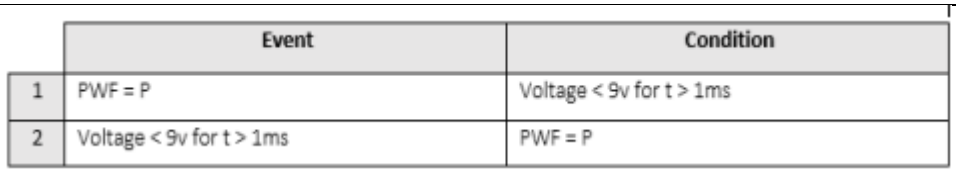
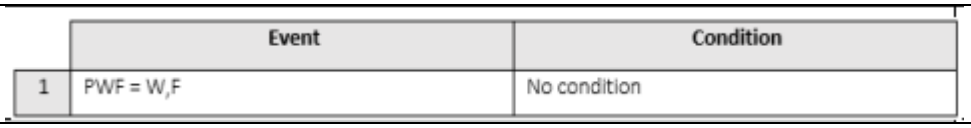
BCE2023 (BODY & CONFORT ECU 2023)

Exterior light specification

Object id	Description	Object type
BCE_Light_1	**1.General information**	Title
BCE_Light_2	**1.1Description according to the activation/deactivation tables**	Title
BCE_Light_3	Functions, which are not active while deactivation conditions are getting fulfilled, do not have to be deactivated.	Information
BCE_Light_4	The table is divided into two areas: - Event (Trigger) - Condition	Information
BCE_Light_5	If elements in the column "Trigger/Event" have an "OR" operation, this must be interpreted as if this event would be splitted into two rows	Information
BCE_Light_6	**1.2Abbreviations of used concepts in the system**	Title
BCE_Light_7	The nomenclatures listed below shall be observed for better clarity of Exterior Light domain	Information
BCE_Light_8	Car states: PWF: PARKEN WOHNEN FAHREN: Parking Live Drive - P = PARKEN: Parking - W = WOHNEN: Live - F = FAHREN: Drive	Information
BCE_Light_9	DTC = Diagnostic Trouble Codes LCU= Status Light control unit TIC= Status Turn indication control BRS= Status Brightness Rain sensor Fkt. = Function DR = Driving light POS = Position light PAR = Parking light HB = High-beam BR = Brake light EB = Emergency Brake light DL = Direction light AC_DL = Active Direction light BRM= Battery rescue mode BCE: Body & comfort ECU	Information
BCE_Light_10	**2.Safe vehicle state**	Title
BCE_Light_11	Unsafe car state shall be given when: (Motor_Speed >= 5 km/h)OR(Motor_Speed is Invalid/error And (VEH_ST !=Parken or VEH_ST= unknown))"	Requirement
BCE_Light_12	The BCE shall evaluate the speed signal Motor_Speed as invalid if ((Motor_Speed == FFFFh Signal ungueltig)OR(Motor_Speed > 300 km/h))	Requirement
BCE_Light_13	The BCE shall evaluate the speed signal VEH_ST as unknown if VEH_ST has values not listed in message catalog.	Requirement
BCE_Light_14	**3. Light control unit**	Title
BCE_Light_15	**3.1 ECU description**	Title
BCE_Light_16	The Light control unit (LCU) is the central controll panel for the exterior light functions. It contains the controll-sections for the main light functions (manual/automated driving light, position light), the Parking light functions and additional light functions…	Information
BCE_Light_17	The LCU has 6 Positions (0,1,2, A,Pl_R/L) Handled by LIN interface LIN message Light_Ctrl_Inputs: Receiver: BCE ,signals: ST_L_P_LIN (Please refer to the message catalog)	Information
BCE_Light_18	When parking or position lights are switched off due to energy bordnet reasons (Battery rescue mode) the LCU-status shall change to OFF-Position.	Information

