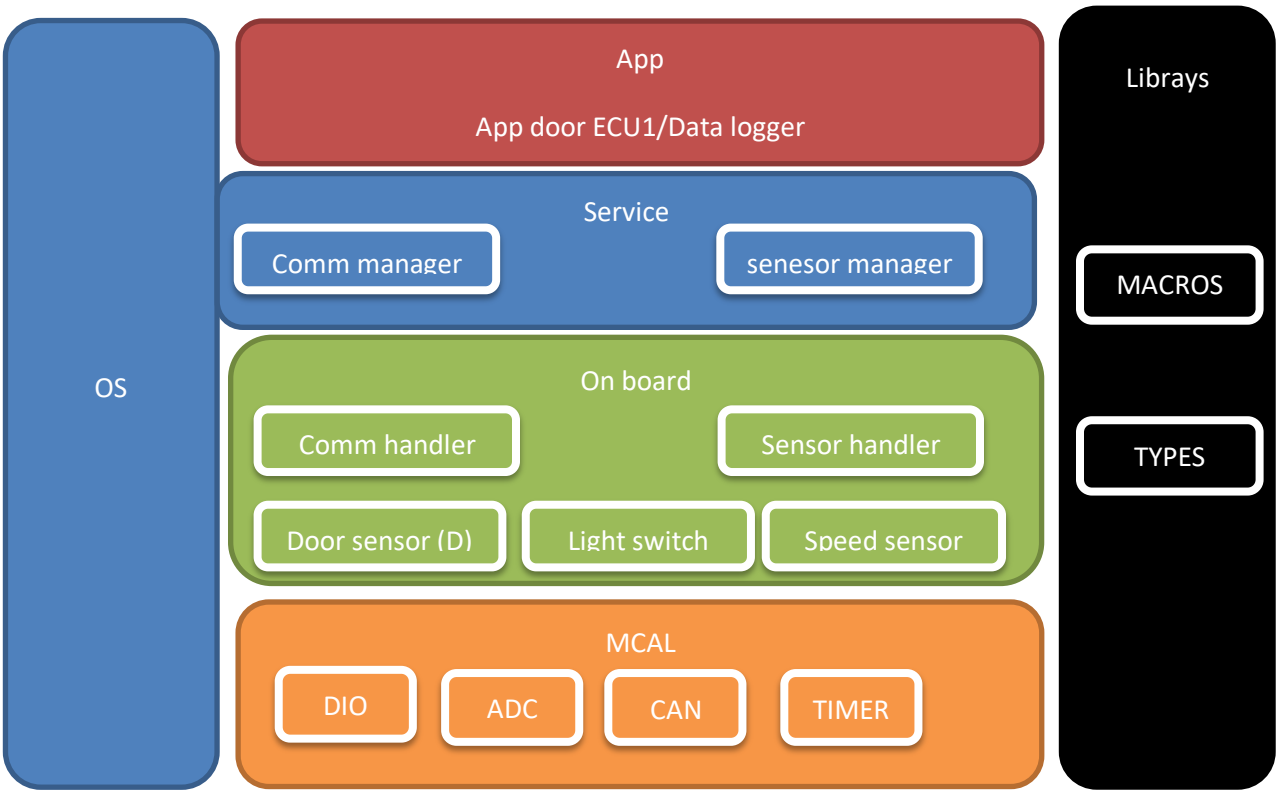
1-ECU1



1-APP LAYER

1.1 -App door ECU1

Function name	U8 Send _Door_ state(void)	
Arugments	inputs	void
	output	O1: door state if open or close
Return	open	1
	close	0
Description	It will get door state if open or close	

Function name	U8 Send_Light_switch_state (void)	
Arugments	inputs	void
	output	O1: door state if open or close
Return	open	1
	close	0
Description	It will get light state if open or close	

Function name	U8 Send_Speed _Value (void)	
Arugments	inputs	void
	output	O1: door state if open or close
Return	speed	Value range
Description	It will get speed value	

1.2-Data logger

Function name	void Data_Logger_DataSave (u8 data)	
Arugments	inputs	A1:data will be send
	output	None
Return	None	None
Description	Save data	

2-Service Layer

2.1-comm manager

Function name	void Comm_Manager (u8 msg,u8 bus)	
Arugments	inputs	A1:msg will be send A2:Bus we will choose
	output	None
Return	None	None
Description	user will send msg to my bus from app layer	

2.2-Sensor Manager

Function name	void Sensor_Manager (u8 ID)	
Arugments	inputs	A1:ID we will choose
	output	None
Return	None	None
Description	it choose Sensor to use from app layer	

3-On Board(HAL)

3.1-Comm_Handler

Function name	Void Comm_ Handler (u8 msg,u8 bus)	
Arugments	inputs	A1:msg will be send A2:Bus we will choose
	output	None
Return	None	None
Description	it will send msg to my bus to HW	

