

How To: LaunchPad (Tiva C) IoT

Description

The Texas Instruments Tiva C LaunchPad is a low-cost 120 Mhz ARM Cortex-M4 based evaluation platform. The Tiva C has a TM4C1294 single-chip Microcontroller (MCU). This LaunchPad has an on board Ethernet connector that allows for rapid Ethernet prototyping and provides a software configurable interface for a variety of sensors.

This "How To" will provide the step-by-step details on how to assemble, configure, and load the LaunchPad to publish the following data:

- Information Log Messages
- Location Data (Latitude, Longitude, etc)
- Ethernet MAC Attribute Information
- Analog to Digital Convertor (ADC) Temperature Sensor Property

Software Prototyping Platform

The Energia open-source software prototyping platform will be used throughout the demo. Energia includes an integrated development environment (IDE) that is compatible with the LaunchPad.

Requirements

The following items are requirements for a working LaunchPad IoT:

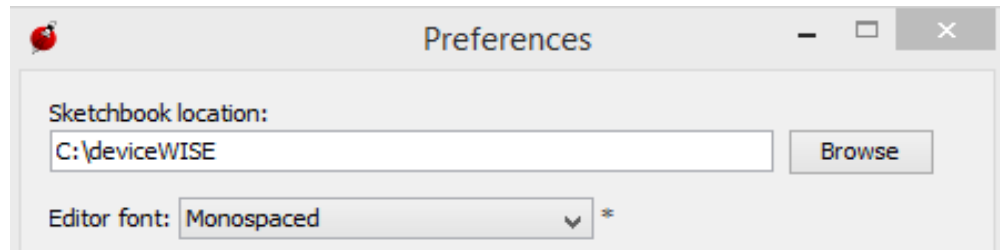
- Tiva C LaunchPad Evaluation Kit
- Windows Compatible PC with Internet Access
- Energia Prototyping Platform (steps outlined below)

Setup

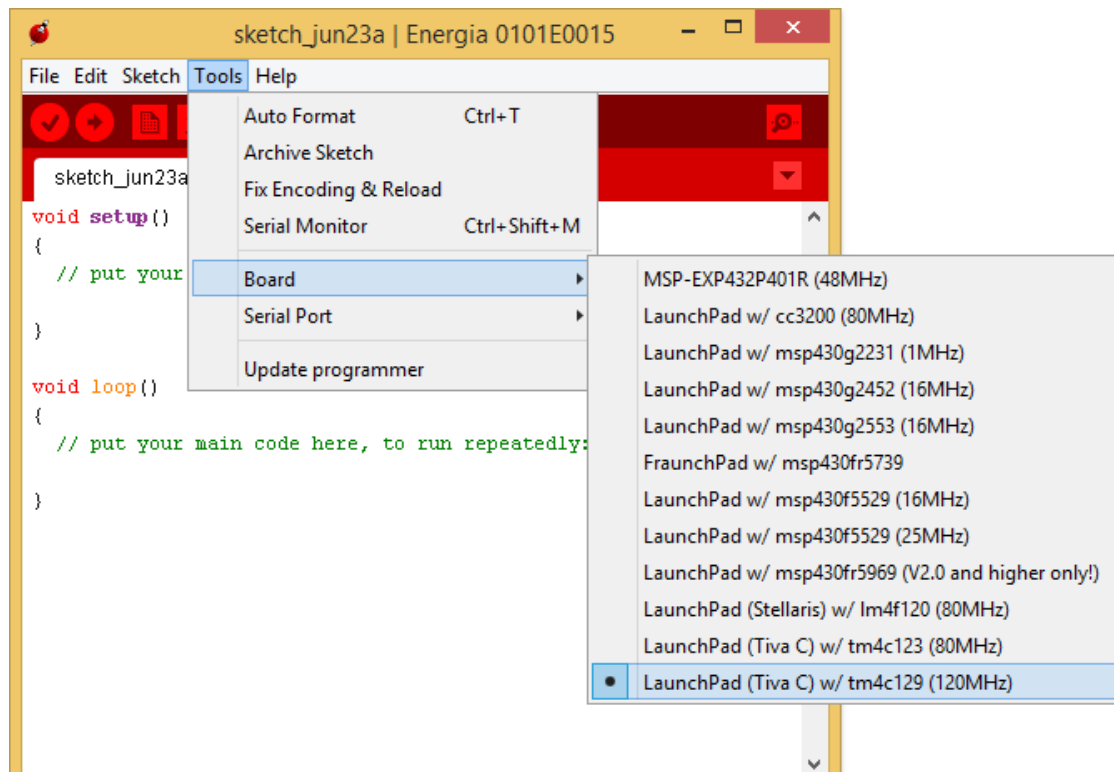
Setup for the LaunchPad IoT consist of these steps:

1. Signup for an M2M Account on the Management Portal
2. Download the getting started file from the Management Portal
3. Create a new “Thing” Definition on the Management Portal
 1. Open the downloaded file and extract the ‘DevKitThingDefinition.json’ file to your PC’s desktop
 2. Select ‘Developer’ from the Management Portal
 3. Click on ‘Thing definitions’ and then click the ‘Import’ button
 4. Click the ‘Attach File’ button and select the JSON file copied in the previous step
 5. Press the ‘Import’ to import the thing definition into the ORG
4. Create an Application token for your thing definition
 1. Select ‘Developer’ from the Management Portal
 2. Click on ‘Applications’ and then click the ‘New Application’ button
 3. In the ‘Name’ field enter ‘LaunchPad’
 4. In the ‘Description’ field enter ‘LaunchPad App’
 5. In the ‘Auto Registration Thing Definition ID’ select ‘DevKit IoT Device’
 6. Check the ‘Org Admin’ checkbox and press the ‘Add’ button
 7. Record the ‘Token’ ID that is provided for a subsequent step – this is your Application token
5. Install the Tiva C LaunchPad USB ICDI driver
 1. Do not connect your LaunchPad to your PC yet - If you already plugged it into your PC then unplug it before proceeding to step 2.
 2. Download the LaunchPad drivers for Windows: [Tiva C LaunchPad USB Driver](#)
 3. Unzip and extract the contents to the C:\ directory
 4. Connect the LaunchPad to the USB port of the computer
 5. The LaunchPad is now ready for use
6. Install the Energia IDE
 1. Using Windows Explorer, create a deviceWISE folder on the C: (ie C:\deviceWISE)
 2. Download the Energia package from [here](#)

3. Open the downloaded file (should be located in your 'Downloads' folder) and copy the folder into C:\deviceWISE. (Result should be C:\deviceWISE\energia...)
4. Create a shortcut for "C:\deviceWISE\energia...\energia.exe" to the Desktop
5. Open Energia by double clicking on the Desktop shortcut
6. Select 'File' from the Energia menubar and then 'Preferences'
7. Enter "C:\deviceWISE" into the "Sketchbook location" field and press "OK"



8. Select 'Tools' from the Energia menubar then 'Board' and afterwards your LaunchPad model. (In this demo we are using the LaunchPad Tiva C 120Mhz model.)



9. Select 'Tools' from the menubar and then 'Serial Port'. Select the displayed COM port so it has a ✓ (Check) mark.

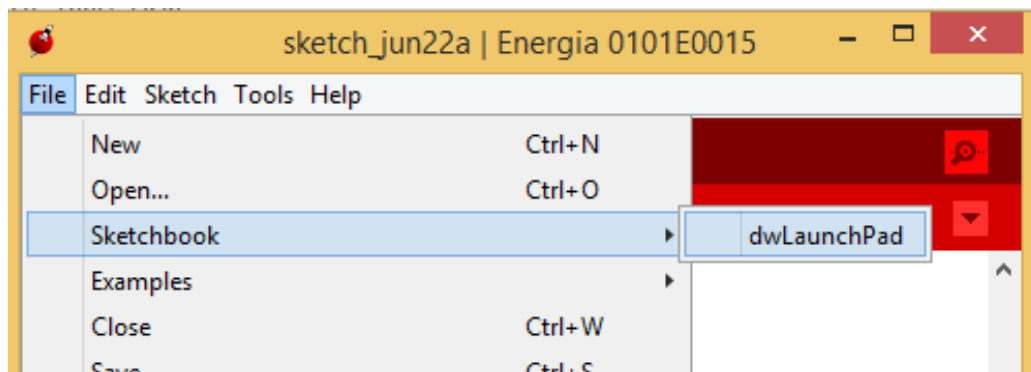
10. Exit Energia by selecting “File” and then “Quit” from the Energia menubar.

7. From within the file downloaded in step 2

1. Copy the “dwLaunchPad” folder into C:\deviceWISE. This will result in a “C:\deviceWISE\dwLaunchPad” folder.

2. Copy the “libraries” folder into C:\deviceWISE. This will result in a “C:\deviceWISE\libraries” folder.

8. Open the Energia IDE and select File->Sketchbook to load in the sample dwLaunchPad sketch.



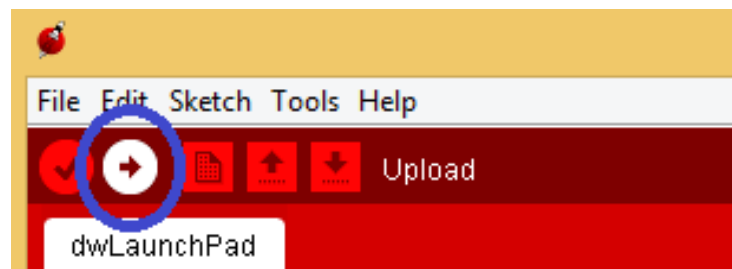
9. Ensure that the “#define WIFI_AVAILABLE 1” one line 34 is commented out

```
///#define WIFI_AVAILABLE 1
```

10. Enter the m2m Application Token (on line 59) that was obtained in the earlier step

```
// Authentication/Registration Details
#define DWOPEN_APPTOKEN "IgP2lz2ghabxqw7J" //Application Token
.....
```

11. Compile and load the demo program onto the LaunchPad by pressing the “Upload” arrow button



12. After the Upload completes, press the “<Shift><Ctrl>M” keys to display the demo program output
13. Open the “Things” page on the Management Portal to display your device
14. Open your ‘Thing’ device by clicking the ‘view’ icon (the eyeball) next to your device. All your device’s details are displayed on this page.
15. Use the ‘Methods’ tab and the ‘Green LED’ and ‘Red LED’ methods to turn ON and OFF the LEDs on the LaunchPad.