APPENDIX A

Detailed Description on PC Configuration

Version 1.1

Revision History

Revision	Date	Change Description
1.0	10-09-2007	Write a draft
1.1	15-12-2008	Add function - STREAM SWITCHING FAST

List of Contents

1 BLUETOOTH PARAMETERS

1.1 DEVICE NAME

Item	Product	Default Value
DEVICE NAME	FB100AS, FB200AS	FBx00v*N.N.N*
	FB755AC, FB755AS	FB755v*N.N.N*
	FB155BC, FB155BS	FB155v*N.N.N*
	FB570AC, FB570AS	FB570v*N.N.N*

- The device name may be consisted of up to 12 alphanumeric characters.

- The set device will operate as Slave, if Master requests name it will transfer the text row stored in the Device Name.

- The initial set value is recorded in each device name and S/W version. ("N" means the figure.)

1.2 ROLE

Item	Product	Default Value
ROLE	FB100AS, FB200AS	SLAVE
	FB755AC, FB755AS	
	FB155BC, FB155BS	
	FB570AC, FB570AS	

- Bluetooth is basically made to operate to take role between **MASTER** and **SLAVE**.

- In general, Master refers to the device performing inquiry, and page, and Slave refers to the device performing inquiry Scan and Page Scan.

- Default is set as Slave.

1.3 REMOTE BD ADDRESS

Item	Product	Default Value
REMOTE BD ADDRESS	FB100AS, FB200AS	000000000000
	FB755AC, FB755AS	
	FB155BC, FB155BS	
	FB570AC, FB570AS	

- It is the MAC Address of Bluetooth connected at latest.

- If no connection has been made so far, it will display "000000000000".

- Up to 12 alphanumeric characters with 16 system can be entered, The correction can be made only in the **CONNECTION MODE of MODE3**.

- The input in **12 digits of 16 decimals** is available and the correction is available in **mode 3 of connection mode in case of correction in configuration Menu.**

1.4 INQUIRY ACCESS CODE (IAE)

- It will be supported in the future.

1.5 CLASS OF DEVICE (CoD)

- It will be supported in the future.

1.6 POWER SAVE

Item	Product	Default Value
POWER SAVE	FB100AS, FB200AS	DISABLED
	FB755AC, FB755AS	
	FB155BC, FB155BS	
	FB570AC, FB570AS	ENABLED

- Bluetooth has the function of low power management which is activated by approval of Master in case of no data communication for some time after connection is made. The low power management function will automatically be released if date is transmitted / received.
- FIRMTECH Co,. Ltd. Supports to use Sniff as Bluetooth low power management function.
- Using low power management will generate more delay than that of normal data transmission / receipt, therefore enough tests shall be conducted before use.

1.7 LINK SUPERVISION TIMEOUT

Item	Product	Default Value
LINK SUPERVISION TIMEOUT	FB100AS, FB200AS	5 sec
	FB755AC, FB755AS	
	FB155BC, FB155BS	
	FB570AC, FB570AS	

- It refers to the time takes to stop the connection If Bluetooth communication is not possible. The supported unit is 1 ~ 99 seconds. The smaller figure will recognize the disconnection of Bluetooth fast, however the temporary non communication of Bluetooth shall be recognized as no communication, which leads to disconnection.
- Default is 5 seconds.

1.8 SUPPORT PROFILE

- It will be supported in the future.

1.9 SERVICE NAME

- It will be supported in the future.

2 SECURITY PARAMETERS

2.1 AUTHENTICATION

Item	Product	Default Value
AUTHENTICATION	FB100AS, FB200AS	ENABLED
	FB755AC, FB755AS	DISABLED
	FB155BC, FB155BS	
	FB570AC, FB570AS	

- Bluetooth device requires pairing works for interconnection. Authentication is the procedure to certify if the key required for pairing has been distributed with each other.

2.2 PIN CODE (PASS KEY)

Item	Product	Default Value
PIN CODE	FB100AS, FB200AS	BTWIN
	FB755AC, FB755AS	
	FB155BC, FB155BS	
	FB570AC, FB570AS	0000

- The Pin code of this company allows up to 12 alphanumeric characters.
- If the Bluetooth device to be connected in the Authentication process, or the key has not been distributed with each other, nor identical, it will generate new confidential key based on the Pin code. To generate new confidential key, **Pin code of the two Bluetooth device shall be identical.**

2.3 ENCRYPTION

Item	Product	Default Value
ENCRYPTION	FB100AS, FB200AS	ENABLED
	FB755AC, FB755AS	DISABLED
	FB155BC, FB155BS	
	FB570AC, FB570AS	

- To select if it will allow encryption or not for the traffic being exchanged between the two Bluetooth devices of which authentication is completed.