BCE_Light_19	**3.2 Error handling**	Title
BCE_Light_20	If Unsafe car state is Active and LCU = Error/Unknown, The BCE shall consider the LCU in Position 2 .	Requirement
BCE_Light_21	The BCE shall evaluate the LCU position signal ST_L_P_LIN as unknown if ST_L_P_LIN has values not listed in message catalog.	Requirement
BCE_Light_22	**4.Battery rescue mode**	Title
BCE_Light_23	**4.1 Activation and deactivation conditions**	Title
BCE_Light_24	**4.1.1 Functionality requirements**	Title
BCE_Light_25	In battery rescue mode, the active light functions position light and parking light must be deactivated in order to prevent permanent damage to the battery.	Requirement
BCE_Light_26	4.1.2 Activation conditions	Title
BCE_Light_27	The BCE must activate battery rescue mode in accordance with the following table. The lines are to be combined.	Information
BCE_Light_28		Requirement
BCE_Light_29	4.1.3 Deactivation conditions	Title
BCE_Light_30		Requirement
BCE_Light_31	**4.1.4Diagnostic Trouble Codes (DTCs)**	Title
BCE_Light_32	As soon as battery rescue mode is active, resulting in deactivation of the side light &parking light, the BCE must set the DTC 0X0212D: Battery discharge protection Mode active.	Requirement
BCE_Light_33	**5.Driving light**	Title
BCE_Light_34	**5.1 Functional description**	Title
BCE_Light_35	The purpose of the Driving light is to illuminate the area (road surface) in front of the vehicle without dazzling approaching vehicles.	Information
BCE_Light_36	**5.2 Architecture overview**	Title
BCE_Light_37	The BCE communicates the Driving light function via the CAN system bus to the connected light ECU (FLSM)	Information
BCE_Light_38	If there is a Left/right Driving-light ON/Off request, the connected light sources shall be actuated by the corresponding light ECU	Information
BCE_Light_39	The Front light slave manager (FLSM) shall activate the proper Driving light lamps as follow: If FLSM receives CTR_FN_DR = On then Dr_L , Dr_R shall be immediately On Otherwise Dr_L = Off and Dr_R = Off	Requirement
BCE_Light_40	**5.3 Input variables**	Title
BCE_Light_41	PWF-Status: CAN message: PWF, signal: VEH_ST	Information
BCE_Light_42	Status Light control unit (LCU): LIN message : Light_Ctrl_Inputs, signal : ST_L_P_LIN	Information
BCE_Light_43	Status Brightness Rain sensor (BRS): LIN message: Brighthness_Rain_Sensor, signals: ST_RB_LIN	Information
BCE_Light_44	**5.4 Output variables**	Title
BCE_Light_45	Control Function Driving light CAN: Message: CTR_EL_F, signal: CTR_FN_DR	Information
BCE_Light_46	Control Function BRS CAN: Message: CTR_ECU, signal: CTR_FN_BRS	Information

