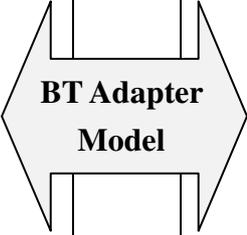# Bluetooth RS-232 Adapter

User manual for BT-232B and BT-232B-E models

BT-232B **Bluetooth RS-232 Adapter with Internal Chip Antenna**	BT Adapter Model	**BT-232B-E** **Bluetooth RS-232 Adapter with External Dipole Antenna**

White Box Dimension: 10.5 x 5.5 x 5 (cm) **Total Package Weight: 110 g**	**White Box Dimension: 10.5 x 5.5 x 5 (cm)** **Total Package Weight: 120 g**

Marking (Round Silver Sticker)

1. Packing Contents

1.1 BT-232B Package Contents:

- RS-232 adapter x 1
- Battery power line and connector x 1
- User manual x 1
- USB Cable x 1

1. Packing Contents

1.1BT-232B-E Package Contents:

- RS-232 adapter x 1
- Battery power line and connector x 1
- User manual x 1
- USB Cable x 1
- External Dipole Antenna x 1

2. Before using the adapter

2.1 For BT-232B-E model, fasten the external antenna to the adapter before performing Quick Guide 3.1

2.2 Power input (Please chose one): Mini USB cable (Default) or DB9 connector Pin 9 (VCC, 5VDC, 1.5A Max.) or external battery (3~3.7 VDC Li-Polymer Battery or 3 units standard A, AA or AAA battery)

2.3 Most built-in Bluetooth is in class 2, the 10 meters range, for PC or NB. You will need use the class 1 adapters on both sides if you need to reach over 100 meters range.

3. Quick Guide

3.1 Using the USB cable provided in the package, plug the mini USB connector into the Bluetooth RS-232 adapter then connect it to the power adapter with USB or PC

3.2 Turn on the power from the slide switch. The red LED power is on.
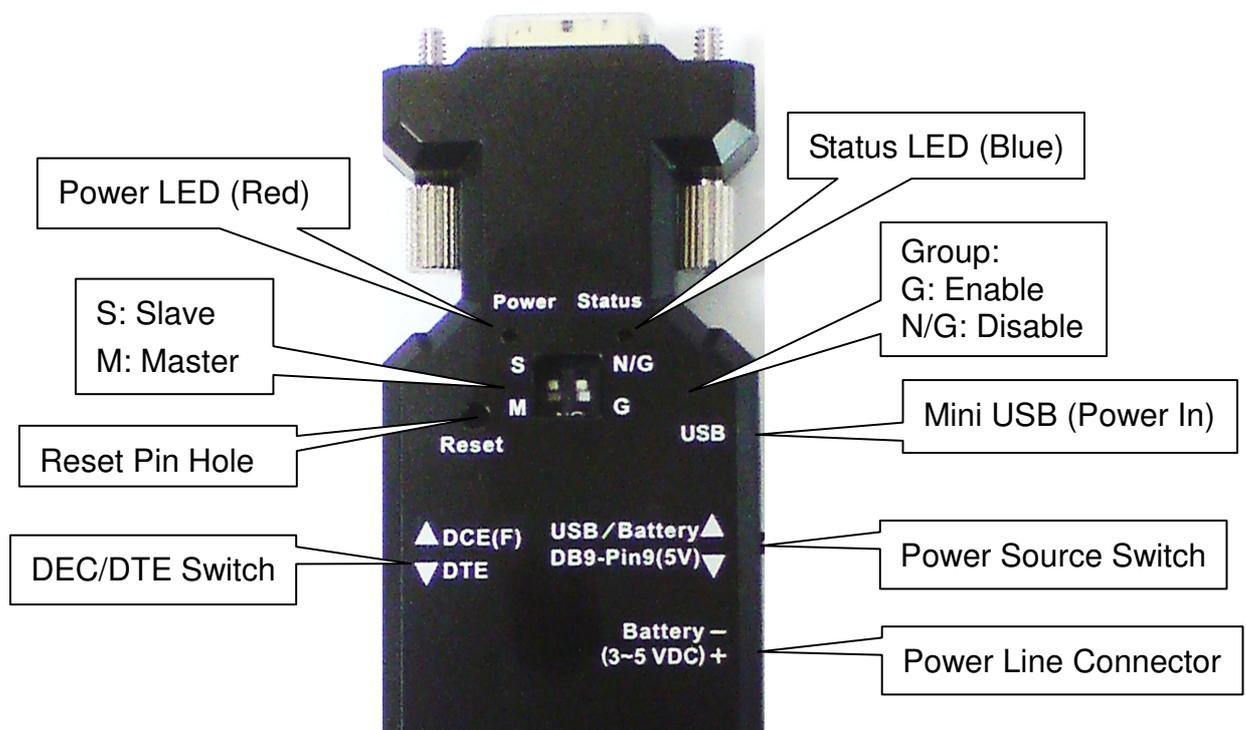
3.4 Check the RS-232 setting on 2 sides if they both have the following values:

● Baud rate: 19200 bps

● Data bit: 8

● Parity: none

● Stop bit: 1

● Flow control: none

   If not, please modify the setting by using hyper terminal software and the setup command via COM port. (See section 11 for the setup commands.)

3.5 Two RS-232 adapter connections in a master-slave environment (See section 3.3 for illustration). Upon first connection, it is in slave-mode by default and can be set to master-mode using the setup command (See "ROLE" command in section 11).

3.6 If you are using PC or NB, start the IVT software or the built in Bluetooth management software, like Toshiba.

4. How to use external battery

- Standard A, AA or AAA battery: 3 units for each model.

- Li-Polymer Battery: 3~3.7 VDC. The capacity depends on the applications. General working power consumption: 100 mAh (for reference)

5. Factory Settings for COM port and Bluetooth:
- Baud rate: 19200 bps
- Data bit: 8
- Parity: none
- Stop bit: 1
- Flow control: none
- Bluetooth PIN code is "1234"

Bluetooth default setting: To inquire default values, see section 11 for the setup command.

6. Reset Button (Pressed with a clip or pin into the hole)
6.1 Disconnect and reconnect a wireless connection (after a short press).
6.2 Restore the factory settings (after over three seconds' press).

7. Slide Switch
Use the slide switch to swap between DTE/DCE. By switching, you can set the adaptor either as a DTE (towards antenna connector) or a DCE (towards RS232 connector).

8. Power Supply: The adaptor can be powered via the following source.
8.1 USB cable
8.2 External Battery: Please refer to section 4.

9. LED Status:

Status	Description
Power LED off	No power supply.
Power LED on	The power input is equal or larger than 3.5 Volt (Please check the command "DETECT")
Power LED (0.5 sec) blinking	The power input is lower than 3.5 Volt (Please check the command "DETECT")
Link LED off	No pairing established.
Link LED fast (0.1 sec) blinking	Pairing (slave or master mode).
Link LED fast (0.3 sec) blinking	Discoverable and waiting for a connection (slave mode).
Link LED slow (0.9 sec) blinking	Inquiring (master mode).
Link LED very slow (1.2 sec) blinking	Connecting (master mode).
Link LED steadily on	Connection established.

10. Configuration the parameters of the COM port
10.1 Configure via Hyper terminal, Telnet or other COM port tool freeware.
10.2 Use the downloadable Bluetooth Serial Adapter's configuration software provided by the distributor.

