BTS1009C

Bluetooth to Serial Adapter

User's Manual

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BTS1009C Bluetooth to Serial Adapter
User's Manual

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Safety Information

1. Keep this User's Manual for future reference.
2. Always read the safety information carefully.
3. Keep this equipment away from direct sunlight, or in humid or damp places.
4. Do not place this equipment in an unstable position, or on vibrating surface before setting it up.
5. Do not use or place this equipment near magnetic fields, televisions, or radios to avoid electronic interface that affects device performance.
6. Do not attempt to disassemble or repair the equipment or the warranty would be useless.
7. To avoid damaging your system and equipment, please make sure that your computer is off before you install the product.

Contents

Introduction

Thank you for your purchase of the Bluetooth-to-Serial (RS-232) Adapter. Featuring Bluetooth wireless technology, the serial adapter provides cable-free Serial connections between your Bluetooth equipped PC and serial devices. Bluetooth-to-Serial Adapter is compliance to Bluetooth Ver2.0+EDR and you can connect your computer and RS-232 serial devices 100 meters apart without cables in your working environments.

1.0 Features

- Link RS-232 device to a Bluetooth communication
- Supports Bluetooth Class 1 (20 dbm) version Ver2.0+EDR standard
- Operating distance of up to 100 meters in free space
- Supports baud rate up to 460 Kbps
- Compact sized and easy operation design with User-friendly Windows configuration software
- Intelligent draw/provide 5VDC power to/from the device through the 9th-pin
- Powered by external power adapter or USB port on hosting device
- Support for Microsoft Windows 98SE, Me, 2000, XP and 2003

2.0 Package Content

Check if the following items are present and in good condition upon opening your package. Contact your retailer if any of the items is damaged or missing.

1. Hardware:

    Bluetooth to Serial Adapter:

        Bluetooth to RS-232   × 1

    Power Adapter:

        5V / 1A   1.3mm ⊖━━◉━━⊕

2. CD Driver

3. User's Manual (This document)
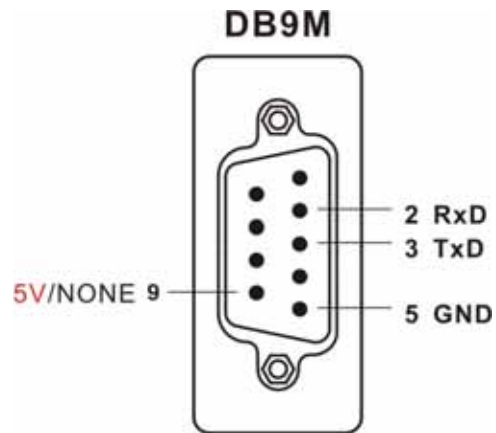
3.0 Hard Drives Requirements

- PC should have a Bluetooth host installed, such as a Bluetooth USB dongle. It allows you to communicate with Bluetooth to Serial Adapter.
- Windows System : Win 98/Me/2000/XP/2003/Vista

4.0 Specifications

Model Name	Bluetooth to RS-232 Adapter
Certification	FCC, CE
Standard	Bluetooth V2.0 + EDR
Frequency Band	2.4~2.4835GHz unlicensed ISM band
Modulation Method	GFSK, 1Mbps, 0.5BT Gaussian
Spread Spectrum	FHSS (Frequency Hopping Spread Spectrum)
Services Supported	Series Port Profile (SPP)
Transfer Rate	1200~ 460,800 bps Baud
RF Output Power	Class 1
Antenna	2dBi External Antenna
Working Distance	Up to 100m in free space
Sensitivity	<-88dBm at < 0.1% BER
Power Consumption	Tx Typical: 115mA
	Rx Typical: 75mA
	Standby Mode: 15mA
Input Power	5V DC
I/O Interface	RS-232 DTE Mode
Connector	DB9 Male
Signal	RxD, TxD, GND, 5V
LEDs Indicator	Power / Bluetooth active / Mode active
Case Material	PC
Environment	Operation temperature: 0 ^{o}C ~ + 60 ^{o}C
	Storage temperature: -10 ^{o}C ~ +70 ^{o}C
	Humidity: 5 ~ 90% non-condensing
Size	109 (L) x 34(W) x 18(H) mm
Weight	150 $\pm$ 2 g

5.0 Pin Assignment

◆ **RS-232**

6.0 Hardware Guide

1. RS232 DB9M Connector

2. Set Button:

   Push it to change operation between Configure/Data Mode.

3. DC Jack

   Apply power to Bluetooth to Serial Adapter by using the power adapter accompanied.

   5V / 1A   1.3mm

4. Antenna

5. ⬤ Power LED (RED) :

    Power LED turns on when Power is applied to Bluetooth to RS-232 adapter.

6. ⬤ Mode LED   (Orange) :

    MODE LED is ON when Bluetooth to Serial Adapter is set to Configuration mode.

    MODE LED is OFF when Bluetooth to Serial Adapter is set to normal DATA mode.

7. ⬤ Link LED   (BLUE) :

    Link LED is ON when Bluetooth communication is paired and linked.

    Link LED is OFF when Bluetooth communication is not linked.

    Link LED is blinking when there is data transmitting / receiving between the linked devices

8. Switch (Applicable only in Power-version Bluetooth to RS-232 Adapter)

   There are two states for the 9th pin on the DB9M connector, selectable by switch depend on

   user's application. The three states are as follow:

A. None : (Default)

   Setting the switch to " NONE   position, the DB9M 9th-pin connector is useless.

NONE — 5V

B. 5V input / output :

   Setting the switch to " 5V   position, the adapter can either draw/provide DC 5V power to/from

   the device through the 9th-pin of the connector depends on the following scenario,

NONE — 5V

1. If the device equips 5V self-power features (e.g. barcode scanner with 5V power adapter input),

   Bluetooth to RS-232 Adapter can work successfully without any power. A DC 5V power will be

   applied to Bluetooth to RS-232 Adapter through DB9M 9th-pin connector from the device.

