

GetRileyLink.org

https://getrileylink.org/getrileylinkorg_firmware_update_august2018/

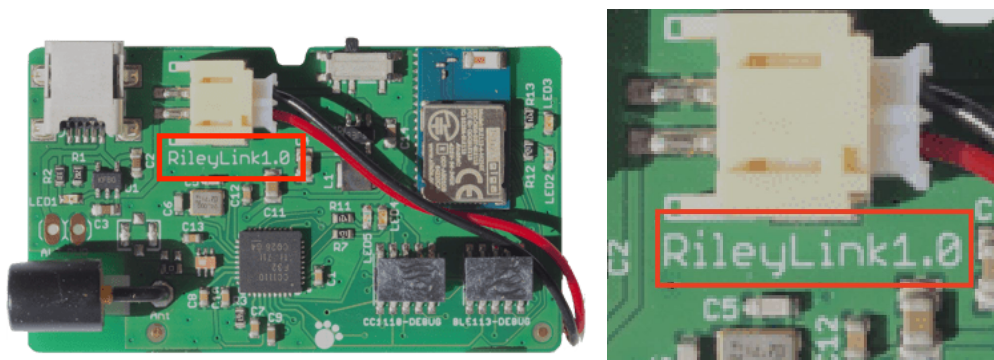
RileyLink 1.0 Firmware Guide update to subg_rfspy 2.2 / ble_rfspy 2.0

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Overview

This document provides instructions for existing users of the RileyLink 1.0 Bluetooth Smart (BLE) to Sub-1 GHz module to update their RileyLink hardware to the latest release of the radio firmware(s). If you purchased your RileyLink between January 2017 – May 2018 a firmware update is available for RileyLink 1.0 Boards. You can check your board version by the imprint on the surface of the board. The version imprint is located just below the battery JST connection and will state “RileyLink1.0”.



To check the current firmware on your board you can run the iOS Loop or RileyLink App and check the firmware version for your RileyLink. If your board has the latest release it will state “subg_rfspy 2.2 / ble_rfspy 2.0”. If your board does not have the latest firmware you can use this guide to update your RileyLink.

Firmware subg_rfspy 2.2 / ble_rfspy 2.0

Required Hardware:

The following hardware is required to update the firmware on your RileyLink 1.0 Board.

1.) RileyLink1.0 Board

A RileyLink 1.0 version PCB. “RileyLink1.0” is etched on to board surface.

2.) Windows PC or Virtual Machine

Windows 7,8,10 PC or Suitable Virtual Machine with USB Passthrough Bridge (VMware Fusion 10 has been tested to work if your using a Mac). This guide was developed on VMWare Fusion Version 10.1.2 (8502123), running a Windows 10 VM.

3.) TI CC Debugger Tool

<https://www.digikey.com/product-detail/en/texas-instruments/CC-DEBUGGER/296-30207-ND/2231678>



Required Software:

1.) RileyLink and SubgRFspy Firmware Source Code and Binaries

You will need to download the source code for BlueGiga BLE RileyLink 2.0 and Binary hex file for the TI CC1110 firmware's.

- 1.) BlueGiga BLE Firmware Source Code (RileyLink 2.0 Firmware)

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- 2.) Texas Instruments CC111x subg_rfspy 2.x Firmware Binary Hex

This guide will only instruct on how to flash the Binary Hex file not compile the subg_rfspy firmware.

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2.) Texas Instruments Smart RF Studio 7 for Windows (Used for CC Debugger Drivers)

You can download TI Smart RF Studio 7 from the following location you will be required to register with TI and affirm you are using the software for civil purposes.

<http://www.ti.com/tool/download/SMARTRFTM-STUDIO/>

3.) TI Flash Programmer v1.12.8 (Used to Update TI CC1110 Firmware)

You can download the TI Flash Programmer from the following location you will be required to register with TI and affirm you are using the software for civil purposes.

Download version 1.12 FLASH-PROGRAMMER not version 1.7.5 FLASH-PROGRAMMER-2

<http://www.ti.com/tool/flash-programmer>

4.) BlueGiga Update Tools (Used to Update Bluegiga BLE Firmware)

You will need to download 2 tools from Bluegiga website. You will need to register with Blue Giga to download files from their website.

