

7. Construction of the Device Box

Requirements for the Box

- It should be compact
- It should be easy to disintegrate and assemble back
- Provide structural support to the circuit
- Non conducting and thermally insulating
- Have opening for the sensor

Structural Design and Tests

The box has two compartments and can be easily disintegrated. The top compartment houses the entire circuit and the sensors are attached to the bottom part of the top panel. This ensures protection from ambient environment. Moreover, the box is made up of wood to prevent thermal and electric conduction.

The dimensions of the box and the compartments are shown in Figure 1.

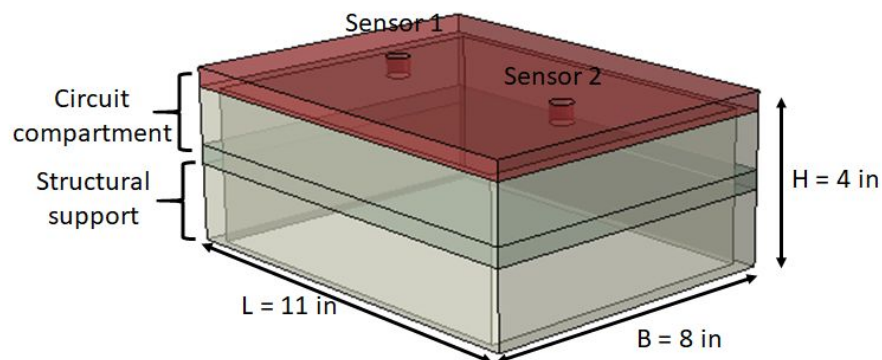


Figure 1: The dimensions of the box

Additionally, to test the structural integrity, a finite element simulation was performed in ABAQUS. The bottom part was constrained with zero degree of translation freedom and a uniform pressure of 1.136 psi (equivalent to 100 pounds total force acting on the top surface) was applied. The maximum deformation observed is 0.08 inches. Since the deformation is very

less even at such high loads, Team AD can conclude that the design passes the structural integrity test.

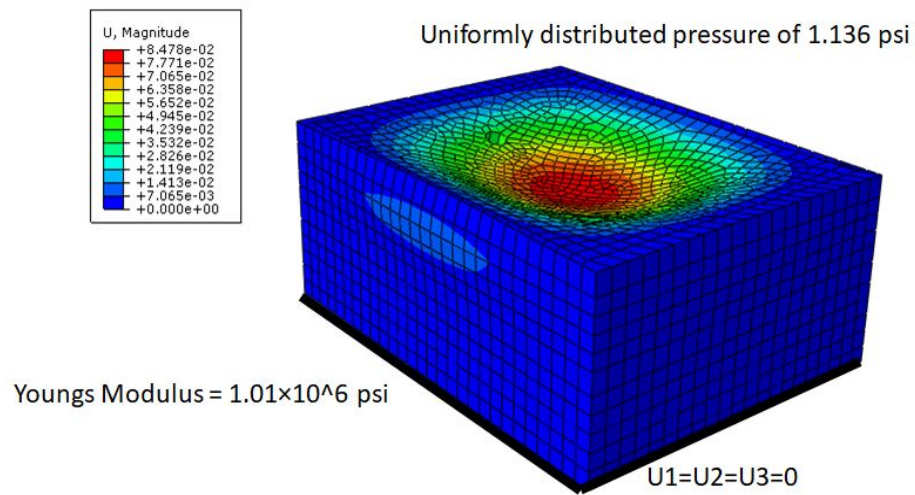


Figure 2: FEM Analysis of the box