2. If Bluetooth to RS-232 Adapter with 5V power adapter input, a DC 5V power will output to the

   device (e.g. barcode scanner) through DB9M 9th-pin connector from Bluetooth to RS-232 Adapter

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⚠ **CAUTION:** Take caution not to let any of the following situations happen while the switch is set to "5V" position, or damages may occur to both your device and the Bluetooth Adapter:

1. Do NOT plug in DC 12V power required devices.

2. Do NOT use DC 5V power adapters on both sides at the same time.

3. Your device MUST support power in/output toward DB9M 9th-pin connector.

7.0 Configure Bluetooth to Serial Adapter

This chapter explains how to configure the Bluetooth-to-Serial Adapter and pair it with a Bluetooth USB Dongle. Please note that Bluetooth USB Dongle is NOT included in the package. We assume that you have already installed Bluetooth USB Dongle and bound software in your PC successfully. The following demonstration is the process of pairing steps with Microsoft embedded Bluetooth driver on Windows XP Service Pack 2.

All the Bluetooth to Serial Adapter must be configured first before they can be used. The purpose of configuration is to pair two Bluetooth devices for an exclusive connection between them, and pairing is done by utilizing Bluetooth Address and PIN code.

After pairing process is done and power is on, Bluetooth to Serial Adapter will AUTOMATICALLY try to link (Master) or to be linked (Slave) with another paired Bluetooth device wirelessly, just like there is a cable connected between them.

There are two ways to configure your Bluetooth to Serial Adapter :
◆   Local Setting Up
◆   Remote Setting Up

7.1   Local Setting Up

Local setting up can be done by connecting a Bluetooth to Serial Adapter to your PC. You can connect PC COM port to a Bluetooth to Serial Adapter directly or through a RS-232 **converter** cable as shown in Appendix (page 28).

If you forgot any setting which was done before, local setting up is also the only way which allows you to recreate the setting again.

7.1.1   Preparation :

Step 1 :
Connect this Bluetooth to Serial Adapter to your PC COM Port, such as COM1, COM2 or any other.
Step 2 :
Apply power to Bluetooth to Serial Adapter by using the accompanied 5V Power Adapter.

Step 3 :

Push the **Mode Button** until the MODE LED lights ● (Orange color), which indicates that the adapter is in the Configuration Mode. In this mode, Bluetooth to Serial Adapter is working at Slave state which is waiting to be linked with other Bluetooth devices.

Step 4 :

Launch Bluetooth to Serial Adapter Utility **- CableReplacementTool2.exe** in the accompanied CD driver :

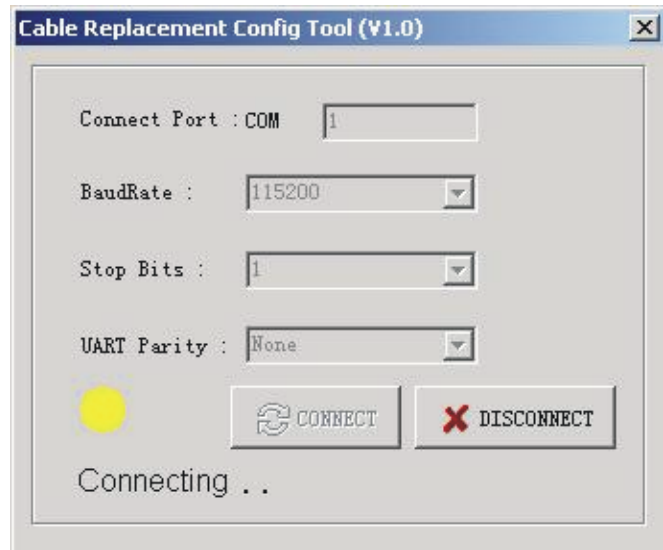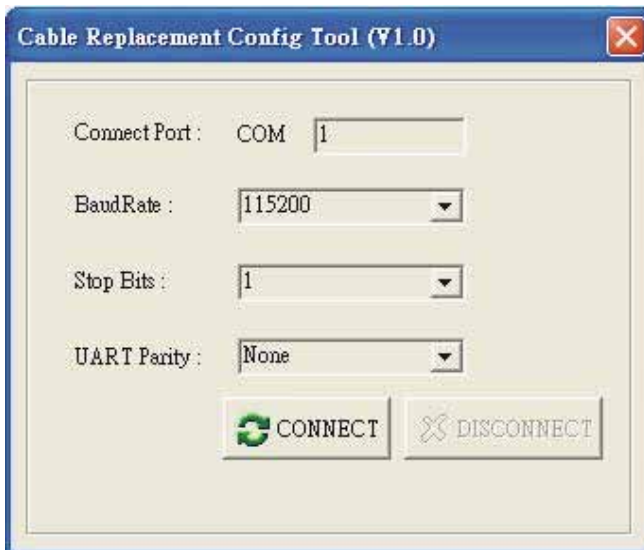**:\bluetooth\CableReplacementTool2.exe**

Step 5 :

Select the PC COM Port which Bluetooth to Serial Adapter is connected.

If it is the first time you are configuring this Bluetooth to Serial Adapter, you can choose the default Baud Rate : **115200**.
Press **Connect** Button.
Local PC will use this baud rate to connect with your Bluetooth to Serial Adapter.

Note :

The connection will fail if wrong COM port is connected or Baud Rate settings is not correct.

Please refer to section 7.1.3 (page14) for more detail on baud rate setting.

7.1.2 Start Configuration :

Device Mode (default is slave)

Depending on the applications, there are two states which Bluetooth to Serial Adapter can operate in DATA mode. They are Master and Slave states. If you are using a USB Bluetooth Dongle to pair with a Bluetooth to Serial adapter, then Bluetooth to Serial Adapter can be set to either Master or Slave state. If you are using two Bluetooth to Serial Adapter to pair together, then one of them shall be set to Master and another shall be set to Slave.

Master - Trying to link with other Bluetooth devices.

Slave - Waiting to be linked with other Bluetooth devices.

Master state :

If you choose this state, then you must enter Bluetooth MAC Address of the remote Bluetooth device (e.g. 000000000000) which this Bluetooth to Serial Adapter will be pairing and connecting with. Default is none.

Note : Remote Bluetooth Address can be found by searching your Bluetooth to Serial Adapter as shown in page 20.

Slave State : (Default)

Bluetooth to Serial Adapter can be found by searching Bluetooth Device on PCs. If it is disabled, then it can not be found. This feature will prevent other Bluetooth host or devices to create a link with it accidentally if it has already been configured to pair with another device before.

