brainboxes

Product Manual

BL-819 / 830

RS232 Bluetooth Adapters

Version: 6.0

---

1. Introduction

1.1. Preamble

Brainboxes' RS232 Bluetooth adapters are fully embedded, stand-alone Bluetooth solutions, which will Bluetooth enable any device with an RS232 port. Unlike many of Brainboxes wide range of Bluetooth products, the adapters do not require any additional Bluetooth software.

For many applications, a Bluetooth Adapter used in combination with another Bluetooth product (e.g. Brainboxes' USB adapter connected to a PC with Brainboxes' Bluetooth Software Suite, or a second adapter) essentially replaces the serial cable, freeing the device from the limits imposed by the cable specification and in many applications removes the need for expensive cable installation and maintenance. The devices are designed to appear transparent to a user's applications that would otherwise be communicating via a COM port and over a cable, therefore no specific Bluetooth programming is required. The connection uses Bluetooth security to ensure that sensitive data is not "sniffed" by any unauthorised source, although this feature can be turned off.

The products described by this document are designed as cable replacement products. Their primary function is to offer "point to point" Bluetooth capabilities to devices which otherwise do not have the capacity for such behaviour. This capability is configured by a "set and forget" interface, which is not designed to cater for multiple device connection scenarios. At the time of publication, the adapters are only capable of connecting to one other Bluetooth device at a time.

The Adapter is user configurable to baud rates between 244 and 1.3Mbaud in steps of 244, with none, odd, or even parity, and with 1 or 2 stop bits. **Its default factory settings are 115,200 baud, no parity, 8 data bits and 1 stop bit.**

A convenient reset button can be used to restore various functions of the device including a restore of factory settings.

We trust that if you adhere to the following procedures you will enjoy many years of useful service from your Brainboxes Bluetooth Adapter.

1.2. Products and Firmware

This document covers Brainboxes part numbers BL-819 and BL-830. Any features that apply to a specific part code will be clearly identified.

This document covers firmware version 4.3 with which your RS-232 Adapter is supplied. New versions of firmware will become available in the future, along with an updated Product Manual. Both of these items will be available for download from our website, http://www.brainboxes.com/

2. Physical Product Features

2.1. BL-819 / 830
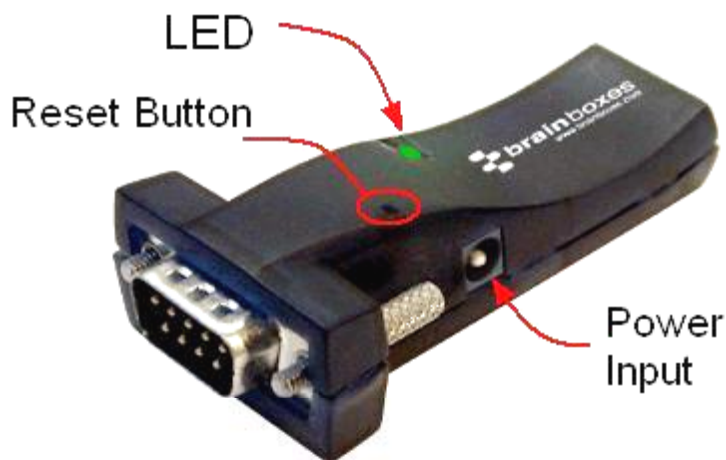
Product Shown: BL-819 (male version)

Reset button

See section 6 for more details on how to use the reset button.

LED

The Green LED on the top of the device indicates the current device status. There are 3 states that the light will indicate;

Permanently On – The device has power but no Bluetooth Connection

Flashing – The device has power and has a Bluetooth Connection

On when power is applied, then permanently off – This occurs when the device is in Upgrade mode.

2.2. Comparison of BL-819 and BL-830 Features

The BL-819 and BL-830 adapters share almost identical features, with the only difference being the gender of the adapter. The BL-819 is 9-pin male (DTE) with the BL-830 being female (DCE).

The main anticipated use of BL-819 is to be connected to a DCE device that would normally plug into the back of a PC. If you wish to use BL-819 as a DCE device (e.g. to plug into the back of a PC or similar for configuration) you should use the included "gender changer".

The BL-830 is supplied with a DCE connector (female) and no gender changer is supplied. This device will plug into any serial port on a PC or Laptop.

2.3. BL- 819 / 830 Power Options

The BL-819 & BL-830 also carry the ability to be powered through Pin 9 by a suitable serial port. This negates the need for an external power source. Brainboxes offer two serial cards, which can perform this function for the BL-830, UP-189 and UP-200. **NB. The BL-819 can be powered through Pin 9, but not with the supplied gender changer**. For information of the power requirements of your RS-232 Bluetooth Adapter, please see the **Input Voltage Requirements** in the **Technical Specification** Section.

3. Product Configuration

This device contains a comprehensive set of Bluetooth and COM port features which can be changed from an easy to use Windows Configuration Application. This section gives full details about the changes that can be made, how to make them, and the implications the changes will have on the manner in which your Adapter behaves.

3.1. Configuration features at a glance

Below is a quick list of the configuration options that are available from the configuration application. They will be covered in more detail later in this section.

- View/Set local COM port settings (baud rate, parity, stop bits)
- View/Set Discoverability, Security mode and PIN number
- View/Set Pairing options (including pairing to another adapter)
- View/Set Client/Server configuration (Client connects to Server – important if "pairing" 2 adapters)
- View/Set Local Device Name and Device Class
- View all "factory" and modified settings plus local Bluetooth Address
- Disable command interface and configuration menu
- Permanently update "factory" settings
- Upgrade Device Firmware

3.2. Installing the Configuration Applications

Insert the Bluetooth Solutions CD supplied with the product. This will auto load an Interactive menu. Please select the product that you own, and click to install the Configuration Software. If the Interactive menu does not automatically load then the Configuration software can be installed by running the setup.exe file in the following directory location on the CD   "BL-819\BL-819_Configuration_Utility\setup.exe"
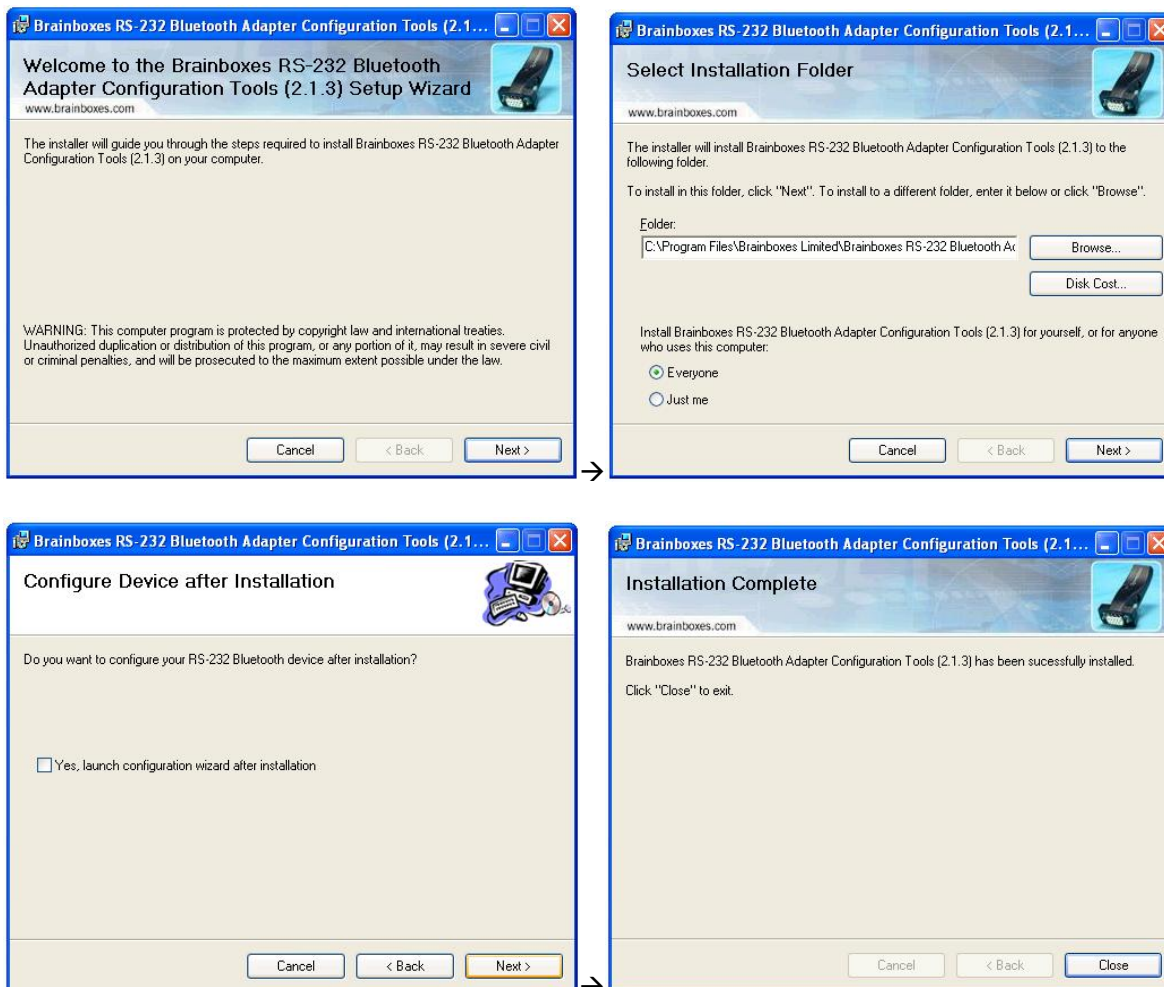
3.3. Opening the Configuration Applications

After attaching your Adapter to an available COM port on your Computer, either start the application by double clicking the new application icon located on your desktop or go to "*Start/All Programs/Brain Boxes Software/RS-232 Bluetooth Adapter Configuration Tools/RS-232 Bluetooth Adapter Configuration Utility*", as shown below. The Configuration Wizard is also opened in the same manner.
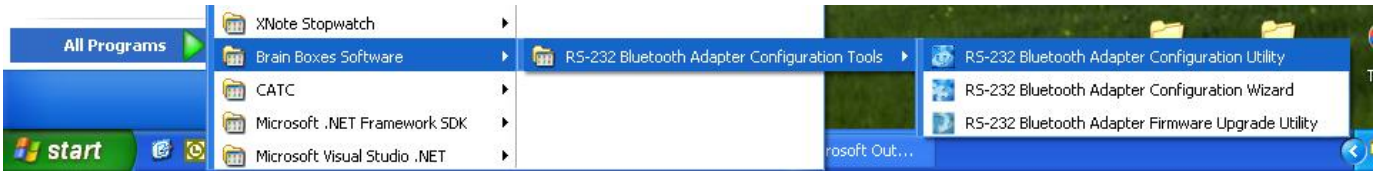
3.4. Using the Configuration Wizard

The Configuration Wizard is a tool that will guide you through all the necessary configuration options for configuring your Adapter for the first time. This section will give a brief overview of the Configuration Options on offer. Please see **section 3.5**. To move to the next page of the Configuration Wizard, click 'Next'. At any time, to re-configure certain options, click the 'Back' button to return to the previous page.
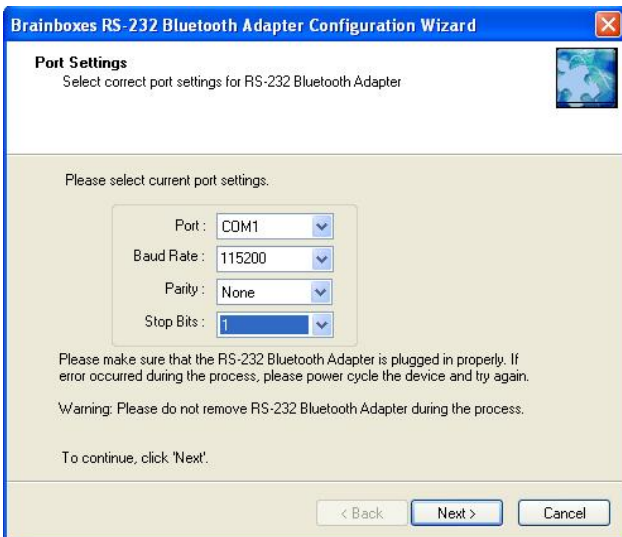
Initially the Configuration Wizard will need to connect to the Adapter to configure it.

COM Port: Select the port number of the COM port to which you have attached your adapter. Select "Auto" if you don't know the number and the utility will attempt to find the device for you.

Other Settings: Select the other parameters to match those that have been set on the adapter. If you don't know them, select "auto" and the utility will attempt to find the device for you. The default parameters for the adapters are 115200 baud, No Parity and 1 Stop bit.

![Brainboxes logo]
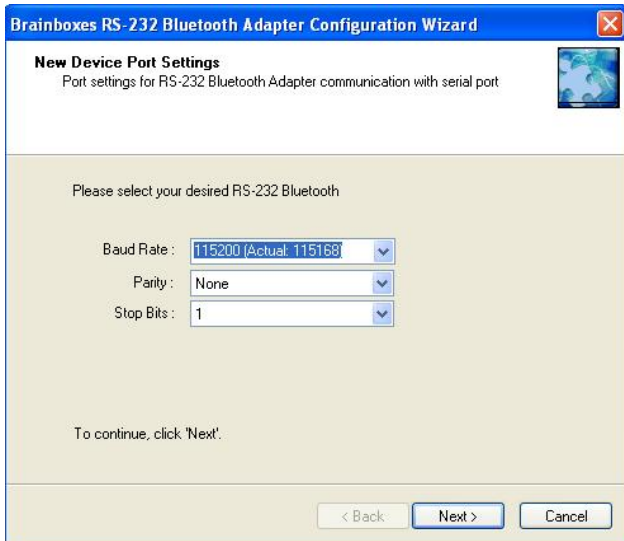
This Screen will allow you to change the RS-232 Port settings for communication to the Adapter.

