Getting Started

With Himax WE-I Plus

(Windows)

Muhammad Zeeshan

1. Downloading and installing software

To compile the code, convert it, and upload the image file to the flash memory of our Himax Development board. We need some software to accomplish this task. Here is the list of required software we need.

1. ARC GNU Toolchain
2. Himax Image Generation Tool
3. Tera Term

1.1 ARC GNU Toolchain

The easiest way to install ARC GNU Toolchain is using the ARC GNU IDE. You just need to download the EXE installer from here. Currently, I am using GNU Toolchain for ARC Processors, 2019.03 RC1. You can find this version on page 3. Scroll down to the page and you will find a download button.

	Linux x86_64	Windows x86_64	Linux ARC HS	MacOS
Baremetal	Little endian \ Big endian			Little endian \ Big endian
Linux/uClibc ARC700	Little endian \ Big endian			
Linux/uClibc ARC HS	Little endian \ Big endian		Little endian	
Linux/glibc ARC HS	Little endian			
IDE	Download	Download		Download

Figure 1: Download ARC GNU IDE

After downloading, install the IDE with the default settings. Here are a few images that show the installation process.

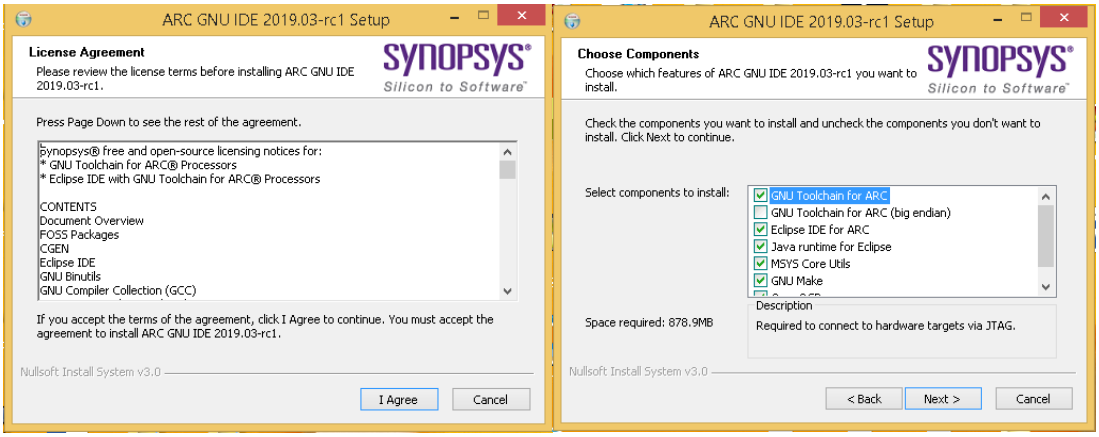

Figure 2: ARC GNU IDE Installation

At the end close the installation window.

To confirm your toolchain is installed and working. Open the Command Prompt and type **arc-elf32-gcc --version**. You will get a similar output as shown here.

