CC3100 SimpleLink™ Wi-Fi® and IoT Solution Getting Started Guide

User's Guide

Literature Number: SWRU375
June 2014

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CC3100 SimpleLink™ Wi-Fi® and IoT Solution Getting Started Guide

ABSTRACT

This guide is intended to assist users in the initial setup and demonstration of the *Getting Started with WLAN Station* application. The guide explains how to install an Integrated Development Environment (IDE), and then compile, download and debug *Getting Started with WLAN Station*.

1 Introduction

1.1 Prerequisites

The user should have the following items:

- One CC3100BOOST
- One CC31XXEMUBOOST or MSP430F5529 Launchpad
- An 802.11b/g/n Wireless Access Point (AP)
- A computer running Microsoft® Windows® 7 or XP operating systems.

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2 Getting Started

2.1 Download and Install Software

Download and install the following software:

- CC3100 SDK package http://www.ti.com/tool/cc3100sdk
  - This guide assumes the use of the default installation folder *C:\TI\CC3100SDK*.

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3 Getting Started with SimpleLink Studio

3.1 Configure Boards

1. The jumpers on the CC3100BOOST should be connected as shown in Figure 1.

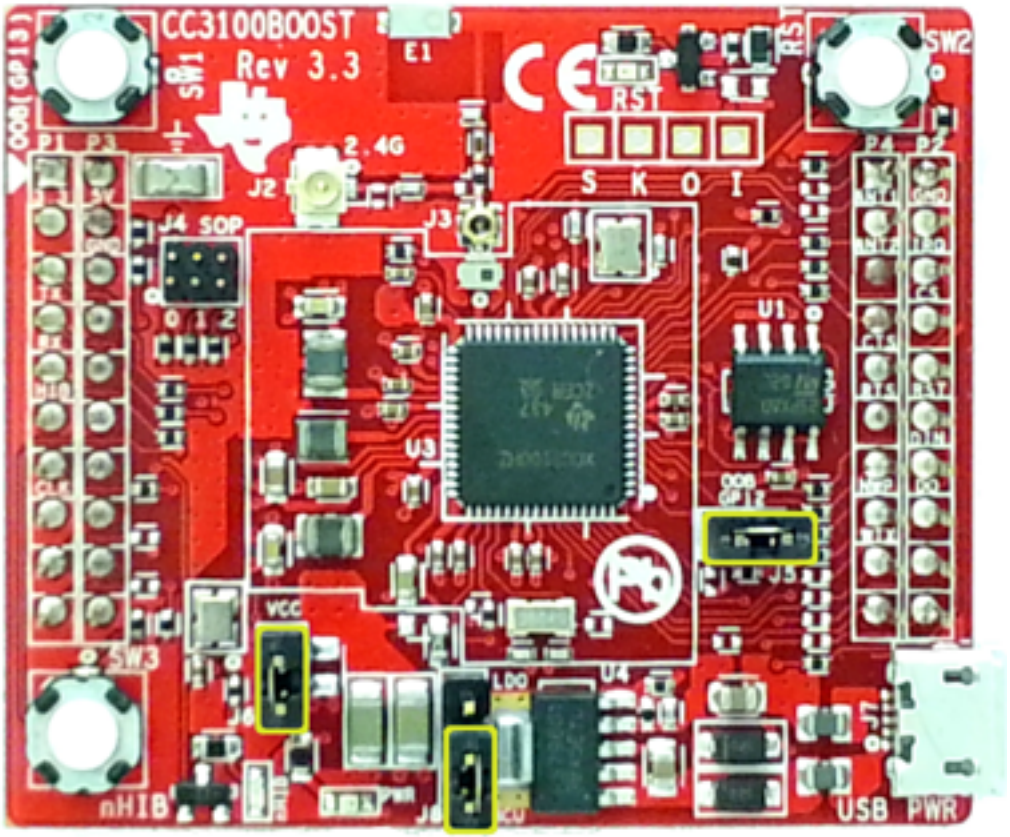

Figure 1. CC3100BOOST

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2. The jumpers on the CC31XXEMUBOOST should be connected as shown in Figure 2.

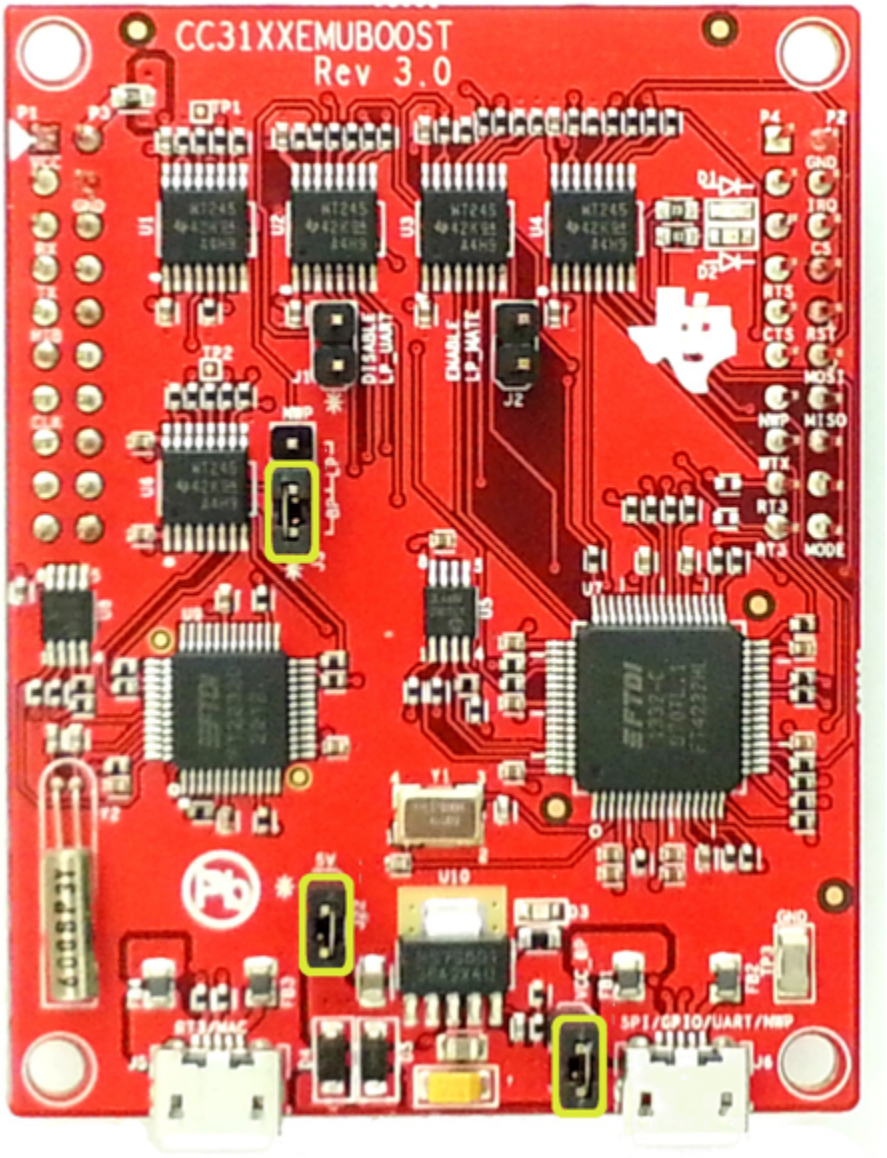

Figure 2. CC31XXEMUBOOST

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3. Connect the CC3100BOOST to the CC31XXEMUBOOST as shown in Figure 3.

