Component Design Document

For LCD MODULE

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Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Date** | **Reason For Changes** | **Version** |
| Saber Osman | 18/4/2018 | Make the first LCD Design Document | 1.0 |
| Saber Osman | 21/4/2018 | Make some modification after review | 1.0.1 |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

# *1. Introduction*

## Objective

This module is used to monitor fan and temperature status and if there is an adjustment it will show the result after any change.

## Context Diagram

## 

## 

# *External Interface*

## <DIO.h>

### Types

|  |  |
| --- | --- |
| Data Type | Description |
|  |  |

### Interface

|  |  |
| --- | --- |
| Function | Description |
| Dio\_WritePin() | This function takes two arguments the pin name and the value which will be assigned to it if high or low. |

### Const

### Symbol <#defines>

## <Delay.h>

### Types

|  |  |
| --- | --- |
| Data Type | Description |
|  |  |

### Interface

|  |  |
| --- | --- |
| Function | Description |
| Delay\_ms() | This function makes a delay in milliseconds with the desired value which will be passed to it through input argument. |
| Delay\_us() | This function makes a delay in milliseconds with the desired value which will be passed to it through input argument. |

### Const

### Symbol <#defines>

# *Static Design*

## Files

### Used Files

|  |  |
| --- | --- |
| FILE NAME | Description |
| LCD\_priv.h | Contains all defines and functions which will be used in LCD\_prog.c file |
| LCD\_config.h | Contains all configuration parameters that control the animation on lCD. |
| LCD\_int.h | Introduce all function’s prototypes which will be given to the user. |
| LCD\_prog.c | Contains the functionality which will make the LCD works as we want. |

### Files Inclusion

## 

## 3.2 Types

|  |  |
| --- | --- |
| Req ID | DIO\_001 |
| Covers | HLD\_004 |
| Name | DIO\_pinName |
| Type | Enumeration |
| Range | It’s Configuration |
| Description | ------------------------ |

## Symbol Define <#define>

|  |  |
| --- | --- |
| Req ID | DIO\_001 |
| Covers | HLD\_004 |
| Name | DIO\_pinName |
| Type | Enumeration |
| Range | It’s Configuration |
| Description | ------------------------ |

## Const

|  |  |
| --- | --- |
| Req ID | DIO\_001 |
| Covers | HLD\_004 |
| Name | DIO\_pinName |
| Type | Enumeration |
| Range | It’s Configuration |
| Description | ------------------------ |

## Interface (Services)

|  |  |  |  |
| --- | --- | --- | --- |
| Req ID | LCD\_001 | | |
| Covers | HLD\_004 | | |
| Name/protoTypes | void LCD\_voidInitialize(void); | | |
| Service ID | Enumeration | | |
| Re-entrant / Non re- entrant | It’s Configuration | | |
| Synchronous/Asynchronous | ------------------------ | | |
| Return Value | | Void | No Return Value |
| Input parameter | | Void | No Input Parameter |
| Output parameter | | Void | No Output Parameter |
| Input /Output Parameter | | Void | No Input/ Output Parameter |

|  |  |  |  |
| --- | --- | --- | --- |
| Req ID | LCD\_002 | | |
| Covers | HLD\_004 | | |
| Name/protoTypes | void LCD\_voidWriteString\_CustomPosition(u8 \*u8Pointer2Array); | | |
| Service ID | Enumeration | | |
| Re-entrant / Non re- entrant | It’s Configuration | | |
| Synchronous/Asynchronous | ------------------------ | | |
| Return Value | | Void | No Return Value |
| Input parameter | | Pointer to unsigned integer | Pointer refers to the start of the string which will be displayed on LCD |
| Output parameter | | Void | No Output Parameter |
| Input /Output Parameter | | Void | No Input/ Output Parameter |

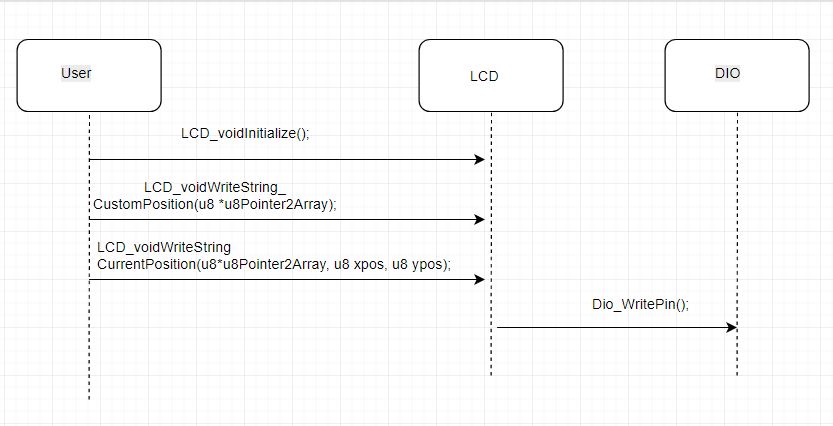
|  |  |  |  |
| --- | --- | --- | --- |
| Req ID | LCD\_003 | | |
| Covers | HLD\_004 | | |
| Name/protoTypes | void LCD\_voidWriteStringCurrentPosition(u8 \*u8Pointer2Array, u8 xpos, u8 ypos); | | |
| Service ID | Enumeration | | |
| Re-entrant / Non re- entrant | It’s Configuration | | |
| Synchronous/Asynchronous | ------------------------ | | |
| Return Value | | Void | No Return Value |
| Input parameter | | Pointer to unsigned integer | Pointer refers to the start of the string which will be displayed on LCD |
| unsigned integer | Refer to x axis position from it the string will be printed. |
| unsigned integer | Refer to y axis position from it the string will be printed. |
| Output parameter | | Void | No Output Parameter |
| Input /Output Parameter | | Void | No Input/ Output Parameter |