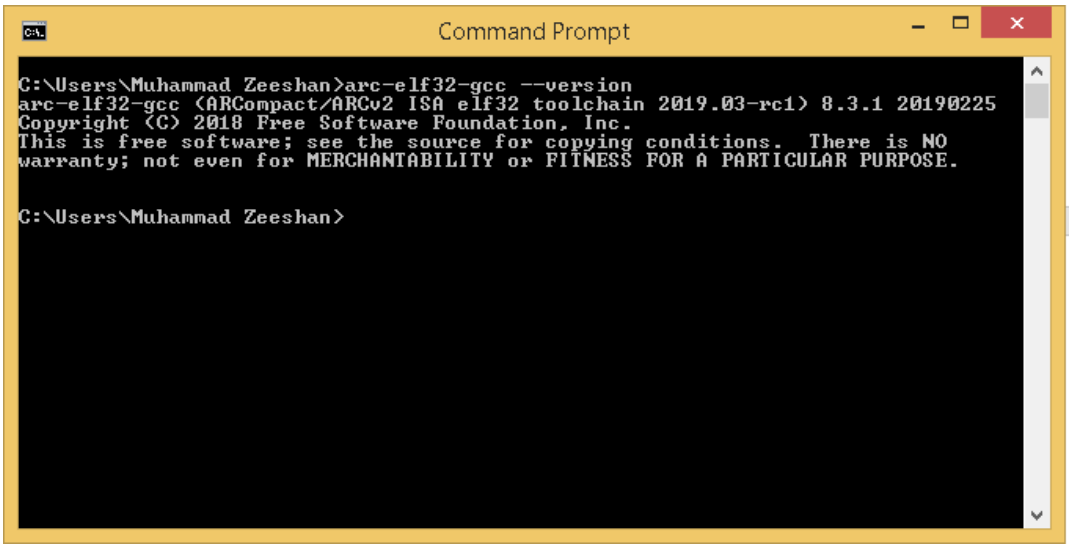

Figure 3: ARC gcc version

1.2 Himax Image Generation Tool

Himax Image Generation Tool is a command line software used to convert your compiled source code (.elf file) to an image file (.img). You can download the Image Generation Tool from here. In this repository, there are a lot of example projects, guides, and tools. We just need the Image Generation Tool found in the Image_gen_Tool_windows_version directory.

After downloading the repository, extract only the **image_gen_windows_v2_1_11** directory anywhere you want. I am extracting it to my C:\ drive. We have to add this path to our makefile.

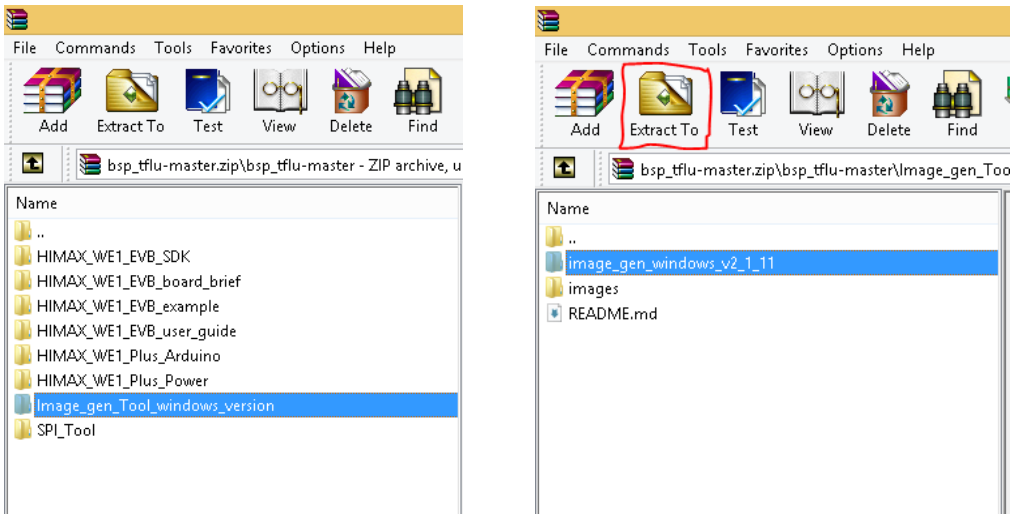

Figure 4: Extract Himax Image Generation Tool

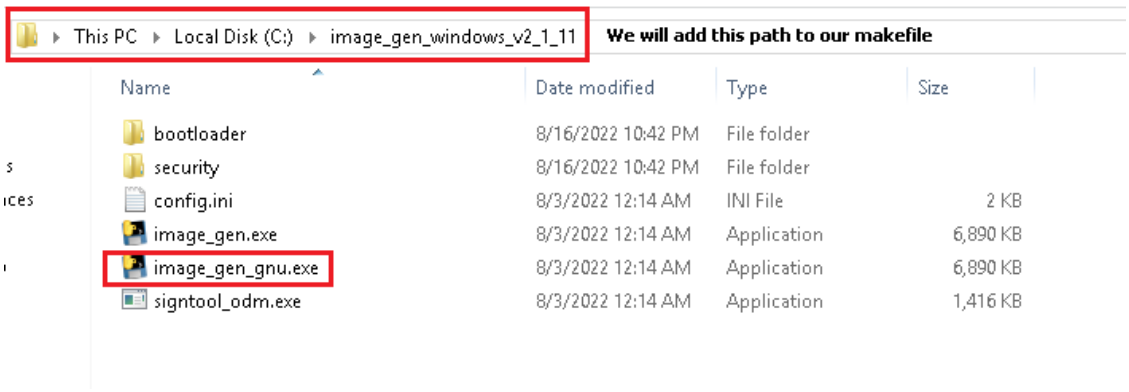

Figure 5: Himax Image Generation Tool

To make sure the Image Generation Tool is working. Open the Command Prompt, change the directory where you have extracted your Image Generation Tool, and type **image_gen_gnu –h**. You will see all the available options to use this software.