- 1.) [Bluetooth Smart Software and SDK v.1.5.0](#) (Required BGBuild.exe Tool/Compiler)

<https://www.silabs.com/documents/login/software/Bluegiga-ble-1.5.0-137.exe>

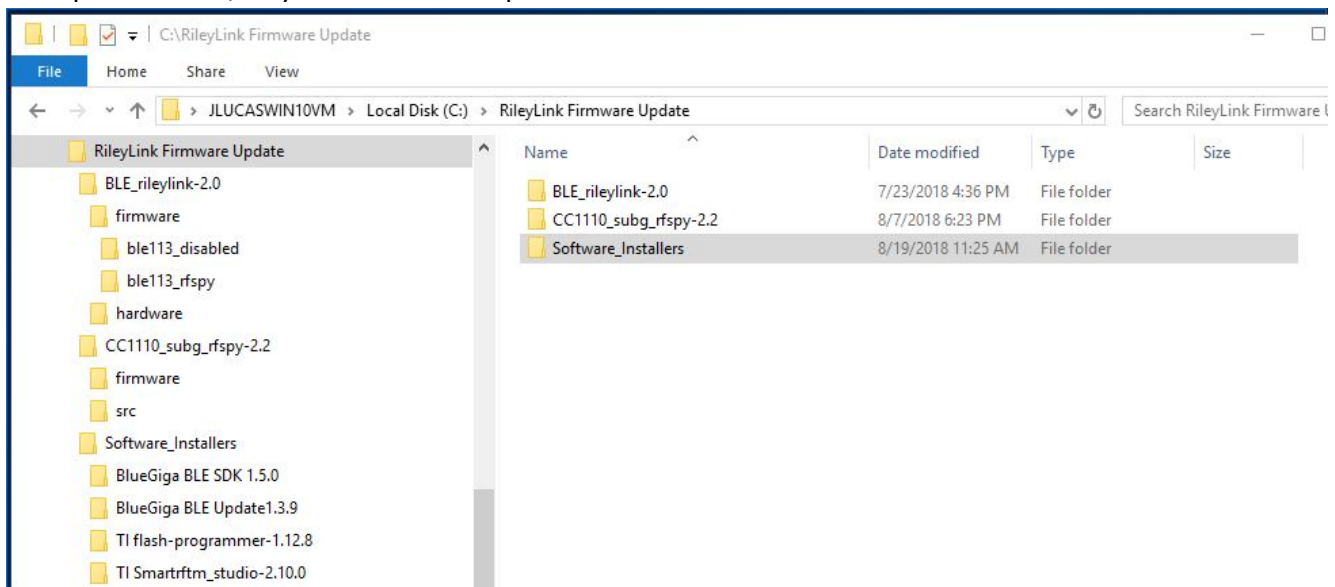
- 2.) [BLE Update Tool v1.3.9 \(Windows XP,7,8 and 10\)](#) (Required to Update Firmware)

<https://www.silabs.com/documents/login/miscellaneous/bleupdate-1.3.9.exe>

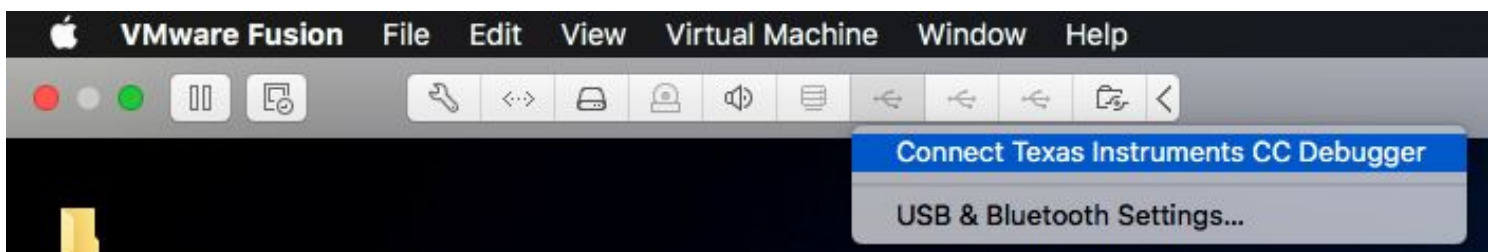
Software Installation and Preparation for Firmware Update

- 1.) Prepare VM / Windows PC: Virtual Machines can be tricky and configuration to allow USB Bridge / Passthrough for the CC-Debugger can be prevented by the host operating system without some VM and Operating System configuration updates. If you are having issues with this I would recommend sourcing a Windows PC to complete the firmware update as it will be simpler.
- 2.) Copy and Extract / Unzip all Installers and Source code to a simply accessed directory on the PC.

