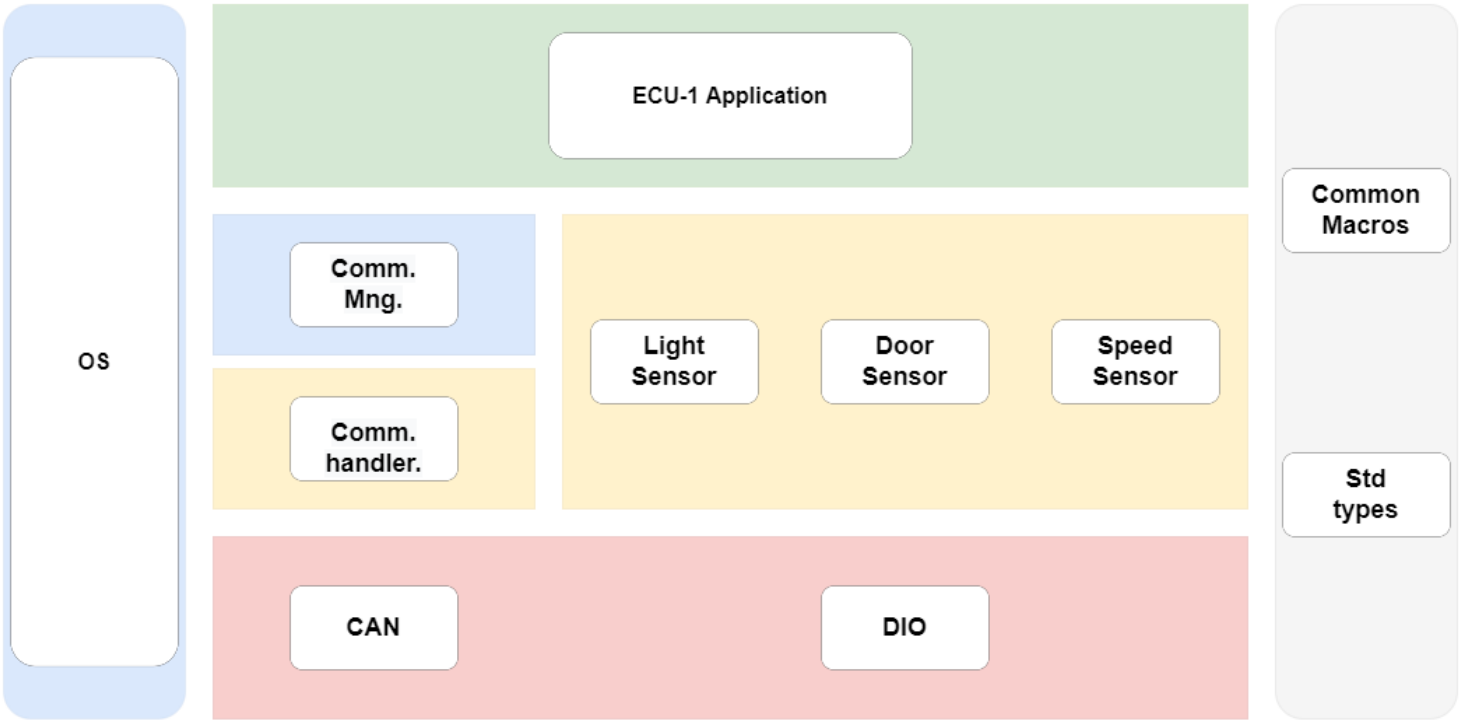
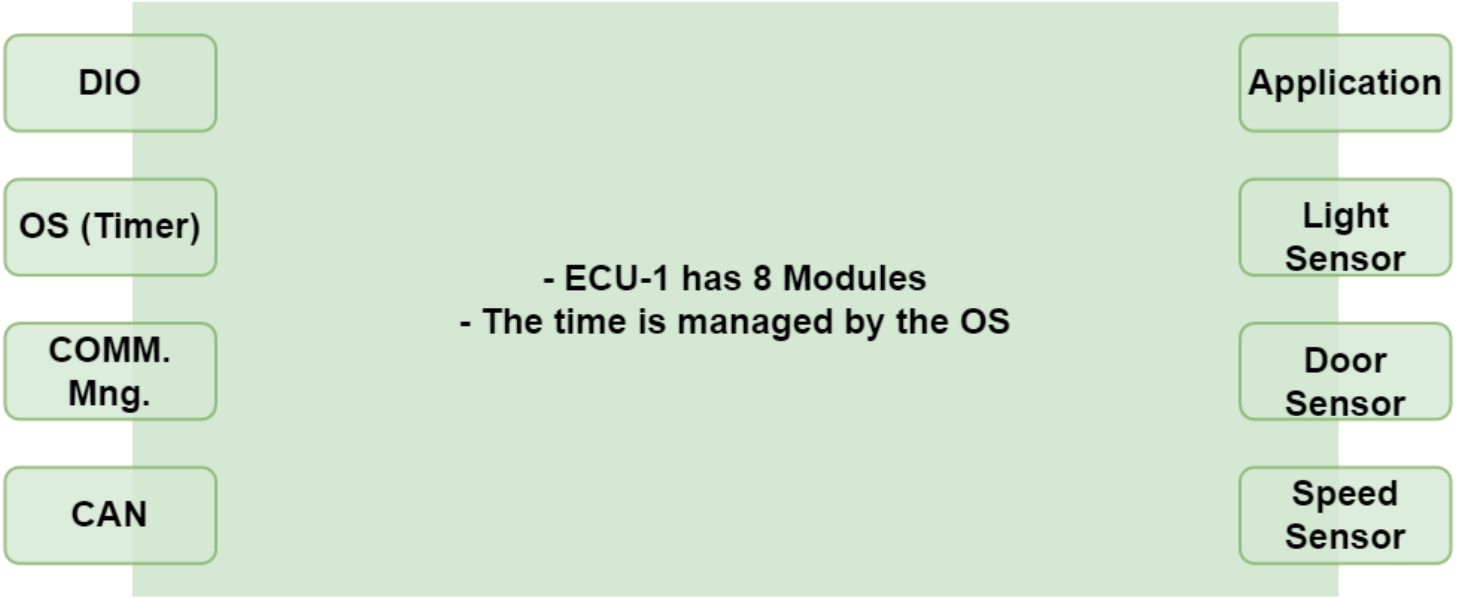
ECU 1

