

Automotive door control system Dynamic Design

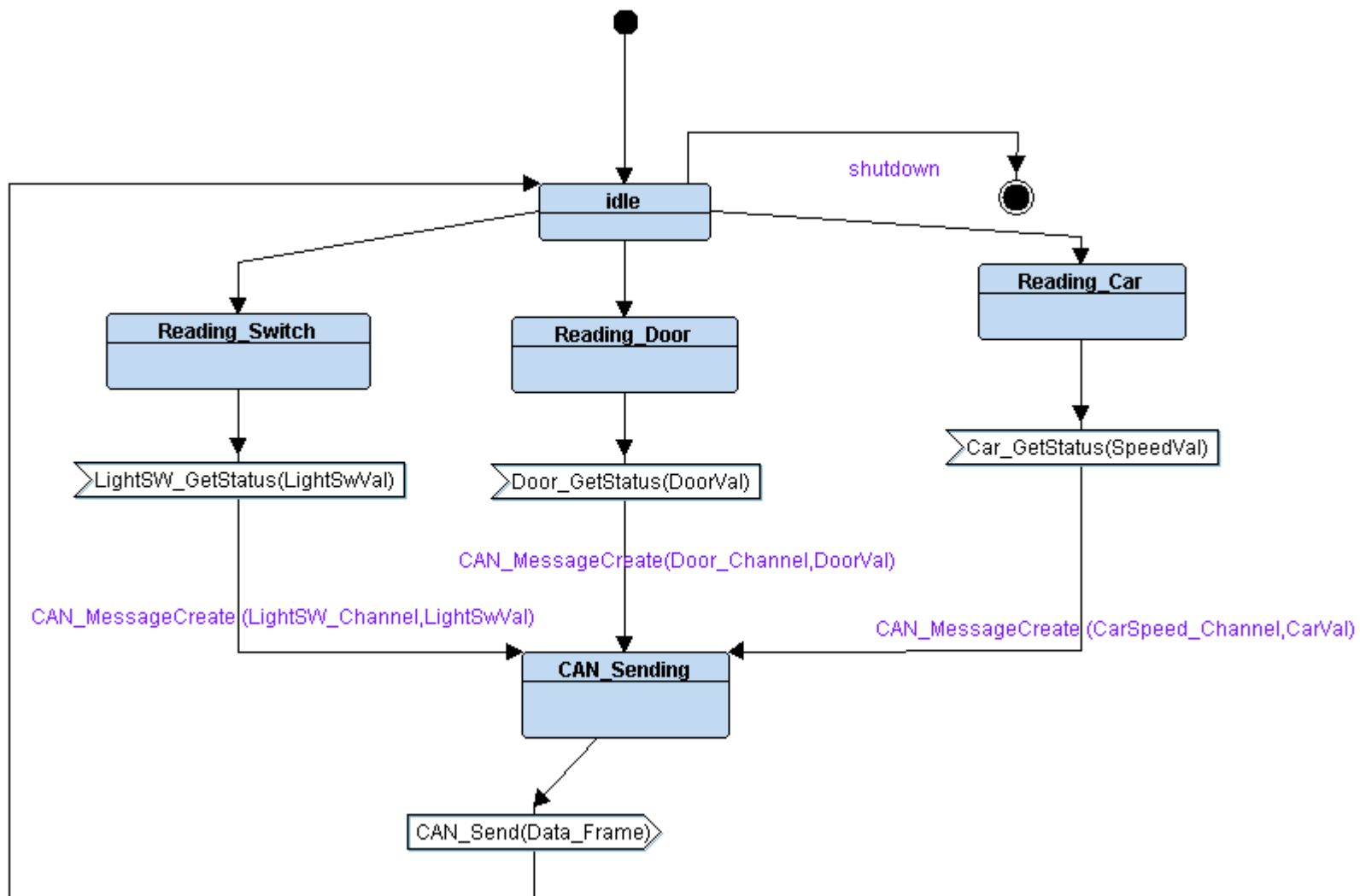
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- System Analysis:

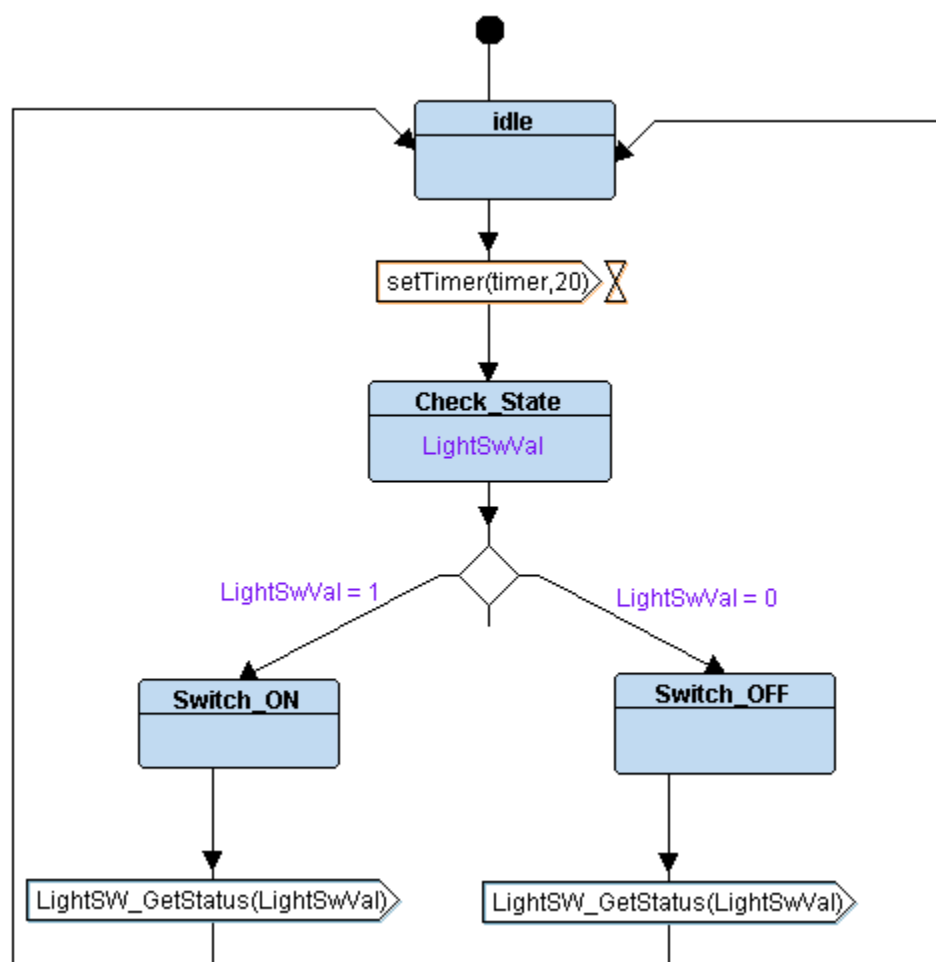
- **State Machine diagrams**

- 1- ECU1:

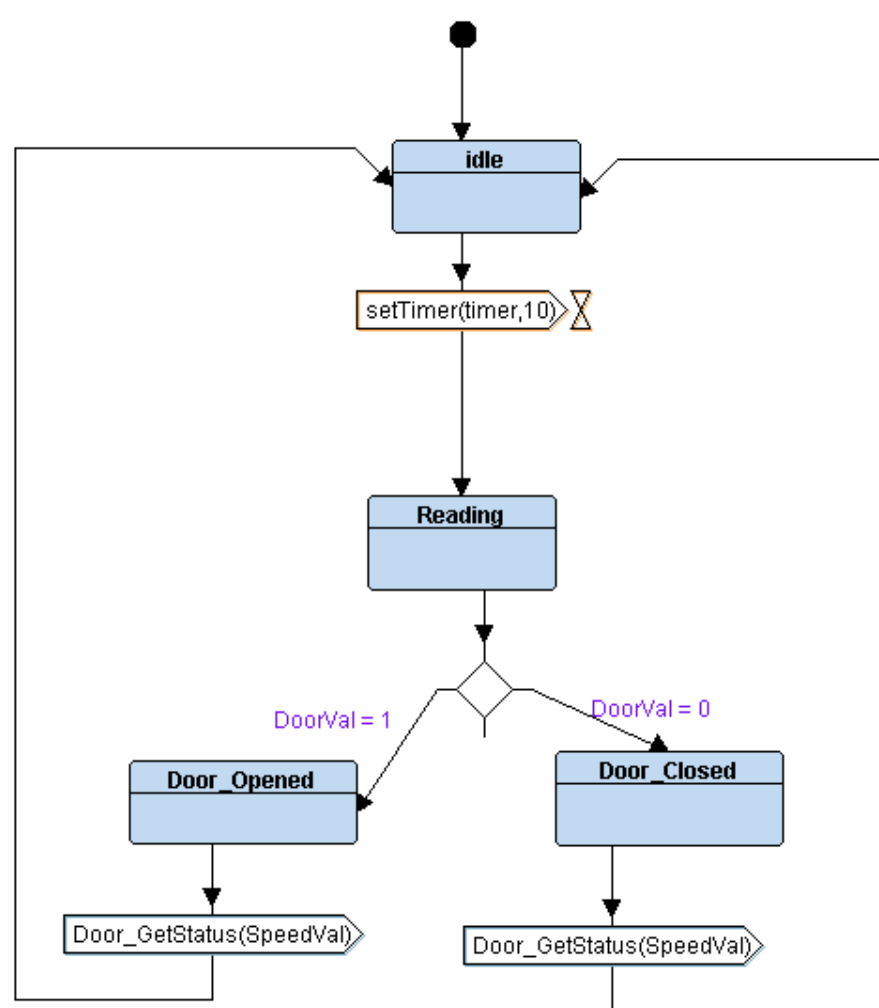
- ECU1 operation



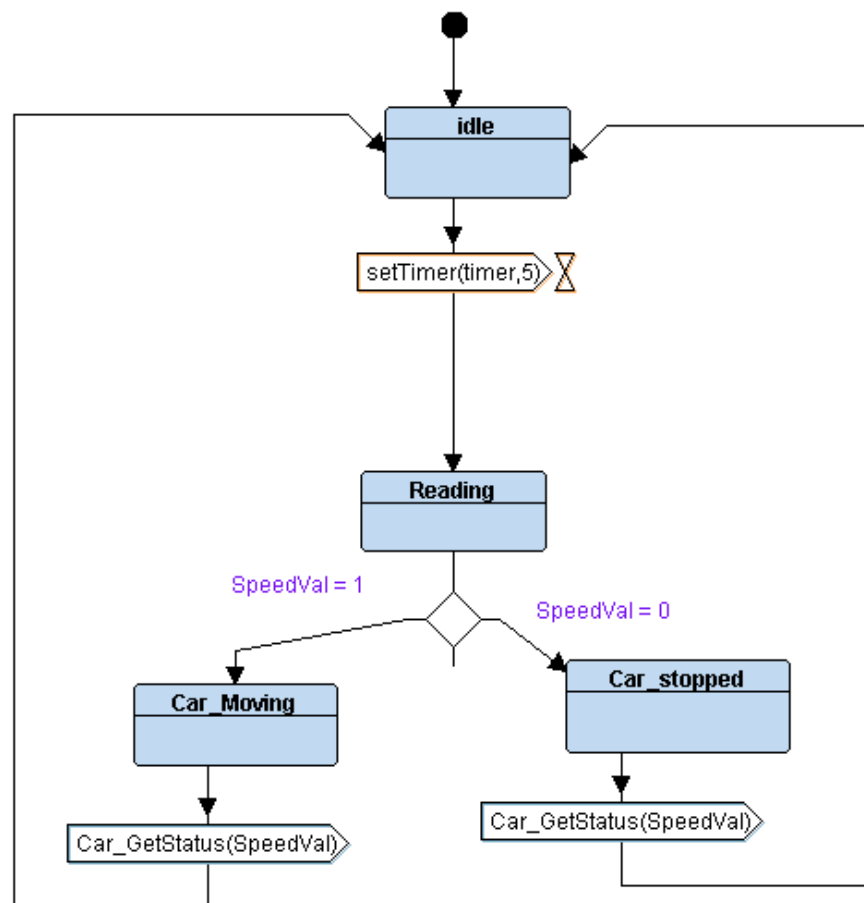
