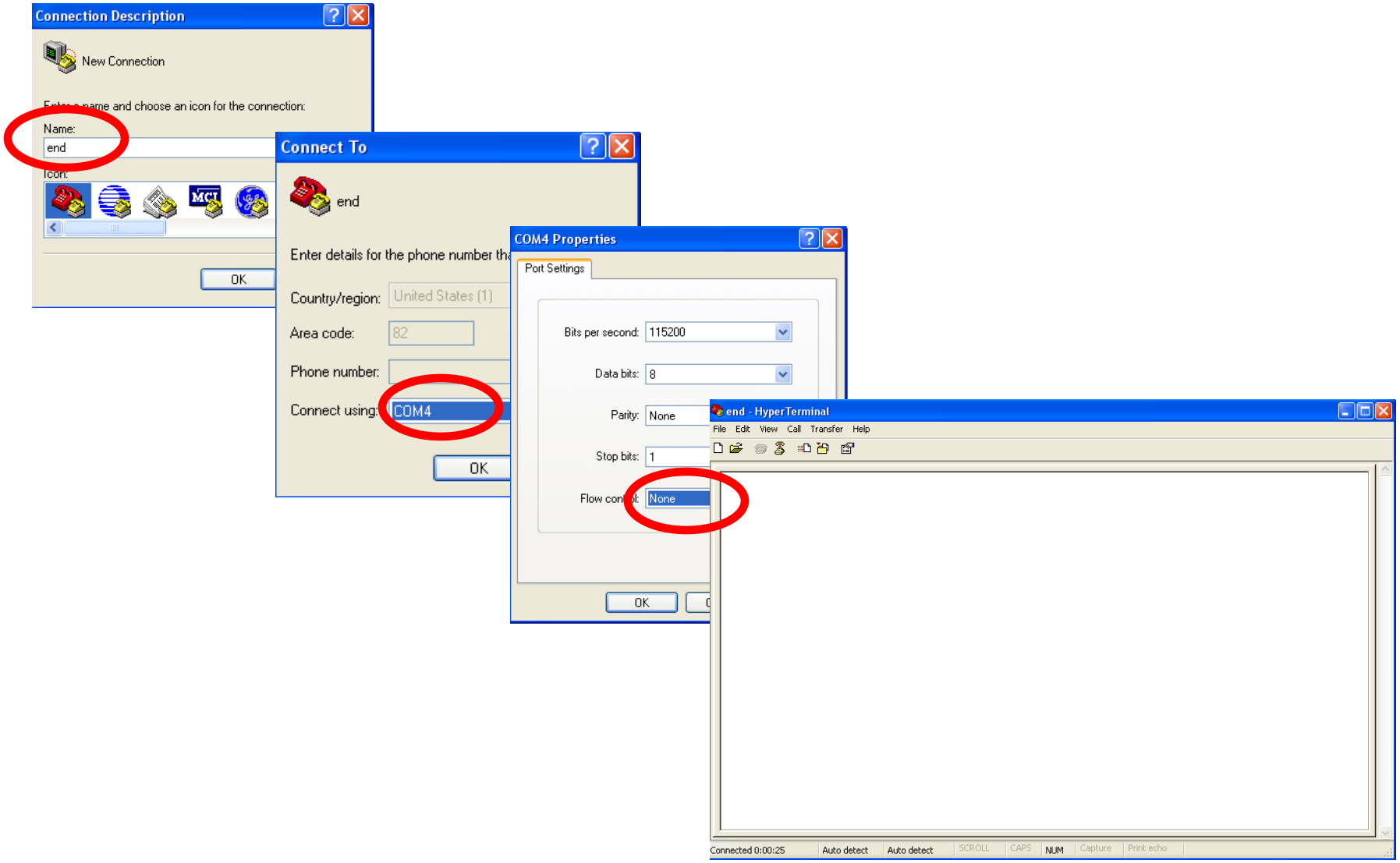
(5) Hyper terminal set-up - completion



• **If you want to use FZ750BX as Router, step by step diagram below**



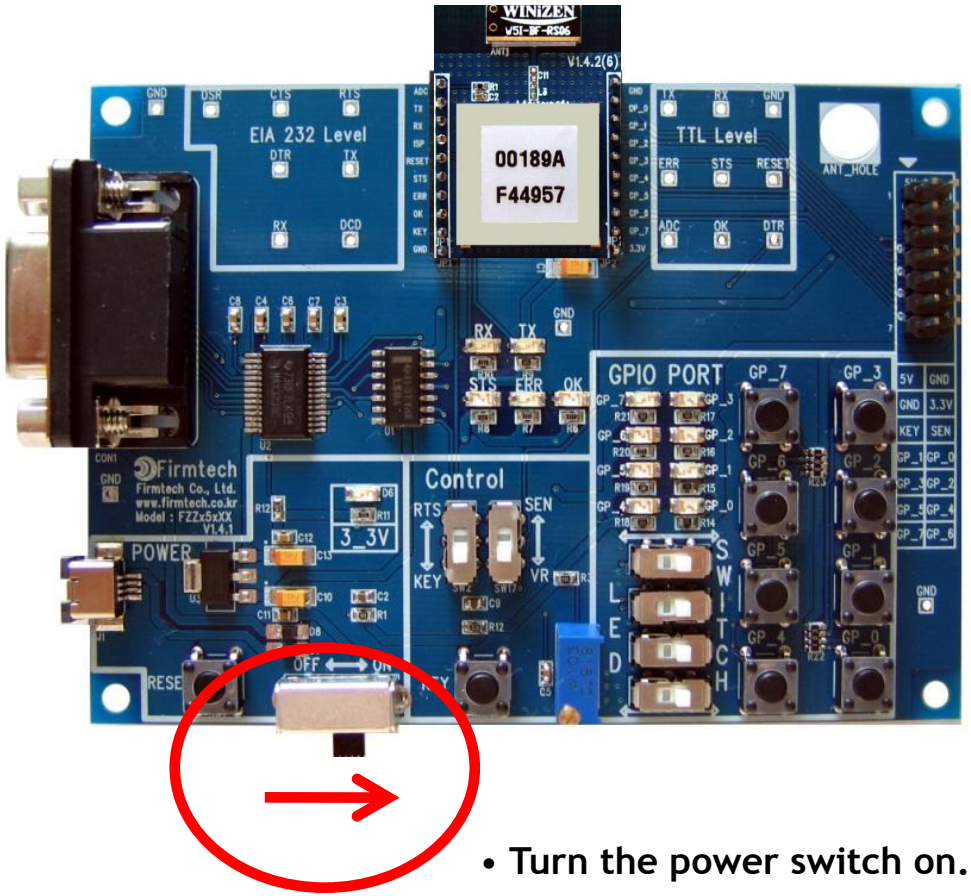
• **If you want to use FZ750BX as End Device, step by step diagram – Use Port 4**



[2] FZ750BX Operating

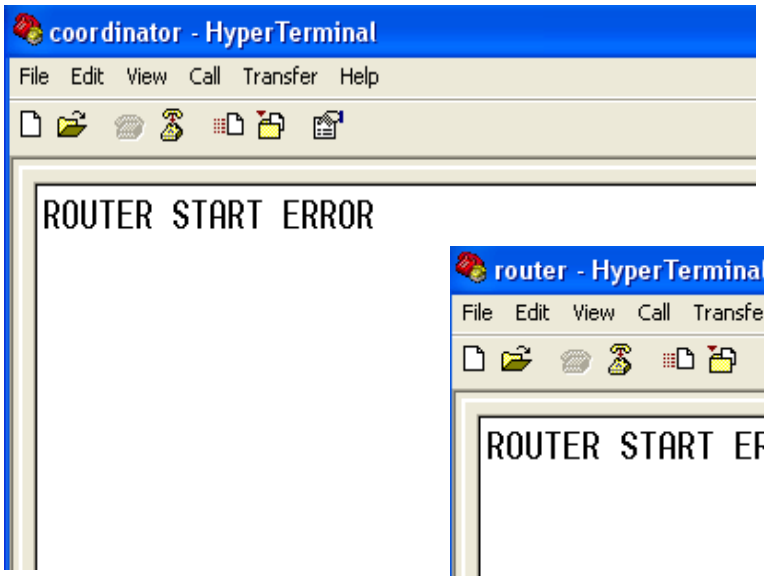
1. Operating FZ750BX

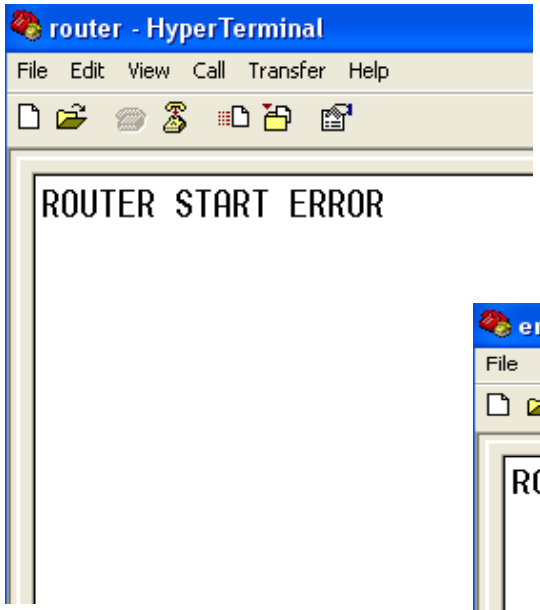
(1) FZ750BX Power ON

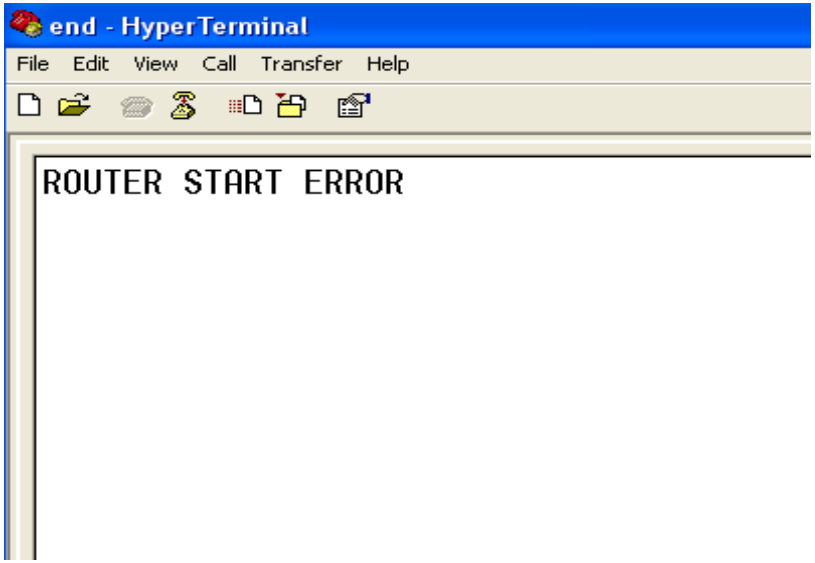


- Turn the power switch on.

(2) Hyper Terminal Output

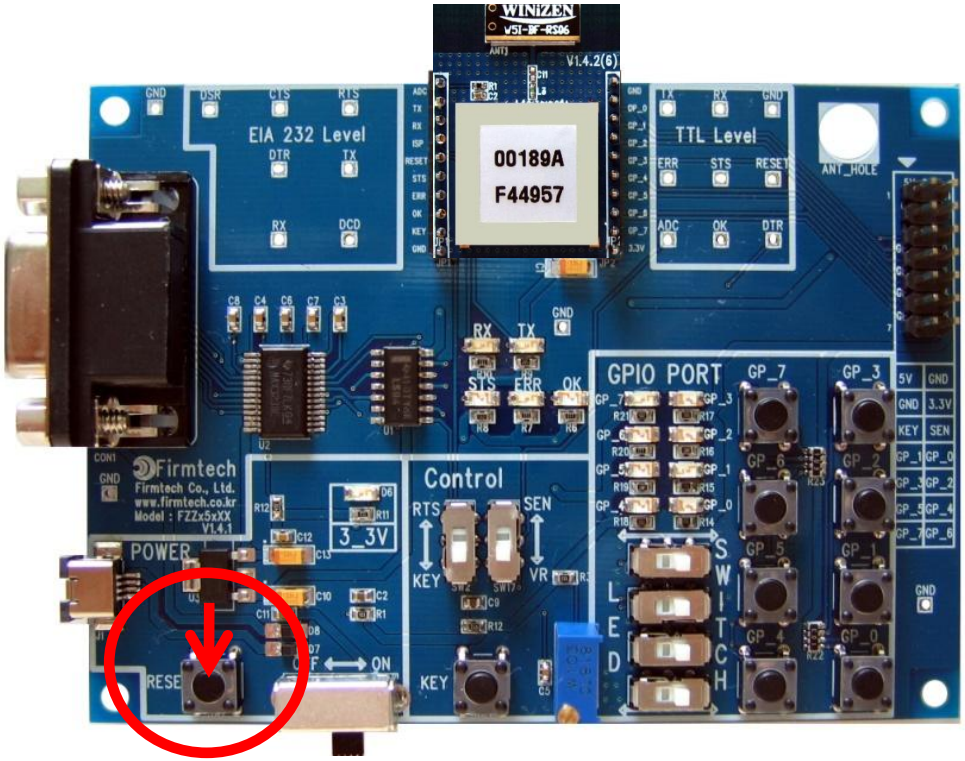






- **Turn the power of 3 Interface Boards on**
- **Since they are all set to Factory setup, the 3 Interfaces Boards are supposed to output “ROUTER START” and “ERROR”.**

• **FZ750BX Restart**



- **If FZ750BX does not operate properly or nothing is shown in the Hyper Terminal, you need to restart FZ750BX.**
- **FZ750BX restarts by pushing the Reset switch on Interface Board.**
- **Check baud rate and connection status of external interfaces.**

[3] FZ750BX Set-up

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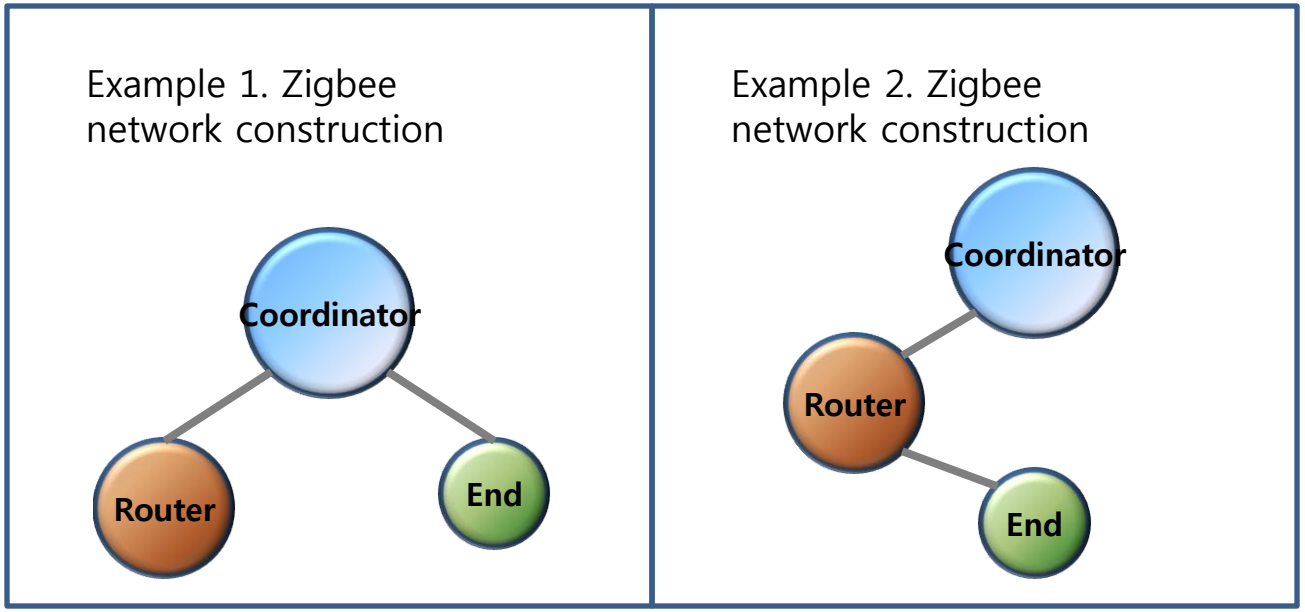
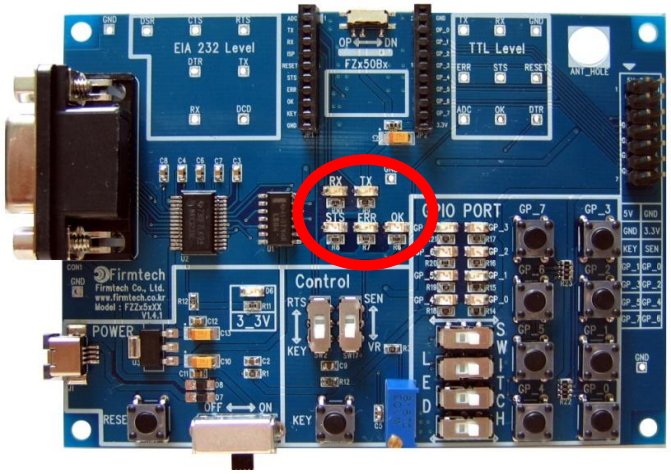
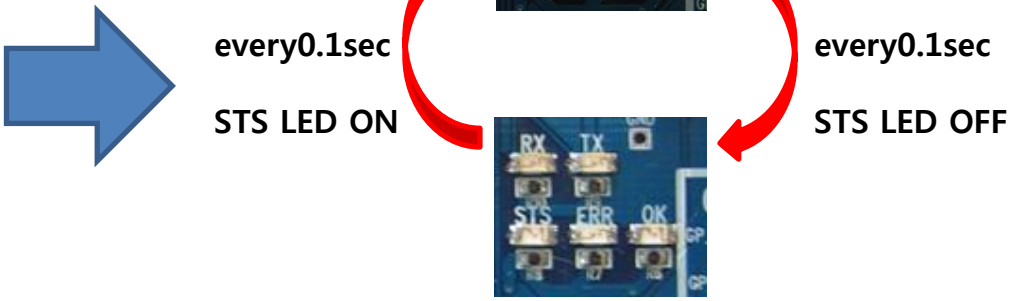
ZigBee Network Construction



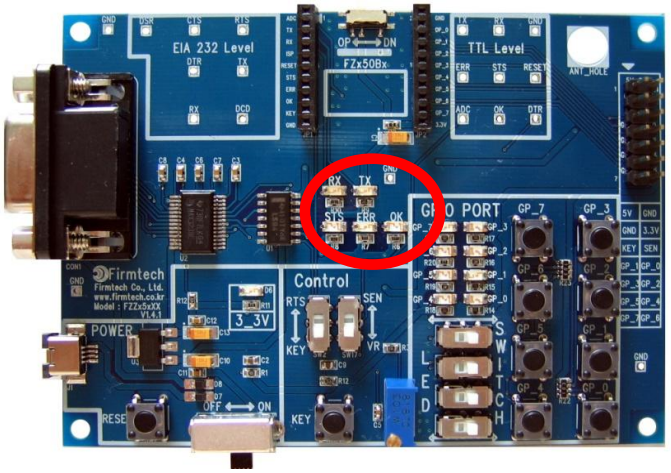
• **The STS LED conditions of Operation Mode when Network construction/participation is failed.**

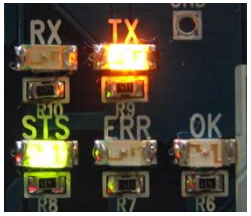


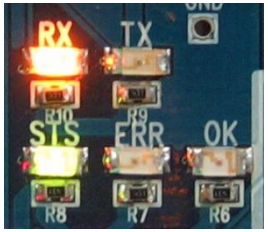


- **Check the condition of STS LED FZ750BX when the power is on.**
- **STS LED blinks quickly every 0.1 sec because Network Construction/Participation has yet to be successful.**

• OK/ERR LED conditions of Operation Mode





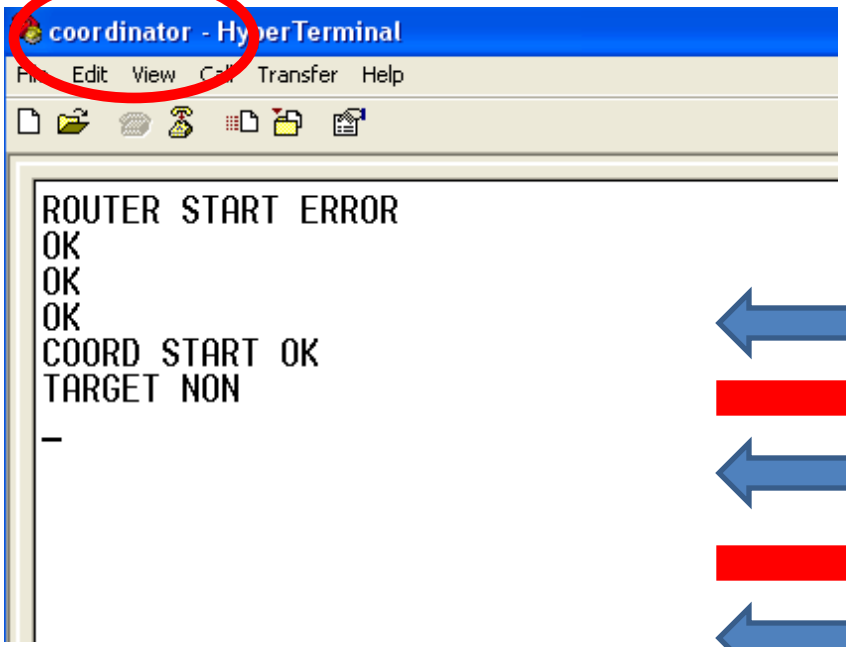


- TX LED blinks when FZ750BX is in an Operation mode and Serial data is output from FZ750BX
- RX LED blinks if Serial data is input from FZ750BX when FZ750BX is in an Operation Mode

- ERR/OK LED doesn't show the Serial's input and output, holding the light turned on when FZ750BX is in an AT Command Mode.

1. FZ750BX Coordinator Set-up & ZigBee Network Construction

(1) FZ750BX Coordinator Set-up

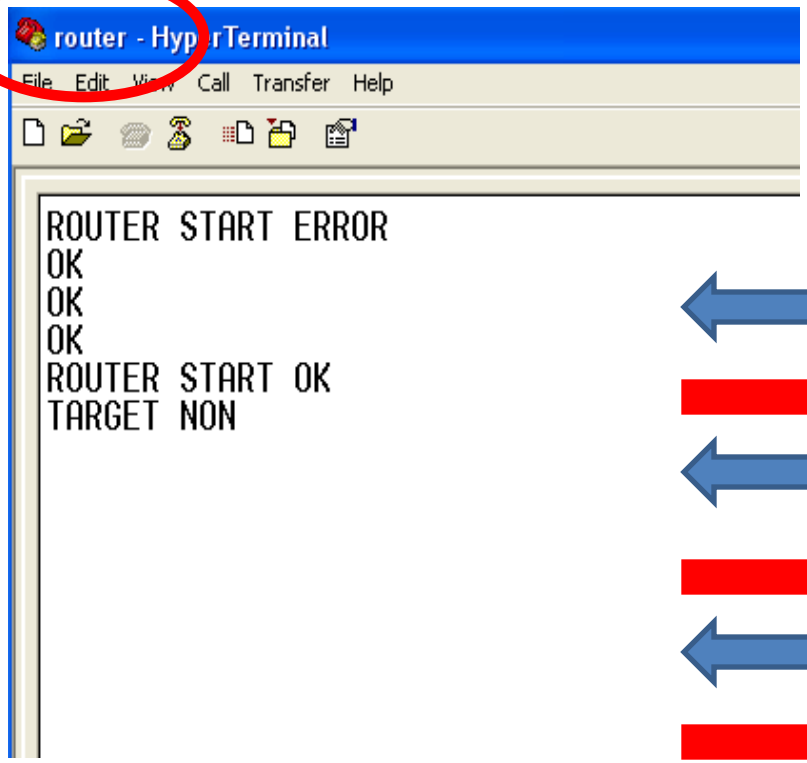


- Input the following into Hyper terminal connected to FZ750BX that is set to Coordinator

- Input“+++”in Hyper terminal.
- “OK” is output from FZ750BX.
- After inputting “AT+SETCOORD” in Hyper terminal, press Enter key.
- “OK” is output from FZ750BX.
- Press Enter key after inputting “ATZ” in Hyper terminal.
- “OK” is output from FZ750BX
- FZ750BX Device is re-started
- “COORD START OK” is output
- “TARGET NON” is output

2. FZ750BX Router set-up & ZigBee Network Participation

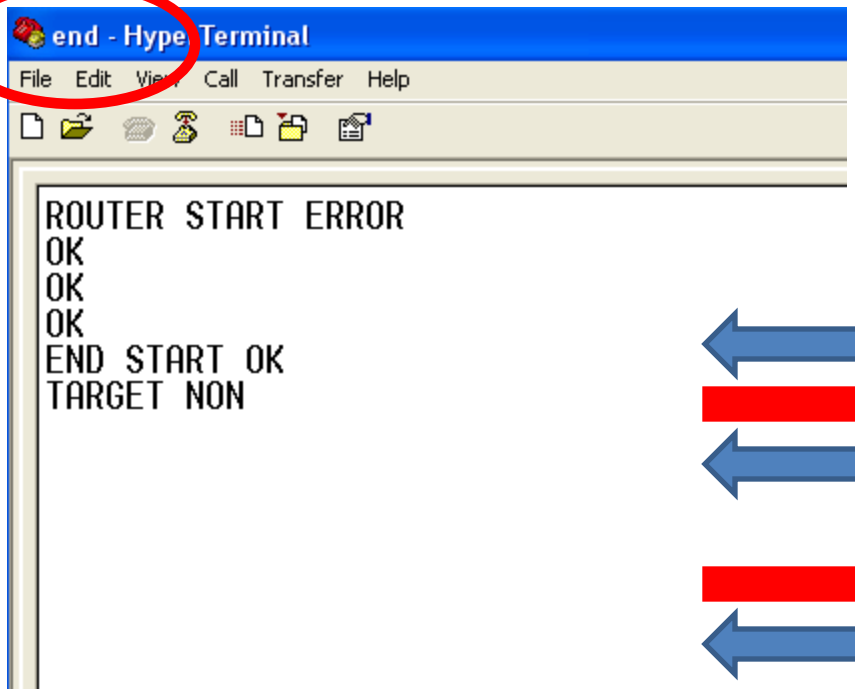
(1) FZ750BX Router Set-up



- Input the following into Hyper Terminal connected to FZ750BX that is set to Router
- Input“+++”in Hyper terminal.
- “OK” is output from FZ750BX.
- After inputting “AT+SETROUTER” in Hyper terminal, press Enter key.
- “OK” is output from FZ750BX.
- After inputting “ATZ” in Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- FZ750BX Device re-started.
- “ROUTER START OK” is output.
- “TARGET NON” is output.

3. FZ750BX End Device set-up & ZigBee Network Participation

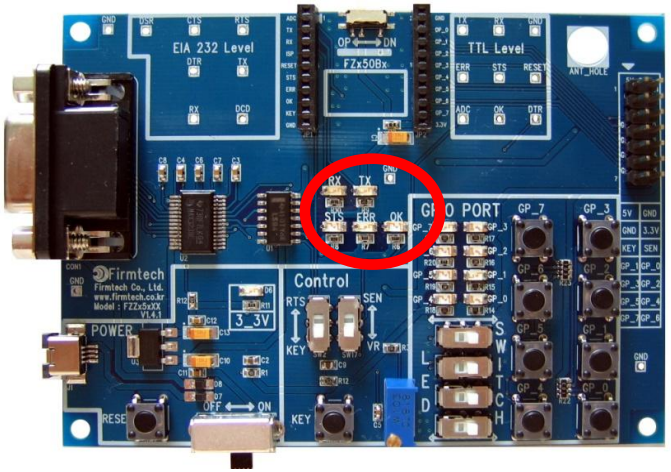
(1) FZ750BX End device Set-up

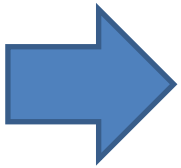


- Input the following into Hyper terminal connected to FZ750BX that is set to End Device

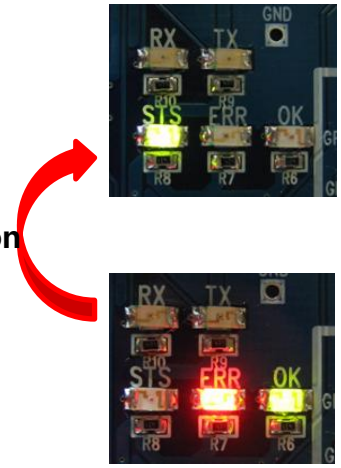
- Input“+++”in Hyper terminal.
- “OK” is output from FZ750BX.
- After inputting “AT+SETEND” in Hyper terminal, press Enter key.
- “OK” is output from FZ750BX.
- Press Enter key after inputting “ATZ” in Hyper terminal.
- “OK” is output from FZ750BX.
- FZ750BX Device re-started.
- “END START OK” is output.
- “TARGET NON” is output.

• **STS/ERR/OK LED Status in AT Command Mode**





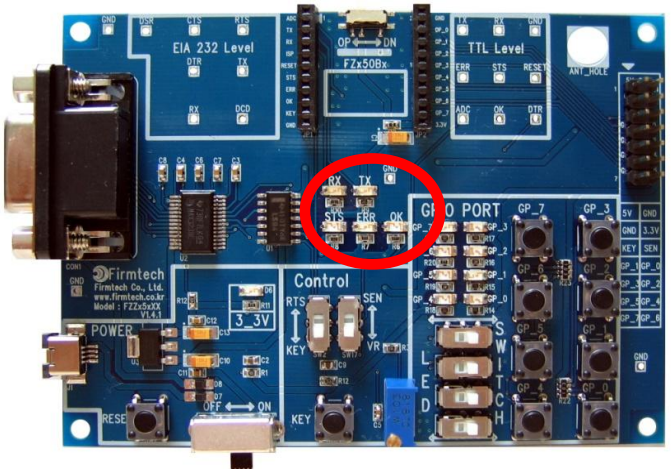
switched Operation Mode

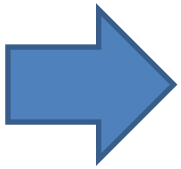


switched AT Command Mode

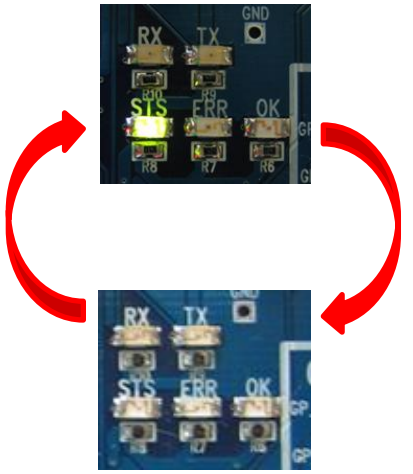
- **Mode is switched from Operation to AT Command when you input "+++" in Hyper Terminal**
- **STS LED keeps being turned off when FZ750BX is in an AT Command Mode.**
- **ERR/OK LED holds the light turned on when FZ750BX is an AT Command Mode**
- **Mode is switched from AT Command to Operation by inputted "ATO" into Hyper Terminal and pressing enter key.**
- **In the AT Command mode, you can change the mode to operation mode by inputting "ATZ" into Hyper Terminal and pressing enter key. In this case device is reset simultaneously.**

• The STS LED conditions of Operation Mode when Network Construction/Participation is completed





Every 0.1 sec
STS LED ON

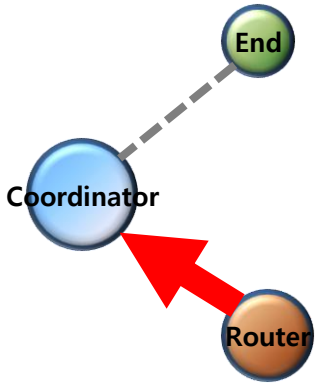


Every 0. 1 sec
STS LED OFF

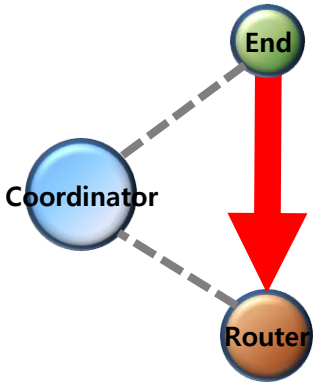
- When Network Construction/Participation is completed, STS LED blinks every 1 second.
- ERR/OK LED of FZ750BX keeps being turned off
- When Network Construction/Participation is completed for the first time, it is automatically proceeded from the next even if device is reset

[4] FZ750BX

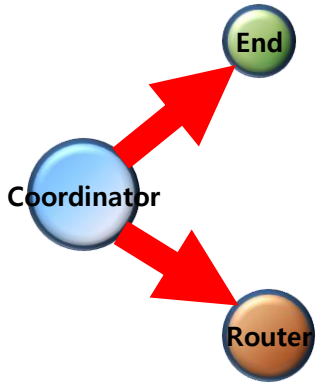
Setting up Target Device



In order to communicate, Router should be aware of Coordinator's address.



In order to communicate, End Device should be aware of Router's address.

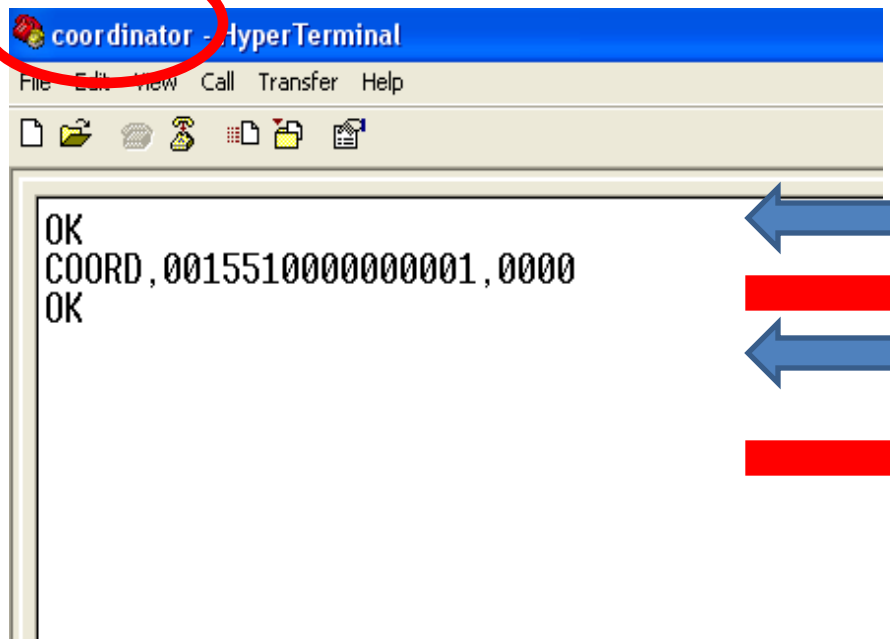


In order to communicate,

Coordinator uses Broadcast's address.

