MAVID Application Development Guide

Revision: 1.0

Libre Wireless Technologies Private Limited

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Table of Contents

1. Document Information

1.1. Abstract

This document explains the procedures to develop applications on MAVID using Libre SDK.

1.2. Document Convention

Icon	Meaning	Description
	Note	Provides information good to know
	Caution	Indicates situation that might result in loss of data or hardware damage

1.3. Document Revision History

Revision	Date	Description of change	Author
1.0	February 25, 2020	Added the section **Hardware Setup**	Sachin
0.1	January 07, 2020	Initial Draft	Sachin

2. Libre AWS IoT Application Development

The Libre application development platform provides the tools and development environment for custom application development.

It is based on the latest FreeRTOS kernel.

2.1. Hardware Requirement

The hardware requirements are as follows:

- MAVID Development Kit
- STlink debugger
- USB TTL Serial cable

2.2. Software Requirement

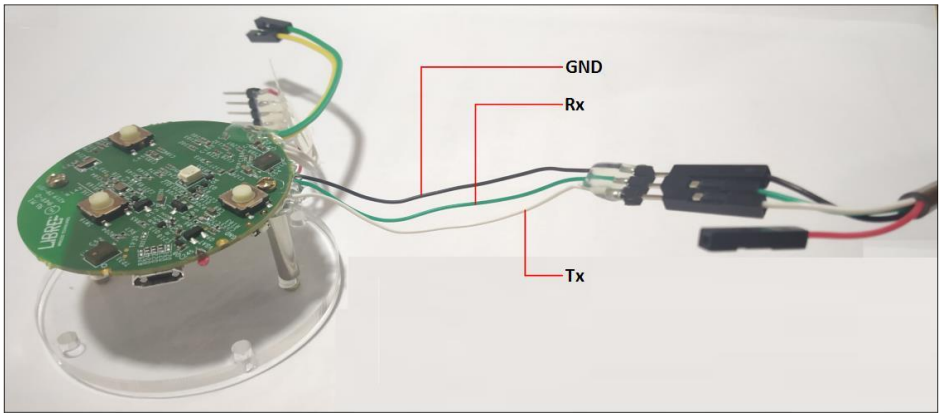
The software requirements are as follows:

- IAR version 7.70
- STM32 ST-LINK Utility v4.2.0
- Teraterm/Putty/GTK-term or any similar serial port terminal application
- Libre software development kit (contains software development SDK and ENV tool to generate custom ENV binary)

2.3. Hardware Setup

Follow the below steps to setup the hardware components:

Step 1. Connect the USB TTL cable to the device as shown below (Connect the pins to their respective colours i.e., green-green, black-black and white-white):



GBS Tower – Cable connections

Step 2. Connect the micro USB power cable to the device.

Step 3. Launch the serial port terminal on the PC with the following settings:

Baud Rate	460800
Data	8 bits
Parity	none
Stop Bits	1 bit
Flow Control	none
Enable LF on the serial receive	

Step 4. Press button SW15 to Power ON the device.

