Tone2 XMOS Quick Start

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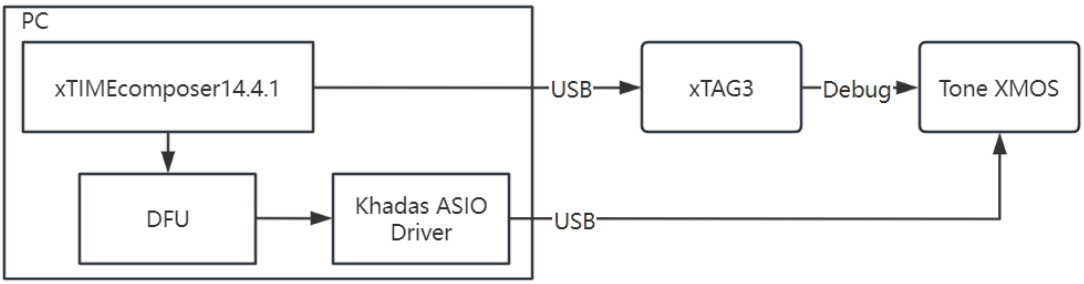
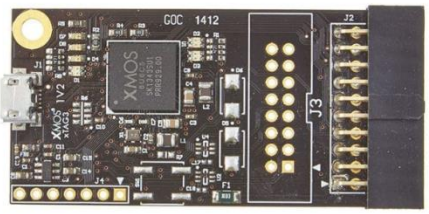
Tone2 XMOS development tool instructions

Tone2 uses the XU208-128-QF48-C10 as the USB2.0 audio decoder and the MX25V8035FZUI SPI Flash as the XMOS program storage. The XMOS development tools under the Windows platform are as follows:



1. Download Community_14.4.1 and install. (use v14.4.1, XTC 15.x is not supported yet)
2. Download khadas-tone-driver and install.
3. Download khadas-audio-dfu-tool and decompress, no installation is required.
4. Purchase xTAG-3 debugging tool.



XA-XTAG3

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HARDWARE MANUAL

DESIGN FILES

XTAG 3 DEBUG ADAPTER

Used with our tools for xcore-200 boards supporting the XSYS connector. It connects via a 20-pin 0.1 IDC XSYS connector, which incorporates JTAG, Reset, a high speed xLink, and advanced debug signals. Whether executing and updating flash memory, or performing advanced debug, the xtag is essential for xcore®-200 development.

For use of the XTAGv3 with our tools, see XTC Tools Guide

Tone2 dual-channel XMOS project compilation and upgrade.