3 SYSTEM PARAMETERS

3.1 STATUS MESSAGE

Item	Product	Default Value
STATUS MESSAGE	FB100AS, FB200AS	ENABLED
	FB755AC, FB755AS	
	FB155BC, FB155BS	
	FB570AC, FB570AS	

- When power is authorized to the products of FIRMTECH Co., Ltd., you may choose current status message among "BTWIN Master mode start", "BTWIN Slave mode star", "CONNECT 123456789012", and "DISCONNECT".

3.2 CONNECTION MODE

Item	Product	Default Value
CONNECTION MODE	FB100AS, FB200AS	MODE3
	FB755AC, FB755AS	MODE4
	FB155BC, FB155BS	
	FB570AC, FB570AS	

3.2.1 Description of Glossary

- **Inquiry** : A function of Master which is the process to attempt to find Bluetooth devices in its boundary.
- **Inquiry Scan** : It is the function of Slave that it refers to the status to give answers to the inquiry which was sent by the Master around.
- **Page(connection request)** : It is the function of Master and refers to the process of connection request required for setting up connection.
- **Page Scan** : It is the function of Slave and refers to the status where the Master will wait for the Master to establish connection based on the Page.
- CONNECTION MODE is the function which allows or limits the connection with other Bluetooth devices, on the basis of GAP(Generic Access Profile).
- Master will allow to establish connection for Inquiry and Page works, while the Slave will perform Inquiry Scan and Page Scan so that both shall be allowed to set up connection with each other.
- There are four different modes of CONNECT MODE, the usage of each mode is as follows.

3.2.2 CONNECTION MODE1

- Function of MASTER
  - If REMOTE BD ADDRESS is "000000000000", it will make an inquiry to the Bluetooth devices to request page processing. The connection will be achieved when the pin code is identical.
  - If there is REMOTE BD ADDRESS, it will try Page only to the device of the Address.

- Function of SLAVE
  - If REMOTE BD ADDRESS is "000000000000", connection with Bluetooth with the same pin code is achieved while processing the Inquiry Scan and Page Scan.
  - If there is REMOTE BD ADDRESS, it will allow connection to Bluetooth device of Remote BD Address only while processing the Inquiry Scan and Page Scan.

3.2.3 CONNECTION MODE2

- Function of MASTER
  - It always make an inquiry to the Bluetooth device around, and request connection (page) to the found Bluetooth device. Connection is made when the pin code is identical.
- Function of SLAVE
  - It performs always Inquiry Scan and Page Scan, it will connected with the master requested with the same Pin code.

3.2.4 CONNECTION MODE3

- Function of MASTER
  - It functions the same as Master of CONNECTION MODE1.
- Function of SLAVE
  - If REMOTE BD ADDRESS is "000000000000", it will function the same as the Slave of CONNECTION MODE1.
  - If there is REMOTE BD ADDRESS, perform only Page Scan. The Master around cannot find upon Inquiry, connection will be made as soon as page is requested.

3.2.5 CONNECTION MODE4

- Since CONNECTION MODE4 is simply waiting for AT command language in standby mode, it will wait for the command language to come when the power is authorized. Therefore, AT command language should be entered to execute the series of operation. Regarding the command language usage, please refer to the "Appendix B detailed description on AT command language".

3.3 ESCAPE CHARACTER

Item	Product	Default Value
ESCAPE CHARACTER	FB100AS, FB200AS	0x2B ("+")
	FB755AC, FB755AS	
	FB155BC, FB155BS	
	FB570AC, FB570AS	Not is Use

- Escape Sequence Character is the parameter which is used for Master only at CONNECTION MODE4(AT command language).

- The preliminary text row which is fixed at "+(0x2B)" basically.　It is entered when the Bluetooth connection status will be switched to AT command language standby mode. Simply enter "+++" will switch connection status to AT command language standby mode.
- That is ASCII code of Escape Character to change, it should be printable character (exists on the keyboard).
- **When you enter "00", it does not inquire "+++", it will enhance the data transmission/receipt performance.**

3.4 DEBUG CHARACTER

Item	Product	Default Value
DEBUG CHARACTER	FB100AS, FB200AS	0x02 ("CTRL + B")
	FB755AC, FB755AS	
	FB155BC, FB155BS	
	FB570AC, FB570AS	

- AT Command shall not be used except for the CONNECTION MODE4. However, when you enter the value set as Debug Character in CONNECTION MODE1, MODE2, MODE3, it will change to CONNECTION MODE4(AT command language standby mode) temporary, which will enables to control set up value or series of operation using AT command language.
- **The configuration tool or connection wizard provided by FIRMTECH Co., Ltd will be controlled by entering the set value by AT command language with this command language.**
- If **ASCII character is output established as Debug Character at HOST connected with the product, we recommend to change or to disable the Debug character before use.**
- When you enter "00", Debug character will be disabled.
- If Debug character is DISABLED, you will not able to use the connection wizard as well.
- Default value is 0x02.

