Application Report
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Integrating the 6LoWPAN Mesh Designs Into a New TI-15.4 Stack Example

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ABSTRACT

The 6LoWPAN mesh TI designs implemented the 6LoWPAN mesh stacks based on the SimpleLink™ CC13xx SDK (Software Development Kit) TI-15.4 stack example. As the SimpleLink SDK is evolving with new features or bug fixes, developers might need to integrate the existing 6LoWPAN mesh software into a new SimpleLink SDK TI-15.4 example. As the TI-15.4 stack supports 2.4-GHz frequency bands in the SimpleLink CC26x2 SDK, developers might be also interested in integrating the 6LoWPAN mesh stacks into the 2.4-GHz-based TI-15.4 example. This article aims to provide the details on how to achieve this. The corresponding TI designs are TIDA-010003 and TIDA-010024.

Contents

1 Introduction 2
2 Integrating the 6LoWPAN Mesh Software Example into a New TI-15.4 Sensor Example 3
3 References 10

List of Figures

1 SimpleLink™ CC13x0 SDK Version 2
2 TI-15.4 Stack Sensor Example Project 3
3 6LoWPAN Mesh TI Design Software Example 4
4 Include Options in the TI-15.4 Sensor Example 5
5 Include Options in the 6LoWPAN Mesh Example 6
6 Predefined Symbols in the TI-15.4 Sensor Example 7
7 Predefined Symbols in the 6LoWPAN Mesh Example 8
8 app.cfg and cc13x0lp.cmd 9
9 "FIXME" in the 6LoWPAN Mesh Example 10

List of Tables

1 List of Files to be Modified 9

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1 Introduction

This article will discuss the step-by-step instructions based on the TIDA-010003 reference design. The 6LoWPAN mesh software example was implemented based on the TI-15.4 sensor example as parts of the SimpleLink CC13x0 SDK v2.10.0.36. Figure 1 shows the Code Composer Studio screen capture for the SimpleLink CC13x0 SDK version in the 6LoWPAN mesh Code Composer Studio project, which was the latest version at the time the TI design was published.