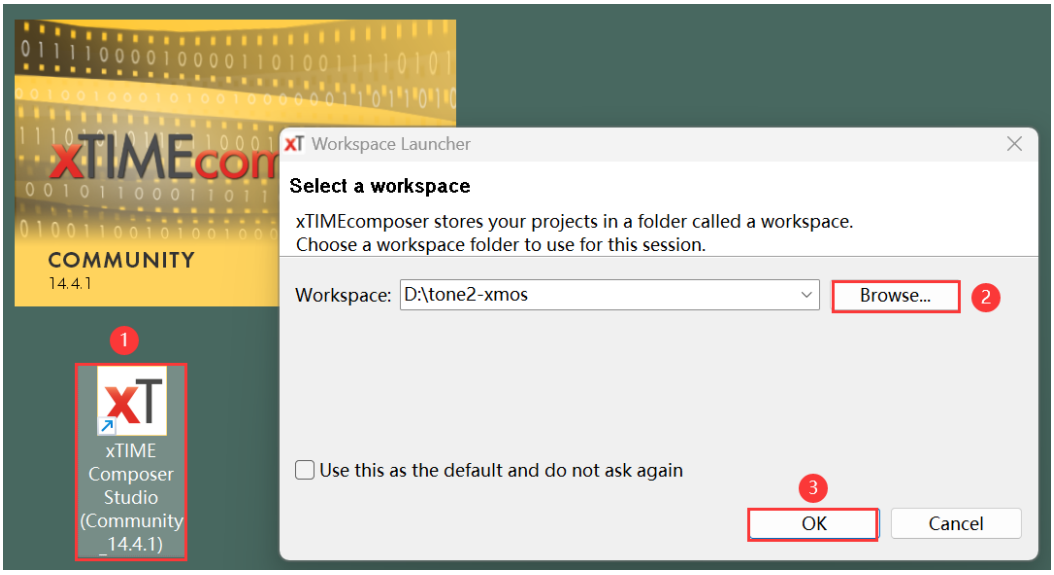
1.Download code

The Tone2 XMOS code includes two branches, dual and mul, which correspond to dual-channel output firmware and multi-channel output. The compilation and upgrade operations of the dual branch are the same as mul branch. We will use the dual branch as the below example.

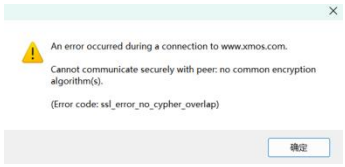
2.Create a new Tone2 project

Community_14.4.1 development tools need to be installed in advance.

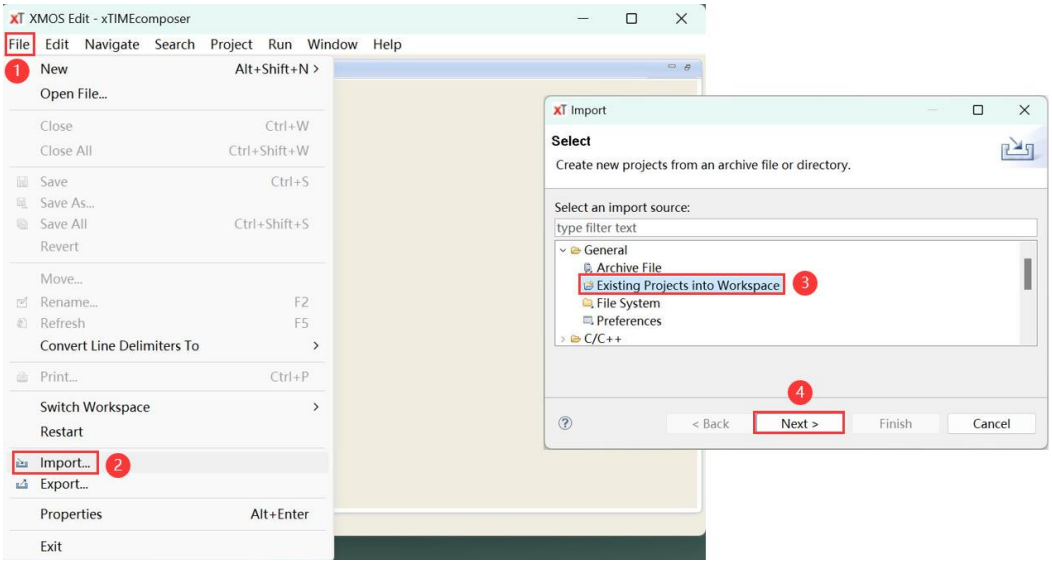
a) Open xTIME Composer Studio (Community_14.4.1) and select the working directory.