Baud Rate, Parity and Stop Bits can be changed to suit the type of connection your applications require.

NB It is possible to select higher baud rates than a standard RS-232 port can achieve. If this does happen and configuration becomes impossible please perform a long reset (See Section 6)
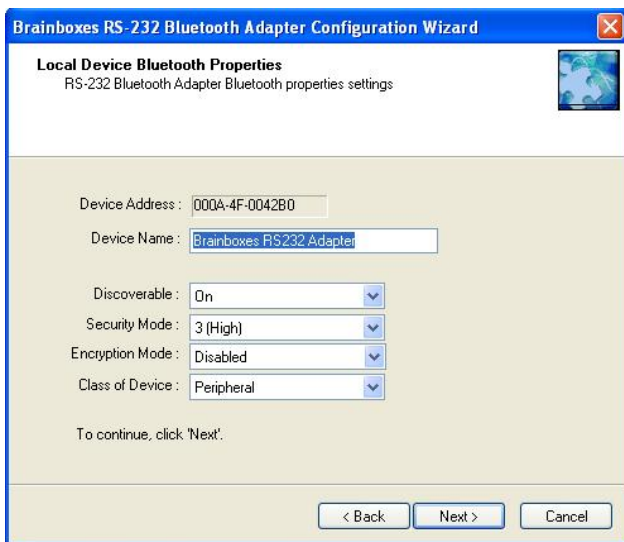
The Standard Bluetooth Properties of the Adapter are presented next, along with the MAC address of the device. This is not user changeable.

The User can change the Local Device Name, Discoverability, Security Mode, Encryption Options and the Class of Device.
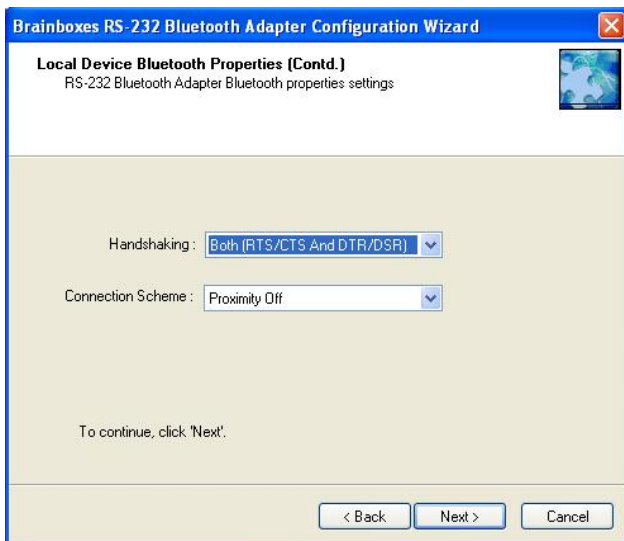
The Handshaking Options and Proximity Mode of the device are configurable on this screen.

There are two types of handshaking RTS/CTS and DTR/DSR.

For more information on Proximity Modes please see 'Connection Scheme' on page 17

brainboxes
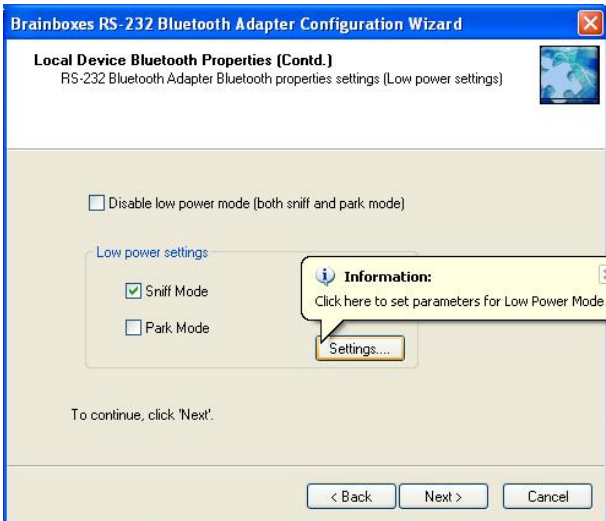
The Low power modes can be turned on or off here.

The settings button will allow you to configure the particular parameters that are used for both Sniff and Park Mode.

The Last configuration options are the Bluetooth Connection Settings.

The User is able to change the Device Mode, Pin Code, Switch Role status, select a Partner Device and chose the Bluetooth Profile which is used to connect
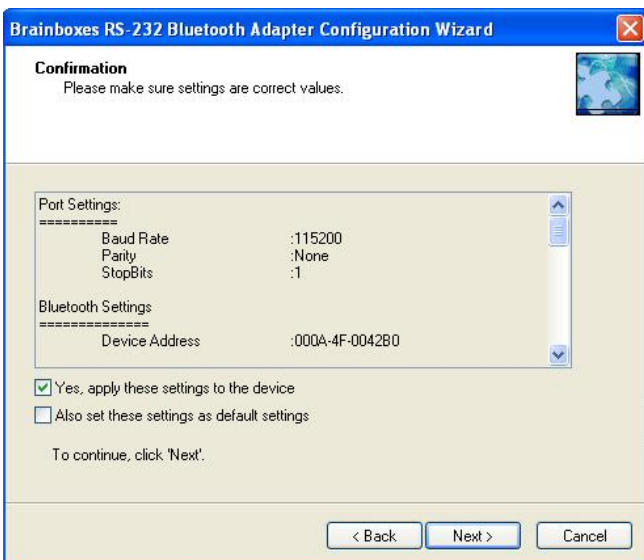
Finally the user will be able to view all the settings which will be applied to the Adapter, and confirm whether they wish to apply them to the device.

If 'Cancel' is selected here (or at any time during the Wizard) the Wizard will exit without changing any Settings.

3.5. Using the Configuration Utility

The Configuration Utility will display allowing selection of the appropriate COM port settings for the Adapter device you have attached to the port:
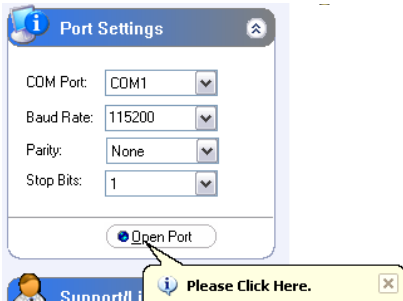
COM Port: Select the port number of the COM port to which you have attached your adapter. Select "Auto" if you don't know the number and the utility will attempt to find the device for you.

Other Settings: Select the other parameters to match those that have been set on the adapter. If you don't know them, select "auto" and the utility will attempt to find the device for you. The default parameters for the adapters are 115200 baud, No Parity and 1 Stop bit.

At the bottom of the application there are four 'action' icons. These can be used to restore the local RS-232 Bluetooth Adapter to its default settings, save the current settings as default settings, reload the current settings and apply the current settings:

The feature that allows a user to change the default configuration settings on their Adapter would be useful in cases where the Adapter was in use in an application where the physical security of the Adapter couldn't be guaranteed. If the application required that the settings were very different from the original factory settings then if a long reset were performed (restoring default settings) the application would no longer work until the Adapter was reconfigured. Updating the default settings to the required ones means that should a long reset be performed the device will power up with the settings required by the application.

Care should be taken to make a note of the updated settings when using this feature, particularly in the case of future use or reconfiguration of the product. Use the table below to note any settings you have changed:

Baud Rate		Encryption	
Parity		Pin Code	
Stop Bits		Client/Server	
Local Device Name		Class of Device	
Security Mode		Partner Device	

Other Notes:

The application will now load. There may be a short delay whilst the device is detected and its current configuration is queried and the appropriate fields are populated.

As a rule, sections on the left-hand side of the application display information about your device. Settings cannot be changed here. Sections on the right-hand side are where settings can be changed as well as viewed.

Useful "tips" are displayed if the cursor is "hovered" over various fields to help explain those options.

Each section can be expanded to see or change the relevant settings for your RS-232 Bluetooth Adapter

All the settings are described in full detail below.

3.5.1. Device Info

The Device Info section displays the Bluetooth address, name and firmware of the product currently attached.

The local device name field displays the "friendly" name of the device that is connected.   This can be changed to any name as required as detailed further below.

Each Bluetooth device in the world must have a unique address. Some Bluetooth devices need to know the address of the device they are connecting to. This address is also identified on the label attached to your product.

The firmware loaded onto your connected device is also displayed here. This is provided mainly for technical support purposes, but also allows you to check for available or suitable updates.

3.5.2. Port Settings

3.5.3. Support/Links
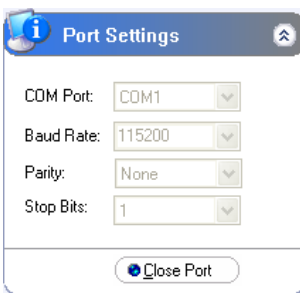
The Port Settings section displays the current used port settings for the connected Adapter i.e. the port settings that were used to open and access the device. This includes the current COM port, Baud Rate, Parity and Stop Bits.
In this section the port that accesses your RS-232 Bluetooth Adapter can be opened and closed.

See section 3.3 for more details on the options in this section
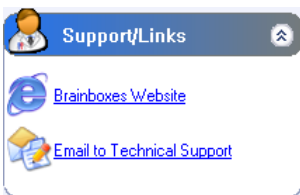
The Support/Links section can be used to get more help from Brainboxes should you be experiencing any difficulties.

The Brainboxes Bluetooth Support website and support email address are available in this section.

3.6. Current Settings
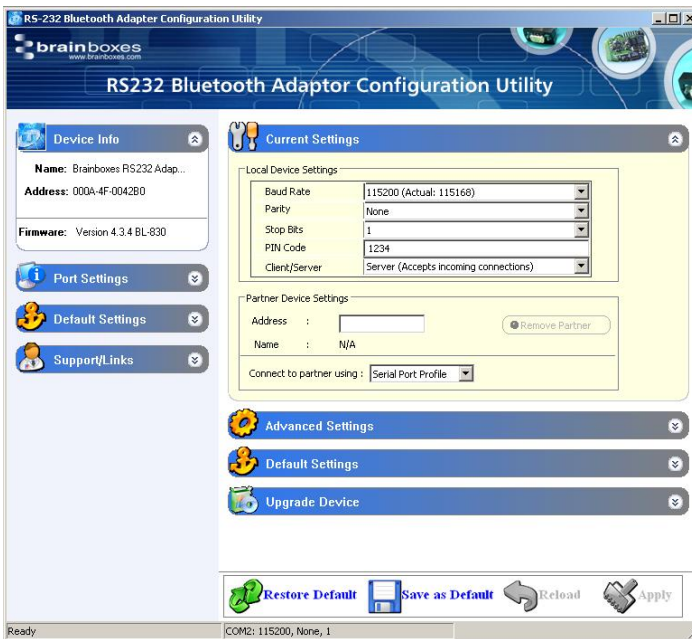
The Current Settings section is broken down into two sections; Local Device Settings and Partner Device Settings. Each field will be discussed further below.

When the Current Settings has been selected, an additional section appears in the left-hand section called Default Settings. Both sections can be expanded at the same time to enable the user to view the current settings and the default settings at the same time.

As each section is opened, the previously opened section will close to prevent information moving off the bottom of the screen and thus requiring the user to scroll down.

Whenever a setting is changed, the field changes colour to indicate that a change has been made but not applied.

Baud Rate

Click the drop down arrow at the far right of this field to display a list of popular baud rates. Due to some technical limitations, it is not possible for the product to achieve all of these baud rates exactly, although most of them are available to within 1%. Normal RS232 operation is not affected by such small differences in data rates unless very long streams of continuous data are being used. The Actual baud rate achieved is displayed next to your selection.

This option is only applied when the "Apply" icon is clicked. Along with updating the device, the application will immediately change its own communications parameters to match those new settings so it can continue to interact with the device. Multiple changes to communications settings are ALL applied when the "apply" icon is selected.

NOTE: It is possible for the adapters to be configured to baud rates that are not supported by a PC's COM port. If your application requires such a "non-standard" baud rate, you may no longer be able to communicate to the Adapter from your PC. If you "apply" the setting inadvertently, you can restore the default settings of the Adapter by performing a reset as documented below.

The adapter's normal factory set baud rate (and default baud rate) is 115200 baud.

Parity

Click the drop down arrow at the far right of this field to display the available options for Parity.
This option is only applied when the "Apply" icon is clicked. Along with updating the device, the application will immediately change its own communications parameters to match those new settings so it can continue to interact with the device. Multiple changes to communications settings are ALL applied when the "apply" icon is selected.

Stop Bits

Click the drop down arrow at the far right of this field to display the available options for Stop Bits.
This option is only applied when the "Apply" icon is clicked. Along with updating the device the application will immediately change its own communications parameters to match those new settings so it can continue to interact with the device. Multiple changes to communications settings are ALL applied when the "apply" icon is selected.

Data bits

Unfortunately this setting cannot be changed. Your RS-232 Adapter only supports the 8 data bit format. Thus there is not a configuration menu option for this setting.

PIN Code

The PIN (Personal Identification Number) is used to create a secure and trusted connection between 2 Bluetooth devices during a process called pairing or bonding. The PIN can be any combination of printable characters. The PIN is only used when the adapter is configured to be in security mode 2 or 3 (High or Medium security).

The factory set PIN is "1234". This can be changed and you may enter your own combination up to a maximum of 16 characters. If you try to create a PIN code that is larger than this, an error message is generated and you will be given another opportunity to enter your own PIN.

To change your device's PIN number, click in this field and simply type the new code you want applied. This can be any printable alphanumeric character or symbol, but you should take care to choose a PIN appropriately remembering that some Bluetooth devices (e.g. cell phones) only have limited input mechanisms and may not have a full range of characters available. Press the "Apply" icon to apply the new PIN code.

