APIs Design for a moving Robot modules By/ Ahmed Maged

DIO APIs

| Function Name | DIO_eSetPinDirection(const u8 u8PortIdCpy, const u8 u8PinIdCpy, const u8 u8PinDirCpy) | | | | |
|------------------|---|--|----------|--|--|
| | | u8PortIdCpy | const u8 | | |
| | | description: the PORT contain the PIN set direction | | | |
| | innuts | description: the PORT contain the PIN to set direction u8PinIdCpy u8PinIdCpy u8 description: the pin to set direction u8PinDirCpy const u8 | | | |
| | inputs | description: the pin to set direction u8PinDirCpy const u8 the direction you want whether input o output | | | |
| A way you a mata | | u8PinDirCpy | const u8 | | |
| Arguments | | onst u8 u8PinDirCpy) u8PortIdCpy const u8 description: the PORT contain the PIN to set direction u8PinIdCpy u8 description: the pin to set direction u8PinDirCpy const u8 the direction you want whether input or output N/A description: N/A description: 0 1 | | | |
| | | N/A | | | |
| | outputs | description: | | | |
| | in much / a colonia | N/A | | | |
| | input/output | description: | | | |
| Doturn | E_OK | 0 | | | |
| Return E_NOK | E_NOK | 1 | | | |
| Description | call this api to se | t the pin direction input or | output | | |

| Function | DIO_eSetPinValue(const u8 u8PortIdCpy, const u8 u8PinIdCpy, | | | |
|-------------|---|--|----------------|--|
| Name | const u8 u8PinValueCpy) | | | |
| | | u8PortIdCpy | const u8 | |
| | | description: the PORT conta set direction | ain the PIN to | |
| | innute | usPortIdCpy const us description: the PORT contain the PIN to set direction usPinIdCpy const us description: the pin to set direction usPinValueCpy const us the direction you want wether input or output N/A description: N/A description: 0 1 | | |
| | inputs | description: the pin to set d | irection | |
| Argumanta | | u8PinValueCpy | const u8 | |
| Arguments | | usPortIdCpy const us description: the PORT contain the PIN to set direction usPinIdCpy const us description: the pin to set direction usPinValueCpy const us the direction you want wether input or output N/A description: N/A description: 0 | | |
| | | const u8 u8PinValueCpy) u8PortIdCpy const u8 description: the PORT contain the PIN to set direction u8PinIdCpy const u8 description: the pin to set direction u8PinValueCpy const u8 the direction you want wether input or output N/A description: N/A description: 0 | | |
| | outputs | N/A | | |
| | outputs | description: | | |
| | innut/outnut | N/A | | |
| | input/output | description: | | |
| Doturn | E_OK | 0 | | |
| Return | E_NOK | 1 | | |
| Description | call this api t | to set the pin value HIGH or L | .OW | |

| Function Name | DIO_eGetPinValue(const u8 u8PortIdCpy,const u8 u8PinIdCpy, u8 * pu8PinValue) | | |
|------------------|---|----------------------------|------------------|
| | | u8PortIdCpy | const u8 |
| | | description: the PORT co | ntain the PIN to |
| | inputs | set direction | |
| | | u8PinIdCpy | const u8 |
| Arguments | | description: the pin to se | et direction |
| Aiguments | | pu8PinValue | u8 * |
| | outputs | description: the pin curr | ent value HIGH |
| | input/output | or LOW | |
| | | N/A | |
| | | description: | |

| Return | E_OK | 0 |
|-------------|--|---|
| | E_NOK | 1 |
| Description | call this api to get the pin value whether HIGH or LOW | |

MOTOR APIs

| Function Name | MOTOR_eInit(void) | | |
|---------------|--|--------------|---|
| | innuts | N/A | |
| | inputs | description: | |
| Argumonts | outputs | N/A | |
| Arguments | outputs | description: | |
| | :+/+ | N/A | |
| | input/output | description: | |
| Return | E_OK | | 0 |
| Return | E_NOK | 1 | |
| Description | call this api to initialize the motors | | |

| Function Name | М | OTOR_eStop(void) | |
|---------------|--------------|------------------|--|
| | innuts | N/A | |
| | inputs | Description: | |
| Arguments | outputs. | N/A | |
| | outputs | description: | |
| | ionut/outout | N/A | |
| | input/output | description: | |

| Return | E_OK | 0 |
|-------------|-----------|------------------------|
| | E_NOK | 1 |
| Description | Call this | api to stop the motor. |