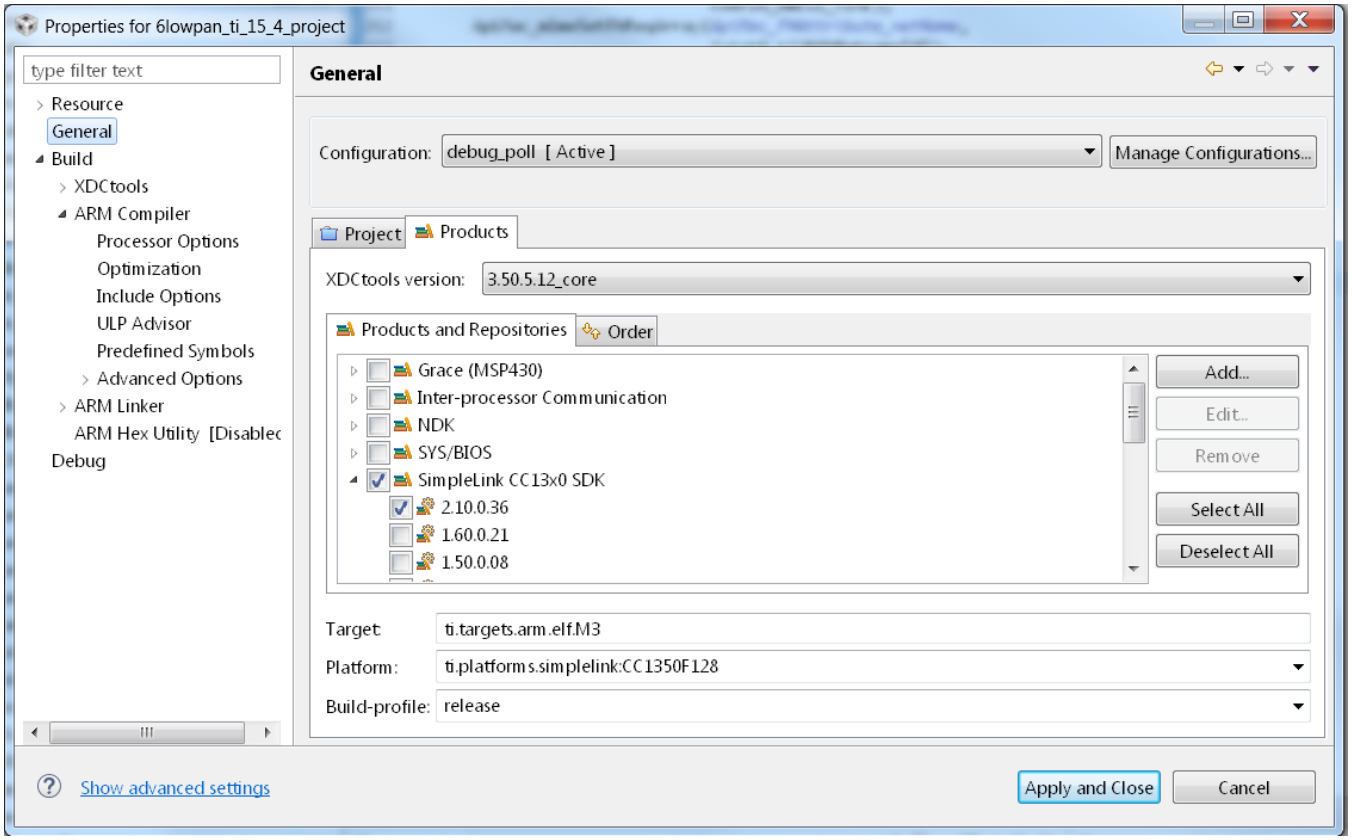

Figure 1. SimpleLink™ CC13x0 SDK Version

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2 Integrating the 6LoWPAN Mesh Software Example into a New TI-15.4 Sensor Example

Figure 2 and Figure 3 show the Code Composer Studio projects for the TI-15.4 sensor example and the 6LoWPAN mesh software example, respectively. The 6LoWPAN mesh software example was implemented based on the TI-15.4 sensor example and thus most of the file names under the directory of Application are identical.

