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Quick Start Guide

BL-521 RS232 Bluetooth Converter

Version: 2.3

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1. Introduction

Brainboxes BL-521 RS232 Bluetooth Adapter is a fully embedded, stand-alone Bluetooth solution, which will Bluetooth enable any device with an RS232 port. BL-521 does not require any host Bluetooth software.

BL-521, when used in combination with another Bluetooth product, (e.g. Brainboxes USB adapter connected to a PC) replaces a cable freeing the device from the limits imposed by the cable specification. The connection uses Bluetooth security and encryption to ensure that sensitive data is secure.

It is user configurable to baud rates between 244 and 1,382,400 baud, with no, 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.

This quick start guide shows you how to get started with the BL-521 in the shortest possible time. For documentation on the full set of configuration features please refer to the full product manual.

2. Changing Settings

2.1. Options at a glance

- View/Set local COM port settings (baud rate, parity, stop bits) *
- View/Set Discoverability, Security mode, encryption and PIN number
- View/Set Pairing options (including pairing to another BL-521)
- View/Set Client/Server configuration (Client connects to Server – important if “pairing” 2 BL-521’s)
- View/Set Local Device Name and Device Class
- View current settings
- Disable/enable configuration menu
- Permanently update “default” settings

2.2. Accessing the configuration menus.

Note: If the BL-521 is connected to another Bluetooth device the configuration menu is not be available.

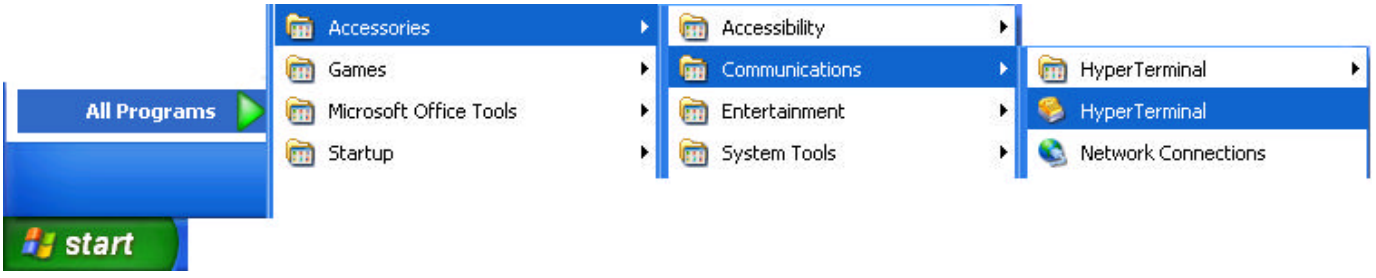
First, connect BL-521 to an available serial port on your computer. In this example, we use COM1. You will need the DTE gender changer from the supplied cable for this to work when connected to a PC.

Ensure the power adapter is connected and switched on (the LED’s on the BL-521 should come on).

The example given below uses 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 Windows open HyperTerminal by clicking “Start\All Programs\Accessories\Communications\HyperTerminal”. Some versions of Windows have a slightly different sequence of clicks, or do not install HyperTerminal by default. Please refer to your operating system instructions for more details.

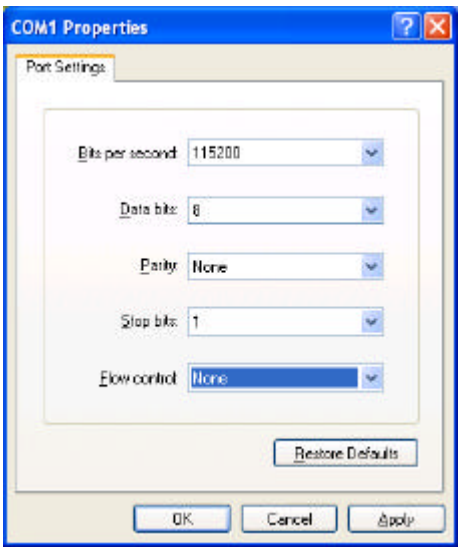
Sending a single “Carriage Return” character to the BL-521 accesses the initial main menu.



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 will not affect the connection.

