IOT DEVELOPMENT KIT QUICKSTART GUIDE

NC STATE UNIVERSITY

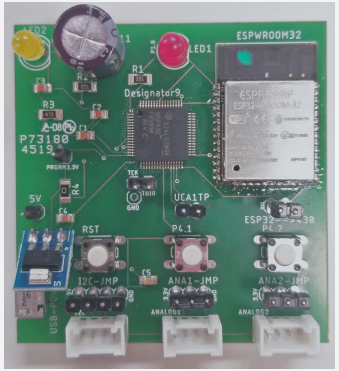
Texas Instruments

Scout IoT Development Kit MSP430FR5994 and ESP32

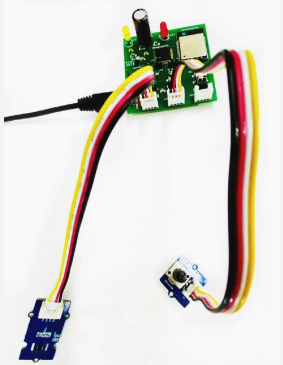
The IoT field can be intimidating to those with little experience. The Scout is a user-friendly and inexpensive platform for IoT development that is a viable option for users at any experience level. All that is required is a TI Launchpad and Code Composer Studio. The Scout is compatible with SEEED Grove Sensors right out of the box.

Required Hardware:

- MSP-EXP430FR5994 LaunchPad
- PC
- 2 x MicroUSB cables
- Jumper wires
- Sensors



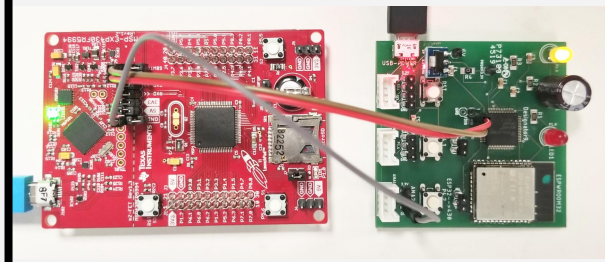
The Scout IoT DevKit



The Scout with 2 SEEED Grove Sensors

Flashing software to the MCU

1. Install Code Composer Studio
2. Clone one of the example projects from https://github.com/NCSU-Scout-IoT/SeniorDesignF2019
3. Connect the TCK, TDIO, and GND pins to the same pins on your MSP-EXP430FR5994 LaunchPad and power your board
4. Connect your LaunchPad to your PC
5. Flash the program using Code Composer Studio.



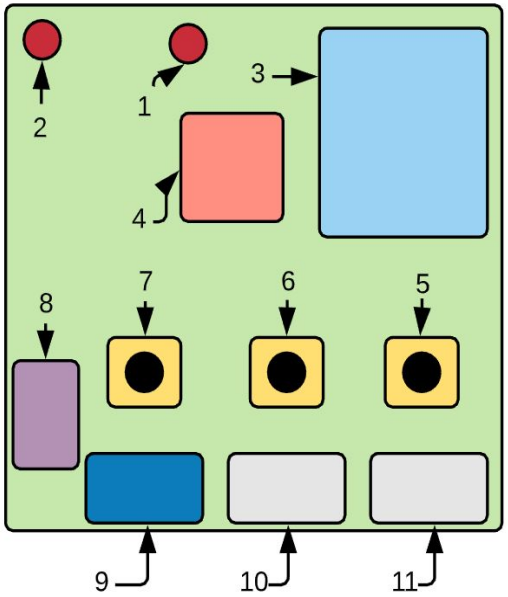
The Launchpad connected to the Scout for programming

Out-of-box Examples

Go to [link] for all the out-of-box example projects.

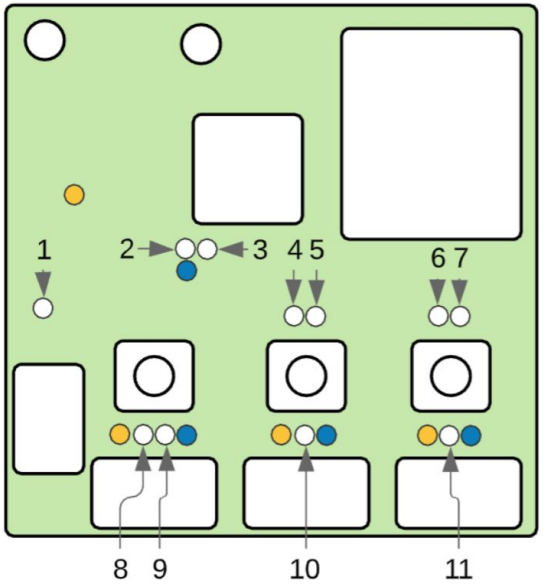
The full IoT example project will take data from an analog sensor, convert it to a percentage and send the data to Microsoft Azure IoT Hub when given an SSID, password, and IoT Hub connection string. For more information about IoT Hub, refer to https://docs.microsoft.com/en-us/azure/iot-hub/about-iot-hub

General Layout



1. LED 1 (p1.0)
2. LED 2 (p4.0)
3. ESP32
4. MSP430
5. Button 1 (p4.2)
6. Button 2 (p4.1)
7. Button 3 (RST)
8. USB Port
9. I2C Digital SEEED Sensor Port SDA(p7.0)/SCL(p7.1)
10. Analog SEEED Sensor Port 1 (p1.4)
11. Analog SEEED Sensor Port 2 (p1.3)

Pin Layout



= 3.3V

= Ground

1. 5V
2. TCK
3. TDIO
4. UCA1 TX
5. UCA1 RX
6. MSP430 -> ESP32
7. ESP32 -> MSP430
8. SDA (p7.0)
9. SCL (p7.1)
10. P1.4
11. P1.3

Pins accessible by headers on the board. Note: UCA1 is not connected to anything except the headers. Headers 8, 9, 10, and 11 are connected to the Grove connectors.

Setting Up the Scout For Use With a TI Boosterpack

You will need 4 female-to-female jumper wires

- Connect headers on both boards that are labeled:
  - GND
  - 3.3V
  - SDA
  - SCL

This process can be used for almost any 3.3V digital sensor using I2C!