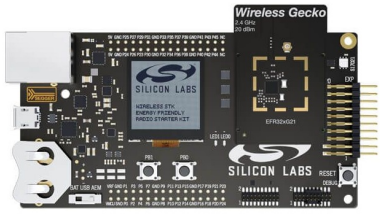

Software s Silicon Labs Works With Conference 2021 Pre-Work Software Instruction Manual

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Silicon Labs Works With Conference 2021 Pre-Work

Thank you for registering to attend Works With 2021! If you are planning to attend one of our Hands-On courses, you will need to install the following software to follow along
with the course instructors.

Simplicity Studio v5
For developers and designers enrolled in the Works With 300-level courses below, Simplicity Studio v5 is the IDE course instructors will use for hands-on exercises and demonstrations of developing IoT devices and applications. It is highly recommended you install Simplicity Studio v5 prior to the event to get the most out of the 300-level courses. **Learn More**

Note: "AMZ-301: Building a Sidewalk Demo with Silicon Labs EFR32" and "MAT-301: Matter Development with OpenThread & Home Ecosystems" are sponsored technical demonstrations with no pre-work required.

Course ID	Title	Required SDKs
WIR-301	Exploring RTOS Options for Wireless IoT Projects	Bluetooth SDK, Flex SDK, Gecko SDK
WSN-300	Building Large Scale Smart City Networks with Wi-SUN	Wi-SUN SDK, Gecko SDK
SEC-301	Hands-On With CPMS Security	Gecko SDK
EML-301	Add Predictive Maintenance in Smart Building Devices with TinyML	Gecko SDK
EML-302	Industrial Predictive Maintenance with Embedded Machine Learning	Gecko SDK

1. Install Simplicity Studio v5
   a. Simplicity Studio v5 Offline Installer: **(Windows .exe, Mac .dmg, Linux .tar)**
   i. Includes Bluetooth, OpenThread, Z-Wave, and Flex SDKs
   b. You'll need to create or sign in with your **www.silabs.com** account
2. Verify you have the necessary SDKs, listed in the above table, installed for your 300-level courses

a. Update Protocol SDKs by clicking menu bar Help -> Update Software.

i. Click Package Manager

ii. Click on the tab for “SDKs” in the Package Manager window

iii. Verify/Install the SDKs for your courses listed above

3. If you’re enrolled in one of the following courses, there are unique development tools outside of Simplicity Studio v5 required. Click the course links below to view specific instructions. Otherwise, all you need is Simplicity Studio v5 and you’re ready to attend Works With 2021!

   Note: SSv5 may require additional steps to run properly on MAC OS Big Sur, see page 4 of this doc.

   WIR-301: Exploring RTOS Options for Wireless IoT Projects

   The Thunderboard Sense 2 is accompanied by a mobile app that makes it easy to interact with the board and gather status information. You’ll use the app in the first part of this lab. You should take a few minutes to download the app from either the **Apple Store** or **Google Play** before getting started

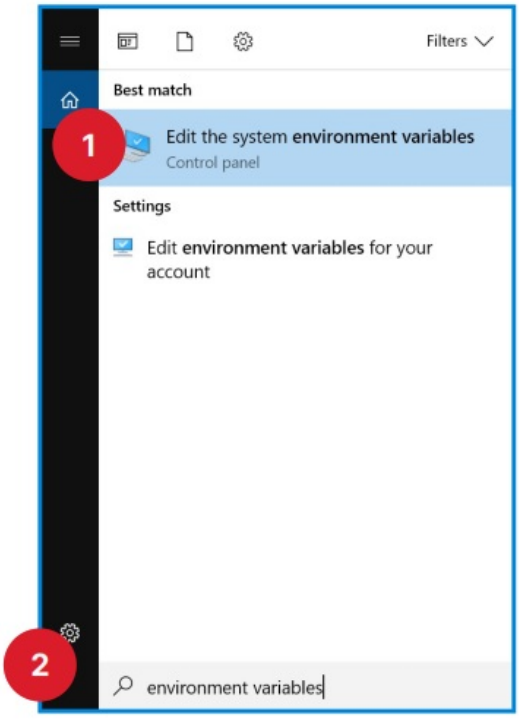
WSN-300: Building Large Scale Smart City Networks with Wi-SUN
Download and install the latest stable version of Wireshark **here**.

SEC-301: Hands-On with CPMS Security

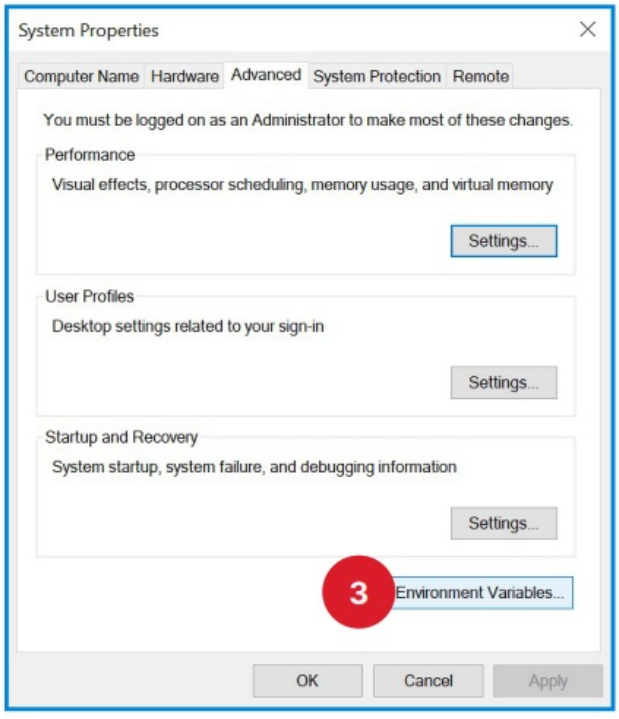
This security course will use a tool called Simplicity Commander and it is recommended you prepare your operating system’s environment variables to simply execute code using a command prompt.

Prepare Windows OS to run Simplicity Commander

For simplicity’s sake add the path of Simplicity Commander (C:\SiliconLabs\SimplicityStudio\v5\developer\adapter_packs\commander) to the path environment variable in your OS so that the commander command can be called from any directory.

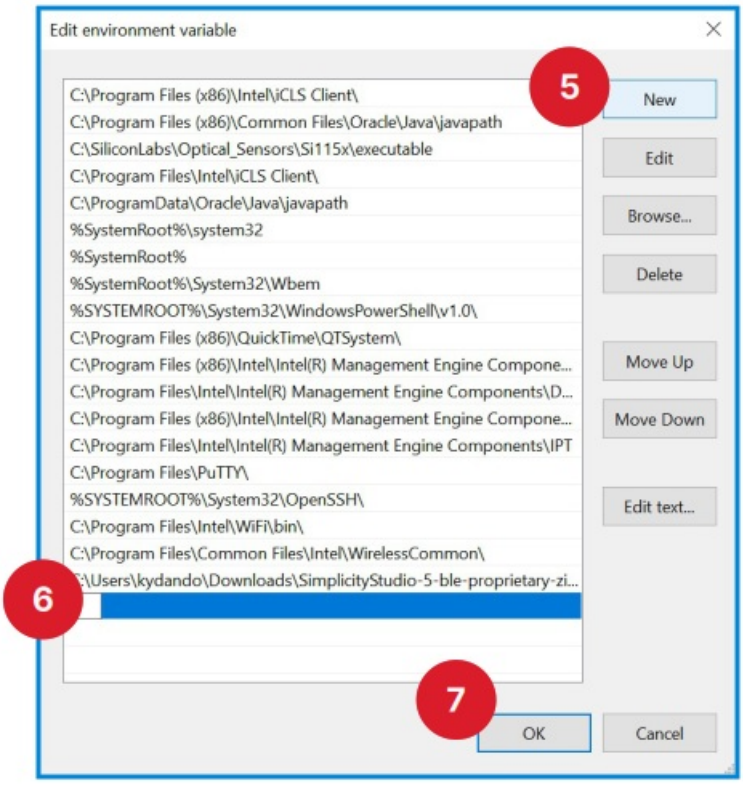


1. Use the Search bar in Windows 10 to locate “Environment Variables” menu.



3. Select “Environment Variables” in the System Properties window.

2. Select “Edit the system environment variables”



5. Click **“New”.**
Verify this is the valid path for your installation. **C:\SiliconLabs SimplicityStudio\v5\developer\adapter_packs\commander** Most default installations will have this path. It will be different if you modified the installation folder for Simplicity Studio.
6. Paste the verified location of Simplicity Commander
7. Click “OK” 3 times to close the open windows
8. Computer will need to be restarted for the new PATH variable to be updated

Prepare MacOS Catalina and Linux OS to run Simplicity Commander

The following section details how to set up Simplicity Commander to the path environment variable in a macOS or Linux OS.