| Function Name | MOTOR_eStart(const Dir_t u8DirectionCpy) | | | | |
|---------------|--|-------------------------|----------------|--|--|
| | | u8DirectionCpy | Const Dir_t | | |
| | inputs | description: enumulati | on contain the | | |
| | | side to be affected by | the fn. | | |
| Arguments | outputs | N/A | | | |
| | outputs | description: | | | |
| | innut/outnut | N/A | | | |
| | input/output | | | | |
| Dotum | E_OK | 0 | | | |
| Return | E_NOK | 1 | | | |
| Doscription | call this api to start th | ne motor wether the (RI | GHT, LEFT, or | | |
| Description | | вотн) | | | |

| Name | u8DirectionCpy | | |
|-------------|--|---|---------------|
| Туре | enumeration | | |
| Range | FORWARD | 0 | Move forward |
| | BACKWARD | 1 | Move backward |
| | RIGHT | 2 | Move right |
| | LEFT | 3 | Move left |
| Description | These values are controlling the direction of robot. | | |

ROBOT Control APIs

| Function Name | ROBOT_eInit(void) | | |
|------------------|---|--------------|---|
| | innuts | N/A | |
| | inputs | description: | |
| Argumonto | outputs | N/A | |
| Arguments | outputs | description: | |
| | | N/A | |
| | input/output | description: | |
| Doturn | E_OK | | 0 |
| Return | E_NOK | | 1 |
| Description | call this api to initialize the Robot Control module and the needed other modules | | |

| Function Name | Robot_bUpdateMoving(void) | | |
|------------------|---------------------------|--------------|--|
| | inputs | N/A | |
| | | description: | |
| Arguments | | N/A | |
| | outputs | description: | |
| | input/output | N/A | |

| | | description: |
|-------------|---|--------------|
| E_Ok | E_OK | 0 |
| Return | E_NOK | 1 |
| Description | call this api periodically to update the moving direction and speed | |

Timer APIs

| Function Name | Timer_eInit(void) | | |
|------------------|---|--------------|---|
| | | N/A | |
| | inputs | description: | |
| | | N/A | |
| Arguments | outputs | description: | |
| | input/output | N/A | |
| | input/output | description: | |
| Return | E_OK | | 0 |
| Retuiii | E_NOK | | 1 |
| Description | call this api to initialize the timer as specified in the configuration file Timer module must use Timer0 in hardware. | | |

| Function | Timer_eStart(void) | | |
|-----------|--------------------|--------------|--|
| Name | Timer_estart(void) | | |
| | inputs | N/A | |
| | | description: | |
| Arguments | | N/A | |
| | | description: | |
| | input/output | N/A | |

| | | description: |
|-------------|--|--------------|
| Doturn | E_OK | 0 |
| Return | E_NOK | 1 |
| Description | call this api to make the timer start counting from zero | |

| Function Name | Timer_bGetCurrentTiming_mS(u32* u32Current_mS) | | | |
|---------------|---|--|----------------------|--|
| | innuts | N/A | | |
| | inputs | description: | | |
| | | u32Current_mS | u32 | |
| Arguments | outputs | Description: used to return the elapsed time (in mS) since the timer was started | | |
| | | from zero using T | imer_eStart API. | |
| | innut/outnut | N/A | | |
| | input/output | description: | | |
| Doturn | E_OK | | 0 | |
| Return | E_NOK | E_NOK 1 | | |
| Description | call this api get th | ne current second e | elapsed from calling | |
| Description | Timer_eStart(); | | | |

| Name | u32Current_mS | | |
|-------------|---|--|--|
| Туре | U32 | | |
| Range | 0 The least value | | |
| | 3 600 000 000 The max value you can ge Equal 1000 hours | | |
| Description | These is the elapsed time since starting count from zero. | | |

| Function Name | Timer_eStop(void) | | |
|---------------|---------------------------------|--------------|---|
| | i na vanaka | N/A | |
| | inputs | description: | |
| Argumonts | outputs | N/A | |
| Arguments | | description: | |
| | input/output | N/A | |
| | | description: | |
| Return | E_OK | | 0 |
| Return | E_NOK | 1 | |
| Description | call this api to stop the timer | | |

