Goal

To control a dishwasher using only the users voice. This page provides a setup guide for AWS Lambda functions, Amazon Developer Alexa Skills, Echo Dot, and Particle photon. This guide does not include the setup for creating a server to track electricity prices and triggering Lambda functions using AWS Cloudwatch.

Supplies

Particle Photon

Particle Relay Shield

12V Power Supply

Dishwasher

Amazon Echo Dot

Wires

Files

Folder: Dishwasher\_Alexa

Subfolder: Alexa\_Skill

File: Intent\_Schema

File: Sample\_Utterances

Subfolder: Particle\_firmware

File: alexa\_ino

Subfolder: Lambda

File: index

File: AlexaSkill

Node Module Folder: request

Creating a Lambda Function

1. Go to <https://console.aws.amazon.com/lambda>
2. Click “Functions”
3. Click “Create a Lambda function”

Select blueprint

1. Select runtime “Node.js 6.10” (This means we are coding in the most recent version of JavaScript, if a newer version is available select that option)
2. Click “Blank function”

Configure triggers

1. Click the dashed line box
2. Select “Alexa Skills Kit” (this allows us to create a ‘Skill’)
3. Click Next

Configure function

1. Give function a name, for example “Dishwasher”
2. Select code entry type “Upload a .ZIP file”
3. Upload the .zip file created using the steps dictated in “Creating a .zip file for your Lambda Function”
4. Leave Handler as “index.handler” (index refers to the code, somewhere in the code it should say exports.handler)
5. Select Role “Create new role from template(s)’
6. Give role a name, for example “SimplePermission”
7. Select policy template “Simple Microservice permissions”
8. Click Next

Review

1. Click “Create function”

Creating an Alexa Skill

1. Log in to <https://developer.amazon.com>
2. Click “Alexa” tab
3. Click “Get Started” under Alexa Skills Kit
4. Click “Add a new skill”

Skill Information

1. Select Skill Type “Custom Interaction Model” (building a custom skill)
2. Give skill a name, for example “Dishwasher”
3. Give skill an invocation name, for example “dishwasher” (this is what you would say to Alexa to activate the skill)
   1. For information on naming and invoking custom skills go to https://developer.amazon.com/public/solutions/alexa/alexa-skills-kit/docs/choosing-the-invocation-name-for-an-alexa-skill#invocation-name-requirements
4. Click “No” next to Audio Player
5. Click “Save”
6. Click “Interaction Model”

Interaction Model

1. Under Intent Schema copy and paste “Intent\_Schema” located in Dishwasher\_Alexa → Alexa\_Skill
2. Do not enter anything under Custom Slot Types
3. Under Sample Utterances copy and paste “Sample\_Utterances” located in Dishwasher\_Alexa → Alexa\_Skill
4. Click “Save”
5. Click “Configuration”

Configuration

1. Select Service Endpoint Type “AWS Lambda ARN”
2. Select “North America”
3. Copy and paste the ARN for your Lambda function
   1. Go to <https://console.aws.amazon.com/lambda>
   2. Click “Functions”
   3. Click on your function, for example “Dishwasher”
   4. Copy the ARN found in the upper right hand corner of the screen
   5. Go back to your skill configuration and paste the ARN under where it says “North America”
4. Select “No” under account linking
5. Do not select anything under permissions
6. Click “Save”

Setting up Echo Dot

1. Go to <http://echo.amazon.com/#skills>
2. Click “Begin Setup”
3. Click “Echo Dot”
4. Select “English”
5. Follow the instructions given on the Alexa app and by your Echo Dot to set up Wifi
6. Select “No speakers”
7. Click “Next” until the screen says “All done!”
8. Click “Go to Home”

Setting up Particle Photon

1. Insert Particle photon into Particle relay shield.
2. Plug the power supply into the relay shield and the other end into the wall.
3. Hold down the SETUP button on your device and it should start blinking blue
4. Go to setup.particle.io
5. Make an account
6. Click “Setup a photon”
7. Click “Next”
8. Click “Continue with Local File”
9. Open file that just downloaded called photosetup.html
10. Connect to wifi network “Photon-XXXX” on your computer
11. Enter your wifi information on the webpage
12. Reconnect to your wifi network on your computer
13. Click “Name your device”
14. Enter name, for example my-particle

Uploading Firmware to Photon Particle

1. Go to <https://build.particle.io/build>
2. Click “Code” tab
3. Name app “alexa”
   1. A tab at the top named alexa.ino should show up
   2. Copy and paste code from the alexa\_ino Sublime Text file located in Dishwasher\_Alexa → Particle\_Firmware.
4. Click “Save” located in the upper left hand corner
5. Click “Verify”  located in the upper left hand corner
6. Click “Flash” located in the upper left hand corner

NOTE: You must go through the setup again if connecting on a different wifi network. Photon particle can save up to 5 networks.

Changing the Code to work with your Devices

1. Go to your Dishwasher Lambda function
2. Select “Edit code inline”
3. Locate the following three parts of code
   1. var APP\_ID = “<<appid>>”;
   2. var deviceid = “<<deviceid>>”;
   3. var accessToken = “<<accesstoken>>”;

Finding the Application ID (Alexa Skill)

1. Go to <https://developer.amazon.com/edw/home.html#/skills>
2. Click “View Skill ID” under the name of your skill
3. The Application ID should be displayed
4. Replace <<appid>> in the code with your Application ID.

Finding the Action Device ID (Photon Particle)

1. Go to <https://build.particle.io>
2. Click “Devices”
3. Click the arrow next to your device
4. The device ID should be displayed
5. Replace <<deviceid>> in the code with your Device ID.

Finding the access token (Photon Particle)

1. Go to <https://build.particle.io>
2. Click “Settings”
3. Access token should be displayed
4. Replace <<accesstoken>> in the code with your access token.

Creating a .zip file for your Lambda Function

1. Go to <http://www.7-zip.org/> and download the correct version of 7zip to your computer. Manually zipping files using your computers built in zip function may lead to issues when uploading to AWS Lambda.
2. Open 7zip
3. Navigate to the ‘Lambda’ folder containing request, index.js, and AlexaSkill.js and select all of the files in this folder
4. Click Add
5. Change the archive format to .zip
6. Click OK
7. A .zip folder should show up in the same folder as the other files

Connecting Relay Shield and Dishwasher

1. Insert one end of a wire into relays one through three and tighten the screw on the relay to secure it.
2. Solder the other end of the wire connected to relay one to the power button on the dishwasher.
3. Solder the other end of the wire connected to relay two to the start button on the dishwasher.
4. Solder the other end of the wire connected to relay three to the wash cycle button on the dishwasher.