

# Updating Firmware Images on the SLN-VIZN-IOT (RT106F) using J-LINK

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This guide will cover the steps necessary to properly flash your SLN-VIZN-IOT kit using a J-Link. In this guide, we will cover flashing your kit using either MCUXpresso IDE or J-Link Commander.

If you already have MCUXpresso IDE installed, it is recommended that you follow the steps under **Using MCUXpresso** simply for the ease-of-use, however either option will work. If you would like to download MCUXpresso IDE, follow this link <https://www.nxp.com/design/software/development-software/mcuxpresso-software-and-tools/mcuxpresso-integrated-development-environment-ide:MCUXpresso-IDE>.

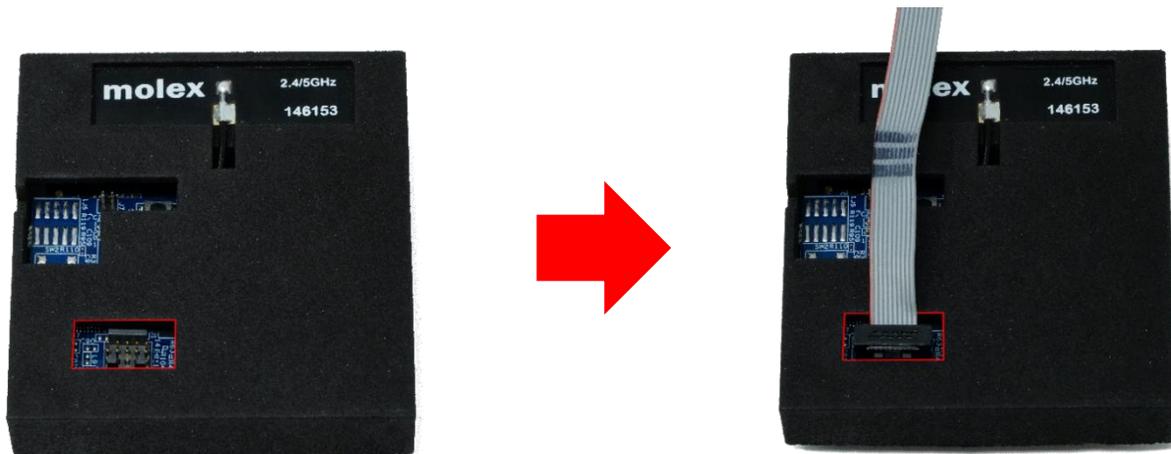
## Prerequisites

It is assumed that you have either a **J-Link Plus** or **J-Link Ultra+** and have downloaded the latest **J-Link Software and Documentation Pack** from the SEGGER website here (v6.62 or greater) : <https://www.segger.com/downloads/jlink/#J-LinkSoftwareAndDocumentationPack>.

Additionally, it is assumed that you have access to an updated JLinkDevices.xml file with support for the “i.MXRT106FDVL6A” part number. This is true for any version of J-Link running v6.62 or greater.

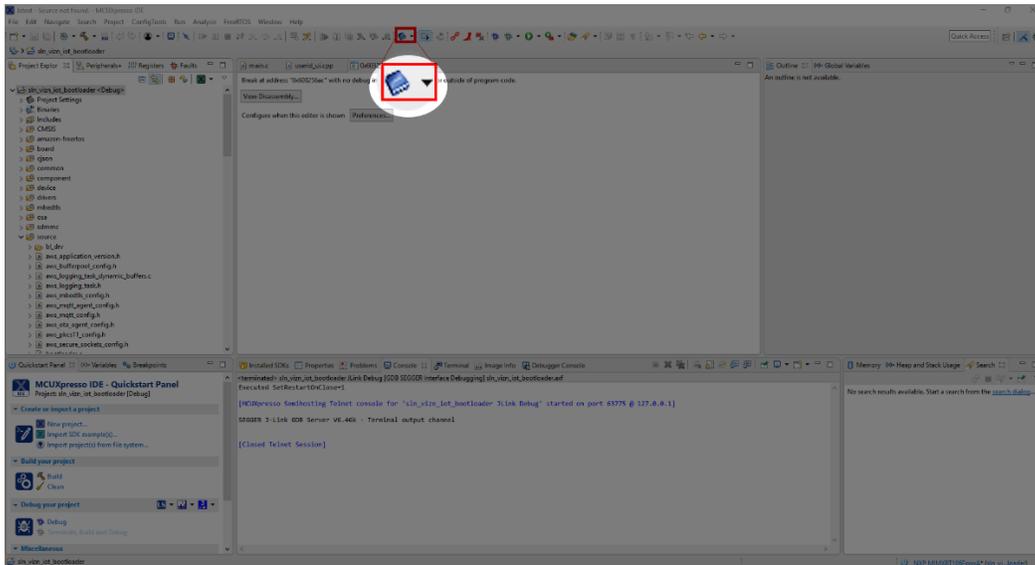
## Setup

Attach your **J-Link** debug probe into the header shown below.