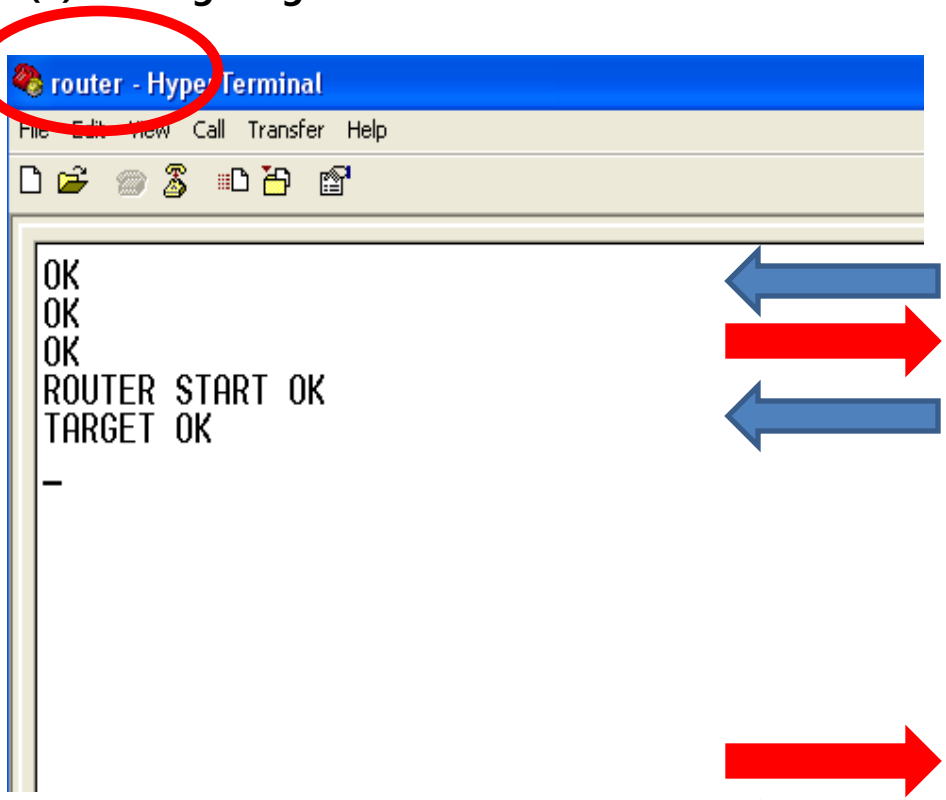
1. Setting Target Device of Router to Coordinator(Router ->Coordinator)

(1) Coordinator IEEE address search



- Input the following into Hyper Terminal
- Input "+++"
- "OK" is output from FZ750BX
- After inputting "AT+GETLOCAL" and press Enter key.
- "COORD, 0015510000000001, 0000" is output from FZ750BX
- IEEE ADDRESS of Coordinator is "0015510000000001"
- After inputting "ATO", Enter key.
- "OK" is output

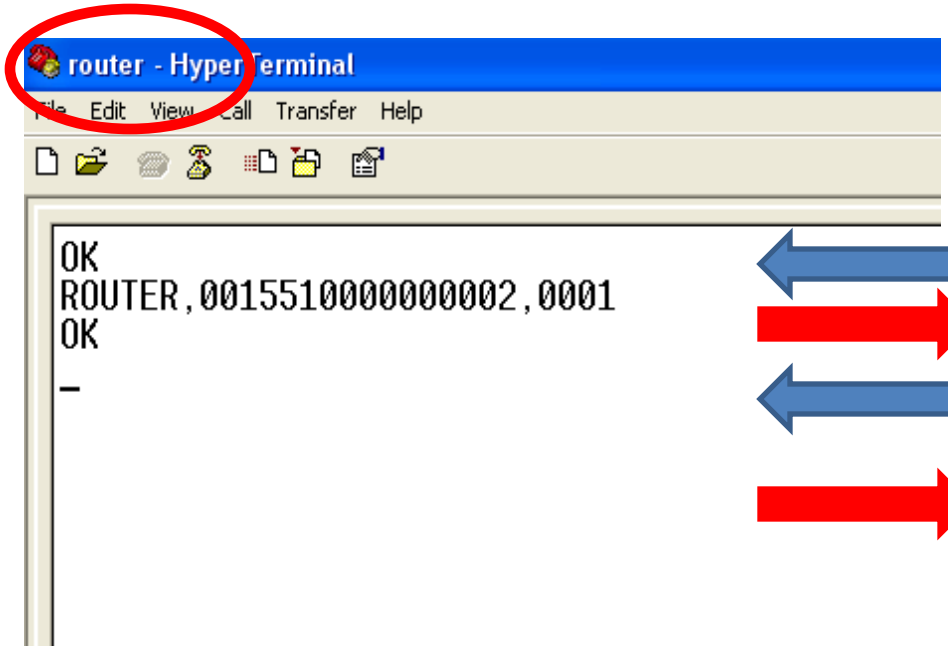
(2) Setting Target Device of Router to Coordinator



- Input the following into Hyper Terminal
- Input "+++"
- "OK" is output from FZ750BX
- After inputting "AT+SETTARGET 0015510000000001"and press Enter key.
- 0015510000000001 is the address that has already been searched before. If you use another device, you should search the address again because each device has its own address.
- FZ750BX "OK" is output from FZ750BX
- After inputting "ATZ" in Hyper Terminal, address Enter key.
- FZ750BX "OK" is output from FZ750BX
- Device is re-started.
- "ROUTER START OK" is output.
- "TARGET OK" is output.

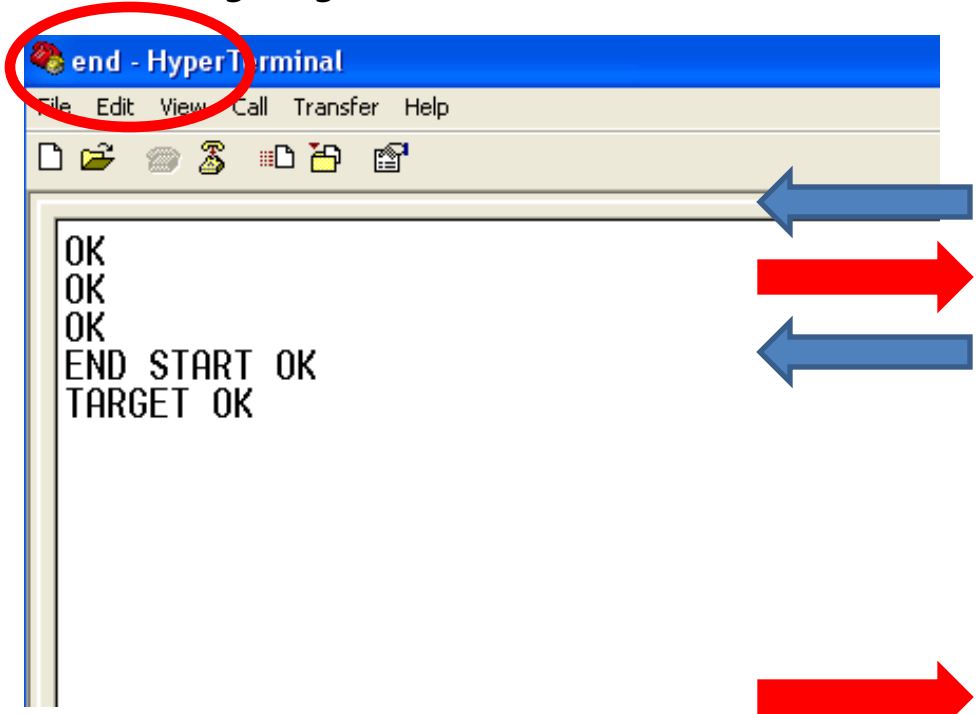
2. Setting Target Device of End Device to Router (End Device -> Router)

(1) Router device IEEE address search



- Input the following into Hyper Terminal
- Input “+++”
- “OK” is output from FZ750BX
- After inputting “AT+GETLOCAL” and press Enter key.
- “ROUTER, 0015510000000002, 0001” is output from FZ750BX
- IEEE address of Router is “0015510000000002”
- After inputting “ATO”, press Enter key.
- “OK” is output.

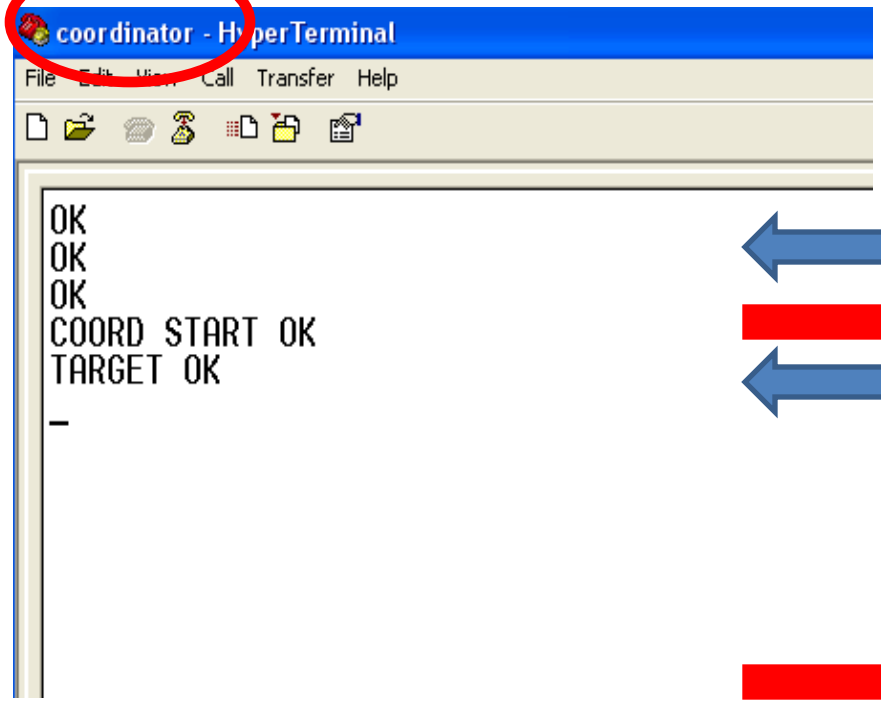
(2) Setting Target Device of End Device to Router



- Input the following into Hyper Terminal
- Input "+++"
- "OK" is output from FZ750BX
- After inputting "AT+SETTARGET 0015510000000002" and press Enter key.
- 0015510000000002 is the address that has already been searched before. If you use another device, you should search the address again because each device has its own address.
- FZ750BX "OK" is output from FZ750BX
- After inputting "ATZ" in Hyper Terminal, press Enter key.
- FZ750BX "OK" is output from FZ750BX
- FZ750BX device is re-started
- "ROUTER START OK" is output
- "TARGET OK" is output

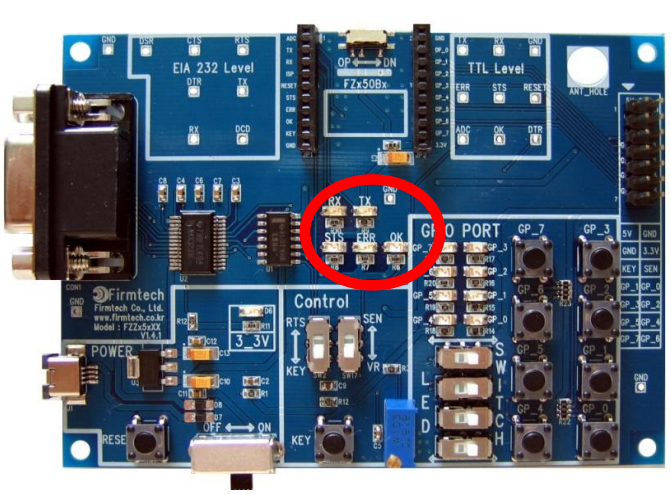
3. Setting the Target device of Coordinator to ALL Device

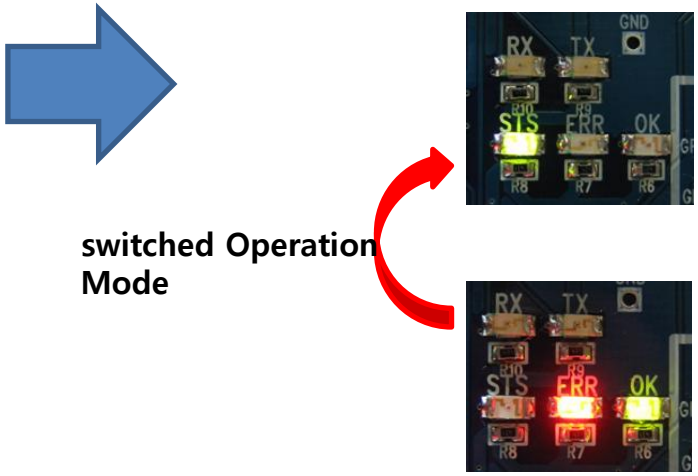
(Coordinator -> ALL Device)



- Input the following into Hyper Terminal
- Input "+++"
- "OK" is output from FZ750BX
- After inputting "AT+SETTARGETFFFFFFFFFFFFFFFF" and press Enter key.
- FFFFFFFFFFFFFFFF is all devices that are not in a low power consumption mode, and still working with ZigBee Network
- "OK" is output from FZ750BX
- After inputting "ATZ" , press Enter key.
- "OK" is output from FZ750BX
- FZ750BX Device is re-started.
- "COORD START OK" is output.
- "TARGET OK" is output.

• **STS/ERR/OK LED of AT Command Mode Status**



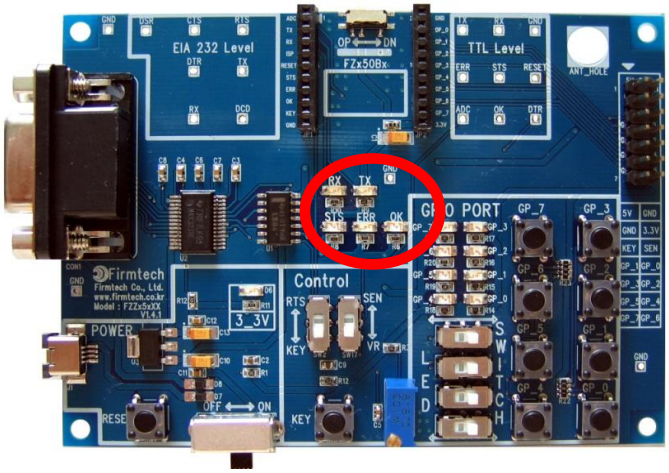


switched Operation Mode

switched AT Command Mode

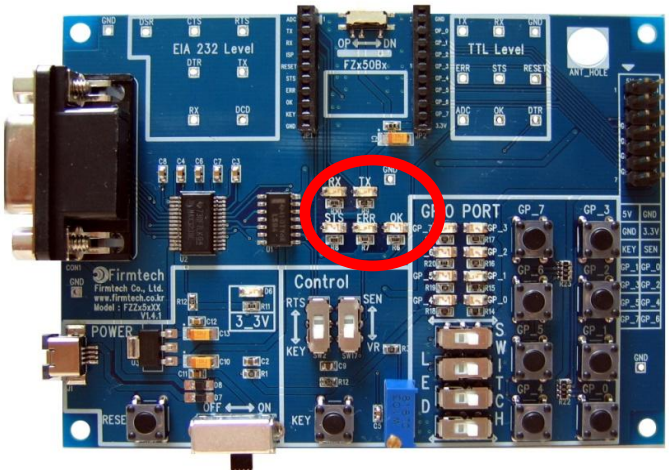
- **Mode is switched from Operation to AT Command when you input "+++" in Hyper Terminal**
- **STS LED keeps being turned off while FZ750BX is in an AT Command Mode.**
- **ERR/OK LED hold the light turned on while FZ750BX is an AT Command Mode**
- **Mode is switched from AT Command to Operation by inputted "ATO" into Hyper Terminal and pressing enter key.**
- **In the AT Command mode, you can change the mode to operation mode by inputting "ATZ" into Hyper Terminal and pressing enter key. In this case device is reset simultaneously.**

• STS LED Status of Operation Mode that was set to Target Device (Coordinator & Router)

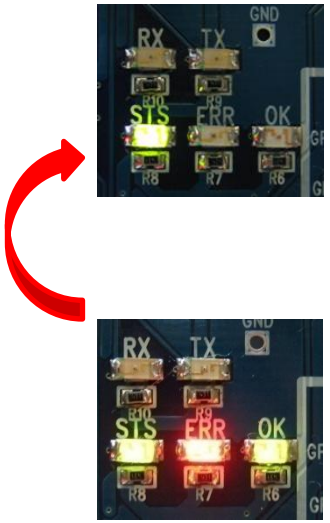


- If Target device is set, STS LED keeps being turned on.
- STS LED keeps being turned ON after Target Device is set.
- ERR/OK LED keeps being turned OFF in an Operation Mode.
- Once Target Device set-up is done for the first time, it is automatically proceeded from the next even if the device is reset.

• STS LED status of Operation Mode that was set to Target Device (End Device)



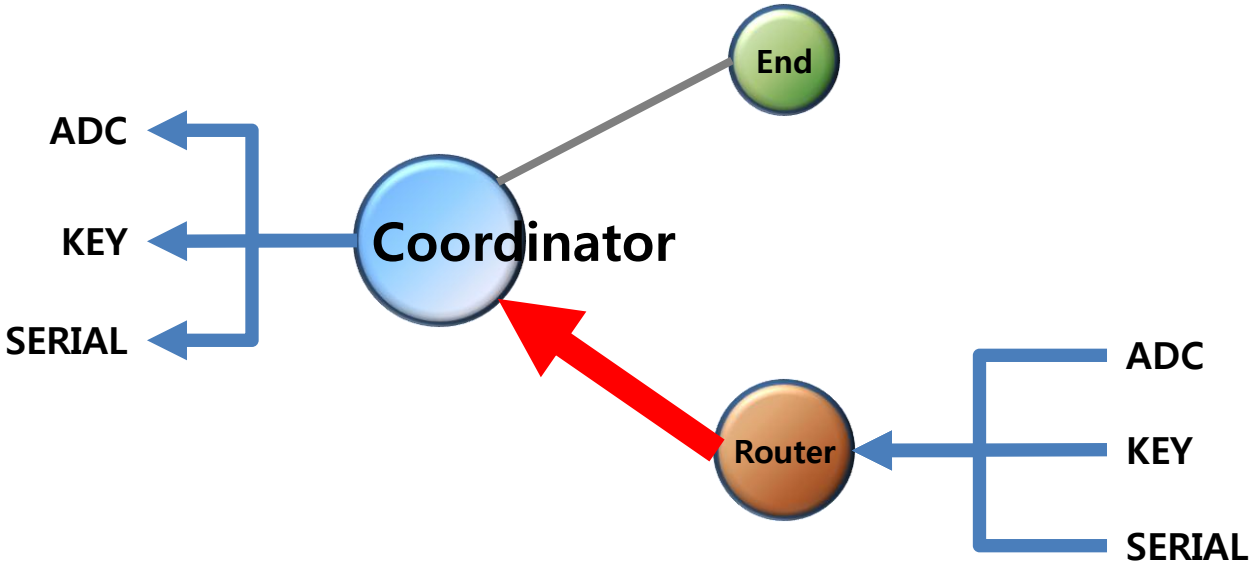
wake-up in 10 seconds



Low power consumption Mode in 1 second

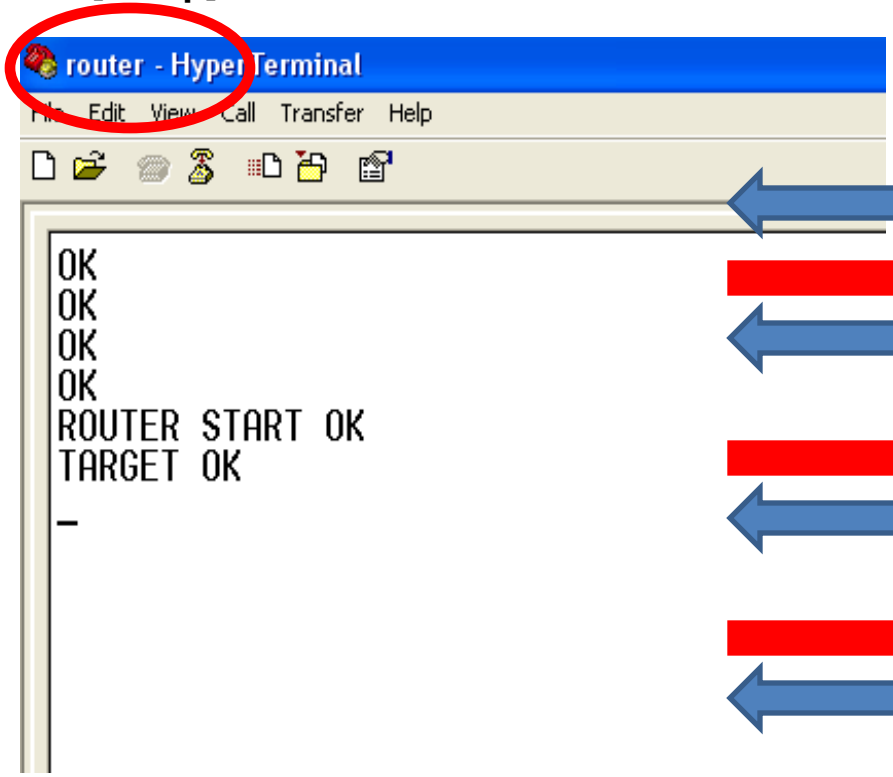
- STS LED keeps being turned ON after Target Device is set.
- ERR/OK LED keeps being turned OFF in an Operation Mode
- After Target Device is set, End Device automatically goes into low power consumption mode and makes wake-up every certain time that is currently set to 10 seconds.
- Once the Target Device set-up is done for the first time, it is automatically proceeded from the next even if device is reset

[5] ADC, KEY, Serial Data transmission from Router to Coordinator



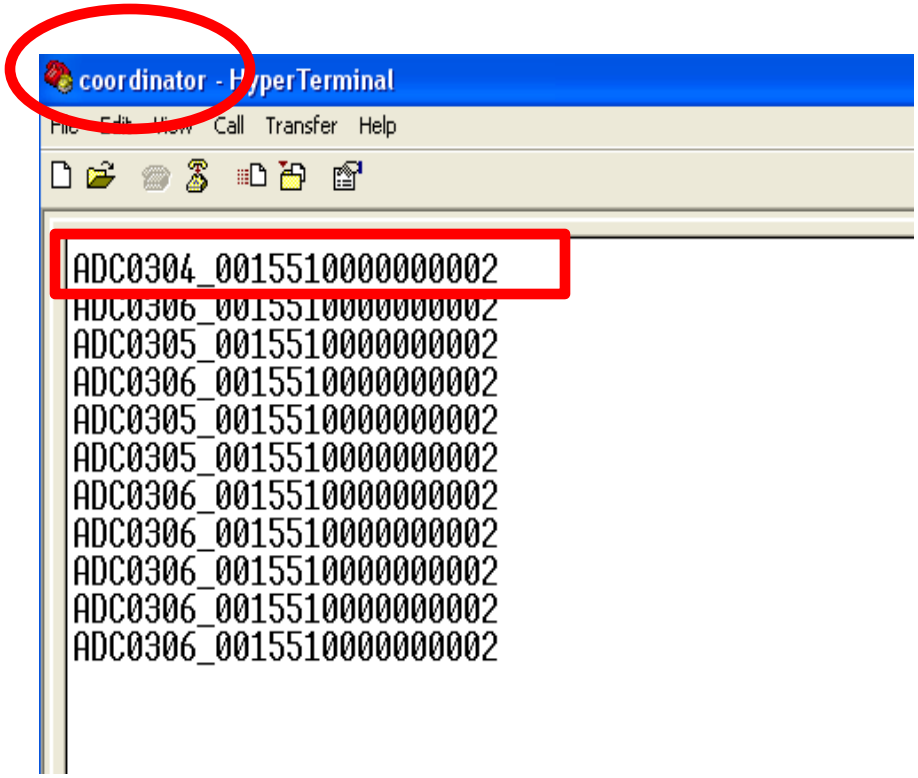
1. ADC Data Transmission “Router -> Coordinator” once every 10 seconds

(1) [Setup] ADC Data in Router Transmission : use & Transmission time : 10 sec



- Input the following into Router
- Input “+++”in Hyper Terminal.
- “OK” is output from FZ750BX.
- After inputting “AT+SETADC1” in Hyper Terminal, press Enter key.
- FZ750BX“OK” is output from FZ750BX.
- After inputting “AT+SETTMR10” in Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX.
- After inputting “ATZ” in Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- FZ750BX device re-started.
- “ROUTER START OK” is output.
- “TARGET OK” is output.

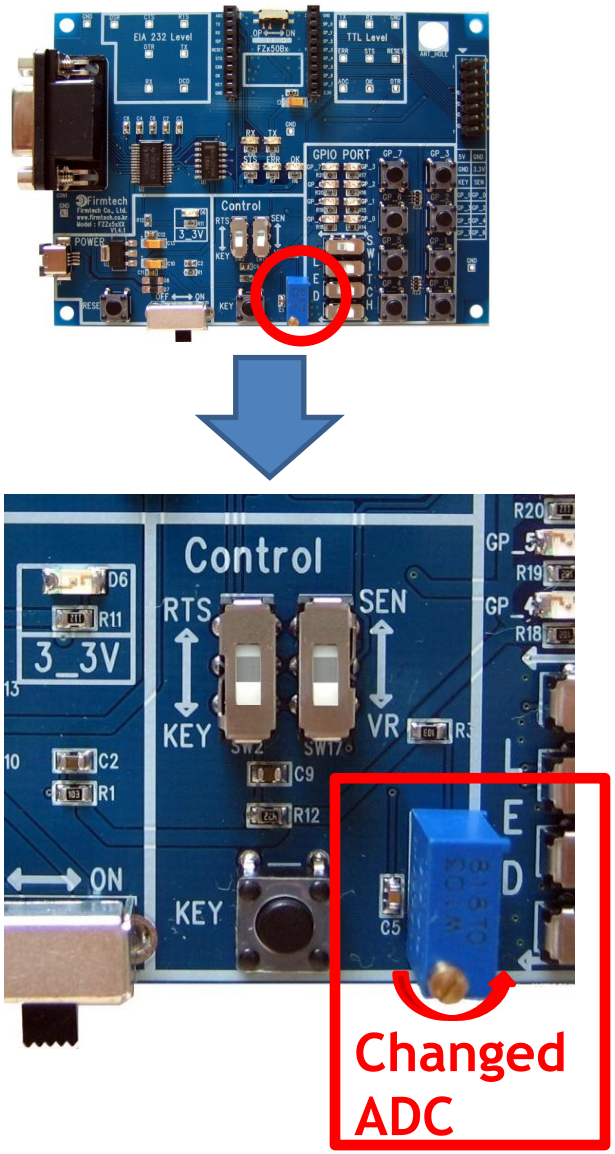
(2) Received ADC Data Check – Check it in Hyper Terminal of Coordinator once every 10 seconds



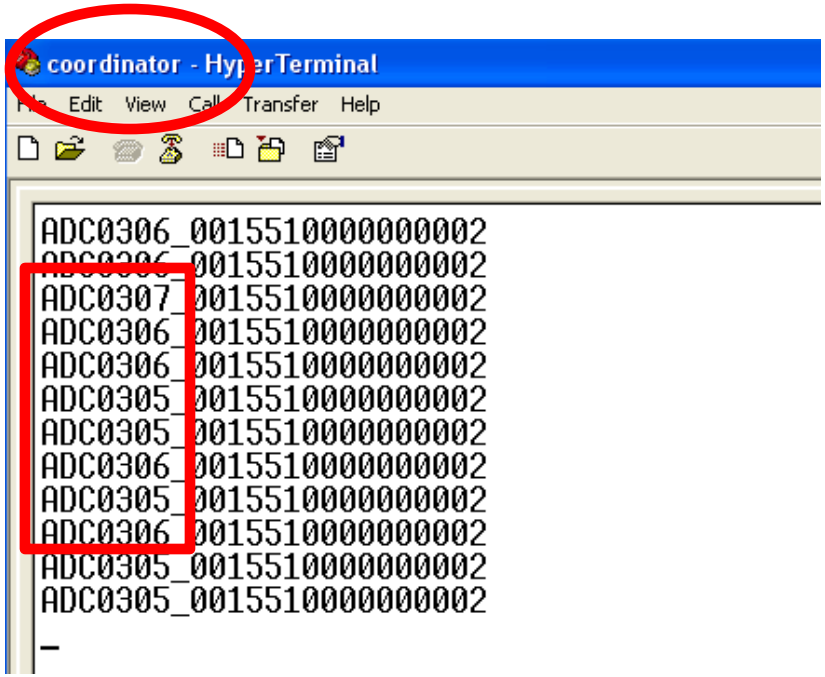
Received Data is output once every 10 seconds in Hyper Terminal connected FZ750BX set to Coordinator

- "ADC" is the received Data type.
- "0306"is the received ADC Value
- "0015510000000002" is the Device that transmitted the Data.
- In conclusion, FZ750BX receives ADC Data that has a value "0306" "From the Device which has an IEEE address "0015510000000002"

(3) ADC Data Change using variable resistance of Router

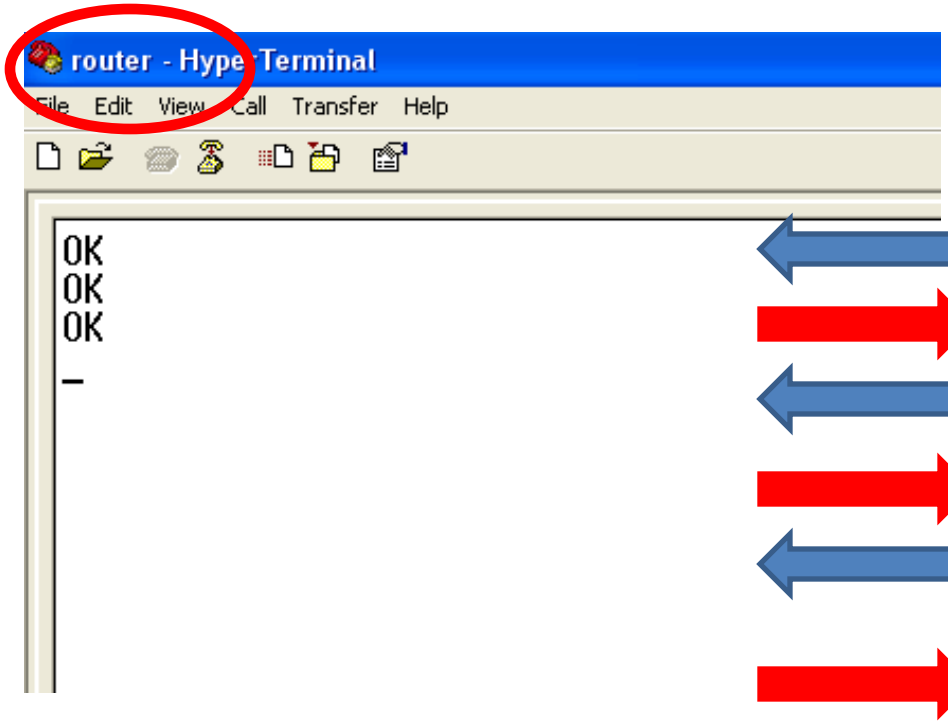


- If you change variable resistance, the changed ADC value is output in Hyper Terminal.



2. KEY Data transmission “Router -> Coordinator”

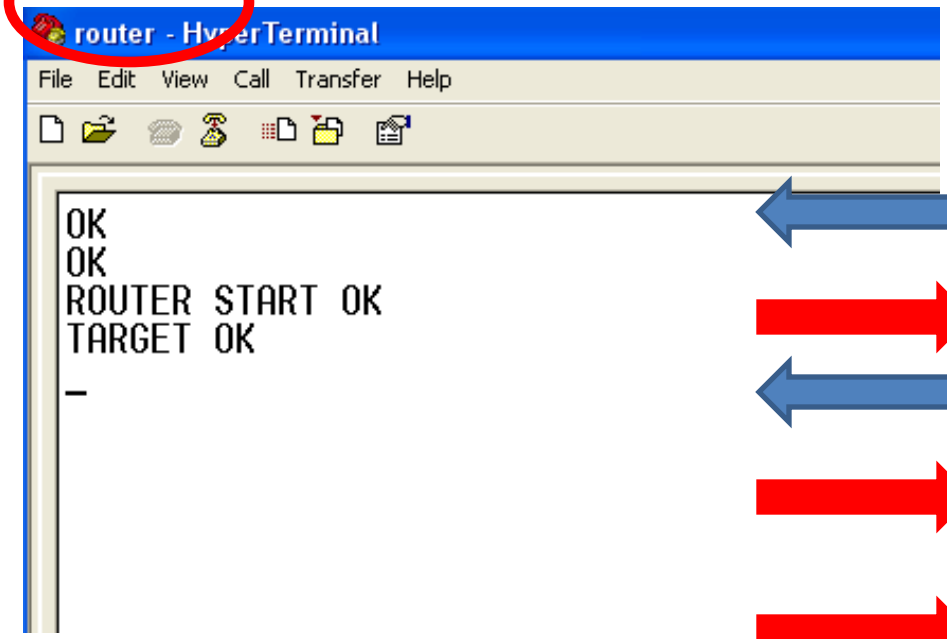
(1) [Setup] ADC Data transmission in Router : unused & transmission time : 0 sec



- Input the following into Hyper Terminal
- input“+++”in Hyper Terminal
- “OK” is output from FZ750BX
- After inputting “AT+SETADC0” in Hyper Terminal, press Enter key
- “OK” is output from FZ750BX
- After inputting “AT+SETTMR0”, press Enter key.
- “OK” is output from FZ750BX

- Now, ADC is unused and transmission time is set to 0 second.

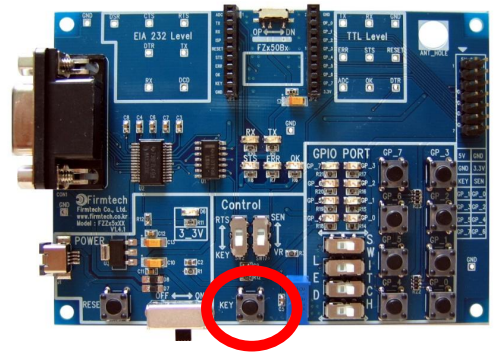
(2) [Setup] KEY Data Transmission of Router : use

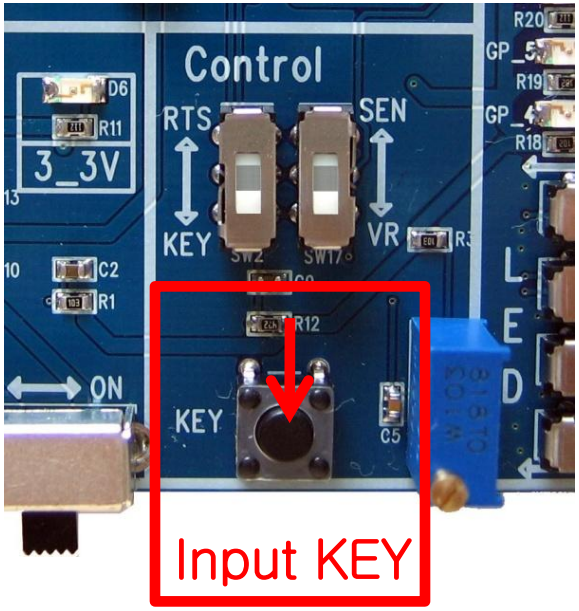


- Input the following continuously into Hyper Terminal
- After inputting"AT+SETKEY1" in Hyper Terminal, press Enter key.
- "OK" is output from FZ750BX
- After inputting "ATZ" in Hyper Terminal, press Enter key.
- "OK" is output from FZ750BX
- FZ750BX Device Re-start
- "ROUTER START OK" is output
- "TARGET OK" is output

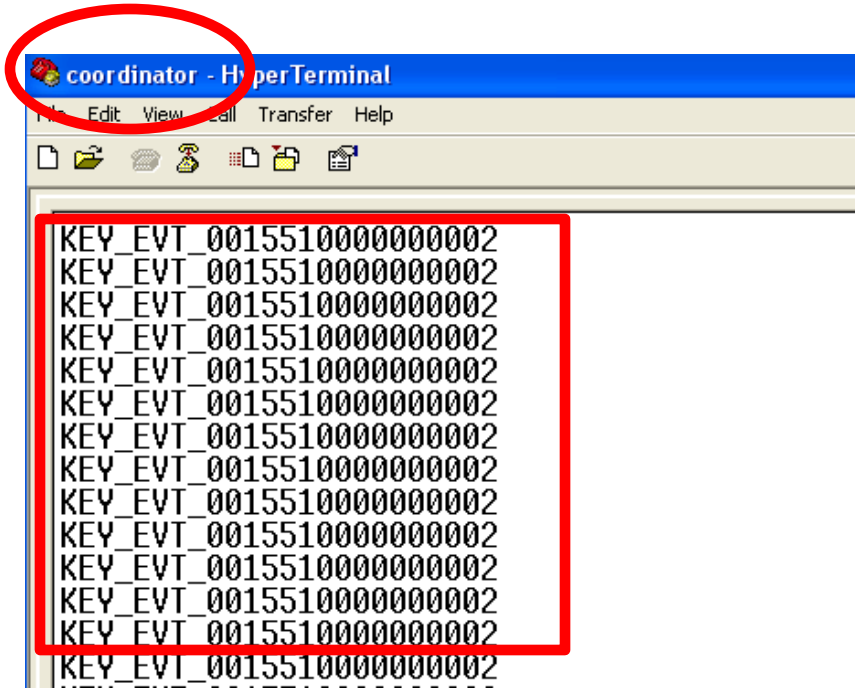
- You should restart a Device by using a command "ATZ" to apply the related time matters (AT+SETTMR0) that was already mentioned on the previous page.

