

# How it works

Assemble the device

Attatch the transducer

Configure the msp430 to accept frequencies, to  
place in the memory map.

## Need

Milk allergy can cause anaphylaxis, which is a reaction that narrows the airways and can block breathing.

Milk is the third most common food after peanuts and tree nuts, which cause anaphylaxis.

This design aims to assist in how clean a product can be.

Our design would boost the confidence of consumption from smaller grocery stores.

food products creating a sustained culture of selling edible products.

## Objective

Design a data transfer device that will provide a test signal, for the purpose of evaluating consumable liquid.

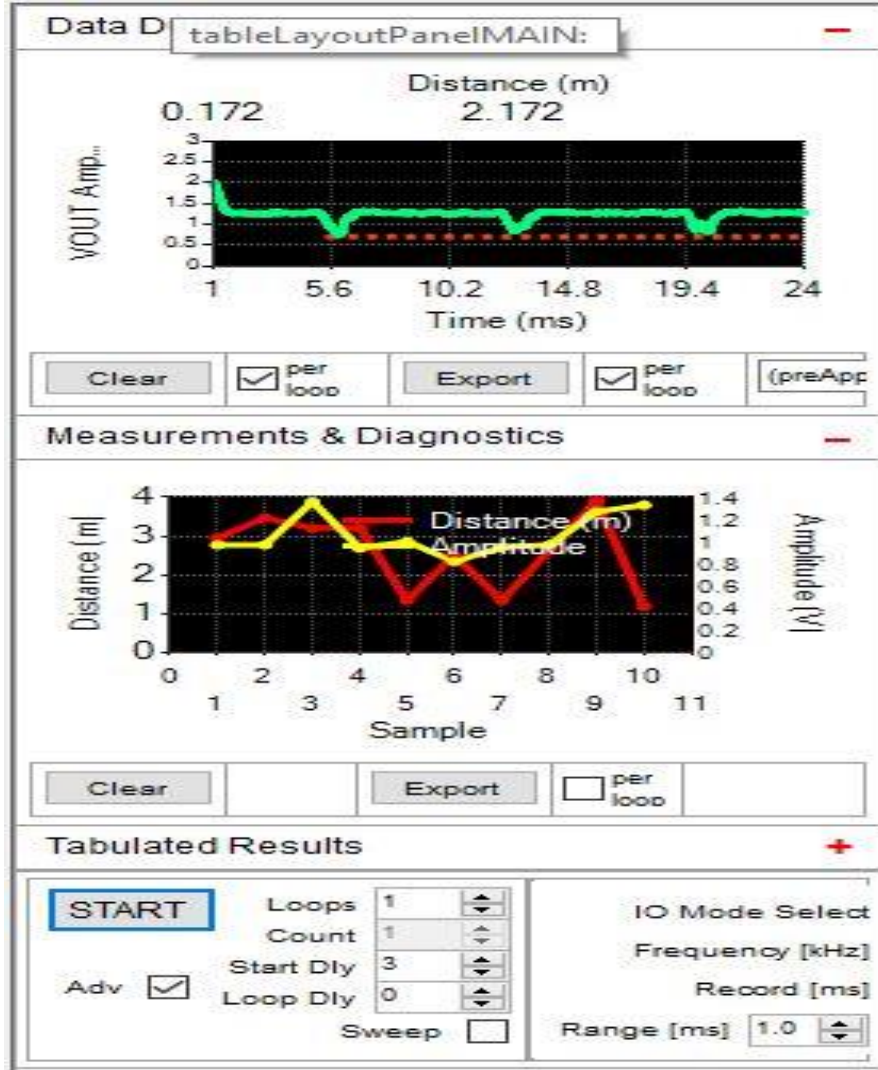
The device will transmit updated information without using invasive techniques that could risk contamination. The frequency will measure the electrical signatures of ions within the tested liquid, providing a reflected impedance for analysis.

The device should be adjustable for the intended frequency range of the ultrasonic transducer for sensors testing range meaning it will store information data remote and locally.

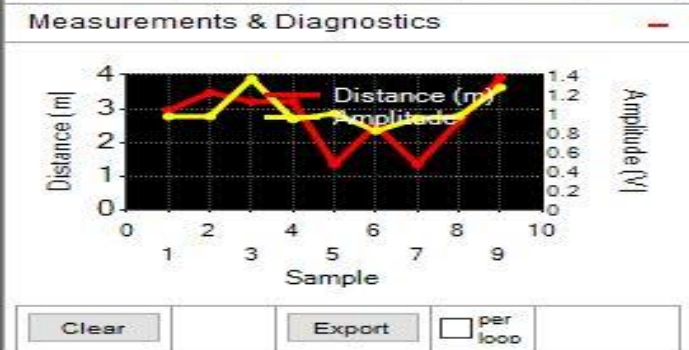
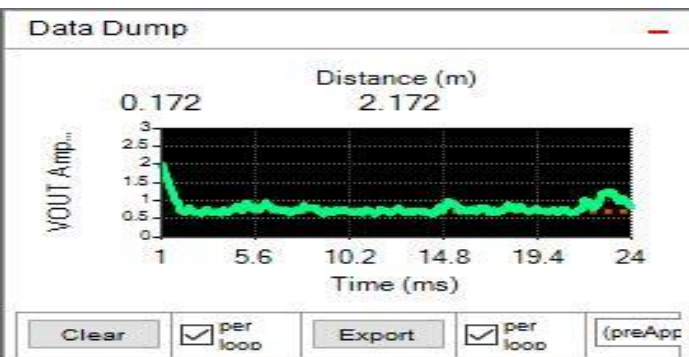
The device should be able to evaluate if the milk is consumable.