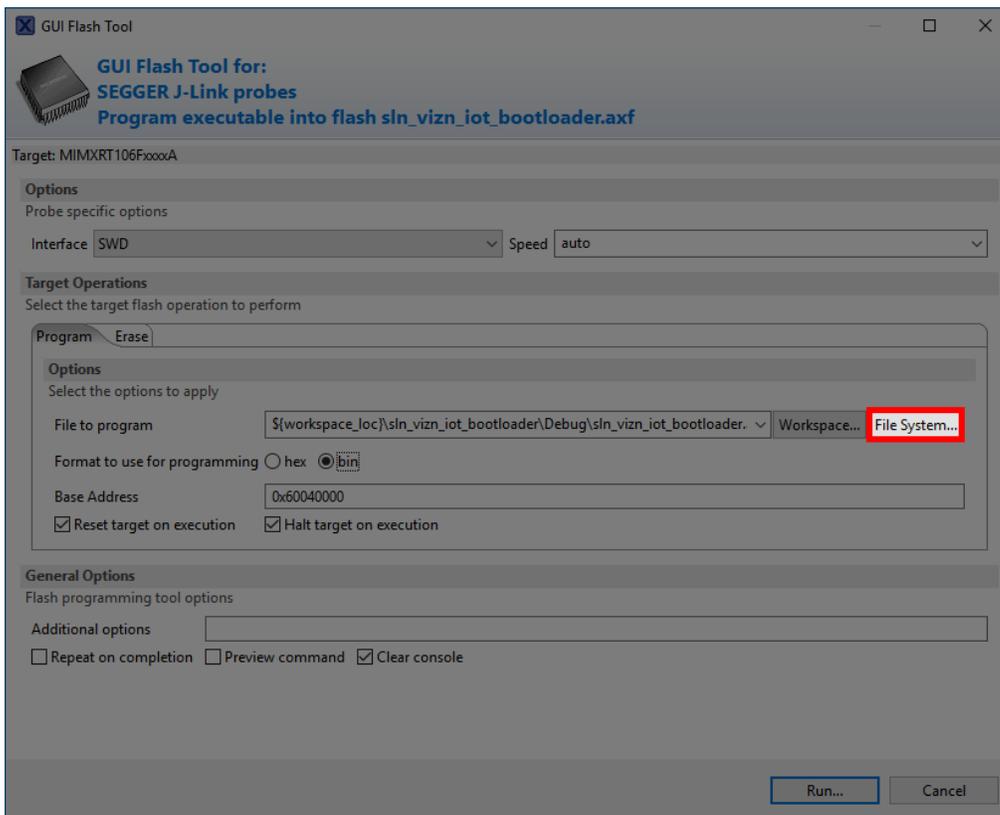


## Using MCUXpresso:

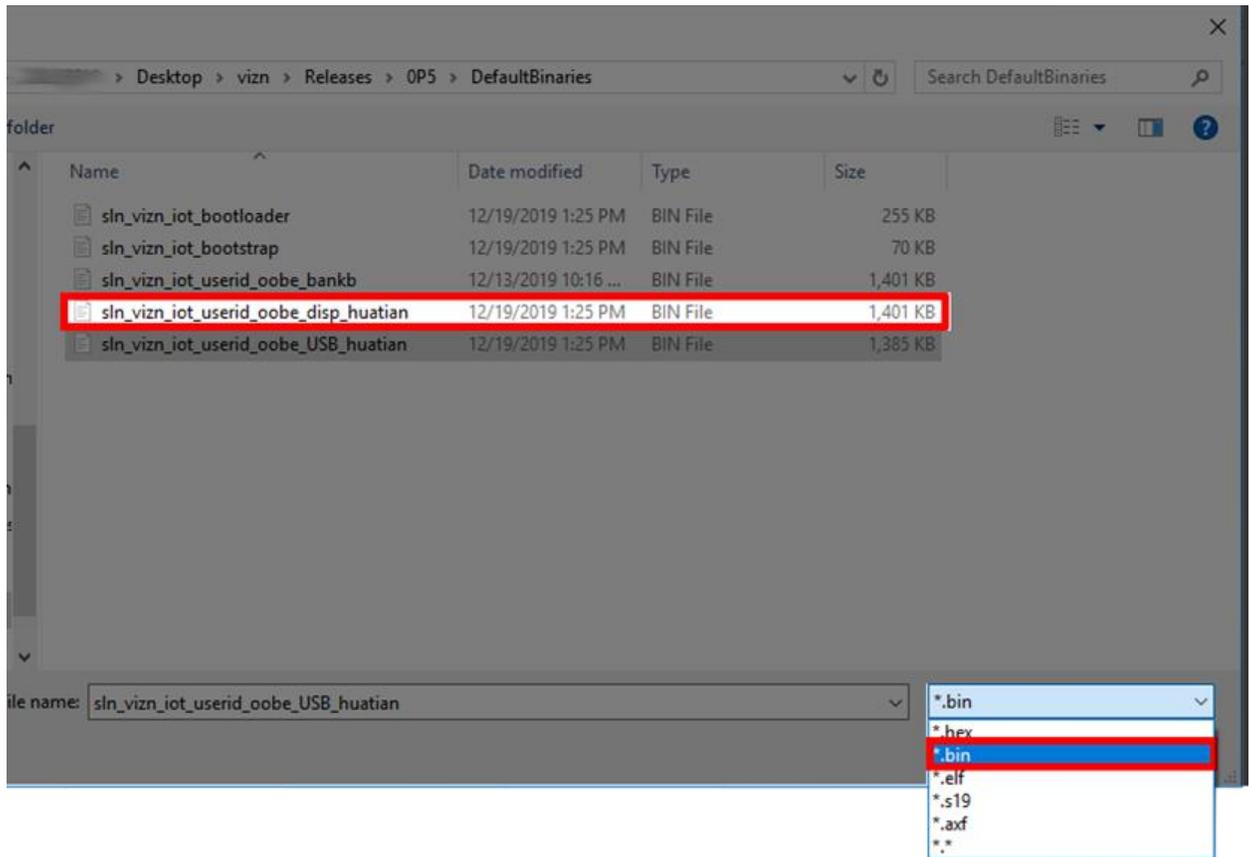
1. Open MCUXpresso and click on the **GUI Flash Tool** icon:



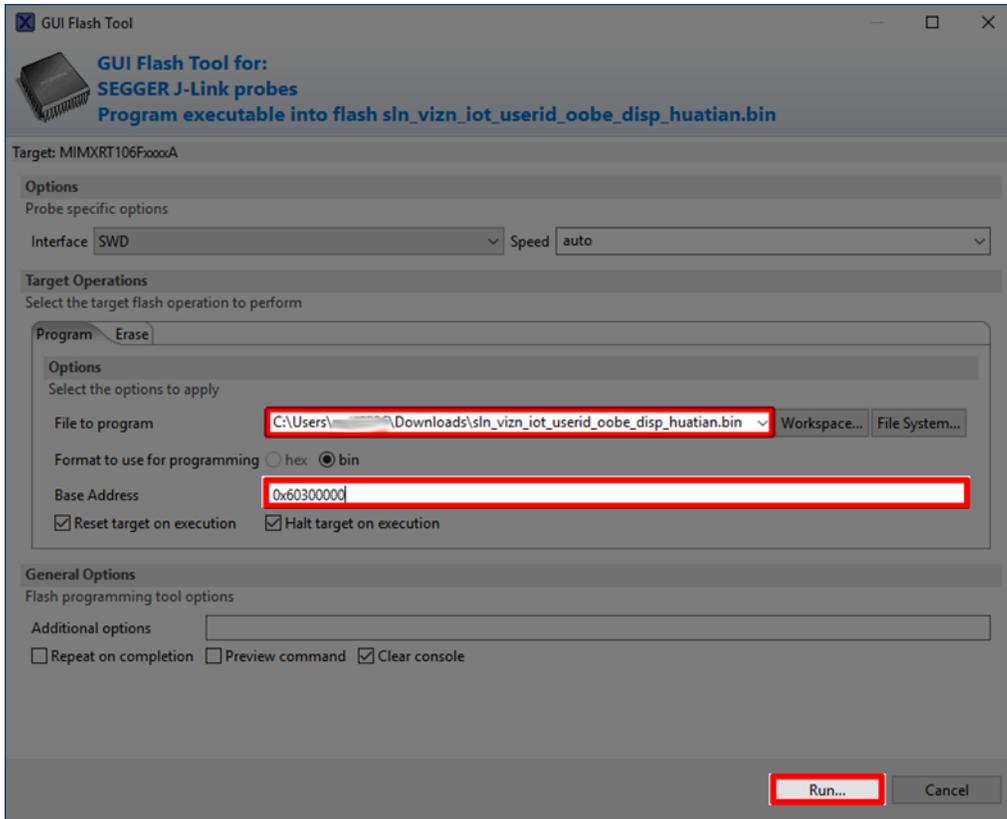
2. Under the **GUI Flash Tool** window, select **File to Program** -> **File System**



