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## **Instructions for firmware and filter update for the dac1321, dac1421 and dac1541.**

The procedure for updating firmware and filters for the three dac1xxx are the same and not really that complicated, if you have a little computer knowledge you can do it yourself.

Step 1 is to acquire an USB to TTL Serial interface, also called an USB to RPi Serial interface. The recommended one is the FTDI TTL-232R-RPI, available at multiple sources like Digikey, Farnell and other sources for Raspberry Pi accessories. If running Windows you need to install a driver for the serial interface, follow the instruction that come with the USB interface. It should work directly with the latest version of Apple OS-X and Linux

Step 2 is to get the right software. The dac1xxx use a serial interface so you need a terminal emulator, the recommended one for Windows is Tera Term, you can download the newest version from <https://osdn.net/projects/ttssh2/>. The software instructions below are for Tera Term, but the principles also apply to other Windows software, Apple OS-X and Linux.

Step 3 is to download the right firmware for your DAC from the Soekris "Downloads" page.

Step 4 is to connect the Soekris DAC to a computer. First disconnect power to the DAC, then open the DAC by unscrewing the screws in the bottom and slide the cover off. You then locate three pins on the board marked "GND", "TXD" and "RXD", they're located close to the front. You then connect the same three pins from the USB to TTL Serial interface, the black pin to "GND", the yellow pin to "TXD" and the orange pin to "RXD". If you got a different USB to TTL serial interface the colors might be different. Connect the USB end to a free USB port on your computer.

Step 5 is to start and configure the terminal emulator software, so start Tera Term. Then do "setup -> serial port", first select the "Port", probably "COM1" if your computer don't have any other serial ports, then set "Baud rate" to "115200", "Data" should be "8", "Parity" should be "none", "Stop" should be "1", "Flow control" should be "none", then click "OK". Now do "File -> New connection", select "Serial" and set the "Port" to the COM port as above, then click "OK". Now the communication should be setup and you can connect power to the DAC and turn it on, be careful not to touch anything inside the DAC. You should then see a short list of status messages.

Step 6 is to do the actual download and update. First get into the uManager by entering "+++" followed by a short pause. You should then see something like:

```
dac1xx1 uManager Rev 1.xx 201xxxxxx FPGA Rev 1.xx Press ? for help.
#
```

Where the xx are the current revision numbers. If that is not 1.20, then download the new firmware and filters by writing:

# download

And then start a Tera Term download by doing "File -> Transfer -> XMODEM -> Send", on the file menu, then locate the file with the DAC firmware you downloaded earlier, and for faster speed, click on the 1K option in the bottom left corner.

When done downloading do a:

# update

And click Y when asked for confirmation. Finally do a power off, short pause, then power on. You can go into uManager again using the "+++" and check that both the uManger and FPGA are the new revisions. You can then disconnect power, slide the cover back on and put the screws on again, then reconnect power.

**That's it, you can now enjoy the even better sound of you Soekris DAC and its new advanced anti-aliasing filters.**

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