How MQB platform vehicles (like the Mk7 Golf) control external lights -preliminary observations

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1. Introduction

The 09-Cent. Elect. control module, or as it is also known, the Body Control module (BCM) is a central component in any car. But the BCM is particularly important in MQB platform vehicles. The importance of the BCM in the mk7 Golf is underscored by the fact that it contains anywhere from 1,760 to 2,500 adaptation channels, depending on the unit that has been installed. This is over 50% of all of the adaptation channels in the car.

Buried deep within the large list of functions that the BCM manages is control of the car's lights. In the mk7 Golf, there are 665 adaptation channels devoted entirely to the way that the car's external lights operate. Understanding how the BCM allocates resources to these adaptation channels enables VCDS cable users to customise the way that lights operate.

2. The Basics

Whilst there are numerous adaptation channels devoted to lighting in the mk7, this document concentrates specifically on those channels that control the car's external lighting (and the foot-well lighting). These lights include the front headlight and rear taillight assemblies, fog-lights, cornering lights and side marker lights.

Regardless of the light, the structure of the group of adaptation channels that control its operation is the same. For each external light:

- There are 19 x Adaptation channels which are used to manage how each light works. I call these associated 19 x channels, a (Leuchte) **Channel-set**.
    - Each adaptation channel in a Channel-set commences with an identifier, being the bracketed number (1) to (19)
- Channels with bracketed numbers (1), (2) & (3) are basic set-up channels that establish the nature of the light and the Bit configuration for lamp error detection (i.e. detection of filament short/open condition)
- The remaining 16 x adaptation channels (i.e. bracketed numbers (4) to (19)) are grouped into 4 Banks of 4 x adaptation channels. I call each of these 4 x adaptation channels a (Leuchte) **Channel-subset**.
    - Each of these Channel-subsets is separately programmable as a pair of functions.
    - Within each subset, the first 2 x adaptation channels has two functions which are defined by an alphabetic identifier (i.e. A and B, C and D, E and F, G and H) - I call each of these a (Leuchte) **Alpha channel**.
    - The remaining two channels in each subset determines the "Dimmwert" (Dimming value) and the "Dimming Direction" of the pair of functions. I call these (Leuchte) **Dimming channels**

Summary of Terms (as used in this paper)

Term	Explanation
Channel-set	A group of related 19 x Leuchte channels that determine how an individual lamp operates
Channel-subset (Bank)	A bank of 4 x channels that can be separately programmed to change how each lamp works. There are 4 x Channel-subsets for each Channel-set
Alpha channel	An individual channel that is identified by the characters A, B, C...H. The setting of an Alpha channel will ascribe a particular function to a lamp. There are 2 x Alpha channels (**Alpha pair**) in each Channel-subset (i.e. total of 8 x alpha channels in each Channel-set)
Dimming Channels	The pair of "Dimmwert" and "Dimming direction" channels for each Channel sub-set. These channels define the lighting level and illumination profile for an Alpha pair

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As an example, Table 1 below shows the adaptation channels that control the outer Tail light lamp on the right side of the car . The table has been coloured to illustrate the structure that has been described above. Note the construction: the first three channels (set-up channels) and the 4 x programmable channels sub-sets (**Banks**), with each sub-set containing 2 x Alpha channels and the Dimming channels. Note also that Channel (7) has a different label. This will be explained in the next chapter.

