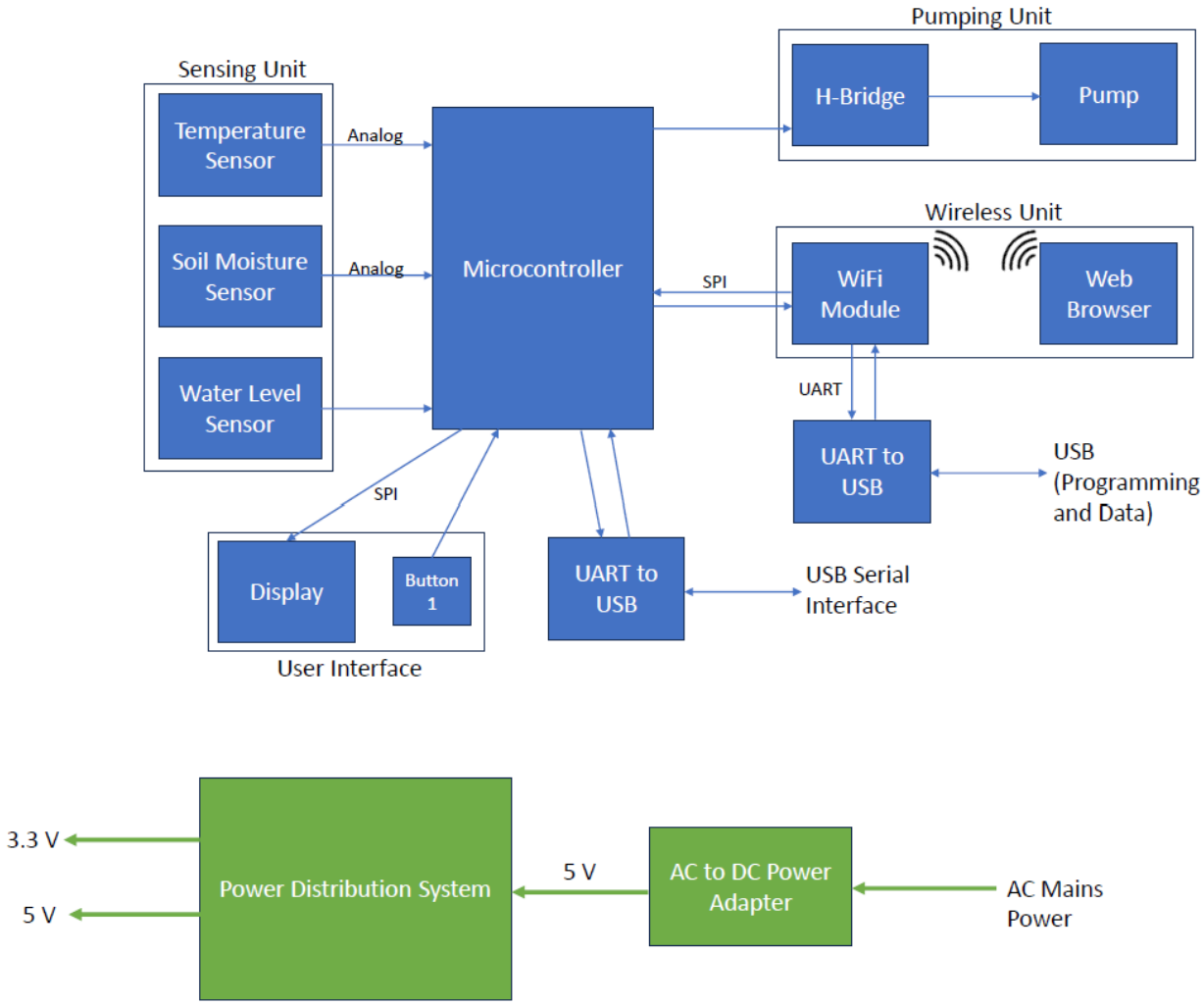
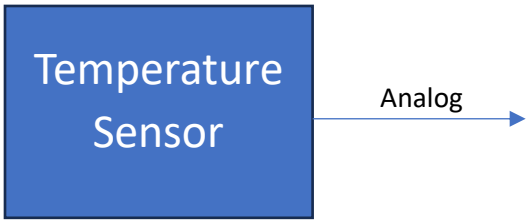
Smart Pot Automatic Plant Watering System

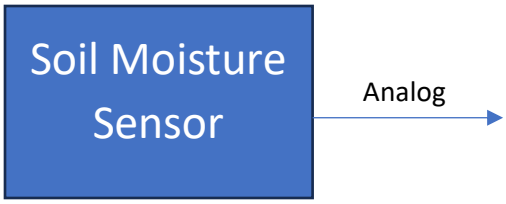
Block Diagram for the System:



More detailed descriptions of each block are provided in the following pages.



