LCD CDD

for

Digital Elevator PO4\_DGELV

Version 1.0 Draft

Prepared by: Islam El-Bahnasawy

Jan 28, 2020

Document Status

|  |  |  |  |
| --- | --- | --- | --- |
| **Version** | **Document Status** | **Author** | **Date** |
| V\_1.0 | Draft | Islam El-Bahnasawy | MAR 04, 2020 |

Revision History

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Name** | **Version** | **Author** | **Date** | **Change Description** | **Document Status** |
| LCD\_CDD\_DIGITAL\_ELEVATOR | V\_1.0 | Islam El-Bahnasawy | Mar 4, 2020 | Initial creation of the CDD Document by adding  1) Naming convention  2) Document status  3) Revision history  4) Context diagram  5) Flow Chart  6) APIs  7) Configuration | Draft |
|  |  |  |  |  |  |

Reference Table

|  |  |  |
| --- | --- | --- |
| **Ref. Document** | **Version** | **Document Status** |
| SRS\_DIGITAL\_ELEVATOR | V\_1.4 | Proposed |
| GDD\_DIGITAL\_ELEVATOR | V\_1.2 | Released |
|  |  |  |

Contents

[Revision History 3](#_Toc34386631)

[Reference Table 4](#_Toc34386632)

[**1.** **Introduction** 6](#_Toc34386633)

[**Purpose** 6](#_Toc34386634)

[**Project Scope** 6](#_Toc34386635)

[**2.** **LCD Software Context Diagram** 7](#_Toc34386636)

[**3.** **Global Variables** 8](#_Toc34386637)

[**4.** **Configurations** 9](#_Toc34386638)

[**5.** **LCD Flow Chart** 10](#_Toc34386639)

[**6.** **LCD APIs** 1](#_Toc34386640)

1. **Introduction**

**Purpose**

This project aims at developing a Digital Elevator with lock system to be more secure and have specific functionalities.

The purpose of this document is to present a component detailed design of the LCD component in our Digital Elevator System. It will explain the software context, APIs and configurations of the LCD component.

**Project Scope**

This software system will be an Embedded System for a digital elevator. This system will be designed to secure the usage of the elevator and handle the movement of it. By having a limited number of resigned users with unique ID and entered password, we can secure the usage of the elevator. Using some developed buttons, the users can easily control the movement of the elevator.

# **LCD Software Context Diagram**

DIO\_SetPinVal

CLCD\_voidWriteString

CLCD\_voidInitialize

CLCD\_voidGoToXVPos

Handler

Keypad Management

LCD

Manager

Display Handler

# **Global Variables**

**N/A**

# **Configurations**

|  |  |
| --- | --- |
| **Name** | LCD\_PORT\_Config |
| **Description** | To configure the LCD used PORT |
| **Element** | CLCD\_u8\_RS\_PORT  CLCD\_u8\_RW\_PORT  CLCD\_u8\_E\_PORT  CLCD\_u8\_DATA\_PORT |
| **Range** | {‘A’, ‘B’, ‘C’, ‘D’} |

|  |  |
| --- | --- |
| **Name** | LCD\_PIN\_Config |
| **Description** | To configure the LCD used PINS |
| **Element** | CLCD\_u8\_RS\_PIN  CLCD\_u8\_RW\_PIN  CLCD\_u8\_E\_PIN  CLCD\_u8\_D0  CLCD\_u8\_D1  CLCD\_u8\_D2  CLCD\_u8\_D3  CLCD\_u8\_D4  CLCD\_u8\_D5  CLCD\_u8\_D6  CLCD\_u8\_D7 |
| **Range** | {0, 1,…..,6, 7} |

|  |  |
| --- | --- |
| **Name** | LCD\_MODE\_Config |
| **Description** | To configure the LCD used MODE |
| **Element** | CLCD\_u8\_DATA\_LENGTH |
| **Range** | {FOUR\_BITS, EIGHT\_BITS} |

# **LCD Flow Chart**

CLCD\_voidInitialize

Signal

If (x is valid & Y is valid)

CLCD\_voidWriteString

CLCD\_voidGoToXVPos

No

No

Yes

Yes

DIO\_SetPinVal

Error

If (String is valid)

Error

1. **LCD APIs**

|  |  |  |  |
| --- | --- | --- | --- |
| **Req. ID** | Req\_DIGELV\_LCD\_CDD\_001\_V1.0 | | |
| **Component Name** | LCD\_Driver | | |
| **API Name** | Error\_Status CLCD\_voidInitialize(void); | | |
| **Return type** | It’s u8 Error\_Status, it returns E\_OK or E\_NOK   |  |  | | --- | --- | | E\_OK | 0 | | E\_NOK | 1 | | | |
| **Input signal** | N/A | Output signal | N/A |
| **Description** | The functionality of this API to make the hardware ready by applying standard sequence on it. | | |
| **Covers** | Req\_DIGELV\_GDD\_005\_V1.0 | | |
| **Type (Public/Private)** | Public | | |

|  |  |  |  |
| --- | --- | --- | --- |
| **Req. ID** | Req\_DIGELV\_LCD\_CDD\_002\_V1.0 | | |
| **Component Name** | LCD\_Driver | | |
| **API Name** | Error\_Status CLCD\_voidGoToXVPos(u8 Copy\_u8XPos, u8 Copy\_u8YPos); | | |
| **Return type** | It’s u8 Error\_Status, it returns E\_OK or E\_NOK   |  |  | | --- | --- | | E\_OK | 0 | | E\_NOK | 1 | | | |
| **Input signal** | u8 Copy\_u8XPos  u8 Copy\_u8YPos | Output signal | N/A |
| **Description** | The functionality of this API to move the cursor to the desired position. | | |
| **Covers** | Req\_DIGELV\_GDD\_006\_V1.0 | | |
| **Type (Public/Private)** | Public | | |

|  |  |  |  |
| --- | --- | --- | --- |
| **Req. ID** | Req\_DIGELV\_LCD\_CDD\_003\_V1.0 | | |
| **Component Name** | LCD\_Driver | | |
| **API Name** | Error\_Status CLCD\_voidWriteString(const char\* Copy\_pchString); | | |
| **Return type** | It’s u8 Error\_Status, it returns E\_OK or E\_NOK   |  |  | | --- | --- | | E\_OK | 0 | | E\_NOK | 1 | | | |
| **Input signal** | const char\* Copy\_pchString | Output signal | N/A |
| **Description** | The functionality of this API to print a text on the LCD. | | |
| **Covers** | Req\_DIGELV\_GDD\_007\_V1.0 | | |
| **Type (Public/Private)** | Public | | |