# Appendix **B**

AT Command Language with Detailed Description and Usage

Version 1.0.1 Date 2007-09-10

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# Detailed Description of AT Command Language and Usage

Basically, the products of FIRMTECH Co., Ltd. supports AT command when the connection Mode is in MODE4. However, for 1:N communication, AT command is used to control 1:N communication regardless of Connection MODE.

### **Definition of DEVICE**

HOST refers to the devices which control the products of FIRMTECH Co., Ltd. through AT command.

BT refers to the Bluetooth devices of FIRMTECH Co., Ltd.

Definition of SYMBOL

Following symbols are used to define the grammar of AT command.

Symbol	Meaning	ASCII Code
لم	Carriage return	OXOD
Z	Carriage return + Line feed 0x0D + 0x0A	
x	Character	
123456789012	Bluetooth device address	
n	One digit decimal number	
tO	Timeout in second	

<Table B-1 Symbol>

### AT Response

BT will generate the response of " $\angle OK \angle$ " when the AT command entered at the Host is executed normally; response of " $\angle ERROR \angle$ " when it is not being executed normally, or in the status not executable or no response may be generated in case of unreadable.

**Operation Status** 

STANDBY : AT command - Stand-by Mode.

PENDING : AT command – some operation is being executed.

CONNECT : Status being connected with Bluetooth device of the other party. BYPASS : Status of data can be transmitted to the Bluetooth devices of the other party.

# **Command Category**

Command Category	Index	AT Command
	1	AT,J
Deset	2	ATZ₊J
Reset	3	AT&F₊J
	4	AT+BTINFODEV?n₊J
Information	5	AT+BTCOUNT?↓
mormation	6	AT+BTINFO?↓
	7	AT+BTINFO?n↓
	8	+++
	9	ATO
	10	ATOnJ
	11	AT+BTCANCEL₊J
Connection	12	AT+BTSCAN,J
	13	AT+BTINQ?,⊣
	14	ATD↓
	15	ATD123456789012₊J
	16	ATH↓
Setting	17	AT+BTLPM,n₊J
	18	AT+BTUART,b(baud rate),p(parity bit),s(stop
	19	AI+BISEC,n(Authentication),n(Encryption),
	20	AT+BTMODE,n↓
	21	AT+BTOPMODE,n,J
	22	AT+BTMSG,n,J
	23	AT+BTNAME=xxxxxxxxxxxx
	24	AT+BTKEY=xxxxxxxxxxx↓
	25	AT+BTLT=nn↓

26	AT+BTSETGUI₊J
27	AT+BTROLE=x,J
28	AT+BTDEV=n₊J
29	AT+SETESC=nn↓
30	AT+SETDEBUG=nn₊J
31	AT+BTBUFF=nnn↓
32	AT+BTADDR=123456789012↓
33	AT+BTDUT↓

<Table B-2 AT Command Category>

# AT Command Language Usable by Status

No	AT Command	STANDBY	PENDING	1:1	1:N	Bypass
			CONNECT	CONNECT	Dypuss	
1	AT.J	a	a	a	a	
2	ATZ₊J	a	a			
3	AT&F↓	a				
4	AT+BTINFODEV?n,J				a	
5	AT+BTCOUNT?,J				a	
6	AT+BTINFO?,J	<b>a</b>			a	
7	AT+BTINFO?n,J	<b>a</b>			a	
8	8 +++					m
9	ATO,J			m		
10	ATOn₊J				S	
11	11 AT+BTCANCEL↓		a			
12	AT+BTSCAN,J	S			S	
13	AT+BTINQ?₊J	m				
14	ATD	(11)				

15	ATD123456789012,J	m		
16	ATH		m	
17	AT+BTLPM,n.J	a		
18	AT+BTUART,b(baud rate),p(parity bit),s(stop bit),J	<b>a</b>		
19	AT+BTSEC,n(Authentication),n(Encryption),J	a		
20	AT+BTMODE,n.J	a		
21	AT+BTOPMODE,n↓	a		
22	AT+BTMSG,n₊J	a		
23	AT+BTNAME=xxxxxxxxxxxx	a		
24	AT+BTKEY=xxxxxxxxxxxx.J	<b>a</b>		
25	AT+BTLT=nn₊J	a		
26	AT+BTSETGUI↓	a		
27	AT+BTROLE=x,J	a		
28	AT+BTDEV=n₊J	<b>a</b> n		
29	AT+SETESC=nn₊J	a		
30	AT+SETDEBUG=nn.J	a		
31	AT+BTBUFF=nnn₊J	<b>a</b> n		
32	AT+BTADDR=123456789012₊J	a		

