Zigbee Embedded Module

FZ750BC/FZ750BS



FZ750BC







ABOUT FZ750BS/FZ750BC Zigbee 2006 Support 20PINs Header type Chip or CMP Antenna

AT Command provided

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• Reorient or relocate the receiving antenna.

• Increase the separation between the equipment and receiver.

• Connect the equipment into an outlet on a circuit different from that to which the receiver is con-nected.

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Caution

Modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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IMPORTANT NOTE:

FCC RF Radiation Exposure Statement:

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

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What is zigbee?

1. Features of Bluetooth

1) Objectives of Zigbee : To realize Personal Wireless Communication for short distance and slow speed with Low Power consumption and Low Cost, which is based on IEEE 802.15.4 Standard.

2) Frequency in Use : To use ISM(Industrial, Scientific, Medical) Band which does not require any permission to use.

- 868 ~ 870 MHz: 1 channel, 868MHz in Europe (No.0 channel)
- 902 \sim 928 MHz: 10 channels, 915MHz in the U.S.A (No.1 \sim 10 channel)
- 2.400 ~ 2.4835 GHz: 16 channels in all nations (No.11 ~26 channel)
- 3) Transmission Rate
- 868 ~ 870 MHz: 20Kbps
- 902 ~ 928 MHz: 40Kbps
- 2.400 ~ 2.4835 GHz: 250Kbps
- 4) Tx Power and working distance
- 1mW (0dBm) Inside: 30m, Outside: 100m
- Over 100m with 1mW
- Tx Power is subject to change depending on manufacturers.
- 5) Configuration
- Zigbee device is configured of Coordinator, Router and End Device.
- Coordinator configures Network
- Router expands Network
- End device participates in Network
- With 64bit address, can configure a maximum of 65536 Networks connected

6) Reliability

- Supports Network level and Device level using Authentication-Network Key and Link Key.
- Supports encrypted packet transmission using 128bit AES Encryption.
- Guarantees data reliability on the application layer using ACK option in APS Packet
- Guarantees data reliability on the physical layer using ACK option in MAC Packet.

2. Zigbee operation



< Zigbee Mesh network configuration>

1) Coordinator configures the Zigbee Network.

Coordinator communicates with Router and End Device.

- 2) Router expands Network by connecting Coordinator or other Routers.
- 3) End Device participates in Zigbee network and communicates with Router or Coordinator.

Products overview

FZ750BS/FZ750BC can configure Zigbee network with low power consumption and low capacity by using Zigbee stack.

- < Major features of FZ750BS/FZ750BC>
- 1. Zigbee 2006 support
- 2. Mesh network support
- 3. Easily applicable to the product with 20Pins Header type
- 4. Easy to input data with data Input ports, such as UART, ADC, KEY and GPIO port.
- 5. Supports AT command, and control Devices by using the AT command.

6. Supports Low power consumption mode of End Device Low power consumption mode 1: Use 25uA Low power consumption mode 2: Use 2uA Low power consumption mode 3: Use 1uA

7. Can check whether data is successfully transmitted or not by using ACK option.

8. By using Key Option, can obtain new Zigbee Network Routes so that data re-transmission is possible even if finding the communication route is failed for the first time.

9. Use 2.400 ~ 2.4835 GHz(ISM Band) 15 channels (No.11 ~25 channel)

11 (0x0B): 2405MHZ, 12 (0x0C): 2410MHZ, 13 (0x0D): 2415MHZ,

14 (0x0E): 2420MHZ, 15 (0x0F): 2425MHZ, 16 (0x10): 2430MHZ,

17 (0x11): 2435MHZ, 18 (0x12): 2440MHZ, 19 (0x13): 2445MHZ,

20 (0x14): 2450MHZ, 21 (0x15): 2455MHZ, 22 (0x16): 2460MHZ,

23 (0x17): 2465MHZ, 24 (0x18): 2470MHZ, 25 (0x19): 2475MHZ,

We request the new users of FZ750BS/FZ750BC to read the information on this description carefully before they start to use the products.

* Please consult Firmtech.co., Ltd if you want to configure Zigbee Network using more than 30 devices of FZ750BS/FZ750BC

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1. Preliminary usage of product

1-1. Product components

- 1-1-1. FZ750BS/FZ750BC
- FZ750BS/FZ750BC Zigbee Embedded Module
- On-board Chip or Helical Antenna (1 dBi Gain)

1-1-2. PC Interface Board

- Interface Board
- Serial Extension Cable
- USB Power Cable
- CD
 - * If you find any of above components is defective, or not included in the package, please contact the seller you purchased.







< FZ750BC-Type 1set >







< FZ750BS-Type 1set >

1-2. FZ750BS/FZ750BC Overview

(1) To configure the Zigbee network, set each device (FZ750BS/FZ750BC) to Coordinator, Router and End Device.

The initial factory set value of FZ750BS/FZ750BC is set to Router.



(2) Do not use Broadcast accompanied by a lot of traffic in the Zigbee network unless it is vital to be used.

It is not recommended to make a lot of traffic in the Zigbee network because it causes lots of trouble when transmitting data and bothers to set the new route toward target devices.

(3) Do not set short time for data transmission in the Zigbee Network. The more nodes the Zigbee Network has, the longer time for transmission time should be set.

Example.1) Zigbee Network Contribution using 10 FZ750BS/FZ750BCs Set a time space to 2seconds for data transmission between FZ750BS/FZ750BCs. (set 2sec minimally per 10 FZ750BS/FZ750BCs) Example.2) Zigbee Network Contribution using 20 FZ750BS/FZ750BCs Set a time space to 4seconds for data transmission between FZ750BS/FZ750BCs. (set 2sec minimally per 10 FZ750BS/FZ750BCs*2=4sec) It is not recommended to make a lot of traffic in the Zigbee Network.



(4) Coordinator and Router can configure child nodes up to 8

(5) End Devices cannot configure Child nodes

Setting FZ750BS/FZ750BC to End Devices should be prior to the Zigbee Network Configuration. If you want to change the device type of FZ750BS/FZ750BC from Router to End Device in the Zigbee Network, you had better re-configure the whole Zigbee Network in advance.

FZ750BS/FZ750BC can configure Child nodes after they are set to Routers and participated in the Zigbee Network. Also, other devices can participate in the Zigbee Network by setting the FZ750BS/FZ750BC set to Routers to their parent nodes, as well. If you change the FZ750BS/FZ750BC set to parent nodes to End Devices, the current End Devices cannot configure child nodes. In this situation, it is possibly can happen that other devices set the Routers to their parent nodes before the Routers are changed to End devices.

FZ750BS/FZ750BC supports mesh network, so you can expect the stable Zigbee Network. However, in order to make sure of proper Zigbee Network configuration, FZ750BS/FZ750BC of child nodes had better save FZ750BS/FZ750BCs set to Router (or coordinator) as their parent nodes

Thus, you had better set the type of each Device (especially End Device) before the Zigbee Network Configuration.



(6) FZ750BS/FZ750BC can configure the Zigbee Network up to 4 Depth.

- (7) FZ750BS/FZ750BC configures the Zigbee Network with one Coordinator.
- (8) FZ750BS/FZ750BC can transmit data by multipath because it supports mesh network. Contribute the Zigbee Network which has multipath.



(9)FZ750BS/FZ750BC has UART port for Serial Input and Output. The UART port is connected to the RS-232 on interface boards.

If you input Serial data into FZ750BS/FZ750BC, It transmits the Serial data to its target device.

If you input Serial data into FZ750BS/FZ750BC, other data is not transmitted. For example, if you input 1bit of Serial data in the middle of ADC data transmission once every 10seconds by FZ750BS/FZ750BC, the ADC data transmission stops until the Serial data transmission is completed. The FZ750BS/FZ750BC starts to transmit the ADA data again after the Serial data Transmission is finished.

(10) FZ750BS/FZ750BC has ADC port for Analog signal Input. The ADC port is connected to variable resistance on an Interface board.

FZ750BS/FZ750BC reads ADC port every certain time and transmits ADC data to its target device.

(11) FZ750BS/FZ750BC has a KEY port for Digital signal Input. The KEY port is connected to KEY switch on an interface board.

If you input KEY data input FZ750BS/FZ750BC, it transmits the KEY data to its target device.

(12) FZ750BS/FZ750BC has GPIO port for Digital signal input and output. If you use the GPIO for Input, It should be connected to GPIO switch on an interface board. It should be connected to GPIO LED on an interface board for Output.

If you input GPIO data into FZ750BS/FZ750BC, It transmits the GPIO data to its target device.

(13) FZ750BS/FZ750BC has STATUS port for showing the status of the Device.

The STATUS port is connected to STATUS LED on an interface board.

OK port of FZ750BS/FZ750BC shows that the status of FZ750BS/FZ750BC is okay, and it is connected to OK LED on an interface board.

ERROR port of FZ750BS/FZ750BC shows the status of FZ750BS/FZ750BC is error, and it is connected to ERROR LED on an interface board.

(14) When you transmit data by using FZ750BS/FZ750BC, you need to check the result value for the transmission through the OK/ERROR port.



< FZ750BS/FZ750BC data transmission Interaction >

(15) FZ750BS/FZ750BC supports Low power consumption mode when it is set to End Device.

The terms of wake-up;

Low power consumption mode 1: Internal time, KEY port, Re-set

Device is not reset after wake-up.

(Except for the "Re-set" in terms of low power consumption mode 1)

Low power consumption mode 2: Internal time, KEY port, Re-set

Device is reset after wake-up.

Low power consumption mode 3: KEY port, Re-set

Device is not reset after wake-up

Serial data Input and data transmission is not possible while FZ750BS/FZ750BC is in a low power consumption mode

- All received Serial data is ignored while FZ750BS/FZ750BC is in a low power consumption mode.
- ⇒ All received data is ignored while FZ750BS/FZ750BC is in a low consumption mode
- In order to input Serial data into FZ750BS/FZ750BC in a low power consumption mode, you should wait until FZ750BS/FZ750BC makes wake-up by internal time or use a KEY port to wake FZ750BS/FZ750BC up, and then input the Serial data. Also, you can input the Serial data after resetting the FZ750BS/FZ750BC, as well.
- ⇒ The major function of End Device in the Zigbee Network is ADC data and KEY data transmission.

(16) FZ750BS/FZ750BC has an IEEE ADDRESS and a NETWORK ADDRESS.

64 Bit IEEE ADDRESS is a physical address of FZ750BS/FZ750BC.

Every device has its own IEEE ADDRESS and the IEEE ADDRESS is not changeable.

FZ750BS/FZ750BC set target devices by using IEEE ADDRESS.

In conclusion, **"target device set-up"** is an inquiry using IEEE ADDRESS for NETWORK ADDRESS of its target devices

FZ750BS/FZ750BC has a 16 Bit of NETWORK ADDRESS for the Zigbee Network communication.

NETWORK ADDRESS is given when FZ750BS/FZ750BC participates in the Zigbee Network

NETWORK ADDRESS can be changed depending on the Zigbee Network Configuration.

NETWORK ADDRESS cannot be shown unless FZ750BS/FZ750BC participates in the Zigbee Network.

FZ750BS/FZ750BC performs data transmission by using NETWORK ADDRESS.

(17) If you configure the Zigbee Network and perform data transmission, the result value is shown as [volume of received data > volume of transmitted data]

FZ750BS/FZ750BC on a MAC layer automatically re-transmits data depending on the Zigbee Network Configuration.

In case of using ACK option, FZ750BS/FZ750BC on an application layer automatically re-transmits data depending on the Zigbee Network Configuration. Thus, Received data could be more than 2 depending on the Zigbee network configuration even if only one data is transmitted.

K < <u>Routing table update of FZ750BS/FZ750BC</u>>

Routing table is assigned to each FZ750BS/FZ750BC after the Zigbee Network Configuration.

Below is the Zigbee network status when data is transmitted from Router2 to Router1 to Coordinator.

Data is input into Router2, the Router2 transmits the data to Router1, and then the Router1 transmits the data to Coordinator. Consequently, the data inputted into Router2 is transmitted to Coordinator by routing table belonging to Router2 and Router1

If Router 1 is in abnormal status in the Zigbee Network, Router2 cannot transmit data, and shows its error status through ERROR port. When ACK Option is disabled (<u>NACK communication</u>) of FZ750BS/FZ750BC, Device is automatically reset and Router2 creates a new routing table if the Router2 happens to show its error status 5times successively through the error port because of the abnormal Router1. Multipath set-up is required ahead of the time to update the routing table.



Coordinator

Router

When the ACK Option of FZ750BS/FZ750BC is enabled (<u>ACK communication</u>), users should control the routing table directly to update it. If the data transmission is successively failed, users need to reset its target device's address (<u>same as the existing one</u>) and the Device.

1-3. Operation of FZ750BS/FZ750BC and Interface Boards

We explain it with FZ750BS/FZ750BC which has the initial factory set value.

(1) FZ750BS/FZ750BC automatically searches a Zigbee coordinator or a parent node and tries to participate in the Network.

If FZ750BS/FZ750BC outputs "ROUTER START ERROR", that means the FZ750BS/FZ750BC is failed to participate in the Zigbee Network.

If FZ750BS/FZ750BC outputs "ROUTER START OK", that means a Zigbee Coordinator is around or FZ750BS/FZ750BC is successfully participated in the Zigbee Network with its parent node. RX / TX port of FZ750BS/FZ750BC are connected to RS-232 on an Interface board. Messages from FZ750BS/FZ750BC are shown on a screen through RS-232 on an Interface Board connected to PC.



< FZ750BS/FZ750BC is failed to participate in the Zigbee Network/ Operation of Each port>

(2) If FZ750BS/FZ750BC is filed to participate in the Zigbee Network, STATUS port outputs High and Low repeatedly.

STATUS port of FZ750BS/FZ750BC is connected to STATUS LED on an Interface Board STATUS LED on an Interface board flickers quickly, which means the Zigbee Network Participation is failed.

If FZ750BS/FZ750BC is successfully participated in the Zigbee Network, STATUS port shows "High - > Low -> High". (None target devices)

STATUS LED on an interface board flickers once.



< FZ750BS/FZ750BC is successfully participated in the Zigbee Network (None target devices)/ Operation of Each port >

(3) FZ750BS/FZ750BC automatically sets target devices after the Zigbee Network Participation.

After FZ750BS/FZ750BC is participated in the Zigbee Network, It outputs a message "ROUTER START OK". After that, a message "TARGET NON" comes up on the screen shortly.

The message **"TARGET NON"** means that a target device's address is not saved.

If FZ750BS/FZ750BC saves a target device's address, FZ750BS/FZ750BC outputs "TARGET OK" or "TARGET ERROR". The message "TARGET OK" means that the target device is participated in the Zigbee Network and the target device is set-up properly. The message "TARGET ERROR" means that the saved target Device is not participated in the Zigbee Network or the target device is improperly set.

(4) When a target device is set, High value is output from STATUS port.

If FZ750BS/FZ750BC successfully sets its target device, STATUS LED on an interface board turns ON.

If FZ750BS/FZ750BC fails to set its target device, STATUS port outputs High and Low repeatedly. STATUS LED on an Interface Board flickers once.



< A target device is successfully set-up/ Operation of each port >



< A target device is failed to set-up, Operation of each port >

(5) Serial data Transmission becomes possible after FZ750BS/FZ750BC is participated in the Zigbee Network and the target device set-up is properly done.

Serial data transmission of FZ750BS/FZ750BC is basically enabled.

In order to perform Serial data Transmission using FZ750BS/FZ750BC, input Serial data into a RX port and press Enter key. Then, data is transmitted to a target device.

53 bit including Enter key is a maximum of data length for transmission.

Once the Serial data Input is started, other forms of data transmission are impossible until the process for Serial data transmission is finished.

RX port of FZ750BS/FZ750BC is connected to RS-232 on an Interface Board.

(6) ADC data transmission becomes possible after FZ750BS/FZ750BC is participated in the Zigbee Network and the target device set-up is properly done.

ADC data transmission of FZ750BS/FZ750BC is basically disabled.

In order to perform ADC data transmission using FZ750BS/FZ750BC, set the ADC Transmission to be enabled by using a command "AT+SETADC1". And then, input ADC data into ADC port. Then, FZ750BS/FZ750BC reads the ADC port every certain time, changes Analog data to Digital Data, and transmits the ADC data to its target device.

A command "AT+SETTMR10 (10 seconds)" is used for setting internal time.

ADC port of FZ750BS/FZ750BC is connected to variable resistance on an Interface board.

(7) KEY data transmission becomes possible after FZ750BS/FZ750BC is participated in the Zigbee Network and its target device set-up is properly done.

KEY data transmission of FZ750BS/FZ750BC is basically disabled.

In order to perform KEY data transmission using FZ750BS/FZ750BC, set the KEY Transmission to be enabled by using a command "AT+SETKEY1".

If FZ750BS/FZ750BC is a Coordinator or a Router, KEY data transmission is possible regardless of the KEY option, but if FZ750BS/FZ750BC is an End Device, KEY data transmission is subject to the KEY option.

In order to perform KEY data transmission using FZ750BS/FZ750BC, input KEY data into KEY port. And then, FZ750BS/FZ750BC creates a certain form of KEY data and transmits it to its target device. KEY port of FZ750BS/FZ750BC is connected to a KEY switch on an Interface Board.

(8) COUNT data transmission becomes possible after FZ750BS/FZ750BC is participated in the Zigbee Network and its target device set-up is properly done.

COUNT data transmission of FZ750BS/FZ750BC is basically disabled.

In order to perform COUNT data transmission using FZ750BS/FZ750BC, set the COUNT Transmission to be enabled by using a command "AT+SETCOUNT1".

COUNT data transmission of FZ750BS/FZ750BC is possible only when ADC data is transmitted.

In conclusion, "ADC Enabled + COUNT Enabled (1)": COUNT data instead of ADC data is transmitted to a target device once every set time.

"ADC Enabled + COUNT Disabled (0)": ADC data is transmitted to a target device once every set time.

"ADC Disabled + COUNT Enabled (1)": None of them are transmitted.

COUNT data transmission cannot be done at the same time as when GPIO value is transmitted. In order to send COUNT Data, set GPIO use terms to be disabled by using a command

"AT+SETGPIO0" for COUNT data transmission.

(9) GPIO Value Transmission becomes possible after FZ750BS/FZ750BC is participated in the Zigbee Network and its target device set-up is properly done.

GPIO Use of FZ750BS/FZ750BC is basically disabled.

In order to send GPIO Value using FZ750BS/FZ750BC, set the GPIO Use Terms to INPUT by using a commend "AT+SETGPIO1".

GPIO Value Transmission of FZ750BS/FZ750BC is possible only when KEY data or ADC data is transmitted.

In conclusion,

"KEY Enabled + GPIO INPUT(1)" : If KEY data is input, GPIO Value instead of the KEY data is transmitted to a target device.

"ADC Enabled + GPIO INPUT(1)" : GPIO Value instead of the ADC data is transmitted to a target device once every set time.

GPIO Value Transmission cannot be done at the same time as when COUNT data is transmitted.

In order to send GPIO Value, set the use terms of COUNT data transmission to be disabled by using a command "AT+SETCOUNT0" for GPIO Value Transmission.

(10) Wireless Transmission becomes possible after FZ750BS/FZ750B is participated in the Zigbee Network.