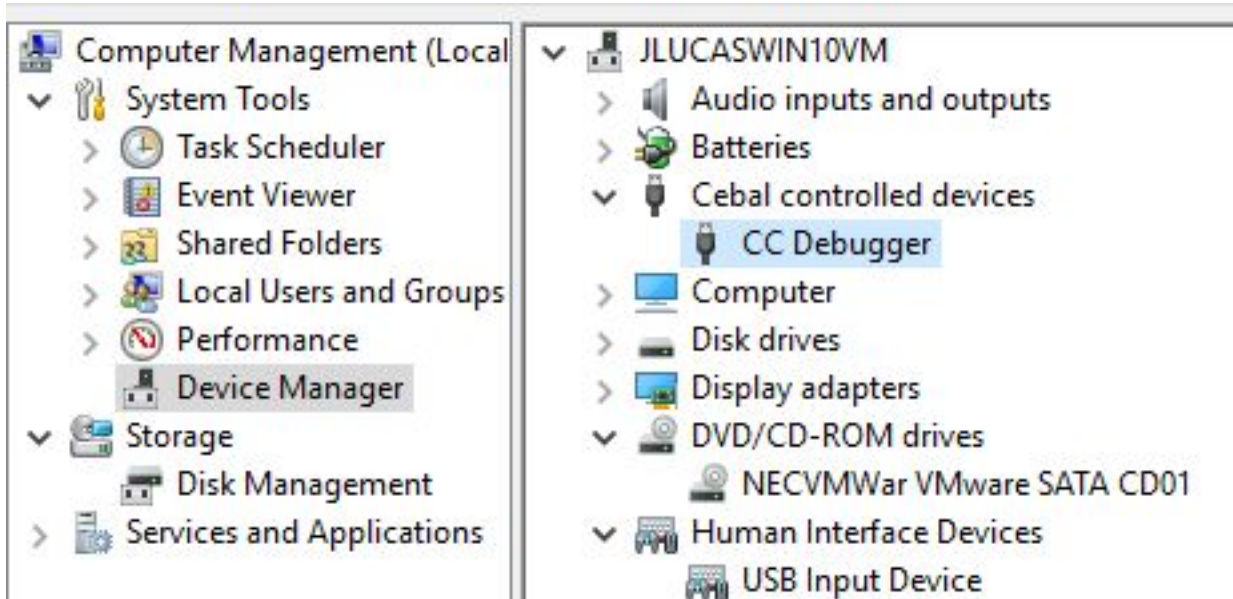
Example C:\RileyLink Firmware Update



- 3.) Install TI Smart RF Studio 2.1 (Right Click and Run as Administrator) Ignore any install errors and accept drivers when prompted. This is only needed to install CC-Debug Drivers
- 4.) Install TI Flash Programmer 1.12.8 (Right Click and Run as Administrator)
- 5.) Install Blugiga BLE SDK 1.5.0 (Right Click and Run as Administrator)
- 6.) Install Bluegiga BLE Update 1.3.9 (Right Click and Run as Administrator)
- 7.) Plug your CC-Debug Programmer into your USB port and ensure it is recognized by your operating system. On VMWare you will need to make sure that the Virtual Machine has access to the CC-Debug Device.