11. Setup Command set (Please type in <u>all capital letter</u> or <u>all lowercase letter</u>)

Command	Value	Description
<<<		Set the local adapter change the data mode into command mode. The command will be unavailable if the data pass through within 1 second when after set the command.
<<<		Switch the data mode to the command. The time interval between each character will be more than the time: [500ms] "<" [500ms] "<" [500ms] "<" [1500ms]
<<<=	?	Inquire the current setting.
	Y	Turn on the "<<<" command
(Default)	N	Turn off the "<<<" command
>>>		Set the remote adapter change the data mode into command mode from the local adapter in connecting status. The command is available after 500 ms when data transferring finished.
>>>		Switch the remote adapter from the data mode to the command. The time interval between each character will be more than the time: [1 sec] "<" [1 sec] "<" [1 sec] "<" [2 sec]
>>>=	?	Inquire the setting status of the ">>>" command.
	Y	Turn on the ">>>" command
(Default)	N	Turn off the ">>>" command
ADDRESS=		This command is used to display the Bluetooth address of the local adaptor.
	?	Inquire the Bluetooth address of the local adaptor.
AT		Check the connection status between control terminal and the RS-232 adapter. Response: "OK" when the connection is ok. Response: "ERROR" when the connection is not ok.
AT		Test the RS-232 status when first connect the adapter with the controller.
AUTO=		This command is used to enable/disable auto-connection feature. It is available only when the adaptor is in the master role. The command is available when DIP=N. The system will not re-start after change.
	Y	The Master role adapter will connect the latest paired Bluetooth device automatically.
(Default)	N	The user will connect the Bluetooth device manually.
	?	Inquire the current setting.
BAUD=		This command is used to specify the baud rate of COM port. The command will need 200 ms delay.
	1200	1200 bps
	2400	2400 bps
	4800	4800 bps
	9600	9600 bps
(Default)	19200	19200 bps
	38400	38400 bps
	57600	57600 bps
	115200	115200 bps
	230400	230400 bps
	460800	460800 bps

	921600	921600 bps
	R	Restore the default settings. (Baud rate =19200 bps)
	?	Inquire the current baud rate.
CONNECT=		This command is used to establish a connection manually. It is available only when the adaptor is in the master role.
	DEVICE	Connect the adaptor to a specified Bluetooth device manually. It is available only when "DEVICE=xxxxxxxxxxxx" is executed.
	1~8	Connect the adaptor to a Bluetooth device in the neighborhood found through "SEARCH=?"
	xxxxxxxxxxxx	Connect the remote adapter by type the MAC address directly without searching.
	?	Display the MAC address of the latest paired device.
	Y	Recover the latest connection in the command mode.
	N	Disconnect the two adapters in the command mode
	P	Connect the previous connected adapter.
DEFAULT=		This command is used to restore the default settings and originate a warm start.
	Y	Restore the default settings (e.g. 19200 bps). The command will re-start the system for 1 second.
DETECT=		The command is used to detect the voltage of the power supply and set the alert value of low power.
(Default)	N	Disable the voltage detection
	Y	Enable the voltage detection
	R	Restore the default value (3.5 Volt)
	x.x	Setup the range of voltage detection from 3.0 to 3.7 Volt. The "x" indicate the number.
	?	Inquire the setting ststus
DEVICE=		For security purpose, this command is used to specify a unique remote Bluetooth serial adaptor to be connected. In the master role, the adaptor pairs and connects with the designated remote slave address. If the adaptor is in the slave mode, this command is a filter condition to accept the inquiry of the master device.
	xxxxxxxxxxxx	"xxxxxxxxxxxx" is a string of 12 hexadecimal digits.
	R	Restore the status in which the adaptor can connect with any remote address.
	?	Inquiry the designated address that can be paired and connected.
DFU=		Device Firmware Upgrade
	Y	
DIP=		Set the DIP switch function.
	?	Inquire the setting status of the DIP switch function.
	Y	Turn on the function of the DIP switch. The "ROLE" and "AUTO" command are not available to set the "Master" or "Slave".
(Default)	N	Turn off the function of the DIP switch. The "ROLE" and "AUTO" command are available when the DIP=N.
DISCOVER=		This command is used to specify whether the adaptor can be discovered or connected by remote devices. This command is available only when the adaptor is in the slave role.
	N	The adaptor enters the undiscoverable mode. If a pair has been made, the original connection can be resumed. But other remote master device