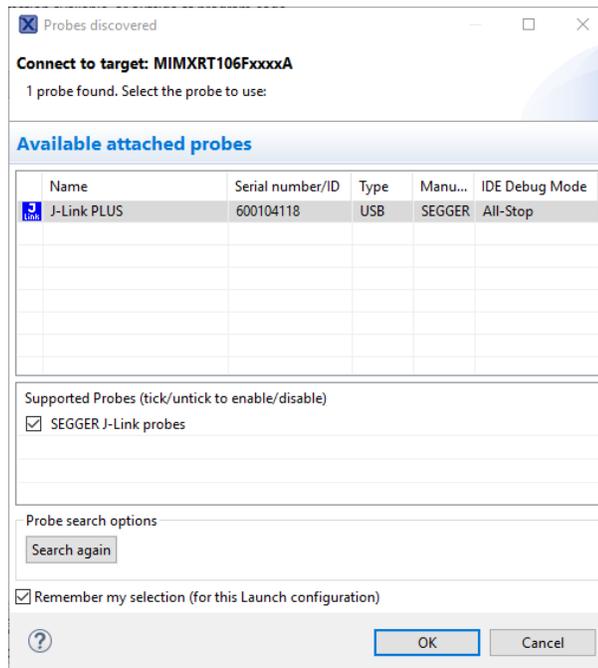
3. In the **File Explorer** window, change the window to show **“.bin”** files using the drop-down menu and select the binary you want to flash. Click **OK** once the binary has been selected.



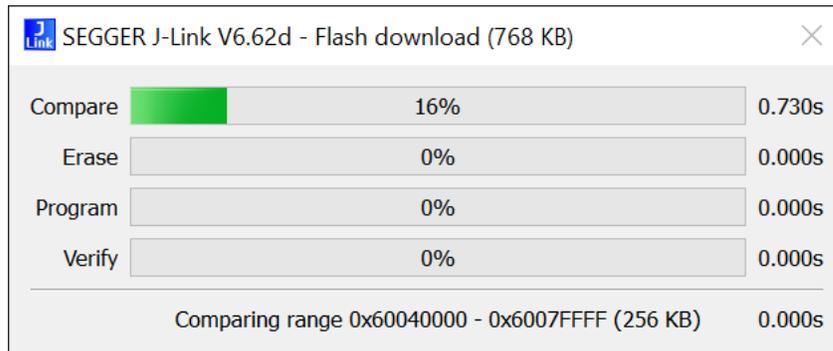
4. In the **GUI Flash Tool** window again, make sure that the binary you selected in the previous step is being shown next to **File to Program** and set the base address to 0x60300000. Once these two fields are properly filled in, click **Run**.



5. Select the J-Link probe connected to your SLN-VIZN-IOT and click **OK**.

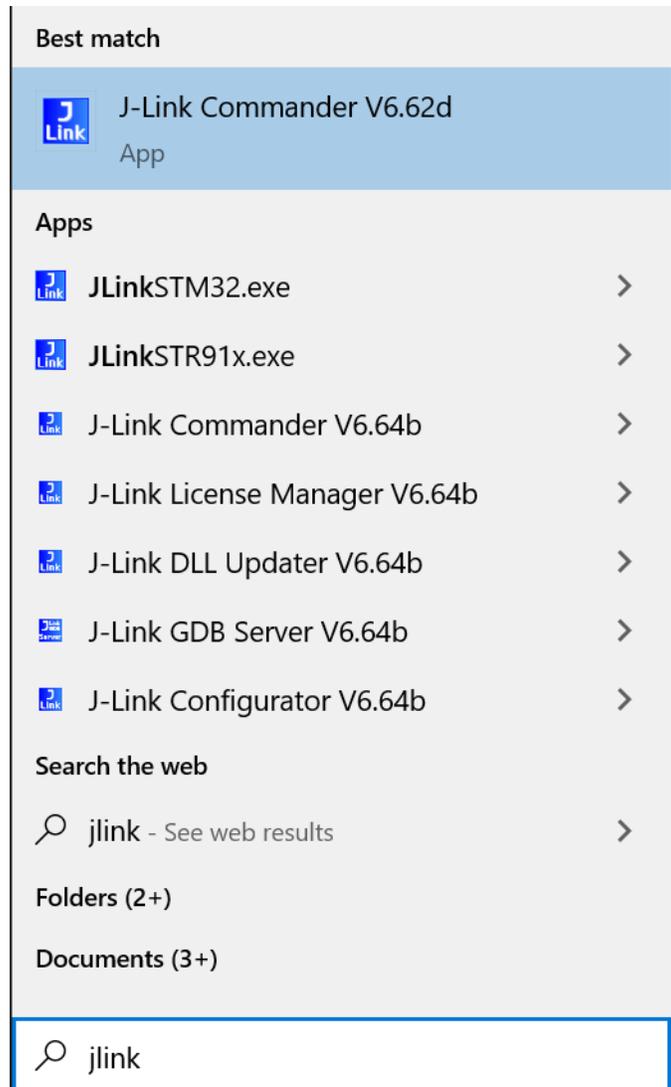


6. You will see a dialog like the following which indicates that your binary is being flashed. Once complete, your kit is ready to go.