	Right Brake /Tail Lamp (outer)	
	Adaptation Description	*Setting (103TSI)*
Set-up	(1)-Leuchte21BR RC8-Lasttyp 21	**13 - Bremsleuchten**
	(2)-Leuchte21BR RC8-Lampendefektbitposition 21	20
	(3)-Leuchte21BR RC8-Fehlerort mittleres Byte DTC-DFCC 21	3A
Bank 1	(4)-Leuchte21BR RC8-Lichtfunktion A 21	Brake light
	(5)-Leuchte21BR RC8-Lichtfunktion B 21	not active
	(6)-Leuchte21BR RC8-Dimmwert AB 21	100
	(7)-Leuchte21BR RC8-Lichtansteuerung HD AB 21	Always
Bank 2	(8)-Leuchte21BR RC8-Lichtfunktion C 21	Standlicht allgemein (Schlusslicht; Positionslicht; Begrenzungslicht)
	(9)-Leuchte21BR RC8-Lichtfunktion D 21	Parking light right
	(10)-Leuchte21BR RC8-Dimmwert CD 21	28
	(11)-Leuchte21BR RC8-Dimming Direction CD 21	maximize
Bank 3	(12)-Leuchte21BR RC8-Lichtfunktion E 21	not active
	(13)-Leuchte21BR RC8-Lichtfunktion F 21	not active
	(14)-Leuchte21BR RC8-Dimmwert EF 21	0
	(15)-Leuchte21BR RC8-Dimming Direction EF 21	maximize
Bank 4	(16)-Leuchte21BR RC8-Lichtfunktion G 21	not active
	(17)-Leuchte21BR RC8-Lichtfunktion H 21	not active
	(18)-Leuchte21BR RC8-Dimmwert GH 21	0
	(19)-Leuchte21BR RC8-Dimming Direction GH 21	maximize

Table 1

3. Anatomy of the Adaptation Channel Description

Within each Channel-set, the following nomenclature is used - refer to Table 1 above:

Label	Meaning
(1) to(19)	Basic identifier for the adaptation channel
Leuchte	German for "Light"
"21"	This is a simple sequence-number (i.e. range is 0-34). Initial investigation suggests that this number links "**Leuchte**" Channels to "**Lighting configuration**" channels (see subsequent description).
BR	German abbreviation for the lamp position. In this case BR means "Bremslicht hinten Rechts", or in English, Brake-light, Rear right
R	" Rechts ", or in English "Right". The Left Lamp will have the letter L (for "Links" in German)
C8	The physical connector for the light on the BCM. In this case: Socket "C", pin "8"
"A", "B"....."H"	8 x programmable functions - these are the **Alpha Channels**
AB, CD, EF, GH	Dimming Value and Dimming Direction commands for an **Alpha pair -** these are the **Dimming channels**
HD	In German, **H**eck**D**eckel , or "Trunk Lid". This channel determines how the light will behave when Trunk Lid is open/closed. The stored value for this adaptation channel can be "always" or "Only_if_closed", meaning that the light will illuminate always, or only if the trunk lid is closed

4. Complete Leuchte Channels listing for a mk7 - Attachments

I have enclosed a comprehensive list of Leuchte channel information at the rear of this document as follows:

Table 5A: The entire list of the Adaptation Channel descriptors for mk7 Golf including the German abbreviation (with English translation) and the Socket/Pin for each external light.

Table 5B: Listing of adaptation channel identifiers and lamp position on the car

Table 5C: Leuchte-set designations comparing a range of MQB platform vehicles

Table 6: The allowable settings that may be applied to the "Alpha" adaptation channels

Table 7: The allowable settings for the "Lasttyp" channel (i.e. the first adaptation channel in a Channel-set)

Screen -shots: Copies of VCDS screens for those adaptation channels where there are limitations in the permissible settings

Lamp position: Pictorial information detailing the lamp position and Leuchte channel for each Channel-set (

5. Leuchte channels - other considerations:

5.1 Lamp fault protection

Unlike previous models, almost all of the exterior lamps on a mk7 don't have individual fuses. Instead, the BCM appears to provide circuit protection and monitoring functions as well as providing switched voltage to each lamp.

Lamp protection appears to take place in the adaptation channels that commence with parenthesis (2) and (3) (i.e. the adaptation channels "Lampendefektbitposition" and "Fehlerort mittleres Byte DTC-DFCC"). Not much is known about these two mysterious channels outside VW and I have not been able to find any information regarding their operation. My suspicion is that the settings in these two adaptation channels refer to a Hexadecimal memory address. If these two channels are memory locations it's not surprising that an individual setting may only be used once in a BCM. Table 2 below shows the settings for Leuchte channels (2) - "Lampendefektbitposition" and (3)- "Fehlerort mittleres Byte DTC-DFCC" for the complete set of lamps for a 103TSI Golf