33	AT+BTDUT,J	a				
	<table :="" at="" b-3="" by="" commands="" status="" usable=""></table>					
(a) : Common Command Language to both Master / Slave.						

(m): Command Language for Master only.

(S) : Command Language for Slave only

① : Command Language usable for OPERATION MODE1 or OPERATION MODE2.

# Features of AT Commands

# 1. AT,J

Feature	To verify if the HOST is connected to BT properly.				
Response	∠OK∠				
	If HOST and BT are connected properly, it will respond with				
Description	"∠OK∠".				
	If the connection is not made, no response is transmitted, or				
	Abnormal text will be transmitted.				
<b>F</b>	HOST → BT : AT,J				
EX	BT → HOST : ∠OK∠				

# 2. ATZ,J

Feature	Have BT software reset.
Response	-
	The same effect as though the power of BT is re-authorized.
	Other connection with other Bluetooth will be released, and all the
Decorintion	jobs currently performed will stop, including connection trial to
Description	Bluetooth or connection waiting to Bluetooth.
	Among the AT Command Languages, the Setting command
	language shall be software reset by using this command after use.

# 3. AT&F₊J

Feature	To Reset the hardware.		
Response	∠OK∠		
	This command language will give the same effects as the reset		
Description	button is pressed in the pc configuration mode.		
Description	After this command is used, all the values of PC Configuration		
	shall change to factory set value		

Foaturo	To transmit the BD address of Master connected to Slave to the				
reature	Host during 1 : N communication.				
Response	∠12345	∠123456789012∠			
	It trans	mits the BD address of Master connected to Slave to the			
	Host wh	ile 1:N communication is being used.			
	The BD	address will be transmitted in the order of connection			
	represe	nted by n value.			
	The cor	nmand language will be recognized properly when "LOW"			
	signal is pressed at MESSAGE CONTROL(CTS) RS-232 level and				
	"HIGH" TTL level.				
	n = 1	DB address of Master connected as the first.			
Description	n = 2	DB address of Master connected as the second.			
	n = 3	DB address of Master connected as the third.			
	n = 4	DB address of Master connected as the fourth.			
	n = 5	DB address of Master connected as the fifth.			
	n = 6	DB address of Master connected as the sixth.			
	n = 7	DB address of Master connected as the seventh.			
	n = a	= a BD address of all Masters connected to Slave			
	HOST → BT : AT+BTINFODEV?1,J				
	BT → HOST : ∠123456789012∠				

# 4. AT+BTINFODEV?nJ

### 5. AT+BTCOUNT?↓

Feature	To transmit the number of Masters connected to Slave currently to	
	the Host while 1:N communication is used.	
Response	$\angle 1 \angle \sim \angle 7 \angle$	
Description	The command transmits the number of Masters connected to	
	Slave currently to the Host while 1:N communication is used.	
	The command language will be recognized properly when "LOW	
	signal is pressed at MESSAGE CONTROL(CTS) RS-232 level and	
	"HIGH" TTL level.	

### 6. AT+BTINFO?₊J

Feature	To transmit the current status of BT to the Host.	
	∠STANDBY∠	
Response	∠PENDING∠	
	∠CONNECT∠	
Description	To transmit the current status of BT to the Host.	