In macOS Catalina:

1. Open a terminal window
2. Return to the root folder by typing cd ~
3. Use an editor like nano to edit the .zshrc file. Type nano .zshrc
4. Add the following to an existing PATH command or else add it to the end of the file.
   export PATH=$PATH: /Applications/Simplicity\
   Studio.app/Contents/Eclipse/developer/adapter_packs/commander/Commander.app/Contents macOS
5. Exit and save the .zshrc file by hitting CTRL-X to exit, and answer Y to save the file.
6. Now source the file to make it the active path: Type. ~/.zshrc

For Mojave and Linux:

1. Follow the same process above for both only editing the .bashrc file in step 3:
2. For Linux, the path is also different from what you add in step 4.

export PATH=$PATH: ~/SimplicityStudio_v5/developer/adapter_packs/commander

3. Now source the file to make it an active path in Mojave or Linux: Type. ~/.bashrc

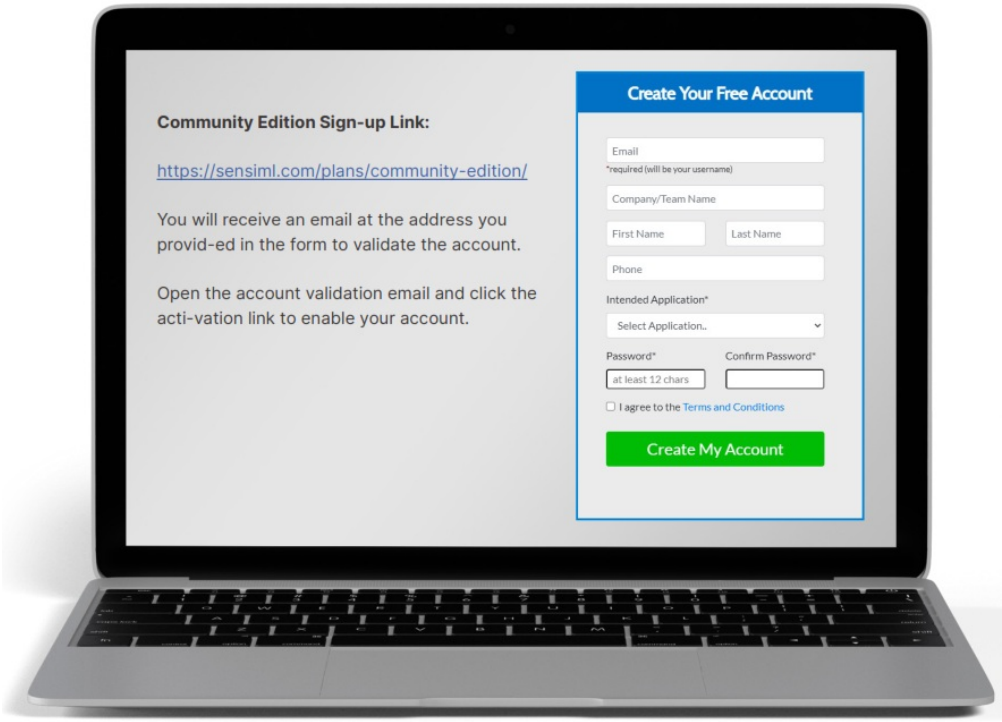
Mac OS Big Sur Troubleshooting:
If SSv5 is not working properly on MAC OS Big Sur, a workaround is provided below:
Download the Python 3.6.8 installer for macOS from **https://www.python.org/downloads/release/python-368/**
"Python3.6 (64bit, for 10.9 and later)".
Then do the following from a terminal window:

sudo /usr/local/bin/python3 -m pip install jinja2 pyx html2text
cd "/Applications/Simplicity Studio.app/Contents/Eclipse/developer/adapter_packs/python/bin/"
mv python.Orig
mv python3 python3.Orig
mv python3.6 python3.6.orig
ln -s /user/local/bin/python3 python
ln -s /user/local/bin/python3
ln -s /user/local/bin/python3.6

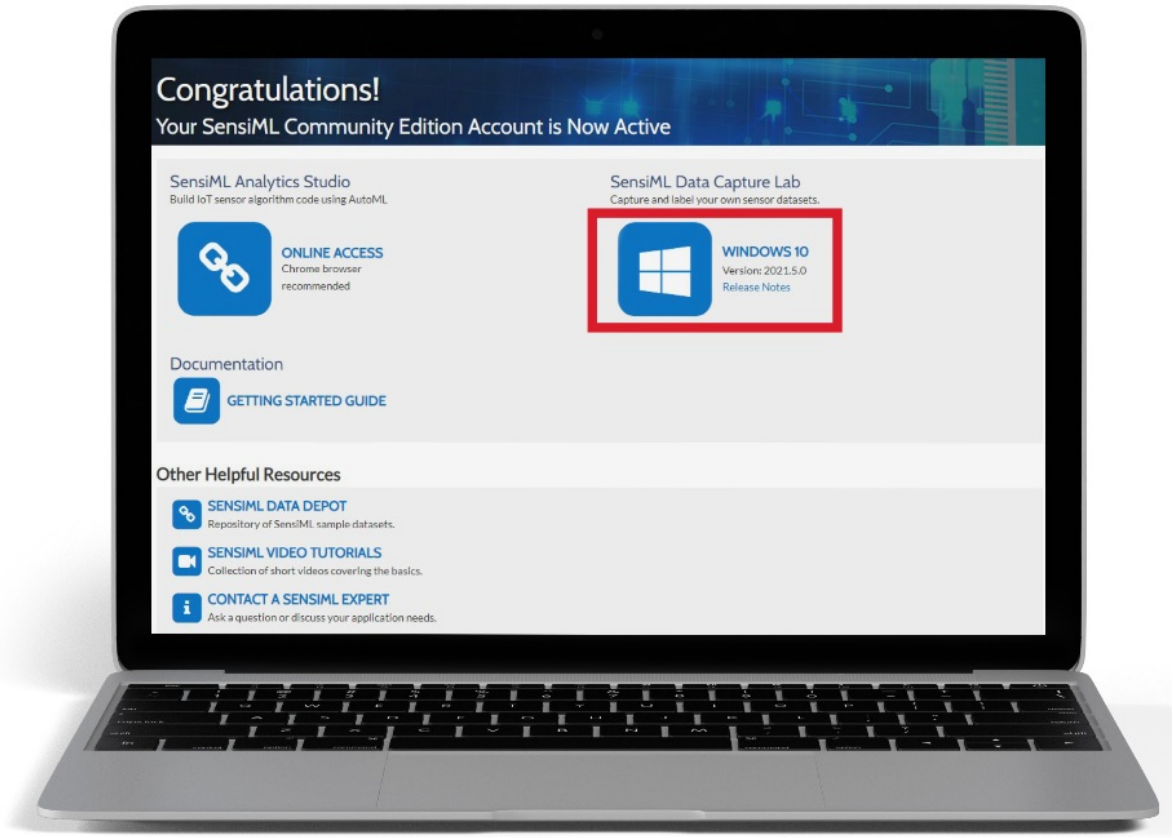
EML-301: Add Predictive Maintenance in Smart Building Devices with TinyML

To maximize the available lab time for the EML-301 workshop, the following steps should be performed by attendees in advance of the scheduled session on September 15th 11:00a CDT:

1. Sign-up for SensiML Community Edition (free forever tier of SensiML Analytics Toolkit). Go to the link below, enter your account information, and click 'Create My Account.



