



We Make Wireless Work For You!

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Getting Started Guide

Please visit our website to download additional information such as the kcSerial Users Guide, and the kcSerial Reference Guide.

www.kcwirefree.com



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Getting Started

KC Wirefree Modules and Serial Adapters are delivered complete with all the embedded firmware a user needs to operate the Bluetooth device without additional device drivers. Our standard firmware includes a complete upper layer stack, lower layer stack, and kcSerial, a Bluetooth Serial Port Profile (SPP).

Because of this high-level of integration, developers can easily use basic serial communication programs to develop host applications/products that interface through a UART port.



Standard Firmware - kcSerial

kcSerial is a cable replacement application that provides point-to-point communication between two Bluetooth devices. A serial port is used to communicate with a host device through an AT command interface.

kcSerial provides the following basic features:

- Point-to-point connection - standard kcSerial supports a connection with one device at a time.
- Serial Port Profile - SPP is supported with kcSerial for both Client and Server application.
- Dial Up Networking - DUN profile support for Client applications (DUN Server is not currently supported).
- Command and Bypass modes - it is possible to switch between Command and Bypass (data transmit/receive) modes during an active connection
- Security - Bonding and data encryption provides a secure link between two devices.
- Multiple Device Bonding - special security keys can be exchanged with multiple devices to allow different devices to securely connect with kcSerial (although not simultaneously)

- Power conservation - use of Park, Sniff, and Hold features to minimize power consumption
- Variable Baud Rates - the serial port can be configured for the following baud rates: 9600, 19.2K, 38.4K, 57.6K, 115.2K (default), 230.4K, 460.8K, 921.6K

Communications Software

1.1 Connect Bluetooth Device

First, connect the Serial Adapter to your PC using a null modem serial cable, and then connect DC power.

1.2 Launch terminal program

Use HyperTerminal included with Windows OS, or your preferred terminal program. The HyperTerminal default location is:

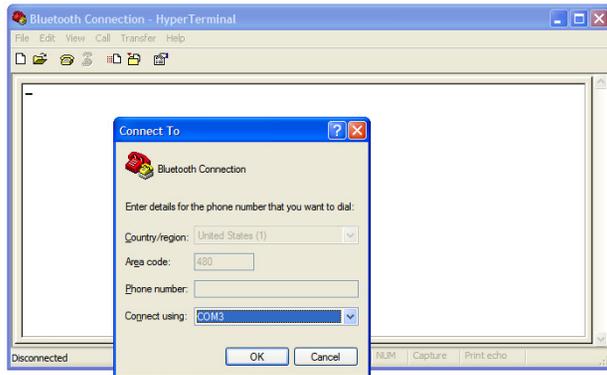
Start Menu > Programs > Accessories > Communications > HyperTerminal

Enter a name for the new connection and click **OK**.



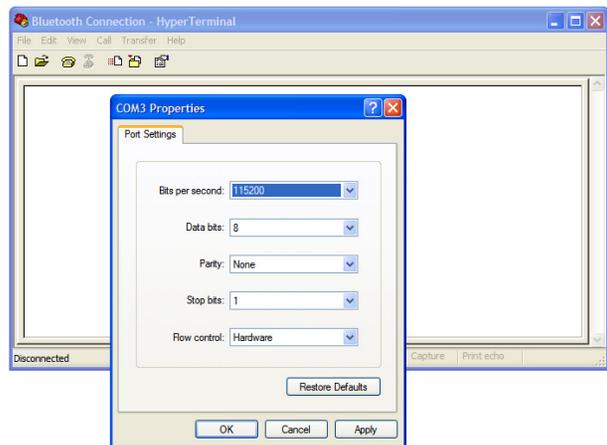
1.3 Choose Communication Port

The **Connect To** dialogue box appears. Choose the com port where the Serial Adapter is connected to the computer and click on **OK**.



1.4 Set Communication Properties

The Com Port Settings dialogue box appears next. The default serial port setup for KC Wirefree adapters is 115kbps, 1 stop bit, no parity, 8 data bits, and HW flow control enabled.



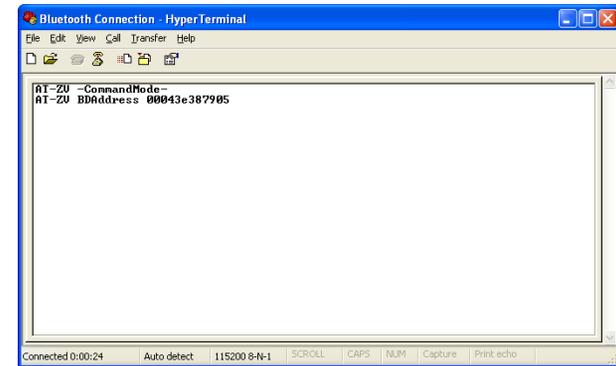
Enter the appropriate settings and click on **OK**.