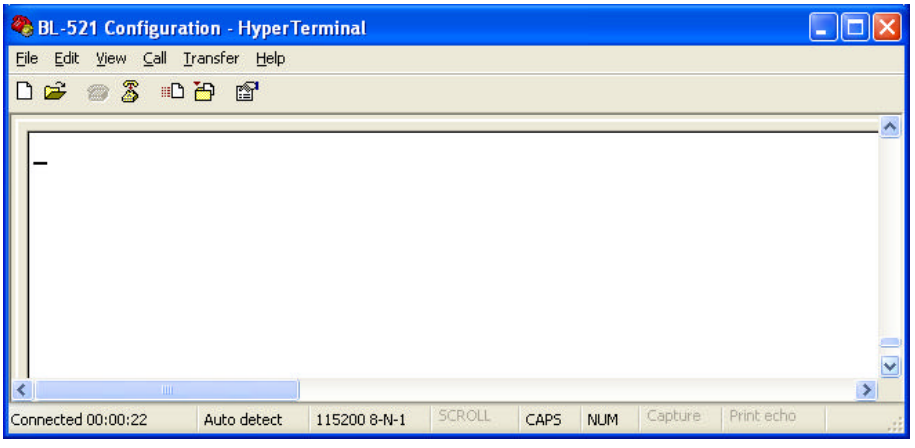
In the next screen give a name to your connection (e.g. BL-521 Configuration), then click OK and select the Port that the BL-521 is plugged into. All other fields will then be greyed out.

Click OK



Select the communications parameters that your device is configured to. In this example we have used the factory defaults. If you have previously changed these values, make sure the settings here match those configured on the device.

Click OK



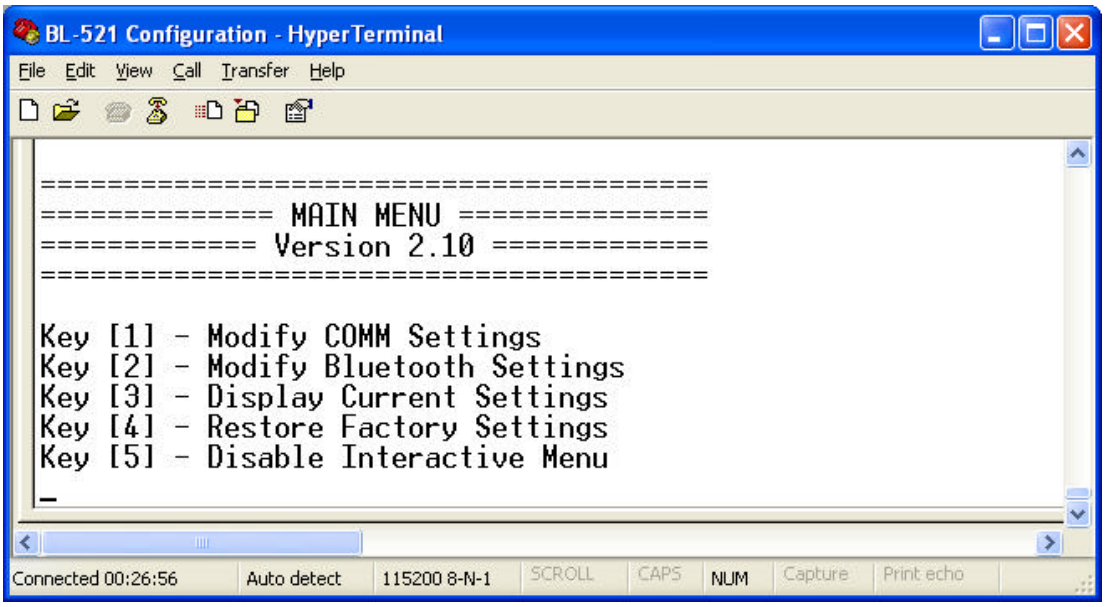
HyperTerminal should now be running.

Now hit the “Enter” key once. This will activate the main menu as shown in 2.3.1 below. You will now be able to now interact with the menus as described in the following sections.

