ECU 1 components and modules:

- Microcontrollers (TIVA C)
- Speed sensor(LM393)
- Door sensor (IR sensor)
- Light switch(button)

ECU 1 APIS:

- DIO

API	description
DIO_INIT()	DIO function that Initialize the port
DIO_READ()	DIO function that gets the pin value
DIO_WRITE()	DIO function to set the direction of the pin to be input or output

- RCC

API	description
RCC_INIT()	Set the RCC
RCC_EnablePeripheral()	Enable the peripheral

- NVIC

API	description
ISR()	Enables the external interrupt

- TIMER

API	description
TIMER_INIT()	To initiate the timer states
TIMER_START()	To start the count
TIMER_STOP()	To end the count

- CAN

API	description
CAN_INIT()	To initiate the Can Bus
CAN_RECEIVE()	To receive the data via can bus
CAN_TRANSMIT()	To transmit the data via can bus

- door sensor

API	description
Get _state()	A function that gets the value of the input pin of the sensor
Door_init	To initiate the door sensor

- speed sensor

API	description
Get _state()	A function that gets the value of the input pin of the sensor
speed_init	To initiate the speed sensor

- switch

API	description
Get _state()	A function that gets the value of the input pin of the sensor
switch_init	To initiate the switch

- **STD_TYPES**

  Module: Common - Platform Types Abstraction

  File Name: std_types.h

  Description: types for tiva c

- Common macros

API	description
SET_BIT(REG,BIT)	Set a certain bit in any register
CLEAR_BIT(REG,BIT)	Clear a certain bit in any register
TOGGLE_BIT(REG,BIT)	Toggle a certain bit in any register

ROR(REG,num)	Rotate right the register value with specific number of rotates
ROL(REG,num)	Rotate left the register value with specific number of rotates
BIT_IS_SET(REG,BIT)	Check if a specific bit is set in any register and return true if yes
BIT_IS_CLEAR(REG,BIT)	Check if a specific bit is cleared in any register and return true if yes

Folder structure of ECU 1:

CTOS:

1. MCAL

- DIO
- CAN
- NVIC
- TIMER
- RCC

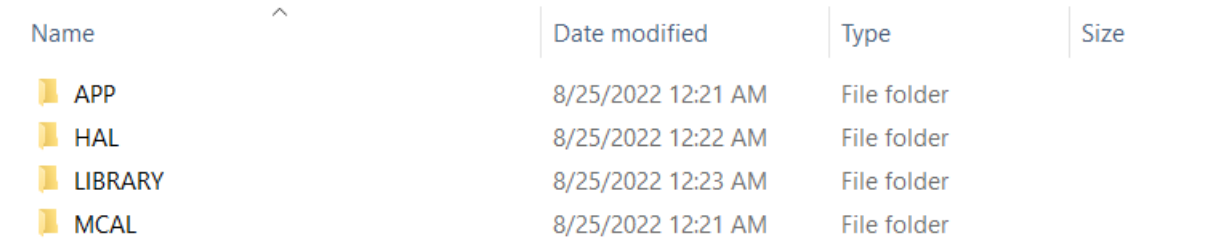
2. HAL

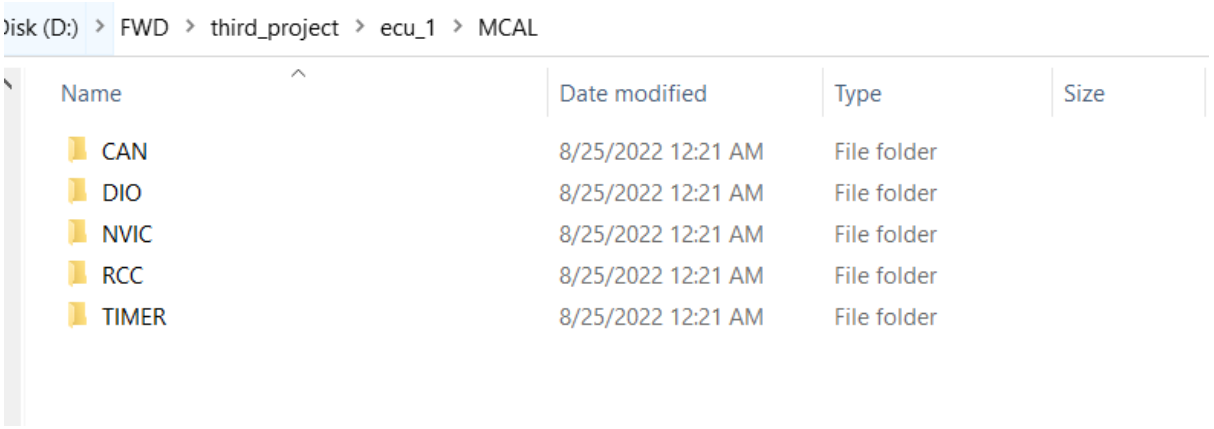
- Door sensor
- Speed sensor
- Button/switch