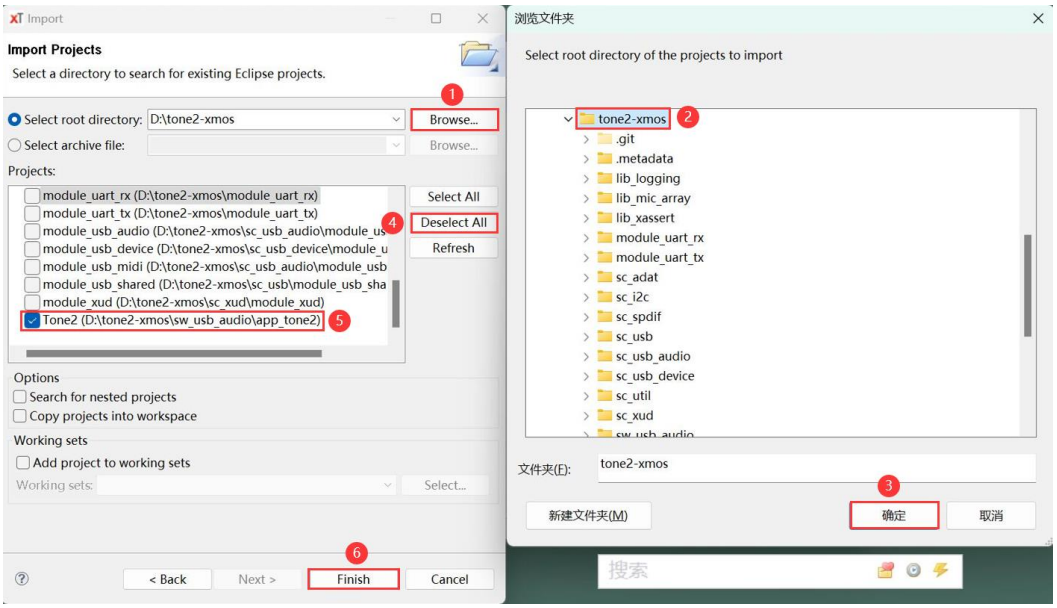


b) Please ignore the connection error when opening Community_14.4.1



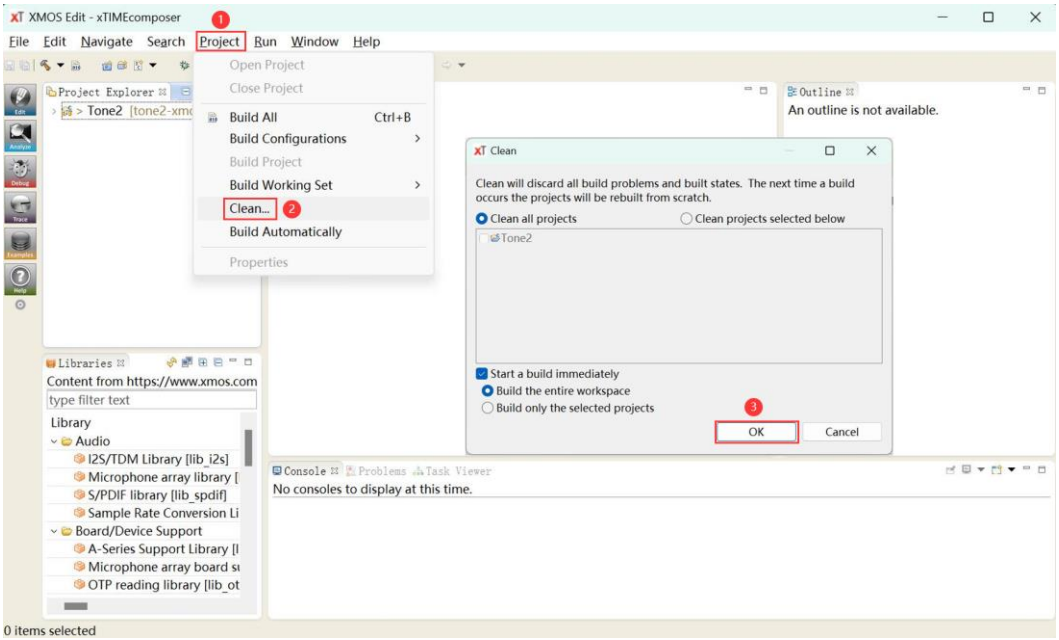
c) Import Tone2 source code.