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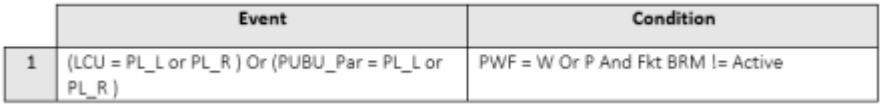
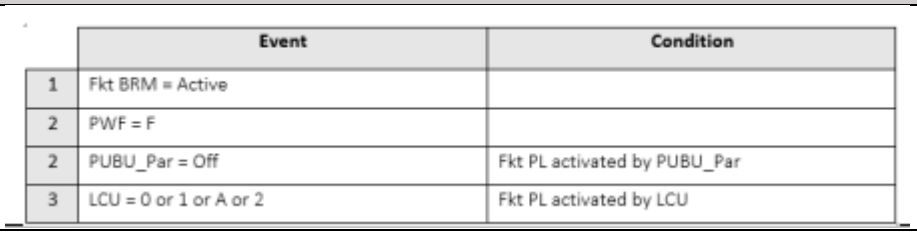
<tr><td></td><td></td><td></td></tr>
<tr><td>BCE_Light_47</td><td>Control Function Light control
CAN: Message: CTR_ECU , signal: CTR_FN_LCU</td><td>Information</td></tr>
<tr><td>BCE_Light_48</td><td>5.5 Activation and deactivation conditions</td><td>Title</td></tr>
<tr><td>BCE_Light_49</td><td>5.5.1 Functionality requirements</td><td>Title</td></tr>
<tr><td>BCE_Light_50</td><td>The Driving Light function must be activated by the BCE according to the activation/deactivation conditions</td><td>Requirement</td></tr>
<tr><td>BCE_Light_51</td><td>The Driving Light function must be activated by the BCE with the signals CTR_FN_DR</td><td>Requirement</td></tr>
<tr><td>BCE_Light_52</td><td>5.5.2 Activation conditions</td><td>Title</td></tr>
<tr><td>BCE_Light_53</td><td>The BCE must activate the Driving light function according to the following the following table. The lines are to be combined.</td><td>Requirement</td></tr>
<tr><td>BCE_Light_54</td><td><table><tr><th></th><th>Event</th><th>Condition</th></tr><tr><td>1</td><td>PWF = F</td><td>LCU = 2</td></tr><tr><td>2</td><td>LCU = 2</td><td>PWF = W or F</td></tr><tr><td>3</td><td>PWF = F</td><td>(LCU= Off or A) And BRS = Darkness</td></tr><tr><td>4</td><td>LCU = Off or A</td><td>PWF = F And BRS = Darkness</td></tr><tr><td>5</td><td>BRS = Darkness</td><td>PWF = F And (LCU= Off orA)</td></tr></table></td><td>Requirement</td></tr>
<tr><td>BCE_Light_55</td><td>5.5.3 Deactivation conditions</td><td>Title</td></tr>
<tr><td>BCE_Light_56</td><td><table><tr><th></th><th>Event</th><th>Condition</th></tr><tr><td>1</td><td>PWF = P or W</td><td></td></tr><tr><td>2</td><td>LCU ! = 2</td><td>PWF = W</td></tr><tr><td>3</td><td>LCU = 1</td><td>PWF = F</td></tr><tr><td>4</td><td>LCU = Off or A</td><td>PWF = F and BRS = Light</td></tr><tr><td>5</td><td>BRS = Light</td><td>PWF = F and (LCU = Off or A)</td></tr></table></td><td>Requirement</td></tr>
<tr><td>BCE_Light_57</td><td>5.6 Error handling</td><td>Title</td></tr>
<tr><td>BCE_Light_58</td><td>The safe state for the Driving function in the state 'DRIVE' is Driving Light ON</td><td>Requirement</td></tr>
<tr><td>BCE_Light_59</td><td>If PWF state is ('DRIVE' Or 'Invalid') And (LCU = Error or Invalid or PL_L or PL_R) And BRS = Darkness The FLSM has to activate the Driving light function.</td><td>Requirement</td></tr>
<tr><td>BCE_Light_60</td><td>The safe state for the Driving function in the state! =“DRIVE” is Driving Light OFF</td><td>Requirement</td></tr>
<tr><td>BCE_Light_61</td><td>6.Position Light</td><td>Title</td></tr>
<tr><td>BCE_Light_62</td><td>The side light signals the presence of the vehicle to other road users in all directions. The side light is executed as a function both alone and as a partial function in Driving light Fkt .</td><td>Requirement</td></tr>
<tr><td>BCE_Light_63</td><td>6.1 Architecture overview</td><td>Title</td></tr>
<tr><td>BCE_Light_64</td><td>The BCE communicates the Position light function via the CAN system bus to the connected light slaves (FLSM & RLSM)</td><td>Requirement</td></tr>
<tr><td>BCE_Light_65</td><td>The Front light slave manager (FLSM) and Rear light slave manager (RLSM) shall activate the proper Position light lamps as follow: If FLSM receives CTR_FN_POS = On then PosF_L, PosF_R and LCF shall be immediately On Otherwise PosF_L = Off , PosF_R = Off and LCF = Off . If RLSM receives CTR_FN_POS = On then PosR_L , PosR_R and LCR shall be immediately On Otherwise PosR_L = Off , PosR_R = Off and LCR = Off .</td><td>Requirement</td></tr>
<tr><td>BCE_Light_66</td><td>6.2 Input variables</td><td>Title</td></tr>
<tr><td>BCE_Light_67</td><td>PWF-Status:
CAN message: PWF, signal: VEH_ST</td><td>Information</td></tr>
<tr><td>BCE_Light_68</td><td>Status Light control unit (LCU):
LIN message: Light_Ctrl_Inputs,signals: ST_L_P_LIN</td><td>Information</td></tr>
</table>