If FZ750BS/FZ750BC is set to a target device, TX port outputs received data from the Device that transmits wireless data. The TX port is connected to RS-232 on an Interface board.

If FZ750BS/FZ750BC receives KEY Data, it outputs **"KEY_EVT_00155100000000B"** through Serial If FZ750BS/FZ750BC receives ADC Data, it outputs **"ADC0012_00155100000000B"** through Serial If FZ750BS/FZ750BC receives Serial Data, it outputs the data as it is through Serial.

If FZ750BS/FZ750BC receives COUNT Data, it outputs "CNT0005_00155100000000B" through Serial. If FZ750BS/FZ750BC receives GPIO Value, It outputs "GPT007F_00155100000000B" through Serial.

GPIO Use Terms of FZ750BS/FZ750BC is set to OUTPUT, the FZ750BS/FZ750BC outputs GPIO value through a GPIO port.

To check the GPIO Output Value of FZ750BS/FZ750BC, connect the GPIO port to LED on an Interface board.

A command "AT+SETGPIO2" is used to set GPIO to OUTPUT.



< FZ750BS/FZ750BC Received data Type >

(11) FZ750BS/FZ750BC has OK port and ERROR port to show status for results.

OK / ERROR ports of FZ750BS/FZ750BC are connected to OK / ERROR LED on an interface board.

If FZ750BS/FZ750BC is failed to participate in the Zigbee Network, ERROR port outputs Low and "High" repeatedly. ERROR LED on an interface board flickers once.

If FZ750BS/FZ750BC is participated in the Zigbee Network, OK port outputs Low and High repeatedly. OK LED on an Interface board flickers once.

If any target devices of FZ750BS/FZ750BC are not saved, nothing is output from the OK/ ERROR port. OK port outputs Low and High repeatedly when the target Set-up is completed. OK LED on an Interface board flickers once.

If the target Set-up is failed, ERROR port outputs Low and High repeatedly.

ERROR LED on an Interface board flickers once.

If Serial data is inputted when a target device set-up is not completed, ERROR port outputs Low and High repeatedly. ERROR LED on an Interface board flickers once.

If KEY data is inputted when a target device set-up is not completed, nothing is output from the OK/ERROR ports.

If data transmission is successfully done, OK port outputs Low and High repeatedly. OK LED on an Interface board flickers once.

If data transmission is failed, ERROR port outputs Low and High repeatedly. ERROR LED flickers once.

The next data transmission may be performed after checking OK/ERROR LED for current data transmission.

(12) When FZ750BS/FZ750BC is in an operation mode, OK port and ERROR ports basically keep Low, but output Low and High repeatedly in case of getting result value.
While FZ750BS/FZ750BC is in an operation mode, OK / ERROR LED on an Interface board keep to be turned OFF, but flicker once (LED ON) for the result value.

(13) FZ750BS/FZ750BC is in an AT command mode, OK port and ERROR port keep High. STATUS port of FZ750BS/FZ750BC becomes Low.

If FZ750BS/FZ750BC is changed from an operation mode to AT command mode, OK port and ERROR port are changed to High from Low. Status port becomes Low. OK/ERROR LED on an Interface board are turned ON. STATUS LED is turned OFF.

Change the Operation mode to the AT command mode by using a command "+++" A message "OK" is output from TX port of FZ750BS/FZ750BC.

When the mode is changed from AT Command to operation mode, OK and ERROR ports are also changed from High to Low. The STATUS port is changed depending on exiting value.

The OK / ERROR LED on an Interface Board are turned OFF. The STATUS LED is changed depending on existing value.

Change the mode from AT Command to Operation by using a command "ATO" .

A message "OK" is output from the TX port of FZ750BS/FZ750BC.



< Operation of each port in the operation mode and the AT command mode >

- (14) FZ750BS/FZ750BC is set to End Device, and its target device is set.
 FZ750BS/FZ750BC enters into a low power consumption mode.
 STATUS / OK / ERROR ports of FZ750BS/FZ750BC changed to High.
 STATUS/OK/ERROR LED on an Interface board is turned ON.
- (15) If wake-up from End Device in a low power consumption mode occurs, OK and ERROR ports are changed to Low.
 - STATUS port keeps High because the End Device has a target device.
 - STATUS LED on an Interface board keeps being turned ON.
 - OK / ERROR LED on an Interface board are turned OFF.



< Operation of each port in a Low power consumption mode and an Operation mode (Low power

consumption mode 1) >

1-4. Features of End Device

End Device has differences in a way to manage its operation compared to Coordinator and Router.

Do not set End Device to a target device of other Devices.

Once End Device starts to operate, (After target device set-up) it automatically enters into a low power consumption mode. The End Device in a low power consumption mode ignores all data that is transmitted or inquired from other Devices.

The major function of End Device is transmitting ADC/KEY data to its target device (Router or coordinator).

While the End Device is in a wake-up mode (about 1 sec), it functions almost same as Coordinator or Router. However, the End Device happens to function differently at the moment when the wake-up occurs in a low power consumption mode.

The following are notable features of End Device.

- (1) Internal time (AT+SETTMR) is used for ADC data transmission in case of coordinator and Router. For example, if "AT+SETTMR60" is set, the Coordinator or Router reads ADC port once every 60 seconds and send it to its target device. (ADC Option Enabled) However, in case of End Device, Internal time (AT+SETTMR) is used for wake-up time in low power consumption mode. For example, if "AT+SETTMR60" is set, wake-up from End device occurs once every 60 sec. (This does not apply to the Low power consumption mode 3)
- (2) If data is inputted into KEY port, Coordinator or Router transmits the KEY data to its target device regardless of KEY option. In case of End Device, however, it may happen only while the End Device makes wake-up with KEY option set to be enabled. (This does not apply to the Low power consumption mode 1. The End Device in a low power consumption mode1 does not transmit KEY data even if wake-up occurs.) End Device makes wake-up in a low power consumption mode if data is inputted into KEY port.

Wake-up from End Device in a low power consumption mode 1 occurs when KEY port meets Rising Edge (Low -> High)



< FZ750BS/FZ750BC Low power consumption mode 1, Wake-up point >

Wake-up from End device in a low power consumption mode 2 /3 occurs when KEY port becomes Low.



< FZ750BS/FZ750BC Low power consumption mode 2 or 3 , Wake-up point >

(3) Coordinator or Router can transmit Serial data to its target device by inputting Serial data unless they are put on standby for ACK after data transmission. However, End Device in a low consumption mode ignores all inputted Serial Data.

In order for End Device to transmit Serial Data, put the End Device in a wake-up mode, and see if the End Device operates.

End Device transmits Serial data to its target device when it is not in an operation mode. If Serial data is inputted when End Device does not operate, the Serial data is transmitted to the target device.

(4) End Device - Low power consumption mode 1

Once End Device set its target device, it automatically enters into a Low power consumption mode. The End Device in a Low power consumption mode1 uses 25uA.

The major function of End Device in a Low power consumption mode1 is ADC / KEY data transmission.

If ADC Option of End Device in a Low power consumption mode1 is enabled, the End Device makes wake-up by internal time and transmits ADC data to its target device.

If KEY option of End Device in a Low power consumption mode1 is enabled, the End Device makes wake-up by inputting KEY data and send KEY data to its target device.

If KEY option of End Device in a Low power consumption mode1 is disabled, the End Device makes wake-up by inputting KEY data and enters into a Low power consumption mode again after 1 second.

Serial data transmission is possible by inputting Serial data before the End Device enters into the Low power consumption mode again.

(5) End Device - Low power consumption mode 2

Once End Device set its target device, it automatically enters into a Low power consumption mode. The End Device in a Low power consumption mode1 uses 2uA.

The major function of End Device in a Low power consumption mode2 is ADC data transmission. If ADC Option of End Device in a Low power consumption mode2 is enabled, the End Device makes wake-up by internal time and is reset. After that, its target device is automatically set, and the End Device transmits ADC data to the target device.

If ADC Option of End Device in a low power consumption mode2 is enabled, the End Device makes wake-up with inputted KEY Data, and is reset. After that, its target device is automatically set, and the End Device transmits ADC data to the target device.

If KEY data is inputted when End Device is in a wake-up mode, the End Device transmits the KEY data to its target device. (KEY option should be enabled)

In case that ADC Option is disabled, KEY option is enabled, and internal time is set, End Device in a low power consumption mode2 makes wake-up by Internal time and is reset. After that, its target device is set and the End Device transmits KEY data to the target device. In conclusion, End Device based on a low power consumption mode2 mainly performs ADC data transmission by internal time owing to its significant feature.

In case of ADC option and KEY option are disabled, End Device in a low power consumption mode2 only makes wake-up after KEY data is inputted. After that, the End Device is reset and its target device is set. The End Device enters into a Low power consumption mode again 1sec after that.

If Serial data is inputted before the End Device enters into the low power consumption mode, the End Device transmits Serial data to its target device.

(6) End Device – Low power consumption mode 3

Once End Device sets a target device, it automatically enters into a Low power consumption mode. The End Device in a Low power consumption mode3 uses 1uA.

The major function of End Device in a Low power consumption mode3 is KEY data transmission.

End Device in a low power consumption mode3 does not make wake-up by internal time

KEY option is enabled, End Device makes wake-up in a low power consumption mode3 by inputting KEY data. After that, the End Device is reset and its target device is set. For the last, the End Device transmits KEY data to the target device.

If KEY data is inputted when End Device is in a wake-up mode, the End Device transmits KEY data to its target device. (KEY option should be enabled)

In case that KEY option is disabled, End Device only makes wake-up after KEY data is inputted. After that, the End Device is reset and its target device is set. The End Device enters into a low power consumption mode again 1 second after the target device set-up is completed. Serial data transmission is possible by inputting Serial data before End Device enters into a low power consumption mode.

(7) In order to put End Device in an AT command mode while the End Device operates, note the features mentioned above.

If End Device is in a low power consumption mode, put the End Device in a wake-up mode for data transmission. Input "+++" promptly after the End Device get receipt of ACK. It should be done before the End Device enters into a low power consumption mode again (It takes about 1 second).

- (8) The following is the sequences regarding ADC Transmission when the End Device is in a Low power consumption mode2.
 - ① End Device makes wake-up by internal time.
 - 2 End Device is reset
 - ③ End Device participates in the Zigbee Network.
 - ④ End Device sets its target device.
 - (5) End Device transmits ADC data to its target device.
 - 6 End Device receives ACK from its target device.
 - End Device is on standby for 1sec.
 - (8) End Device enters into a low power consumption mode.



< Wake-up → Network Participation → Target Set-up → data transmission → Low power consumption mode >

2. Product Performance

2-1. FZ750BS/FZ750BC Performance

Part	Specification
Zigbee Spec.	Zigbee 2006 Specification Support
Communication Distance	120 M
Frequency Range	2.4 GHz ISM Band
Sensitivity	-98 dBm
Transmit Power	10 dBm
Size	20.54 mm X 27.70 mm X 9.40 mm
Input Power	3.3 V
Current Consumption	38 mA (Max)
Operating Temperature	-20 °C - +50 °C
Max Operating Temperature	-40 °C - +85 °C
Communication Speed	9,600 bps ~ 230,400 bps
Antenna	Chip or CMP Antenna
	UART (TTL Level), ADC(Analog Input), KEY(Digital Input),
DATA Interface	GPIO (Digital Input / Output)
STATUS Interface	STATUS / OK / ERROR

<Table 2-1 FZ750BS/FZ750BC Performance>

3. Current consumption

3-1. FZ750BS/FZ750BC Current Consumption

		Current Consumption	
	Device type	Low Power Consumption mode	data transmission
	Coordinator	_	38mA
	Router	_	38mA
End Device	Wake-up	_	38mA
	Low power consumption mode1	25uA	_
	Low power consumption mode2	2uA	_
	Low power consumption mode3	1uA	_

<Table 3-1 FZ750BS/FZ750BC Current Consumption>

4. PRODUCT APPEARANCE

4-1. FZ750BS/FZ750BC Image & Dimension



<Feature 4-1-① FZ750BS Image>









<Feature 4-1-③ FZ750BS Dimension>



<Feature 4-1-④ FZ750BC Dimension>
4-2. FZ750BS/FZ750BC PIN Assign



<Feature 4-2 FZ750BS/FZ750BC PIN Assign>

PIN			DIRECTION OF	DEMARKS
NUMBER			INPUT/OUTPUT	
1	ADC	Analog data Input	I	
2	ТХ	Transfer Data	0	
3	RX	Received Data	I	
4	ISP	_	-	
5	RESET	Device Reset	I	
6	STATUS	Display Status	0	
7	ERROR	Display Status	0	
8	ОК	Display Status	0	
9	KEY	Digital data Input	I	
10	GND	-	-	
11	VCC	3.3V DC	I	
12	GPIO 7	Digital data Input / Output	I/O	
13	GPIO 6	Digital data Input / Output	I/O	
14	GPIO 5	Digital data Input / Output	I/O	
15	GPIO 4	Digital data Input / Output	I/O	
16	GPIO 3	Digital data Input / Output	I/O	
17	GPIO 2	Digital data Input / Output	I/O	
18	GPIO 1	Digital data Input / Output	I/O	
19	GPIO 0	Digital data Input / Output	I/O	
20	GND	_	-	

<Table 4-1 port Performance>

4-3. FZ750BS/FZ750BC Pin Description

4-3-1. ADC port

It is an Analog port of FZ750BS/FZ750BC.

A range of Input is from 0V to 1.5V.

(Do not input over 1.5V into an ADC port.)

FZ750BS/FZ750BC transmits 0000 to its target device if 0V is inputted into an ADC port. FZ750BS/FZ750BC transmits 03FF to its target device if 1.5V is inputted into an ADC port. It is connected to variable resistance of Interface Board.

4-3-2. TX port

It is an UART Output(TTL)port of FZ750BS/FZ750BC.

Received wireless data or responsive value from AT Command is output through a TX port. It is connected to RS-232 RX port(EIA) on an Interface board.

4-3-3. RX port

It is an UART Input(TTL)port of FZ750BS/FZ750BC. AT Command or Serial Communication data is inputted into a RX port. It is connected to RS-232 TX port(EIA) on an Interface board.

4-3-4. ISP port

It is used for Firmware Update Configuration Set-up.

Do not connect anything to it because it can cause disturbance of Program.

4-3-5. RESET port

If Low(0V) is inputted into a RESET port, Software is reset. It is connected to a Re-set switch on an Interface Board.

When RESET port operates improperly because of noise, or operates by abnormal timing set by users, the Zigbee Network can be disturbed. Therefore, any connections to the Reset port are not recommendable except when Firmware needs to be updated. ATZ command is recommended for Reset instead.

4-3-6. STATUS port It shows status of devices.

Status1. Device creates the Zigbee Network and Participates in it.

- ⇒ When Device creates the Zigbee Network and participates in it, STATUS port outputs High and Low slowly and repeatedly. STATUS LED on an Interface board flickers once.
- ⇒ If Device fails to create the Zigbee Network or participates in the Zigbee Network, a STATUS port outputs High and Low quickly and repeatedly. STATUS LED on an Interface Board quickly flickers.

Status2. Device sets its target device.

- ➡ If FZ750BS/FZ750BC sets its target device, STATUS port outputs High. STATUS LED on an Interface Board is turned ON.
- ➡ If FZ750BS/FZ750BC failed to set its target device, a STATUS port outputs High and Low slowly and repeatedly. STATUS LED on an interface Board flickers once.

When the mode of FZ750BS/FZ750BC is changed from Operation to AT Command, STATUS port is changed to Low. STATUS LED on an Interface board is turned OFF.

In case of End Device, STATUS port outputs High when the End Device is in a low power consumption mode. STATUS LED on an Interface Board is turned ON.

In case of End Device, STATUS port outputs High when the End Device makes wake-up in a low power consumption mode. STATUS LED on an Interface Board is turned ON.

4-3-7. ERROR port It shows status of Devices.

While FZ750BS/FZ750BC operates after the Network initialization, ERROR port outputs Low. ERROR LED on an Interface board keeps being turned OFF.

It shows result value of operation.

- ➡ If Device fails to create the Zigbee Network or participates in the Zigbee Network, ERROR port outputs Low, High and Low in order. ERROR LED on an Interface Board flickers once.
- ⇒ If data is sent to target device improperly, ERROR port outputs Low, High and Low in order. ERROR LED on an Interface board flickers once.

When the mode of FZ750BS/FZ750BC is changed from Operation to AT Command, ERROR port is changed to High. ERROR LED on an Interface board is turned ON.

In case of End Device, ERROR port outputs High when the End Device enters into a low power consumption mode. ERROR LED on an Interface Board is turned ON.

In case of End Device, ERROR port outputs Low when the End Device makes wake-up in a low power consumption mode. ERROR LED on an Interface Board is turned OFF.

4-3-8. OK port It shows status of Devices.

While FZ750BS/FZ750BC operates after the Network initialization, OK port outputs Low. OK LED on an Interface board is turned OFF.

It shows result value of operation.

- ⇒ When Device creates the Zigbee Network and participates in it, OK port outputs Low, High and Low in order. OK LED on an Interface board flickers once.
- ➡ If FZ750BS/FZ750BC sets its target device, OK port outputs Low, High and Low in order. OK LED on an Interface board flickers once.
- ⇒ If data is sent to target device properly, OK port outputs Low, High and Low in order. OK LED on an Interface Board flickers once.

When the mode of FZ750BS/FZ750BC is changed from Operation to AT Command, OK port is changed to High. OK LED on an Interface board is turned ON.

In case of End Device, OK port outputs High when the End Device enters into a low power consumption mode. OK LED on an Interface Board is turned ON.

In case of End Device, OK port outputs Low when the End Device makes wake-up in a low power consumption mode. OK LED on an Interface Board is turned OFF.

4-3-9. KEY port

It is a Digital Input port.

If Low (0V) is inputted into a KEY port, FZ750BS/FZ750BC notes that KEY data is inputted in it.

However, the judgments on KEY data inputted are subject to Device Type and mode of FZ750BS/FZ750BC.

End Device does not enter into a Low power consumption mode if a certain form of data remains inputted in a KEY port. The End Device enters into a low power consumption mode 1sec after the data in the KEY port is removed.

It is connected to KEY switch on an Interface board is connected.

4-3-10. GND port It connects Low (0V) signal.

4-3-11. VCC port It connects DC3.3V of voltage.

4-3-12. GPIO port It is a port for Digital Input/output.

When GPIO port is used for Input, connect it to the switch on an interface board. When GPIO port is used for Output, connect it to the LED on an interface board. GPIO port consists of 8 bit (GPIO 0 \sim GPIO 7) GPIO set value of FZ750BS/FZ750BC is High (1).

If GPIO port is set to INPUT, and the connected switch is pushed, Low (0) is inputted into a the GPIO port. The GPIO port also notices that the Low (0) is inputted.

If GPIO port is set to OUTPUT, and connected to the LED on an interface board, the GPIO port can receive wireless GPIO value, and output each value of bits.

If the received wireless GPIO value is High (1), GPIO port outputs High.

If the received wireless GPIO value is Low (0), GPIO port outputs Low.

If GPIO port outputs High, the LED on an Interface Board is turned OFF. If GPIO port outputs Low, the LED on an Interface Board is turned ON.