Discoverable (default is Enable)

If Discoverable is enabled, Bluetooth to Serial Adapter can be found by searching Bluetooth Device on PCs. If it is disabled, then it can not be found. This feature will prevent other Bluetooth host or devices to create a link with it accidentally if it has already been configured to pair with another device before has already been configured to pair with another device before.

Auto ReConnect (default is Enable)

If Auto ReConnect is enabled, When Bluetooth to Serial Adapter is broken it will auto reconnect , If disable the Bluetooth will not auto reconnect.

Bluetooth to RS-232 adapter state
Local MAC Address :

The Bluetooth to RS-232 adapter MAC address

Local Device Pin code : (default is 0000)

When you pair Bluetooth to RS-232 adapter you need pin code for security.

Local Device Name : (default is Serial Adapter)

Enter a Device Name for your Bluetooth to Serial Adapter (length <= 31 alphanumeric characters).

Remote Device MAC :

This MAC address for two Bluetooth to RS-232 adapter auto link each other. When you want one link another , you should input another one MAC address in this block then it will search this Bluetooth to RS-232 that use this MAC address and auto link it.

How to advance the Bluetooth to RS-232 ultra configure

Step1

Click " **ADVANCE** " button and you can entry the advanced page.

Step2

You can configure the Bluetooth to RS-232 adapter's Baud Rate, Stop bits and Parity settings in this page. Press "OK" to save settings and exit this window.

Baud Rate: (default is 115200)

1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200, 230400, 460800

Stop Bit: (default is One)

One/Two

Parity Bit: (default is None)

None/Odd/Even

Note :

1. Local device will use above settings to connect with your PC host via Bluetooth to Serial Adapter.

2. Maximum Baud Rate can go up to 460.8 Kbps. Guaranteed is 115.2 Kbps.

Step 3

Click " **SET** " button to save your settings.

Then MODE LED 🟠 (Orange LED) will be off.

7.1.3 More Detail on Initial Baud Rate Setting :

1). When power is applied to a Bluetooth to Serial Adapter, it will try to link (Master) or be linked (Slave) with another Bluetooth device with matched MAC address or PIN code. A link will finally be built between them. If another Bluetooth device can not be found (e.g. its power is turned off), then the initial baud rate of this Bluetooth to Serial Adapter will be set to 115200 (default).

If you forgot any previous setting of Bluetooth to Serial Adapter, and you want to reconfigure it. You can turn off power of other Bluetooth devices, then power on your Bluetooth to Serial Adapter individually. At this moment, because it is impossible for your Bluetooth to Serial Adapter to establish a link with its paired Bluetooth device (it is turned off), so the baud rate of the Bluetooth to Serial Adapter is set to 115200 (default).

You can then use 115200 baud in advance step 2 of section 7.1.2 to connect Bluetooth to Serial Adapter, with your PC, then change its settings accordingly.

2). When power is applied to a Bluetooth to Serial Adapter, if its paired Bluetooth device is found and automatic connection has been made between them (i.e. they are pairing connected), then the BLUE Bluetooth LED 🔵 on Bluetooth to Serial Adapter will light up, and the baud rate of the Bluetooth to Serial Adapter will be the value which was previously input in UART Configure of section 7.1.2.

For your Bluetooth to Serial Adapter, when its BLUE Bluetooth LED 🔵 lights, and you want to local set up your Bluetooth to Serial Adapter, after entering into Configuration mode (both blue 🔵 and yellow 🟠 LED light up now), you must remember this baud rate and use it to **Connect** with COM port as mentioned in Step 5 of section 7.1.1.

3). When power is applied to a Bluetooth to Serial Adapter, and a new baud rate is entered and saved in UART Configure step. If you then push MODE button to get into DATA mode, then push MODE button again to enter Configuration mode, baud rate will be the new one just entered.

7.1.4 Example :
Please refer to page 22 – section 8.0 APPLICATION for detail.

7.2.1 Preparation :

Step 1 :

Please insert your USB Bluetooth Dongle to your PC USB Port, and then windows systems will install the drivers automatically.

Please go the control panel and
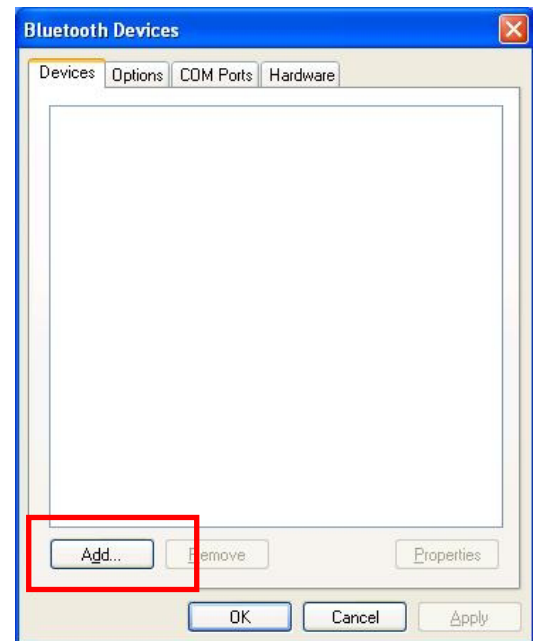Click **Bluetooth Devices** icon.

Step 2 :

Push MODE button and LED ● (yellow color) will light. Please click **Add** to search the Bluetooth device in the round of your USB Bluetooth Dongle.