If your RS-232 Bluetooth Adapter is to be configured into Client mode, this is the PIN that will be used by your Adapter to initiate pairing with the remote device before any connection is made. If your remote device is another Brainboxes RS-232 Adapter in Server mode, you will need to ensure that "both" devices are configured to use the same PIN number.

Client/Server

The option Client/Server changes the default behaviour of your product. This is important if you want a remote device to connect to the product or whether you want the product to connect to a remote device. Click on the drop down arrow on the far right of this field to see the 2 selectable options. The default configuration of your product is set to "Server" operation. This means that the product will wait for devices to connect to it (just like a network or web server). Changing this setting to "Client" will put the product into a state where it will attempt to connect to remote devices contained in its internal database.

The "remote" or "partner" device feature is explained below. It is this option that requires attention if you wish to configure 2x Brainboxes RS-232 Adapters to communicate to each other to create a "true" cable replacement scenario.

Due to the nature of this feature (it connects to a remote device and therefore renders the configuration utility unavailable) we recommend that this setting is changed after all other configuration changes have been made and applied.

Partner Device

This feature serves 2 purposes:

In Server mode it shows the address of the last device to successfully bond and connect.
In Client mode, it shows the device to which the product will attempt to pair/connect.

A remote device address must first be entered into the "partner device" field before the product, configured in Client mode, will be able to initiate any connections to that remote device. Adding a partner device using this feature will stop remote devices bonding with the device in Server Mode if one of those remote devices is not the partner device.

Click on the field to enter the Bluetooth Address (BD_ADDR) of the remote device you wish to connect to. This should be in the same format as indicated on the products label (NAP-UAP-LAP, for those of you who know). The option to remove this newly entered device exists at this point should you have made a mistake. You should be sure to check that the PIN number entered above exactly matches the PIN code requirement of the remote device to which you are trying to connect.

Once the RS-232 Bluetooth Adapter has successfully added a partner device the menu will update to give the user the option to remove the partner. All settings must be applied using the "Apply" icon before they are set.

Connect Using

Clicking the arrow on the far right of this field shows a drop down list of the available service options. It should be noted that this feature does not actually query the remote device for its supported services, so you must be sure that your remote device actually supports your selection.

This feature can be used to connect to remote devices that support DUN, LAN or FAX services i.e. some Bluetooth phones will only let devices that are Dial Up Networking clients to connect to them. Although Brainboxes Bluetooth Adapters do not actually include all the software necessary for it to support DUN, LAN and FAX fully, these are all based on SPP, which the Brainboxes devices do support. The additional software can come from the Operating System such as XP.

For example, a Bluetooth phone can be used by an RS-232 Bluetooth Adapter to dial out to the internet on a PC if the Connect Using feature is set to DUN, partner address is the phone's Bluetooth address and the Adapter is in Client mode. When the phone confirms that a Bluetooth connection is present, a modem can be installed on the PC, which would use the COM port that the Adapter is connected to. Some Bluetooth phone's such as Nokia and Sony Ericsson have a special Bluetooth modem driver that you can download from their website. Once installed you can then use the Create a New Connection wizard from Control Panel/Network Connections to dial out using the new modem. You will require an ISP with username and password for this.

3.7. Advanced Settings

The Advanced Settings section contains a more detailed range of settings that are least likely to require modification for any particular scenario to work. Each field will be discussed further below.

When the Advanced Settings has been selected, an additional section appears in the left-hand section called Default Settings. Both sections can be expanded at the same time to enable the user to view the current settings and the default settings at the same time.

As each section is opened, the previously opened section will close to prevent information moving off the bottom of the screen and thus requiring the user to scroll down.

Whenever a setting is changed, the field changes colour to indicate that a change has been made but not applied. After making a selection select the "Apply" icon to apply the setting.

Device Address

This field shows the Bluetooth Address (BD_ADDR) of the local device. As each Bluetooth device must have its own unique address, this field cannot be edited or modified in any way.

Device Name

In scenario's where more than 1 Adapter is to be used in the same geographical location (i.e. they are all in range of each other/the controlling device), it may be wise to change the name of each device so that human users can more easily identify each individual.

This field does not have a drop down list of options. You must select the field and edit the name to your requirements.

Memory constraints on the Adapter mean that you must ensure that your desired name is less than 30 characters. The Factory setting for the local device name is "Brainboxes RS232 Adapter ".

Discoverability

Discoverability is a feature that allows any other Bluetooth device to find (or not find) your Bluetooth device. Just because a Bluetooth device is non-discoverable it doesn't mean it's not also connectable. Because a Bluetooth connection is made using only the device's address, if an application already knows the address of a non-discoverable remote device, and it has already bonded (if appropriate) or knows the correct PIN number, then it can connect to that device. You may wish to set this option to help avoid confusion when many RS-232 Bluetooth Adapters exist in close proximity to each other.

This field has 2 options selected from the drop down list.

1) "On" is the default setting for the adapters. This setting will make the Adapter "viewable" by any other Bluetooth device.

2) Selecting "Off" immediately renders the adapter "non-discoverable". No other Bluetooth devices will be able to see the Adapter when they perform a device discovery. However, in this mode, your adapter is still "connectable".

Security Mode

The factory set security mode is 3 (Highest). This field has 3 available settings from the drop down list:

1) Selecting option "1" will immediately place your adapter into security mode 1. This is the lowest security mode that the Adapter can be configured to. Connections, including service discovery, can take place without the need for "pairing" or "bonding". In mode 1, the Adapter automatically accepts all access requests without initiating authentication, encryption, or authorization procedures. Any attempt by a remote application to perform authentication or encryption procedures will be rejected.

2) Selecting option "2" will immediately place your Adapter into security mode 2. This mode allows remote Bluetooth devices to search for and retrieve the services on your Adapter without pairing, but will not allow them to connect unless the 2 devices are paired.

3) Selecting option "3" will immediately place your Adapter into security mode 3 (default). This is the highest security mode available. Connections of any kind (other than a device discovery) from a remote Bluetooth device are only allowed after a successful "pairing" has been performed. No services will be shown to other Bluetooth devices unless the 2 devices are successfully paired.

The tables below show some more information with regards to the application of the security settings…

Security modes for Adapter as Client (initiates Connections):

Security:	*Who can Pair?*	*Who can it connect to?*	*Possible use:*
High (Mode 3)	BL-819 / 830 will only pair with device entered in the 'Set Partner' menu. Other device must have identical PIN number	Only device entered in the 'Set Partner' Menu, after pairing.	Secure connection between the BL-819 / 830 and a preset device (Link level enforced security – can see device but not services unless paired)
Medium (Mode 2)	BL-819 / 830 will only pair with device entered in the 'Set Partner' menu. Other device must have correct link key	Only device entered in the 'Set Partner' Menu, after pairing.	Secure connection between the BL-819 / 830 and a preset device (Service level security – can see services but not connect unless paired)
Low (Mode 1)	N/A	Only device entered in the 'Set Partner' Menu.	When users who do not want to spend time pairing and do not require a secure connection

Security mode for Adapter as Server (receives connections):

Security:	*Who can Pair?*	*Who can Connect?*	*Possible Use:*
High (Mode 3)	Any Device with correct PIN.	Any device	Secure connection between the BL-819 / 830 and a preset device (Link level enforced security – can see device but not services unless paired)
Medium (Mode 2)	Any Device with correct PIN.	Any device	Secure connection between the BL-819 / 830 and a preset device (Service level security – can see services but not connect unless paired)
Low (Mode 1)	N/A	Any device	When users who do not want to spend time pairing and do not require a secure connection

Encryption

Encryption is a method of ensuring that the communications between 2 devices cannot be "bugged" or "listened" to by any unauthorised source. This encryption is performed in lower layers of the protocol stack as defined by the Bluetooth Specification.

The factory set Encryption mode is "Disabled".   This field has a drop down list from which the configuration can be changed to enable "Point to Point" or "Point to Point & Broadcast".

Switch Role

This Function will allow an RS-232 Bluetooth Adapter to connect to another device as a Client, then when the connection has been made, to switch the role to Server. This option is required if you wish to connect two or more adaptors to a control device, with the adaptors initiating the connection. NB, the adaptors are only capable of being connected to one other device at time.

Class of Device

Some remote device applications will only communicate to devices of a certain type. This option allows you to reconfigure your RS-232 Bluetooth Adapter to appear as a number of different device types. The Factory setting for the Class of device is "Peripheral". The available options are: Peripheral, Desktop, Laptop, Imaging, Phone/Modem and LAN.

IMPORTANT NOTE: Changing this Class of Device setting does not alter the published functionality of the product. It will continue to offer ONLY One Serial port profile connection.

Handshaking

This setting allows the user to select the handshaking scheme used for the device. By default the setting is no handshaking. Handshaking options are RTS/CTS, DTR/DSR, RTS/CTS & DTR/DSR or none. When changing between handshaking options, a power cycle is required before the configuration utility can be re-accessed.

RTS/CTS handshaking is used between the Adapter and the port to which it is connected (hardware handshaking). DTR/DSR handshaking is used over the Bluetooth connection between the adapter and the device to which it is connected via Bluetooth (over-the-air handshaking).

As shipped from the factory, this product is configured NOT to require the use of RTS/CTS handshaking. Its implementation is such that these control signals are NOT transferred over the Bluetooth link, but instead are used to control the passage of data between the adapter and the physically connected RS232 device (PC, modem etc). It is therefore not possible to use this product in an application that uses the RTS and/or CTS handshake lines for purposes other than simply to control the flow of data.

Whilst the Adapter is configured NOT to require RTS/CTS handshaking, some devices to which it may be connected will require this flow control. If this is the case, unless the following procedures are undertaken the Adapter will not send any data and the communications between the 2 devices will appear corrupt or broken.

Whilst the product ships without handshaking to make initial configuration easier, Brainboxes do not recommend that you leave RTS/CTS handshaking disabled unless you are connecting the Adapter to a device that specifically does not use any itself. This handshaking exists to ensure that no data is lost between the 2 devices. In applications where there is a significant amount of data flowing between devices, there is an increased risk of data being lost. Disabling handshaking unnecessarily may cause your application to fail intermittently due to this lost data.

No provision has been made in the current design for the implementation of the DCD and RI lines.

Connect Scheme

This allows the selection of a connection scheme called Proximity. This connection scheme tells the adapter to go out, find the first Bluetooth device in range and connect to that device. If there are any problems connecting or pairing, then the adapter will give up and go out to search again.

There are two different proximity schemes, 1 and 2. Scheme 1 finds a device to connect to and then saves that device's address as it's partner device, so that the next time the adapter is powered up, it will always connect to that partner device. Scheme 2 finds a device to connect to and doesn't save that device's address, so that next time the adapter is powered up, it will go out and find a new device to connect to again. It may be the same device as last time (if it is still in range) or it may be a new device.

The closest device to the adapter is not necessarily going to be the device that responds to the inquiry first. The adapter needs to be in Client mode for Proximity to work and as soon as a partner address is populated in the partner address field, the adapter behaves just as though it is in Client mode with a partner device to connect to.

Low Power Mode

This setting allows the selection of either Park or Sniff low power modes. These can be used to reduce the power consumption of the adapter when an active Bluetooth connection exists. These settings only reduce power consumption when a Bluetooth connection is present. They do not affect the power consumption of the adapter while it is inquiring, waiting for a connection or trying to make a connection. The setting requires the connecting device to also support the selected low power mode.

A server device in park or sniff mode periodically wakes up to listen to transmissions from the master. The client device only transmits at these same times periodically. Also, in Park mode, a server device can have as many as 255-parked clients, as oppose to the usual limit of 7 clients. However, only 7 of the parked clients can be brought from park mode to be active at the same time. For further information on low power modes and their operation please see the Bluetooth website www.bluetooth.org
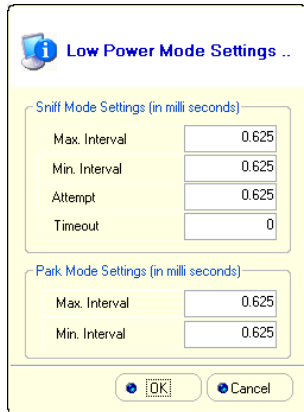
The settings used for the low power modes can be changed to suit whatever the application is that the devices are being used for. Increasing interval times will reduce the power usage, but will also increase the response time of the adapter's as they are "out of action" for much longer.

Max Interval: This is used to specify in milliseconds the maximum possible time that should exist between server/client communication 'slots'

Min Interval: This is used to specify in milliseconds the minimum possible time that should exist between server/client communication 'slots'

Attempt & Timeout: These are used to specify the number of attempts that the client device will listen at the specified interval, if there is no data there the first time it starts to listen.

Interactive Menu

Some RS232 devices (GPS devices for example) emit a continuous stream of data regardless of whether a cable is connected. When there is no Bluetooth connection, this data (from the RS232 device) will be interpreted by the Adapter as commands to (or interaction with) the menu and ultimately change settings (such as baud rate) that render the Adapter inoperable. Selecting "off" for this setting will stop the Adapter being unwontedly re-configured in this manner. Unfortunately, this will also disable all the functionality required for this configuration application to interact with this product.

If you inadvertently select "off" for this setting, the menu/command interface (and thus the operation of the configuration application on this device) will only be re-enabled by a long reset as documented below.

WARNING: Use with care: Selecting the "off" option of this feature will render further configuration impossible if set as a default setting.

3.8. Default settings

The "Default Settings" section is simply a display page showing all the configuration options either as they were set in the factory (default or custom) or as the user has chosen to update them from this application or menu.

These are the settings that will be restored if the "Restore Default" icon is selected at the bottom of the page.

When the Default Settings section is opened (on the right-hand side of the application), a new section appears in the left-hand side called Current Settings, which can also be expanded so that the current and default settings can be viewed at the same time.