The device should employ the sensor to a surface area, in turn the device will provide a signal if the impedance is not consumable. During this project a goal is to be able to find a viable way to transmit food data using ultrasonic sound waves across any thin, transparent barrier of liquid.

Milk



# Water



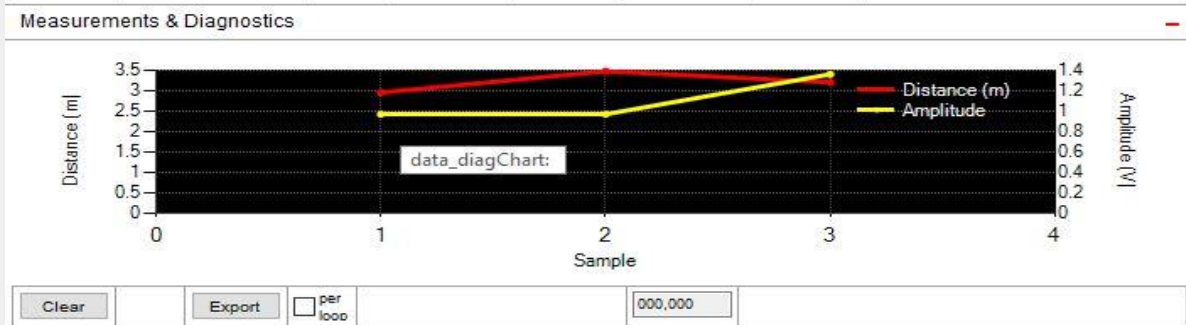
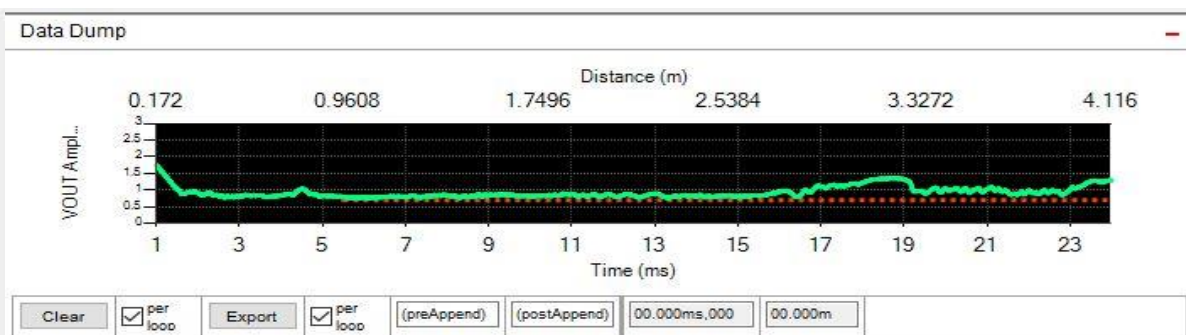
Tabulated Results

START

Adv ☒

Loops 1  
Count 1  
Start Dly 3  
Loop Dly 0  
Sweep ☐

IO Mode Select  
Frequency [kHz]  
Record [ms]  
Range [ms] 1.0



Tabulated Results

START

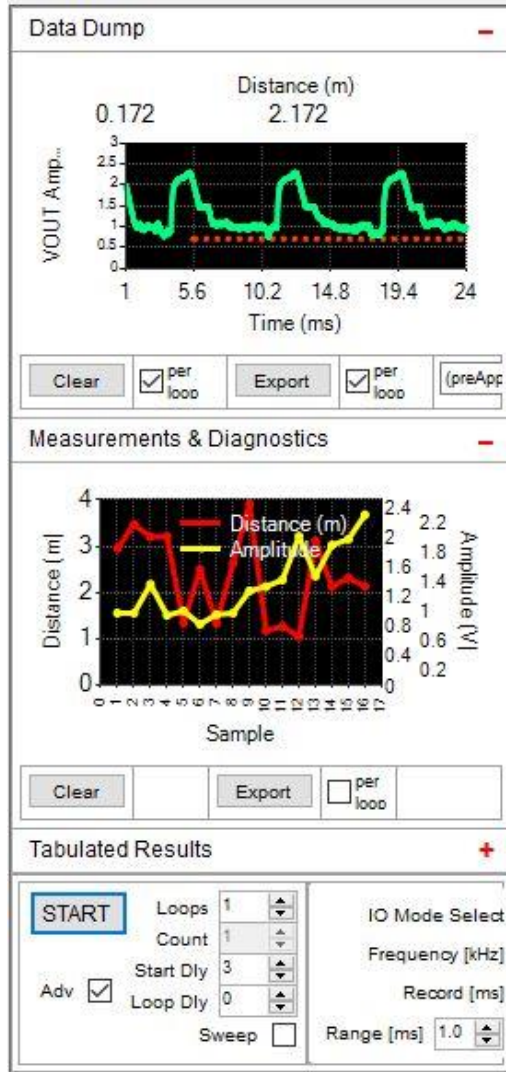
Adv ☒

Loops 1  
Count 1  
Start Dly 3  
Loop Dly 0  
Sweep ☐

IO Mode Select 0  
Frequency [kHz] 200.0  
Record [ms] 24  
Range [ms] 1.0 to 24.0

No. Pulses 40  
GUI Threshold Enable ☒  
Threshold Level [V] 0.7  
Threshold Start [ms] 5.5

# Gatorade



# Conclusion

Learned about time of flight and the ability to detect conductivity.

The device was not able to conclusively verify a whether any of the tested liquids were bad, by our definition. However the device was able to verify accurately between three test, a general range between 0.5% of a sample.

## **Improvements** *(See Code Implementation)*

Through further analysis, this device can be optimized to save the results.

The device depending on the background does depend on the container that is housing the liquid.

As well, there needs to be a GUI that is added to the Texas Instruments packaging, that analyzes the results.