Overview

The Host Audio example supports the audio microphone device.
The application prints the audio microphone information when the USB microphone device is attached.

System Requirement

Hardware requirements

- Mini/micro USB cable
- USB A to micro AB cable
- Hardware (Tower module/base board, and so on) for a specific device
- Personal Computer

Software requirements

- The project files are in:
  <MCUXpresso_SDK_Install>/boards/<board>/usb_examples/usb_host_audio_recorder/<rtos>/<toolchain>.

  Note

  > The <rtos> is FreeRTOS OS, not support Bare Metal. In the bare metal, writing sdcard is in blocking mode, so the host can't guarantee getting all of stream data of audio device (some transfers may be lost).

Getting Started

Hardware Settings

For detailed instructions, see the appropriate board User's Guide.

Note

> Set the hardware jumpers (Tower system/base module) to default settings.

Prepare the example

1. Download the program to the target board.
2. Power off the target board and power on again.
3. Prepare a sdcard and format it with FAT32 file system.

Note

> For detailed instructions, see the appropriate board User's Guide.

Run the example

1. Connect the board UART to the PC, you can see the Serial port number from "Device Manager", then open the COM port in a terminal tool such as PuTTy as the following picture, the baud rate is 115200.

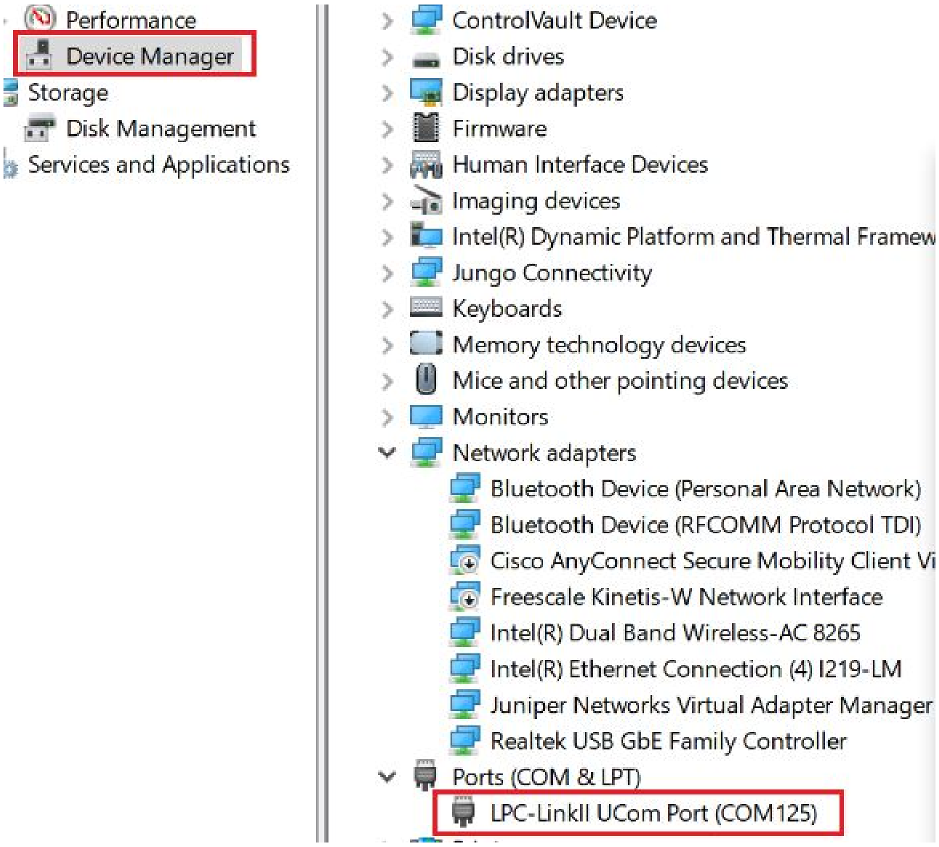
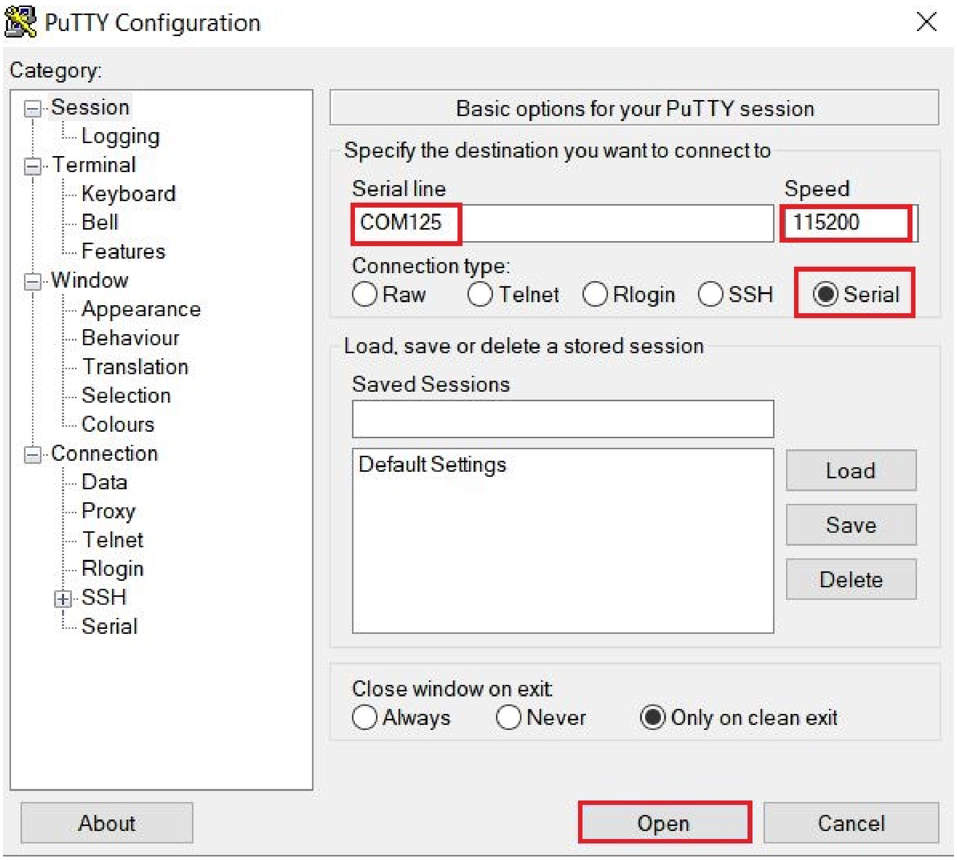

