Samsung

ARTIK™ Modules

0

020 Getting Started Guide

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VERSION HISTORY

Revision	Date	Description	Maturity
1.0	10/12/2016	Initial Public Release	Release

INTRODUCTION

The ARTIK 020 Development Kit is meant to help you evaluate the ARTIK 020 Module and get you started with your own software development.

This quick-start guide helps you get started with the ARTIK 020 Development Kit.

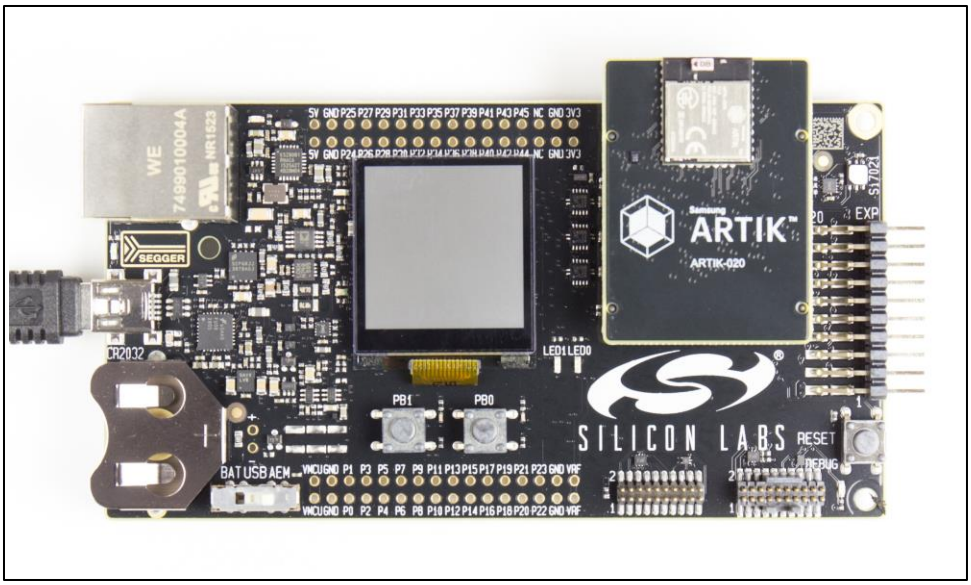


Figure 1. ARTIK 020 Main Board

ARTIK 020 Module Development Board Setup

The following steps need to be completed to start testing the Bluetooth functionality:

1. Connect the ARTIK 020 Radio Board to the ARTIK 020 Main Board
2. Connect the ARTIK 020 Main Board to your development PC using the USB cable
3. Turn the power switch of the ARTIK 020 Main Board in the AEM position
   a. At this stage you might be prompted to install drivers, please ignore this step for now
4. Verify that the blue USB connection indicator LED starts blinking
5. Check that the main board LCD shows the Silicon Labs logo

Figure 2, shows the picture of the ARTIK 020 Main Board with its associated switches and indicators.

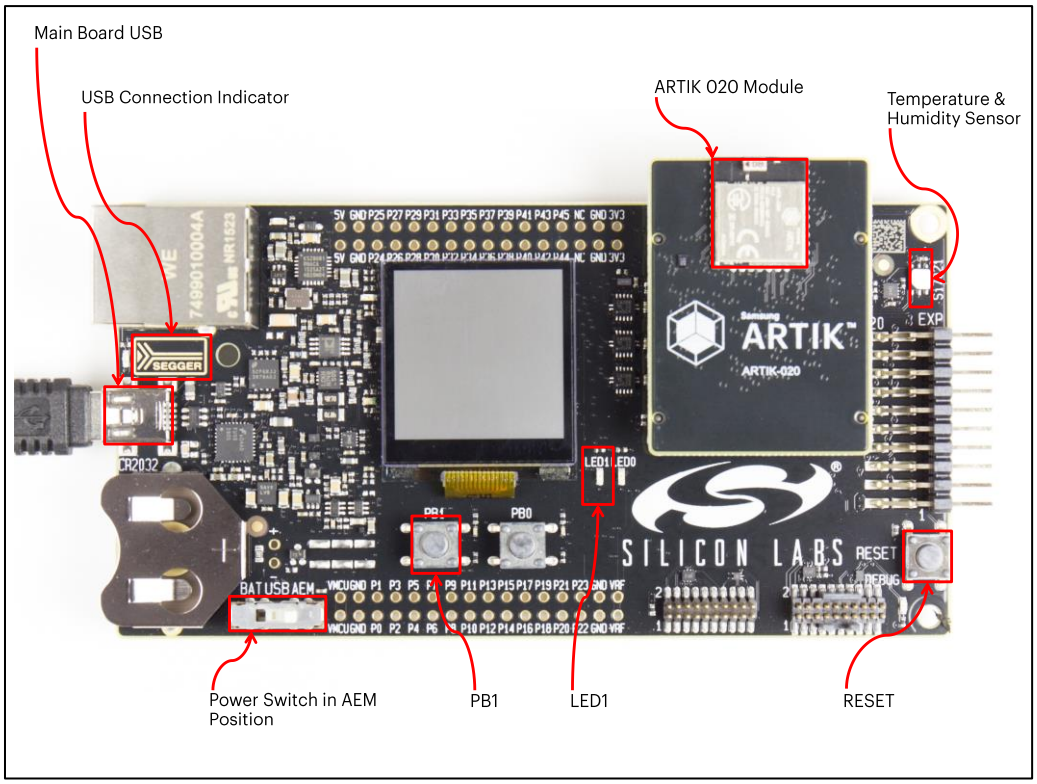


Figure 2. ARTIK 020 Main Board

When the ARTIK 020 Main Board is up and running to the point discussed above it is time to start showing the use of Silicon Labs Simplicity Studio™ 4.0.

SILICON LABS SIMPLICITY STUDIO™ 4.0

INSTALLATION

To install Silicon Labs Simplicity Studio™ 4.0 first download the installer from *http://www.silabs.com/products/mcu/Pages/simplicity-studio-v4.aspx*. See also *Figure 3*.

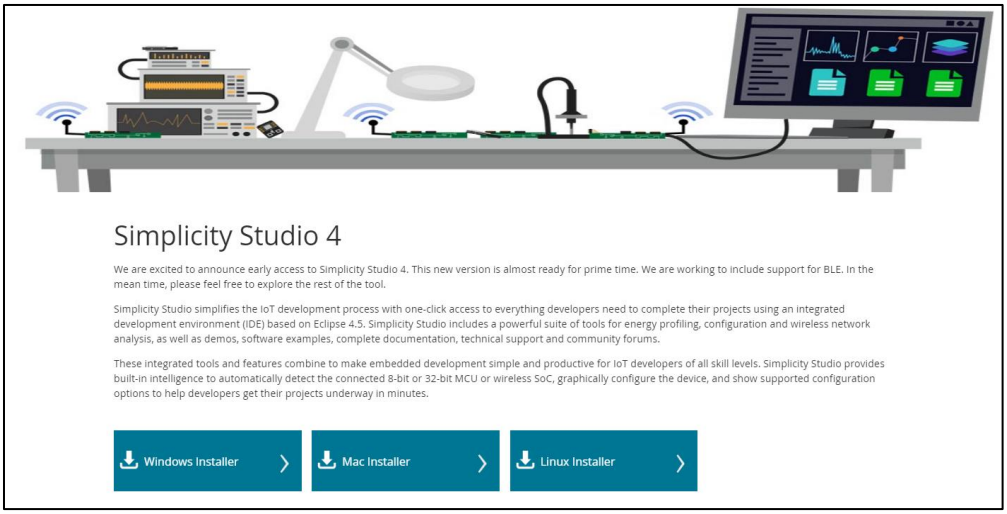


Figure 3. Simplicity Studio™ Installer

Double click on the right Installer (Windows, Mac or Linux, going forward we will use the Windows installer) and follow the installation instructions as below:

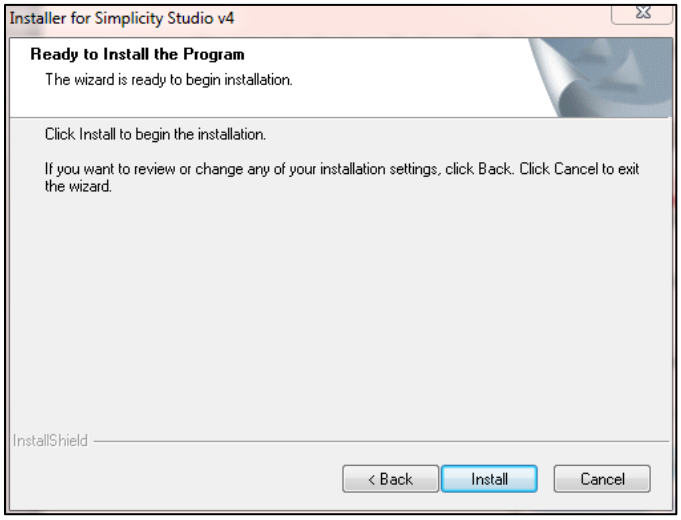


Figure 4. Simplicity Studio™ Installer

In order to get all the needed additional installation packages for your ARTIK 020 Development Kit, you need to sign into Simplicity Studio™ using your Silicon Labs® technical support account. If you do not have an account, click on the 'Create an Account' on the bottom of the Login Window in *Figure 5*. This will take you to the Silicon Labs® web page to create an account.

Figure 5. Login Window

After 'Log In', Simplicity Studio™ will download all needed additional packages.

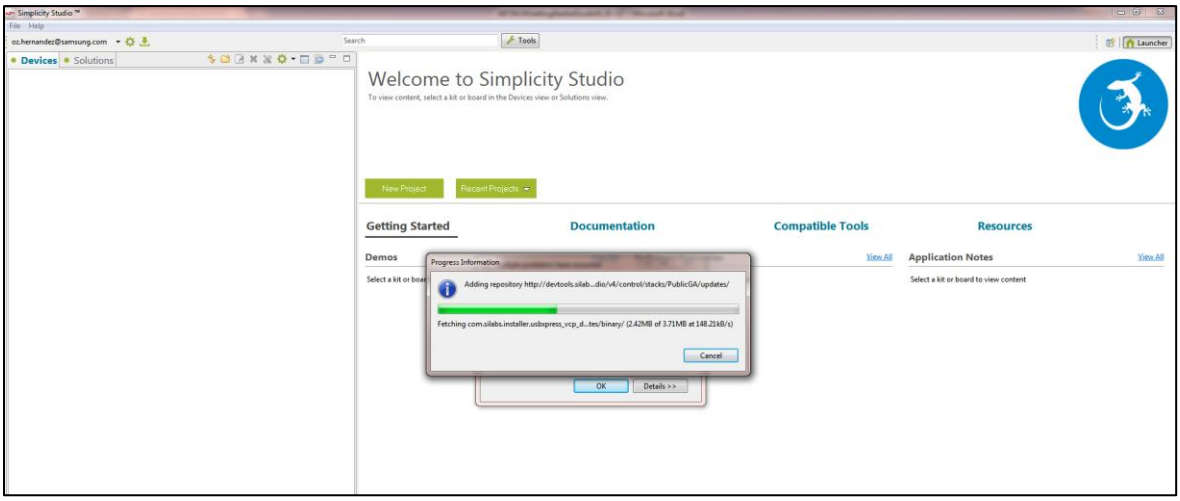


Figure 4. Checking for software updates in Simplicity Studio™ 4.0

Once all additional packages are installed, Simplicity Studio™ will check for connected hardware. If you have not connected your ARTIK 020 Main Board, you are prompted to do so now. Also accept any step asking to install drivers.

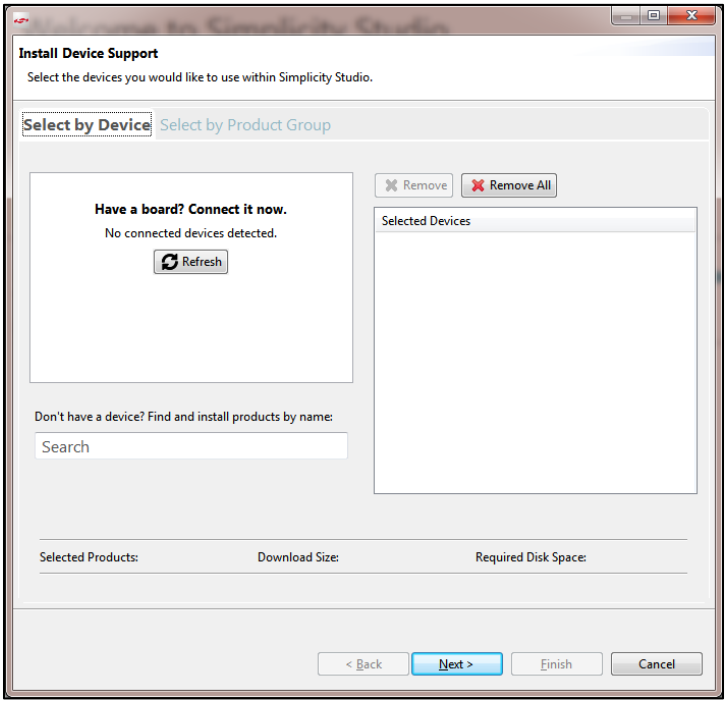


Figure 6. Connect ARTIK 020 Main Board

MANUAL SELECTION OF ADDITIONAL PACKAGES

If your board is not automatically detected you can also manually select additional packages going to the 'Select by Product Group' tab select 'Wireless' and keep the options selected by default than click 'Finish', see *Figure 7*.

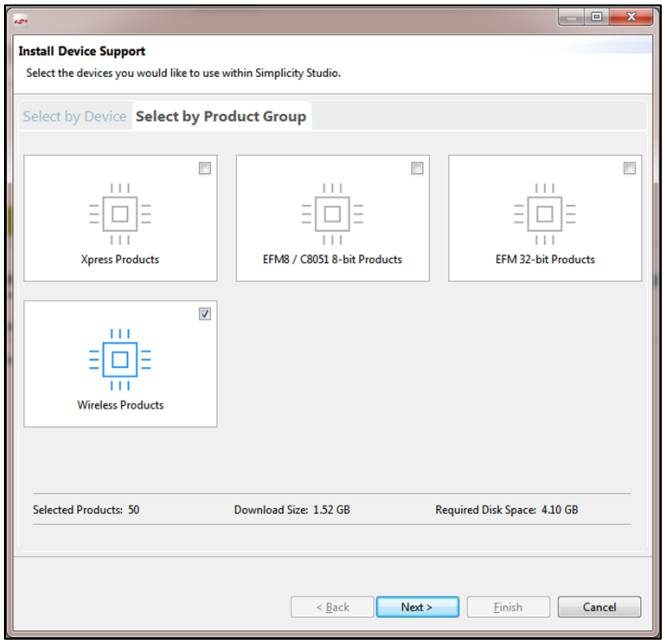


Figure 7. 'Select by Product Group' tab

When selected, Simplicity Studio™ will install additional software packages related to your connected evaluation boards, as shown in *Figure 8*. This procedure can take some time, during which the green progress indicator may appear stationary. However, the update steps above the progress bar are continuously refreshed.

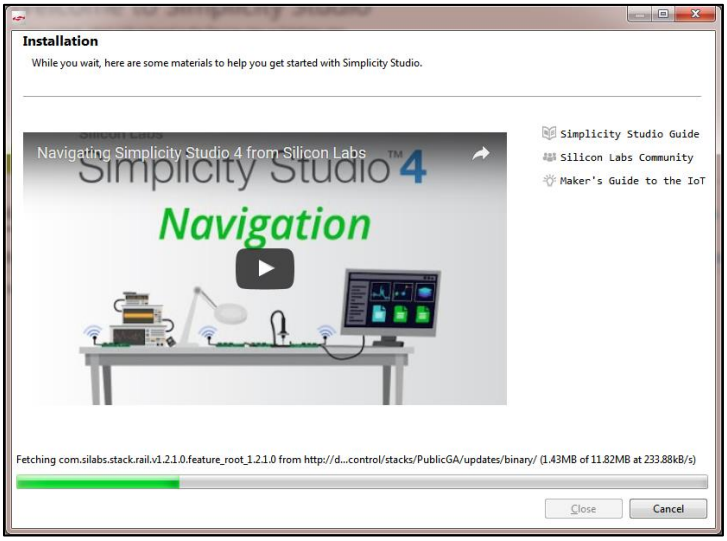


Figure 8. Installing Additional Packages for Wireless

After the update cycle is complete, restart Simplicity Studio™ see *Figure 9*.

