**Reliability Test:** nocLock System

**Test ID:** Test Case 7.1

**Test Description:**

This procedure has been created to test the reliability and robustness of the nocLock system as it is implemented in a general use- case scenario, this test will be accomplished by setting up the entire system to replicate a real life situation. The piezo sensor will be secured to an acrylic board to simulate a knocking surface, which will then be used to repeatedly unlock and open system. This test will not only verify the systems capabilities of differentiating between knock sequences, but will also be crucial in evaluating the behavior of the system after prolonged use.

**Equipment:**

1. Oscilloscope
2. Digital Multi-meter
3. Function Generator
4. Two Channel DC Power Supply
5. AVR Dragon Board

**Part(s):**

1. Microcontroller module
2. Knock Sensor module
3. Solenoid Drive module
4. Program Button module
5. Unlock Button module
6. Erase EEPROM module
7. LED Sensor module
8. Acrylic Knocking Surface

**Reference:**

1. T02\_nocLock\_rev3.sch (for reference)
2. T02 – Test Plan “Parametric Test”
3. T02 System setup diagram (for reference)
4. T02 nocLock general operation.
5. Test Case 1.1
6. Test Case 1.3
7. Test Case 1.4
8. Test Case 1.5
9. Test Case 1.7
10. Test Case 3.1-3.6

**Setup:**

Fully assemble system with all external peripherals as described in “System setup diagram” and securely attach piezo element to acrylic knocking surface. Prepare system by programming the nocLock with a simple 3-knock sequence with a 3 second delay between each individual knock.

**Procedure:**

* Connect all external peripherals (LED, Solenoid, Unlock button, sensor and power)
* Secure Knock Sensor module to Acrylic Knocking Surface
* Confirm functionality of all sub-systems using parametric test section from test plan.
* Program system with knock; make sequence as simple as possible.

**-**Press program button

- knock, count to 3.

- knock, count to 3.

- knock, count to 3.

* Confirm knock sequence; reenter knock sequence.
* Begin testing; use table below for expected system behavior.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Step** | **Action** | **Expected Result** | **Pass/Fail** | **Comments** |
| 1. | Press unlock button | Led will turn from red to yellow to indicate system is listening |  |  |
| 2. | Enter knock sequence | N/A |  |  |
| 3. | Press unlock button again to end knocking | Led will turn green if knock is accepted, solenoid will engage.  Led will turn red if knock is denied and return to stand- by |  |  |

* Repeat unlocking procedure and record attempt in the form below, after completing test at normal pace, redo procedure without changing the programmed knock sequence but changing knocking pace.
* Vary the Knocking pace.
* slow pace.

- knock, count to 5.

- knock, count to 5.

- knock, count to 5.

* Fast pace.

- knock, count to 0.

- knock, count to 0.

- knock, count to 0.