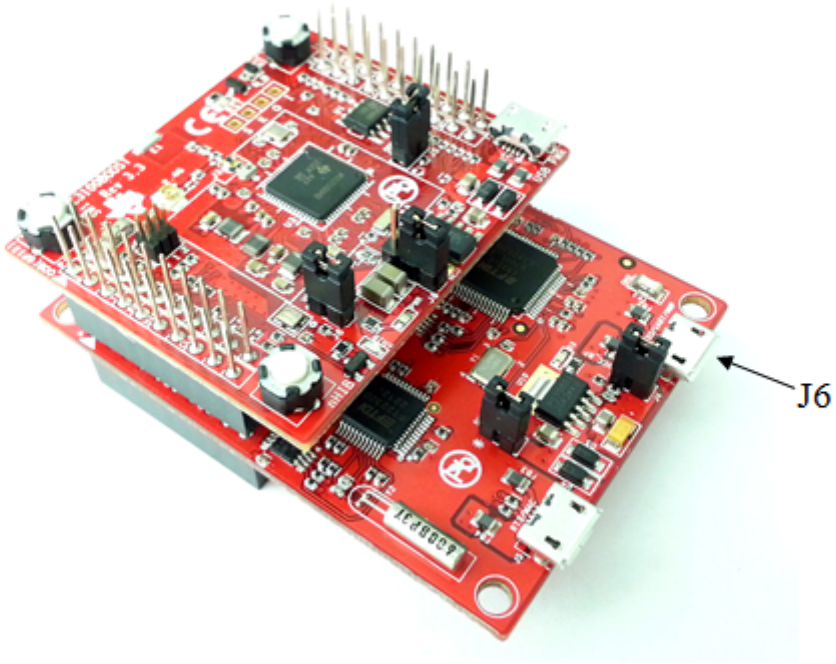

Figure 3. Connect the CC3100BOOST to the CC31XXEMUBOOST

3.2 Install USB Driver

1. Connect the J6 port CC31XXEMUBOOST to the PC using the provided micro-USB cable.
2. Open Windows Device Manager by selecting *Start Menu>Control Panel>Device Manager*. The CC3100BOOST will appear as four instances of “CC3100-BOOST” under the category *Other Devices* as shown in Figure 4. For all of these instances, the driver software will need to be updated.

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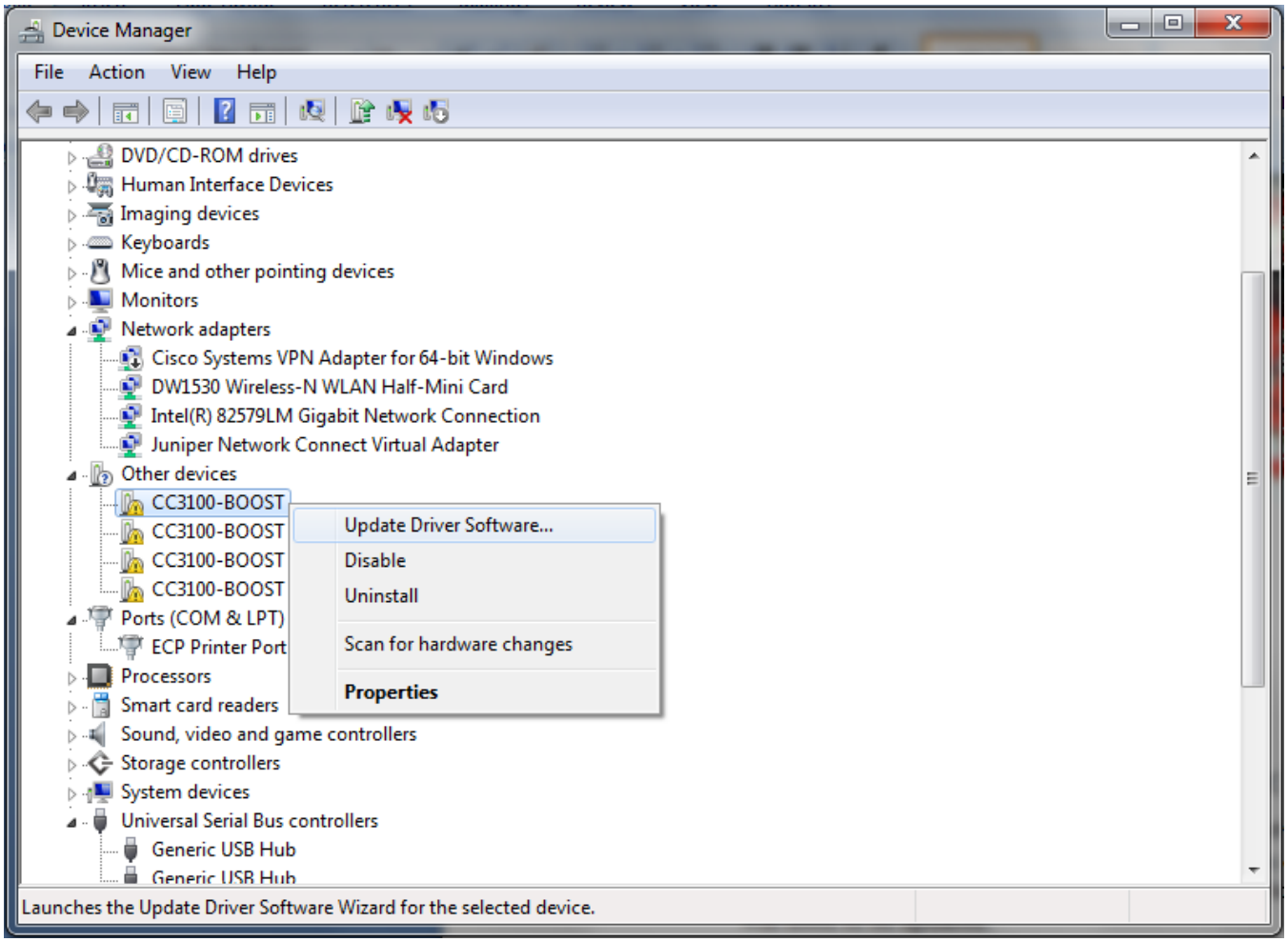

Figure 4. Device Manager

3. Right click on the first instance of “CC3100-BOOST” and select “Update Driver Software…”
4. Select “Browse my computer for driver software”.