3.2- Sensor Handler

Function name	void Sensor_ Handler (u8 ID)	
Arugments	inputs	A1:ID we will choose
	output	None
Return	None	None
Description	it choose Sensor to use from HW	

3.3-Door sensor

Function name	void Door_Sensor_Init (void)	
Arugments	inputs	None
	output	None
Return	None	None
Description	Init door sensor with pins in DIO	

Function name	U8 Door_Sensor_GetState (void)	
Arugments	inputs	None
	output	O1:get state open or close
Return	open	1
	close	0
Description	Get state of door sensor	

3.4-Light Switch

Function name	void Light_Switch_Init (void)	
Arugments	inputs	None
	output	None
Return	None	None
Description	Init Light Switch with pins in DIO	

Function name	U8 Light_Switch _GetState (void)	
Arugments	inputs	None
	output	O1:get state ON or OFF
Return	ON	1
	OFF	0
Description	Get state of Light_Switch	

3.5-Speed Sensor

Function name	void Speed_Sensor_Init (void)	
Arugments	inputs	None
	output	None
Return	None	None
Description	Init Light Switch with pins in DIO and ADC	

Function name	U8 Speed_Sensor_GetSpeed (void)	
Arugments	inputs	None
	output	O1:speed value
Return	Speed value	Value range
Description	Get speed of Sensor	

4-MCAL Layer

4.1-TIMER

Function name	void TIMER _Init (void)	
Arugments	inputs	None
	output	None
Return	None	None
Description	Init TIMER TO START	

Function name	void TIMER _START_DELAY (u8 delay)	
Arugments	inputs	A1:value of delay
	output	None
Return	None	None
Description	It Start timer and delay	

4.2-ADC

Function name	void ADC _Init (void)	
Arugments	inputs	None
	output	None
Return	None	None
Description	Init ADC TO START	

Function name	void ADC_Read (u8 ch_id)	
Arugments	inputs	A1:channel id
	output	O1:value range of adc
Return	None	None
Description	It read value of ADC	

4.3-DIO

Function name	void DIO_Init (void)	
Arugments	inputs	None
	output	None
Return	None	None
Description	Init DIO TO START	

Function name	U8 DIO_Read (void)	
Arugments	inputs	None
	output	O1:value of DIO
Return	value	0/1
Description	It read value of DIO	

Function name	void DIO_Write (u8 value)	
Arugments	inputs	A1:value 0/1
	output	None
Return	None	None
Description	It Write value of DIO	

