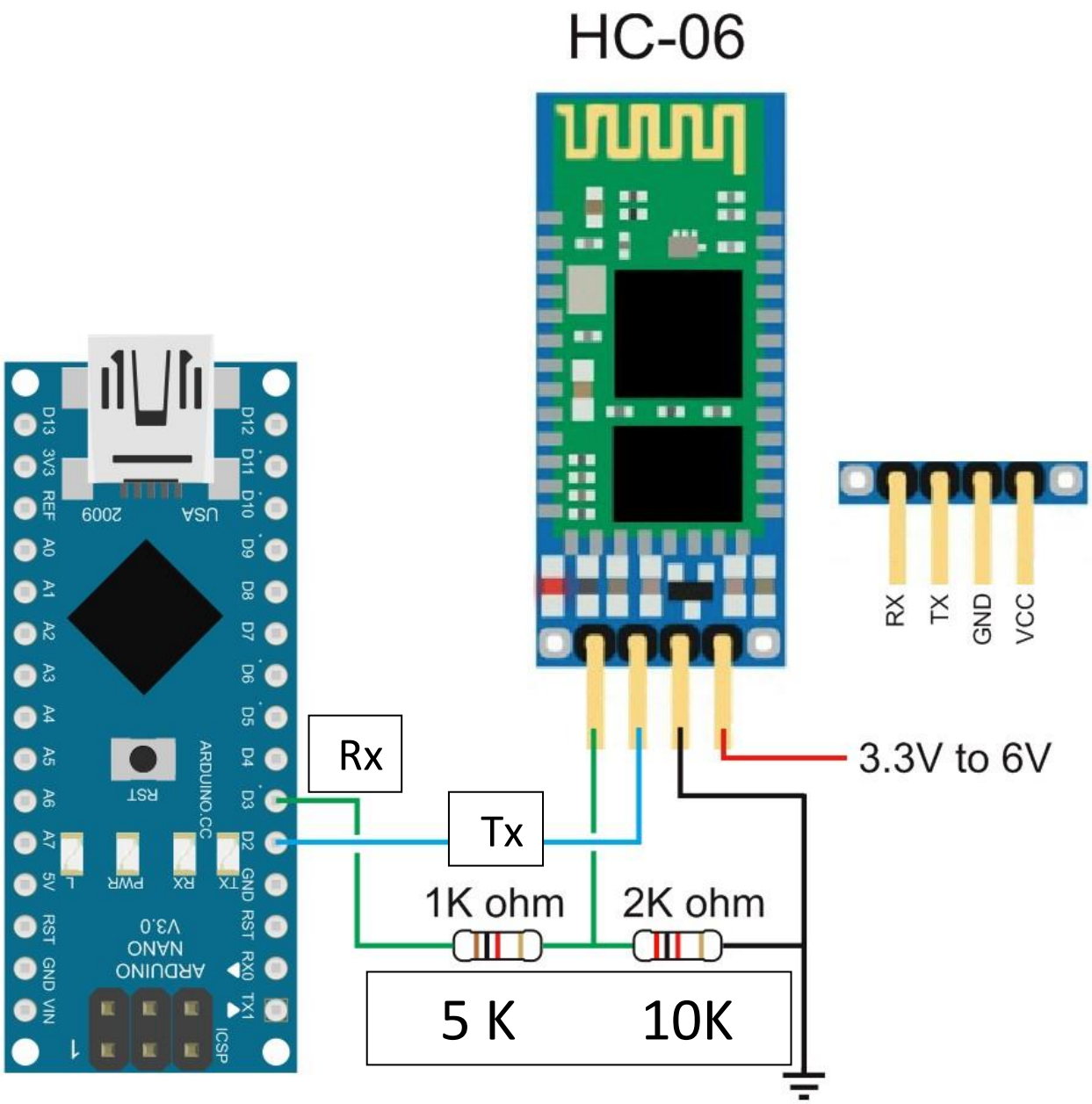