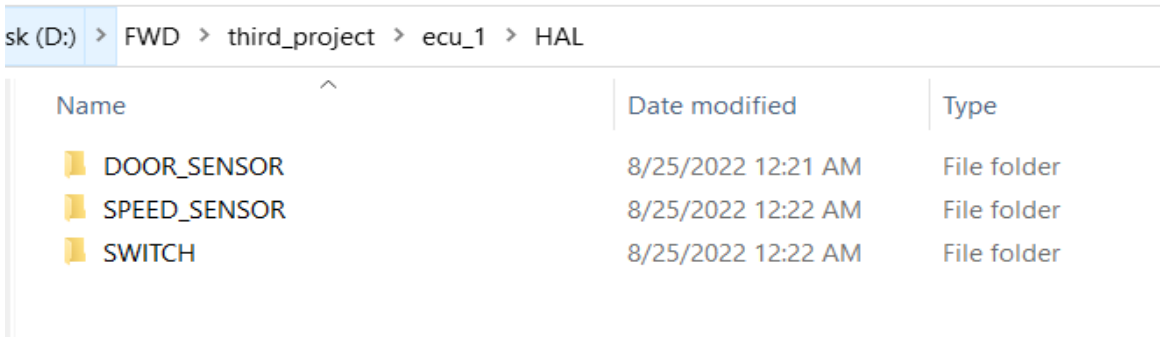
3. library

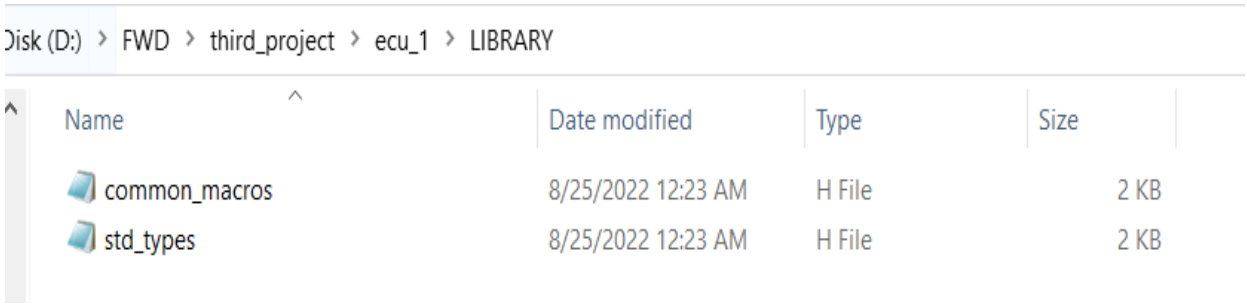
- STD_TYPES
- Common_macros

4. APP









ECU 2 components and modules:

- Microcontrollers (TIVA C)
- LEDS
- Resistances
- buzzer

ECU 1 APIS:

- DIO

API	description
DIO_INIT()	DIO function that Initialize the port
DIO_READ()	DIO function that gets the pin value
DIO_WRITE()	DIO function to set the direction of the pin to be input or output

- RCC

API	description
RCC_INIT()	Set the RCC
RCC_EnablePeripheral()	Enable the peripheral

- NVIC

API	description
ISR()	Enables the external interrupt

- TIMER

API	description
TIMER_INIT()	To initiate the timer states
TIMER_START()	To start the count
TIMER_STOP()	To end the count

- CAN

API	description
CAN_INIT()	To initiate the Can Bus
CAN_RECEIVE()	To receive the data via can bus
CAN_TRANSMIT()	To transmit the data via can bus

- LED

API	description
Set_led()	set the value of the led as high
CLR_LED()	set the value of the led as low
LED_INIT()	Initiate the led

- Buzzer

API	description
Set_buzzer()	Set the value of the buzzer as high
CLR_buzzer()	set the value of the buzzer as low
Buzzer_INIT()	Initiate the buzzer

- **STD_TYPES**

  Module: Common - Platform Types Abstraction

  File Name: std_types.h

  Description: types for tiva c

- Common macros

API	description
SET_BIT(REG,BIT)	Set a certain bit in any register
CLEAR_BIT(REG,BIT)	Clear a certain bit in any register
TOGGLE_BIT(REG,BIT)	Toggle a certain bit in any register
ROR(REG,num)	Rotate right the register value with specific number of rotates
ROL(REG,num)	Rotate left the register value with specific number of rotates
BIT_IS_SET(REG,BIT)	Check if a specific bit is set in any register and return true if yes
BIT_IS_CLEAR(REG,BIT)	Check if a specific bit is cleared in any register and return true if yes