> **Note :**
>
> Bluetooth to Serial Adapter can be easily found if it is staying at Configuration or DATA/Slave mode. If it is staying at DATA/Master mode, because it will keep sending request to find a paired device to establish a link, at this moment, it can not be found.
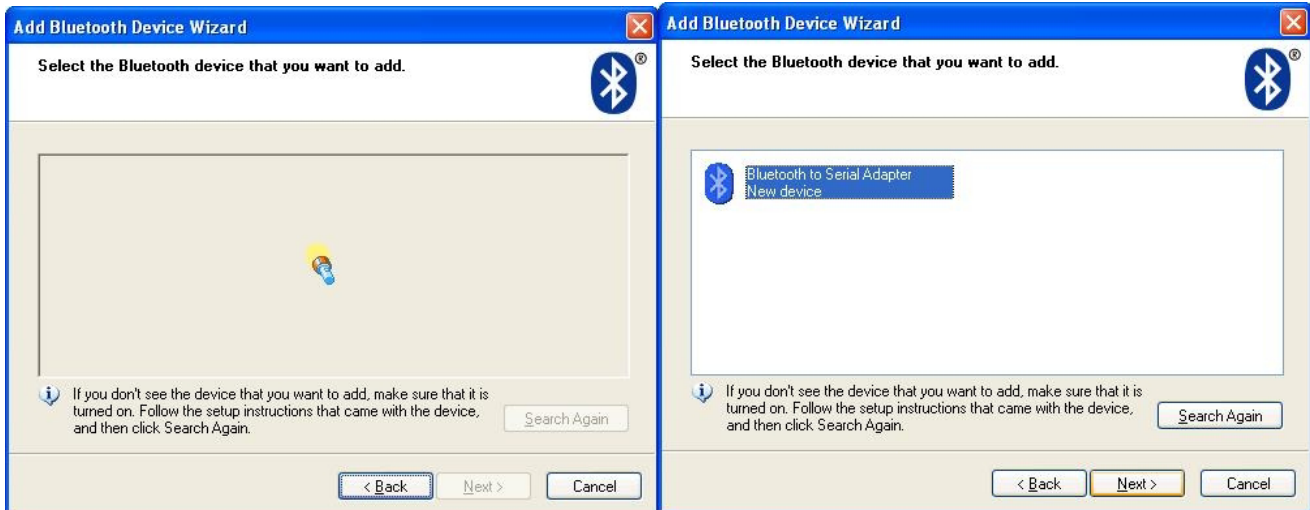

Step 3 :

Choose "My device is set up and ready to be found". Click **Next** to continue.

Step 4 :

Windows Bluetooth Device Wizard will find **Bluetooth to Serial Adapter**.

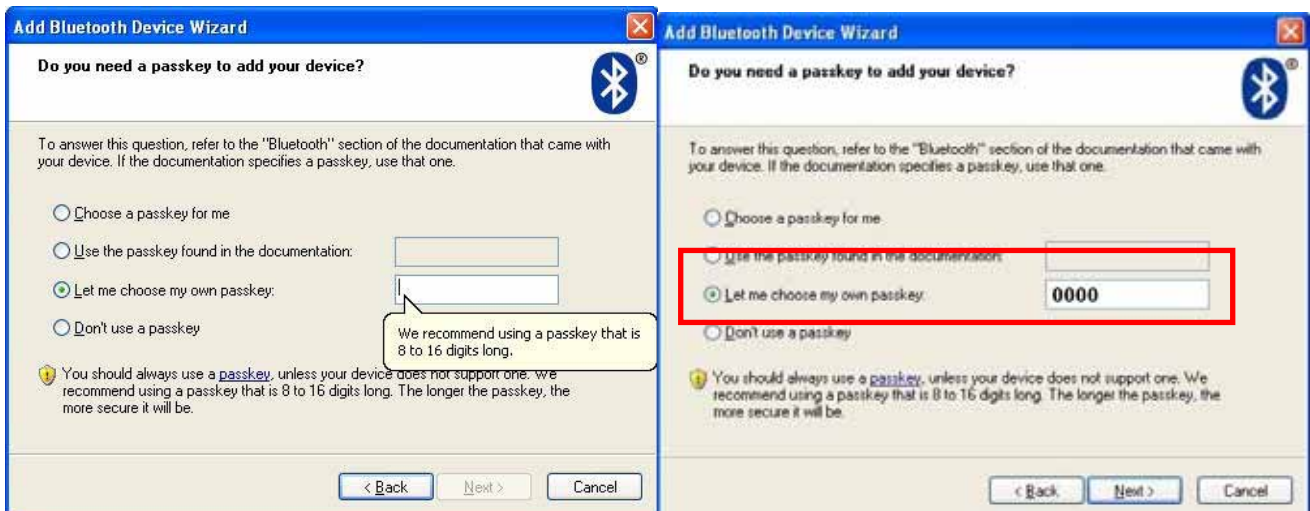Click this new device and press **Next** to continue.

Step 5 :

System will ask you to input Bluetooth to Serial Adapter PIN code. If the remote Bluetooth to Serial Adapter is the first time being configured, then its PIN code is factory default to "**0000**". Enter "0000" in this step.

If PIN code was configured before, then previous setting of PIN code must be entered.

Click **Next** to continue.

Step 6 :

System will verify your PIN code!! If your pin code is correct, Bluetooth to Serial Adapter and USB Bluetooth Dongle will pair together. Then click **Finish** to finish pairing steps.
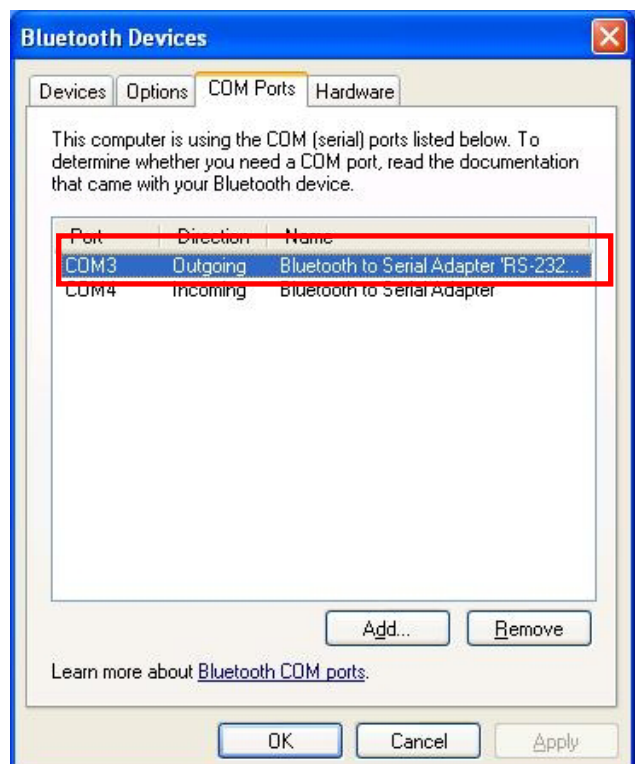

Note :