5. Interface (Pin Connection)



5-1. Connection between a FZ750BS/FZ750BC and an Interface Board

<Figure 5-1 Pin Connection between a FZ750BS/FZ750BC and an Interface Board.>

5-2. Pin Connection between a FZ750BS/FZ750BC and a MICOM



<Figure 5-2 Pin connection between and a FZ750BS/FZ750BC a MICOM>



5-3.Connection between a FZ750BS/FZ750BC and a PC

<Figure 5-3 Pin connection between and a FZ750BS/FZ750BC and a PC>

✗ Information on 74LS04

74LS04 on an interface board is used for users' conveniences. Users can easily get know the operation status of FZ750BS/FZ750BC when STATUS port is connected to LED through the 74LS04. LED on an interface board is ACTIVE Low. LED is turned on when Low signal is inputted into it. If STATUS port is directly connected to LED without 74LS04, LED is turned off when STATUS port becomes High, and the LED is turned on when the STATUS port becomes Low With 74LS04, LED is turned on when STATUS port becomes High, and the LED when STATUS port becomes High, and the LED is turned on when STATUS port becomes High, and the LED is turned on when STATUS port becomes High, and the LED is turned on when STATUS port becomes High, and the LED is turned when the STATUS port become Low.

74LS04 is used on a PC interface because the RTS Operation Point of PC is different from the KEY port Operation point of FZ750BS/FZ750BC.

KEY port of FZ750BS/FZ750BC normally keeps High(3V).

To transmit signal to KEY port, input Low(0V) into a KEY port or change the voltage from Low(0V) to High(3V).

RTS port of PC basically outputs High. RTS High Signal of PC is changed to Low through MAX. If the RTS Signal changed to Low is inputted into the KEY port of FZ750BS/FZ750BC, It may cause some problems. Thus, change the Low signal to High signal by using 74LS04, and input the changed signal before the RTS Signal of PC is inputted into the KEY port of FZ750BS/FZ750BC. This is the best proper way to transmit signal from PC to FZ750BS/FZ750BC.



5-4. Pin Connection between a GPIO port of FZ750BS/FZ750BC and MICOM (Extension Connection)

<Figure 5-4-1 Pin Connection between GPIO(INPUT) of FZ750BS/FZ750BC and MICOM>



<Figure 5-4-2 Pin Connection between GPIO(OUTPUT) of FZ750BS/FZ750BC and MICOM >



5-5. Pin Connection between a GPIO port of FZ750BS/FZ750BC and an interface board (Extension Connection)







6. Set value of Product

6-1. Set value of FZ750BS/FZ750BC

	<table 6-1=""></table>	shows	main	set values	of	products
--	------------------------	-------	------	------------	----	----------

Part	Set value
Device Name	FZ750 Vx.x.x
Device Type	ROUTER
Device Channel	0B
Device Transmit Power	00
UART (baud rate-data bit-parity bit-stop bit)	115200-8-N-1
KEY option	0(Disable)
ADC Option	0(Disable)
Count Option	0(Disable)
GPIO Option	0(Disable)
Internal Time	10
ACK Option	0(Disable)
Retry Option	9
Power Mode	1
Reset Option	0(Disable)
target device Address	00000000000000
Link Quality Option	0(Disable)
Start Message Option	1(Enable)
Debug Message Option	0(Disable)
Battery Low Option	0(Disable)
Quick Low Power Entry	0(Disable)

<Table 6-1 FZ750BS/FZ750BC set values>

To change the set values of FZ750BS/FZ750BC, use PC Software (Window HyperTerminal, Firmtech configuration program) after connecting FZ750BS/FZ750BC to PC by using a PC Interface board, or use MICOM working with AT command.

Note: Please, refer to the contents in "8. Zigbee Network Configuration" or "10. FZ750BS/FZ750BC Set-up using GUI(ZIGNET)" for further information on Set-up Modification.

7. PC Interface Board



Use an Interface Board to test Configuration and Operation Status of FZ750BS/FZ750BC.



7-1. Interface Board Description

- 7-1-1. USB power input terminal & power on/off switch & reset switch
- (1) Connect USB port of PC to an Interface board by using USB power cable.
- (2)The power is authorized to Interface Board and a FZ750BS/FZ750BC with the power switch turned on.
- (3) Software is reset if reset switch is pushed. (Power OFF \rightarrow ON)



< Figure 7-1-1 USB Power Input & Power Switch & Reset switch >

7-1-2. RS232 interface terminal

(1)Connect PC to Interface Board by using RS232 cable.

(2)Inputting and outputting data into UART port becomes possible by using serial program of PC.

(3)Configuration set-up of FZ750BS/FZ750BC is possible by using GUI (ZIGNET).



<Figure 7-1-2 RS232 Interface Terminal>

7-1-3. FZ750BS/FZ750BC connection connector

(1) Connect Interface Board to FZ750BS/FZ750BC.

(2)All functions of FZ750BS/FZ750BC can be used by Interface Board.

(3) Functions of FZ750BS/FZ750BC are shown on PC.



< Figure 7-1-3 FZ750BS/FZ750BC >

7-1-4. Control selection switch

- (1) KEY / RTS selection switch
 - If you set "KEY / RTS selection switch" to KEY, KEY port of FZ750BS/FZ750BC is connected to KEY switch on an Interface Board.

You can input KEY data into KEY port of FZ750BS/FZ750BC by using a KEY switch on an Interface Board.



< Figure 7-1-4-(1)-① KEY / RTS selection switch - Select KEY >

② If you set "KEY / RTS selection switch" to RTS, KEY port of FZ750BS/FZ750BC is connected to RTS Terminal of RS232.

You can input KEY data into KEY port by using RTS port of PC.

In this case, KEY switch on an Interface Board does not operate.



< Figure 7-1-4-(1)-2 KEY / RTS selection switch - Select RTS >

(2) VR / SEN selection switch

① If you set "VR / SEN selection switch" to VR, ADC port of FZ750BS/FZ750BC is connected to variable resistance of an Interface Board.

You can input ADC data into ADC port of FZ750BS/FZ750BC by using the variable resistance of Interface Board.



< Figure 7-1-4-(2)-① VR / SEN selection switch - Select VR >

② If you set "VR / SEN selection switch" to SEN, ADC port of FZ750BS/FZ750BC is connected to extension test port on an Interface Board.

You can input ADC data into ADC port by using the extension test port of an Interface Board. In this case, Variable Resistance of Interface Board does not operate.



< Figure 7-1-4-(2)-2 VR / SEN selection switch -Select SEN >

7-1-5. KEY data Input Switch

(1) To use "KEY data Input Switch" on an Interface Board, set "KEY / RTS selection switch" to KEY.(2) If you push the "KEY data Input Switch", KEY data in inputted into KEY port of FZ750BS/FZ750BC.



< Figure 7-1-5 Setting KEY / RTS selection switch to KEY & KEY data Input Switch >

7-1-6. ADC data Input Variable Resistance

- (1) To use "ADC data Input Variable Resistance" of an Interface Board, set "VR / SEN selection switch" to VR.
- (2) If you change the "ADC data Input Variable Resistance", the changed ADC data is inputted into ADC port of FZ750BS/FZ750BC.



< Figure 7-1-6 Setting VR / SEN selection switch to SEN & ADC data Input Variable Resistance >

7-1-7. GPIO selection switch

(1) If you set "GPIO selection switch" to SWITCH, GPIO of FZ750BS/FZ750BC is connected to GPIO Switch on an Interface Board.

You can input GPIO data into GPIO port of FZ750BS/FZ750BC by using GPIO Switch on an Interface Board.

In this case, GPIO Option of FZ750BS/FZ750BC should be set to INTPUT(1).



< Figure 7-1-7-(1) GPIO selection switch - Select SWITCH >

(2) If you set "GPIO selection switch" to LED, GPIO of FZ750BS/FZ750BC is connected to GPIO LED on an Interface Board.

You can check GPIO Value from FZ750BS/FZ750BC by using GPIO LED on an Interface Board. In this case, GPIO Set-up Option of FZ750BS/FZ750BC should be set to OUTPUT (2).



< Figure 7-1-7-(2) GPIO selection switch - Select LED >

- 7-1-8. GPIO Input Switch & GPIO Output LED
- (1) GPIO Input Switch
 - 1 You can used it when you set "GPIO selection switch" on an Interface Board to switch.
 - 2 You can use it when you set GPIO Set-up Option of FZ750BS/FZ750BC to INPUT(1).
 - ③ You can input GPIO data into GPIO port of FZ750BS/FZ750BC by using GPIO switch on an Interface Board.



(2)AT+SETGPIO1



< Figure 7-1-8-(1) Setting GPIO selection switch to SWITCH & GPIO data Input switch >

(2) GPIO Output LED

- (1) You can check GPIO Output with it when you set "GPIO selection switch" to LED on an Interface Board.
- 2 You can use it when you set GPIO set-up Option of FZ750BS/FZ750BC to OUTPUT(2).
- ③ You can check value from GPIO port of FZ750BS/FZ750BC by using GPIO LED on an Interface Board.



< Figure 7-1-8-(2) Setting GPIO selection switch to LED & checking GPIO data Output with LED >

7-1-9. RX / TX LED

(1) They are connected to UART port.

(2) They show status of UART data Input/output.

(3) RX LED flickers when UART data is inputted.

(4) TX LED flickers when UART data is outputted.





< Figure 7-1-9 RX / TX LED >

7-1-10. STS / ERR / OK LED

(1) They are connected to STATUS / ERROR / OK port.

(2) They show overall operation status of FZ750BS/FZ750BC.

(3) STS LED on an Interface Board is connected to CD port of RS232 port. (RS232 port No.1)

(4) OK LED on an Interface Board is connected to CTS port of RS232 port. (RS232 port No.8)

(5) ERR LED on an Interface Board is connected to DSR port of RS232 port. (RS232 port NO.6)







< Figure 7-1-10 STS / ERR / OK LED >

- 7-1-11. ISP selection switch
- (1) It is connected to ISP port of FZ750BS/FZ750BC.
- (2) It is a switch that is used when firmware is updated.
- (3) Do not set it to DN because FZ750BS/FZ750BC program can be destroyed.

In Normal Operation mode





For Firmware Update



Changes should be made only in special case

< Figure 7-1-11 ISP selection switch >

7-1-12. Extension test port

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- (1) It is connected to KEY / ADC / GPIO port of FZ750BS/FZ750BC.
- (2) You can configure other forms of data Input(Output) by using the extension test port on an Interface Board.
- (3) KEY / GPIO port of FZ750BS/FZ750BC is directly connected to the extension test port on an Interface Board.

KEY and GPIO port can use the extension test port without additional Set-up.



< Figure 7-1-12-1 Extension test port >

(4) To use ADC port of FZ750BS/FZ750BC as extension test port of Interface Board, set "VR / SEN selection switch" to SEN.



< Figure 7-1-12-2 Set-up for using ADC port as extension port >

(5) Extension port of FZ750BS/FZ750BC is used for connection with extension interface board. Extension interface board provided is vacant. 2.54mm (100mil) Headers can be used for the connection in case of need.



< Figure 7-1-12-③ Extension Interface Board >



<Figure 7-1-12-④ 2.54mm(100mil) 7*2 Pin Headers >

(6) Extension interface connection board is used for connection between extension port of FZ750BS/FZ750BC and extension interface board.

Extension interface connection board provided is vacant. 2.54mm (100mil) Headers can be used for the connection in case of need.



< Figure 7-1-12-(5) A Extension Interface Connection Board >



<Figure 7-1-12-[®] A connection between Interface Board and Extension Interface Board by Extension Interface Connection Board >



< Figure 7-1-12-7 A connection by 2.54mm(100mil) Headers>

(7) A space between Pins is 2.0mm(75mil).

You can use 2.54mm(100mil)of convertible Board to adjust the space between Pins.

2.54mm(100mil) of convertible Board provided is vacant, Headers can be used in case of need.

8	0	ADC	FZXDOBX	CHD	6	3
1	C	TX		GP_0	C	6
	C	RX		GP_1	C	
2	C	ISP		CP_2	C	
Ø.	C	RESET		GP_3	C	й
۲	C	STS		CP_4	C	
di l	C	ERR		GP_5	đ	
ž	C	OK		GP_6	đ	2
ų.	C	KEY		GP_7	C	6
e.		GND		3.3V	0	\$

< Figure 7-1-12-1 2.54mm(100mil) A Convertible Board >



< Figure 7-1-12-9 2.54mm(100mil) 10*1 Pin Headers >





< Figure 7-1-12-10 2.54mm(100mil) Mounting Convertible Board >

7-2. Check lists before mounting FZ750BS/FZ750BC on an Interface Board.

Check the following before mounting FZ750BS/FZ750BC on an Interface Board.

7-2-1. ISP selection switch Set ISP selection switch to <u>"OP".</u>

7-2-2. KEY / RTS selection switch Set KEY / RTS selection switch to <u>"KEY".</u>

7-2-3. VR / SEN selection switch Set VR / SEN selection switch to <u>"VR"</u>.

7-2-4. GPIO selection switchIn case that GPIO is used for Input, set GPIO selection switch to <u>"SWITCH"</u>.In case that GPIO is used for Output, set GPIO selection switch to <u>"LED"</u>.

7-2-5. Power Input Switch It should be turned OFF before FZ750BS/FZ750BC is mounted.

7-2-6. RS232 ConnectorIt is connected to PC by using RS232 Serial Cable.

7-2-7. USB Power ConnectorIt is connected to PC by using USB Power Cable.

* Approve Power by connecting FZ750BS/FZ750BC to its Connector after all check lists are done. You can use all functions FZ750BS/FZ750BC has by using an Interface Board.

8. Zigbee network Configuration

To configure the Zigbee Network, set up a FZ750BS/FZ750BC DEVICE.

The following is a procedure for FZ750BS/FZ750BC Set-up using Serial communication (HyperTerminal) Program.

The signal speed of FZ750BS/FZ750BC is basically 115200bps.

8-1. Serial Communication (Hyper Terminal) Program Execute

Select [Start] \rightarrow [All Programs] \rightarrow [Accessories] \rightarrow [Communication] \rightarrow [Hyper Terminal] in order, and then a window for Connection Set-up comes up. Put a name in the name blank, and click the OK button.

Connection Description 🛛 ? 🔀
New Connection
Enter a name and choose an icon for the connection:
Name:
test
lcon:
OK Cancel

When a window for Connection target comes up, select COM ports connected to FZ750BS/FZ750BC, and click the OK button.

Connect To	? 🛛
🧞 test	
Enter details for	the phone number that you want to dial:
	a le priorie riamber a las you want to alai.
Country/region:	United States (1)
Area code:	82
Phone number:	
Connect using:	COM1 💌
	OK Cancel

Select each blank as below "Bit/sec: 115200, data Bit: 8, Parity: None, Stop Bit: 1, Flow Control: None", and click the OK button. Hyper Terminal is executed.

COM1 Properties	? 🗙
Port Settings	
	_
Bits per second: 115200	
Data bits: 8	
Parity: None 💌	
Stop bits: 1	
Flow control: None	
Restore Defaults	5
OK Cancel Ap	ply

Hyper Terminal simply does not show any letters inputted.

If you check on "Display the letters inputted on the Terminal" to get to know what letters are inputted, the Recommends between FZ750BS/FZ750BC and Hyper Terminal are mixed up. <u>Do not check this.</u>



8-2. Set-up FZ750BS/FZ750BC Device Type

Zigbee Device is classified as Coordinator, Router, and End Device by objective of its operation.

There should be Coordinator in the Zigbee Network. A Coordinator should exist in a Zigbee Network. Coordinator manages the Network in the Zigbee Network.

Router extends the Network in the Zigbee Network.

End Device participates in the zigbee Network using low power consumption.

Router and End Device are automatically participated in the Network once Coordinator configures the Zigbee Network.

Note: Please, refer to the following when you try to configure the Zigbee Network.

1. Do not turn the power of the Device set to Coordinator ON before all devices' types are set.

- 2. If you already set the rest type of each Device and operate them with the Coordinator that the power is turned on, execute Factory Reset for the devices set to Coordinator and Router. Before the Factory reset, the power of the Coordinator and the Router should be turned OFF. After the Factory reset is done, set each Device to Coordinator and Router, and turn on the power of all devices. The Zigbee Network shall be properly configured.
- 3. Do not change the Device Type of FZ750BS/FZ750BC once the Zigbee Network is configured.
- It is better to set Coordinator and Router again(Factory Reset) if the Device Type of FZ750BS/FZ750BC is changed after the Zigbee Network is already configured.
- See if the Zigbee Network is configured before resetting FZ750BS/FZ750BC to initial set value. The FZ750BS/FZ750BC reset automatically participates in the Zigbee Network if the Zigbee Network still exists there.

8-2-1. FZ750BS/FZ750BC End Device Set-up

(1) The Initial set value of FZ750BS/FZ750BC is ROUTER.

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ROUTER START ERROR
-

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🏶 test - HyperTerminal

OK.

0K

File Edit View Call Transfer Help

ONTER START ERROR

File Edit View Call Transfer Help

ROUTER START ERROR

🗋 🗗 🖓 💿 🔏 💮

(2) Connect Device to PC, execute Hyper Terminal, and approve the power to the Device. "ROUTER START ERROR" is output through Serial port.

"ROUTER START" and "ERROR" are output.

"ROUTER START ERROR" means that The Zigbee Network Participation is failed. "ROUTER START OK" is output if the Zigbee Network is configured.

(3) Input "+++" in Hyper Terminal.

(4) If "OK" is outputted from FZ750BS/FZ750BC, AT-Command can be used from then.

If "OK" is not output even after inputting "+++", press "Enter" key and input "+++" again, or reboot the device and input "+++".

(5) After inputting "AT+SETEND" into Hyper Terminal, press Enter Key.



(6) If "OK" is output from FZ750BS/FZ750BC, reboot FZ750BS/FZ750BC by inputting "ATZ".

(7) **"END START ERROR"** is output at the moment when FZ750BS/FZ750BC is rebooted.

"END START OK" is output if the Zigbee Network is successfully configured.

(8) Now, End Device of FZ750BS/FZ750BC set-up is completed.

Turn the Power of the End Device OFF, and set other devices.

8-2-2. FZ750BS/FZ750BC Router Set-up

(1) The initial set value of Device is ROUTER.

* The initial set value of FZ750BS/FZ750BC is ROUTER.

The following is a procedure of purposely setting Device to Router by using AT-Command. However, Device originally operates as Router without intentional setting.

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File	Edit	View	Call	Transfer	Help
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	ROUT	ER S	TART	ERROR	>

(2) Connect FZ750BS/FZ750BC to PC, execute Hyper Terminal Program, and approve the power to the FZ750BS/FZ750BC. **"ROUTER START ERROR"** is output through Serial port.
"ROUTER START" and "ERROR" are output.

"ROUTER START ERROR" means that the Zigbee Network participation is failed.

"ROUTER START OK" is output if the Zigbee is successfully configured Network.



(3) Input "+++" into Hyper Terminal.

(4) If "**OK**" is output from FZ750BS/FZ750BC, AT-Command can be used from then.

If "OK" is not output even after inputting "+++", press "Enter" key and input "+++" again, or reboot the device and input "+++".

(5) Input **"AT+SETROUTER"** through Serial port of PC and press "Enter" key.

