**PO4\_DGELV\_DIGITAL ELEVATOR**

**HSI DOCUMENT**

**Version 1.2.1**

**Reviewed**

**Current Document Status**

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| 1/24/2020 | Initial Draft, specifying used hardware. | 1.0 | Sara Abdallah Ahmed | Draft |
| 1/25/2020 | Updated Block Diagram | 1.1 | Ahmed Zoher | Proposed |
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**Reference Documents**

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# 1 Introduction

This section introduces the Hardware Software Interface (HSI) for a digital Elevator with lock system and specify the hardware used in the system to meet the customer requirements specification.

## 1.2 Specification Objectives

The objectives of this specification are to:

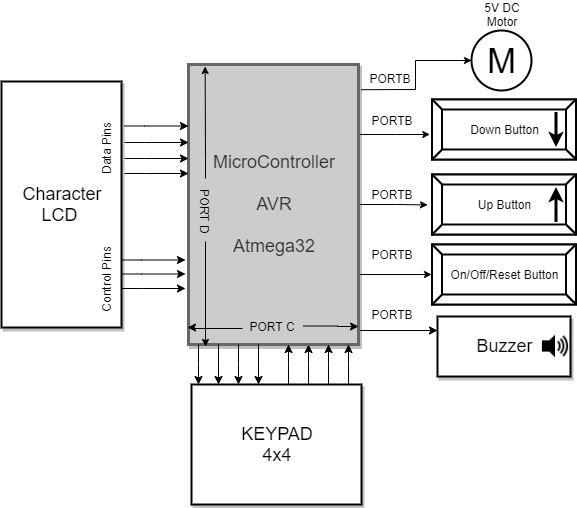
* Provide a Hardware system design system overview for the digital Elevator with lock system.

# 2 System Overview:

## 2.1 Definition:

The digital Elevator has lock system for 10 users that can be configured and edited by the user with high security sequence to ensure that only approved users can use the elevator.

## 2.2 Block Diagram:



## 2.3 Hardware Requirement

|  |  |  |
| --- | --- | --- |
| **Feature** | **REQ\_ID** | **Used Hardware** |
| **Microcontroller** | REQ\_ PO4\_DGELV \_HSI\_01\_V1\_1 | The system will be controlled using AVR microcontroller Atmega32. |
| **Simulation Model** | REQ\_ PO4\_DGELV \_HSI\_02\_V1\_1 | The system will have 6v DC motor (DC Motor 6 Vdc 1:1000 – 30 RPM) to Indicate the movement of the elevator clock wise direction for moving up and anti-clock wise for moving down. |
| **elevator direction selection** | REQ\_ PO4\_DGELV \_HSI\_03\_V1 | The system will have two push buttons (Push Button Type 2 – Green Color) to select direction up and down. |
| **System on, off and reset.** | REQ\_ PO4\_DGELV \_HSI\_04\_V1\_1 | The system will have one push button (Push Button Type 2 – Red Color) for both on and off mode, in addition to a reset mode upon holding the same button for 2 seconds. |
| **Screen for displaying data** | REQ\_ PO4\_DGELV \_HSI\_05\_V1 | The system will have CLCD (Character Liquid Crystal Diodes) (CLCD 2×16) That will be used for displaying data of the user, also to display the entered username and password icon ‘\*’ for each character. |
| **Alarm subsystem** | REQ\_ PO4\_DGELV \_HSI\_06\_V1 | The system will use buzzer (Small Buzzer 5~6V 4100Hz 70d) as alarm system for wrong password after three trial. |
| **Display Login Status** | REQ\_ PO4\_DGELV \_HSI\_07\_V1\_1 | The system will Display OK upon successful login, while NOK upon unsuccessful one. |
| **Username and password input hardware** | REQ\_ PO4\_DGELV \_HSI\_08\_V1\_1 | The system will have keypad (Standard Matrix rigid Keypad 4×4 Numeric switches) to enter a username and a password. |

# 3. Hardware connection:

|  |  |  |
| --- | --- | --- |
| **Feature** | **REQ\_ID** | **Description** |
| **AVR**  **Atmega32** | REQ\_ PO4\_DGELV \_HSI\_01\_V1 | * AVR have four PORTS and every PORT has eight pin DIO. |
| **5v DC Motor** | REQ\_ PO4\_DGELV \_HSI\_02\_V1 | * The DC motor will connect to PORTB and use one pin.   **#output Pins** |
| **Up/down push buttons** | REQ\_ PO4\_DGELV \_HSI\_03\_V1 | * The two push buttons will connect to PORTB and use two pins.   **#input Pin** |
| **ON/OFF/Reset push button** | REQ\_ PO4\_DGELV \_HSI\_04\_V1\_1 | * The push button will connect to PORTB and use one pin.   **#input Pins** |
| **CLCD** | REQ\_ PO4\_DGELV \_HSI\_05\_V1 | * CLCD will connected PORTD and use four pin for sending data and three pin for controlling the data.   **#output Pins** |
| **Buzzer** | REQ\_ PO4\_DGELV \_HSI\_06\_V1 | * Buzzer will connect to PORTB and use one pin.   **#output Pins** |
| **KEYPAD** | REQ\_ PO4\_DGELV \_HSI\_08\_V1 | * The KEYPD 4\*4 will connect to PORTC four pins as input and four pins as output. * The keypad has 16 buttons, the first 10 buttons is for entering number from 0-9 and the other 6 buttons for entering the alphabetic characters every button from those six bottoms represent from 4-5 character and by pressing the button you can change the characters.   **#input and output Pins** |