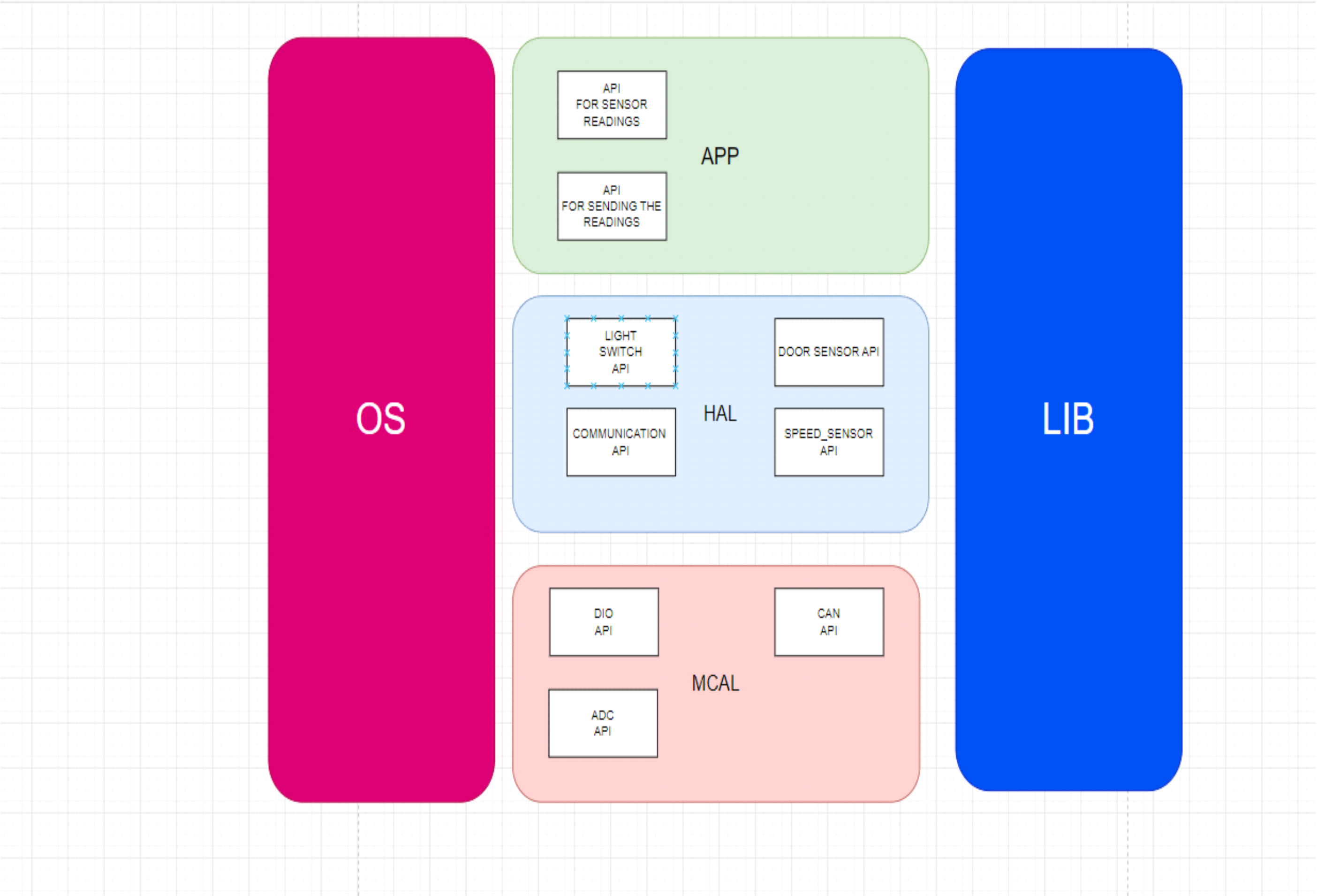
STATIC DESIGN FOR ECU1

ECU1 :Layered architecture



Components:

light_switch

door sensor

speed_sensor

can_bus

ADC

DIO

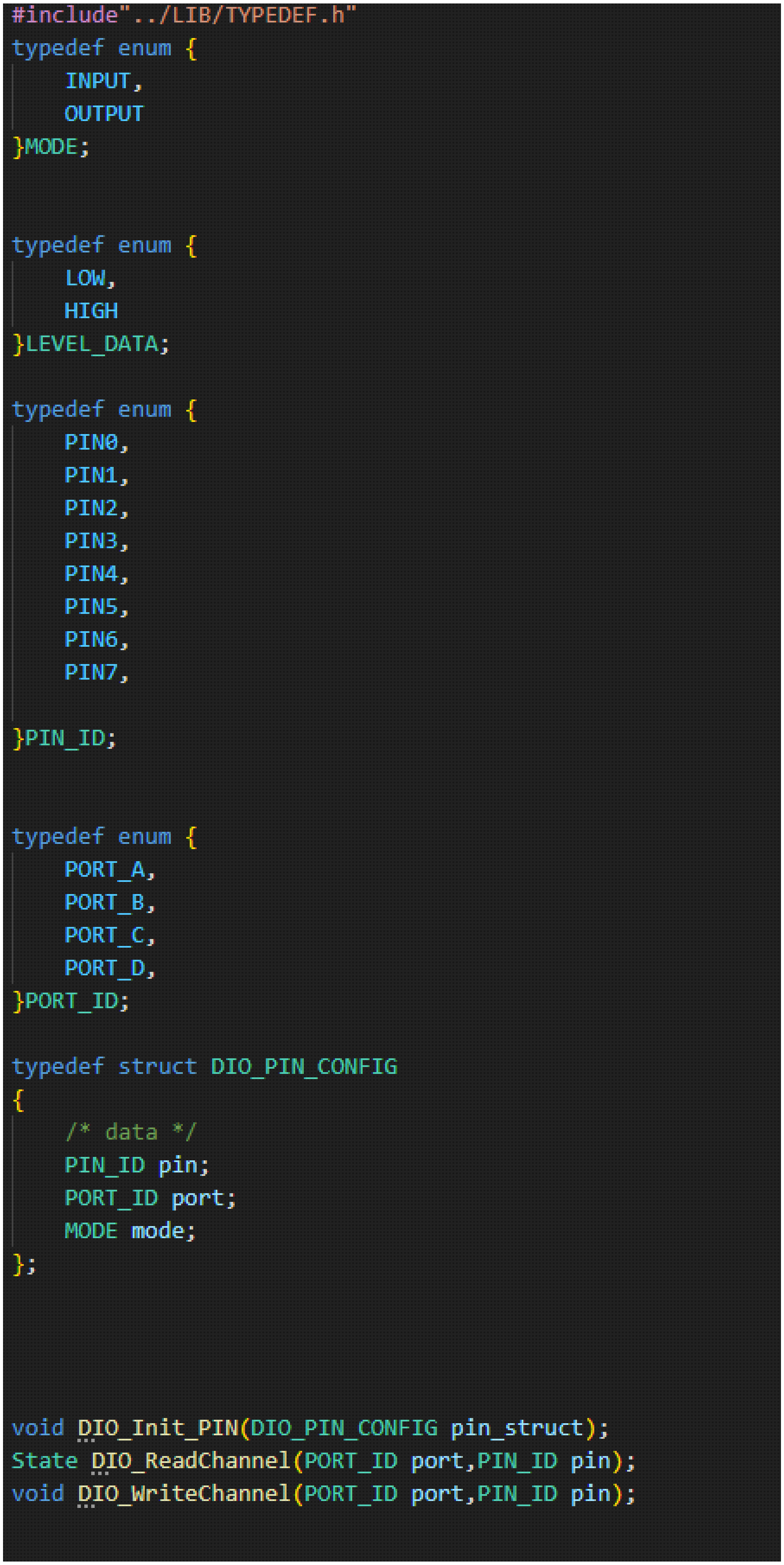
Modules:

Get_sensorReading()

sendDataVia_Can()

APIs

DIO



```c
#include"../LIB/TYPEDEF.h"
typedef enum {
    INPUT,
    OUTPUT
}MODE;


typedef enum {
    LOW,
    HIGH
}LEVEL_DATA;

typedef enum {
    PIN0,
    PIN1,
    PIN2,
    PIN3,
    PIN4,
    PIN5,
    PIN6,
    PIN7,

}PIN_ID;


typedef enum {
    PORT_A,
    PORT_B,
    PORT_C,
    PORT_D,
}PORT_ID;

typedef struct DIO_PIN_CONFIG
{
    /* data */
    PIN_ID pin;
    PORT_ID port;
    MODE mode;
};




void DIO_Init_PIN(DIO_PIN_CONFIG pin_struct);
State DIO_ReadChannel(PORT_ID port,PIN_ID pin);
void DIO_WriteChannel(PORT_ID port,PIN_ID pin);
```

DIO_Init_pin

this initailze the pin that u want to use

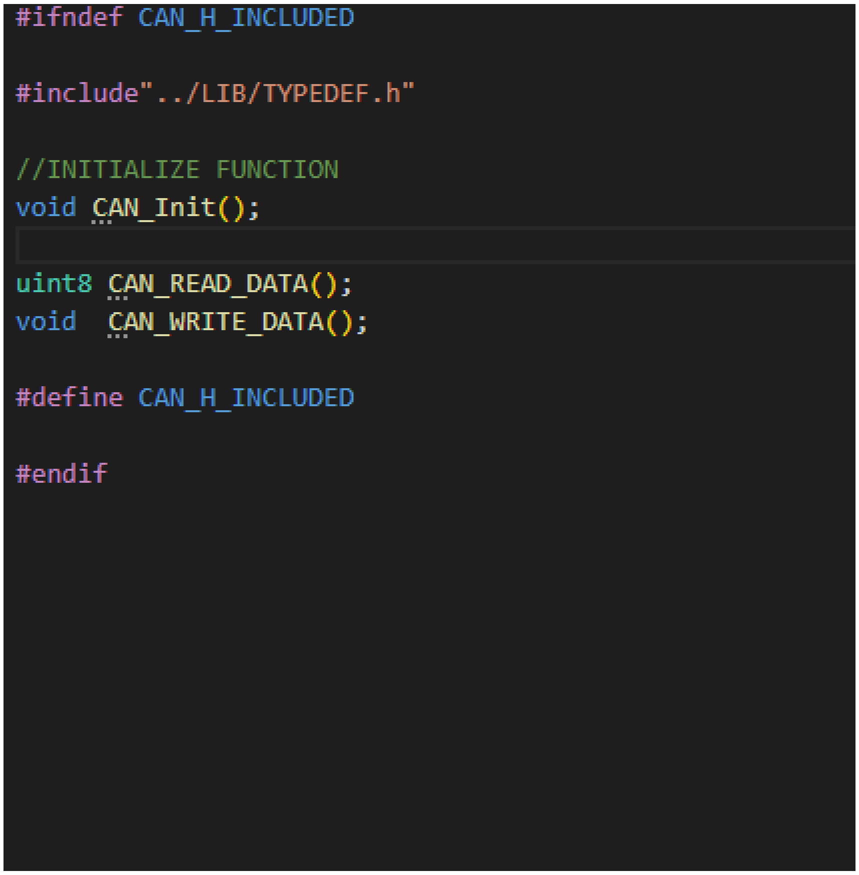
DIO_Readchannel

to read from the pin

DIO_WriteChannle

to Write on the pin

CAN



```
#ifndef CAN_H_INCLUDED

#include"../LIB/TYPEDEF.h"

//INITIALIZE FUNCTION
void CAN_Init();

uint8 CAN_READ_DATA();
void  CAN_WRITE_DATA();

#define CAN_H_INCLUDED

#endif
```

