PDF 7 5 min video

ECU1

ECU2

Component State Machine

	Drive Link	GitHub LInk
ECU 1 State Diagram	DCS ECU1 Dynamic Design	https://github.com/MahmoudElSabrouty/Design_DCS/blob/main/Dynamic%20Design/DCS%20ECU1%20Dynamic%20Design.pdf
ECU 2 State Diagram	DCS ECU2 Dynamic Design	https://github.com/MahmoudElSabrouty/Design_DCS/blob/main/Dynamic%20Design/DCS%20ECU2%20Dynamic%20Design.pdf
Video Link	NA	

Dynamic Architecture CPU Load Calculation *(on hyperPeriod: 20ms)*

ECU1

Task Name	Peridicity (ms)	Mapped Functions	Expected worst case Execution Time (ms)	Startup Time/CPU Load	
Task_Init	INIT	DR_Stat_Init	0.001	**Startup Time (ms)**	**0.296**
		SPD_Stat_Init	0.002		
		SW_Stat_Init	0.002		
		Data_Handler_Init	0.001		
Task_5ms	5	DataHandler_SPD	0.1	**CPU Load (%)**	**0.4**
Task_10ms	10	DataHandler_DR	0.1		**0.2**
Task_20ms	20	DataHandler_SW	0.1		**0.1**
ISR	5	SPD_TickHandler	0.01		**0.04**
					74

ECU2

Task Name	Peridicity (ms)	Mapped Functions	Expected worst case Execution Time (ms)	Startup Time/CPU Load	
Task_Init	INIT	LED_Ctrl_Init	0.002	**Startup Time (ms)**	**0.246**
		BZR_Ctrl_Init	0.004		
Task_5ms	5	BCMH_Update_SPD_State	0.05	**CPU load (%)**	**0.2**
Task_10ms	10	BCMH_Update_DR_State	0.05		**0.1**
	10	SW_StateHandler_StM	0.22		**0.44**
Task_20ms	20	BCMH_Update_SW_State	0.05		**0.05**
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Formula

CPU load = summation of(Task's Frequency * Task's worst case execution time)

Bus Load Formula

Bus load = Used capacity / Max capacity

Assumptions	
1 CAN frame contains approximately (Bits)	125
baud rate (kbps)	500
bit Time (usec)	2
1 Frame Time (usec)	**250**

Bus Load (Percentage / sec)

Msg Name	Msg Structure (Bits)	periodicity (msec)	periodicity (usec)	Msg Bus Load %
DR_Stat	8	10	10000	2.5
SPD_Stat	8	5	5000	5
SW_Stat	8	20	20000	1.25
Total Bus Load				**8.75**