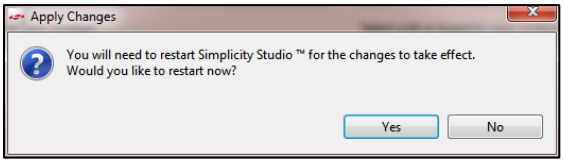


Figure 9. Restart Simplicity Studio™

Once restart is complete, a menu of setup tasks is displayed. Now you should be able to see your boards in the Devices section as shown in *Figure 10*.

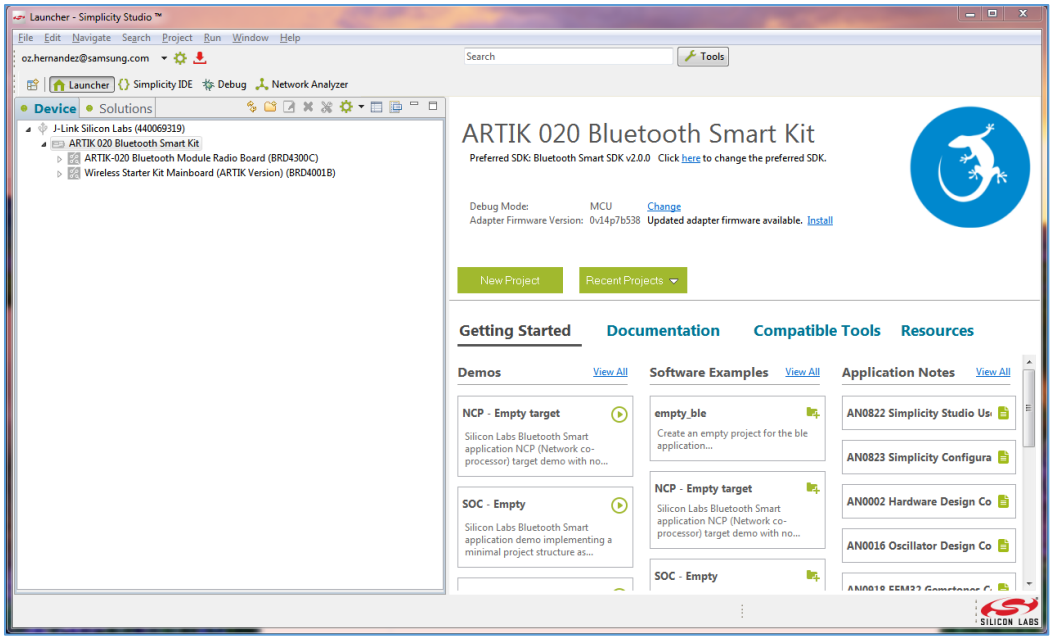
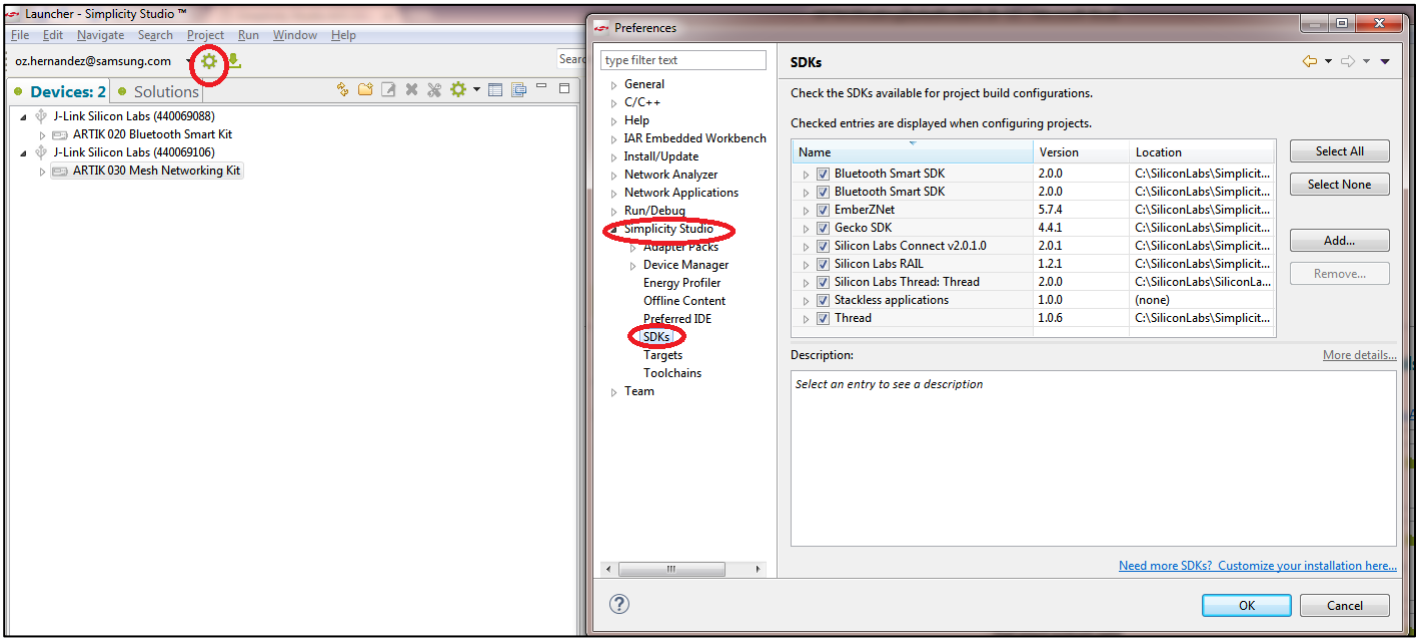
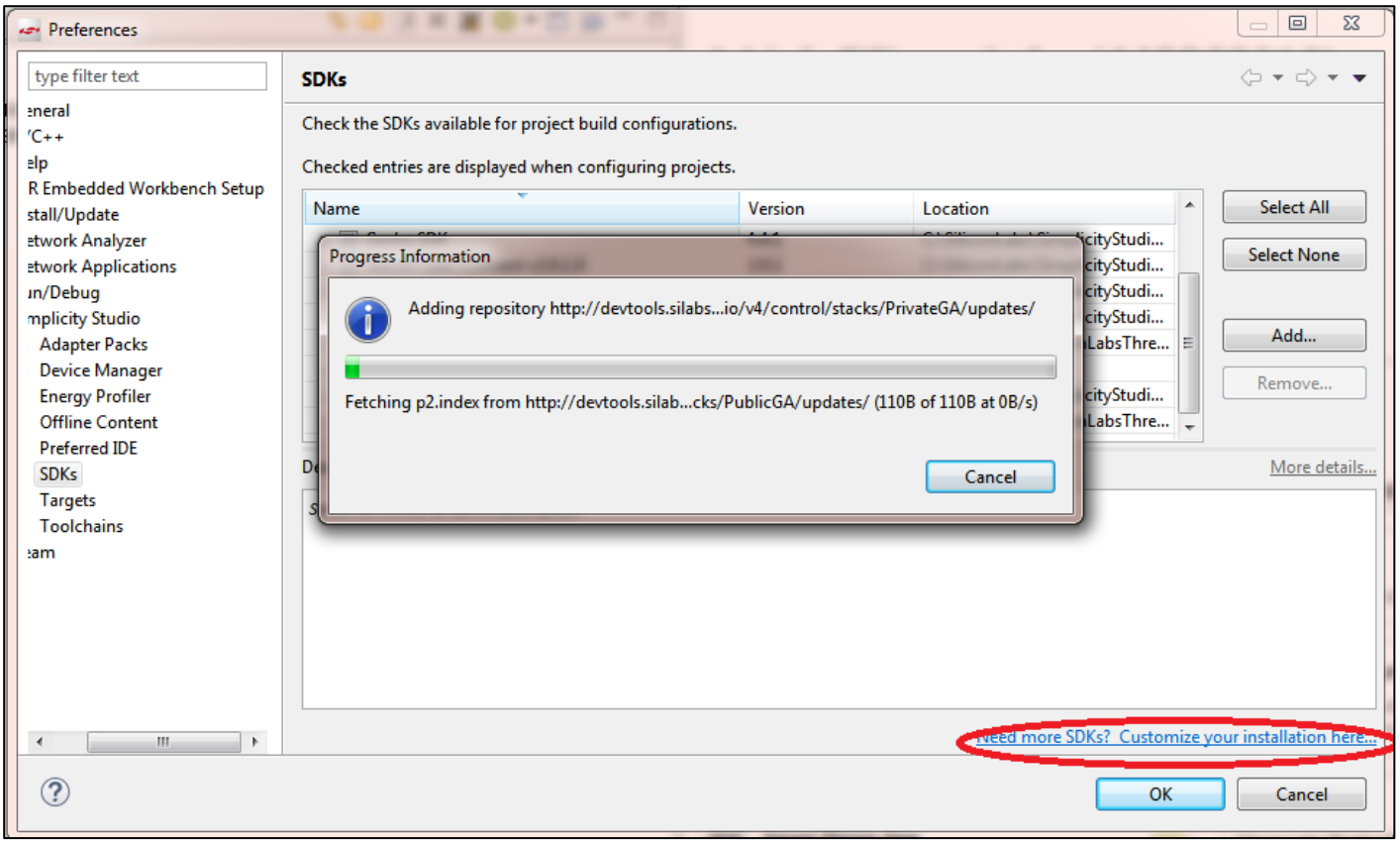