CAN_INIT

to initialzie the can module

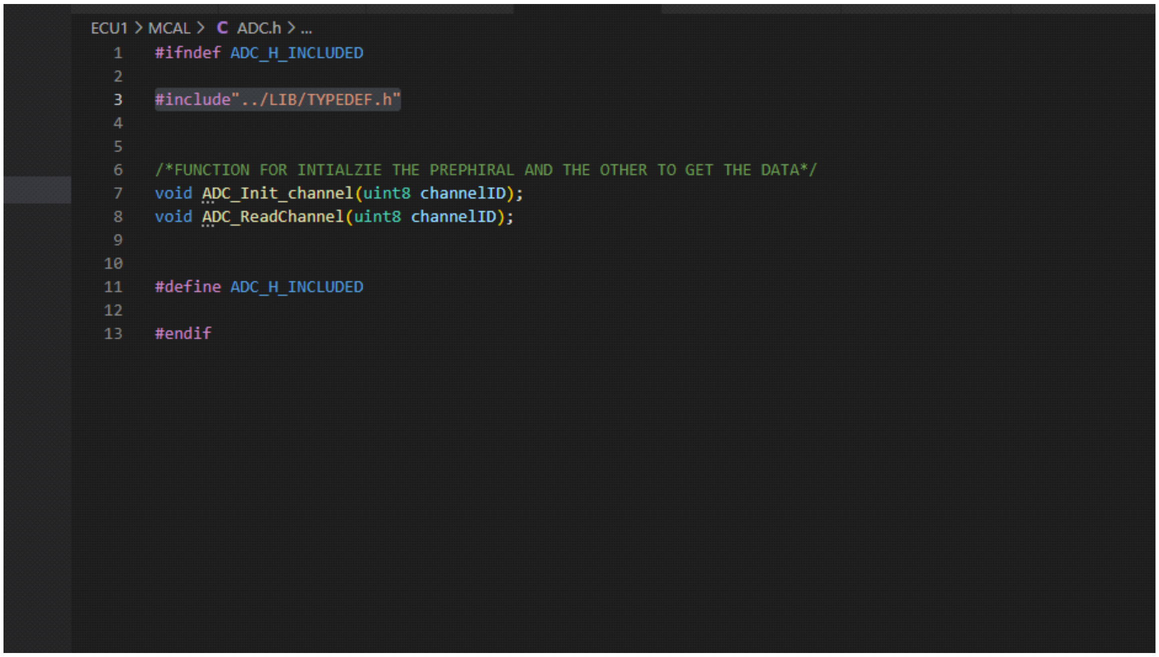
CAN_READ

TO READ DATA FROM CAN

CAN_WRITE

to write Data to can to send it

ADC



```c
#ifndef ADC_H_INCLUDED

#include"../LIB/TYPEDEF.h"


/*FUNCTION FOR INTIALZIE THE PREPHIRAL AND THE OTHER TO GET THE DATA*/
void ADC_Init_channel(uint8 channelID);
void ADC_ReadChannel(uint8 channelID);


#define ADC_H_INCLUDED

#endif
```

