Embedded SW Design

TASK 2

MCAL Layer

DIO APIs:

- DIO_Init()
- DIO_Read()
- DIO_Write()

APIs Description:

Initialization

- Function name: DIO_Init().
- Arguments:
- Input: Pin(DIO_PinType).
- Output: none.
- Input/output: none.
- Return: E_OK(0),E_NOK(1).
- Description: initialize the DIO module .

APIs Description:

Read

- Function name: DIO_Read()
- Arguments:
- Input: Pin(DIO_PinType)
- Output: Level(DIO_LevelType)
- Input/output: none
- Return: E_OK(0),E_NOK(1).
- Description: read the pin value .

APIs Description:

Write

- Function name: DIO_Write().
- Arguments:
- Input: Pin (DIO_PinType), Level (DIO_LevelType).
- Output: none.
- Input/output: none.
- Return: E_OK(0),E_NOK(1).
- Description: Set the Pin value .

DIO Data types :

Pin Type:

- Name: DIO_PinType
- Type: Enumeration
- Range: 0-31
- Description: it define the pin number used in the API.

LevelType:

- Name: DIO_LevelType
- Type: Enumeration
- Range: 0-1
- Description: it define the level used on the pin.

MCAL Layer Timer:

- Timer_Init()
- Timer_Start()
- Timer_Stop()

APIs Description:

Initialization

- Function name: Timer_Init().
- Arguments:
- Input: Config(Timer_ConfigType).
- Output: none.
- Input/output: none.
- Return: E_OK(0),E_NOK(1).
- Description: Initiate the Timer .

APIs Description:

Start

- Function name: Timer_Start().
- Arguments: none.
- Input: none.
- Output: none.
- Input/output: none.
- Return: E_OK(0),E_NOK(1).
- Description: Starts the timer .

APIs Description:

Stop

- Function name: Timer_Stop().
- Arguments: none.
- Input: none.
- Output: none.
- Input/output: none.
- Return: E_OK(0),E_NOK(1).
- Description: Stops the Timer.

Timer Data types :

Timer Configuration:

- Name: Timer_ConfigType
- Type: Struct
- Range: none
- Description: Configuration of the timer.

MCAL Layer PWM:

- PWM_Init()
- PWM_Start()
- PWM_Stop()

APIs Description:

Intialization

- Function name: PWM_Init().
- Arguments: Config (PWM_ConfigType)
- Input: none.
- Output: none.
- Input/output: none.
- Return: E_OK(0),E_NOK(1).
- Description: init the PWM.

APIs Description:

Start

- Function name: Timer_PWM().
- Arguments: none.
- Input: none.
- Output: none.
- Input/output: none.
- Return: E_OK(0),E_NOK(1).
- Description: Starts the PWM.

APIs Description:

Stop

- Function name: PWM_Stop().
- Arguments: none.
- Input: none.
- Output: none.
- Input/output: none.
- Return: E_OK(0),E_NOK(1).
- Description: Stops the PWM.

PWM Data types :

PWM Configuration:

- Name: PWM_ConfigType
- Type: Struct
- Range: none
- Description: Configuration of the PWM.

HAL Layer

LCD:
APIs:

- LCD_Init()
- LCD_Display()

APIs Description:

Init

- Function name: LCD_Init().
- Arguments: Config(LCD_ConfigType).
- Input: none.
- Output: none.
- Input/output: none.
- Return: E_OK(0),E_NOK(1).
- Description: Starts the LCD.

APIs Description:

Display

- Function name: LCD_Display().
- Arguments: Data(LCD_Data).
- Input: none.
- Output: none.
- Input/output: none.
- Return: E_OK(0),E_NOK(1).
- Description: Write on the LCD.

LCD Data types :

LCD Configuration:

- Name: LCD_ConfigType
- Type: Struct
- Range: none
- Description: Configuration of the LCD.

Data Type:

- Name: LCD_DataType
- Type: uint8
- Range: none
- Description: data to be written on the LCD.

Motor:
APIs:

- Motor_Init()
- Motor_Start()
- Motor_Stop()

APIs Description:

Initialization

- Function name:Motor_Init().
- Arguments: Config(Motor_ConfigType).
- Input: none.
- Output: none.
- Input/output: none.
- Return: E_OK(0),E_NOK(1).
- Description: Init the Motor.

APIs Description:

Start

- Function name: Motor_Start().
- Arguments: none.
- Input: none.
- Output: none.
- Input/output: none.
- Return: E_OK(0),E_NOK(1).
- Description: Starts the Motor.

APIs Description:

Stop

- Function name: Motor_Stop().
- Arguments: none.
- Input: none.
- Output: none.
- Input/output: none.
- Return: E_OK(0),E_NOK(1).
- Description: Stops the Motor.

Motor Data types :

Motor Cofiguration:

- Name: Motor_ConfigType
- Type: Struct
- Range: none
- Description: Configuration of the Motor.

Application Layer

Robot:
APIs:

- robot_Init()
- robot_Start()
- robot_Stop()
- robot_MoveUpdate()

APIs Description:

Initialization

- Function name: Robot_Init().
- Arguments: Config(Robot_ConfigType).
- Input: none.
- Output: none.
- Input/output: none.
- Return: E_OK(0),E_NOK(1).
- Description: initialize the Robot.

APIs Description:

Update state machine

- Function name: robot_MoveUpdate().
- Arguments: none.
- Input: none.
- Output: none.
- Input/output: none.
- Return: E_OK(0),E_NOK(1).
- Description: change the state of the robot.

APIs Description:

Start

- Function name: Robot_Start().
- Arguments: none.
- Input: none.
- Output: none.
- Input/output: none.
- Return: E_OK(0),E_NOK(1).
- Description: Starts the Robot.

APIs Description:

stop

- Function name: Robot_Stop().
- Arguments: none.
- Input: none.
- Output: none.
- Input/output: none.
- Return: E_OK(0),E_NOK(1).
- Description: Stops the Robot.

RobotData types :

Robot Configuration:

- Name: Robot_ConfigType
- Type: Struct
- Range: none
- Description: Configuration of the Robot.