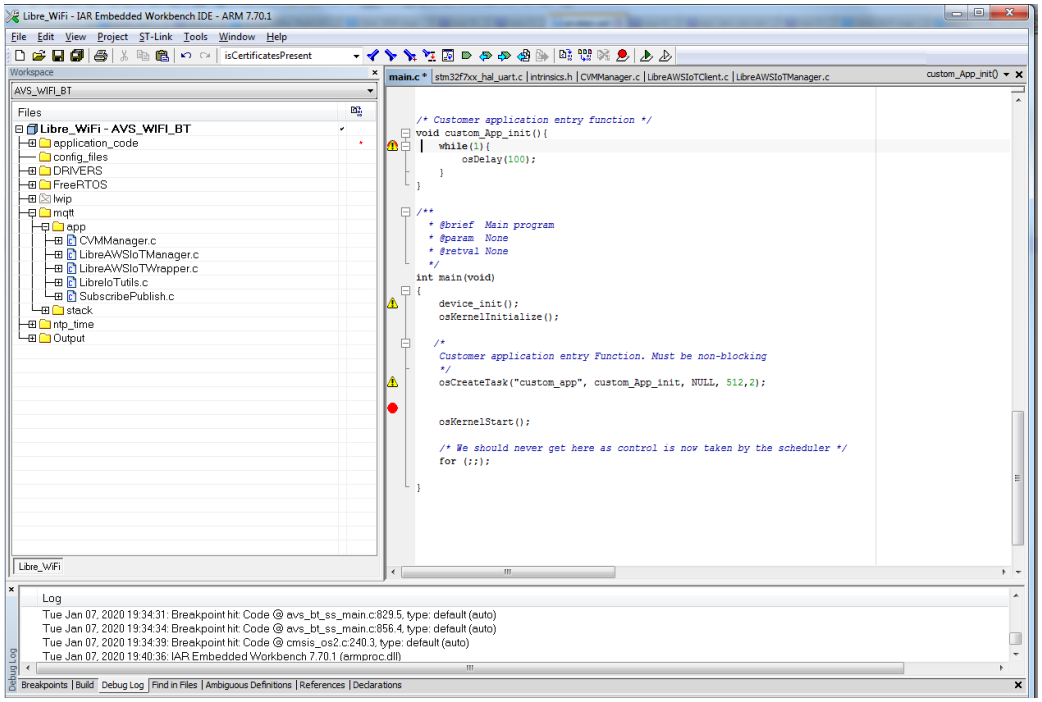
2.4. Application Project Development

2.4.1. Launching the project

The project can be launched by either of the following methods:

1) Run **LaunchProject.bat**

2) Run **\projects\libre\mavid\iar\EWARM\Libre_WiFi.eww**



IAR Project View

2.4.2. Writing Custom Application

- The application execution starts at **main()**
- The **custom_App_init()** for custom applications should be hooked after the **osKernelInitialize()**, but before **osKernelStart();** Do not change anything before **osKernelInitialize()**
- The **custom_App_init()** should be non-blocking
- New files can be added to **application_code** group in the project folder structure or new groups can be created

2.4.3. Compiling

- In the Menu Bar select **Project → Clean** to clean the project
- In the Menu Bar select **Project → Make** to compile the project
- After successful compilation, the output file **Mavid.bin_JTAG.bin** is generated at **projects\libre\mavid\iar\EWARM\AVS_WIFI_BT\Exe** folder
- Load the binary file **Mavid.bin_JTAG.bin** as explained in the section 2.3.5. Loading and Debugging

2.4.4. Generating customized ENV

The ENV_tool (Part of software SDK) contains the tools to modify and generate the env.bin.

The values of ENV can be modified and new env can be added to **envitem.xml**.

Refer "*LibreWirelessTechNote - MAVID_NV_Items_V0.3"* document for more details.

After editing the **envitem.xml**, run **CreateENV.bat**. The output **env.bin** and **env_uid.h** are generated in the same folder.

In case a new ENV is added to **envitem.xml**, replace the **env_uid.h** at **\vendors\libre\mavid\components\Inc** with the newly generated **env_uid.h**.

Load the **env.bin** on MAVID as explained in the section 2.3.5. Loading and Debugging.

2.4.5. Loading and Debugging

1) Connecting Debugger:

a) Connect the ST-link debugger to the MAVID EVK

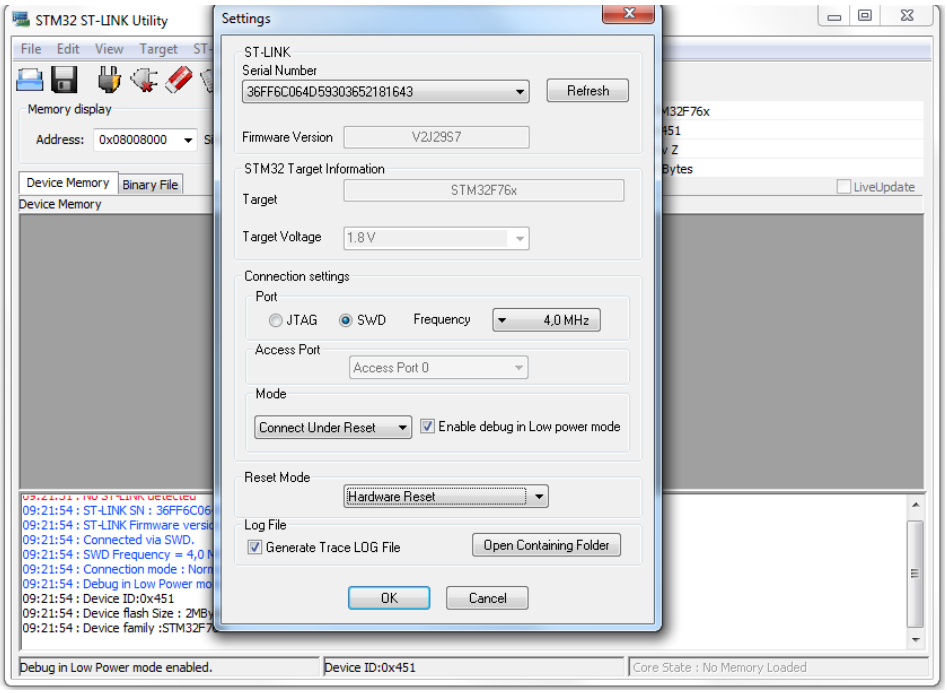
c) Launch **ST-LINK Utility**

d) Once launched, on the menu bar, select **Target → Settings**

e) Under **Connection Settings** select **SWD** option

f) Under **Mode** select **Connect Under Reset** option

g) Under **Reset Mode** select **Hardware Reset**

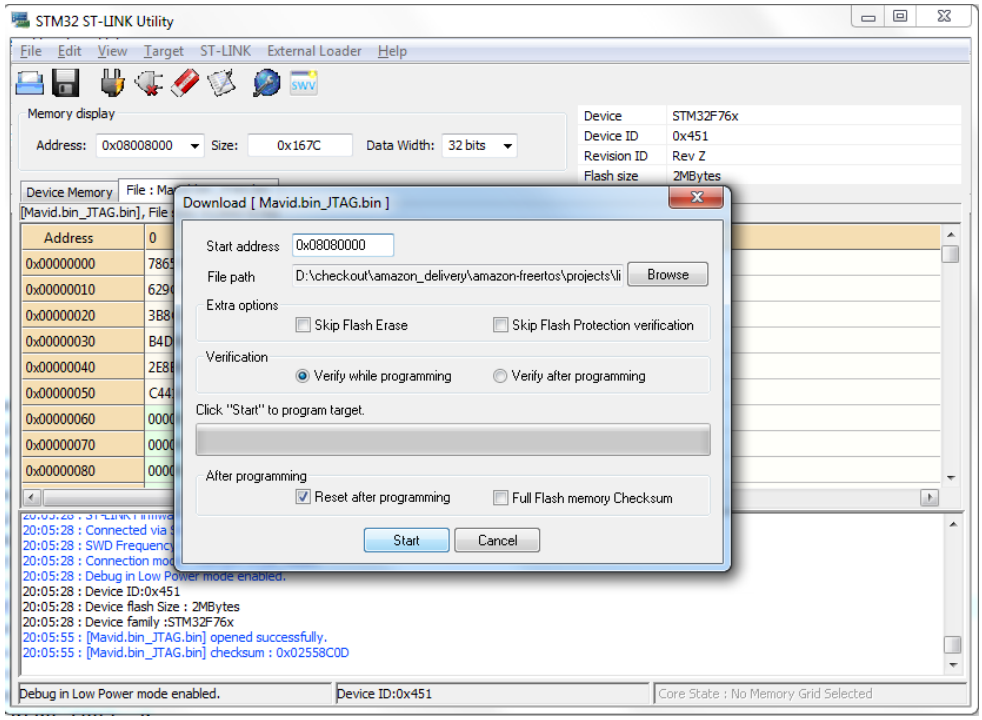


ST-Link Settings

h) On Menu bar, **Target→ Connect**

i) To load binary, **Target → Program and Verify**. This will launch a dialogue box

j) Browse the binary file location to **Select File Path** and fill **Start Address** with load address of each binary as mentioned in the section 2.3.6. Load Address of Binaries



Programming Application image to MAVID

2) Loading ENV:

Load **env.bin**, at address **0X08008000** as mentioned above. This should be done only when a new **env.bin** is generated with ENV_TOOL

3) Loading main Application:

- Once the application binary **Mavid.bin_JTAG.bin** is generated as given in the section 2.3.3. Compiling**,** load the application to the address **0x08080000** as mentioned above.
- Verify the Address **0x08080000** before pressing **"Start"** on STLink Application.
- Follow the steps as given in the section Connecting Debugger to connect the debugger and load the application binary.

4) Debugging Application

1) After the application is programmed, disconnect the target from **STlink Utility** by selecting **Target→ Disconnect** from STlink utility menu bar.

2) Open the project you wish to debug in IAR. Select **Project → Attach to Running Target** from IAR menu bar. This opens the Debug view.

3) Select **Debug → Break** to break and **Debug → Reset**. This takes the execution to **main()**. Select **Debug → Go** to run.

2.4.6. Load Address of Binaries

BootROM	0x08000000
ENV	0x08008000
BSL	0x08018000
Application	0x08080000

Refer to "*MQTT API Reference Guide"* document for MQTT Application development.