# Freescale MQX Example Guide
# ESAI&ASRC example

This document describes the ESAI and ASRC component example application. This example consists 3 cases:

- ESAI playback: This example only supports the 48k, 16bit wav file now.
- ESAI record: This example only supports the 5 second, 48K, 16bit wav file record. And for the microphone without amplifier, it is not supported now.
- ESAI-ASRC playback: This example only supports the 44.1k, 16bit audio playback now.
- SAI record: This example record sound from microphone without amplifier on board and save the sound to a WAV file in SD card. The MIC connected with SAI on board, so we use SAI to do record.

## Running the example

ESAI Playback

- Start a terminal application on your PC and set the serial connection for 115200 baud rate, 8 data bits, 1 stop bit, no parity and no flow control.
- Prepare a SD card with a 48k, 16bit.
- Put J2 to 2-3, use CS48560 as master.
- Insert your headphone into the P7 (OUT1) in the vybrid_autoevb board.
- Type the "play a:\$FILE_NAME" in the terminal, you would see the printed message as the following.

```
shell> ESAI&ASRC card demo

Shell (build: Oct 30 2013)
Copyright (c) 2013 Freescale Semiconductor;
shell>
shell> Installing MFS over SD card driver...
SD card installed to a:

shell> play a:\audio48k16S.wav
===== Play music a:\audio48k16S.wav =====
ESAI START!

data = 883542, Time spends on SD reading is 4 sec, 558 millisec
MUSIC DONE!
```

ESAI Record

- Start a terminal application on your PC and set the serial connection for 115200 baud rate, 8 data bits, 1 stop bit, no parity and no flow control.
- Prepare a SD card and insert the card into the SDCARD slot.
- Put J2 to 1-2, CS48560 as slave.
- Input the audio data by line-in cable inserted into the P6 in the vybrid_autoevb board.
- Type the "record a:\$FILE_NAME" in the terminal, you would see the printed message as the following.

- Notes: there would be noise in the ESAI output and the length of the record is fixed to 5 seconds. As SD write speed is not stable and speed is low, some noise may be heard while using SD card with low speed. Suggest to use high speed SD card (Higher than class 5).

```
shell> ESAI&ASRC card demo

Shell (build: Oct 30 2013)
Copyright (c) 2013 Freescale Semiconductor;
shell>
shell> Installing MFS over SD card driver...
SD card installed to a:
shell> record a:\test_record.wav
rx test over
```

ESAI-ASRC Playback

- Start a terminal application on your PC and set the serial connection for 115200 baud rate, 8 data bits, 1 stop bit, no parity and no flow control.
- Prepare a SD card with a 44k, 16bit audio file.
- Insert your headphone into the P4 in the vybrid_autoevb board.
- Type the "play_asrc a:\$FILE_NAME" in the terminal, you would see the printed message as the following.

```
shell> ESAI&ASRC card demo

Shell (build: Oct 30 2013)
Copyright (c) 2013 Freescale Semiconductor;
shell>
shell> Installing MFS over SD card driver...
SD card installed to a:
shell> play_asrc a:\audio44k16S.wav
===== Play music a:\audio44k16S.wav =====
[source sample rate = 44100]
[target sample rate = 48000]
[slot length = 4]
========================
INSTALL ASRC 0 pair to ESAI
ASRC START!
ESAI START!
ESAI STOP!
ASRC STOP!
MUSIC DONE!
```

**Explanation of the example**

This example would firstly open the 44.1k wav file and convert the PCM data into 48k by ASRC. And then the converted PCM data would be send into ESAI for 48k playback.

SAI Record

- Start a terminal application on your PC and set the serial connection for 115200 baud rate, 8 data bits, 1 stop bit, no parity and no flow control.
- Prepare a SD card and insert the card into the SDCARD slot.
- Type the "record_sai a:\$FILE_NAME" in the terminal, you would see the printed message as the following.

```
shell> ESAI&ASRC card demo

Shell (build: Oct 30 2013)
Copyright (c) 2013 Freescale Semiconductor;
shell>
shell> Installing MFS over SD card driver...
SD card installed to a:
shell> record_sai a:\test_record_sai.wav
rx test over
```

Notice of the example: As the microphone has no amplifier, the sound volume is very small, while using the example, please make the sound loud enough.