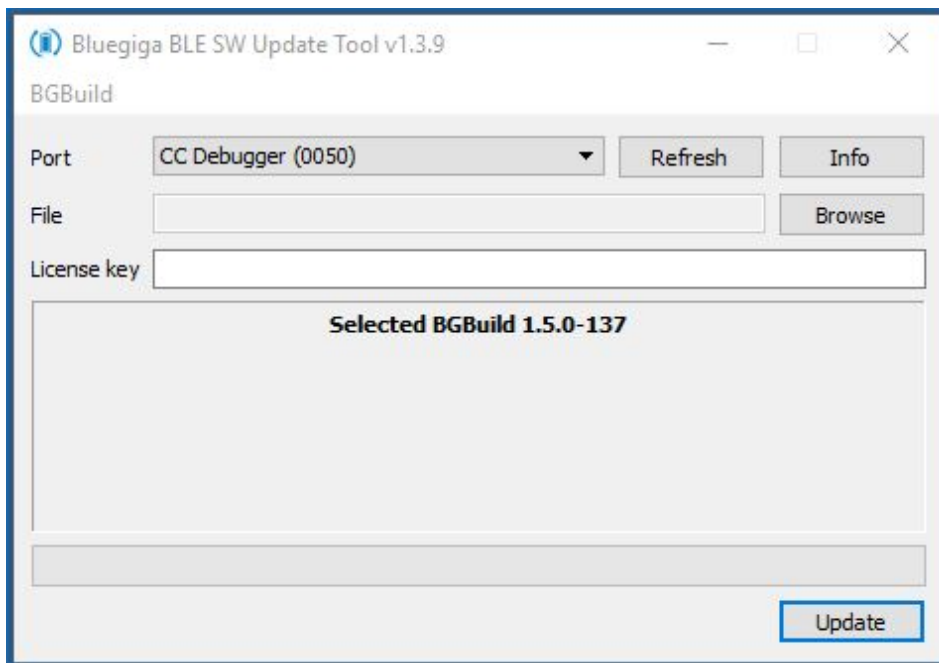


In the Windows Device manager the CC Debugger will show up under “Cebal controlled devices”

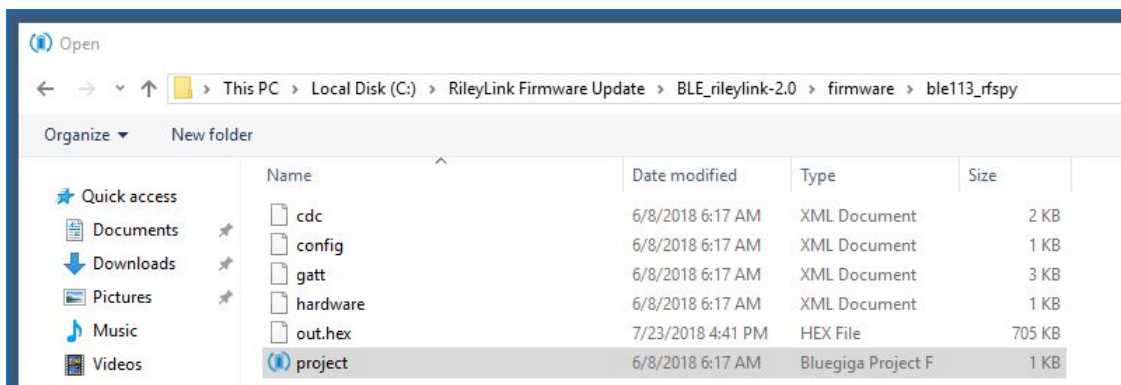


Install RileyLink 2.0 Firmware (ble_rfspy 2.0)on Bluegiga BLE Chip

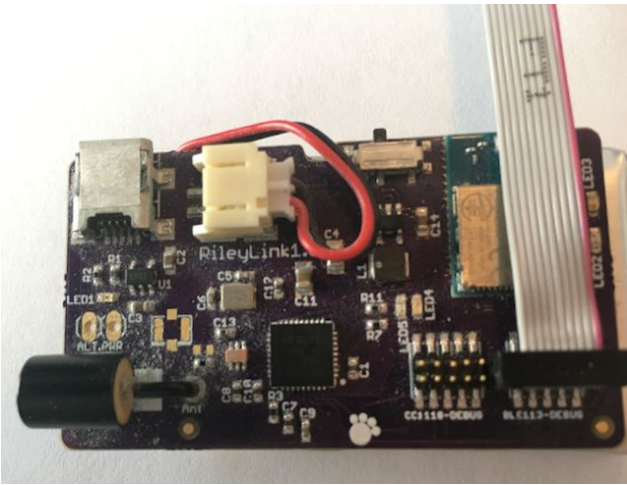
- 1.) Open the Bluegiga BLE Update 1.9 Firmware Updater Application default installation directory is C:\Bluegiga\BleUpdate\bleupdate.exe
- 2.) From the BGBuild Menu choose [Select Manually...] and locate the bgbuild.exe file placed by the 1.5.0 SDK install at C:\Bluegiga\ble-1.5.0-137\bin\bgbuild.exe
- 3.) Your 1.9 Update tool will now show **“Selected BGBuild 1.5.0-137”**



