

## MOTOR Module

|             |  |
|-------------|--|
| Name        | Motor_rotateClockwise                          |
| Name        | Motor_init()                                   |
| Input       | Void   |
| Return      | Void   |
| Description | Makes the motor rotates in clockwise direction |
| Description | Initialization for the motor and buttons       |
|             |  |

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|-------------|---|
| Name        | Motor_rotateAnticlockwise                         |
| Input       | Void  |
| Return      | Void  |
| Description | Make the motor rotates in anticlockwise direction |

## *ADC Module*

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| Name        | ADC_SS3_In                                       |
| Input       | Void   |
| Return      | uint16_t   |
| Description | Read from port and sample, return digital values |

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| Name        | ADC0_SS3_Init  |
| Name        | ADC0_Init  |
| Input       | uint8_t channel  |
| Return      | Void   |
| Description | Initialize Port E and activate ADC   |
| Input       | uint8_t channel, uint16_t mode, uint8_t temp_en  |
| Return      | Void   |
| Description | Initialize sample sequencer 3 with option to activate temperature sensor or disable it |

## *UART Module*

|             |   |
|-------------|---|
| Name        | UART_Init   |
| Input       | uint8_t index   |
| Return      | Void  |
| Description | Initializes desired UART by activating the alternate function of the desired port and setting the baud rate |

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| Name        | UART_Available  |
| Input       | uint8_t index   |
| Return      | uint8_t   |
| Description | Checks the availability of the register of desired UART |

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| Name        | UART_Read                                     |
| Input       | uint8_t index                                 |
| Return      | uint8_t                                       |
| Description | Reads one character at a time of desired UART |

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| Name        | UART_Write                     |
| Input       | uint8_t index,uint8_t data     |
| Return      | Void                           |
| Description | Writes one character at a time |

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|-------------|-------------------------|
| Name        | UART_sendString         |
| Input       | Pointer to a string     |
| Return      | Void                    |
| Description | Writes the whole string |

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|-------------|------------------------|
| Name        | UART_receiveString     |
| Input       | Pointer to a string    |
| Return      | Void                   |
| Description | Reads the whole string |

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|-------------|----------------|
| Name        | pwm_init       |
| Input       | Void           |
| Return      | Void           |
| Description | Initialize PWM |

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| Name        | pwm_setDutycycle                            |
| Input       | uint8_t                                     |
| Return      | Void  |
| Description | Control the density of led (output voltage) |

## ***PWM Module***

## *Temp sensor Module*

|             |  |
|-------------|--|
| Name        | ADC0_init()  |
| Input       | void   |
| Return      | void   |
| Description | <p>Initialize Analog to Digital converter 0.<br/>Configure ADC0 module to enable internal temperature sensor.</p> <p>For ADC0:<br/>Active ADC0, bit 16 of RCGC register, Make sequencer 3 triggered software, get input channel 0enable temperature measurement, set flag on EOC at 1st sample, and enable ADC0 sequencer 3 after finishing configuration.</p> |

|             |  |
|-------------|--|
| Name        | Tempsensor_read()  |
| Input       | void   |
| Return      | uint16_t   |
| Description | <p>Reading values from internal temperature sensor.</p> <p>For Sensor:<br/>First initialize sequencer 3, waiting for temperature converting complete, then read the temperature value,</p> |

|  |                                    |
|--|------------------------------------|
|  | and finally clear completion flag. |
|--|------------------------------------|

## *LCD Module*

|             |   |
|-------------|---|
| Name        | LCD_init  |
| Input       | Void  |
| Return      | Void  |
| Description | Initialize Port B and 3 pins from Port A, set direction, enable digital pins<br><br>For LCD:<br>Enable 2 lines, display on cursor off, clear display screen, shift cursor to right. |

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|-------------|---|
| Name        | LCD_sendCommand   |
| Input       | uint8_t command   |
| Return      | Void  |
| Description | Set enable pin, put data in DATA register, reset enable pin & RS pin. |

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| Name        | LCD_displayString                           |
| Input       | const char *Str                             |
| Return      | Void  |
| Description | To allow LCD to print whole string at once. |

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|-------------|------------------------------------|
| Name        | LCD_displayCharacter               |
| Input       | uint8_t data                       |
| Return      | Void                               |
| Description | To print one character at a time . |

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|-------------|---|
| Name        | itoa1   |
| Input       | int, array of char  |
| Return      | *char   |
| Description | To be able to print temperature degree on LCD we convert it to string this function has the ability to do so. |

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| Name        | LCD_intgerToString                               |
| Input       | uint32_t   |
| Return      | Void   |
| Description | itoa1is called in it to convert and print on LCD |

|             |                 |
|-------------|-----------------|
| Name        | LCD_clearScreen |
| Input       | void            |
| Return      | void            |
| Description | To clear LCD    |

|      |                   |
|------|-------------------|
| Name | LCD_goToRowColumn |
|------|-------------------|



|             |  |
|-------------|--|
| Input       | uint8_t row,uint8_t col                      |
| Return      | void   |
| Description | To make cursor go to specific row and column |

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|-------------|--|
| Name        | LCD_displayStringRowColumn                     |
| Input       | uint8_t row,uint8_t col,const char *Str        |
| Return      | void   |
| Description | print string starting from this row and column |

### *Interrupt module*

|             |                                     |
|-------------|-------------------------------------|
| Name        | interrupt_init                      |
| Input       | void                                |
| Return      | void                                |
| Description | To initiate interrupt and its ports |

|             |               |
|-------------|---------------|
| Name        | GPIOF_Handler |
| Input       | void          |
| Return      | void          |
| Description | ISR           |

### *Timer module*

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|-------------|-----------------------------|
| Name        | Periodic_Timer_Init         |
| Input       | uint32_t TimerNo            |
| Return      | void                        |
| Description | Initiate timer and its port |

## *Systick module*

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|-------------|------------------|
| Name        | systick_init     |
| Input       | void             |
| Return      | void             |
| Description | Initiate systick |

|             |                             |
|-------------|-----------------------------|
| Name        | <code>systick_wait</code>   |
| Input       | <code>uint32_t delay</code> |
| Return      | <code>void</code>           |
| Description | Wait for certain period     |

|             |                            |
|-------------|----------------------------|
| Name        | <code>_delay_ms ()</code>  |
| Input       | <code>uint32_t time</code> |
| Return      | <code>Void</code>          |
| Description | Delay for n milliseconds   |

### *Potentiometer Module*

|             |  |
|-------------|--|
| Name        | <code>Pot_Init ()</code>                             |
| Input       | <code>uint8_t channel, uint16_t mode</code>          |
| Return      | <code>Void</code>                                    |
| Description | Initiate ADC and sequencer modules for potentiometer |

|             |   |
|-------------|---|
| Name        | Pot_Read ()                                   |
| Input       | void  |
| Return      | uint16_t                                      |
| Description | Return the read of ADC based on potentiometer |