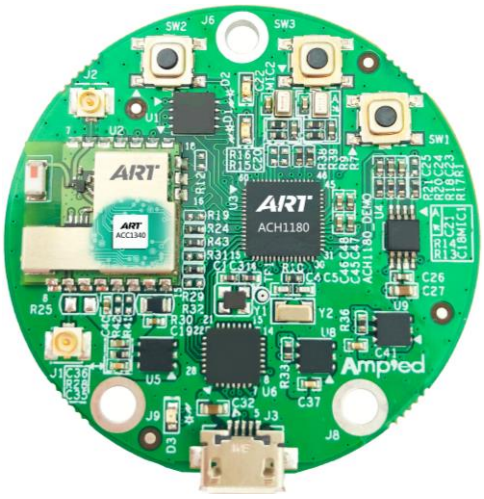
ACH1190 Evaluation Guide

Amp’ed RF Technology, Inc.



1. Introduction

1.1. Overview

The ACH1190 EVB, “Casino”, is designed for evaluating and developing audio and voice processing applications. Additionally, when used with our WiFi modules, the Casino will allow developers to create customized IoT applications directly on the WiFi host platform. Example wave file player and voice recorder projects are included in this evaluation system. The purpose of this document is to give an overview of hardware and software included in the ACH1190 EVB.

1.2. System requirements

This evaluation has the following system requirements:

- Computer running with Windows XP, Windows 7, Windows 8 or Windows 10
- Computer with a minimum of 1 USB ports
- IAR C compiler

1.3. External resources

- A speaker or earphone

2. Contents of kit

2.1. Software

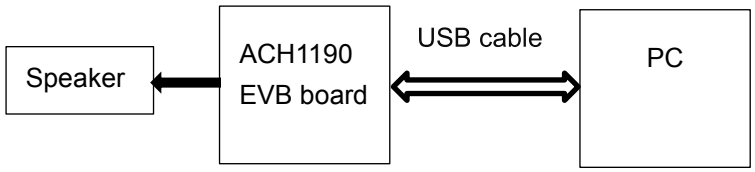
- Term_5.1.exe, PC software tool
- IAR Project file: **ACH_Basic_SDK**
- For WiFi: **ACH_WiFi_SDK**
- Voice Recorder sample application binary image
- Wave Player sample application binary image

2.2. Hardware

- ACH1190_EVB Casino board
- Includes WF60 WiFi dual band module
- Micro USB cable

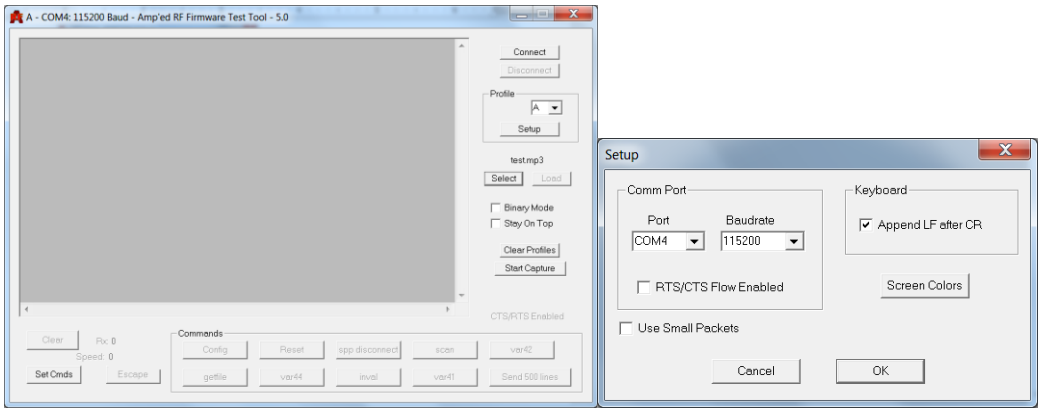
3. Getting started

- Copy the Term_5.1.exe to the computer. Copy the code files, Wave Player and Voice Recorder, to the computer.
- Connect EVB board to computer USB interface with USB cable

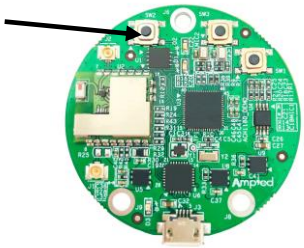


- Find out the port number in Device Manager

- Run the Term_5.1.exe, setup button, to set the baud rate to 115200 and the port number



- Click on connect button
- Press the reset key (SW2) on the board.