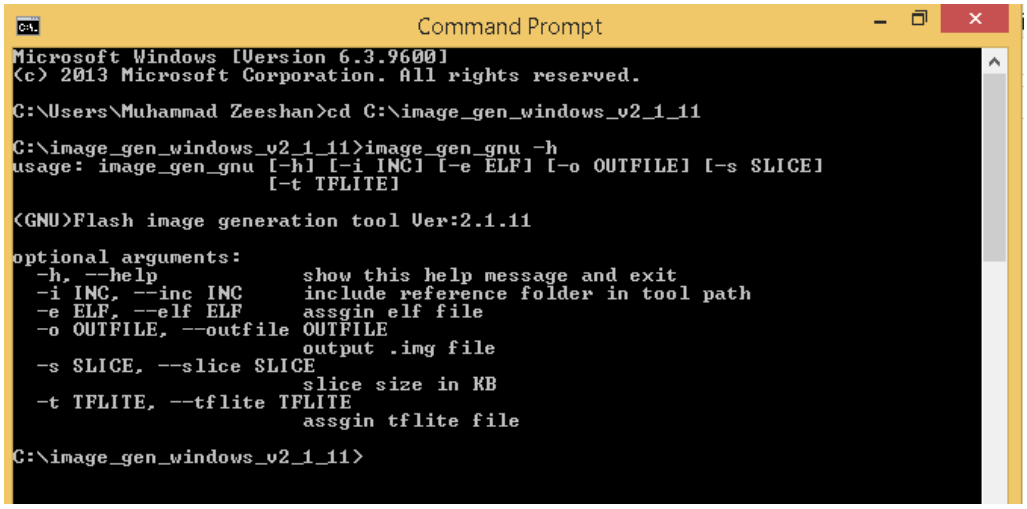

Figure 6: Image Generation Tool Help

Problem: The Image Generation Tool is not going to work with Windows Command Prompt. (This tool is not a native windows executable but compiled with cygwin1.dll). It requires Cygwin terminal. You can download and install it from here.

Another solution is to add the cygwin1.dll file into the Image Generation Tool directory. And the tool will work with Windows Command Prompt. I have added this DLL file and this fixes the problem. See the image below.

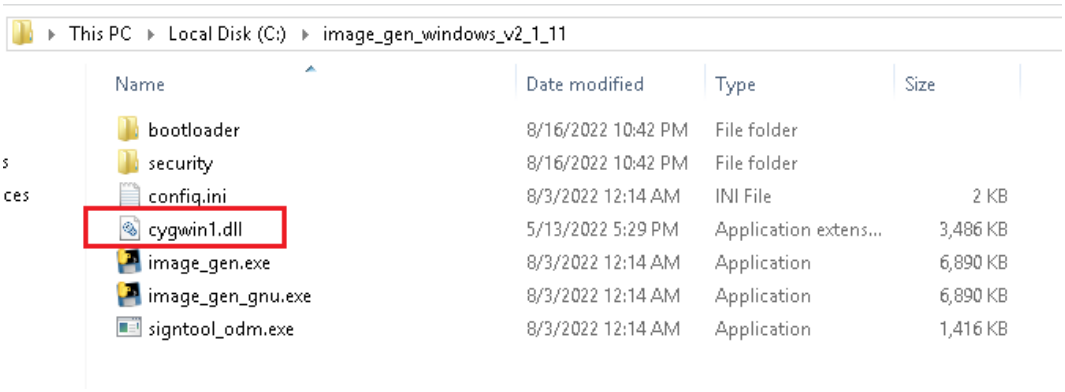

Figure 7: Image Generation Tool Problem Solution

This modified version is available on my GitHub repository.

1.3 Tera Term

Here, Tera Term is used to upload image files to our Himax WE-I Plus development board (using the XMODEM protocol). And later on, we will use this to get the serial data from Himax WE-I Plus. Download the Tera Term software from here and install it with the default settings.

2. Example Project

Before starting our Example Project i.e. blinking LED. Let's take a look at Himax WE-I Plus Development Board first.

2.1 Board Overview

WE-I Plus is packed with a lot of features:

1. VGA Camera module
2. Two MEMS microphones
3. Onboard LEDs (Green and Red)
4. 3-axis Accelerometer
5. Two I2C Buses, one is used by the onboard Accelerometer and other can be used by our application.
6. Three GPIOs
7. One SPI port (available via micro USB)
8. One UART port (available via micro USB)