Figure 10. Simplicity Studio™ Launcher Panel

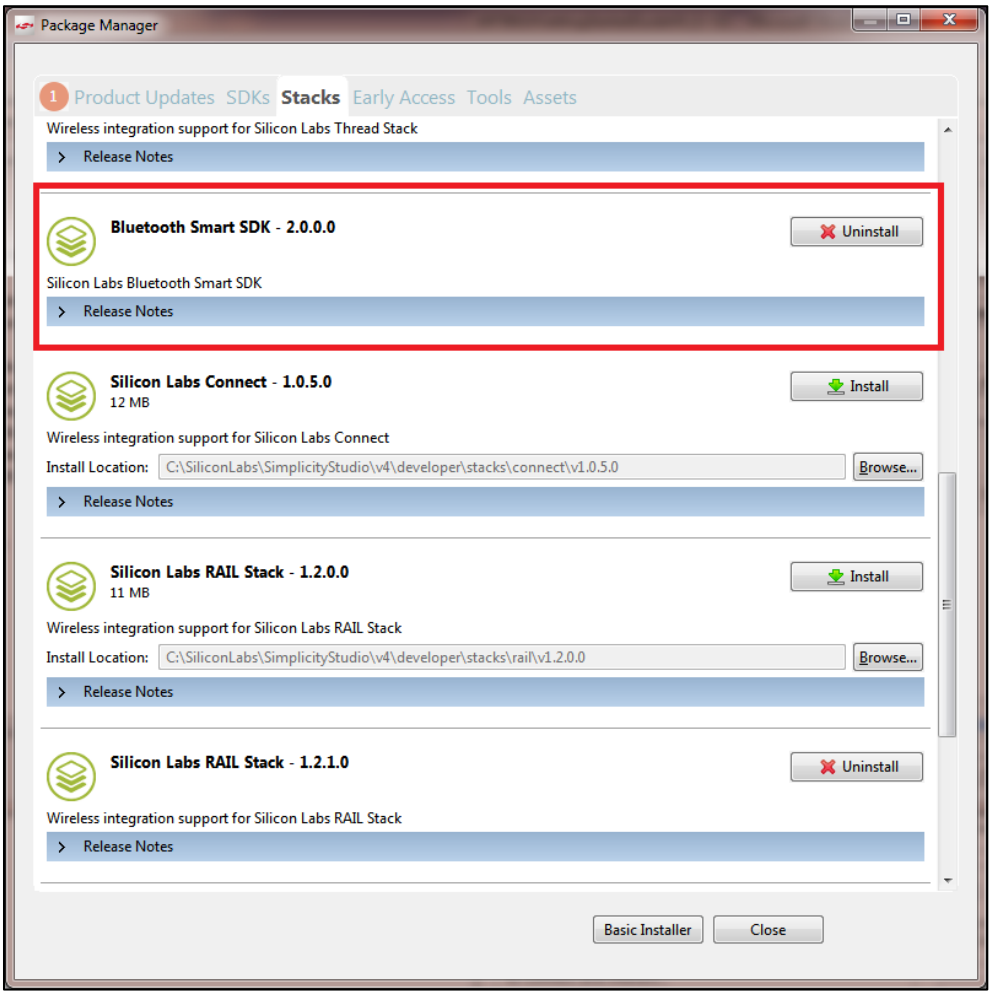
To make sure that the Bluetooth® Smart SDK is installed properly go to 'Setting' → 'Simplicity Studio'→ SDKs.



If the Bluetooth Smart SDK is not already installed you need to manually download and install it. Just click in the link below in the SDK configuration options as shown below



A few seconds after the previous screen you will see this window, just switch to the 'stacks' tab and then look for the stack shown below and click in the 'Install' button



INSTALLING THE IAR EMBEDDED WORKBENCH FOR ARM

You need to install the IAR Embedded workbench for ARM® version 7.30 see *Figure 11*. All Wireless SDK's require this specific compiler version that is available on the Silicon Labs® Wireless Software download page *https://siliconlabs.force.com/home/home.jsp*. You can get a 30 day free evaluation license.

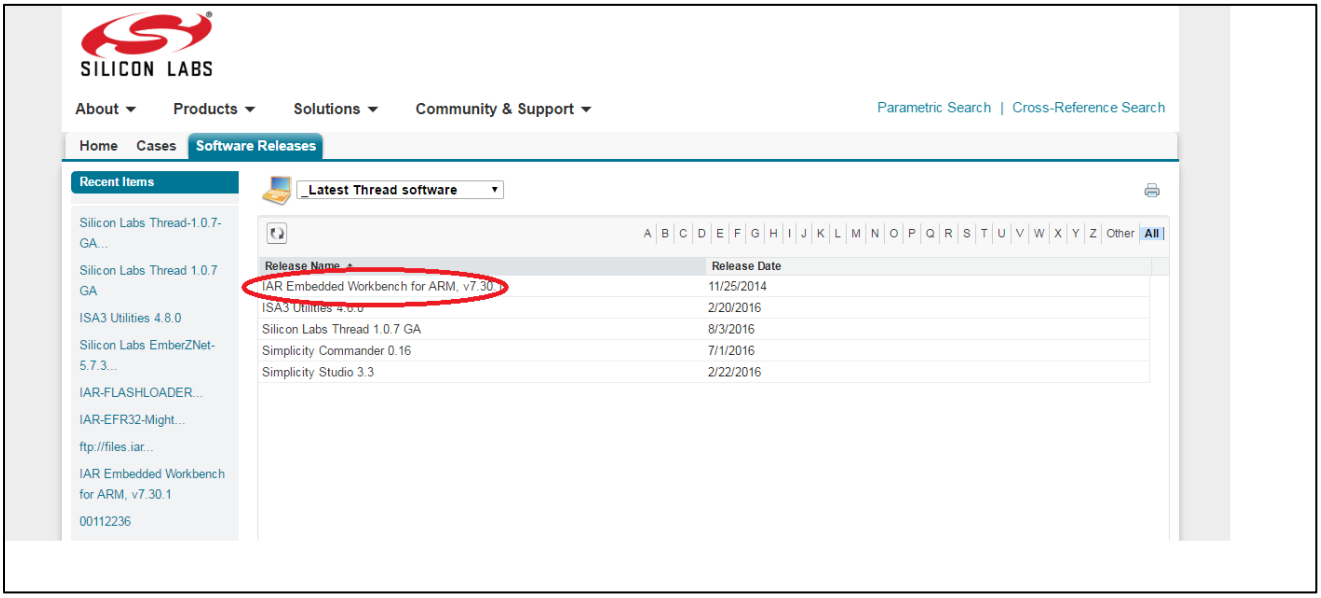


Figure 11. IAR Embedded Workbench for ARM Installation

Click on 'IAR Embedded Workbench for ARM v7.30' and scroll down to the bottom of the new window. Click on the 'EWARM .exe' file to go to the download page.