<table>
<tr><td>BCE_Light_69</td><td>Status Brightness Rain sensor (BRS):
LIN message: El_ECU_BRS ,signals: ST_RB_LIN</td><td>Information</td></tr>
<tr><td>BCE_Light_70</td><td>6.3 Output variables</td><td>Title</td></tr>
<tr><td>BCE_Light_71</td><td>Control Function Position front light
CAN Message: Brighthness_Rain_Sensor, signal: CTR_FN_POS</td><td>Information</td></tr>
<tr><td>BCE_Light_72</td><td>Control Function Position light
CAN Message : CTR_EL_R , signal: CTR_FN_POS</td><td>Information</td></tr>
<tr><td>BCE_Light_73</td><td>Control Function BRS
CAN: Message: CTR_ECU , signal: CTR_FN_BRS</td><td>Information</td></tr>
<tr><td>BCE_Light_74</td><td>Control Function Light control
CAN: Message: CTR_ECU , signal: CTR_FN_LCU</td><td>Information</td></tr>
<tr><td>BCE_Light_75</td><td>6.4 Activation and deactivation conditions</td><td>Title</td></tr>
<tr><td>BCE_Light_76</td><td>6.4.1 Functionality requirements</td><td>Title</td></tr>
<tr><td>BCE_Light_77</td><td>The Position light function must be activated by the BCE according to the activation/deactivation conditions</td><td>Requirement</td></tr>
<tr><td>BCE_Light_78</td><td>The Position light function must be activated by the BCE with the signals CTR_FN_POS</td><td>Requirement</td></tr>
<tr><td>BCE_Light_79</td><td>6.4.2 Activation conditions</td><td>Title</td></tr>
<tr><td>BCE_Light_80</td><td>The BCE must activate the Position light function according to the following the following table. The lines are to be combined .</td><td>Requirement</td></tr>
<tr><td>BCE_Light_81</td><td><table><tr><th></th><th>Event</th><th>Condition</th></tr><tr><td>1</td><td>Fkt DR On</td><td></td></tr><tr><td>2</td><td>LCU = 1</td><td>Fkt BRM != Active</td></tr><tr><td>3</td><td>Fkt BRM != Active</td><td>LCU = 1</td></tr></table></td><td>Requirement</td></tr>
<tr><td>BCE_Light_82</td><td>6.4.3 Deactivation conditions</td><td>Title</td></tr>
<tr><td>BCE_Light_83</td><td><table><tr><th></th><th>Event</th><th>Condition</th></tr><tr><td>1</td><td>Fkt BRM = Active</td><td></td></tr><tr><td>2</td><td></td><td>Fkt DR Off and PWF= F and LCU != 1</td></tr><tr><td>2</td><td>LCU = 2</td><td>PWF = P</td></tr><tr><td>3</td><td>LCU = 0</td><td>PWF = P or W</td></tr><tr><td>4</td><td>LCU = A</td><td>PWF = P Or (PWF = W and BRS = Light)</td></tr><tr><td>5</td><td>BRS = Light</td><td>PWF = W and LCU = A</td></tr></table></td><td>Requirement</td></tr>
<tr><td>BCE_Light_84</td><td>6.5 Error handling</td><td></td></tr>
<tr><td>BCE_Light_85</td><td>7.Parking light</td><td></td></tr>
<tr><td>BCE_Light_86</td><td>7.1 Functional description</td><td></td></tr>
<tr><td>BCE_Light_87</td><td>The parking light is used to secure (illuminate) the stationary or parked vehicle. To reduce the power consumption, only one vehicle side is illuminated.</td><td></td></tr>
<tr><td>BCE_Light_88</td><td>7.2 Architecture overview</td><td></td></tr>
<tr><td>BCE_Light_89</td><td>The BCE communicates the Parking light function via the CAN system bus to the connected light slaves (FLSM & RLSM</td><td></td></tr>
<tr><td>BCE_Light_90</td><td>The Front light slave manager (FLSM) and Rear light slave manager (RLSM) shall activate the proper parking light lamps as follow : If FLSM receives CTR_FN_PAR = On then ParF_L, ParF_R shall be immediately On Otherwise ParF_L = Off , ParF_R = Off . If RLSM receives CTR_FN_PAR = On then ParR_L , ParR_R shall be immediately On Otherwise ParR_L = Off , ParR_R = Off.</td><td></td></tr>
<tr><td>BCE_Light_91</td><td>7.3 Input variables</td><td></td></tr>
<tr><td>BCE_Light_92</td><td>PWF-Status: CAN message: PWF , signal: VEH_ST</td><td></td></tr>
</table>

