

MSP430 Hands-On Design Workshop Installation Guide

Install Guide v3.21b

Introduction

The objective of this guide is to download and install Code Composer Studio, as well as the various other support documents and software to be used with the MSP430 LaunchPad.

The Introduction to the MSP430 Launchpad, as well as detailed instructions for how to use Code Composer Studio (CCS) will come in the lab exercises for Chapters 2 and 3.

For future reference, the main Wiki for this workshop is located here:

http://processors.wiki.ti.com/index.php/MSP430_Design_Workshop

Installation and Setup Topics

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Workshop Equipment & Requirements

You must provide:

- Windows computer using Windows 7 or greater.

You are required to provide your own Windows laptop computer. It should have an available USB port. You will also need at least 1.5 GB of space available on your disc drive to hold the necessary software.

Warning: To install the TI software (or any software), you must have administrative rights on your computer. In many cases, you may also need to be able to temporarily turn off your antivirus software. Please confer with your IT support team if either of these poses a problem.

If you have a Mac or Linux notebook computer, we have seen students be successful running the development tools in a virtual machine, such as VMware or VM Fusion. That said, we cannot guarantee that our instructors will be able to help you with managing these types of environments.

- Audio headphones – you will need these for use in class
- A means of watching MP4 videos on your computer. If you do not already have software that can play these types of files, we highly recommend the free VLC media player:

<http://www.videolan.org/vlc/index.html>

- Pen or pencil
- Magnifying glass ... if you're eyes are getting a bit older. (We're not kidding. Reading the labels on the Launchpad boards can be challenging to those who need reading glasses.)
- Before coming to the workshop, you should install all the software outlined in this document.

Provided at the workshop (Take Home)

If you are paying to attend the 1-day MSP430 LaunchPad Workshop, the following items (as well as lunch) will be provided. You will be able to take them home with you at the end of the day.

If you are doing this workshop on your own, then you will need to purchase these items from the TI eStore or one of TI's authorized distributors.

- a) MSP430F5529 USB LaunchPad Kit ([MSP-EXP430F5529LP](#)) (US \$12.99)
– or –
MSP430 FRAM Launchpad ([MSP-EXP430FR5969](#)) (US \$24.00)
- b) One female-to-female jumper wire (here's a pack of them, as an example, from [adafruit](#))

Provided at the workshop (For in-class use only)

For 'F5529 USB Launchpad users, we use the MSP-FET for measuring energy usage during the *Low Power Optimization* lab exercise. We provide them for in-class use. (Sorry, we can't let you take them home.)

- The new [MSP-FET](#) (Flash/FRAM Emulation Tool) – supports measurement of energy with the EnergyTrace feature for all MSP430 devices (US \$115.00)

Download Checklist (v3.21b)

Integrated Development Environments (IDE)

- Energia (TI port of Arduino)** <http://energia.nu/download>
- Code Composer Studio v6** http://processors.wiki.ti.com/index.php/Download_CCS

You can download either the web installer or offline installer. The web installer is smaller, but the off-line installer is more flexible. If you have a fast internet access, we suggest the off-line installer.

Clicking the link for either installer, you will be directed to log in (or create a free) my.TI account. Then, once you agree to the export conditions you will either be e-mailed a link or be directed to a web page with the link.

Warning – If you use the Web Installer, you must have internet access during installation.
We recommend using the all-in-one downloader.

| Release | Build # | Date | Download |
|---------|-------------|-------------|---|
| 6.0.1 | 6.0.1.00040 | Aug 3, 2014 | Web Installers: Windows Linux Off-line Installers: Windows MD5 Linux MD5 |

Workshop Course Materials

- Workshop Manual (PDF)** [MSP430 Workshop v3 21.pdf](#)
- Workshop Lab Files (EXE)** [MSP430 Workshop setup v3 21.exe](#)
- Installation Document (PDF)** [MSP430 Workshop Installation Guide v3 21b.pdf](#)

These files are all found at the workshop's wiki page: <http://www.ti.com/launchpad-workshop>

MSP430 Device and Launchpad Software and Documentation

The installation locations and directions are noted in the upcoming installation procedures.