(3) KEY Data Transmission of Router – Check received Data in Hyper Terminal of Coordinator

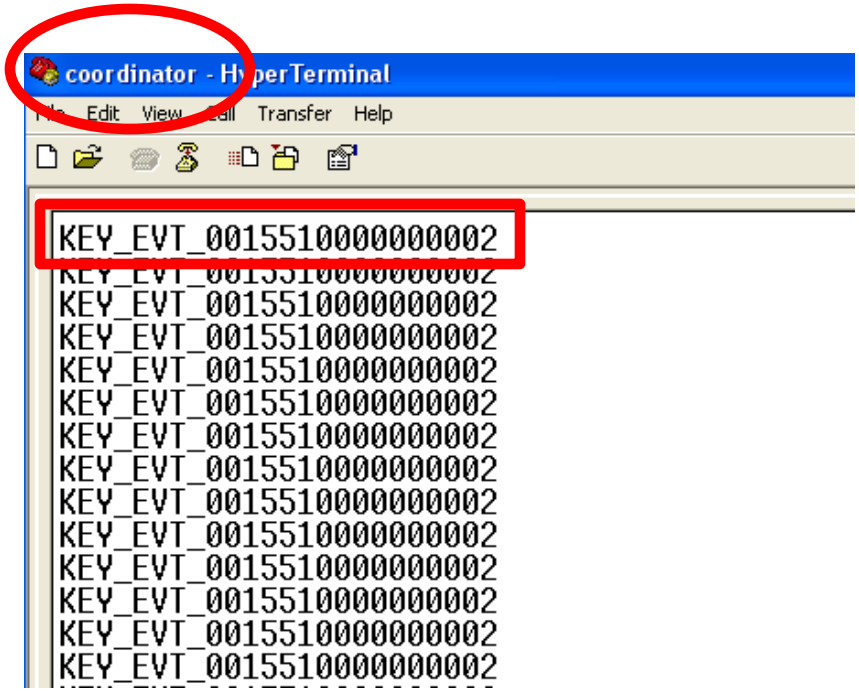




- If you press the KEY connected FZ750BX set to Router, KEY Data is output in Hyper Terminal connected FZ750BX set to Coordinator



(4) Received Data in Coordinator



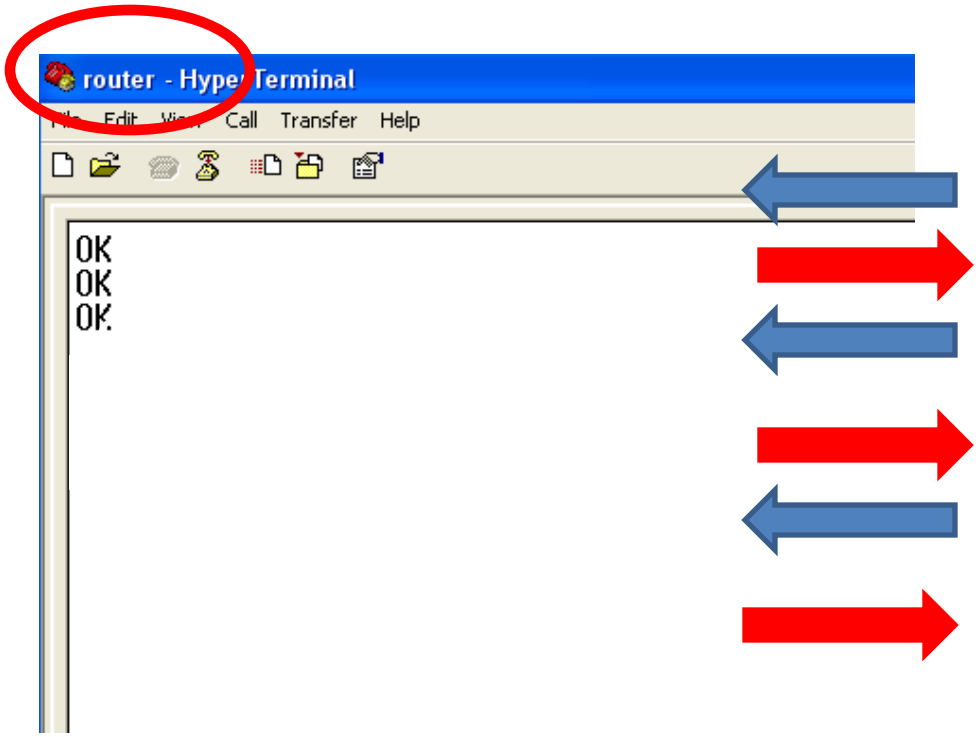
- If you push KEY connected to FZ750BX set to Router, Router transmits KEY Data to Coordinator successively

- "KEY_EVT" is the received Data type
- "0015510000000002"is the Device that transmitted Data

- In conclusion, FZ750BX set to Coordinator shows that it received KEY data from the device which has an "0015510000000002".

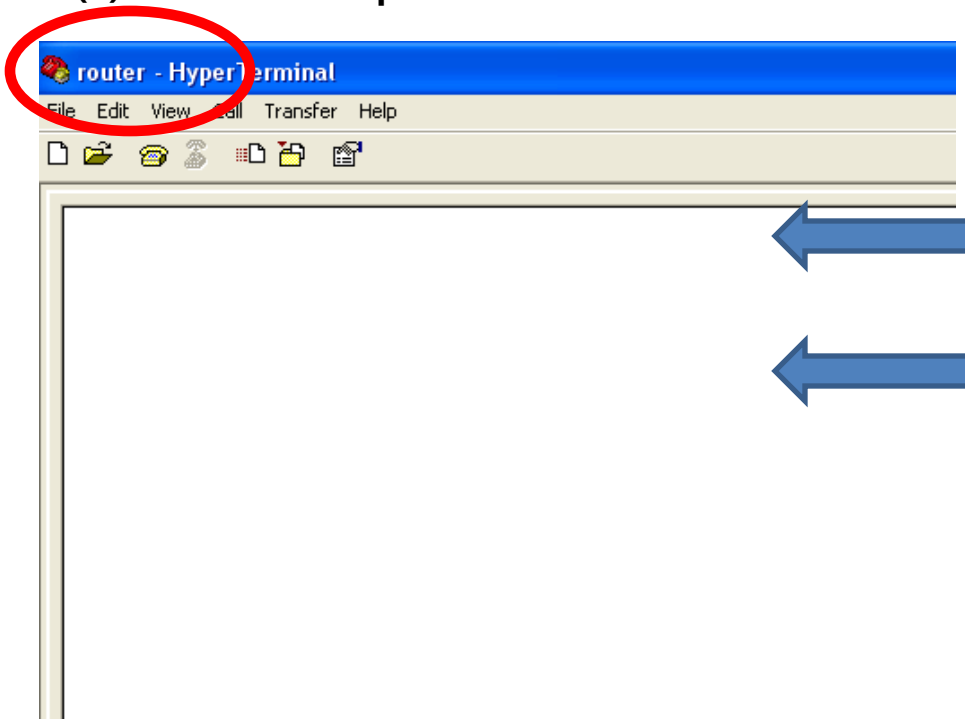
3. Serial Data Transmission “Router -> Coordinator”

(1) [Setup] KEY Data Transmission of Router : unused



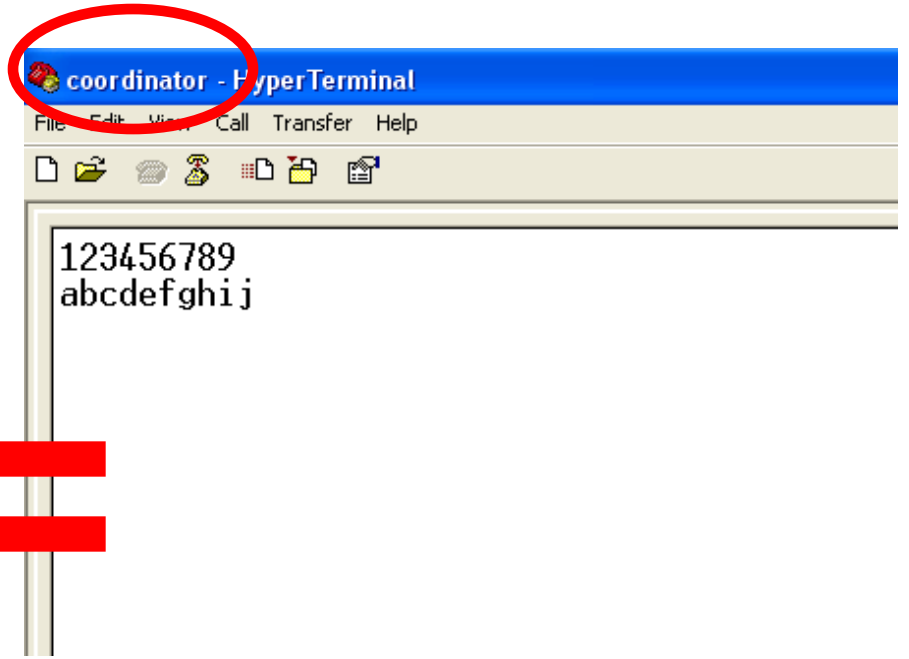
- Input the following into Hyper Terminal
- Input “+++” in Hyper Terminal
- “OK” is output from FZ750BX
- Input “AT+SETKEY0” in Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- Input “ATO” in Hyper Terminal, press Enter key
- “OK” is output from FZ750BX
- Now, KEY is unused.

(2) Serial Data Input in Router – Check it in Coordinator.



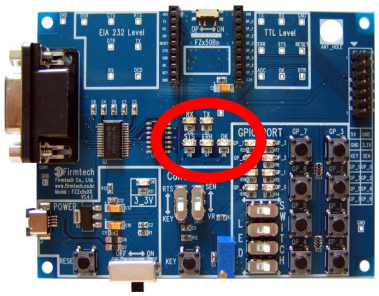
Input the following into Hyper Terminal

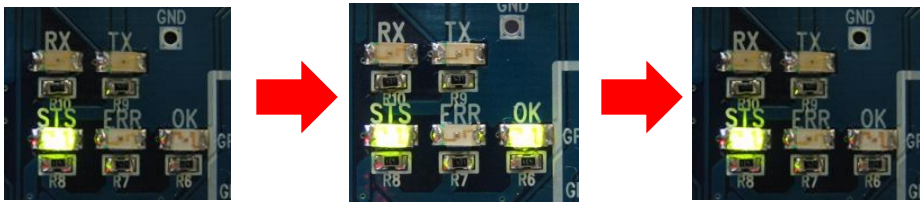
- After inputting “123456789” into Hyper Terminal, press Enter key.
- After inputting “abcdefghij” into Hyper Terminal, press Enter key.



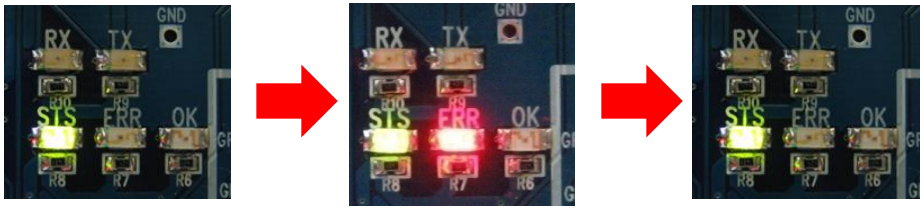
- “123456789” is output
- “abcdefghij” is output.

• OK/ERR LED status related ACK (Router) after Data transmission





< Case 1. ACK transmission is successfully done >

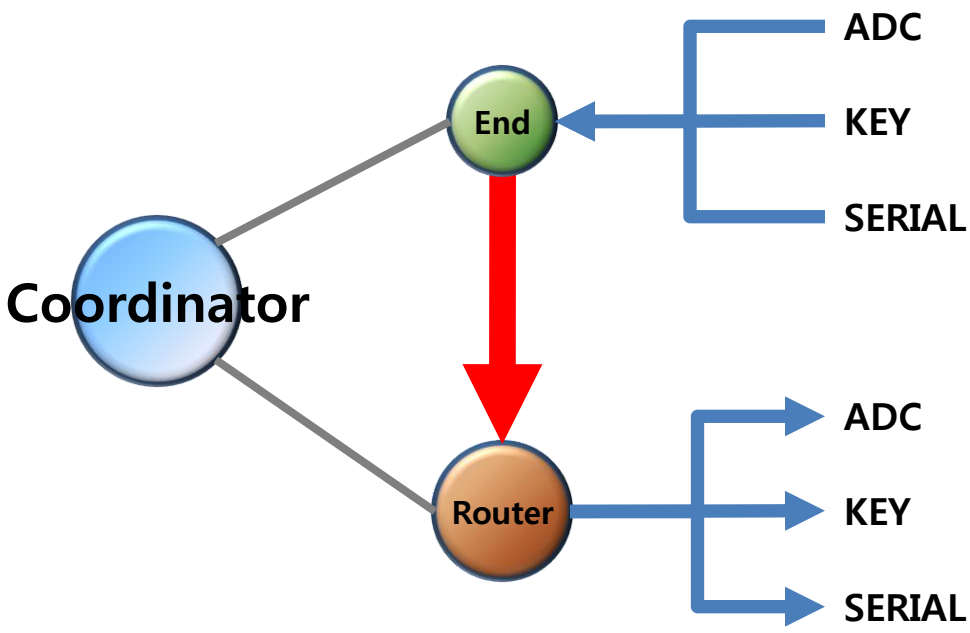


< Case 2. ACK transmission is failed >

* OK LED blinks once if the Data transmission is successfully done.

* ERR LED blinks once if the Data transmission is failed

[6] ADC, KEY, Serial Data Transmission from End Device to Router



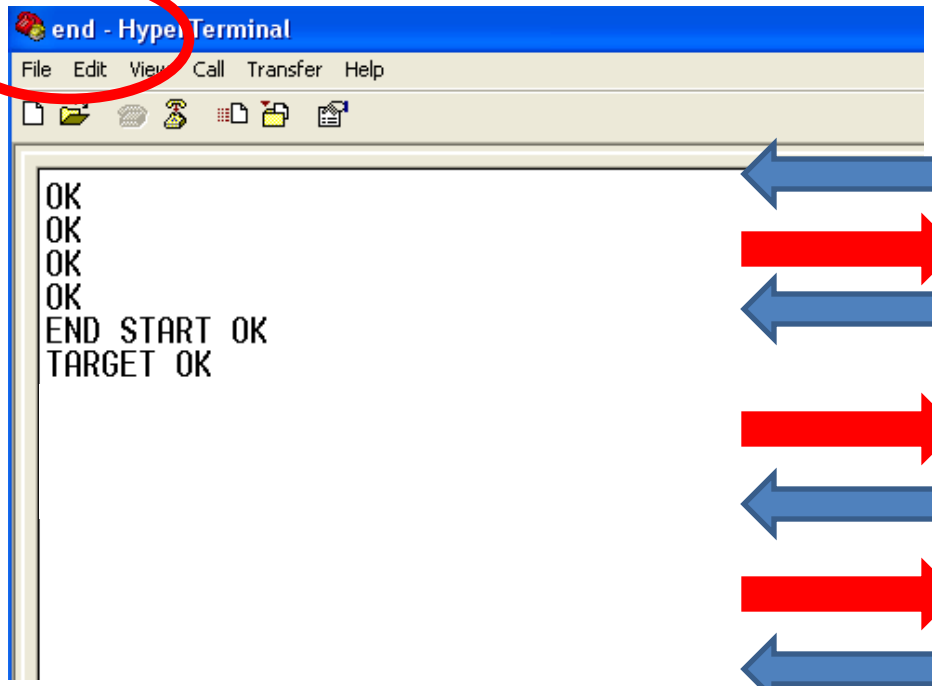
< The following is a summary of End Device status >

- **FZ750BX set to End Device enters into a low power consumption mode automatically because it has a Target Device, and makes wake-up every once 10 seconds(default setting time**
- **You can not input any Serial Data while End Device is in a low power consumption Mode**
- **End Device can not receive wireless Data while the End Device is in a low power consumption Mode**
- **If End Device is in a Low power consumption Mode, You need to work on the following in order to input Serial Data**

  - ✓ **You can check End Device making wake-up at certain time, so you can input Serial Data before the End Device enters into a low power consumption mode again.**
  - ✓ **If End Device doesn't make wake-up by certain time, you should input KEY Data to make End Device start wake-up forcefully. After that, you can input Serial Data before the End Device enters into a low power consumption mode again.**

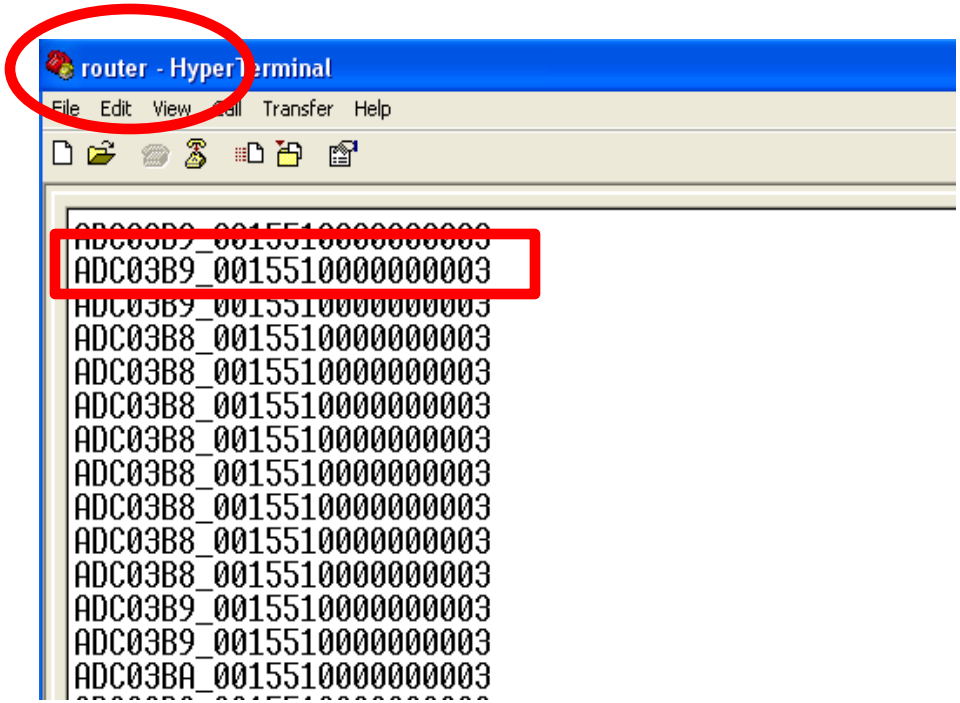
1. ADC Data transmission “End Device -> Router” once every 10 seconds

(1) [Setup] ADC Data transmission of End Device : use



- After making End Device start wake-up, input the following into Hyper Terminal
- Input “+++” in Hyper Terminal
- “OK” is output from FZ750BX
- After inputting “AT+SETADC1” in Hyper Terminal, press Enter key
- “OK” is output from FZ750BX
- “AT+SETTMR10”in Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- After inputting “ATZ” in Hyper Terminal, press enter key.
- “OK” is output from FZ750BX
- FZ750BX device re-started
- “END START OK” is output
- “TARGET OK” is output

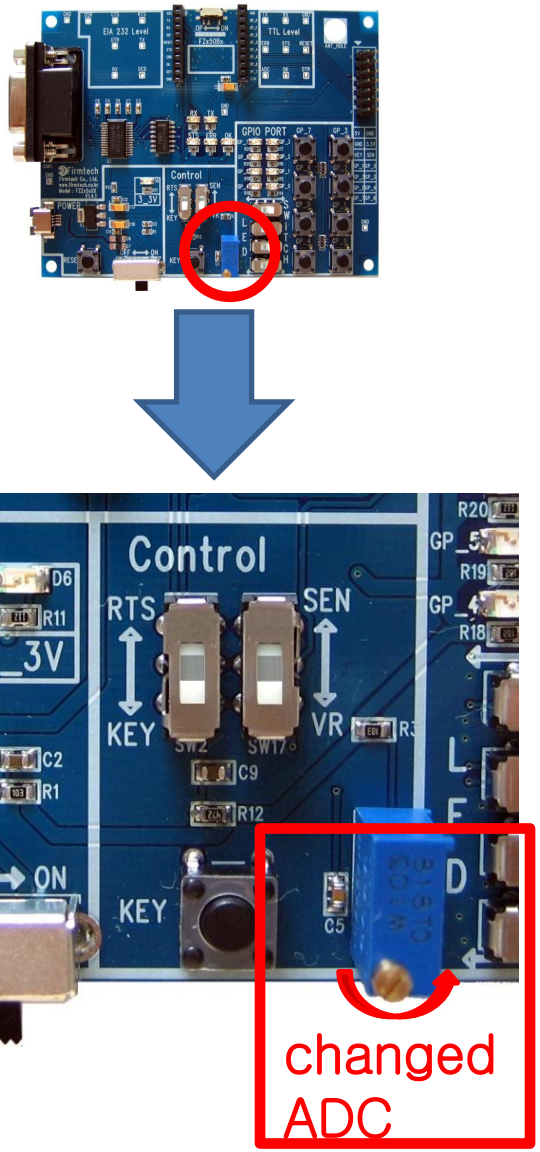
(2) Received ADC Data check – check it once every 10 seconds in Hyper Terminal of Router



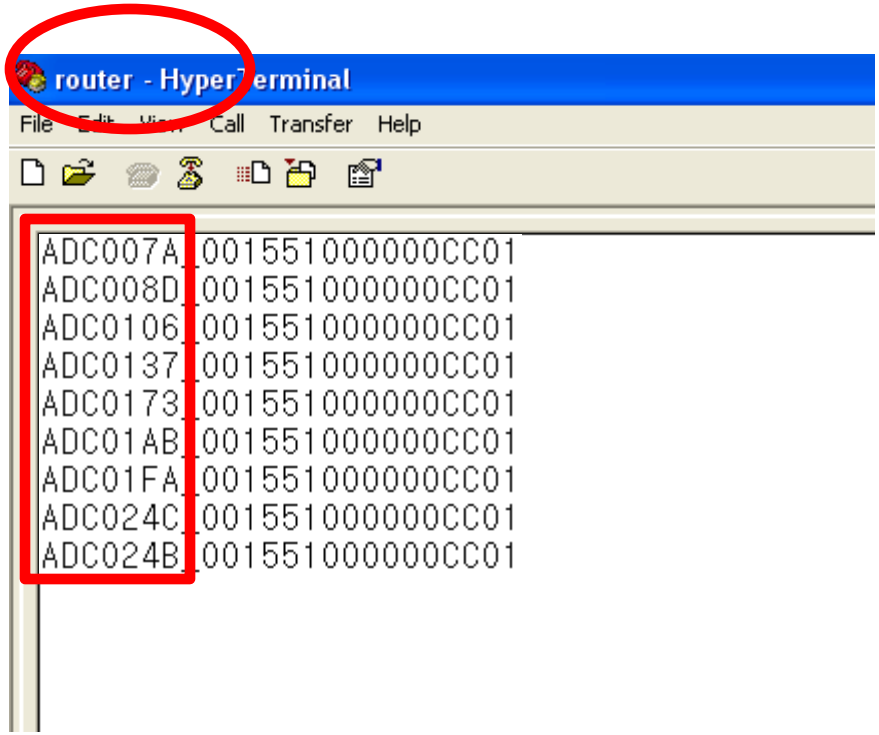
Received Data is output every 10 seconds in Hyper Terminal

- **"ADC" is the received Data type**
- **"03B9" is the received ADC value**
- **"0015510000000003" is the device that transmitted Data**
- **In conclusion, FZ750BX receives ADC Data that has a value "03B9" "From the Device which has an IEEE ADDRESS "0015510000000003" .**

(3) ADC Data Change using variable resistance of End Device

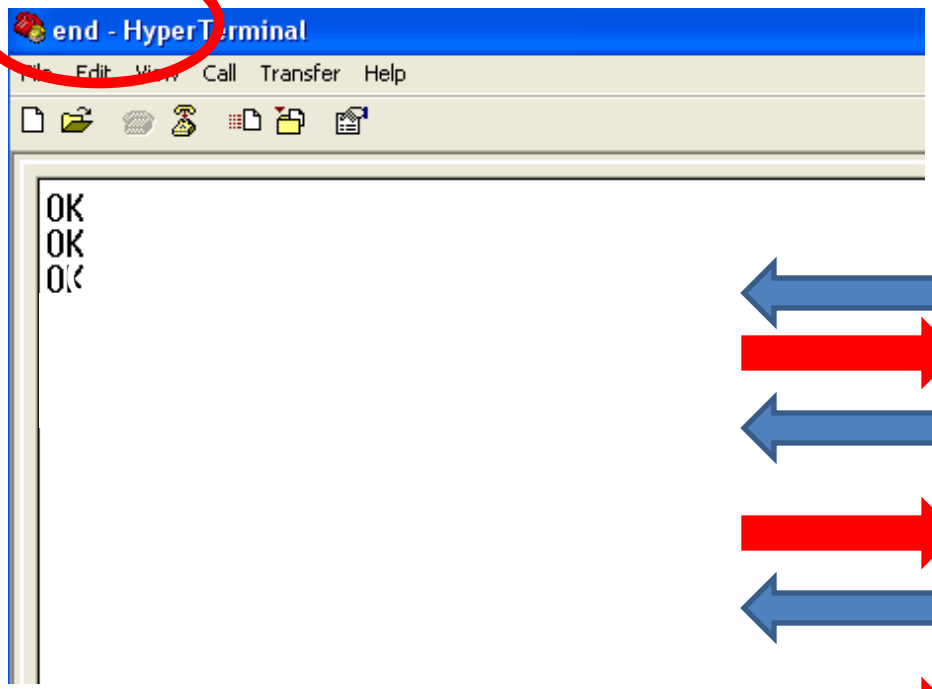


- If you change variable resistance, changed ADC value is output in Hyper Terminal.



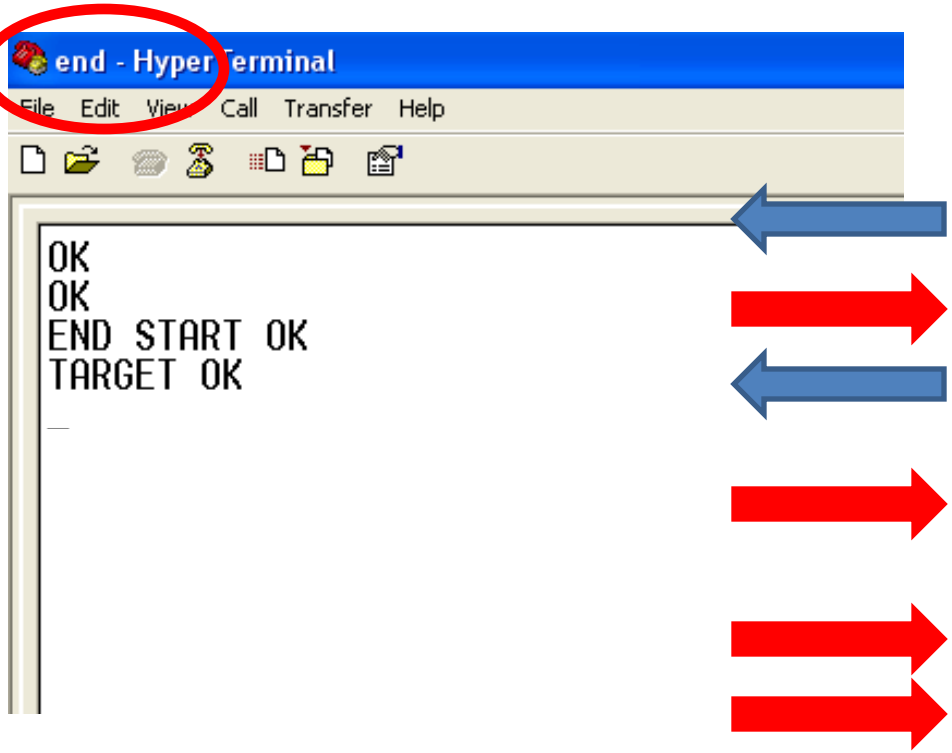
2. KEY Data transmission “End Device -> Router”

(1) [Setup] ADC Data transmission of End Device : use & transmission time : 0 sec



- Input the following into Hyper Terminal after making End Device start wake-up.
- input“+++”in Hyper Terminal
- FZ750BX“OK” is output from FZ750BX
- After inputting “AT+SETADC0”, press Enter key.
- “OK” is output from FZ750BX
- After inputting “AT+SETTMR0”in hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- Now ADC use is activated and transmission time is set to 0 second.

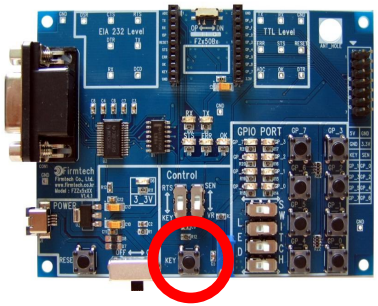
(2) [Setup] KEY Data Transmission of End Device : use

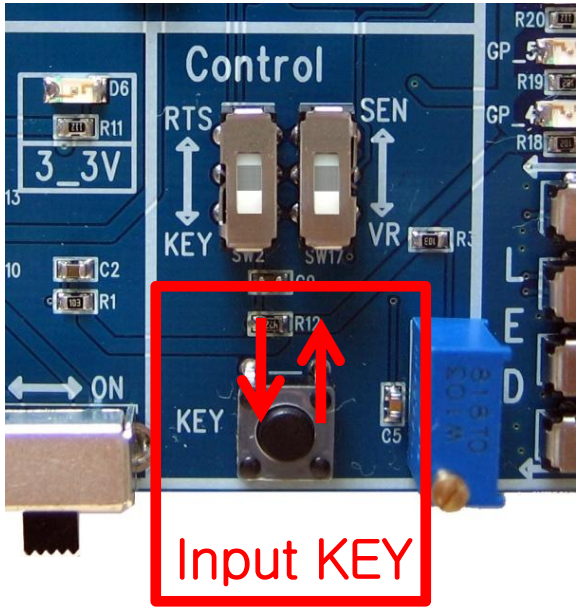


- Input the following continuously into Hyper Terminal
- After inputting “AT+SETKEY1” into Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- After inputting “ATZ” into Hyper Terminal, press Enter key
- “OK” is output from FZ750BX
- FZ750BX device is re-started
- “END START OK” is output
- “TARGET OK” is output

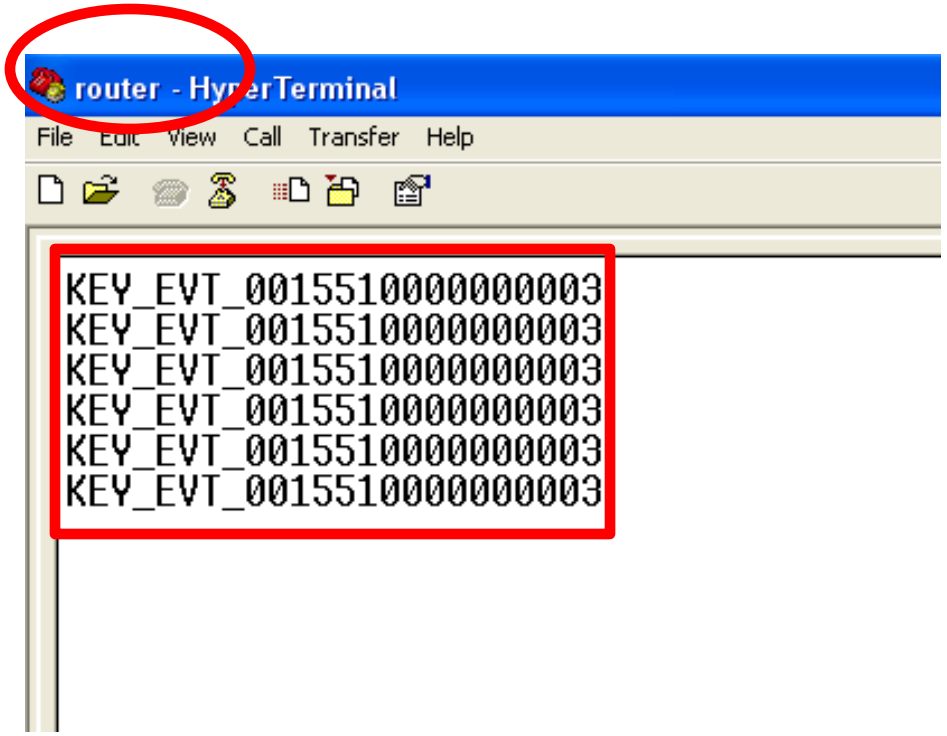
- You should restart a Device by using a command “ATZ” to apply the time related matters (AT+SETTMR0) that was set on the previous page

(3) KEY Data transmission of End Device – check the received Data in Hyper Terminal of Router

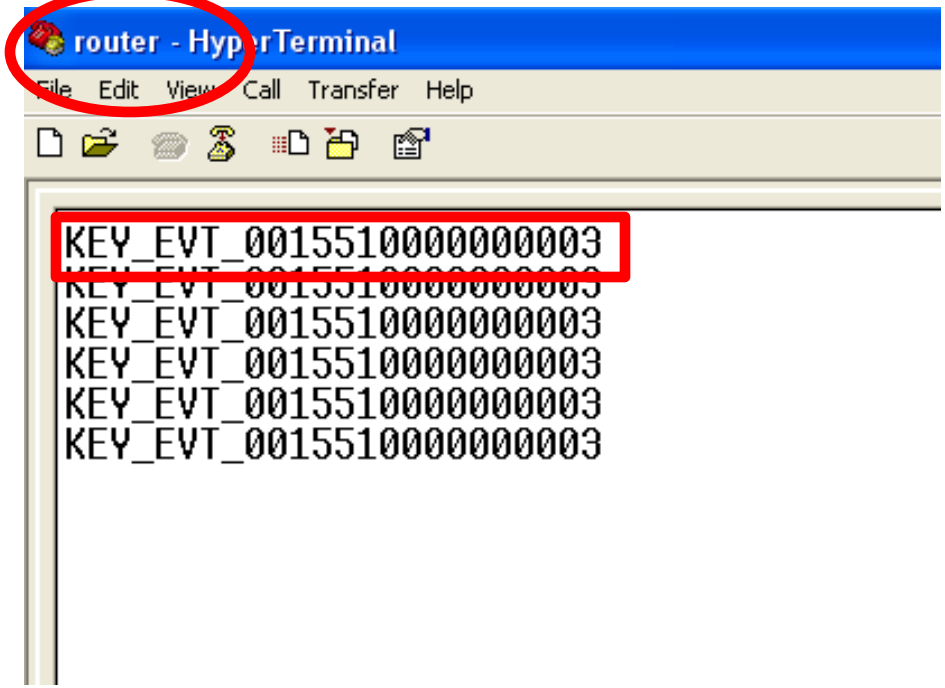




- **KEY Data will be output in Hyper Terminal connected FZ750BX set to Router after you push KEY connected FZ750BX set to End Device**
- **For the next KEY Data transmission you should push KEY after End Device enters into a low power consumption mode.**



(4) Received Data in Router



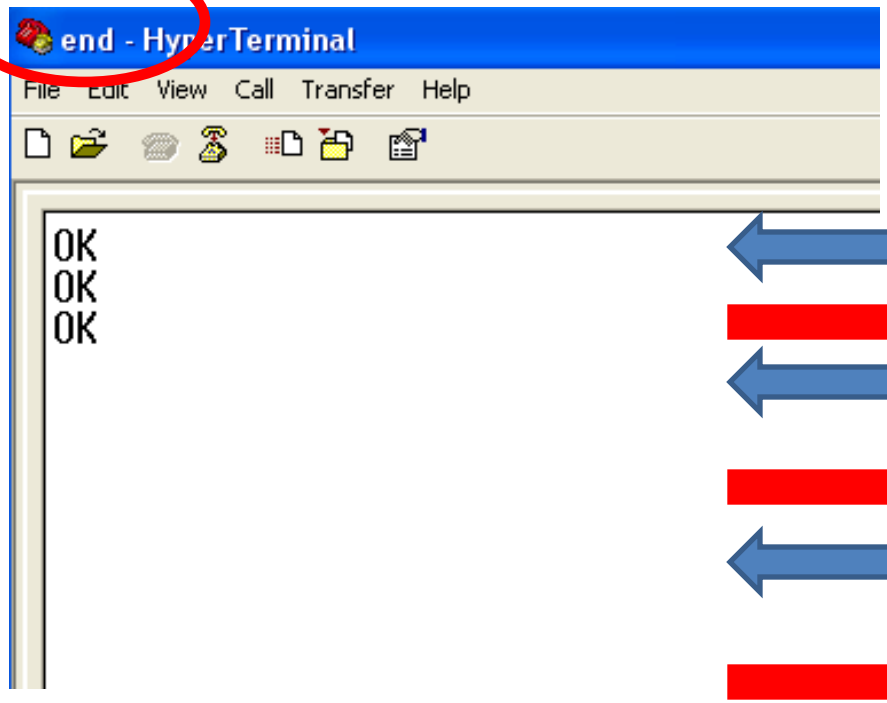
If you press KEY on FZ750BX set to End Device, the End Device transmits KEY Data to Router once.