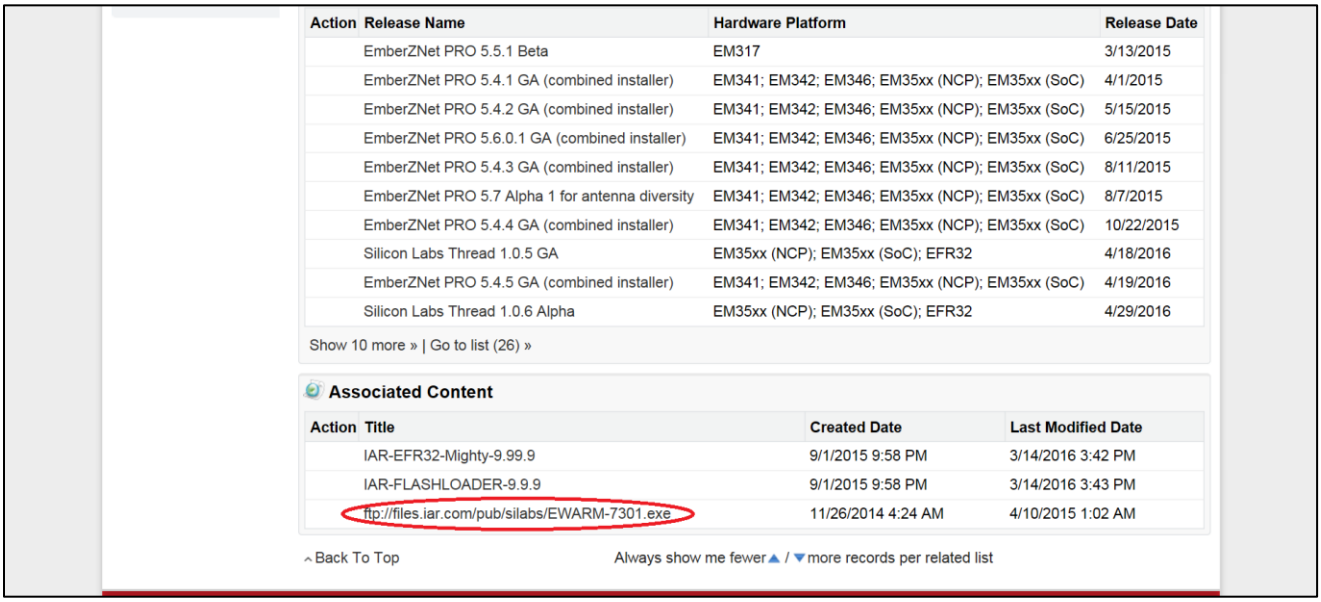


Figure 12. IAR Embedded Workbench for ARM Download Page 2

Click on 'Open' to start the download and execute the .exe file.

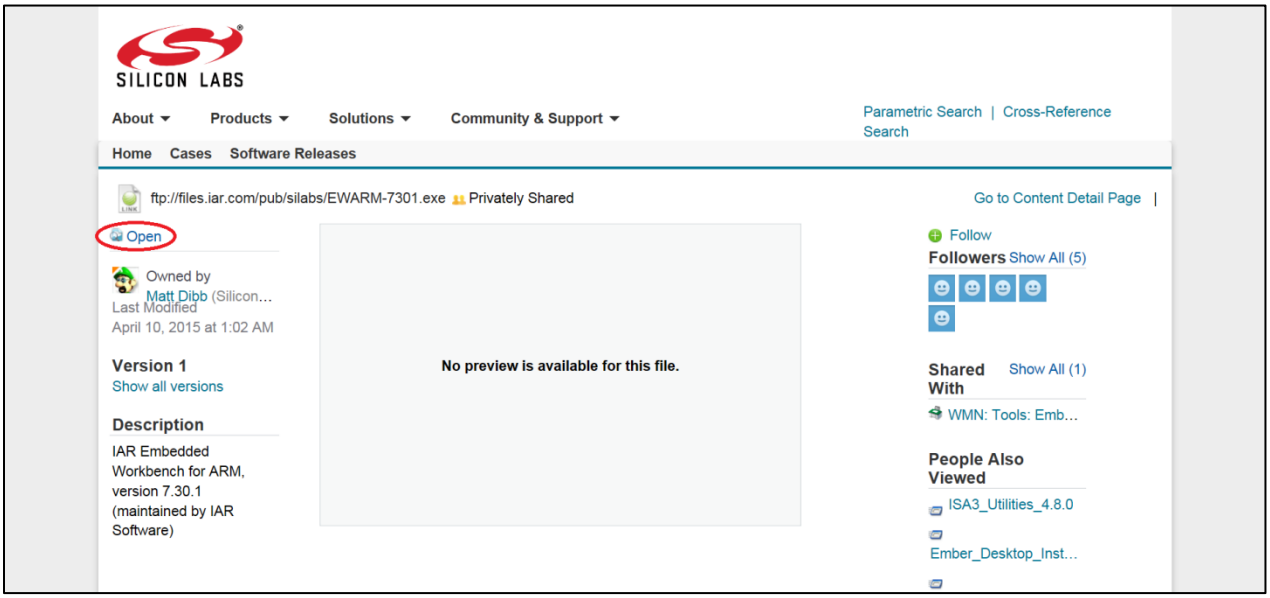
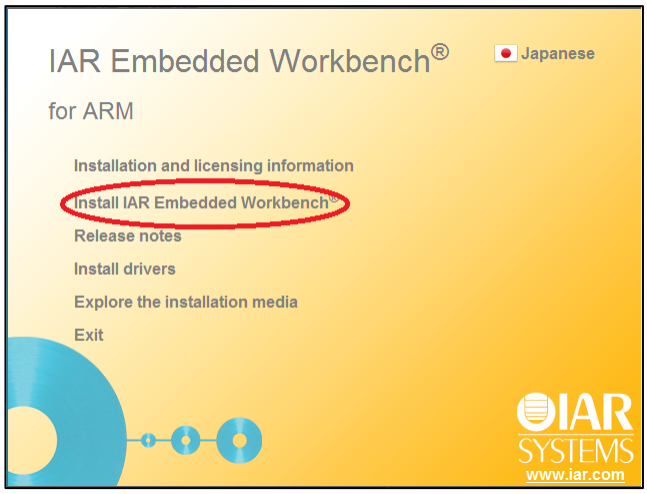
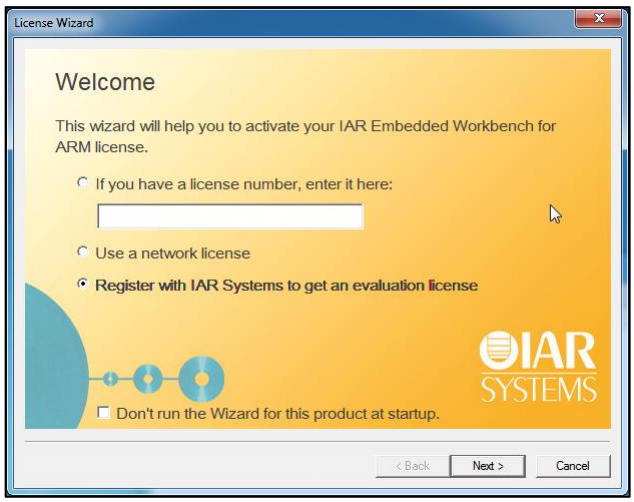


Figure 13. IAR Embedded Workbench for ARM Download Page 3

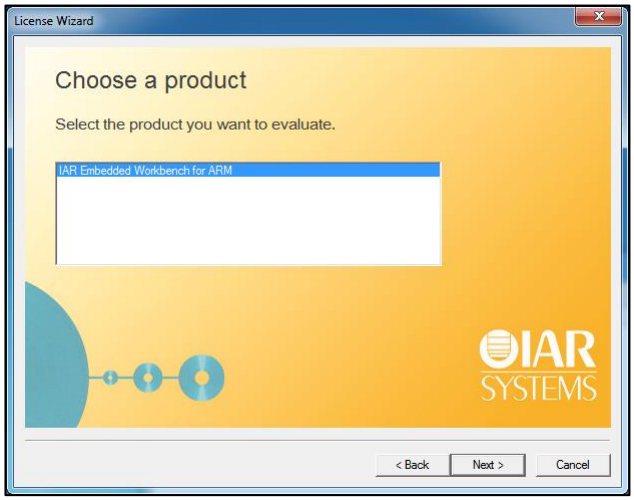
Click 'Install' to start the installation. Make sure 'Install a new instance of this application.' is checked. Click 'Next' to continue. If asked, do not install the dongle drivers. Click 'Finish' when done.

