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# PO1\_DGC Calculator

**(GDD)**

**Status**: **Draft**

### **Document Status**

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| **Version** | **Status** | **Author** | **Date** |
| 1.0 | Draft | May Abdelsalam | 26/2/2020 |
| 1.1 | Draft | Moamen Ahmed | 27/2/2020 |
| 1.2 | Draft | May Abdelsalam | 27/2/2020 |

**History Table**

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| --- | --- | --- | --- |
| **Version** | **Author** | **Date** | **Change** |
| 1.0 | May Abdelelsalam | 26/2/2020 | Initial creation |
| 1.1 | Moamen Ahmed | 27/2/2020 | Added HAL APIs |
| 1.2 | May Abdelelsalam | 27/2/2020 | Update on Input Output signals, Static Architectur |

**Reference documents**

|  |  |  |  |
| --- | --- | --- | --- |
| **Reference number** | **Document name** | **Version** | **Status** |
| 1 | PO1\_DGC Calculator  (SRS) | V1.6 | Proposed |

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## **Project Description**

The Digital Calculator system will consist of a Power component in the APP layer to turn all the system ON whenever the ON switch is pressed.

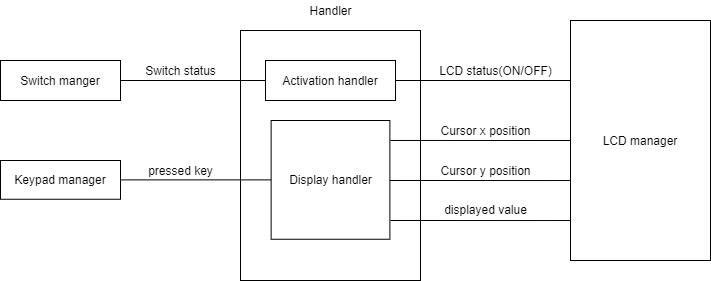
The system starts with the Keypad\_assignment component waiting for any of the Keypad keys to get pressed. When a switch of the keypad is pressed the Keypad\_assignment component will send signals to all of the following components:

1- Math\_calc: will calculate the entered operation and send the result to the Display component.

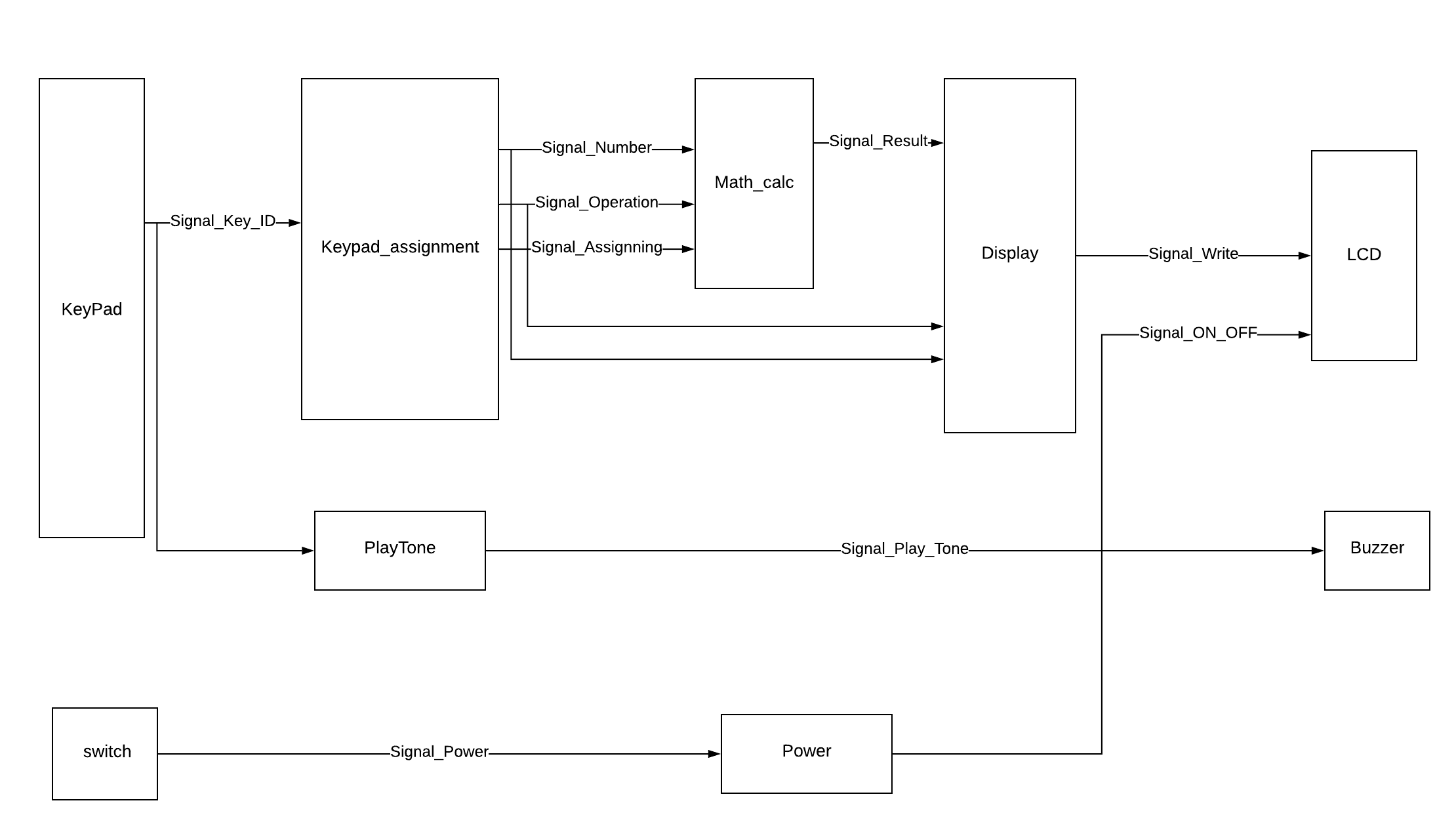
2- Display: will display the entered first operand, operation and second operand.