- "KEY_EVT" is the received Data type
- "0015510000000003" is the Device that transmitted Data.

- In conclusion, FZ750BX set to Router receives Data "KEY" from the Device which has an IEEE ADDRESS "0015510000000003"

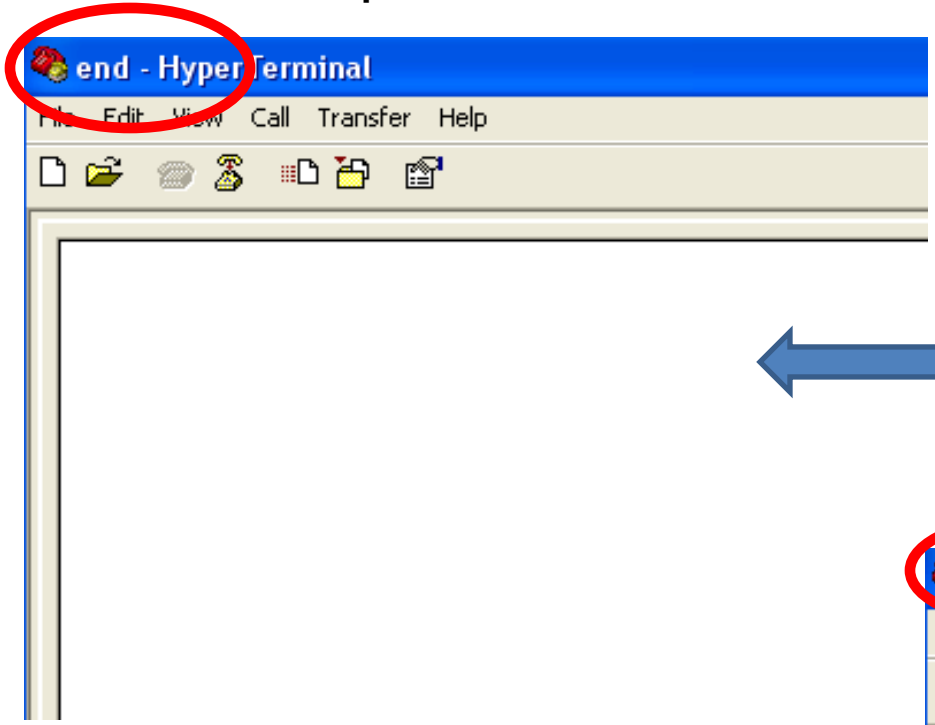
3. Serial Data Transmission “End device -> Router”

(1) [Setup] KEY Data transmission of End Device : use



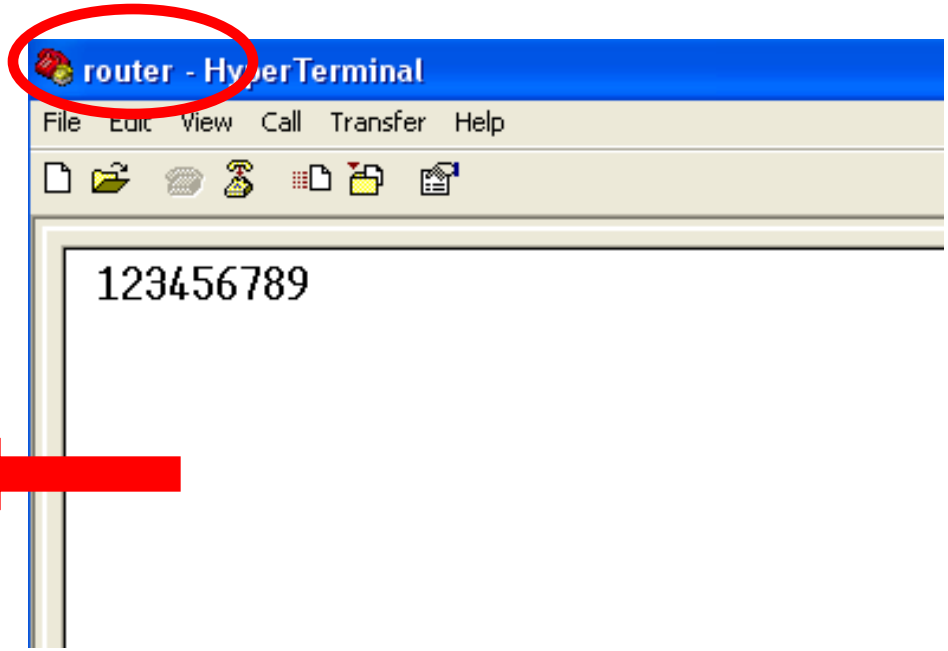
- After putting End device in a wake-up mode, input the following into Hyper Terminal.
- Input “+++” in Hyper Terminal
- “OK” is output from FZ750BX
- After inputting “AT+SETKEY0” in Hyper Terminal, press Enter
- “OK” is output from FZ750BX
- After inputting “ATO” in Hyper terminal, press Enter key.
- “OK” is output from FZ750BX
- Now, KEY is unused.

(2) Serial Data Input in End Device – Check in Router



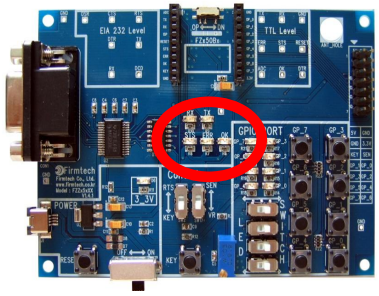
After putting End Device in wake-up mode, input the following into Hyper Terminal connected to FZ750BX set to End Device

- **After inputting "123456789" into Hyper terminal, press Enter key**

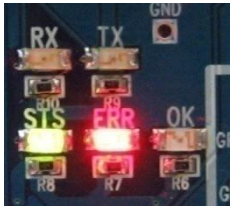


- **"123456789"is output in hyper Terminal**

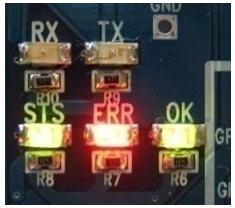
• OK/ERR LED status related ACK after Data Transmission(End device)



< Case 1. ACK transmission is successfully done >



< Case 2 ACK transmission is failed >

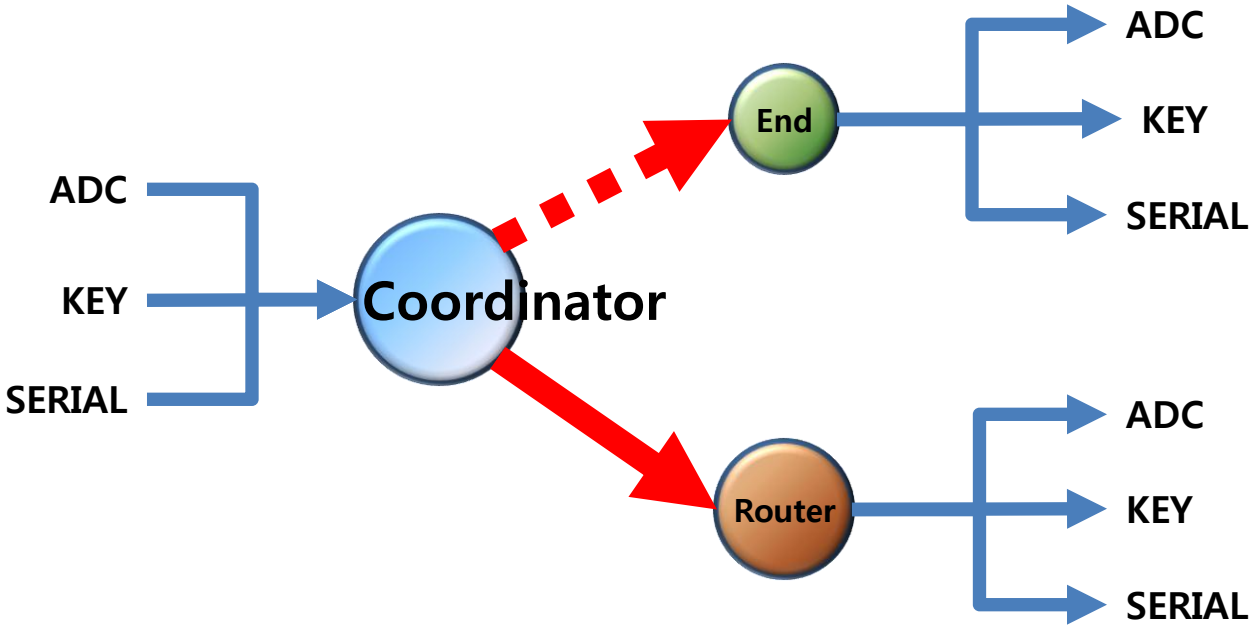


< Low power consumption mode>

- OK LED blinks once after Data transmission if the transmission is successfully done
- ERR LED blinks once after Data transmission if the transmission is failed

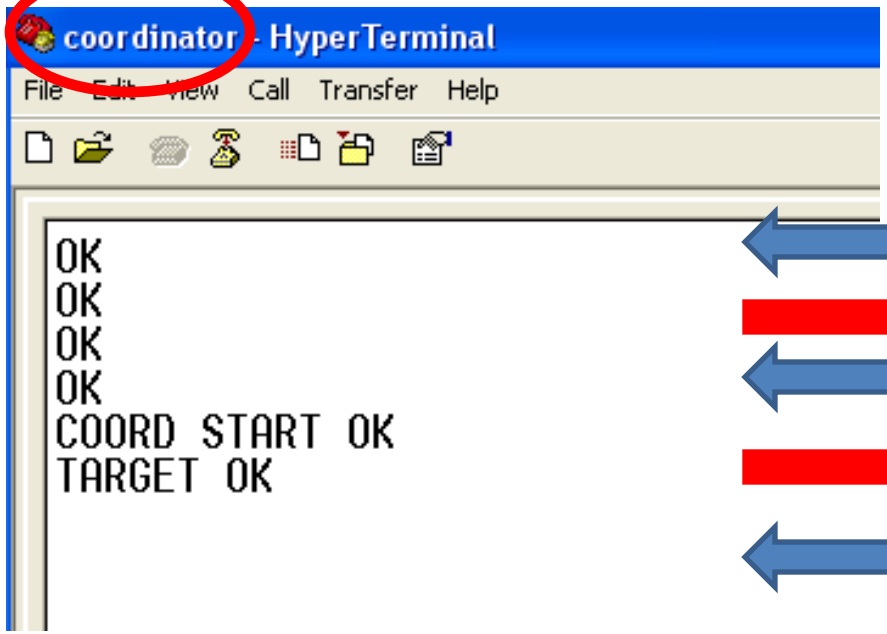
- FZ750BX enters into the Low power consumption mode 1 second after ACK or NACK is transmitted.

[7] ADC, KEY, Serial Data Transmission From Coordinator to All devices



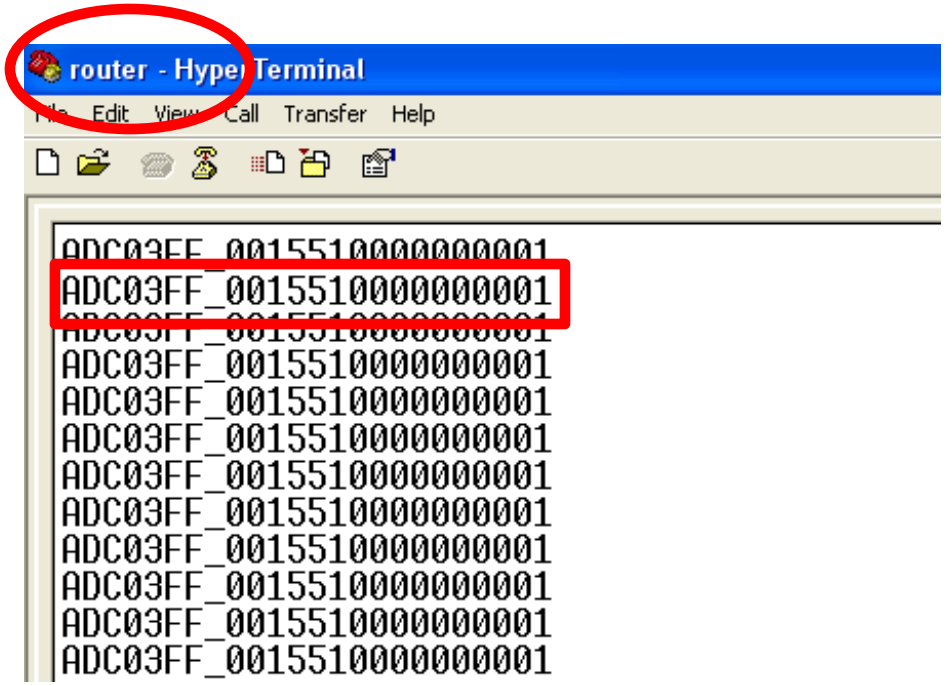
1. ADC Data Transmission “Coordinator -> ALL Device” once every 10 sec

(1) [Setup] ADC Data transmission of Coordinator : use & Transmission time : 10 seconds



- Input the following into Hyper terminal.
- Input “+++” in Hyper Terminal
- “OK” is output from FZ750BX
- After inputting “AT+SETADC1”into Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- After inputting “AT+SETTMR10” into Hyper Terminal, press Enter key
- “OK” is output from FZ750BX
- After inputting “ATZ” into Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- FZ750BX device Re-started
- “COORD START OK” is output
- “TARGET OK” is output

(2) Received ADC Data check – check it in Hyper Terminal of Router every once 10 sec

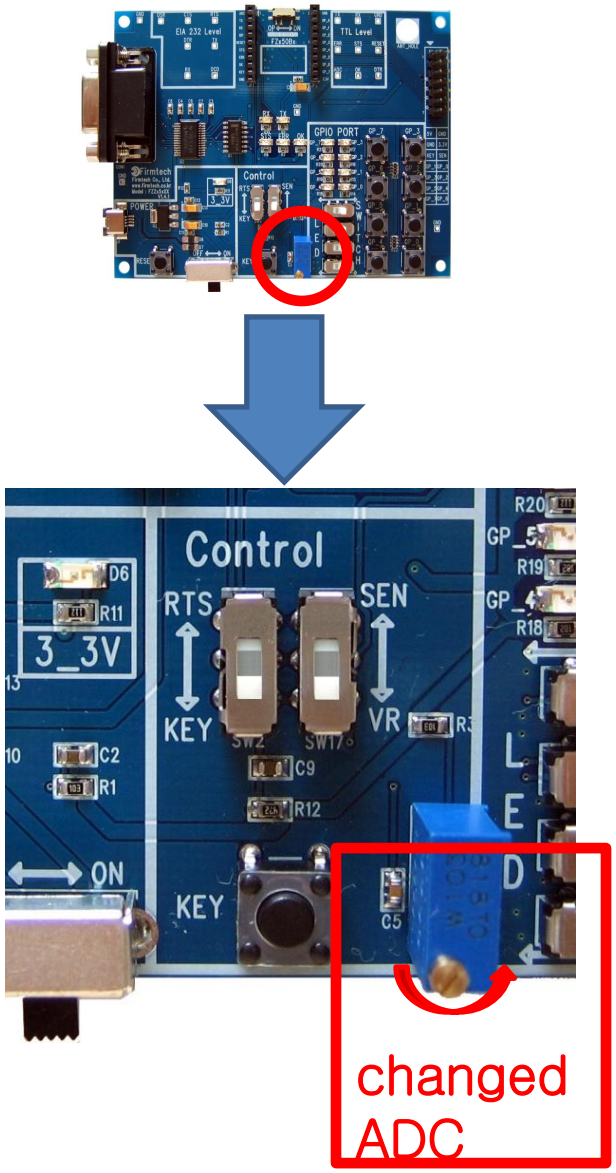


Received Data is output every 10 seconds in hyper Terminal

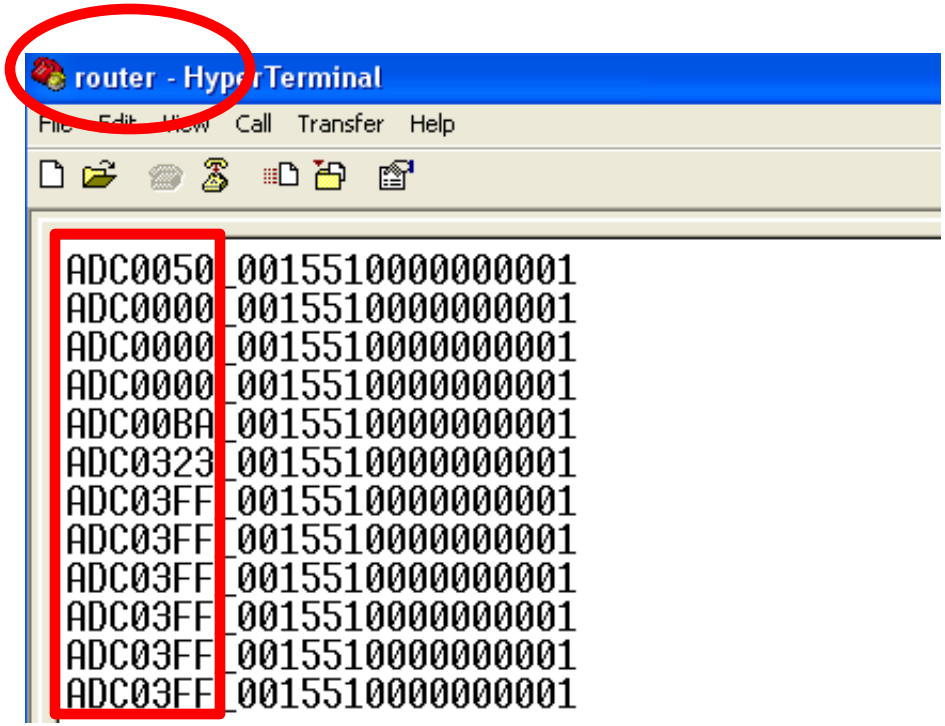
- **"ADC" is the received Data type**
- **"03FF" is the received ADC value.**
- **"0015510000000001" is the Device that transmitted Data.**
- **In conclusion, FZ750BX receives ADC Data that has a value "01EA" from the Device which has an IEEE ADDRESS "0015510000000001"**

- **FZ750BX set to Coordinator transmits ADC Data to all devices**
- **However, FZ750BX set to End Device can not receive Data from Coordinator because it is in a low power consumption mode**
- **In order for End Device to receive Data while it is in a low power consumption mode, you should put the End Device in a wake-up mode**
- **If End Device receive wireless Data while it is in the wake-up mode, it outputs Data to Serial port.**

(3) ADC Data Transmission using variable resistance of Coordinator

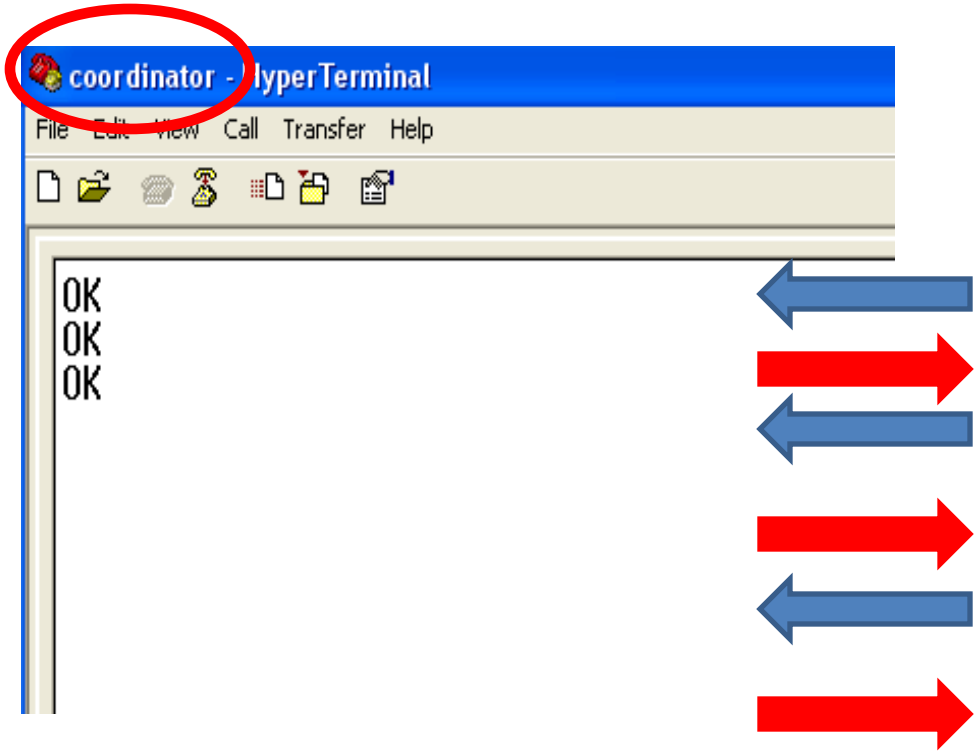


- If you change the variable resistance connected to FZ750BX set to Coordinator, ADC value in Hyper Terminal connected to FZ750BX set to Router is changed and output.



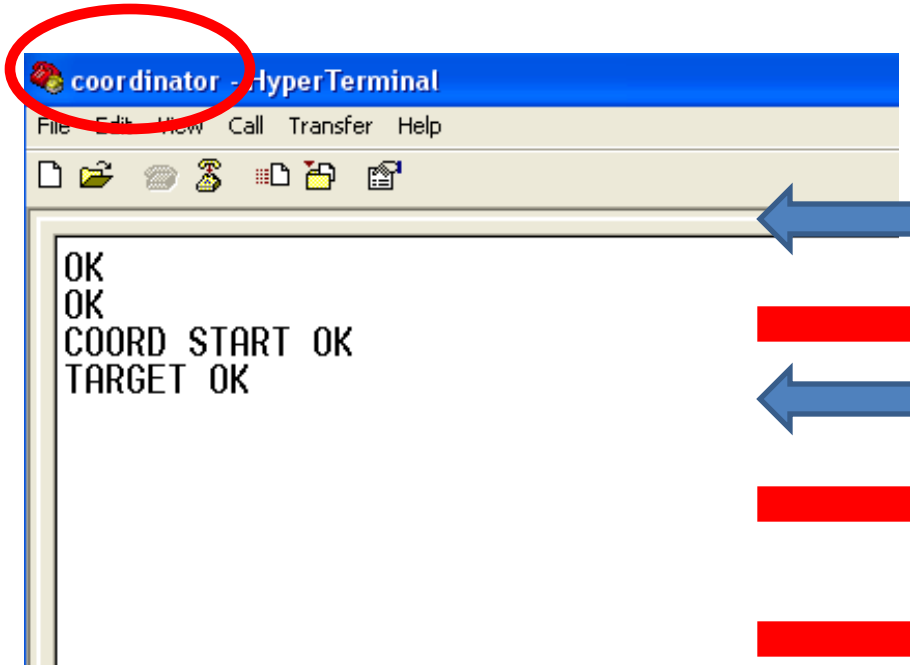
2. KEY Data transmission “coordinator -> ALL Device”

(1) [Setup] ADC Data Transmission of Coordinator : unused & Transmission time : 0sec



- Input the following into Hyper Terminal connected to FZ750B set to Coordinator
- Input“+++”in Hyper Terminal
- “OK” is output from FZ750BX
- After inputting“AT+SETADC0” in Hyper Terminal, press Enter key
- “OK” is output from FZ750BX
- After inputting “AT+SETTMR0”in Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- Now, ADC is unused and transmission time is set to 0 second.

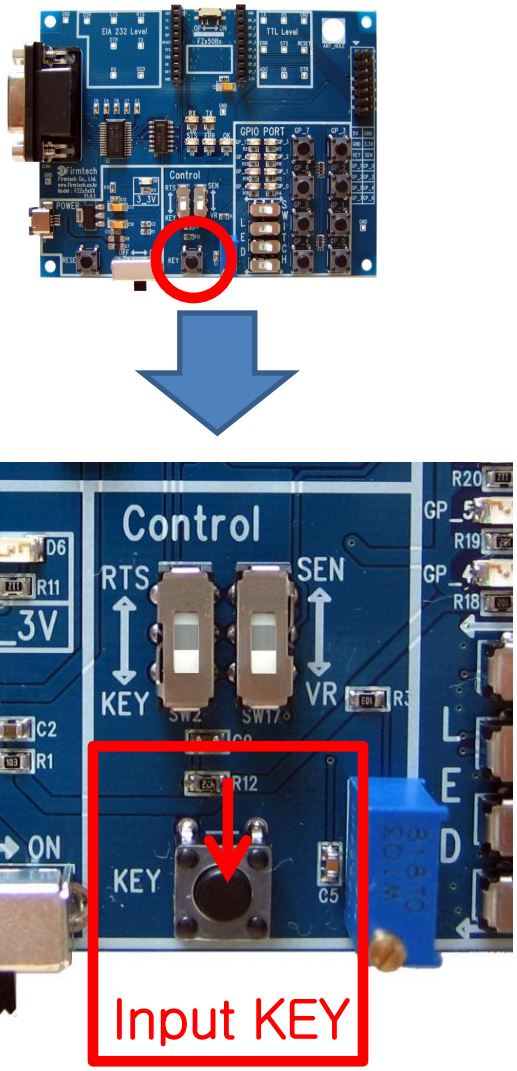
(2) [Setup] KEY Data transmission of Coordinator : use



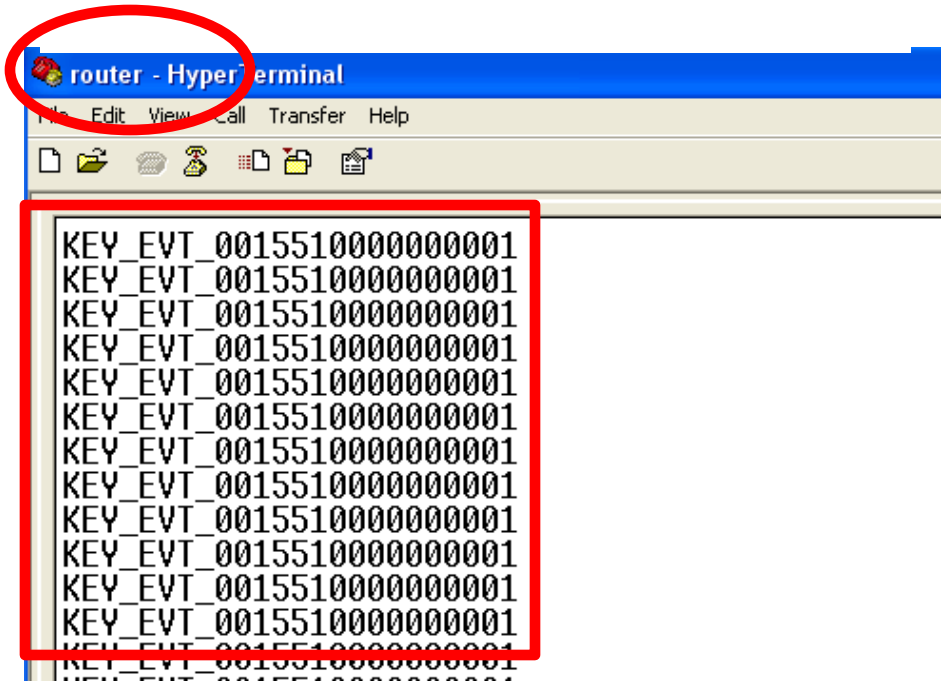
- Input the following continuously into Hyper Terminal
- After inputting “AT+SETKEY1” in Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- After inputting “ATZ” into Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- FZ750BX device is re-started
- “COORD START OK” is output
- “TARGET OK” is output

- You should restart Device by using a command “ATZ” to apply related time matters (AT+SETTMR0) that was already set on the previous page

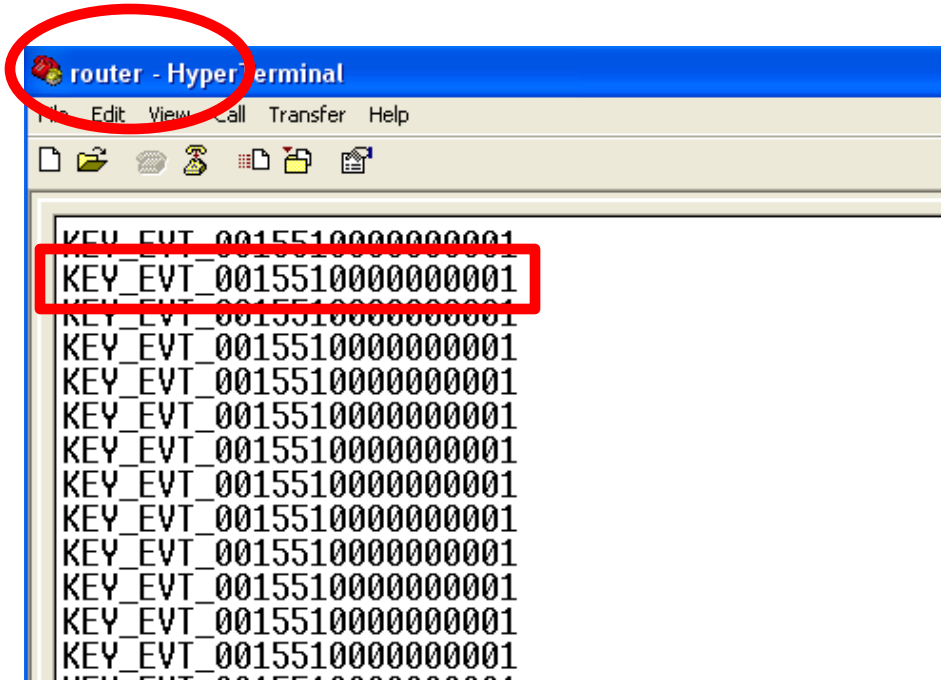
(3) KEY Data Transmission of Coordinator – Check received data in hyper Terminal of Router



- **KEY Data is output in Hyper Terminal connected FZ750BX set to Router after you push KEY connected FZ750BX set to Coordinator**



(4) Received Data in Router



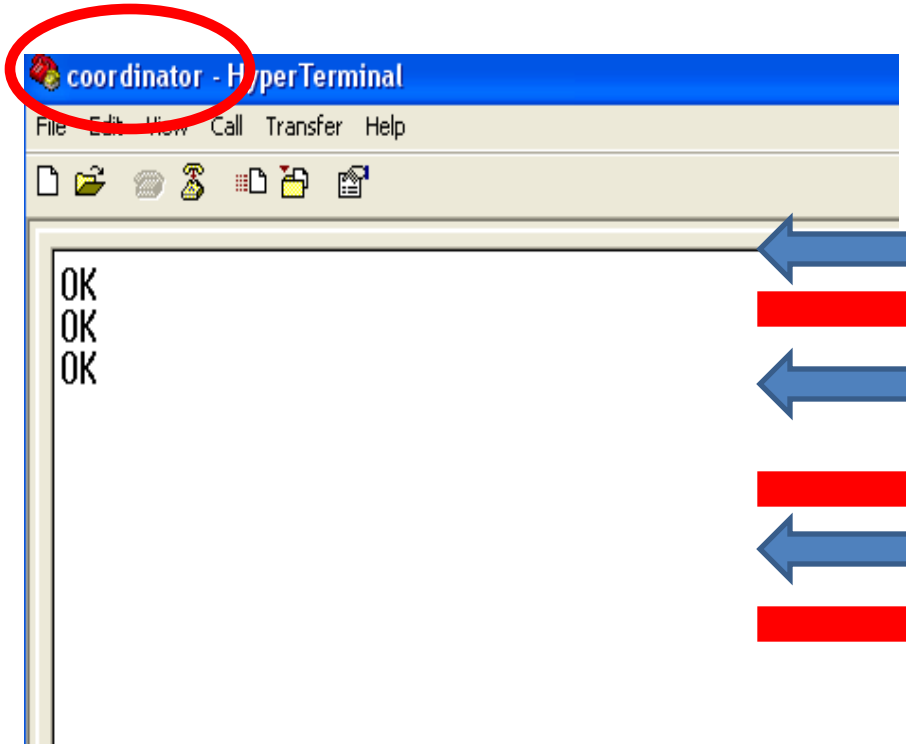
If you press KEY, Coordinator transmits KEY Data to Router successively.

- "KEY_EVT" is the received Data type
- "0015510000000001" is the Device that transmitted Data.
- In conclusion, FZ750BX set to Router receives "KEY" Data from the Device which has an IEEE address "0015510000000001"

- FZ750BX set to Coordinator transmits KEY Data to all Devices.
- However, FZ750BX set to End Device can not receive Data from Coordinator because it is in a low power consumption mode
- In order for End Device to receive Data while it is in a low power consumption mode, you should put the End Device in wake-up mode
- If End Device receives wireless Data while it is in wake-up mode, it outputs Data to Serial port.

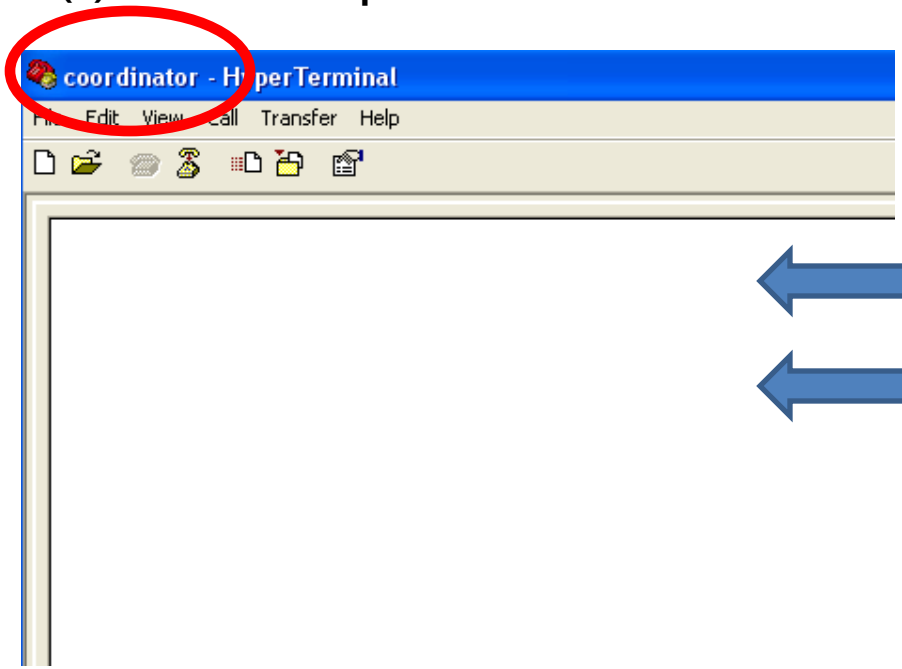
3. Serial Data Transmission “Coordinator -> ALL Device”

(1) [Setup] KEY Data Transmission of Coordinator : unused



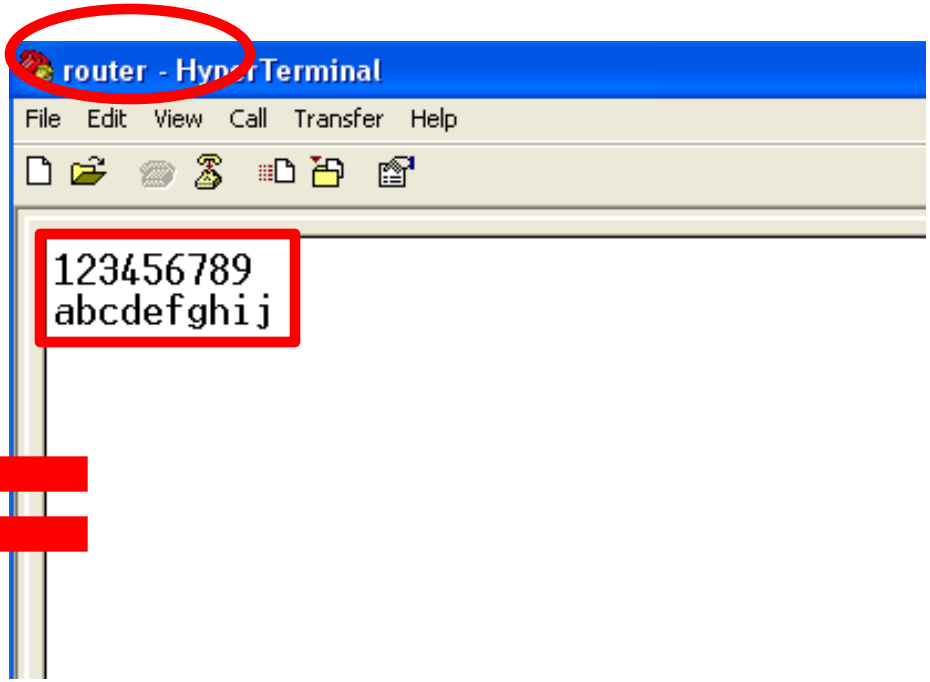
- Input the following into coordinator
- Input “+++” in Hyper Terminal
- “OK” is output from FZ750BX
- After inputting “AT+SETKEY0” into Hyper Terminal and press Enter key.
- “OK” is output from FZ750BX
- After inputting “ATO” into Hyper Terminal
- “OK” is output from FZ750BX
- Now, KEY is unused.