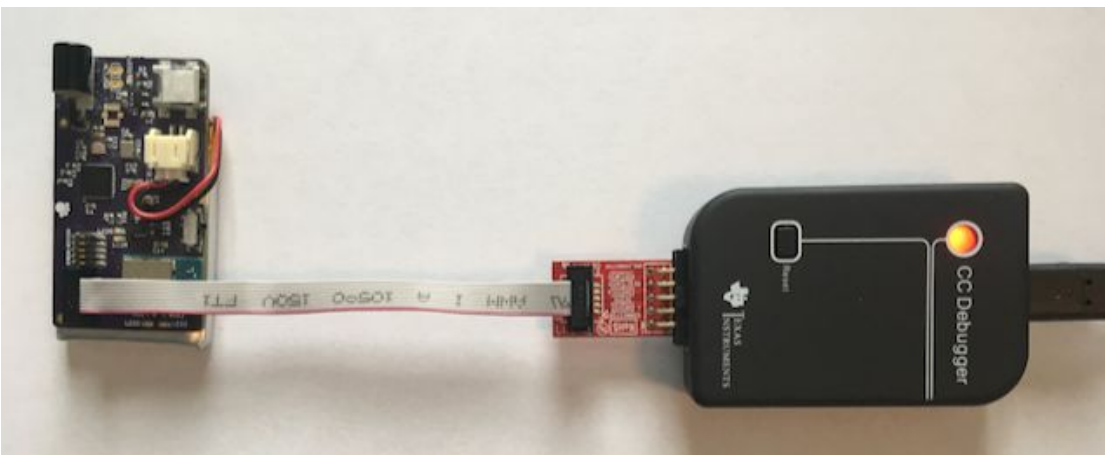
- 4.) Click the [Browse] button and navigate to the RileyLink 2.0 Firmware Folder (ble113_rfspy) and select the “project” file.



- 5.) Connect your RileyLink to the CC-Debug Tool to the Right hand set of Debug Header Pins (See Picture) on the RileyLink. You will need to have the battery powered up and plugged in to update the RileyLink Firmware. The RileyLink must be powered on.



- 6.) Power [On] your RileyLink. The CC-Debug LED may be Red

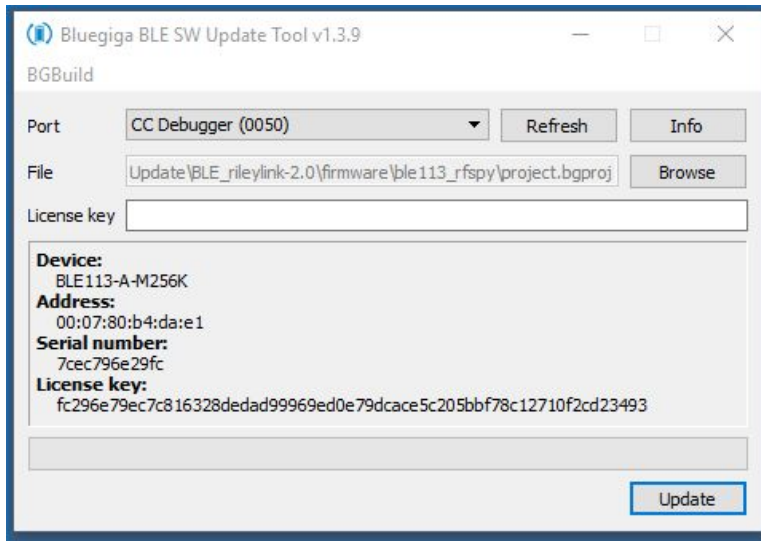


- 7.) Press the [Reset] button on the CC-Debug. The CC-Debug LED will turn Green



8.) Click the [Info] Button in the Update tool you should get a read out of the basic info from the Blugiga BLE Chip