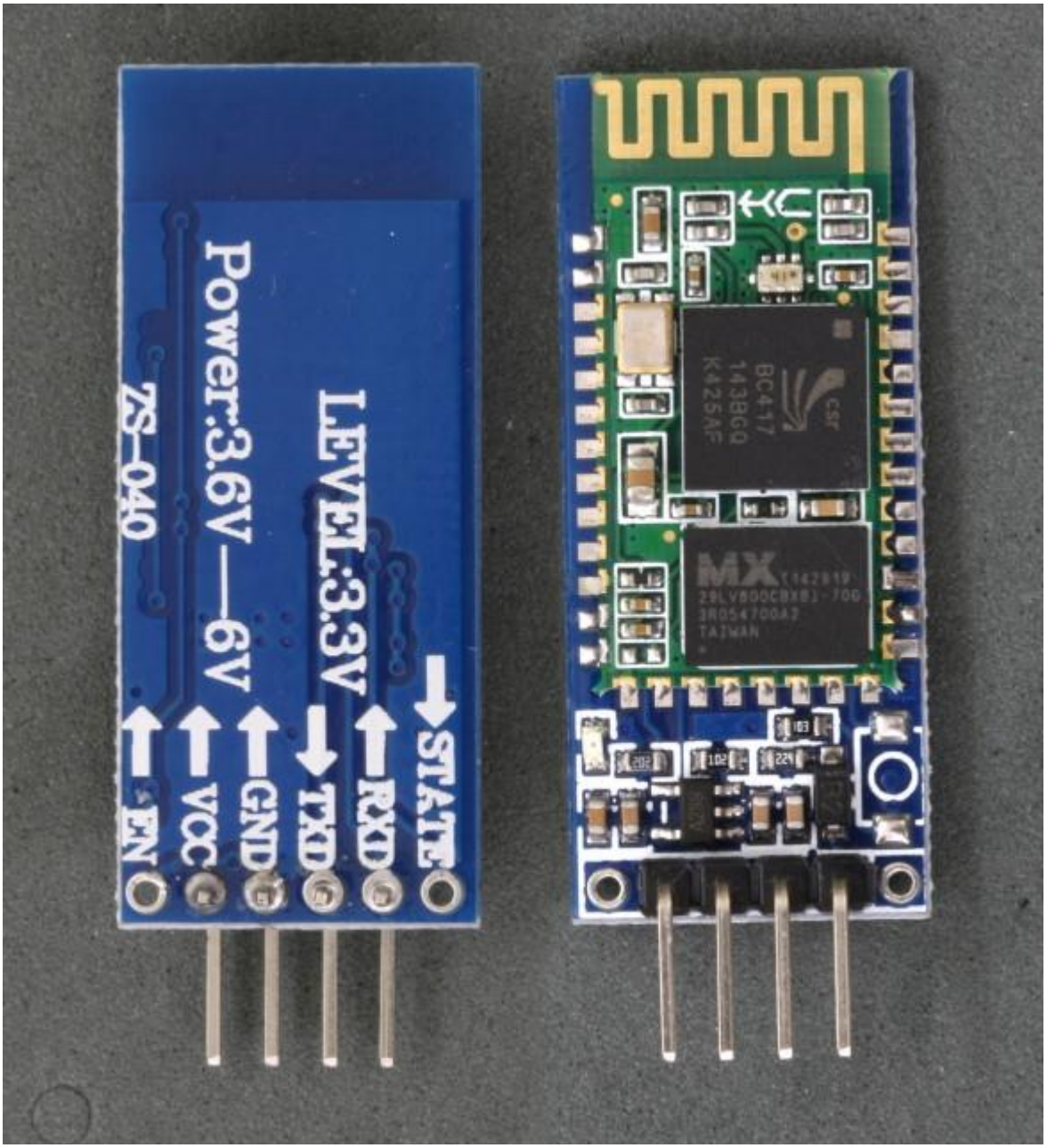