(2) Serial Data input in Coordinator – Check it in Router



Input the following into Hyper Terminal.

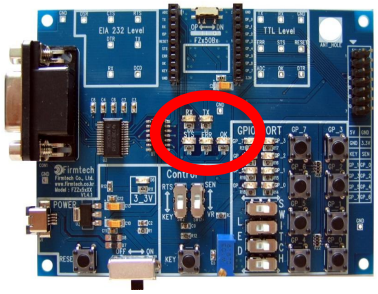
- After inputting “123456789” into Hyper Terminal, press Enter key.
- After inputting “abcdefghij” into Hyper Terminal, press Enter key.

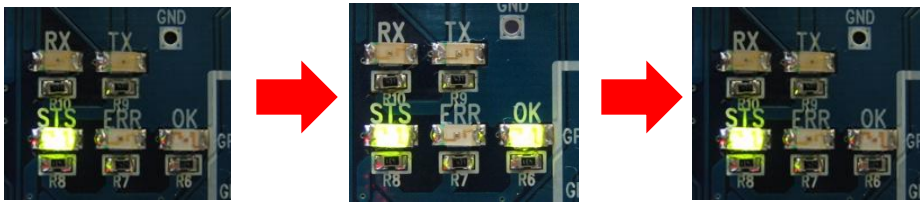


- The following is what it should look like
- “123456789” is output.
- “abcdefghij” is output.

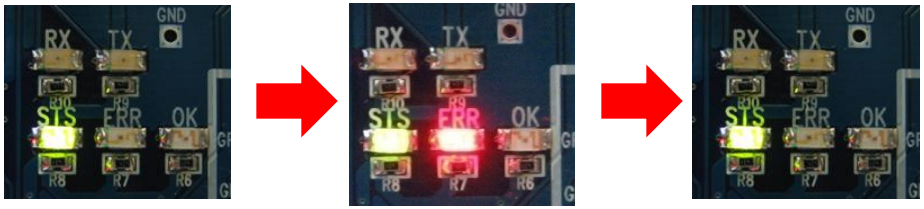
- **FZ750BX set to coordinator transmits Serial Data to all Devices.**
- **However, FZ750BX can not receive Data from Coordinator because it is in a low power consumption mode.**
- **In order for End Device to receive Data while it is in a low power consumption mode, you should put the End Device in a wake-up mode.**
- **If End Device receives wireless Data while it is in the wake-up mode, it outputs Data to Serial port.**

• **OK/ERR LED status related ACK after Data Transmission (Coordinator)**





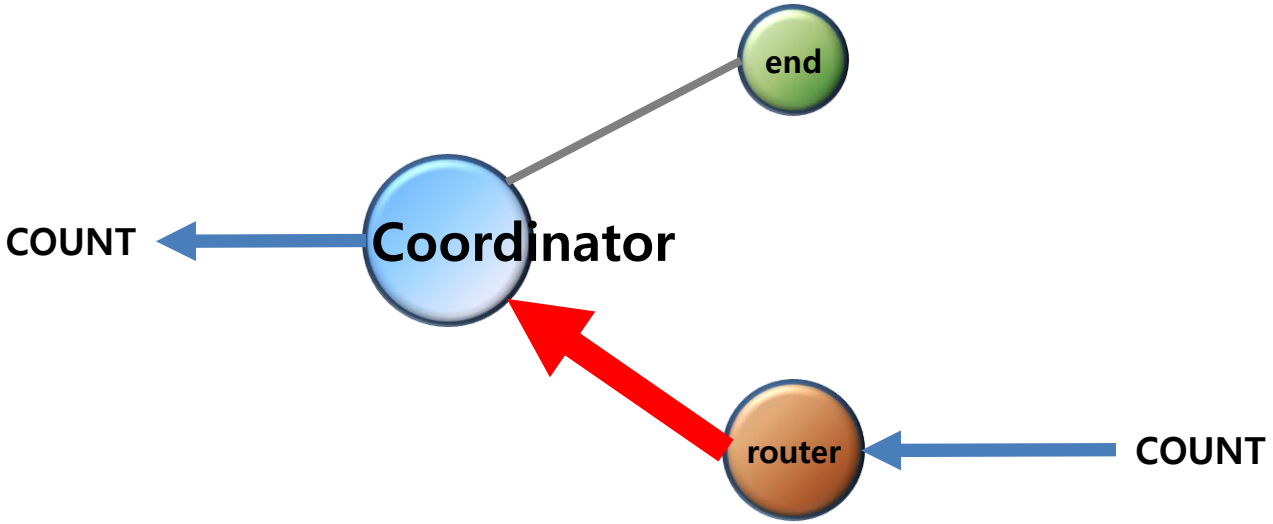
< In case of when Data transmission is successfully done >



< In case of Data transmission is failed >

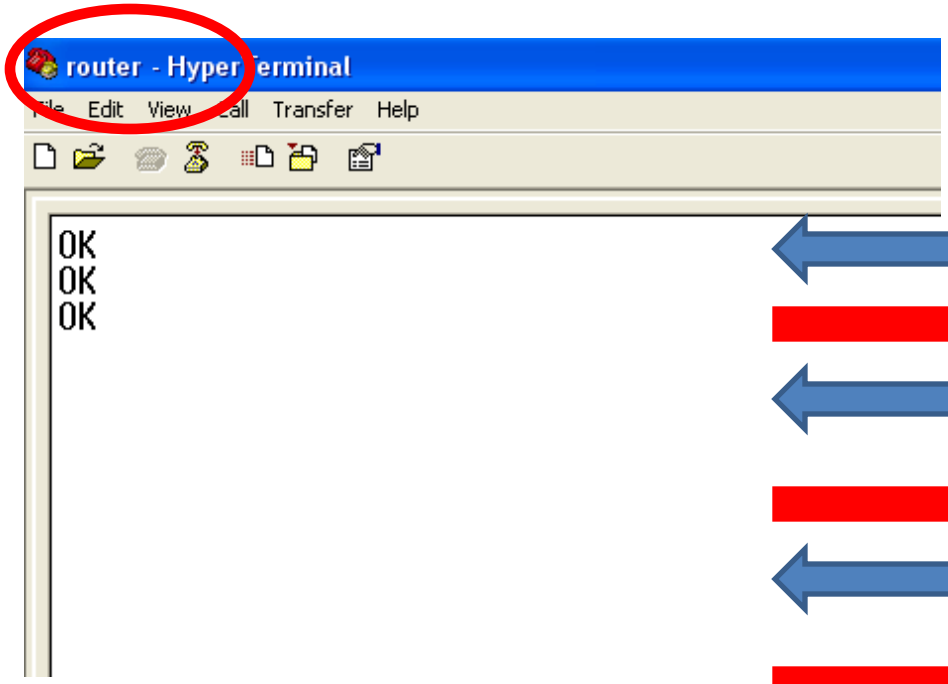
- **FZ750BX set to Coordinator does not receive ACK when it transmits Data to all devices.**
- **FZ750BX set to Coordinator use ERR/OK LED to see if Data is transmitted by using wireless.**
- **OK LED on FZ750BX set to Coordinator blinks once if Data transmission is successfully done by using wireless.**
- **ERR LED on FZ750BX set to Coordinator blinks once if Data transmission is failed.**

[8] COUNT Data Transmission from Router to Coordinator



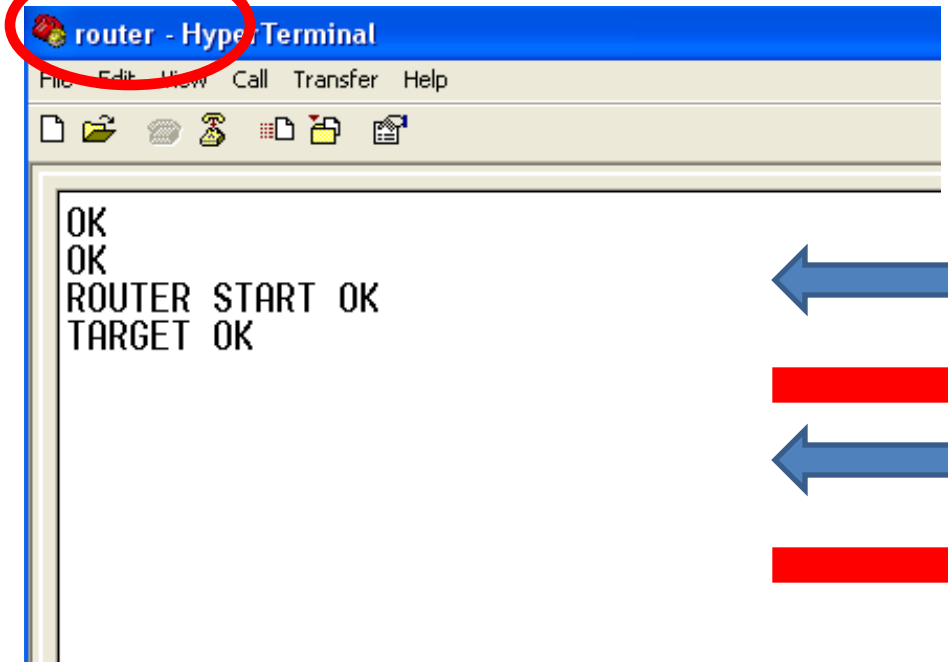
1. Count Data Transmission once every 10 seconds “Router -> Coordinator”

(1) [Setup] ADC Data Transmission of Router : unused & Transmission Time : 10 seconds



- Input the following into hyper Terminal
- Input “+++” in Hyper Terminal
- “OK” is output from FZ750BX
- After inputting “AT+SETADC1”in Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- After inputting “AT+SETTMR10” in Hyper Terminal, press Enter key
- “OK” is output from FZ750BX
- Now, ADC is unused and transmission time is set to 10 seconds.

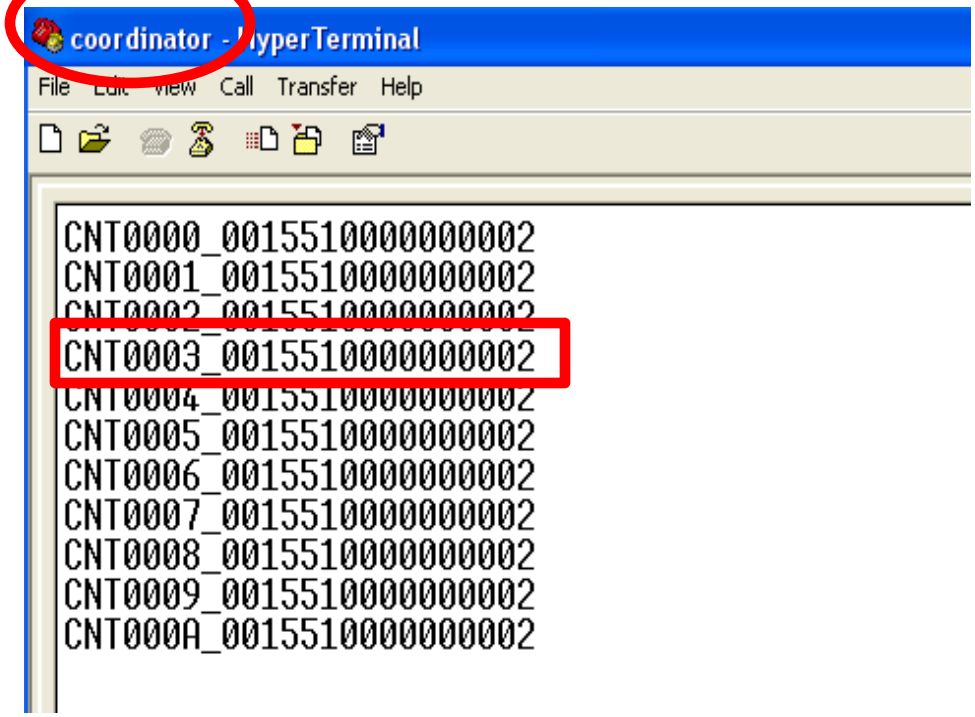
(2) [Setup] COUNT Data Transmission of Router : Use



- Input the following into Hyper Terminal continuously.
- After inputting “AT+SETCOUNT1” into Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- After inputting “ATZ” into Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- FZ750BX device re-started
- “ROUTER START OK” is output from FZ750BX
- “TARGET OK” is output from FZ750BX

- You should restart a Device by using a command “ATZ” to apply the related time matters (AT+SETTMR0) that was set on the previous page

(3) COUNT Data Transmission – Check it in Hyper Terminal of Coordinator every 10 seconds

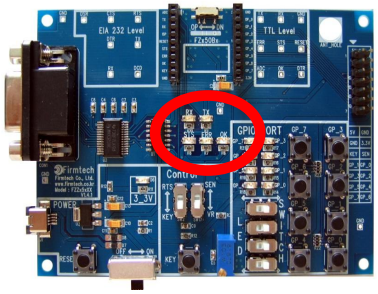


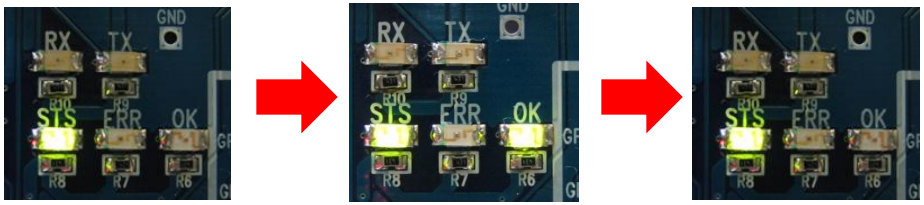
Received data is output in Hyper Terminal every 10 seconds.

- **"CNT" is the received Data type**
- **"0003" is the received COUNT increment.**
- **"0015510000000002" is the Device that transmitted Data**

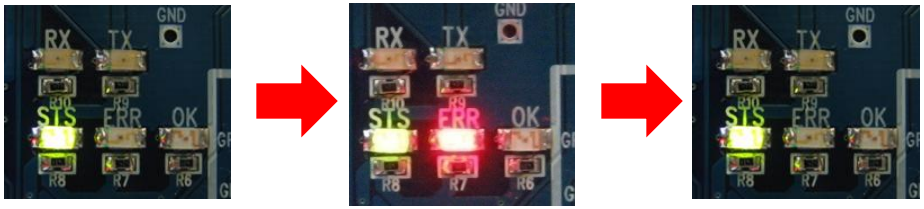
- **In conclusion, FZ750BX set to Coordinator receives Data "COUNT" that has a value "0003" from a Device which has an IEEE ADDRESS "0015510000000002"**

• **OK/ERR LED Status ACK related after Data Transmission (Router)**





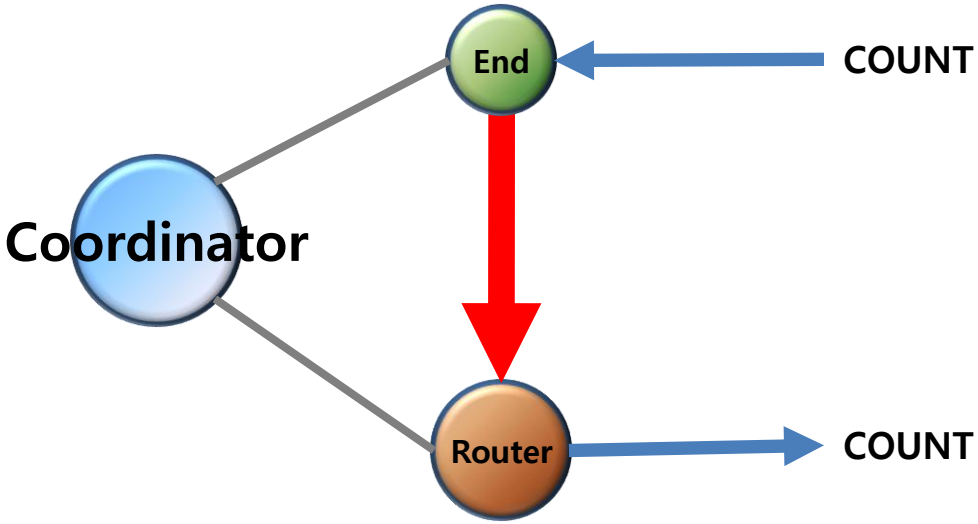
< Case 1. ACK transmission is successfully done>



< Case 2. ACK transmission is failed>

- **OK LED blinks after Data transmission once if the transmission is successful**
- **ERR LED blinks after Data transmission if the transmission is failed**

[9] COUNT Data Transmission from End Device to Router



< The following is a summary of End Device's status>

- **FZ750BX set to End Device enters into a low power consumption mode because it has a Target Device. wake-up does not happen by set time in this situation.**

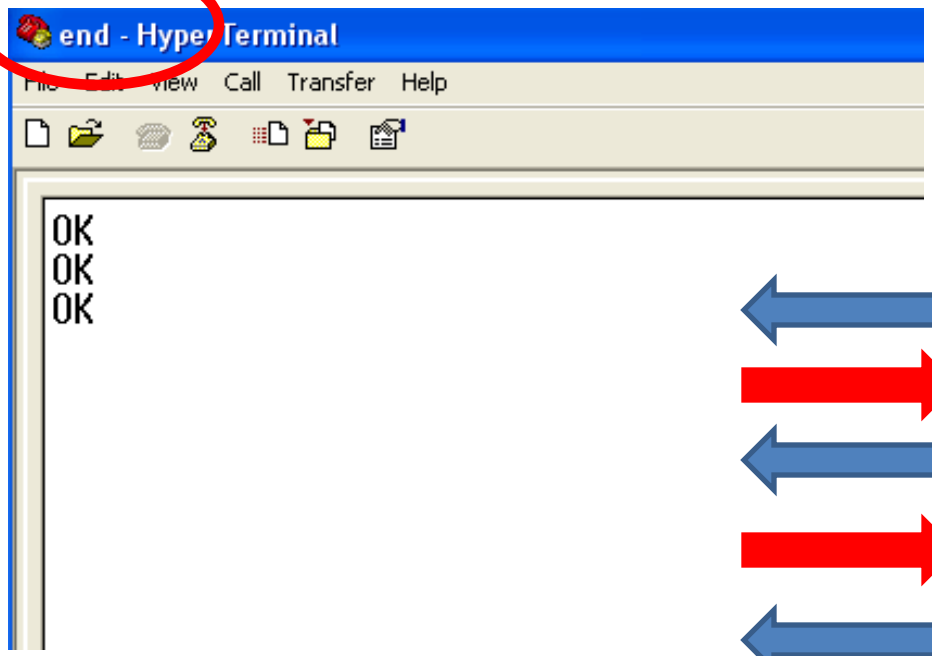
- **You can not input any Serial data while End Device is in a low power consumption mode.**
- **End Device can not receive wireless Data while the End Device is in a low power consumption mode.**

- **In order to input Serial Data, you need to work on the following when End Device is in a low power consumption mode**
  - ✓ **You can check End Device making wake-up at certain time while the End Device is in a wake-up mode. And then, you can input Serial Data before the End Device enters into a low power consumption mode. (It take about 1 second)**

  - ✓ **If End Device does not make wake-up by set time, You should input KEY Data to make End Device start wake-up forcefully, so that you can input Serial Data before the End Device enters into a Low power consumption mode again.**

1. Count Data transmission “End Device -> Router” once every 10 seconds

(1) [Setup] ADC Data Transmission of End Device : use & Transmission time : 10 seconds

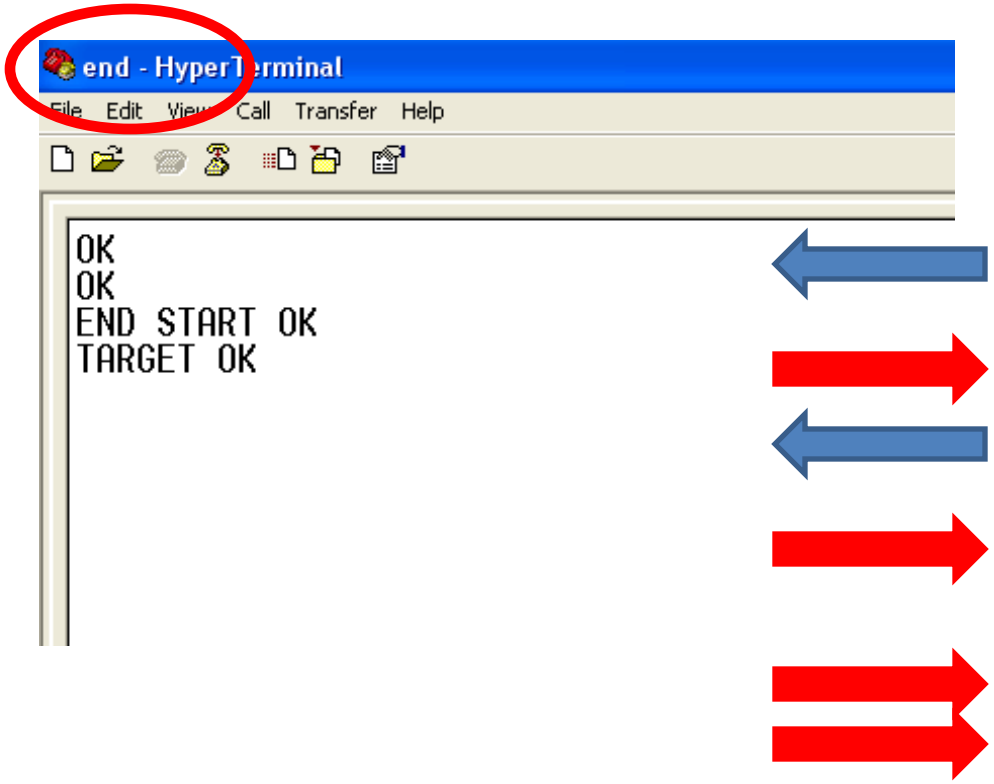


- After putting End Device in a wake-up mode, input the following in Hyper Terminal

- Input “+++” in Hyper Terminal
- “OK” is output from FZ750BX
- After inputting “AT+SETADC1” into Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- After inputting “AT+SETTMR10” in Hyper Terminal, press Enter key
- “OK” is output from FZ750BX

- Now, ADC use is activated and transmission time is set to 10 seconds .

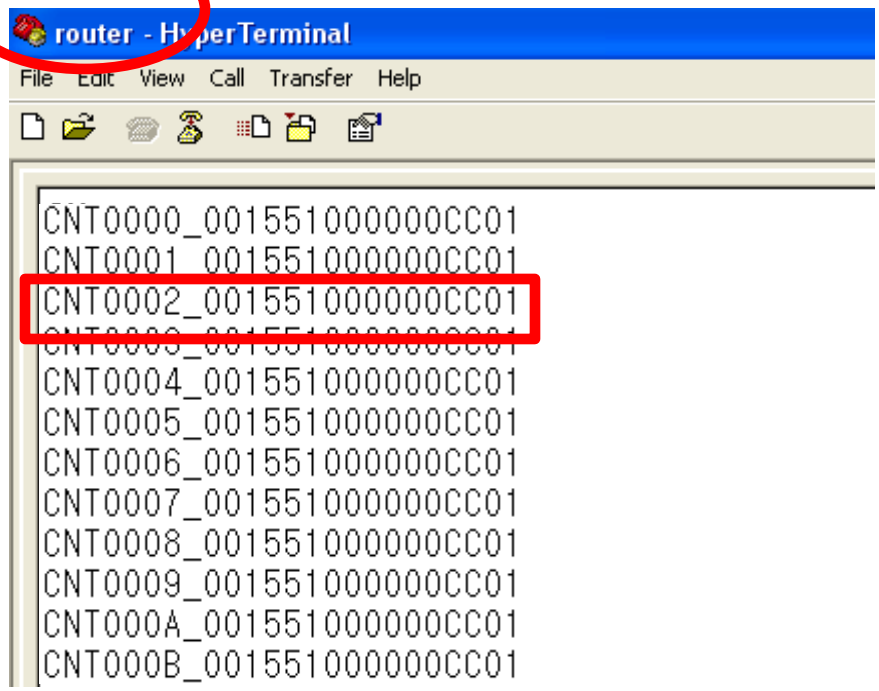
(2) [Setup] COUNT Data Transmission time of End Device : use



- Input the following continuously into Hyper Terminal
- After inputting “AT+SETCOUNT1” into Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- After inputting “ATZ” in Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- FZ750BX device re-started
- “END START OK” is output
- “TARGET OK” is output

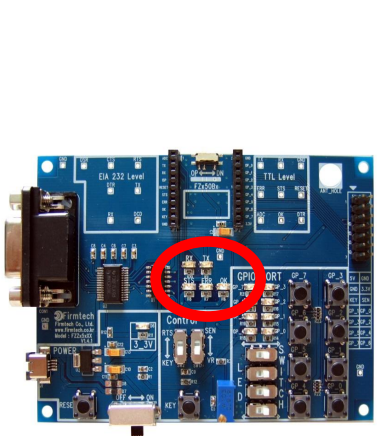
- You should restart a Device by using a command to apply the related time matters (AT+SETTMR0) that was set on the previous page

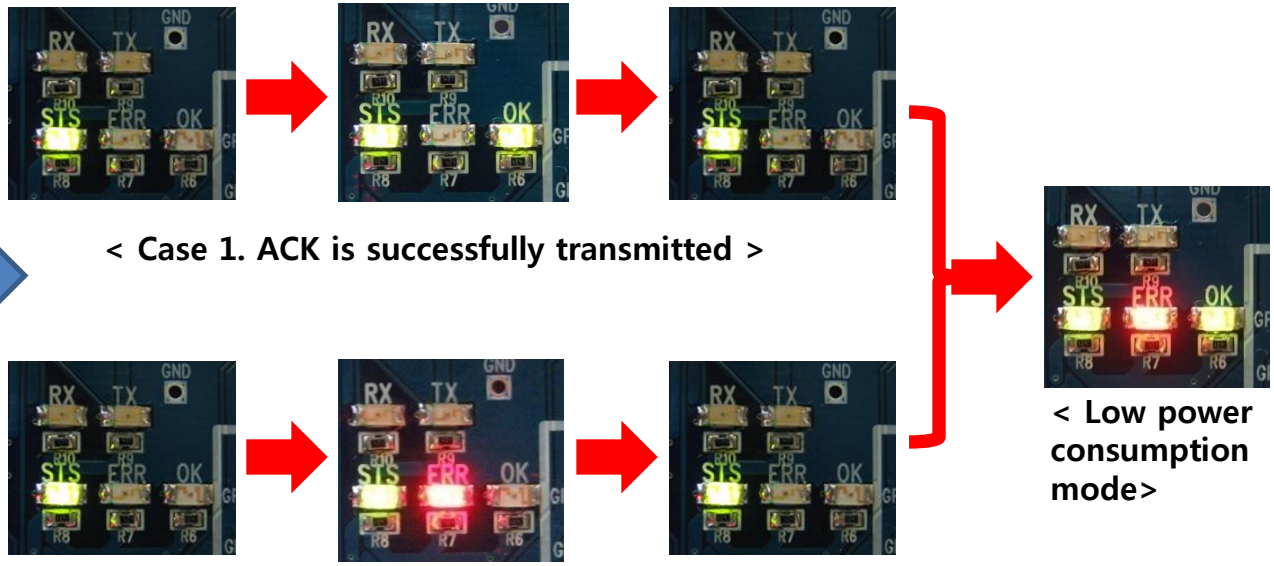
(3) Received COUNT Data check – check it in Hyper Terminal of Router every 10 sec



- Received data is output in Hyper Terminal every 10 seconds.
- "CNT" is the received Data type
- "0005" is the received COUNT increment.
- "001551000000CC01" is the Device that transmitted Data
- In conclusion, FZ750BX set to Router receives Data "COUNT" that has a value "0005" from a Device which has an IEEE ADDRESS "001551000000CC01"

• OK/ERR LED status related ACK after Data Transmission(End Device)





< Case 1. ACK is successfully transmitted >

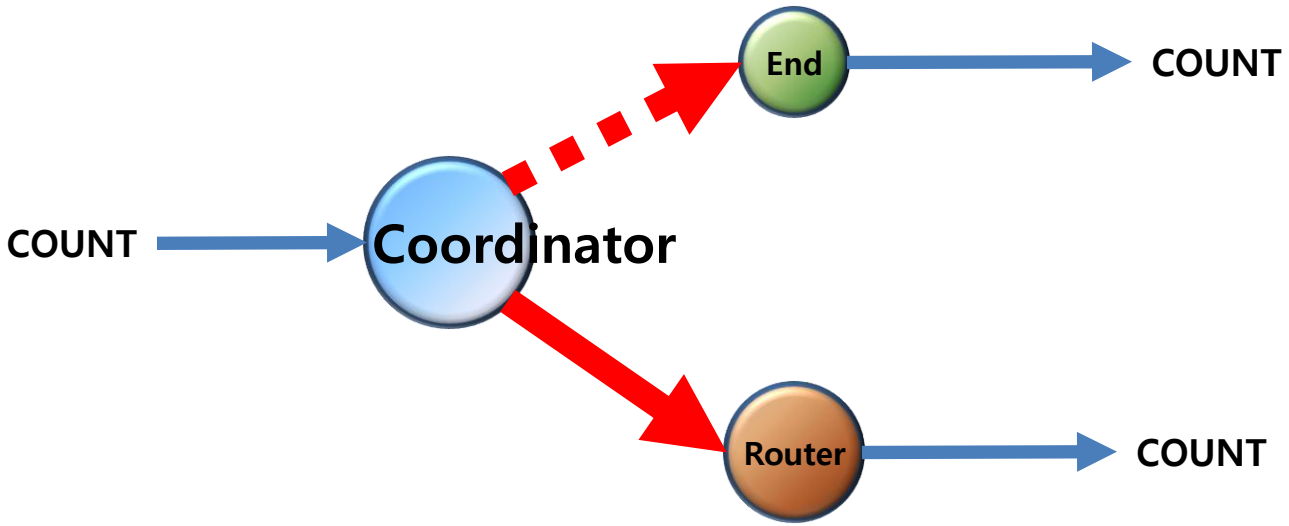
< Case 2. ACK is failed >

< Low power consumption mode>

- OK LED on FZ750BX set to End Device blinks once after Data transmission if the transmission is successfully done.
- ERR LED on FZ750BX set to End Device blinks once after Data transmission if the transmission is failed.

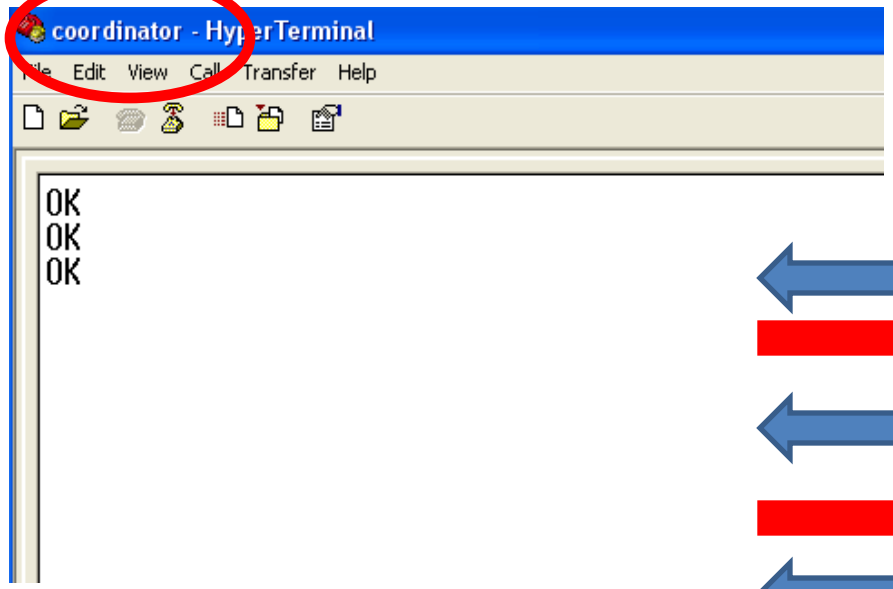
- FZ750BX set to End Device enter into a Low power consumption mode one second after ACK or NACK transmission

[10] COUNT Data Transmission from Coordinator to All devices



1. Count Data Transmission “Coordinator -> ALL Device” every 10 seconds

(1) [Setup] ADC Data transmission of Coordinator : use & Transmission time : 10 seconds

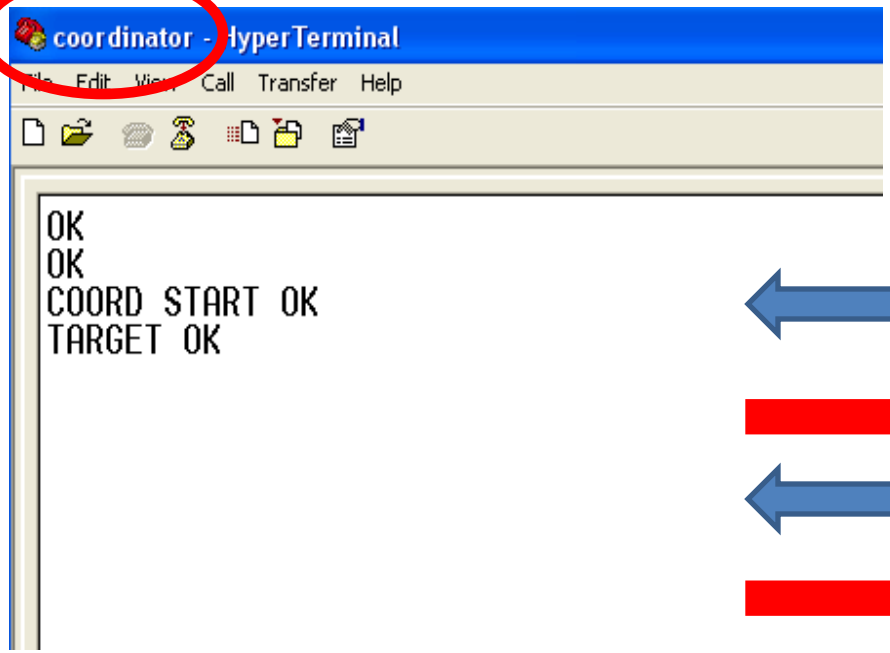


- Input the following into Hyper Terminal

- Input “+++” in Hyper Terminal
- “OK” is output from FZ750BX
- After inputting “AT+SETADC1”, press Enter key.
- “OK” is output from FZ750BX
- After inputting “AT+SETTMR10” in Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX

- Now, ADC use is activated and transmission time is set to 10 seconds .