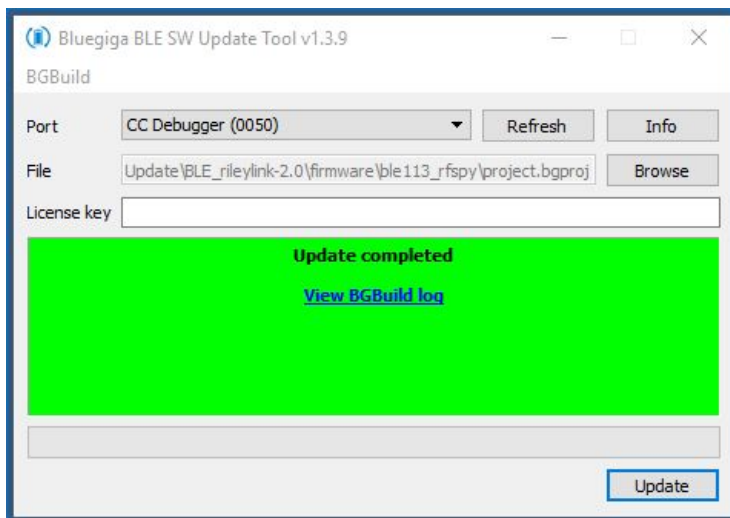
(Your address, serial and key will be different)



9.) Click [Update] button in the Update tool
(Building Project...)

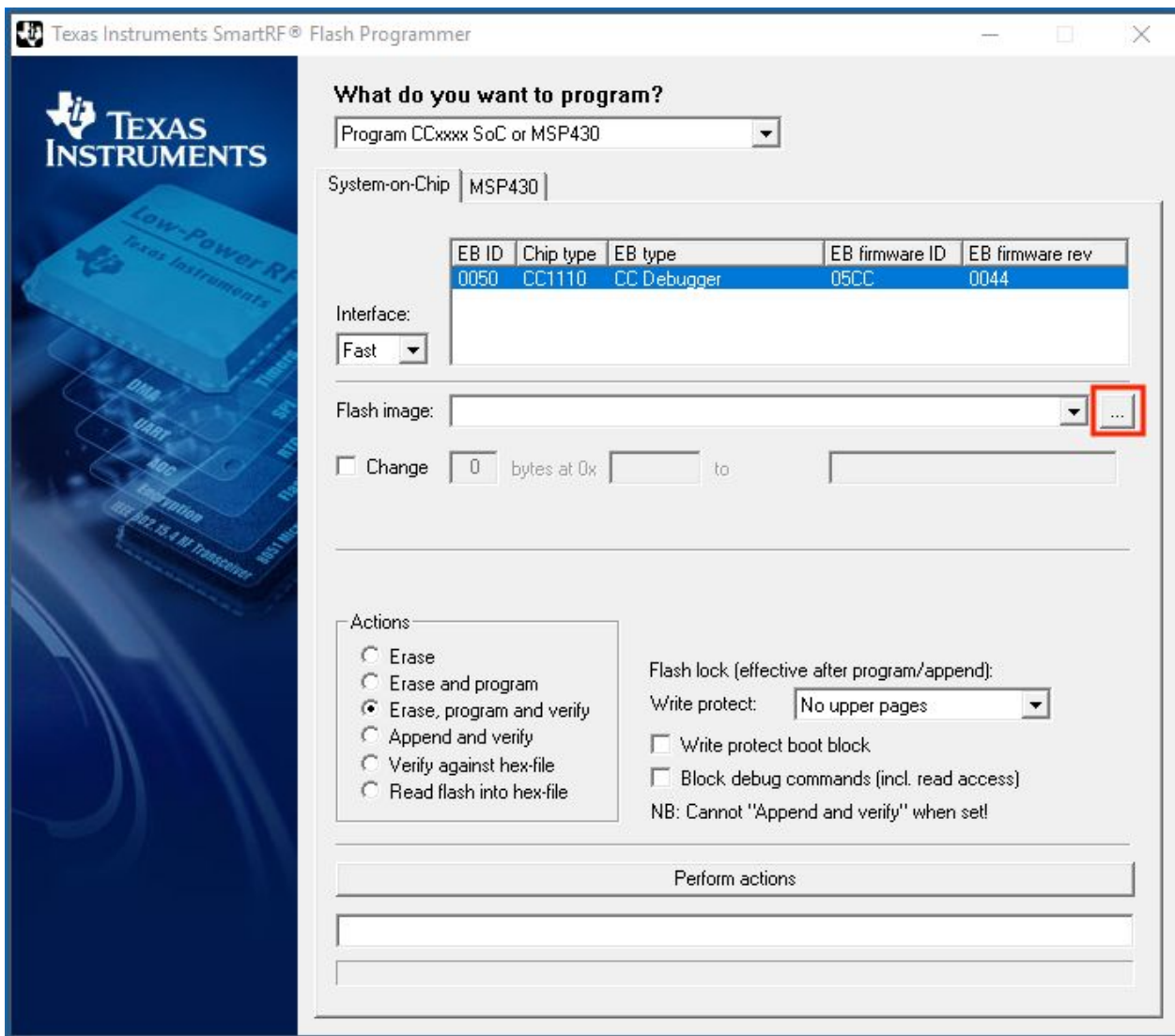
(Updating...)