If your PIN code is not correct, two Bluetooth devices will not pair together. Bluetooth to Serial Adapter default PIN code is "**0000**". If you had modified it before and forgot the PIN code, please reset your Bluetooth to Serial Adapter and follow 7.1.2 section to configure the PIN code.
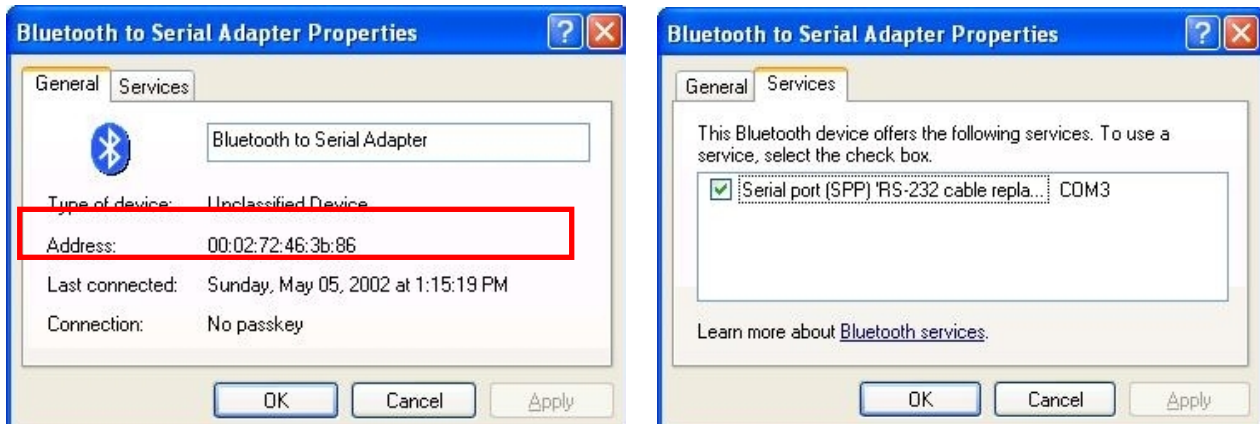
Step 6 :

System will verify your PIN code!! If your pin code is correct, Bluetooth to Serial Adapter and USB Bluetooth Dongle will pair successfully and the BLUE Bluetooth LED ⬤ will light.

You can know the COM port number through "COM Ports" page, such as COM3 as shown below.
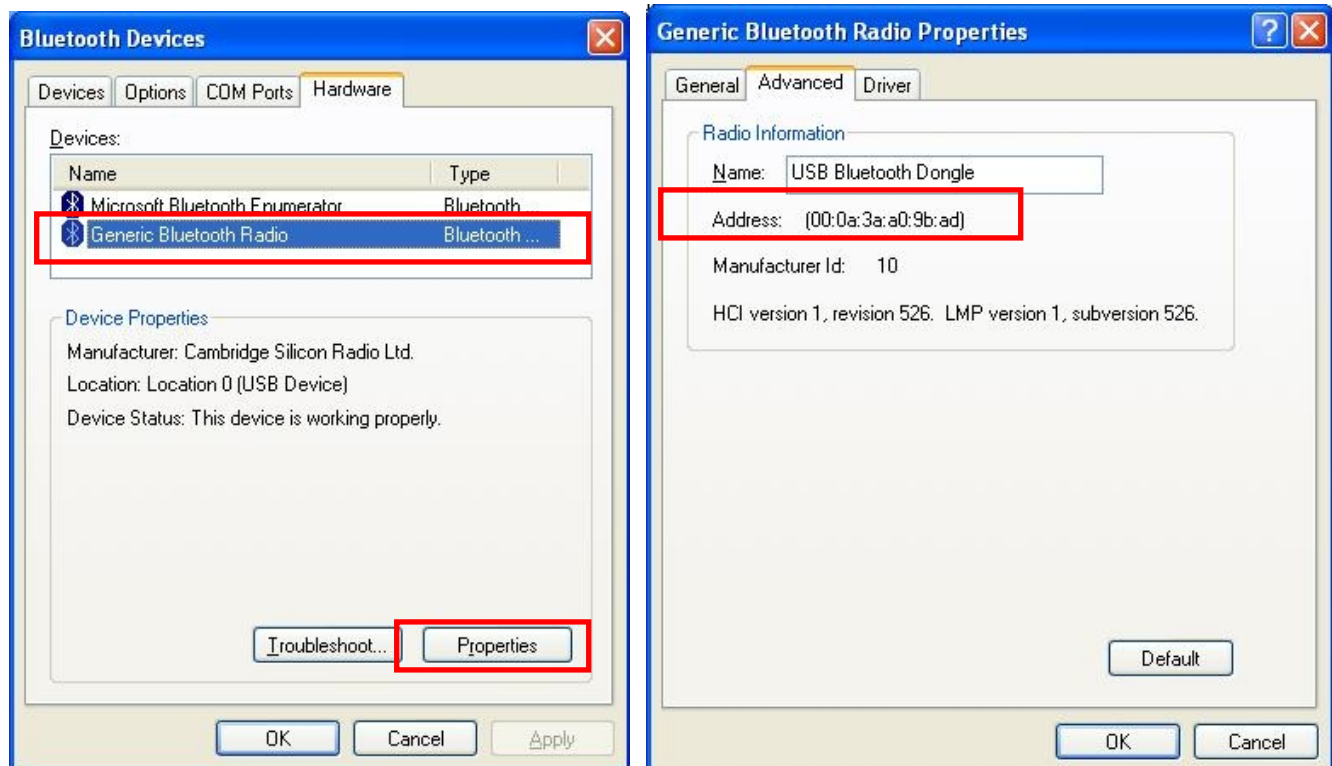
Note :

If you want to check Bluetooth to Serial Adapter MAC address, you can click the Bluetooth to Serial Adapter and press "Properties" on the upper-right graph. For example: 000272463b86

Step 7 :

You can know USB Bluetooth Dongle MAC address in the following paragraphs.

1. Please click the "Generic Bluetooth Radio" device in the "Hardware" page, and then click "Properties" as shown in left picture.

2. Then "Generic Bluetooth Radio Properties" page will pup up and you can know the USB Bluetooth Dongle MAC address in the "Advanced" page, such as 000a3aa09bad .