2.3. Changing specific settings.

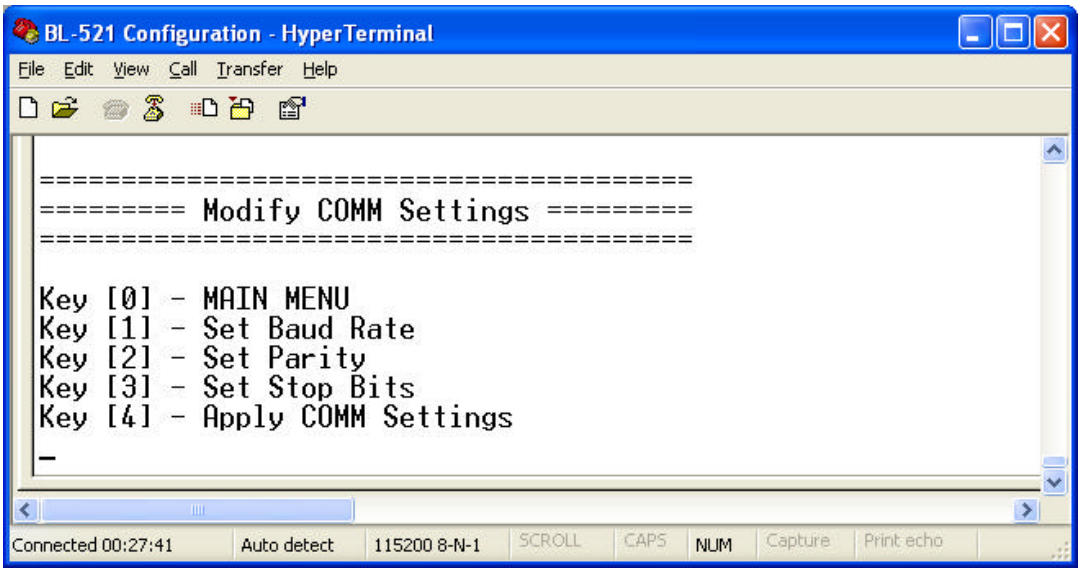
All Settings on the BL-521 are modified through the configuration menu. The main menu is shown below.

2.3.1. Main Menu



2.3.2. Setting the Communications Parameters

This covers options 1 from the main menu, and displays a Communications submenu as shown below.

