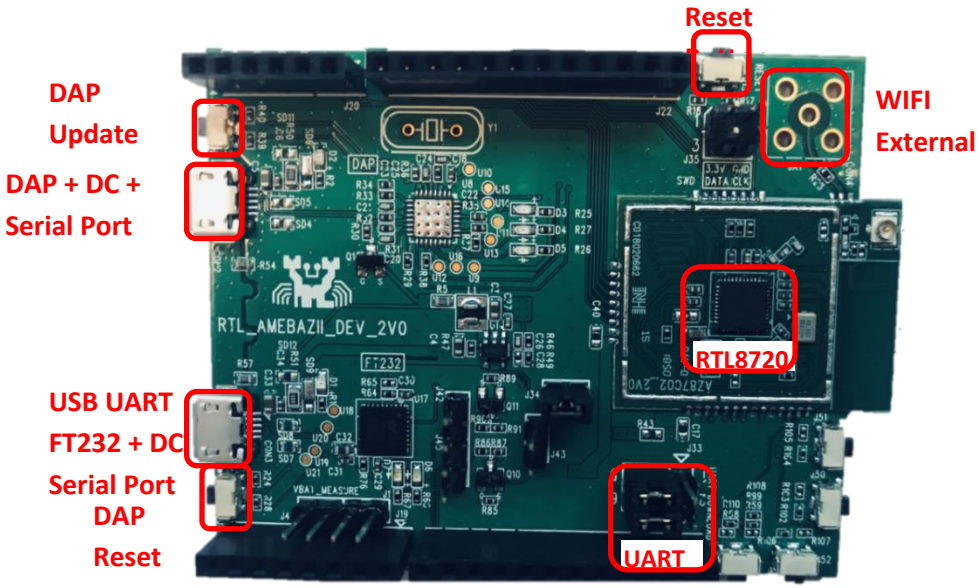
Ameba Z2 Amazon FreeRtos Getting Started Guide

1. Getting Started with the AmebaZ2

The amebaz2 board is able to use the amazon-freertos sdk version 1.4.7. The AmebaZ2 board is designed by Realtek and is a Wi-Fi ready chip.

1. Hardware Requirement
   It is required to have the AmebaZ2 Dev board in order to run the amazon-freertos SDK. The current demo board version is: DEV_2V0



2. Host Operating System.
   Currently the SDK is available for IAR Embedded Workbench on windows.
3. Supported IDE
   Currently the amazon-freertos has been tested in the IAR Embedded Workbench ver.8.30.1.
4. Pre-Requisite
   - Required code repositories.
   - AmebaZ2 Dev Board DEV_2V0
   - IAR Embedded Workbench ver.8.30.1
   - Segger JLINK downloader.

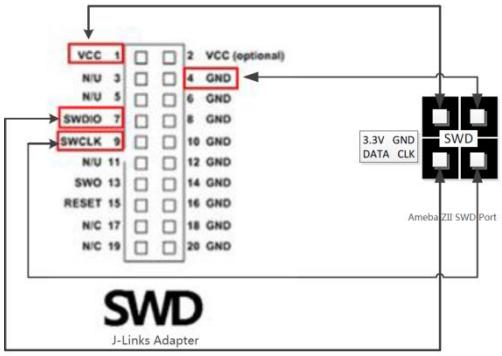
2. Pre-Requisites & Set-Up

To download code or debug on Ameba-ZII, user needs to make sure the debugger is setup properly first. Ameba-ZII supports J-Link and CMSIS-DAP for code download and entering debugger mode.