### 7. AT+BTINFO?nJ

E t	To tra	ansmit the PC Configuration values to Host required to	
Feature	opera	te the BT according to the n value.	
	∠[Dev	vice Name]∠	
	∠[Pin	code], [Authentication], [Encryption] $\angle$	
	∠[Ren	note BD Address]∠	
	∠[CONNECTION MODE]∠		
Desman	∠[Status msg],[Power save],[Link time],[Esc char],[Debug char]∠		
Response	∠[bau	ld rate],8,[parity bit],[stop bit]∠	
	∠[ROI	_E],[OPERATION MODE] $\angle$	
	∠[Nur	nber of connection device],[Buff Size] $\angle$	
	∠[Local BD Address]∠		
	∠[Firn	nware Version]∠	
Description	The v	alue transmitted to the Host depending on the n value is as	
Description	follow	S.	
	n=0	Name of Device	
	n=1	Values set for security, Pin code, Authentication, Encryption	
	n=2	Bluetooth Address of Most Recently Connected Device	
	n=3	CONNECTION MODE (MODE1 ~ MODE4)	
		Status Message, Power save, Link Supervision time, Escape	
	11=4	character, Debug character	
	n=5	Baud rate, Data bit, Parity bit, Stop bit	
	n=6	ROLE, OPERATION MODE	
	n=7	Number of Connection Device, Buff Size	
	n=8	Local Bluetooth Address	

	n=9	Firmware Version
Ex	HOST	→ BT : AT+BTINFO?0,J
	BT →	HOST:∠BMx001v4.0.0∠

#### 8. +++

Feature	To change the operation status from "BYPASS" to standby mode		
	for command language.		
Response	∠OK∠		
Description	After BT is connected to other Bluetooth, all the data sent to BT		
	shall be transmitted to the other party's device of Bluetooth.		
	This status is called BYPASS status, where "+++" text row shall		
	be switched into the standby mode for command which will		
	interpret and process the AT command language.		
	The command language shall be supported by Master.		

# 9. ATO,J

Feature	To switch from standby mode for command language to BYPASS	
	mode where data can be transmitted/received.	
Response	∠OK∠	
Description	With the Bluetooth is connected, switch to standby mode for	
	command language with "+++" text row, then switch to BYPASS	
	mode to transmit/receive data.	

### 10. ATOnJ

Feature	At 1:N communication, to switch BYPASS mode It is used for the		
	Master to which the Slave will send the data, and to switch to the		
	BYPASS condition.		
Response	RS232 level	STREAM STATUS signal is "HIGH". (when command	
		language is properly performed.)	
	TTL level	STREAM STATUS signal is "LOW". (when command	
		language is properly performed.)	
Description	With 1:N communication, it is used to form area between Master		

and Stream (BYPASS) where the data will be transmitted.
This command language is Slave regardless of CONNECTION
MODE, and usable when the OPERATION MODE is MODE1 or
MODE2.
If the command language properly operates, the signal of STREAM
STATUS(DTS) shall be "HIGH" at RS-232 level, and "LOW" at TTL
level. If the command language does not properly operate, the
signal of stream status will keep "LOW" at RS-232 level, and
"HIGH" at TTL level.
The command language will be recognized properly when "LOW
signal is pressed at STREAM CONTROL(DSR) RS-232 level and
"HIGH" TTL level.

# 11. AT+BTCANCELJ

Feature	BT will have the jobs stopped in progress.	
Response	ZOKZ	
Description	Used to stop the jobs being undertaken by BT coercively currently. The kinds of works could be stopped coercively will including inquiry/page scan (AT+BTSCAN), connection trial (ATD), and Bluetooth device inquiry (AT+BTINQ?). BT will be switched to standby mode for command if the works properly completed.	

### 12. AT+BTSCANJ

Feature	To have BT inquiry scan and page scan.	
Response	∠OK∠	
	∠CONNECT 123456789012∠	
	(response if other device is connected.)	
Description	Bluetooth device allows inquiry only for Bluetooth devices which	
	were on inquiry scan, and allows connection only to the devices on	
	page scan.	
	This command allows other Bluetooth devices to search BT and	
	can be connected any time.	
	If connection is made to Bluetooth devices, message of "CONNECT	

123456789012" showed up, and resume inquiry scan and page
scan upon disconnection. Therefore, command of AT+BTCANCEL
shall be used to switch to standby mode for command language.

