



Modify The HC-05 Bluetooth Module Defaults Using AT Commands by

techbitar (/member/techbitar/)

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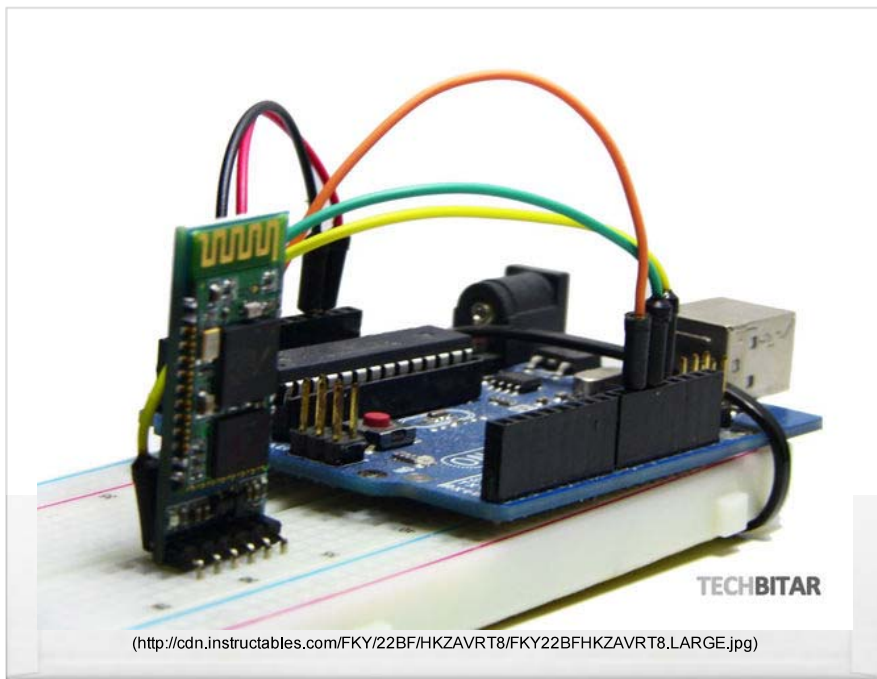
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UPDATES

September 4, 2013: Featured on Hackaday.com <http://goo.gl/qxvWkd> (<http://goo.gl/qxvWkd>)

September 1, 2013: Featured on DangerousPrototypes.com <http://goo.gl/K4kH9g> (<http://goo.gl/K4kH9g>)

INTRODUCTION

In this guide, I will explain how to use Arduino to change the settings of the ubiquitous HC-05 Bluetooth module using the AT command set. The HC-05 comes with a rich set of AT commands to perform various tasks such as changing the module's default settings including changing the pass code, the device name, and the baud rate. But the process of switching the HC-05 into AT command mode for first time users of the module is not straight forward and the docs takes short cuts. There are a couple of ways to do this. I have picked the one I think is the easiest. I will do my best to illustrate the process in simple to follow steps. You can find the full set of AT commands in the attached datasheet.



-All below -

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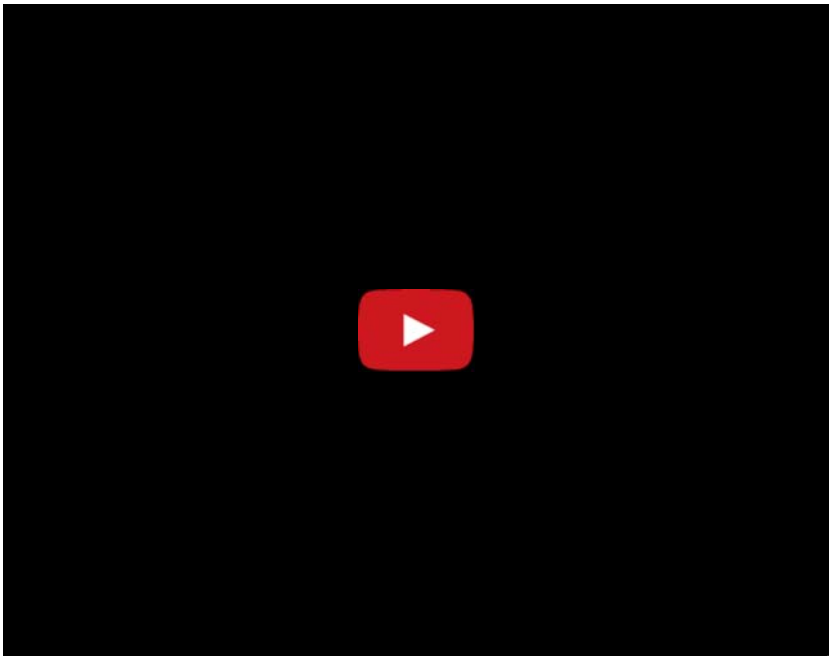
techbitar
(/member/techbitar/)

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BACKGROUND

The HC-05 Bluetooth module and its siblings are by far the most popular and inexpensive Bluetooth modules used for RF communications by microcontroller hackers. It costs less than \$10 on ebay and it's easy to implement. I have published two guides based on the HC-05 Bluetooth module. The first guide explains how to use the HC-05 with the Arduino (<http://www.instructables.com/id/Cheap-2-Way-Bluetooth-Connection-Between-Arduino-a/>). The second is an Android app that simplifies controlling Arduino from your smart phone (<http://www.instructables.com/id/Andruino-A-Simple-2-Way-Bluetooth-based-Android-C/>) over Bluetooth using the HC-05. In both cases, the default settings for the HC-05 were fine.

In the process of using the HC-05 for a project, I ran into a situation where I needed to change the defaults for the module. For example, the default baud rate on the HC-05 is 9600. That's slow for high-speed transmission. The HC-05 can go as high as 1382400 baud rate according to the HC-05 reference. Also, the HC-05 has a default device name of HC-05. Having two or more of those devices in the same area can be confusing. You can use an AT command to change the device name. Also, the pin code default is 1234. You may wish to change that for some projects to ensure basic security.

After spending some time searching the web I realized many people are having a hard time changing the default settings for the HC-05. Switching the HC-05 from data transmission mode to configuration mode, to send AT commands to the HC-05, involves a few wiring and software acrobatics. Add to the mix all the variations of the HC Bluetooth module family and the various vendor settings and you get the picture.

This guide only covers the HC-05 module with the breakout board.

WARNING

The HC-05 is a 3.3V system but the breakout board offers current limiting resistors for some protection. While it's not advisable to keep the HC-05 connected to the 5V Arduino Uno pins, for this short exercise I decided to skip the voltage dividers which I use to drop 5V to 3.3V. I advise you to use voltage dividers whenever you connect the HC-05 pins to 5V pins such as the Arduino Uno. If you skip the voltage divider, do so at your own risk.



(/id/SensoDuino-Turn-Your-Android-Phone-into-a-Wireless)



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Tags:

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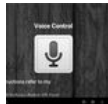
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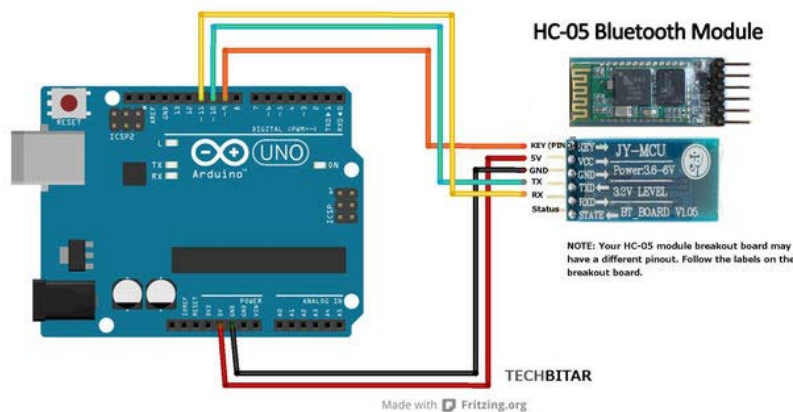
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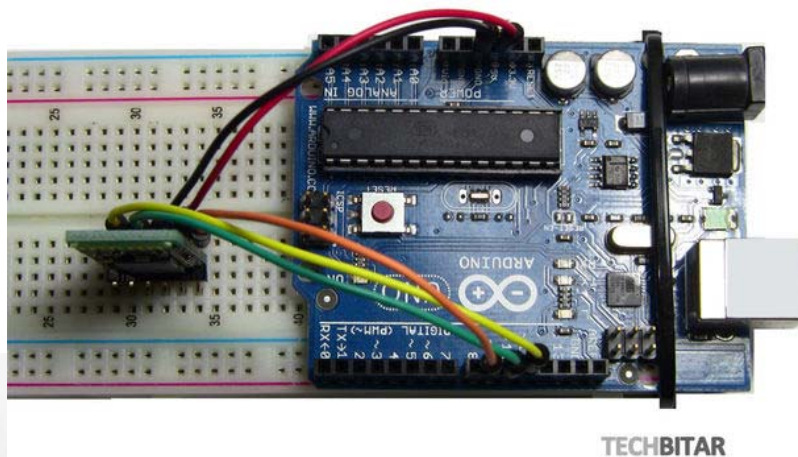


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Step 1: Components & Wiring



(<http://cdn.instructables.com/FM8/W4A2/HKZAVRT9/FM8W4A2HKZAVRT9.LARGE.jpg>)



(<http://cdn.instructables.com/F7U/5PAX/HKZAVRT7/F7U5PAXHKZAVRT7.LARGE.jpg>)

I have tested this guide with the following:

PARTS

- HC-05 Bluetooth module (http://www.ebay.com/itm/30ft-Wireless-Bluetooth-RF-Transceiver-Module-serial-RS232-TTL-HC-05-for-arduino-/310540196588?pt=LH_DefaultDomain_0&hash=item484da35aec) (Bluetooth over serial)
- Arduino Uno R3
- Breadboard & jumper wires
- Arduino IDE (<http://arduino.cc/en/main/software>)

WIRING

- HC-05 GND --- Arduino GND Pin
- HC-05 VCC (5V) --- Arduino 5V
- HC-05 TX --- Arduino Pin 10 (soft RX)
- HC-05 RX --- Arduino Pin11 (soft TX)
- HC-05 Key (PIN 34) --- Arduino Pin 9

Step 2: The Arduino Code for HC-05 Command Mode



(<http://cdn.instructables.com/FAO/8DYR/HINOEF4B/FAO8DYRHINOEF4B.LARGE.jpg>)

This Arduino program (HC_05.ino) does two things. It takes the AT commands you enter from the Arduino IDE Serial Monitor and sends those commands to the HC-05. The program then reads the output of the HC-05 and displays it on the Arduino IDE Serial Monitor. You can also use a terminal emulator such as Tera Term instead of the Arduino Serial Monitor.

The Arduino communicates with the HC-05 using the SoftwareSerial ports while the Arduino communicates with the user via the Serial Monitor.

/*

AUTHOR: Hazim Bitar (techbitar)

DATE: Aug 29, 2013

LICENSE: Public domain (use at your own risk)

CONTACT: techbitar at gmail dot com (techbitar.com)

*/

#include <SoftwareSerial.h>

SoftwareSerial BTSerial(10, 11); // RX | TX

void setup()

```
{
  pinMode(9, OUTPUT); // this pin will pull the HC-05 pin 34 (key pin) HIGH to
  switch module to AT mode
  digitalWrite(9, HIGH);
  Serial.begin(9600);
  Serial.println("Enter AT commands:");
  BTSerial.begin(38400); // HC-05 default speed in AT command mode
}
```

void loop()

```
{

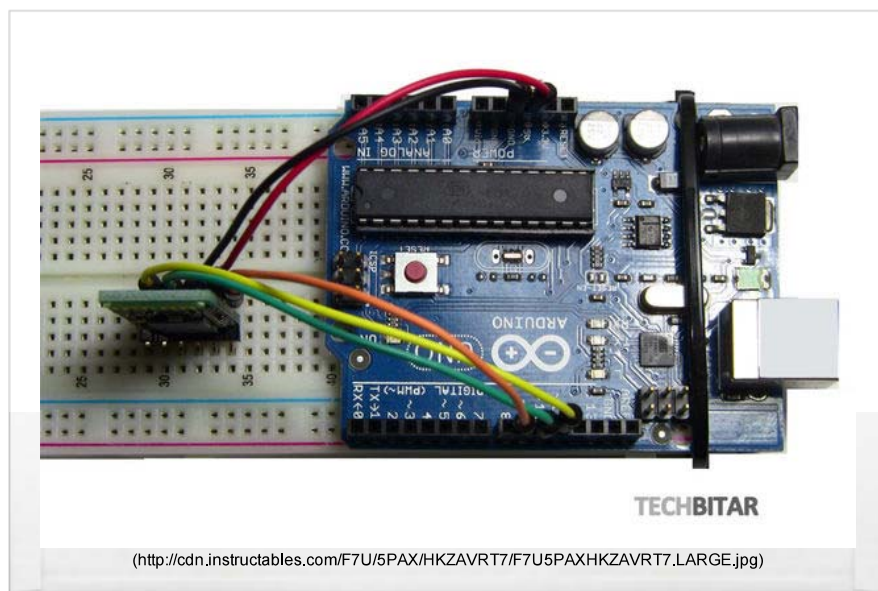
  // Keep reading from HC-05 and send to Arduino Serial Monitor
  if (BTSerial.available())
    Serial.write(BTSerial.read());

  // Keep reading from Arduino Serial Monitor and send to HC-05
  if (Serial.available())
    BTSerial.write(Serial.read());
}
```



HC_05.rar (/files/orig/FNQ/R2J2/HKZAVRVX/FNQR2J2HKZAVRVX.rar)544 bytes

Step 3: Steps To Switch The HC-05 Into Command Mode



For the HC-05 module to switch to AT command mode, the HC-05 pin 34 (often referred to as the Key pin) needs to be pulled HIGH but in a certain order of events explained below. When the HC-05 enters the AT command mode, it will communicate at 38400 baud rate. Follow these steps in the stated order to switch to the HC-05 to AT command mode.

1. Wire the HC-05 and Arduino Uno per instructions.
2. BEFORE YOU CONNECT THE ARDUINO TO THE USB remove the VCC (power) red wire from the HC-05 so it's not getting any power from the Arduino. All other wires are still connected.
3. Now connect the Arduino Uno to the USB cable extended from your PC.
4. Make sure the HC-05 module is NOT PAIRED with any other Bluetooth device.
5. Re-connect the Arduino Uno 5V wire to the HC-05's VCC (5V power) pin.
6. The HC-05 LED will blink on and off at about 2 second intervals. Now the HC-05 is in AT command mode ready to accept commands to change configuration and settings.
7. To test if everything is wired correctly, open the Serial Monitor from the Arduino IDE and type "AT" and click SEND. You should see an "OK"
8. If you don't see an "OK" check your wiring.

Step 4: Example HC-05 AT Commands


You can send AT Commands to the HC-05 from the Arduino IDE Serial Monitor while the Arduino is running the attached Arduino program.

I have listed a few popular AT commands that will change the HC-05 device name, pass code, and speed. You will find a full set of AT commands from the attached HC-05 reference PDF file.

(remove double quotes from AT command)

- To return HC-05 to mfg. default settings: "AT+ORGL"
- To get version of your HC-05 enter: "AT+VERSION?"
- To change device name from the default HC-05 to let's say MYBLUE enter: "AT+NAME=MYBLUE"
- To change default security code from 1234 to 2987 enter: "AT+PSWD=2987"
- To change HC-05 baud rate from default 9600 to 115200, 1 stop bit, 0 parity enter: "AT+UART=115200,1,0"





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Please be positive and constructive.

1-40 of
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sühab (/member/s%C3%BChab/)

8 months ago

Dear Hazim, thank you for this very useful application. I have an EN pin instead of KEY pin on my HC05 and it does not seem to be connected to PIO11 (Pin34) (I have checked it with an AVO. Do you think short circuiting the EN pin with Pin34 will solve the problem?

My second question is, how can I pair the HC05 connected to an Arduino uno with an HC06 connected to an ATtiny 85?

Cheers.


duwageM (/member/duwageM/)

sühab

3 months ago

Dear friend,

(/member/duwageM/)

In my Hc-05 have tiny push button to put AT mode.

what i doing to put configure mode

- 1) disconnect power pin.
- 2) press the tiny push button
- 3) same time connect the power.

Done.

 (<http://cdn.instructables.com/FXR/QIZ1/I67S8X3N/FXRQIZ1I67S8X3N.LARGE.jpg>)

LordL (/member/LordL/)

duwageM

17 days ago

Thanks. This was very helpful. Have been trying and suspected that the pushbutton had something to do with it.


daniel.kral.37 (/member/daniel.kral.37/)

sühab

3 months ago

EN pin should be the same as KEY pin. The default baud rate in AT mode is different for different devices. My HC05 had it set at 9600. Try setting different baud rate and see if that solves the problem.


asadsalehhayat (/member/asadsalehhayat/)

sühab 5 months ago

Same problem. Do you got the solution???

(/member/asadsalehhayat/)


dipayankarmakar37 (/member/dipayankarmakar37/)

sühab

7 months ago

Having same problem. Did u get any solution..?

(/member/dipayankarmakar37/)



TheKoobay. (/member/TheKoobay/)

1 month ago

[Reply](#)

hii,,

(/member/TheKoobay/)

Because not all of hc-05 can be configured, I recommend you use the HC-05 as it is drawn.

Follow the instructions and programs,

[SETTING HC-05.jpg](#)

(<http://cdn.instructables.com/FJW/1ETS/18JA2T93/FJW1ETS18JA2T93.LARGE.jpg>)



bytes

AT_Command_Setting.ino

(/files/orig/F7LW3QD/18JA2TEC/F7LW3QDI8JA2TEC.ino)790



akashpawadashetra (/member/akashpawadashetra/)

TheKoobay.

25 days ago

[Reply](#)

(/member/akashpawadashetra/)

We are using your circuit connections and a well

known code. But the AT commands are not

working in 38400 baud rate. And if we upload

some other code to Arduino, the HC-05 will not

even turn ON. Can you please help me in this....



Chuun (/member/Chuun/)

akashpawadashetra

19 days ago

[Reply](#)

(/member/Chuun/)

If you still wasn't able to solve this, there's a button on the Bluetooth

module. press that button until it blinks like per 2 seconds and there

you have it.

Been solving this for days...



mohamedS15 (/member/mohamedS15/)

21 days ago

[Reply](#)

(/member/mohamedS15/)

Can I remove pin Check !!

pin is not working with module but without from fixed address but without entering "1234"



csshandy (/member/csshandy/)

2 months ago

[Reply](#)

(/member/csshandy/)

I have followed this tutorial and others on the internet and am getting the board

into AT mode and my board is responding however it is responding in absolute

gibberish for example I type AT with both NL & CR on and a baud rate of 9600

on the serial monitor and I get result of ĨŖ†...Ÿ or some other variation of the

same code I have tried and tested playing around with different baud rates I

have several different hc-05 they all give me the same I have connected the

RX, TX in the schematic the way it is labelled and reversed and I am still

getting no luck can anyone give me some helpful information I don't have a USB

TTL converter and would prefer not to wait for one, any help would be

appreciated.

Thanks in advance, **Chris**.



AndrzejK2 (/member/AndrzejK2/)

2 months ago

[Reply](#)

(/member/AndrzejK2/)

It doesn't work. My BT module doesn't want to be in config. mode...



MiloslavN (/member/MiloslavN/)

2 months ago

[Reply](#)

(/member/MiloslavN/)

To all having strange characters in serial monitor:

As I read in the comments, it happens on Linux only (also using Linux) but with the newest Arduino IDE (1.6.1) this problem disappeared.



(/member/Genosai/)

2 months ago

Reply

Thanks a lot. Your post helped me resolve the issue I was facing.
Finally clear text in the terminal.