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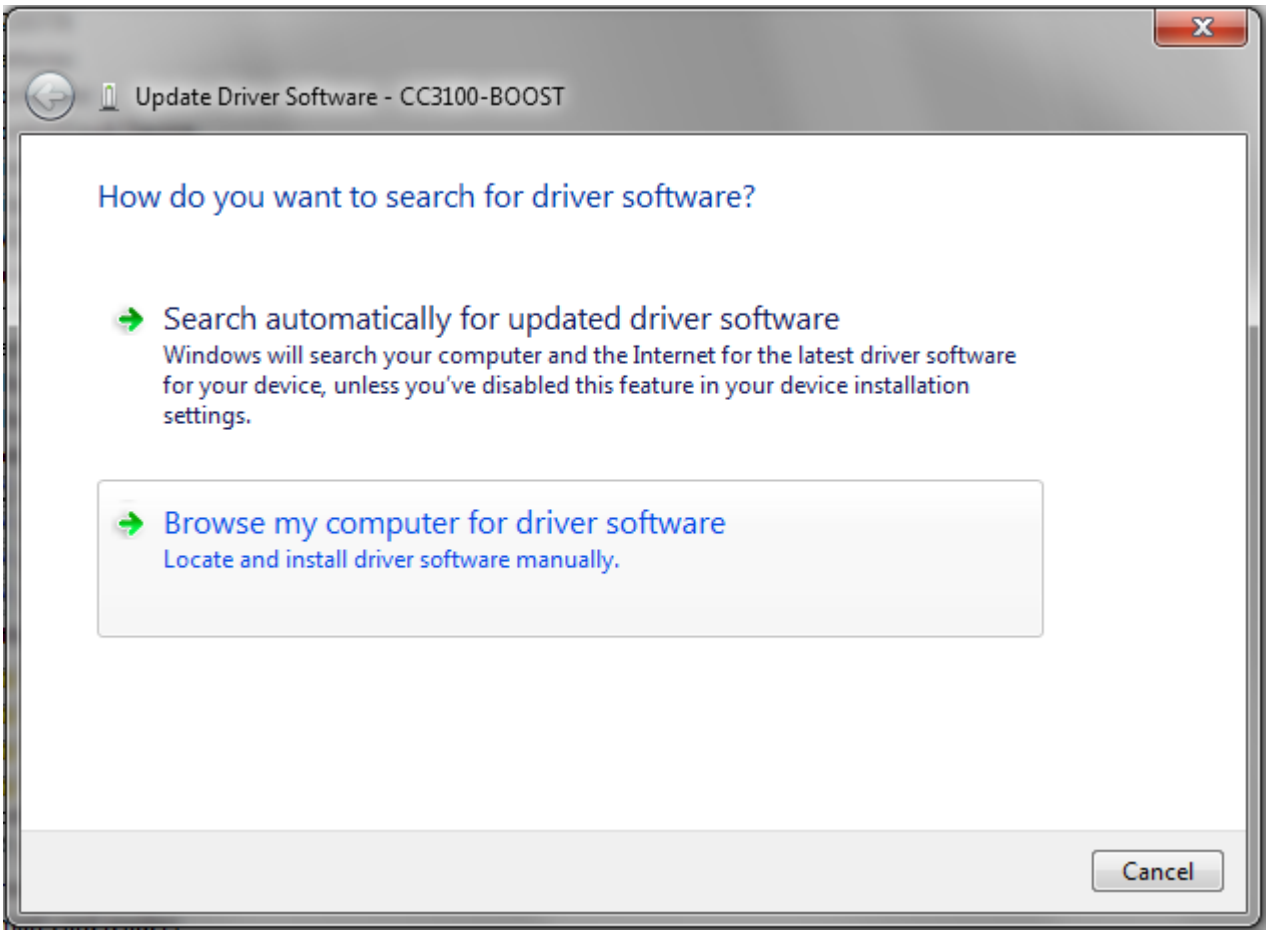

Figure 5. Update Driver Software

5. Fill the search path as *C:\TI\CC3100SDK\cc3100-sdk\tools\cc31xx_board_drivers*, and press Next. There is no need to restart the PC.

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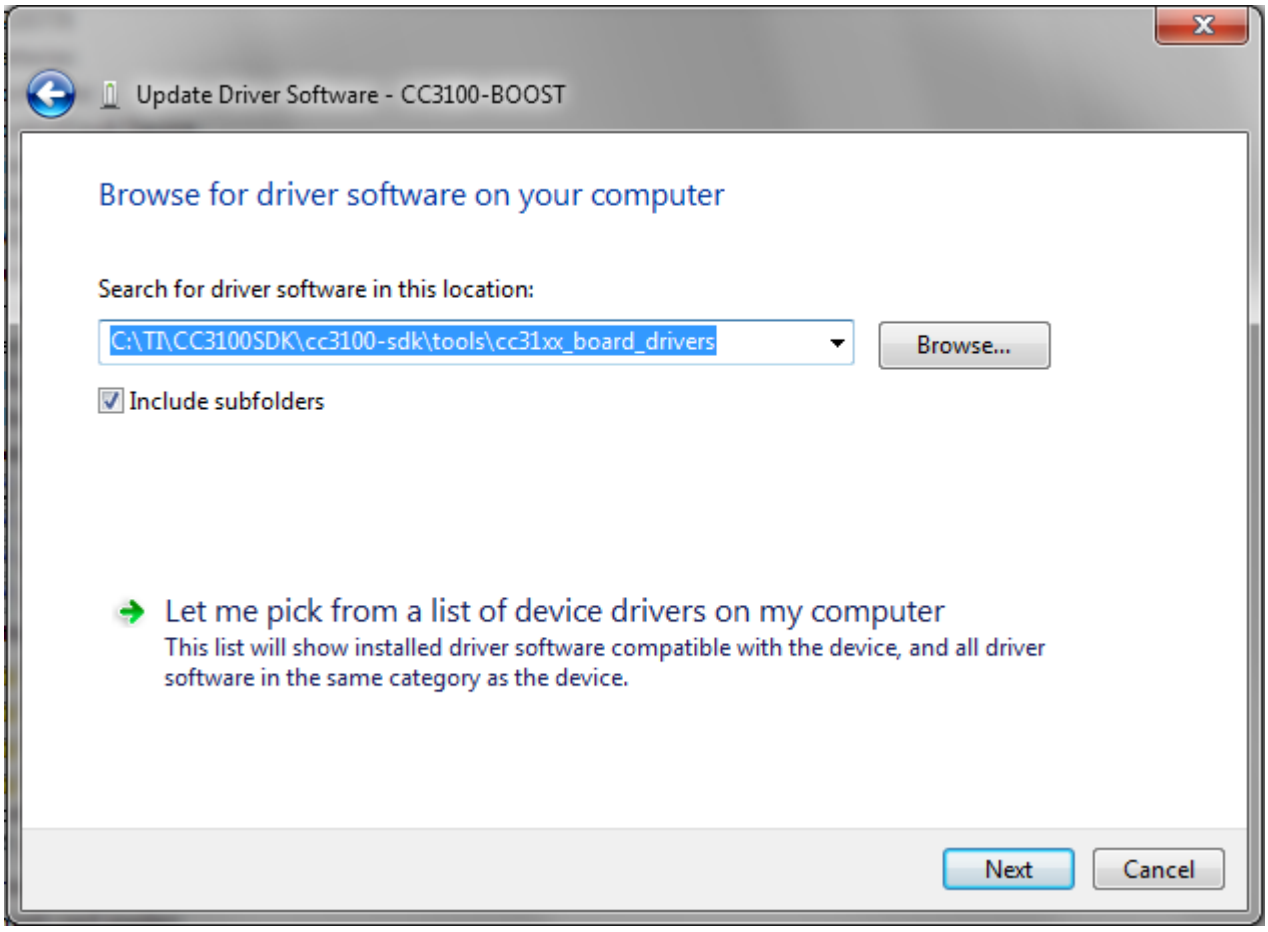

Figure 6. Update Driver Software

6. Repeat the three steps above for each of the three other instances of “CC3100-BOOST.”
7. Repeat the same steps for the four instances of “USB Serial Port” that should have appeared as shown in Figure 7.