(Update Completed)

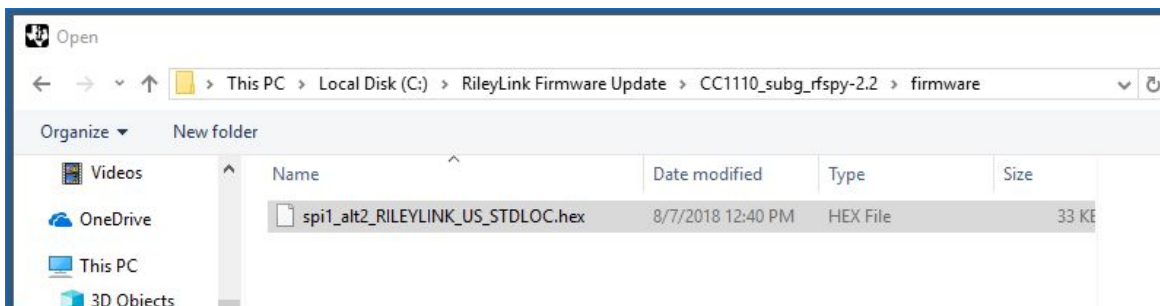


Install subg_rfspy 2.x Firmware on TI CC1110 RF Chip

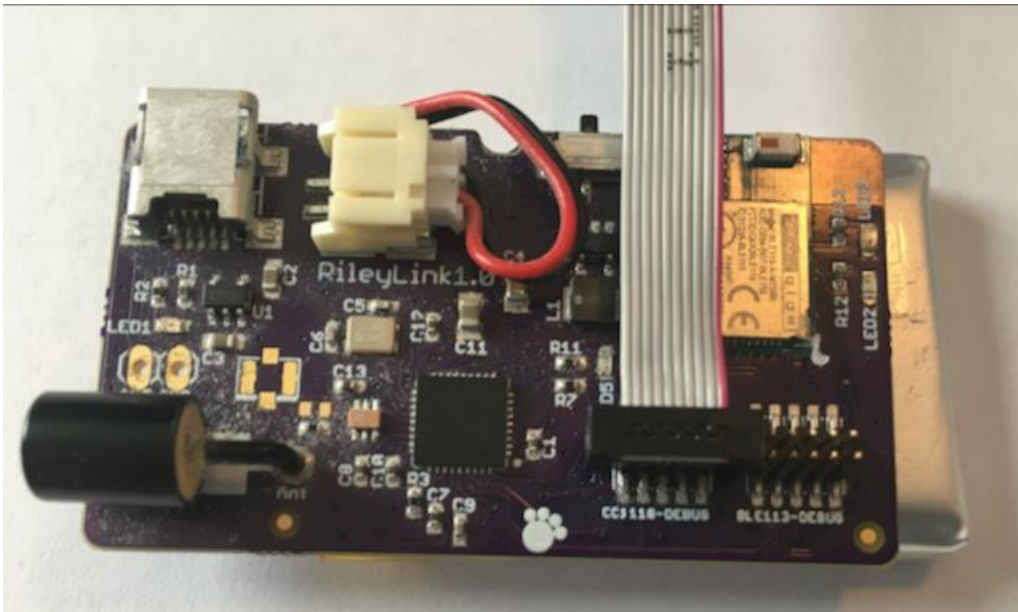
1.) Open the Texas Instruments SmartRF Flash Programmer