Light Config. channel	Socket PIN N°	Function (English)	(2)	(3)
0	B36	Left Front Turn Signal	34	14
1	B20	Right Front Turn Indicator	3E	15
4	B4	Left Daytime Running Light	48	43
5	B32	Right Daytime Running Right	4C	44
6	C5	Left Low Beam Headlamp	36	1A
7	B1	Right Low Beam Headlamp	40	1B
8	B39	Left High Beam Headlamp	37	1C
9	B2	Right High Beam Headlamp	41	1D
12	B45	Left Front Fog Lamp & Cornering Lamp	38	22
13	B5	Right Front Fog Lamp & Cornering Lamp	42	23
18	A60	Left Rear Turn Indicator	8	16
19	C31	Right Rear Turn Indicator	18	18
20	A71	Left Brake /Tail Lamp	10	39
21	C8	Right Brake /Tail Lamp	20	3A
22	A57	High Mounted Brake Light	29	2C
23	C10	Left Tail Light (Inner)	0A	29
24	A65	Right Tail Light (inner)	1A	2A
25	A59	Left License Plate	28	30
26	A72	Left/right Rear Fog Lamp	1C	2F
28	C11	Left Back-up Lamp	0B	31
29	A64	Right Back-up Lamp	1B	32
30	C72	Left/Right Front Foot well Lamp	0	2

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Table 2

5.2 Conflicts - who wins!

The existence of 8 x alpha channels and their arrangement into 4 pairs means that an individual lamp can perform multiple functions. As a consequence, it is entirely likely that a lamp may be asked to perform more than one function at any time. Leuchte programming resolves such conflicts by enforcing a strict priority rule based on the alphabetic assignment of functions. In Leuchte programming the priority is GH>EF>CD>AB. That is, the alpha pair with the highest priority is the GH bank of channels and lowest priority is allocated to the AB bank of channels.

To demonstrate how the Leuchte priority rule works in reality, I have created an artificial list of settings for the Inside rear light on the left side tail-light assembly as shown in Table 3 below

	Parking-Light Rear Right-inside	
	Adaptation Description	**Settuing**
Set-up	(1)-Leuchte24SL HRA65-Lasttyp 24	9 - allgemeine Glühlampe 27W; auch H15
	(2)-Leuchte24SL HRA65-Lampendefektbitposition 24	1A
	(3)-Leuchte24SL HRA65-Fehlerort mittleres Byte DTC-DFCC 24	2A
Bank 1	(4)-Leuchte24SL HRA65-Lichtfunktion A 24	Brake light
	(5)-Leuchte24SL HRA65-Lichtfunktion B 24	Blinken rechts Hellphase
	(6)-Leuchte24SL HRA65-Dimmwert AB 24	100
	(7)-Leuchte24SL HRA65-Lichtansteuerung HD AB 24	Always
Bank 2	(8)-Leuchte24SL HRA65-Lichtfunktion C 24	Blinken rechts Dunkelphase
	(9)-Leuchte24SL HRA65-Lichtfunktion D 24	not active
	(10)-Leuchte24SL HRA65-Dimmwert CD 24	0
	(11)-Leuchte24SL HRA65-Dimming Direction CD 24	minimize
Bank 3	(12)-Leuchte24SL HRA65-Lichtfunktion E 24	Standlicht allgemein (Schlusslicht; Positionslicht; Begrenzungslicht)
	(13)-Leuchte24SL HRA65-Lichtfunktion F 24	not active
	(14)-Leuchte24SL HRA65-Dimmwert EF 24	28
	(15)-Leuchte24SL HRA65-Dimming Direction EF 24	maximize
Bank 4	(16)-Leuchte24SL HRA65-Lichtfunktion G 24	not active
	(17)-Leuchte24SL HRA65-Lichtfunktion H 24	not active
	(18)-Leuchte24SL HRA65-Dimmwert GH 24	0
	(19)-Leuchte24SL HRA65-Dimming Direction GH 24	maximize

Table 3

I have set-up the rear inside light in this example so that it will perform the following three function in priority order:

1. Parking light (illumination 28%)
2. Indicator Light (illumination 100%)
3. Brake light (illumination 100%)

5.3 Lighting Configuration Channels

The BCM contains an equal number of Lighting configuration and Leutche Channels,. That is, there are 35 sets of each type with each set being made-up of 19 adaptation channels (i.e. total of 665 channels in each category). Moreover, the Leutche channel description has a number (0-34) that links with its twin Lighting configuration channel. Table 4 below is an example of a pair of Leutche and Lighting configuration channels.