Folder structure of ECU 2 :

1. MCAL

- DIO
- CAN
- NVIC
- TIMER
- RCC

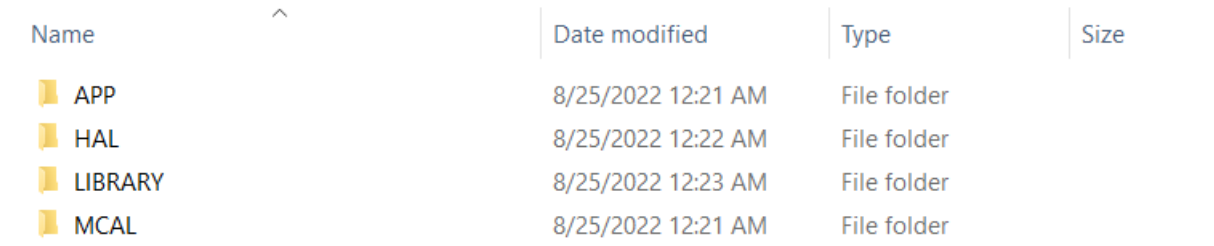
2. HAL

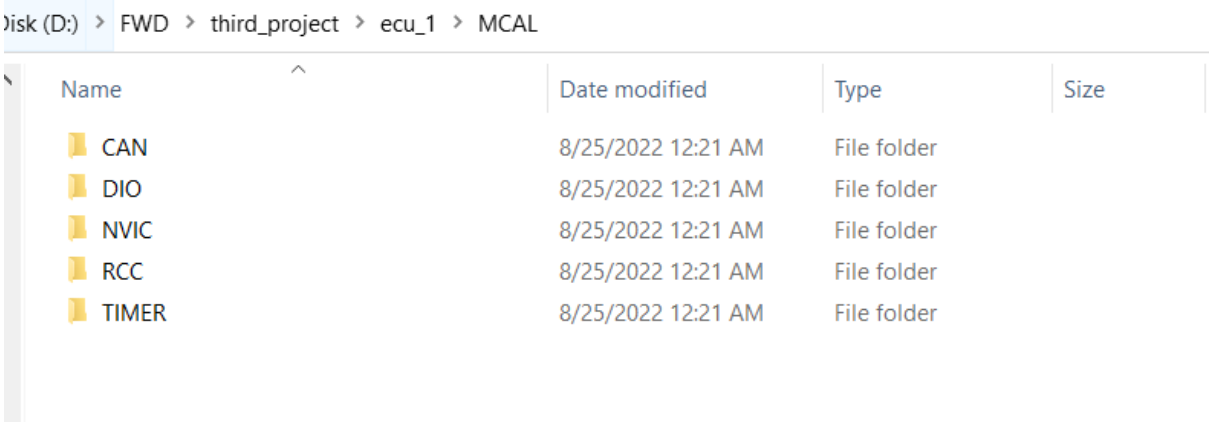
    - LED
    - Buzzer

3. library

- STD_TYPES
- Common_macros

4. APP





sk (D:) › FWD › third_project › ecu_2 › HAL

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led	8/25/2022 12:21 AM	File folder	

Disk (D:) › FWD › third_project › ecu_1 › LIBRARY

Name	Date modified	Type	Size
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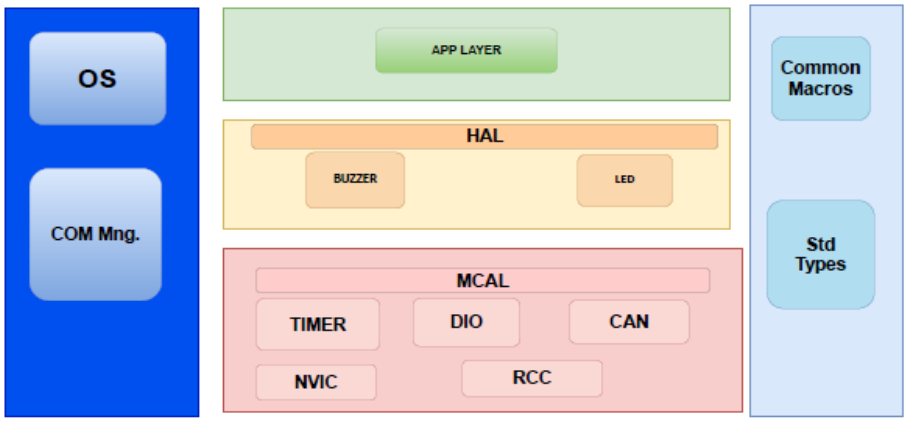
std_types	8/25/2022 12:23 AM	H File	2 KB

Layered architectur

ECU 2 LAYED ARCH



ECU 1 LAYED ARCH