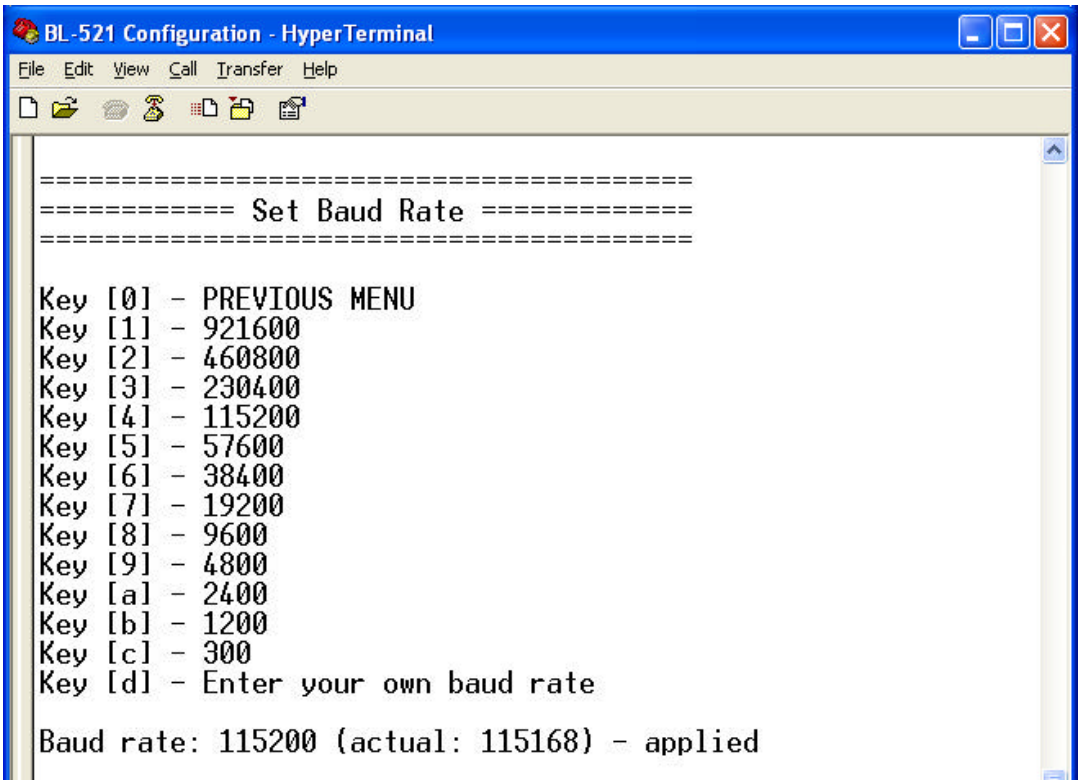


The factory set communications parameters for your BL-521 are as follows…

Baud Rate:	115,200
Data Bits:	8
Parity:	None
Stop Bits:	1
Handshaking:	None

2.3.3. Changing Baud rate.

After selecting option 1 from the “modify COMM menu”, the following baud rate menu is displayed.



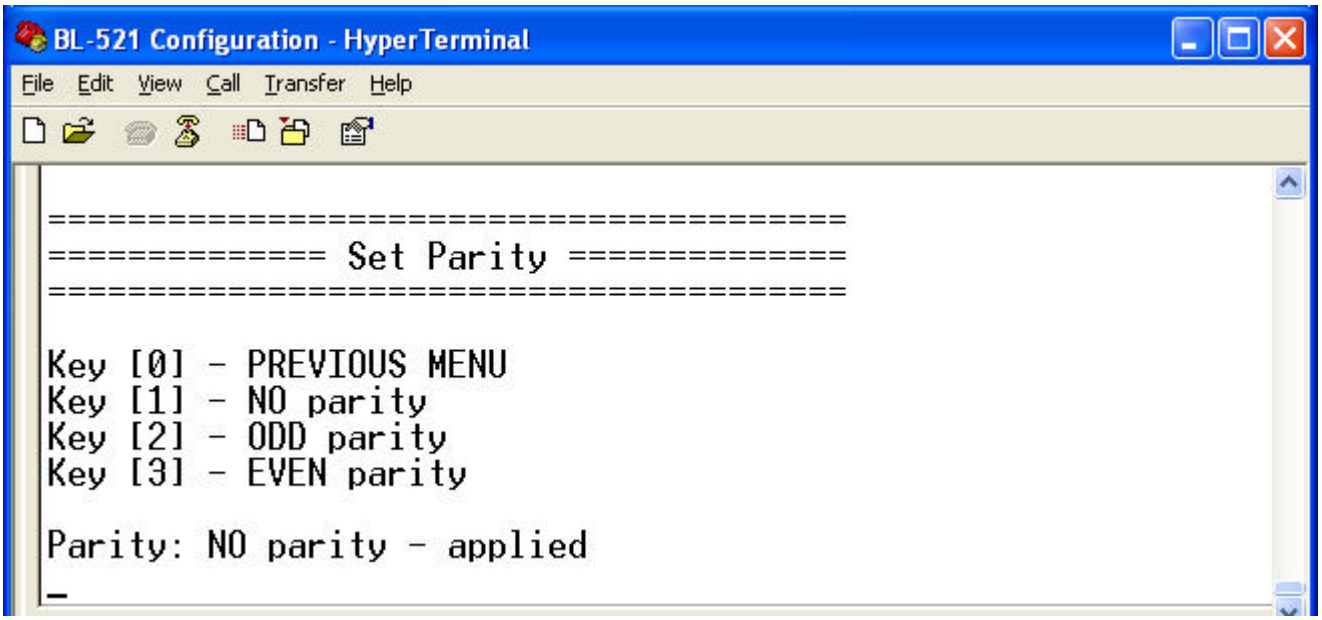
Selecting 0 immediately returns you to the previous menu; selecting any other option will store the appropriate configuration selection.

If you power down your BL-521 at this point, the configuration changes will be discarded.

Note: Configuration changes made in this menu will ONLY be applied when you select option 4 (Apply COMM settings) on the previous menu.

2.3.4. Changing parity.

After selecting option 2 from the main menu, the following menu is displayed.