You can find more details at Himax

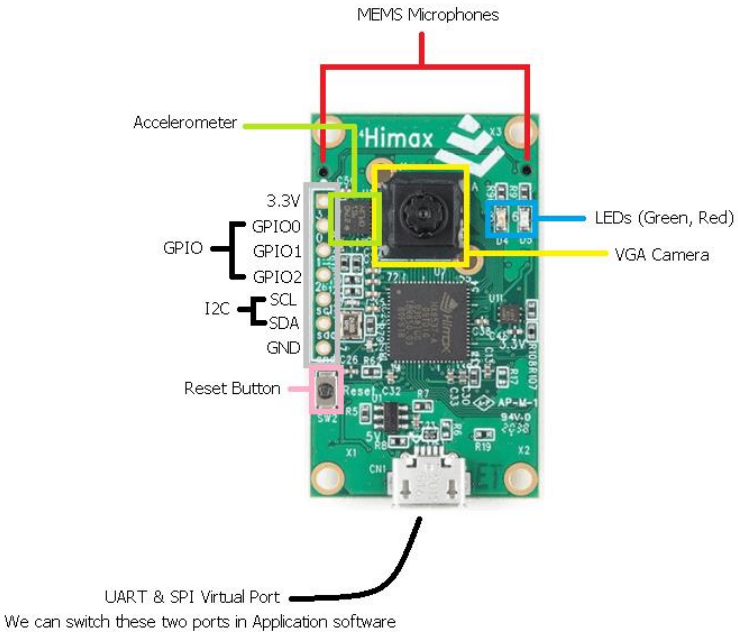

Figure 8: Himax Board Overview

2.2 Blinky Project

To start a new project, use the Example project as a starting point. Head to my GitHub repository (here) and download it. You will find this documentation, an example project, and the Himax Image Generation Tool (I have added the cygwin1.dll).

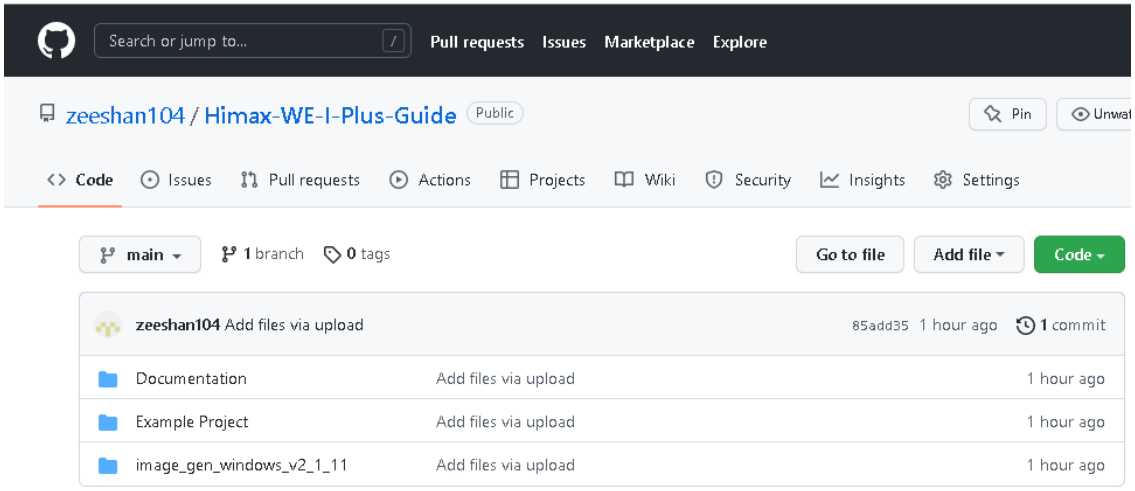

Figure 9: Himax Guide Repository

In the Example Project (Example Project directory), you will find the Blinky example and the Himax SDK (with tensorflow lite).

To start a new project, all you have to do is edit the blink project source code according to your needs that's it. If you want to add library files, copy the .h files to the inc directory and the .c files to the src directory.

