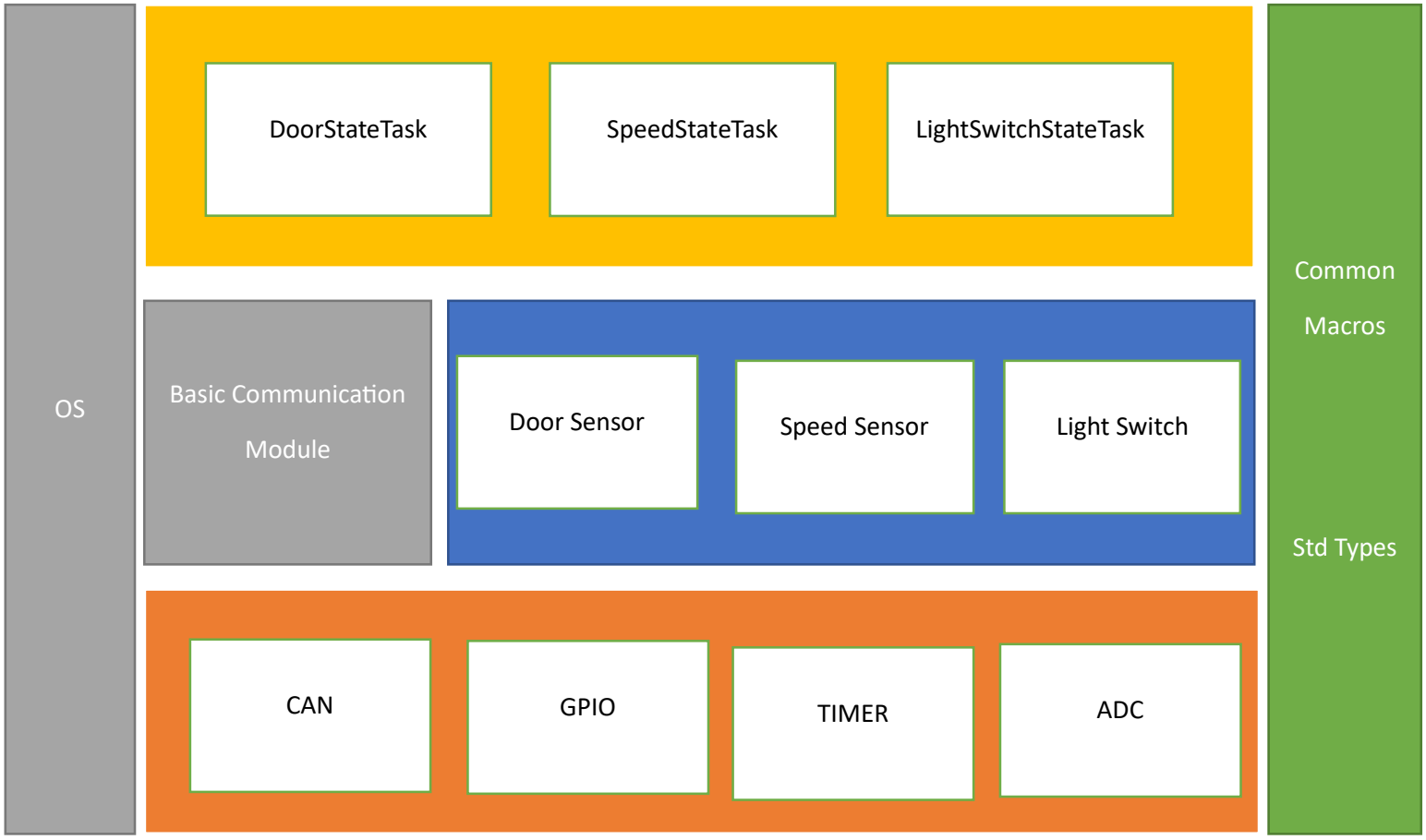
# ECU 1




## ECU Components and Modules:

- **Components**:
  - Door Sensor
  - Speed Sensor
  - Light Switch
- **Modules**
  - GPIO
  - ADC
  - CAN
  - TIMER

ECU1 APIs:

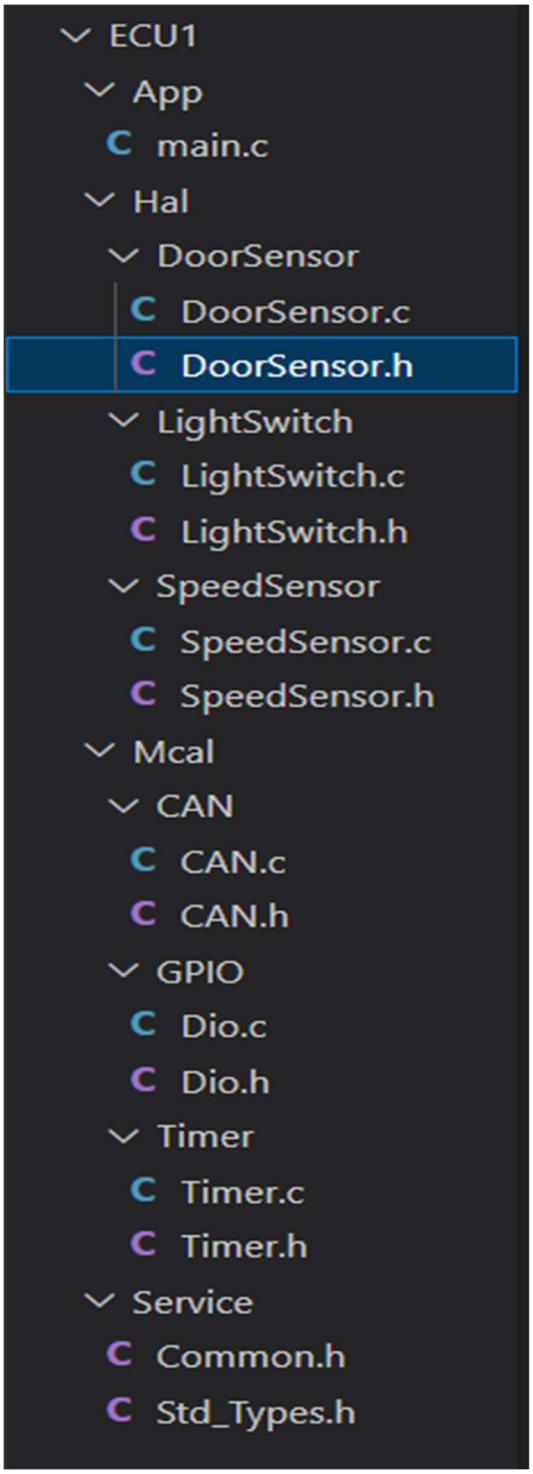
- Application Layer
  - **readDoorState**(): This API reads the current state of the door sensor.
  - **readLightSwitchState**(): This API reads the current state of the light switch.
  - **readSpeedState**(): This API reads the current speed of the vehicle.
  - **sendData**(uint32_t data): This API sends data to ECU 2 via the CAN bus.

- Mcal
  - GPIO
    - **Dio_SetChannelDirection** (***Dio_PortType*** PortID, ***Dio_ChannelType*** ChannelID): This API Set the Direction of a specific Channel in specific port.
    - **Dio_ReadChannel**(***Dio_PortType*** PortID, ***Dio_ChannelType*** ChannelID):: This API return the state of specific channel in specific port.
    - **Dio_WriteChannel**(***Dio_PortType*** PortID, ***Dio_ChannelType*** ChannelID):: This API Write logical high on specific channel in specific port.
    - **Port_Init**(**const PortConfig_Type*** PortConfig): This API takes an array of structs that contain the Configurations of every Channel.
  - ADC
    - **ADC_Init**(): This API Initializes the ADC Peripheral
    - **ADC_Read(**Dio_ChannelType ChannelId**):** This API read the digital signal of the analog sensor that connected to a specific channel.
  - CAN which connect to the Basic Communication Module
    - **initCAN():** This API initializes the CAN bus.