(6) If "OK" is output from FZ750BS/FZ750BC by inputting "ATZ", reboot FZ750BS/FZ750BC.

(7) **"ROUTER START ERROR"** is output at the moment when FZ750BS/FZ750BC is rebooted.

"ROUTER START OK" is output if the Zigbee Network is successfully configured.

(8) Now, Router of FZ750BS/FZ750BC Set-up is completed.

Turn the Power of the Router Device OFF, and set other devices.

8-2-3. FZ750BS/FZ750BC Coordinator set-up

(1) The initial set value of FZ750BS/FZ750BC is ROUTER.

🌯 t	est -	Нуре	rTerr	ninal	
File	Edit	View	Call	Transfer	Help
D	2	1) =[) <mark>6</mark> (°
	ROUT	ER S	TART	ERROF	

(2) Connect FZ750BS/FZ750BC to PC, execute Hyper Terminal Program, and approve the power to the FZ750BS/FZ750BC.
"ROUTER START ERROR" is output through Serial port.
"ROUTER START" and "ERROR" are output.
"ROUTER START ERROR" means that the Zigbee Network participation is failed.
"ROUTER START OK" is output if the Zigbee Network is

successfully configured.

Image: style styl	 (3) Input "+++" into Hyper Terminal. (4) If "OK" is output from FZ750BS/FZ750BC, AT-Command can be used from then. If "OK" is not output even after inputting "+++", press "Enter" key and input "+++" again, or reboot the device and input "+++".
Image: State of the state	(5) Input "AT+SETCOORD" through Serial port of PC and press "Enter" key
Image: Start - HyperTerminal File Edit View Call Transfer Help Image: Start End Start End Start End Start OK Image: Start OK Image: Non	 (6) If "OK" is output from FZ750BS/FZ750BC by inputting "ATZ", reboot FZ750BS/FZ750BC. (7) "COORD START OK" is output at the moment when FZ750BS/FZ750BC is rebooted.

(8) Now, Coordinator of FZ750BS/FZ750BC Set-up is completed, and the Zigbee Network is successfully configured.

Turn the Power of the Coordinator Device OFF, and set other devices.

8-3. The Zigbee Network Configuration using FZ750BS/FZ750BC

Try to configure the Zigbee Network after setting the Type for each Device.

8-3-1. The Zigbee Network confiuration

Coordinator leads the Zigbee Network Congifuration.

Coordinator manages the Zigbee Network.

🍣 test - HyperTerminal
File Edit View Call Transfer Help
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COORD START OK TARGET NON

(1) Turn the power of the Device set to Coordinator ON.
(2) "COORD START OK" is output.
"COORD START OK" and "TARGET NON" are output.
"TARGET NON" means that FZ750BS/FZ750BC has yet to set its target device.

(3) Zigbee Network is configured by Coordinator.

(4) From then, Zigbee Network Participation and Extension is possible by Router and End Device.

(5) Coordinator can transmit Data.

8-3-2. Zigbee Network Extension

Router performs the Zigbee Network Extension.

Communication distance and route can be extended because of the Zigbee Network Extension by Router.

The number of End Device which participates in the Zigbee Network can be increased because of the Zigbee Network Extension by Router.

Router also transmits data in the Zigbee Network, as well.



(1) Turn the Power of the Device set to Router $\ensuremath{\text{ON}}.$

(2) "ROUTER START OK" is output.

"ROUTER START OK" and "TARGET NON" are output.

"TARGET NON" means that FZ750BS/FZ750BC has yet to set its target device.

If "ROUTER START ERROR" is output, which means that no

Zigbee Network is around, reset the Device or check if the Coordinator's status is okay.

(3) Router participates in the Zigbee Network and extends the Zigbee Network.

(4) Router can transmit Data.

8-3-3. Zigbee Network Participation

End Device participates in the Zigbee Network.

End Device performs data transmission in the Zigbee Network.

End Device supports Low power consumption mode.

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END START OK TARGET NON							

(1) Turn the Power of the Device set to End Device ON.
(2) "END START OK" is output.
"END START OK" and "TARGET NON" are output.
"TARGET NON" means that FZ750BS/FZ750BC has yet to set its target device.

If "END START ERROR" is output, which means that no Zigbee

Network is around, reset the Device or check if the Coordinator's status is okay.

(3) End Device participates in the Zigbee Network, and is ready to transmit Data.

9. FZ750BS/FZ750BC data transmission

Data transmission is possible by Devices which set its target devices after The Zigbee Network Configuration.

Data types for data transmission are UART/ADC/KEY/COUNT/GPIO.

If data type for transmission is set to UART, A Device transmits UART data to its target device. -Press "Enter" key after inputting UART Data.

If data type for transmission is set to ADC, A Device transmits ADC data to its target device repeatedly because the Device reads ADC port every certain time. -Check the Internal time with a command "AT+GETTMR"

If data type for transmission is set to KEY, A Device transmits KEY data to its target device. If enabling COUNT data transmission is set after enabling ADC data transmission is set, the Device transmits COUNT data instead of ADC data to its target device every certain time.

If GPIO Use Option is set to INPUT after enabling KEY data transmission is set, the Device transmits GPIO INPUT data instead of KEY data to its target device.

If GPIO Use Option is set to INPUT after enabling ADC data transmission is set, the Device transmits GPIO INPUT data instead of ADC data to its target device every certain time.

9-1. Set-up Transmission data Type

9-1-1. UART set-up

UART(TTL Level Serial Data) data transmission is possible by using FZ750BS/FZ750BC. FZ750BS/FZ750BC supports UART communication. No additional setting is required. The signal speed of FZ750BS/FZ750BC is normally 115200bps. You can input Serial data by using UART port of FZ750BS/FZ750BC.

9-1-2. ADC set-up

ADC (Analog to Digital) data transmission is possible by using FZ750BS/FZ750BCADC. ADC transmission option is basically set to be disabled (0). You can input ADC data by using ADC port of FZ750BS/FZ750BC Set to ADC transmission option to be enabled as below.

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File	Edit	View	Call	Transfe	r Help		
D	Ż	02	\$ =[ם כ	P		
F	ROUTI TARGI XK	ER S Et Ni	TART ON	OK			

(1) Input "+++" through the Serial port of PC.

(2)AT-Command can be used after "OK" is output from FZ750BS/FZ750BC.

If "OK" is not output from FZ750BS/FZ750BC even after you input "+++", press Enter Key and input "+++" again, or reboot the Device.



(3) Input **"AT+SETADC1"** through Serial port of PC and press "Enter" key.

(4) "**OK**" is output from FZ750BS/FZ750BC, which means that ADC transmission option is set to be enabled (1).

If ADC transmission option of FZ750BS/FZ750BC is enabled (1), the Device reads ADE port every certain time(check the Internal time with a command "AT+GETTMR"), change Analog data to Digital Value, and transmits the value to its target device.

The Internal time of FZ750BS/FZ750BC is basically set to 10seconds. FZ750BS/FZ750BC reads ADC port every 10 seconds unless you intentionally change the internal time.

(5) To use variable resistance with ADC data Input, set "VR / SEN Selection switch" on an Interface Board to VR.

(6) Change the variable resistance value of Interface Board and input ADC data value into FZ750BS/FZ750BC.



< Figure 9-1-2 ADC data Input using variable resistance >

9-1-3. KEY set-up

KEY(Digital Input) data transmission is possible by using FZ750BS/FZ750BC.

KEY transmission option is basically set to be disabled (0).

You can input KEY data through KEY port.

Set KEY transmission option of FZ750BS/FZ750BC set to be enabled as below.



(1) Input "+++" through Serial port of PC.

(2) AT-Command can be used after "OK" is output from FZ750BS/FZ750BC.

If "OK" is not output even after inputting "+++", press "Enter" key and input "+++" again, or reboot the device and input "+++".



(3) Input **"AT+SETKEY1"** through Serial port of PC, and press "Enter" key.

(4) "**OK**" is output from FZ750BS/FZ750BC, which means that KEY transmission option is set to be enabled (1).

If KEY transmission option is enabled (1), FZ750BS/FZ750BC transmits KEY data to its target device.

* If Device is set to Coordinator or Router, the Device transmits KEY data inputted to its target device regardless of the KEY option.

If KEY data is inputted into End Device, the End Device transmits the KEY data to its target device according to the KEY option (KEY option should be enabled) or makes wake-up (KEY option should be disabled) in a low power consumption mode.



< Figure 9-1-3 KEY data Input Selection with Switch >

9-1-4. COUNT set-up

COUNT data transmission is possible by using FZ750BS/FZ750BC.

The COUNT transmission option is basically set to be disabled (0).

<u>COUNT transmission of FZ750BS/FZ750BC is possible only when ADC data transmission option is set</u> to be enabled.

If ADC transmission option and COUNT transmission of FZ750BS/FZ750BC are set to be enabled(1), FZ750BS/FZ750BC transmits COUNT data to its target device every certain time rather than transmits ADC Data.

"Enabling ADC data transmission option + Enabling COUNT (1)": A Device transmits COUNT data instead of ADC data to its target device.

"Enabling ADC data transmission option + Disabled COUNT (0)": A Device transmits ADC data to its target device.

"Disabled ADC data transmission option+ Enabling COUNT (1)": Neither of them are sent even if the target device exists.

A commend "AT+SETCOUNT1" is used to set COUNT transmission option to be enabled (1).

COUNT data transmission and GPIO Value Transmission cannot be working at the same time. GPIO Option should be set to be disabled (0) for COUNT data transmission.
9-1-5. GPIO Set-up GPIO Value Transmission is possible by using FZ750BS/FZ750BC.

GPIO Use Option of FZ750BS/FZ750BCis basically set to be disabled (0).

<u>GPIO Value Transmission of FZ750BS/FZ750BC is possible only when KEY data or ADC data</u> <u>transmission Option is set to be enabled.</u>

If KEY transmission option is set to Enable(1) and GPIO Option is set to INPUT(1), a Device reads GPIO Value and transmits the value to its target device rather than transmits KEY data when KEY data is inputted into the Device.

- "Enabling KEY data transmission Option + GPIO INPUT(1)" : A device transmits GPIO Value to its target device rather than transmits KEY data when KEY data is inputted into the Device.
- "Enabling KEY data transmission Option + GPIO Disable(0)" : A device transmits KEY data to its target device when the KEY data is inputted into the Device.

"Disabled KEY data transmission Option + GPIO INPUT(1)": Neither of them are transmitted even if the target device exists.

If ADC transmission option of FZ750BS/FZ750BC is set to Enable(1) and GPIO Use Option is set to INPUT(1), FZ750BS/FZ750BC reads GPIO Value every certain time and transmits the value to its target device rather than reads ADC port and transmits ADC Data.

"Enabling ADC data transmission Option + GPIO INPUT(1)" : A Device transmits GPIO Value to its target device by Internal time rather than transmits ADC Data.

"Enabling ADC data transmission Option + GPIO Disable(0)" : A Device transmits ADC data to its target device by Internal time.

"Disabled ADC data transmission Option + GPIO Enable(1)" : Neither of them are transmitted even if the target device exists.

With a command "AT+SETGPIO1", GPIO port is set to INPUT(1).

GPIO Value Transmission and COUNT data transmission cannot be working at the same time. COUNT Option should be set to be disabled (0) for GPIO Value Transmission.



< Figure 9-1-5-(1) GPIO Input Selection with Switch >

* When FZ750BS/FZ750BC reads GPIO port Value and transmits the Value to its target device, GPIO Option of the Device should be set to INPUT(1).

The target device outputs GPIO Value received through Serial.

If you want to make the target device output the received GPIO port Value through GPIO port, set GPIO port Use Option of the target device to OUTPUT(2).

When GPIO port Use Option of the target device is set to OUTPUT(2) and GPIO port of the target device is connected to LED on an Interface Board, The target device outputs the received GPIO data through Serial and outputs the GPIO Value through LED connected to GPIO.

With a command "AT+SETGPIO2", GPIO OUTPUT(2) of FZ750BS/FZ750BC is set.



< Figure 9-1-5-(2) GPIO Output Selection with LED >

9-2. Target device set-up

To transmit Data, setting a target device, which is supposed to receive the Data, is required in terms of the Zigbee Network using FZ750BS/FZ750BC,.

With no target device, data transmission cannot be done even if data is inputted.

To set a target device, you need to know an IEEE ADDRESS of the Device.

9-2-1. Searching for an IEEE ADDRESS of FZ750BS/FZ750BC

🌯 test - HyperTerminal
File Edit View Call Transfer Help
🏽 🖆 🖏 🖏 🖏
COORD START OK TARBET NON OK

(1) Input "+++" through Serial port of PC while a Device operates.
With Inputting "+++", the mode of FZ750BS/FZ750BC switches from operation mode to AT-command mode.
Data transmission becomes possible when FZ750BS/FZ750BC is in an operation mode. Users can control FZ750BS/FZ750BC when the device is in an AT-command mode.



(2) "OK" is output from FZ750BS/FZ750BC, input
"AT+GETLOCAL" through Serial port of PC and press Enter Key.
(3) "COORD,00155100000000B,0000" is output from the Device.

COORD : It is the Device Type of FZ750BS/FZ750BC.00155100000000B : It is an IEEE ADDRESS of FZ750BS/FZ750BC.0000 : It is a NETWORK ADDRESS.

(4) The IEEE ADDRESS "00155100000000B" is required for the target device set-up.

9-2-2. Target device set-up

Set a target device with the IEEE ADDRESS that is mentioned on the previous page.

🌯 test - Hyper Terminal
File Edit View Call Transfer Help
다 🛩 🛞 🖏 🗈 🎦 😭
TARGET NON
🌯 test - HyperTerminal
File Edit View Call Transfer Help
D 🗳 🍥 🕉 🗈 🎦 🗳
ROUTER START OK TARSET NON

(1) Turn the power of FZ750BS/FZ750BC ON.
(2) FZ750BS/FZ750BC outputs a message "TARGET NON", which means that its target device is not set.

(3) Input "+++" through Serial port of PC while FZ750BS/FZ750BC operates. "OK" is output. From then, its target device set-up is possible with AT Command.



(4) After "OK" is output from FZ750BS/FZ750BC "AT+SETTARGET00155100000000B" through Serial of PC and press "Enter" Key.

AT+SETTARGET : It is a command to save the target device's address.

00155100000000B : It is the target device's IEEE ADDRESS

(5) "**OK**" is output from FZ750BS/FZ750BC which means that the command for saving target device is cognized. If "ERROR" is output, the command inputted is wrong.

(6) Re-start FZ750BS/FZ750BC by inputting a command "ATZ" or turn the power of FZ750BS/FZ750BC off and on, again.

🌯 test - HyperTerminal			
File Edit View Call Transfer Help			
D 🗳 🍥 🍒 🗈 🎦 😭			
DOUTER START OK TARGET OK			

(7) FZ750BS/FZ750BC is re-started and outputs a message "TARGET OK".

Now, the target device set-up using its address is completed.

If **"TARGET ERROR"** is output, FZ750BS/FZ750BC which has an IEEE ADDRESS "00155100000000B" does not exist in the

Zigbee Network or the address saved is wrong.

9-3. data transmission

Data transmission is done in the Zigbee Network.

Data is transmitted to the target device "00155100000000B" that is set on the previous page. IEEE ADDRESS of the Device which is supposed to transmit the data is 001551000000005.

9-3-1. UART data transmission

🌯 1 - HyperTerminal
File Edit View Call Transfer Help
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COORD START OK TARGET NON
🌯 test - HyperTerminal
File Edit View Call Transfer Help
다 🛩 🖉 🖏 🖏 🖆
ROUTER START OK TARGET OK

Turn the power of FZ750BS/FZ750BC set to Coordinator ON.
 The Zigbee Network is configured by Coordinator.

(2)Turn the power of FZ750BS/FZ750BC set to Router ON.The Device participates in the Zigbee Network.Its target device is automatically set.A message "TARGET OK" is output.

If, "TARGET NON" or "TARGET ERROR" is output, its target device is not set. Do the "9-2-2.Target device set-up", again.

(3) Input "1234567890" into Hyper terminal and press "Enter(0x0D)" key.

FZ750BS/FZ750BC transmits data (1234567890) inputted, Carriage Return(0x0D), and Line Feed(0x0A) at the same time. (Do not input 0x0A. 0x0A is automatically added by FZ750BS/FZ750BC.)

🌯 1 - HyperTerminal
File Edit View Call Transfer Help
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COORD START OK TARGET NON 1234567890

(4) Serial Data"1234567890" is output.

Input Serial data through UART port of FZ750BS/FZ750BC

* After inputting the serial data, press "Enter" key.

* 53 bit including "Enter" key is a maximum length of Serial data can be transmitted by FZ750BS/FZ750BC

* The Serial data sent from a Device is output through UART port of its target device.

* the other forms of data cannot be transmitted while the Serial data is inputted.

* To transmit the other forms of data after Serial data transmission, you should wait until you get the Serial Data's result value. In other words, the other data transmission becomes possible after OK LED or ERROR LED shows its status.

9-3-2. KEY data transmission

Process the data transmission in the Zigbee Network.

Process the data transmission with the target device "00155100000000B".

IEEE ADDRESS of the Device which is supposed to transmit data is 0015510000000005.

🌯 1 - HyperTerminal
File Edit View Call Transfer Help
다 🚔 💮 🕉 🗈 🎦 💣
COORD START OK TARGET NON

Turn the power of FZ750BS/FZ750BC set to Coordinator ON.
 The Zigbee Network is configured by Coordinator.



(2) Turn the power of FZ750BS/FZ750BC set to Router ON.The Device participates in the Zigbee Network.Its target device is automatically set.A message "TARGET OK" is output.

If, "TARGET NON" or "TARGET ERROR" is output, its target device is not set.

Do "9-2-2. Target device set-up" ,again.

(3) Input KEY data through KEY port of FZ750BS/FZ750BC.

Push KEY switch on an Interface Board.

KEY port of FZ750BS/FZ750BC operates when Low is inputted.



< Figure 9-3-2 KEY data Input >

🌯 1 - HyperTerminal
File Edit View Call Transfer Help
D 🚔 🍘 🥈 🗈 🎦 😭
COORD START OK TARGET NON 1234557890 KEY_EVT_0015510000000005

(4) KEY data "KEY_EVT_001551000000005" is output.

KEY_EVT_ : it means that KEY data is received. 0015510000000005 : It is an Address of the Device which sent the KEY Data

* Input KEY data through KEY port of FZ750BS/FZ750BC.

% If you input Low(0V) through KEY port of FZ750BS/FZ750BC, FZ750BS/FZ750BC cognize it as KEY signal.

* When the signal is inputted through the KEY port, FZ750BS/FZ750BC transmits a certain form of data to its target device.

* KEY data is output transformed as a certain form through UART port of the target device.

* To transmit the other forms of data after KEY data transmission, you should wait until you get the KEY Data's result value. In other words, the other data transmission becomes possible after OK LED or ERROR LED shows its status.

9-3-3. ADC data transmission

Data transmission is done in the Zigbee Network.

Data is transmitted to the target device "00155100000000B" that is set on the previous page. IEEE ADDRESS of the Device which is supposed to transmit the data is 001551000000005.

🌯 1 - HyperTerminal		
File Edit View Call Transfer Help		
다 🗃 💮 🕈 🗈 🎦		
COORD START OK TARGET NON		

Turn the power of FZ750BS/FZ750BC set to Coordinator ON.
 The Zigbee Network is configured by Coordinator.