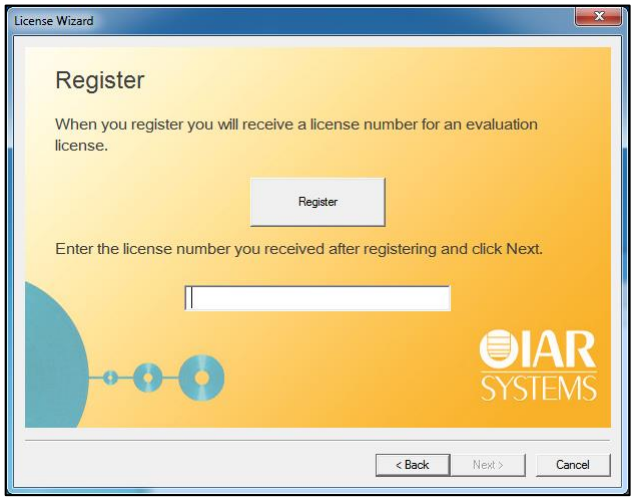
Now apply for a 30 day evaluation license. From the 'Start' menu, find and execute 'IAR License Manager'. Check 'Register with IAR systems to get an evaluation license'. Click 'Next' to continue.



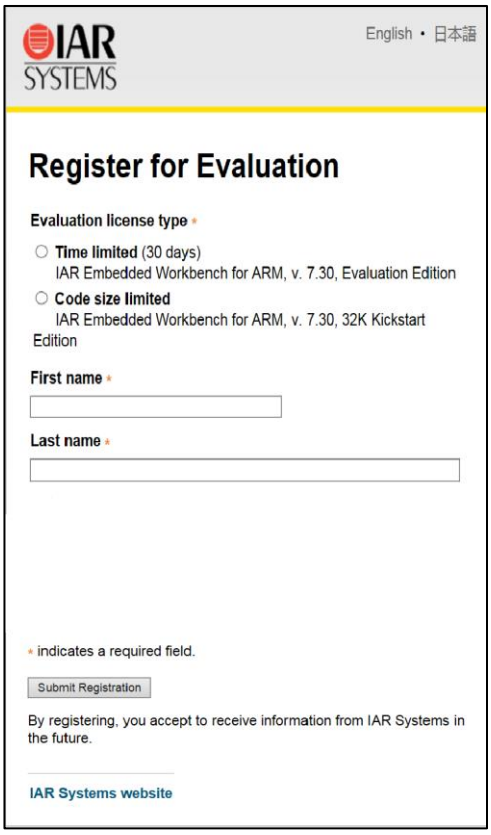


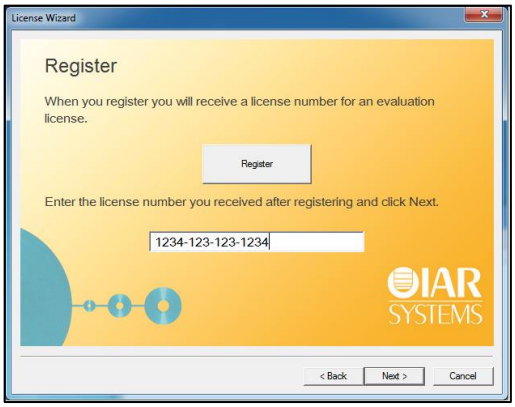
Select the 'IAR Embedded Workbench for ARM' product and click 'Next' to continue. Click 'Register' to go to the Silicon Labs® registration web page.





Select the 'Time limited (30 days)' license. Fill out the form and click 'Submit Registration' at the bottom of the form. A conformation e-mail will be sent to the supplied e-mail address. Follow the link in the e-mail to complete your registration. The link in your registration competition e-mail will complete your registration and display your registration number. Copy/Paste your license number from the competition webpage to the IAR License Manager. Click 'Next' to continue. Confirm the license details and click 'Next' again. When your license has been activated, click 'Done'.





EXAMPLE APPLICATION

INTRODUCTION

When working with example applications in Simplicity Studio™ 4.0, you will typically execute the following steps:

- Select an example application.
- Generate application files.
- Compile and flash the application to the ARTIK 020 Radio Board.
- Execute the application.

The following sections will show how to build and execute the Smart Phone application.

SMART PHONE APPLICATION

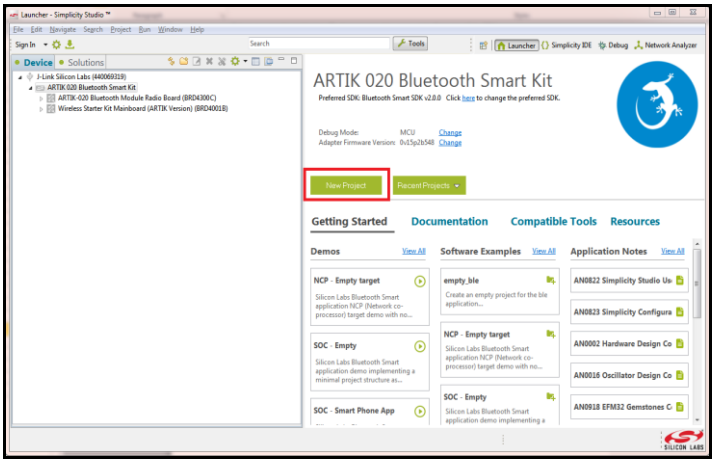
The prerequisites when building and executing the application are:

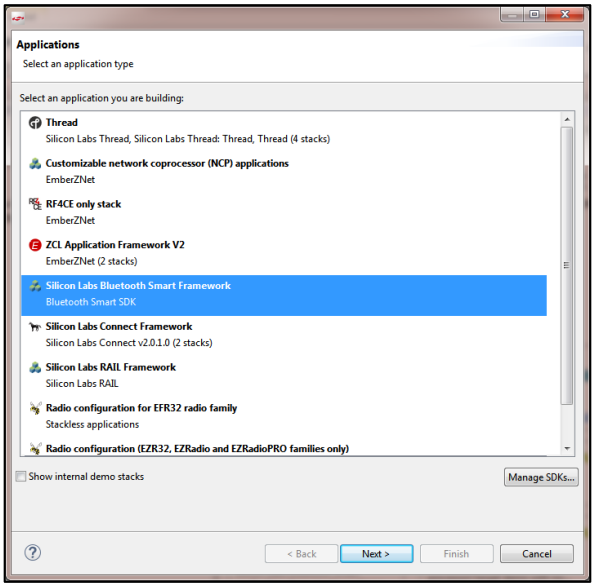
- Simplicity Studio™ version 4.0.
- Bluetooth Smart SDK v2.0.0.
- IAR EWARM installed.
- One ARTIK 020 Main Board with one ARTIK 020 Radio Board.

