**THE DOOR LOCK SECURITY**

**Description:**

The door lock security system is used to ensure security for rooms, houses, entrances, offices,.... Each lock security will have a different password and if you want to go throw, you must enter the correct password. If you enter the password more than 5 times, the system will alarm.

1. **FUNCTION REQUIREMENT**

|  |  |  |
| --- | --- | --- |
| Label | Description | Note |
| R-1.1 | Display words “please enter pass” |  |
| R-1.2 | Shall be able to enter the password from keypad |  |
| R-1.3 | Allow counting the number of password entries |  |
| R-1.4 | Check password, no more than 5 times not correct |  |
| R-1.5 | Can enter password again if it is not over 5 times |  |
| R-1.6 | If it is over 3 times, a buzzer will be activated |  |
| R-1.7 | If password is correct, turn on server motor and unlock |  |
| R-1.8 | Display “Successful access” or “Unsuccessful access” |  |

1. **NON - FUNCTIONAL REQUIREMENT**

|  |  |  |
| --- | --- | --- |
| Label | Description | Note |
| R-2.1 | Measure of device should be about 10 inches diagonally |  |
| R-2.2 | The device weight should be about 400 grams |  |
| R-2.3 | The shape of device must be suitable for its position |  |
| R-2.4 | Buzzer sound pressure at distance of 1m is 60dB |  |
| R-2.5 | Shall have LCD display, no smaller than 2 inch |  |
| R-2.6 | Led and buzzer turn off after 5 minutes |  |
| R-2.7 | Shall use voltage supply about 12V |  |

1. **FUNCTION**

|  |  |  |
| --- | --- | --- |
| Component | Classify | Function |
| Atmel Studio 7 | Software | Write sketches, upload on chip for execution |
| Atmega32 | Hardware | Main microcontroller reads inputs like a finger on a button and turn it into an output: activating motor and buzzer, pushing something to LCD |
| LCD display | Hardware/User Interface | Display information |
| Matrix Keypad | Hardware/User Interface | Take input from the user |
| Servo Motor | Hardware | Produce torque and velocity based on supplied current and voltage |
| Battery | Hardware | Power supply |
| Buzzer | Hardware | Sound emitter |

1. **BLOCK DIAGRAM**

**A diagram of a power supply system

Description automatically generated**

1. **TEST CASE**

|  |  |  |  |
| --- | --- | --- | --- |
| **Features** | **Ojective** | **Test Step** | **Result** |
| Create Password | Enter new password with 6 numbers from keypad | Enter enough 6 numbers | The screen switch to Verify new password. |
| Enter not enough 6 numbers | Waiting until user enter enough 6 numbers. |
| Verify new password | Verify the password after password has been entered. | Verify successfully (password matches) | Password has been set. |
| Verify unsuccessfully (password does not match) | Password has not been set. Requiring enter password again. |
| Enter password | Password should not show clear number while inputting the password. | Enter password from keypad | Display “\*” while entering the number from keypad. |
| Enter password from keypad | Verify correct password | Display “Successful access”, turn on server motor and unlock. |
| Verify wrong password | Display “Unsuccessful access”, require enter password again. Keep door locking. |
| Verify wrong password | Not enable more than attempts for unsuccessful attempts while log-in and track with timestamps and logs. | Verify wrong password over 3 times | Buzzer will be activated. |
| Verify wrong password over 5 times | Display “Try again after 1 minute” and block the screen in 1 minute. Keep door locking. |
| Change password | Should have provision to change the password by end users and by back end when end user forgotten the password. | Verify the last password or ID admin user | Allow user create new password. |