- LED Switch



- Door Sensor

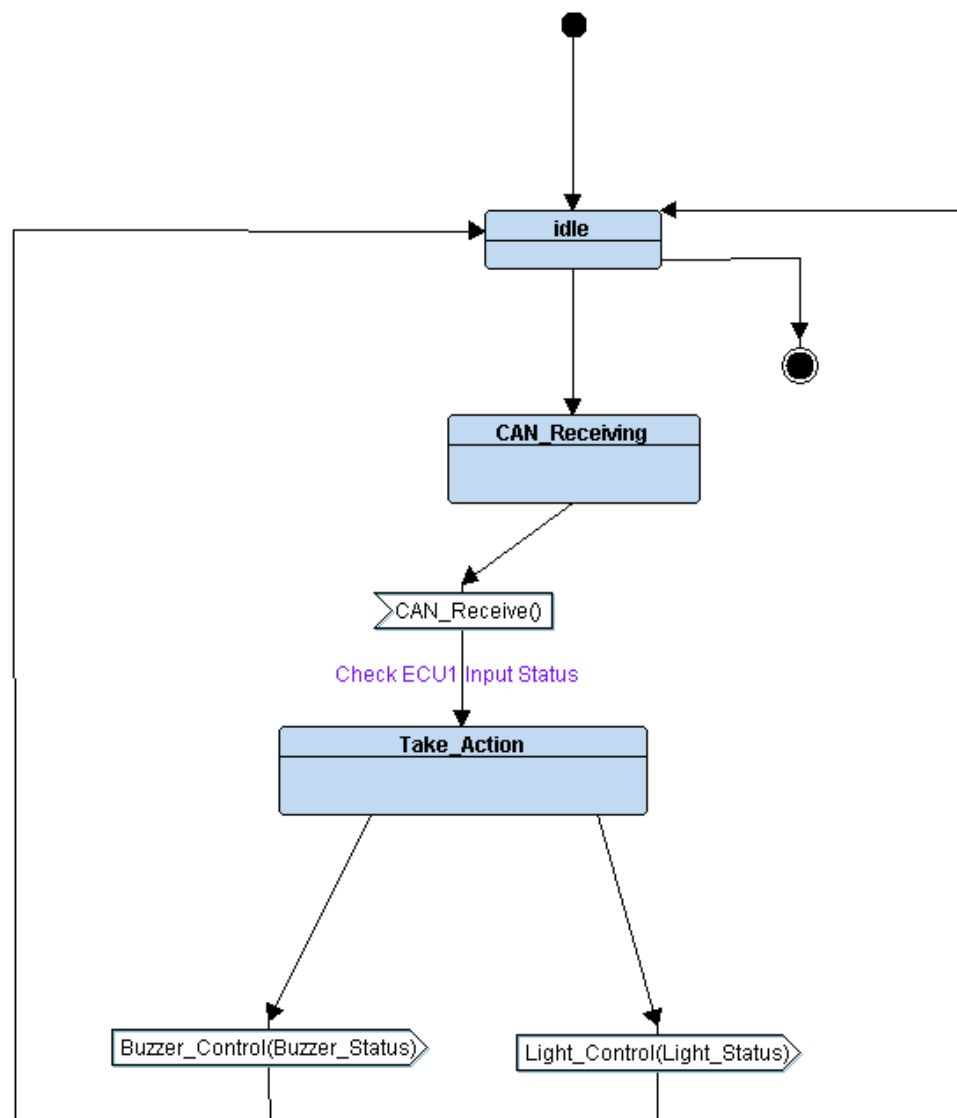