🌯 test	- 하이퍼	티미널	
파일(<u>F</u>)	편집(<u>E</u>)	보기(⊻)	호출(<u>C</u>)
D 🖻	8	<u>B</u>	ľ
ROUTE	R START T OK	ОК	

(2) Turn the power of FZ750BS/FZ750BC set to Router ON.The Device participates in the Zigbee Network.Its target device is automatically set.A message "TARGET OK" is output.

If, "TARGET NON" or "TARGET ERROR" is output, its target device is not set. Do the "9-2-2.Target device set-up", again.

(3) Input Analog data through ADC port of FZ750BS/FZ750BC.

Change Variable resistance of an Interface Board.

ADC port of FZ750BS/FZ750BC changes Analog Data (0V~1.5V) to Digital Data (0x0000~0x03FF).



< Figure 9-3-3 ADC data Input >



(4) ADC data "ADC0000_001551000000005" is output

ADC0000_: It means ADC data 0000 is received. 001551000000005: It is an address of the Device which transmitted ADC Data.

- * Input ADC data through ADC port of FZ750BS/FZ750BC.
- * The possible range of voltage for Input through ADD port is from 0V to 1.5V.
- * FZ750BS/FZ750BC reads ADC port every certain time and transmits.

(Refer to how to set internal time using GUI)

- FZ750BS/FZ750BC changes Analog signal inputted through ADC port to Digital signal. (0x0000 ~ 0x03FF)
- * FZ750BS/FZ750BC transmits the Digital data transformed to its target device.
- * ADC data that is transformed to Digital signal is output through UART port of the target device.

* To transmit the other forms of data after ADC data transmission, you should wait until you get the ADC Data's result value. In other words, the other data transmission becomes possible after OK LED or ERROR LED shows its status.

9-3-4. COUNT data transmission

- (1) Set ADC data transmission Option to be enabled as shown on "9-1-2. ADC Set-up"
- (2) Set COUNT Option to be enabled for COUNT Transmission. Use a command "AT+SETCOUNT1".

(3) After FZ750BS/FZ750BC participates in the Zigbee Network, set Enabling ADC transmission option (AT+SETADC1), Internal time (AT+SETTMR10: set internal time to 10seconds), and input "AT+SETCOUNT1". FZ750BS/FZ750BC transmits COUNT Value to its target device by the internal time rather than transmits ADC Data.

(4) COUNT data is output.

- => "CNT000A_001551000000005" is output
 CNT000A_: COUNT data 000A is received.
 001551000000005: This is an address of the Device which transmitted COUNT Data.
- 9-3-5. GPIO data transmission

< Transmitting GPIO data instead of KEY data >

- (1) Set KEY data transmission option to be enabled as shown on "9-1-3. KEY Set-up".
- (2) Set GPIO Use to INPUT for GPIO data transmission.

Use a command "AT+SETGPIO1".

Connect switch on an Interface Board to GPIO.



< Figure 9-3-5-(1) GPIO Input Selection (Select SWITCH) >

(3) After FZ750BS/FZ750BC participates in the Zigbee Network, set KEY transmission option to be enabled (AT+SETKEY1), input a command "AT+SETGPIO1". Although KEY data is input, FZ750BS/FZ750BC transmits GPIO port to its target device rather than transmits KEY Data.

Input the value though GPIO port.



< Figure 9-1-5-(2) GPIO Input with Switch >

Input KEY data as the value remains.



< Figure 9-1-5-(3) KEY data Input >

(4) GPIO data is output.

=> "GPT007F_001551000000005" is output

GPT007F_: It means that GPIO data 007F is received.

001551000000005: It is an address of the Device which transmitted GPIO Data.

< Transmitting GPIO data instead of ADC data >

- (1) Set ADC data transmission Option to be enabled as shown on "9-1-2. ADC Set-up".
- (2) To transmit GPIO Data, set GPIO Use Option to INPUT.
 - use a command "AT+SETGPIO1".

Connect Switch on an Interface Board to GPIO.



< Figure 9-3-5-(4) GPIO Input Selection (Select SWITCH) >

(3) After FZ750BS/FZ750BC participates in the Zigbee Network, set Enabling ADC transmission option (AT+SETADC1), Internal time (AT+SETTMR10: Internal time 10sec Set-up), and input "AT+SETGPIO1". FZ750BS/FZ750BC transmits GPIO Value to its target device by the internal time rather than transmits ADC Data.

Input the value through GPIO port.



< Figure 9-1-5-(5) GPIO Input with Switch

FZ750BS/FZ750BC reads GPIO data value every certain time and transmits the value to its target device as the inputted value remains.

When COUNT data transmission option is set to be enabled(AT+SETCOUNT1), COUNT data is transmitted instead of GPIO data.

To transmit GPIO data, COUNT transmission option should be disabled. (AT+SETCOUNT0)

- (4) GPIO data is output in Hyper Terminal of a target device.
 - => "GPT007F_001551000000005" is output.
 - **GPT007F_:** It means that GPIO data 007F is received.
 - 001551000000005: It is an address of the Device which transmitted the GPIO Data.
- * How to output the received GPIO data through GPIO port.

If a target device receives GPIO Data, the target device outputs a certain form of data through Serial port.

The following is how to output the received GPIO data through GPIO port.

- 1) Set GPIO port of FZ750BS/FZ750BC set to a target device to OUTPUT. - use a command "AT+SETGPIO2 ".
- 2) Connect the GPIO port to LED on an Interface Board.



< Figure 9–3–5–(6) GPIO Output Selection (Select LED) >

3) When FZ750BS/FZ750BC set to a target device receives GPIO Data, the Device outputs a certain form of data through Serial port.

If "AT+SETGPIO2" is set, GPIO port outputs GPIO port value through LED on an Interface Board.

<image>

< Figure 9-3-5-(7) GPIO Output Check >



10. FZ750BS/FZ750BC Set-up using GUI(TinyBee)

To Set FZ750BS/FZ750BC, use Window GUI provided by Firmtech rather than use Serial program (Hyper Terminal)

First, turn the power of FZ750BS/FZ750BC on

Turning the power ON is for checking the Network's status.

You cannot connect FZ750BS/FZ750BC to GUI while the Device checks the Network's status.

It takes about 3 \sim 5 seconds.

After turning the power of FZ750BS/FZ750BC ON (If the Device is set to Factory set value), "ROUTER START ERROR" or "ROUTER START OK" is output, which means that checking Network is completed.

Window GUI can be used after the checking Zigbee Network's status.

GUI cannot be connected while FZ750BS/FZ750BC operates as End Device and FZ750BS/FZ750BC is in a low power consumption mode. (Device enters into a low power consumption mode if its target device is set)

If you want to operate FZ750BS/FZ750BC as End Device, put the FZ750BS/FZ750BC in a wake-up mode. You can set FZ750BS/FZ750BC using GUI from then.

Connect FZ750BS/FZ750BC set to End Device to GUI before the End Device enters into a low power consumption mode again. (End Device enters into the low power consumption mode again 1 second after wake-up)

The following should be prior to use Window GUI.

- (1) Connect FZ750BS/FZ750BC to an Interface Board, and connect COM port(Serial port) of PC.
- (2) Turn the power of FZ750BS/FZ750BC ON.
- (3) Check if the checking Zigbee Network's status is completed.

If the Zigbee Network does not exist, STATUS LED flickers quickly. GUI Connection is possible.

If a Device participates in the Zigbee Network and target device is not set, STATUS LED flickers once. GUI Connection is possible.

If a Device participates in the Zigbee Network and target device is set, STATUS LED is turned ON and OK /ERROR LED is turned OFF. GUI connection is possible.

(4) Execute Window GUI after checking the Zigbee Network's status.

😵 TinyBee Ver 1.0R				×
SERIAL PORT OPEN SERIAL PORT O	CLOSE READ STATUS	WRITE STATUS	INITIALIZE DEVICE	EXIT
OVERVIEW				
LOCAL CONFIGURATION	Using	ZIGBEE STACK		
OUTPUT CONFIGURATION			R.	
OTHER CONFIGURATION	LOW POWER END USER MASH NETWORK	END USER COORDI END USER ROUTER		TM CONFIGURATION TOOL
ADVANCED	USER			

10-1. Serial port Connection

(1) Click "SERAIL PORT OPEN" Button.

TinyBee Yer 1.0R	8
SERIAL PORT OPEN SERIAL PORT CL	OSE READ STATUS WRITE STATUS INITIALIZE DEVICE EXIT
(1) OVERVIEW	
LOCAL CONFIGURATION	Using ZIGBEE STACK
OUTPUT CONFIGURATION	
OTHER CONFIGURATION	
JOINED NETWORK	END USER MASH NETWORK ROUTER END USER FIRMTECH ZIGBEE PRODUCT CONFIGURATION TOOL
ADVANCED	END USER ROUTER

(2) Select the ports connected FZ750BS/FZ750BC and select the signal speed.

(3)Click "OPEN" button.

💱 TinyBee Ver 1.0R		×
SERIAL PORT OPEN SERIAL PORT C	LOSE READ STATUS WRITE STATUS INITIALIZE DEVICE EX	IT
OVERVIEW		
LOCAL CONFIGURATION	Using ZIGBEE STACK	
OUTPUT CONFIGURATION		
OTHER CONFIGURATION	SERIAL PORT COM PORT COMIL BAUD RATH 115200 OPEN CANLED TIGBEE PRODUCT COM	TM FIGURATION TOOL
ADVANCED		

TinyBee Ver 1.0R	
SERIAL PORT OPEN SERIAL PO	RT CLOSE READ STATUS WRITE STATUS INITIALIZE DEVICE EXIT
OVERVIEW	
LOCAL CONFIGURATION	Using ZIGBEE STACK
OUTPUT CONFIGURATION	WATTING MESSAGE
OTHER CONFIGURATION	Send Configuration Mode Command
JOINED NETWORK	6%
	MASHINETWORK END
	END ROUTER
	USER
ADVANCED	

(4) Wait until Serial Connection is completed.

(5) Click "READ STATUS" button.

🧐 TinyBee Ver 1.0R		×
SERIAL PORT OPEN SERIAL PORT	CLOSE READ STATUS (5) STATUS INITIALIZE DEVICE EX	ит
OVERVIEW		
LOCAL CONFIGURATION	Using ZIGBEE STACK	
OUTPUT CONFIGURATION		
OTHER CONFIGURATION		тм
JOINED NETWORK	END USER MASH NETWORK END USER ROUTER ROUTER ROUTER	FIGURATION TOOL
ADVANCED		

ERIAL PORT OPEN SE	RIAL PORT CLOSE	READ STATUS	WRITE STATUS	INITIALIZE DEVICE	EXIT
OVERV	IEW				
LOCAL CONFIGURAT	ION	Using	ZIGBEE STACK		
OUTPUT CONFIGURAT		ING MESSAGE			
OTHER CONFIGURAT		Read Local Informatic Read Output Informal	n ion)(6) _	тм
JOINED NETWORK		Read Other Information	on 1%	Iny B	ee
		MASHINETWORK	END	TROOL TROOD	Connoolarion foo
		END	ROUTER		
		USER	ROUTER		
ADVANCED					

(6) Wait until READ STATUS is completed.

(7) The program is ready for set-up.

😵 TinyBee Ver 1.0R					×
SERIAL PORT OPEN	ERIAL PORT CLOSE	READ STATUS	WRITE STATUS	INITIALIZE DEVICE	EXIT
OVERV	IEW				
LOCAL CONFIGURAT	IION	Using Z	IGBEE STACK		
OUTPUT CONFIGURAT	TION		-	A.	
OTHER CONFIGURAT	TION		END USER		TM
IOINED NETWORK		END USER MASH NETWORK	COORDI END USER ROUTER ROUTER	FIRMTECH ZIGBEE PRODUC	CONFIGURATION TOOL
ADVANCED					

10-2. OVERVIEW

(1) Click "OVERVIEW" button.

🧐 T	inyBee Ver 1.0R				8
5	(1) OVERVIEW	OSE READ STATUS	WRITE STATUS	INITIALIZE DEVICE	EXIT
۲	LOCAL CONFIGURATION	Using	ZIGBEE STACK		
•	OUTPUT CONFIGURATION			Ľ	
•	OTHER CONFIGURATION	LOW POWER	USER		тм
	JOINED NETWORK	END USER MASH NETWORK	COORDI END USER ROUTER ROUTER	FIRMTECH ZIGBEE PRODUC	CONFIGURATION TOOL
	ADVANCED				

(2) Check currently set value of FZ750BS/FZ750BC.

AL PORT OPEN SE	RIAL PORT CLOSE	READ STATUS	WRITE STATUS	INITIALIZE DEVICE	EXIT
OVERV	EW OVERVIE	w			
LOCAL CONFIGURAT		INFORMATION ITION MODE : COORDINATOR OCAL ADDR :	DEVICE NAME NETWORK ADDR	: FZ750 V0.2.2 : 0000	
OTHER CONFIGURAT	ON OUTPU		CHANNEL ID POWER MODE MESSAGE INFOR	: OB : MODE 1	TinyB
JOINED NETWORK	TARGE	T DEVICE : 000000000000000000000000000000000000	DEBUG MESSA	ge : Disable Ge : Enable	VERSION :
	US ADC	USE ADC : DISABLE USE KEY : DISABLE JSE GPIO : DISABLE USE LQI : DISABLE E COUNT : DISABLE INTERVAL TIME : 10	OTHER INFORMA AUTO DEV LOW BATTERY STA QUICK LOW POW	ATION ICE RESET : DISABLE ATUS SEND : DISABLE VER ENTRY : DISABLE	(2)
	OUTPU	T POWER:00 Y COUNT:9			

10-3. LOCAL CONFIGURATION

SERIAL PORT OPEN SERIAL PORT	CLOSE READ STATUS	WRITE STATUS	INITIALIZE DEVICE	EXIT
	OCAL CONFIGURATION	12. TD		
LOCAL CONFIGURATION	OPERATION MODE	COORDINATOR 💌	(2)	33
OTHER CONFIGURATION	DEVICE NAME	FZ750 ¥0.2.2		0-0
× JOINED NETWORK	PARENT DEVICE	FFFFFFFFFFFFFFF		TinyBee
	NETWORK ADDRESS	0000		
	CHANNEL ID	08 •		
	POWER MODE	MODE 1 (NORMAL POWER)		
	VERSION	FZ750 ¥0.2.2		

(1) Click "LOCAL CONFIGURATION" button.

(2) Set Local Configuration of FZ750BS/FZ750BC.

"OPERATION MODE": Select Device Type of Device Type as END DEVICE / ROUTER / COORD **"DEVICE NAME":** Set a name of FZ750BS/FZ750BC. (12bit is a maximum length)

"LOCAL ADDRESS": It is an IEEE ADDRESS of FZ750BS/FZ750BC (Making correction is impossible)

"PARENT DEVICE": It is a Parent node in the Zigbee Network. (Making correction is impossible)

"NETWORK ADDRESS": It is a NETWORK ADDRESS (Making correction is impossible)

"PAN ID": It is an Identifier given by Coordinator. (Making correction is impossible)

"CHANNEL ID": Set channel for Zigbee Network Participation.(0B ~ 19)

The Channel of a Device should be the same as that of another one which is supposed

to be in the same Zigbee Network. (0x1A Unserviceablility)

"POWER MODE": Set a low power consumption mode in the case of End Device

MODE 1: It uses 25uA in the low power consumption mode.

(The Device is not reset even if it is put in a wake-up mode)

MODE 2: It uses 2uA in the low power consumption mode.

(The Device is reset after it starts wake-up)

MODE 3: It uses 1uA in the low power consumption mode.

(The Device is reset after it starts wake-up)

"VERSION": It shows a version of FZ750BS/FZ750BC Device. (Making correction is impossible)

10-4. OUTPUT CONFIGURATION

	OUTPUT	CONFIGURATION		L STATUS		
	OUTPUT	CONFIGURATION	N.			
OUTPUT CONFIGURATION		T/	ARGET DEVICE	NONE TARGET 00000000000	· (2)	
OTHER CONFIGURATION		USE ADC	DISABLE .	USE C		TinyRee
JOINED NETWORK		USE KEY	DISABLE .	USEC	DISABLE 💌	Thiybee
		USE LQI	DISABLE			
	ADC INT	ERVAL TIME OR I	POLLING TIME	10		
		OL	JTPUT POWER	00 💌		
			RETRY COUNT	9 🔻		

(1) Click "OUTPUT CONFIGURATION" button.

(2) Set Output Configuration of FZ750BS/FZ750BC.

"TARGET DEVICE": Input an IEEE ADDRESS of the Device which is supposed to set a target device.

NONE TARGET: Select it if you don't want to set any target devices.

BROADCASTING: Select it if you want set all devices to target devices.

USER INPUT: Input an IEEE ADDRESS of target device.

"USE ADC": Set weather ADC port is used.

"USE KEY": Set weather KEY port is used.

"USE LQI": Set weather Receive Sensitivity of data received is output.

"USE COUNT": Set weather COUNT Use Option is used.

"USE GPIO": Set function of GPIO.

DISABLE: GPIO port is not used.

USE INPUT: GPIO port is used as Input.

USE OUTPUT: GPIO port is used as Output.

"ADC INTERVAL TIME OR POLLING TIME": set internal time of FZ750BS/FZ750BC. (0 ~ 65000sec)

It is used for ADC Transmission in case of Coordinator and Router. (0 \sim 65000sec)

It is used when End Device enters into Low power consumption mode. (0 \sim 255sec)

"OUTPUT POWER": Set Wireless Output Intensity of FZ750BS/FZ750BC. (Maximum: 0x00, minimum: 0x12)

"RETRY COUNT": Set the number of re-transmission (0 \sim 9)

10-5. OTHER CONFIGURATION

RIAL PORT OPEN SERIAL F	ORT CLOSE	READ STATUS	WRITE STATUS	INITIALIZE DEVICE	EXIT
OVERVIEW	OTHER C	ONFIGURATION			
LOCAL CONFIGURATION OUTPUT CONFIGURATION OTHER CONFIGURATION	<u>Mess</u> <u>UAR</u> <u>Othe</u> LOW QU	age Configuration DEBUG MESSAGE START MESSAGE Configuration BAUD RATE Configuration AUTO DEVICE RESET BATTERY STATUS SEND ICK LOW POWER ENTRY	DISABLE ENABLE 115200 V DISABLE DISABLE DISABLE	(2)	TinyBe
	_				

(1) Click "OHTER CONFIGURATION" button.

(2) Set OTHER Configuration of FZ750BS/FZ750BC.

<Message Configuration>

"DEBUG MESSAGE": Set whether Debug message is output while FZ750BS/FZ750BC operates.

START MESSAGE: Set whether Start message is output while FZ750BS/FZ750BC operates.

<UART Configuration>

"BAUD RATE": Set the signal speed of UART.

<Other Configuration>

"AUTO DEVICE RESET": Set whether reset FZ750BS/FZ750BC when FZ750BS/FZ750BC fails to participate in the Zigbee Network.

Set whether reset FZ750BS/FZ750BC when FZ750BS/FZ750BC fails to set its target device.