| Description | 'F5529 | 'FR5969 |
|---|---------------------------------|---|
| <input type="checkbox"/> LaunchPad User's Guide | slau533b.pdf | slau535a.pdf slau553.pdf |
| <input type="checkbox"/> MSP430 Device User's Guide | slau208n.pdf | slau367e.pdf |
| <input type="checkbox"/> Device Datasheet | msp430f5529.pdf | msp430fr5969.pdf |
| <input type="checkbox"/> MSP430 C Compiler User's Guide | slau132i.pdf | |
| <input type="checkbox"/> MSP430 Assembly Language Tools | slau131i.pdf | |

Download's are continued on the next page. ↵

Additional Tools and Documentation

The installation locations and directions are noted in the upcoming installation procedures.

| Description | Source Location | Action | File Name |
|--|---|---------|--|
| <input type="checkbox"/> MSP430Flasher | http://software-dl.ti.com/msp430/msp430_public_sw/mcu/msp430/MSP430Flasher/latest/index_FDS.html | Install | MSP430Flasher-1_03_02_00-windows-installer.exe |

Additional information:

- CCSv6 User's Guide for MSP430: [slau157af.pdf](#)
- www.ti.com/launchpadwiki
- www.ti.com/launchpad
- [MSP430Flasher Wiki page](#)
- [Capacitive Touch Library](#)

Third Party Websites

There are many, many third party MSP430 websites out there. Here's one of them:

- <http://www.43oh.com>

Installation

Code Composer Studio

Note: If CCSv6 or higher, is already installed you may skip the CCS installation procedure.

Install Code Composer Studio 6

1. If you haven't already done so, download CCS. (Refer to the *Download Checklist*, on page 3, for details.)

2. If you downloaded the full, all-in-one installer you must **unzip** it first.

Windows makes zip files look like folders, but trying to run an installer from a zipped file does not work well. Please unzip the file before starting the installer.

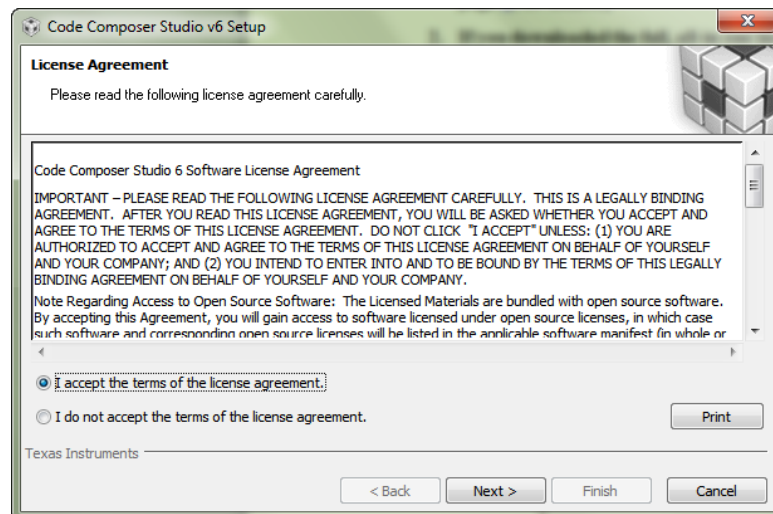
3. Run the CCS Installer.

`ccs_setup_CCS6.0.1.00040.exe` (latest version available when this document was printed)

4. You may see a warning message indicating you that you have an anti-virus program running.

If the CCS installer detects an antivirus program is running on your computer, it will warn you that this could be a problem. It is recommended that you temporarily disable your anti-virus tool and continue with the installation.