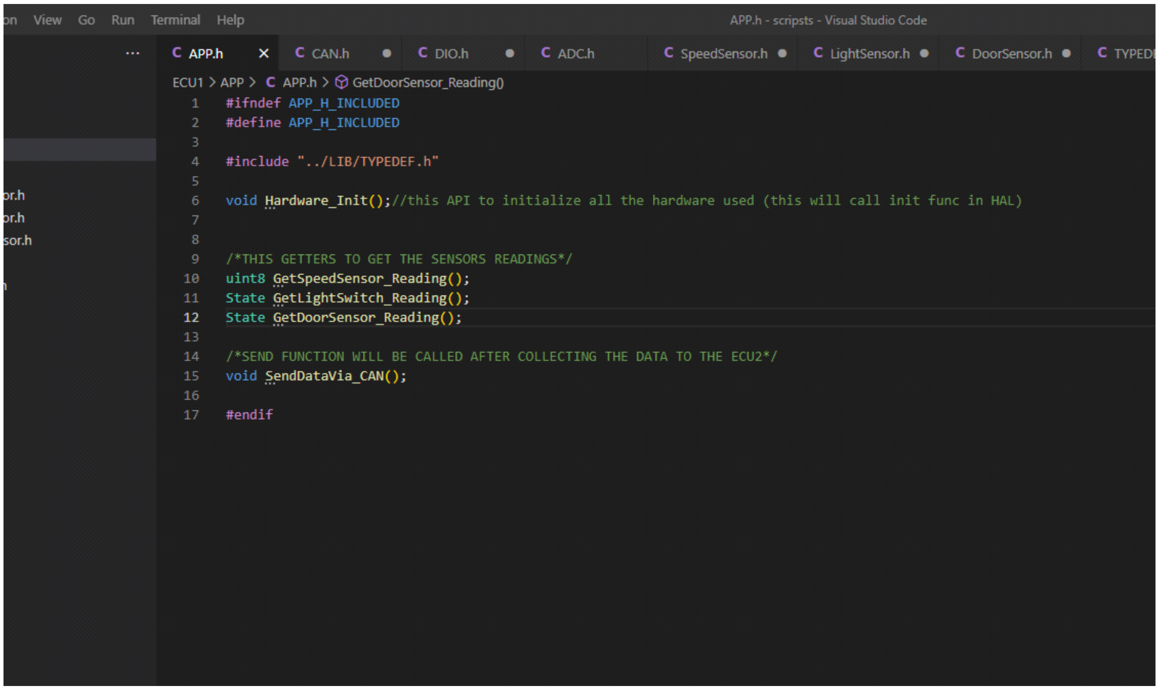
ADC_INIT

to initialzie the pin that will be used as ADC converter

ADC_READCHANNEL

to read from a specific pin

APP


on View Go Run Terminal Help
APP.h - scripsts - Visual Studio Code
APP.h
CAN.h
DIO.h
ADC.h
SpeedSensor.h
LightSensor.h
DoorSensor.h
TYPEDI
ECU1 > APP > APP.h > GetDoorSensor_Reading()
or.h
or.h
sor.h

```c
#ifndef APP_H_INCLUDED
#define APP_H_INCLUDED

#include "../LIB/TYPEDEF.h"

void Hardware_Init();//this API to initialize all the hardware used (this will call init func in HAL)


/*THIS GETTERS TO GET THE SENSORS READINGS*/
uint8 GetSpeedSensor_Reading();
State GetLightSwitch_Reading();
State GetDoorSensor_Reading();

/*SEND FUNCTION WILL BE CALLED AFTER COLLECTING THE DATA TO THE ECU2*/
void SendDataVia_CAN();

#endif
```

Hardware _init

this function that will intialize all hardware and call any initialize function for them(sensors and canbus)