CREATING THE PROJECT

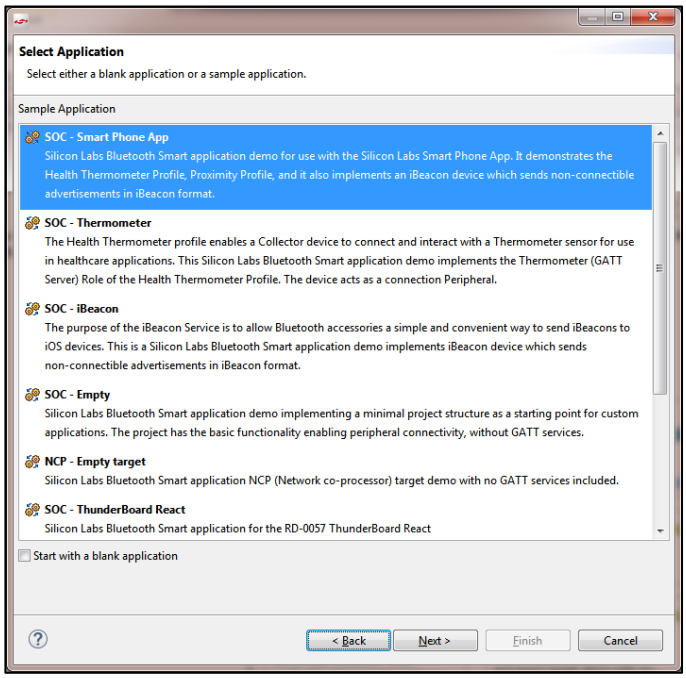
Launch Simplicity Studio™ 4.0:

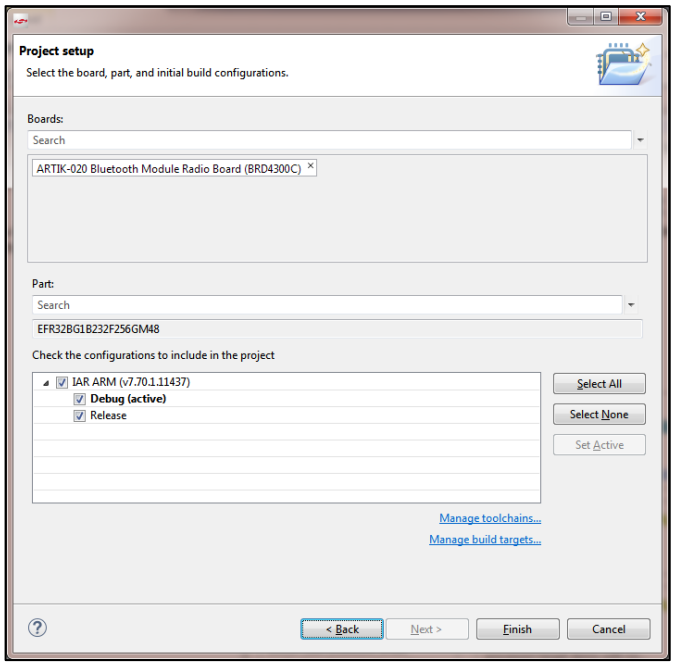
- Make sure you have one fully populated ARTIK 020 Main Board and connect it to your Windows Laptop using the mini-usb cable.
- In Simplicity Studio™ 4 home page, select 'New Project', then select the 'Bluetooth Smart SDK v2.0.0' stack and click 'Next'.



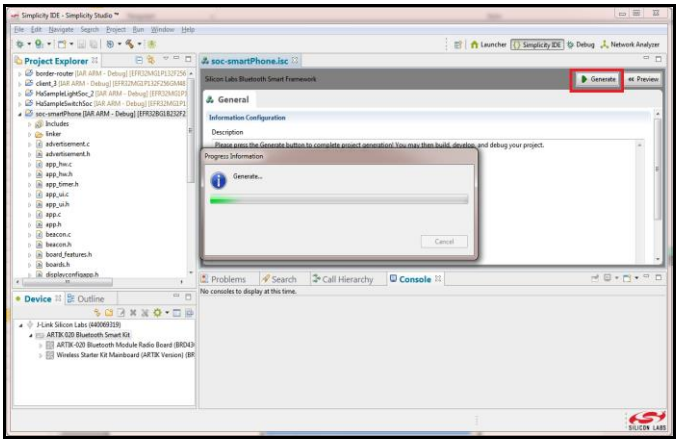


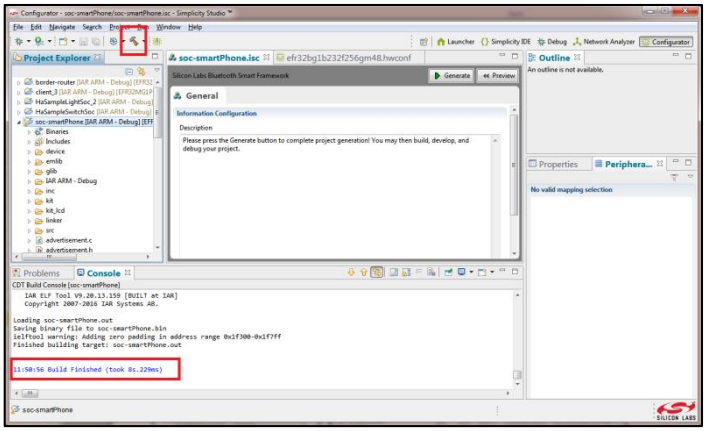
- Select 'SOC Smartphone Application' Project and click 'Next'. Then follow all the steps with default options until you see 'Finish' as shown below.





- Make sure you see the ARTIK 020 Radio Board and then click 'Finish'.
- Now click 'Generate' to create the project source files as shown on the left below.



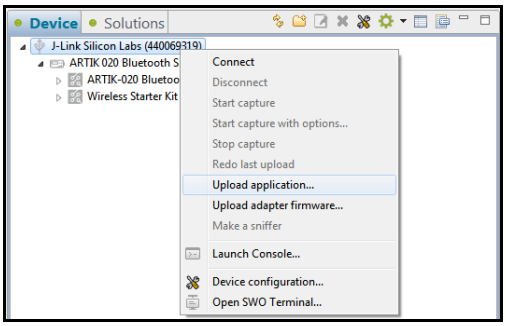


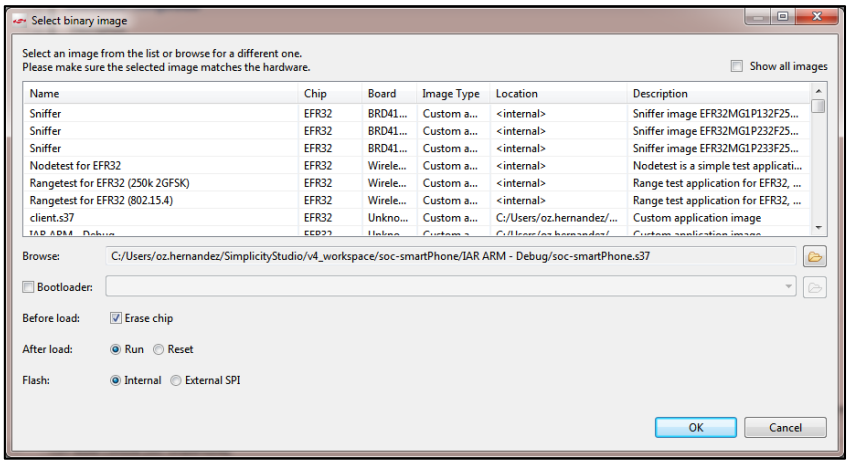
- Back in Simplicity Studio™ IDE, click the build icon and wait until the build process finishes see above.

Loading the Application

Once the application is built, we need to load the application onto the ARTIK 020 Main Board. We do this as follows:

- In the 'Devices Window' select one ARTIK 020 Main Board instance and right click, 'Upload application...'.
- Make sure to load the correct '.s37' file for the Smart Phone project you just built in the previous step. Browse to the folder with your compiled application. The standard location is at : 'C:\Users\<user_name>\SimplicityStudio\v4_workspace\soc-smartPhone\IAR ARM - Debug\soc-smartPhone.s37'. Replace '<user_name>' with your user name.