Selecting 0 immediately returns you to the previous menu; selecting any other option will store the appropriate configuration selection.

If you power down your BL-521 at this point, the configuration changes will be discarded.

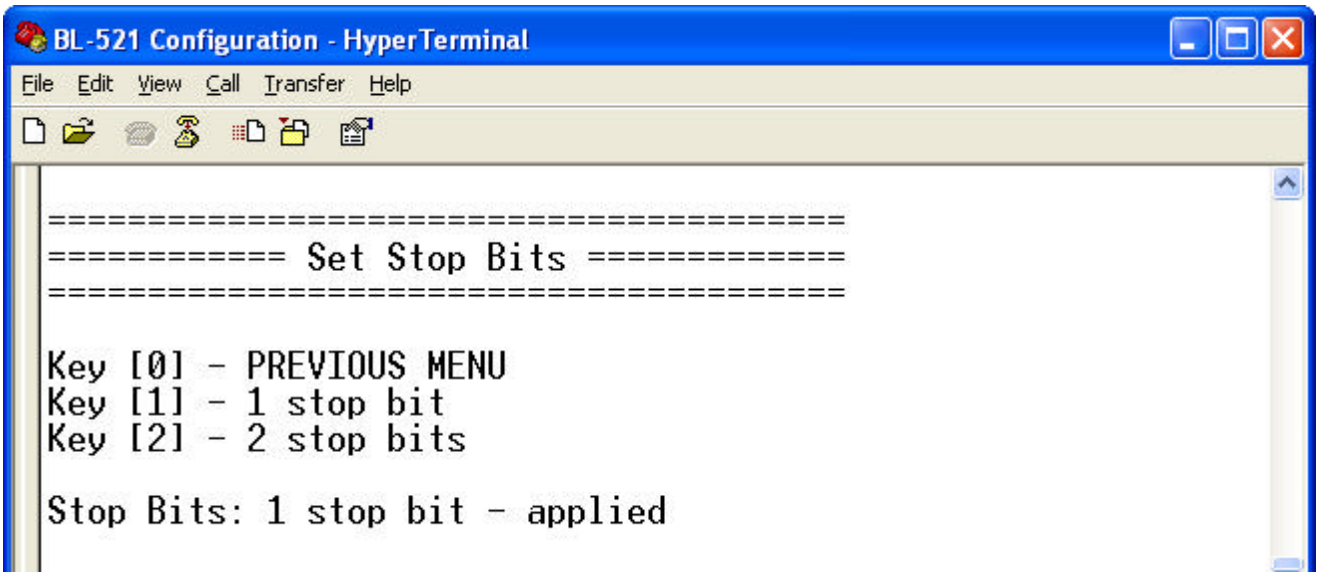
Configuration changes made in this menu will ONLY be applied when option 4 from the previous menu is selected.

2.3.5. Changing data bits.

Unfortunately this setting cannot be changed. Only the 8 data bit format is supported.

2.3.6. Changing number of stop bits.

After selecting option 4 from the main menu, the following menu is displayed.



Selecting 0 immediately returns you to the previous menu without storing any changes; selecting any other option will store the appropriate configuration selection.

If you power down your BL-521 at this point, the configuration changes will be discarded.

Configuration changes made in this menu will ONLY be applied when you select option 4 (Apply COMM settings) from the previous menu.

2.3.7. Applying configuration settings.

Selecting option 4 from the “Modify COMM menu” causes the currently selected serial port configuration options to be applied. This should be with immediate effect. If you wish to further interact with the BL-521, you will need to reconfigure your terminal applications settings to reflect those at which the BL-521 is now operating. Most Bluetooth options are applied immediately.

2.3.8. Handshaking

The version of product in this box supports RTS/CTS handshaking.

2.3.9. Pin Number

The Factory set PIN number is 1234. This can be changed from the Bluetooth configuration menu. The Factory set security state of BL-521 is Mode3 or High. This means the device must be bonded (paired) before any Bluetooth data can be transferred.

3. Connecting via Bluetooth

Connecting to your BL-521 will vary depending on your application, but will usually consist of 3 Steps.

1 – Configuring the communications parameters.

2 – Physically connecting BL-521 to your device.

