

USB audio 2.0 input board firmware update

Introduction

Starting in April 2016, the USB audio input boards are sold with a new firmware. It features the following improvements:

- DXD support (maximum PCM sampling frequency has been increased from 192 kHz to 384 kHz)
- DSD128 support (in DoP) for both DSF and DFF files (maximum DSD sampling frequency has been increased from 2.8224 MHz to 5.6448 MHz).
- Use of XMOS's credentials to provide a Microsoft signed driver which is much easier to install on any Windows PC (including on Windows 10). The old one wasn't signed so it was tedious to install it (refer to Windows 8/10 driver installation sections for details)

Unlike other parts of CH Precision unit's firmware (microcontroller, display, DSP, and FPGA), this firmware is located on the option board itself so it can't be updated through regular firmware update from a USB flash drive like the rest of the unit.

It has to be loaded from a DFU (Device Firmware Update) program running on a PC connected to the USB audio input board.

Below are the detailed steps explaining how to do so. To summarize, what needs to be done is:

1. Configure a PC so that it can be used to load the new firmware (install legacy driver and DFU utility program)
2. Load the firmware in the board
3. Install the new driver on the PC (to test and/or use the USB audio input board)

Step 1: Legacy driver and DFU utility program installation

The new firmware can be loaded on existing USB audio input boards from a properly configured Windows PC.

Basically, this PC needs a driver to communicate with the USB audio input board and the DFU utility program to load the firmware once the connection is established. Both get installed upon legacy driver *ch_usb_driver1v22b* installation. This old driver can be downloaded from the *Products | C1 | Downloads* page of CH Precision website (http://ch-precision.com/images/firmwares/ch_usb_driver1v22b.zip).

More info on how to install it recent Windows PC can be found in the document *Windows 10 driver installation instructions (USB Audio Class 2.0)* available in the *Products | C1 | Downloads* page on CH Precision website (<http://ch-precision.com/images/firmwares/windows-10-driver-installation.pdf>).

Step 2: USB audio DSP firmware update

Once Legacy driver is installed, follow these steps:

1. Turn on a C1 (with the USB Audio input board to be updated fitted in) and connect it to a USB port of a properly configured PC. Make sure the USB Audio input board is properly detected as USB Audio class 2.0 Audio device by the PC. Make sure *C1 Settings | Audio Settings | USB Audio Class* is configured as 2.0
2. Download DSP firmware *ch_usb_firmware_v6.6.2.zip* on the *Products | C1 | Downloads* page of CH Precision website (http://ch-precision.com/images/firmwares/ch_usb_firmware_v6.6.2.zip)
3. Unzip the *ChUsbFw_v662.bin* file to the folder where the Legacy driver has been installed (by default it should be *C:\Program Files\CH_Precision\USBAudio*)
4. Open a *Cmd* window (right click on Window icon \ Run; Open: *cmd*)
5. Go to the folder where the Legacy driver has been installed (it should be *C:\Program Files\CH_Precision\USBAudio*)
6. Type the command line *dfucons download ChUsbFw_v662.bin*
7. Make sure the update succeeds

Step 3: New driver installation

At that point the USB audio input board has been updated, but it can't be used or tested until the new driver is installed on the PC.

To do so:

1. Disconnect the USB audio input board from the PC
2. Download the new driver *ch_usb_driver_pid307B_v3.20.0.zip* from the *Products | C1 | Downloads* page of CH Precision website (http://ch-precision.com/images/firmwares/ch_usb_driver_pid307B_v3.20.0.zip)
3. Unzip the file *CH_USB_Driver_PID307B_v3.20.0.exe*
4. Run it (double click on it)
5. Accept all messages and connect the USB audio input board to the PC when prompted to do so
6. When the new driver installation is finished, run the the console panel *xmosusbaudiost307B_cpl.exe* (it should be installed in *C:\Program Files\XMOS\USBAudioStDriver_307B*). The USB audio input board equipped C1 should be detected and displayed (USB Audio Device: CH Precision USB Audio 2.0)
7. Use any music player to test it. JRiver is recommended for DSD and DXD playback