5. When the installation program runs, accept the license agreement and click *Next*.

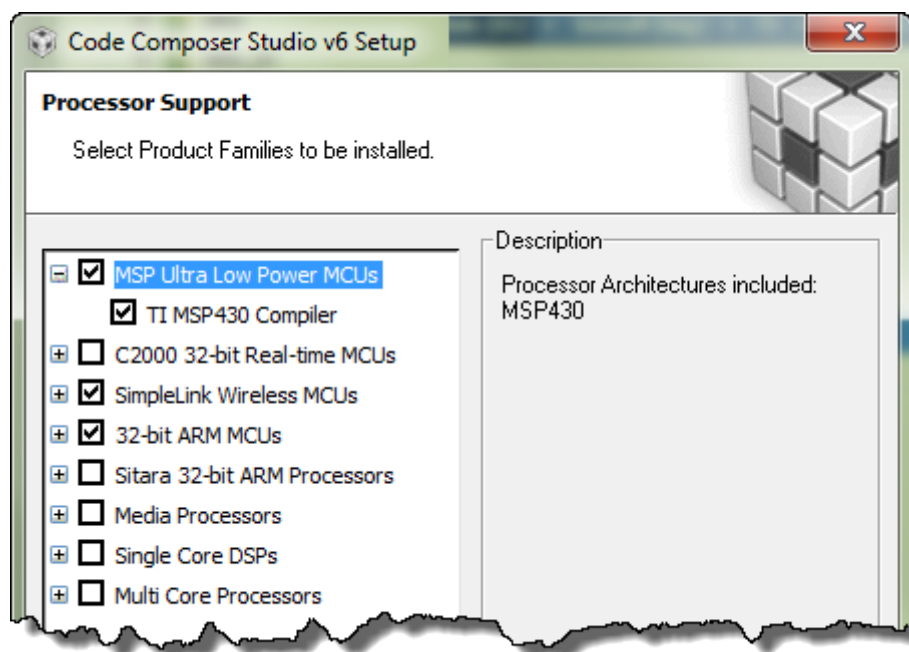


6. When the Choose Installation Location dialog appears, we suggest that you install Code Composer in the **default** `C:\ti` folder. Click *Next*.

7. Choose the devices you will be using the *Processor Support* dialog.

At a minimum, choose **MSP430 Low Power MCUs**, as this is needed for the MSP430 Launchpad Workshop.

If you are working with, or plan to attend, the Tiva C series workshop, you should also check the 32-bit ARM MCUs. Likewise, if you are attending a workshop on the TI SimpleLink wireless connectivity solutions, check that box, too.

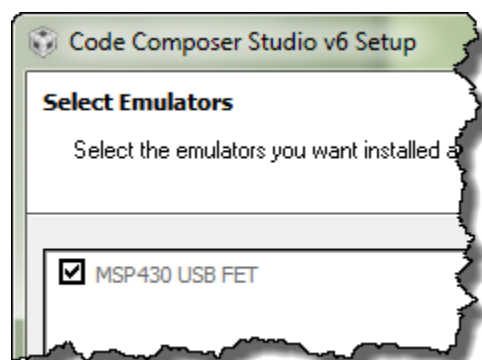


The more devices you choose means a longer installation time. If you have a slower computer, we recommend choosing as few as possible. (It's not really about CPU performance; installations are all about copying a lot of files.)

When done selecting processors, click **Next**.

8. When the *Select Emulators* dialog appears, take the default and hit **Next**.

If you are installing Tiva C and Stellaris, additional emulator options will be listed – we recommend that you accept the **default** selections.



9. CCS App Center selections.

CCSv6 now includes its own *App Center*. This is available during installation, as well as from within Code Composer Studio once it has been installed and running.

Note: The message (pointed to by the arrow) below states that any App Center selections will be installed the first time you run CCS. It will require internet access to download and install these selections – and CCS will need to be restarted after they've been installed.

We recommend that you select **MSP430ware**. You can also download MSP430ware from the TI website and install it independently, but if you have internet access, it's easier to install it this way.

We also suggest that you download GUI Composer. This is used for a lab in the Tiva C Workshop – and will be used for a future MSP430 lab exercise.



You may also want to install the new MSP430 GCC beta compiler. At this point, the MSP430 Workshop does not support this compiler, as there are a few minor variations in syntax (such as #pragma support). Please note, though, that MSP430ware supports the GCC compiler.

Click **Finish** once you've made your selections.