- On the Term interface, you will see the Main menu

```
System power on v79
Uart init ok
ART bootrom v1.0 -- Normal mode

Spi init ok
Load image to address RAM_DEBUG_ADDR
Image loaded done!

ACH Flashloader 1.6 - 2019.02.19
CPU 200 MHz

Press space to repaint menu.
Press CR to go back one menu.
Main Menu
 1. Upload File
 2. Delete File
 3. Run Application
 4. Default Application
 5. Undefault Application
 6. List Files
 7. Advanced Menu
#
```

- Enter number “3” to run application

```
Spi init ok
Load image to address RAM_DEBUG_ADDR
Image loaded done!

ACH Flashloader 1.6 - 2019.02.19
CPU 200 MHz

Press space to repaint menu.
Press CR to go back one menu.
Main Menu
 1. Upload File
 2. Delete File
 3. Run Application
 4. Default Application
 5. Undefault Application
 6. List Files
 7. Advanced Menu
#3
Run Application
 1.   19812 x  WavePlayer.bin
 2.   19812 x  VoiceRecord.bin
#
```

- Two applications are pre-loaded. The first one “**WavePlayer**” is to demonstrate playing wave music files, the second one “**VoiceRecord**” is to demonstrate recording a voice clip.

- Enter the number of the wave clip to play. In this case, press “4” to select the “Vivaldi” wave file clip

```
 2.   19812 x  VoiceRecord.bin
#1
WavePlayer -  200 MHz

Volume is 0. Press +/- to change volume. (80 max)

Select WAV File:
 1. jeannie.wav
 2. outer_limits.wav
 3. ta-da.wav
 4. Vivaldi.wav
4
Wave file: Vivaldi.wav  1995580 bytes.
=====================================
AudioFormat   PCM
NumChannels   2
SampleRate    22050
BitsPerSample 16
BlockAlign    4
PlayTime      22.6 sec
DataSize      1995536 bytes
=====================================
Press any key to stop
```

- Adjust the volume by entering “+” or “-”.

- If the **VoiceRecord** application was selected. Enter Number “2” to select “**Record**”, then “1” to “**Start**” recording, “2” to “**stop**” recording, and “3” to “**Playback**” the recording.

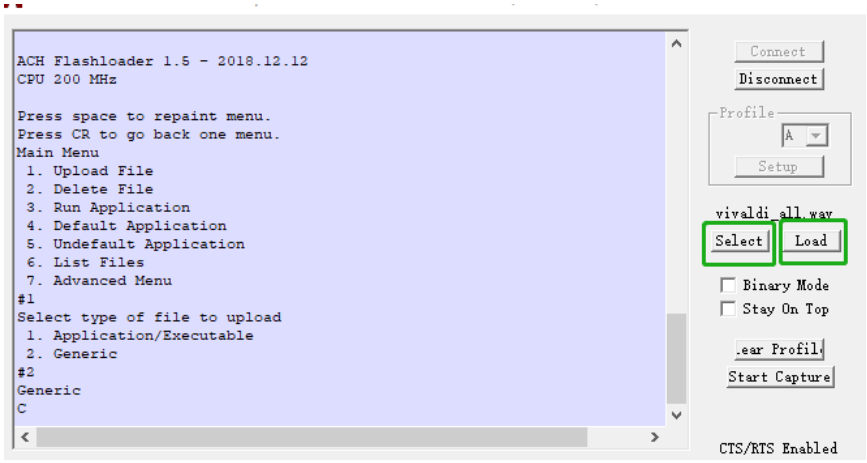
```
 7. Advanced Menu
#3
Run Application
 1.   19812 x  WavePlayer.bin
 2.   19812 x  VoiceRecord.bin
#2
SystemCoreClock 200 MHz
Flash: SPI2 (10.0 MHz, Div=10)
Flash IDs: 16 16 EF 60 17

Volume is 0. Press +/- to change volume. (80 max)

Press space to repaint menu.
Press CR to go back one menu.
Main Menu
 1. Playback
 2. Record
#2
Record
 1. Start
 2. Stop
 3. Playback
#
```