# 13. AT+BTINQ?,J

Feature	To inquiry for Bluetooth devices exists around.
Response	∠OK∠ ∠[Bluetooth address],[Device name],[Class of Device]∠ ∠OK∠
Description	It searches for Bluetooth devices on inquiry scan to transmit the devices' information including address, name of devices, and class of device to the Host. Can search for up to 8 Bluetooth devices in about 20 seconds, and "OK" message will be transmitted upon completion of Bluetooth searching.

# 

Frankrige	To attempt again to connect with the latest recently connected					
Feature	Bluetooth device.					
	∠OK∠					
Response	∠CONNECT 123456789012∠					
	(response when reconnection is made)					
	$\angle ERROR \angle$ (response in case of connection failure)					
Description	BT remembers the address of Bluetooth device most recently					
	connected. (can be certified with AT+BTINFO?2.)					
	In this case, you can try to connect the Bluetooth device again by					
	using this command simply without specifying the address of the					
	appropriate Bluetooth device.					
	It will generate "ERROR" message in case the address of the					
	Bluetooth device has not been connected at all. "0000000000000"					

### 15. ATD123456789012↓

Feature	Try	to	Connect	to	Bluetooth	with	the	Bluetooth	address	of
	123456789012									

	∠OK∠					
Response	∠CONNECT 123456789012∠					
	(response when reconnection is made)					
	$\angle$ ERROR $\angle$ (response in case of connection failure)					
Description	Try to connect by specifying the address of target Bluetooth					
	device.					
	For successful connection, the target Bluetooth device should be					
	on page scan.					
	The connection attempt will last for 30 seconds, BT will take					
	procedures of authentication automatically, if required.					

# 16. ATH**.**⊣

Feature	To release the current connection.				
Response	∠OK∠				
	ZDISCONNECTZ				
	It shall be used to release the connection of Bluetooth.				
Description	This command shall be operable by Master only when the				
	OPERATION MODE is in MODE0				

# 17. AT+BTLPM,n₊

Footuro	To select if low power management feature of BT will be used or						
reature	not.						
Response	∠OK∠						
Daramotors	n = 1 (the power save mode is used.)						
Parameters	n = 0 (the power save mode is not used.) default						
	In general, the Bluetooth device connected to other Bluetooth						
	device can save power consumption of the device while there is no						
	data transmission/receipt, by using low power management						
Description	feature.						
	This command is to select if low power management feature will						
	be used or not. With BT, it is set such that it shall not use as initial						
	value.						
	If the value of n is 1, it will use low power management feature						

	and n is 0, it shall not use low power management feature.
	In case the low power management feature will be utilized, there
	might be some delay in data transmit/receipt.
Ev	HOST → BT : AT+BTLPM,1,J
EX	BT → HOST : ∠OK∠

# 18. AT+BTUART,b,p,s,J

Feature	To Change the set value of serial communication of BT.				
Response	∠OK∠				
Parameters	b(baud rate)	1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400			
	p(parity bit) N(NONE) / E(EVEN) / O(ODD)				
	s(stop bit)	1 / 2			
	The elements required for serial communication including number				
Description	of bit per second (baud rate), parity, and stop bit may be				
	changeable.				
E.	HOST → BT : AT+BTUART,57600,N,1,J				
	BT → HOST:∠OK∠				

# 19. AT+BTSEC,n(Authentication),n(Encryption),J

Feature	To select the fe	atures of Authentication, and Encryption of						
	Bluetooth.							
Response	∠OK∠							
Parameters	Authoptication	n = 1 (used)						
	Authentication	n = 0 (not used)						
	Encryption	n = 1 (used)						
		n = 0 (not used)						
Description	To select if the authentication process and encryption feature of							
	Bluetooth will be used or not.							
Ex	HOST → BT : AT+BTSEC,1,1,J							
	BT → HOST : ∠OK∠							