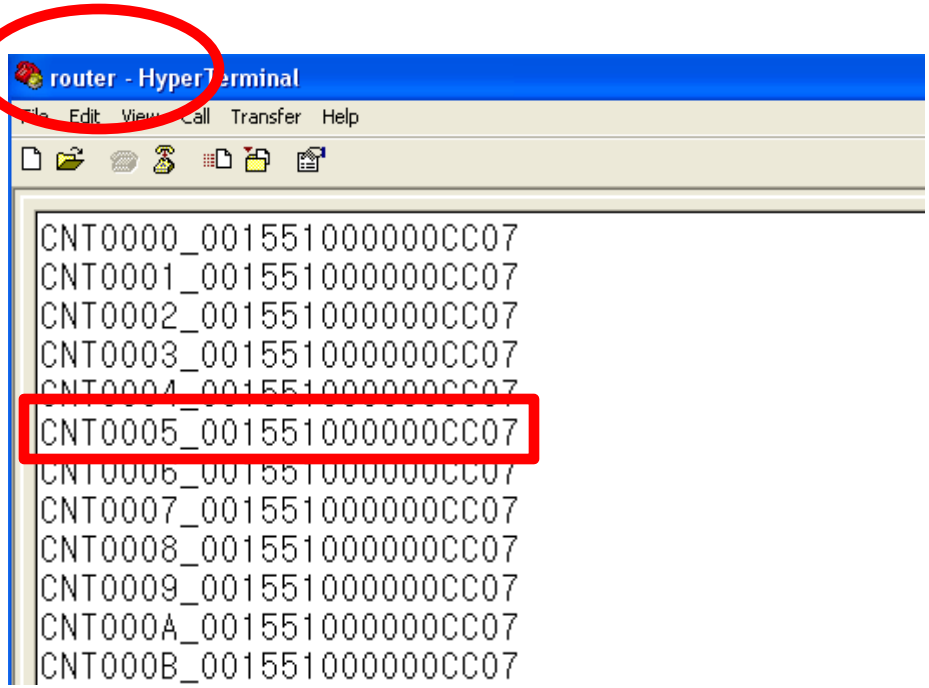
(2) [Setup] COUNT Data transmission of Coordinator : use



- Input the following into Hyper Terminal continuously.
- After inputting “AT+SETCOUNT1” into Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- After inputting “ATZ” into Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- FZ750BX device Re-started
- “COORD START OK” is output from FZ750BX
- “TARGET OK” is output from FZ750BX

- You should re-start a Device by using a command “ATZ” to apply the related time matters (AT+SETTMR0) that was set on the previous page

(3) Received COUNT Data check– check it in Hyper Terminal of Router every 10 sec



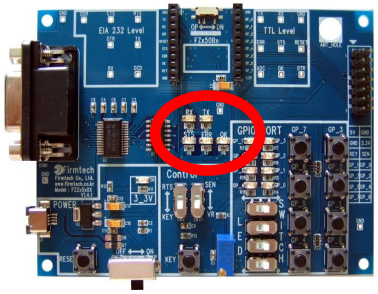
Received data is output in Hyper Terminal every 10 seconds.

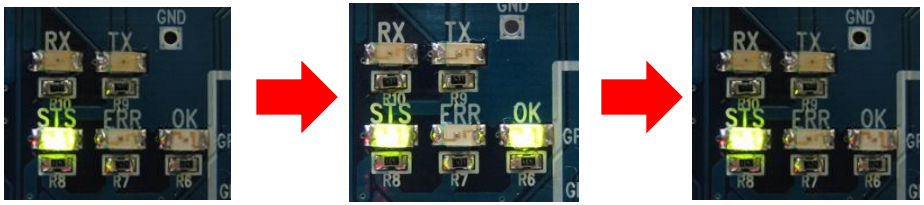
- **"CNT" is the received Data type**
- **"0005" is the received COUNT increment.**
- **"001551000000CC07" is the Device that transmitted Data**

- **In conclusion, FZ750BX set to Router receives Data "COUNT" which has a value "0005" from a Device which has an IEEE ADDRESS "001551000000CC07"**

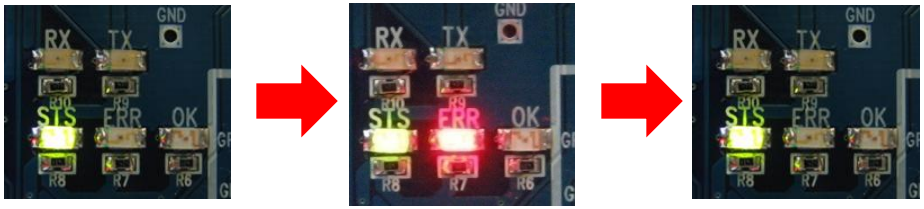
- **FZ750BX set to Coordinator transmits COUNT Data to All Devices**
- **However, FZ750BX set to End Device can not receive the transmitted data from Coordinator because it is in a Low power consumption mode**
- **FZ750BX set to End Device receives COUNT Data in the only case that the FZ750BX is in a wake-up mode by time**
- **End Device outputs wireless Data to Serial port in the only case that it is in a wake-up mode as “CNT0001”, “CNT0003”, and “CNT0005”. End Device can not receive wireless Data, and output data to Serial port while it is in a Low power consumption mode as ”CNT002”, “CNT0004”, “CNT0006”**
- **In order for End Device to receive Data, you should make End Device start wake-up when the End Device is in a low power consumption mode.**
- **End Device outputs wireless Data to Serial port while the End Device is in a wake-up mode.**

• **OK/ERR LED status related ACK after Data Transmission (Coordinator)**





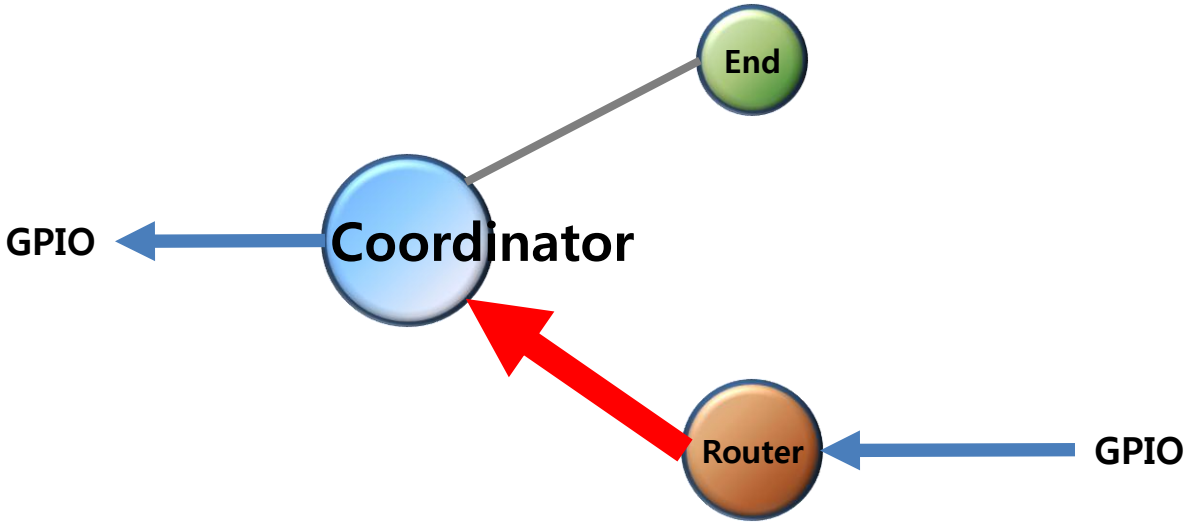
<Case1. Data transmission is done by using wireless >



< Case2. Data transmission is failed >

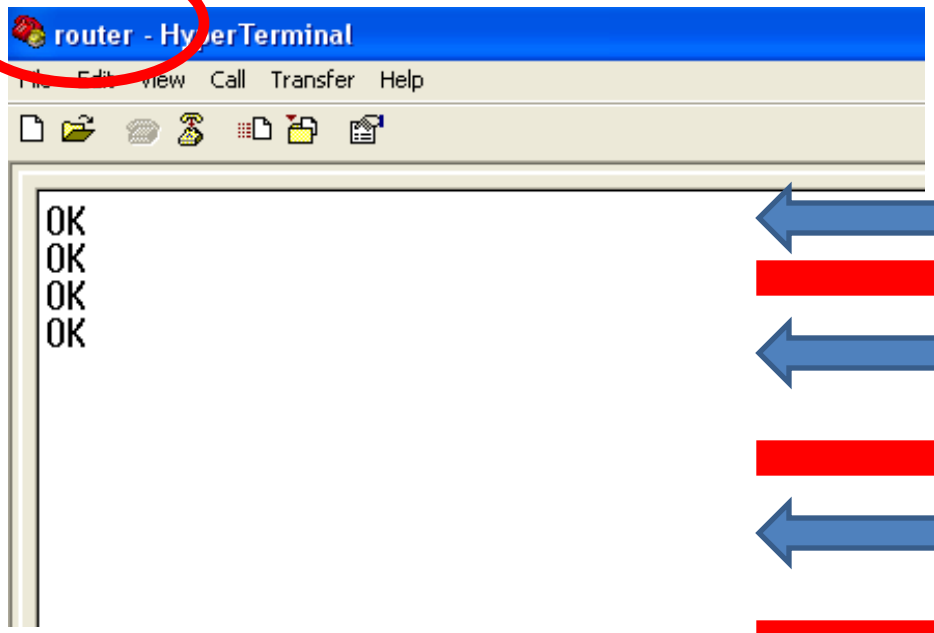
- **FZ750BX set to Coordinator does not receive ACK when it transmits Data to all devices.**
- **FZ750BX set to Coordinator use ERR/OK LED to see if Data is transmitted by using wireless.**
- **OK LED on FZ750BX set to Coordinator blinks once if Data transmission is successfully done by using wireless.**
- **ERR LED on FZ750BX set to Coordinator blinks once if Data transmission is failed.**

[11] GPIO Data Transmission from Router to Coordinator



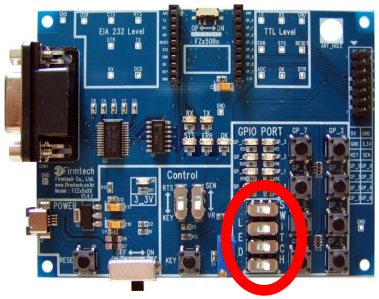
1. GPIO Data Transmission “Router -> Coordinator” : Use ADC

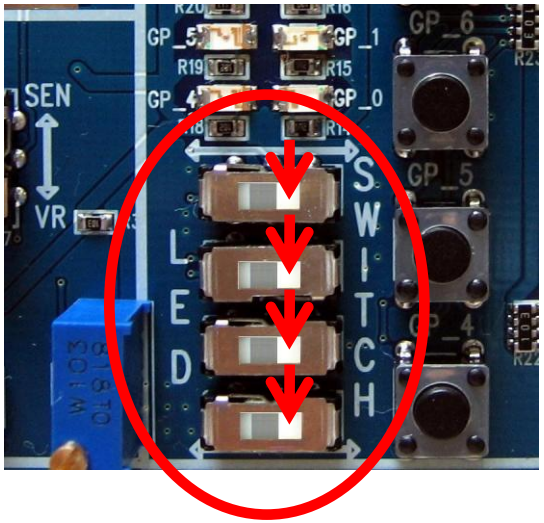
(1) [Setup] COUNT Data Transmission of Router : unused & GPIO Data Input Set-up



- Input the following into Hyper Terminal.
- Input “+++” in Hyper Terminal
- “OK” is output from FZ750BX
- After inputting “AT+SETCOUNT0” in Hyper Terminal, press Enter key
- “OK” is output from FZ750BX
- After inputting “AT+SETGPIO1” in Hyper Terminal, press Enter key
- “OK” is output from FZ750BX
- After inputting “ATO” in Hyper Terminal, press Enter key
- “OK” is output from FZ750BX

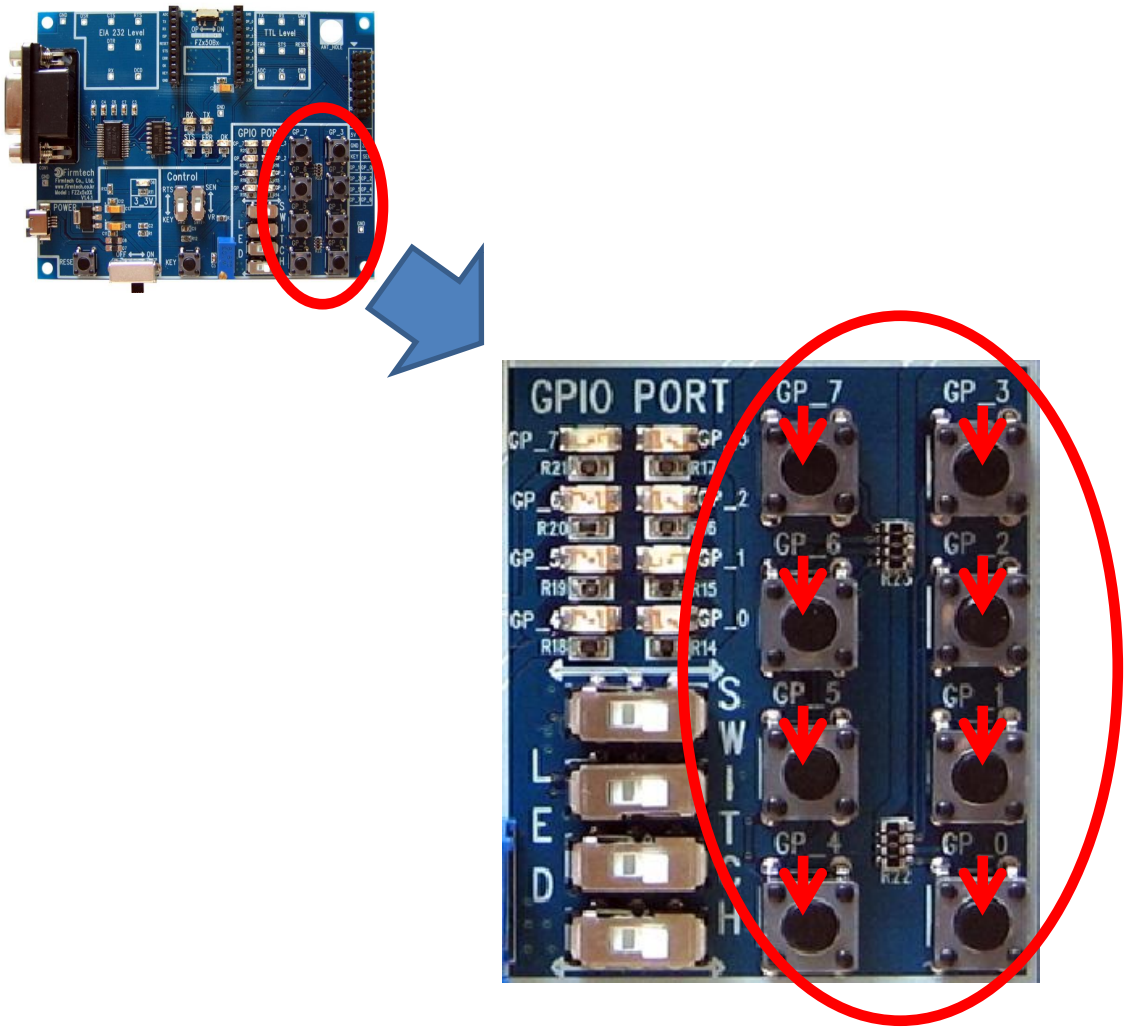
(2) Interface Board of Router GPIO Selection switch – select switch





Select GPIP Selection switch to SWITCH.

(3) GPIO Data input



Input GPIO Data using GPIO Input switch. Keep pushing it until Data transmission time is finished

Input the following GPIO Data.

No pushing: 1111 1111 (= FF)

Push GP_0 : 1111 1110 (= FE)

Push GP_1 : 1111 1101 (= FD)

Push GP_2 : 1111 1011 (= FB)

Push GP_3 : 1111 0111 (= F7)

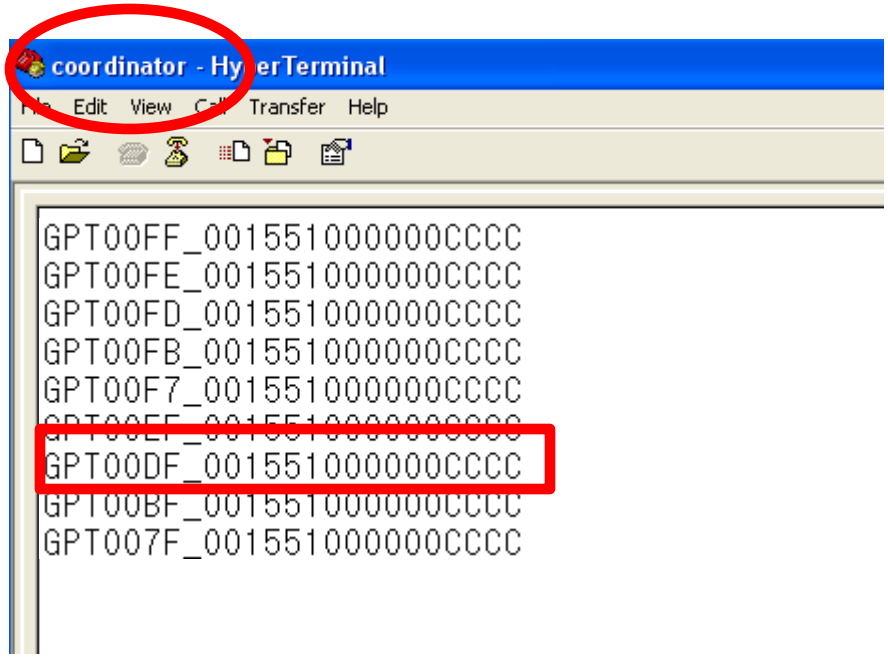
Push GP_4 : 1110 1111 (= EF)

Push GP_5 : 1101 1111 (= DF)

Push GP_6 : 1011 1111 (= BF)

Push GP_7 : 0111 1111 (= 7F)

(4) Received GPIO Data check – Check it in Coordinator of Hyper Terminal every 10 seconds

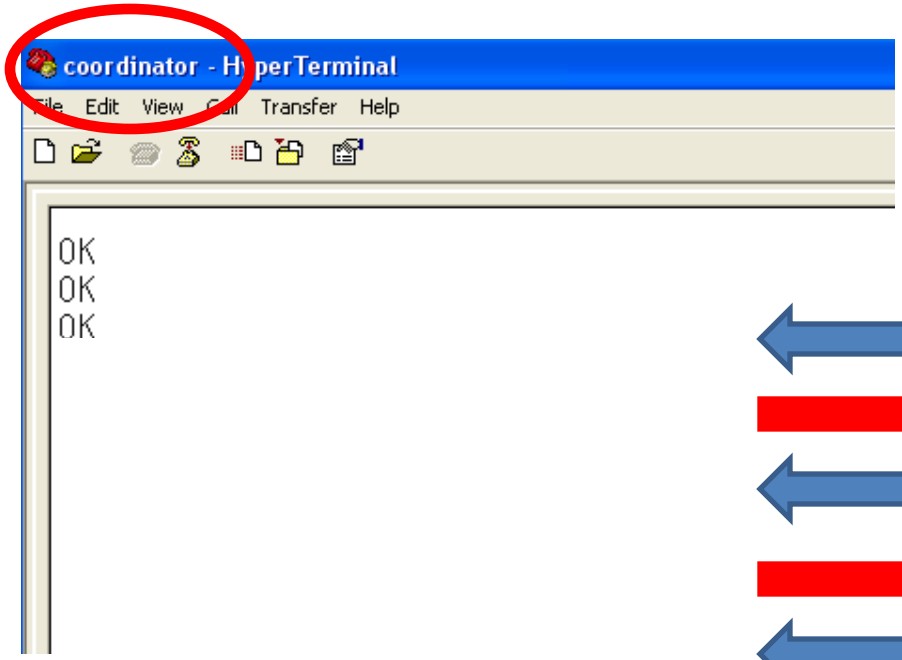


Received data is output in Hyper Terminal every 10 seconds.

- **"GPT" is the received Data type**
- **"00EF" is the received GPIO Data.**
- **"001551000000CCCC" is the Device that transmitted Data**

- **In conclusion, FZ750BX set to Coordinator receives Data "GPIO" that has a value "00EF" from a Device which has an IEEE ADDRESS "001551000000CCCC"**

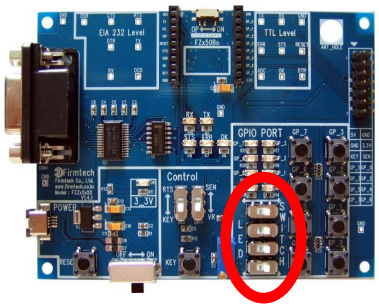
(5) “GPIO Data output” of Coordinator Set-up

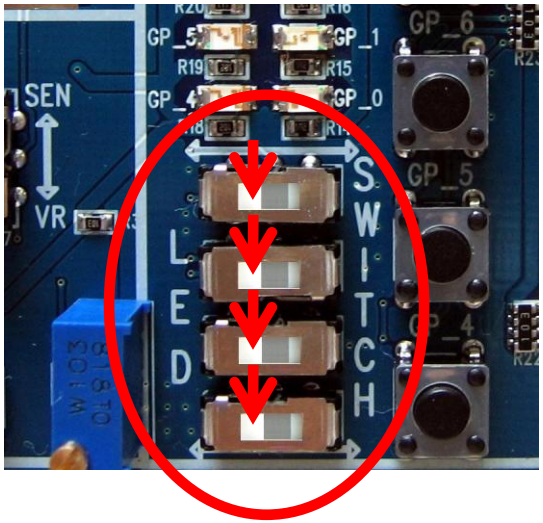


- Input the following into Hyper Terminal

- Input “+++” in Hyper Terminal
- “OK” is output from FZ750BX
- After inputting “AT+SETGPIO2” in Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- After inputting “ATO” in Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX

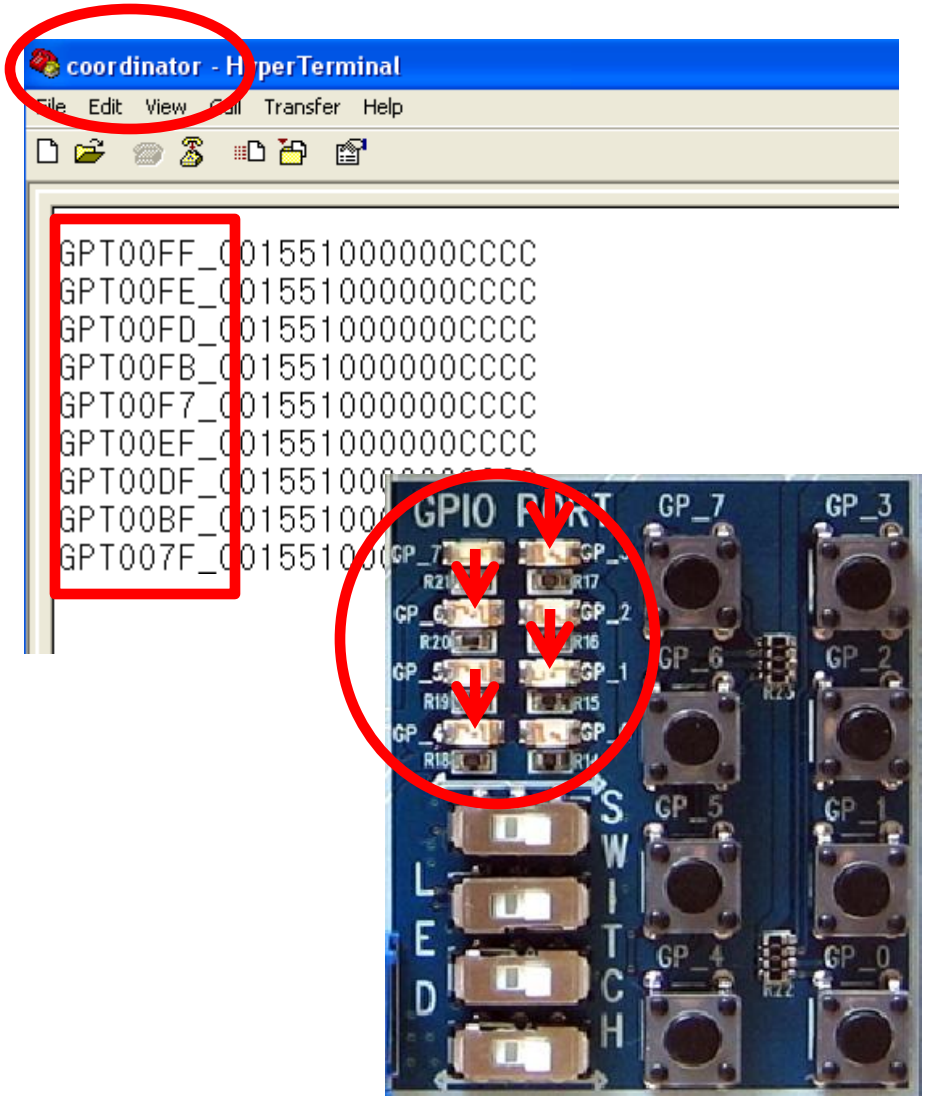
(6) Interface Board of Coordinator GPIO Selection switch – select LED





Select GPIO Selection switch to LED.

(7) Received GPIO Data Check – Check it in Hyper Terminal of Coordinator and on a Interface Board



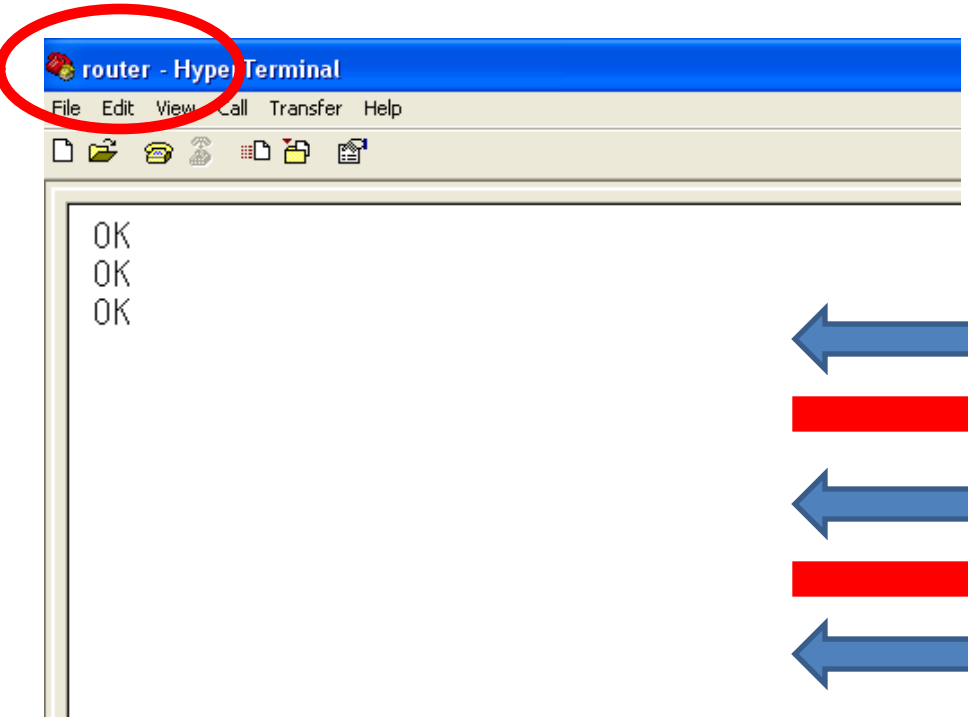
Received data is output once every 10 seconds in Hyper Terminal

GPIO LED on a FZ750BX shows the received Data.

- All GPIO LEDs are turned OFF when they receives “GPT00FF”
- GP_1 LED is turned ON when it receives “GPT00FD” .
- GP_3 LED is turned ON when it receives “GPT00F7”.
- GP_4 LED is turned ON when it receives “GPT00EF”.
- GP_6 LED is turned ON when it receives “GPT00BF”

2. GPIO Data Transmission “Router -> Coordinator” : Use KEY

(1) [Setup] ADC Data Transmission of Router : use & Transmission time : 0sec

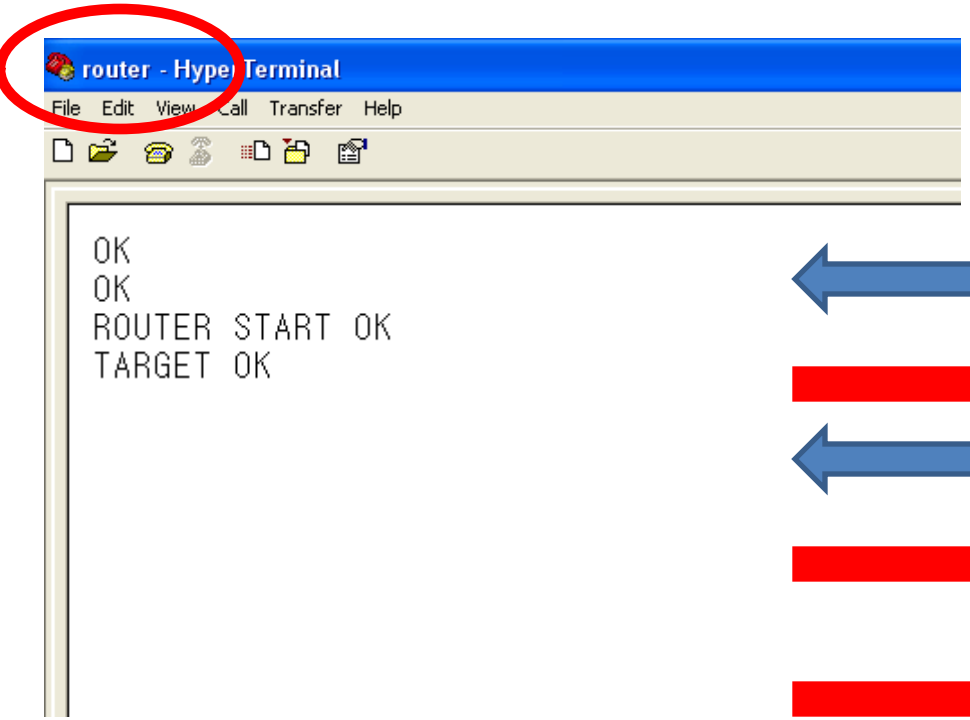


- Input the following into Hyper Terminal.

- Input “+++” in Hyper Terminal
- “OK” is output from FZ750BX
- After inputting “AT+SETADC0” in Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- After inputting “AT+SETTMR0” into Hyper Terminal, press Enter key
- “OK” is output from FZ750BX

- Now, ADC use is activated and transmission time is set to 0 second.

(2) [Setup] KEY Data Transmission of Router : use

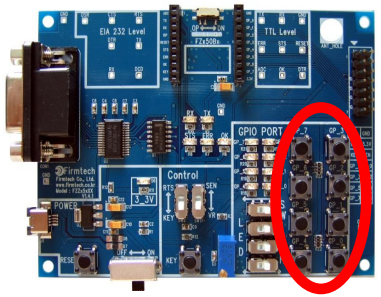


- Input the following continuously into Hyper Terminal

- After inputting “AT+SETKEY1” in Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- After inputting “ATZ” into Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- FZ750BX Device is re-started
- “ROUTER START OK” is output
- “TARGET OK” is output

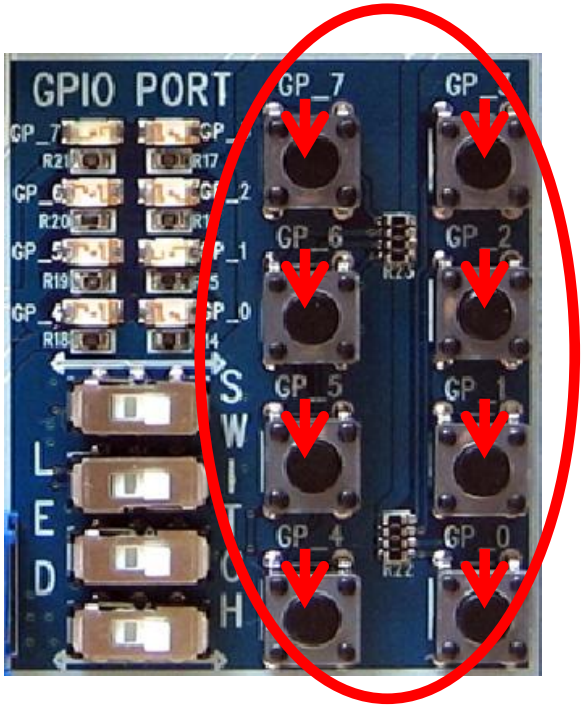
- You should restart Device by using a command “ATZ” to apply the related time matter (AT+SETTMR0) that was already done on the previous page

(3) GPIO Data input & Data Transmission

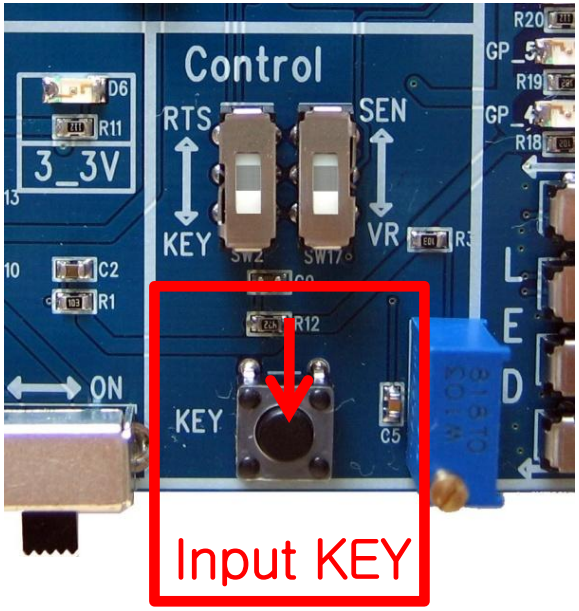


Input GPIO data using an Input GPIO switch.

Transmit GPIO Data using a KEY switch on FZ750BX with the GPIO Data input

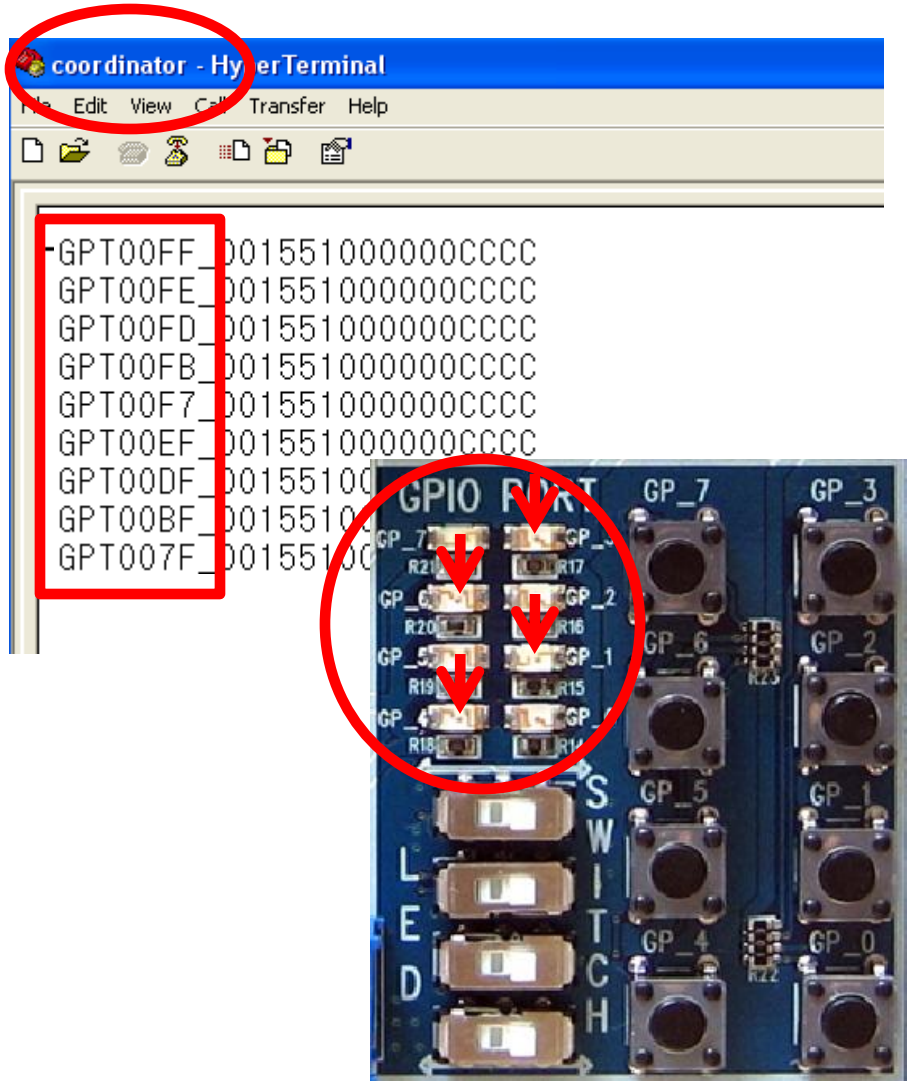


(1) GPIO Data Input



(2) Data Transmission

(4) Received GPIO Data Check– Check it in Coordinator of Hyper Terminal and an Interface Board

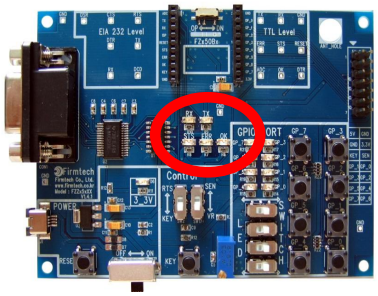


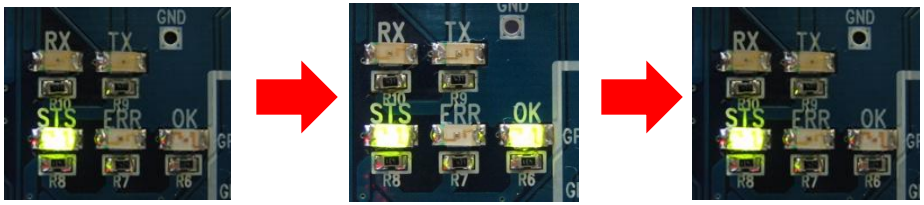
Received data is output once every 10 seconds in Hyper Terminal

GPIO LED on a FZ750BX shows the received Data.