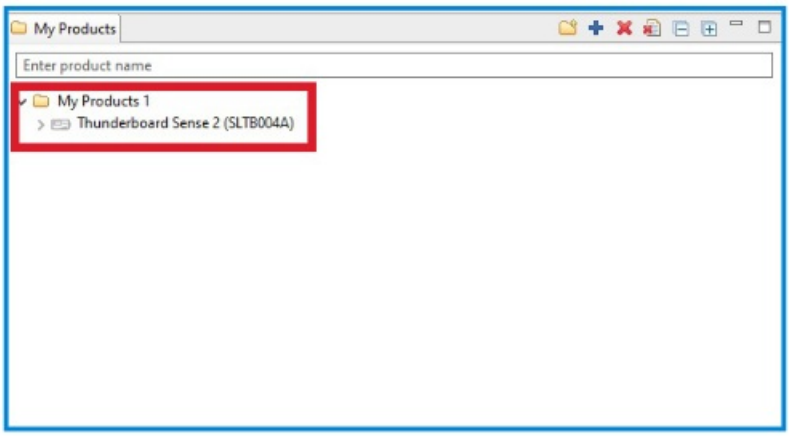
2. Once your account has been created, your browser will provide a link to download the PC client application for Data Capture Lab (Windows 10 or Windows10 compatible virtual machine for Linux and macOS machines is required). Click the link circled in red in the image below to initiate the Data Capture Lab application installer download.



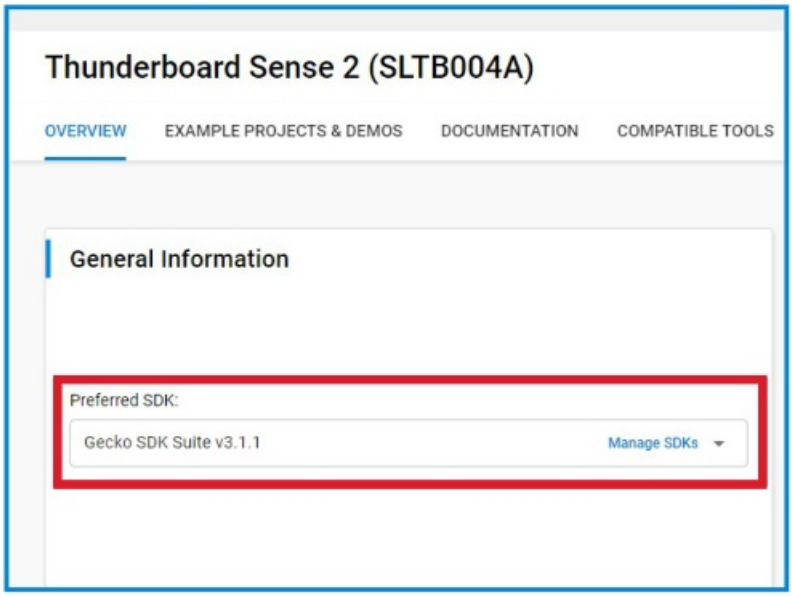
At this point, your account is now ready for building SensiML machine learning models and the necessary SensiML software is installed

3. Next, the board must be flashed with sensor data collection firmware that is compatible with SensiML Data Capture Lab. Silicon Labs provides firmware source/library code for data collection using IMU and audio sensors on the Thunderboard Sense 2 board. These are included in their public GitHub Pages https://github.com/SiliconLabs). For the workshop, we will be using just the IMU Data Collection firmware to build a model using the accelerometer/gyro sensor on the Thunderboard. This file can be directly downloaded at the link below: https://github.com/SiliconLabs/platform_applications/blob/master/platform_SensiML/platform_SensiML_D **Click the download button at the link above.**
4. Open Simplicity Studio and go to “Launcher”

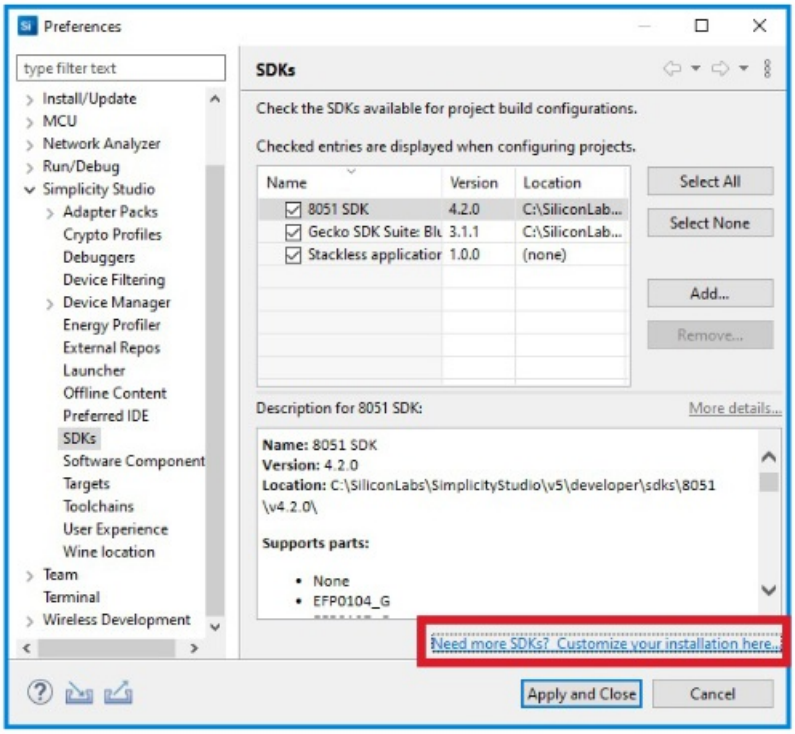
5. Plug in your ThunderBoard Sense 2 and wait for it to show up in the “My Products” area in the lower left-hand corner:



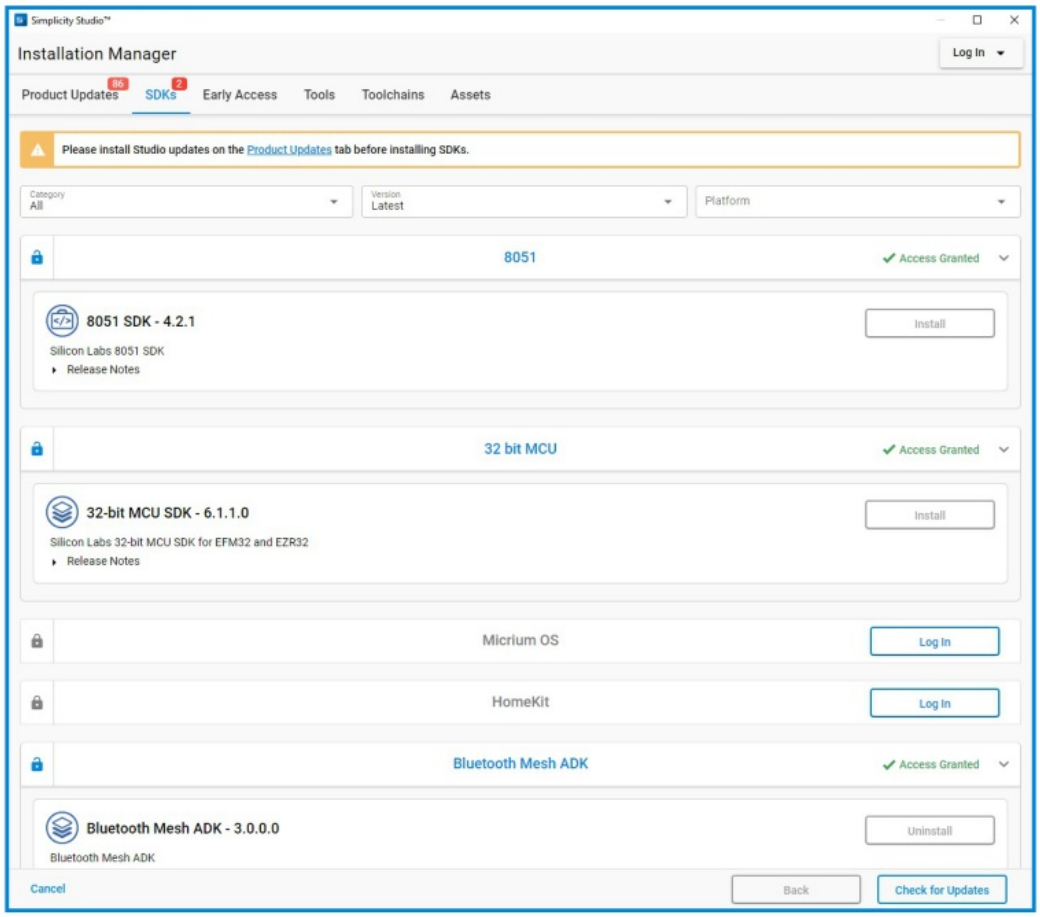
6. Select your board, and you should see an SDK installed. At a minimum “Gecko SDK Suite” is required



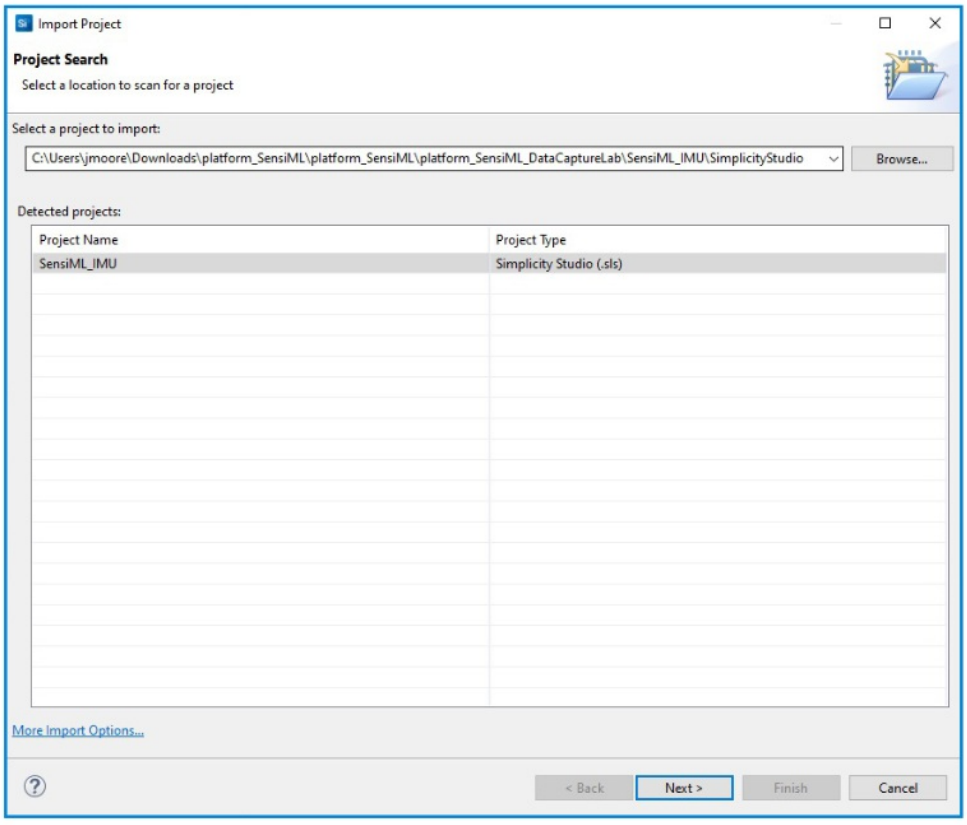
7. If you need to install SDKs, click on “Manage SDKs”, and then “Need more SDKs? Customize your installation here…”



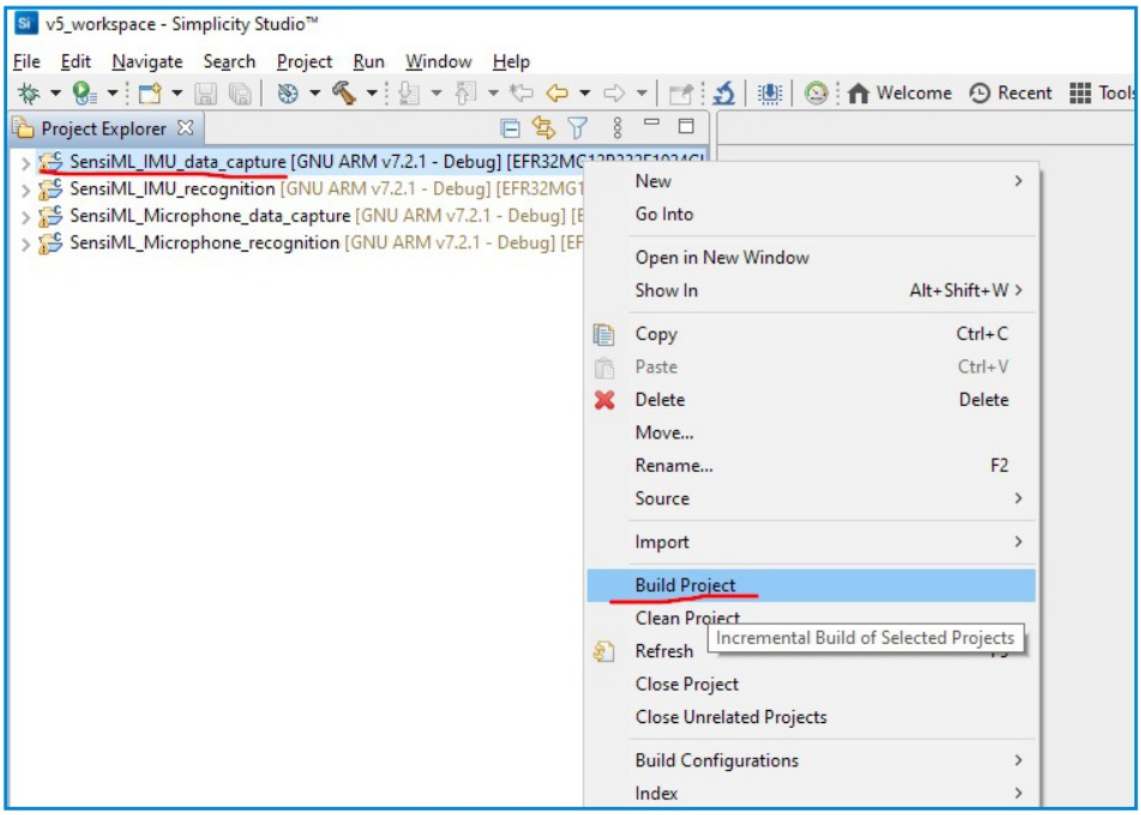
This will bring up the Simplicity Studio installation manager, allowing you to search and select the Gecko SDK Suite: Edge Impulse Introduction and Setup