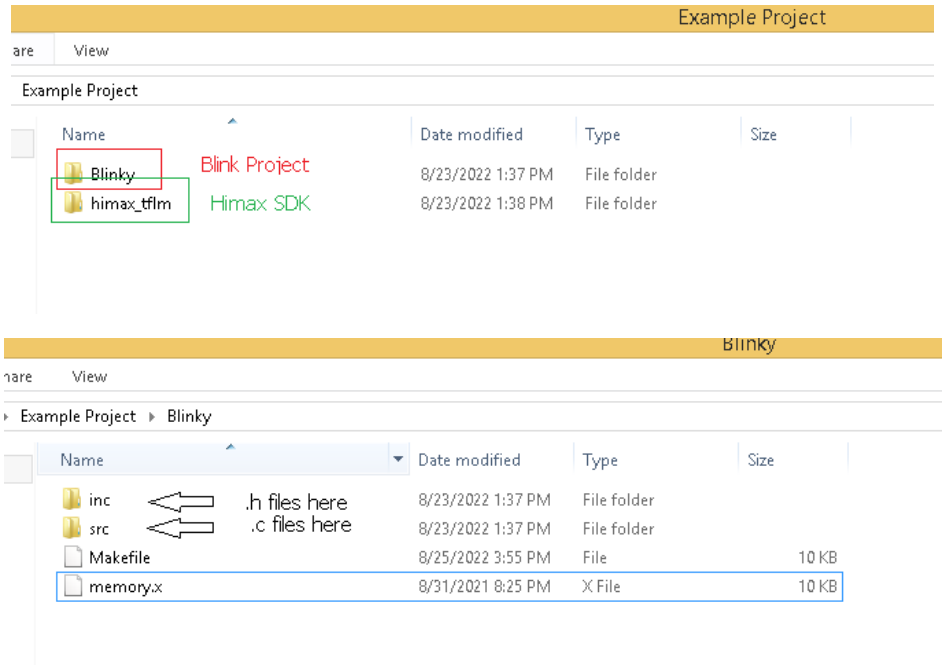

Figure 10: Example Project

But for now we are going to compile this blink project and upload to our Himax board.

2.3 Compiling Blink Project

To compile the blink project, open the command prompt and change the directory to the blinky project (note: after downloading the repository, place the image generation into the C: directory, otherwise you have to edit the make file and add the path accordingly) and type **makes.**

The Compilation process will take some time and, in the end, generate an output.elf file**.**

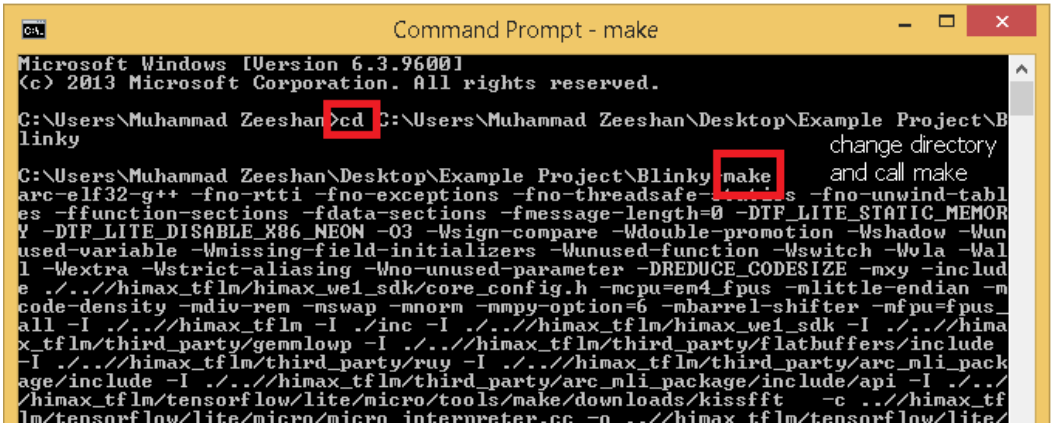

Figure 11: Project Compilation

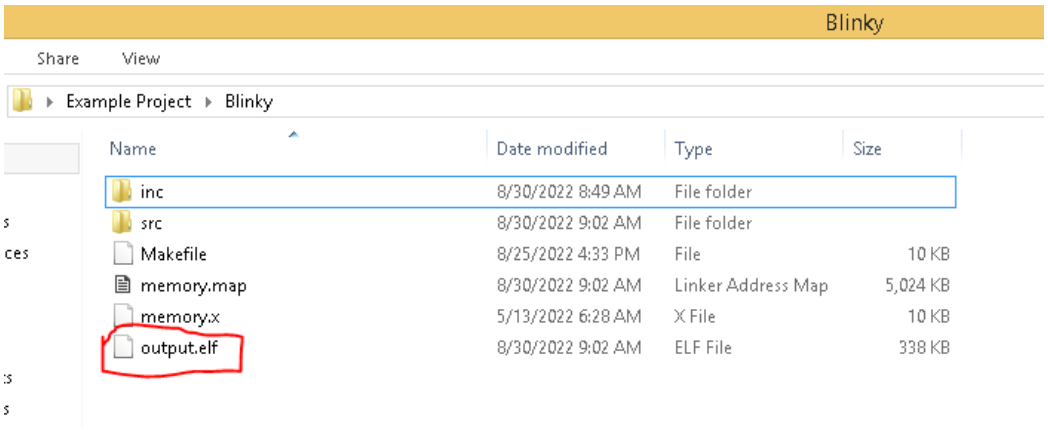

Figure 12: Compilation output

2.4 Converting ELF into IMG File

After getting output.elf file, what you have to do is convert this file into an image file that we will upload to our Himax board in the next section. To convert the .elf file just type **make imagefile** in the command prompt. This will generate an output_gnu.img file in the project directory.