		cannot discover this adaptor.
(Default)	Y	The adaptor enters the discoverable mode.
	?	Inquire the current setting.
ECHO=		This command is used to specify whether the adaptor echoes characters received from the UART back to the DTE/DCE.
	N	Command characters received from the UART are not echoed back to the DTE/DCE.
(Default)	Y	Command characters received from the UART are echoed back to the DTE/DCE.
	?	Inquire the current setting.
FLOW=		This command enable or disable flow control signals (CTS/RTS) of the UART port. Note, the setting is not affected by DEFAULT. The command will need 1 second delay.
(Default)	N	Disable flow control.
	Y	Enable flow control.
	?	Inquire the current setting
NAME=		This command is used to specify a name for the adaptor. You can specify a friendly name using 0 to 9, A to Z, a to z, space and –, which are all valid characters. Note that "first space or -, last space or – isn't permitted". The default name is "Serial Adaptor".
(Default)	Serial Adaptor	Default device name
	xx….xx	"xx….xx" is a character string with the length from 2 to 30.
	R	Restore the default settings name="Serial Adaptor".
	?	Inquire the name of the local adaptor.
PARITY=		This command is used to specify parity bit setting of COM port. The command will need 200 ms delay.
(Default)	N	None parity bit
	O	Odd parity
	E	Even parity
	?	Inquire the current setting.
PIN=		This command is used to specify a PIN. The default PIN is "1234". Paired adaptors should have a same PIN. This command is used to specify a PIN. The default PIN is "1234" and the length is not smaller than 4. Paired adaptors should have a same PIN. The PIN code includes the numeral and English characters.
(Default)	1234	
	xx….xx	"xx….xx" is a 4~16 digit string or English character (in capital or lower case)
	N	Cancel authentication by PIN.
	R	Restore the default settings PIN="1234".
	?	Inquire the current PIN.
PROMPT=		The command is used to decide whether result messages are prompted when Setup commands are executed. The result messages are: OK/ERROR for command execution, or CONNECT/DISCONNECT/Try Connect Device for connection status.
(Default)	Y	Prompt result messages.
	N	Not prompt result messages.
	?	Inquire the current setting.

| RECONNECT=		The command is used to re-connect the lost link for the Master adapter.
	?	Inquire the current setting.
(Default)	Y	Re-connect is disable
	N	Re-connect is Enable
ROLE=		This command is used to specify whether the adaptor is in the master or slave role. If the device role is changed, the adaptor will reboot and all paired addresses will be cleared. The command is available when the adapter is in DIP=N status. The command will need 1 second delay.
	M	Set the adaptor to the master role.
(Default)	S	Set the adaptor to the slave role.
	?	Inquire the current role of the adaptor.
RSSI=		Received signal strength indication
	?	Display the Received signal strength indication in command mode when connected. 1. Strong: RSSI>-9 2. Medium: -9>RSSI>-20 3. Weak: RSSI<-20
SEARCH=		This command is used to search for any Bluetooth device in the neighborhood within one minute. If any device is found, its name and its 12-digit-address will be listed. The search ends with a message "Inquiry ends. xx device(s) found." This command is available only when the adaptor is in the master role by manual.
	?	Inquire Bluetooth devices in the neighborhood, listing 8 devices the maximum
STATUS=		Inquire all the current setting of the adapter.
	T	Inquire the inner temperature of the IC in centigrade
	?	Display the current setting of the adapter
STOP=		This command is used to specify one or two stop bits of COM port. The command will need 200ms delay.
(Default)	1	One stop bit.
	2	Two stop bits.
	?	Inquire the current setting.
VERSION=		This command is used to inquiry the firmware version.
	?	Inquire the version codes.

Remark: If you need to customized the command, please call.