Performance
Device Manager
Storage
Disk Management
Services and Applications
ControlVault Device
Disk drives
Display adapters
Firmware
Human Interface Devices
Imaging devices
Intel(R) Dynamic Platform and Thermal Framew
Jungo Connectivity
Keyboards
Memory technology devices
Mice and other pointing devices
Monitors
Network adapters
Bluetooth Device (Personal Area Network)
Bluetooth Device (RFCOMM Protocol TDI)
Cisco AnyConnect Secure Mobility Client Vi
Freescale Kinetis-W Network Interface
Intel(R) Dual Band Wireless-AC 8265
Intel(R) Ethernet Connection (4) I219-LM
Juniper Networks Virtual Adapter Manager
Realtek USB GbE Family Controller
Ports (COM & LPT)
LPC-LinkII UCom Port (COM125)

Figure 1: UART port number



PuTTY Configuration

Basic options for your PuTTY session

Specify the destination you want to connect to

Serial line: COM125

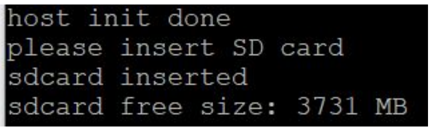
Speed: 115200

Connection type: ○ Raw ○ Telnet ○ Rlogin ○ SSH ● Serial

Close window on exit: ○ Always ○ Never ● Only on clean exit

Figure 2: Open UART

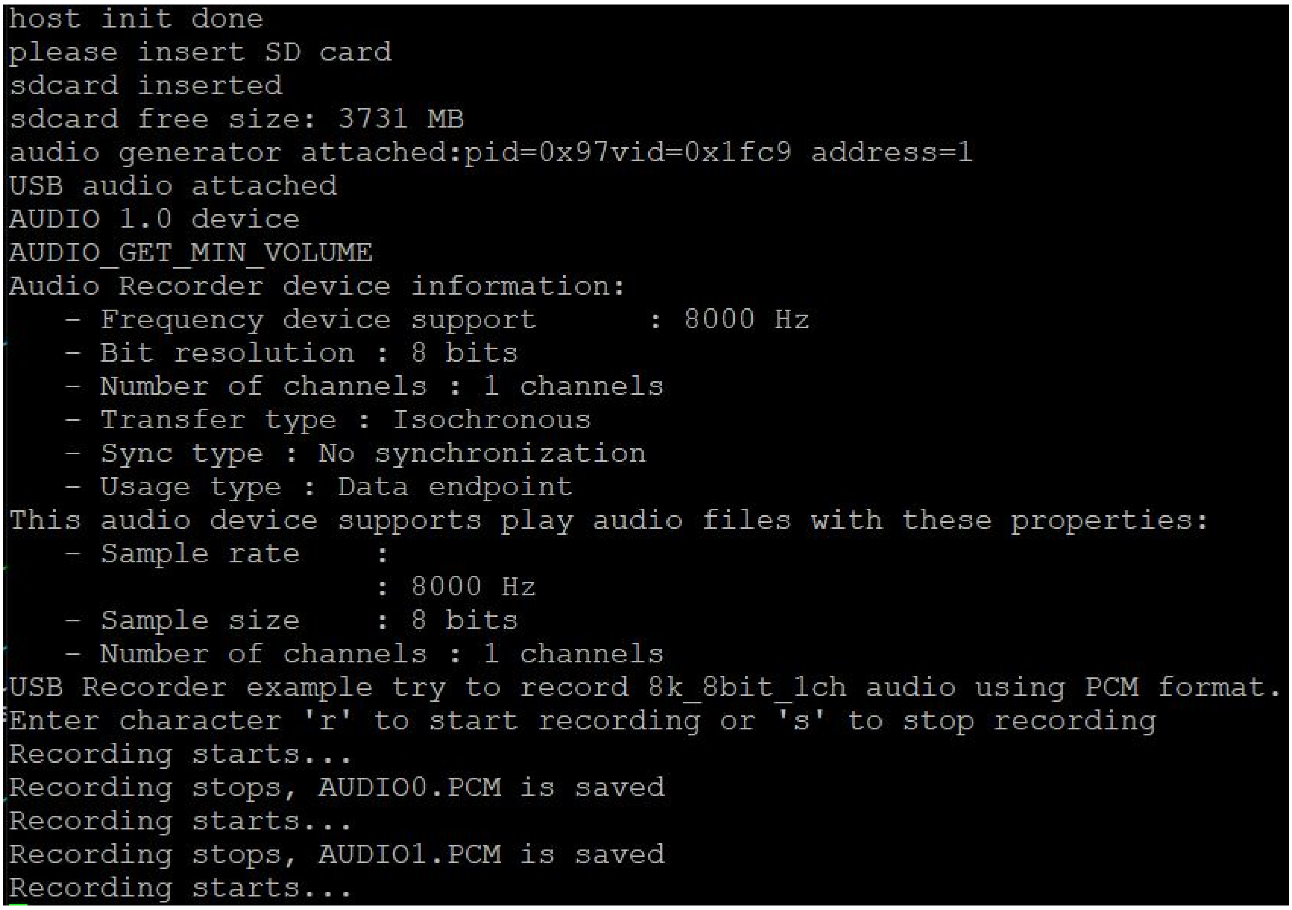
2. Insert the SD card into the slot. "sdcard inserted" and free memory size is printed out in the terminal as the following image.



```
host init done
please insert SD card
sdcard inserted
sdcard free size: 3731 MB
```