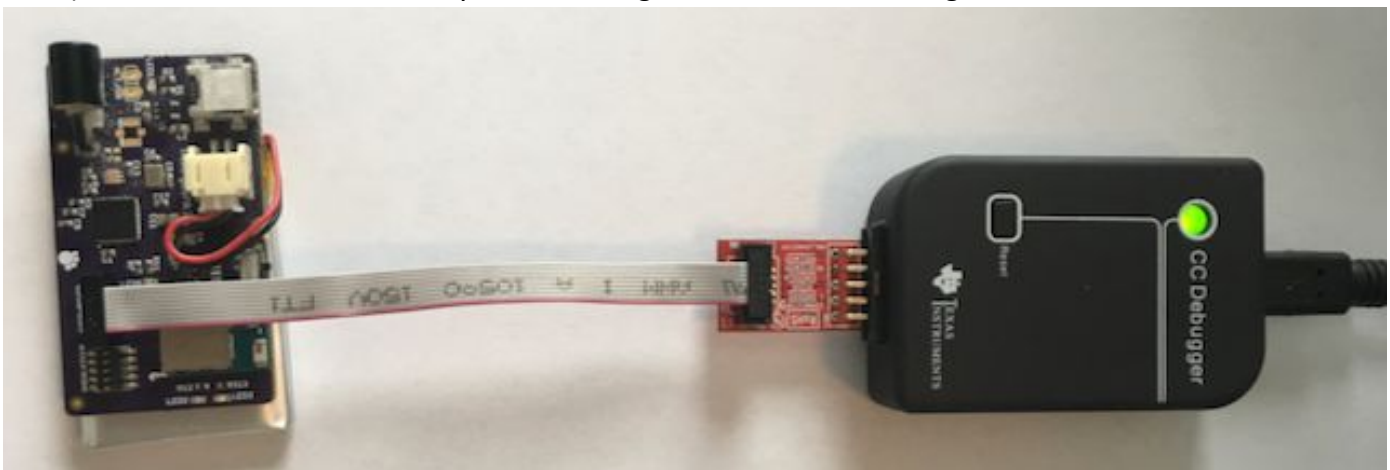
2.) Click the [...] button and locate the subg_rfspy hex file.



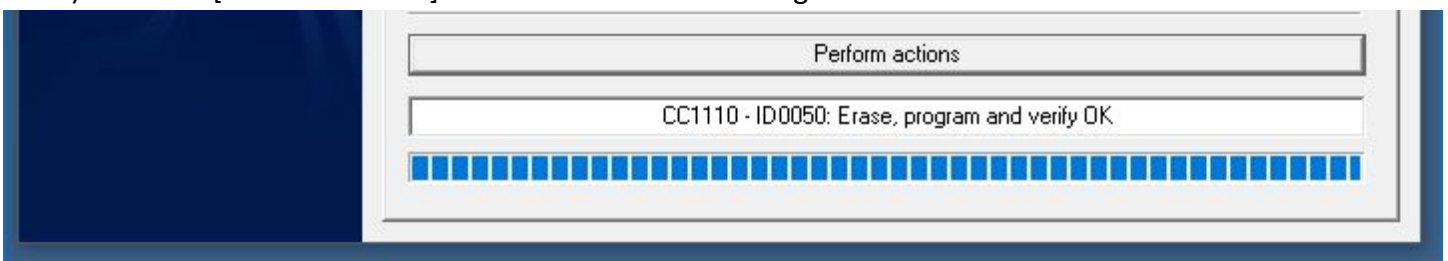
- 3.) Connect your RileyLink to the CC-Debug Tool to the Left hand set of Debug Header Pins (See Picture) on the RileyLink. You will need to have the battery powered up and plugged in to update the RileyLink Firmware. The RileyLink must be powered on.



- 4.) Press the [Reset] Button on your CC-Debug. The Led on the Debug will turn Green



- 5.) Click the [Perform actions] Button in the Smart RF Programmer Software.



Congratulations you've done it.