Jul 24, 2022

Arduino

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Mock-Coastal-Environment

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ABSTRACT

This guide shows how to assemble The electronic components of the Mock Coastal Environment. This build uses a prototyping breadboard and wires. It should be noted that soldering of components and wires would make a more permanent solution but is outside the scope of this protocol.

PROTOCOL CITATION

bibewih 2022. Arduino. **protocols.io** https://protocols.io/view/arduino-cd4rs8v6

CREATED

Jul 24, 2022

LAST MODIFIED

Jul 24, 2022

PROTOCOL INTEGER ID

67441

MATERIALS TEXT

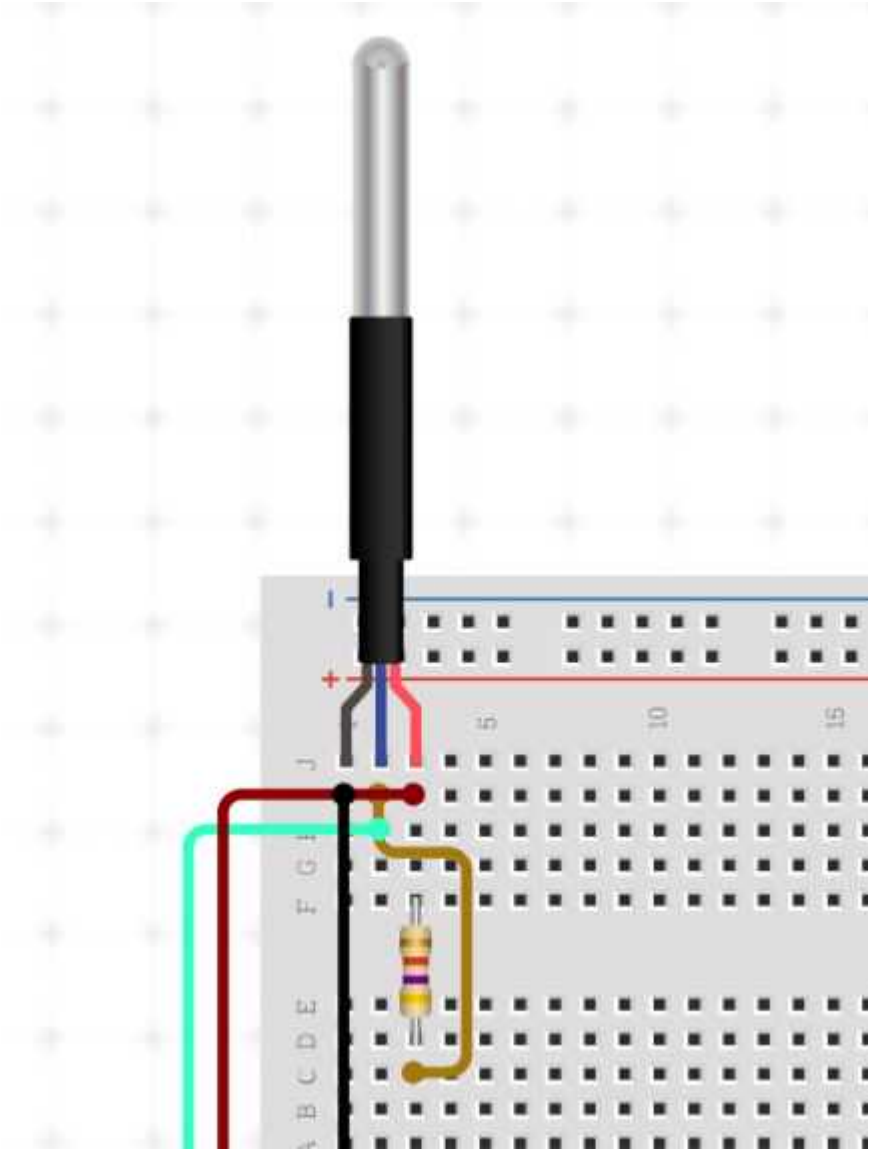
- Arduino Mega 2560 (https://www.amazon.com/ARDUINO-MEGA-2560-REV3-A000067/dp/B0046AMGW0/)
- Breadboard & wires (https://www.amazon.com/BOJACK-Values-Solderless-Breadboard-Flexible/dp/B08Y59P6D1)