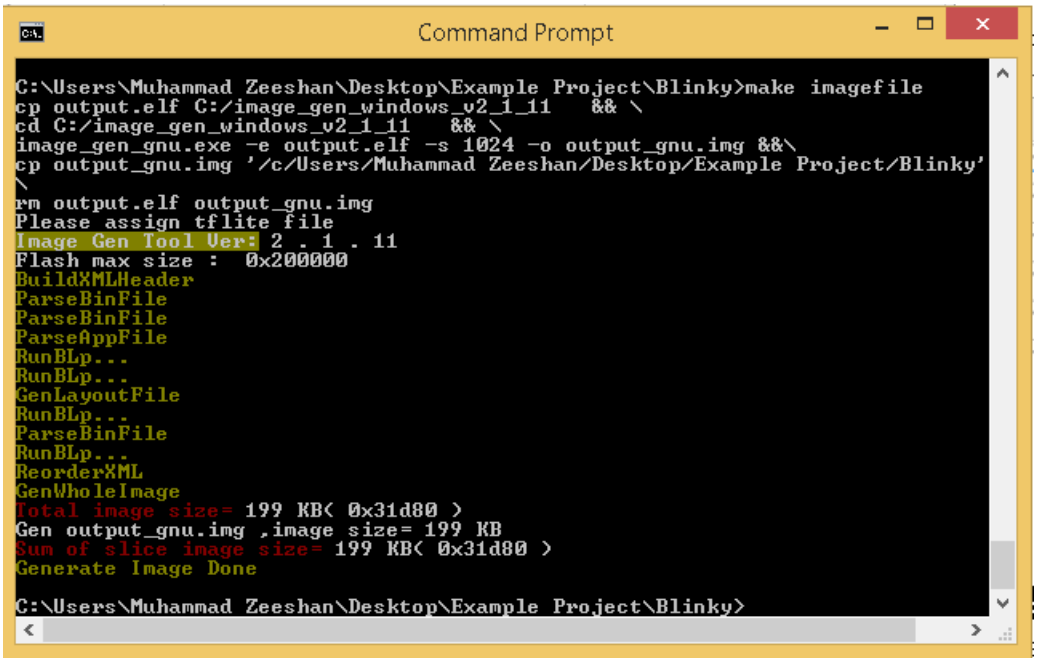

Figure 13: ELF to IMG Conversion

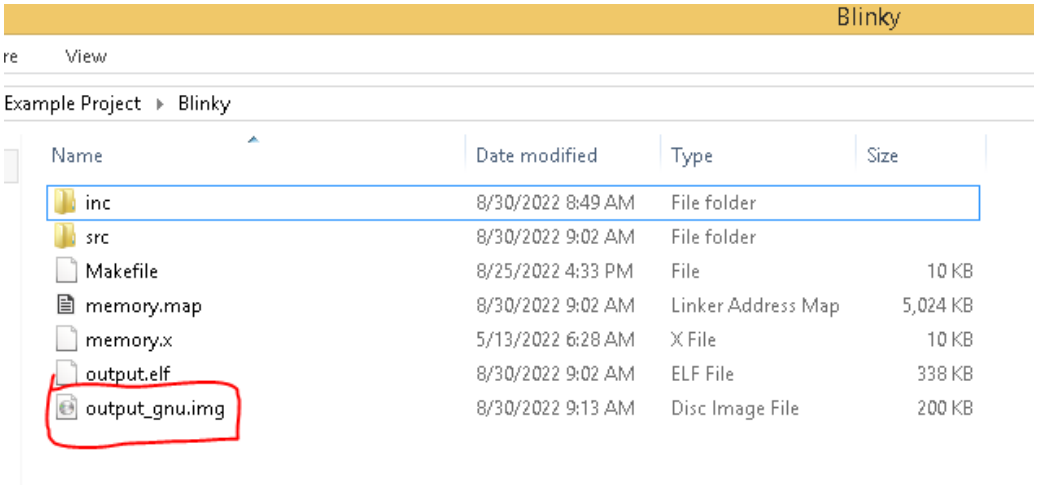

Figure 14: ELF to IMG Conversion output

2.5 Uploading Image File to Himax WE-I Plus

Here we are using Tera Term to upload output_gnu.img file to our Himax board. Connect your board to your PC with a micro USB. Open the Tera Term software. Select the Serial port where your board is connected and click ok.