1- Layered architecture



2- Components and Modules



3- Modules Design Tables

CAN Module:

Function Name	CAN_Init(void)		
Arguments	**Inputs**	N/A	
		Description:	
	Outputs	N/A	
		Description:	
	Inputs/Outputs	N/A	
		Description:	
Return	**E_OK**	**0**	
	E_NOK	**1**	
Description	Initialize CAN module		

Function Name	CAN_SendByte(u8 ByteCpy)		
Arguments	**Inputs**	ByteCpy	u8
		Description: data sent	
	Outputs	N/A	
		Description:	
	Inputs/Outputs	N/A	
		Description:	
Return	**E_OK**	**0**	
	E_NOK	**1**	
Description	Send u8 data using CAN module		

Function Name	u8 CAN_RecieveByte(void)		
Arguments	**Inputs**	void	
		Description: no input	
	Outputs	u8	u8
		Description: data received	
	Inputs/Outputs	N/A	
		Description:	
Return	**E_OK**	**0**	
	E_NOK	**1**	
Description	Receive u8 data using CAN module		

Name	ByteCpy	
Type	u8	
Range	0	Min value sent
	255	Max value sent
Description	Data sent by CAN module	

DIO Module:

Function Name	DIO_Init(void)		
Arguments	**Inputs**	void	
		Description:	
	Outputs	N/A	
		Description:	
	Inputs/Outputs	**N/A**	
		Description:	
Return	**E_OK**	**0**	
	E_NOK	**1**	
Description	Initialize DIO Pins		

Function Name	DIO_WritePin(u8 channelNo, u8 levelType)		
Arguments	**Inputs**	ChannelNolevelType	u8
		Description:	
	Outputs	N/A	
		Description:	
	Inputs/Outputs	**N/A**	
		Description:	
Return	**E_OK**	**0**	
	E_NOK	**1**	
Description	Set Pin High or Low using DIO module		

Function Name	u8 DIO_ReadPin(u8 ChannelNo)		
Arguments	**Inputs**	ChannelNo	u8
		Description:	
	Outputs	u8	u8
		Description: pin high / low	
	Inputs/Outputs	**N/A**	
		Description:	
Return	**E_OK**	**0**	
	E_NOK	**1**	
Description	Read Value of Pin whether it's High or low		

Name	ChannelNo	
Type	u8	
Range	0	Min value sent
	Depend on ECU	Max value sent
Description	DIO channel Number	

Name	levelType	
Type	u8	
Range	0	Min value sent (LOW)
	1	Max value sent (High)
Description	DIO PIN Level	