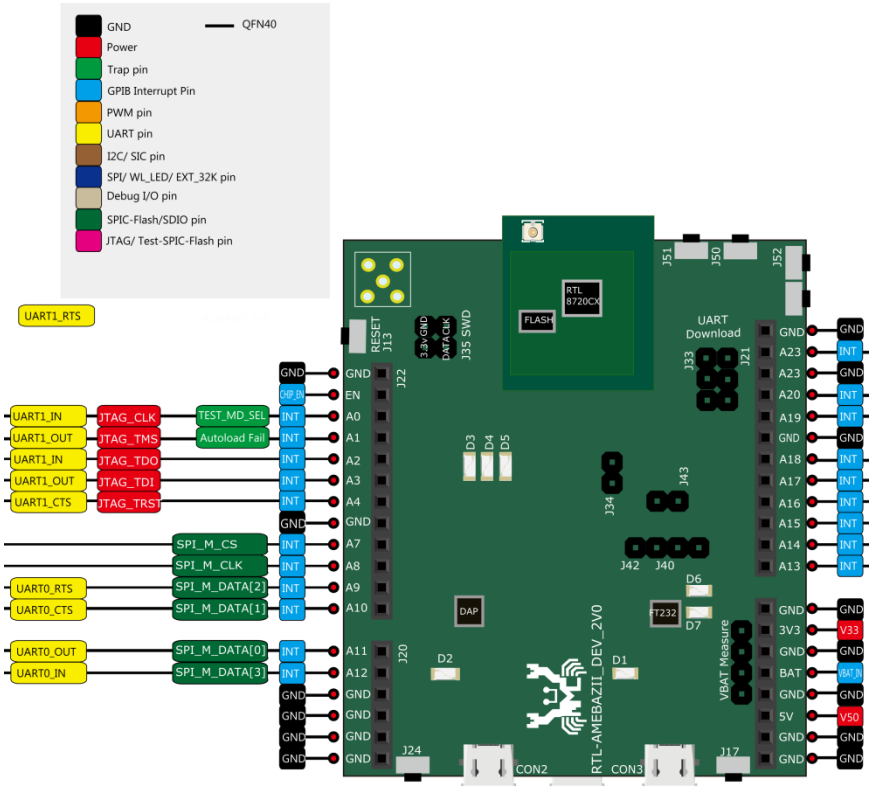
The settings are described below. Since the DEV_2V0 board supports only the JLINK debugger we shall be highlighting the JLINK setup first.

2.1 J-Link Setup

Ameba-ZII supports J-Link debugger. We need to connect the SWD connector to J-Link debugger. The connection is shown as below.



The SWD connectors on the actual dev board are seen on the schematic as shown below:

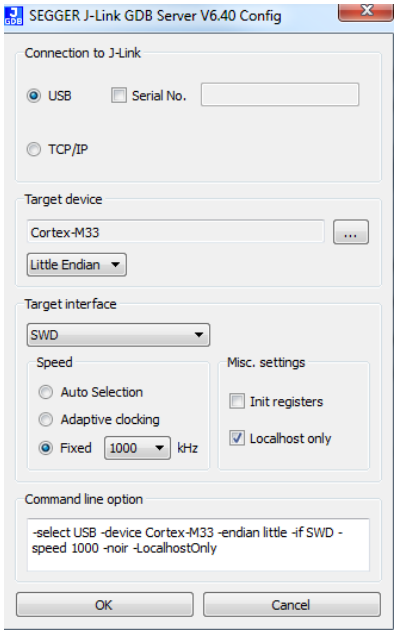


After finished these configuration, please connect it to PC side. Note that if you are using Virtual Machine as your platform, please make sure the USB connection setting between VM host and client is correct so that the VM client can detect the device.