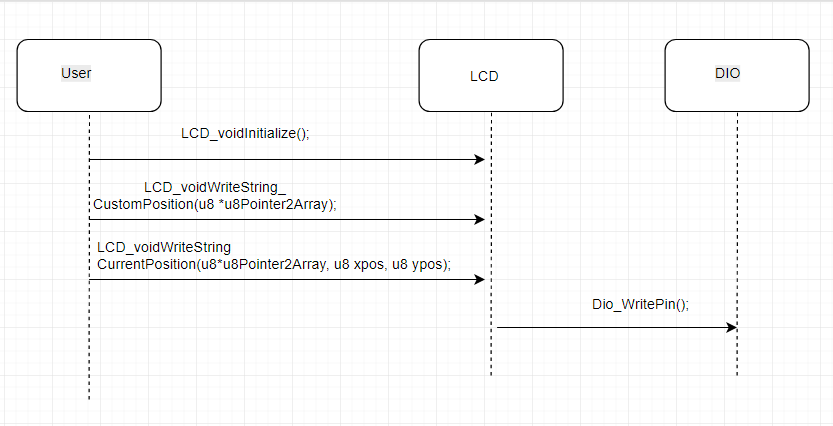
# *Dynamic Design*

## Mode Management

<Draw the state diagram for the component if it’s not exist don’t draw it >

## Sequence Diagram



\

# *Shared Resources*

## Analysis

### There is no shared Variables

## Protection

### There is no shared Variables

## 

# *Configuration Parameters*

## Pre-compile time

|  |  |
| --- | --- |
| Symbol Name | Description |
| #define LCD\_u8\_DATA\_PIN\_0 | Choose LCD DATA PIN 0 from UC Pins |
| #define LCD\_u8\_DATA\_PIN\_1 | Choose LCD DATA PIN 1 from UC Pins |
| #define LCD\_u8\_DATA\_PIN\_2 | Choose LCD DATA PIN 2 from UC Pins |
| #define LCD\_u8\_DATA\_PIN\_3 | Choose LCD DATA PIN 3 from UC Pins |
| #define LCD\_u8\_DATA\_PIN\_4 | Choose LCD DATA PIN 4 from UC Pins |
| #define LCD\_u8\_DATA\_PIN\_5 | Choose LCD DATA PIN 5 from UC Pins |
| #define LCD\_u8\_DATA\_PIN\_6 | Choose LCD DATA PIN 6 from UC Pins |
| #define LCD\_u8\_DATA\_PIN\_7 | Choose LCD DATA PIN 7 from UC Pins |
| #define LCD\_u8\_RS\_PIN | LCD RESET PIN |
| #define LCD\_u8\_RW\_PIN | LCD Read/Write PIN |
| #define LCD\_u8\_ENABLE\_PIN | LCD ENABLE PIN |
| #define LCD\_u8\_Set\_Display\_BIT | Set display off/on from control command register |
| #define LCD\_u8\_Set\_Cursor\_BIT | Set cursor off/on from control command register |
| #define LCD\_u8\_Blink\_Cursor\_BIT | Set Blink cursor off/on from control command register |
| #define LCD\_u8\_Set\_DataLength\_BIT | Set interface data length from Function Set Control Command |
| #define LCD\_u8\_Active\_Line\_BIT | open one line on screen or two from Function Set Control Command |
| #define LCD\_u8\_Font\_Type\_BIT | Display font type (5\*11 or 5\*8) from Function Set Control Command |

## Link time

## Post-build

# *Configuration Constrains*

There is possibility to create 32 Dio\_PIN\_N, when N number of PINS doesn’t exceed 32

# *Integration Constrains*

# *History*

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|  |  |
| --- | --- |
| Date | Description |
| 18/4/2018 | Creating the template |
| 21/4/2018 | Editing for sequence diagram,  Shared resources, configuration constrains and integration constrains |

**Appendix A: Glossary**