Figure 7. USB Serial Port

8. The CC3100BOOST will now be visible in the Device Manager as shown in Figure 8. The user may see two COM ports instead of four.

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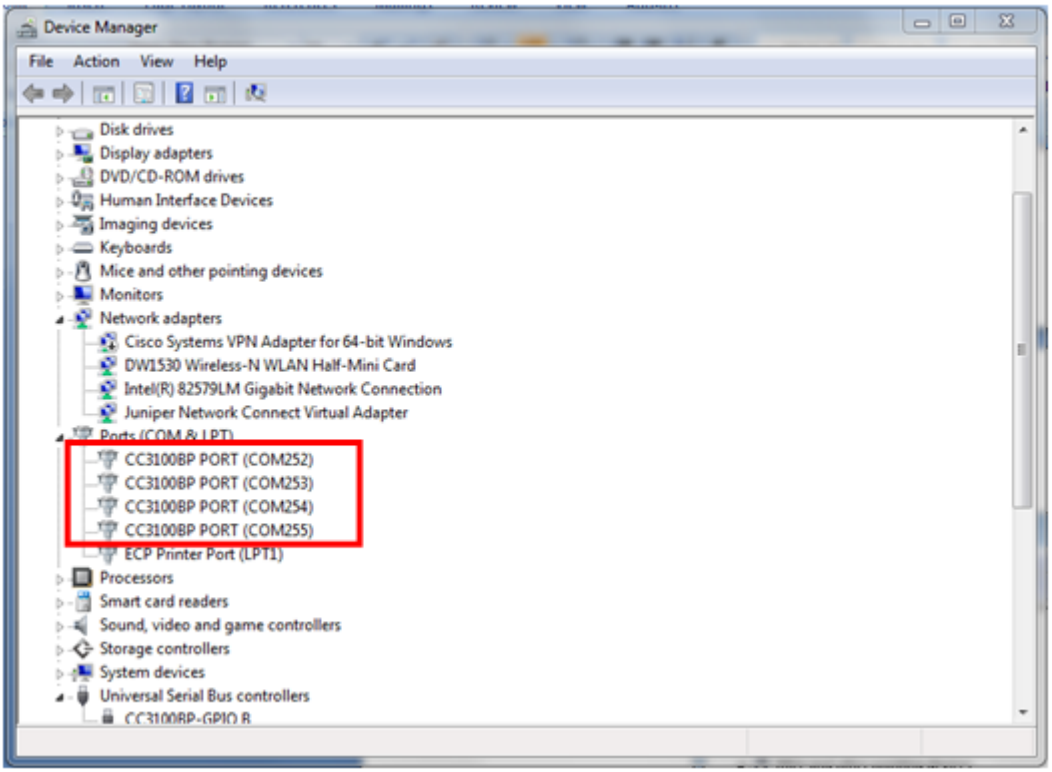

Figure 8. Device Manager

3.3 Run the Software

The *Getting Started with WLAN Station* example uses SimpleLink Studio. This example performs the following functions:

1. Prompts the user for the SSID of an AP to connect to.
2. Prompts the user for the security type.
3. Prompts the user for the password to the AP.
4. Attempts to acquire an IP address through DHCP.
5. Attempts to reach the internet.

Option 1. Microsoft Visual Studio:

1. Download and install Microsoft Visual Studio Express (2010 or later) from http://www.microsoft.com/en-us/download/details.aspx?id=40787.
2. Open Microsoft Visual Studio Express, and select *File>Open>Project/Solution*.
3. Navigate to *C:\TI\CC3100SDK\cc3100-sdk\platform\simplelinkstudio\example_project_vs\getting_started_with_station*, and open *getting_started.sln*. Update the project file if using a Visual Studio version later than 2010.
4. Select *Build>Build Solution* from the menu.
5. When building is complete, select *Debug>Start Debugging* from the menu.

Option 2. Eclipse:

1. Download and install the latest version of Java: https://www.java.com/en/download/.
2. Download and Extract Eclipse from http://www.eclipse.org/downloads/. Choose the Eclipse IDE for C/C++ Developers package.

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3. Download and install MinGW from http://sourceforge.net/projects/mingw/files/latest/download?source=files. During installation, make sure you have the following configurations selected:

   (a) Set the installation location as *C:\MinGW*.

   (b) In the MinGW Installation Screen, select packages for **mingw32-base** and **mingw32-gcc-g++** as shown in Figure 9.

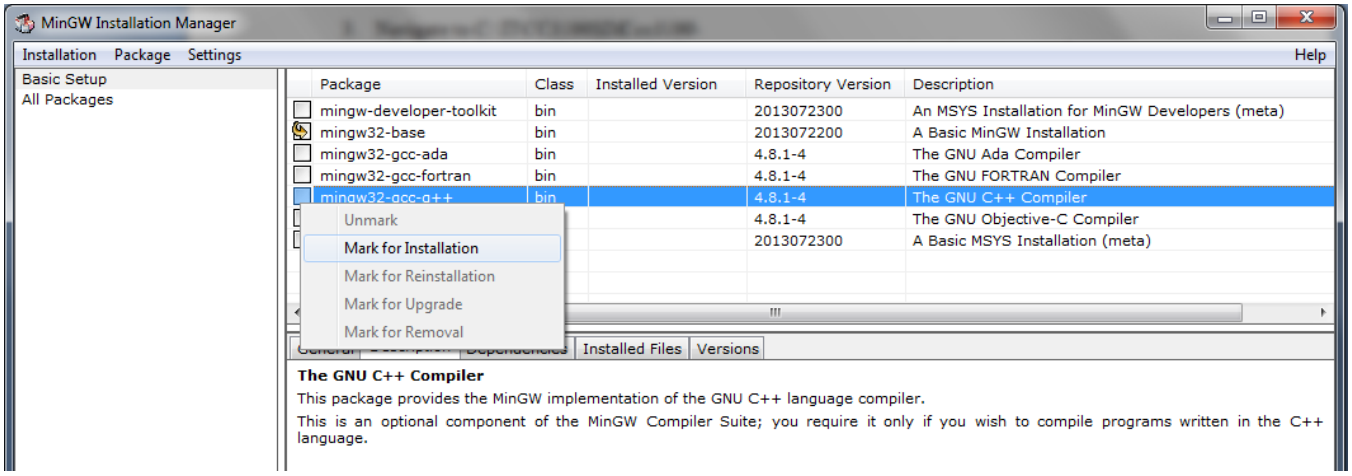

Figure 9. MinGW Installation Screen

   (c) After selecting the packages, choose *Installation>Apply Changes* from the menu, then press Apply.

   (d) Select *Installation>Quit* from the menu to quit the installer.

