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MATLAB-Arduino Water Level Sensor with Wireless Data Upload- Hardware Setup

**Hardware Setup:**

Bill of Materials:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Part Name | Purpose | Item Name | URL | Price |
| Arduino | a programmable microcontroller circuit board and a piece of [software](http://arduino.cc/en/Main/Software)(IDE) that runs on your computer, used to write and upload computer code to the physical board | SparkFun RedBoard-Programmed with Arduino | https://www.sparkfun.com/products/13975 | $19.95 |
| Water level sensor | Measures the water level - a solid-state sensor with a resistive output that varies with the level of the fluid | 12” eTape Liquid Level Sensor | https://www.adafruit.com/product/464 | $39.95 |
| 470 Ω resistor | Provides an additional 470Ω of electrical resistance to the circuit | 470-Ohm 1/2-Watt 5% Carbon Film Resistor | https://www.amazon.com/Projects-100EP512470R-470-Resistors-Pack/dp/B0185FIDF0/ref=sr\_1\_3?ie=UTF8&qid=1521524413&sr=8-3&keywords=470+ohm+resistor | $ 0.07 |
| Breadboard | Solderless breadboard used as a construction base in developing an electronic circuit | Breadboard - Self-Adhesive (White) | https://www.sparkfun.com/products/12002 | $4.95 |
| Wifi Adapter | Give any microcontroller access to your WiFi network | WiFi Module - ESP8266 | https://www.sparkfun.com/products/13678 | $ 6.95 |
| Jumper Wires | 155mm long jumpers, interconnect the Arduino and breadboard components | Jumper Wires Premium 6" M/M Pack of 10 | https://www.sparkfun.com/products/8431 | $(3.95)\*2 =7.90 |
| Breadboard Base | Plastic plate with space to  Hold the Arduino and breadboard in place | Arduino and Breadboard Holder | https://www.sparkfun.com/products/11235 | $3.95 |
| Mini\_B USB cable | USB 2.0 type A to Mini-B 5-pin cable-Connects arduino to computer | SparkFun Mini\_B USB cable-6ft | https://www.sparkfun.com/products/11301 | $3.95 |

Hardware Schematic:

Hookup Guide:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Part | Pin | Connector | Pin | Part |
| Arduino | 5v | M2M | in | 470 ohm resistor |
| 470 ohm resistor | out | M2M | A0 | Arduino |
| Wire | 2 | M2M | HV2 | Logic board |
| Wire | 3 | M2M | HV1 | Logic board |
| Wire | GND | M2M | GND | Breadboard |
| Wire | A0 | M2M | Breadboard | Resistor |
| Wire | 5V | M2M | HV | Logic board |
| Wire | GND | M2M | GND | ESP |
| Wire | 5V | M2M | RST | ESP |
| Wire | 5V | M2M | CHPD | ESP |
| Wire | 5V | M2M | VCC | ESP |
| Wire | LV1 | M2M | RDX | ESP |
| Wire | LV2 | M2M | TDX | EPS |
| Wire | LV | M2M | 5V | Breadboard |
| Wire | GND (3V) | M2M | GND | Logic board |
| Wire | GND | M2F | GND | Water level sensor |
| Wire | 5V | M2F | A0 | Water level sensor |

The power board and arduino are powered through chords connecting to the computer. The arduino connects to the logic board through the 0 to the HV1, the 1 to the HV2 and the 5V to the HV. The arduino also connects the A0 to the power after it goes through the 470 ohm resistor and connect the GND to the GND on the 3.3V side of the breadboard. The logic board connects the ESP through the LV1 to the RXD and the LV2 to the TXD. This connection helps in the receiving and outputting of the ESP. The ESP connects the GND to the breadboard GND and the 5V to the RST, VCC, and the CHPD. The water level sensor would then connect to the GND with one wire and the voltage from the 5V passing through the resistor on the other side. The water level sensor piece then uses this to output different ohm values to us based on the level of the water.

Images:







