- **System Analysis:**
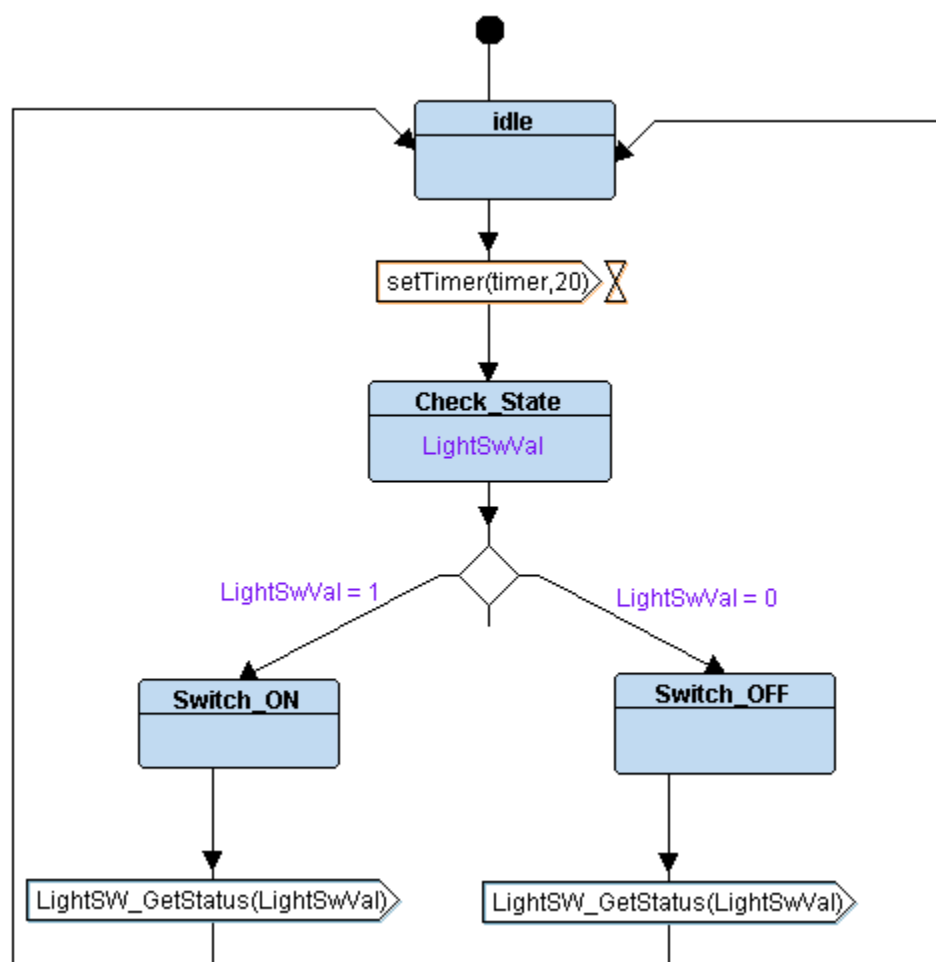
- ➢ **State Machine diagrams**
1- ECU1:
- ECU1 operation

- LED Switch

- Door Sensor

idle

setTimer(timer,10)

Reading

DoorVal = 1   DoorVal = 0

Door_Opened   Door_Closed

Door_GetStatus(SpeedVal)   Door_GetStatus(SpeedVal)

- Speed Sensor

idle

setTimer(timer,5)

Reading

SpeedVal = 1   SpeedVal = 0

Car_Moving   Car_stopped

Car_GetStatus(SpeedVal)   Car_GetStatus(SpeedVal)

2- ECU2:

- ECU2 operation

idle

CAN_Receiving

CAN_Receive()

Check ECU1 Input Status

Take_Action
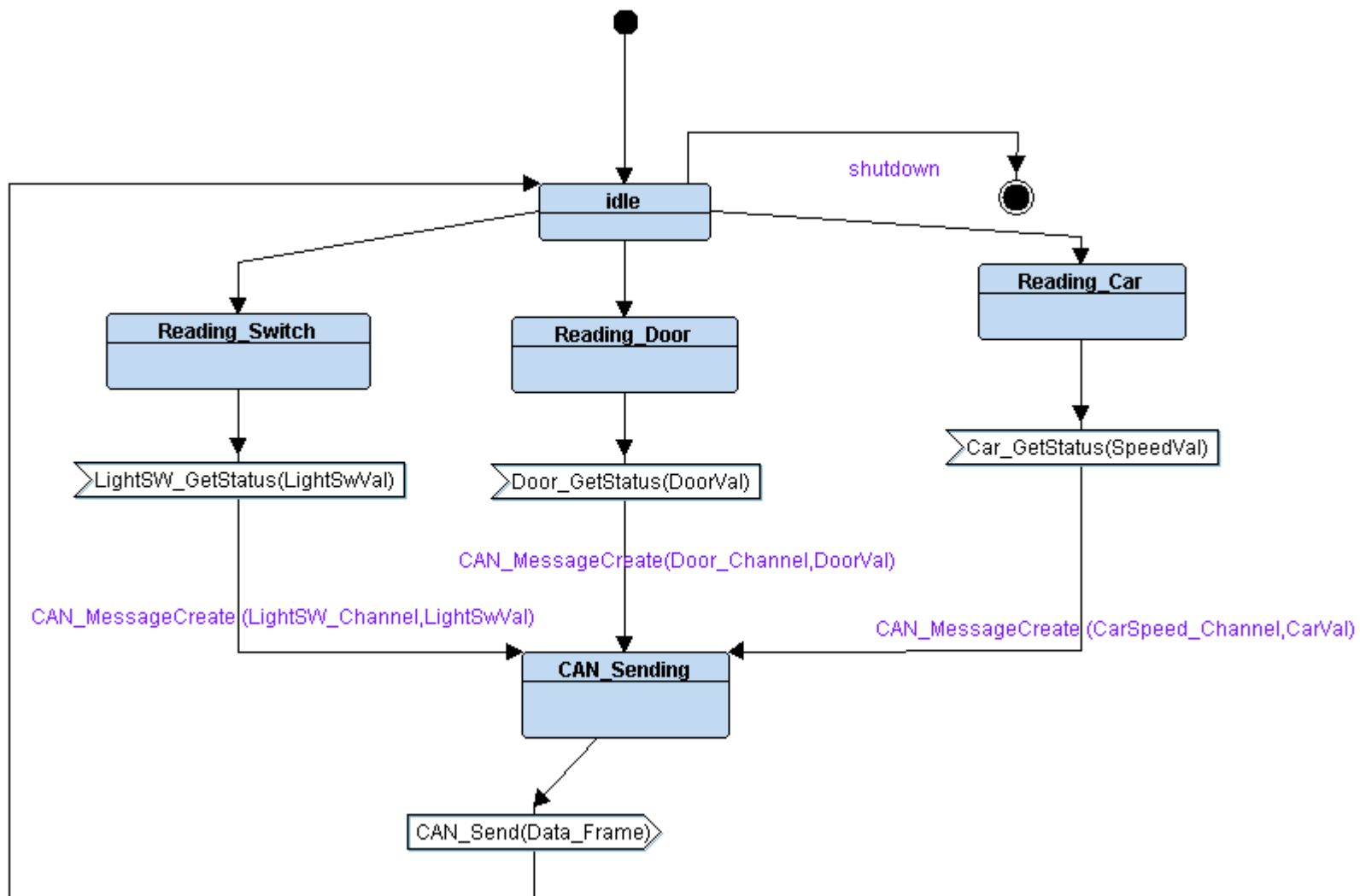