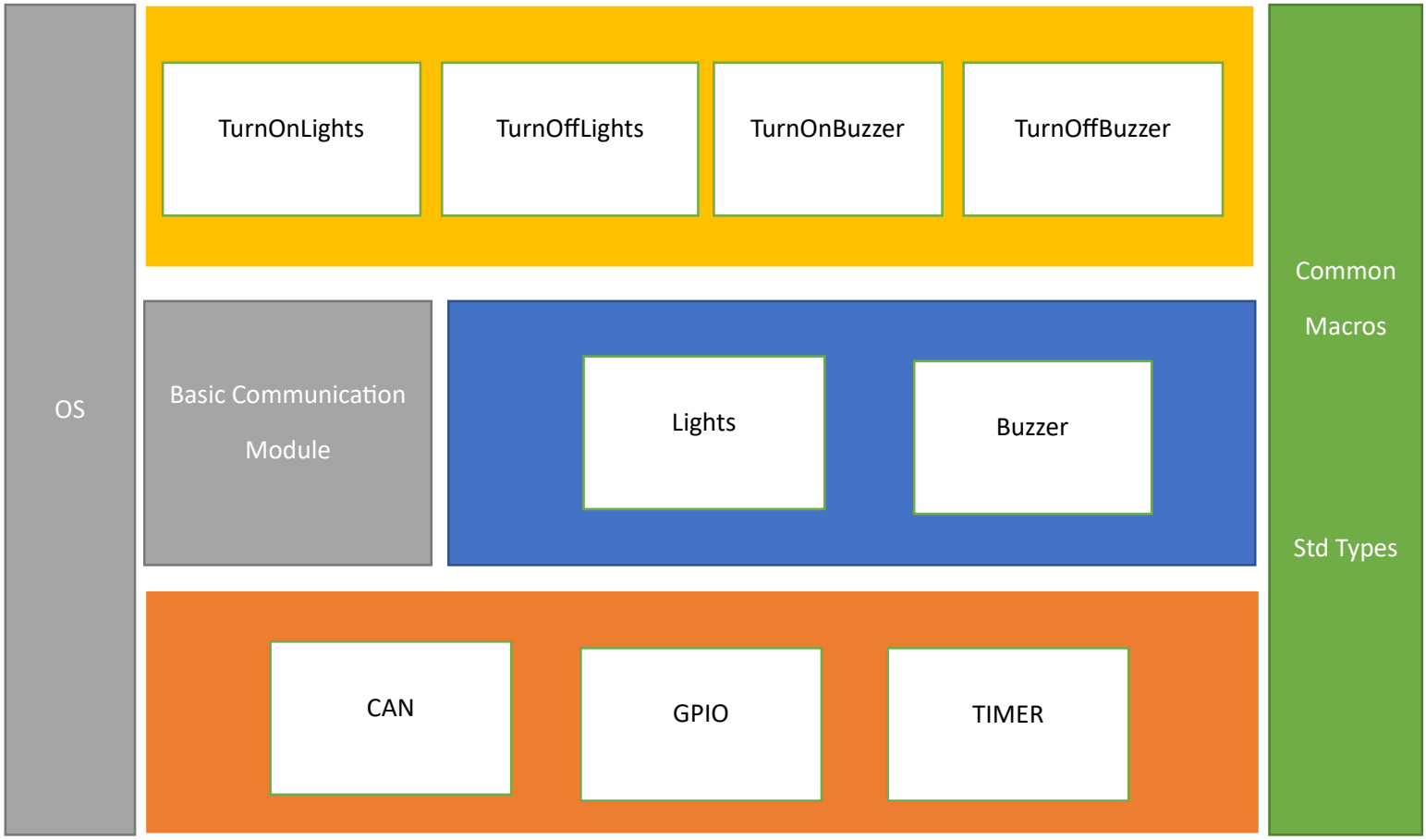
- **sendCANData(uint32_t data):** This API sends data over the CAN bus.
- **receiveCANData():** This API receives data from the CAN bus.

- TIMER Connected to the OS to Handle SysTicks.

## Folder Structure



# ECU 2




## ECU Components and Modules:

- **Components**:
  - Buzzer
  - Left Light
  - Right Light
- **Modules**
  - GPIO
  - CAN
  - TIMER

ECU1 APIs:

- Application Layer
  - **turnOnLights** (): This API Turn on the Lights depending on the message coming from ECU1.
  - **turnOffLights** (): This API Turn Off the Lights depending on the message coming from ECU1.
  - **turnOnBuzzer** (): This API Turn on the Buzzer depending on the message coming from ECU1.
  - **turnOffBuzzer** (): This API Turn off the Buzzer depending on the message coming from ECU1.
  - **receiveData**(): This API receives data from ECU 1 via the CAN bus.

- Mcal
  - GPIO
    - **Dio_SetChannelDirection** (***Dio_PortType*** PortID, ***Dio_ChannelType*** ChannelID): This API Set the Direction of a specific Channel in specific port.
    - **Dio_ReadChannel**(***Dio_PortType*** PortID, ***Dio_ChannelType*** ChannelID):: This API return the state of specific channel in specific port.
    - **Dio_WriteChannel**(***Dio_PortType*** PortID, ***Dio_ChannelType*** ChannelID):: This API Write logical high on specific channel in specific port.
    - **Port_Init**(**const PortConfig_Type*** PortConfig): This API takes an array of structs that contain the Configurations of every Channel.
  - CAN which connect to the Basic Communication Module
    - **initCAN():** This API initializes the CAN bus.
    - **sendCANData(uint32_t data):** This API sends data over the CAN bus.

- **receiveCANData():** This API receives data from the CAN bus.

- TIMER Connected to the OS to Handle SysTicks.

## ❖ File Structure