7.2.2 Start Configuration Mode

Launch Bluetooth to Serial Adapter Utility **- CableReplacementTool2.exe** in the accompanied CD driver:
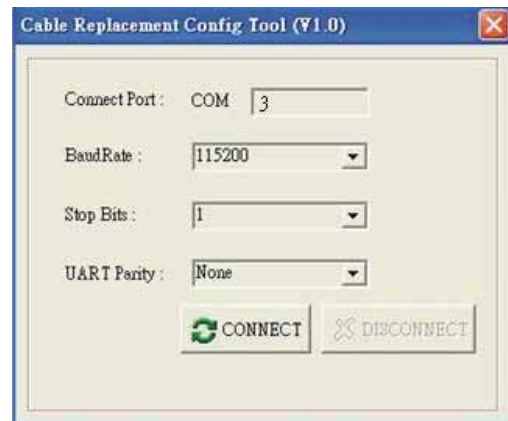
:\bluetooth\CableReplacementTool2.exe

Select COM Port (COM3 in this case)
Press **Connect** button

Local PC will use this COM port to connect with your Bluetooth to Serial Adapter. Baud rate settings is irrelevant.

Remote Device Mac :
Select Remote Device Mac address. Enter Bluetooth MAC Address of the Bluetooth device (e.g. USB Bluetooth Dongle 000a3aa09bad) which this Bluetooth to Serial Adapter will be pairing and connecting with.

Press **Set** Button

Note :
In this case, we input PC Dongle MAC address, because we want them paired and linked later.
If you want Bluetooth to Serial Adapter to pair with another Bluetooth device, you shall input its MAC address, and not the MAC address of PC Dongle.

Local Device PinCode (default is 0000)

Select Secure Connection. Enter PIN code
(length <=12 digits), default PIN code is "0000".
Enter the PIN code (e.g .0000) keep it the same
as the remote Bluetooth device, so pairing can
be done between these two devices.

Press **Set** Button to save settings.

UART Configure.

You can configure the Bluetooth to RS-232 adapter's
Baud Rate, Stop bits and Parity settings in the
advanced page. Press "**OK**" to save settings and
exit this window.

Baud Rate: (default is 115200)

1200, 2400, 4800, 9600, 19200, 38400,
57600, 115200, 230400, 460800

Stop Bit: (default is One)

One/Two

Parity Bit: (default is None)

None/Odd/Even

> **Note :**
> 1.Local device will use above settings to connect
>   with your PC host via Bluetooth to Serial Adapter.
> 2. Maximum Baud Rate can go up to 460.8 Kbps.
>   Guaranteed is 115.2 Kbps.

Local Device Name (default is Serial Adapter)

Enter a Device Name for your Bluetooth to Serial Adapter (length <= 31 alphanumeric characters).

Press Set Button.

7.2.3 Automatic ReConnection :

Press **Close** button.

Connect your Bluetooth to Serial Adapter to a RS232 device (e.g. a Modem).

Push MODE button to change from Configuration mode to DATA mode.

MODE LED 🟠 (yellow color) will be off.

Now, automatic reconnection will begin. In this example, PC Dongle will set up the wireless link with your Bluetooth to Serial Adapter automatically, and Bluetooth LED 🔵 (blue color) of Bluetooth to Serial Adapter will light.

7.2.4 Example :

Supposed there is a remotely configured Bluetooth to Serial Adapter DTE Adapter which is connected to a RS232 modem, and its paired device is a USB Bluetooth Dongle connected to your PC. You then can use PC to wirelessly control the operations of the remote modem.
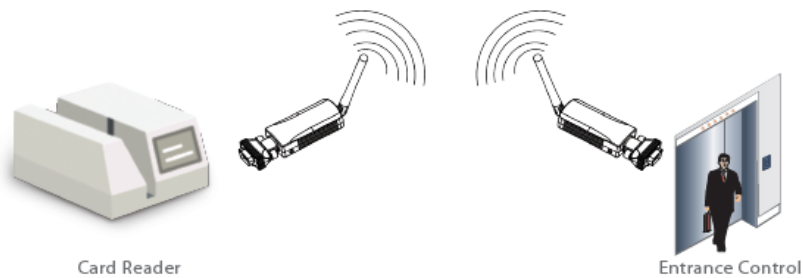
8.0 Application

8.1 Host Control Mode:

User can control maximum 7 Bluetooth to serial adapters via one USB Bluetooth Dongle or embedded Bluetooth module on PC host. After establishing an exclusive connection by utilizing Bluetooth MAC Address and PIN code, Bluetooth to serial adapter will automatically try to link (Master) or to be linked (Slave) with another paired Bluetooth device wirelessly, just like there is a cable connected between them.

8.2 Pair Connection Mode:

User can pair two Bluetooth to serial adapters with different RS-232 or RS-422/485 devices without any PC host controlling. After pairing process is done and power is on, two Bluetooth to serial adapters will automatically establish an exclusive connection with each other, just like there is a RS-232 or RS-422/485 cable connected between them.

8.3   Operation:

In this application, we will show you how to transfer files between barcode scanner and PC by using Hyper-Terminal program. Barcode scanner has a Bluetooth to Serial Adapter attached, and PC is using a USB Bluetooth Dongle. We still keep their pairing PIN code to be "0000".

Bluetooth MAC addresses :

Bluetooth to Serial Adapter: 000272463b86 (in Master state).

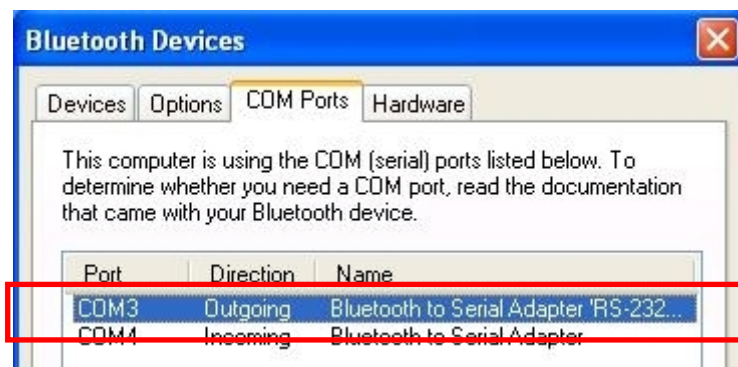USB Bluetooth Dongle : 000a3aa09bad (in Master/Slave state).

Step 1 :

Please follow chapter 7.0 to configure your Bluetooth to Serial Adapter by local or remote settings.

Step 2 :

Please pair Bluetooth to Serial Adapter and USB Bluetooth Dongle by USB Bluetooth dongle bound software, such as Widcomm, IVT, or Microsoft Windows XP sever pack2 embedded driver shown as section 7.2.1.

Step 3 :

Please make sure the COM port number that Bluetooth to Serial Adapter connects to your PC, such as COM3 as demonstrated in section 7.1.2 step 5.

Step 4 :

Please execute the "Hyper Terminal" program to test the data transmission on your PC.

Start > Program > Accessories > Communications > Hyper Terminal

Enter "Barcode Scanner Test" as the project name.   Press OK.

Step 5 :

Choose **COM3**, because Bluetooth to
Serial Adapter is connected to COM3 of
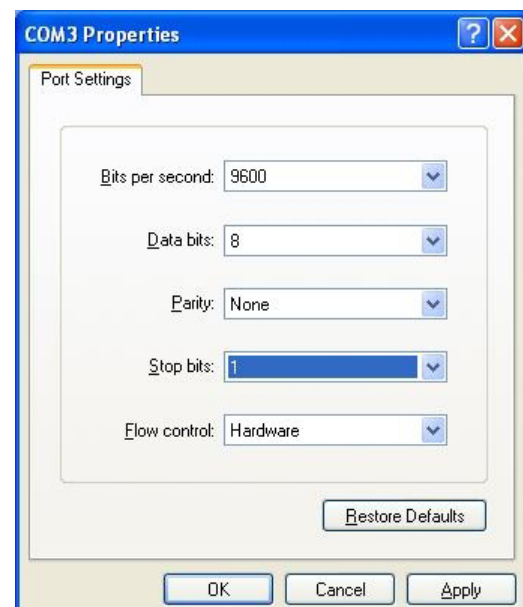your PC by using Bluetooth wireless
technology.

Press OK

Note:

Bluetooth to Serial Adapter is a RS-232 cable replacement equipment and COM3 is a virtual COM
port.

Step 6 :

Select kinds of parameter in COM3 Properties setting !!

Press OK

Note:

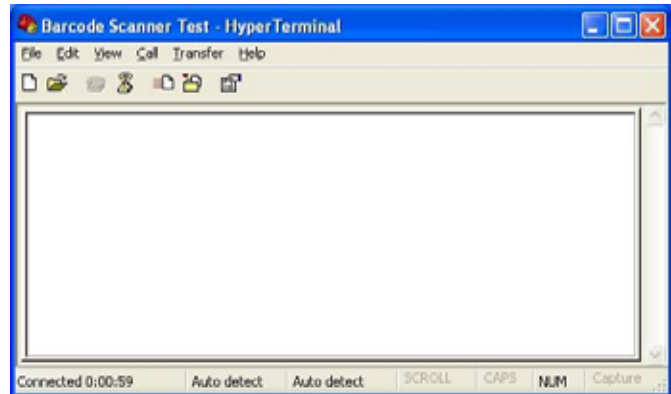All parameter should be same as the Bluetooth to
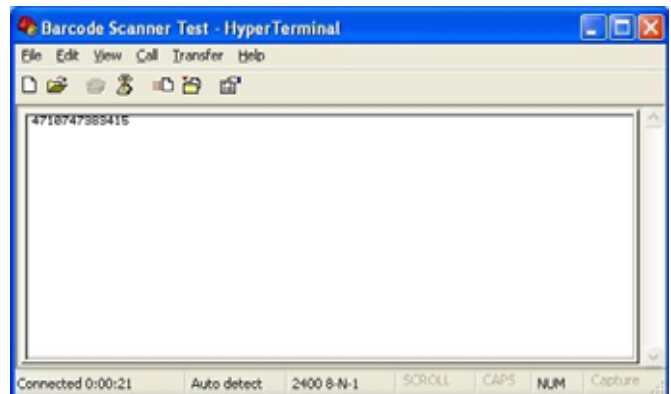Serial Adapter, or the data transmission will fail.

Step 7:

The COM3 had been connected successfully between Bluetooth to Serial Adapter and barcode scanner if this COM (COM3) can be open.

The BLUE Bluetooth LED ● (blue) will light at this moment.

Step 7:

Please try your barcode scanner and the barcode will show in the Hyper Terminal.

9.0 Trouble Shooting

1. Why I can not get into Configuration mode when pushing MODE button?:
A: Turn off the power of Bluetooth to Serial Adapter, and remove it from your serial (RS-232) device.
   Then apply power to it, and try again (like a hardware RESET).

2. Data is not correctly set and saved.
A: 1. Check if it is staying at Configuration mode.
   2. If it is in local setting, check if settings of connecting COM port and Baud Rate are correct.
   3. If it is in remote setting, check if its connecting virtual COM port is correct.
   4. Check the COM ports settings (parameter) are the same between PC and serial device.
      Please refer to page 10 & 19.

3. In DATA mode, automatic link can not be established.
A: 1. Check if remote MAC address is set correctly.
    2. Check if PIN code is set to the same.
    3. Repeat the pairing processes. That is, repeat the configuration processes for two devices again
       to make sure nothing wrong was done.

4. Configuration is OK, but automatic link can not be established.
A: Turn off the power of Bluetooth to Serial Adapter, remove it from your serial (RS-232) device, apply
   power to it, and try again (like a hardware RESET).

   For a Master Bluetooth to Serial Adapter, it keeps sending a linking request to find another Slave
   device, while a Slave Bluetooth to Serial Adapter is waiting to receive any linking request. If you
   configure both two Bluetooth to Serial Adapter to all Master states, or to all Slave states, then they
   can not link together.

   Bluetooth Dongle is staying at Master or Slave state randomly, in a moment, it acts as a Master
   device and sends linking request wirelessly, while in another moment, it acts as a Slave device and
   is waiting for other Master devices to link with it. Once the link is built, it will stay at the proper mode
   which it should be.

5. Garbage code is received.
A: Wrong RS-232 parameters were set, such as baud rate or parity bit. Configure your Bluetooth to
   Serial Adapter to a correct setting again.

6. Mass data transmission will stop midway or receive garbage code.

A: Please select "Hardware" in flow control setting.

7. Can not connect the Bluetooth to Serial Adapter when in Remote Setting Up.

A : Check to see if Bluetooth to Serial Adapter is staying at DATA mode. If YES, please disconnect its link first.   This can be done by turning off the power of another Bluetooth device which this Bluetooth to Serial Adapter is linked with.

Turn off power of Bluetooth to Serial Adapter, then turn it on. Push MODE button to get into Configuration mode.

8. Want to reconfigure Bluetooth to Serial Adapter, but forgot its previous baud rate setting.

A: Turn off power of Bluetooth to Serial Adapter, then turn it on. Push MODE button immediately before it automatically links with other Bluetooth device (i.e. let the link NOT be built). At this moment, baud rate is default set to 115200, you then can use this baud rate to get into configuration mode.

9. Which mode Bluetooth to Serial Adapter is staying when in Configuration state?

A: In Configuration state, it is always staying at Slave mode. The difference between Master and Slave modes only exists in DATA state.

10. How to check the Bluetooth to Serial Adapter and USB Bluetooth Dongle MAC address?

A: Bluetooth to Serial Adapter MAC address that you can check page 20.
   USB Bluetooth Dongle MAC address that you can check page 18.

11. Can two Bluetooth to Serial Adapters which connected to devices communication with each other without any PC? For example one is connected to barcode scanner and the other is connected to serial printer.

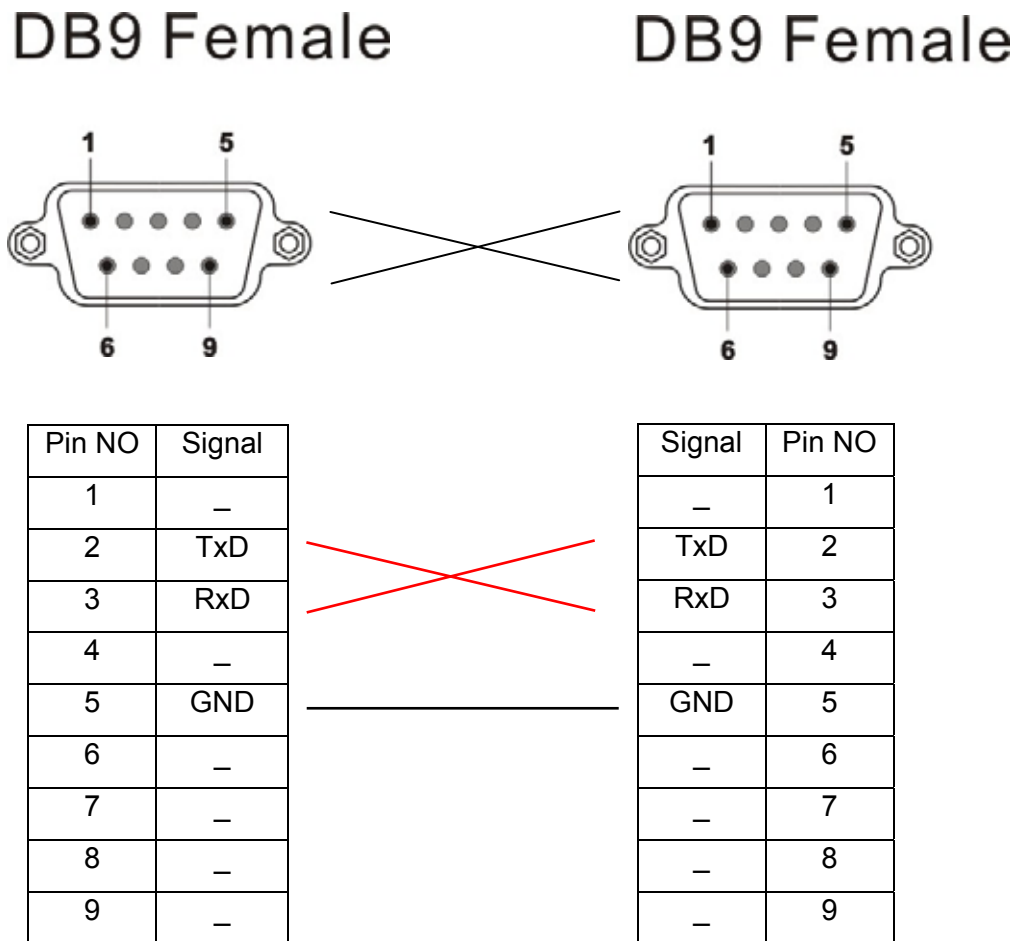A: No!! Bluetooth to Serial Adapters is a RS-232 cable replacement equipment.
   Devices will not communication with each other without PC's programming.

10.0 Appendix

10.1 RS-232 converter cable

This DB9 female to DB9 female converter cable will be used when using local setting up mode. User can purchase this cable from your vendor or make by yourself.

◆   RS-232

DB9 Female   DB9 Female

Pin NO	Signal	Signal	Pin NO
1	–	–	1
2	TxD	TxD	2
3	RxD	RxD	3
4	–	–	4
5	GND	GND	5
6	–	–	6
7	–	–	7
8	–	–	8
9	–	–	9

10.2 Safety Guide

■ Read and follow all instructions and warnings provided.

■ Save these instructions for future use.

■ When service or replacement of parts is required, ensure work isdone by a qualified technician.

■ Do not use this unit near water or in a rainy/moist environment.

■ Use supplied cables only.

■ Do not attempt to service this product yourself. Doing so will expose you to various hazards including dangerous voltage.

■ This unit is suitable for a 110V to 230V AC power supply (Auto-detect).

■ Disconnect the power cable (pull plug) and USB cable in the following situations :
  * In the event of service.
  * Power cable/plug becomes damaged.
  * Unit is exposed to excess moisture/rain
  * Unit has been dropped.
  * Unit is being cleaned.

■ Unit must be used with adult supervision at all times. Children must not be allowed to handle any of the cables.

■ Never insert any objects other than CDs in the trays.

■ Never insert any objects through ventilation holes.

Remember ! ! Any electrical equipment is hazardous if handled improperly.