Buzzer_Control(Buzzer_Status)   Light_Control(Light_Status)
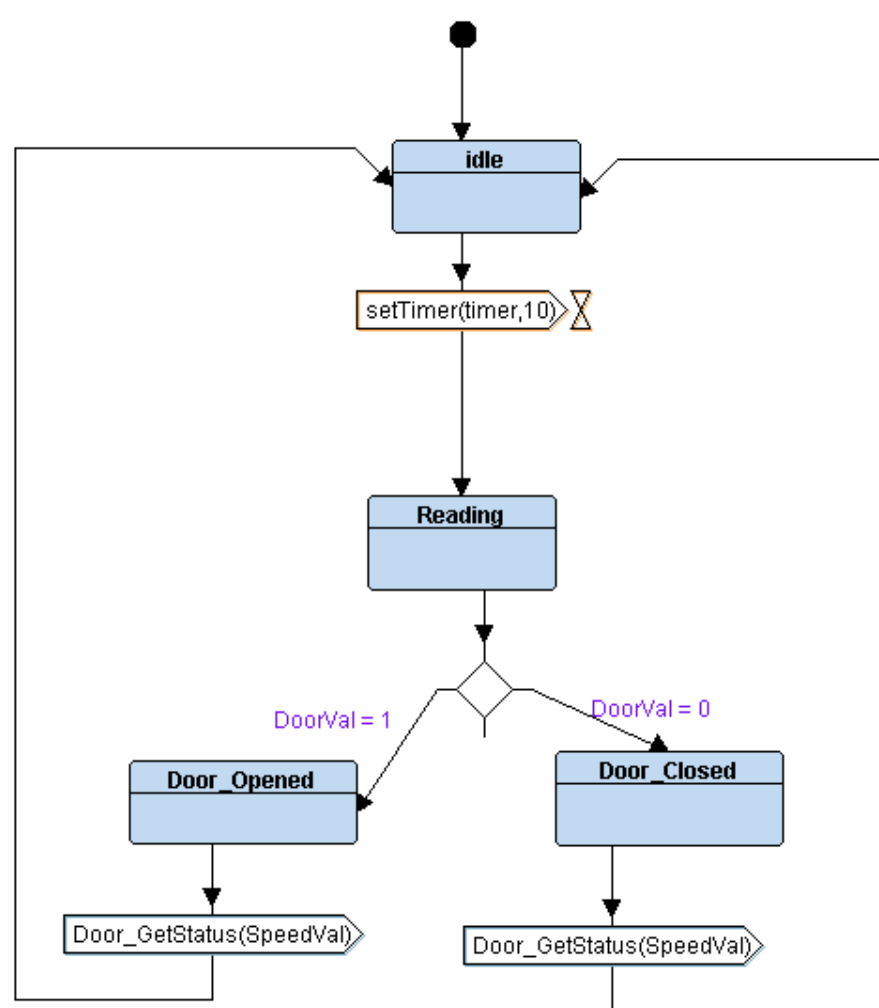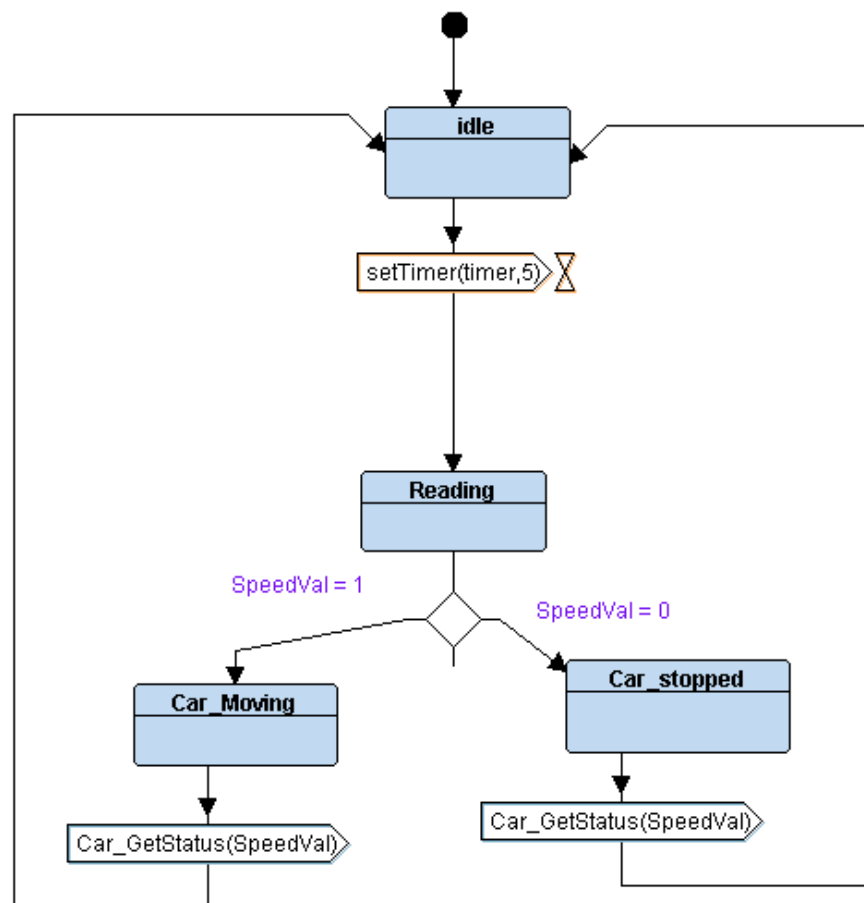