**Team 302 Component Selection**

Comins, Hawthorne, Onyenso, Salt

**Sensor #1: Water Level**

| **Solution** | **Pro(s)** | **Con(s)** |
| --- | --- | --- |
| **Picture** | * Application Specific * Printed measurement system on sensor * Wide temperature operating range * Intuitive operation * Temperature Compensation | * Expensive * No-solder pins * Wider tolerance at higher values |
| **Option#1** | eTape PN-12110215TC-12 | |
| **Description** | A solid state, continuous (multi-level) fluid level sensor for measuring levels in water, non-corrosive water based liquids and dry fluids. (powders) | |
| **Price** | $39.95 | |
| **Link** | [Link](https://www.digikey.com/en/products/detail/adafruit-industries-llc/464/8558263) | |

| **Solution** | **Pro(s)** | **Con(s)** |
| --- | --- | --- |
| **Picture** | * Relatively cheap * Thin * Wide range of actuation force * Sensitive * Durable * Variety of configurations | * Too basic * Water resistance is questionable * Requires more setup * Questionable physical integration into main device |
| **Option#1** | Interlink Electronics FSR® 408-300 | |
| **Description** | A robust polymer thick film (PTF) device that exhibits a decrease in resistance with increase in force applied to the surface of the sensor. | |
| **Price** | $21.95 | |
| **Link** | [Link](https://www.digikey.com/en/products/detail/interlink-electronics/34-00071/7672216) | |

| **Solution** | **Pro(s)** | **Con(s)** |
| --- | --- | --- |
| **Picture** | * Higher penetration power * Waterproof * Dustproof * Direct serial connection * Easy setup * Durable * Aesthetically pleasing * Cheap | * Awkward implementation * May interfere with data collection * May impact results |
| **Option#1** | DFRobot A02YYUW Waterproof Ultrasonic Sensor | |
| **Description** | An ultrasonic distance sensor determines the distance to a target by measuring time lapses between the sending and receiving of the ultrasonic pulse. | |
| **Price** | $18.62 | |
| **Link** | [Link](https://www.digikey.com/en/products/detail/dfrobot/SEN0311/11202577) | |

**Final Selection**

**Sensor #1: Water Level**

For sensor #1, the water level sensor, we chose to go with **Option #1,**  what this option provides more than every other option in its category is simplicity. It may be on the pricier side, but the sensor is catered to the direction we want to take our project. We expect its integration to be straightforward and simple, with the caveat of not being able to solder the pins on it. Option #3 was also in consideration for what it had to offer at the price it was at, however it appeared to be more general as opposed to option #1’s focused intent.

**Motor Driver**

| **Solution** | **Pro(s)** | **Con(s)** |
| --- | --- | --- |
| **Picture** | * Can work with 3.3V * Relatively inexpensive |  |
| **Option#2** | TLE94103EPXUMA1CT-ND | |
| **Description** | IC HALF BRIDGE DRVR 2A TSDSO-14 | |
| **Price** | $1.96 | |
| **Link** | [Link](https://www.digikey.com/en/products/detail/infineon-technologies/TLE94103EPXUMA1/8627132) | |

| **Solution** | **Pro(s)** | **Con(s)** |
| --- | --- | --- |
| **Picture** | * Relatively easy set up | * Bare minimum datasheet * Supply voltage 18 |
| **Option#3** | 620-1498-1-ND | |
| **Description** | IC HALF BRIDGE DRIVER 1A 10SSOP | |
| **Price** | $1.43 | |
| **Link** | [Link](https://www.digikey.com/en/products/detail/allegro-microsystems/A3909GLNTR-T/3979655) | |

| **Solution** | **Pro(s)** | **Con(s)** |
| --- | --- | --- |
| **Picture** | * Used in class * Well developed data sheet * Multiple funtions | * Expensive * Harder to configure |
| **Option#3** | IFX9201SGAUMA1CT-ND | |
| **Description** | IC HALF BRIDGE DRIVER 6A 12DSO | |
| **Price** | $3.79 | |
| **Link** | [Link](https://www.digikey.com/en/products/detail/infineon-technologies/IFX9201SGAUMA1/5415542) | |

**Final Selection:**

**Option #1:**

rational

**Atmospheric Pressure Sensor**

| **Solution** | **Pro(s)** | **Con(s)** |
| --- | --- | --- |
| **Picture** | * 0.5% accuracy offset * Low operating voltage * High temperature range | * Expensive |
| **Option 1** | BLCR-L10D-U2 | |
| **Description** | Barometric SENSOR 0.36PSIG 0.12" .032V | |
| **Price** | $37.41 | |
| **Link** | [Link](https://www.digikey.com/en/products/detail/BLCR-L10D-U2/9838276) | |

| **Solution** | **Pro(s)** | **Con(s)** |
| --- | --- | --- |
| **Picture** | * Works with 5V supply voltage * Accurate in high temperature scenarios * Easy to Install | * Expensive * 1.5% Accuracy offset |
| **Option 2** | MPXH6400AC6U | |
| **Description** | Barometric SENSOR 58.02PSIA 0.13" 4.8V SSOP | |
| **Price** | $18.51 | |
| **Link** | [Link](https://www.digikey.com/en/products/detail/MPXH6400AC6U/1168412) | |

| **Solution** | **Pro(s)** | **Con(s)** |
| --- | --- | --- |
| **Picture** | * High Temperature range * Easy to Install * High max operating pressure * Low operating voltage | * Expensive * Through Hole |
| **Option 3** | ADP41913 | |
| **Description** | Barometric SENSOR 142.24PSIG 0.1" .065V | |
| **Price** | $19.75 | |
| **Link** | [Link](https://www.digikey.com/en/products/detail/ADP41913/644703) | |

**Final Selection:**

**Option 1: BLCR-L10D-U2**

The sensor is easy to install, has a favorable operating range and is accurate with a .5% offset even in high temperatures.

| **Solution** | **Pro(s)** | **Con(s)** |
| --- | --- | --- |
| **Picture** | * Less expensive * Simple to use * Standard footprint | * Less extensive data sheet |
| **Option 1** | MCP3221A0T-E/OTCT-ND | |
| **Description** | IC ADC 12BIT SAR SOT23-5 | |
| **Price** | $1.91 | |
| **Link** | [Link](https://www.digikey.com/en/products/detail/microchip-technology/MCP3221A0T-E-OT/2601429) | |

| **Solution** | **Pro(s)** | **Con(s)** |
| --- | --- | --- |
| **Picture** | * Good datasheet * 3 analog inputs * Runs on either 5V and 3.3V | * Might need a larger set up * Expensive |
| **Option 2** | MAX11613EUA+CT-ND | |
| **Description** | IC ADC 12BIT SAR 8UMAX | |
| **Price** | $4.15 | |
| **Link** | [Link](https://www.digikey.com/en/products/detail/analog-devices-inc-maxim-integrated/MAX11613EUA-T/2062201) | |

| **Solution** | **Pro(s)** | **Con(s)** |
| --- | --- | --- |
| **Picture** | * Typical to use * Uses I2C (easy) | * Relatively Expensive * Might be difficult to solder |
| **Option 3** | LTC2451CDDB#TRMPBFCT-ND | |
| **Description** | IC ADC 16BIT SIGMA-DELTA 8DFN | |
| **Price** | $3.77 | |
| **Link** | [Link](https://www.digikey.com/en/products/detail/analog-devices-inc/LTC2451CDDB-TRMPBF/1785517) | |

**Final Selection:**