****

# PO1\_DGC Calculator

**(HSI)**

**Status** : **Proposed**

### **Document Status**

|  |  |  |  |
| --- | --- | --- | --- |
| **Version** | **Status** | **Author** | **Date** |
| V 1.0 | Draft | Areej Ayman Helal | 23/1/2020 |
| V 1.1 | Proposed | Areej Ayman Helal | 6/2/2020 |

### 

### **History Table**

|  |  |  |  |
| --- | --- | --- | --- |
| **Version** | **Author** | **Date** | **Change** |
| 1.0 | Areej Ayman Helal | 23/1/2020 | Initial creation |
| 1.1 | Areej Ayman Helal | 6/2/2020 | * Document status updated. * Version of Document is defined in all pages. * History table location is updated . * Reference documents table is added. * Features section is updated. * Components’ IDs are added to the microcontroller pins section. |
|  |  |  |  |

## **Table of contents**

1. **Hardware Components**
2. **Block Diagram**
3. **Microcontroller Pins**
4. **Features**

## **Index of figures**

* **Figure 1 : Block Diagram ……………………..……. 4**
* **Figure 2 : Microcontroller Pins ...……………....… 5**
* **Figure 3 : Features Table ..………....………………. 6**
* **Figure 4 : Reference Document ..………....………. 6**

## **Hardware Components :**

* **AVR Atmega32 Microcontroller**
* **Keypad 4\*4**
* **Push Button**
* **Buzzer**
* **Character LCD 16\*2**

### **Block Diagram**

### Figure 1

### 

### **Microcontroller Pins**

### Figure 2

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **HW Component ID** | **Component** | **Port** | **Pins** | **Direction** | **Description** |
| **HWC\_DGC\_HSI\_002\_v1.1** | **Keypad** | **Port B** | **0 : 7** | **Input** | **8 Pins from Port B connected to the Keypad** |
| **HWC\_DGC\_HSI\_001\_v1.1** | **Push Button** | **Port D** | **4** | **Input** | **1 Pin from Port D connected to Button** |
| **HWC\_DGC\_HSI\_001\_v1.1** | **Push Button** | **Ground** | **Power Pins** | **-** | **1 Pin ground connected to Button** |
| **HWC\_DGC\_HSI\_003\_v1.1** | **LCD** | **Port A** | **0 : 7** | **Output** | **8 Pins from Port A connected to Data Pins** |
| **HWC\_DGC\_HSI\_003\_v1.1** | **LCD** | **Port D** | **0 : 2** | **Output** | **3 Pins from Port D connected to Rs , Rw and Enable** |
| **HWC\_DGC\_HSI\_003\_v1.1** | **LCD** | **Ground and VCC** | **Power Pins** | **-** | **2 Pins 5v connected to Anode and Vdd** |
| **HWC\_DGC\_HSI\_003\_v1.1** | **LCD** | **Ground and VCC** | **Power Pins** | **-** | **2 Pins ground connected to cathode and Vss** |
| **HWC\_DGC\_HSI\_004\_v1.1** | **Buzzer** | **Port D** | **3** | **Output** | **1 Pin from Port D connected to Buzzer** |
| **HWC\_DGC\_HSI\_004\_v1.1** | **Buzzer** | **Ground** | **Power Pins** | **-** | **1 Pin from ground connected to Buzzer** |

### 

### **Features**

|  |  |
| --- | --- |
| **Requirement ID** | **Requirement Description** |
| **HWC\_DGC\_HSI\_001\_v1.1** | Push Button is connected to microcontroller to turn the calculator on/off when it is pressed. |
| **HWC\_DGC\_HSI\_002\_v1.1** | Keypad for numbers and operations connected to the microcontroller . |
| **HWC\_DGC\_HSI\_003\_v1.1** | The pressed numbers and chosen operations from keypad will be displayed on the LCD. |
| **HWC\_DGC\_HSI\_004\_v1.1** | Buzzer is connected to microcontroller to play tunes whenever a key is pressed . |

### Figure 3

### **Reference Documents**

|  |  |  |  |
| --- | --- | --- | --- |
| **Reference Number** | **Document Name** | **Version** | **Status** |
| 1 | CRS | - | - |

### Figure 4

### 