Voice is recorded at 8KHz sampling rate, 16 bits per sample.

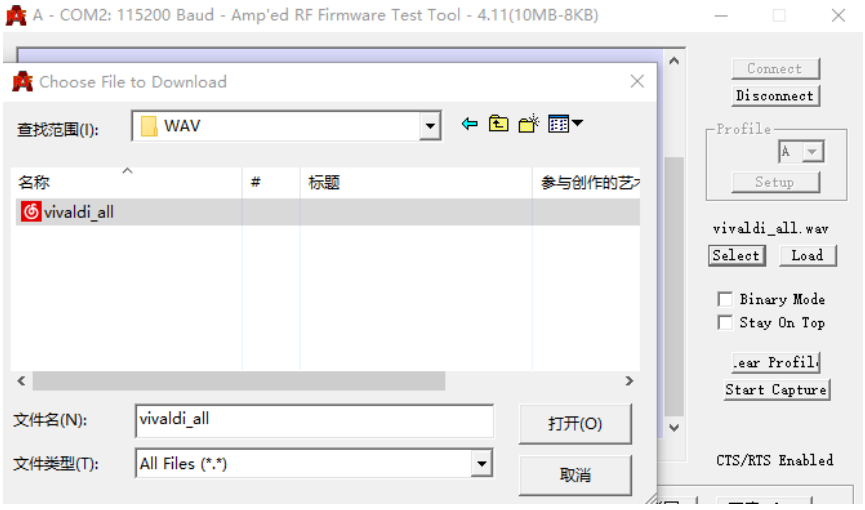
Note that the maximum record time should not exceed 5 seconds.

4. How to load WAV

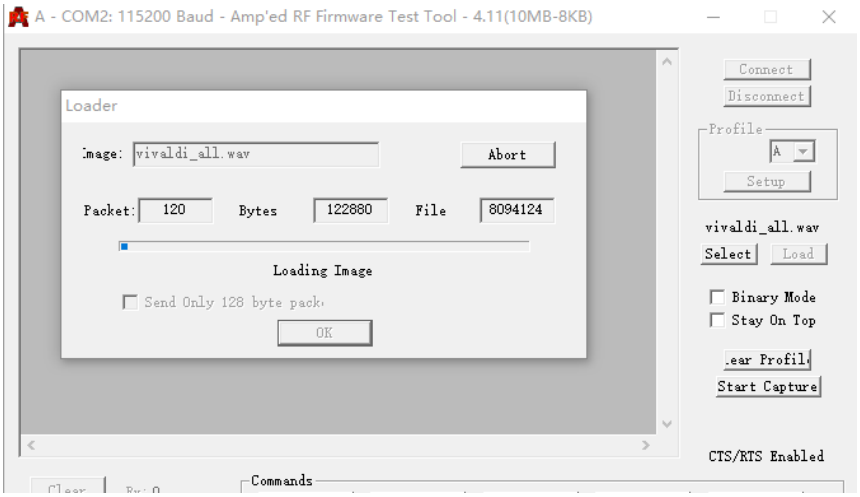
To upload a new wave file, enter the number “1” under the main menu. Then enter the number “2” to choose load generic. Typically, 22KHz sampling rate at 16-bit samples is used for wav files in this example. For this upload tool the maximum file size is 512K, which means approximately 6 seconds. Much larger files may be uploaded using a different third-party upload tool that implements the Y-Modem protocol.



