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| SOVY |
| Digital Calculator PO1\_DGC\_GDD |

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# Document Status

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| Name | SOVY |
| Version | 1.1 |
| Status | Draft |
| Author | Habiba Mahmoud |
| Date | 5/4/2021 |

# Document History

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| --- | --- | --- | --- |
| Version | Author | Date | Change |
| 1.0 | AAF | 3/4/2021 | Initial Creation. |
| 1.0 | Habiba Mahmoud | 5/4/2021 | Added APP Component APIs   * Req\_PO1\_DGC\_GDD\_0011-V1.0 * Req\_PO1\_DGC\_GDD\_0012-V1.0 * Req\_PO1\_DGC\_GDD\_0013-V1.0 * Req\_PO1\_DGC\_GDD\_0014-V1.0 |

# Reference Documents

|  |  |  |  |
| --- | --- | --- | --- |
| Ref. No. | Doc. Name | Version | Status |
| 1 | PO1\_DGC\_SRS\_DigitalCalculator | 1.3 | proposed |

# Project Description

“Sovy” is a simple digital calculator that performs basic mathematical operations and displays the operation on an LCD-screen, with an ON/OFF button and keypad for user input.

# MCAL Component APIs

## Port:

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| **Req\_ID** | Req\_PO1\_DGC\_GDD\_001-V1.0 | | |
| **Component** | Port | | |
| **Return Type** | void | **Input arguments** | void |
| **Name** | **Port\_vidInit** | | |
| **Description** | Initialize all pins and ports to their operation mode and initial values | | |
| **Covers** | -None | | |
| **Range** | - | | |

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| **Req\_ID** | Req\_PO1\_DGC\_GDD\_002-V1.0 | | | |
| **Component** | Port | | | |
| **Return Type** | void | **Input arguments** | ***u8*** | Copy\_u8SwPinNo |
| ***u8*** | Copy\_u8PinMode |
| **Name** | **Port\_vidSetPinMode** | | | |
| **Description** | This function is used to change the Software pin Mode | | | |
| **Covers** | -None | | | |
| **Range** | **-** Copy\_u8SwPinNo**: {PORT\_u8PIN\_0 -> PORT\_u8PIN\_31}**  - Copy\_u8PinMode**: {PORT\_u8OUTPUT\_LOW, PORT\_u8OUTPUT\_HIGH, PORT\_u8INPUT\_PULL\_UP ,PORT\_u8INPUT\_HIGH\_IMP}** | | | |

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| **Req\_ID** | Req\_PO1\_DGC\_GDD\_003-V1.0 | | | |
| **Component** | Port | | | |
| **Return Type** | void | **Input arguments** | ***u8*** | Copy\_u8SwPinNo |
| ***u8*** | Copy\_u8SwPinDir |
| **Name** | **Port\_vidSetPinDir** | | | |
| **Description** | This function is used to change the Software pin direction | | | |
| **Covers** | -None | | | |
| **Range** | **-** Copy\_u8SwPinNo**: {PORT\_u8PIN\_0 -> PORT\_u8PIN\_31}**  - Copy\_ u8SwPinDir**: {Port\_u8INPUT,Port\_u8OUTPUT}** | | | |

## Dio

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| **Req\_ID** | Req\_PO1\_DGC\_GDD\_004-V1.0 | | | |
| **Component** | Dio | | | |
| **Return Type** | u8 | **Input arguments** | ***u8*** | Copy\_u8SwPinNo |
| ***u8*** | Copy\_u8SwPinVal |
| **Name** | **Dio\_u8SetPinVal** | | | |
| **Description** | This function is used to change the Software pin Value | | | |
| **Covers** | -None | | | |
| **Range** | **-** Copy\_u8SwPinNo**: {PORT\_u8PIN\_0 -> PORT\_u8PIN\_31}**  - Copy\_ u8SwPinVal**: {DIO\_u8HIGH, DIO\_u8LOW}** | | | |

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| **Req\_ID** | Req\_PO1\_DGC\_GDD\_005-V1.0 | | | |
| **Component** | Dio | | | |
| **Return Type** | u8 | **Input arguments** | ***u8*** | Copy\_u8SwPinNo |
| **Name** | **Dio\_u8GetPinVal** | | | |
| **Description** | This function is used to get the Software pin Value | | | |
| **Covers** | -None | | | |
| **Range** | **-** Copy\_u8SwPinNo**: {PORT\_u8PIN\_0 -> PORT\_u8PIN\_31}**  **-** returnrange **: {DIO\_u8HIGH, DIO\_u8LOW}** | | | |

## Timer

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| **Req\_ID** | Req\_PO1\_DGC\_GDD\_006-V1.0 | | |
| **Component** | Timer | | |
| **Return Type** | Void | **Input arguments** | Void |
| **Name** | **Gpt\_vidInit** | | |
| **Description** | This function is used to initialize the Timer | | |
| **Covers** | -None | | |
| **Range** | **-** None | | |