"LOW BATTERY STATUS SEND": Set whether Battery's status of target device is transmitted when FZ750BS/FZ750BC's Input Voltage is 2.6V.

"QUICK LOW POWER ENTRY": Set whether Entry towards Low power consumption mode is processed quickly

10-6. WRITE STATUS

	(1) Cli	ck "WRI	TE STAT	rUS" b	utton.
--	---------	---------	---------	--------	--------

😵 TI	nyBee Ver 1.0R	x
SE	RIAL PORT OPEN SERIAL	PORT CLOSE READ STATUS WRITE STATUS INITIALIZE DEVICE EXIT
۲	OVERVIEW	OTHER CONFIGURATION
٢	LOCAL CONFIGURATION	Message Configuration
۲	OUTPUT CONFIGURATION	WARNING X
۲	OTHER CONFIGURATION	Do you want to write data in ZIGBEE Device? If you want to write, click 'YES'. If not, click 'NO'
	JOINED NETWORK	If you do not want to write and return to last read data, click 'RETURN'.
		AUTO DEVICE RESET DISABLE QUICK LOW POWER ENTRY DISABLE
	ADVANCED	

(2) Click "OK" button.

"OK": Click it if you want to write data in FZ750BS/FZ750BC.

"RETURN": Click it if you want return to last read data.

"CANCEL": Click it if you want to cancel the process of WRITE STATUS .

® 11	nyBee Ver 1.0R					×
SE	RIAL PORT OPEN SERIA	AL PORT CLOSE	READ STATUS	WRITE STATUS	INITIALIZE DEVICE	EXIT
•	OVERVIEW	OTHER	ONFIGURATION			
	LOCAL CONFIGURATION	Mes	sage Configuration			85
•	OUTPUT CONFIGURATION	- ya	TING MESSAGE		X	
۲	OTHER CONFIGURATION		Write Local Informal Write Output Inform	tion ation)(3)	TinyBee
	JOINED NETWORK		Write Other Informa	tion 50%		
		IOW	AUTU DEVICE RES			
		QL	JICK LOW POWER ENTR			
-						
	ADVANCED	1				

(3) Wait until the WAITING MESSAGE is gone.

(4) Serial port is closed and program goes back to the initial scene.

🧐 TinyBee Ver 1.0R	2
SERIAL PORT OPEN SERIAL PORT	LOSE READ STATUS WRITE STATUS INITIALIZE DEVICE EXIT
OVERVIEW	
LOCAL CONFIGURATION	Using ZIGBEE STACK
OUTPUT CONFIGURATION	
OTHER CONFIGURATION	
JOINED NETWORK	END ROUTER TIPSEE PRODUCT COMPUTER
	ROUTER
	USER ROUTER
ADVANCED	

(5) FZ750BS/FZ750BC set-up using Window GUI is completed.

Turn the power of the Device OFF and process set-up for other devices.

10-7. INITIALIZE DEVICE

It is used when you want to initialize a Device to factory set value.

All contents in the Device are removed and the Device goes back to factory set value.

To initialize FZ750BS/FZ750BC to factory set value, connect FZ750BS/FZ750BC to GUI and finish with WRITE STATUS.

INITIALIZE DEVICE button is not activated before that.

(1) Click "INITIALIZE DEVICE" button.

🧐 ТІ	inyBee Ver 1.0R				3	
SE	ERIAL PORT OPEN	SERIAL PORT CLOSE	READ STATUS	WRITE STATUS	INITIALIZE DEVICE EXIT	
	OVE	RVIEW			(1)	
	LOCAL CONFIGUR	RATION	Using ZIGBEE STACK			
٢	OUTPUT CONFIGUR	ALERT I			×	
•	OTHER CONFIGUR		Do you want to initial	lize the Device to Fa ze, 'OK', if not, click '	ctory Set? CANCEL'.	
	JOINED NETWO	RK (2	MASH NETWORK	CANCEL END USER ROUTER ROUTER	BEE PRODUCT CONFIGURATION TOOL	
	ADVANCED					

(2) Click "OK" button.

"OK": If you want to initialize the Device, click it.

"CANCEL": If you want to cancel the process, click it.

11. FZ750BS/FZ750BC Management TIP

Refer to the following to configure Zigbee Network properly in terms of data transmission and Controls.

11-1. FZ750BS/FZ750BC Device Type Set-up

(1) End Device Set-upSet Z750BS/FZ750BC to End Device before Coordinator and Router is set. (AT+SETEND)Turn the power of the FZ750BS/FZ750BC OFF.

(2) Router Set-upSet FZ750BS/FZ750BC to Router before Coordinator is set. (AT+SETROUTER)Turn the power of the FZ750BS/FZ750BC OFF.

(3) Coordinator Set-upSet FZ750BS/FZ750BC to Coordinator. (AT+SETCOORD)Turn the power of FZ750BS/FZ750BC OFF.

11-2. Zigbee Network Configuration

- (1) Turn the power of FZ750BS/FZ750BC set to Coordinator ON.
- (2) Turn the power of Router and End Device which are supposed to make 1 Depth ON.You can create Devices in 1 Depth up to 8.
- (3) Turn the power of Router and End Device which are supposed to make 2 Depth ON.
 - You can create Devices in 2 Depth up to the number of Router in 1 Depth * 8.
 - Devices are automatically created in 1 Depth if any seats are available in 1 Depth.
- (4) Turn the power of Router and End Device which are supposed to make 3 Depth ON.
 - You can create Devices in 3 Depth up to the number of Router in 2 Depth * 8.
 - Devices are automatically created in 1/2 Depth if any seats are available in 1/2 Depth.
- (5) Turn the power of Router and End Device which are supposed to make 4 Depth ON.
 - You can create Devices in 4 Depth up to the number of Router in 3 Depth * 8.
 - Devices are automatically created in 1/2/3 Depth if any seats are available in 1/2/3 Depth.

11-3. [Set-up] target device & data transmission type

(1) Set target device of each Device after the Zigbee Network is configured.

Save an IEEE ADDRESS of target device by using a command "AT+SETTARGET" Reset the Device so that its target device set-up can be processed.

< It is not recommended that there is a lot of traffic in the Zigbee Network. >

Refer to the meanings of Traffic in terms of Zigbee Network.

The Traffic is caused by "Zigbee Device which performs data transmission in the Zigbee Network", "Zigbee Device which performs data transmission to get its target device", "Zigbee Device which transmits data to its target device" "ACK data for checking if Zigbee Device transmits data its target device properly", and "Transmitted data for checking if the Zigbee Network works properly."

There is no traffic in case of Coordinator and Router unless they are turned ON again. Coordinator and Router are always turned ON because they intermediate Devices.

In case of End Device, a lot of traffic is caused because the power of End Device is turned ON and OFF repeatedly.

If there are a lot of Nodes in the Zigbee Network, set the space of time longer for data transmission between the Nodes,

Especially, in case of End Device, great caution is required.

(A space of data transmission per 10 Devices: minimum 2seconds)

The Shorter the space of data transmission is, the more traffic in the Zigbee Network is caused.

Do not change target device too often. When you set or change a target device, data for transmission is more created to get its route. The more data there is in the Zigbee network, the more traffic is caused.

In case thatEnd Device receives ACK data after data transmission, (For control using MICOM and data re-transmission) set ACK data transmission receipt to be enabled by using a command AT+SETACK1.

In this situation, more traffic in the Zigbee Network is caused in comparison.

If ACK data recipe is not required after data transmission using End device (For data transmission only), set ACK data receipt to be disabled by using a command **AT+SETACK0**. In this situation, less traffic in the Zigbee Network is caused in comparison.

Do not use Broadcast data transmission unless it is essential.

When FZ750BS/FZ750BC performs a command to get information on Nodes participated in the Zigbee Network, a lot of traffic in the Zigbee Network is caused.

Because Router cannot save information on all nodes in the Zigebee Network, the inquired data is mostly transmitted by broadcast.

Broadcast data increase traffic in the Zigbee Network.

In case of you need, use AT command to inquire information on nodes in the Zigbee Network.

A lot of traffic in the Zigbee Network bothers data transmission and target device set-up

(2) Set data transmission type after target device set-up.

To set ADC data transmission, use commands "AT+SETADC1" and "AT+SETTMR".

If FZ750BS/FZ750BC is Coordinator or Router, use a command "AT+SETTMR" for the set-up in 0 ~ 65000 sec.

If FZ750BS/FZ750BC is End Device, use a command "AT+SETTMR" in $0 \sim 255$ sec.

The Device reads ADC port every certain time and transmits ADC data to its target device. The target device receives "ADC0015_001551000000005 + 0x0D + 0x0A".

For setting KEY data transmission, use a command **AT+SETKEY1**. If KEY data is inputted in a Device, the Device transmits KEY data to its target device. The target device receives "KEY_EVT_0015510000000005 + 0x0D + 0x0A".

No additional setting is required for Serial data transmission. If Serial data is inputted in a Device, the Device transmits Serial data to its target device. The target device receives "KEY_EVT_001551000000005 + 0x0D + 0x0A".

Press Enter key[ENTER](0x0D) after inputting Serial Data, and then the Serial data is finally sent. The target device receives "Serial data from the Device + 0x0D + 0x0A".

For setting COUNT data transmission, use a command AT+SETCOUNT1. Process COUNT data transmission after ADC data transmission Set-up is completed. A device transmits COUNT data to its target device every certain time. The target device receives "CNT0005_001551000000005 + 0x0D + 0x0A" For setting GPIO data transmission, use a command AT+SETGPIO1(Set INPUT) Set GPIO data transmission Option to INPUT after KEY data transmission is completed. Set GPIO data transmission Option to INPUT after ADC data transmission is completed.

If KEY data transmission is completed to GPIO Transmission, a Device transmits GPIO data to its target device after inputting GPIO data and KEY Data.

If ADC data transmission is completed to GPIO Transmission, a Device transmits GPIO data to its target device every certain time.

The target device receives "GPT007F_001551000000005 + 0x0D + 0x0A".

Use GPIO Switch on an Interface Board for GPIO data Input.

* A procedure is finished ("Device Type Set-up -> Zigbee Network Configuration -> target device set-up -> data transmission Type-> data transmission is completed once -> <u>ACK data Receipt</u>"), which means that the Zigbee Network configuration is completed.

11-4. START MESSAGE

(1) START MESSAGE

It means that FZ750BS/FZ750BC starts to operate. START MESSAGE is output as Serial data through UART port.

If you don't want a Device to output the START MESSAGE, input AT command (AT+SETSTAMSG0).

(2) Sorts of START MESSAGE

COORD START OK

: A Device starts as Coordinator and the Zigbee Network is configured properly. Thus, data transmission is possible.

COORD START ERROR

A Device starts as Coordinator, and the Zigbee Network Configuration is failed.
In this situation, a normal Zigbee Network cannot be configured.
After initializing the Device to factory set value (AT&F) and set the Device to Coordinator again,

Change the Channel used.

ROUTER START OK

: A Device starts as Router and the Zigbee Network is configured properly. Thus, Zigbee Network Extension and data transmission is possible.

ROUTER START ERROR

: A Device starts as Router, and the Zigbee Network Configuration is failed. See if there is Coordinator around.

See if there is Router participated in the Zigbee Network configured by Coordinator.

See if there is channel which is the same as the one Coordinator use.

END START OK

: A Device starts as End Device and the Zigbee Network is configured properly. Thus, data transmission is possible.

END START ERROR

: A Device starts as Router, and the Zigbee Network Configuration is failed. See if there is Coordinator around.

See if there is Router participated in the Zigbee Network configured by Coordinator.

See if there is Coordinator which has 8 child nodes.

See if there is Router which participates in the Zigbee Network and has 8 child nodes.

TARGET NON

: There is no IEEE ADDRESS of target device saved. In this case, data transmission is not possible.

Set a target device to process data transmission.

TARGET OK

: Target Set-up is properly done by using an IEEE ADDRESS of target device. Data transmission is possible.

TARGET ERROR

: Target Set-up using IEEE ADDRESS of target device is failed.

See if there is the target device in the Zigbee Network.

If there is the target device participated in the Zigbee network, check if the IEEE ADDRESS of the target device is correctly saved.

OK

- : The message "OK" is output from FZ750BS/FZ750BC when a Device switches its mode from operation mode to AT command mode.
- Use a command +++ to make the Device switches its mode from operation mode to AT command mode.

The massage "OK" is also output when a Device switches its mode from AT command mode to operation mode.

- Use a command "ATO" to make the Device switches its mode AT command mode to operation mode.

11-5. DEBUG MESSAGE

(1) DEBUG MESSAGE

It is output from FZ750BS/FZ750BC when the Device starts to operate. The DEBUG MESSAGE is output as Serial data through UART port. It shows the status related to data transmission.

If you want Device to output the Debug message, use AT Command (AT+SETDEBMSG1).

(2) Sorts of DEBUG MESSAGE

[SEND]

: FZ750BS/FZ750BC sent data to its target device.

Transmission for other data is not possible.

[ACK_OK:0001]

: FZ750BS/FZ750BC got ACK from its target device after transmitting data to the target device. Transmission for other data is possible afterwards.

- If FZ750BS/FZ750BC transmits Count Data, the Count value is output.
- If FZ750BS/FZ750BC transmits ADC, KEY, or Serial Data, Count Value is meaningless.

[WAIT_ACK_T.O]

: FZ750BS/FZ750BC failed to get ACK after transmitting data to its target device. Transmission for other data is possible afterwards.

[RE_SEND:1]

: FZ750BS/FZ750BC re-sent data to its target device.

If FZ750S/FZ750BC fails to get ACK after transmitting data successfully, the Device judges that the data transmission is failed. In this case, The Device retransmits the data as many times as it is set. The number of time is also output together.

Transmission for other data is not possible.

(Transmission for other data is possible after a Device receives ACK or data transmission is error ([WAIT_ACK_T.O])).

[NACK_OK:0001]

- : Wireless data from FZ750BS/FZ750BC was output properly when ACK Option is set to "No ACK Receipt" (AT+SETACK0), but no information on data Receipt of target device.
- Transmission for other data is possible afterwards.
- data transmission by Broadcast also has the same message when ACK Option is set to "No ACK Receipt" (AT+SETACK0).
- If FZ750BS/FZ750BC transmits Count Data, the Count value is output.
- If FZ750BS/FZ750BC transmits ADC, KEY, or Serial Data, Count Value is meaningless.

[NACK_ERR]

: Wireless data from FZ750BS/FZ750BC was not output when ACK Option is set to "No ACK Receipt" (AT+SETACK0).

Transmission for other data is possible afterwards.

[OVER_FLOW]

: Serial data inputted was longer than 53bit. (Caution: A maximum length of Serial data is 53bit.) Initialize the Serial data inputted, and then data transmission can be continuously processed.

[VCC_ERR]

: The voltage inputted into FZ750BS/FZ750BC was below 2.5V.

(FZ750BS/FZ750BC doesn't operate properly if the voltage is input below 2.5V)

[BAT_LOW]

: The voltage inputted into FZ750BS/FZ750BC was 2.6V.

If you want to know whether the voltage inputted is okay, set Battery Option to be enabled by using a command **AT+SETBATTERY1**. The Device warns that the voltage inputted is not good by transmitting data ""BAT2600_001551000000005" when the voltage of 750BS/FZ750B becomes 2.6V,

If you don't want to use the battery option, use a command AT+SETBATTERY0.

11-6. RESET OPTION

(1) RESET OPTION

FZ750BS/FZ750BC operates properly in the Zigbee Network.

Once the power of FZ750BS/FZ750BC is turned ON, the device automatically participates in the Zigbee Network. After the Zigbee Network Participation, the Device outputs "ROUTER START OK" or "END START OK". Target device Se-up is possible afterwards.

FZ750BS/FZ750BC outputs **"ROUTER START ERROR"** or **"END START ERROR"** if there is no Zigbee Network around or the Device cannot participate in the Zigbee Network.

Target device set-up is prior to data transmission.

Turn the power of FZ750BS/FZ750BC ON, and then the Device is participated in the Zigbee Network. If FZ750BS/FZ750BC has its target device's Address, FZ750BS/FZ750BC searches if its target device is participated in the Zigbee Network.

If the target device of FZ750BS/FZ750BC is participated in the Zigbee Network and the target device is properly set, **"TARGET OK"** is output. Data transmission becomes possible from then. If the target device of FZ750BS/FZ750BC is not participated in the Zigbee Network and the target device is failed, **"TARGET ERROR"** is output.

When RESET OPTION is set to be enabled with a command AT+SETRESET1, FZ750BS/FZ750BC fails to participate in the Zigbee Network and its target device is not properly set, FZ750BS/FZ750BC is reset.

When RESET OPTION is set to be disabled with a command AT+SETRESET0, FZ750BS/FZ750BC fails to participate in the Zigbee Network and its target device is not properly set, FZ750BS/FZ750BC is put on standby for a handle by users.

11-7. How to connect FZ750BS/FZ750BC to Magnetic Sensor & Set-up for operation

The case of using other senses should be the same as below.

(1) Choice for magnetic sensor

Choose the magnetic sensor which operates as below.

< It operates as Low(0V) after magnetic is connected >





(2) Connection between FZ750BS/FZ750BC and magnetic sensor

The following is how to connect FZ750BS/FZ750BC to magnetic sensor.


(3) FZ750BS/FZ750BC set-up and operation of Magnetic sensor

Set FZ750BS/FZ750BC to End Device to connect it to a sensor.

It operates differently depending on how set FZ750BS/FZ750BC.

FZ750BS/FZ750BC is in a low power consumption mode 1. (check whether the door is open or closed)

The following figure shows how FZ750BS/FZ750BC cognize the value of sensor depending on how the sense operates.



FZ750BS/FZ750BC in the low power consumption1 cognize the point when the value of sensor connected to KEY port is changed from Low to High. The point means a moment when the magnetic sensor is unconnected.

If the magnetic sensor is connected to a door, it senses when the door is open.

FZ750BS/FZ750BC transmits data to its target device once when wake-up occurs in the low power consumption mode 1.

If the magnetic sensor is connected to a door, it transmits data once as the door is closed.

② FZ750BS/FZ750BC is in a low power consumption mode 3. (Check one option of the door between Security and Emergency)

The following figure shows how FZ750BS/FZ750BC cognize the value of sensor depending on how the sense operates.



FZ750BS/FZ750BC in the low power consumption mode3 cognize the point when the value of sensor connected to KEY port becomes Low. The point means a moment when the magnetic sensor is connected.

If the magnetic sensor is connected to a door, it senses when the door is closed.

FZ750BS/FZ750BC transmits data successively when wake-up occurs in the low power consumption mode3.

If magnetic sensor is connected to a door, FZ750BS/FZ750BC transmits data successively.

If switch is connected rather than magnetic sensor is connected (in case of emergency), FZ750BS/FZ750BC transmits data successively.

* If FZ750BS/FZ750BC is used for security through connecting it to the magnetic sensor, which continuously check the door open, the magnetic sensor operates in the opposite way to the explanation above. In other words, FZ750BS/FZ750BC uses a sensor which outputs Low when the magnetic is connected so the door can be open or closed. (Low power consumption mode 1), FZ750BS/FZ750BC uses a sensor which outputs Low when the magnetic is unconnected so the door for security is open (Low power consumption mode 3).