- USB cable for Arduino (https://www.amazon.com/StarTech-com-3-Feet-USB-Certified-Cable/dp/B001GTW5Z2)
- Power cable for Arduino (https://www.amazon.com/Adapter-Arduino-Schwinn-Elliptical-Recumbent/dp/B06Y1LF8T5)
- 20x4 i2c LCD screen (https://www.amazon.com/SunFounder-Serial-Module-Arduino-Mega2560/dp/B01GPUMP9C)
- DS18B20 Temperature Sensor Waterproof (https://www.amazon.com/Gikfun-DS18B20-Temperature-Waterproof-EK1083x3/dp/B012C597T0)
- Mount Screw Terminal Block Connector (https://www.amazon.com/KeeYees-60pcs-Terminal-Connector-Arduino/dp/B07H5G7GC6)
- Fork spade wire connectors (https://www.amazon.com/Insulated-Connectors-Electrical-Terminals-MILAPEAK/dp/B07Q2XMKXZ)
- 4ch AC relay (https://www.amazon.com/SainSmart-101-70-101-4-Channel-Relay-Module/dp/B0057OC5O8)
- Iot Relay (https://dlidirect.com/products/iot-power-relay)
- Raspberry Pi (https://www.amazon.com/Raspberry-Model-2019-Quad-Bluetooth/dp/B07TD42S27)
- Power cable for Pi (https://www.amazon.com/Raspberry-Model-Official-SC0218-Accessory/dp/B07W8XHMJZ)
- Case for Pi (https://www.amazon.com/Miuzei-Raspberry-Aluminum-Included-Black/dp/B07VX3HQGJ)
- sd card for Pi (https://www.amazon.com/SDSDQUA-064G-A11-Professional-MicroSDXC-formatted-recording/dp/106171327X)

1 Wire components to Arduino board as depicted in wiring diagrams.

1.1 Setup breadboard by attaching a red wire from (+) to 5V on and black (-) wires to GND on Arduino board.

1.2



Wire the waterproof thermometer sensor as shown in the diagram above. The red wire to (+) and the black wire to (-) on breadboard. A 4.7k Ohm resistor links the red wire to the yellow (depicted blue in diagram) wire. The yellow wire is also connected to the 7 digital pin on the Arduino (teal lead on diagram). Thread the sensor through the hole in the metal collar of the water bath with enough wire to submerge in water.

1.3 Connect LCD screen by connecting SDA and SCL to respective digital pins on the Arduino. The VCC should be connected to positive (+) and GND to negative

(-) on the breadboard.

1.4 Connect IOT relay to Arduino by connecting the 6 digital pin on the Arduino to the positive (+) terminal on the relay and connect the negative (-) terminal on the relay to negative (-) on the breadboard.

1.5 Cut 8" from the white wire of both 3d printer heating pads used to assemble the water bath. Attach fork spade wire connectors to both wires. use these connectors to connect both to the V+ screw terminal on the power supply located in the electronic enclosure on the water bath. Connect the other ends of the white wires to two of the relays on the 4ch relay board. connect the white wires on the heating pads to the other connection on the relay. Attach fork spade wire connectors to the unconnected wires on the heating pads and attach them to the V- screw terminal on the water bath's power supply. Connect VCC and GND on 4ch relay board to positive (+) and (-) on breadboard respectively. Connect the inputs for the used relays to digital pins 8 and 9 on the Arduino.

2 Download Arduino IDE from https://www.arduino.cc/en/software on your personal computer.

3 Open Arduino IDE and connect Arduino board to computer with USB cable.

4 Obtain code for Arduino at https://anonymous.4open.science/r/Mock-Coastal-Environment-8C1E/

5 Upload code to Arduino. Follow the guide here: https://docs.arduino.cc/software/ide-v2/tutorials/getting-started/ide-v2-uploading-a-sketch

6 If using Raspberry Pi, setup using the instructions provided here: https://projects.raspberrypi.org/en/projects/raspberry-pi-setting-up

7 Obtain Temperature scripts from same link in step 5 and load them on the computer or raspberry pi.

8 Turn on water bath, IOT relay, and Arduino. Connect computer or raspberry pi to Arduino using

USB cable.

9 Run Temperature script on computer or raspberry pi.