HC-06
RX
TX
GND
VCC
Rx
Tx
3.3V to 6V
1K ohm
2K ohm
5 K
10K

Arduino and HC-06 (ZS-040)

Posted on **October 8, 2014**

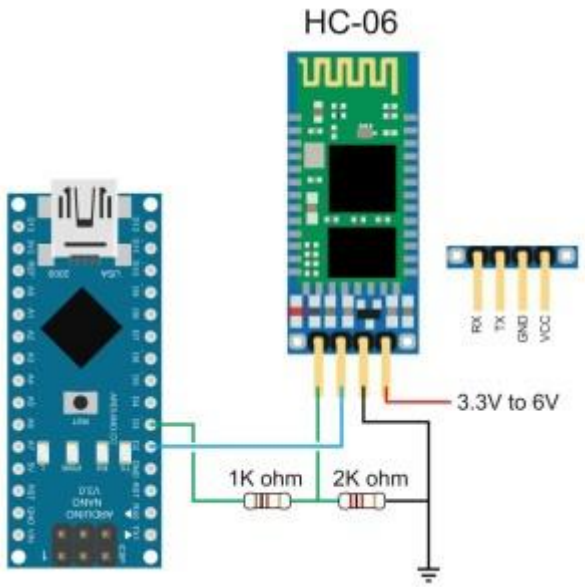
The HC-06 is a slave only BT module that is fairly easy to use with the Arduino using serial communication. Once it is connected it simply relays what it receives by bluetooth to the Arduino and whatever it receives from the Arduino it sends to the connected device. There are several slightly different versions of the HC-06, however, all seem to use the same firmware and have the same AT commands. The ones I have are labelled as zs-040. I also have some HC-05s which share the same PCB and are also labelled as zs-040.



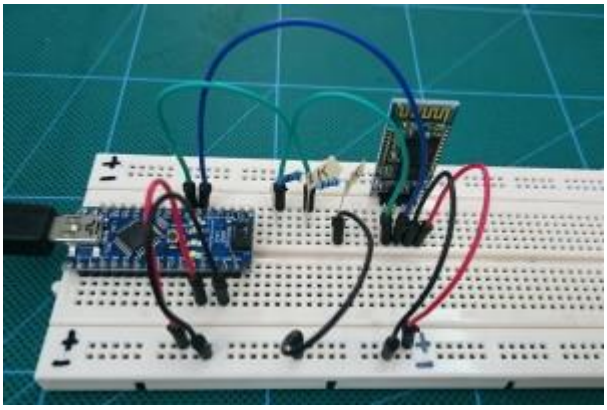
The HC-06 defaults to AT mode at power on. This is indicated by a rapidly flashing LED. After the HC-06 is connected to another device the LED stops flashing and is constant on.

Connections

The Bluetooth module the ZS-040 is based on, the EGBT-046S, is a 3.3V device. The HC-06 breakout board has a 3.3v regulator that allows a larger input voltage to be used, in the range of 3.6 to 6 volts. The RX pin can still only accept 3.3V though. This means a voltage divider is required to connect to a 5V Arduino. A simple voltage divider can be created using 2 resistors. I am using a 1K ohm resistor and a 2K ohm resistor. The Arduino will read 3.3V as a HIGH so the HC-06 TX pin can be connected directly to the Arduino.



HC-06 Vin to 5V (can be from the +5V out from the Arduino)
HC-06 GND to common GND
HC-06 RX to Arduino pin D3 (TX) via a voltage divider
HC-06 TX to Arduino pin D2 (RX) connect directly



Test Communication With The HC-06
After connecting everything we need to talk to the HC-06. We can do this by using software serial on the Arduino. I use software serial to talk to Bluetooth modules and use the hardware serial for debugging.

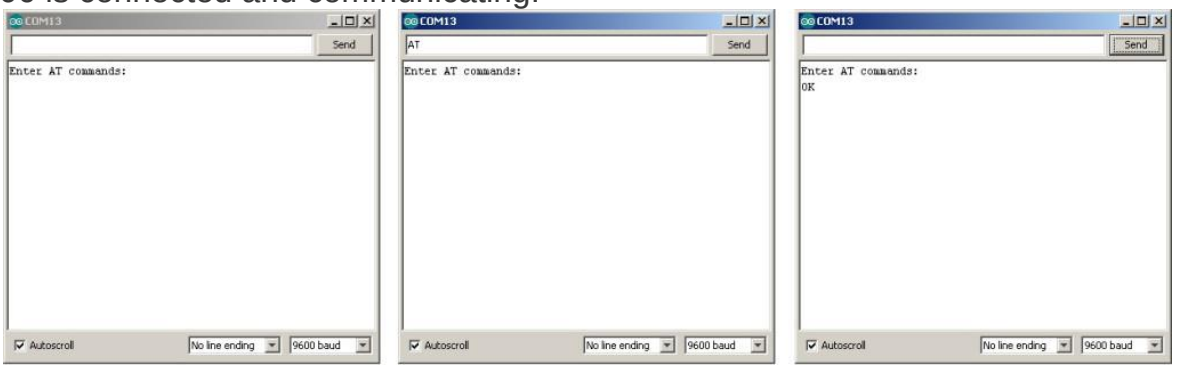
The following sketch takes whatever is entered in to the serial monitor on a host computer and relays it to the HC-06. The sketch also takes whatever the HC-06 outputs and forwards it to the serial monitor. The Arduino is acting like a relay station between the serial monitor and the BT module.