## Using J-Link Commander

1. Open **J-Link Commander** (v6.62 or greater).



2. Type the command **“connect”**

```
Select J-Link Commander V6.62d
SEGGGER J-Link Commander V6.62d (Compiled Mar  2 2020 09:23:14)
DLL version V6.62d, compiled Mar  2 2020 09:22:41

Connecting to J-Link via USB...O.K.
Firmware: J-Link V10 compiled Apr 16 2020 17:17:24
Hardware version: V10.10
S/N: 600104118
License(s): RDI, FlashBP, FlashDL, JFlash, GDB
VTref=3.296V

Type "connect" to establish a target connection, '?' for help
J-Link>
```

3. Use the default device (**MIMXRT106FDVL6A**) by pressing the **Enter** key at the “**Device>**” prompt.

```
J-Link Commander V6.62d
SEGGGER J-Link Commander V6.62d (Compiled Mar  2 2020 09:23:14)
DLL version V6.62d, compiled Mar  2 2020 09:22:41

Connecting to J-Link via USB...O.K.
Firmware: J-Link V10 compiled Apr 16 2020 17:17:24
Hardware version: V10.10
S/N: 600104118
License(s): RDI, FlashBP, FlashDL, JFlash, GDB
VTref=3.296V

Type "connect" to establish a target connection, '?' for help
J-Link>connect
Please specify device / core. <Default>: MIMXRT106FDVL6A
Type '?' for selection dialog
Device>
```

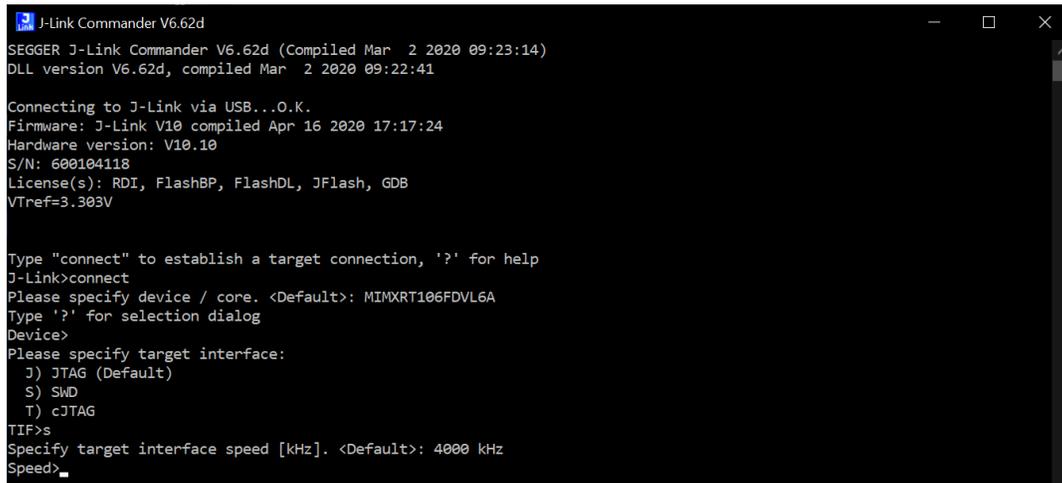
4. Use **SWD** by typing “**s**” at the “**TIF>**” prompt.

```
J-Link Commander V6.62d
SEGGGER J-Link Commander V6.62d (Compiled Mar  2 2020 09:23:14)
DLL version V6.62d, compiled Mar  2 2020 09:22:41

Connecting to J-Link via USB...O.K.
Firmware: J-Link V10 compiled Apr 16 2020 17:17:24
Hardware version: V10.10
S/N: 600104118
License(s): RDI, FlashBP, FlashDL, JFlash, GDB
VTref=3.303V

Type "connect" to establish a target connection, '?' for help
J-Link>connect
Please specify device / core. <Default>: MIMXRT106FDVL6A
Type '?' for selection dialog
Device>
Please specify target interface:
  J) JTAG (Default)
  S) SWD
  T) cJTAG
TIF>s
```

5. Use the **default** target interface speed (**4000 kHz**) by pressing the **Enter** key at the “Speed>” prompt.

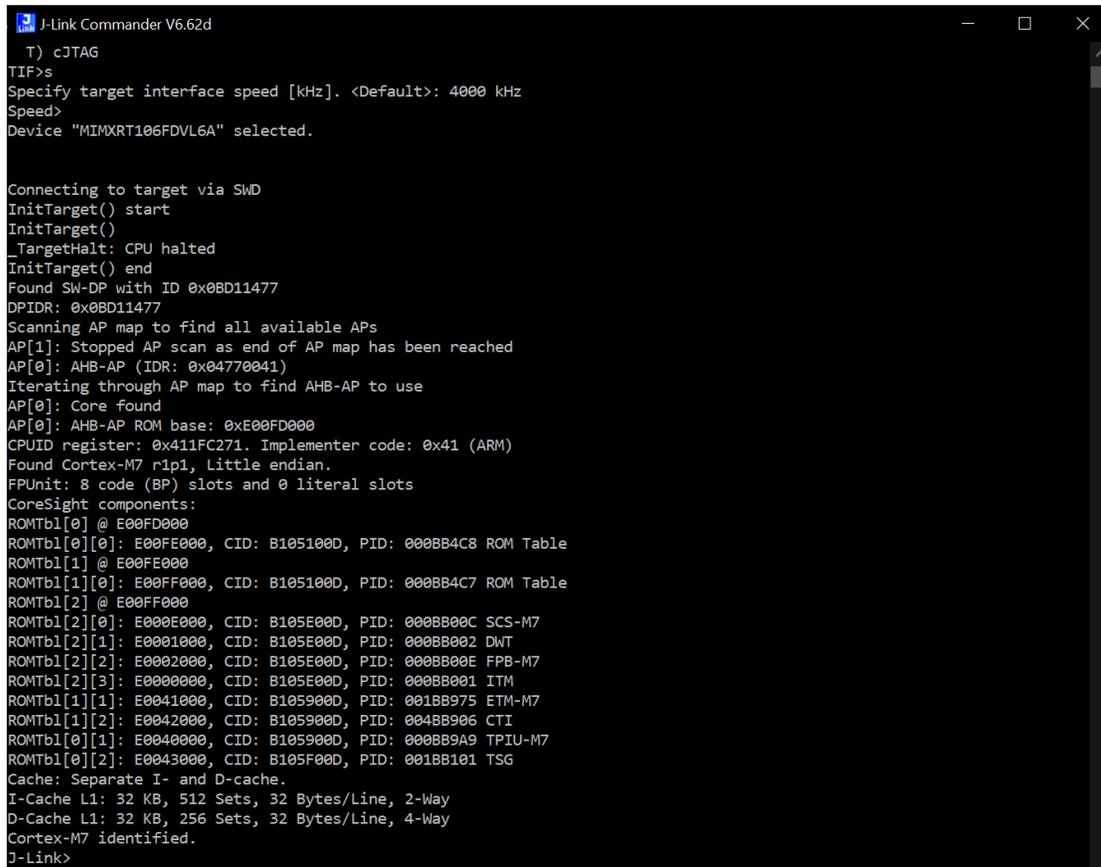


```
J-Link Commander V6.62d
SEGGER J-Link Commander V6.62d (Compiled Mar  2 2020 09:23:14)
DLL version V6.62d, compiled Mar  2 2020 09:22:41

Connecting to J-Link via USB...O.K.
Firmware: J-Link V10 compiled Apr 16 2020 17:17:24
Hardware version: V10.10
S/N: 600104118
License(s): RDI, FlashBP, FlashDL, JFlash, GDB
VTref=3.303V

Type "connect" to establish a target connection, '?' for help
J-Link>connect
Please specify device / core. <Default>: MIMXRT106FDVL6A
Type '?' for selection dialog
Device>
Please specify target interface:
  J) JTAG (Default)
  S) SWD
  T) cJTAG
TIF>s
Specify target interface speed [kHz]. <Default>: 4000 kHz
Speed>
```