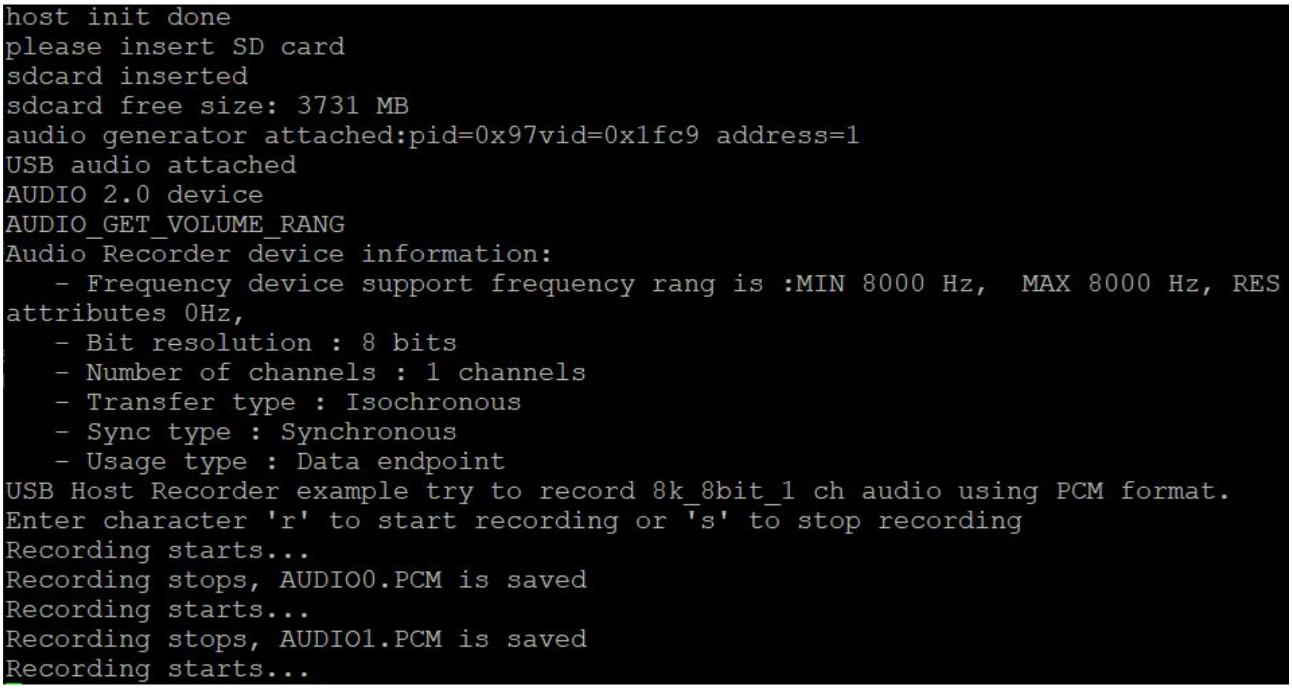
Figure 3: SDcard Insert

3. Plug in the USB audio microphone(generator) device to the board and the related information is printed in the terminal.
4. Enter ’r’ to start recording. The USB application will transfers the audio data from the USB audio microphone device and the sound is written in sd card. Enter ’s’ to stop recording, then one PCM file is saved. The following image shows how to attach a USB audio microphone device.



```
host init done
please insert SD card
sdcard inserted
sdcard free size: 3731 MB
audio generator attached:pid=0x97vid=0x1fc9 address=1
USB audio attached
AUDIO 1.0 device
AUDIO_GET_MIN_VOLUME
Audio Recorder device information:
   - Frequency device support      : 8000 Hz
   - Bit resolution : 8 bits
   - Number of channels : 1 channels
   - Transfer type : Isochronous
   - Sync type : No synchronization
   - Usage type : Data endpoint
This audio device supports play audio files with these properties:
   - Sample rate     :
                     : 8000 Hz
   - Sample size     : 8 bits
   - Number of channels : 1 channels
USB Recorder example try to record 8k_8bit_1ch audio using PCM format.
Enter character 'r' to start recording or 's' to stop recording
Recording starts...
Recording stops, AUDIO0.PCM is saved
Recording starts...
Recording stops, AUDIO1.PCM is saved
Recording starts...
```

Figure 4: Attach audio 1.0 microphone device



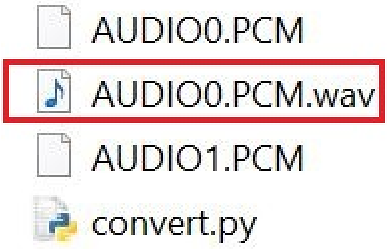
```
host init done
please insert SD card
sdcard inserted
sdcard free size: 3731 MB
audio generator attached:pid=0x97vid=0x1fc9 address=1
USB audio attached
AUDIO 2.0 device
AUDIO_GET_VOLUME_RANG
Audio Recorder device information:
   - Frequency device support frequency rang is :MIN 8000 Hz,  MAX 8000 Hz, RES
attributes 0Hz,
   - Bit resolution : 8 bits
   - Number of channels : 1 channels
   - Transfer type : Isochronous
   - Sync type : Synchronous
   - Usage type : Data endpoint
USB Host Recorder example try to record 8k_8bit_1 ch audio using PCM format.
Enter character 'r' to start recording or 's' to stop recording
Recording starts...
Recording stops, AUDIO0.PCM is saved
Recording starts...
Recording stops, AUDIO1.PCM is saved
Recording starts...
```

Figure 5: Attach audio 2.0 microphone device

5. Every time step 4 is executed, a file will be saved. For the convenience of audio testing, the following python script is provided to convert PCM to be WAV. Please set right parameters for setparams functon, which nchannels is channel count, sampwidth is byte width, framerate is sample rate. In the current test case, we should use setparams((1, 1, 8000, 0, ’NONE’, ’NONE’)). Open the WAV file with any media player and verify it by listening on the speaker of Laptop/PC.

```
import sys
import wave

for arg in sys.argv[1:]:
    with open(arg, ’rb’) as pcmfile:
        pcmdata = pcmfile.read()
    with wave.open(arg+’.wav’, ’wb’) as wavfile:
        wavfile.setparams((nchannels, sampwidth, framerate, 0, ’NONE’, ’NONE’))
        wavfile.writeframes(pcmdata)
```



AUDIO0.PCM
AUDIO0.PCM.wav
AUDIO1.PCM
convert.py

Figure 6: Convert PCM to WAV using python

Note

1. USB host only supports PCM format. If device has no PCM format, usb host will print necessary log.