Launch CCS and Let App Center Complete Its Installations

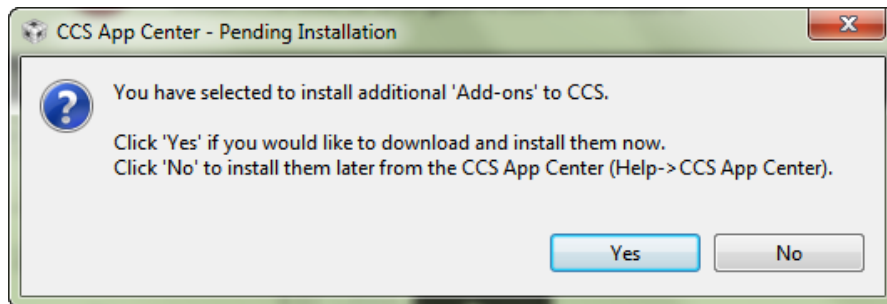
10. When CCS finishes installing, go ahead and *Launch CCS*.

11. Choose the default *Workspace* location.

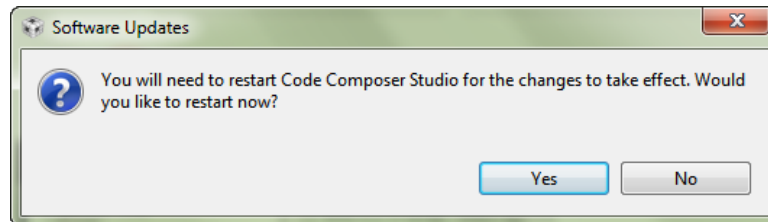
We recommend that you take the default *Workspace* location at this point in time. Later on, during our lab exercises, we'll choose a better location for our working location.

12. Let App Center continue with its installations

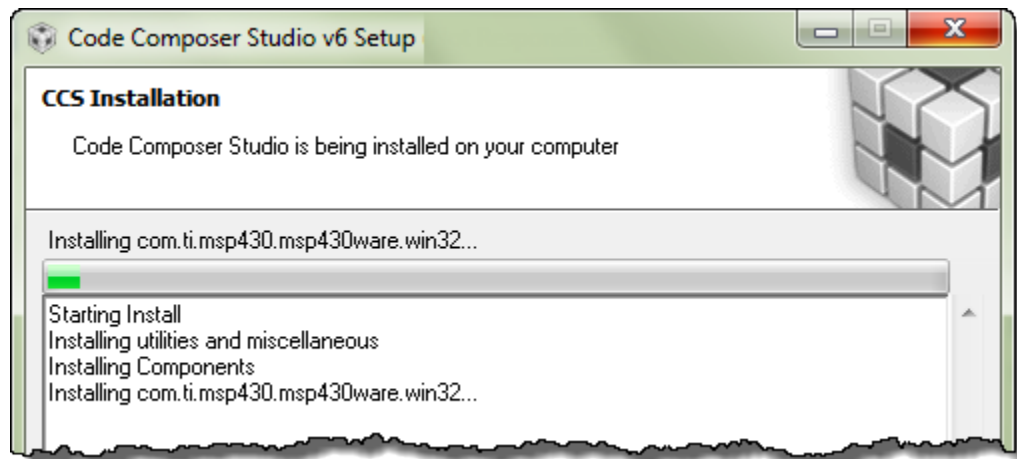
If you elected to install any items that were part of the CCS App Center, select **Yes** to let CCS install them. Note: you need internet access for this step.