4. After a successful MinGW installation, add its path (*c:\MinGW\bin*) to the Windows environment variable path by going into *Control Panel>System>Advanced System Settings>Environment Variables*. Under *System Variables*, select PATH and press Edit. Append ";C:\MinGW\bin\" to the end of the line and press Ok.
5. Open Eclipse by running *eclipse.exe* from the extracted Eclipse folder.
6. In the "Select a workspace," choose your desired workspace directory (for example: *C:\Users\myself\Desktop\eclipse_workspace*). This directory should be different from the user's other versions of Eclipse.
7. From the menu select *File>New>Makefile Project with Existing Code*.
8. Enter 'Getting_started' as the project name.
9. For Existing Code Location, enter *C:\TI\CC3100SDK\cc3100-sdk\platform\simplelinkstudio\example_project_eclipse\getting_started_with_station*.
10. For Toolchain for Indexer Settings, choose "MinGW GCC" as shown in Figure 10.

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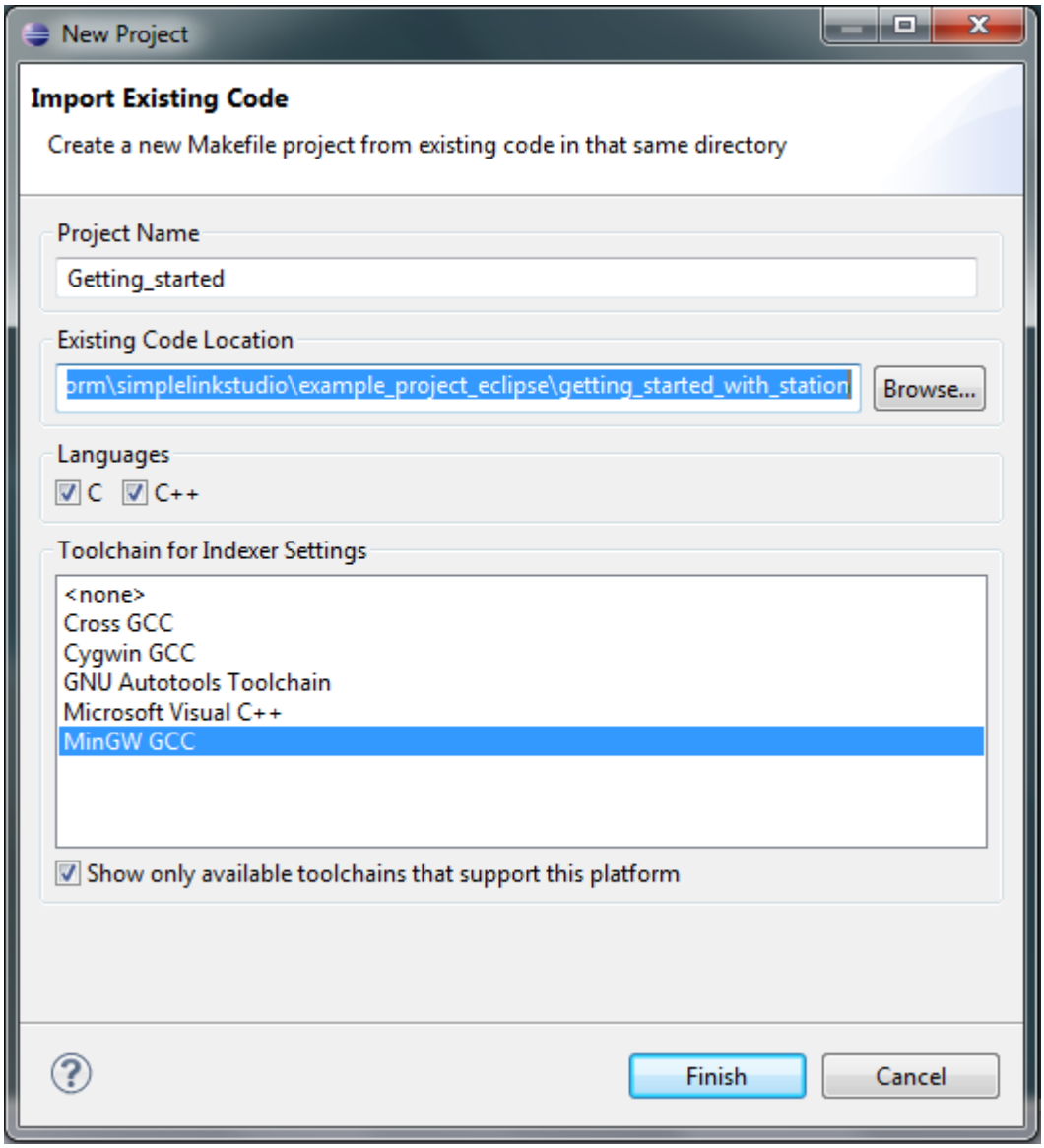

Figure 10. Import Existing Code

11. Press Finish.
12. Select *Window>Show View>Project Explorer* from the menu.
13. Select the Getting_started project in the Project Explorer, and select *File>Properties* from the menu.
14. In the Project Explorer window, right click on <*Project_Folder_Name*>, then select Property.
15. Click the **C/C++ Build** menu and do the following:
    (a) Uncheck **Use the default build command**.
    (b) Type *mingw32-make -f Makefile* in **Build command**.
    (c) Uncheck **Generate Makefiles automatically**.
    (d) Set the Build Directory as: *${workspace_loc:/Getting_started}*
16. Expand the **C/C++ Build** menu, and select **Tool Chain Editor**. Under **Current Builder**, Select "Gnu Make Builder", then click Apply.
17. Select **Environment** in the **C/C++ Build** menu. Make sure the value of MSYS_HOME is empty, then click Apply.

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18. Click the **C/C++ General** menu, and select **Paths and Symbols**. Under the **Includes** tab, in the Languages column, select **GNU C**. Press the Add button to add the directory: *C:\TI\CC3100SDK\cc3100-sdk\simplelink\include*.