BCE_Light_93	Status Light control unit (LCU): LIN message: El_ECU_LCU ,signals: ST_L_P_LIN	
BCE_Light_94	Push Button Parking Light: HW signals: PUBU_Par : Off or PL_L or PL_R	
BCE_Light_95	7.4 Output variables	
BCE_Light_96	Control Function parking light CAN: Message: CTR_EL_F, signal: CTR_FN_PAR	
BCE_Light_97	Control Function parking light CAN: Message: CTR_EL_R, signal: CTR_FN_PAR	
BCE_Light_98	**7.5 Activation and deactivation conditions**	
BCE_Light_99	**7.5.1 Functionality requirements**	
BCE_Light_100	The parking light function must be activated by the BCE according to the activation/deactivation conditions	
BCE_Light_101	The parking light function must be activated by the BCE with the signals CTR_FN_PAR	
BCE_Light_102	**7.5.2 Activation conditions**	
BCE_Light_103	The BCE must activate the parking light function according to the following table. The lines are to be combined.	
BCE_Light_104		
BCE_Light_105	**7.5.3 Deactivation conditions**	
BCE_Light_106		
BCE_Light_107		
BCE_Light_108		
BCE_Light_109		
BCE_Light_110		
BCE_Light_111		
BCE_Light_112		
BCE_Light_113		
BCE_Light_114		
BCE_Light_115		
BCE_Light_116		
BCE_Light_117		
BCE_Light_118		
BCE_Light_119		
BCE_Light_120		
BCE_Light_121		
BCE_Light_122		
BCE_Light_123		
BCE_Light_124		
BCE_Light_125		
BCE_Light_126		
BCE_Light_127		

	Event	Condition
1	(LCU = PL_L or PL_R) Or (PUBU_Par = PL_L or PL_R)	PWF = W Or P And Fkt BRM != Active

	Event	Condition
1	Fkt BRM = Active	
2	PWF = F	
2	PUBU_Par = Off	Fkt PL activated by PUBU_Par
3	LCU = 0 or 1 or A or 2	Fkt PL activated by LCU

BCE_Light_128		
BCE_Light_129		
BCE_Light_130		
BCE_Light_131		
BCE_Light_132		
BCE_Light_133		
BCE_Light_134		
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BCE_Light_137		
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