Feature	To set CONNECTION MODE of BT.				
Response	∠OK∠	∠OK∠			
Parameters	n = 1 (MODE1)	Master	If there is information on the Slave most recently connected, it shall try to connect with the Slave only unless factory set value (AT&F) is requested. If there is no information on the most recently connected Slave, it will search for the Bluetooth around among which it will request to connect to the first Slave has sent the response.		
		Slave	If there is information of Master most recently connected, it will allow only the Master to be connected. If there is no information of Master most recently connected, it will allow the first Master requesting connection only for inquiry scan and page scan.		
	n = 2 (MODE2)	Master	To provide connection with the Slave found out first around the Bluetooth devices.		
		Slave	To allow the first Master requesting to be connected among the around Bluetooth devices for on page scan, and inquiry scan.		
	n = 3 (MODE3)	Master	To perform the same functions as with MODE1.		
		Slave	If there is the latest connected information of Master, it will allow only page scan, which prevent other Masters to find Slaves. If there is no information of Masters connected, it shall operate as with MODE2.		
	n = 4 (MODE4)	AT com	mand is in standby mode.		

### 20. AT+BTMODE,n₊J

Description	BT supports four kinds of CONNECTION MODE.				
	The CONNECTION MODE is used to allow or limit the connection of				
	other Bluetooth devices, based on the GAP.				
	If the power is authorized the same operation will be executed as				
	explained				
E v	HOST → BT : AT+BTMODE,1.J				
EX	BT → HOST : ∠OK∠				

# 21. AT+BTOPMODE,nJ

Feature	To set 1:N com	To set 1:N communication use or not		
Response	∠OK∠	∠OK∠		
	n = 0	MODE0		
Parameters	n = 1	MODE1		
	n = 2	MODE2		
	As for the 1:N communication set up, MODE0 is based on 1:1			
	communication, MODE1 is based on monitoring, and MODE2 is for			
Description	selective large volume transmit/receive.			
	Please refer to the User Manual 1:N data transmission/receipt for			
	detailed information. (Appendix C)			
<b>5</b>	HOST → BT : AT+BTOPMODE,1.J			
EX	BT → HOST:∠OK∠			

# 22. AT+BTMSG,nJ

Feature	To select status message output or not.					
Response	∠OK∠					
Daramators	n = 1 status message in use – default					
Parameters	n = 0 status message used					
Description	If power is authorized, with current status is connected as "BTWIN					
	Master mode start, "BTWIN Slave mode start,", you may select					
	output of status message such as "CONNECT 123456789012" or					
	not. If you don't need message, you may disable it by set to N=0.					
Ex	HOST → BT : AT+BTMSG,1,J					

BT → HOST : ∠OK∠

### 23. AT+BTNAME=xxxxxxxxxxx

Feature	To change the name of BT devices.
Response	∠OK∠
Description	To allow BT with name easily identifiable by user.
	This name can be used in other Bluetooth devices to search for
	Bluetooth devices. Up to 12 alphanumeric characters could be
	used.
Ex	HOST → BT : AT+BTNAME=test,J
	BT → HOST:∠OK∠

### 24. AT+BTKEY=xxxxxxxxxx↓

Feature	To change the Pin Code of BT.
Response	∠OK∠
	The PIN code shall be consisted of text row, up to 12
Description	alphanumeric character could be used.
	Basic set value is "BTWIN".
Ex	HOST → BT : AT+BTKEY=1234.J
	BT → HOST : ∠OK∠

# 25. AT+BTLT=nn₊J

Feature	To set connection status check interval.
Response	∠OK∠
	It represents the time to complete the connection if the Bluetooth
	communication is not achieved, simply enter the time equivalent
	to the nn.
Description	The time unit supported 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.
Ex	HOST → BT : AT+BTLT=10,J
	BT → HOST : ∠OK∠

# 26. AT+BTSETGUI↓

Feature	To output the status message temporary.
Response	∠OK∠
	Even though status message is disabled, temporary status
	message will output once the AT+BTSETGUI command language is
Description	executed.
	When the power OFF and ON once more, the status message will
	not appear any longer.
	Please make sure the status of our company's Config Tool or
	CONNECTION Wizard using this command.
Ex	HOST → BT : AT+BTSETGUI.J
	BT → HOST : ∠OK∠

# 27. AT+BTROLE=x↓

Feature	To select Master or Slave.
Response	∠OK∠
Parameters	x = M (Master)
	x = S (Slave)
Description	Master requests connection through inquiry for Bluetooth around,
	while Slave is on inquiry scan and page scan.
Ex	HOST → BT : AT+BTROLE=M.J
	BT → HOST : ∠OK∠