(/member/cmart%C3%ADn+carrasco/)

cmartin carrasco (/member/cmart%C3%ADn+carrasco/) MiloslavN
2 months ago

Reply

Thanks bro!
I download arduino IDE 1.6.1 and re-upload the
code and its works!!



(/member/ridoy.putrapanjaitan/)

ridoy.putrapanjaitan (/member/ridoy.putrapanjaitan/)

2 months ago

Reply

hi All! i'm using FB155BC as the bluetooth module. i had a response "OK" by
typing AT but i got "ERROR" by typing AT+BTRSSI? .

i use Arduino 1.0.6.

could somebody help me?

thanks



(/member/TheKoobay./)

TheKoobay. (/member/TheKoobay./) ridoy.putrapanjaitan

2 months ago

Reply

Whether you go through the tutorial above?
~~Can you~~ please tell me in advance when your
configuration details, because this is related to
the program and the bluetooth module. In order
to find an appropriate answer

Explain to when you before entering the AT-
command?



(/member/TheKoobay./)

TheKoobay. (/member/TheKoobay./) TheKoobay. 2 months ago

Reply

Orang Indonesia,



(/member/ridoy.putrapanjaitan/)

ridoy.putrapanjaitan (/member/ridoy.putrapanjaitan/) TheKoobay.

2 months ago

Reply

Hi TheKoobay,
orang indonesia?

yes i am!

so it did works with my configuration. i'm using
hyperterminal instead of Serial Monitor in
Arduino. Finally i got the AT+BTRSSI value in
slave mode, but not in master mode. In master
mode (FB155BC), i can't connect it with my
smartphone.

So know i'm working on it.

Regards



(/member/TheKoobay./)

TheKoobay. (/member/TheKoobay./) ridoy.putrapanjaitan

2 months ago

Reply

Smartphones can not connect, if HC-05 be set as
"master"!!!!

Try to change the HC-05 as a "slave", now you
try to connect with your smartphone.

You can restart the Configuration HC-05 "AT +
ORGL" and "AT + RESET"
Greetings Indo, Jakarta



(/member/MiloslavN/)

MiloslavN (/member/MiloslavN/)

2 months ago

Reply

To all receiving nothing when typing "AT":

I had the same issue but then I tried to type "AT+RESET" (no response but led started blinking faster) and then I checked SoftwareSerial library documentation and I used wrong pin for Rx on my Leonardo. Pin you use for receiving has to support change interrupts. Check documentation: <http://arduino.cc/en/Reference/softwareSerial> for more informations.



shankar.makal (/member/shankar.makal/)

2 months ago

[Reply](#)

(/member/shankar.makal/)

Can any one help me, wireless communication between Hc05 ,problem:I am able to send the data till 0.62 voltage equivalent digital is 127. After 0.63 it is -128 ,0.64 it is -126 ,0.65 it is -124 and so on.....



StephanT (/member/StephanT/)

3 months ago

[Reply](#)

(/member/StephanT/)

hello,
is it possible to change Module Bluetooth adress with AT Commands or is there another way to change it?



fcfelix (/member/fcfelix/)

3 months ago

[Reply](#)

(/member/fcfelix/)

Hi, very usefull ible.
I have one question. Is it possible to configure the HC-05 through AT commands to be seen as a keyboard/gamepad/mouse? According to the command ref pdf (appendix 2) you posted, there is such functionality. The question is if this would suffice, or a firmare flashing would be needed for it.



fansblink (/member/fansblink/)

4 months ago

[Reply](#)

(/member/fansblink/)

HC-05 bluetooth why I did not respond to anything when I type AT? please help,I want to change the name and passwordnyaa



Lo Fi Robot (/member/Lo+Fi+Robot/) fansblink

3 months ago

[Reply](#)

(/member/Lo+Fi+Robot/)

Hey, this instructable is missing one thing. To communicate Arduino with HC-05 you have to set line ending box in Arduino Serial Monitor to "Both NL and CR"

Hope it helps.



WhizzWr (/member/WhizzWr/)

1 year ago

[Reply](#)

(/member/WhizzWr/)

One IMPORTANT thing, Newline feed (\n) and Carriage return (\r) are needed on every AT command entered. So if you're using Arduino's serial monitor make sure you select "Both NL and CR" on the dropdown.



banajimenez (/member/banajimenez/) WhizzWr

3 months ago

[Reply](#)

(/member/banajimenez/)

Thank Youuuu!!!



thekevinshen (/member/thekevinshen/) WhizzWr

5 months ago

[Reply](#)

(/member/thekevinshen/)

WOW! THANK YOU for sharing this! I have been stuck on this tutorial for 3 days now, never being able to display any response in my serial monitor from the HC-05. I even bought another HC-05, thinking that my original was defective. You rock :)



JeffW3 (/member/JeffW3/) WhizzWr

8 months ago

[Reply](#)

(/member/JeffW3/)

Thanks for this!



shanX (/member/shanX/) WhizzWr

1 year ago

[Reply](#)

(/member/shanX/)

THANKS!! THAT WAS NEEDED :))



lilipad.cottage (/member/lilipad.cottage/)

6 months ago

[Reply](#)

Very useful set of instructions.

(/member/lilipad.cottage/)

I have the same module but found that you could enter AT mode by disconnecting power to the HC-05, pressing the reset button on the module and reapplying power.

When initially connected the red LED would flash quickly. When in AT mode, the LED flashes much more slowly.



gavingt (/member/gavingt/)

lilipad.cottage

5 months ago

[Reply](#)

Thank you, this worked for me.

(/member/gavingt/)

To clarify, you must:

- 1) disconnect power from module
- 2) press and hold the little button on the module
- 3) reconnect power and continue holding the button until you see the light blinking slowly

This is the module I'm using:

http://www.amazon.com/gp/product/B00L083QAC/ref=oh_aui_detailpage?ie=UTF8&psc=1



banajimenez (/member/banajimenez/)

gavingt

3 months ago

[Reply](#)

same module, i cant see any button

(/member/banajimenez/)



prmccafferty (/member/prmccafferty/)

5 months ago

[Reply](#)

Hello,

(/member/prmccafferty/)

I have a CZ-HC-05 Bluetooth module that I've wired to an Arduino UNO Rev3 per the instructions on this website. I have successfully gotten the LED to blink slowly (2 seconds on, 2 seconds off) indicating to me that I'm in AT command mode. However, when I open the serial monitor and type AT I don't get an OK response from the HC-05. I copied and pasted the code from this website into the Arduino IDE so I'm certain it's correct. My serial monitor is set to 9600 to match the serial port baud rate. I also set the serial port to Both NL & CR. I have tried typing AT\r\n as well and still no response from the HC-05. Can anyone help me?



banajimenez (/member/banajimenez/)

prmccafferty

3 months ago

[Reply](#)

Same Problem, no response, have you got it?

(/member/banajimenez/)



zootalaws (/member/zootalaws/)

prmccafferty

5 months ago

[Reply](#)

The default rate for the BT module is 38400.

(/member/zootalaws/)



elias47 (/member/elias47/)

4 months ago

[Reply](#)

hello, thanks for everything you done.

(/member/elias47/)

my problem is the HC 05 is not responding after verifying the wiring the code every thing many times, so could you tell me what could be the problem ???

thanks again .



returner (/member/returner/)

4 months ago

[Reply](#)

Hi, i have a question and i hope you guys can help me with this. how does the arduino actually know which data it is going to send or receive? in which part of the code does it do that? i want to make two arduinos one having a HC05 as a master sending data over to a HC06 slave on two different laptops. I hope you can answer me.



dnwagner (/member/dnwagner/)

4 months ago

Reply

(/member/dnwagner/)

I've been searching and searching and I have not been able to find your sketch for this tutorial. (PS: Im new to BT and Arduino)...one week ago I thought a "sketch" was just a basic drawing of something...but now it also means Arduino code too. :-)

1-40 of 152

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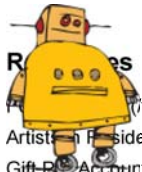
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