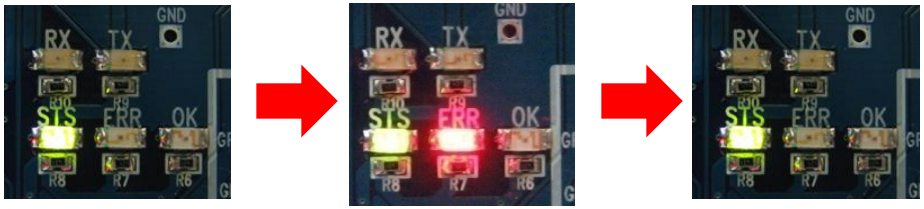
- All GPIO LEDs are turned OFF when they receives “GPT00FF”
- GP_1 LED is turned ON when it receives “GPT00FD” .
- GP_3 LED is turned ON when it receives “GPT00F7”.
- GP_4 LED is turned ON when it receives “GPT00EF”.
- GP_6 LED is turned ON when it receives “GPT00BF”

• **OK/ERR LED status related ACK after Data Transmission (Router)**





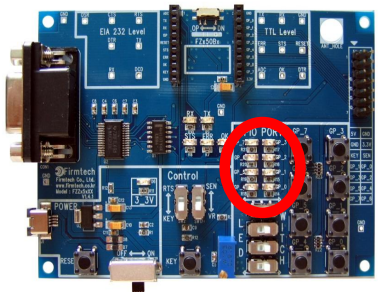
< Case1. ACK transmission is successfully done >



< Case2. ACK transmission is failed >

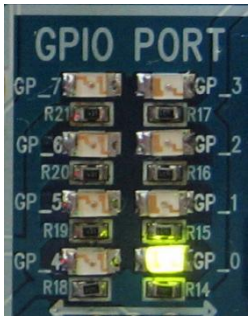
- **OK LED on FZ750BX set to Router blinks once after Data Transmission if the data transmission is successfully done**
- **ERR LED on FZ750BX set to Router blinks once after Data transmission if the transmission is failed.**

• **GPIO LED status after GPIO Data Transmission (Coordinator)**



GPT00FF

- **FZ750BX set to Coordinator operates GPIO LED depending on a received GPIO Data value.**



GPT00FE

GPT00FD

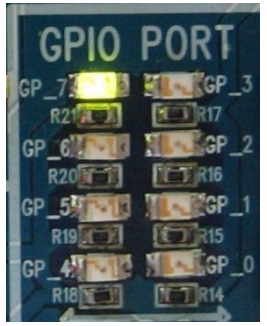
GPT00FB

GPT00F7

GPT00EF

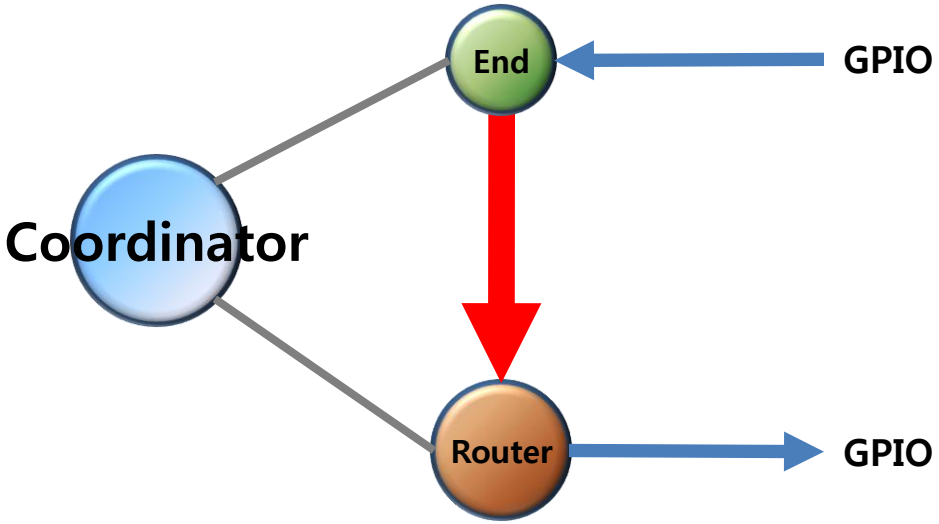
GPT00DF

GPT00BF



GPT007F

[12] GPIO Data Transmission from End Device to Router

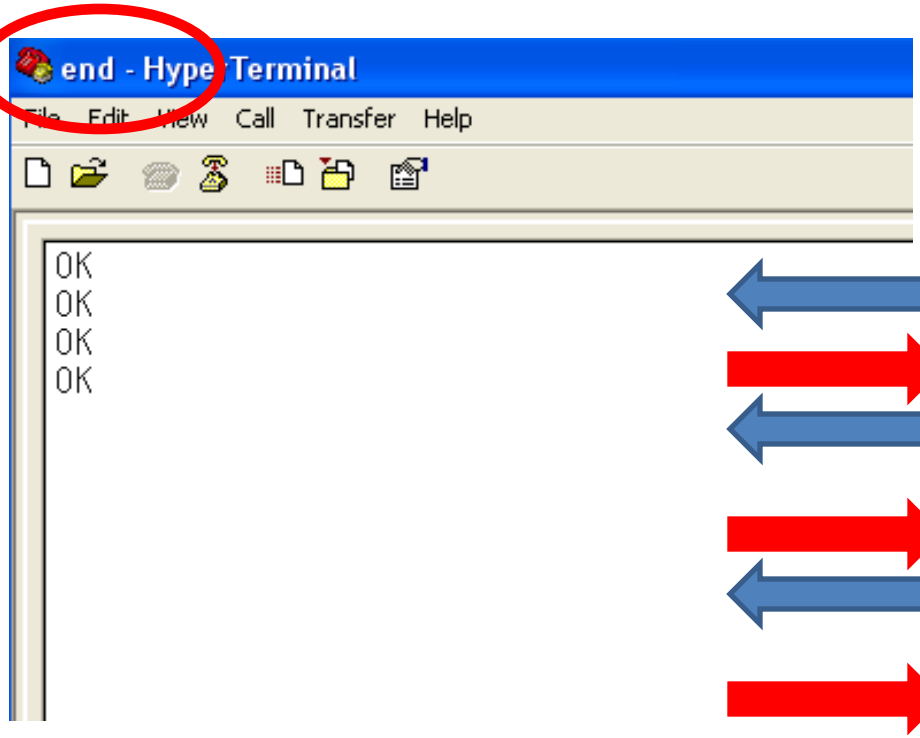


< The following is a summary of End Device's status >

- **FZ750BX set to End Device enters into a Low power consumption mode automatically because it has a Target Device(The Target Device was set on the previous page), and makes wake-up once every 10 seconds**
- **You can not input any Serial Data while End Device is in a Low power consumption mode**
- **End Device can not receive Data while it is in a Low power consumption mode.**
- **In order to input Serial Data, you need to work on the following while End Device is in a low power consumption mode.**
  - ✓ **You can check End Device making wake-up by set time, and then you can input Serial Data before it goes into a Low power consumption mode.(it takes about 1 second.)**
  - ✓ **You should make End Device start wake-up forcefully by inputting KEY Data if the End Device doesn't wake-up by set time, so that you can input Serial Data before the End Device goes into a low power consumption mode again.**

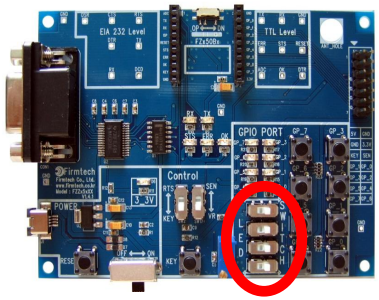
1. GPIO Data Transmission “End Device -> Router” : Use ADC

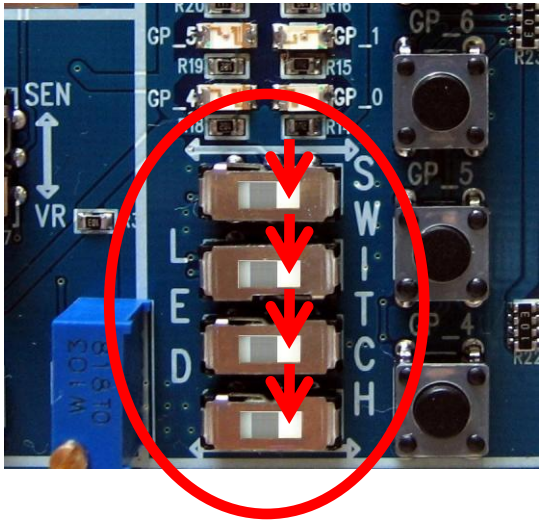
(1) [Setup] COUNT Data of End Device Transmission : use & GPIO Data : Input



- After making End Device start wake-up, input the following into Hyper Terminal.
- Input “+++” in Hyper Terminal
- “OK” is output from FZ750BX
- After inputting “AT+SETCOUNT0” in Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- After inputting “AT+SETGPIO1” in Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- After inputting “ATO” in Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX

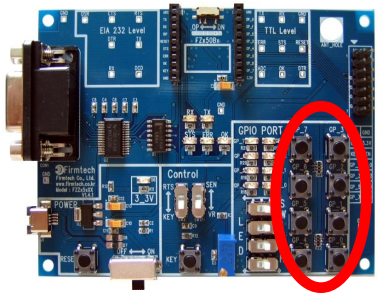
(2) Interface Board of GPIO GPIO Selection switch – Select SWITCH

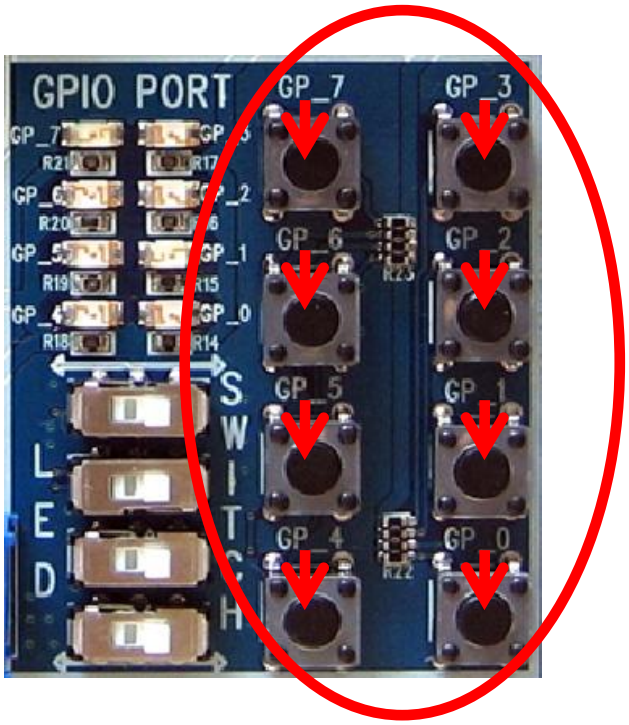




Select GPIO Selection switch to SWITCH

(3) GPIO Data input





Input GPIO Data using GPIO Input switch. Keep pushing until Data transmission time is finished

Input the following GPIO Data.

No pushing: 1111 1111 (= FF)

Push GP_0 : 1111 1110 (= FE)

Push GP_1 : 1111 1101 (= FD)

Push GP_2 : 1111 1011 (= FB)

Push GP_3 : 1111 0111 (= F7)

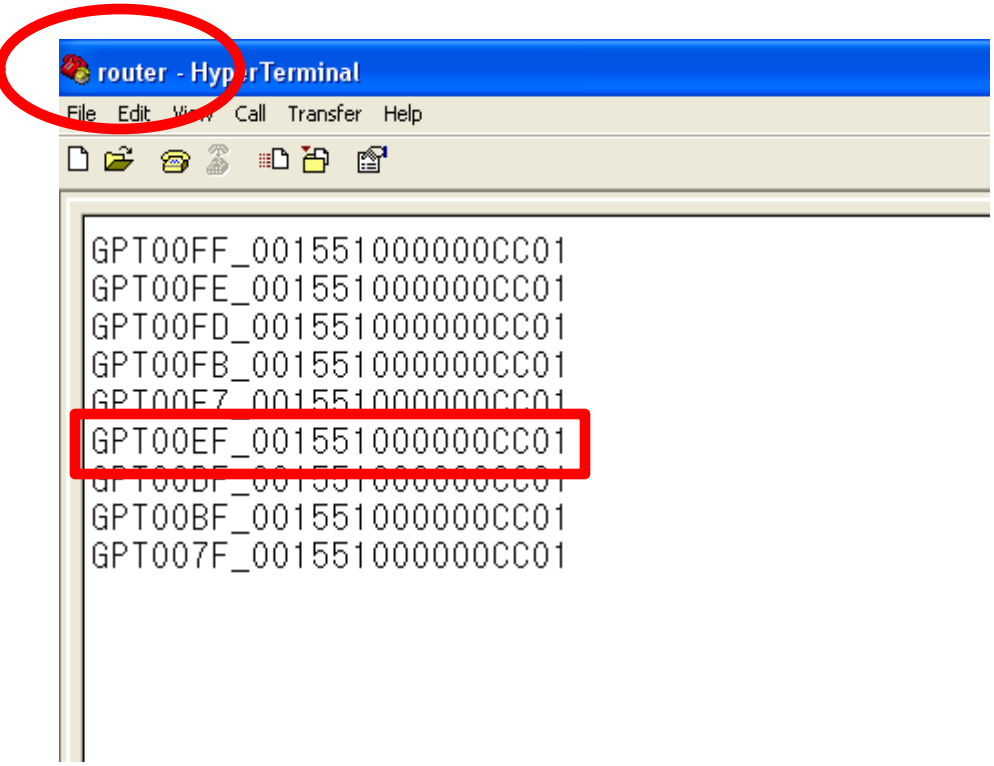
Push GP_4 : 1110 1111 (= EF)

Push GP_5 : 1101 1111 (= DF)

Push GP_6 : 1011 1111 (= BF)

Push GP_7 : 0111 1111 (= 7F)

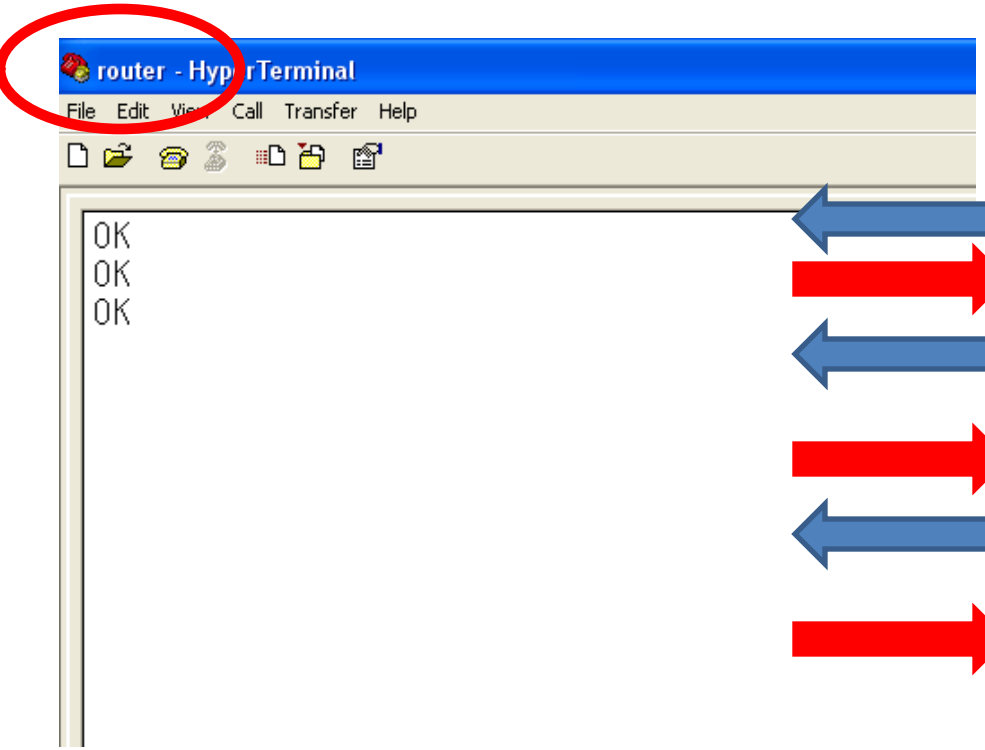
(4) Received GPIO Data Check – Check it in Hyper Terminal of Router every 10 seconds



Received Data is output in Hyper Terminal every 10 seconds

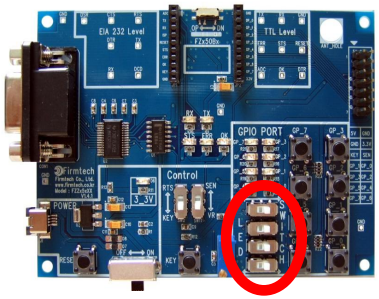
- "GPT" is the received Data type
- "00EF" is the received GPIO Data
- "001551000000CC01" is the Device that transmitted Data
- In conclusion, FZ750BX receives Data "GPIO" that has a value "00EF" from a Device which has an IEEE address "001551000000CC01"

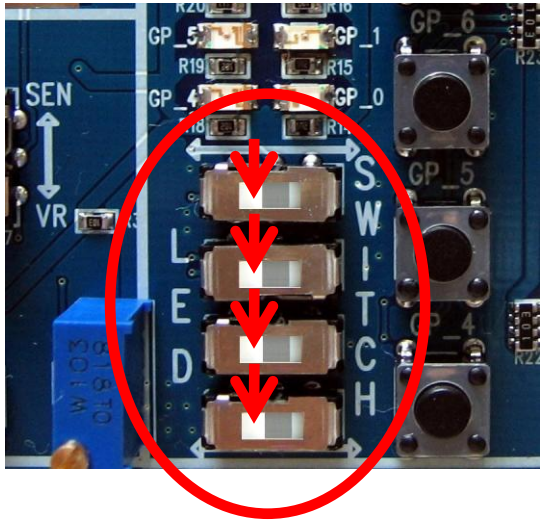
(5) “GPIO Data Input” of Router



- Input the following in Hyper Terminal.
- Input “+++” in Hyper Terminal
- “OK” is output from FZ750BX
- After inputting “AT+SETGPIO2” in Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- After inputting “ATO” in Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX

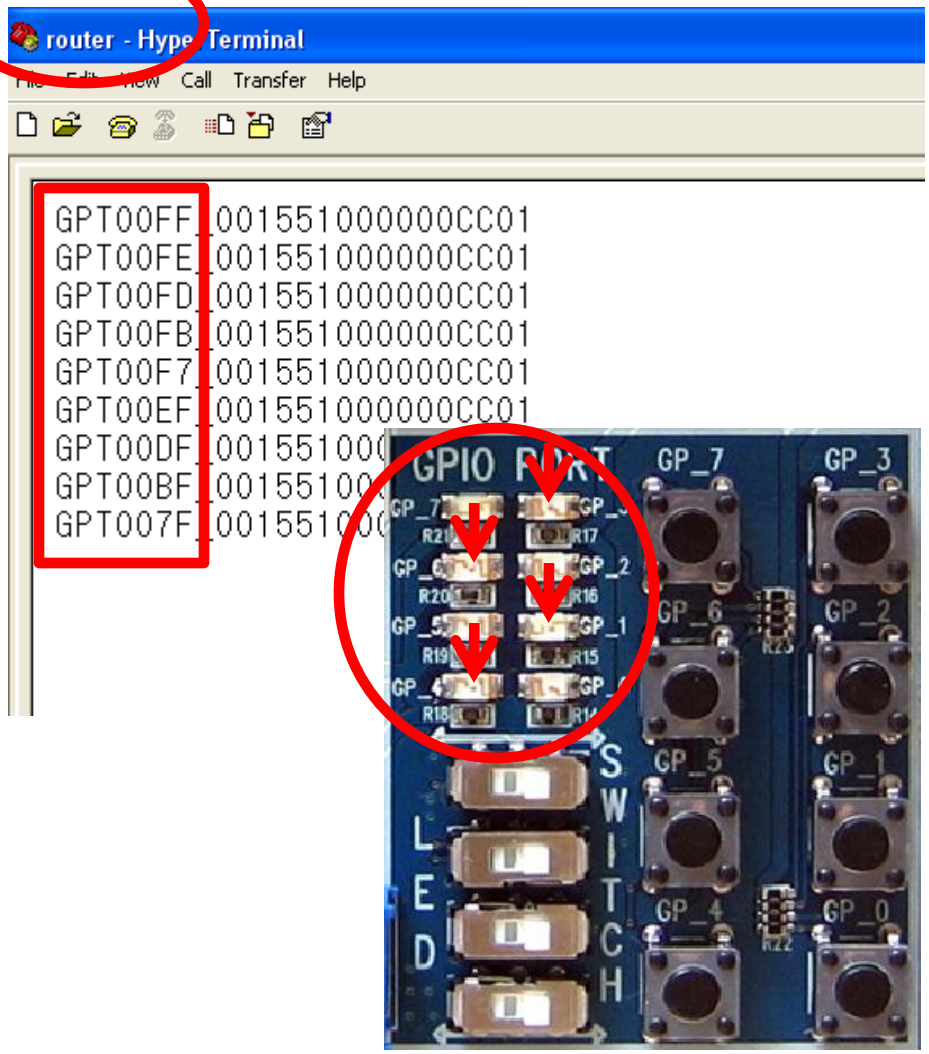
(6) Interface Board of Router GPIO Selection switch – Select LED





Select GPIO Selection switch to LED.

(7) Received GPIO Data Check – Check it in Hyper Terminal of Router and an Interface Board



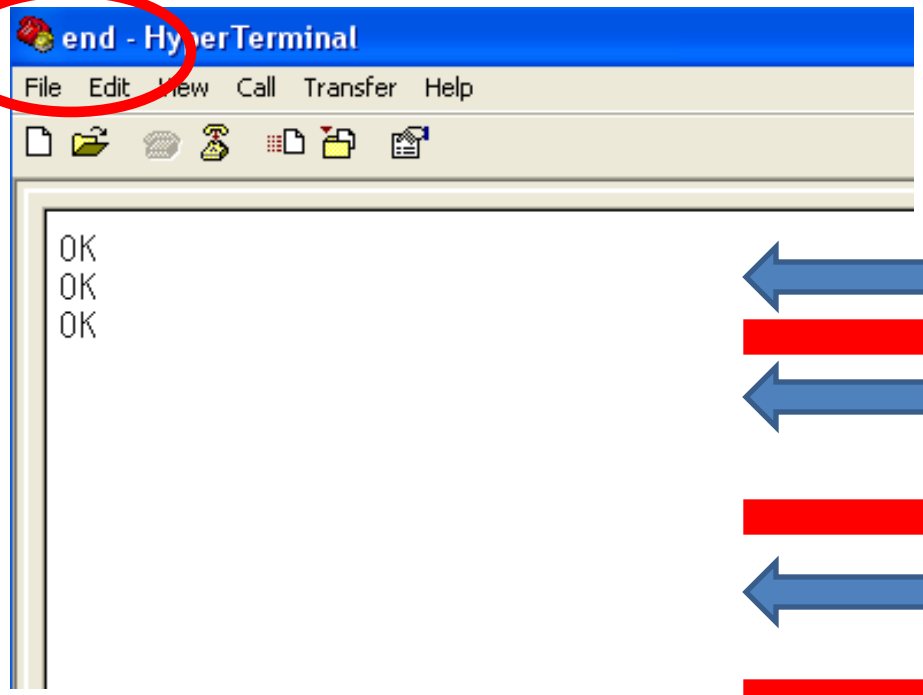
Received data is output once every 10 seconds in Hyper Terminal

GPIO LED on a FZ750BX shows the received Data.

- All GPIO LEDs are turned OFF when they receives “GPT00FF”
- GP_1 LED is turned ON when it receives “GPT00FD” .
- GP_3 LED is turned ON when it receives “GPT00F7”.
- GP_4 LED is turned ON when it receives “GPT00EF”.
- GP_6 LED is turned ON when it receives “GPT00BF”

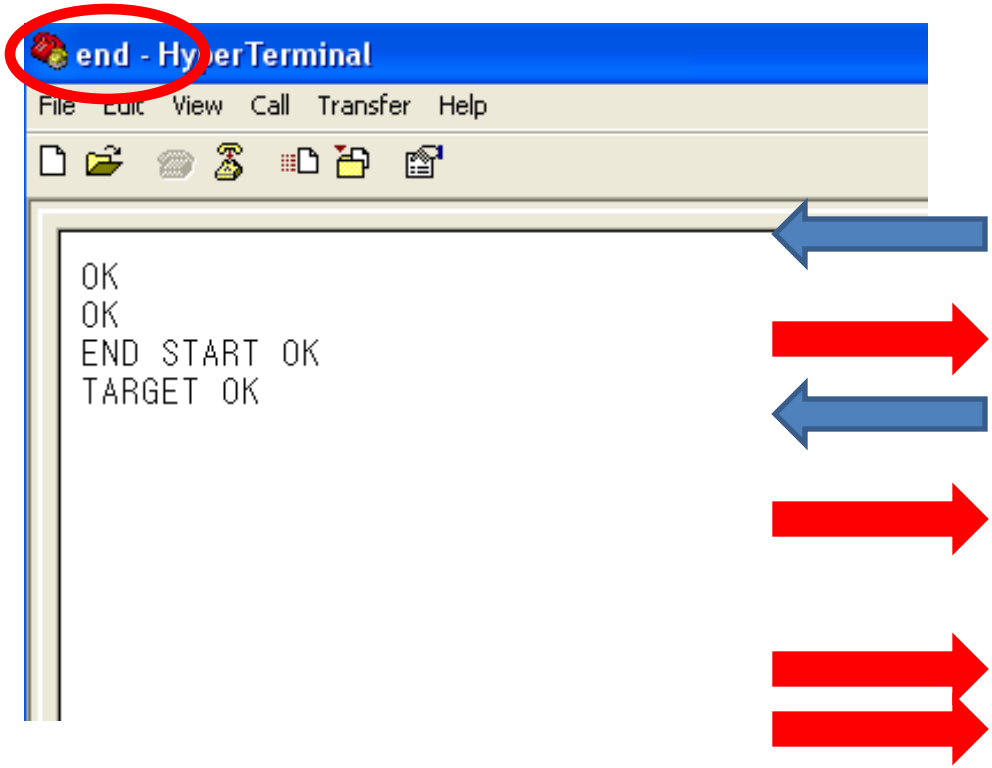
2. GPIO Data Transmission “End Device -> Router” : Use KEY

(1) [Setup] ADC Data Transmission of End Device : unused & Transmission time : 0



- After making End Device wake-up, input following into Hyper Terminal.
- Input “+++” in Hyper Terminal
- “OK” is output from FZ750BX
- After inputting “AT+SETADC0” in Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- After inputting “AT+SETTMR0” in Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- Now, ADC is unused and transmission time is set to 0 second.

(2) [Setup] Received KEY Data Transmission : use



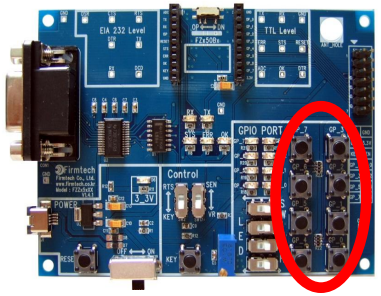
- Input the following continuously into Hyper Terminal
- After inputting “AT+SETKEY1” in Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- After inputting “ATZ” into Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- FZ750BX Device Re-start
- “END START OK” is output
- “TARGET OK” is output

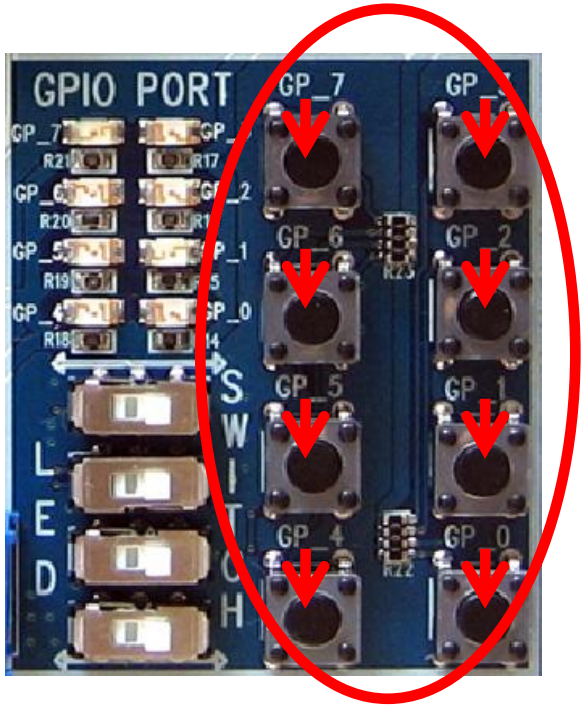
- You should re-start Device by using a command “ATZ” to apply the related time matter(AT+SETTMR0) that was already done on the previous page

(3) GPIO Data Input & Data Transmission

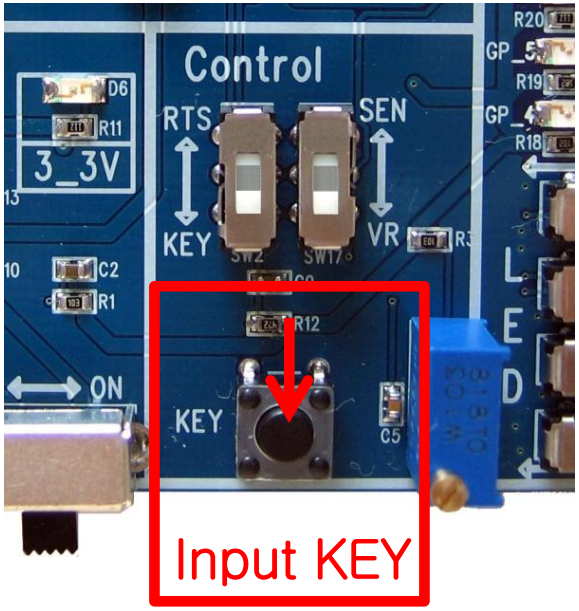
Input GPIO Data using GPIO Input switch on a FZ750BX set to End Device.

Transmit GPIO Data by pushing a KEY switch as GPIO Data Input keeps being pressed.



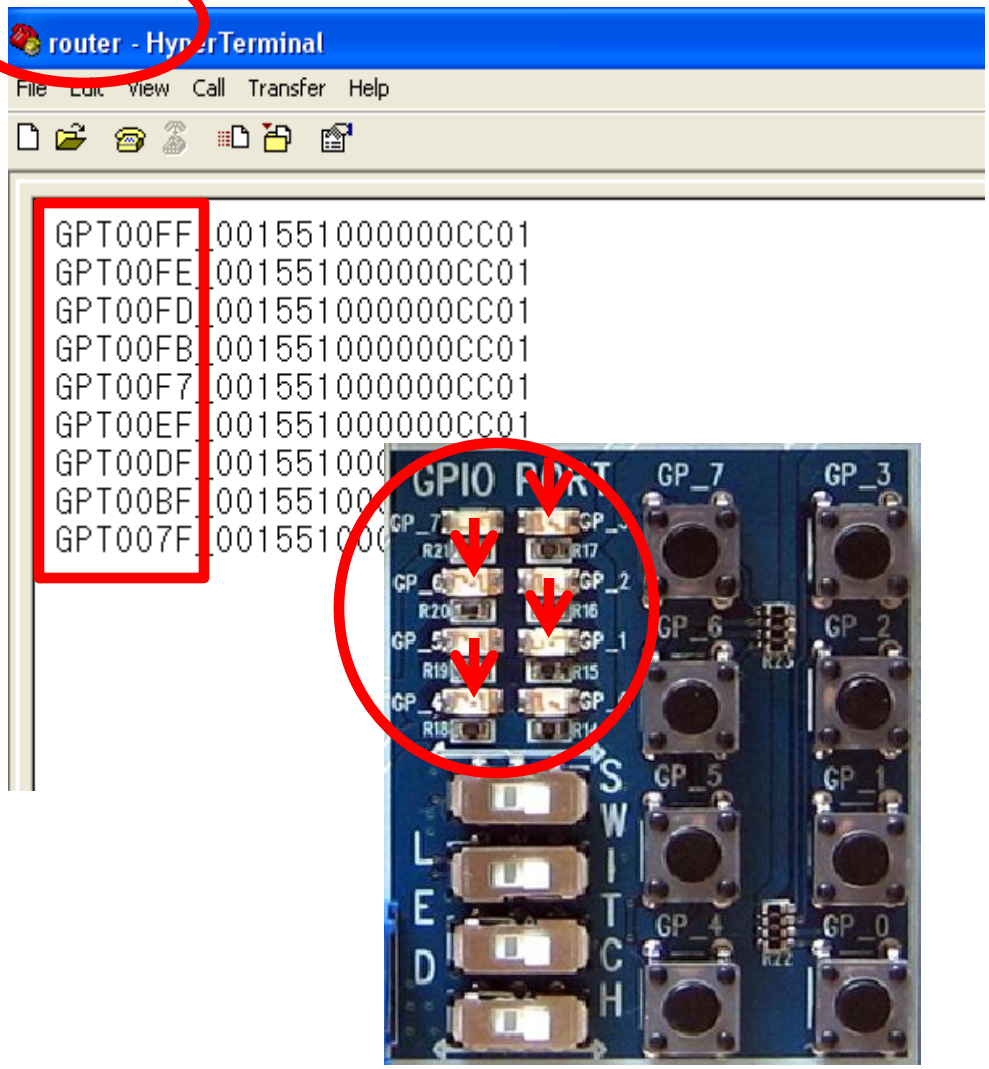


(1) GPIO Data Input



(2) Data Transmission

(4) Received GPIO Data Check – Check it in Hyper Terminal of Router and an Interface Boar

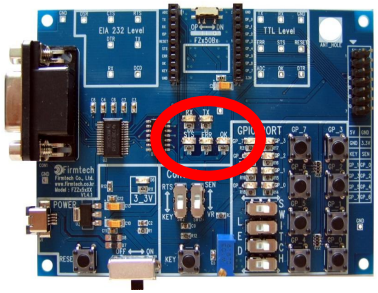


Received data is output once every 10 seconds in Hyper Terminal

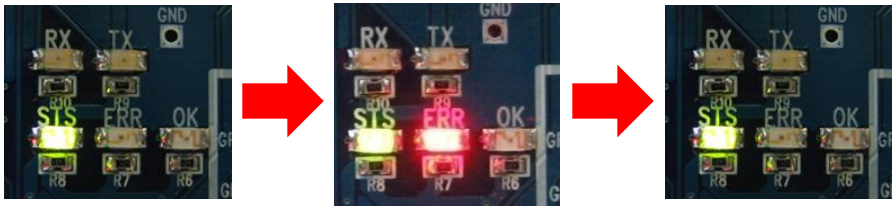
GPIO LED on a FZ750BX shows the received Data.