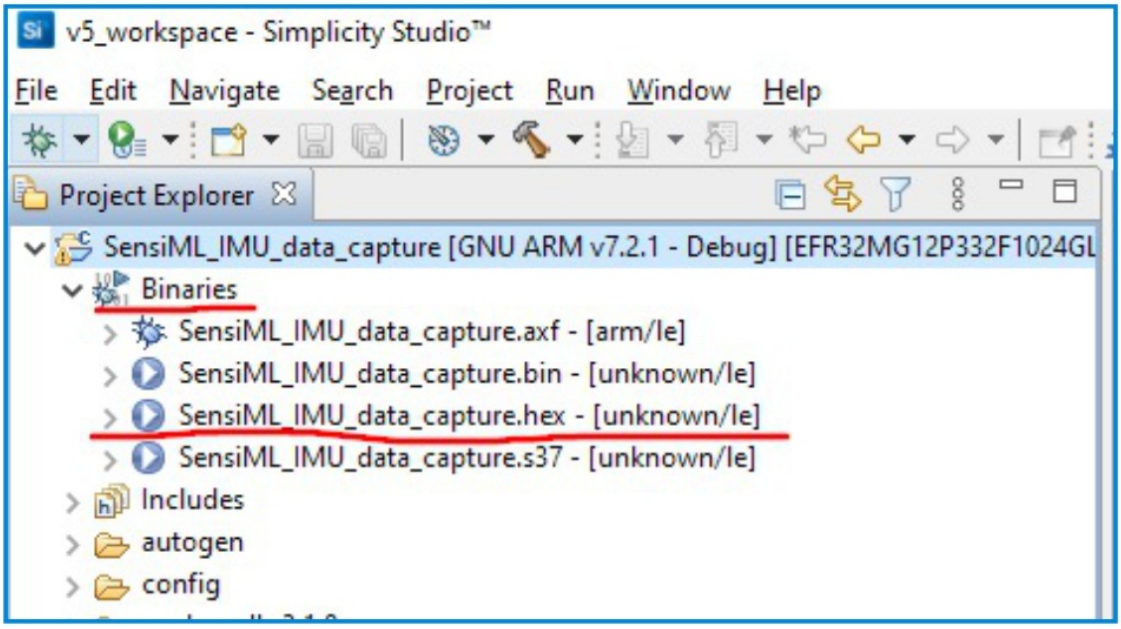
8. Next, select File->Import and select the folder to which you just downloaded the .sls file above. The Import Project window should then list SensiML_IMU_data_capture as a detected project within the designated folder. Click ‘Next’ through two screens accepting default values and then ‘Finish’ to import the firmware into Simplicity Studio.



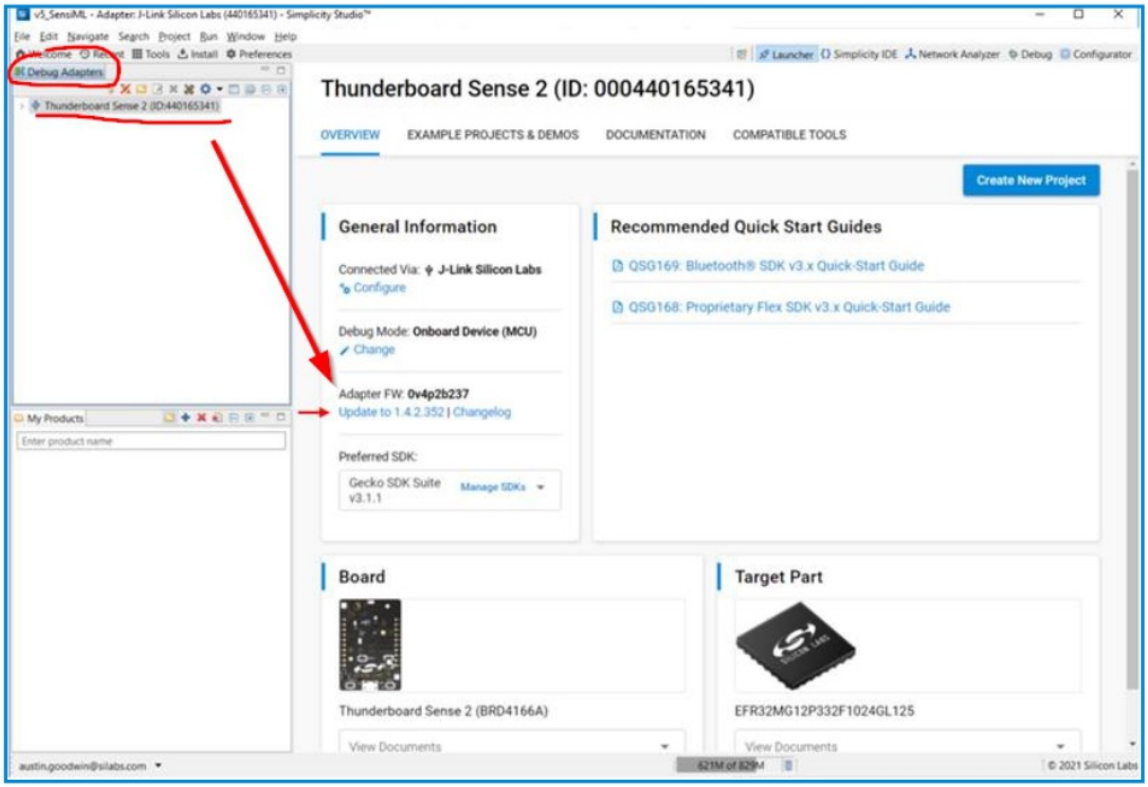
9. Now you will need to build the project to generate the .hex file executable for flashing.



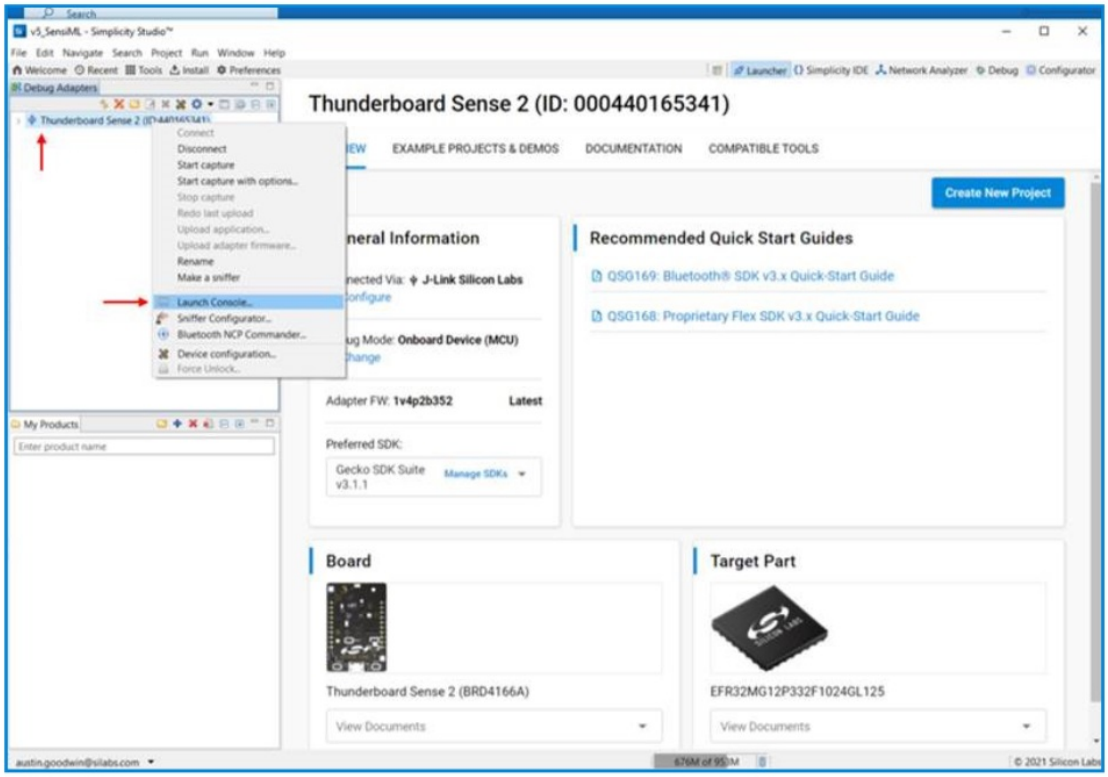
Once the build process completes, you should see the hex file listed under ‘Binaries’.