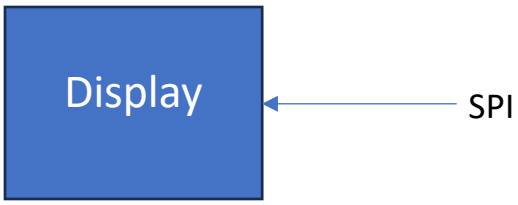
- Inputs
  - a 3.3 V DC power supply
- Outputs
  - Analog signal indicating temperature
- Function
  - Senses the temperature of the air and communicates these values via an analog signal



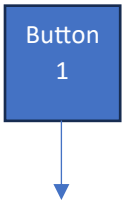
<u>Soil Moisture Sensor:</u>

- Inputs
  - A 3.3 V DC power supply
- Outputs
  - An analog signal between 0 and 3.3 V
- Function
  - Senses the moisture of the soil and outputs as an analog voltage

- Inputs
  - A 3.3 V DC power supply
- Outputs
  - A digital signal indicating if the water level is low
- Function
  - Senses if the water level in the reservoir is too low and needs to be refilled



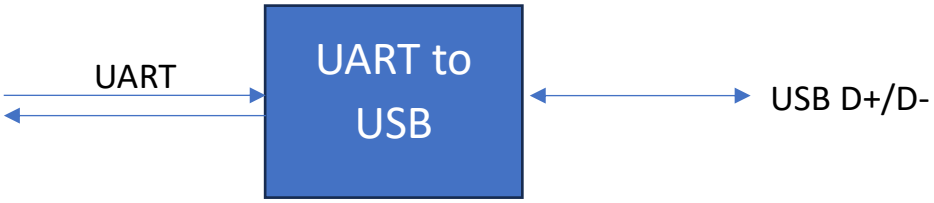
- Inputs
  - An up to 5 V DC voltage
  - SPI CLK, CS, and Data In digital lines
- Outputs
  - none
- Function
  - Displays relevant information and data on a screen



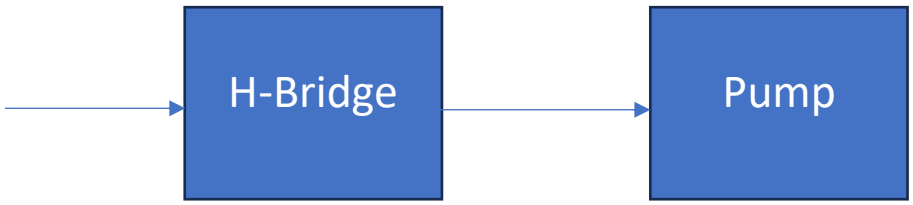
- Inputs
  - 3.3 V DC
- Outputs
  - A digital signal indicating if the button has been pressed
- Function
  - Provides a signal for button pushes

- Inputs
  - 3.3 V DC
  - SPI CLK, CS, and Data In digital signal
  - UART Data In
  - RF signal compliant with 802.11 a/g/n
- Outputs
  - SPI Data Out digital signal
  - UART Data out
  - RF signal compliant with 802.11 a/g/n
  - USB-C port
- Function

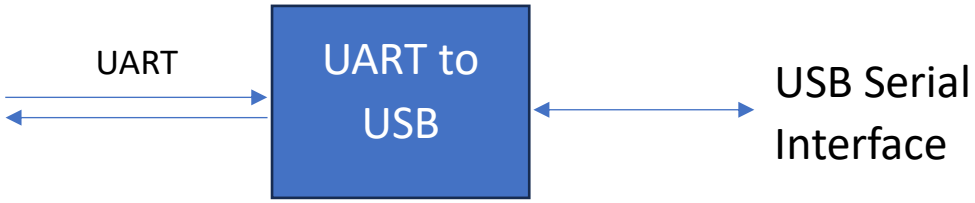
- Receives a message over SPI and publishes the message via WiFi; also repeats the received data from the SPI line through a UART line



- Inputs
  - 3.3 V DC
  - UART Data in
- Outputs
  - UART Data out
  - USB D+/D-
- Function
  - Translates the UART message to USB and vice versa. The USB lines can be sent to interface with a computer. Ultimately, this will be the interface for programming the WiFi module, and will also allow the data to be sent to a computer serially.



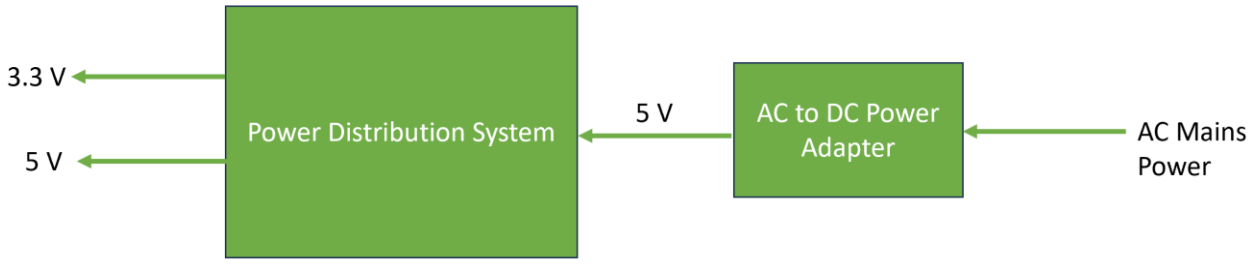
- Inputs
  - 3.3 V DC and 5 V DC
  - 3.3V digital input to control the pump speed
- Outputs
  - A 5 V pulse width modulated signal going to the pump
- Function
  - Produces a driving voltage for the pump



- Inputs
  - UART RX and USB D+/-
  - 3.3 V DC
- Outputs
  - UART TX
- Function

- Provides serial communication to computer terminal for microcontroller

- Inputs
  - 3.3V DC
  - 1x analog signal
  - 4x digital signals
- Outputs
  - 1x PWM signal
- Serial Communications
  - 1x UART
  - 2x SPI
- Function
  - Acts as the central device that interprets sensor signals and controls the entire device



- Inputs
  - An AC power source of 100 VAC to 240 VAC with line frequency of 50-60 Hz
- Outputs
  - 3.3 V DC
  - 5 V DC

- Function
    - Converts the AC mains voltage to a logic level 3.3 V DC voltage and a 5 V DC voltage