6. Upon success, you will receive the following output, indicating you are now connected:



```
J-Link Commander V6.62d
  T) cJTAG
TIF>s
Specify target interface speed [kHz]. <Default>: 4000 kHz
Speed>
Device "MIMXRT106FDVL6A" selected.

Connecting to target via SWD
InitTarget() start
InitTarget()
  _TargetHalt: CPU halted
InitTarget() end
Found SW-DP with ID 0x0BD11477
DPIDR: 0x0BD11477
Scanning AP map to find all available APs
AP[1]: Stopped AP scan as end of AP map has been reached
AP[0]: AHB-AP (IDR: 0x04770041)
Iterating through AP map to find AHB-AP to use
AP[0]: Core found
AP[0]: AHB-AP ROM base: 0xE00FD000
CPUID register: 0x411FC271. Implementer code: 0x41 (ARM)
Found Cortex-M7 r1p1, Little endian.
FPUnit: 8 code (BP) slots and 0 literal slots
CoreSight components:
ROMTbl[0] @ E00FD000
ROMTbl[0][0]: E00FE000, CID: B105100D, PID: 000BB4C8 ROM Table
ROMTbl[1] @ E00FE000
ROMTbl[1][0]: E00FF000, CID: B105100D, PID: 000BB4C7 ROM Table
ROMTbl[2] @ E00FF000
ROMTbl[2][0]: E000E000, CID: B105E00D, PID: 000BB00C SCS-M7
ROMTbl[2][1]: E0001000, CID: B105E00D, PID: 000BB002 DWT
ROMTbl[2][2]: E0002000, CID: B105E00D, PID: 000BB00E FPB-M7
ROMTbl[2][3]: E0000000, CID: B105E00D, PID: 000BB001 ITM
ROMTbl[1][1]: E0041000, CID: B105900D, PID: 001BB975 ETM-M7
ROMTbl[1][2]: E0042000, CID: B105900D, PID: 004BB906 CTI
ROMTbl[0][1]: E0040000, CID: B105900D, PID: 000BB9A9 TPIU-M7
ROMTbl[0][2]: E0043000, CID: B105F00D, PID: 001BB101 TSG
Cache: Separate I- and D-cache.
I-Cache L1: 32 KB, 512 Sets, 32 Bytes/Line, 2-Way
D-Cache L1: 32 KB, 256 Sets, 32 Bytes/Line, 4-Way
Cortex-M7 identified.
J-Link>
```

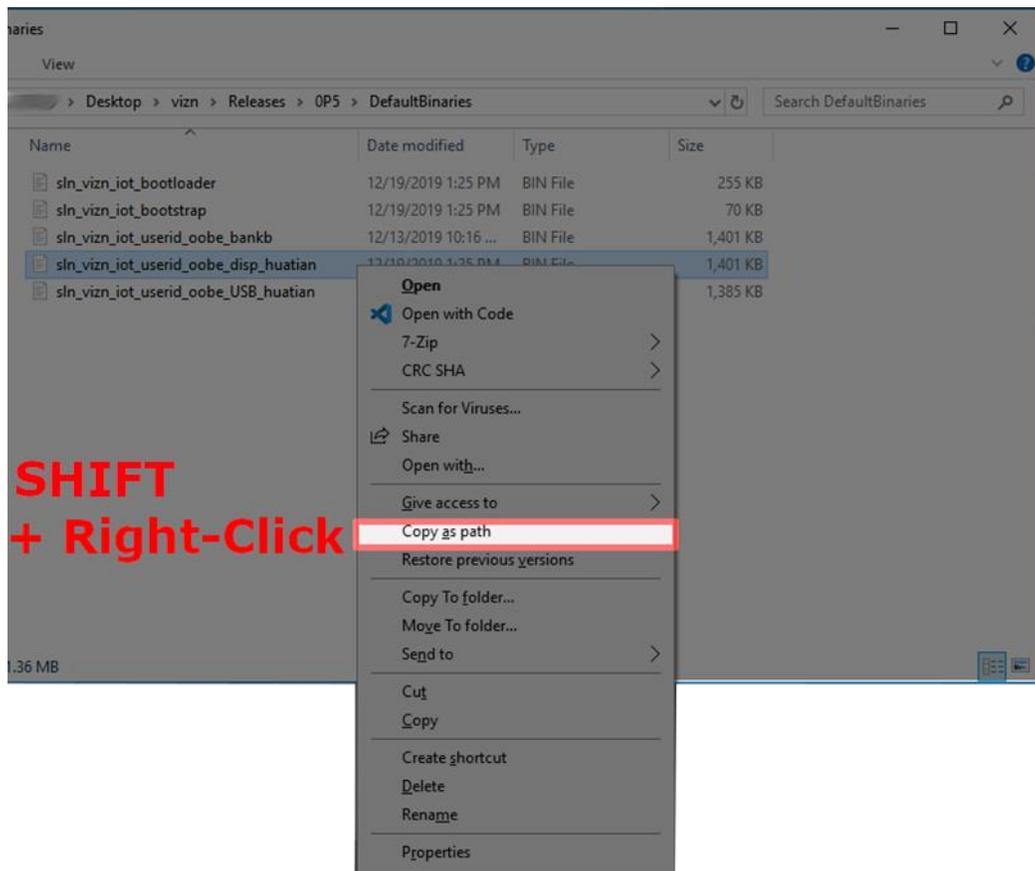
*If you do not see output like that shown above, try checking your J-Link connection to the kit and to the J-Link device itself. Additionally, make sure the “expansion” (top) board has not come loose from the RT106F (bottom) board.*