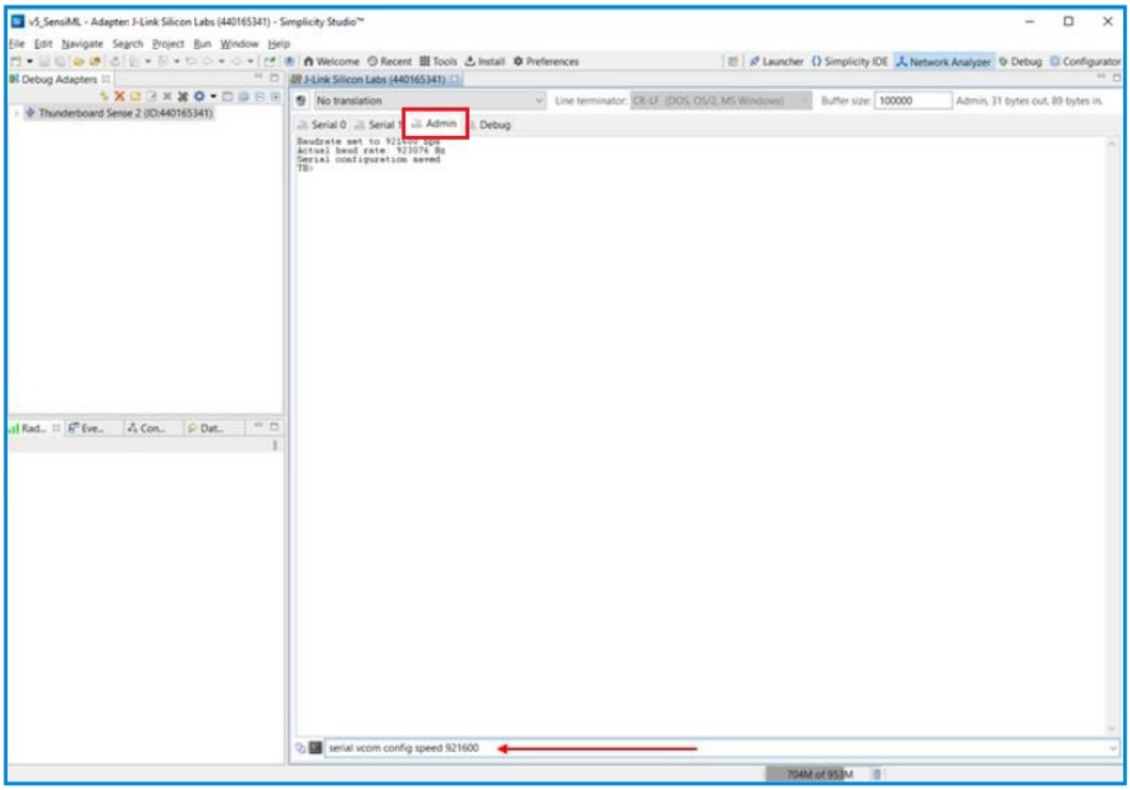
10. To prepare for flashing the board, first, update the debug adapter firmware. This can be done from the Launcher in Simplicity Studio by clicking and following the update link in the Overview tab under “Adapter FW”



11. After the Debug Adapter, firmware update completes, in the Debug Adapters window, right-click on the Thunderboard Sense 2 and select “Launch Console…” from the drop-down menu.

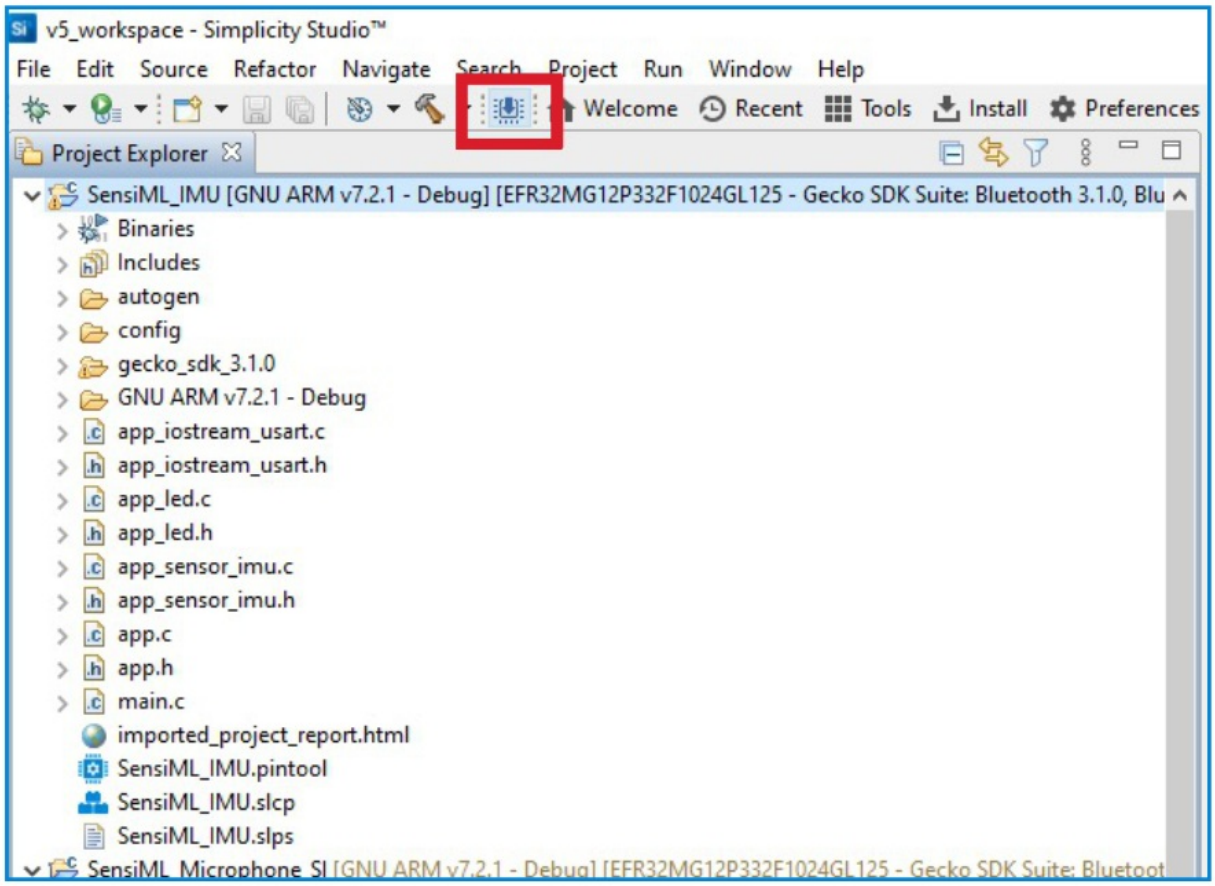


12. In the Console window, select the “Admin” tab and type “serial vcom config speed 921600” into the terminal input window and press “enter.”