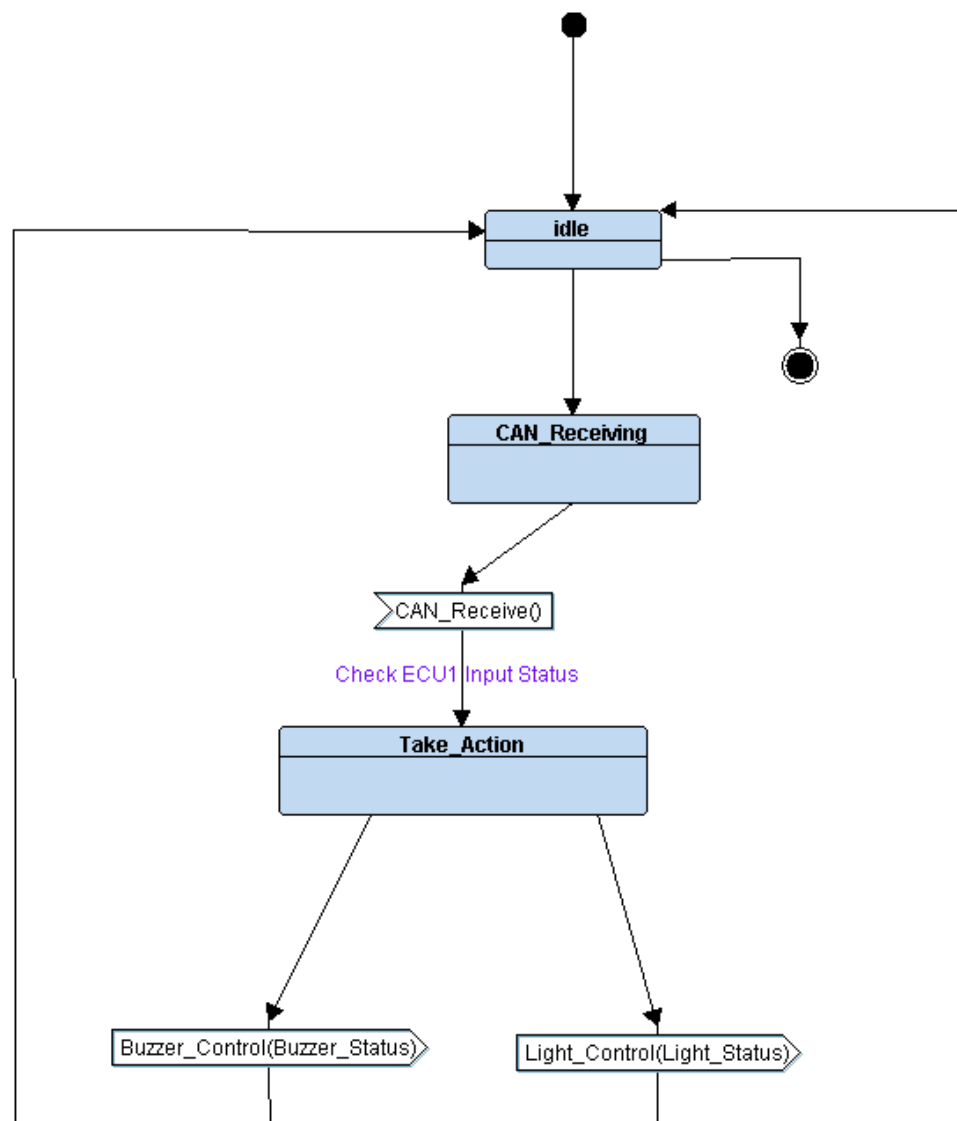
- Light control