3.5 CONNECTION DELAY TIME

- It will be supported in the future.

3.6 STREAM SWITCHING FAST

Item	Product	Default Value
STREAM SWITCHING FAST	FB100AS, FB200AS	DISABLED
	FB755AC, FB755AS	
	FB155BC, FB155BS	
	FB570AC, FB570AS	Not is Use

- A series of channel modulation is necessary to transmit the data from Slave (1) to Master (N) in 1:N communication. It takes more than 800ms to change the channel. If the stream switching fast is enabled, the modulation time is reduced less than 200ms because it minimizes the time to modulate the channel.
- Process to connect again after disconnection for a while in the firstly connected master if the 1:N connection is accomplished by the enabling of the stream switching fast.
- The stream switching fast is effective in communication between **FIRMTECH products only**. Please contact our company in communication to other products.

4 UART PARAMETERS

- Basically **Data bit** is fixed at **8 bit**.

4.1 BAUDRATE

Item	Product	Default Value
BAUDRATE	FB100AS, FB200AS	9600 bps
	FB755AC, FB755AS	
	FB155BC, FB155BS	
	FB570AC, FB570AS	

- Baud rate supports 1200bps ~ 230400bps.

- Default value is 9600bps.

4.2 PARITY BIT

Item	Product	Default Value
PARITY BIT	FB100AS, FB200AS	NONE
	FB755AC, FB755AS	
	FB155BC, FB155BS	
	FB570AC, FB570AS	

- Parity bit supports NONE, ODD, and EVEN.

- Default value is NONE.

4.3 STOP BIT

Item	Product	Default Value
STOP BIT	FB100AS, FB200AS	1 BIT
	FB755AC, FB755AS	
	FB155BC, FB155BS	
	FB570AC, FB570AS	

- STOP BIT supports 1bit, and 2bit.

- Default value is 1bit

4.4 HARDWARE FLOWCONTROL

- It will be supported in the future.

5 COMMUNICATION PARAMETERS

5.1 OPERATION MODE

Item	Product	Default Value
OPERATION MODE	FB100AS, FB200AS	MODE0
	FB755AC, FB755AS	
	FB155BC, FB155BS	Not is Use
	FB570AC, FB570AS	

- OPERATION MODE is set for 1:N communication control.

- OPERATION MODE0 is based on the existing 1:1 way of communication foundation which can be used to control other Bluetooth device and flow control.

- OPERATION MODE1 is the way of 1:N monitoring which will accommodate up to 7 Masters to a single Slave where data is transmitted/received once at each interval.

- OPERATION MODE2 is selective 1:N two way communication system where a single Slave can be connected with up to 7 Masters to establish stream zone using internal flow control to achieve the two way communication.

- If you select OPERATION MODE1, or MODE2, additional menu which requires OPERATION MODE will be generated.

- Default is set with OPERATION MODE0.(1:1 communication)

- Please refer to the Appendix C for detailed usage.

5.2 NUMBER OF CONNECTION DEVICE

Item	Product	Default Value
NUMBER OF CONNECTION DEVICE	FB100AS, FB200AS	1
	FB755AC, FB755AS	
	FB155BC, FB155BS	Not is Use
	FB570AC, FB570AS	

- Can be set at OPERATION MODE1 or OPERATION MODE2.

- Represents the number of devices to connect.

- We can connect up to 7 sets.

- Default is one.

5.3 BUFF SIZE

Item	Product	Default Value
BUFF SIZE	FB100AS, FB200AS	0

	FB755AC, FB755AS	
	FB155BC, FB155BS	Not is Use
	FB570AC, FB570AS	

- Could be usable at RX / TX BUFF SIZE 는 OPERATION MODE1 only.

- RX BUFF SIZE is BUFF SIZE for one time output.

- TX BUFF SIZE refers to the BUFF SIZE to send out at one time.

- If BUFF SIZE is 0, it transmits or receives irregular based on the scheduler in the product.

- Default is 0.