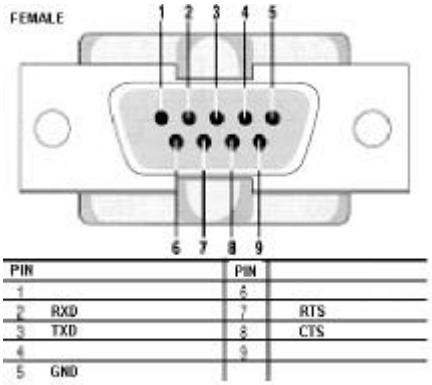
3 – Connecting to BL-521 from a remote device via Bluetooth and transferring data.

3.1. Configuring the communications parameters.

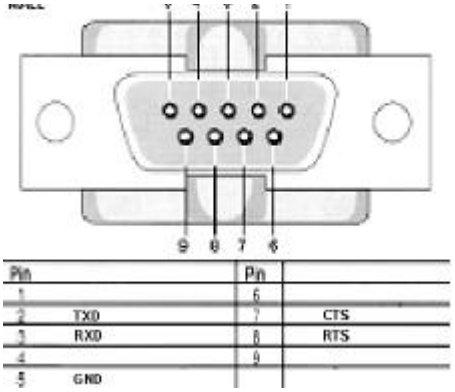
You must match your device communication parameters and those in BL-521 as described above.

4.2 Physically connecting your device to BL-521 via the RS232 connector

Pinouts for standard cable



Pinouts for supplied gender changer



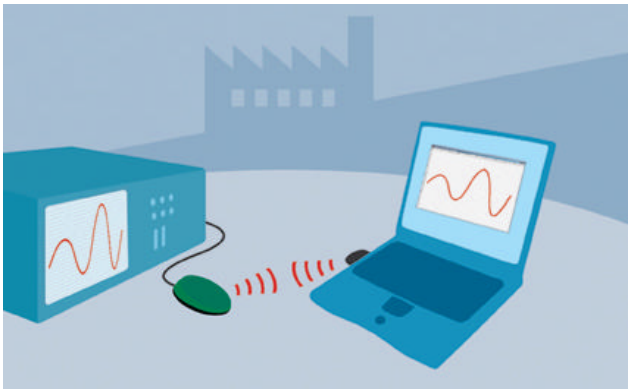
The female connector is designed so that it can be plugged directly into a PC's standard COM port.

The Female to Male "Gender Changer" allows maximum cabling flexibility where existing cabling is already attached.

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.

3.2. Connecting to BL-521 using a Brainboxes Bluetooth product.

There are many different scenarios whereby a connection can be made to a BL-521 and consequently its attached device. The application scenarios will also depend on what sort of device you have attached to the BL-521. One worked example is shown here for illustrative purposes, but the principle will be the same regardless of the device you are connecting to excepting perhaps the cabling arrangements your device might require.



In this example we have connected a Tektronix TDS220 Oscilloscope to a BL-521 and plugged in the power adapter included. No additional cables or gender changers were used in this application. In order to communicate to the scope/BL-521 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 BL-521 with a different manufacturers Bluetooth product, please refer to the manufacturers instructions for that product.

Broadly, this process requires the following steps that are detailed below.