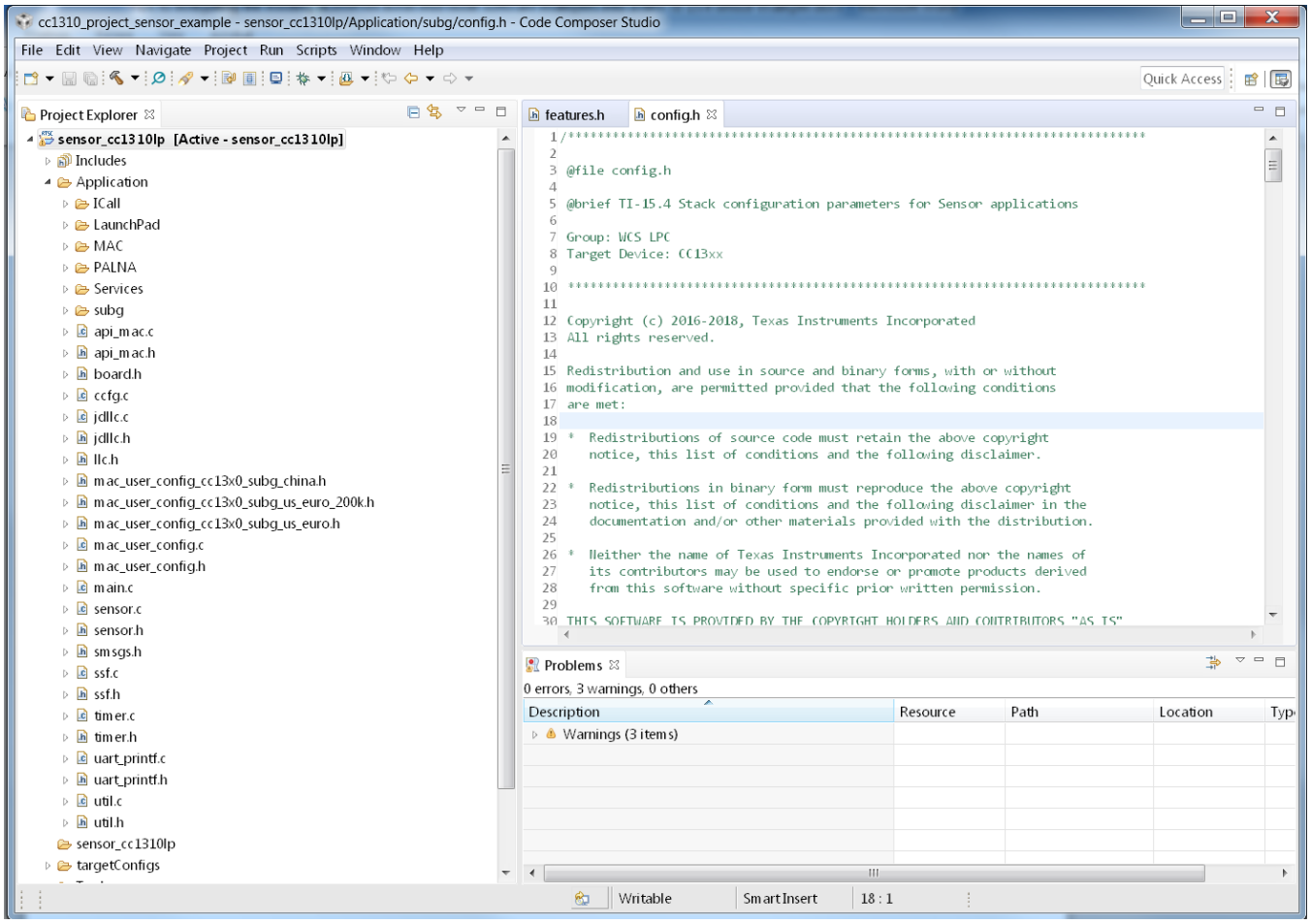

Figure 2. TI-15.4 Stack Sensor Example Project

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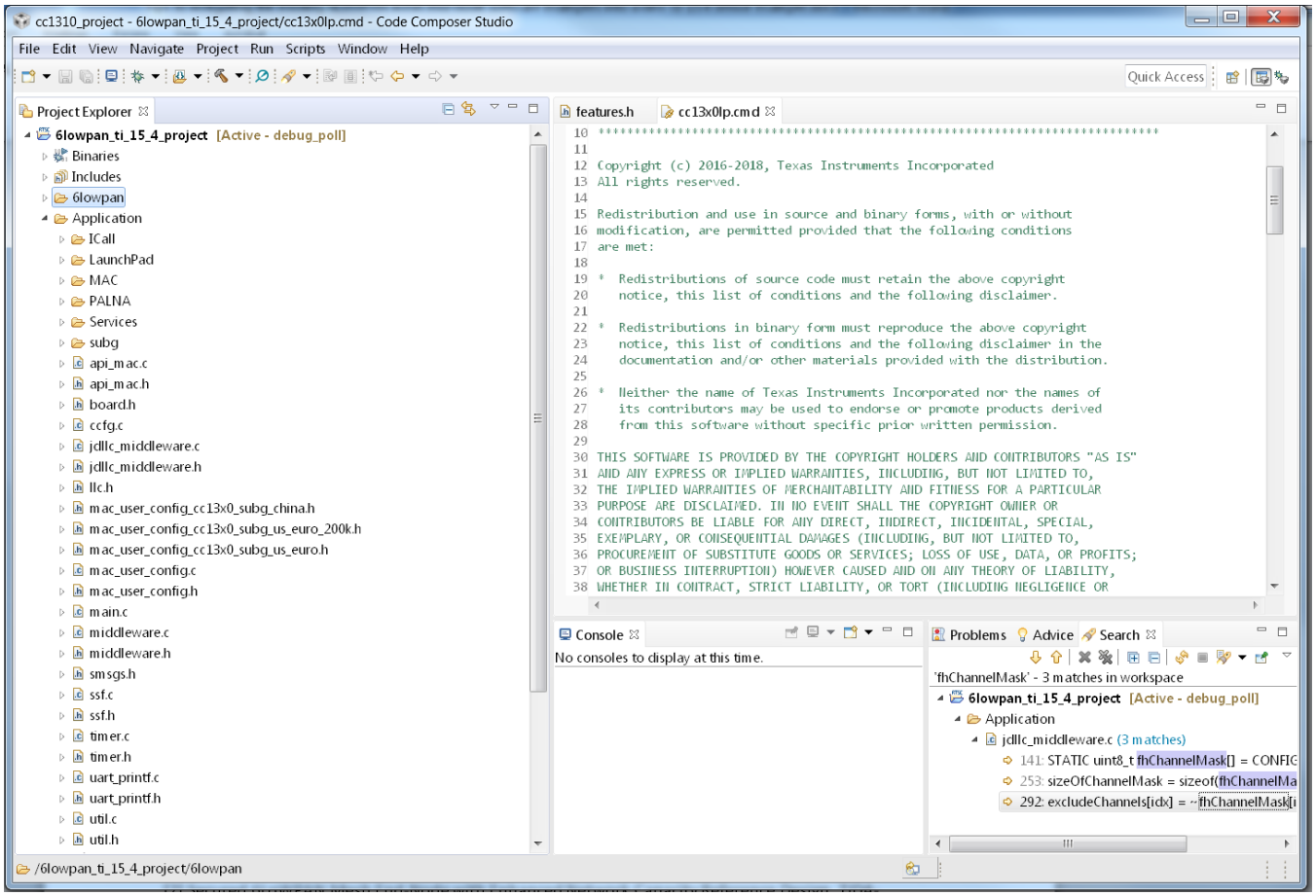

Figure 3. 6LoWPAN Mesh TI Design Software Example

2.1 Copying the Complete "6lowpan" Directory Into the New Sensor Example

The first step is to copy the complete directory of the 6lowpan in the 6LoWPAN mesh software example into the new TI-15.4 sensor example. The directory of the 6lowpan is highlighted in Figure 3 .

2.2 Updating Code Composer Studio Project Configuration

2.2.1 Include Options

Figure 4 and Figure 5 show the Include Options in the sensor example and the 6LoWPAN mesh example, respectively. The new TI-15.4 sensor example needs to be updated with the Include Options based on the 6LoWPAN mesh example.

