Embedded Security Door System

***System Description and specification***

2013

1. Ghada Mansour
2. Mahmoud Helal
3. Marian Melad
4. Momen El-Masry
5. Waleed El-Nagar

Table of Contents

[System Diagram 3](#_Toc359531703)

[System Description 3](#_Toc359531704)

[*Microcontroller Communication* 3](#_Toc359531705)

[*Keypad* 3](#_Toc359531706)

[*LCD* 4](#_Toc359531707)

[*Buzzer* 4](#_Toc359531708)

[*Stepper Motor (S.M.)* 4](#_Toc359531709)

[*EEPROM* 4](#_Toc359531710)

[*PC* 4](#_Toc359531711)

[System constraints 4](#_Toc359531712)

# System Diagram

# System Description

Embedded Security Door System is system designed to secure doors microcontroller 1 (Actuator) represent control unit exist in the door and microcontroller 2 (Controller) represent control unit exist in control room the door only opens (for 30 seconds) when user enters correct username and password else it'll alarm after three wrong trials

The security officer can add/edit/delete user or password through desktop application connected to control unit

# Microcontroller Communication

1. Two microcontrollers are communicate with each other using SPI protocol

# Keypad

1. user enters username and password through keypad
2. user can enter username and password from 0-9
3. user can OK, clear, cancel data

# LCD

1. LCD used to display data/messages to user
2. It displays username integers when user insert username
3. It displays asterisk characters (\*) when user enters password
4. It displays system messages to the user (enter username and password, incorrect username/password please re-enter, correct data door open, wait to verify data)

# Buzzer

1. Buzzer activated after three wrong trials for username and password
2. Buzzer sends status to microcontroller 2 (controller) to report status
3. Buzzer stops when receive control command from microcontroller 2 (controller)

# Stepper Motor (S.M.)

1. Stepper motor is the door locker
2. When the user enters correct username and password the door opens i.e. stepper motor rotates 90o
3. When the door opens it wait for 30 seconds and closed i.e. stepper motor back to 0o

# EEPROM

1. EEPROM stores username and password for users allowed to enter
2. Through EEPROM system can check if entered username and password are correct
3. EEPROM and add edit delete username/password through PC interface

# PC

1. PC interface with system using UART that send data and receive commands from PC
2. PC receive data such as Buzzer status and username and passwords stored in EEPROM
3. PC sends commands such as stopping buzzer and add/edit/update username and password

# System constraints

1. Username and password are integers only
2. Max length for Username and password is 10 char
3. Max number for username and passwords is 10 users