3.9. Upgrade Device
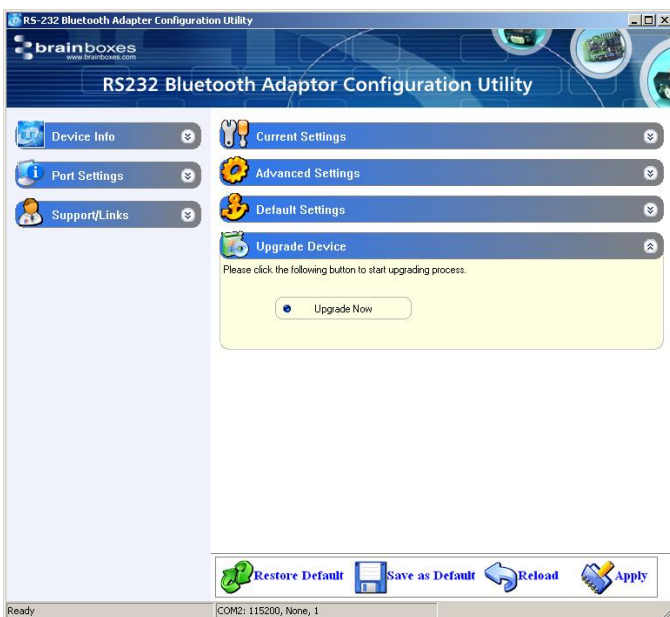
The "Upgrade" section is a new feature that allows the user to upgrade the adapter firmware using a simple upgrade wizard.
Updated firmware will be available from the Brainboxes support website so please check the site regularly:

http://www.brainboxes.com

4. Alternative Product Configuration

## 4.1. Accessing the configuration menus and commands.

The adapter's configuration menu is available at any time that there is no Bluetooth radio connection established with another device (unless of course you have selected the option to disable the menu). As soon as a Bluetooth connection is made, the data sent to the Adapter will be sent over the radio link to the remote device. A short time after the Bluetooth connection is broken, the configuration menu's become available again.

Sending a single "Carriage Return" character to the Adapter whilst no Bluetooth connection exists will activate the initial main menu, or typing the command required will initiate the appropriate response. Both the menu and command list are documented further below.

The example given below to connect to the configuration menus is performed in Windows XP using HyperTerminal, a terminal application that ships with Windows. If you are using a different operating system, you will need a similar "terminal" or "tty" type application (e.g. minicom), which talks directly to a serial port in that operating system. If you are using a different version of Windows the specific steps to invoke and use the HyperTerminal application may be slightly different – please refer to your operating system documentation if you need further help in this respect.

First, connect the adapter, along with the supplied gender changer, to an available serial port on your computer. In this example, the COM1 port on the PC has been used.

Ensure the power adapter is connected and switched on (the leftmost green LED on the Adapter should light. Start HyperTerminal by clicking "Start\All Programs\Accessories\Communications\HyperTerminal".
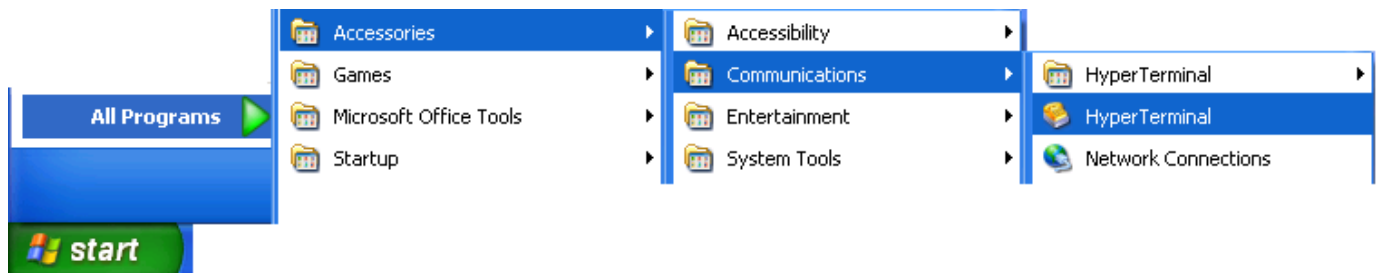
If you are running HyperTerminal for the first time you will be prompted for information about your location. This section must be filled in, but is not used for our purposes, so you are free to add anything here.

The next screen (left) is just to name this instance of the connection. You are free to name this as anything except an existing device name (e.g. COM1).

Click OK

Select the Port that you have connected the adapter to. All other fields will then be "greyed out" then Click OK.
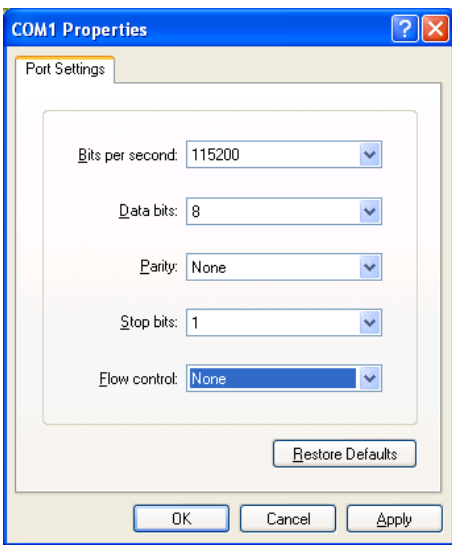
Select the communications parameters that your device is configured to. In this example we have used the factory defaults normally applied. If you have previously reconfigured these values, then you will need to make sure the settings here match those you have configured to device to be.

Click OK
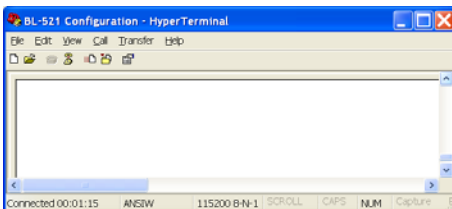
HyperTerminal should now be running.

Now hit the "Enter" key once. This should activate the main configuration menu as shown in Main Menu below. You should be able to now interact with the menus as described in the following sections.
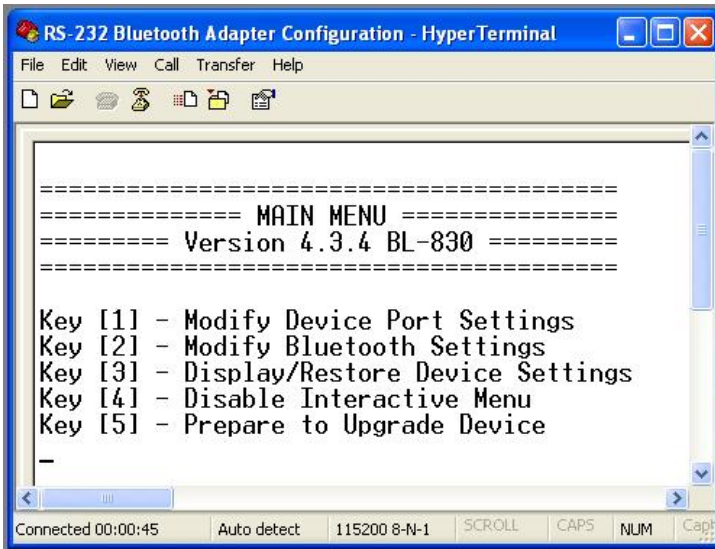
4.2. Configuration Menu.

4.2.1. Navigation

As a general principle, from any menu screen hitting the "Enter" key refreshes the current menu and hitting the "Esc" or "Escape" key returns the user to the previous menu or skips a particular option.

Menu selection is performed by pressing the number on your keyboard that corresponds to the number listed on the menu item you wish to view/configure.

Reminder: The configuration menu is not available whilst a radio (Bluetooth) connection is established.
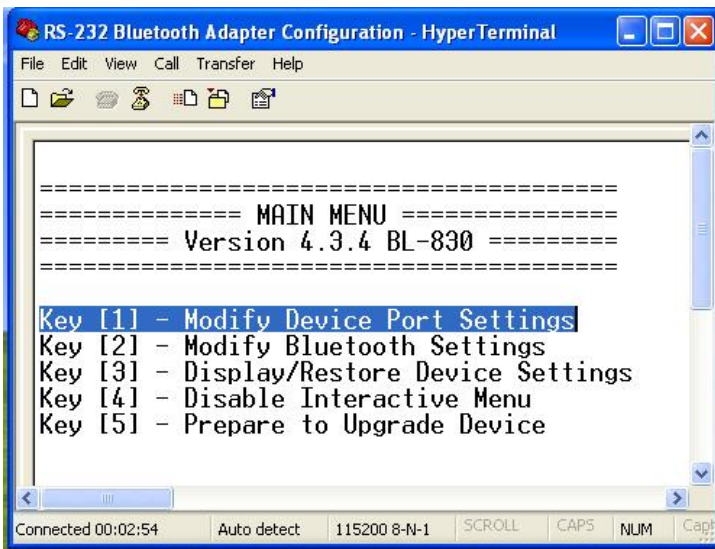
4.2.2. Main Menu

Sending the "Enter" character to the adapter accesses its main menu. This is also sometimes referred to as "Carriage Return".

All basic configuration options for adapter are accessed via this menu. Advanced features are not available from the menu interface.

Users wishing to alter "advanced" settings can do so by either using the Windows Configuration application documented above, or by using the commands documented below.

4.2.3. Communications Parameters

Selecting option 1 from the "Main Menu" menu displays the Communications settings menu.

It is from this menu that all available serial port settings can be changed. The available options are detailed below.

The factory set communications parameters for your adapter are as follows…

Baud Rate:	115,200
Data Bits:	8 (non-configurable)
Parity:	None
Stop Bits:	1

You can alter these settings by using the configuration menu options shown below.
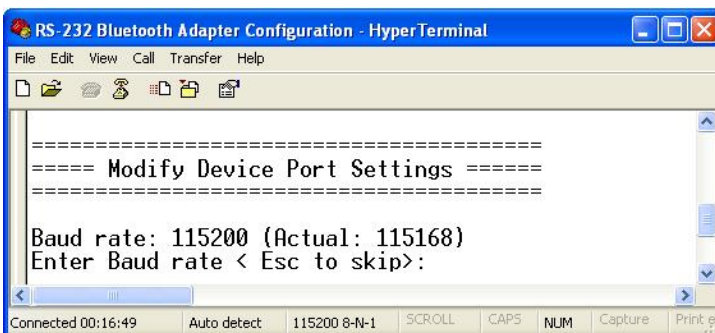
The user is first prompted to change the Baud Rate. The current setting is shown. To change the baud rate, just type the rate you want to use and press <enter>. The Adapter will accept any number you type, but will set the baud rate to the one that's closest to what it can actually achieve.

Press "Esc" to skip this setting – the current setting will remain unchanged

---

```
RS-232 Bluetooth Adapter Configuration - HyperTerminal
File  Edit  View  Call  Transfer  Help

Current Parity: NO parity
Enter Parity <Enter 'n','o','e' or Esc to skip>:

Connected 00:24:37    Auto detect    115200 8-N-1    SCROLL   CAPS   NUM   Capture   Print echo
```
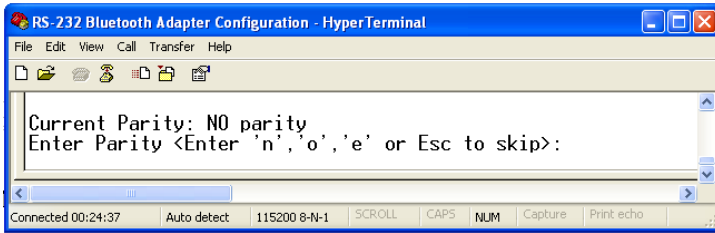
Next the user is prompted to set the adapter's Parity. Options here are None, Odd or Even.

"Esc" skips this selection leaving the current setting unchanged.

```
RS-232 Bluetooth Adapter Configuration - HyperTerminal
File  Edit  View  Call  Transfer  Help

Current Stop Bits: 1 stop bit
Enter Stop Bits < Enter 1, 2 Or  Esc to skip>:

Connected 00:25:40    Auto detect    115200 8-N-1    SCROLL   CAPS   NUM   Capture   Print echo
```

Then the user is prompted to change Stop bits. Options here are 1 or 2.

Pressing "Esc" skips this selection leaving the current setting unchanged.

```
RS-232 Bluetooth Adapter Configuration - HyperTerminal
File  Edit  View  Call  Transfer  Help

Do you want to apply 9600,n,1 (Actual: 115168) setting?
<Press 'y' to apply now Or  Esc to skip>:

Connected 00:26:47    Auto detect    115200 8-N-1    SCROLL   CAPS   NUM   Capture   Print echo
```

The user is then asked if they wish to Apply the new settings immediately. If settings are not immediately applied, the changes will only take effect after the Adapter has had it's power cycled.

This is to minimise the disruption to the device configuration by having to reconfigure the terminal application after changing each setting.
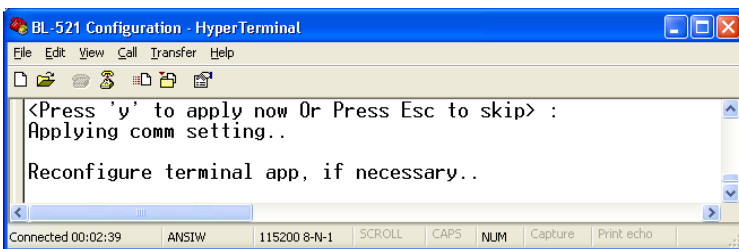
If you have changed any communications parameters, and wish to continue to access the configuration menu, you will need to update your terminal applications settings. The easiest method of performing this in HyperTerminal is to close and re-start the application, setting the new parameters during the initial application configuration.

```
BL-521 Configuration - HyperTerminal
File  Edit  View  Call  Transfer  Help

<Press 'y' to apply now Or Press Esc to skip> :
Applying comm setting..

Reconfigure terminal app, if necessary..

Connected 00:02:39    ANSIW    115200 8-N-1    SCROLL   CAPS   NUM   Capture   Print echo
```

4.2.4. Handshaking

Handshaking is discussed in more detail in the section below, as it is not an option directly available from the menu.