1 - Discover the device

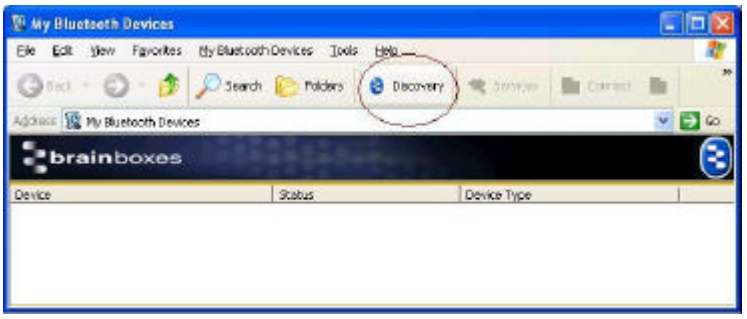
2 - Secure the relationship

3 - Connect to the profile

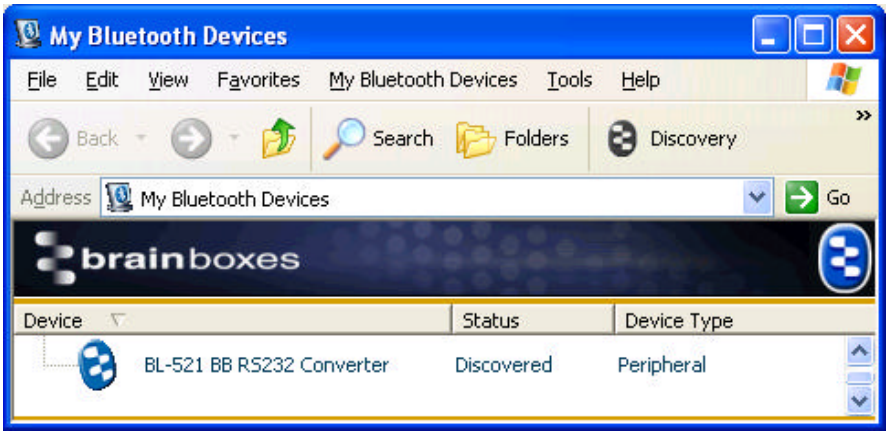
4 - Connect your application to the COM port.

3.2.1. Discover the device

This is performed in Brainboxes Windows software by first opening the “My Bluetooth Devices” window and clicking the discovery button. This sets the software to display all the Bluetooth devices it can find “in range”.



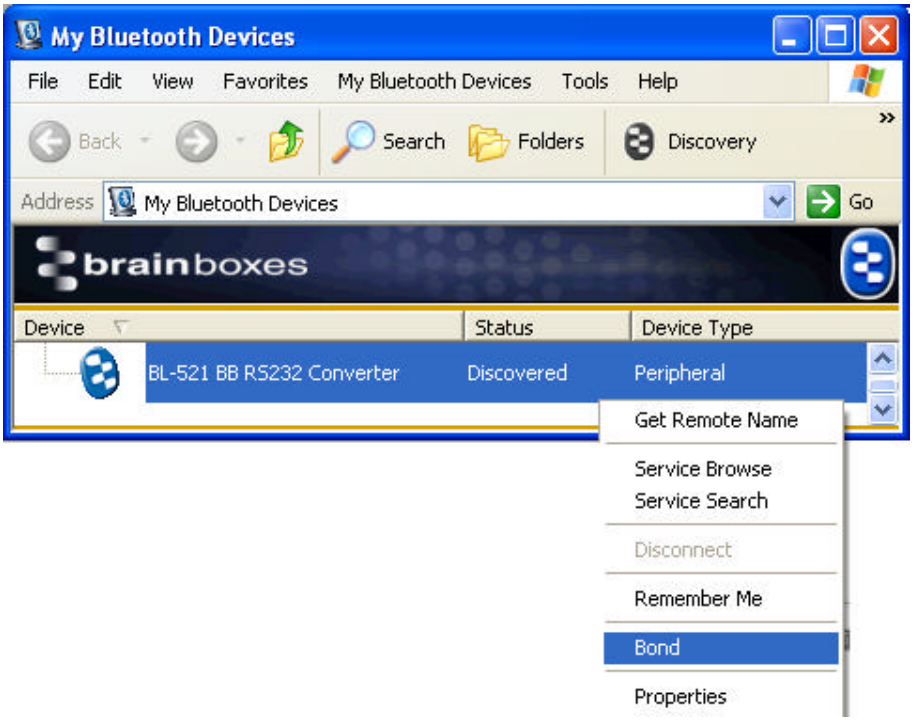
Assuming that your BL-521 is switched on and in range you should see it displayed (perhaps alongside other Bluetooth devices in range) in the main screen.