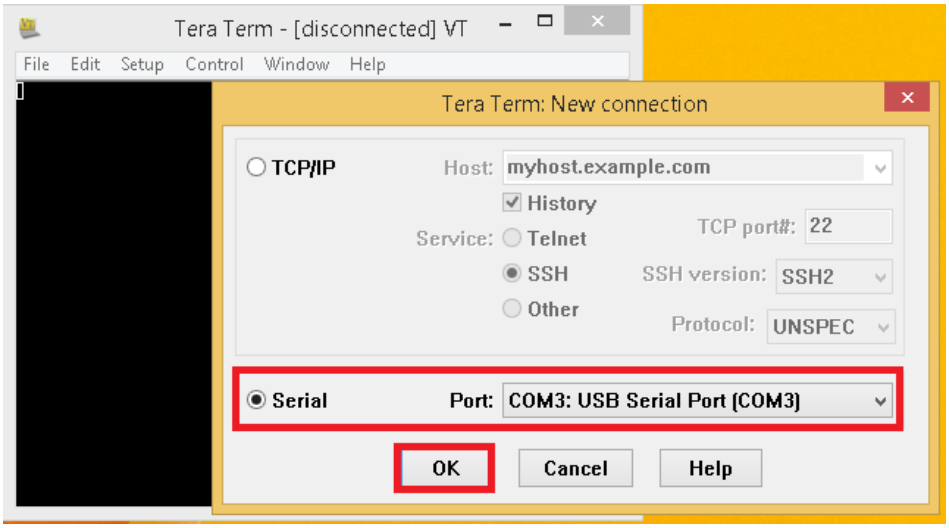

Figure 15: Select Himax Serial Port

Change the serial baud rate to 115200

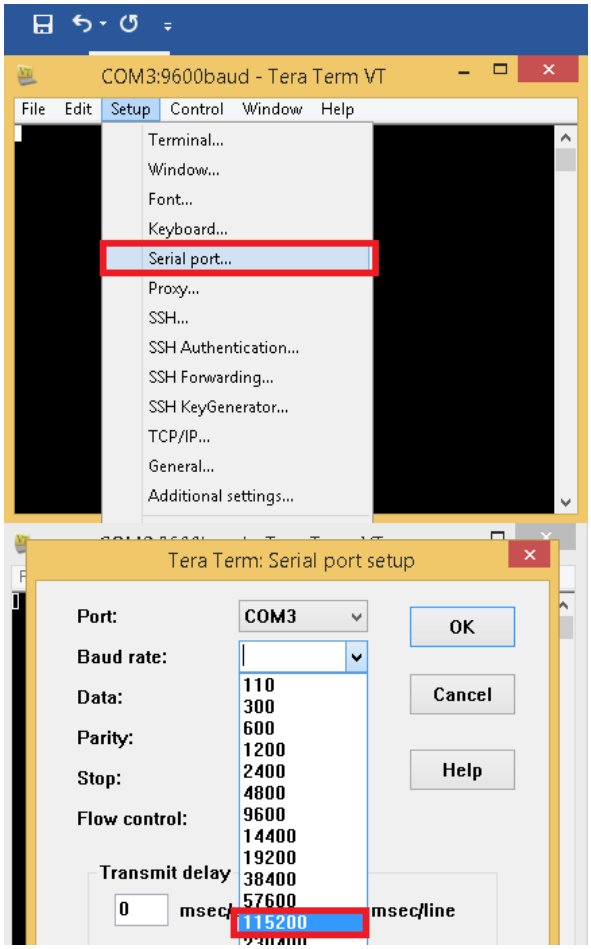

Figure 16: Change Baud Rate to 115200

To upload the Image file, click the reset button of your Himax board and within 0.3 second press any key from your keyboard. You will see two options.

