How To: <u>Arduino Yun IoT</u>

Description

The Arduino Yun development platform is an open source, high performance board for prototyping Wearables and IoT devices. The Yun is unique as it has both an Atmel ATmega32U4 and Atheros AR9331 processor. The AR9331 runs Linux and the OpenWrt wireless stack. The Yun is programmed via the Arduino IDE similar to the Arduino Leonardo and provides a bridge interface to access some Linux features and network interfaces.

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

- Information Log Messages
- Location Data (Latitude, Longitude, etc)
- Ethernet MAC Attribute Information
- Analog Property Data
- Simulated Alarm Data

Software Prototyping Platform

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

Requirements

The following items are requirements for a working IoT:

- Arduino Yun Developer Board
- Grove Starter Kit for Arduino
- Windows Compatible PC with Internet Access
- Arduino Prototyping Platform (steps outlined below)
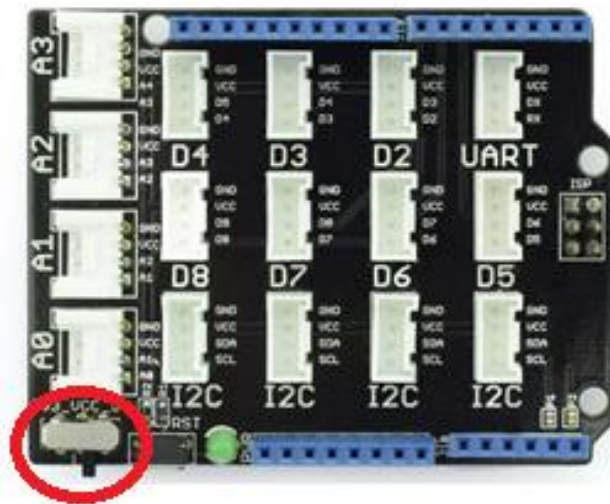
Setup

Setup for the Arduino Yun IoT consist of these steps:

1. Signup for an M2M Account on the Management Portal

2. Download the getting started file

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 'ArduinoYun
   4. In the 'Description' field enter 'ArduinoYun App'
   5. In the 'Auto Registration Thing Definition ID' select 'Arduino IoT'
   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 Arduino IDE

   1. Using Windows Explorer, create a deviceWISE folder on the C: (ie C:\deviceWISE)
   2. Download the Arduino package from [here](#)
   3. Run the Arduino installer and follow the prompted instructions
   4. Connect your Arduino Yun to your PC. The Arduino Yun will be automatically recognized – wait for Windows to install the USB device drivers
   5. Open the Arduino IDE by double clicking on the Desktop Arduino shortcut
   6. Select 'Tools' from the Arduino menubar then 'Board' and afterwards 'Arduino Yun'

7. Select 'Tools' from the menubar and then 'Serial Port'.

8. Select the "Arduino Yun Port"

9. Exit Arduino by selecting "File" and then "Quit" from the Arduino menubar.

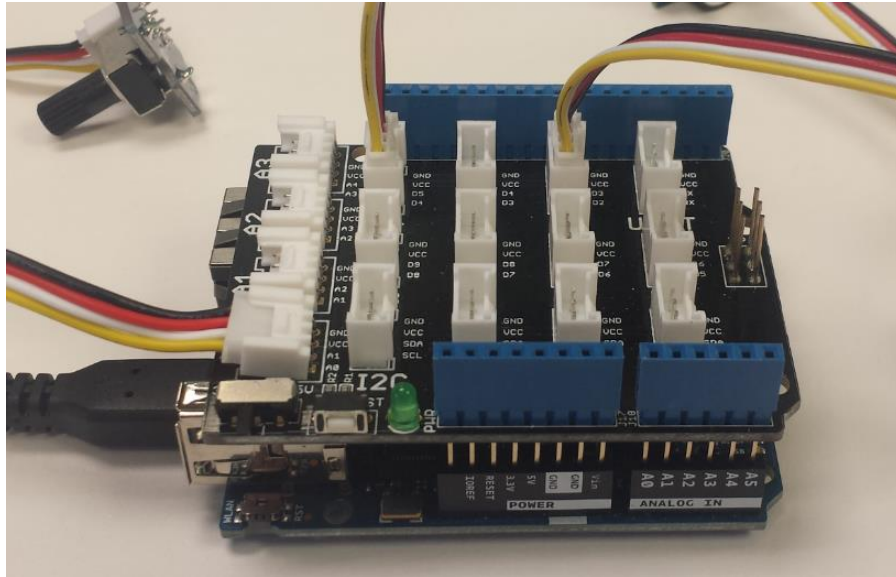6. Power down the Arduino Yun by unplugging it from the USB port

7. Set the VCC switch on the Grove Starter Kit Board to 5V

8. Connect Grove Kit sensors to the Grove Starter Kit Board
   1. Rotary Sensor to A0
   2. Buzzer to D2
   3. LED to D4

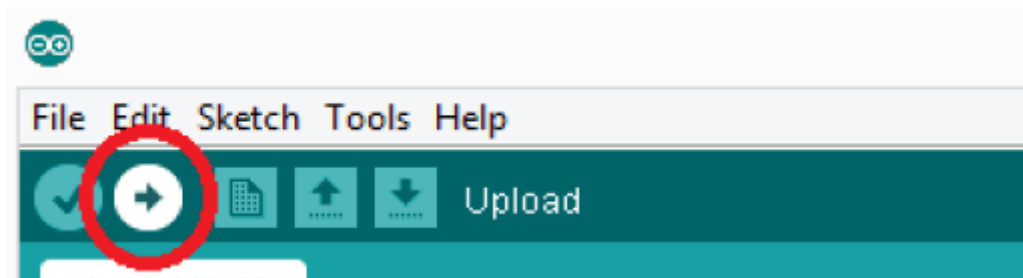9. Mount the Grove Starter Kit Board onto the Arduino Yun Developer board

10. Power up the Arduino Yun by plugging it back into the USB port
11. Configure the Arduino Yun onboard WiFi by following these steps: [Config WiFi](#)
12. Power down the Arduino Yun once the WiFi is configured
13. Power up the Arduino Yun by plugging it into the USB port
14. From within the file downloaded in step 2

   1. Copy the "dwYunWifi" folder into the …\Documents\Arduino folder. This will result in a "…\Documents\Arduino\dwYunWifi" folder.

   2. Copy the "libraries" folder into …\Documents\Arduino\libraries folder. This will result in a "…\Documents\Arduino\libraries\dwArduinoYunWiFiOpenClient" folder.

   3. Open the Arduino IDE and select File->Sketchbook to load in the sample dwYunWifi sketch.

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

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

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

15. Press the Shift-Ctrl-M keys (together) when the uploading is successfully completed to display the terminal emulator output of the Arduino Yun

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

17. 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.

18. Use the 'Methods' tab and the 'Set LED' method to turn ON and OFF the LED

19. Use the Rotary sensor to change the rotary properties. Notice that an Alarm will be set on the Portal when the rotary value exceeds the thresholds defined within the sample program.