		Left Low Beam Headlamp	
(115)-Light configuration-Lasttyp 6	**11 - Abblendlicht**	(1)-Leuchte6ABL LC5-Lasttyp 6	**11 - Abblendlicht**
(116)-Light configuration-BAP Bitposition 6	36	(2)-Leuchte6ABL LC5-Lampendefektbitposition 6	36
(117)-Light configuration-Fehlerort mittleres Byte DTC-DFCC 6	1A	(3)-Leuchte6ABL LC5-Fehlerort mittleres Byte DTC-DFCC 6	1A
(118)-Light configuration-Lichtfunktion A 6	11	(4)-Leuchte6ABL LC5-Lichtfunktion A 6	Abblendlicht links
(119)-Light configuration-Lichtfunktion B 6	0	(5)-Leuchte6ABL LC5-Lichtfunktion B 6	not active
(120)-Light configuration-Dimmwert AB 6	100	(6)-Leuchte6ABL LC5-Dimmwert AB 6	100
(121)-Light configuration-Lichtansteuerung HD AB 6	Always	(7)-Leuchte6ABL LC5-Lichtansteuerung HD AB 6	Always
(122)-Light configuration-Lichtfunktion C 6	0	(8)-Leuchte6ABL LC5-Lichtfunktion C 6	not active
(123)-Light configuration-Lichtfunktion D 6	0	(9)-Leuchte6ABL LC5-Lichtfunktion D 6	not active
(124)-Light configuration-Dimmwert CD 6	0	(10)-Leuchte6ABL LC5-Dimmwert CD 6	0
(125)-Light configuration-Dimming Direction CD 6	maximize	(11)-Leuchte6ABL LC5-Dimming Direction CD 6	maximize
(126)-Light configuration-Lichtfunktion E 6	0	(12)-Leuchte6ABL LC5-Lichtfunktion E 6	not active
(127)-Light configuration-Lichtfunktion F 6	0	(13)-Leuchte6ABL LC5-Lichtfunktion F 6	not active
(128)-Light configuration-Dimmwert EF 6	0	(14)-Leuchte6ABL LC5-Dimmwert EF 6	0
(129)-Light configuration-Dimming Direction EF 6	maximize	(15)-Leuchte6ABL LC5-Dimming Direction EF 6	maximize
(130)-Light configuration-Lichtfunktion G 6	0	(16)-Leuchte6ABL LC5-Lichtfunktion G 6	not active
(131)-Light configuration-Lichtfunktion H 6	0	(17)-Leuchte6ABL LC5-Lichtfunktion H 6	not active
(132)-Light configuration-Dimmwert GH 6	0	(18)-Leuchte6ABL LC5-Dimmwert GH 6	0
(133)-Light configuration-Dimming Direction GH 6	maximize	(19)-Leuchte6ABL LC5-Dimming Direction GH 6	maximize

Table 4

Notice the identical structure of each channel set and the similarities in the stored values. Notice also the linking number for each bank of channels in the channel description (in this case the number "6"). This pattern is replicated for all light banks in the BCM. However not all exterior lights share the closeness of stored values which are exhibited in table 4 above.

Of the 35 x channel-sets in the BCM of my 103TSI, 10 x channels-sets are not active. Of the 25 channel-sets that are active, 6 x channels-sets appear to have a close correlation between the Leuchte channels and the Light configuration channels. The remaining 19 x "active" channel-sets do not appear to have this correlation.

The close correlation channels are: Low Beam Headlamp, Front Turn Indicator and Daytime Running Lamp (left and Right lamps in each case). The only linking aspect for these lights is that they are all part of the front headlight assembly albeit the High beam lamp is missing from the list. Whenever a stored valued of a Leutche channel is changed for these lamps, the corresponding stored value of the Lighting configuration channel automatically changes to the altered value.