PWM APIs

| Function Name | PWM_elnit(void) | | | |
|------------------|--|--------------|---|--|
| | | N/A | | |
| | inputs | description: | | |
| Argumonts | outputs. | N/A | | |
| Arguments | outputs | description: | | |
| | input/output | N/A | | |
| | | description: | | |
| Dotum | E_OK | | 0 | |
| Return | E_NOK | 1 | | |
| Description | call this api to initialize the pwm module to the Timer1 hardware module | | | |

| Function Name | PWM_eSetCompareValue(const u16 u16CompareValueCpy) | | | |
|------------------|--|----------------------------|-----------|--|
| | inputs | u16CompareValueCpy | const u16 | |
| | inputs | description: compare value | | |
| Arguments | outnuts | N/A | | |
| outputs | | description: | | |
| | input/output | N/A | | |

| | | description: |
|-------------|--|--------------|
| Doturn | E_OK | 0 |
| Return | E_NOK | 1 |
| Description | call this api to set the pwm compare value | |

| Function Name | PWM_eStart(void) | | |
|------------------|--------------------------------|--------------|---|
| | inputs | N/A | |
| | inputs | description: | |
| Argumonts | outputs | N/A | |
| Arguments | | description: | |
| | input/output | N/A | |
| | | description: | |
| Dotum | E_OK | | 0 |
| Return | E_NOK | | 1 |
| Description | call this api to start the pwm | | |

| Function Name | PWM_eStop(void) | | |
|------------------|-------------------------|--------------|---|
| | | N/A | |
| | inputs | description: | |
| Argumanta | outputs input/output | N/A | |
| Arguments | | description: | |
| | | N/A | |
| | | description: | |
| Return | E_OK | | 0 |
| | E_NOK | | 1 |

| Description | call this api to stop the stop |
|-------------|--------------------------------|
| 2 000 | can time up to stop time stop |

LCD APIs

| Function Name | LCD_eInit(void) | | |
|---------------|---|--------------|--|
| | inputs | N/A | |
| | | description: | |
| Arguments | outputs | N/A | |
| Arguments | | description: | |
| | input/output | N/A | |
| | | description: | |
| Dotum | E_OK | 0 | |
| Return | E_NOK | 1 | |
| Description | call this api to initialize the lcd as specified in the lcd configuration file but limited to PORTC (from pin0 : pin10) | | |

| Function Name | LCD_eSendCommand(const u8_u8CmdCpy) | | |
|---------------|--|---|----------|
| | inputs | u8CmdCpy | const u8 |
| | | description: a copy of the command to send to the lcd | |
| Arguments | outputs | N/A | |
| | | description: | |
| | input/output | N/A | |
| | | description: | |
| Dotum | E_OK | 0 | |
| Return | E_NOK | 1 | |
| Description | call this api to set the pin direction input or output | | |

| Name | u8CmdCpy | | |
|-------|------------------------------|---|---|
| Туре | enumeration | | |
| Range | lcd_Clear 0 Clear the screen | | |
| | lcd_Home | 1 | Move to the first position in first row |
| | lcd_DisplayOff | 2 | Disable the display |
| | lcd_DisplayOn | 3 | enable the display |

Description These values are the commands to be sent to the lcd.

| Function Name | LCD_bGotoxy(const u8 XPosCpy,const u8 YPosCpy) | | |
|---------------|---|--|----------|
| | inputs | XPosCpy | const u8 |
| | | description: the horizontal position | |
| | | starting from 0:15 for 2x16 lcd | |
| | | YPosCpy | const u8 |
| Argumonts | | description: the vertical position (0:1) for | |
| Arguments | | 2x16 lcd | |
| | outputs | N/A | |
| | | description: | |
| | input/output | N/A | |
| | | description: | |
| Return | E_OK | 0 | |
| | E_NOK | 1 | |
| Description | call this api to go to specific position on the lcd | | |

| Name | XPosCpy | |
|-------------|---|---|
| Туре | U8 | |
| Range | 0 | The first position in the screen starting from left |
| | 15 | The last position in the screen starting from left |
| Description | These values are the horizontal positions in a 2x16 LCD | |

| Name | YPosCpy | |
|-------------|---|--|
| Туре | U8 | |
| Range | 0 | The first row in the screen starting from upper row |
| | 1 | The second row in the screen starting from upper row |
| Description | These values are the horizontal positions in a 2x16 LCD | |

| Function Name | LCD_bWriteChar(const u8 u8DataCpy) | | | |
|---------------|---|---|----------|--|
| | | u8DataCpy | const u8 | |
| | inputs | description: the charcter to be writen in | | |
| | | ascii representation | | |
| Arguments | outouts | N/A | | |
| | outputs | description: | | |
| | innut/outnut | N/A | | |
| | input/output | description: | | |
| Dotum | E_OK | 0 | | |
| Keturn | Return E_NOK | 1 | | |
| Doscription | call this api to write a specific character in the current cursor | | | |
| Description | position | | | |

| Name | u8DataCpy | | |
|-------------|---|-------------------------|--|
| Туре | U8 | | |
| Range | 0 | The least decimal value | |
| | 127 | The last decimal value | |
| Description | These values are the decimal representation o | | |
| Description | code. | | |