Testing Document

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| Node | Problem | Description | Solution |
|  | A-B Password Ending | If the password ended in either A or B, the corresponding option would be selected in the proceeding menu. | A new display was added that requires # key to be pressed to confirm. |
|  | Debounce | A single press of a key would result in ~30 inputs of the pressed key. | A delay was added after every button press to avoid multiple inputs being received. |
|  | Infinite locking loop | Locking the system would result in an infinite loop if the password ended in A. | Solved when the previous bug-fixes were introduced, as the combination of them resulted in the first menu option (Lock) always being selected. |
| Control Pad (1) | Alarm spam | Pressing enough keys would eventually stop the alarm. | The inputs would act as another attempt on password, when 3 attempts were made, the timer reset. |
|  | Fake timer (display) | During/after the lockdown timer, password attempts could still be seen on the LCD. | Introducing a full lockdown mechanism disabled the keypad, not allowing any further inputs during alarm phase. |
|  | Fake timer (function) | Entering the correct password after the alarm started would unlock the system. | After Lockdown has initiated, the only method to stop is using an external device (cloud). |
|  | Alarm crash | Introducing a second timer during the alarm phase would crash the system. | While not confirmed, it is believed either the testing board only had one timer, or the library only allowed for one timer.  Code was re-developed to only require one timer. |
| Safe System (2) | Ultrasonic not outputting correctly | Ultrasonic would only display 0 or >1000 regardless of range. | Field of View was shorter than expecting, along with digital readings of an analogue device. |
|  | Sound Trigger sensitivity | Adjusting the tolerance of the device would increase/decrease the “base number” but no noticeable change could be made from external sound. | Changed from analogue to digital readings, as analogue would only change by mV where as digital would generate a threshold to cross. |

Node 2:

Node 3:

Node 4: