

Dongles by W2HUV

What is a “dongle”? It’s a device that you plug into your computer to provide an interface needed. It is usually a USB device. Here are some examples:

External PTT / Paddle inputs
PC controlled PTT output
USB sound card
USB travel hub

Items 1) and 2) you build yourself or have someone build them for you. Items 3) and 4) are commercially available at low cost. Typically, you would use Item 3) to interface a traditional headset, say a Heil Pro 7, with your computer. Effectively, this is adding a USB interface. Item 4) would be used to accommodate the other “dongles”.

Let us focus on items 1) and 2). The simplest way to construct these items is to start with the following parts for each:

Preferred:

a) USB to DB9 male RS232 10 cm cable

<http://www.mouser.com/ProductDetail/895-CHUPI-X10>

b) DB9 Breakout Connector RS232 Serial 9 Pin Connector Db9 Terminal Female with Screw

http://www.amazon.com/gp/product/B073RGRQ43/ref=ppx_yo_dt_b_asin_title_o07_o00_s00?ie=UTF8&psc=1

Alternate:

c) USB to RS232 Adapter with FTDI Chipset, CableCreation 6ft Gold Plated USB 2.0 to RS232 Male DB9

http://www.amazon.com/gp/product/B075YGKFC1/ref=ppx_yo_dt_b_asin_title_o05_o00_s00?ie=UTF8&psc=1

d) Uxcell a15011600ux0286 RS232 D-SUB DB9 Female Adapter to Terminal Connector Signal Module

http://www.amazon.com/gp/product/B01736DOS8/ref=ppx_yo_dt_b_asin_title_o06_o00_s00?ie=UTF8&psc=1

Follow the links to see the parts:

The advantage of the a) / b) combination is that the USB cable is much shorter, so it will result in less clutter by your PC. The disadvantage is higher cost. The advantage of the c) / d) combination is reduced cost. The disadvantage is the 6ft cable.

In addition to the a) / b) combination or c) / d) combination, you will need a 3.5mm stereo audio extender cable (plug on one end, jack on the other).

Stereo extender cables are available at Best Buy. So are USB to RS232 adaptor cables, but don not buy their USB to RS232 adaptor cables, because they utilize the Prolific chipset, which is problematic. Only purchase USB to RS232 adaptor cables utilizing the FTDI chipset.

If you plan on plugging Item 2) into Item 1), which normally would be the case, you will need an isolator. The suggested part is the following, because no external parts are required:

f) PCB Mount PhotoMOS relay

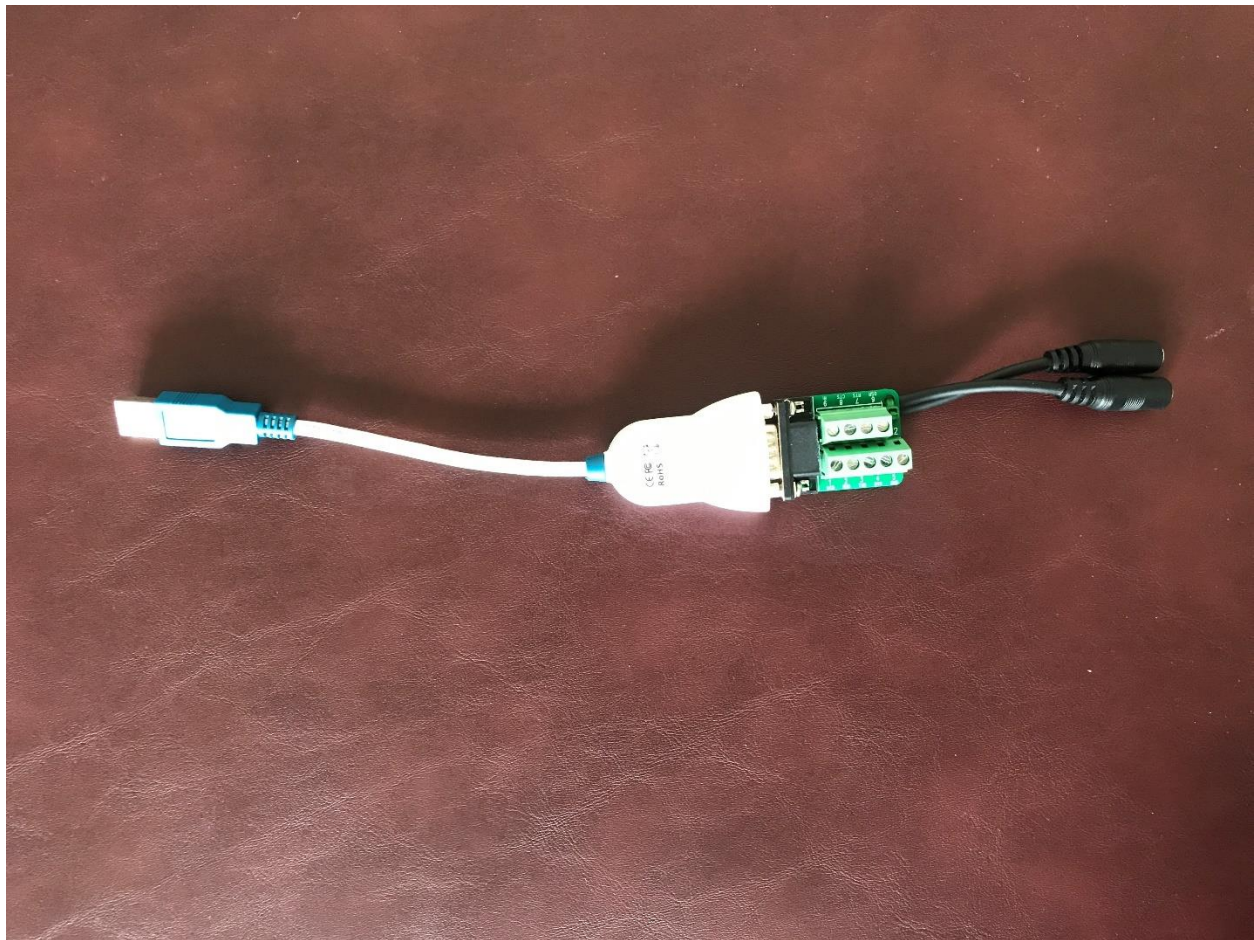
<http://www.mouser.com/ProductDetail/769-AQZ102D>

Here is an example of a USB Sound Card:

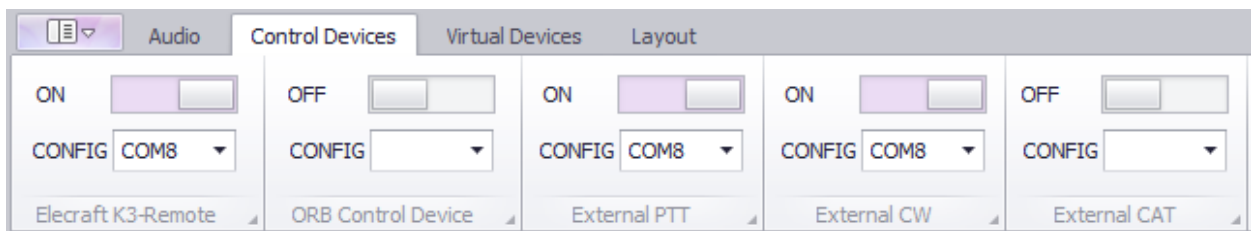
http://www.amazon.com/gp/product/B00NMXY2MO/ref=ppx_yo_dt_b_asin_title_o00_o00_s00?ie=UTF8&psc=1

Construction of an “External PTT / Paddle inputs” dongle:

Photo of the finished product:



The connections needed are specified in the “External PTT” and “External CW” settings on the RCForb client “Control Devices” tab.



External PTT Settings: Click the down arrow, select the port, set PTT Pin to CTS and check “Use RTS as Power”.

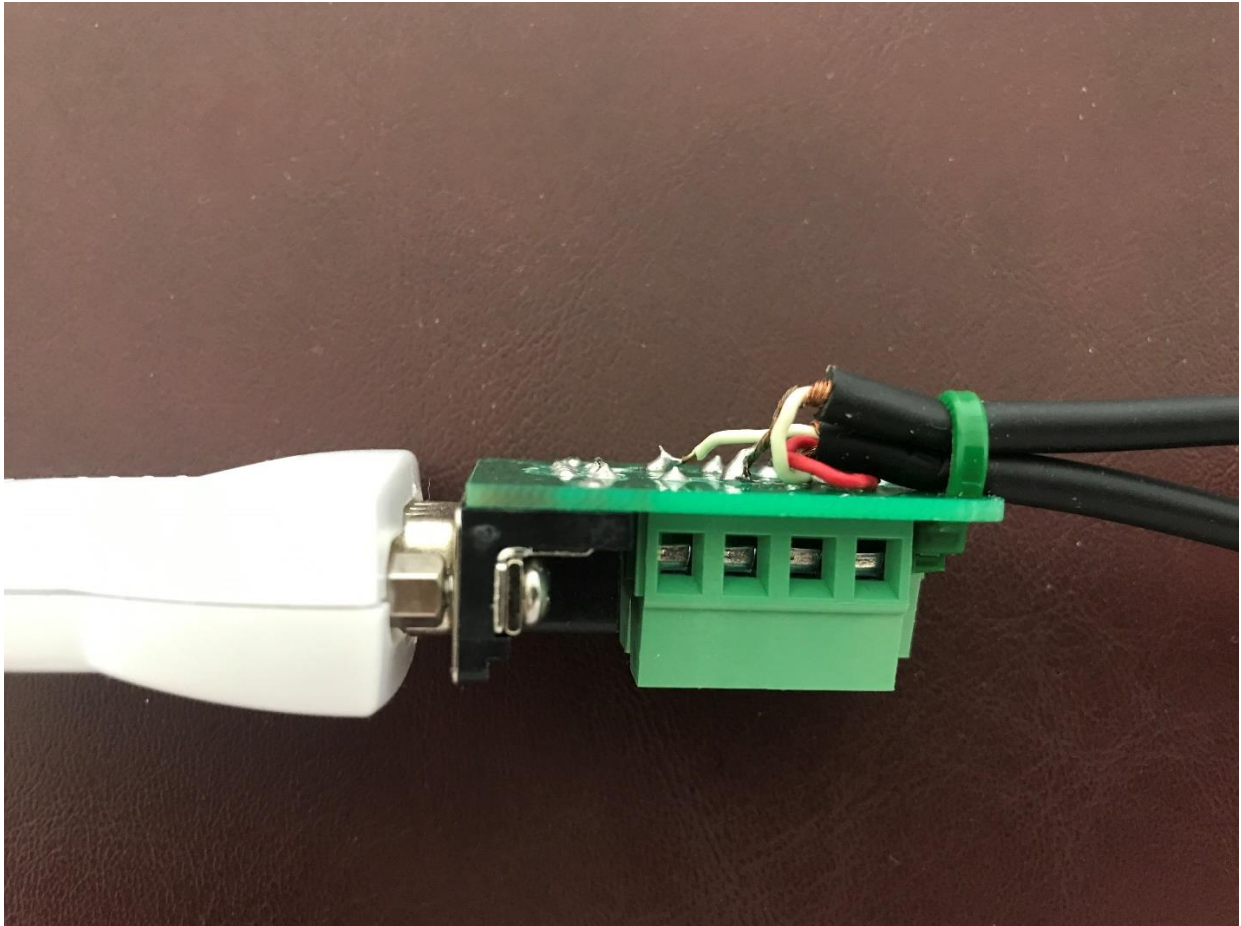
External CW Settings: Click the down arrow, select the port, set DIT to DCD, DAH to DSR, KEY to CTS and check “Use RTS as Power”. Note that the PTT input is used for the KEY input. The RCForb Server/Client determines what to do with the input based on the mode.

Top view closeup:



The top row of PCB terminals are DCD, RXD, TXD, RTS and GND, left to right. The bottom row of PCB terminals are RI, CTS, RTS and DSR, left to right.

Side view closeup:



The red wire is out of the bottom cable and is connected to DSR. The white wire out of the bottom cable is connected to DCD. This is for compatibility with K3 connections. The shield is connected to RTS. This is the paddles input cable.

The white wire out of the top cable is connected to RTS and the shield is connected to CTS. This is the PTT input cable.

The two cables are the jack ends of two stereo extender cables and are about 4" long. They are secured in place with a cable tie that passes through to holes at that location.

NOTE: Connect a key or keyer to the PTT input cable.

Construction of a PC controlled PTT output dongle:

Closeup of the finished product:



The top row of PCB terminals are DCD, RXD, TXD, RTS and GND, left to right. The bottom row of PCB terminals are RI, CTS, RTS and DSR, left to right.

The black device is an AQZ102D PhotoMOS relay. There are four terminals, two to the left of a gap and two to the right. The four terminals are Output +, Output -, Input + and Input -, left to right. Output + is connected to the red wire coming out of the cable and Output - is connected to the shield. Input + is connected by a jumper to RTS and Input - is connected to GND.

Why an isolator is required:

If you look back at the PTT input cable discussion, you will see that the white wire coming out of the PTT input cable is connected to RTS and the shield is connected to CTS. RTS is configured to provide a positive sensing voltage. A short between RTS and CTS pulls CTS up to RTS. This works fine with the isolated output provided by the PC controlled PTT output dongle just discussed. However, if a PNP transistor circuit or 2N7000 PMOS transistor were used instead of the isolator, the output would be shorted

to GND, which is common to all COM ports. This means that CTS would be shorted to GND with no input and that RTS would be shorted to GND in addition with an input.

The good news is that you won't need a PC controlled PTT output dongle if CAT PTT or VOX works properly in your application.

Please address all questions, comments and issues to w2huv@arrl.net.