<u>* If you want to use other sensors which are not mentioned here, use them after setting</u> <u>FZ750BS/FZ750BC to appropriate status in accordance with the sensor you use.</u>

12. AT-Command

12-1. Command Category

Command Category	Index	AT Command
	1	AT+SETEND[ENTER]
	2	AT+SETROUTER[ENTER]
	3	AT+SETCOORD[ENTER]
	4	AT+SETADC1[ENTER]
	5	AT+SETADC0[ENTER]
	6	AT+SETKEY1[ENTER]
	7	AT+SETKEY0[ENTER]
	8	AT+SETCOUNT1[ENTER]
	9	AT+SETCOUNT0[ENTER]
	10	AT+SETTMR60[ENTER]
	11	AT+SETTARGET1234567890123456[ENTER]
	12	AT+SETDEVNAME123456789012[ENTER]
	13	AT+SETBAUD9600[ENTER]
	14	AT+SETCHANNEL0B[ENTER]
	15	AT+SETRETRY3[ENTER]
	16	AT+SETACK1[ENTER]
Set Command	17	AT+SETACK0[ENTER]
oot ooninand	18	AT+SETPMODE1[ENTER]
	19	AT+SETSTAMSG1[ENTER]
	20	AT+SETSTAMSG0[ENTER]
	21	AT+SETDEBMSG1[ENTER]
	22	AT+SETDEBMSG0[ENTER]
	23	AT+SETTXPOWER00[ENTER]
	24	AT+SETLQI1[ENTER]
	25	AT+SETLQI0[ENTER]
	26	AT+SETRESET1[ENTER]
	27	AT+SETRESET0[ENTER]
	28	AT+SETLPQUICK1[ENTER]
	29	AT+SETLPQUICK0[ENTER]
	30	AT+SETBATTERY1[ENTER]
	31	AT+SETBATTERY0[ENTER]
	32	AT+SETGPIO0[ENTER]
	33	AT+SETGPIO1[ENTER]
	34	AT+SETGPIO2[ENTER]

	35	AT+GETPAN[ENTER]
	36	AT+GETVER[ENTER]
	37	AT+GETTMR[ENTER]
	38	AT+GETACK[ENTER]
	39	AT+GETKEY[ENTER]
	40	AT+GETADC[ENTER]
	41	AT+GETLQI[ENTER]
	42	AT+GETBAUD[ENTER]
	43	AT+GETLOCAL[ENTER]
	44	AT+GETCOUNT[ENTER]
	45	AT+GETRETRY[ENTER]
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	48	AT+GETPARENT[ENTER]
	49	AT+GETSTAMSG[ENTER]
	50	AT+GETDEBMSG[ENTER]
	51	AT+GETCHANNEL[ENTER]
	52	AT+GETTXPOWER[ENTER]
	53	AT+GETDEVNAME[ENTER]
	54	AT+GETRESET[ENTER]
	55	AT+GETLPQUICK[ENTER]
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	57	AT+GETGPIO[ENTER]

Request Command	58	AT+REQADDR[ENTER]
	59	AT+REQEXTADDR1234[ENTER]
	60	AT+REQNWKADDR1234567890123456[ENTER]

Special Command	61	+++
	62	AT[ENTER]
	63	ATO[ENTER]
	64	ATZ[ENTER]
	65	AT&F[ENTER]

12-2. Function of AT Command

12-2-1. AT+SETEND

Feature	FZ750BS/FZ750BC is set to End Device by a command AT+SETEND.
Response	OK[0X0D][0X0A]
Description	To apply the device type you set, you need to reset FZ750BS/FZ750BC after you set a
	type of the Device.
Ex.	Host -> FZ750BS/FZ750BC : AT+SETEND[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

12-2-2. AT+SETROUTER

Feature	FZ750BS/FZ750BC is set to Router by a command AT+SETROUTER.
Response	OK[0X0D][0X0A]
Description	To apply the device type you set, you need to reset FZ750BS/FZ750BC after you set a
	type of the Device.
Ex.	Host -> FZ750BS/FZ750BC : AT+SETROUTER[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

12-2-3. AT+SETCOORD

Feature	FZ750BS/FZ750BC is set to Coordinator by a command AT+SETCOORD.
Response	OK[0X0D][0X0A]
Description	To apply the device type you set, you need to reset FZ750BS/FZ750BC after you set a
	type of the Device.
Ex.	Host -> FZ750BS/FZ750BC : AT+SETCOORD[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

12-2-4. AT+SETADC1

Feature	ADC data transmission is set to be enabled by a command AT+SETADC1.
Response	OK[0X0D][0X0A]
	Analog data inputted through ADC port is read by FZ750BS/FZ750BC every certain time
Description	and changed to Digital Data. FZ750BS/FZ750BC transmits the Digital data to its target
	device.
	data from 0V to 1.5V can be input through ADC port.
	The target device outputs the received data through Serial.
Ex.	Host -> FZ750BS/FZ750BC : AT+SETADC1[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

Feature	ADC data transmission is set to be disabled by a command AT+SETADC0.
Response	OK[0X0D][0X0A]
Description	-
Ex.	Host -> FZ750BS/FZ750BC : AT+SETADC0[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

12-2-5. AT+SETADC0

12-2-6. AT+SETKEY1

Feature	KEY data transmission is set to be enabled by a command AT+SETKEY1.
Response	OK[0X0D][0X0A]
Description	FZ750BS/FZ750BC senses signal inputted through KEY port and transmits the signal to
	its target device.
	If FZ750BS/FZ750BC is set to Coordinator or Router, KEY port senses LOW signal(0V)
	regardless of KEY option.
	FZ750BS/FZ750BC is set to End Device in a low power consumption mode1, KEY port
	senses the signal changed from LOW(0V) to High(3V).
	FZ750BS/FZ750BC is set to End Device in a low power consumption mode2 or 3, KEY
	port senses LOW signal (0V).
Ex.	Host -> FZ750BS/FZ750BC : AT+SETKEY1[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

12-2-7. AT+SETKEY0

Feature	KEY data transmission is set to be disabled by a command AT+SETKEY0.
Response	OK[0X0D][0X0A]
	FZ750BS/FZ750BC does not sense signal inputted through KEY port and also not
	transmit the signal to its target device.
	If FZ750BS/FZ750BC is set to End Device with disabled KEY Data, wake-up occurs in a
Description	low power consumption mode by signal inputted though KEY port, but does not
Description	transmit KEY data to its target device.
	Once End Device enters into a low power consumption mode, it cannot control other
	things at all.
	End Device can control other things after wake-up.
Ex.	Host -> FZ750BS/FZ750BC : AT+SETKEY0[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

Feature	COUNT data transmission is set to be enabled by a command AT+SETCOUNT1.
Response	OK[0X0D][0X0A]
Description	FZ750BS/FZ750BC transmits increased Internal Hexa Count value to its target device
	by Internal time.
	To transmit COUNT Data, ADC data transmission should be set to be enabled. In other
	words, FZ750BS/FZ750BC transmits Internal hexa count instead of ADC Data.
	Increased internal count value is from0 to 50000. (0x0000 ~ 0xC350)
Ex.	Host -> FZ750BS/FZ750BC : AT+SETCOUNT1[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

12-2-8. AT+SETCOUNT1

12-2-9. **AT+SETCOUNT0**

Feature	COUNT data transmission is set to be disabled by a command AT+SETCOUNT0
Response	OK[0X0D][0X0A]
Description	-
Ex.	Host -> FZ750BS/FZ750BC : AT+SETCOUNT0[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

12-2-10. AT+SETTMR60

Feature	Internal time of FZ750BS/FZ750BC is set by a command AT+SETTMR60
Response	OK[0X0D][0X0A]
	FZ750BS/FZ750BC transmits ADC/COUNT data by internal time or makes wake-up in a
	low power consumption mode.
	Coordinator or Router transmits ADC/COUNT data by internal time. (set 60sec: A
	Device transmits ADC/COUNT data to its target device every 60sec)
	End Device makes wake-up in a low power consumption mode by internal time.
Description	(set 60 sec: wake-up from a device in a low power consumption mode occurs every
Description	60 seconds)
	Input seconds for setting an Internal time. (example. 5sec -> 5, 1min -> 60)
	Possible value for Input in case of Coordinator or Router is from 0 to 65000. (Maximum
	18hours)
	Possible value for Input in case of End Device is from 0 to 255. (Maximum 4mim 20sec)
	Internal time saved is applied after FZ750BS/FZ750BC is reset.
Ex.	Host -> FZ750BS/FZ750BC : AT+SETTMR60[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

Feature	FZ750BS/FZ750BC saves an address of its target device by a command
	AT+SETTARGET1234567890123456
Response	OK[0X0D][0X0A]
	IEEE ADDRESS of a target device is 16bit.
	When FZ750BS/FZ750BC is reset, the FZ750BS/FZ750BC searches if its target device
Description	exists in the Zigbee network by using the IEEE ADDRESS of the target device.
	If the target device exists in the Zigbee network, the target device is set to a target of
	FZ750BS/FZ750BC.
	It is applied after FZ750BS/FZ750BC is reset.
Ex.	Host -> FZ750BS/FZ750BC : AT+SETTARGET1234567890123456[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

12-2-11. AT+SETTARGET1234567890123456

12-2-12. AT+SETDEVNAME123456789012

Feature	A name of FZ750BS/FZ750BC is set by a command AT+SETDEVNAME123456789012.
Response	OK[0X0D][0X0A]
Description	A maximum of length for a name is 12 bit.
	If any Devices inquire IEEE ADDRESS in the zigbee network, FZ750BS/FZ750BC shows
	its IEEE ADDRESS and its name. (AT+REQADDR)
Ex.	Host -> FZ750BS/FZ750BC : AT+SETDEVNAME123456789012[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

12-2-13. AT+SETBAUD9600

Feature	UART Communication speed is set to by a command AT+SETBAUD9600.
Response	OK[0X0D][0X0A]
Description	Possible communication speed for setting are 9600, 19200, 38400, 57600, 115200, and
	230400.
	To apply UART Communication speed set, you need to reset FZ750BS/FZ750BC.
Ex.	Host -> FZ750BS/FZ750BC : AT+SETBAUD9600[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

Feature	A wireless channel of FZ750BS/FZ750BC is set by a command AT+SETCHANNEL0B
Response	OK[0X0D][0X0A]
Description	Possible wireless channel are 0B, 0C, 0D, 0E, 0F, 10, 11, 12, 13, 14, 15, 16, 17, 18,
	and 19.
	To apply the wireless channel set, you need to reset FZ750BS/FZ750BC.
Ex.	Host -> FZ750BS/FZ750BC : AT+SETCHANNEL0B[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

12-2-14. AT+SETCHANNEL0B

12-2-15. AT+SETRETRY3

Feature	Numbers of wireless re-transmission is set by a command AT+SETRETRY3
Response	OK[0X0D][0X0A]
Description	If FZ750BS/FZ750BC does not ACK after wireless data transmission, the
	FZ750BS/FZ750BC tries the transmission again.
	Possible numbers of re-transmission is from 0 to 9.
Ex.	Host -> FZ750BS/FZ750BC : AT+SETRETRY3[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

12-2-16. AT+SETACK1

Feature	ACK after data transmission is set to be enabled by a command AT+SETACK1.
Response	OK[0X0D][0X0A]
Description	After wireless data transmission, FZ750BS/FZ750BC cognizes that the Transmission is
	completed by getting ACK.
	ACK does not work if data is transmitted by broadcast even if the ACK is set to be
	enabled.
Ex.	Host -> FZ750BS/FZ750BC : AT+SETACK1[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

Feature	ACK after data transmission is set to be disabled by a command AI+SEIACKU.
Response	OK[0X0D][0X0A]
Description	After wireless data transmission, FZ750BS/FZ750BC cognizes that the Transmission is
	completed by getting ACK
Ex.	Host -> FZ750BS/FZ750BC : AT+SETACK0[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

12-2-17. AT+SETACK0

12-2-18. AT+SETPMODE1

Feature	A low power consumption mode is set by a command AT+SETPMODE1.
Response	OK[0X0D][0X0A]
	If FZ750BS/FZ750BC is set to End Device, It uses a low power consumption mode.
	PMODE1: the Devices uses about 25uA in the low power consumption mode.
	Wake-up terms of FZ750BS/FZ750BC: Internal time, KEY Input, Reset
	FZ750BS/FZ750BC is not reset. (except for the term of Reset)
Description	PMODE2: the Devices uses about 2uA in the low power consumption mode
	Wake-up terms of FZ750BS/FZ750BC: Internal time, KEY Input, Reset
	FZ750BS/FZ750BC is reset when wake-up occurs.
	PMODE3: the Devices uses about 2uA in the low power consumption mode
	Wake-up terms of FZ750BS/FZ750BC : KEY Input, Reset
	FZ750BS/FZ750BC is reset when wake-up occurs.
Ex.	Host -> FZ750BS/FZ750BC : AT+SETPMODE1[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

12-2-19. AT+SETSTAMSG1

Feature	Messages related Start are set to be enabled by a command AT+SETSTAMSG1.
Response	OK[0X0D][0X0A]
Description	When FZ750BS/FZ750BC is in an operation mode, the received data and Start message
	is output.
	Start messages of FZ750BS/FZ750BC: ROUTER START ERROR, ROUTER START OK,
	TARGET NON, TARGET ERROR, TARGET OK, OK(after ATO Input)
Ex.	Host -> FZ750BS/FZ750BC : AT+SETSTAMSG1[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

Feature	Messages related Start is set to be disabled by a command AT+SETSTAMSG0.
Response	OK[0X0D][0X0A]
Description	When FZ750BS/FZ750BC is in an operation mode, nothing is output, but the received
	Data.
	Start messages of FZ750BS/FZ750BC: ROUTER START ERROR, ROUTER START OK,
	TARGET NON, TARGET ERROR, TARGET OK, OK(after ATO Input)
Ex.	Host -> FZ750BS/FZ750BC : AT+SETSTAMSG0[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

12-2-20. **AT+SETSTAMSG0**

12-2-21. AT+SETDEBMSG1

Feature	Messages related to debug are set to be enabled by a command AT+SETDEBMSG1.
Response	OK[0X0D][0X0A]
Description	When FZ750BS/FZ750BC is in an operation mode, It outputs the value related to data
	transmission through Serial.
	Debug messages of FZ750BS/FZ750BC: [SEND], [ACK_OK:0001], [WAIT_ACK_T.O],
	[RE_SEND:1], [VCC_ERR], [NACK_OK], [NACK_ERR], [OVER_FLOW], [BAT_LOW]
Ex.	Host -> FZ750BS/FZ750BC : AT+SETDEBMSG1[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

12-2-22. AT+SETDEBMSG0

Feature	Messages related to debug is set to be enabled by a command AT+SETDEBMSG0.
Response	OK[0X0D][0X0A]
Description	When FZ750BS/FZ750BC is in an operation mode, It does not output the value related
	to data transmission through Serial.
Ex.	Host -> FZ750BS/FZ750BC : AT+SETDEBMSG0[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

Feature	Wireless Output Value of FZ750BS/FZ750BC is set by a command AT+SETTXPOWER00.
Response	OK[0X0D][0X0A]
Description	You can choose among 00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 0A, 0B, 0C, 0D, 0E, 0F,
	10, 11, and 12 for setting the Wireless Output Value.
	A maximum value is 00. A minimum value is 12.
Ex.	Host -> FZ750BS/FZ750BC : AT+SETTXPOWER00[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

12-2-23. AT+SETTXPOWER00

12-2-24. AT+SETLQI1

Feature	Receive Sensitivity Output of Received data is set to be enabled by a command
	AT+SETLQI1.
Response	OK[0X0D][0X0A]
Description	FZ750BS/FZ750BC outputs the Receive Sensitivity of wireless data received.
	However, FZ750BS/FZ750BC does not output the wireless data received.
Ex.	Host -> FZ750BS/FZ750BC : AT+SETLQI1[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

12-2-25. AT+SETLQI0

Feature	Receive Sensitivity Output of Received data is set to be disabled by a command
	AT+SETLQI0.
Response	OK[0X0D][0X0A]
Description	-
Ex.	Host -> FZ750BS/FZ750BC : AT+SETLQI0[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

12-2-26. AT+SETRESET1

	ase that 121300001 213000 fails to participate in the zigbee Network and its target
Feature devi	ce is not set properly, Device Re-set is set to be enabled by a command
AT+	SETRESET1.
Response OK[[A0X0][D0X0]
FZ7	50BS/FZ750BC set its target device after its power is turned ON. If the target
devi	ce is not set, FZ750BS/FZ750BC is automatically reset.
Hos	-> FZ750BS/FZ750BC : AT+SETRESET1[ENTER]
FZ7	50BS/FZ750BC -> Host : OK[0x0D][0x0A]

	In case that FZ750BS/FZ750BC fails to participate in the Zigbee Network and its target
Feature	device is not set properly, Device Re-set is set to be disabled by a command
	AT+SETRESET0.
Response	OK[0X0D][0X0A]
Description	FZ750BS/FZ750BC set its target device after its power is turned ON. If the target
	device is not set, FZ750BS/FZ750BC is put on standby for a handle of users.
Ex.	Host -> FZ750BS/FZ750BC : AT+SETRESET0[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

12-2-27. AT+SETRESET0

12-2-28. AT+SETLPQUICK1

Feature	In case of end Device, the time when End Device enters into a low power consumption
	mode is set to be quick by a command AT+SETLPQUICK1.
Response	OK[0X0D][0X0A]
Description	End Device originally makes wake-up or enters into a low power consumption mode
	1sec after data transmission. However a Device enters into a low power consumption
	mode immediately without this extra 1sec.
Ex.	Host -> FZ750BS/FZ750BC : AT+SETLPQUICK1[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

12-2-29. AT+SETLPQUICK0

Feature	In case of end Device, any certain time when End Device enters into a low power
	consumption mode to is not intentionally set by a command AT+SETLPQUICK0.
Response	OK[0X0D][0X0A]
Description	-
Ex.	Host -> FZ750BS/FZ750BC : AT+SETLPQUICK0[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

12-2-30. AT+SETBATTERY1

Feature	In case that the inputted voltage of FZ750BS/FZ750BC is 2.6V, the FZ750BS/FZ750BC
	informs its target the inputted voltage by a command AT+SETBATTERY 1.
Response	OK[0X0D][0X0A]
Description	FZ750BS/FZ750BC transmits data "BAT2600_001551000000005" to its target device.
Ex.	Host -> FZ750BS/FZ750BC : AT+SETBATTERY1[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

Feature	In case that the inputted voltage of FZ750BS/FZ750BC is 2.6V, the FZ750BS/FZ750BC
	does not inform its target the inputted voltage by a command AT+SETBATTERY0.
Response	OK[0X0D][0X0A]
Description	-
Ex.	Host -> FZ750BS/FZ750BC : AT+SETBATTERY0[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

12-2-31. AT+SETBATTERY0

12-2-32. AT+SETGPIO0

Feature	GPIO port is set to be disabled by a commend AT+SETGPIO0
Response	OK[0X0D][0X0A]
Description	-
Ex.	Host -> FZ750BS/FZ750BC : AT+SETGPIO0[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