- Speed Sensor

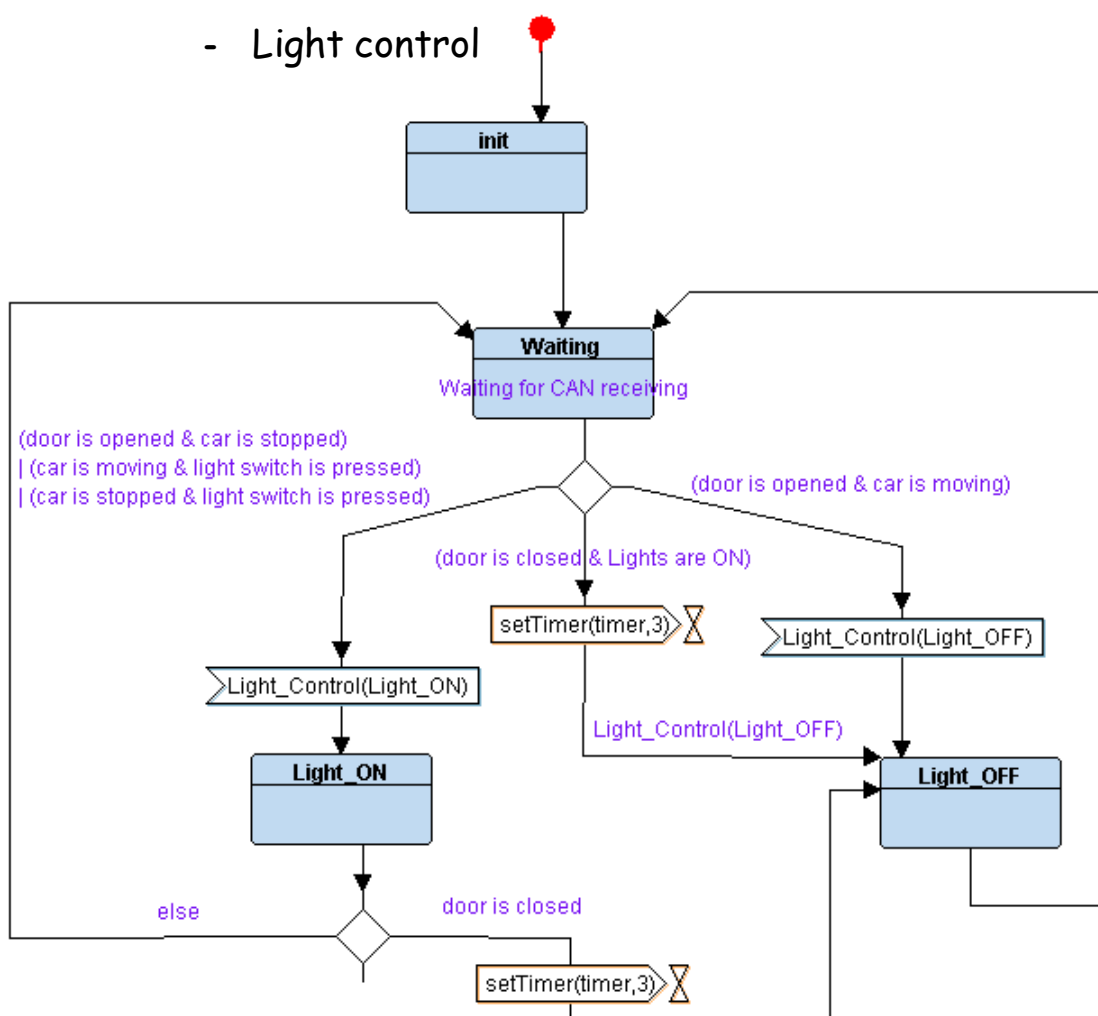


2- ECU2:

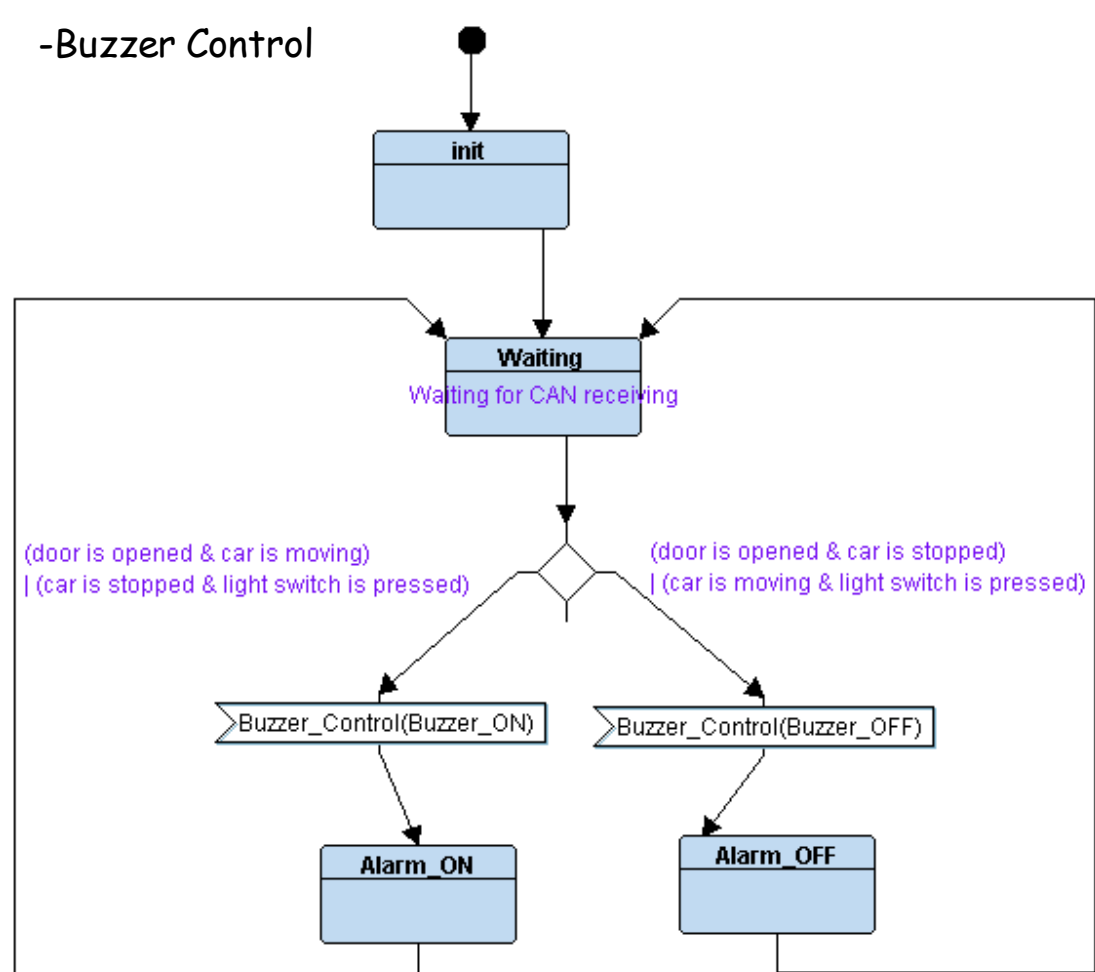
- ECU2 operation



- Light control

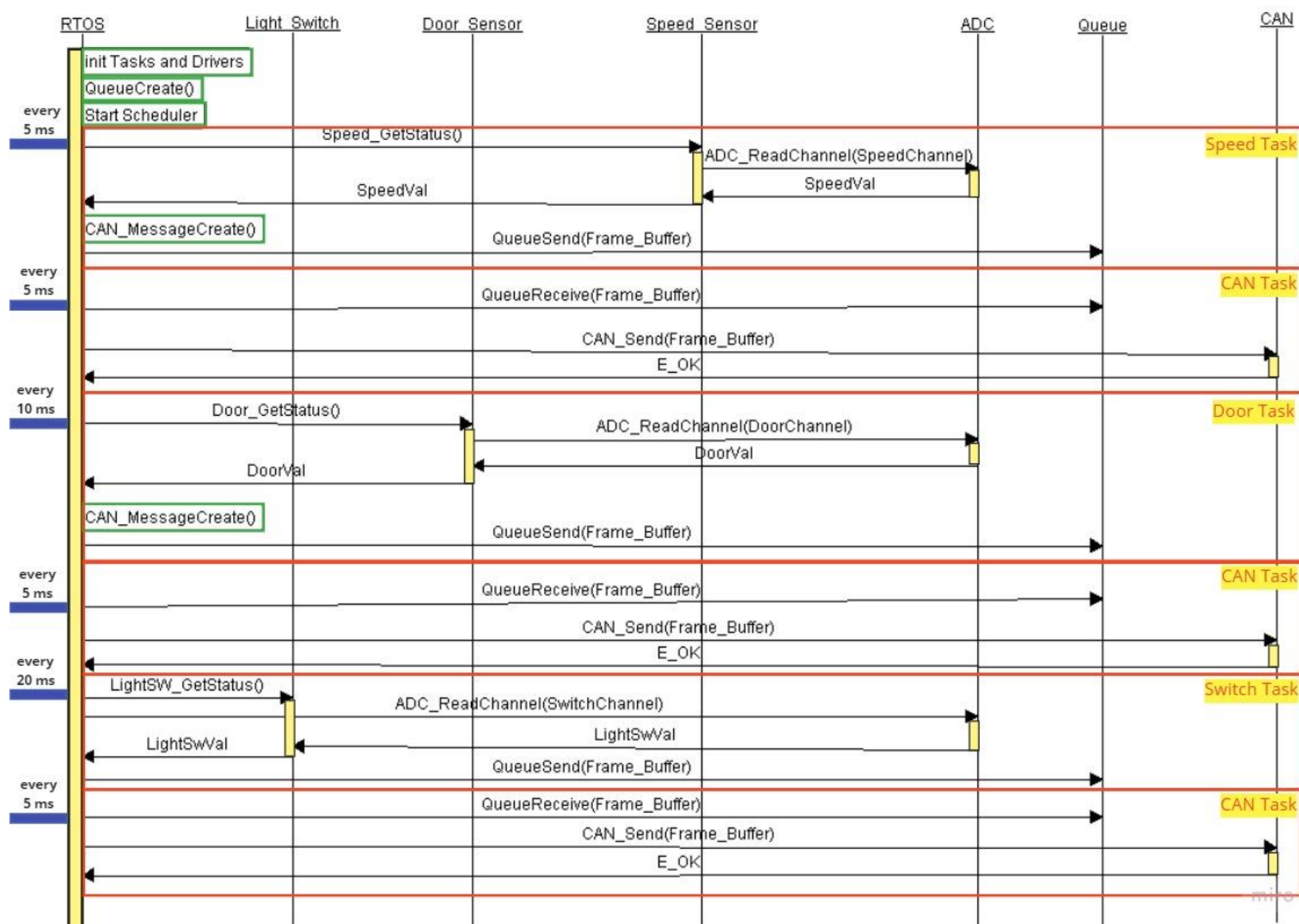


-Buzzer Control

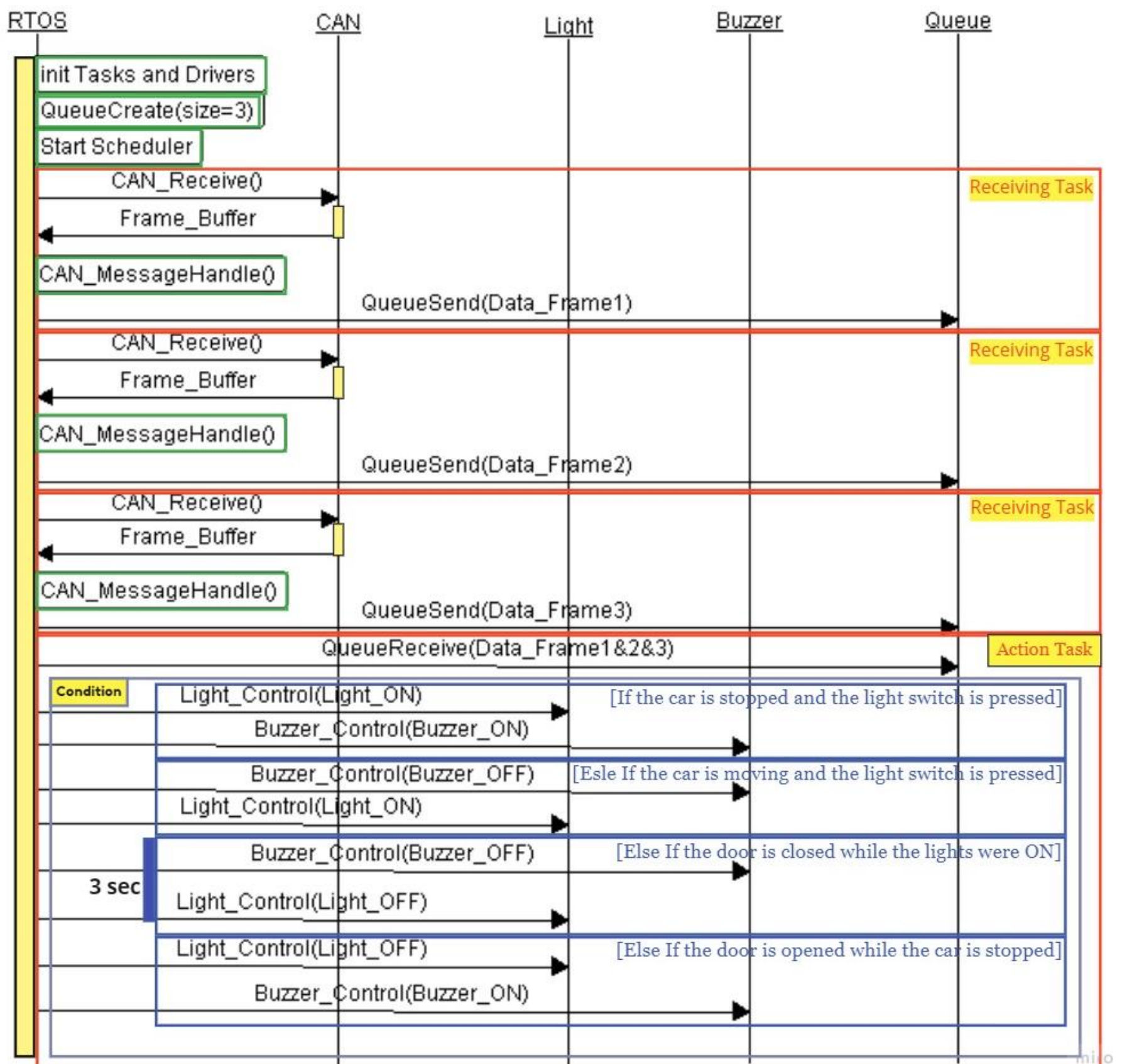


➤ Sequence Diagram:

- 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%

Door_Automotive.xml

Qt Model data									
General Scheduler Processors Tasks									
id	Name	Task type	Abort on miss	Date	Period (ms)	ct. da	Deadline (ms)	WCET (ms)	