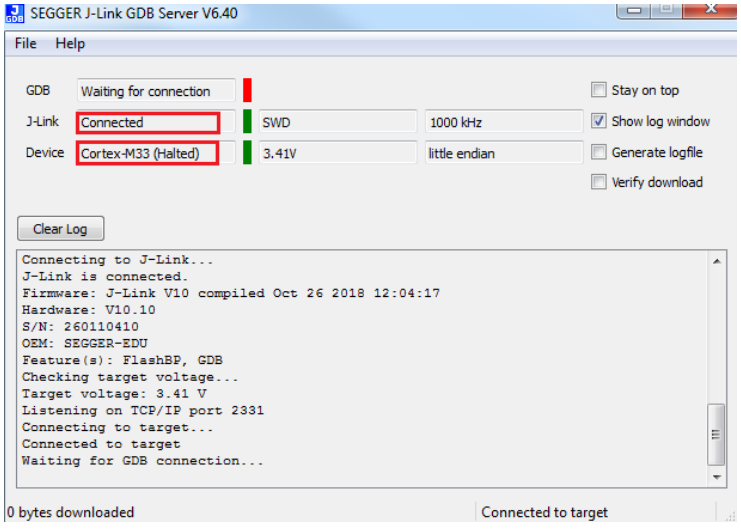
Note: To be able to debugger Ameba-ZII which is powered by Cortex-M33, user needs a J-Link debugger with the latest hardware version (Check https://wiki.segger.com/Software_and_Hardware_Features_Overview for details). J-Link with hardware version V10 is used to prepare this document.

2.2 Windows Setup

To be able to use J-Link debugger, user needs install J-Link GDB server first. For Windows, please check http://www.segger.com and download “J-Link Software and Documentation Pack” (https://www.segger.com/downloads/jlink). To check whether the connection works fine, user can go to the location of SEGGER J-Link tool and run “JLinkGDBServer.exe”. Make sure the configuration is correct as shown below and click “OK”.



Please check and make sure below information is shown properly.



2.3 Serial Port Setup

In order to connect the serial port to the PC, a micro USB needs to be connected to the Dev board to the connector “CON3”. This connector can be seen on the schematic shown previously. The connector acts as both the serial port and the power supply to the board.

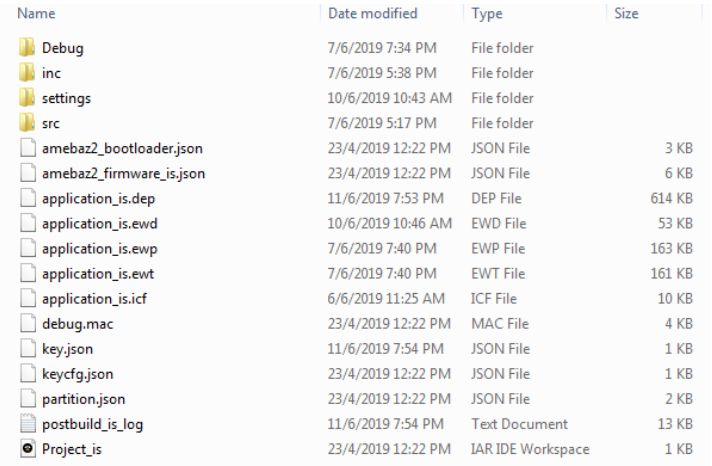
2.4 IAR Project Introduction

IAR IDE provides the toolchain for Ameba-ZII. It allows users to write programs, compile and upload them to your board. Also, it supports step-by-step debug. User can visit the official website of IAR Embedded Workbench, and install the IDE by following its instructions.

Note: Please use IAR version 8.30 or above.

3. Build and Run the FreeRTOS Demos

All the amazon-freertos demo files are already built into the project file present in the folder: “amazon-freertos\demos\realtek\amebaz2\iar”



