

ACH1190 Evaluation Guide

Amp'ed RF Technology, Inc.



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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

A - COM4: 115200 Baud - Amp'ed RF Firmware Test Tool - 5.0	
Commands Commands	Setup Comm Port Port Baudrate COM4 I15200 RTS/CTS Flow Enabled Cancel OK

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



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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

    Default Application
    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



** WavePlayer -	200 MHz
Volume is 0. 1	Press +/- to change volume. (80 max)
Select WAV Fil	le:
1. jeannie.wa	av
2. outer lim:	its.wav
3. ta-da.wav	
 ta-da.wav Vivaldi.wa 	av
 ta-da.wav Vivaldi.wa 	av
3. ta-da.wav 4. Vivaldi.wa 4 Wave file: Viv	av valdi.wav 1995580 bytes.
3. ta-da.wav 4. Vivaldi.wa 4 Wave file: Viv AudioFormat	av valdi.wav 1995580 bytes. PCM
3. ta-da.wav 4. Vivaldi.wa 4 Wave file: Viv AudioFormat NumChannels	av valdi.wav 1995580 bytes. PCM 2
3. ta-da.wav 4. Vivaldi.wa 4 Wave file: Viv 	av valdi.wav 1995580 bytes. PCM 2 22050
3. ta-da.wav 4. Vivaldi.wa 4 Wave file: Viv AudioFormat NumChannels SampleRate BitsPerSample	av valdi.wav 1995580 bytes. PCM 2 22050 16
3. ta-da wav 4. Vivaldi.w/ 4 wave file: Viv 	av valdi.wav 1995580 bytes. PCM 2 22050 16 4
3. ta-da wav 4. Vivaldi.wa 4 Wave file: Vir 	av valdi.wav 1995580 bytes. PCM 2 22050 16 4 22.6 sec

• Adjust the volume by entering "+" or "-".

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• 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.



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.

• ACH Flashloader 1.5 - 2018.12.12	^	Connect
CPU 200 MHz		Disconnect
Press space to repaint menu. Press CR to go back one menu.		Profile A -
Main Menu 1. Upload File		Setup
2. Delete File 3. Run Application 4. Default Application		vivaldi all.wav
5. Undefault Application 6. List Files		Select Load
7. Advanced Menu		🔲 Binary Mode
<pre>#1 Select type of file to upload</pre>		🗌 Stay On Top
 Application/Executable Generic 		.ear Profile
#2		Start Capture
Generic		
C	×	
<	>	CTS/RTS Enabled

• Then click the "select" button to select the path of the wave file you want to upload. Then click "open".

🛕 A - COM2: 1	15200 Baud - A	mp'ed F	RF Firmware Test	: Tool - 4.11(10	MB-8KB)		- 🗆 X
A Choose File	to Download				×	1	Connect
查找范围(I):	WAV				* Ⅲ▼	L	Profile A -
名称	^	#	标题		参与创作的艺>		Setup
ovivaldi_all							vivaldi_all.wav Select Load Binary Mode Stay On Top .ear Profil
<					>		Start Capture
文件名(N): 文件举型(T):	vivaldi_all				打开(0)	~	CTS/RTS Enabled
())	1				取消		



• Click the "load" button to wait for the download to complete

	Loader image: vivaldi_all.wav Abort Facket: 120 Bytes 122880 File 8094124 Loading Image Send Only 128 byte pack. OK	ŕ	Connect Disconnect Profile Setup vivaldi_all.wav Select Load Binary Mode Stay On Top .ear Profil] Start Capture
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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.

🔀 Workspace - IAR Embedded	Wor	kbencl	IDE									-		0	ĸ
File Edit View Project S	imula	tor 1	ools Window Help												
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Workspace		×												-	×
Basic		•													
Files	82	1. 1.													
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H - ⊕ 🗀 ach118x_lib															
Application															
📕 🛏 🗋 device															
FreeRTOS															
HAL															
lib 🖂 🕀 🔁															
📙 🗁 linker															
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Uverview DevSuite dsp															
Ready			,												14

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