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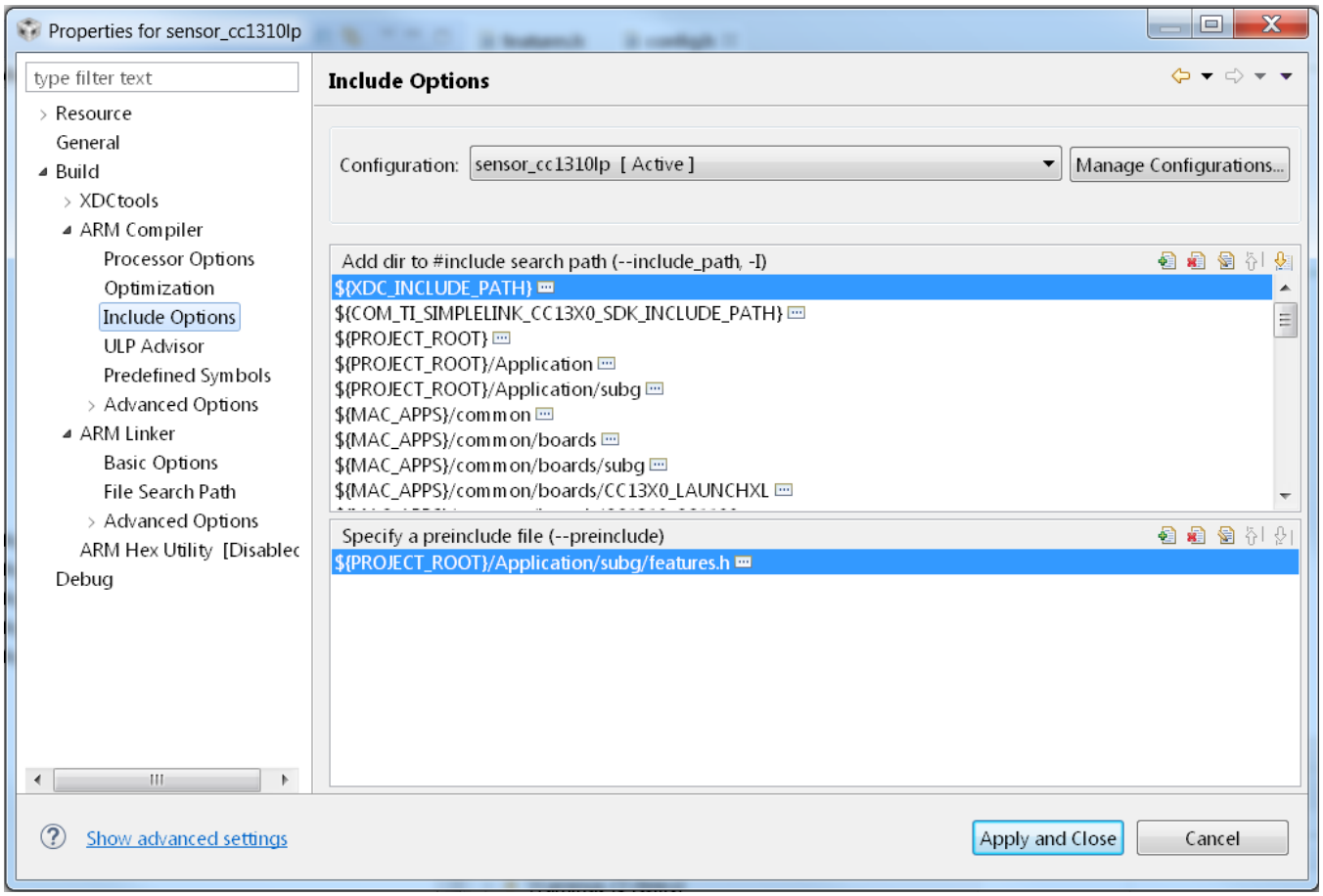