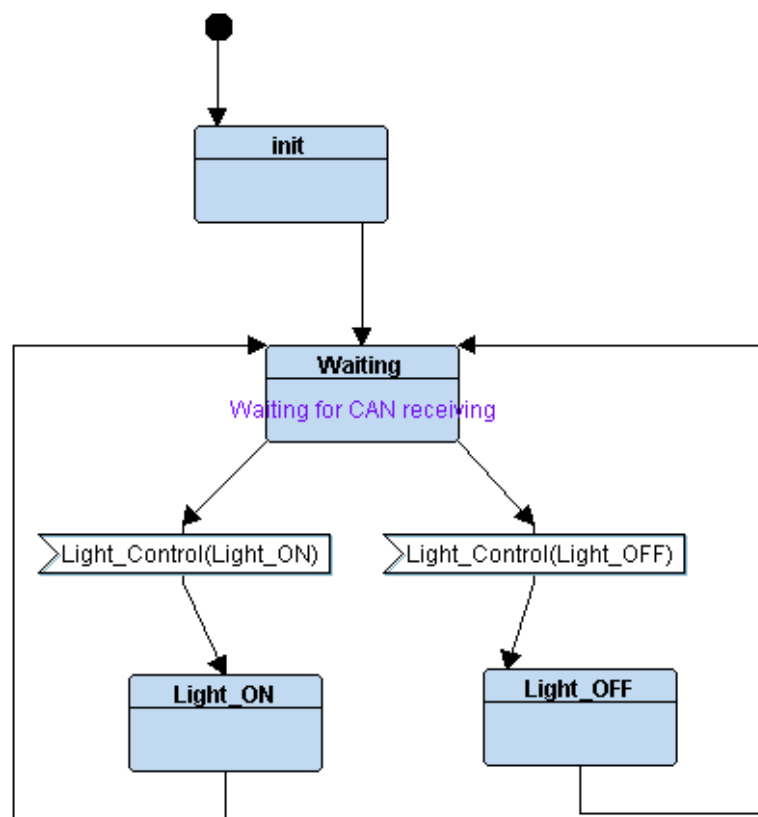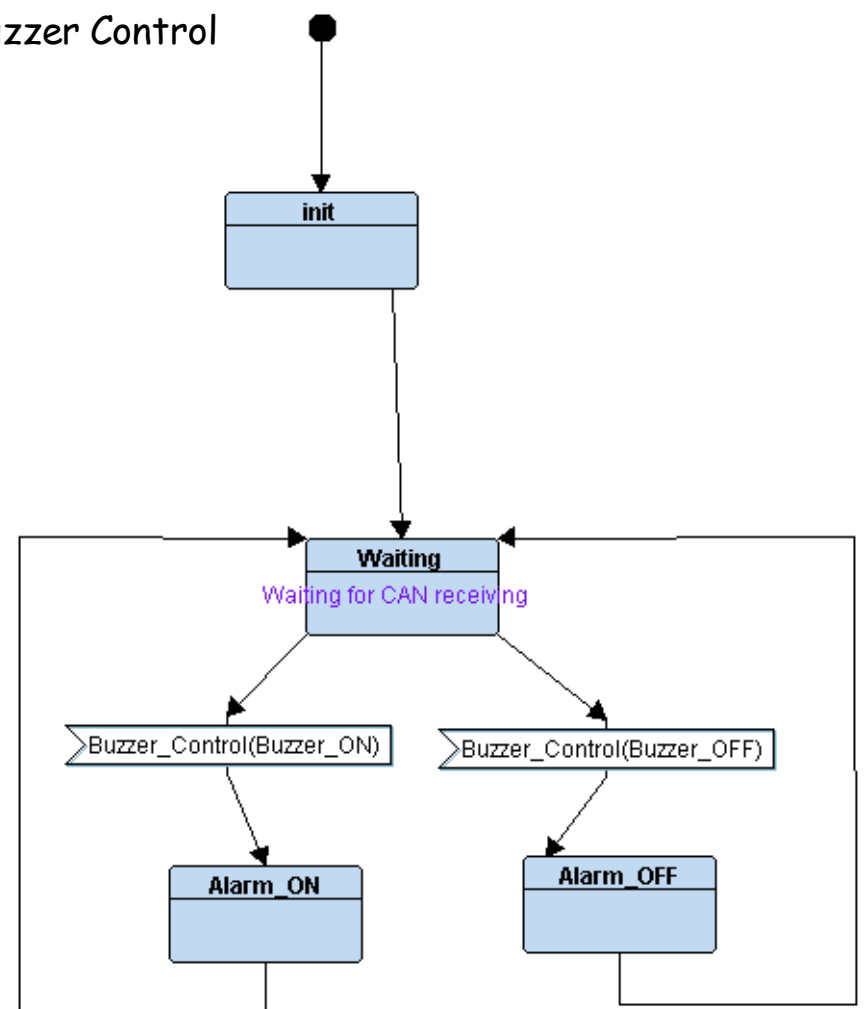