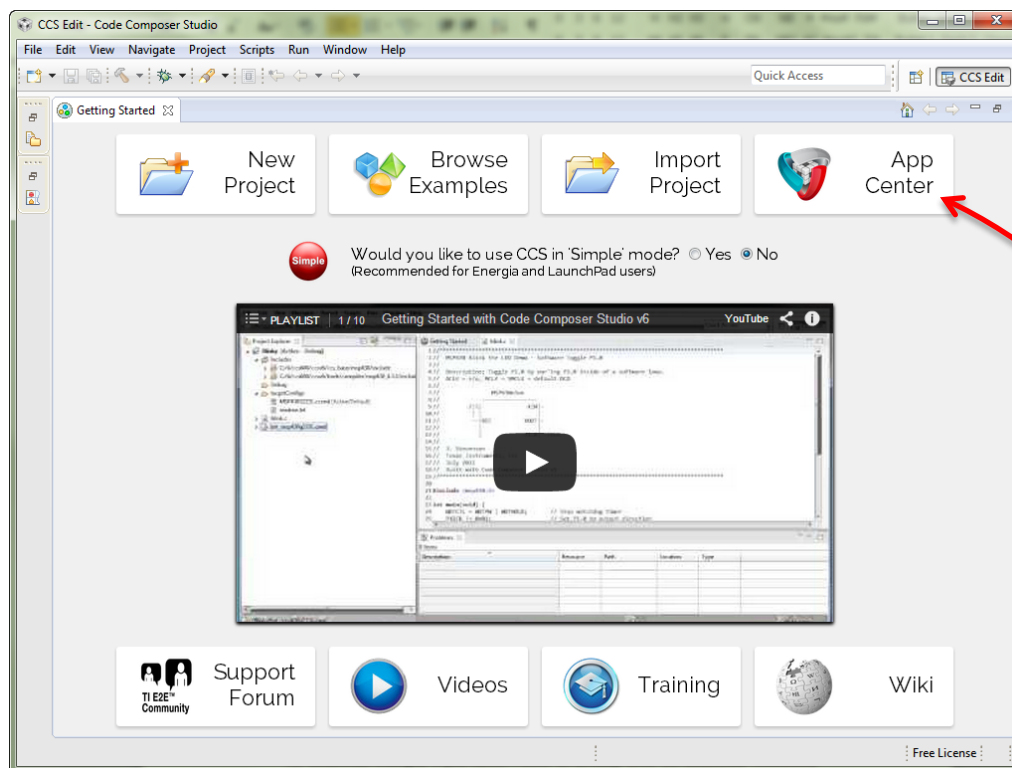
CCS then begins downloading the App Center install packages. Once downloaded, it will ask you to restart: choose **Yes**



And finally the installation of the App Center content (e.g. MSP430ware) begins.



13. After installation completes, CCS should be ready to use. Launching CCS you should see:



Notice that a button for **App Center** appears on the Getting Started screen.

You can check this out later to see what other choices are available to you. For example, if you wanted to use TI-RTOS, there's a link in App Center that will download and install it for you.

14. **Final step of CCS installation** — check for any updates.

Help → Check for Updates

Apply any updates to CCS, MSP430 emulation, or MSP430ware that are found.

Installing Energia

15. To use Energia you will need to have the LaunchPad drivers installed.

Thankfully, this was handled for us by the CCS installation. (If for some odd reason you are not using CCS, please refer to the Energia site for driver installation details.)

16. Download Energia, if you haven't done so already. (See the *Download Checklist*.)

17. Installing Energia just requires unzipping the file: `energia-0101E0013-windows.zip`

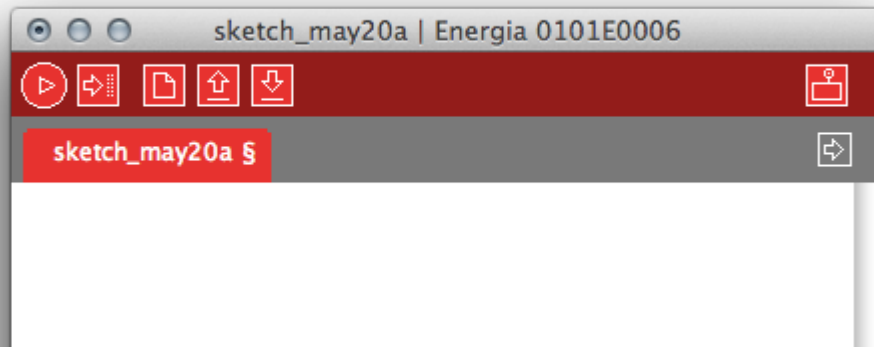
To keep all the TI tools together, we recommend unzipping the files to the following location:

```
C:\TI\energia-0101E0013\
```

Starting and Configuring Energia

18. Within the Energia folder, double-click `Energia.exe`.

Energia will start and an empty Sketch window will appear.