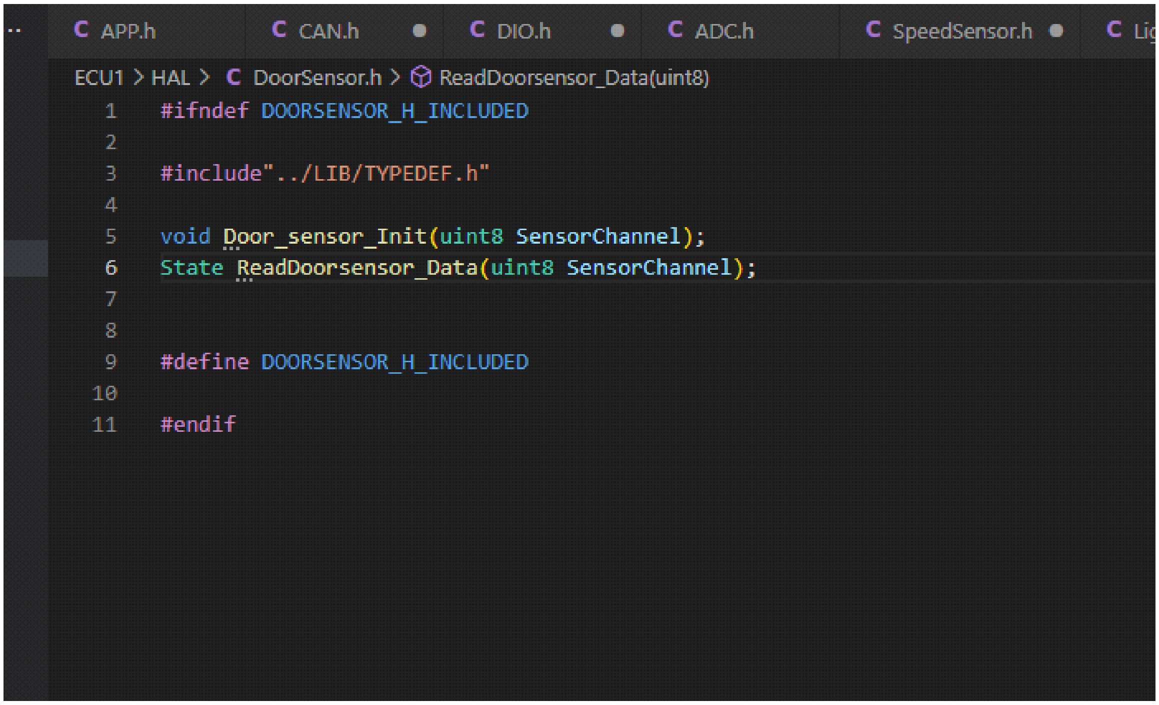
GetSpeedSensor

its agetter to get sensor data

Send DataVIA_Can

this will be used to send data through can_bus

HALL



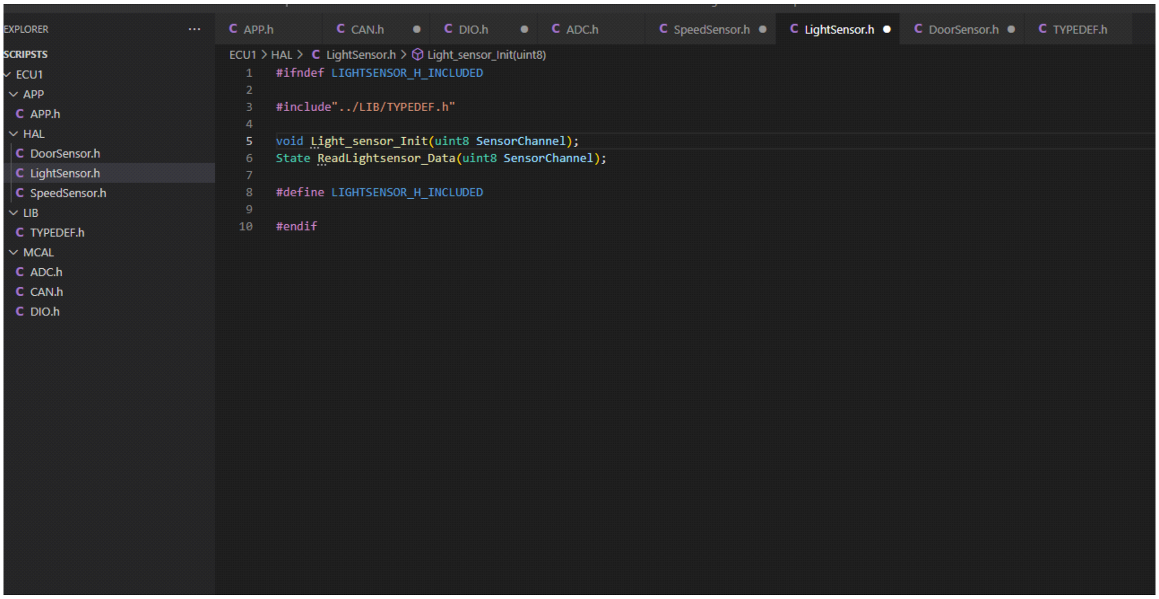
```c
#ifndef DOORSENSOR_H_INCLUDED

#include"../LIB/TYPEDEF.h"

void Door_sensor_Init(uint8 SensorChannel);
State ReadDoorsensor_Data(uint8 SensorChannel);


#define DOORSENSOR_H_INCLUDED

#endif
```