The HC-06s I have have a default baud rate of 9600. Other modules have a different baud rate. If 9600 doesn't work try other speeds. 38400 is also very common. Once you have communication working you can change the baud rate to suit your needs.

```
// Basic Bluetooth sketch HC-06_01
// Connect the Hc-06 module and communicate using the serial monitor
//
// The HC-06 defaults to AT mode when first powered on.
// The default baud rate is 9600
// The Hc-06 requires all AT commands to be in uppercase. NL+CR should not be added to the command string
//


#include <SoftwareSerial.h>
SoftwareSerial BTserial(2, 3); // RX | TX
// Connect the HC-06 TX to the Arduino RX on pin 2.
// Connect the HC-06 RX to the Arduino TX on pin 3 through a voltage divider.
//


void setup()
{
    Serial.begin(9600);
    Serial.println("Enter AT commands:");

    // HC-06 default serial speed is 9600
    BTserial.begin(9600);
}

void loop()
{

    // Keep reading from HC-06 and send to Arduino Serial Monitor
    if (BTserial.available())
    {
        Serial.write(BTserial.read());
    }

    // Keep reading from Arduino Serial Monitor and send to HC-06
    if (Serial.available())
    {
        BTserial.write(Serial.read());
    }

}
```

The HC-06 zs-040 expects commands to be in upper case and does not require carriage return and new line (\r\n) characters.
Open the serial monitor and select a baud rate of 9600 and ensure "No line ending" is selected from the drop down list at the bottom of the window.
Enter "AT" (no quotes) into the top text box and hit Send. If the HC-06 likes you it will say OK. AT is a basic communications test command that allows you to check the HC-

06 is connected and communicating.

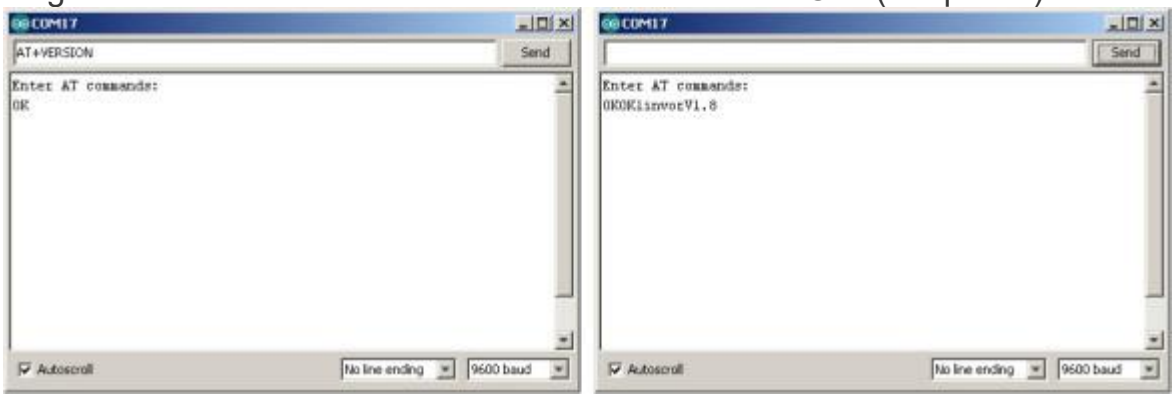


AT Commands

The HC-06 has a limited number of commands. You can rename the device, change the baud rate, and change the PIN/password. That's about it.

Command	Reply	Comment
AT	OK	Communications test
AT+VERSION	OKlinvorV1.8	Firmware version.
AT+NAMEmyBTmodule	OKsetname	Sets the modules name to "myBTmodule"
AT+PIN6789	OKsetPIN	Set the PIN to 6789
AT+BAUD1	OK1200	Sets the baud rate to 1200
AT+BAUD2	OK2400	Sets the baud rate to 2400
AT+BAUD3	OK4800	Sets the baud rate to 4800
AT+BAUD4	OK9600	Sets the baud rate to 9600
AT+BAUD5	OK19200	Sets the baud rate to 19200
AT+BAUD6	OK38400	Sets the baud rate to 38400
AT+BAUD7	OK57600	Sets the baud rate to 57600
AT+BAUD8	OK115200	Sets the baud rate to 115200
AT+BAUD9	OK230400	Sets the baud rate to 230400
AT+BAUDA	OK460800	Sets the baud rate to 460800
AT+BAUDB	OK921600	Sets the baud rate to 921600
AT+BAUDC	OK1382400	Sets the baud rate to 1382400

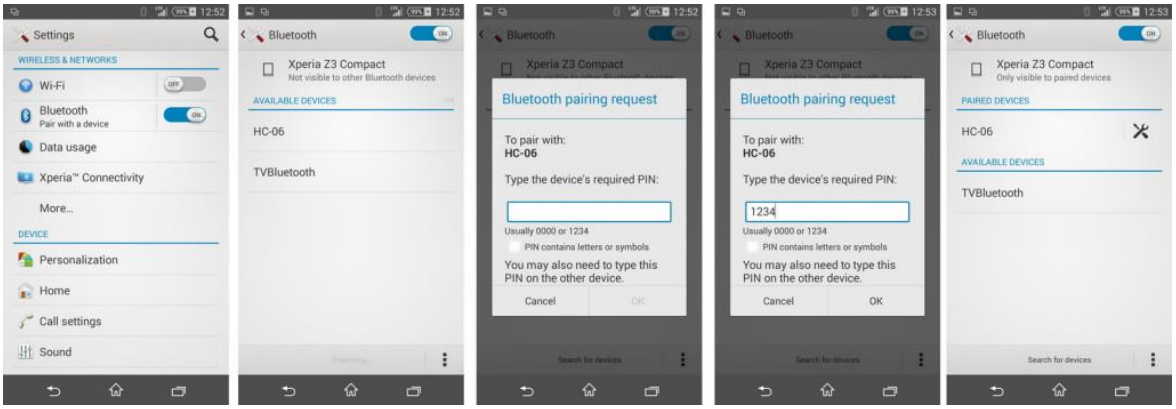
To get the modules firmware version enter “AT+VERSION” (no quotes):



The modules I have report they are using version linvorV1.8 which seems to be common for many HC-06s.
Note: Windows cannot use baud rates above 115200. If you are using Windows and you accidentally set the baud rate higher than 115200 you’re screwed!

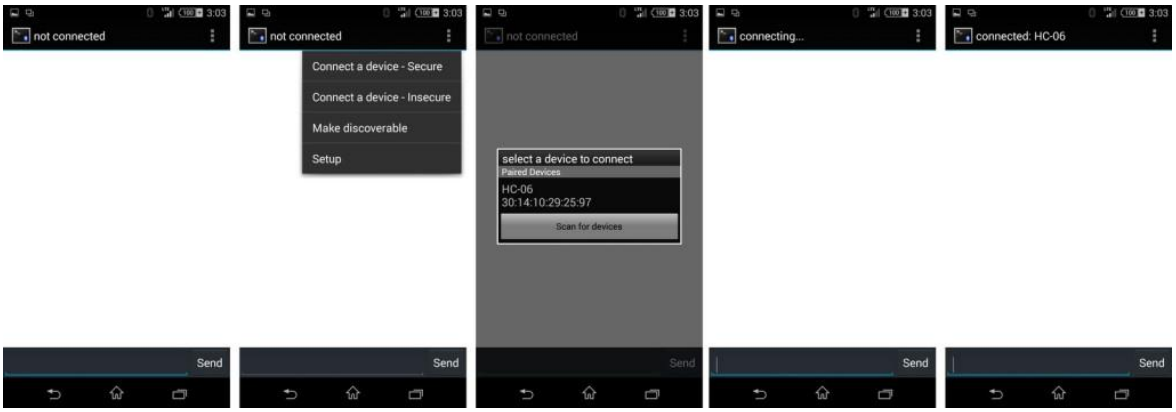
After confirming that the HC-06 is working and communicating we can try to connect to an Android device.

HC-06 Connecting to an Android Device
Since the HC-06 is a slave only device, the connection must be started by another device. Below are the steps to pair and then connect with an Android device.
I am using an app called Bluetooth Terminal which is available for free on google play.
Before you can connect to the HC-06 you need to pair it.
Power on the HC-06. The LED will flash rapidly.
Open Settings on the Android device and select Bluetooth.
If your device does not auto-scan you will need to manually scan for available bluetooth devices. The HC-06 should appear in the list.
Select the HC-06. You will be asked for the pin. The default pin is “1234”.
The modules name may include the mac address; a series of hexadecimal numbers.

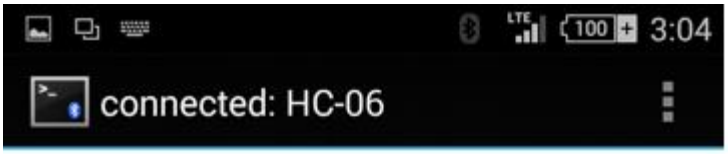


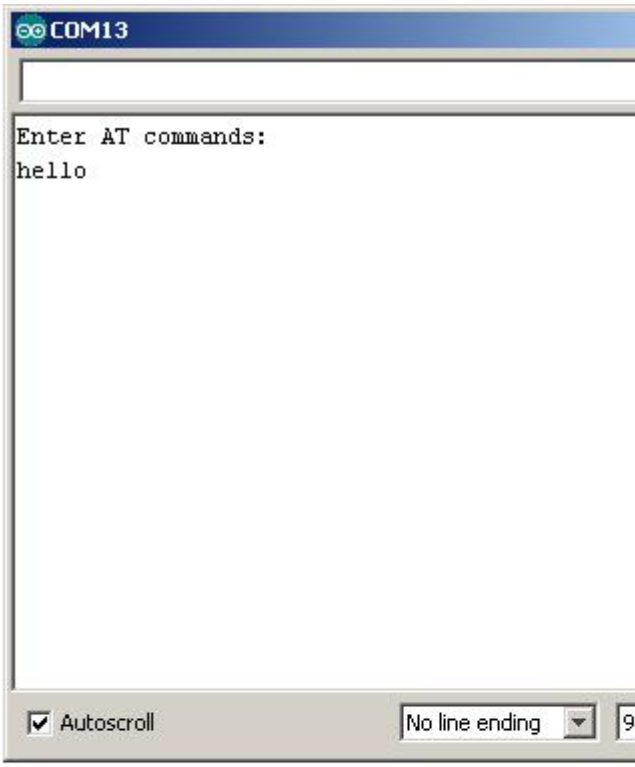
After the HC-06 is paired you need to communicate with it somehow. To test things are working you can use a BT terminal program such as Bluetooth Terminal available on Google Play
Install and open Bluetooth Terminal.
Open the menu, icon at the top of the screen.
Select “Connect a device – Insecure”. This brings up a list of available devices.

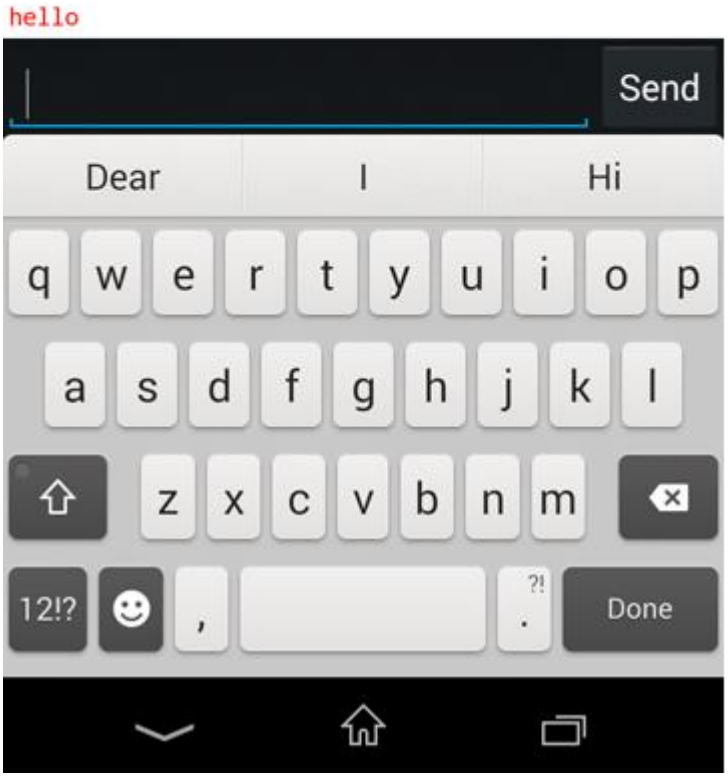
Select the HC-06
Once connected, “connected: HC-06″ is displayed at the top of the screen.



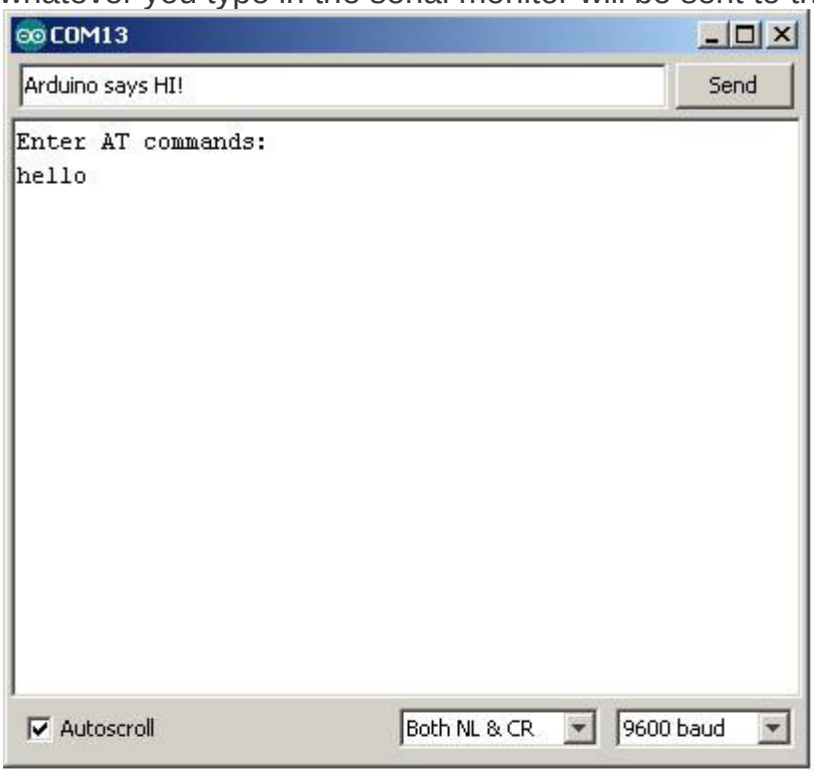
Make sure the Arduino serial monitor is open and everything you enter into the Android Bluetooth Terminal will be echoed in the serial monitor.

