Date: *10/31/03*
Student Name: Cem Tozeren
TA : Uriel Rodriguez
Louis Brandy
Instructor. A. A Arroyo

University of Florida
Department of Electrical and Computer Engineering
EEL 5666
Intelligent Machines Design Laboratory

CATRAY

SPECIAL SENSOR REPORT

PRESSURE SENSOR

IESP-12 Pressure Sensor:

IESP-12 Pressure sensors from CUI Inc. are used to monitor the contents of the tray. The IESP has a special rubber membrane which bends under pressure. While bent, membrane makes contact with a ceramic plate with resistive traces. As the applied pressure increases, the resistive traces are covered by ceramic and the output resistance drops. The figure below shows the resistance vs. applied pressure graph.

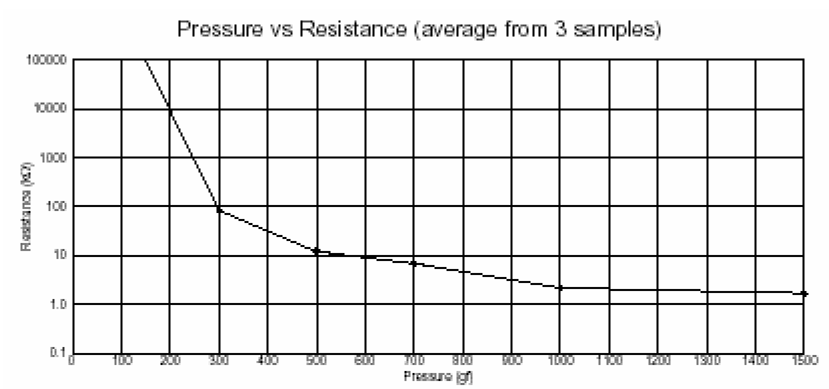

Figure 9: Pressure Vs. Output Resistance Graph

As can be seen, when the load is less than 100 Grams, the output resistance is ~5MΩ. However when the load is increased to 300 grams, the resistance reduces to 100KΩ. Since the glasses that are used on the tray weigh around 300 grams, a simple voltage divider circuit was built with 100K to detect the changes in the resistance. The output of the voltage divider is connected to a buffer to isolate the microcontrollers analog pin input resistance to effect the measurements. The analog output of the buffer is input to A/D converter on the microcontroller and a threshold-based code is written to interface the pressure sensor.

Figure 10: IESP-12

The pressure sensors are placed on a cup holder which is used to secure the glass on a jerky platform. The pressure sensor together with the cup holder is shown below.

Figure 11: Specialized Pressure Sensor