4.2.5. Bluetooth Parameters

```
RS-232 Bluetooth Adapter Configuration - HyperTerminal
File  Edit  View  Call  Transfer  Help

==================================
============ MAIN MENU ===========
========= Version 4.3.4 BL-830 =========
==================================

Key [1] - Modify Device Port Settings
Key [2] - Modify Bluetooth Settings
Key [3] - Display/Restore Device Settings
Key [4] - Disable Interactive Menu
Key [5] - Prepare to Upgrade Device
_

Connected 00:29:00    Auto detect    115200 8-N-1    SCROLL   CAPS   NUM   Capture
```

Selecting option 2 from the "Main Menu" menu displays the Bluetooth settings menu shown below left.

The factory set Bluetooth Parameters are:

Partner device: None
Role (Client/Server): Server
PIN: 1234
Local device name: adapter BB RS232 Adapter

It is from this menu that all available Bluetooth settings can be changed. The available options are detailed below.

The Currently configured partner device is shown (if any). The user is then prompted to enter a new partner device address.
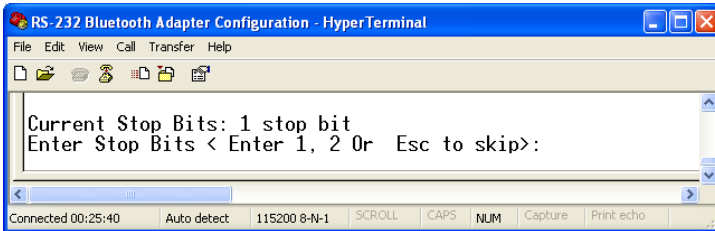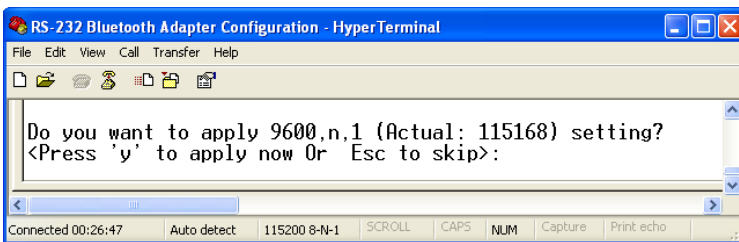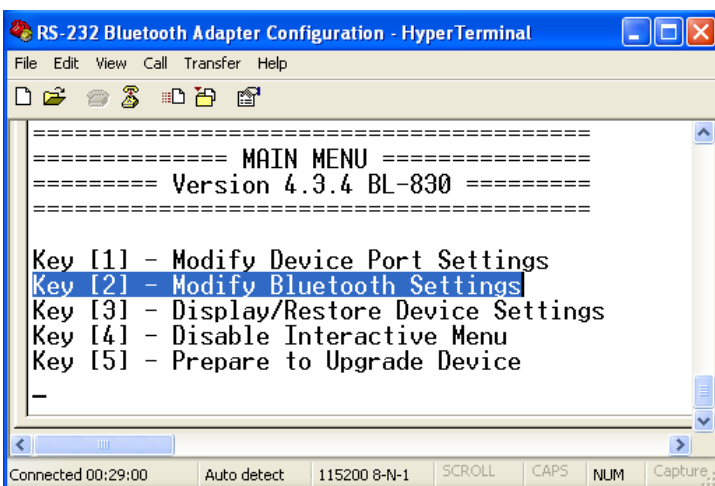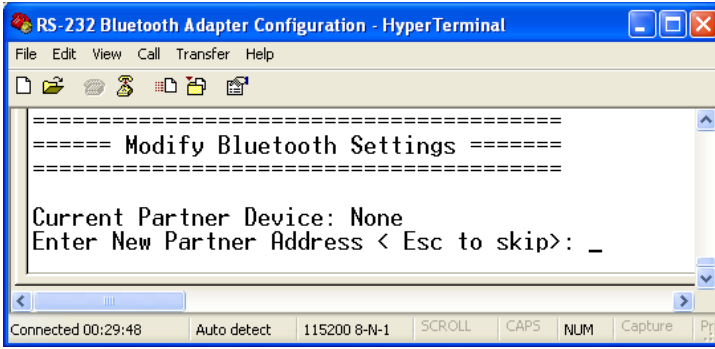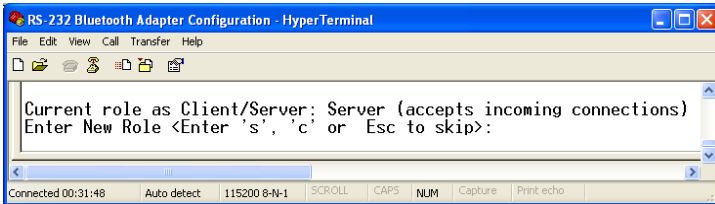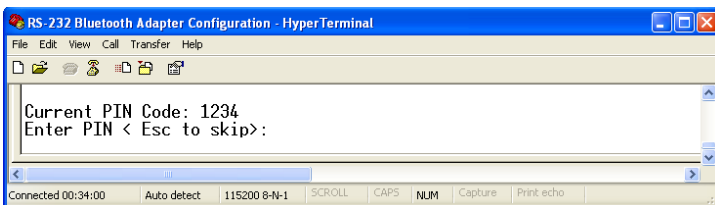
To keep the same partner, or skip this option, press the "Esc" key

Next the user is prompted to choose a role for the device (the current one is identified). "s" chooses Server, "c" chooses Client or "Esc" skips this section leaving the current setting unchanged.


The user is then prompted for a new PIN to be entered. You can enter any characters you wish here up to a maximum of 16 characters. You should bear in mind that some devices have limited input mechanisms and may not be able to use a full character set.
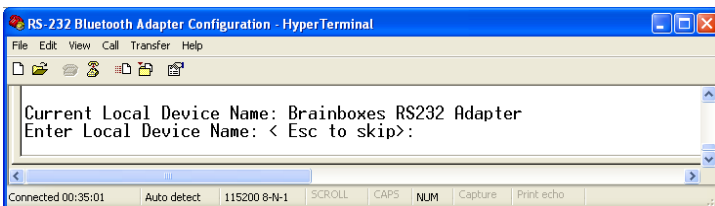

Lastly, the user is offered to change the adapters friendly name. Typing your chosen name followed by "enter" will immediately alter the published name, hitting the "Esc" key will skip this setting leaving the current name unchanged.

4.2.6. Display, Restore and Update Current and Factory Settings
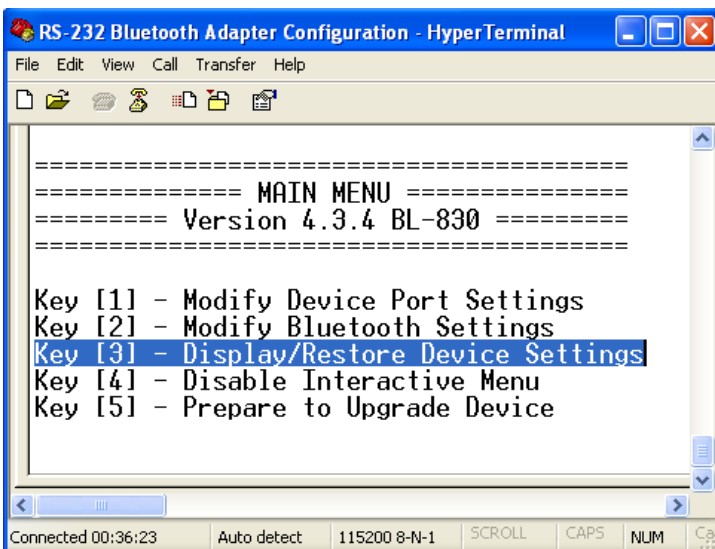
Selecting option 3 from the "Main Menu" menu displays the Current Settings menu and allows the user to display, change or restore the default settings.
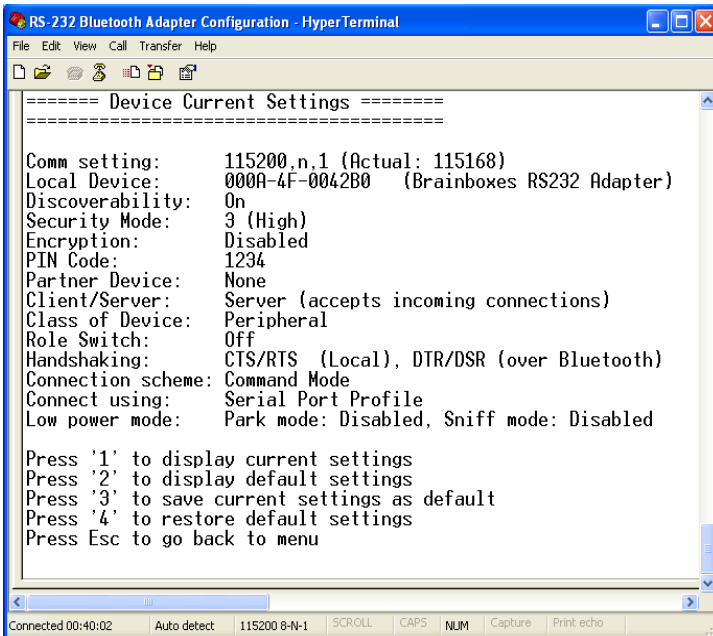
The first screen that displays shows the current state of the adapter's settings.

If any settings have been modified by the user following the instructions above, then this list will differ from the default (factory) settings

Selecting option 2 from this menu shows the original factory settings for the product (if viewing for the first time). The one item that will be different for each individual product will be the local device setting. This setting is unique for each individual Bluetooth device in existence and cannot be changed.

Selecting option 3 from this "Settings" menu allows the current user settings to be used to update the "factory" settings, providing some level of protection from losing application configuration settings during a device reset when the reset button is activated.

A warning message will appear to ask the user to be sure that the default settings should be changed. This is not something you really want to do unless you're sure you have the settings as you want them and are sure you can remember them, as there is no way back from here…

Selecting option 4 from the "Settings" menu above allows the user to restore the device to its default settings. Be sure to take a note of, or print these settings, as you will need to ensure that the next time you attempt to communicate with your Adapter you use these new settings. Remember that the original factory settings may have been updated using the previous menu.

4.2.7. Disabling Interactive Menu
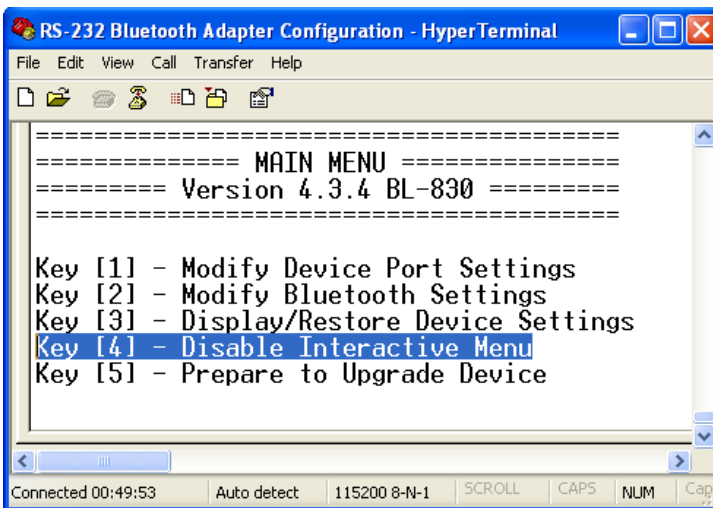
Some RS232 devices (GPS devices for example) emit a continuous stream of data regardless of whether a cable is connected. When no Bluetooth connection exists, this data can actually appear as commands to the menu and change settings that render the Adapter inoperable. Disabling the menu, stops the Adapter being unwontedly re-configured in this manner.

Selecting option 5 from the main menu displays the following Disable Interactive menu.
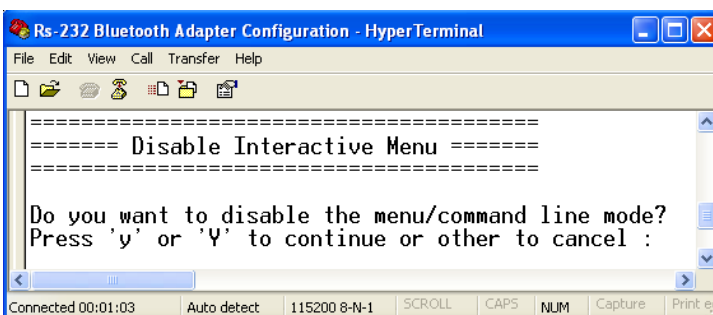
Selecting 'y' or 'Y' from this menu means that no further interaction with the menu will be possible until the device has been completely reset to it's factory defaults by performing a "long" reset from the reset button.

4.2.8. Upgrading Firmware [3.0]

This feature is only available from firmware version 3.0 onwards.
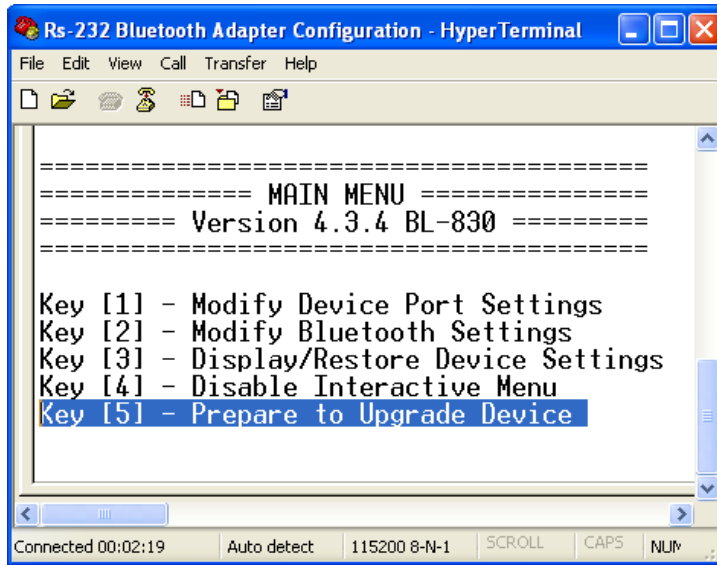
Upgrade DFU (Device Firmware Upgrade) is an option to be taken seriously as it has the potential to leave your product in an unusable state.

The upgrade is a 2 stage process, the menu option must be used in conjunction with the upgrade software supplied on the accompanying CD ROM which requires a Microsoft Windows 95 or later operating system
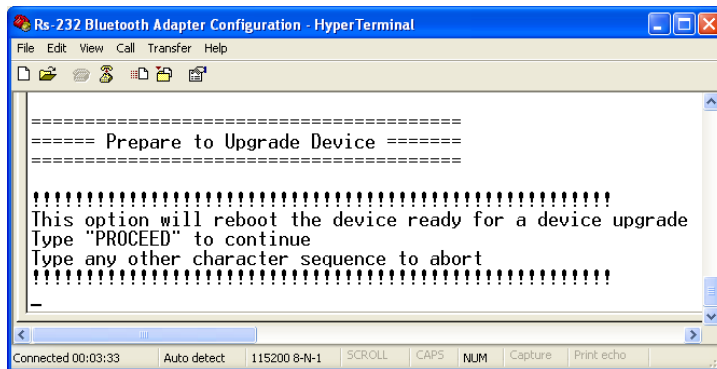
Selecting option 5 from the main menu displays the following Firmware Upgrade menu.

To activate this feature, you must type the word "PROCEED" exactly. This command is case sensitive.

Typing "PROCEED" correctly will cause the product to enter its firmware upgrade mode with immediate affect.
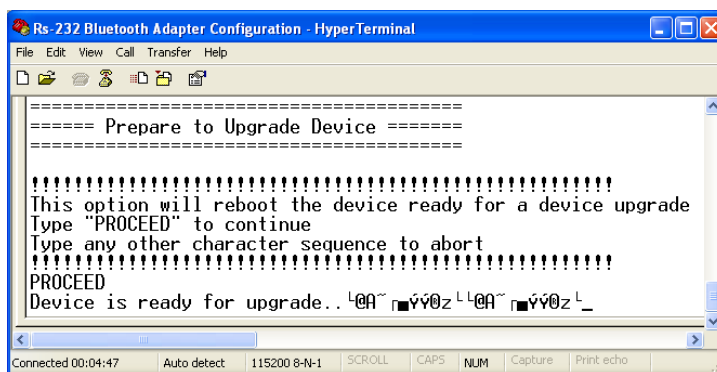
Failure to enter "PROCEED" correctly will cause the menu option to abort and you will be able to continue navigating the menu in the normal fashion.

In some (but not all) instances you will see some "odd" characters displayed as shown above. This is normal behaviour and indicates the product is ready to receive its firmware upgrade commands from the supporting software.

At this point, you will no longer be able to interact with the menu, nor will you be able to use the product as advertised. ONLY the supporting software can restore this setting. Neither a power reset nor any combination of presses of the reset button will restore normal operation to the product. It is now permanently in a state to upgrade the firmware.
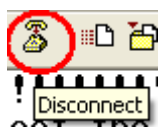
IMPORTANT, in order for the upgrade application to connect to your product and perform the upgrade, you must ensure you disconnect your terminal application from the COM port. In HyperTerminal, this is done either by closing the application down, or Clicking the "disconnect" toolbar Icon

Now run the "upgrade" application documented in the section below for upgrading.

4.3. Command Interface

This interface has been developed primarily to support programming access to the configuration settings by an application such as our own configuration application, but can also offer a powerful human operated (e.g. via HyperTerminal) command driven interface in it's own right. Additionally, the commands can be placed in a Text/script file and sent (e.g. by HyperTerminal) in one go to the adapter. The "scr" command is strongly recommended for use in this scenario.

The command interface protocol is quite straightforward. Each command (see table and descriptions below) must be sent over the COM port, followed by a Carriage return <CR>. This can be done in HyperTerminal just by typing each command and hitting the Enter key.

There are up to 3 ways each command can be used.

1. On its own. This acts as a "query" command.
> e.g. `cod<CR>`
> Returns the current device class

2. With an "=" and parameter(s). This acts as a "set" command
> e.g. `cset`=9600,n,1<CR>
> Sets the current settings to 9600 baud, No Parity and 1 Stop Bit
> Not all commands support this function as they are query commands only

3. With a "?" which acts as a "help" command
> e.g. `svc?<CR>`
> Returns a description of the command syntax and allowable parameters

The command list summary is given below.

Command Name	Description	Command Name	Description
aset	Get all settings	padd	Partner Address
btset	Get current Bluetooth settings	pair	Pair
cnx	Manually connect to a found device	parkset	Park Settings
cod	Class Of Device	part	Partner
cset	Communication Settings	pin	PIN code
delpair	Delete the current pair	pnam	Partner Name
delpart	Delete the current Partner	prox	Set the proximity mode
dflt	Default settings	remcfg	Remote Configuration
disc	Discoverability	scr	Script Mode
enc	Encryption	sec	Security
find	Manually perform an inquiry	sniffset	Sniff Settings
help or ?	Help	switchrole	Switch Role On / Off
hsk	Handshaking	svc	Connect Using profile other than SPP
ladd	Local device address	svr	Server or Client
list	List the manually-found devices	upg	Prepare for upgrading
lowpwr	Low Power Mode	ver	F/W app version
lnam	Local device name	verb	Verbose
menu	Display Menu		

The full command list syntax and programming examples will be given in a future edition of this manual. In the meantime, this information can be found using the help or ? command in HyperTerminal when your Adapter is attached to an available COM port.

5. Remote Configuration

One of the great features of Brainboxes RS-232 Bluetooth Adapters is the ability to be remotely configured. For example, a Bluetooth connection can be created from a second device and that second device can change the baud rate, local name or any of the settings of the adapter over the Bluetooth link.
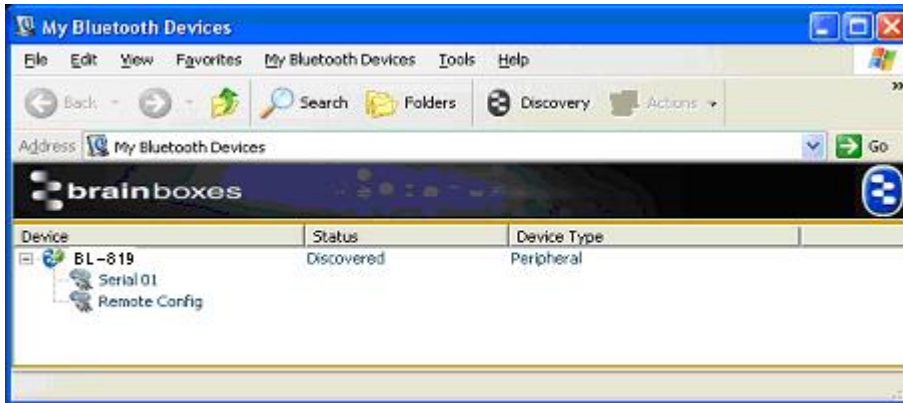
This is achieved by the adapter presenting two services to connect to; one is the standard serial port service and the other is a remote configuration service. The latter is connected to, to enable the second device to access the adapter's configuration menu using HyperTerminal and thus make any changes. Changes to port settings such as baud rate, parity or stop bits do not affect the port settings of the second devices' HyperTerminal settings, so the adapter can be set to 115200, n, 1 and the HyperTerminal settings for the second device that is accessing the adapter's menu remotely can be set to any settings i.e. 9600, e, 2.

Currently the remote configuration feature is not accessible from the main configuration utility application and HyperTerminal or some other suitable terminal application should be used.

Also, upgrading of the adapter cannot be achieved using remote configuration because as soon as the adapter starts to upgrade, the Bluetooth connection is lost and there is no longer a way of communicating to the adapter remotely.

To use remote configuration from adapter to adapter use the command line "remcfg=xxxx-xx-xxxxxx" where the x's stand for the remote device's Bluetooth address.

6. Resetting the Product

The adapter has a "reset button" located on the top of the case as shown in section 2.1 above. This button performs 2 different functions.

a) Resets Paired Devices.
   A short press (less than 3 seconds) of the reset button causes any paired device information to be deleted. When the device is in low security mode, this will not have any effect on the devices operation, but whilst in high security mode, this will mean that another device can pair with adapter, or that the original device must expire its bond in order to reconnect.

b) Resets adapter to factory defaults.
   A long press (more than 3 seconds) of the reset button causes all factory defaults to be restored. Care should be taken here to remember that these "factory" settings can actually be updated via the interactive menu and thus may not be the same as the device was shipped with. The user should also remember that adapter is likely to need it's parameters re-configuring to ensure communications can be re-established with either the local serial device, or remote Bluetooth device.

7. Upgrading your device

If you have installed the Configuration Utility already, the Upgrade application will also have installed and a shortcut will be placed onto your desktop. Otherwise browse the CD, navigate to the "Adapter Configuration Utility" directory, and run the "Setup.exe" application. Follow the onscreen instructions to install the application. This will create an entry in your start menu as well as a desktop shortcut.

Run the application by selecting it from the "Start" menu.
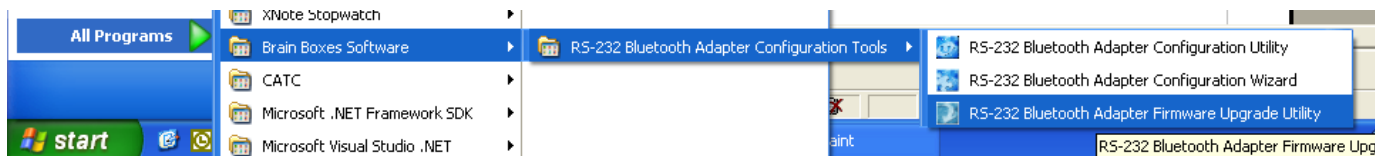
The first screen is displayed. The version of the application is displayed in the lower right corner of the screen.

Click "Next"
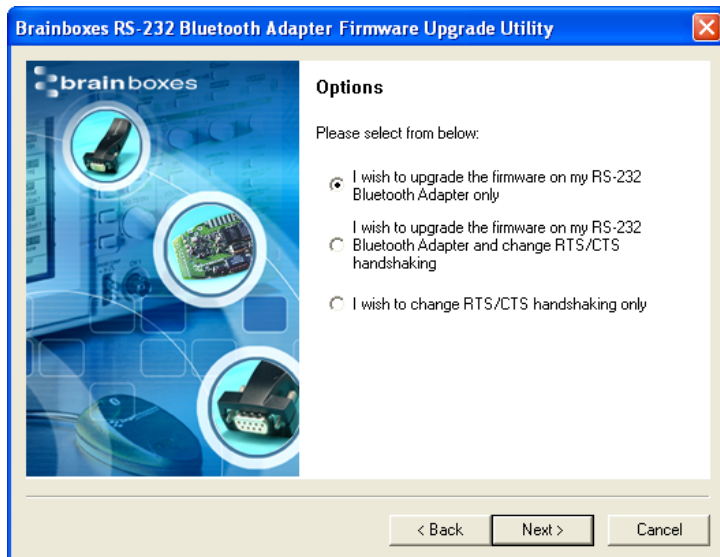
Three options are presented to the user with the choice or either just upgrading the firmware, upgrading the firmware and changing the RTS/CTS handshaking setting or just changing the RTS/CTS handshaking setting.

To simply upgrade the firmware, select the first option.
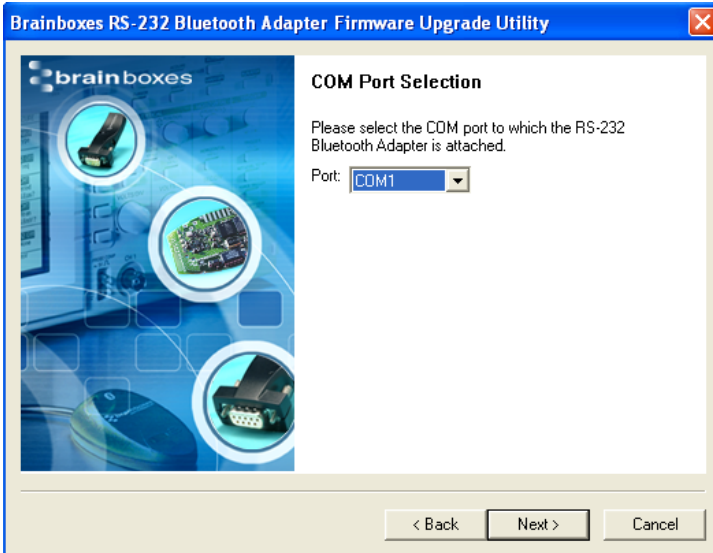
Select the COM port to which you have connected your product. (Remember to close the Configuration Utility or Hyper Terminal application if you still have either open)

Then Click "Next".
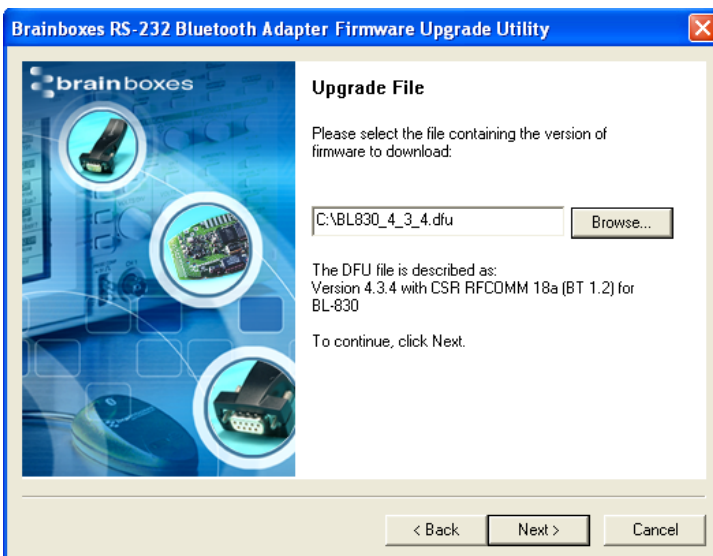
Point the upgrade wizard to the upgrade file you wish to use.