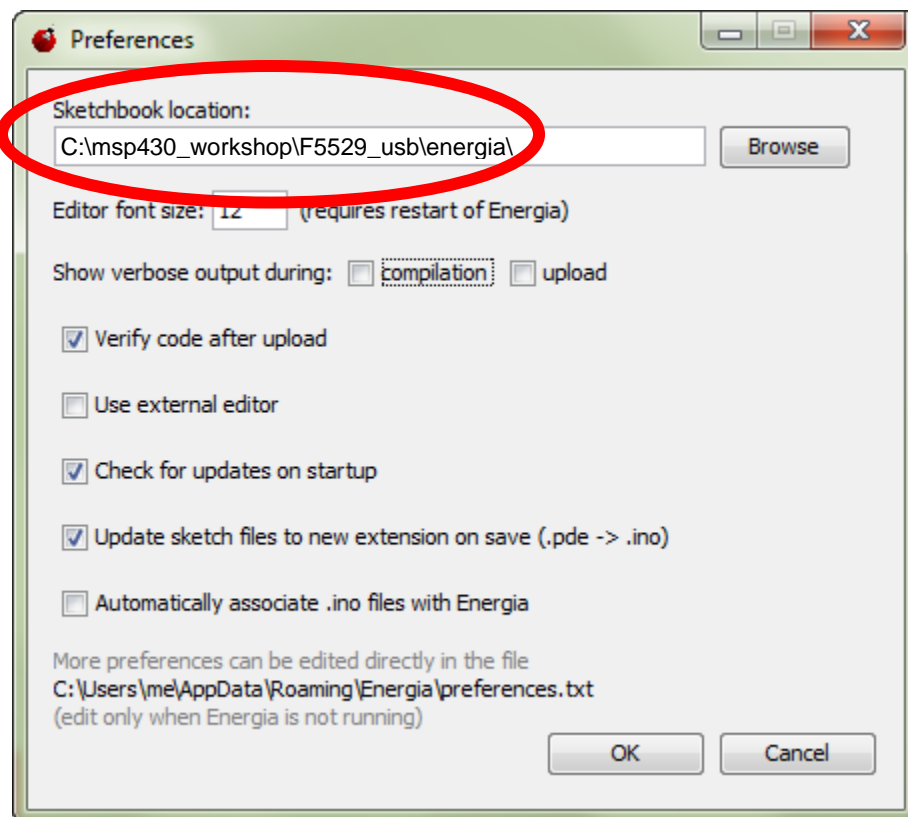
19. Set your working folder in Energia.

It makes it easier to save and open files if Energia defaults to the folder where you want to put your sketches.

The easiest way to set this locations is via Energia's preferences dialog:

File → Preferences

Which opens:



Use either:

```
C:\msp430_workshop\F5529_usb\energia\  
C:\msp430_workshop\FR5969_fram\energia\  

```

Install the Additional MSP430 Tools & Files

This file should have already been downloaded (see links on the Download Checklist.)

20. Install the “MSP430Flasher” Tool to C:\ti\msp430.

The default for this location is C:\ti (which would be OK, too); though we like to put it under the ‘msp430’ folder for *neatness* sake.

C:\ti\msp430

Install the Workshop Lab and Solution Files

21. Run the workshop files installation: MSP430_LaunchPad_Workshop_v3.21.exe

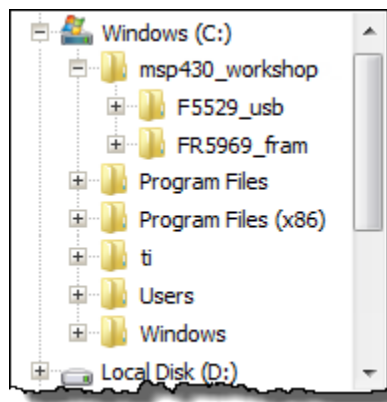
(See download link on page 3, if you haven’t already downloaded this installer.)

Double-click the MSP430_LaunchPad_Workshop.exe file to install the labs and solutions for this workshop. The workshop files will be installed (by default) into the following location:

C:\msp430_workshop\

Hint: The installer lets you override the default install location; although, we recommend that you avoid this since the lab instructions reference this location.

After installation, you should see the workshop folder with sub-directories that correlate with each of the supported Launchpad development boards.



22. Make sure you have downloaded the latest Workshop PDF file, as you will be referring to this throughout the workshop.

MSP430_Launchpad_Workshop_v3.21.pdf

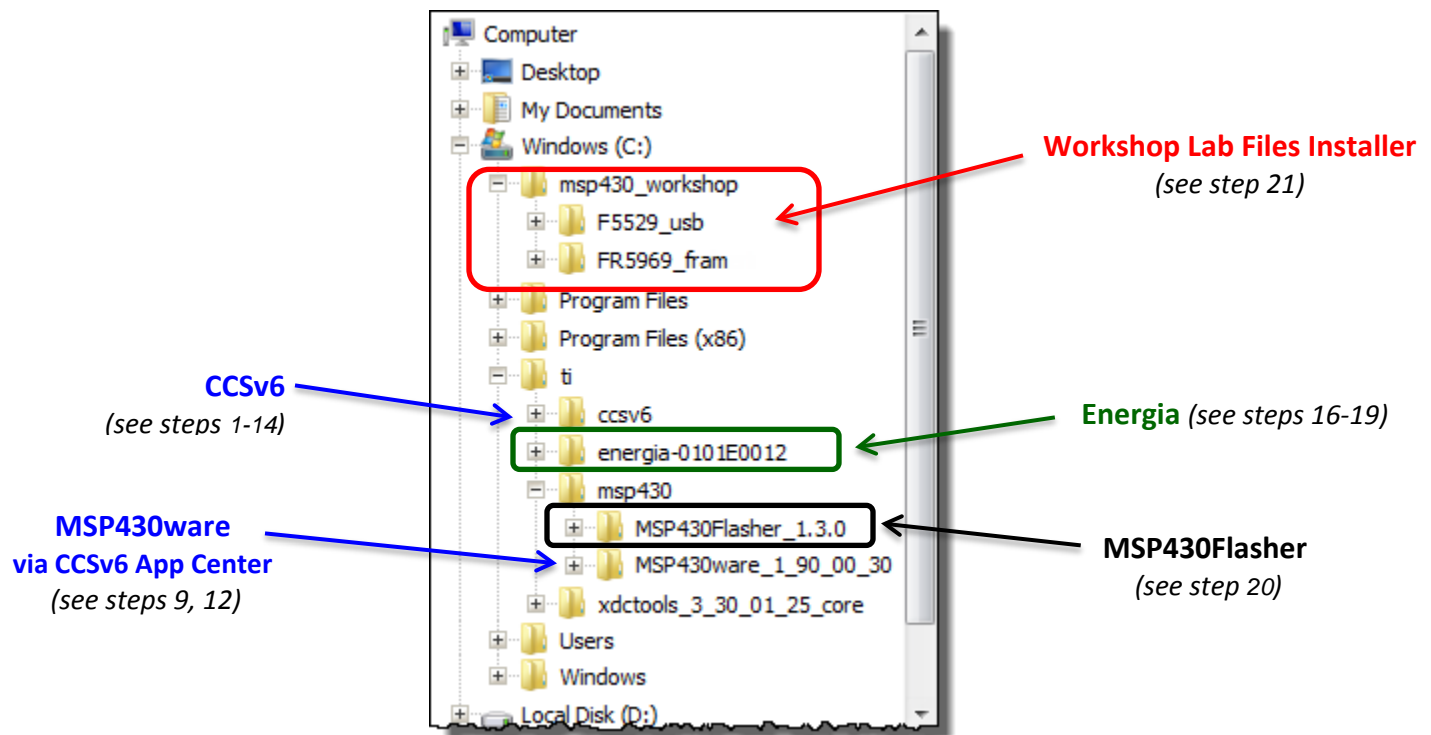
(See download link on page 3, if you haven’t already downloaded this installer.)

Double-Check Your Installation

23. Verify that the required files have been installed.

Using Windows Explorer, look at your file-system and verify that each of these has been installed. We recommend that you check-off each one as you verify it.

- MSP430 Workshop Lab Files** (step 21)
- CCSv6** (steps 1-13)
- CCSv6 App Center** → **MSP430ware** (steps 9, 12)
- MSP430Flasher** (step 20)
- Energia** (steps 16-19)



24. If you have not so already, please download the other documents and User Guides listed in the *Download Checklist* (on pages 3-4).

- MSP430 Workshop Manual (PDF)
- LaunchPad User's Guides
- MSP430 Device User's Guide
- Device Datasheet
- MSP430 C Compiler User's Guide
- MSP430 Assembly Language User's Guide



That's it ... You're Done