Timer-Optimized Container Access Monitor
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**Abstract (Optional)**

Based on the need for consumers to know when they last took their medicine, we developed an attachable, semi-universal sensor to monitor and update when patients last opened a pill bottle. Techniques used included: a Hall effect sensor and Reed switch, 3D-printed fabrication to hold the sensor device, Arduino compatibility, gyroscope sensor, and OLED/LCD display screens to show the time elapsed since last opened. It features a display for easy monitoring, an adjustable band to fit various pill bottle sizes, and a magnetic strip and sensor combination for accurate detection. Extensions and modifications can be made to extend the module to be fully portable and independent with a Bluetooth module and Arduino Nano/Feather.

**Background**

Issue: I have to take a course of antibiotics: 1 pill every 8 hours. The problem is, I can’t remember the last time I took a pill. What do I do?

Patients often face difficulty adhering to a medication regime due to forgetting when they last took their medicine. This can be remedied by a monitor which helps patients keep track of their medication routine.

**Hypothesis/Argument & Approach**

Create attachable lid sensor with timer
- detects when lid is opened
- displays time since lid was last opened

Allow patient to know time since last dosage was taken and follow medication’s appropriate course of treatment

**Circuit Diagram of Device**

**Future Directions**

TCAM could be extended to be made more portable and space-efficient. The main methods to achieve these would be to make the device fully independent of external hardware (e.g. Arduino). This would be achieved by maximizing the bottle’s lid space by using an Arduino Nano/Feather and also making the overall circuit fit on a smaller perf-board (soldering). Also, by incorporating a Bluetooth module and a corresponding mobile application, TCAM would be a fully integrated and independent product.

**References & Acknowledgments**

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Various online resources