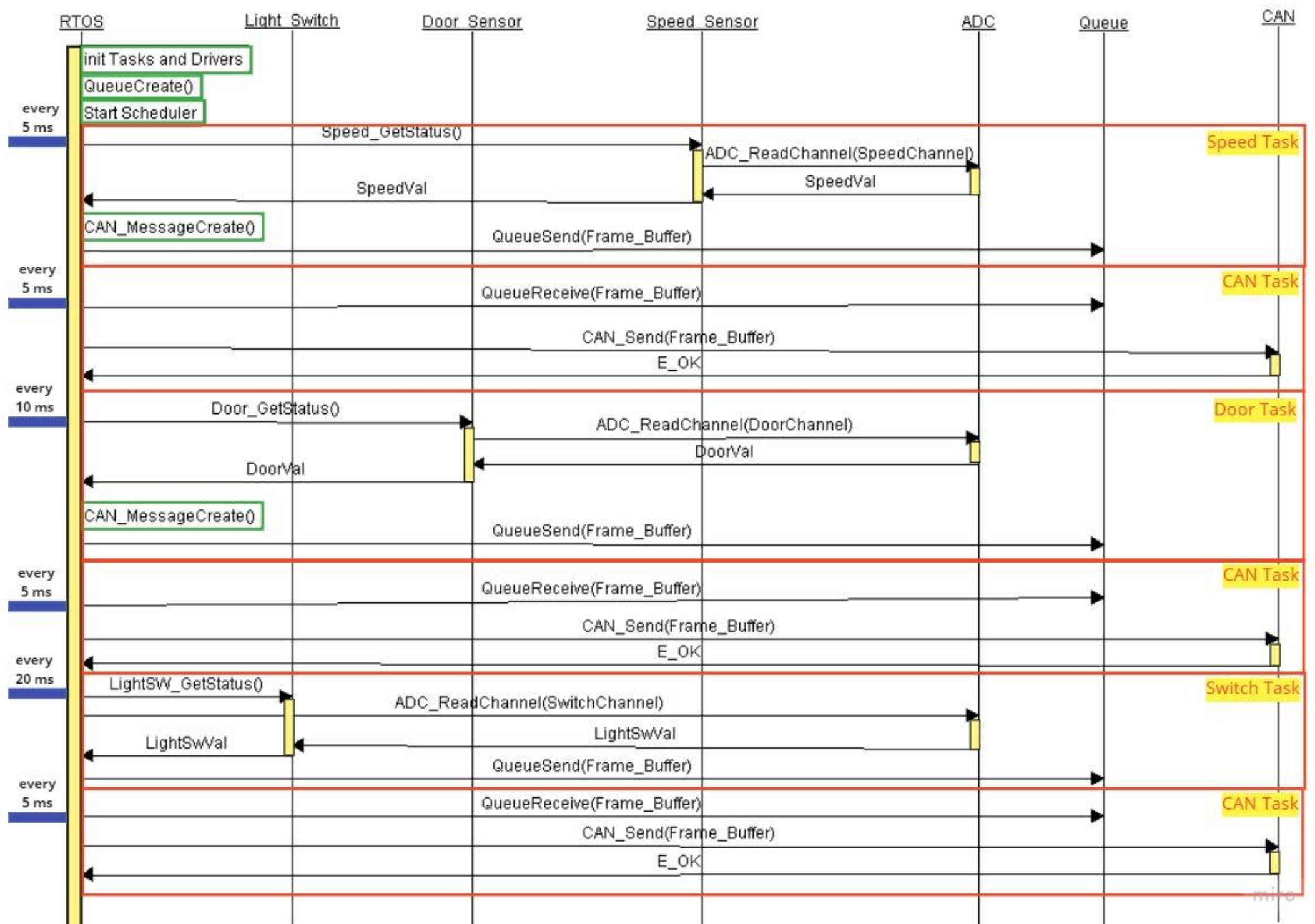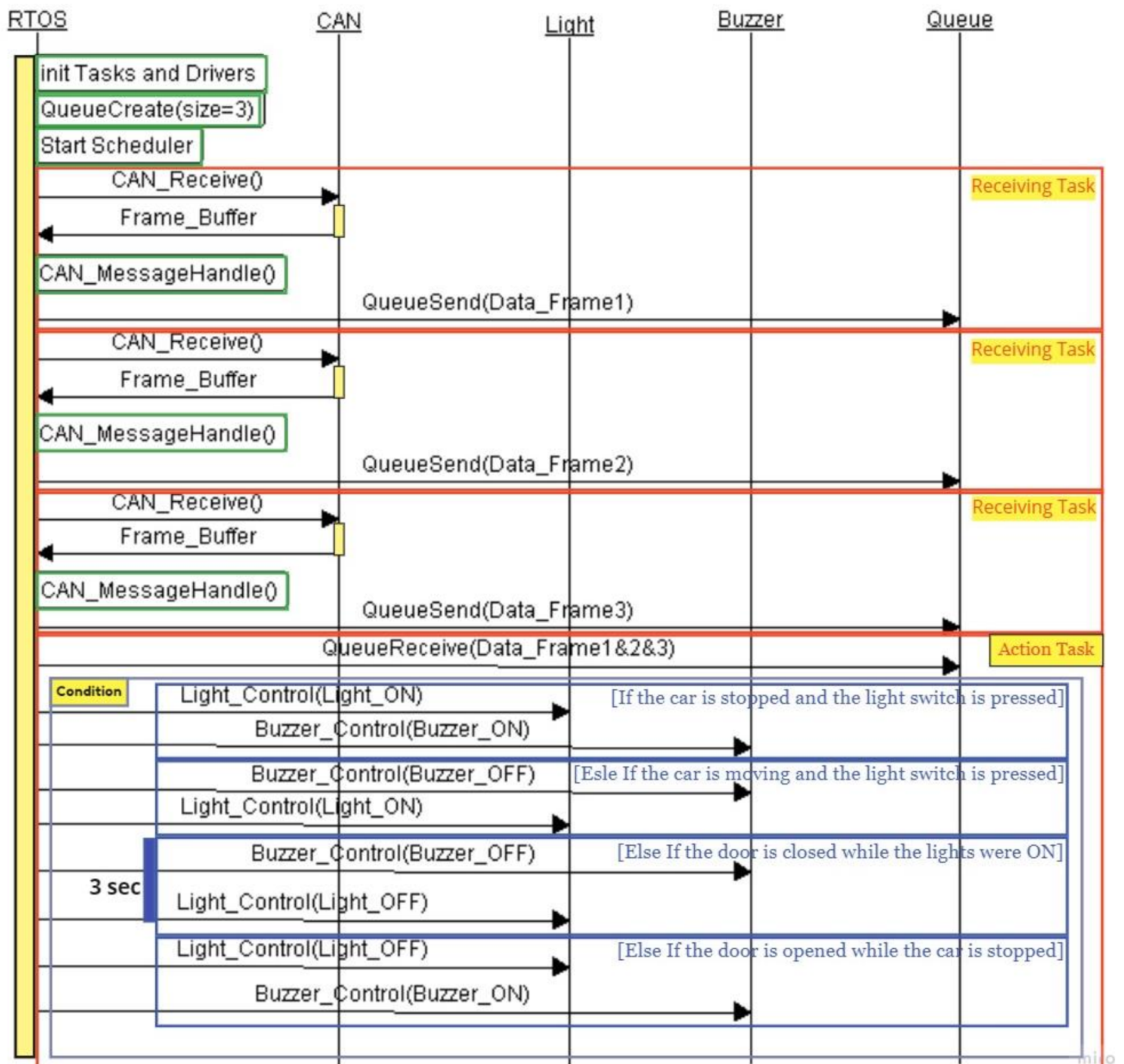

