## **HC-05 Bluetooth Configuration**

In order to allow the Bluetooth modules to connect to one another and transmit information they first need to be configured. These modules can be configured using AT commands that described in the datasheet of the module. The modules need to be connected to the computer in order to send the commands to the modules through the serial port. To accomplish this the modules are connected to the CP2102 USB to UART module.

### **Preparing HC-05 for Configuration**

Machine generated alternative text:

Before the commands can be sent to the Bluetooth module, it needs to connect to the CP2102 first. Figure 1 shows the how the two modules should be connected together.

Figure : Connections between CP2102 and HC-05.

The CP2102 module then connects to the computer USB port. In order to make the Bluetooth module enter configuration mode, a button shown in figure 2 needs to be pressed down when the CP2102 module is connected to the computer. If the module has entered configuration mode, it will flash an LED once every two seconds. If the button is not pressed the Bluetooth device will be powered up in normal mode.

Machine generated alternative text:
wuU.hC01.C 
BUtton 

Figure : HC-05 button location.

To send commands to the module PuTTY must be opened and connected to the COM port which the CP2102 is connected to at a baud rate of 38400 as this is the baud rate the Bluetooth module uses in configuration mode. The number of the COM port that CP2102 is connected to can be found in the device manager.

### **AT Commands**

The following AT commands were used to configure the Bluetooth modules as either master or slave devices.

**AT** - Checks if the Bluetooth module is responsive. The response from the Module should be "OK" if it is.

**AT+ADDR** - Prints out the address of the device. It will be needed to make the master module connect to the specific address. The address of the slave module is: +ADDR:2017:4:173778. Only this 2017:4:173778 part of the address is required.

**AT+ROLE=<PARAMETER>** - This command sets the module up as a slave or master. PARAMETER = 0 for slave and 1 for master.

**AT+UART=<PARAMETER1>,<PARAMETER2>,<PARAMETER3>** - This command sets serial communication parameters. It only sets these parameters for normal mode operation; the configuration mode is not affected by these changes.

* PARAMETER1 - The Baud rate.
* PARAMETER 2 - The number of stop bits. PARAMETER2 = 0 = 1 Stop Bit and PARAMETER2 = 1 = 2 Stop Bits.
* PARAMETER 3 - The parity bit. PARAMETER3 = 0 = No parity bit, PARAMETER3 = 1 = Odd Parity, PARAMETER3 = 2 = Even Parity.

**AT+BIND=<PARAMETER>** - This command is used to make the master module only connect to the specific slave device. The address that obtained from the slave module is the parameter of this command. The colons are replaced with commas when binding the address like so: 2017,4,173778

### **Configuration: Slave**

When the Bluetooth module is configured as a slave device, it cannot connect to seek connections to any Bluetooth. To configure the device as a slave the following commands and parameters were used:

* **AT+ADDR**
* **AT+ROLE=0**
* **AT+UART=115200,0,0**

### **Configuration: Master**

When the Bluetooth module is configured as a master device, it is able to seek to connect with Bluetooth devices in range. The following commands and parameters were used to configure the Bluetooth module as a master device.

* **AT+ROLE=1**
* **AT+UART=115200,0,0**
* **AT+BIND=2017,4,173778**