Note: while KC Serial Adapters can operate at data rates as high as 921kbps, most PC serial ports operate at only 115kbps.

Establish a Serial Connection

After launching HyperTerminal, a window representing your connection appears. Click on the connect icon to establish a connection from the computer's communication port to the evaluation/development board.

After a connection is established from the computer's communication port to the Serial Adapter, you will see the following response:



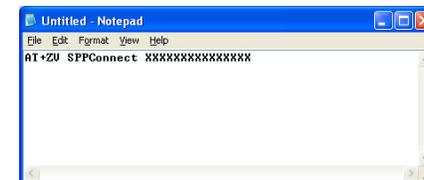
Write Command Scripts

In order to facilitate using HyperTerminal with KC Bluetooth adapters, the use of pre-written test scripts is highly recommended. Since the firmware is not able to accept typed command corrections, any errors will require the command to be completely re-entered. To solve this inconvenience, follow the procedure detailed in this section to create HyperTerminal text scripts for AT type commands:

- Create a new text document to use as your script file.
- Example: Right click on the **Desktop**, and select **New > Text Document** from the menu.
- Name the document "Connect_Command.txt" for example.
- Open the new text document for editing.
- Add the following command line, substituting the desired remote BD address in place of [BD_Addr]:

```
AT+ZV SPPConnect [BD_Addr]
```

Example: AT+ZV SPPConnect 00043e3879a5



- You must press **Return/Enter** at the end of the command line text, otherwise the script will not work.

- Save the script file.
- Creating script files for common commands is recommended. For example:

```
sppconnect.txt
AT+ZV SPPConnect 00043e3879a5

chbaud1.txt
AT+ZV ChangeBaud 115200

chbaud2.txt
AT+ZV ChangeBaud 230400

chbaud4.txt
AT+ZV ChangeBaud 460800

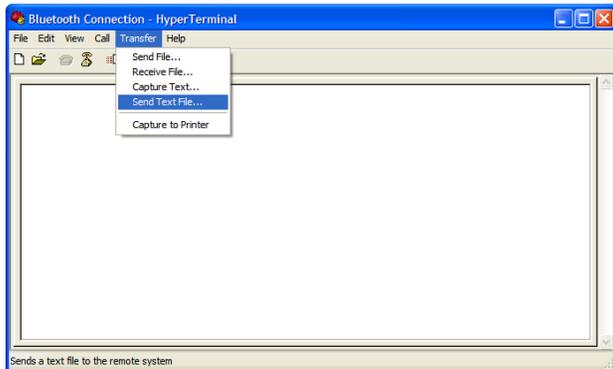
chbaud9.txt
AT+ZV ChangeBaud 921600
```

Invoke the Connect Command

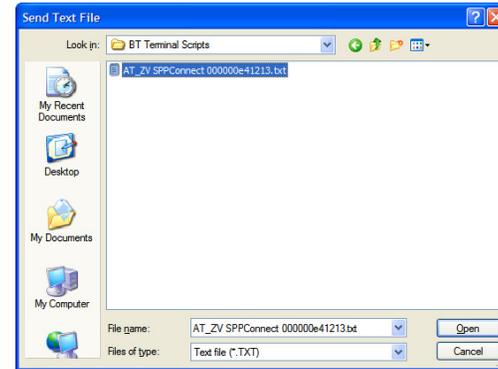
This section describes how to use the `SPP Connect` command script and demonstrates a file transfer over a Bluetooth link.

To invoke a command script and perform a file transfer:

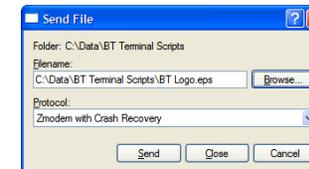
- On the sending computer's HyperTerminal main menu, click on **Transfer** and then select **Send Text File**.



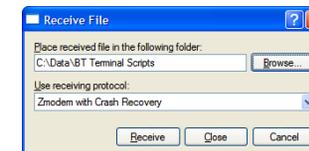
- Locate the previously saved Connection Command script from the browse window that appears, and click **Open**.



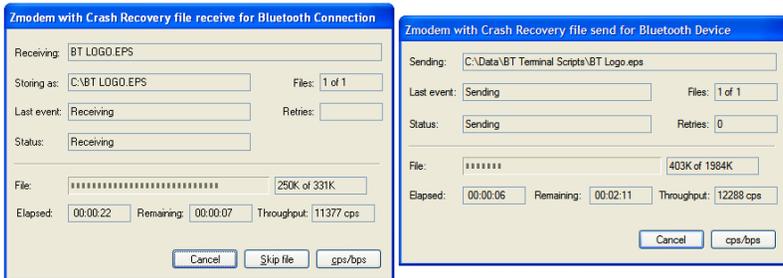
- The script will execute, and a Bluetooth connection will be established to the receiving unit.
- On the sending terminal, select **Transfer > Send File**. The following window appears:



- Enter the name of the file to send, or click **Browse** to find one.
- Choose **Zmodem** from the list of protocols and click **Send**.
- On the receiving terminal, select **Transfer > Receive File**. The following window appears:



- Click **Browse** to choose the location for the incoming file.
- Choose **Zmodem** from the list of protocols and click **Receive**.
- Transfer dialog windows will appear on each terminal:



Changing the Baud Rate

Although the adaptors initially have a default baud rate of 115200 bps, multiple baud rates are supported. To change the baud rate for the current session, use the following command and press **Return/Enter**.

```
AT+ZV ChangeBaud [new baud rate]
```

It is not necessary to reset. If the adaptor is reset, the baud rate and other session configurations will be reset to default.

To permanently change the default baud rate, use the following command:

```
AT+ZV ChangeDefaultBaud [new baud rate]
```

In this case, the new default baud rate will be applied after every reset, but not for the current session.

- After the baud rate has been changed, the terminal's baud rate must also be changed to match. On HyperTerminal's main menu, select **File > New Connection**. Follow the instructions of section 2, but enter the new baud rate.

1.5 High Speed Serial Cards

In order to increase the UART speed of the PC to values above 115kbps, it is often necessary to use an add-in high speed serial card.

Streaming Mode Dip Switch

Dip Switch 1: On = Enable Streaming, Off = Disable Streaming

Dip Switches 2, 3, 4: Future Use

Reset power to the adaptor after changing dip switches.

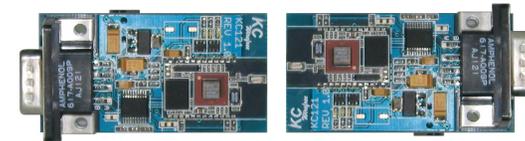
The default UART setting for hardware flow control, CTS/RTS, is enabled. If this setting is not desired, a feature called streaming serial mode may be enabled using the Dip Switch block on the back of the KC serial adaptor.

Streaming serial mode activates the following changes:

- The CTS/RTS flow control lines are ignored by the UART
- Data may be discarded when the Bluetooth link is unable to transmit due to poor RF conditions such as out of range.
- The maximum baud rate is limited to 115K bps.

Antenna Performance

The ceramic chip antenna is a high-performance device that must be aligned properly for best performance.



Poor Range - Antennas "pointing" at each other



Best Range - Antennas aligned in parallel or vertically.

As with all 2.4GHz wireless devices such as cordless phones, WiFi internet, range is reduced by walls, metal obstructions, and other wireless interferences. KC Wirefree products can typically achieve a communication range of 30m for class 2 devices, and 200m for class 1 devices with an unobstructed line of sight connection.

kcSerial Commands

Bond	AT+ZV Bond [BD addr] [PIN]
Bypass	AT+ZV Bypass
ChangeBaud	AT+ZV ChangeBaud [rate]
ChangeDefaultBaud	AT+ZV ChangeDefaultBaud [rate]
DeleteSmartCable	AT+ZV DeleteSmartCable
DisableBond	AT+ZV DisableBond
Discovery	AT+ZV Discovery
DunConnect	AT+ZV DUNConnect [BD Addr] [Service]
DunDisconnect	AT+ZV DUNDisconnect
EnableBond	AT+ZV EnableBond [BD addr] [PIN] [timeout]
EraseBondTable	AT+ZV EraseBondTable
ExitPart	AT+ZV ExitPark [BD address]
ExitSniff	AT+ZV ExitSniff [BD address]
GPIOConfig	AT+ZV GPIOConfig [GPIO Pin] [Configuration]
GPIORead	AT+ZV GPIORead [GPIO Pin]
GPIOWrite	AT+ZV GPIOWrite [GPIO Pin] [Setting]
Hold	AT+ZV Hold [BD address] [Hold Duration]
HostEvent	AT+ZV HostEvent [Enable/Disable]
LocalName	AT+ZV LocalName [name]
Park	AT+ZV Park [BD address] [Beacon Period]
RemoteCmdDisconnect	AT+ZV RemoteCmdDisconnect
Reset	AT+ZV Reset
Security	AT+ZV Security [level]
SmartCableSetup	AT+ZV SmartCableSetup [BD address] [Attempts] [Interval]
Sniff	AT+ZV Sniff [BD address] [Sniff Interval]
SPPConnect	AT+ZV SPPConnect [BD Addr] [Service]
SPPDisconnect	AT+ZV SPPDisconnect
UpdateInquiryScan	AT+ZV UpdateInquiryScan [mode] [duration] [interval]
UpdatePageScan	AT+ZV UpdatePageScan [mode] [duration] [interval]
Version	AT+ZV Version

For more detailed information about serial application programming, download the [kcSerial User Guide](#) and the [kcSerial Reference Guide](#) from our website.

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