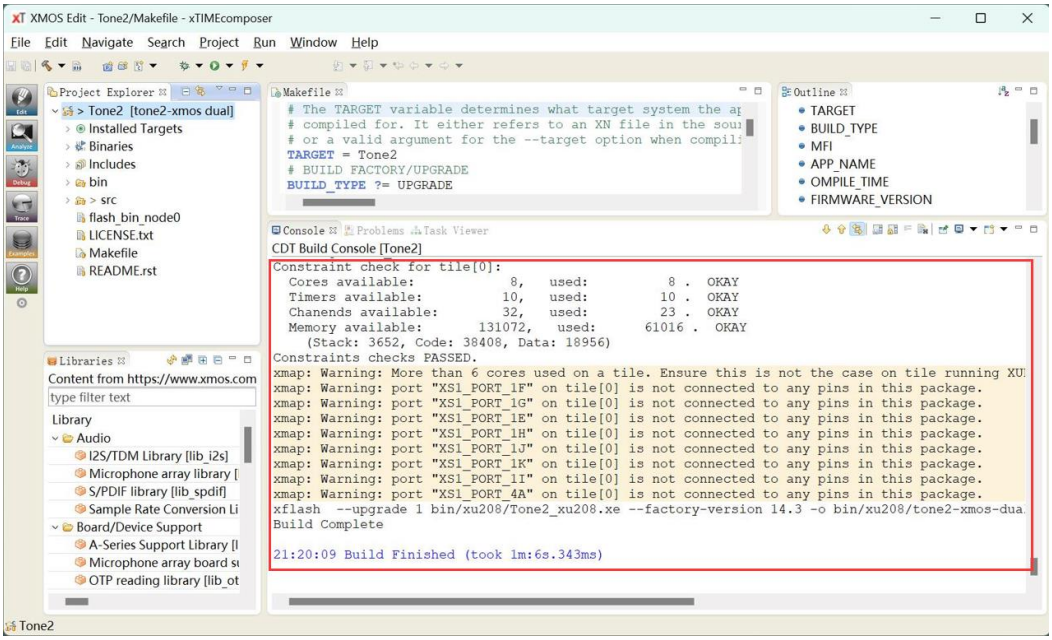


3.Compile dual XMOS code

Start compilation.

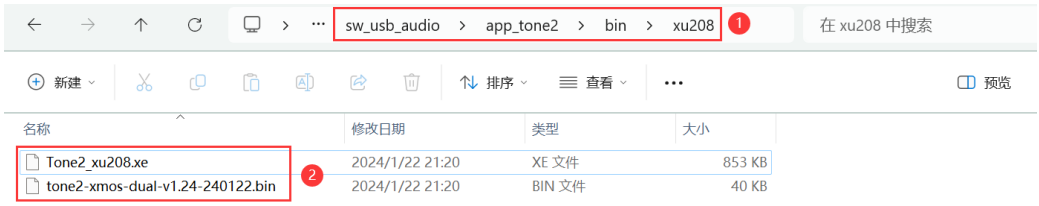


Finished compiling.



4.Description of generated file

2 files will be generated at “sw_usb_audio\app_tone2\bin\xu208” when compilation is finished.



Tone2_xu208.xe: use the xTAG-3 debug adapter to upgrade and debug.

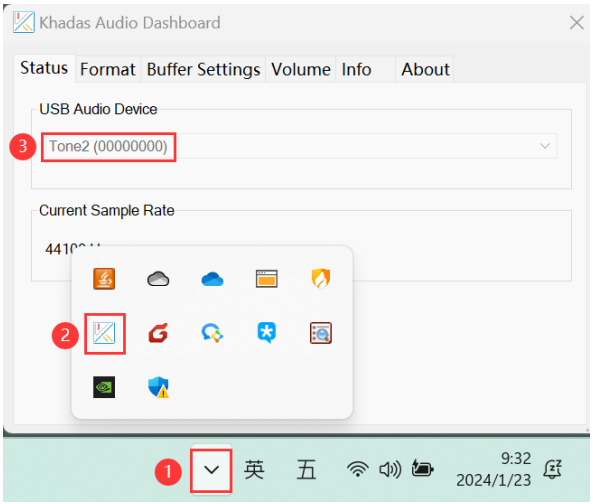
tone2-xmos-dual-v1.24-240113.bin: use DFU tool to upgrade (requires functional Tone2)

Upgrade .bin file using the DFU tool

Install the khadas-tone-driver and khadas-dfu-tool in advance.

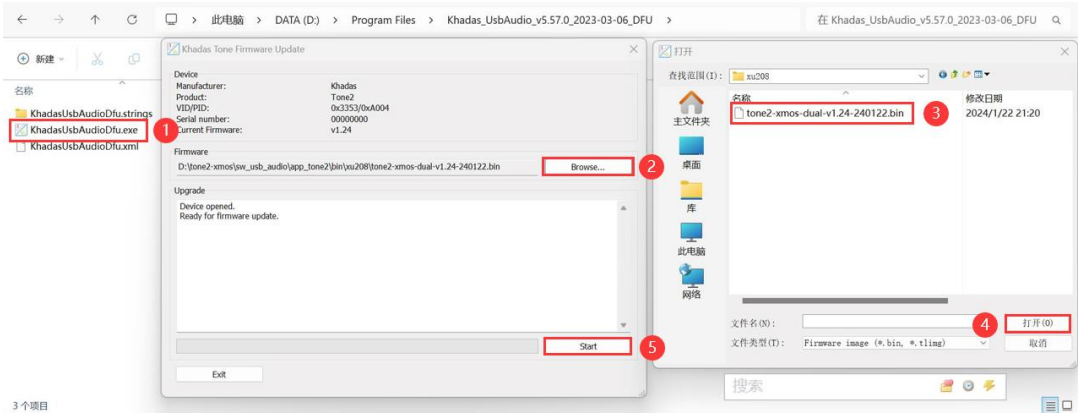
1. Connect Tone2 to PC

Connect Tone2 to your PC using a USB data cable. You can see that a Tone2 device has been connected to your PC and it is recognized by the khadas Audio Dashboard.