Type the commands “r” followed by the command “h” in order to reset and halt the processor, respectively, to ensure that the kit may be flashed properly.

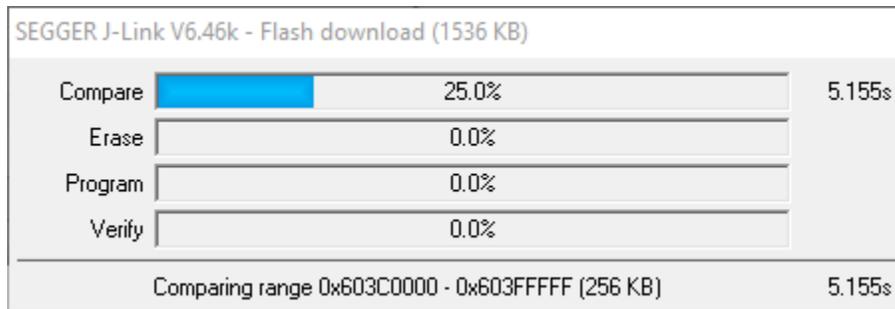
```
J-Link>r
Reset delay: 0 ms
Reset type NORMAL: Resets core & peripherals via SYSRESETREQ & VECTRESET bit.
Reset: Halt core after reset via DEMCR.VC_CORERESET.
Reset: Reset device via AIRCR.SYSRESETREQ.
J-Link>h
PC = 00202090, CycleCnt = 00000000
R0 = 00000000, R1 = 00000000, R2 = 00000000, R3 = 00000000
R4 = 00000000, R5 = 00000000, R6 = 00000000, R7 = 00000000
R8 = 00000000, R9 = 00000000, R10= 00000000, R11= 00000000
R12= 00000000
SP(R13)= 20201000, MSP= 20201000, PSP= 00000000, R14(LR) = FFFFFFFF
XPSR = 01000000: APSR = nzcvg, EPSR = 01000000, IPSR = 000 (NoException)
CFBP = 00000000, CONTROL = 00, FAULTMASK = 00, BASEPRI = 00, PRIMASK = 00

FPS0 = 00000000, FPS1 = 00000000, FPS2 = 00000000, FPS3 = 00000000
FPS4 = 00000000, FPS5 = 00000000, FPS6 = 00000000, FPS7 = 00000000
FPS8 = 00000000, FPS9 = 00000000, FPS10= 00000000, FPS11= 00000000
FPS12= 00000000, FPS13= 00000000, FPS14= 00000000, FPS15= FFFFFFFF
FPS16= 00000000, FPS17= 00000000, FPS18= 00000000, FPS19= 00000000
FPS20= 00000000, FPS21= 00000000, FPS22= 00000000, FPS23= 00000000
FPS24= 00000000, FPS25= 00000000, FPS26= 00000000, FPS27= 00000000
FPS28= 00000000, FPS29= 00000000, FPS30= 00000000, FPS31= FFFFFFFF
FPSCR= 00000000
J-Link>
```

7. Open **File Explorer** and click on the binary you intend to flash. Once highlighted, use “**Shift + Right Click**” to bring up an expanded context menu and click on the option to “**Copy as Path.**”



- Use the command `'loadfile "PATH_TO_BINARY" 0x60300000'` to begin flashing the board. You will see a pop-up window like the following which indicates that the kit is being flashed.



- Once completed, you will receive the following output message in **J-Link Commander** indicating that the board was successfully flashed.