# 28. AT+BTDEV=nJ

Feature	To set the number of devices for 1:N communication.
Response	∠OK∠
Description	It defines the number of devices to be connected for 1:N

	communication.
	It is executable when OPERATION MODE is on MODE1 and MODE2.
	FB755 will allow 1 ~ 7 sets of connection, while other devices will
	allow 1 ~ 5 connection at maximum.
Ex	HOST → BT : AT+BTDEV=5,J
	BT → HOST : ∠OK∠

# 29. AT+SETESC,nn₊J

Feature	To change the Escape sequence character.
Response	∠OK∠
	Escape sequence character is text row used to switch from
	Bluetooth connected status to command standby mode, fixed at
Description	"+++" basically.
	nn is ASCII code of Escape sequence character to change, and
	should be printable character (resides on keyboard).
	If "00" is entered in the nn position, it will bring performance
	enhancement of data transmission during bypass status since
	"+++" is not searched for.
	Default is 0x2B.
Ex	HOST → BT : AT+SETESC,2B,J
	BT → HOST:∠OK∠

# 30. AT+SETDEBUG,nn₊J

Feature	To change Debug character.
Response	∠OK∠
Description	The CONNECTION MODE does not allow to use other AT command
	language than MODE4.
	However, if the value set with debug character is entered at the
	CONNECTION MODE of MODE1, MODE2, MODE3, the
	CONNECTION MODE will change to MODE4(AT command language
	standby) temporary so that the set value or other operation will be
	controlled by AT command language.
	For the company provided configuration tool or connection wizard,

	enter the set value with this command language to control with AT
	command language.
	If ASCII character is output set on this command language, please
	disable Debug character and proceed to use it.
	If "00" is entered on nn, the Debug character will be disabled.
	Default is 0x02.
Ex	HOST → BT : AT+SETDEBUG,02,J
	BT → HOST:∠OK∠

# 31. AT+BTBUFF=nnn₊J

Feature	For 1:N communication, set transmit/receive buffer.	
Response	∠OK∠	
	This command language is usable when the operation mode is at	
	MODE1.	
Description	The operation mode will set the RX TX Buff Size at MODE1.	
	The fixed buffer size will be sent out at every time of transmission.	
	You can enter the number of $1 \sim 999$ .	
Ev	HOST → BT : AT+BTBUFF=30,J	
	BT → HOST : ∠OK∠	

# 32. AT+BTADDR=123456789012↓

Feature	To change the address of the latest connected Bluetooth device.		
Response	ZOKZ		
	It changes the last BD address of which connection was made		
	successfully.		
	It provides the same features as MODE3 of CONNECTION MODE.		
Description	You can connect by simply enter address of the Slave you want to		
	connect, and then use "ATD".		
	To initialize the address, enter "AT+BTADDR=000000000000",		
	then it will return to factory set value.		
<b>F</b>	HOST → BT : AT+BTADDR=123456789012,J		
	BT → HOST:∠OK∠		

### 33. AT+BTDUT,J

Feature	To proceed with Device Under TEST.	
Response	∠OK∠	
	The setting is changed into Device Under Test. When the power is	
Description	authorized again, it is possible to connect various measurement	
	devices of Bluetooth to perform tests.	
Ev	HOST → BT : AT+BTDUT,J	
EX.	BT → HOST : ∠OK∠	

### Usage of AT Command Language

Following description is based on the products newly purchased (factory set mode), and for the description of the embedded products, it is assumed that it is mounted on the interface board (Jig) to enable serial communication with PC

The serial communication program is required to use AT command language.

We will explain further using Hyper Terminal provided by Window OS. Please refer to the product description how to configure the Hyper Terminal in detail.

Except for BM1001 and BM2001, other product is set at MODE4 as the CONNECTION MODE.

If you change the CONNECTION MODE by using BM1001, BM2001 and products, please set the CONNECTION MODE as with MODE4 on <Figure B-1>.