1	Speed Sensor	Periodic	<input checked="" type="checkbox"/> Yes	0	5	-	5	1	
2	Door Sensor	Periodic	<input checked="" type="checkbox"/> Yes	0	10	-	10	1	
3	Light Switch	Periodic	<input checked="" type="checkbox"/> Yes	0	20	-	20	1	
4	CAN Send	Periodic	<input checked="" type="checkbox"/> Yes	0	5	-	5	0.5	

Qt Results				
General Logs Tasks Scheduler Processors				
Observation Window: from 0.00 to 100.00 ms				
	Total load	Payload	System load	
CPU 1	0.4500	0.4500	0.0000	

*Door_Automotive.xml

Qt Model data									
General Scheduler Processors Tasks									
id	Name	Task type	Abort on miss	Date	Period (ms)	ct. da	Deadline (ms)	WCET (ms)	
1	CAN_Receive	Periodic	<input checked="" type="checkbox"/> Yes	0	5.0	-	5.0	1.0	
2	Action_Task	Periodic	<input checked="" type="checkbox"/> Yes	0	10	-	10	1.0	

Qt Results				
General Logs Tasks Scheduler Processors				
Observation Window: from 0.00 to 100.00 ms				
	Total load	Payload	System load	
CPU 1	0.3000	0.3000	0.0000	