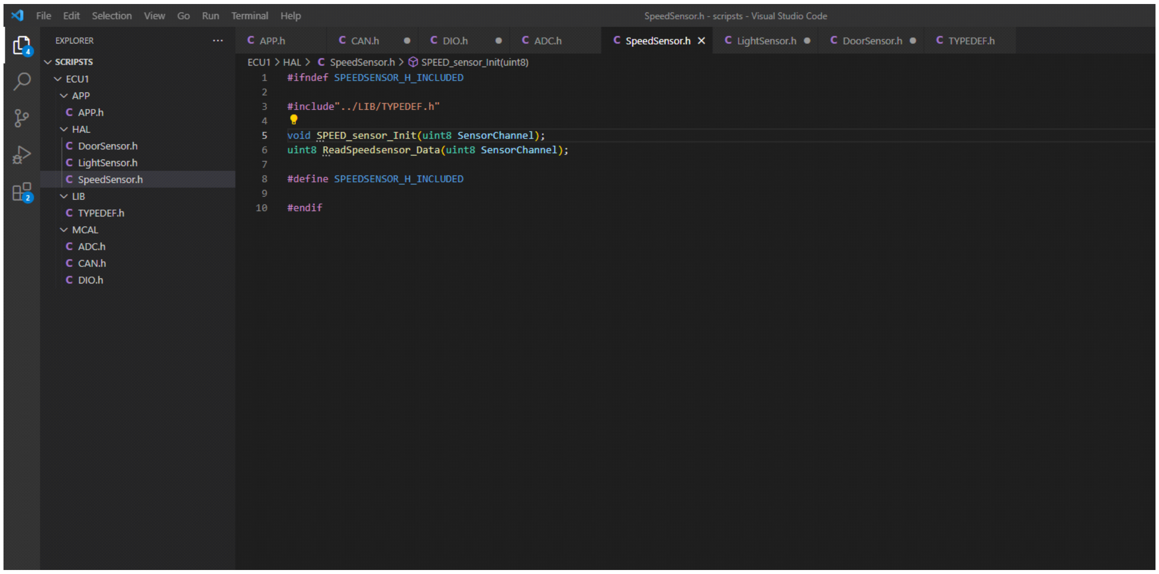
```c
#ifndef LIGHTSENSOR_H_INCLUDED

#include"../LIB/TYPEDEF.h"

void Light_sensor_Init(uint8 SensorChannel);
State ReadLightsensor_Data(uint8 SensorChannel);

#define LIGHTSENSOR_H_INCLUDED

#endif
```



```c
#ifndef SPEEDSENSOR_H_INCLUDED

#include"../LIB/TYPEDEF.h"

void SPEED_sensor_Init(uint8 SensorChannel);
uint8 ReadSpeedsensor_Data(uint8 SensorChannel);

#define SPEEDSENSOR_H_INCLUDED

#endif
```