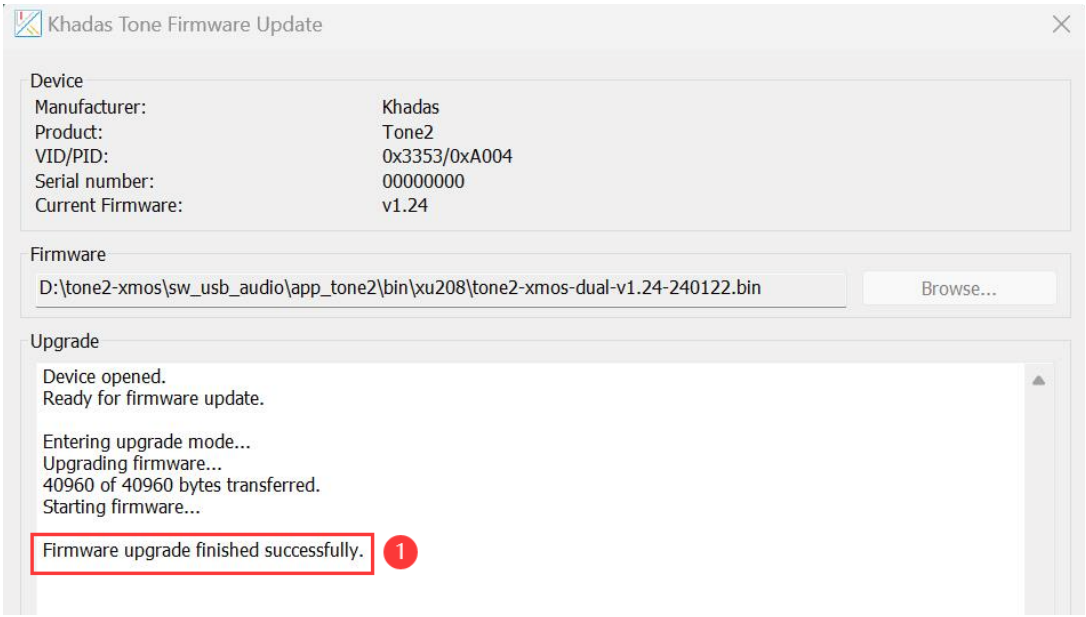
2.Firmware loading and upgrading

Open the khadas-audio-dfu-tool, load .bin format DFU firmware, and press start to upgrade.



3.Upgrade complete

After the upgrade is complete, a success message will be displayed, and the firmware version will be updated after reconnecting your PC with Tone2.



4.Reboot device

By design, the XMOS contains the MCU firmware. Therefore, to complete the upgrade, restart your Tone2. When restarting, the MCU will detect the firmware version in the newly upgraded XMOS firmware. If there is a difference in version, the 0x51 identifier in the MCU's EEPROM memory will be set to the upgrade flag. Reset Tone2 to enter the MCU's firmware update process. This process is relatively short and can be completed within 1 minute.

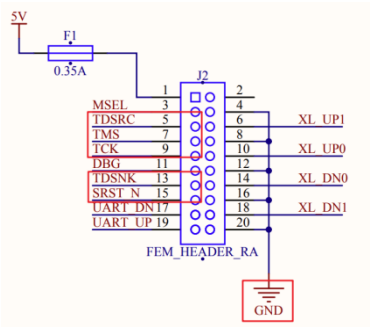
Upgrade .xe files through xTAG-3 tool

Prepare the xTAG-3 tool in advance.

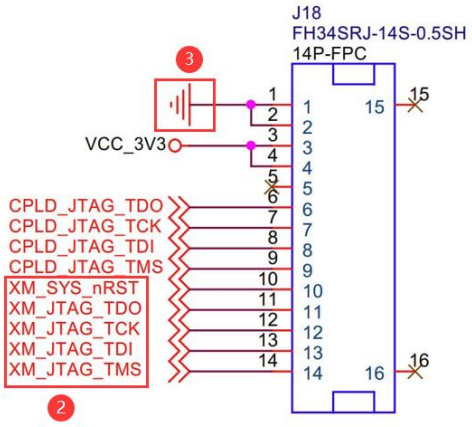
1.Connecting your devices

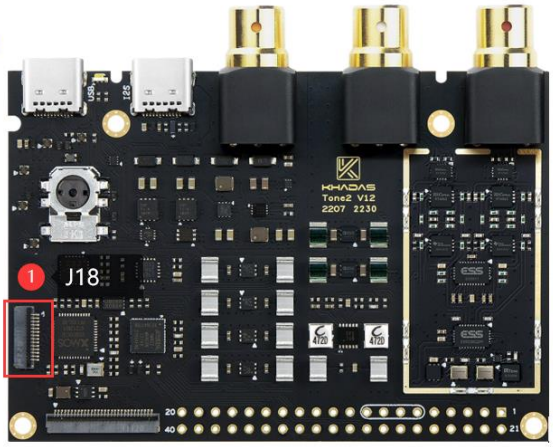
In addition to connecting the xTAG-3, you also need to power up the Tone2 via USB, when upgrading.

The xTAG-3 interface description is here.