- Then click the “select” button to select the path of the wave file you want to upload. Then click “open”.



- Click the “load” button to wait for the download to complete



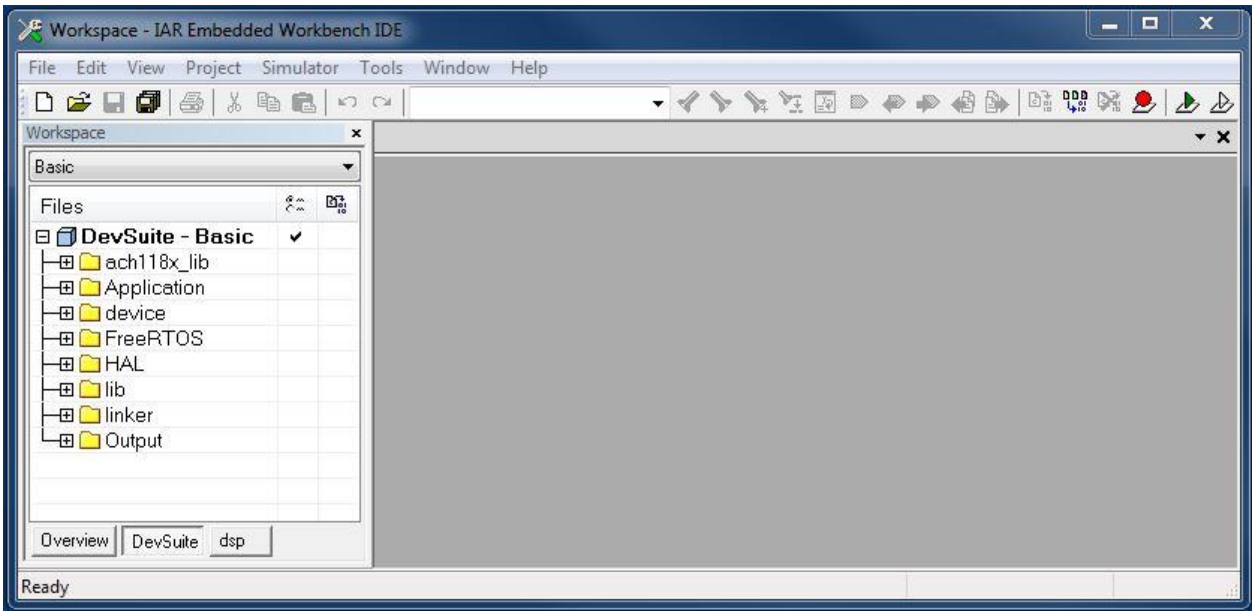
5. IAR Project: ACH_Basic_SDK

You can begin your project development with the **ACH_Basic_SDK** project. This is compiled for the IAR IDE, but it can easily be modified to use another IDE such as Kiel.

In the top-level folder, please find --

- **ach119x_lib** folder contains all the headers needed for the ACH library
- **Application** folder contains the application source code and its headers
- **device** folder contains headers for the flash device
- **Drivers** folder contain headers and sources for CMSIS
- **EWARM** folder contains IAR project information
- **FreeRTOS** folder contains headers and source code for the FreeRTOS OS
- **HAL** folder contains headers for the Generic Kernel Interface (GKI)
- **lib** folder contains the ACH library
- **linker** folder contains the **icf** file needed for linking the project.

To use **ACH_Basic_SDK** with **IAR** click on **Workspace.eww** in the **EWARM** folder.



Select your preferred project, and compile it by pressing **F7**. The resultant binary image can be found in the created **Exe** folder. Further information on how to use the IAR IDE can be found under the **Help** menu.

6. Revision history

1.0	22 April, 2019	Initial release
1.1	26 April, 2019	Added IAR project details
1.2	06 Jan, 2010	Updated to ACH1190 part number