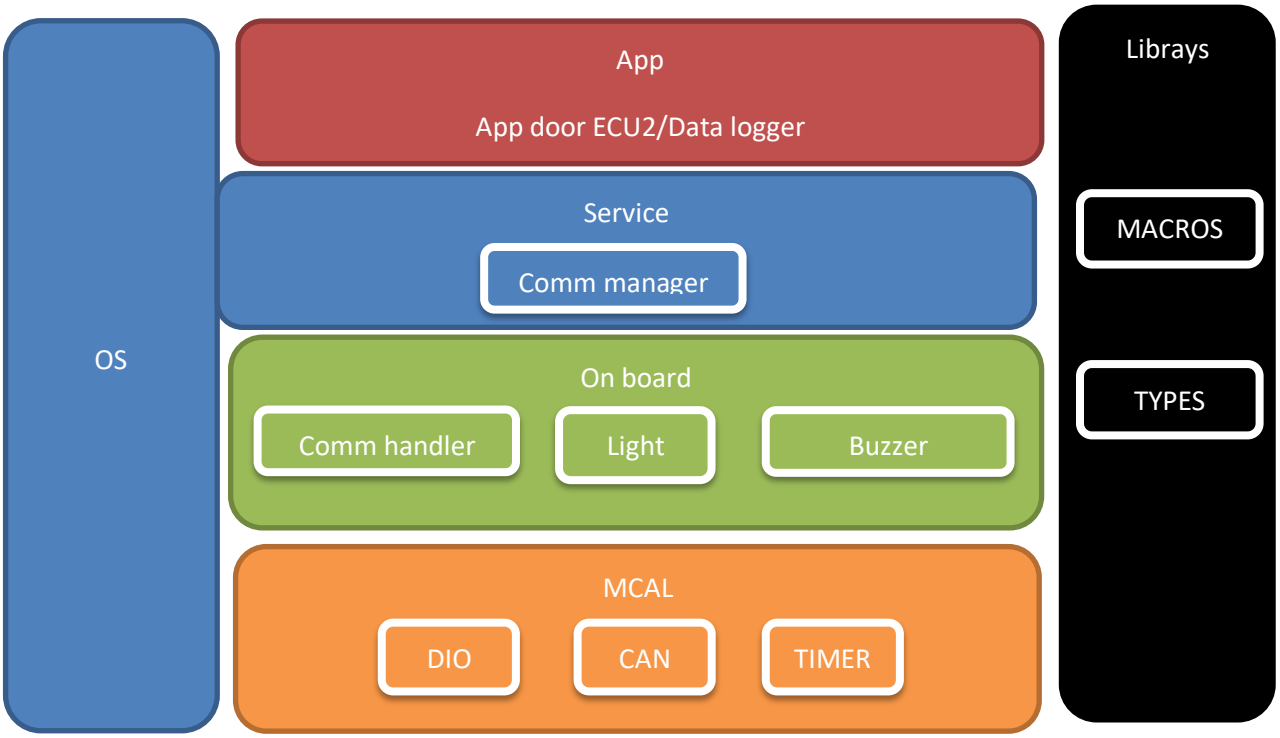
4.4-CAN

Function name	void CAN _Init (void)	
Arugments	inputs	None
	output	None
Return	None	None
Description	Init CAN TO START	

Function name	void CAN_TX (u8 id,u8 msg)	
Arugments	inputs	A1:id choose pin A2:msg will be send
	output	None
Return	value	None
Description	It transimate msg	

Function name	U8 CAN_RX (u8 id,u8 msg)	
Arugments	inputs	None
	output	O1:msg will recieve
Return	value	None
Description	It recieve msg	

2-ECU2



1-APP LAYER

1.2 -App door ECU2

Function name	void RX_MSG(u8 msg)	
Arugments	inputs	A1:msg
	output	void
Return	None	None
Description	It will rx msg	

Function name	void ON_OFF_Light (void)	
Arugments	inputs	void
	output	void
Return	None	None
Description	It will turn right or left light	

Function name	U8 ON_OFF_Buzzer (void)	
Arugments	inputs	void
	output	void
Return	None	None
Description	It will on or off buzzer	

1.2-Data logger

Function name	void Data_Logger_DataSave (u8 data)	
Arugments	inputs	A1:data will be send
	output	None
Return	None	None
Description	Save data	

2-Service Layer

2.1-comm manager

Function name	void Comm_Manager (u8 msg,u8 bus)	
Arugments	inputs	A1:msg will be send A2:Bus we will choose
	output	None
Return	None	None
Description	user will send msg to my bus from app layer	

3-On Board(HAL)

3.1-Comm_Handler

Function name	Void Comm_ Handler (u8 msg,u8 bus)	
Arugments	inputs	A1:msg will be send A2:Bus we will choose
	output	None
Return	None	None
Description	it will send msg to my bus to HW	

3.2-Light

Function name	void Light _Init (void)	
Arugments	inputs	None
	output	None
Return	None	None
Description	Init Light with pins in DIO	

Function name	void Light_ON_OFF (u8 control)	
Arugments	inputs	A1: control on 1 or off 0
	output	void
Return	None	None
Description	Turn on or off light	

3.3-Buzzer

Function name	void Buzzer _Init (void)	
Arugments	inputs	None
	output	None
Return	None	None
Description	Init Buzzer with pins in DIO	

Function name	void Buzzer _ON_OFF (u8 control)	
Arugments	inputs	A1: control on 1 or off 0
	output	void
Return	None	None
Description	Turn on or off buzzer	

4-MCAL Layer

4.1-TIMER

Function name	void TIMER _Init (void)	
Arugments	inputs	None
	output	None
Return	None	None
Description	Init TIMER TO START	

Function name	void TIMER _START_DELAY (u8 delay)	
Arugments	inputs	A1:value of delay
	output	None
Return	None	None
Description	It Start timer and delay	

4.2-DIO

Function name	void DIO_Init (void)	
Arugments	inputs	None
	output	None
Return	None	None
Description	Init DIO TO START	

Function name	U8 DIO_Read (void)	
Arugments	inputs	None
	output	O1:value of DIO
Return	value	0/1
Description	It read value of DIO	

Function name	void DIO_Write (u8 value)	
Arugments	inputs	A1:value 0/1
	output	None
Return	None	None
Description	It Write value of DIO	

4.3-CAN

Function name	void CAN _Init (void)	
Arugments	inputs	None
	output	None
Return	None	None
Description	Init CAN TO START	

Function name	void CAN_TX (u8 id,u8 msg)	
Arugments	inputs	A1:id choose pin A2:msg will be send
	output	None
Return	value	None
Description	It transimate msg	

Function name	U8 CAN_RX (u8 id,u8 msg)	
Arugments	inputs	None
	output	O1:msg will recieve
Return	value	None

Description	It recieve msg	

-LIB Layer

1-TYPES

```
typedef unsigned char u8;

typedef unsigned short int u16;

typedef unsigned long  int u32;
```

2-MACROS

```
#define SET_BIT(REG , BITNUM) REG |= 1<<BITNUM

#define CLR_BIT(REG , BITNUM) REG &= ~(1<<BITNUM)

#define TOG_BIT(REG , BITNUM) REG ^= 1<<BITNUM

#define GET_BIT(REG , BITNUM) ( (REG >> BITNUM) & 1 )
```