3- PlayTone: will play a tune every time keypad\_assignment component is used.

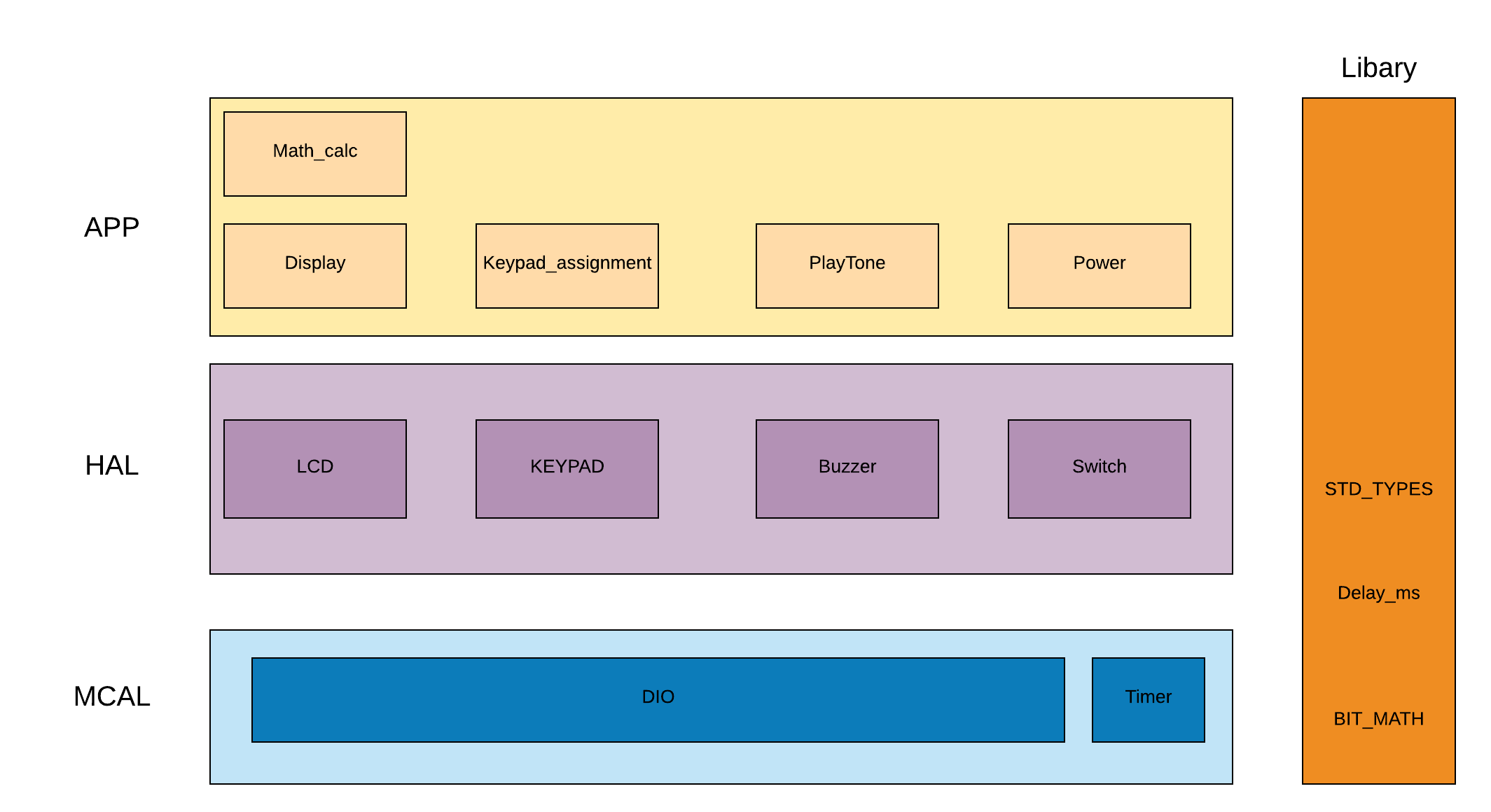
Software context diagram:



**Input Output signals:**

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**Static Architecture:**



### **APP Components APIs:**

### **HAL Components APIs**

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| **Req\_ID** | Req\_PO1\_DGC\_GDD\_API\_HAL\_LCD\_001 V1.0 | | |
| **Return Type** | void | **Input arguments** | void |
| **Name** | LCD\_voidInit | | |
| **Description** | Initialize LCD pins to output and set the default configurations  (5:8, Blinking: off,Cursor: off, 2 lines: on ) | | |

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| **Req\_ID** | Req\_PO1\_DGC\_GDD\_API\_HAL\_LCD\_002 V1.0 | | |
| **Return Type** | void | **Input arguments** | u8 Copy\_u8Command |
| **Name** | LCD\_voidWriteCommand | | |
| **Description** | Control the LCD using the commands found in the LCD datasheet | | |

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| **Req\_ID** | Req\_PO1\_DGC\_GDD\_API\_HAL\_LCD\_003 V1.0 | | |
| **Return Type** | void | **Input arguments** | u8 Copy\_u8Data |
| **Name** | LCD\_voidWriteData | | |
| **Description** | Write a single character to the LCD | | |

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| **Req\_ID** | Req\_PO1\_DGC\_GDD\_API\_HAL\_LCD\_004 V1.0 | | |
| **Return Type** | void | **Input arguments** | u8 Copy\_u8Shape[8] |
| **Name** | LCD\_voidWriteToCGRAM | | |
| **Description** | Add a custom shape to CGRAM | | |

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| **Req\_ID** | Req\_PO1\_DGC\_GDD\_API\_HAL\_KEYPAD\_001 V1.0 | | |
| **Return Type** | void | **Input arguments** | void |
| **Name** | KEYPAD\_voidInit | | |
| **Description** | Initialize keypad pins (1,2,3,4) to input and pins (5,6,7,8) to output | | |

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| **Req\_ID** | Req\_PO1\_DGC\_GDD\_API\_HAL\_KEYPAD\_002 V1.0 | | |
| **Return Type** | u8 | **Input arguments** | void |
| **Name** | KEYPAD\_u8GetPressedKey | | |
| **Description** | Returns the current pressed key(1:16) or returns 0 if no key is pressed | | |

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| **Req\_ID** | Req\_PO1\_DGC\_GDD\_API\_HAL\_BUZZER\_001 V1.0 | | |
| **Return Type** | void | **Input arguments** | void |
| **Name** | BUZZER\_voidInit | | |
| **Description** | Initialize buzzer pin to output | | |

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| **Req\_ID** | Req\_PO1\_DGC\_GDD\_API\_HAL\_BUZZER\_002 V1.0 | | |
| **Return Type** | void | **Input arguments** | void |
| **Name** | BUZZER\_voidSetBuzzerOn | | |
| **Description** | Turn on the buzzer by outputting a high signal on the buzzer pin | | |

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| **Req\_ID** | Req\_PO1\_DGC\_GDD\_API\_HAL\_BUZZER\_003 V1.0 | | |
| **Return Type** | void | **Input arguments** | void |
| **Name** | BUZZER\_voidSetBuzzerOff | | |
| **Description** | Turn off the buzzer by outputting a low signal on the buzzer pin | | |

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| --- | --- | --- | --- |
| **Req\_ID** | Req\_PO1\_DGC\_GDD\_API\_HAL\_SWITCH\_001 V1.0 | | |
| **Return Type** | void | **Input arguments** | void |
| **Name** | SWITCH\_voidInit | | |
| **Description** | Initialize the switch pin to input pull up | | |

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| **Req\_ID** | Req\_PO1\_DGC\_GDD\_API\_HAL\_SWITCH\_002 V1.0 | | |
| **Return Type** | u8 | **Input arguments** | void |
| **Name** | SWITCH\_u8GetSwitchStatus | | |
| **Description** | Returns 1 if the switch is pressed or 0 otherwise | | |

### **MCAL Components APIs**

### **Reference Documents**

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| --- | --- | --- | --- |
| **Reference Number** | **Document Name** | **Version** | **Status** |
| 1 | SRS | 1.6 | proposed |