These upgrade files all have the extension .dfu and the latest version is available from the Brainboxes website.

NB The BL-819 and the BL-830 have their own distinctive version of firmware. Make sure that you are choosing the correct firmware for your device
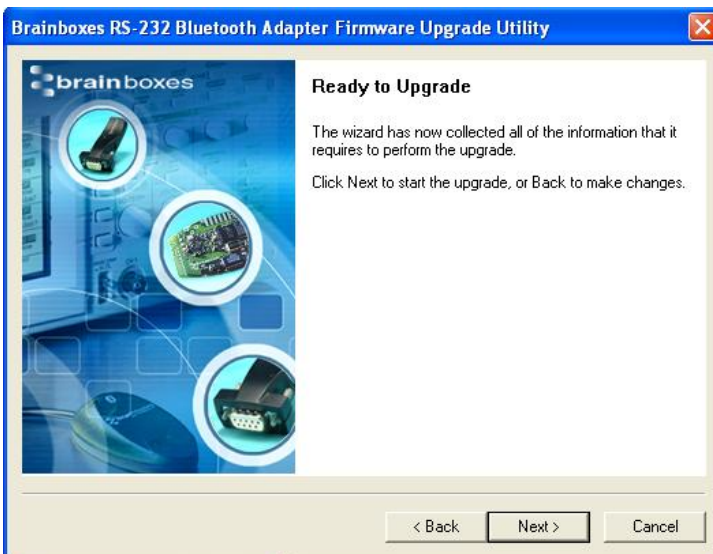
Confirm you have made the correct selections by clicking "Next" to start the upgrade procedure.
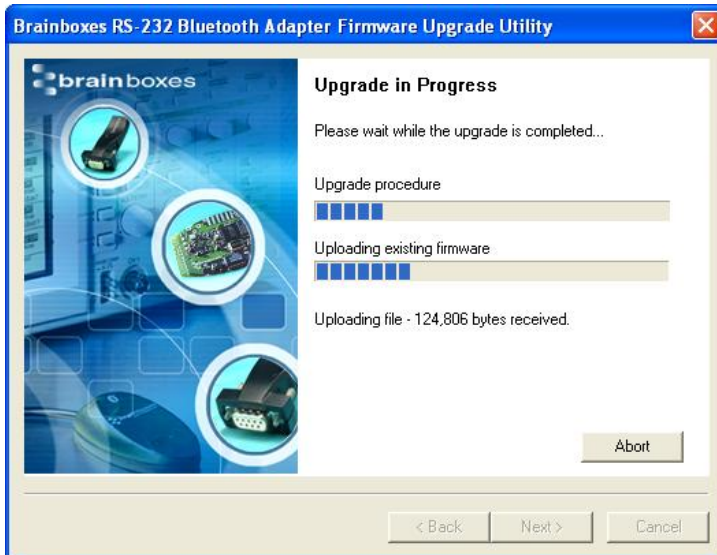
Assuming you have selected the correct options, the wizard will detect the product connected to the selected port and begin the upgrade.

This may take a few minutes, as the wizard will automatically make a copy of the firmware currently on the device before uploading the new version.

A progress bar indicates how the procedure is going.
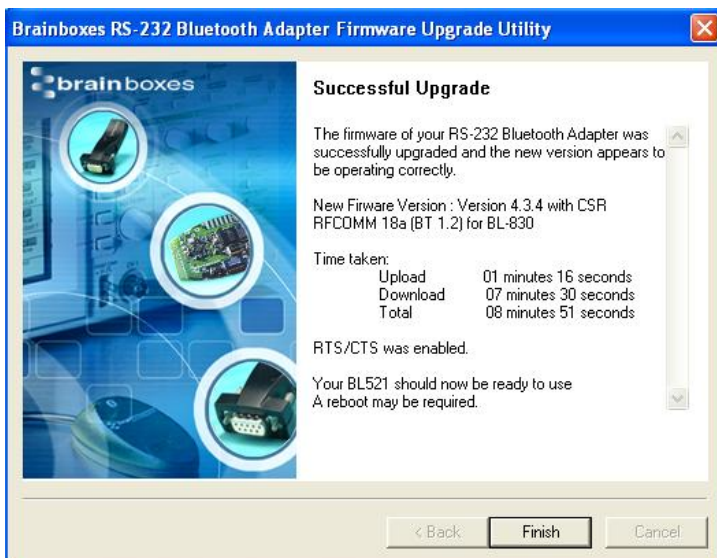
If everything went well the final screen should show indicating any further action that may be required.

Typically a power cycle of the device will be necessary before the upgrade completes.

8. Physically connecting to your RS232 device

8.1. Configuring the communications parameters.

The adapters do not have the ability to auto-detect the communications parameters (e.g. baud rate) so they must be configured to match the data rate used in the application to which they are connected.
Please refer to section 4.2.3 above, for details on how to do this.

It is possible, if a little confusing, to "pair" two adapters and have them physically connected to RS232 devices which use totally different communications parameters.

8.2. Physically connecting your device to adapter via the RS232 connector

The adapter is supplied with a 9-pin D type connector, Male (DTE) for the BL-819 and Female (DCE) for the BL-830. The DTE (Data Terminal Equipment) configuration of the BL-819 has been chosen to allow for easy connection to DCE (Data Communication Equipment) RS232 devices that would normally connect directly to the RS232 port on a computer. Included is a convenient and appropriately wired gender changer that allows the Adapter to behave as a DCE device (e.g. if you wish to connect it to your computer for configuration or to Bluetooth enable the same).
Connector Pin-Outs for the BL-819 DTE are as follows.
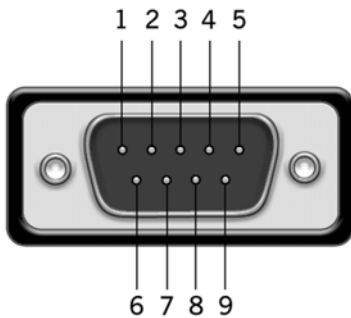
Pin	Signal	Pin	Signal	Pin	Signal
1	N/C	4	DTR – N/C	7	RTS
2	RxD	5	Ground	8	CTS
3	TxD	6	DSR – N/C	9	N/C

As the RS232 standard allows for many different cable configurations, your device may need an additional cable to work with the adapter, such as a "cross-over" or "null-modem" cable. Please refer to your device's documentation for specific details.

For the BL-830 and the BL-819 fitted with the supplied gender changer, the Pin-Outs are
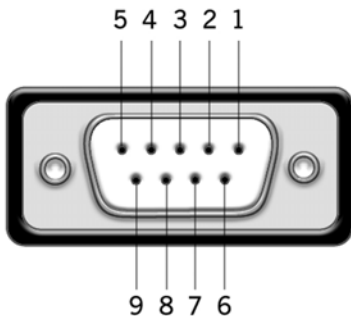
Pin	Signal	Pin	Signal	Pin	Signal
1	N/C	4	DSR – N/C	7	CTS
2	TxD	5	Ground	8	RTS
3	RxD	6	DTR – N/C	9	Power on Pin 9*

The female connector is designed so that it can be plugged directly into a PC's motherboard COM port. If you are connecting it directly to a different device you may need an additional cable, such as a "cross-over" or "null-modem" cable. Please refer to your device's documentation for further details. *NB The ability to use Power on Pin 9 'out of the box' is only available for the BL-830. For the BL-819 to use this method of powering a different gender changer to the one supplied will be required, which has Pin 9 connected.

9. Connecting adapters over Bluetooth.

There are 3 scenarios in which adapter can be connected via Bluetooth. This section details all 3 methods.

a) Client/Server Pair: 2 adapters, configured to perform a "true" cable replacement.
b) Client: adapter is the Bluetooth device which initiates the connection
c) Server: Connecting TO adapter from a remote Bluetooth device (Factory Default)

Each of these 3 different scenarios can be configured in each of the 3 configuration methods previously described and are also documented herein.

## 9.1. Client/Server Pair: "Cable Replacement".

One of the strongest features of the adapter is that 2 of them can be configured to connect to each other and thus behave almost exactly as a cable. This configuration is very straightforward, does not require any Bluetooth software and is detailed below.

For adapter's to connect as a pair, one of the devices needs to be configured as a client device, and one as a server. As the factory settings for adapter are "Server" it follows then that only 1 of the pair needs any alternate configuration from that supplied.

It is advisable that you first configure the communications settings (baud rate etc) for each adapter so that they are suitable for the devices into which you are plugging them. When configuring a pair of adapter's the Communications parameters of each Adapter do not have to match each other's, only that of the devices into which they are connected.

Each adapter has a unique Bluetooth Address (BD_ADDR). This is printed on a label on the base of every product, but is also accessible from the "View Current Settings" menu detailed above. For our example here, we will use a adapter with a BD_ADDR of 000A-4F-00082D, which we'll call the Server, and a second, with a BD_ADDR of 000A-4F-0013BB, which we'll call the Client. We'll leave all other settings for this example as factory defaults. As explained above we only need to change the settings of the Client device…
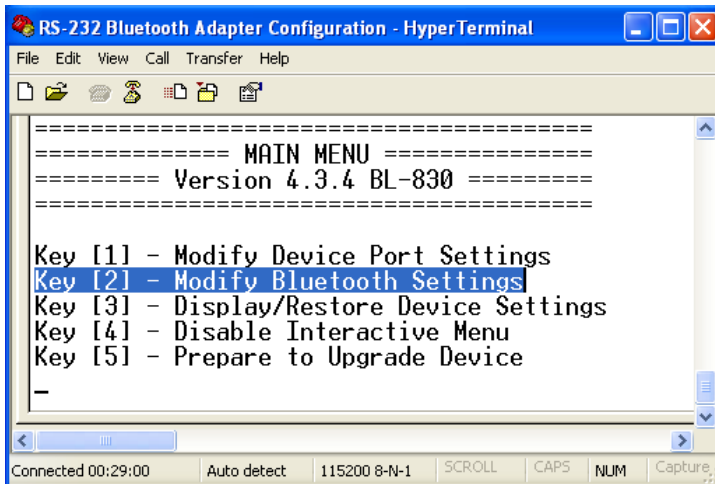
9.1.1. Configuration by Windows Application
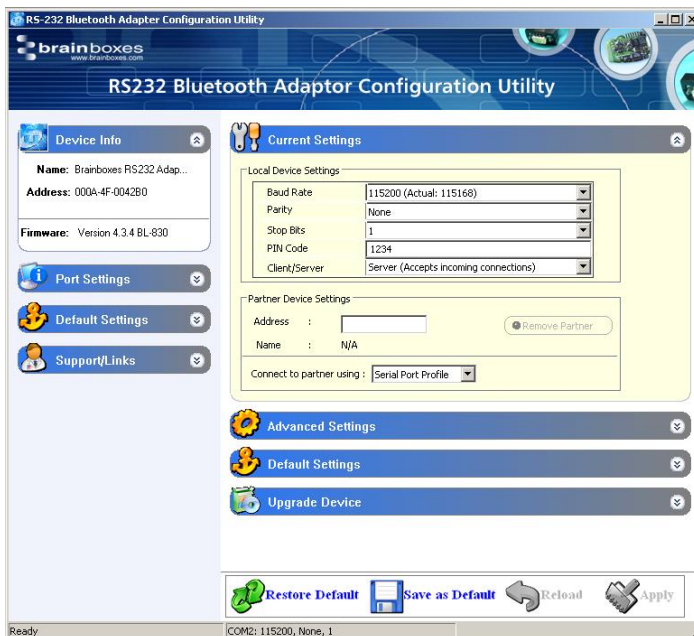
Add the address of your remote device into the "Partner Device Settings" Section in the "Address" field.

Next Click the drop down arrow at the right of the "Client/Server" field in the "Local Device Settings" section and select the "Client" Option
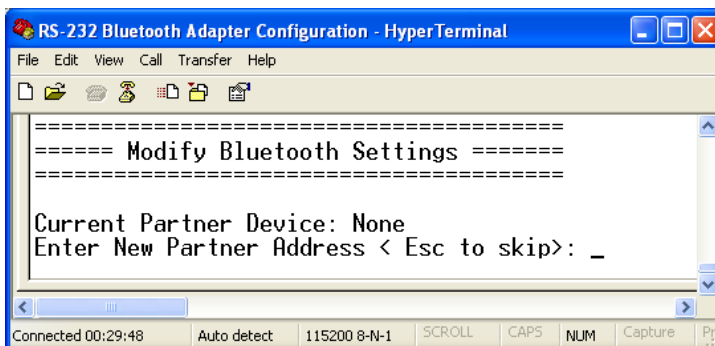Click "Apply"

9.1.2. Configuration by Menu

Select option 2 from the "Main Menu" menu to display the Bluetooth settings menu shown below left.
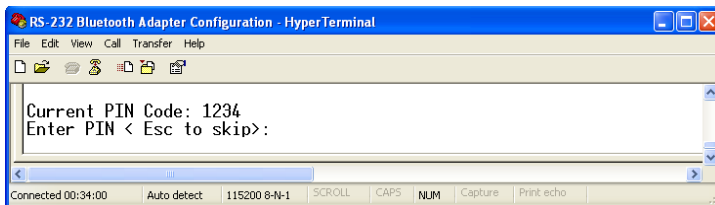
You should enter here the Bluetooth Address (BD_ADDR) of the remote (server) device you wish to pair (in our case this is 000A-4F-00082D) followed by ENTER.