12-2-33. AT+SETGPIO1

Feature	GPIO port is set to be for Input by a command AT+SETGPIO1.
Response	OK[0X0D][0X0A]
	When FZ750BS/FZ750BC transmits GPIO port value to its target device by inputting the
	value (Low/High) through the GPIO port, FZ750BS/FZ750BC should be set to be for
	Input.
Description	GPIO port consists of 8 bit. (GPIO 0 \sim GPIO 7)
	The initial set value of GPIO port is High(1). In other words, a Device reads GPIO port
	without data inputted, and transmits it to its target device. The target device outputs
	00FF(11111111). The front numbers of it "00" are meaningless Data.
	If FZ750BS/FZ750BC transmits GPIO data to its target device, the target device outputs
	"GPT003F_00155100000000B".(3F = 00111111)
Ex.	Host -> FZ750BS/FZ750BC : AT+SETGPIO1[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

12-2-34. AT+SETGPIO2

Feature	GPIO port is set to be for Output by a command AT+SETGPIO2.
Response	OK[0X0D][0X0A]
	To output received GPIO data as value(Low/High), GPIO port should be set to be for
	Output.
Description	GPIO port consists of 8 bit. (GPIO 0 \sim GPIO 7)
	The initial set value of GPIO is High (1). In other words, all GPIO of FZ750BS/FZ750BC
	is output as High even if none of received GPIO data exists. (FF = 11111111)
	If FZ750BS/FZ750BC receives "GPT003F_00155100000000B", the Device outputs
	3F(00111111) through GPIO port.
Ex.	Host -> FZ750BS/FZ750BC : AT+SETGPIO2[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0x0D][0x0A]

12-2-35. AT+GETPAN

Feature	PAN ID in the Zigbee Network is output through Serial by a command AT+GETPAN.
Response	078D[0X0D][0X0A]
Description	One PAN ID is shared in a Zigbee network.
Ex.	Host -> FZ750BS/FZ750BC : AT+GETPAN[ENTER]
	FZ750BS/FZ750BC -> Host: 078D[0x0D][0x0A]

12-2-36. AT+GETVER

Feature	The version of FZ750BS/FZ750BC is output through Serial by a command AT+GETVER .
Response	FZ750 V0.2.0[0X0D][0X0A]
Description	-
Ex.	Host -> FZ750BS/FZ750BC : AT+GETVER[ENTER]
	FZ750BS/FZ750BC -> Host : FZ750 V0.2.0[0x0D][0x0A]

12-2-37. AT+GETTMR

Feature	The Internal time Set value of FZ750BS/FZ750BC is output through Serial by a
	command AT+GETTMR.
Response	10[0X0D][0X0A]
Description	The value is output as seconds.
Ex.	Host -> FZ750BS/FZ750BC : AT+GETTMR[ENTER]
	FZ750BS/FZ750BC -> Host : 10[0x0D][0x0A]

Feature	ACK set value is output through Serial by a command AT+GETACK.
Response	1[0X0D][0X0A]
Description	1 is output, which means that the function is used.
	0 is output, which means that the function is not used.
Ex.	Host -> FZ750BS/FZ750BC : AT+GETACK[ENTER]
	FZ750BS/FZ750BC -> Host : 1[0x0D][0x0A]

12-2-38. AT+GETACK

12-2-39. AT+GETKEY

Feature	KEY set value is output through Serial by a command AT+GETKEY.
Response	1[0X0D][0X0A]
Description	1 is output, which means that the function is used.
	0 is output, which means that the function is not used.
Ex.	Host -> FZ750BS/FZ750BC : AT+GETKEY[ENTER]
	FZ750BS/FZ750BC -> Host : 1[0x0D][0x0A]

12-2-40. AT+GETADC

Feature	ADC set value is output through Serial by a command AT+GETADC .
Response	0[0X0D][0X0A]
Description	1 is output, which means that the function is used.
	0 is output, which means that the function is not used.
Ex.	Host -> FZ750BS/FZ750BC : AT+GETADC[ENTER]
	FZ750BS/FZ750BC -> Host : 0[0x0D][0x0A]

12-2-41. AT+GETLQI

Feature	LQI set value is output through Serial by a command AT+GETLQI.
Response	0[0X0D][0X0A]
Description	1 is output, which means that the function is used.
	0 is output, which means that the function is not used.
Ex.	Host -> FZ750BS/FZ750BC : AT+GETLQI[ENTER]
	FZ750BS/FZ750BC -> Host : 0[0x0D][0x0A]

Feature	UART Communication set value is output through Serial by a command AT+GETBAUD.
Response	115200[0X0D][0X0A]
Description	-
Ex.	Host -> FZ750BS/FZ750BC : AT+GETBAUD[ENTER]
	FZ750BS/FZ750BC -> Host: 115200[0x0D][0x0A]

12-2-42. AT+GETBAUD

12-2-43. AT+GETLOCAL

Feature	Device Type, IEEE ADDRESS, and Network Address of FZ750BS/FZ750BC is output
	through Serial by a command AT+GETLOCAL.
Response	ROUTER,001551000000005,0001[0X0D][0X0A]
	ROUTER: It shows the Device type of FZ750BS/FZ750BC
	001551000000005: It shows an IEEE ADDRESS of FZ750BS/FZ750BC.
Description	0001: It shows a Network address of FZ750BS/FZ750BC.
	The network address is shown only when the Device participates in the Zigbee Network.
	If the Device does not participate in the Zigbee Network, the network address is shown
	as FFFF.
Ex.	Host -> FZ750BS/FZ750BC : AT+GETLOCAL[ENTER]
	FZ750BS/FZ750BC -> Host : ROUTER,001551000000005,0001[0x0D][0x0A]

12-2-44. AT+GETCOUNT

Feature	COUNT set value is output through Serial by a command AT+GETCOUNT.
Response	0[0X0D][0X0A]
Description	1 is output, which means that the function is used.
	0 is output, which means that the function is not used.
Ex.	Host -> FZ750BS/FZ750BC : AT+GETCOUNT[ENTER]
	FZ750BS/FZ750BC -> Host : 0[0x0D][0x0A]

12-2-45. **AT+GETRETRY**

Feature	Re-transmission set value is output through Serial by a command AT+GETRETRY.
Response	3[0X0D][0X0A]
Description	-
	Host -> FZ750BS/FZ750BC : AT+GETRETRY[ENTER]
EX.	FZ750BS/FZ750BC -> Host : 3[0x0D][0x0A]

12-2-46. AT+GETPMODE

Feature	Low power consumption mode Set value is output through Serial by a command						
	AT+GETPMODE.						
Response	[0X0D][0X0A]						
	1 is output, which means the device uses a low power consumption mode1.						
Description	2 is output, which means the device uses a low power consumption mode2.						
	3 is output, which means the device uses a low power consumption mode3.						
Ex.	Host -> FZ750BS/FZ750BC : AT+GETPMODE[ENTER]						
	FZ750BS/FZ750BC -> Host : 1[0x0D][0x0A]						

12-2-47. AT+GETTARGET

Feature	IEEE ADDRESS of target device is output through Serial by a command									
	AT+GETTARGET.									
Response	0015510000000B,ENABLE[0X0D][0X0A]									
	00155100000000B: It shows an IEEE ADDRESS of target device.									
	ENABLE: It means that the target device is properly set. If DISABLE is output, the target									
Description	device which has the address does not exist in the Zigbee Network or The target device									
	is improperly set. Or it could be the case that only an IEEE ADDRESS of the target									
	device is saved by a command "AT+SETTARGET".									
Ex.	Host -> FZ750BS/FZ750BC : AT+GETTARGET[ENTER]									
	FZ750BS/FZ750BC -> Host: 00155100000000B,ENABLE[0x0D][0x0A]									

12-2-48. AT+GETPARENT

Feature	IEEE ADDRESS of parent node is output through Serial by a command AT+GETPARENT.
Response	0015510000000B[0X0D][0X0A]
Description	The depth of Zigbee Network can be expected by Parent nodes.
	The address which is used in the Zigbee Network is assigned from Parent nodes.
Ex.	Host -> FZ750BS/FZ750BC : AT+GETPARENT[ENTER]
	FZ750BS/FZ750BC -> Host: 00155100000000B[0x0D][0x0A]

Feature	Messages related Start s	et value	is	output	through	Serial	by	а	command
	AT+GETSTAMSG.								
Response	1[0X0D][0X0A]								
Description	1 is output, which means that the function is used.								
	0 is output, which means that the function is not used.								
	Host -> FZ750BS/FZ750BC : AT+GETSTAMSG[ENTER]								
EX.	FZ750BS/FZ750BC -> Host	:1[0x0D][0x0	A]					

12-2-49. AT+GETSTAMSG

12-2-50. AT+GETDEBMSG

Feature	Messages related Debug Set value is output through Serial by a command							
	AT+GETDEBMSG.							
Response	1[0X0D][0X0A]							
Description	1 is output, which means that the function is used.							
	0 is output, which means that the function is not used.							
	Host -> FZ750BS/FZ750BC : AT+GETDEBMSG[ENTER]							
EX.	FZ750BS/FZ750BC -> Host : 1[0x0D][0x0A]							

12-2-51. AT+GETCHANNEL

Feature	RF Channel set value is output through Serial by a command AT+GETCHANNEL.			
Response	0B[0X0D][0X0A]			
	A channel is shared in a Zigbee Network.			
Description	data transmission is possible between Devices which use the same channel in a zigbee			
	Network.			
	Host -> FZ750BS/FZ750BC : AT+GETCHANNEL[ENTER]			
⊏X.	FZ750BS/FZ750BC -> Host : 0B[0x0D][0x0A]			

12-2-52. AT+GETTXPOWER

Feature	Wireless	Output	Intensity	Set	value	is	output	through	Serial	by	а	command
	AT+GETT	XPOWER	•									
Response	00[0X0D]][0X0A]										
Description	-											
	Host -> FZ750BS/FZ750BC : AT+GETTXPOWER[ENTER]											
EX.	FZ750BS/FZ750BC -> Host: 00[0x0D][0x0A]											

Feature	The name of Device is output through Serial.			
Response	FZ750 V0.2.0[0X0D][0X0A]			
Description	As a set value of the name, a version of FZ750BS/FZ750BC is set.			
Ex.	Host -> FZ750BS/FZ750BC : AT+GETDEVNAME[ENTER]			
	FZ750BS/FZ750BC -> Host : FZ750 V0.2.0[0x0D][0x0A]			

12-2-53. AT+GETDEVNAME

12-2-54. AT+GETRESET

Feature	If FZ750BS/FZ750BC fails to participate in the Zigbee Network or its target device is not						
	set, set value related to Re-set is output through Serial by a command AT+GETRESET.						
Response	1[0X0D][0X0A]						
Description	1 is output, which means that the function is used.						
	0 is output, which means that the function is not used.						
Ex.	Host -> FZ750BS/FZ750BC : AT+GETRESET[ENTER]						
	FZ750BS/FZ750BC -> Host : 1[0x0D][0x0A]						

12-2-55. AT+GETLPQUICK

Feature	In case of End Device, set value related to extra 1 second before the End Device enters				
	into a low power consumption mode is output by a command AT+GETLPQUICK.				
Response	1[0X0D][0X0A]				
Description	1 is output, which means that the extra 1 second is not used.				
	0 is output, which means that the extra 1 second is used.				
	Host -> FZ750BS/FZ750BC : AT+GETLPQUICK[ENTER]				
EX.	FZ750BS/FZ750BC -> Host : 1[0x0D][0x0A]				

12-2-56. AT+GETBATTERY

Feature	In case that the Input voltage of FZ750BS/FZ750BC is 2.6V, set value related the Input				
	voltage is output to its target device by a command AT+GETBATTERY.				
Response	0[0X0D][0X0A]				
Description	1 is output, which means that the function is used.				
	0 is output, which means that the function is not used.				
	Host -> FZ750BS/FZ750BC : AT+GETBATTERY[ENTER]				
EX.	FZ750BS/FZ750BC -> Host : 0[0x0D][0x0A]				

Feature	GPIO Use set value is output through Serial by a command AT+GETGPIO.			
Response	1[0X0D][0X0A]			
Description	1 is output, which means that GPIO port is used for Input.			
	2 is output, which means that GPIO port is used for Output.			
	0 is output, which means that GPIO port is not used.			
Ex.	Host -> FZ750BS/FZ750BC : AT+GETGPIO[ENTER]			
	FZ750BS/FZ750BC -> Host : 1[0x0D][0x0A]			

12-2-57. AT+GETGPIO

12-2-58. AT+REQADDR

Feature	An IEEE ADDRESS of a device in an operation mode is output through Serial by a						
	command AT+REQADDR.						
	OK[0X0D][0X0A]						
	00155100000000B,FZ750BS/FZ750BC V0.1.0,C[0X0D][0X0A]						
Response	00155100000000A,FZ750BS/FZ750BC V0.1.0,R[0X0D][0X0A]						
	00155100000000C,FZ750BS/FZ750BC V0.1.0,R[0X0D][0X0A]						
	OK[0X0D][0X0A]						
	OK: the first "OK" means that the command is cognized properly.						
	00155100000000A: It shows an IEEE ADDRESS of a device in an operation mode.						
	FZ750BS/FZ750BC V0.1.0: It shows a name of a device in an operation mode.						
	R: It shows a type of Device in an operation mode.						
	OK: The last "OK" means that Operation by the command is completed.						
Description	(The operation is completed about 10 seconds after the command is inputted.)						
	In case of End Device in a low power consumption mode, its address is not searched.						
	Address can be searched through a lot of routes.						
	If there is a lot of traffic in the Zigbee Network, Address cannot be output.						
	Other Controls cannot be processed before OK, which Operation by the command is						
	completed, is output.						
	Host -> FZ750BS/FZ750BC : AT+REQADDR[ENTER]						
Ex.	FZ750BS/FZ750BC -> Host : OK[0X0D][0X0A]						
	00155100000000B,FZ750BS/FZ750BC V0.1.0,C[0X0D][0X0A]						
	00155100000000A,FZ750BS/FZ750BC V0.1.0,R[0X0D][0X0A]						
	00155100000000C,FZ750BS/FZ750BC V0.1.0,R[0X0D][0X0A]						
	OK[0X0D][0X0A]						

Feature	An IEEE ADDRESS of FZ750BS/FZ750BC which has a network address "1234" is output			
	through Serial by a command AT+REQEXTADDR1234.			
	OK[0X0D][0X0A]			
Response	0015510000000B[0X0D][0X0A]			
	OK[0X0D][0X0A]			
	OK: The first "OK" means that the command is properly cognized.			
	00155100000000B: It shows an IEEE address of FZ750BS/FZ750BC which has a			
Deceriation	network address "1234'.			
Description	OK: The last "OK" means that operation by the command is completed. If the			
	FZ750BS/FZ750BC does not exist in the Zigbee Network, It outputs ERROR after			
	15seconds.			
Ex.	Host -> FZ750BS/FZ750BC : AT+REQEXTADDR0000[ENTER]			
	FZ750BS/FZ750BC -> Host : OK[0X0D][0X0A]			
	0015510000000B[0X0D][0X0A]			
	OK[0X0D][0X0A]			

12-2-59. AT+REQEXTADDR1234

12-2-60. AT+REQNWKADDR1234567890123456

	A Network	address	of	FZ750BS/F	Z750BC	which	has	an	IEEE	ADDRESS
Feature	"1234567890	123456"	is	output	through	n Sei	rial	by	а	command
	AT+REQNWKADDR1234567890123456									
Response	OK[0X0D][0>	(0A]								
	0000[0X0D][0X0A]									
	OK[0X0D][0>	(0A]								
	OK: The first "OK" means that the command is properly cognized.									
	0000: It shows a Network address of FZ750BS/FZ750BC which has an IEEE ADDRESS									
Description	"1234567890123456".									
	OK: The last "OK" means that operation by the command is completed. If the									
	FZ750BS/FZ750BC does not exist in the Zigbee Network, It outputs ERROR after 15sec.									
Ex.	Host -> FZ750BS/FZ750BC : AT+REQNWKADDR00155100000000B[ENTER]									
	FZ750BS/FZ750BC -> Host : OK[0X0D][0X0A]									
	0000[0X0D][0X0A]									
	OK[0X0D][0X0A]									

12-2-61. +++

Feature	Mode of FZ750BS/FZ750BC switches from operation mode to AT command mode by a				
	command +++.				
Response	OK[0x0D][0x0A]				
Description	data is transmitted in operation mode.				
	FZ750BS/FZ750BC is controlled in AT command mode.				
	By inputting +++ OK is output in AT command mode				
Ex.	Host -> FZ750BS/FZ750BC : +++				
	FZ750BS/FZ750BC -> Host : OK[0X0D][0X0A]				

12-2-62. **AT**

Feature	Whether host is properly connected to FZ750BS/FZ750BC is checked by a command			
	AT.			
Response	OK[0x0D][0x0A]			
Description	You can check the status in AT Command.			
	If the Device is in operation mode and its target is set, data inputted is transmitted to			
	the target device.			
Ex.	Host -> FZ750BS/FZ750BC : AT[ENTER]			
	FZ750BS/FZ750BC -> Host : OK[0X0D][0X0A]			

12-2-63. **ATO**

Feature	Mode of FZ750BS/FZ750BC is switched from AT command mode to operation mode by
	a command ATO.
Response	OK[0x0D][0x0A]
Description	-
Ex.	Host -> FZ750BS/FZ750BC : ATO[ENTER]
	FZ750BS/FZ750BC -> Host : OK[0X0D][0X0A]

12-2-64. **ATZ**

Feature	FZ750BS/FZ750BC is Soft reset by a command ATZ.				
Response	OK[0X0D][0X0A]				
	FZ750BS/FZ750BC is reset after OK, which means that the command is properly				
Description	cognized, is output.				
	It has the same result as when you approve the power of FZ750BS/FZ750BC again.				
Ex.	Host -> FZ750BS/FZ750BC : ATZ[ENTER]				
	FZ750BS/FZ750BC -> Host : OK[0X0D][0X0A]				

12-2-65. AT&F

Feature	FZ750BS/FZ750BC is Hard reset by a command AT&F .						
Response	OK[0X0D][0X0A]						
	FZ750BS/FZ750BC is reset after OK, which means that the command is properly						
Description	cognized, is output.						
	Set value of FZ750BS/FZ750BC is changed to the initial factory set value.						
Ex.	Host -> FZ750BS/FZ750BC : AT&F[ENTER]						
	FZ750BS/FZ750BC -> Host : OK[0X0D][0X0A]						

* Noise Preventing Method for Zignee Application Configurations

If power goes off forcefully during operation of FZ750BX/FZ760BX, data inside the flash memory can be erased due to unstable voltage.

This data erasing problem can be prevented by stabilizing input power for FZ750BX/FZ760BX and by using a Voltage Detector IC.

A Voltage Detector IC used here must have a Voltage Detect Level over 1.8V and a Reset Delay. (If a Voltage Detector IC with other Detect Level and Delay Time is used, it may cause severer data erasing in the flash memory. We highly recommend of using RT9818B-18GV from Richtek.)

For input power stabilization, a 33uF Capacitor (Tantal/Electrolytic/Neo Capacitor, excluding Ceramic type) and a 0.1uF Capacitor (Ceramic type) are used near the power port of FZ750BX/FZ760BX.



If a Voltage Detector IC cannot be used for any reason, connect 3.3V to the reset port of FZ750BX/FZ760BX.

(But, it is highly recommended to use a Voltage Detector IC.)