Now you will be able to connect the board for data capture.

13. To flash the board from Simplicity Studio, click the Flash Programmer button as shown below.



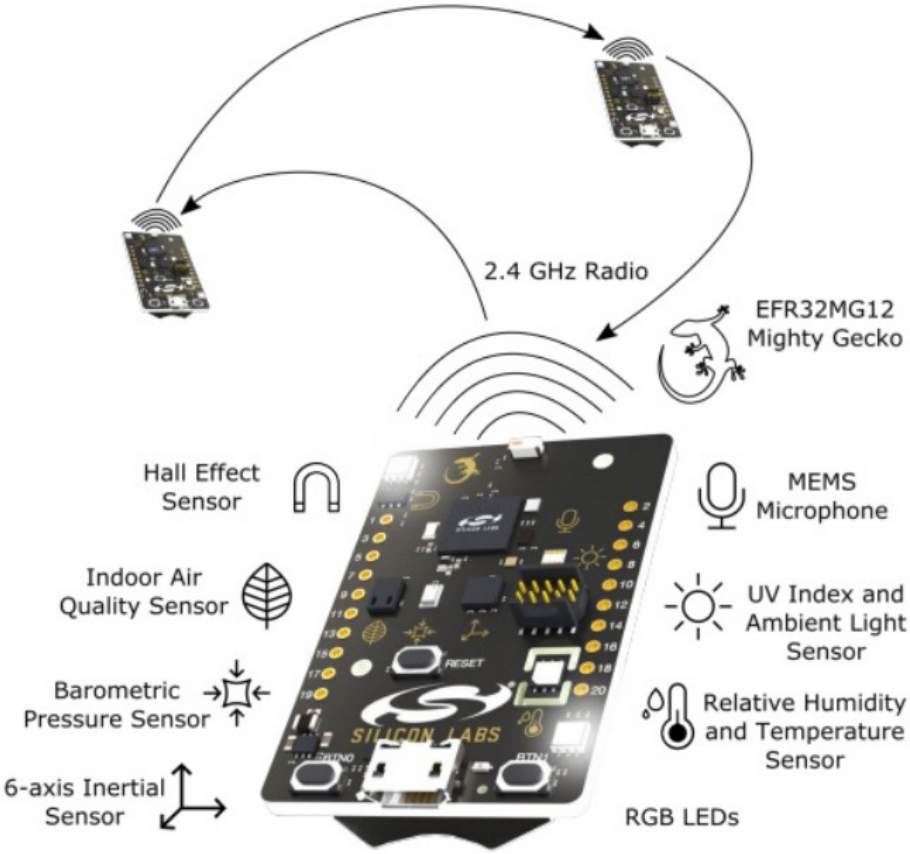
Select the previously built .hex file, and click on “Program”. At this point, you should have a working board capable of communicating IMU sensor data with SensiML Data Capture Lab.

This completes the pre-work needed for the workshop. We look forward to seeing you there!

EML-302: Industrial Predictive Maintenance with Embedded Machine Learning

For this lab you will need the following:

- EFR32MG12 Thunderboard Sense 2 (SLTB004A)
- Micro-USB to USB Type-A cable (Not included with Thunderboard)
- A computer running Windows or Mac
- An account created with Edge Impulse **using@silabs.com** email address
- Any mobile phone or computer – for recording audio samples
- The prebuilt dataset provided with the prework lab package

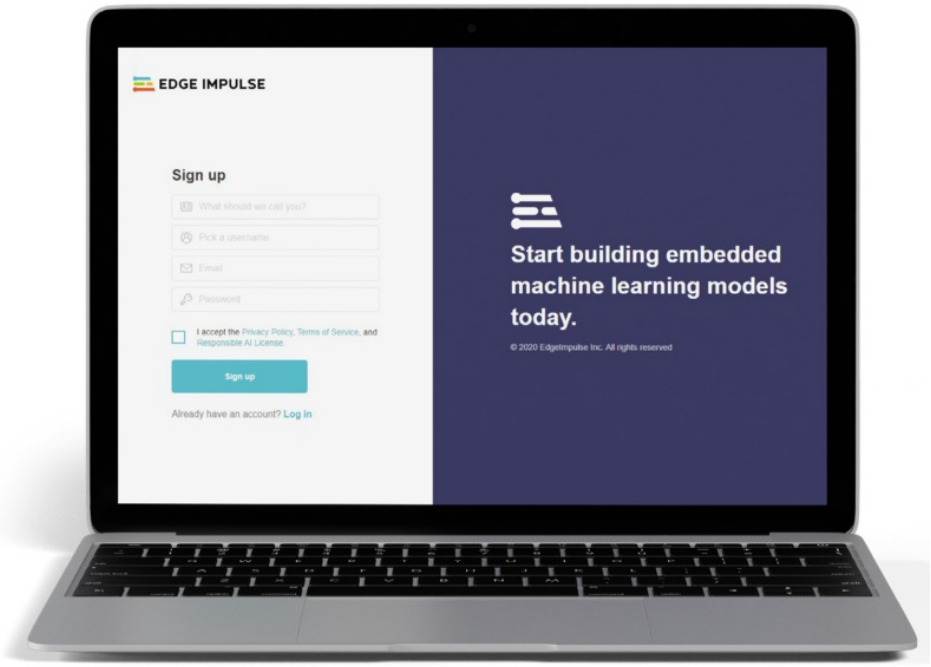


Edge Impulse Introduction and Setup

Edge Impulse is a development platform that can be used to create intelligent device solutions with machine learning on embedded devices. This section will go over getting set up with Edge Impulse.

1.1 Create an account with Edge Impulse

Sign up with the **corresponding@silabs.com** address on Edge Impulse's website **here**.



Sign in using the newly created credentials.

1.2 Installing Dependencies for Thunderboard Sense 2

To set up Thunderboard Sense 2 in Edge Impulse, the following software will need to be installed:

- Node.js v12 or higher. Note that you may need to check the box to install “chocolatey.” This may be easy to overlook so watch out and avoid clicking through or skipping this.
- On Linux:
  o GNU Screen – install for example via Sudo apt install screen
- The Edge Impulse CLI. Install by opening a command prompt or terminal and run the node package manager:
  npm install -g edge-impulse-cli

1.3 Adding Software Components

With all the software in place, we can proceed to connect the development board to Edge Impulse.

1.3.1 Connect the development board to your computer

1. Use a micro-USB cable to connect the development board to your computer.
2. The development board should mount as a USB mass-storage device (like a USB flash drive), with the name TB004. Make sure you can see this drive.