DEVICE NAME       [MAX]: char [12]       BMx001v4.0.1	PIN CODE [MAX] : char [12] BTWIN	REMOTE BD ADDR.           [MAX] : char [12]           000000000000000000000000000000000000
LOCAL BD ADDR.		STATUS MESSAGE
0011B1B23A0B	ENABLE	ENABLE 💌
		POWER SAVE
CONNECTION 4	ENABLE	DISABLE
Link Supervision Time	SERIAL SETUP	
5 Range : 1 ~ 99	Baud Rate 9600 💌	SLAVE 💌
ESC CHAR	Parity Bit None 💌	Operation(New Func.)
0x 28 char [2]	Stop Bit 1	Operation 0
DEBUG CHAR	BUFFER SIZE	
<b>0x</b> 02 char [2]	0 Range : 0 ~ 999	1

=====================================	======================================
====== TOP M 0 => DEVICE NAME 1 => AUTHENTICATION 2 => REMOTE BD ADDRESS LOGAL BD ADDRESS 3 => CONNECTION MODE 4 => OTHER PARAMETER 5 => UART CONFIG 6 => ROLE 7 => OPERATION MODE	ENU ====================================
[ Back Spcae : Input data [ t : Move top menu Select(0 ~ 7) >	Cancel ] ] ==================================

Please refer to the product description for setting up configuration.

<Figure B-1 PC Configuration Menu>

Slave can be connected with each other as long as SCAN(inquiry scan and page scan) works are completed, while Master shall complete the works of Inquiry and Page(connection request).

First, set up the Slave, then try connection through inquiry at the Master.

### 1 Setting Up 1 Slave

(1) Turn the Power On after connecting the products to be set as Slave to serial port of PC.

(2) Execute the Hyper terminal and enter the following command language.

HOST → BT : AT J

BT  $\rightarrow$  HOST :  $\angle OK \angle$  (normally execute the command language)



<Figure B-2 : Standby Mode for AT Command Language>

(3) If <Figure B-2> appears, proceed with the following command language. (If it does not show as on <Figure B-2>, please verify the setting again and resume the procedures from (1).)



< Figure B-3 Slave : Command Language Procedures for Connection Standby>

HOST → BT : AT+BTSCANJ (SCAN command language)

BT  $\rightarrow$  HOST :  $\angle OK \angle$  (normally executes the command language)

BT  $\rightarrow$  HOST :  $\angle$  ERROR $\angle$  (does not execute the command language properly)

(4) If the command language is executed properly, the STATUS LED begins to flickering.

### 2 Setting Up and Connecting Master

(1) If Slave setting up is completed, connect the product to be Master to the serial port of PC and turn the power on. (The power of Slave should be turned on.)
(2) Execute Hyper Terminal and enter the following command language.
HOST → BT : AT,J
BT → HOST : ∠OK∠(executes the command language properly)

(3) <Figure B-2> comes up, proceed with following command language. (Verify the configuration if it does not come up as <Figure B-2>, and restart from (1).)

```
BTWIN Slave mode start

OK

AT+BTROLE=M

OK

ATZ

BTWIN Master mode start

OK

AT+BTINQ?

OK

D011B1B0EA96,BM×001v4.0.0,1F00

D011B1A165E4,BM×001v3.7,1F00

OK
```

<Figure B-4 : Results of AT+BTINQ? Command language>

HOST  $\rightarrow$  BT : AT+BTROLE=M, (command language to change the ROLE)

 $\mathsf{BT} \rightarrow \mathsf{HOST}: \angle \mathsf{OK} \angle \text{ (Execute command language properly)}$ 

HOST → BT : ATZ, (Soft Reset command language)

 $\mathsf{BT} \twoheadrightarrow \mathsf{HOST}: \mathsf{BTWIN} \text{ Master mode start} \angle$ 

 $\mathsf{BT} \twoheadrightarrow \mathsf{HOST}: \angle \mathsf{OK} \angle$ 

HOST → BT : AT+BTINQ? ↓ (Inquiry command language)

 $BT \rightarrow HOST : \angle OK \angle$  (execute command language properly)

BT → HOST : ∠0011B1B0EA96,BMx001v4.0.0,1F00∠ (output Inquiry result)

 $\mathsf{BT} \rightarrow \mathsf{HOST}: \angle \mathsf{OK} \angle \text{ (execute Inquiry result properly)}$ 

(4) Try to connect to the address of Bluetooth after inquiry, with combined use of following command language through ATD.