Figure 4. Include Options in the TI-15.4 Sensor Example

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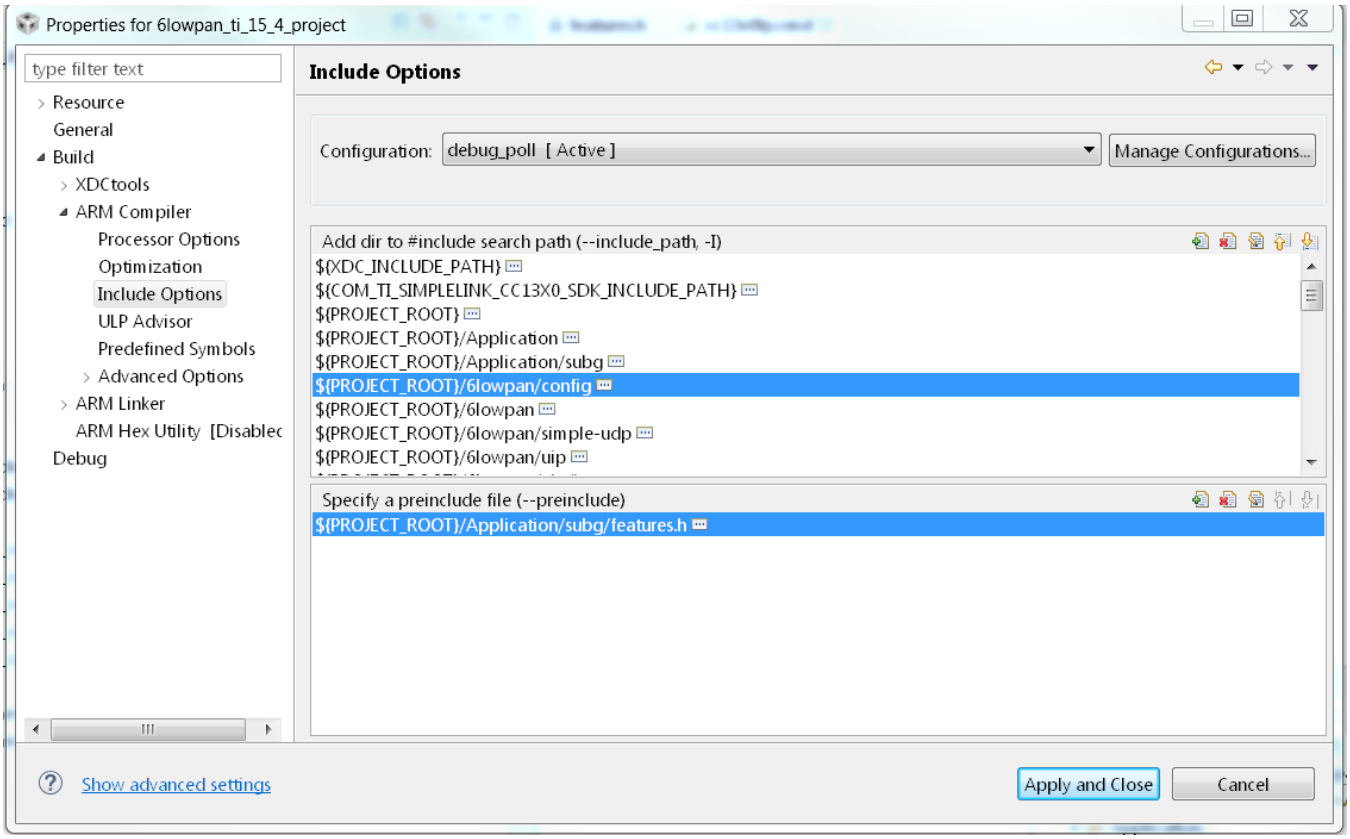

Figure 5. Include Options in the 6LoWPAN Mesh Example

2.2.2 Predefined Symbols

Figure 6 and Figure 7 show Predefined Symbols in the sensor example and the 6LoWPAN mesh example, respectively. The new sensor example needs to update the Predefined Symbols identical to those in the 6LoWPAN mesh example.

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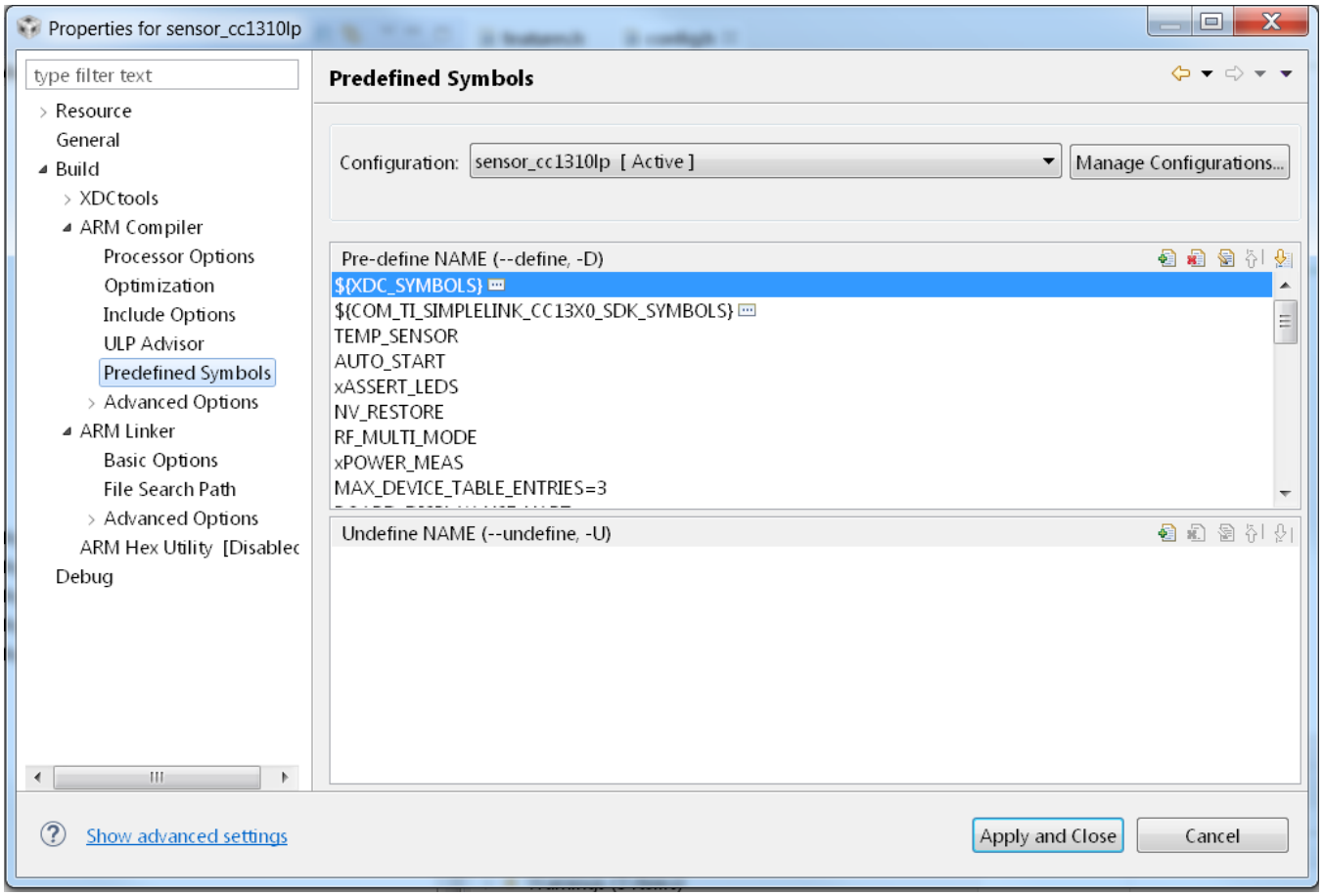