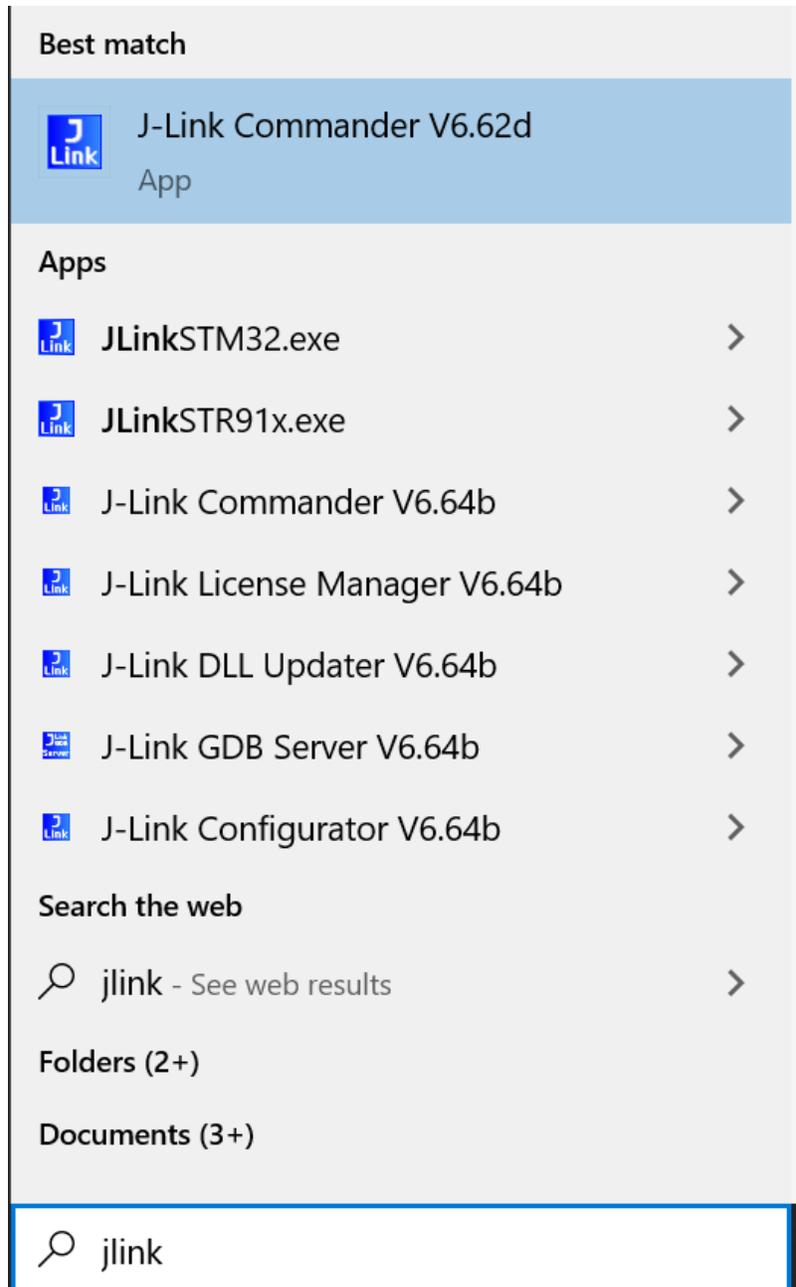
```
J-Link>loadfile "C:\Users\...\Desktop\vizn\Releases\0P5\DefaultBinaries\sln_vizn_iot_userid_oobe_disp_huatian.bin"
0x60300000
Downloading file [C:\User...\Desktop\vizn\Releases\0P5\DefaultBinaries\sln_vizn_iot_userid_oobe_disp_huatian.bin]
...
J-Link: Flash download: Bank 0 @ 0x60000000: 1 range affected (1572864 bytes)
J-Link: Flash download: Total time needed: 25.796s (Prepare: 0.032s, Compare: 7.275s, Erase: 0.098s, Program: 11.099s, V
erify: 7.285s, Restore: 0.004s)
O.K.
J-Link>
```

- Power cycle your board to run your new firmware.

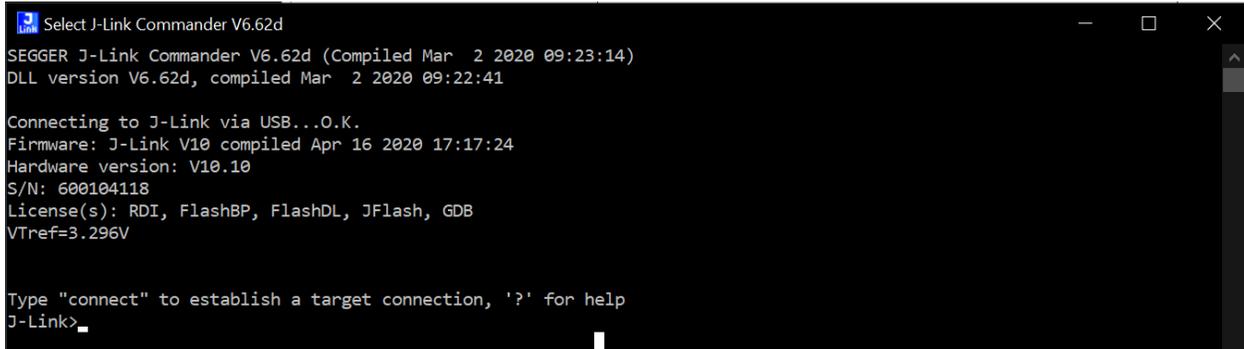
## Erase All Flash Banks

There may be a scenario where you wish to perform a factory reset and go back to the default, stock binaries. In these scenarios, it can often be helpful to erase the entire flash of the SLN-VIZN-IOT kit just to be safe. This can be done using the same J-Link Commander application used in the previous section. The following steps will show the process of connecting to the SLN-VIZN-IOT using J-Link Commander and erasing all flash banks.

1. Open **J-Link** Commander (v6.62 or greater).



## 2. Type the command “connect”

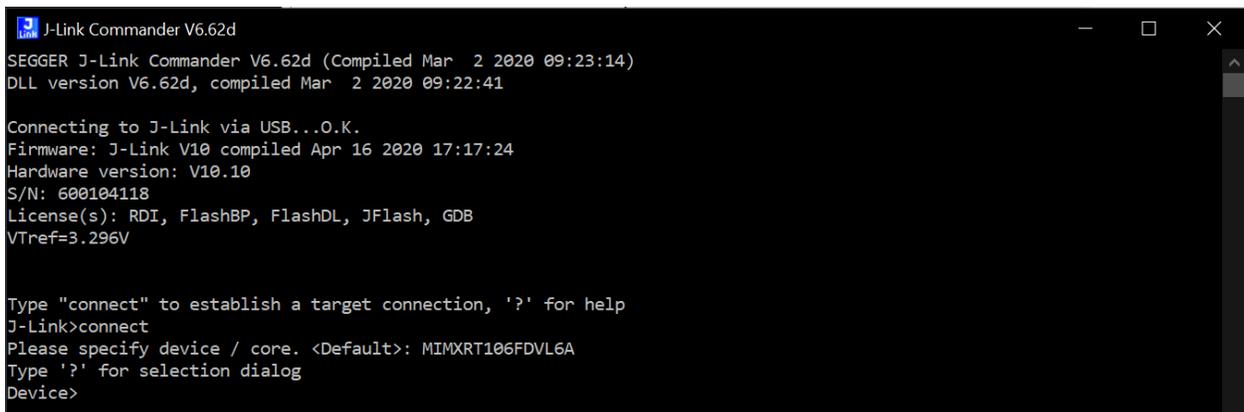


```
Select J-Link Commander V6.62d
SEGGGER J-Link Commander V6.62d (Compiled Mar  2 2020 09:23:14)
DLL version V6.62d, compiled Mar  2 2020 09:22:41

Connecting to J-Link via USB...O.K.
Firmware: J-Link V10 compiled Apr 16 2020 17:17:24
Hardware version: V10.10
S/N: 600104118
License(s): RDI, FlashBP, FlashDL, JFlash, GDB
VTref=3.296V

Type "connect" to establish a target connection, '?' for help
J-Link>
```