0011B1B0EA96, BM×001v4.0.0, 1F00 0011B1A165E4, BM×001v3.7, 1F00 0K ATD0011B1B0EA96

0K

CONNECT OO11B1B0EA96

<Figure B–5 ATD command language>

HOST → BT : ATD0011B1B0EA96, (ATD command language)

 $BT \rightarrow HOST : \angle OK \angle$  (execute command language properly)

BT → HOST : ∠CONNECT 0011B1B0EA96∠ (connection result)

(5) If the message of "CONNECT 123456789012" appears, means the connection is made properly which is the status enables to transmit/receive data with the connected devices.



<Figure B-6 : Master Switch Over and Connection Inquiry>

### **3 To Release the Connection**

When the Bluetooth is connected with each other, the data input shall be output on the opposite side of Bluetooth device.

But, you can switch over AT command language standby mode by using Escape Character.

Default Esc Char is 0x02("+"). Entering 3 bytes of Esc Char in series, the AT command language will be switch to standby mode, then you can release the connection by using ATH command language. The procedure of command language is performed as follows:



<Figure B-7 : To Use ATH command language>

HOST $\rightarrow$ BT : +++ (Enter 3 bytes of Esc Char in series)
BT $\rightarrow$ HOST : $\angle OK \angle$ (perform command language properly)
HOST $\rightarrow$ BT : ATH, (command language for connection release)
BT $\rightarrow$ HOST : $\angle OK \angle$ (command language properly performed)
BT $\rightarrow$ HOST : $\angle$ <b>DISCONNECT</b> $\angle$ (complete connection release)

### 4 How to Change PC Configuration through AT Command Language.

FIRMTECH products allow to configure the PC using AT command language. The Config tool provided by FIRMTECH is the tool made with the basics of AT command language.

AT command language has two kinds of command languages; one allows executable according to the operation status as shown <Table B-3>reference) and the other one which does not allow execution.

The certifying method is as follows.

Г	
	AT+BTINE0?
	CTANDOU
	STANUUT
	_
	-

<Figure B-8 : AT+BTINFO? Command language>

HOST → BT : **AT+BTINFO**, (command language to verify the current status) BT → HOST :  $\angle$ **STANDBY** $\angle$  (transfer the current status to the HOST)

As shown on <Figure B-8>, the "STANDBY" mode will allow touse configuration setting command language. In case, the status is "PENDING" or "CONNECT", it's impossible to use configuration setting command language. For detailed information, please refer to the Appendix B : Usable AT Command Language. Now we will try to change the current device name using AT command language.

The order of command language shall be as follow.

AT+BTINFO? STANDBY AT+BTINFO?O FB151v3.0.1
AT+BTNAME=name_test OK ATZ BTWIN Slave mode start
OK AT+BTINFO?O name_test

<Figure B-9 : Change device name by using AT command language>

HOST  $\rightarrow$  BT : **AT+BTINFO?0**, (command language to inquire the information of current device name)

BT  $\rightarrow$  HOST :  $\angle$ FB151v3.0.1 $\angle$  (to transfer to the current device name to the HOST)

HOST → BT : **AT+BTNAME=name\_test**, (command language to change device name)

BT  $\rightarrow$  HOST :  $\angle OK \angle$  (proper operation of command language)

HOST → BT : ATZ (Soft Reset command language)

 $\mathsf{BT} \twoheadrightarrow \mathsf{HOST} : \angle \mathsf{BTWIN} \text{ Slave mode start} \angle$ 

 $\mathsf{BT} \twoheadrightarrow \mathsf{HOST} : \angle \mathsf{OK} \angle$ 

HOST  $\rightarrow$  BT : **AT+BTINFO?0**, (command language to certify the current information of device name)

BT  $\rightarrow$  HOST :  $\angle$ name\_test $\angle$  (to transfer to the current device name HOST)

To store the configuration, be sure to execute "ATZ" command language (refer to the ATZ command language)