Figure 6. Predefined Symbols in the TI-15.4 Sensor Example

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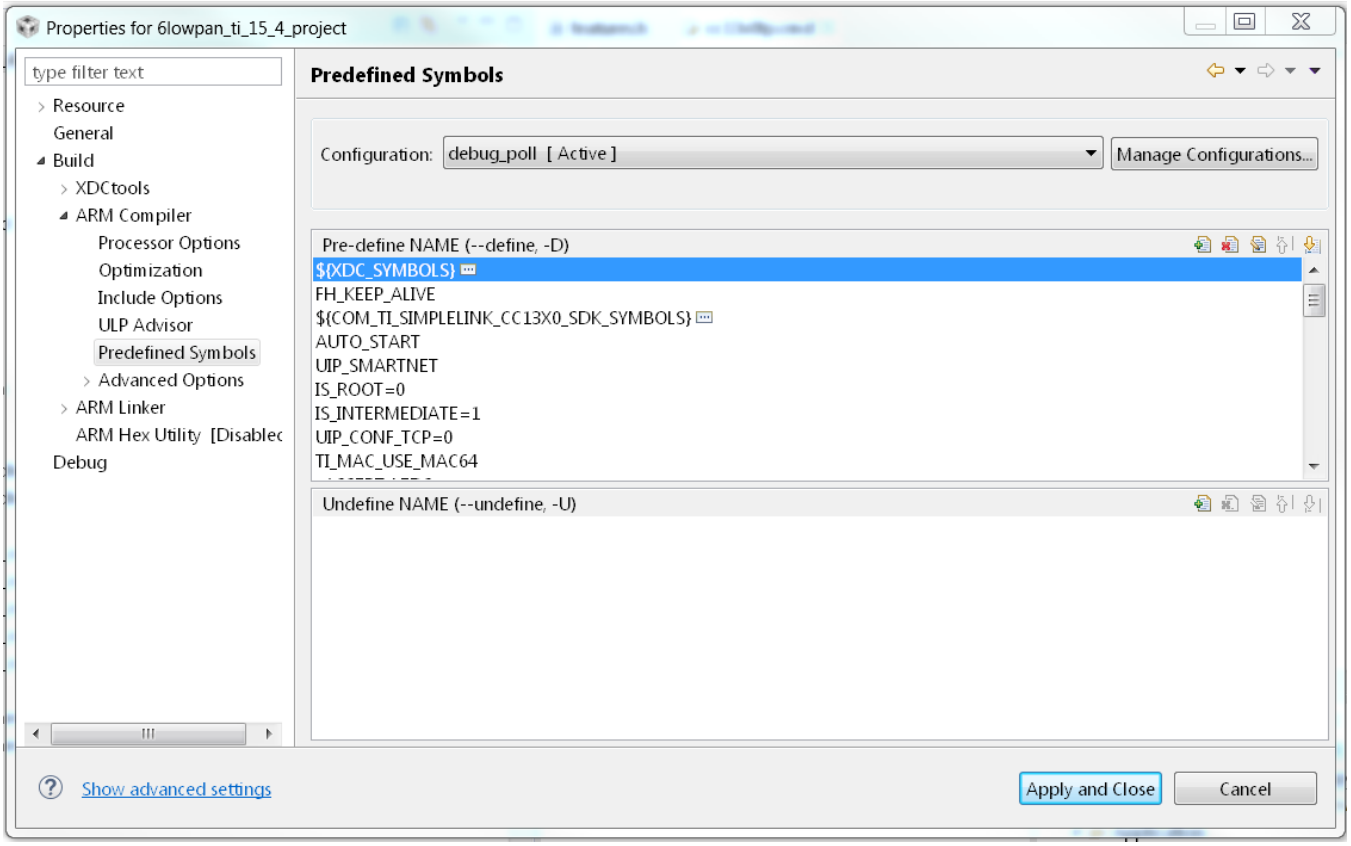

