The Dromond Platform
Sponsor: Decagon Devices
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Abstract
Design a wireless sensor to monitor water content and temperature in various environments in order to predict the possibility of mold growth. This sensor, called the Dromond Platform, must communicate with a smartphone that serves as the user interface.

Objective
Develop the Dromond Platform with the following features:
• Low Cost
• Bluetooth Low Energy (BLE)
• Temperature and Humidity Sensor
• Communicate with a Smart Phone

Function

Design Reiterations
Alpha Prototype Version 1
BGM111 BLE
SHT25
Alpha Prototype Version 2
Board layout
Power Supply
JTAG
Extra LED
Beta Prototype
MDBT40
Extra Buttons
External Oscillator Crystal

Business Card

Case
• Designed with SOLIDWORKS
• The test chamber is designed to isolate the sensor from the rest of the circuit, with an O-ring between the case and the PCB
• The JTAG port is accessible from both the top and bottom of the case

Firmware
Device runs two active embedded systems
• Nordic nRF51 soft device S130
• Dromond proprietary system

Verification Tests
The Dromond Platform range and power consumption were tested for verification.

Future Applications
• Compress circuit to the size of a silver dollar
• Apply button battery
• Establish a connection protocol in the iOS application to connect to multiple Dromond Platforms at a time
• Implement firmware options for low energy application

Impact Analysis
Some applications to apply Dromond Platform:
• Shipping Container
• Water Damaged Infrastructure
• Food Processing
• Home Use

Glossary
• nRF51 S130: Bluetooth module to implement, S130 referring to the version of API being used.
• RSSI: Received Signal Strength Indicator.

Acknowledgements:
Dr. Patrick Pedrow
Steve Allen
Jacob Preston
Dromond

iOS Application

PCB
Altium PCB Design software is used in designing the circuit and printing to PCB

Alpha Prototype
Parallax

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Cost

The estimated cost of the Dromond Platform is $22.77, below the maximum target price of $25.00.