How To: <u>Arduino (Leonardo) with Skywire IoT</u>

Description

The Arduino Leonardo is a microcontroller board based on the ATmega32u4. It has 20 digital input/output, a 16 MHz crystal oscillator, a micro USB connection, a power jack, an ICSP header, and a reset button. For this example, the microcontroller board will be fitted with a NimbleLink Skywire shield. The Skywire Arduino shield provides cellular connectivity to the Arduino prototyping board.

This guide will provide the step-by-step details on how to assemble, configure, and load the Arduino Leonardo to publish the following data:

- Information Log Messages
- Location Data (Latitude, Longitude, etc.)
- Sample Attribute Information
- Variable Counter Property

Software Prototyping Platform

The Arduino open-source software prototyping platform will be used throughout this guide. Arduino includes an integrated development environment (IDE) that is compatible with the Leonardo microcontroller board.

Requirements

The following items are requirements for a working IoT:

- Arduino Leonardo Prototype Board
- NimbleLink SkyWire Board with Telit Module
- Windows Compatible PC with Internet Access
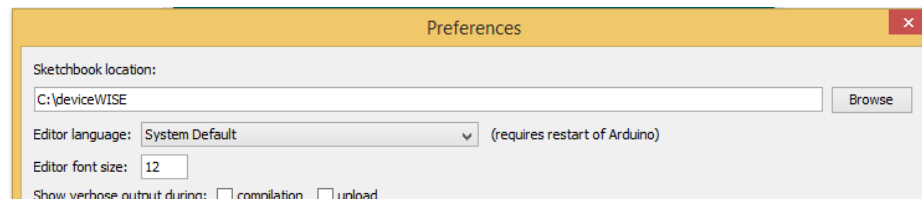- Arduino Prototyping Platform (steps outlined below)

Setup

Setup for the 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 'Arduino
   4. In the 'Description' field enter 'Arduino 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
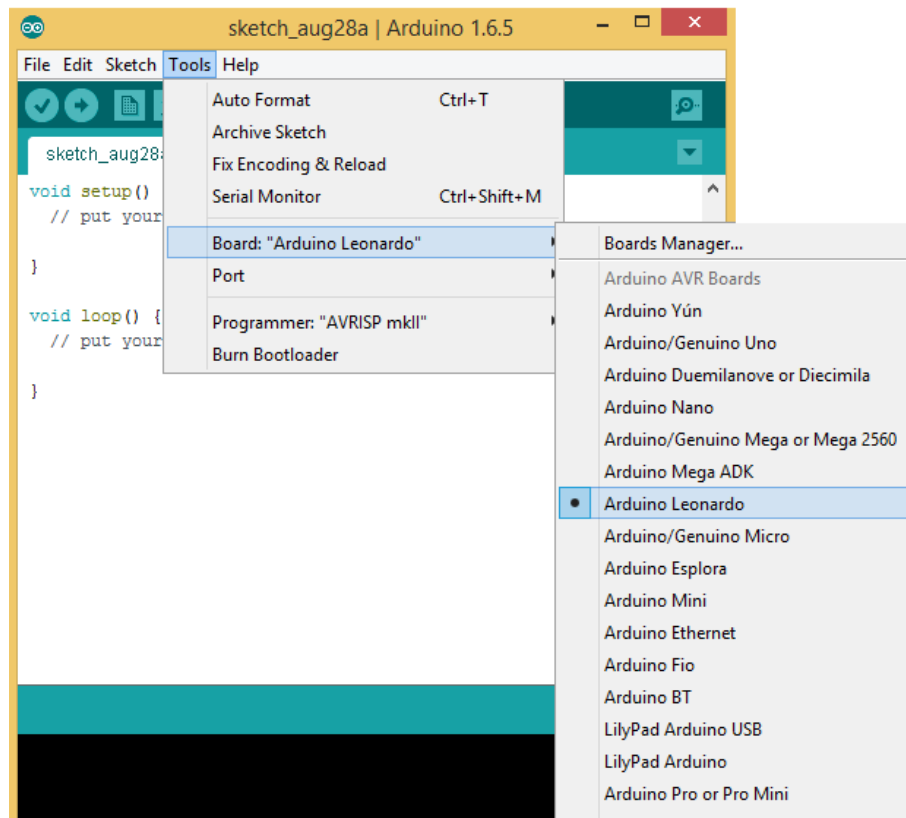
5. Connect your modules as shown below – note the placement and direction of the boards (Do NOT connect the USB cable to the computer at this point.)
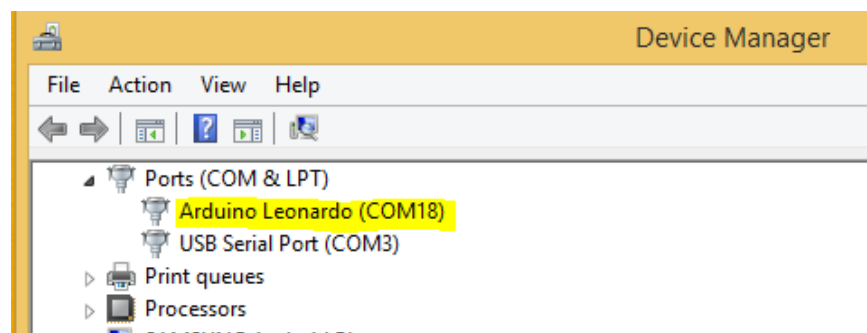

6. Install the Energia IDE

   1. Using Windows Explorer, create a deviceWISE folder on the C: (ie C:\deviceWISE)

   2. Download the Arduino 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. Run the Arduino installer and follow the prompted instructions

   5. Connect the USB Cable from the Arduino to the Windows computer

   6. Open Arduino by double clicking on the Desktop shortcut

   7. Select 'File' from the Arduino menubar and then 'Preferences'

   8. Enter "C:\deviceWISE" into the "Sketchbook location" field and press "OK"

   9. Select 'Tools' from the Arduino menubar then 'Board' and afterwards Arduino Leonardo

10. Open the Windows "Device Manager" on your computer
11. Find your "Arduino Leonardo" under "Ports" and take note of the COM port assigned (COM18 in this specific example)
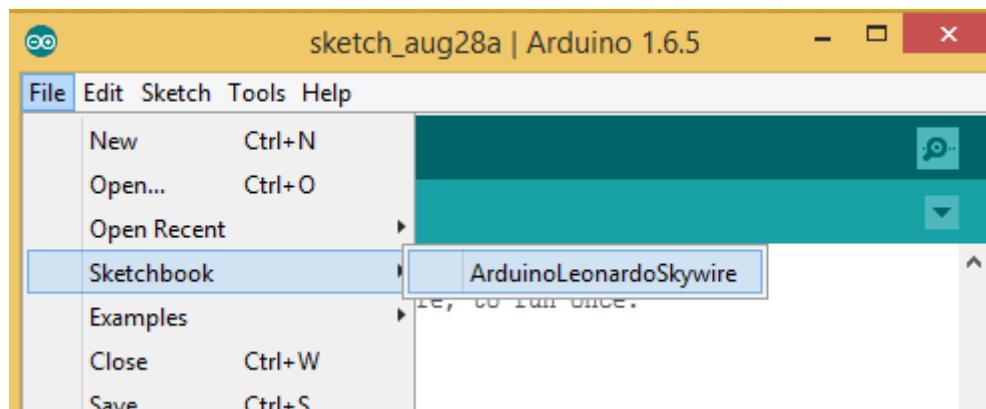

12. On Arduino select 'Tools' from the menubar and then 'Port'. Select the displayed COM port so it has a √ (Check) mark.
13. Exit Arduino by selecting "File" and then "Quit" from the Arduino menubar.

7. From within the file downloaded in step 2

    1. Copy the "ArduinoLeonardoSkywire" folder into C:\deviceWISE. This will result in a "C:\deviceWISE\ArduinoLeonardoSkywire" folder.

    2. Copy the "libraries" folder into C:\deviceWISE. This will result in a "C:\deviceWISE\libraries" folder.
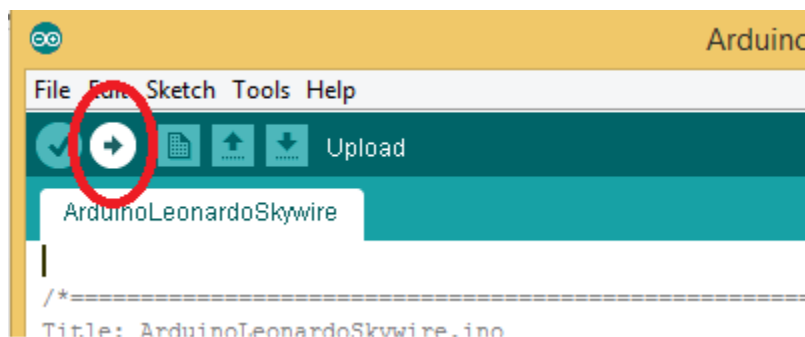
8. Open the Arduino IDE and select File->Sketchbook to load in the sample ArduinoLeonardoSkywire sketch.

9. Enter the m2m Application Token that was obtained in the earlier step

10. Compile and load the demo program onto the Arduino by pressing the "Upload" arrow button

11. After the Upload completes, press the "<Shift><Ctrl>M" keys to display the demo program output

12. Open the "Things" page on the Management Portal to display your device

13. 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.