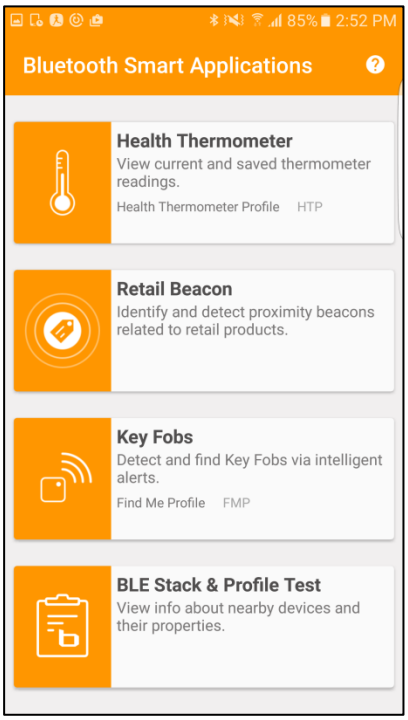
- Make sure that 'Before load: Erase chip' is checked.

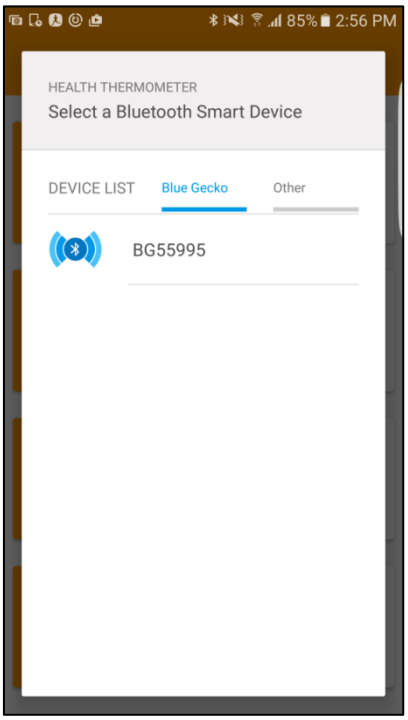
Testing the Application

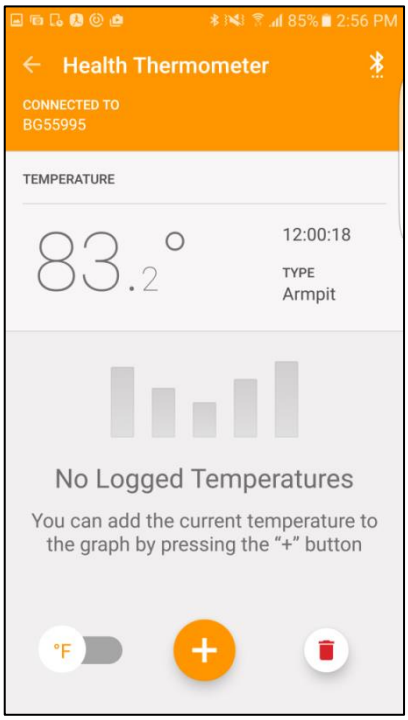
Once the application binary is loaded onto the ARTIK 020 Module we can start creating a BLE connection. A smartphone should already have the BLE application installed. To get a copy of the iOS™ or Android application just go to the App store or Google Play and search for 'Silicon Labs Blue Gecko' or 'ARTIK Node communicator'. Both applications provide exactly the same functionality. Install the application and open it.

Health Thermometer

On the left below you see the ARTIK Node communicator application's main screen. The 'SoC Smartphone' project we flashed onto the ARTIK 020 Module supports all the three demos: health thermometer, Retail beacon and Key Fob.



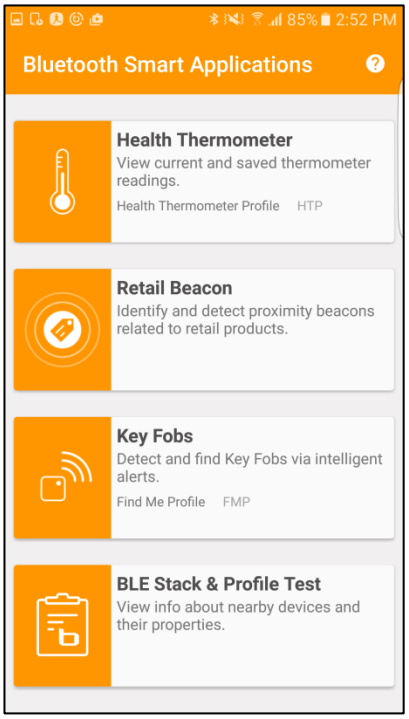


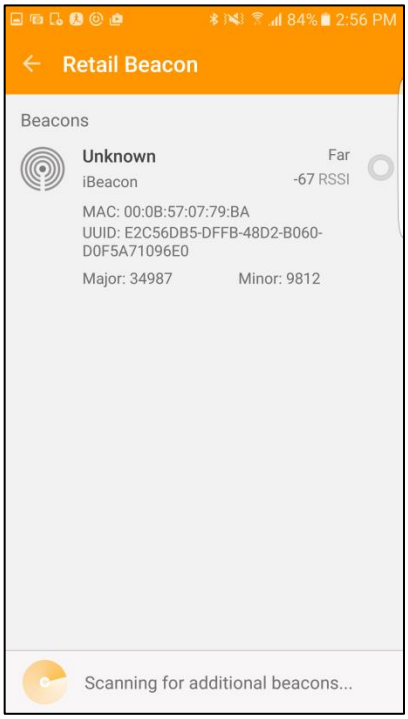


Go to the Health Thermometer option and select your ARTIK 020 Module Device Name displayed on the ARTIK 020 Main Board's LCD display. The 'Health Thermometer' screen becomes visible reporting temperature readings from the temperature sensor on the ARTIK 020 Main Board.

RETAIL BEACON

Go back to the main screen and click on the 'Retail Beacon' option as shown on the left.

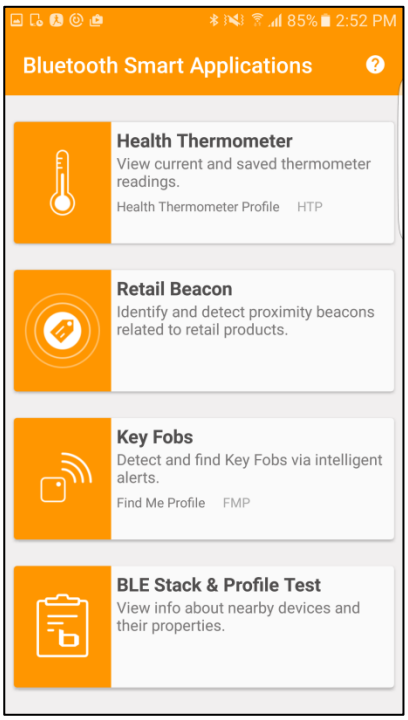


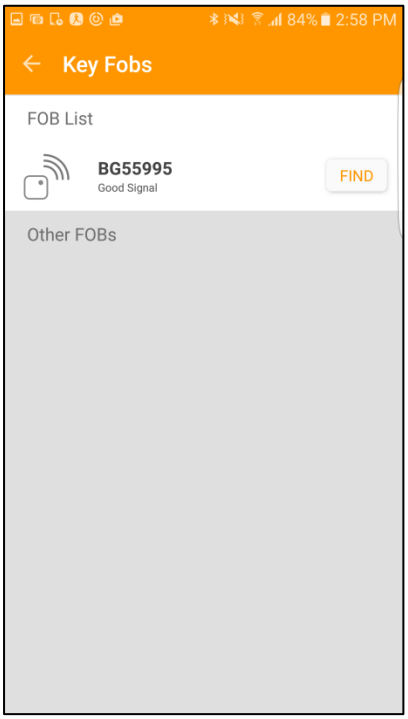


In this example the ARTIK 020 Module is running a non-connectable iBeacon demo that broadcasts advertisements in iBeacon format.

KEY FOBS

Finally, go back to the main screen and open the 'Key Fobs' option, see left screenshot. In this case, the ARTIK 020 Module is running the Proximity profile and is simulating a Key Fobs device. Once you click on the 'Find' button, the middle screenshot, the right screenshot opens and LED0 and 1 on the ARTIK 020 Main Board should start blinking.





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