- All GPIO LEDs are turned OFF when they receives “GPT00FF”
- GP_1 LED is turned ON when it receives “GPT00FD” .
- GP_3 LED is turned ON when it receives “GPT00F7”.
- GP_4 LED is turned ON when it receives “GPT00EF”.
- GP_6 LED is turned ON when it receives “GPT00BF”

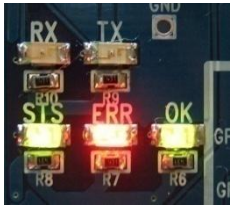
• OK/ERR LED status related ACK after Data Transmission (End Device)



< Case1. ACK Transmission is successfully done >



< Case2. ACK transmission is failed >

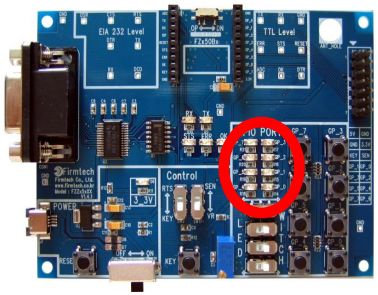


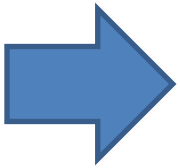
< Low power consumption mode>

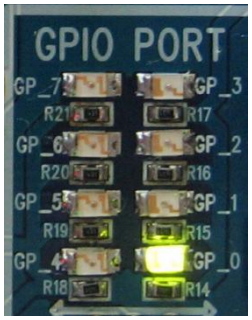
- OK LED on FZ750BX set to End Device blinks once if Data transmission is successfully done
- ERR LED on FZ750BX set to End Device blinks once if Data transmission is failed.
- FZ750BX set to End Device enters into a Low power consumption mode 1 second after it receives ACK or NACK

• GPIO LED status after GPIO Data transmission (Router)

GPT00FF







GPT00FE

GPT00FD

GPT00FB

GPT00F7

- FZ750BX set to Router operates GPIO LED depending of the received GPIO Data value

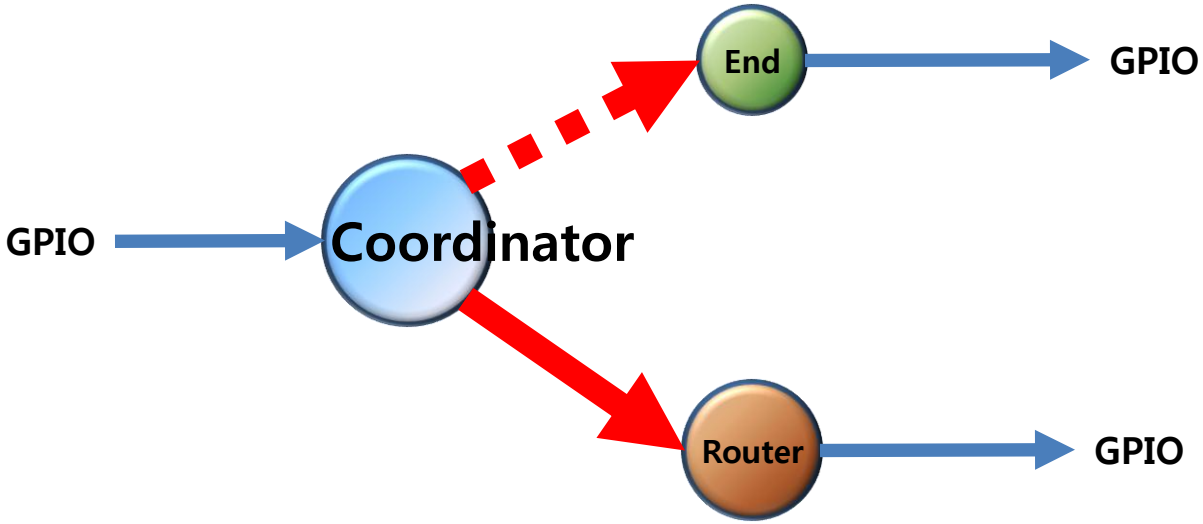
GPT00EF

GPT00DF

GPT00BF

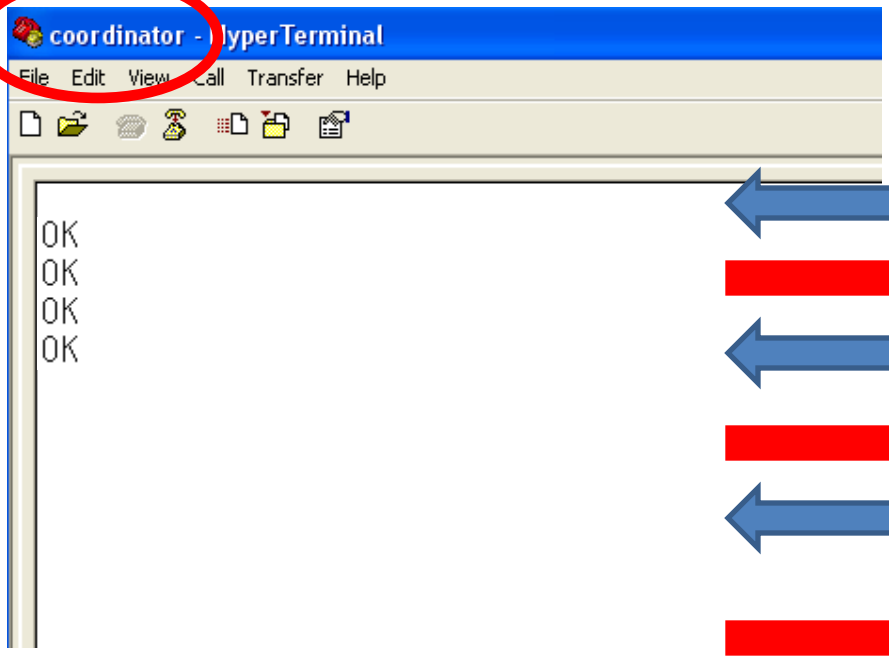
GPT007F

[13] GPIO Data Transmission from Coordinator to All the Devices



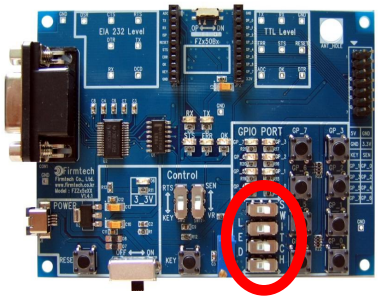
1. GPIO Data Transmission “Coordinator -> ALL Device” : Use ADC

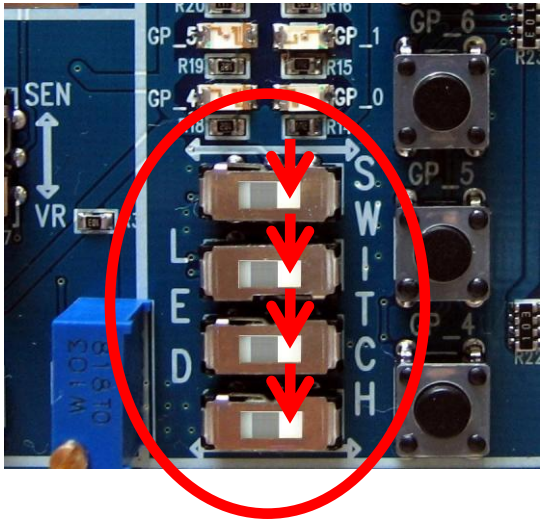
(1) [Setup] Coordinator COUNT Data transmission : unused & GPIO Data : Input



- Input The following in Hyper Terminal.
- Input “+++” in Hyper Terminal
- “OK” is output from FZ750BX
- After inputting “AT+SETCOUNT0” in Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- After inputting “AT+SETGPIO1” in Hyper Terminal, press Enter key.
- “OK” is output
- After inputting “ATO” in Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX

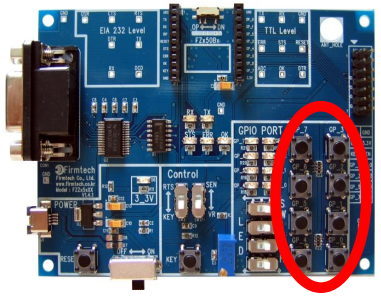
(2) Interface Board GPIO Selection switch of Coordinator

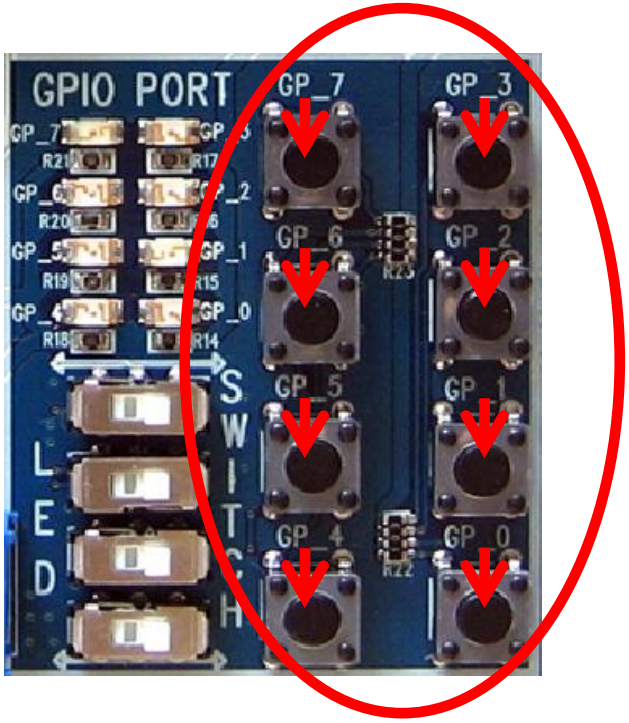




Select SWITCH on GPIO Selection switch SWITCH

(3) GPIO Data input





Input GPIO Data using GPIO Input switch. Keep pushing until Data transmission time is finished

Input the following GPIO Data.

No pushing : 1111 1111 (= FF)

Push GP_0 : 1111 1110 (= FE)

Push GP_1 : 1111 1101 (= FD)

Push GP_2 : 1111 1011 (= FB)

Push GP_3 : 1111 0111 (= F7)

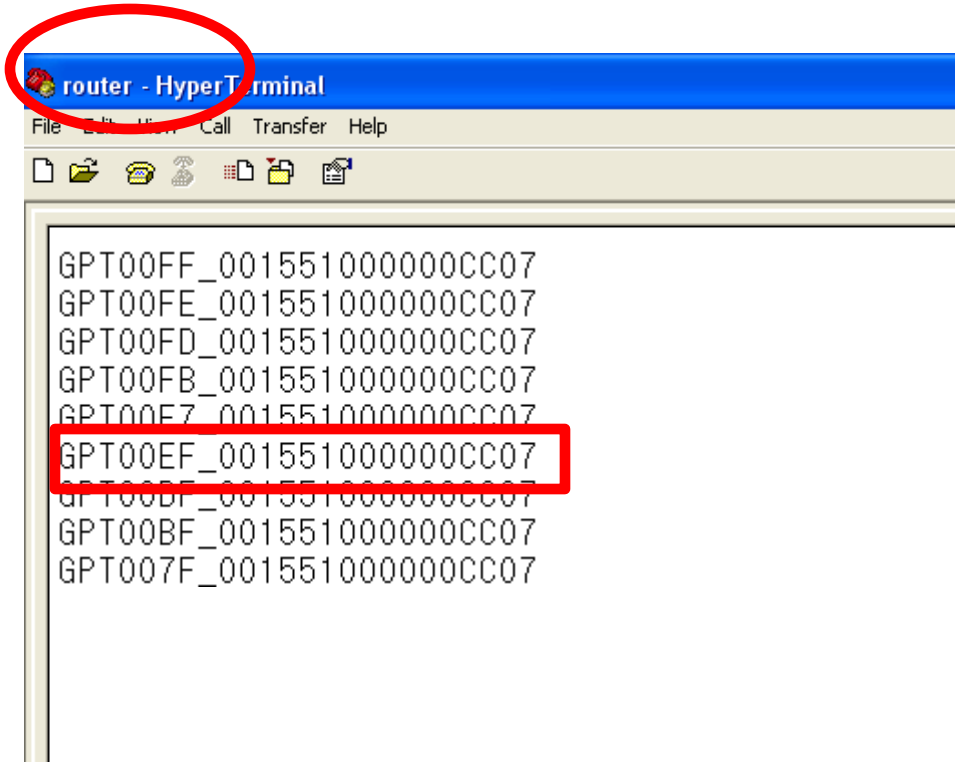
Push GP_4 : 1110 1111 (= EF)

Push GP_5 : 1101 1111 (= DF)

Push GP_6: 1011 1111 (= BF)

Push GP_7: 0111 1111 (= 7F)

(4) Received GPIO Data check – Check it in Hyper Terminal of Router every 10 seconds

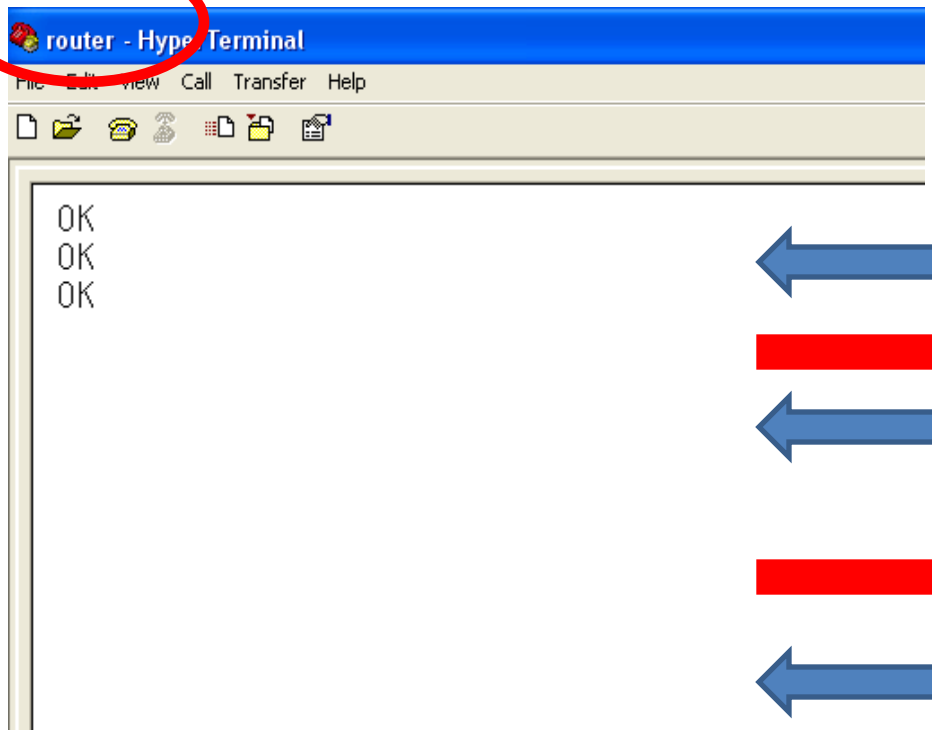


Received Data is output in hyper Terminal every 10 seconds.

- "GPT" is the received Data Type.
- "00EF" is the received GPIO Data.
- "001551000000CC07" is the Data that transmitted Data.

- In conclusion, FZ750BX receives Data "GPIO" that has a value "00EF" from a Device which has an IEEE address "001551000000CC07".

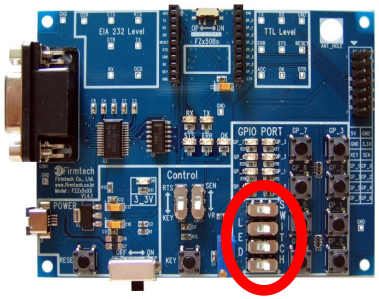
(5) “GPIO Data Transmission” of Router Set-up

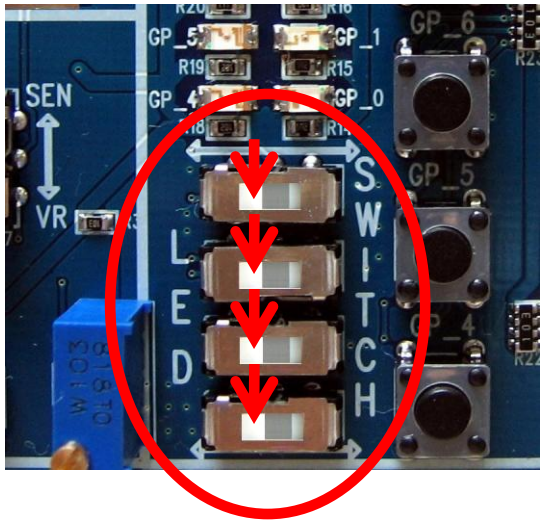


- Input the following into Hyper Terminal

- Input “+++” in Hyper Terminal
- “OK” is output from FZ750BX
- After inputting “AT+SETGPIO2” in Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- After inputting “ATO” in Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX

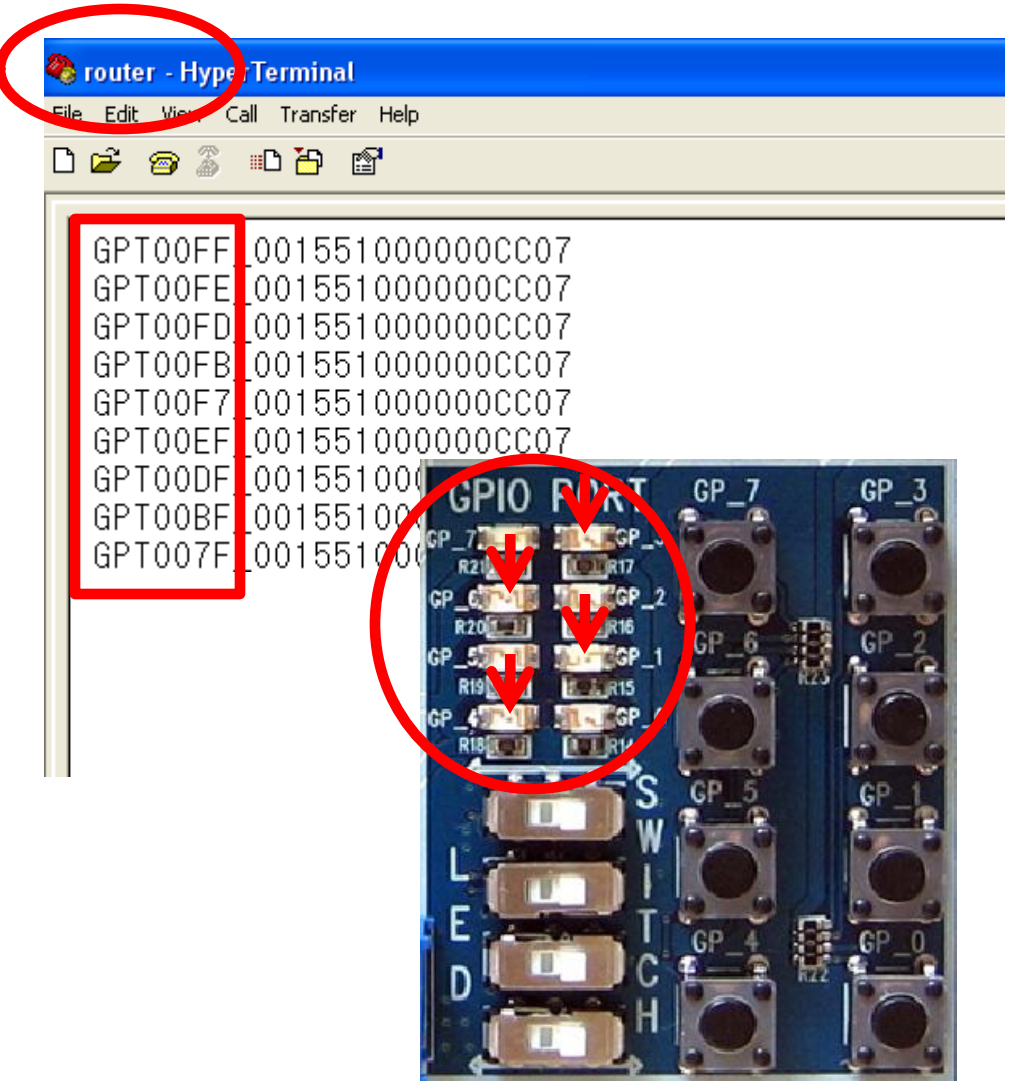
(6) Interface Board GPIO Selection switch of Router





Select GPIO Selection switch to LED

(7) Received GPIO Data Check – Check it in Hyper Terminal of Router and an Interface Board



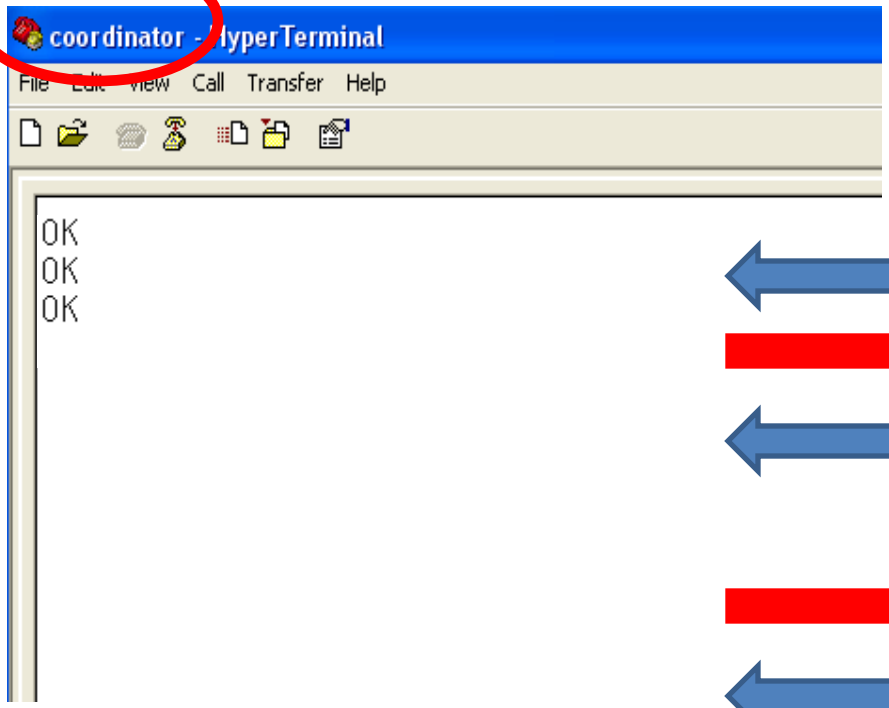
Received data is output once every 10 seconds in Hyper Terminal

GPIO LED on a FZ750BX shows the received Data.

- All GPIO LEDs are turned OFF when they receives “GPT00FF”
- GP_1 LED is turned ON when it receives “GPT00FD” .
- GP_3 LED is turned ON when it receives “GPT00F7”.
- GP_4 LED is turned ON when it receives “GPT00EF”.
- GP_6 LED is turned ON when it receives “GPT00BF”

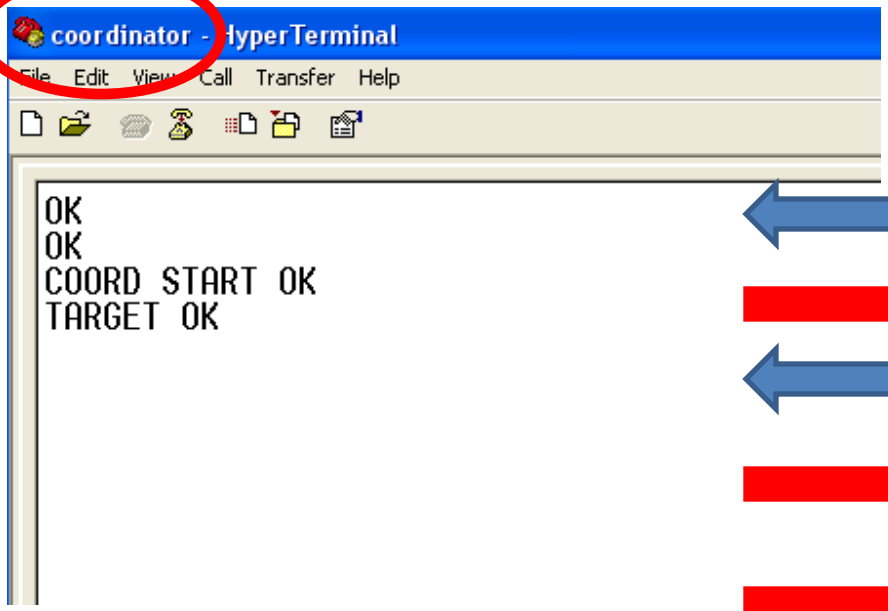
2. GPIO Data Transmission “Coordinator -> ALL Device” : Use KEY

(1) [Setup] ADC Data transmission of Coordinator : unused & Transmission time : 0



- Input the following in to Hyper Terminal.
- Input “+++” in Hyper Terminal
- “OK” is output from FZ750BX
- After inputting “AT+SETADC0” in Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- After inputting “AT+SETTMR0” in Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- Now, ADC is unused and Transmission time is set to 0 second.

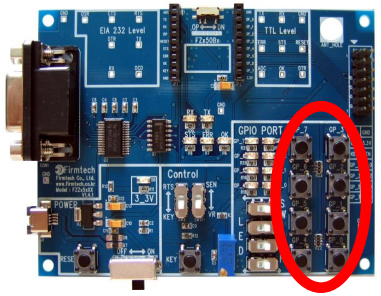
(2) [Setup] KEY Data Transmission of Coordinator : use



- Input the following continuously into Hyper Terminal
- After inputting “AT+SETKEY1” in Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- After inputting “ATZ” into Hyper Terminal, press Enter key.
- “OK” is output from FZ750BX
- FZ750BX device is re-started
- “COORD START OK” is output
- “TARGET OK” is output

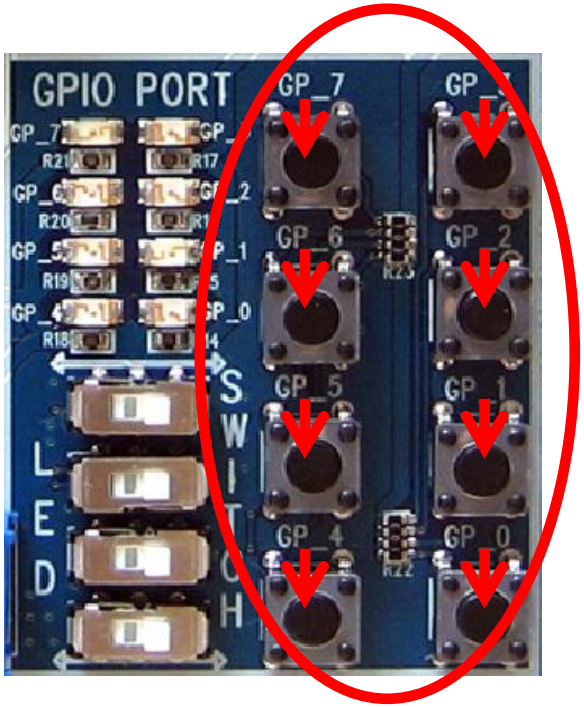
- You should re-start Device by using a command “ATZ” to apply related time matter (AT+SETTMR0) that was already set on the previous page

(3) GPIO Data Input & Data Transmission

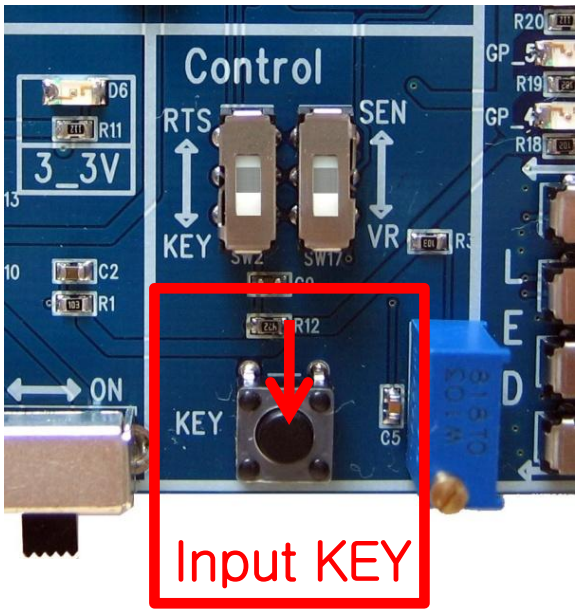


Input GPIO Data using GPIO Input switch on FZ750BX .

Transmit GPIO Data using a KEY switch with GPIO Data input .

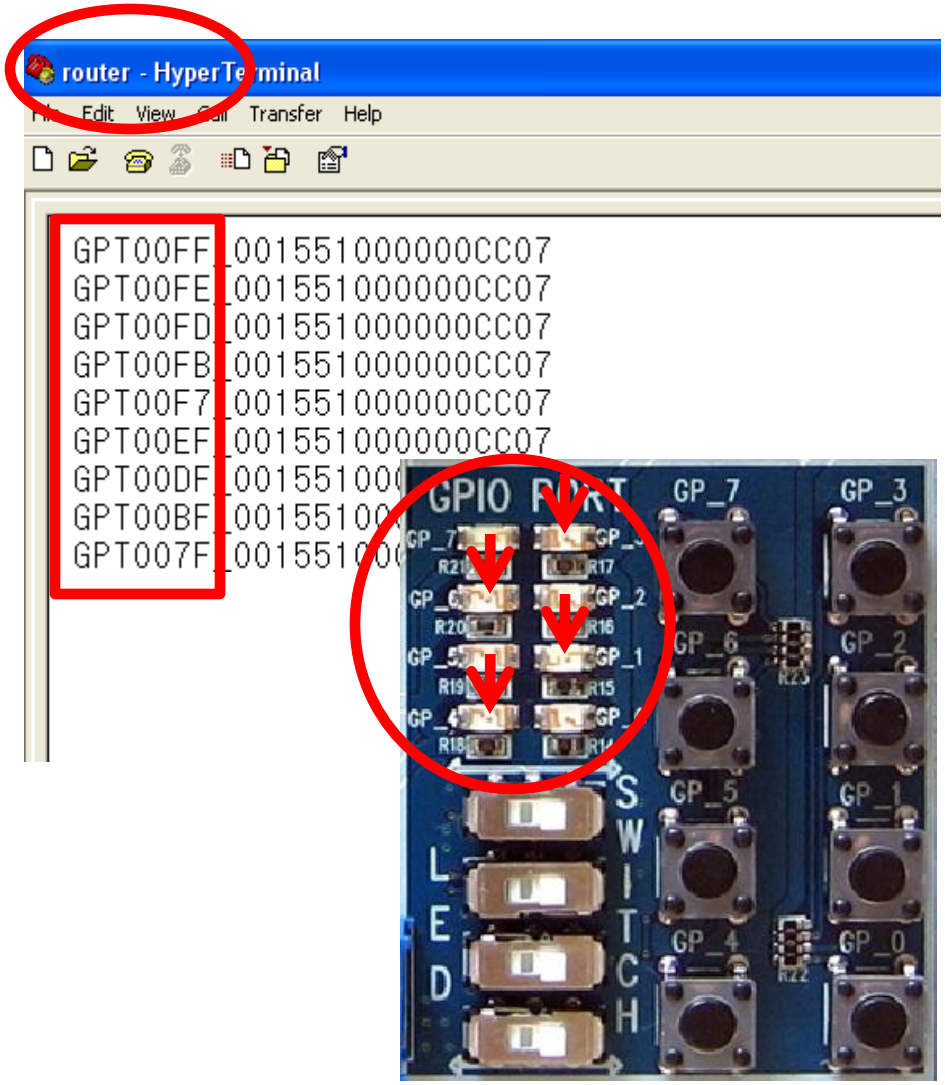


(1) GPIO Data Input



(2) Data Transmission

(4) Received GPIO Data Check – Check it in Hyper Terminal of Router and an Interface Board



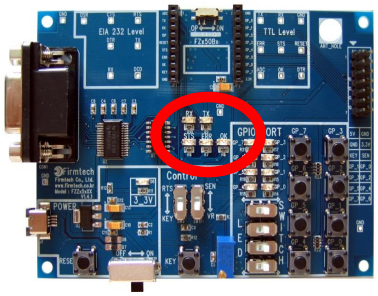
Received data is output once every 10 seconds in Hyper Terminal

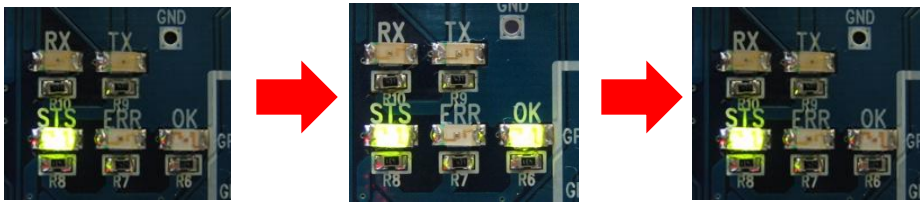
GPIO LED on a FZ750BX shows the received Data.

- All GPIO LEDs are turned OFF when they receives “GPT00FF”
- GP_1 LED is turned ON when it receives “GPT00FD” .
- GP_3 LED is turned ON when it receives “GPT00F7”.
- GP_4 LED is turned ON when it receives “GPT00EF”.
- GP_6 LED is turned ON when it receives “GPT00BF”

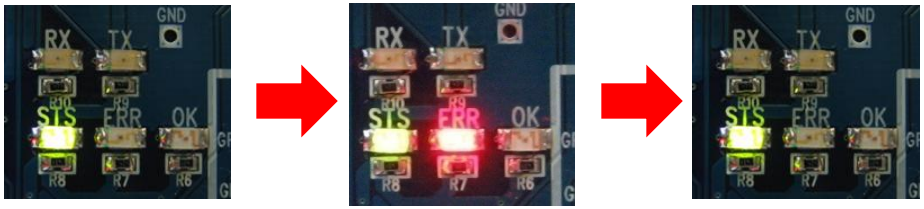
- **FZ750BX set to Coordinator transmits GPIO Data to all devices**
- **However, FZ750BX set to End Device can not receive Data from Coordinator because the End Device is in a low power consumption mode**
- **FZ750BX set to End Device receives GPIO Data in the only case that the End Device makes wake-up by set time**
- **In order for End Device to receive Data , you should make End Device start wake-up if the End Device is in a low power consumption mode**
- **End Device outputs wireless Data to Serial port while End Device keeps wake-up.**
- **In order for End Device to output the received GPIO Data to a GPIO port, you should set GPIO to Output (AT+SETGPIO2) and set LED on a GPIO selection switch.**

• OK/ERR LED status related ACK after Data Transmission (Coordinator)





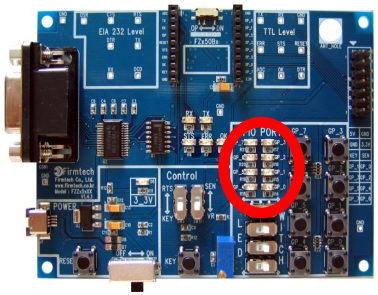
<Case1. wireless Data transmission is successfully done >



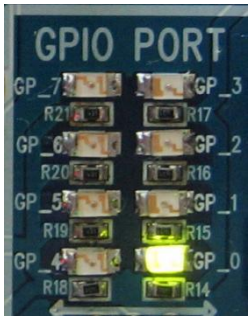
< Case2. wireless Data transmission is failed >

- FZ750BX set to Coordinator does not receive ACK when it transmits Data to all devices.
- FZ750BX set to Coordinator use ERR/OK LED to see if Data is transmitted by using wireless.
- OK LED on FZ750BX set to Coordinator blinks once if Data transmission is successfully done by using wireless.
- ERR LED on FZ750BX set to Coordinator blinks once if Data transmission is failed.

• **GPIO Data Transmission , GPIO LED Status (Coordinator)**



GPT00FF



GPT00FE

GPT00FD

GPT00FB

GPT00F7

- **FZ750BX operates GPIO LED depending on a received GPIO Data value**

GPT00EF

GPT00DF

GPT00BF

GPT007F

Please refer to the FZ750BX manual for further details.