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| **Req\_ID** | Req\_PO1\_DGC\_GDD\_007-V1.0 | | |
| **Component** | Timer | | |
| **Return Type** | Void | **Input arguments** | Void |
| **Name** | **Gpt\_vidStartTimer** | | |
| **Description** | This function is used to start the Timer | | |
| **Covers** | -None | | |
| **Range** | **-** None | | |

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| **Req\_ID** | Req\_PO1\_DGC\_GDD\_008-V1.0 | | |
| **Component** | Timer | | |
| **Return Type** | Void | **Input arguments** | Void |
| **Name** | **Gpt\_vidStopTimer** | | |
| **Description** | This function is used to stop the Timer | | |
| **Covers** | -None | | |
| **Range** | **-** None | | |

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| **Req\_ID** | Req\_PO1\_DGC\_GDD\_009-V1.0 | | |
| **Component** | Timer | | |
| **Return Type** | Void | **Input arguments** | Void (\*pfun)(void) |
| **Name** | **Gpt\_vidSetCBF** | | |
| **Description** | This function is used to set the call back function of the Timer | | |
| **Covers** | -None | | |
| **Range** | **-** None | | |

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| **Req\_ID** | Req\_PO1\_DGC\_GDD\_0010-V1.0 | | | |
| **Component** | Timer | | | |
| **Return Type** | Void | **Input arguments** | ***u8*** | Copy\_u8LoadVal |
| **Name** | **Gpt\_vidLoadTimer** | | | |
| **Description** | This function is used to load the timer with a value to start counting from it | | | |
| **Covers** | -None | | | |
| **Range** | **-** Copy\_u8LoadVal : {0 -> 255 } | | | |

# App Component APIs

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| **Req\_ID** | Req\_PO1\_DGC\_GDD\_0011-V1.0 | | |
| **Component** | Math\_calc | | |
| **Return Type** | ReturnStatus\_e | **Input arguments** | f32\* Copy\_f32Result |
| **Name** | DGC\_CalcResult | | |
| **Description** | Calculate the operation and output the result and handle the corner cases. | | |
| **Covers** | -Req\_1ST123\_SRS\_overall\_003-V1.1  -Req\_1ST123\_SRS\_overall\_004-V1.1  -Req\_1ST123\_SRS\_overall\_005-V1.1  -Req\_1ST123\_SRS\_overall\_006-V1.1  -Req\_1ST123\_SRS\_overall\_008-V1.0  -Req\_1ST123\_SRS\_overall\_009-V1.1  -Req\_1ST123\_SRS\_overall\_010-V1.1  -Req\_1ST123\_SRS\_overall\_011-V1.1  -Req\_1ST123\_SRS\_overall\_012-V1.1 | | |
| **Range** | Copy\_f32Result: (Float range)  ReturnStatus\_e: (OK, NOK) | | |

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| **Req\_ID** | Req\_PO1\_DGC\_GDD\_0012-V1.0 | | |
| **Component** | Display | | |
| **Return Type** | ReturnStatus\_e | **Input arguments** | u8 Copy\_u8Char |
| **Name** | DGC\_DisplayChar | | |
| **Description** | Display a character on the LCD screen | | |
| **Covers** | -Req\_1ST123\_SRS\_overall\_014-V1.0  -Req\_1ST123\_SRS\_overall\_015-V1.0  -Req\_1ST123\_SRS\_overall\_016-V1.0  -Req\_1ST123\_SRS\_overall\_017-V1.0  -Req\_1ST123\_SRS\_overall\_018-V1.0  -Req\_1ST123\_SRS\_overall\_019-V1.0  -Req\_1ST123\_SRS\_overall\_020-V1.0 | | |
| **Range** | Copy\_u8Char: ([0:9],+,-,\*,/,=)  ReturnStatus\_e: (OK, NOK) | | |

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| --- | --- | --- | --- |
| **Req\_ID** | Req\_PO1\_DGC\_GDD\_0013-V1.0 | | |
| **Component** | Display | | |
| **Return Type** | ReturnStatus\_e | **Input arguments** | u8 Copy\_kpau8Str |
| **Name** | DGC\_DisplayError | | |
| **Description** | Display error message when needed | | |
| **Covers** | -Req\_1ST123\_SRS\_overall\_021-V1.0  -Req\_1ST123\_SRS\_overall\_022-V1.0 | | |
| **Range** | Copy\_kpau8Str: (“Syntax Error”,” Math Error”)  ReturnStatus\_e: (OK, NOK) | | |

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| **Req\_ID** | Req\_PO1\_DGC\_GDD\_0014-V1.0 | | |
| **Component** | PlayTone | | |
| **Return Type** | ReturnStatus\_e | **Input arguments** | void |
| **Name** | DGC\_PlayTone | | |
| **Description** | Plays a tone when a key is pressed on the keypad | | |
| **Covers** | -Req\_1ST123\_SRS\_overall\_026-V1.0 | | |
| **Range** | ReturnStatus\_e: (OK, NOK) | | |