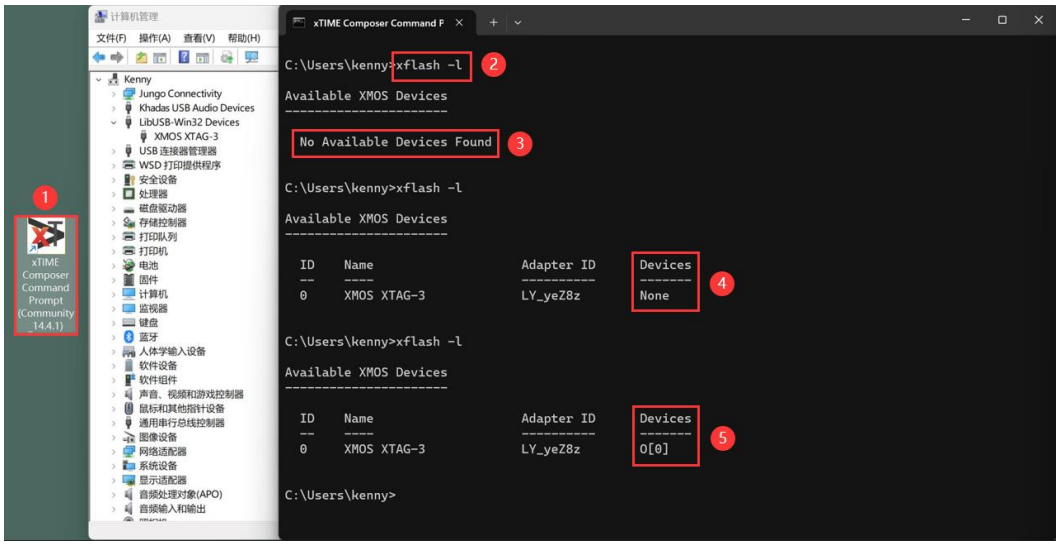
Tone2 XMOS debug interface is shown as below:
TDSRC=XM_JTAG_TDI, TMS=XM_JTAG_TMS, TCK=XM_JTAG_TCK, TDSNK=XM_JTAG_TDO, SRST_N=XM_SYS_nRST, GND also need to connect.





2.Get connection status

Open the xTIME Composer Command Prompt (Community_14.4.1) tool and enter the command “xflash -l” to display the current device connection status.



③No Available Devices Found: xTAG-3 is not connected, or xTAG-3 driver is not installed correctly.

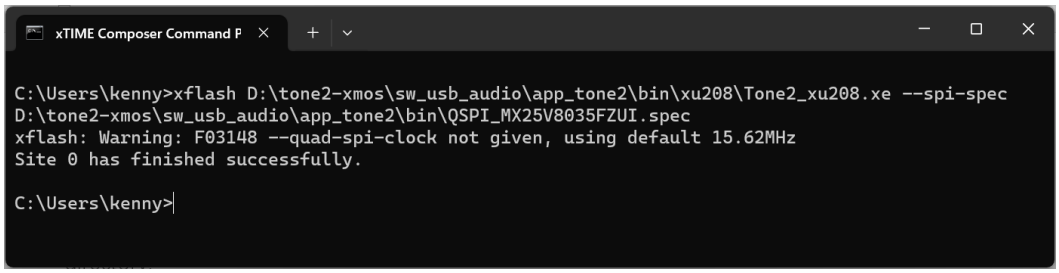
④Devices None: Abnormality in the Tone2 and xTAG-3 connection.

⑤Devices 0[0]: The connection is successful.

3.Firmware upgrade

The QSPI_MX25V8035FZUI.spec file will be used. This file is in the sw_usb_audio\app_tone2\bin\ directory.

Instruction format: xflash [xe file path] --spi-spec [spi flash parameter file]



We can see that the operation was successful, and the .xe file has been upgraded successfully.

4.Reboot Tone2

By design, the XMOS contains the firmware of the MCU. To complete the upgrade, restart the Tone2. Upon restarting, the MCU will detect the firmware version in the newly upgraded XMOS firmware. If there is a difference in version numbers, the 0x51 identifier is sent to the MCU's EEPROM to indicate a firmware upgrade flag. Tone2 is then reset and the MCU's firmware will be updated. This process is relatively short and can be completed within 1 minute.