# SiFive Learn Inventor

# Getting Started Guide

# Version 1.0

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## Release Information

| Version | Date | Changes |
| --- | --- | --- |
| 1.0 | November 26, 2019 | Initial Release |

# Contents

# Chapter 1

# Overview

This tutorial provides instructions for getting started with the SiFive Learn Inventor development system. If you do not already have the SiFive Learn Inventor, visit https://pimoroni.com/sifive.

You can find the development IDE, user manual, toolchain and SDK for the board here: https://www.sifive.com/boards.

Before you begin, you must configure AWS IoT and your Amazon FreeRTOS installation to con- nect your device to the AWS Cloud. See the following chapters for instructions. In this tutorial, the path to the Amazon FreeRTOS download directory is referred to as amazon-freertos.

# Chapter 2

# Required Hardware

Using the SiFive Learn Inventor requires the following hardware.

## 2.1 SiFive Learn Inventor

The SiFive Learn Inventor is a development board for the FE310-G003, a microcontroller with an E31 RISC-V RV32IMAC CPU.

## 2.2 USB Cable

A standard USB Type A Male to Micro-B Male cable is used to connect a host system to the SiFive Learn Inventor. A USB connection is used for power and communication.

- USB cable example:

  http://store.digilentinc.com/usb-a-to-micro-b-cable/

# Chapter 3

# Set Up the Hardware

No special setup for the SiFive Learn Inventor is required - just plug it into your computer with the USB cable. Before doing so, it is recommended that you install drivers for the built-in Segger J-Link OB debug module.

See the following link for downloads relating to the Segger J-Link OB debug module:

https://www.segger.com/products/debug-probes/j-link/models/j-link-ob/

Once you have connected the board to your computer, you will have two serial ports and the J-Link debugger available. One serial port is used for SiFIve CPU debug output, and the other serial port outputs ESP32 Wi-Fi module log messages. Both serial ports are configured to use 115200 8N1.

As the board uses a Wi-Fi internet connection, you will need a Wi-Fi access point available.

# Chapter 4

# Set Up the Development Environment

1. Download Amazon FreeRTOS from the Amazon FreeRTOS Github repository. Be sure to select the proper configuration for the SiFive Learn Inventor.
2. Download SiFive Freedom Studio from here; follow the User Manual for installation.

# Chapter 5

# Build the Amazon FreeRTOS Demo Project

1. Open Freedom Studio and enter a name for a new workspace.
2. From the **File** menu, choose **Import**.
   Expand **General**, choose **Existing Projects into Workspace**, then choose **Next**.
3. In **Select Root Directory**, locate the download folder for Amazon FreeRTOS and enter `projects\sifive\hifive1_rev_b\freedom_studio\aws_demos`.
4. The project `aws_demos` should be selected by default.
5. Choose **Finish** to import the project into Freedom Studio.
6. From the **Project** menu, choose **Build All**.
   Confirm that the project compiles without any errors.

# Chapter 6

# Run and Debug the Amazon FreeRTOS Demo Project

1. With the SiFive Learn Inventor connected to your computer using a USB cable, open Freedom Studio.
2. From **Project Explorer**, right-click aws_demos, choose **Debug As**, and then choose **Debug Configurations**.
3. In the **Debug Configurations** dialog, right-click on **SiFive GDB SEGGER J-Link Debugging** and create a **new** debug configuration.
4. Click on the **Target DTS** tab and select the following path:
   `vendors\sifive\boards\hifive1_rev_b\aws_demos\application_code\sifive_code\bsp\PapayaConfig.dts`.
5. Click on the **Debugger** tab and select **Device Name** FE310.
6. Choose **Apply**, and then choose **Debug**.
7. When the debugger stops at the breakpoint in `main()`, from the **Run** menu, choose **Resume**.

# Chapter 7

# Troubleshooting

There are no known issues at this time.