Light Sensor Module

Function Name	LightSensor_Init(void)		
Arguments	**Inputs**	N/A	
		Description:	
	Outputs	N/A	
		Description:	
	Inputs/Outputs	N/A	
		Description:	
Return	**E_OK**	**0**	
	E_NOK	**1**	
Description	Initialize light sensor to be ready		

Function Name	u8 LightSensor_GetData()		
Arguments	**Inputs**	N/A	
		Description:	
	Outputs	u8	
		Description:	
	Inputs/Outputs	N/A	
		Description:	
Return	**E_OK**	**0**	
	E_NOK	**1**	
Description	Get Light Sensor Reading		

Door Sensor Module:

Function Name	DoorSensor_Init(void)		
Arguments	**Inputs**	N/A	
		Description:	
	Outputs	N/A	
		Description:	
	Inputs/Outputs	N/A	
		Description:	
Return	**E_OK**	**0**	
	E_NOK	**1**	
Description	Initialize Door sensor to be ready		

Function Name	u8 DoorSensor_GetData()		
Arguments	**Inputs**	N/A	
		Description:	
	Outputs	u8	
		Description:	
	Inputs/Outputs	N/A	
		Description:	
Return	**E_OK**	**0**	
	E_NOK	**1**	
Description	Get Door Sensor Reading		

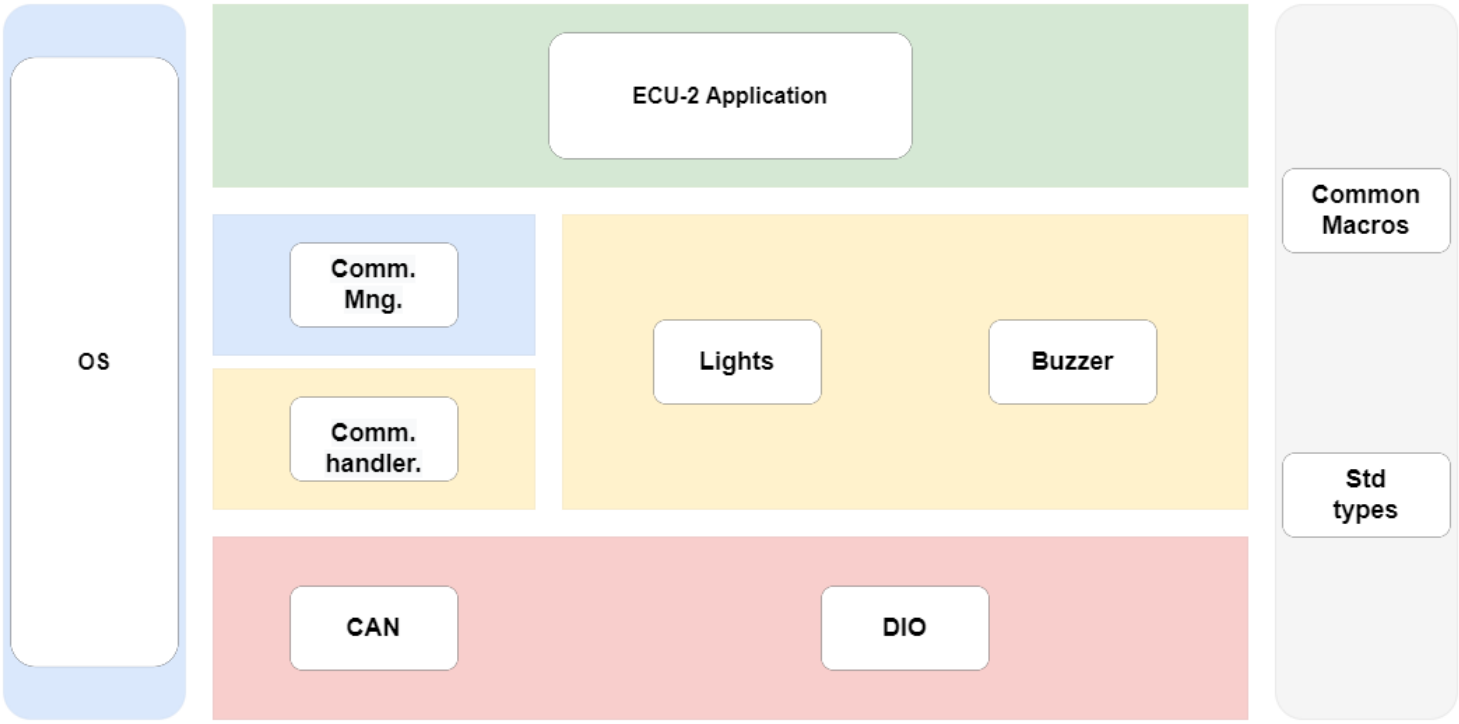
Speed Sensor Module:

Function Name	SpeedSensor_Init(void)		
Arguments	**Inputs**	N/A	
		Description:	
	Outputs	N/A	
		Description:	
	Inputs/Outputs	N/A	
		Description:	
Return	**E_OK**	**0**	
	E_NOK	**1**	
Description	Initialize Speed sensor to be ready		

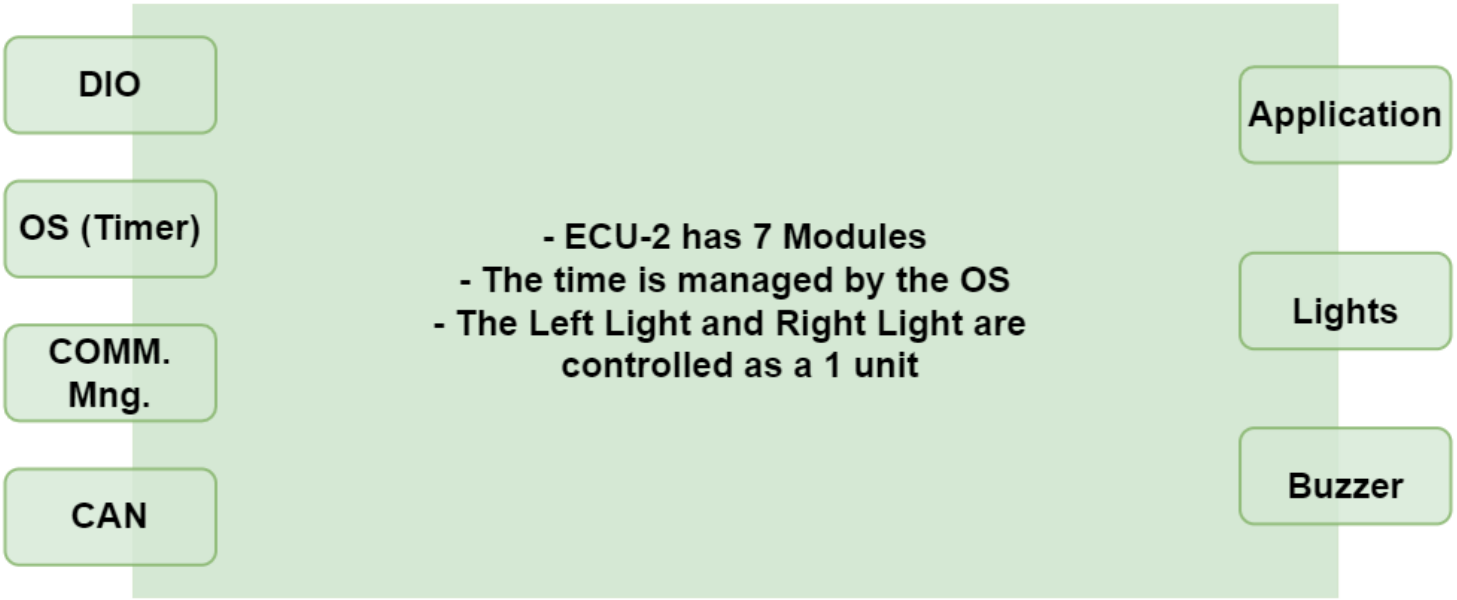
Function Name	u8 SpeedSensor_GetData()		
Arguments	**Inputs**	N/A	
		Description:	
	Outputs	u8	
		Description:	
	Inputs/Outputs	N/A	
		Description:	
Return	**E_OK**	**0**	
	E_NOK	**1**	
Description	Get Speed Sensor Reading		

ECU 2

1- Layered architecture



2- Components and Modules



3- Modules Design Tables

CAN Module:

Function Name	CAN_Init(void)		
Arguments	**Inputs**	N/A	
		Description:	
	Outputs	N/A	
		Description:	
	Inputs/Outputs	N/A	
		Description:	
Return	**E_OK**	**0**	
	E_NOK	**1**	
Description	Initialize CAN module		

Function Name	CAN_SendByte(u8 ByteCpy)		
Arguments	**Inputs**	ByteCpy	u8
		Description: data sent	
	Outputs	N/A	
		Description:	
	Inputs/Outputs	N/A	
		Description:	
Return	**E_OK**	**0**	
	E_NOK	**1**	
Description	Send u8 data using CAN module		

