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HOW TO: Make your own USB cable for HK-T6A calibration

April 27th, 2012 [psychoul](#) [Leave a comment](#) [Go to comments](#)

Hey!

About a month ago I managed to go ahead and buy my first quadcopter (split the cost with two of my colleagues 😊) and all the required equipment. I will do another post on that because it is really interesting!

I played around with RC airplanes some 10 years ago. There are some things changed now. Controllers are different. You are able to buy a 6 channel radio for under 30 Euros! Wow... Anyway, so I bought this controller from Hobbyking, named [HK-T6A](#). However, I missed the fact that I needed a USB cable as well. To cut the story short, I had everything I needed to fly the brand new quad, but the controller needed calibration. Since the USB calibration cable was out of stock it would take some time to arrive. The cheap cables in ebay were shipped from China so it would take an additional month to get it. We had a problem!

Looking around in the internet, my attention was drawn to a picture of the transmitter communication socket. It was indicating TX/RX so I thought “wait a minute... could this be just serial comms?”. And so it was 😊

What you need...

The only device you need is a simple USB-to-Serial (TTL) converter. If you are into digital electronics you should have a couple of them in your desk drawer. My personal favorite is [CP2102](#). Take a look at my [older post](#) which I talk about this device. They cost only a couple of dollars including delivery from ebay. Check it out. You will also need 4 simple wires.



CP2102 USB-to-serial ttl module



The HK-T6 transmitter with the CP2102 and 4 wires. That is all you need!

Now take look at the trainer port of the controller.



The 4-pin din connection port of HK-T6

Connect everything together, really simple:

GND<-->GND

5V<-->5V

TX<-->TX

RX<-->RX




This is my temporary setup. It works!

Make sure your controller is switched off though. Then connect the CP2102 on your USB port of your PC. It could take some short time until your PC first finds the appropriate drivers and power the controller. You should see a red light on your transmitter. That means it is receiving power from the USB of your PC.

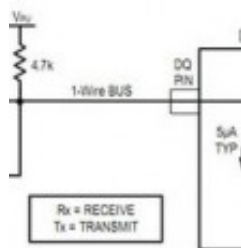
If something is not working, try switching the TX with RX lines. I mix them up all the time!!! You are now ready to calibrate your controller. Choose the software of your choice. I prefer [Digital Radio](#). It is much better than T6Config. Note that this will work with FlySky CT6B since it is essentially the same controller.

Let me know if you need any help.

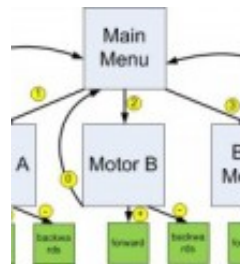
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1.



saad

May 9th, 2012 at 10:18 | [#1](#)

[Reply](#) | [Quote](#)

Hi,

really interesting article, one question though will it work with FlySky CT6a

Thanks ...

2.



saad

May 9th, 2012 at 11:01 | [#2](#)

[Reply](#) | [Quote](#)

Can you also please show us from CP2102 – these 4 wires goes where in the trainer port.

Thanks.

3.



psychoul

May 10th, 2012 at 07:54 | [#3](#)

[Reply](#) | [Quote](#)

Hi there,

I think it should work with CT6a as well. I haven't tested it but the connections seem to be the same.

Wires:

The USB-to-serial module should have pins for TX/RX, 5V and GND. So take a wire and connect the GND of the module with the trainer port. GND is actually the shield of the socket so stick you wire between the shield and the outer plastic. It stays there don't worry. Then connect the module's TX line to the TX line of the trainer port and so on...

Some USB-to-serial modules may have the TX/RX pins reversed, so if you fail to connect try to switch those two.

Hope this helps

4.



joethelion

May 18th, 2012 at 19:46 | [#4](#)

[Reply](#) | [Quote](#)

Brilliant hack and advice psychoul! Keep up the good work 😊

5.



psychoul

May 18th, 2012 at 20:20 | [#5](#)

[Reply](#) | [Quote](#)

I am glad you find it useful Joe!



6.

[Will](#)May 28th, 2012 at 10:47 | [#6](#)[Reply](#) | [Quote](#)

Hey

You should include the driver link for the CP2102 drivers-

<http://www.silabs.com/products/mcu/pages/usbtouartbridgevcpcdrivers.aspx>

7.

posad

July 31st, 2012 at 05:31 | [#7](#)[Reply](#) | [Quote](#)

You made a very nice job...

I have a questions:

1- Can we connect directly our transmitter outs to 9 pin serial port?

2- Did you connect tx and rx together?

Thanks from now

Best regards...



8.

[James](#)August 16th, 2012 at 05:31 | [#8](#)[Reply](#) | [Quote](#)

Can I use only GND, TX and RX? Can I power it from the batteries instead? I have a 3-pin serial board, but not a 4 pin.



9.

psychoul

August 22nd, 2012 at 15:28 | [#9](#)[Reply](#) | [Quote](#)

Hi there James. I don't think I tested it but it should be OK.



10.

ben

February 6th, 2013 at 20:34 | [#10](#)[Reply](#) | [Quote](#)

Did anybody try rigging the Tx strait to the 9 pin serial port using the Tx power source??



11.

Vladimir

February 27th, 2013 at 05:59 | [#11](#)[Reply](#) | [Quote](#)

I saw mistake in text.

Connectin must be done as
RX TX
TX RX

12.



psychoul

February 27th, 2013 at 11:44 | [#12](#)[Reply](#) | [Quote](#)

Hi Vladimir, your comment is correct however that is not a mistake! Actually it depends on how the designer of the board chose the names! From my experience, when a board writes TX has two meanings:

- 1) That pin is the TX pin of the chip, i.e. data is coming out from the chip
- 2) That pin is where the TX pin of the microcontroller should be connected i.e. data is going into the chip

So it is always best to check what your board refers to.

13.



Niccolo

November 24th, 2013 at 21:48 | [#13](#)[Reply](#) | [Quote](#)

Did you ever make that post about splitting the cost with your colleagues? would be interested in seeing what build you made

14.



Alex

January 18th, 2014 at 17:35 | [#14](#)[Reply](#) | [Quote](#)

Thanks for this, saved me a bit of money and more importantly 12 days waiting! 😊

15.



psychoul

January 18th, 2014 at 17:56 | [#15](#)[Reply](#) | [Quote](#)

You are welcome! Glad I helped.

16.



psychoul

January 18th, 2014 at 17:58 | [#16](#)[Reply](#) | [Quote](#)[@Niccolo](#)

Hey, sorry for the late reply. Unfortunately not I did not write post. I figured that many stuff are changed since then so I don't know if its useful for anyone now.



17.

Alex

January 18th, 2014 at 21:01 | [#17](#)[Reply](#) | [Quote](#)**Alex :**

Thanks for this, saved me a bit of money and more importantly 12 days waiting!

I should also add that I used an arduino as the serial adapter by jumping the reset and ground pins!



18.

hazi

February 21st, 2014 at 14:27 | [#18](#)[Reply](#) | [Quote](#)

Thanks for this information.

I tried this with FTDI serial converter for arduino. But could n't connected to either t6 config or Digital radio.

What is the baud rate we should set for com port?

Thnx



19.

psychoul

February 26th, 2014 at 20:58 | [#19](#)[Reply](#) | [Quote](#)

Hey hazi. I don't really remember but I think the baud rate should be 9600.



20.

Pegado

March 25th, 2014 at 16:42 | [#20](#)[Reply](#) | [Quote](#)

Hi, I used a USB / RS232 (9 pin) converter that doesn't have 5V output, so I used the 5V from another USB port, the red led was on so I understand that power isn't the issue. Unfortunately it didn't work, tried switching RX and TX with no success... Any ideas?



21.

Pegado

March 25th, 2014 at 16:42 | [#21](#)[Reply](#) | [Quote](#)

BTW, great post!!



22.

psychoul

March 25th, 2014 at 18:41 | [#22](#)[Reply](#) | [Quote](#)

[@Pegado](#)

Hi I am glad that you like the post! I hope we can make it work.

Did you connect the ground of the other USB port? You need to have common ground.

23.



Pegado

March 26th, 2014 at 17:00 | [#23](#)

[Reply](#) | [Quote](#)

[@psychoul](#)

No, I used the ground from the adapter output (pin 5) and the 5V (only) from the other USB port.

I measured the voltage VCC referenced to the USB ground and the adapter ground and both measured 5V. I also measured tension between both grounds and measured 0.02V. I believe the difference is neglectable. Even though the difference is very small, I'm not confident to join both grounds together, because I'm afraid it will burn one of my USB ports...

Do you think I should try using both 5V and ground from the other usb port?

24.



Stream

April 5th, 2014 at 00:54 | [#24](#)

[Reply](#) | [Quote](#)

Hi!

Could i use an arduino nano or a ftdi tool as the TTL converter?

25.



Stream

April 11th, 2014 at 16:36 | [#25](#)

[Reply](#) | [Quote](#)

[@Stream](#)

You can use an FTDI tool! I'm using one similar to this one: <http://www.dx.com/p/cruius-ftdi-basic-breakout-5v-usb-to-ttl-6-pin-module-for-mwc-multiwii-lite-se-228307>

And it works. Thank you for this post psychoul!

26.



psychoul

April 11th, 2014 at 16:42 | [#26](#)

[Reply](#) | [Quote](#)

[@Pegado](#)

Sorry for the delay, i didn't get an email of your reply comment. Well If both of them are connected on your PC then the GND should be the same I guess.

Maybe something simpler is going on. Are you sure the TX/RX pins are the right way? Try switching them. If you could post a diagram maybe we can figure it out easier.



27.

psychoul

April 11th, 2014 at 16:43 | [#27](#)[Reply](#) | [Quote](#)[@Stream](#)

You are welcome 😊 I am glad you find it useful!



28.

shijin

May 28th, 2014 at 09:50 | [#28](#)[Reply](#) | [Quote](#)

sir

can i use it as simulator? with cp2102



29.

Derek

June 28th, 2014 at 12:29 | [#29](#)[Reply](#) | [Quote](#)

Hi there,

I was doing some research on the internet, as I was having problems with a HK-T6A V2 transmitter I had purchased from Hobbyking when I came across your interesting article. I also purchased the supposedly correct cable at the same time. Problem is I cannot programme it with T6config, I purchased the "Digital Radio" software which seems to be so much better than the T6config but same problem, just will not work no matter what I try. I connect transmitter to PC with the cable, then turn on the transmitter and open "Digital Radio" and the led turns green to tell me I am connected, but when I press the get settings button, the synchronize led will not turn green, and that's as far as it gets! I was so frustrated today that I decided to open up the usb on the end of the cable, and there was a board similar to the one in your diagram, and it had CP2102 stamped on it. Only problem was it has only 3 wires on it. Black (GND) Red (I presume would be power) and a yellow which I guess had to be Tx or Rx? Now here is where it gets really interesting, after finding only 3 wires at the USB end of the cable, I then opened up the DIN plug at the end of the cable that fits into the trainer port on the back of the transmitter. Here the black wire goes in the same position as yours (earthed on the outer case) my red wire goes to the spot where you have marked Tx, and my yellow wire goes to the spot you have marked Rx.

Was this cable ever meant to work with this transmitter? With only three wires instead of four, and let's not forget, this is the recommended cable from Hobbyking for the HK-T6A V2!

I also noticed that when i turn on the transmitter my WiFi shuts down, but comes back when i switch the transmitter off!



30.

psychoul

June 30th, 2014 at 14:10 | [#30](#)[Reply](#) | [Quote](#)[@shijin](#)

I think so. It should work. Test it and let us know!



31.

psychoul

June 30th, 2014 at 14:16 | [#31](#)[Reply](#) | [Quote](#)[@Derek](#)

Hi there Derek.

Your cable seems not to supply the 5V to the controller. It has 3 lines, GND, TX and RX needed for communication. I tested my cable with 5V provided by the CP2102 as described in the post. I don't know if the external 5V is essential or not in order to work. I didn't test mine without the 5V.

Is your controller on or off when you try to communicate?



32.

Derek

July 1st, 2014 at 02:36 | [#32](#)[Reply](#) | [Quote](#)

Hi there,

Controller is on, if switched off it shows as disconnected and green bars are not visible. Once it is switched on and you open the software i have a green led to show it is connected and the green bars are visible and move according to the corresponding controls on the controller. At this point i am a little confused as what to do next? If i click on the get settings tab should the settings from the controller show up in the software? because i get nothing. Also i have filled in all the settings that i want to send to my controller, problem is i only require 1 mix and unless i fill in all the blanks it keeps saying missing data. I have ordered another cable in the hope that this one is faulty. I have also tried it as a simulator with the same cable using ClearView software and it will not work either.



33.

psychoul

July 1st, 2014 at 11:35 | [#33](#)[Reply](#) | [Quote](#)[@Derek](#)

How about the baud rate of your serial port? Try 9600...

Unfortunately its been since 2012 since I worked with this controller so I might not be very helpful.



34.

sathya

July 16th, 2014 at 16:15 | [#34](#)[Reply](#) | [Quote](#)

sir i am using DB9 serial port ... how to connect the pins ???



35.

Rikki

February 15th, 2015 at 19:14 | [#35](#)

[Reply](#) | [Quote](#)

Hi just use the ppm signal and ground to connect to the mic input jack on your pc. Then use smartpropoplus to setup a ppm decoder. It also installs vJoy which emulates a virtual joystick...

36.



kintana18

June 27th, 2015 at 22:07 | [#36](#)

[Reply](#) | [Quote](#)

I aIs0 f0rg0t t0 buy the cable and I find this hack, u are big!! thank u!!

37.



collin

July 9th, 2015 at 20:34 | [#37](#)

[Reply](#) | [Quote](#)

Does this still work?

38.



psychoul

July 9th, 2015 at 23:20 | [#38](#)

[Reply](#) | [Quote](#)

Yes sure!

39.



Stu

July 11th, 2015 at 00:39 | [#39](#)

[Reply](#) | [Quote](#)

Thanks for this.

I cut down a four-pin S-Video lead (correct connectors but wrong pins available), to be honest that was not really worth it, ended up pulling the connector apart but I was looking to make a nice lead. Instructions worked fine but I did have to swap RX/TX as you mentioned in other comments.

Other end was a USB serial adapter with 3.5mm socket bought from G4ZLP for CIV control of a ham radio. As that has a socket/jack it is still fine for the original use.

Used it to update a Turnigy TGY-i6 which had a nasty habit of spinning up the motor on switch A, does seem better with the newer FlySky firmware.

40.



psychoul

July 11th, 2015 at 15:23 | [#40](#)

[Reply](#) | [Quote](#)

Hey Stu, I am glad the post was useful for you!

1. September 22nd, 2012 at 13:04 | [#1](#)
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2. September 23rd, 2012 at 10:52 | [#2](#)
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