This should be in the same format as indicated on the products label (NAP-UAP-LAP, for those of you who know)
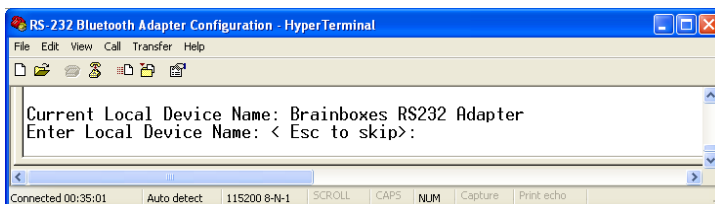
Press "Esc" to skip this section

Press C to select the client option. This setting is stored immediately and is not discarded upon a reboot. In fact it requires a re-boot in order to activate it.

Press "Esc" to skip this option

Re-boot (power cycle) your adapter. When the Client adapter is switched on, it will connect to the Server device you have entered in the menu above, assuming of course that the server device is also powered up. Remember of course that the factory shipped configuration of the adapters is "server" so only 1 device needs any modification in this respect

9.1.3. Configuration by Commands

Access the Adapter you wish to change to "Client" for command mode as documented above and send the following commands:

```
padd = 000A-4F-00082D<CR>
svr = 0<CR>
```

Now power cycle your Adapter and it will attempt to connect to the server device.

9.2. Client: adapter is the Bluetooth device which initiates the connection

The instructions in the above section for creating a "cable replacement" connection should be followed to place the adapter into Client Mode in order to initiate a connection to a remote device substituting the address for that of the other device which you are trying to connect to.

Some remote devices do not allow connection to a Serial Port Profile, but may allow connection to DUN, LAN or FAX profiles. If this is the case, only the Windows Configuration UI or command mode can be used to change the behaviour of your Adapter in this respect. This option is documented above in the Adapter configuration section.

9.3. Server: Connecting to adapter from a remote Bluetooth device.

Connecting to your adapter will vary depending on your application, but will usually consist of 3 Steps.

1 – Configuring the adapter's communications parameters.
2 – Physically connecting adapter to your device.
3 – Connecting to adapter from a remote device via Bluetooth and transferring data.

There are many different scenarios whereby a connection can be made to a adapter and consequently its attached device. The application scenarios will also depend on what sort of device you have attached to the adapter.

9.3.1. Configure and connect the adapter

Configure the communications and Bluetooth parameters of the Adapter as described in the above sections and physically connect it to your RS232 device.

9.3.2. Bluetooth Enable your PC

Any PC based Bluetooth device could be used, but for this example we have used a Brainboxes USB adapter and Bluetooth software for Windows XP.

9.3.3. Discover the device
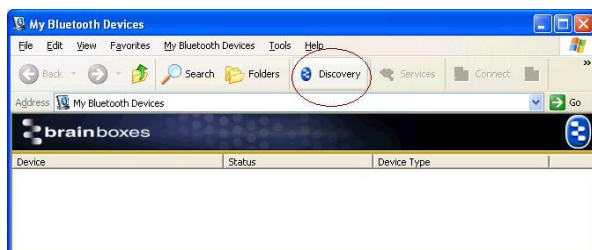
Open the "My Bluetooth Devices" window and click the discovery button to discovering the Adapter using the Brainboxes Bluetooth Windows software. This sets the software to display all the Bluetooth devices it can find "in range".

This software will not operate the Adapter products if attached to the PC although it can be used to connect by Bluetooth to a Adapter attached to the same PC.

Assuming that your adapter is switched on, in radio range and set to "discoverable) you should see it displayed (perhaps alongside other Bluetooth devices in range) in the main screen.

9.3.4. Secure the relationship
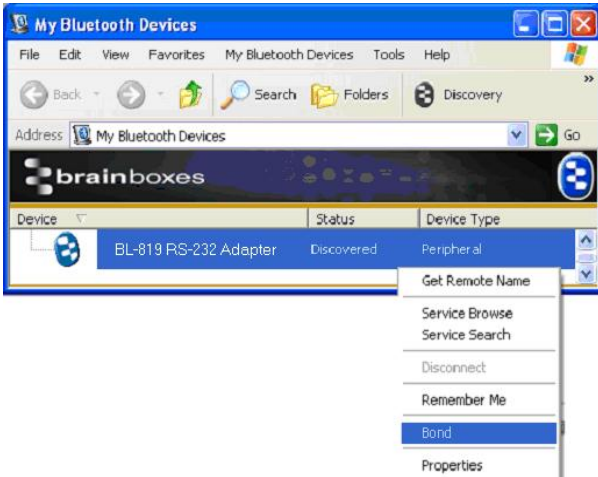
This is where you must "Bond" or "Pair" with the device. This is a feature of Bluetooth, which allows secure communications to take place. It is also used to stop other devices from performing unauthorised connections.

You can start the bonding process by selecting and right clicking on your adapter from the main screen. This brings up a context menu from which you should select the "Bond" option.

If you have configured your adapter from the menu to use a low security mode (and thus not require bonding) then this step can be skipped and you can jump straight to section "9.3.5 Connect to the Serial Port profile".
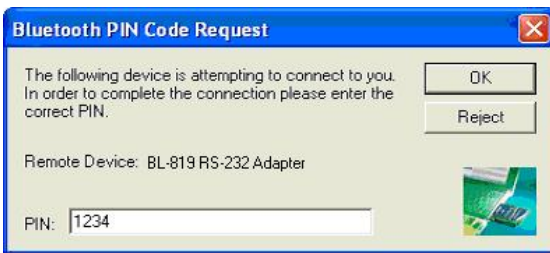
You will then be prompted to enter a PIN number. Enter the Pin number (which is 1234 by default, unless you have used the configuration menu to change it). Click OK

The Icon of your adapter in the main window should now change to indicate a "bonded" status as shown here.

9.3.5. Connect to the Serial Port profile

In order to actually connect to the appropriate function on the adapter you will need to discover it's services.

Double-Click the device selected.

This will display a serial port service called "Serial 01" Double clicking this service (or right clicking and selecting the "connect" option), will create a COM port style connection to the adapter.

This screen shot shows that the port in our example here is listed as COM25, although yours will most likely be a much lower number than this.

This "COM" port is now available for any application to use to communicate with your device, or in our case, the oscilloscope.

9.3.6. Connect your application to the new COM port

In our initial testing at our labs, we use the HyperTerminal application included in Windows to open the new COM port. See documentation above for details of using the HyperTerminal application

10. Worked Examples

10.1. Scientific equipment data logging:

In this example we have connected a Tektronix TDS220 Oscilloscope to a adapter and plugged in the power adapter included. No additional cables or gender changers were used in this application scenario.

In order to communicate to the oscilloscope/adapter we have connected a Brainboxes USB adapter (Order code BL-554) to a laptop with Brainboxes Bluetooth software suite installed. If you are connecting to adapter with a different manufacturers Bluetooth product, please refer to the manufacturers instructions for that product. If you are Bluetooth enabling your laptop with another Brainboxes Adapter you should follow the previous sections instructions.

In this scenario, adapter was configured as a Server (default) and it's baud rate was changed to match that of the oscilloscope (19200 baud). Connection from the USB adapter to the adapter was performed exactly as described in the section above.

Setting HyperTerminal to save data to a file called screen.bmp, and activating the hardcopy feature of the oscilloscope, caused all data to be sent from the scope to the file as listed. This file could then be viewed using any picture editing software and displays an exact screen copy of the oscilloscope. Instructions for using HyperTerminal can be found above. Of course it is also possible for you to write (as we did) your own application to read this data from the COM port and display it very easily.

11. Custom Factory Configuration

To help ease larger application rollouts by removing the need for customer re-configuration of each individual unit supplied, all the settings documented in this manual can be pre-configured to your specification at the factory. Please speak to your account manager/distributor for more details about this service.

12. Troubleshooting

In the rare occasion that you experience difficulties using this product, please read the following suggestions from the table below before contacting our support team.

Symptom	Description	Solution
Data doesn't seem to be received by the product, but seems to be sent by it (e.g. data only travelling in one direction)	This is normally the result of the product being configured as requiring RTS/CTS handshaking, but being plugged into a device which does not support it.	Switch off the RTS/CTS handshaking by putting the device into upgrade mode and using the Upgrade Wizard
Interaction with the menu appears slow and unresponsive, but data does show eventually.	This is normal operation when the product is in Client mode. The product is using most of its processor cycles to try and find and connect to a remote device.	Reconfigure the product to Server mode whilst attempting to configure other options
Cannot interact with the menu	There are a number of scenarios where this might happen… 1. A Bluetooth connection is made 2. The Product has failed to initialise correctly (perhaps if the power adapter has been attached whilst switched on). 3. Incorrect communication parameters selection. 4. Incorrect Wiring configuration	1. No interaction with the menu is possible when a Bluetooth connection is present. Break the connection to restore access to the menu. 2. Switch the power off then on again. 3. Change the communication settings in your terminal application to match those of the devices settings. If you have forgotten or lost these settings, then the device can be restored to its factory settings by performing a long reset. Check your devices wiring and handshake configuration requirements
Firmware upgrade (DFU Wizard) fails	1. Product not connected 2. Product not configured for upgrade	1. Connect your Adapter to a suitable port on your PC and connect the power. 2. Follow instructions in above sections for preparing for upgrade

13. Technical Specifications

Qualified Output Power:	> 0 dBm < +4.0 dBm @ 25 ₀C Receive sensitivity Single Slot = -83 dBm with 0.1% BER

13.1. Storage and Operating Environment

13.1.1. Storage

Temperature: -10°C to +60°C
Humidity: 8% to 95% non-condensing

13.1.2. Operational

Temperature   : 0°C to +40°C
Humidity   : 20% to 75% non-condensing

13.2. Power requirements

13.2.1. Input Voltage Requirements

The product was qualified using a fully rectified AC/DC power supply supplying 550mA @ 5V. To ensure your product performs within the regulatory requirements, it is recommended that you use the AC/DC adapter supplied.. For your information only, the voltage range is given below. Minimum 5.0 V – Maximum 13.6 VDC ***NOTE:*** Power supplied through Pin 9 of the RS 232 connector does go through the regulator and has the same input requirements as the DC jack, +5.0 to 13.6 VDC.

14. Regulatory Information

Bluetooth product operating in 2.4GHz band for Home and Office use.

14.1. Europe – EU Declaration of Conformity

This device complies with the R&TTE Directive 1999/5/EC, and the following standards:

EN 301 489-1 EN 301 489-17	Electromagnetic compatibility and radio spectrum matters(EMR); Electromagnetic compatibility (EMC) standard for radio equipment and services.
ETS 300 328-1: ETS 300 328-2:	Electromagnetic compatibility and radio spectrum matters (EMR); Wideband transmission systems; Data transmission equipment operating in the 2.4 GHz ISM band and using spread spectrum modulation technique.
EN 60950	Safety of information Technology Equipment

14.2. Important Notice for use in France and Italy

Italy: License required for use. Your reseller will tell you the procedure to follow.
E'necessaria la concessione ministeriale anche per l'uso. Verification con Irivenditori la procedura da seguire.

France: Low power device (1mW), there is no limitation for indoor or outdoor use.
Dispositif à faible uissance (1mW), pas de limitation pour son usage à l'intérieur ou a l'extérieur.

14.3. Rest of World

Country restrictions apply for home and office use.

Version History

Version	Date	Author	Checked By	Comments
1.0	06/01/2003	Gav		Initial version
2.0	10/01/2003	Gav		Added info for configuration menu options, changes in pinouts, and other features along with minor formatting changes.
2.1	14/01/2003	Gav		Minor formatting changes
3.0	03/04/2003	Gav	ETW ;SE ;DR ;MW ;OS ;NP J ;PG	Updated to reflect changes on Rev7 Product PCB and updates to product firmware (V2.10)
3.1	11/04/2003	Gav	ETW ;SE ;DR ;MW ;OS ;NP J ;PG	Minor mods and clarifications following review. Creation of index. Minor changes to device menu display updated.
3.2	11/04/2003	Gav	ETW ;SE ;DR ;MW ;OS ;NP J ;PG	Section re-order, update tables.
4.0	26/08/2003	Gav		Re-write for firmware 3.0 additions. Addition of Technical data Various additional explanation/clarification in many areas Addition of troubleshooting information Additional worked examples
4.1	04/09/2003	Gav	SG;NP-J;DR;	Major Formatting alterations
5.0	26/09/2003	Gav	MR; MW	Major Update for new firmware version 4.0 features
5.1	10/12/2003	Gav		Formatting and minor content clarification changes following review
5.2	22/03/2004	Michelle Best		Formatting and minor content changes following updated firmware release
5.3	20/09/2004	Michelle Best		Minor content changes and additions following updated firmware release
6.0	31/09/2005	Doug Arnold	BM; JK; SG	Manual Adapted for BL-819 / 830 RS-232 Bluetooth Adapters

Free Manuals Download Website

http://myh66.com

http://usermanuals.us

http://www.somanuals.com

http://www.4manuals.cc

http://www.manual-lib.com

http://www.404manual.com

http://www.luxmanual.com

http://aubethermostatmanual.com

Golf course search by state

http://golfingnear.com

Email search by domain

http://emailbydomain.com

Auto manuals search

http://auto.somanuals.com

TV manuals search

http://tv.somanuals.com