Figure 7. Predefined Symbols in the 6LoWPAN Mesh Example

2.3 Updating app.cfg and cc13x0lp.cmd

The next step is to update the Code Composer Studio configuration (.cfg) and command (.cmd) files in the new TI-15.4 sensor example. The app.cfg is located in the directory of Tools and the cc13x0lp.cmd is in the main project directory as shown in Figure 8.

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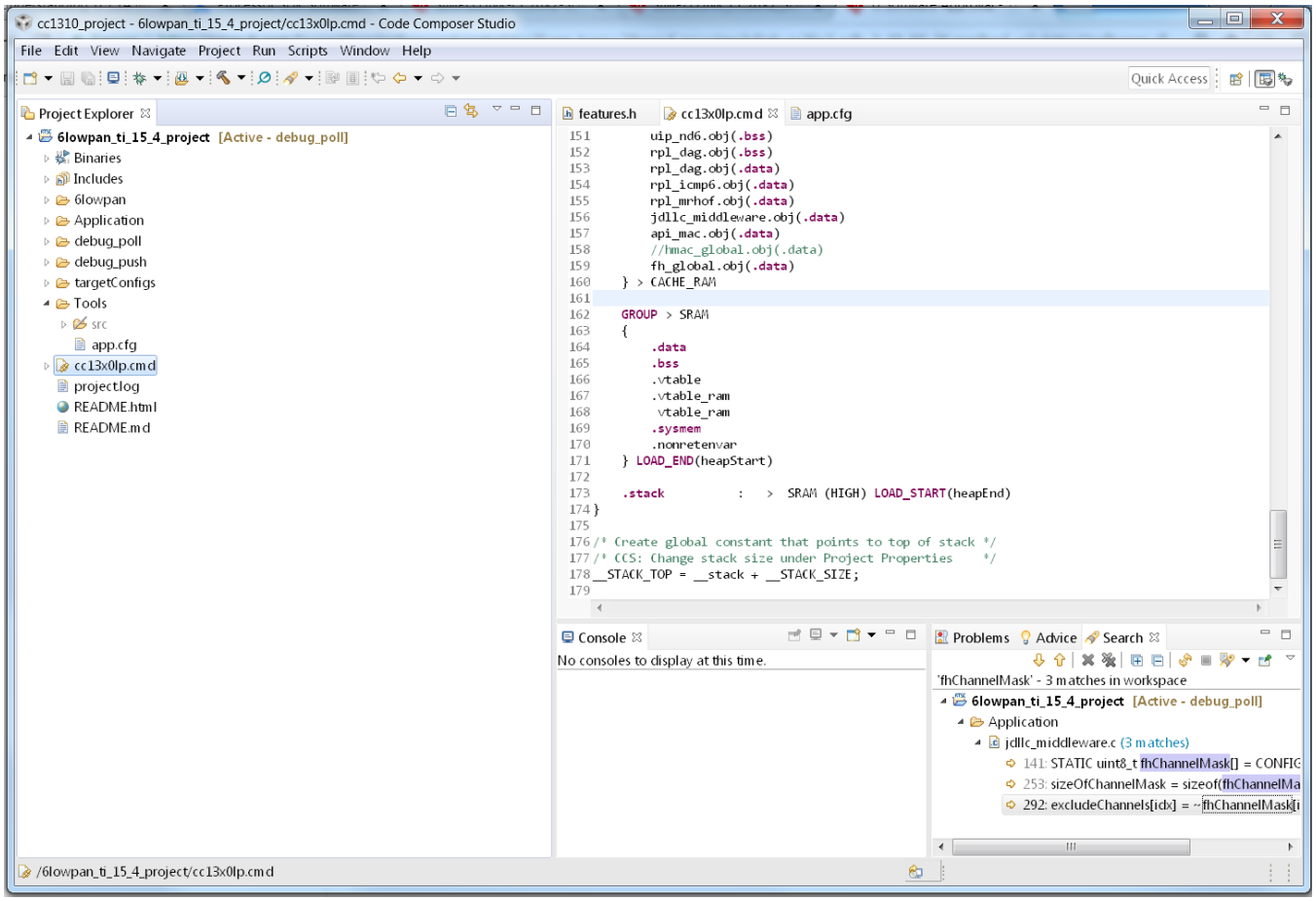

Figure 8. app.cfg and cc13x0lp.cmd

2.4 Modifying Source Files in the Directory of Application

The final step is to modify the source files in the directory of Application. Finding the modifications in the source files can be done by running “diff” those files in the 6LoWPAN mesh software example and the TI-15.4 sensor example. Table 1 summarizes the list of files to be compared.