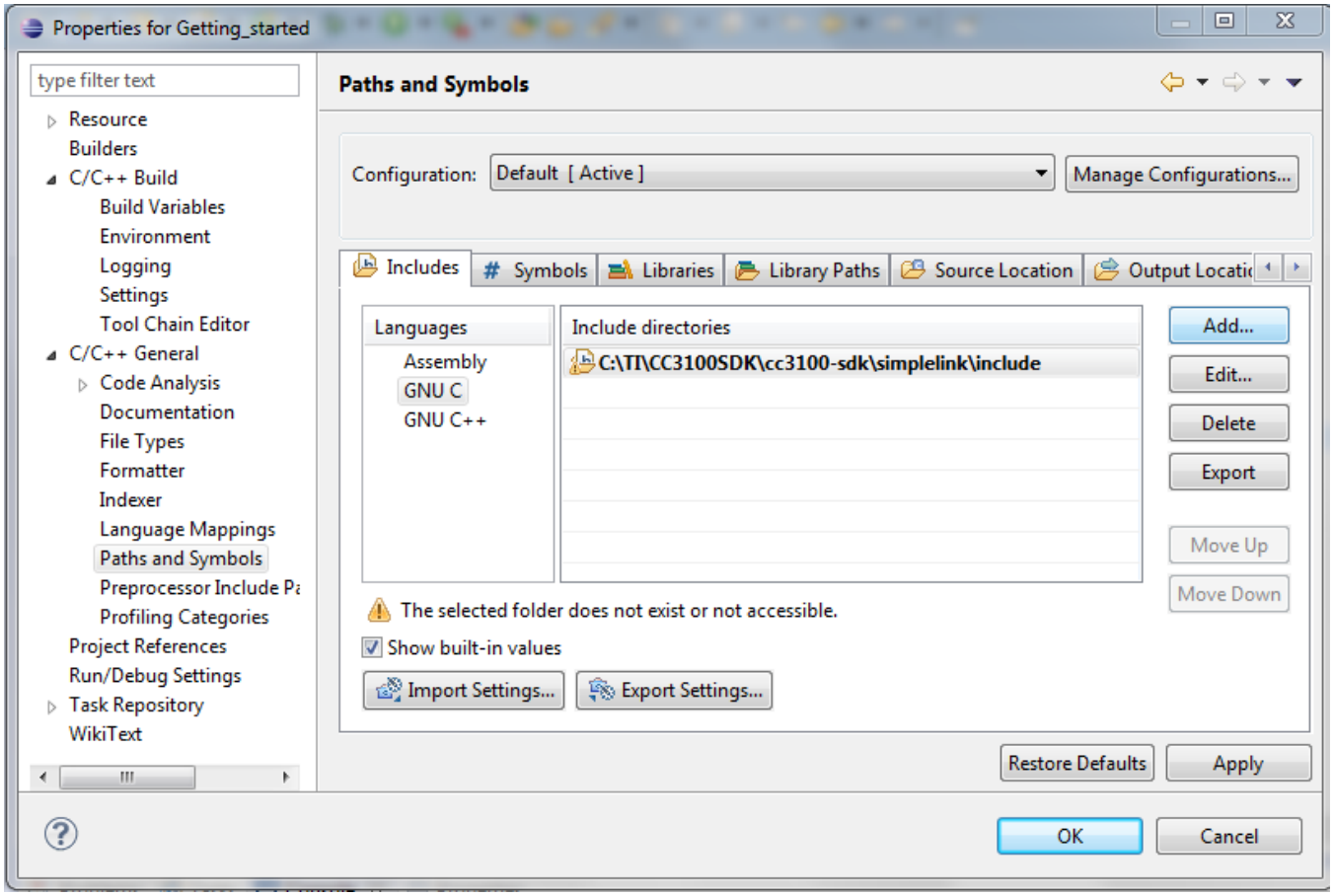

Figure 11. Paths and Symbols

19. Press OK.
20. To fix a known bug in Eclipse console output, add the following line of code to the beginning of the main function:

```
setvbuf(stdout, NULL, _IONBF, 0);
```

21. Save the file, and select *Project>Clean* from the menu.
22. Select the Getting_started project and press OK.
23. Select the Getting_started project from Project Explorer, and from the menu select *Project>Build Project*.
24. Press Ctrl+F11 to start the program.

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4 Getting Started with the MSP430F5529

4.1 Configure Boards

1. The jumpers on the CC3100BOOST should be connected as shown in Figure 12.

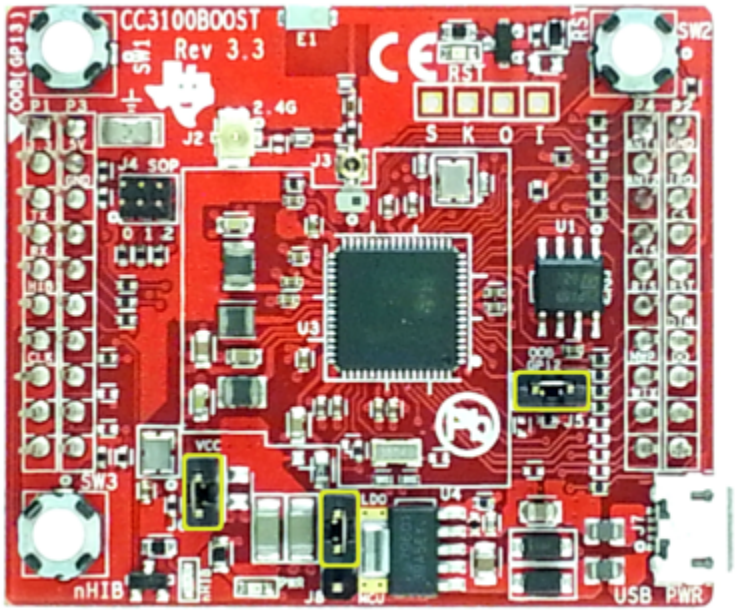

Figure 12. CC3100BOOST

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2. The jumpers on the MSP430F5529 Launchpad should be connected as shown in Figure 13.