-Buzzer Control

➢ **Sequence Diagram:**
- ECU1

- ECU2

➢ **CPU Load** (with estimated Execution Time)

- bus load in the system = 30 % of system bus was busy per 1 second (1.5ms per 5 ms)

- ECU 1:

   ≫ CPU utilization = 45%

- ECU2:

   ≫ CPU utilization = 30%

ECU 1 — Model data — Tasks

id	Name	Task type	Abort on miss	Date	Period (ms)	ct. da	Deadline (ms)	WCET (ms)
1	Speed Sensor	Periodic ▼	☑ Yes	0	5	-	5	1
2	Door Sensor	Periodic ▼	☑ Yes	0	10		10	1
3	Light Switch	Periodic ▼	☑ Yes	0	20	-	20	1
4	CAN Send	Periodic ▼	☑ Yes	0	5	-	5	0.5

ECU 1 — Results — General

Observation Window:

from 0.00 to 100.00 ms

	Total load	Payload	System load
CPU 1	0.4500	0.4500	0.0000
Average	0.4500	0.4500	0.0000

ECU 2 — Model data — Tasks

id	Name	Task type	Abort on miss	Date	Period (ms)	ct. da	Deadline (ms)	WCET (ms)
1	CAN_Receive	Periodic ▼	☑ Yes	0	5.0	-	5.0	1.0
2	Action_Task	Periodic ▼	☑ Yes	0	10	-	10	1.0

ECU 2 — Results — General

Observation Window:

from 0.00 to 100.00 ms

	Total load	Payload	System load
CPU 1	0.3000	0.3000	0.0000
Average	0.3000	0.3000	0.0000