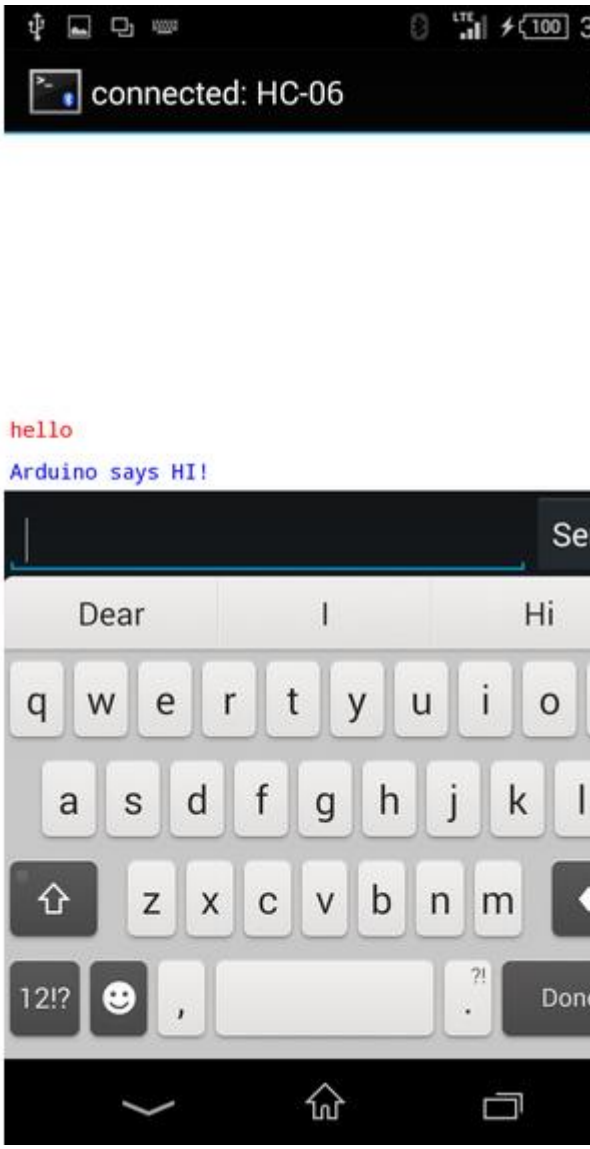






In the Arduino serial monitor, select “Both NL & CR” at the bottom of the window and whatever you type in the serial monitor will be sent to the Android Bluetooth Terminal.





If NL&CR are not selected, the Arduino will still send the data but the Bluetooth Terminal program will not display it until it receives a carriage return / newline.

Next step. Turning an LED on and off.

Turning a LED On and Off by Bluetooth
I have updated and moved the Turning an LED on and off guide to its own post

Update per gli HC06 nuovo il firmware è diverso, gu ardare le pagine seguenti
I have new HC-06 zs-040 modules that have the hc01.comV2.0 firmware. See here.

指令	响应	参数
AT+UART=<Param>,<Param2>,<Param3>	OK	Param1：波特率（bits/s）
AT+ UART？	+ UART=<Param>,<Param2>,<Param3> OK	取值如下（十进制）： 2400 4800 9600 19200 38400 57600 115200 230400 460800 921600 1382400 Param2：停止位 0——1 位 1——2 位 Param3：校验位 0——None 1——Odd 2——Even 默认设置：9600，0，0

举例：设置串口波特率 115200，2 位停止位，Even 校验

https://lowpowerlab.com/forum/currentranger/bt-output-doesn't-work/

erho
ewbie
sts: 5

HC-06 version 3.0 detection by the CurrentRanger
« **on:** May 06, 2019, 07:10:43 AM »

I got finally the HC06 module working (it appeared to be version 3.0 with completely changed AT commands). The module appears as two BT serial ports in my laptop. I got the baud rate changed successfully to 230400 as instructed, and got serial data passed through (from a UART-USB adapter to a BT serial port and vice versa). However, when I connect the HC06 to the CurrentRanger and power it up (and connect to it so that the LED on the HC06 indicates a connection), nothing appears in the terminal of the BT serial port. I assume it should start sending data immediately. What is wrong?

Logged

elix
dministrator
ero Member
wPowerLab
sts: 6007
ountry:

Re: HC-06 version 3.0 detection by the CurrentRanger
« **Reply #1 on:** May 06, 2019, 02:05:46 PM »

If you look at the CR firmware, it tries to poll for the BT module with AT commands, and it expects an OK back. If it gets no response it assumes nothing is there.
So assuming the wiring is correct, could the module not be responding?

Logged

erho
ewbie
sts: 5

Re: HC-06 version 3.0 detection by the CurrentRanger
« **Reply #2 on:** May 07, 2019, 12:25:07 AM »

Ah, now I clearly see the issue. The new firmware of the HC06 (version 3.0) requires AT **and** CR+LF instead of AT only, and there is no 1 second timeout anymore. So I should update the firmware of the CurrentRanger.

The new requirement of CR+LF was one reason why it got such a long time from me to find out why the HC06 is not responding to AT commands, and later on why it doesn't accept the AT+BAUDn command. After getting the version read (it was 3.0-20170609), some googling got me on the track. It appeared that the AT+BAUD9 command had to be replaced by AT+UART=230400,0,0 (& CR+LF) in order to get the baud rate changed.

Logged

elix
dministrator

Re: HC-06 version 3.0 detection by the CurrentRanger
« **Reply #3 on:** May 07, 2019, 09:18:16 AM »