At the time of writing, the purpose of the Lighting configuration channels is not known. However, my initial suspicion is that each Lighting Configuration channel-set records the set-up parameters for the power supply circuits of the exterior light that is defined in its twin Leuchte channel-set.

Clearly more information is needed about Lighting configuration channels. If you can help in this regard, please PM me (I'm on VWWatercooled, VWVortex, VWGolf.net.au, Golfmk7 and RT forum)

Any information that adds greater clarity to this matter would be welcomed - Thanks in advance

6. Example-Designing a VCDS Tweak with Leuchte Programming

The following simple example demonstrates how to apply the information that is outlined earlier in this paper.

For the purpose of this example, the incandescent rear tail-lights on my 103TSI will be changed so as to add a "brake-light" function to the inner fitting. In its default state, the inner tail-light only act as parking lights.

The Leuchte-set for the left and Right lamps are shown in the table 5 below

	Left Tail Light (Inner)	
	Adaptation Channel Description	Setting
Set-up	(1)-Leuchte23SL HLC10-Lasttyp 23	**9 - allgemeine Glühlampe 27W; auch H15**
	(2)-Leuchte23SL HLC10-Lampendefektbitposition 23	0A
	(3)-Leuchte23SL HLC10-Fehlerort mittleres Byte DTC-DFCC 23	29
Bank 1	(4)-Leuchte23SL HLC10-Lichtfunktion A 23	Standlicht allgemein (Schlusslicht; Positionslicht; Begrenzungslicht)
	(5)-Leuchte23SL HLC10-Lichtfunktion B 23	not active
	(6)-Leuchte23SL HLC10-Dimmwert AB 23	28
	(7)-Leuchte23SL HLC10-Lichtansteuerung HD AB 23	only_if_closed
Bank 2	(8)-Leuchte23SL HLC10-Lichtfunktion C 23	not active
	(9)-Leuchte23SL HLC10-Lichtfunktion D 23	not active
	(10)-Leuchte23SL HLC10-Dimmwert CD 23	**0**
	(11)-Leuchte23SL HLC10-Dimming Direction CD 23	maximize
Bank 3	(12)-Leuchte23SL HLC10-Lichtfunktion E 23	not active
	(13)-Leuchte23SL HLC10-Lichtfunktion F 23	not active
	(14)-Leuchte23SL HLC10-Dimmwert EF 23	0
	(15)-Leuchte23SL HLC10-Dimming Direction EF 23	maximize
Bank 4	(16)-Leuchte23SL HLC10-Lichtfunktion G 23	not active
	(17)-Leuchte23SL HLC10-Lichtfunktion H 23	not active
	(18)-Leuchte23SL HLC10-Dimmwert GH 23	0
	(19)-Leuchte23SL HLC10-Dimming Direction GH 23	maximize

	Right Tail Lamp (inner)	
	Adaptation Channel Description	Setting
Set-up	(1)-Leuchte24SL HRA65-Lasttyp 24	**9 - allgemeine Glühlampe 27W; auch H15**
	(2)-Leuchte24SL HRA65-Lampendefektbitposition 24	1A
	(3)-Leuchte24SL HRA65-Fehlerort mittleres Byte DTC-DFCC 24	2A
Bank 1	(4)-Leuchte24SL HRA65-Lichtfunktion A 24	Standlicht allgemein (Schlusslicht; Positionslicht; Begrenzungslicht)
	(5)-Leuchte24SL HRA65-Lichtfunktion B 24	not active
	(6)-Leuchte24SL HRA65-Dimmwert AB 24	28
	(7)-Leuchte24SL HRA65-Lichtansteuerung HD AB 24	only_if_closed
Bank 2	(8)-Leuchte24SL HRA65-Lichtfunktion C 24	not active
	(9)-Leuchte24SL HRA65-Lichtfunktion D 24	not active
	(10)-Leuchte24SL HRA65-Dimmwert CD 24	**0**
	(11)-Leuchte24SL HRA65-Dimming Direction CD 24	maximize
Bank 3	(12)-Leuchte24SL HRA65-Lichtfunktion E 24	not active
	(13)-Leuchte24SL HRA65-Lichtfunktion F 24	not active
	(14)-Leuchte24SL HRA65-Dimmwert EF 24	0
	(15)-Leuchte24SL HRA65-Dimming Direction EF 24	maximize
Bank 4	(16)-Leuchte24SL HRA65-Lichtfunktion G 24	not active
	(17)-Leuchte24SL HRA65-Lichtfunktion H 24	not active
	(18)-Leuchte24SL HRA65-Dimmwert GH 24	0
	(19)-Leuchte24SL HRA65-Dimming Direction GH 24	maximize