Table 1. List of Files to be Modified

Path	File Name
Application/ICall	icall_addrs.h icall.c
Application/MAC/FreqHop	fh_global.c
Application/subg	config.h
Application/	ccfg.c main.c middleware.c (senesor.c [(1)]) middleware.h (sensor.h) jdllc_middleware.c (jdllc.c) jdllc_middleware.h (jdllc.h) ssf.c ssf.h

(1) This is the baseline file to be modified in the new TI-15.4 sensor example

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An easy way to find the modifications in the 6LoWPAN mesh software example is to search for “FIXME” in the Code Composer Studio project. Figure 9 shows the screen capture of the list of files and changes on the right bottom window by searching “FIXME” in the 6LoWPAN mesh project.

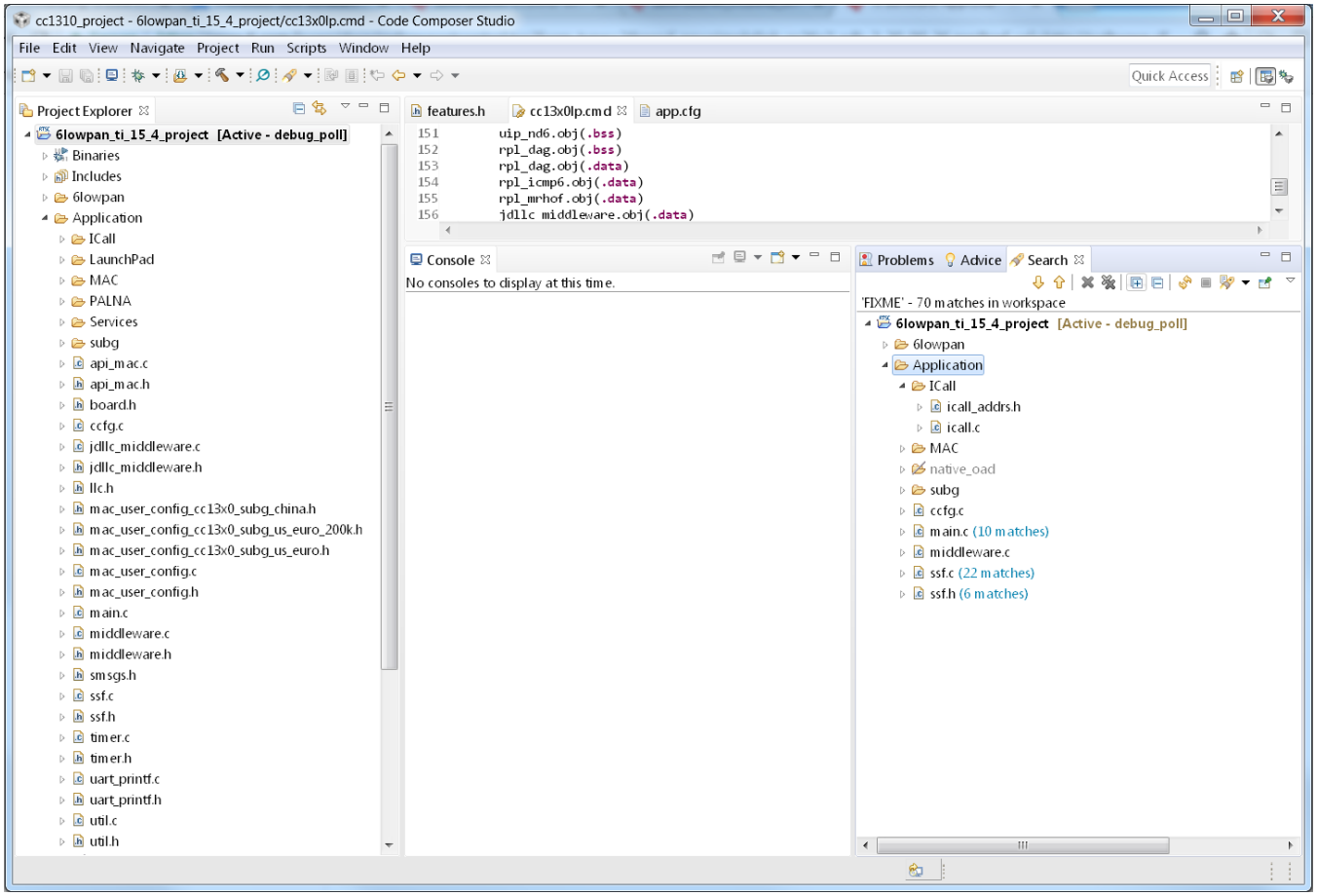

Figure 9. "FIXME" in the 6LoWPAN Mesh Example

3 References

1. *Simple 6LoWPAN Mesh End-Node Improves Network Performance Reference Design* (TIDA-010003)
2. *Secured 6LoWPAN Mesh End-Node with Enhanced Network Capacity Reference Design* (TIDA-010024)

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