1.3.2 Update the firmware

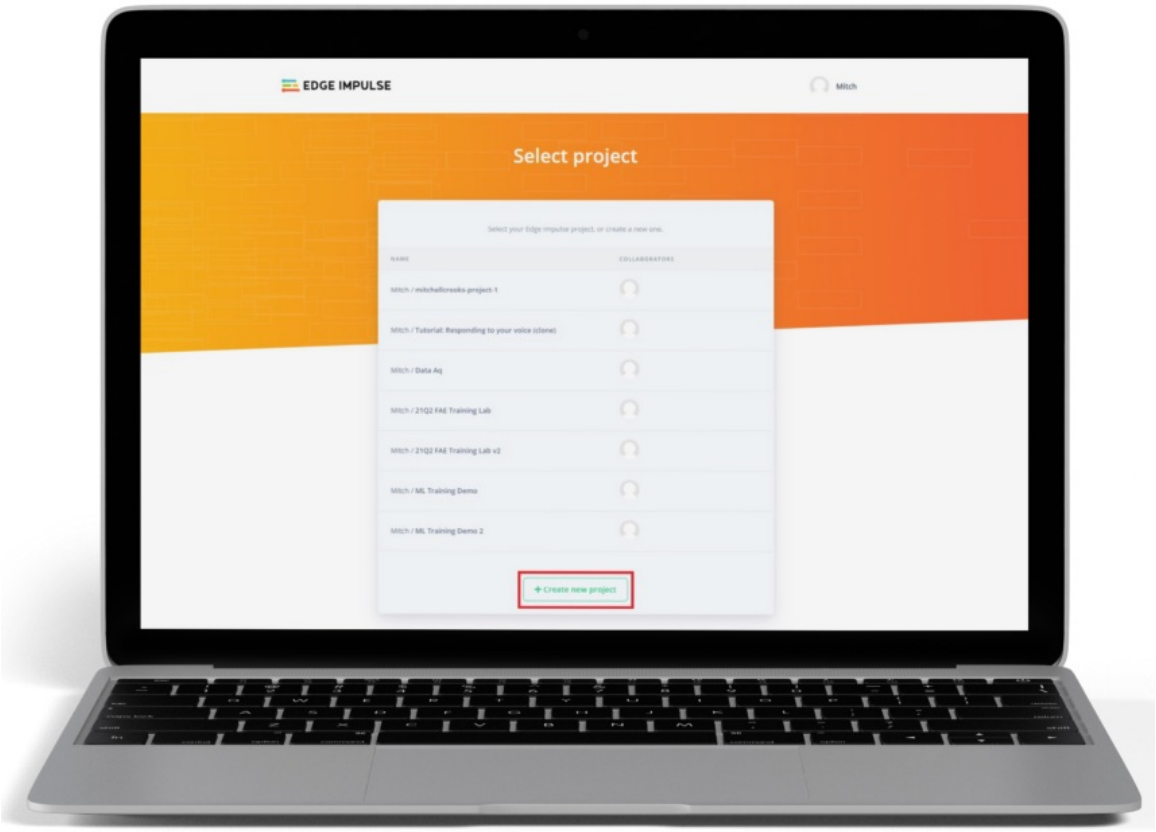
The development board must be flashed with the right firmware, so it is detected by Edge Impulse Studio. To flash the firmware:

1. Download the latest Edge Impulse firmware.
2. Drag the slabs-thunder board-sense2.bin file (the file downloaded in step #1) to the TB004 drive.
3. Wait 30 seconds.

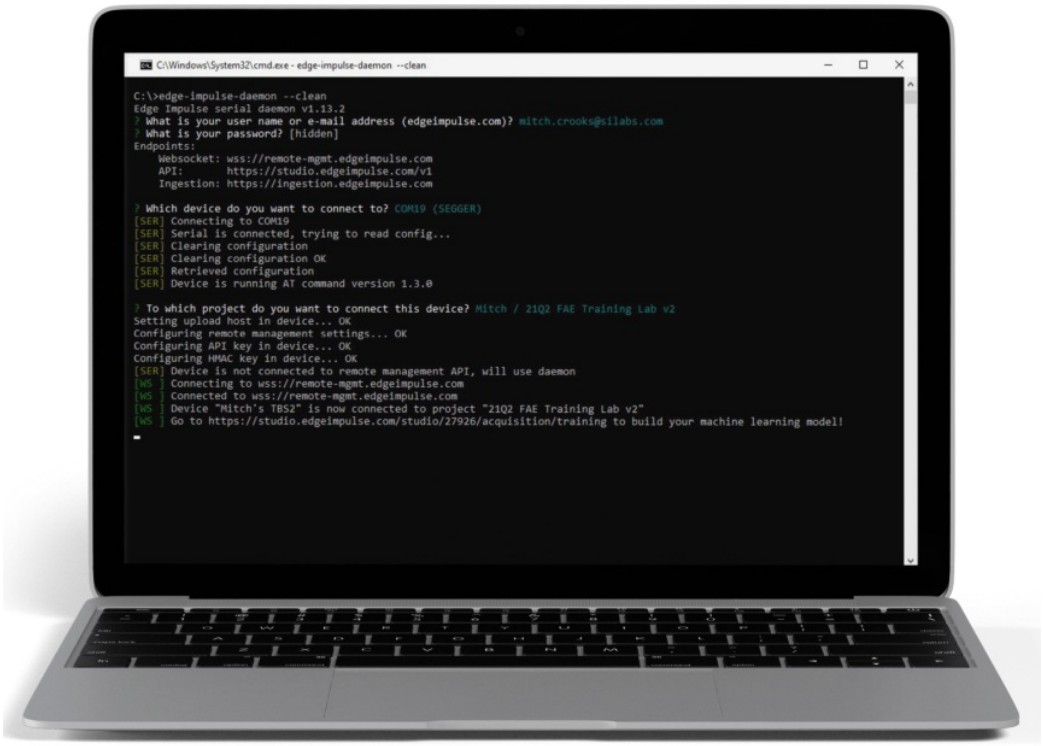
1.3.3 Setting keys

Note: Before completing this step, please be sure that you have created a new project in Edge Impulse Studio. To do this:

1. Go to https://studio.edgeimpulse.com/ and log in
2. Click on [+ Create new project]:



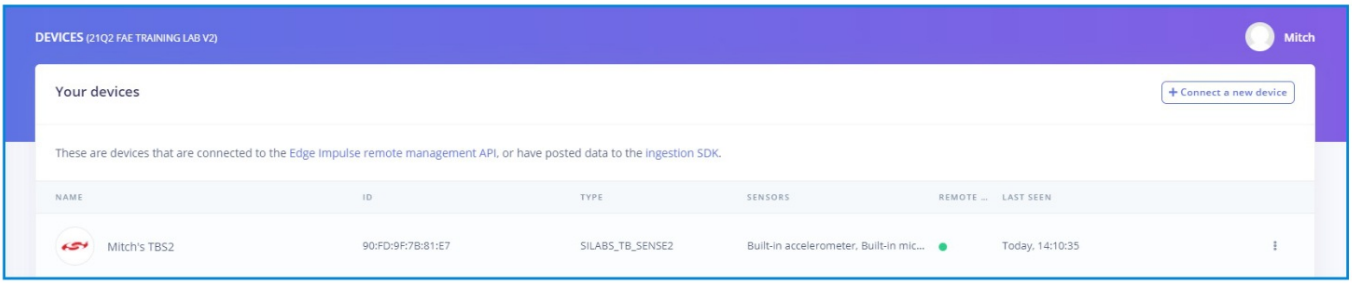
3. Name your project. This will ensure that you have a project to connect to using the Edge Impulse CLI.
   The remainder of this section will simply ensure that you can connect to your device and Edge Impulse account using the CLI.
   From a command prompt or terminal, run: $ edge-impulse-daemon
   This will start a wizard which will ask you to log in and choose an Edge Impulse project. If you want to switch projects, run the command with –clean.



1.3.4 Verifying that the device is connected

To verify that your device is connected, log on to studio.edgeimpulse.com with the credentials created in section 2.1.Click Devices.

The device should be listed here.



Documents / Resources

	Software s Silicon Labs Works With Conference 2021 Pre-Work Software [pdf] Instruction Manual Silicon Labs Works With Conference 2021 Pre-Work Software

References

- Silicon Labs
- Login - Edge Impulse
- Silicon Labs
- Silicon Labs · GitHub
- platform_applications/platform_SensiML/platform_SensiML_DataCaptureLab at master · SiliconLabs/platform_applications · GitHub
- SensiML | Community Edition
- Login - Edge Impulse
- Python Release Python 3.6.8 | Python.org

Manuals+.