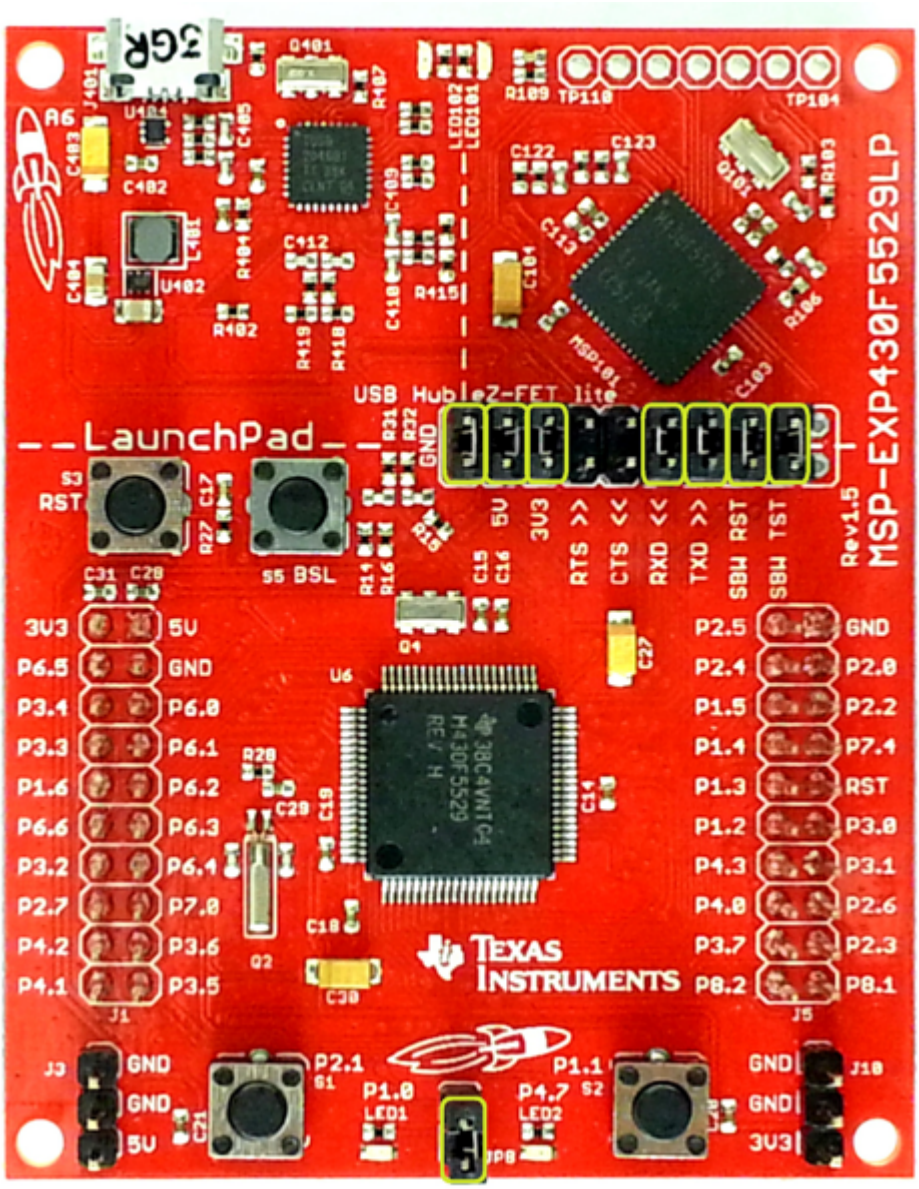

Figure 13. Jumpers on the MSP430F5529 Launchpad

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3. Connect the CC3100BOOST to the MSP430F5529 Launchpad as shown in Figure 14.

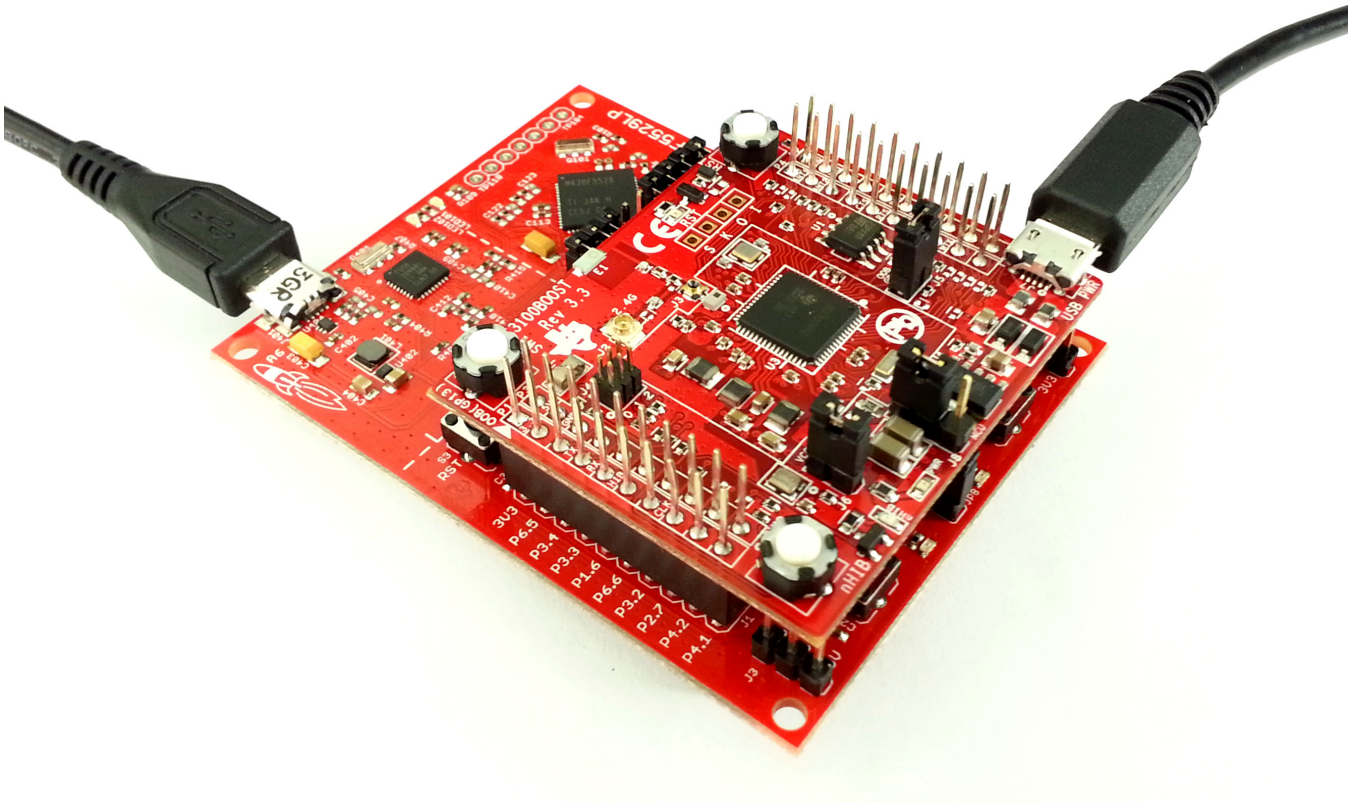

Figure 14. Connect the CC3100BOOST to the MSP430F5529 Launchpad

4. Connect a Micro-USB cable from J7 on the Boosterpack to the Windows PC, and connect a Micro-USB cable from J401 on the MSP430F5529 Launchpad to the Windows PC.

4.2 Run the Software

Option 1. Code Composer Studio (CCS):

1. Download and run the Code Composer Studio 6.0 (CCS) installation wizard (*ccs_setup_win32.exe*) from the TI website or from the CCS Wiki page. Must be **Version 6.0.0.00190** or later. When prompted to select processor support, select the '*MSP Ultra Low Power MCUs*' processor support option. The remaining options for the installer should be left as the default. Installation may take up to an hour.
2. Open CCS, and choose *File>Import* from the menu. Under C/C++, choose **CCS Projects**.
3. Under *Select Search Directory*, enter the path: *C:\TI\CC3100SDK\cc3100-sdk\platform\msp430f5529lp*.
4. Check the project *getting_started_with_wlan_station* and press Finish.