Name	Date modified	Type	Size
Debug	7/6/2019 7:34 PM	File folder	
inc	7/6/2019 5:38 PM	File folder	
settings	10/6/2019 10:43 AM	File folder	
src	7/6/2019 5:17 PM	File folder	
amebaz2_bootloader.json	23/4/2019 12:22 PM	JSON File	3 KB
amebaz2_firmware_is.json	23/4/2019 12:22 PM	JSON File	6 KB
application_is.dep	11/6/2019 7:53 PM	DEP File	614 KB
application_is.ewd	10/6/2019 10:46 AM	EWD File	53 KB
application_is.ewp	7/6/2019 7:40 PM	EWP File	163 KB
application_is.ewt	7/6/2019 7:40 PM	EWT File	161 KB
application_is.icf	6/6/2019 11:25 AM	ICF File	10 KB
debug.mac	23/4/2019 12:22 PM	MAC File	4 KB
key.json	11/6/2019 7:54 PM	JSON File	1 KB
keycfg.json	23/4/2019 12:22 PM	JSON File	1 KB
partition.json	23/4/2019 12:22 PM	JSON File	2 KB
postbuild_is_log	11/6/2019 7:54 PM	Text Document	13 KB
Project_is	23/4/2019 12:22 PM	IAR IDE Workspace	1 KB

The project file is named “project_is.eww” and the application_is.ewp is already pre-configured with all the necessary files, pre-build and post-build scripts.

3.1.1 Project Configurations

1) There are a lot of configurations that can be enabled or disabled from the file “platform_opts.h”
2) The default version will run the baseline software along with the amazon-freertos demos.
3) The demo that needs to be run can be configured from the “aws_demo_runner.c” file by un-commenting the appropriate demo call.

3.1.2 Compile

1) Open amazon-freertos\demos\realtek\amebaz2\iar \Project_is.eww.
2) Confirm application_is in Work Space, right click application_is and choose “Rebuild All” to compile.
3) Make sure there is no error after compile.

3.1.3 Generating image binary

After compile, the images partition.bin, bootloader.bin, firmware_is.bin and flash_is.bin can be seen in the EWARM-RELEASE\Debug\Exe.

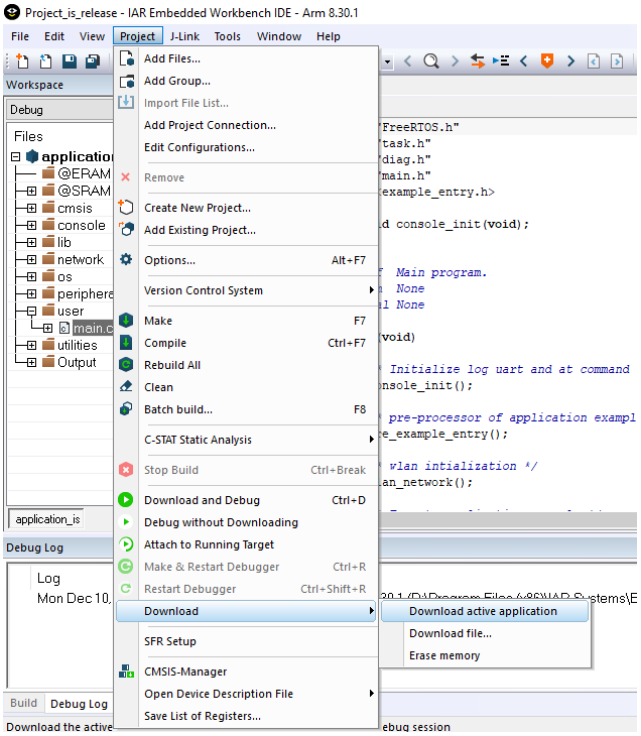
1) partition.bin stores partition table, recording the address of Boot image and firmware image;
2) bootloader.bin is bootloader image;
3) firmware_is.bin is application image;

4) flash_is.bin links partition.bin, bootloader.bin and firmware_is.bin. Users need to choose flash_is.bin when downloading the image to board by PG Tool.

3.1.4 Download

After a successfully compilation and flash_is.bin is generated without error, user can either

1) Directly download the image binary on to demo board from IAR IDE (as below)



2) Once the image is successfully downloaded, the dev board needs to be reset in order to be able to run the application and see the logs.
3) Once the reset button is pushed the board will boot and run the demo program chosen.

3.1.5 Debugging

1) The IAR debugger can be used for debugging.
2) The debugger configurations are already built into the project file and are ready to use.