3.2.2. Secure the relationship

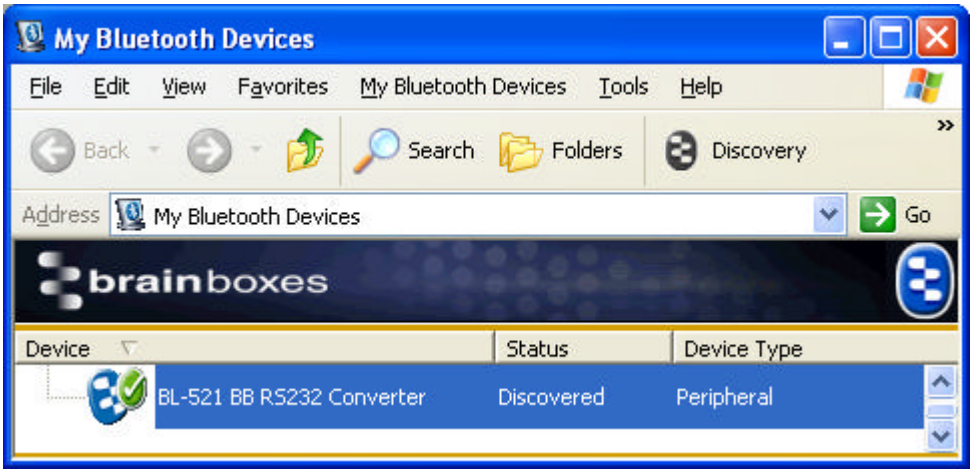
This is where you must “Bond” or “Pair” with the device. This is a feature of Bluetooth, which allows secure communications to take place. It is also used to stop other devices from performing unauthorised connections.

You can start the bonding process by selecting and right clicking on your BL-521 from the main screen. This brings up a context menu from which you should select the “Bond” option.



You will then be prompted to enter a PIN number. Enter the Pin number (which is 00000000 – 8 zeros, unless you have configured it to be different. Click OK

The Icon of your BL-521 in the main window should now change to indicate a “bonded” status as shown below.



3.2.3. Connect to the profile

In order to actually connect to the appropriate function on the BL-521 you will need to discover it’s services.

Simply Double-Click the device.

This will display a serial port service called “Serial 01”

Double clicking this service will create a COM port style connection to the BL-521.

The screen shot below shows that the port in our example here is listed as COM25 – your port number should be much lower than this, but the actual value will depend on your particular machine configuration.

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

3.2.4. Connect your application to the COM port

In our initial testing at our labs, we used the HyperTerminal application included in Windows to open COM25. 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.

4. Regulatory Information

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

1. Europe - EU Declaration of Conformity

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

EN 60950: 1992; EN60335-1: 1994	Safety information Technology Equipment, including Electrical Business Equipment
ETS 300 826; EN 301 489-1/-17: 2000; EN50081 - 1: 1992; EN 50082 - 1: 1997	Electromagnetic compatibility
ETS 300 328-2:	2000 Radio Equipment and Systems (RES); Wideband transmission systems; Technical characteristics and test conditions for data transmission equipment operating in the 2.4 GHz ISM band and using spread spectrum modulation techniques.

4.1. 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 puissance (1mW), pas de limitation pour son usage à l'intérieur ou a l'extérieur.

2. Rest of World

Country restrictions apply for home and office use.

STATEMENT:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation

Notice - FCC Compliance Statement for United States Users:

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

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

Caution - changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

RF Exposure Compliance: this product transmits at very low power of less than 20dBm and therefore complies with the RF exposure compliance requirements. A separation distance of at least 20cm should be maintained between the product and all persons during use, and must not be co-located or operated in conjunction with any other antenna or transmitter.

Important Safety Information

- Do not open the case. There are no user serviceable parts inside the unit
- Do NOT plug in, turn on or attempt to operate an obviously damaged unit.
- Do not alter or modify the cable assembly, or attempt to connect the cable(s) except as directed in the User Guide.
- Do not expose this product to extremes of heat or cold, or to moisture – i.e. dripping or splashing.

Version History

Version	Date	Author	Checked By	Comments
1.0	05/01/ 2003	Gavin Jewell	N/a	Initial version
2.0	10/01/2003	Gavin Jewell		Added info for configuration menu options, changes in pinouts, and other features along with minor formatting changes.
2.1	14/01/2003	Gavin Jewell		Minor formatting changes
2.2	10/04/2003	Gavin Jewell		Updated to reflect rev7 (retail release)
2.3	25/04/2003	Stephen Evans		Add FCC information