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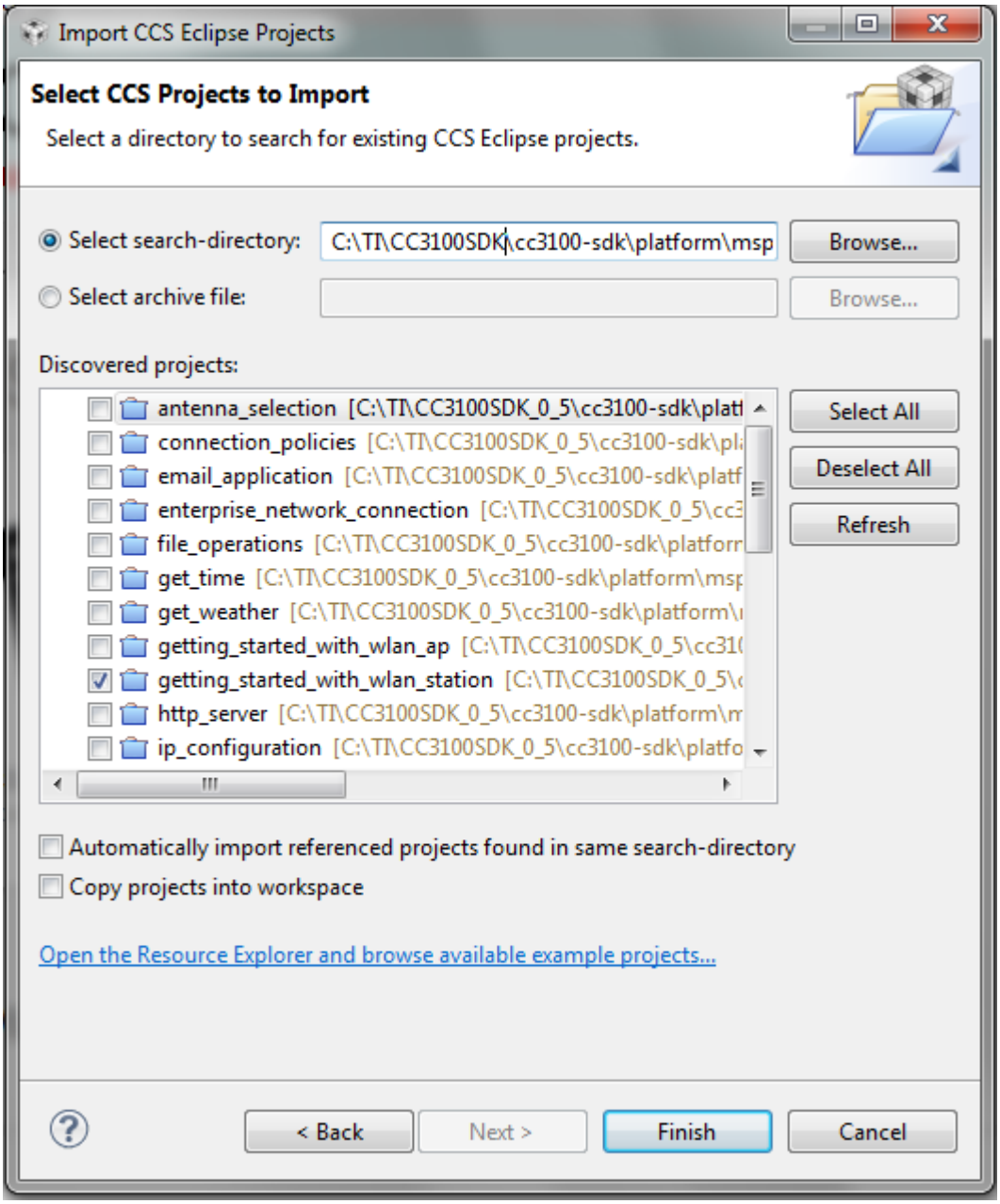

Figure 15. Select CCS Projects to Import

5. Open the *main.c* file of the *getting_started_with_wlan project* for editing (*C:\TI\CC3100SDK\cc3100-sdk\examples\getting_started_with_wlan_station\main.c*).
6. Edit *main.c* to use the SSID, security type and security key of the Access Point being used. Edit the macros SSID_NAME, SEC_TYPE and PASSKEY to contain the Access Point's information as shown in Figure 16. The security types supported for this demo are WPA/WPA2 and Open. For Open security, define SEC_TYPE as SL_SEC_TYPE_OPEN. For WPA and WPA2 security, define it as SL_SEC_TYPE_WPA.

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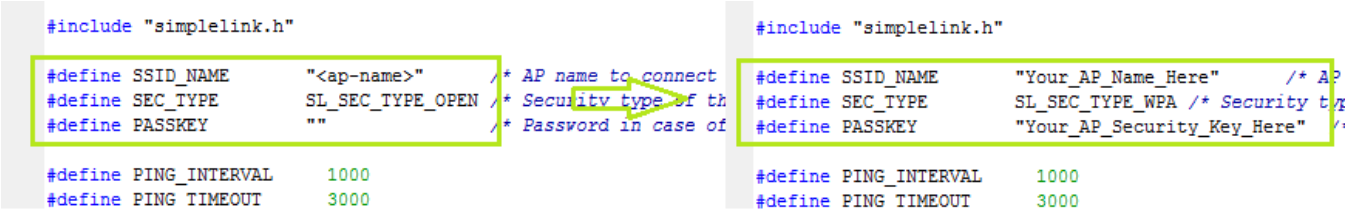

Figure 16. Define SSID_Name

7. Select the *getting_started_with_wlan_station* project in Project Explorer and select *Project>Build Project* from the menu.
8. Press F11on the CCS window to start debugging.

Option 2. IAR Workbench

1. Install IAR Workbench for MSP430 version 6.10 or later: http://www.iar.com/en/Products/IAR-Embedded-Workbench/TI-MSP430/.
2. Open IAR Workbench and select *File>Open>Workspace* from the menu.
3. Select the project: *C:\TI\CC3100SDK\cc3100-sdk\platform\msp430f5529lp\example_project_iar\getting_started_with_wlan_station\ getting_started_with_wlan.eww*.
4. Open the *main.c* file of the *getting_started_with_wlan project* for editing (*C:\TI\CC3100SDK\cc3100-sdk\examples\getting_started_with_wlan_station\main.c*).
5. Edit *main.c* to use the SSID, security type and security key of the Access Point being used. Edit the macros SSID_NAME, SEC_TYPE and PASSKEY to contain the Access Point's information as shown in Figure Figure 17. The security types supported for this demo are WPA/WPA2 and Open. For Open security, define SEC_TYPE as SL_SEC_TYPE_OPEN. For WPA and WPA2 security, define it as SL_SEC_TYPE_WPA.

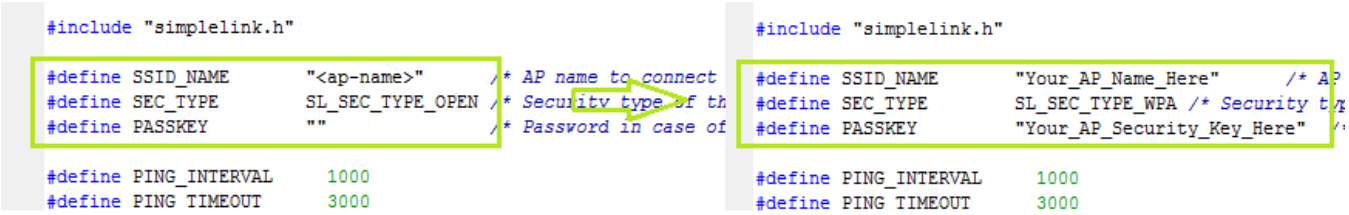

Figure 17. Macro Definition of SSID_Name

6. Select *Project>Rebuild All* from the menu.
7. After building is finished, select *Project>Download and Debug* from the menu to start debugging.

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5 Summary

After the development environment has been set up, see the following resources for further assistance in development:

- CC3100 Programmer's Guide – This guide contains information on how to use the SimpleLink API for writing WLAN-enabled applications.
- Uniflash – The Uniflash tool is used for manually storing files on the external serial flash. This includes the SimpleLink firmware patch file and any configuration files, security certificates, web pages, and so forth.
- CC3100 Wiki – All information and tools for the CC3100, including the above, can be found on the CC3100 Wiki page.

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6 Acronyms Used

STA – Wi-Fi Station

AP – Wi-Fi Access Point

WLAN – Wireless LAN

CCS – Code Composer Studio

GCC – GNU Compiler Collection

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RFID	www.ti-rfid.com		
OMAP Applications Processors	www.ti.com/omap	**TI E2E Community**	e2e.ti.com
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