12. Command is not available in the status:

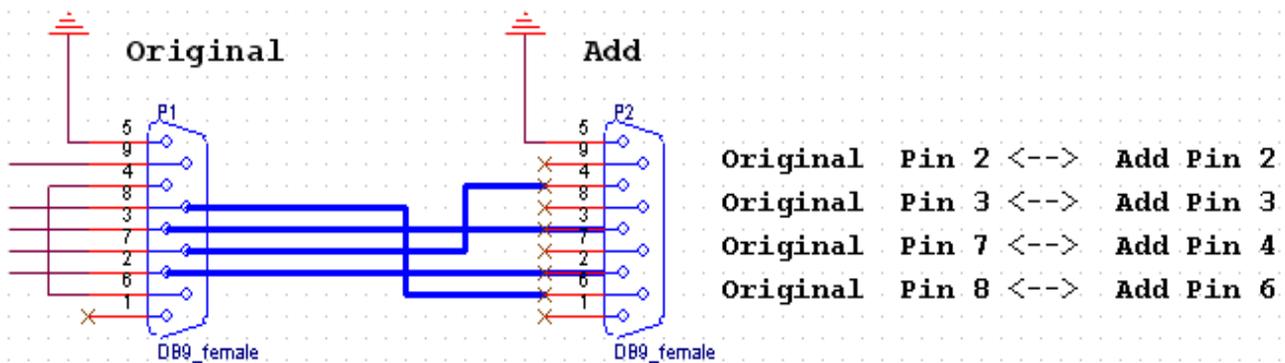| No	Command	Not available command in the conditions
1	ROLE=S	SEARCH=? , CONNECT=?, CONNECT=P , CONNECT=xxxxxxxxxxxx , CONNECT=DEVICE
2	AUTO=Y	SEARCH=? , CONNECT=? , CONNECT=P , CONNECT=xxxxxxxxxxxx , CONNECT=DEVICE
3	DIP=Y	ROLE=M, ROLE=S , AUTO=Y , AUTO=N ,DISCOVER=Y,DISCOVER=N
4	<<<	SEARCH=? , CONNECT=? , CONNECT=P , CONNECT=xxxxxxxxxxxx , CONNECT=DEVICE , DFU=Y
5	>>>	SEARCH=? , CONNECT=? , CONNECT=P , CONNECT=xxxxxxxxxxxx , CONNECT=DEVICE , DFU=Y
6	Not connection	RSSI=? , CONNECT=Y , CONNECT=N

13. RS232 Interface

13.1 Pin-out:
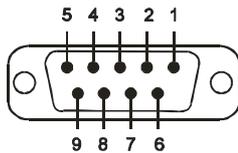
13.2 Signals:

Pin	Signal	DTE Direction	DCE Direction	Description
1	CD	Input	Output	Not connected
2	TxD	Output	Input	Transmitted data
3	RxD	Input	Output	Received data
4	DSR	Input	Output	Contact manufacturer to set this
5	GND	N/A	N/A	Signal ground
6	DTR	Output	Input	Contact manufacturer to set this
7	CTS	Input	Output	Clear to send
8	RTS	Output	Input	Request to send (Default)
9	Vcc	Input	Input	Power supply (5VDC, 1.5A Max.)

14. DSR/DTR Connection:

Original Pin 2 <--> Add Pin 2
Original Pin 3 <--> Add Pin 3
Original Pin 7 <--> Add Pin 4
Original Pin 8 <--> Add Pin 6

15. Example: Procedures for auto link and in group which will be undiscoverable

STEP1: Set slave part, PIN= "your password for pairing"
STEP2: Set master part, ROLE=M, PIN= "your password for pairing", RECONNECT=Y, AUTO=Y
STEP3: Search the neighboring Bluetooth devices and wait for link after pairing
STEP4: Ser slave part, DISCOVER=N

If you need more than two sets in the same space, please set the different PIN code for each pairs. They will connect the paired units when the power on.

Federal Communications Commission (FCC) Statement

RADIO FREQUENCY INTERFERENCE STATEMENT

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try correcting the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into and outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Warning : A shielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord be used.
You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

Declaration:
1. The information contained in this document is subject to change without notice.
2. Document Release V2.4, Date: 2011.04.20
3. Firmware Version: V 4.6   **FCC ID: XJ8-BT-232B**   (((**CCAB09LP2610T2**   C E **1177**