- [0] return to bootup
- [1] Xmodem download and burn FW image

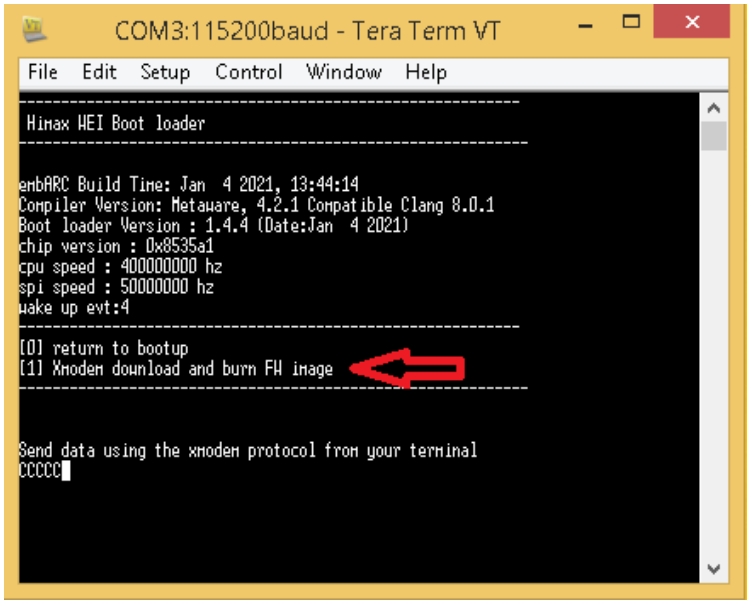

Figure 17: Send IMG to WE-I Plus

From here press 1 from your keyboard and your board is ready to receive image file via Xmodem protocol.

Now to go file→Transfer→XMODEM→Send…

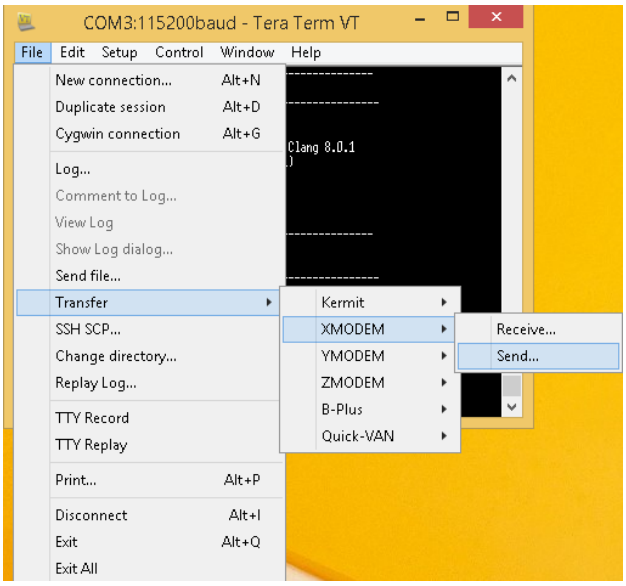

Figure 18: Select IMG File Option in Tera Term

Select your image file and click Open. Wait a minute to complete the upload process.

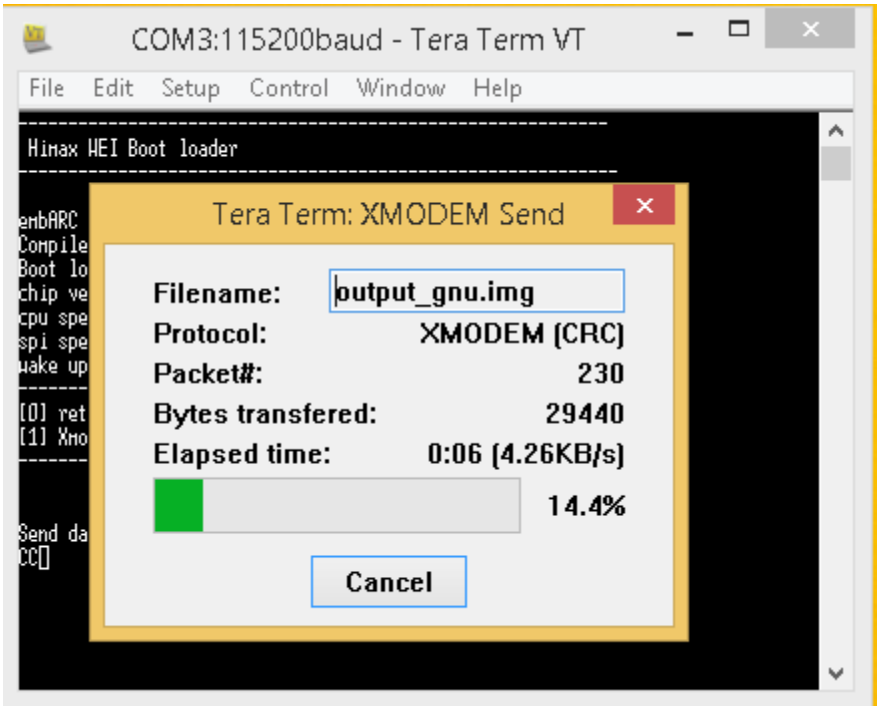

Figure 19: Upload Progress

At the end press the reset button of Himax board. You will see Green and Red LEDs are blinking.