## 3. Use the default device (MIMXRT106FDVL6A) by pressing the **Enter** key at the “Device>” prompt.

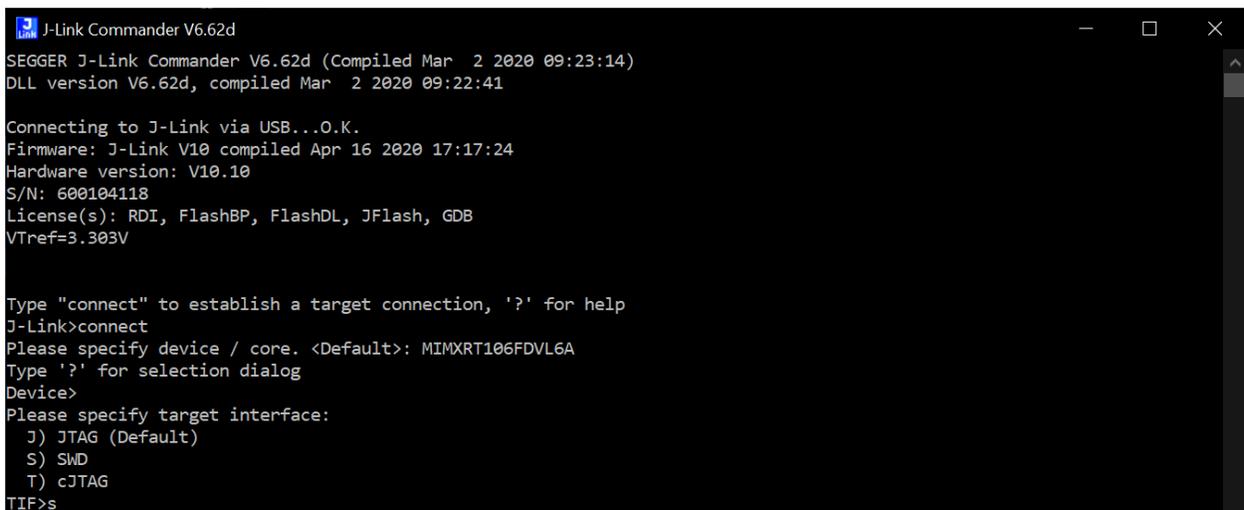


```
J-Link Commander V6.62d
SEGGGER J-Link Commander V6.62d (Compiled Mar  2 2020 09:23:14)
DLL version V6.62d, compiled Mar  2 2020 09:22:41

Connecting to J-Link via USB...O.K.
Firmware: J-Link V10 compiled Apr 16 2020 17:17:24
Hardware version: V10.10
S/N: 600104118
License(s): RDI, FlashBP, FlashDL, JFlash, GDB
VTref=3.296V

Type "connect" to establish a target connection, '?' for help
J-Link>connect
Please specify device / core. <Default>: MIMXRT106FDVL6A
Type '?' for selection dialog
Device>
```

## 4. Use SWD by typing “s” at the “TIF>” prompt.



```
J-Link Commander V6.62d
SEGGGER J-Link Commander V6.62d (Compiled Mar  2 2020 09:23:14)
DLL version V6.62d, compiled Mar  2 2020 09:22:41

Connecting to J-Link via USB...O.K.
Firmware: J-Link V10 compiled Apr 16 2020 17:17:24
Hardware version: V10.10
S/N: 600104118
License(s): RDI, FlashBP, FlashDL, JFlash, GDB
VTref=3.303V

Type "connect" to establish a target connection, '?' for help
J-Link>connect
Please specify device / core. <Default>: MIMXRT106FDVL6A
Type '?' for selection dialog
Device>
Please specify target interface:
  J) JTAG (Default)
  S) SWD
  T) cJTAG
TIF>s
```

5. Use the **default** target interface speed (**4000 kHz**) by pressing the **Enter** key at the “**Speed>**” prompt.

```
J-Link Commander V6.62d
SEGGGER J-Link Commander V6.62d (Compiled Mar  2 2020 09:23:14)
DLL version V6.62d, compiled Mar  2 2020 09:22:41

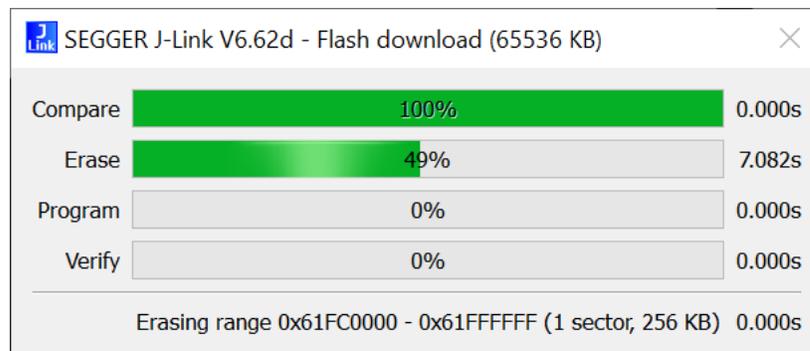
Connecting to J-Link via USB...O.K.
Firmware: J-Link V10 compiled Apr 16 2020 17:17:24
Hardware version: V10.10
S/N: 600104118
License(s): RDI, FlashBP, FlashDL, JFlash, GDB
VTref=3.303V

Type "connect" to establish a target connection, '?' for help
J-Link>connect
Please specify device / core. <Default>: MIMXRT106FDVL6A
Type '?' for selection dialog
Device>
Please specify target interface:
  J) JTAG (Default)
  S) SWD
  T) cJTAG
TIF>s
Specify target interface speed [kHz]. <Default>: 4000 kHz
Speed>
```

6. Type the command “**exec EnableEraseAllFlashBanks**” which will allow the J-Link to erase all the flash from the kit.

```
J-Link Commander V6.62d
J-Link>exec EnableEraseAllFlashBanks
J-Link>
```

7. Now, simply type the command “**erase**” to begin erasing the flash on the kit. After running the command, you should see a window like the following:



8. Upon success, you will receive output like the following:

```
J-Link Commander V6.62d
J-Link>exec EnableEraseAllFlashBanks
J-Link>erase
Erasing device...
J-Link: Flash download: Total time needed: 10.404s (Prepare: 0.069s, Compare: 0.000s, Erase: 10.331s, Program: 0.000s, V
erify: 0.000s, Restore: 0.003s)
Erasing done.
J-Link>
```