Function Name	u8 CAN_RecieveByte(void)		
Arguments	**Inputs**	void	
		Description: no input	
	Outputs	u8	u8
		Description: data received	
	Inputs/Outputs	N/A	
		Description:	
Return	**E_OK**	**0**	
	E_NOK	**1**	
Description	Receive u8 data using CAN module		

Name	ByteCpy	
Type	u8	
Range	0	Min value sent
	255	Max value sent
Description	Data sent by CAN module	

DIO Module:

Function Name	DIO_Init(void)		
Arguments	**Inputs**	void	
		Description:	
	Outputs	N/A	
		Description:	
	Inputs/Outputs	**N/A**	
		Description:	
Return	**E_OK**	**0**	
	E_NOK	**1**	
Description	Initialize DIO Pins		

Function Name	DIO_WritePin(u8 channelNo, u8 levelType)		
Arguments	**Inputs**	ChannelNolevelType	u8
		Description:	
	Outputs	N/A	
		Description:	
	Inputs/Outputs	**N/A**	
		Description:	
Return	**E_OK**	**0**	
	E_NOK	**1**	
Description	Set Pin High or Low using DIO module		

Function Name	u8 DIO_ReadPin(u8 ChannelNo)		
Arguments	**Inputs**	ChannelNo	u8
		Description:	
	Outputs	u8	u8
		Description: pin high / low	
	Inputs/Outputs	**N/A**	
		Description:	
Return	**E_OK**	**0**	
	E_NOK	**1**	
Description	Read Value of Pin whether it's High or low		

Name	ChannelNo	
Type	u8	
Range	0	Min value sent
	Depend on ECU	Max value sent
Description	DIO channel Number	

Name	levelType	
Type	u8	
Range	0	Min value sent (LOW)
	1	Max value sent (High)
Description	DIO PIN Level	

Light Control Module:

Function Name	LightCtrl_Init(u8 channelsNo, u8* channels[channelsNo])		
Arguments	**Inputs**	channelsNo channels	u8 u8[]
		Description: array of light channels and the size of this array	
	Outputs	N/A	
		Description:	
	Inputs/Outputs	**N/A**	
		Description:	
Return	**E_OK**	**0**	
	E_NOK	**1**	
Description	Initialize the ECU DIO pins connected to Lights		

Function Name	LightCtrl_TurnON(u8 channelsNo, u8* channels[channelsNo])		
Arguments	**Inputs**	channelsNo channels	u8 u8[]
		Description: array of light channels and the size of this array	
	Outputs	N/A	
		Description:	
	Inputs/Outputs	**N/A**	
		Description:	
Return	**E_OK**	**0**	
	E_NOK	**1**	
Description	Turn ON Lights		

Function Name	LightCtrl_TurnOFF(u8 channelsNo, u8* channels[channelsNo])		
Arguments	**Inputs**	channelsNo channels	u8 u8[]
		Description: array of light channels and the size of this array	
	Outputs	N/A	
		Description:	
	Inputs/Outputs	**N/A**	
		Description:	
Return	**E_OK**	**0**	
	E_NOK	**1**	
Description	Turn OFF Lights		

Buzzer Control Module:

Function Name	BuzzerCtrl_Init(u8 channelNo)		
Arguments	**Inputs**	channelNo	u8
		Description: channel NO connected to Buzzer	
	Outputs	N/A	
		Description:	
	Inputs/Outputs	**N/A**	
		Description:	
Return	**E_OK**	**0**	
	E_NOK	**1**	
Description	Initialize the ECU DIO pin connected to Buzzer		

Function Name	BuzzerCtrl_StartBuzzer(u8 channelNo)		
Arguments	**Inputs**	channelNo	u8
		Description: channel NO connected to Buzzer	
	Outputs	N/A	
		Description:	
	Inputs/Outputs	**N/A**	
		Description:	
Return	**E_OK**	**0**	
	E_NOK	**1**	
Description	Set Buzzer ON		

Function Name	BuzzerCtrl_StopBuzzer(u8 channelNo)		
Arguments	**Inputs**	channelNo	u8
		Description: channel NO connected to Buzzer	
	Outputs	N/A	
		Description:	
	Inputs/Outputs	**N/A**	
		Description:	
Return	**E_OK**	**0**	
	E_NOK	**1**	
Description	Set Buzzer OFF		