Table 5

Note that the only"Bank" that is populated in each of the Leuchte-sets is the Parking light function (i.e. in the AB Alpha pair in Bank 1).

The steps in the design of the VCDS tweak are as follows:

1. The first decision to be made is what priority to give the new Brake light function given the programming for the existing lamp is as a Parking light. In this case, the new Brake light function will be given priority over the Parking light so it will be placed into Bank 2 (i.e. the CD Alpha pair)
2. The next step is to select the correct setting for the alpha channel in Bank 2 so that the lamp is instructed to illuminate whenever the Brake pedal is pressed. A quick look at **Leuchte Programming:"Alpha" channels - permissible settings** in the attachment to this paper confirms that the appropriate setting is **Brake light** (not surprisingly). So, the setting for:
   a. (8)-Leuchte23SL HLC10-Lichtfunktion C 23 (Left lamp), and
   b. (8)-Leuchte24SL HRA65-Lichtfunktion C 24 (right lamp)

   should be changed from **not active** to **Brake light**
3. Finally, the tweak needs to establish the lighting level, and the profile of illumination for the Brake light function, This is done via the Dimming channels. For this tweak, an illumination of 100% is appropriate and clearly the lamps should "light-up" (rather than "extinguish-down") in illumination. So the settings for:
   a. (10)-Leuchte23SL HLC10-Dimmwert CD 23, and
   b. (10)-Leuchte24SL HRA65-Dimmwert CD 24

   should be changed from 0 to 100, and
   a. (11)-Leuchte23SL HLC10-Dimming Direction CD 23, and
   b. (11)-Leuchte24SL HRA65-Dimming Direction CD 24

   should be maximum (ie.these channels should remain unaltered)

The table below summarises the required changes for the VCDS teak in this example

Adding Brake Light function to Incandescent Inner Rear Lights -VCDS Tweak

Left-Side Inner Tail light	Right-Side Inner Tail light	Old Setting	New Setting
(8)-Leuchte23SL HLC10-Lichtfunktion C 23	(8)-Leuchte24SL HRA65-Lichtfunktion C 24	not active	Brake light
(9)-Leuchte23SL HLC10-Lichtfunktion D 23	(9)-Leuchte24SL HRA65-Lichtfunktion D 24	not active	not active
(10)-Leuchte23SL HLC10-Dimmwert CD 23	(10)-Leuchte24SL HRA65-Dimmwert CD 24	0	100
(11)-Leuchte23SL HLC10-Dimming Direction CD	(11)-Leuchte24SL HRA65-Dimming Direction CD	maximize	maximize

Table 6

The specific instructions for enacting the VCDS tweak changes above are:

1. Select Security Access - 16 from the "Open Controller" screen
2. Enter the magic number 31347 and return to the "Open Controller" screen
3. Select Adaptation - 10 from the "Open Controller" screen
4. From the pull-down button change the adaptation channels shown in the table below to the New Settings as indicated:

Attachments

Leuchte Programming: Adaptation Channel Description

Anatomy of Leutche Adaptation Channel Descriptions					
Adaptation Channel Name				Funktion (German)	Function (English)
Link to Light Config. channel	Abbreviation	Position on Car	Socket PIN N°		
0	BLK	VL	B36	Blinker vorne links	Indicator, Front Left (head Lights)
1	BLK	VR	B20	Blinker vorne rechts	Indicator, Front Right(head Lights)
2	SL	VL	B10	Standlicht vorne links	Parking-Light, Front Left
3	SL	VR	B21	Standlicht vorne rechts	Parking-Light, Front Right
4	TFL	L	B4	Tagfahrlicht links	Daytime Running Lights Left
5	TFL	R	B32	Tagfahrlicht rechts	Daytime Running Lights Right
6	ABL	L	C5	Abblendlicht links	Low Beam, Front Left (headLights), Halogen / Xenon
7	ABL	R	B1	Abblendlicht links	Low Beam, Front Right (headLights), Halogen / Xenon
8	FL	L	B39	Fernlicht, link	High Beam, Front Left (head Lights)
9	FL	R	B2	Fernlicht, rechts	High Beam, Front Right (head Lights)
10	SHUTTER	L	B23		Remote Light shutter Front Left (head Lights)
11	SHUTTER	R	B22		Remote Light shutter Front Right (head Lights)
12	NL	L	B45	Nebelscheinwerfer vorne links	Fog-Light, Front Left (optional)
13	NL	R	B5	Nebelscheinwerfer vorne Rechts	Fog-Light, Front Right (optional)
14	AL	L	B6	Not used	
15	AL	B	B44	Not used	
16	BLK SLB35BLK	SL K	C9	Blinker hinten links im	Indicator, Rear Left-inside (LED tailLights)
17	TFL RBLK SRB3TFL R BLK	SR K	C3	Blinker hinten rechts	Indicator, Rear Right-inside (LED tailLights)
18	BLK	HL	A60	Blinker hinten links (außen)	Indicator, Rear Left-outside (tailLights)
19	BLK	HR	C31	Blinker hinten Rechts (außen)	Indicator, Rear Right-outside (tailLights)
20	BR	L	A71	Bremsleuchte, hinten links	Brake-Light, Rear Left (Rear Lights)
21	BR	R	C8	Bremslicht hinten rechts	Brake-Light, Rear Right (Rear Lights)
22	BR	M	A57	Bremsleuchte, hinten in der Mitte	Brake Light, Rear-center (third brake Light)
23	SL	HL	C10	Standlicht hinten links im	Parking-Light Rear Left-inside (Rear Lights)
24	SL	HR	A65	Standlicht hinten rechts im	Parking-Light Rear Riight-inside (Rear Lights)
25	KZL	H	A59	Kennzeichenbeleuchtung	Number plate Light
26	NSL	L	A72	Nebelschlussleuchte hinten links	Fog-Light Rear Left-inside (Rear Lights)
27	NSL	R	C6	??????	Stand back Lights both inside (LED tailLights)
28	RFL	L	C11	Rückfahrlicht, links	Reversing-Light, Rear Left-inside (Rear Lights)
29	RFL	R	A64	Rückfahrlicht, Rechts	Reversing-Light, Rear Right- inside (Rear Lights)
30	FR	L	C72	Fußraumbeleuchtung	Footwell Lighting

Table 5A

Channel -Lamp Identifier		
Reference	Connect	Lamp Position
8FL	LB39	Left High Beam Headlamp
9FL	RB2	Right High Beam Headlamp
6ABL	LC5	Left Low Beam Headlamp
7ABL	RB1	Right Low Beam Headlamp
10SHUTTER	LB23	Left Front Headlamp Xenon Shutter
11SHUTTER	RB22	Right Front Headlamp Xenon Shutter
4TFL	LB4	Left Daytime Running Lamp
5 TFL	RB32	Right Daytime Running Lamp
12NL	LB45	Left Front Fog Lamp/Cornering Lamp
13NL	RB5	Right Front Fog Lamp/Cornering Lamp
0 BLK	B36	Left Front Turn Signal
1BLK	VRB20	Right Front Turn Signal
2SL V	VLB10	Left Side Marker Lamp
3SL	VRB21	Right Side Marker Lamp
8BLK	HLA60	Left Rear Turn Signal
19BLK	HRC31	Right Rear Turn Signal
16BLK	KC9	Left Rear Fog Lamp
26NSL	LA72	Left Rear Fog Lamp
24SL	HRA65	Right Tail Lamp
23SL	HLC10	Left Brake /Tail Lamp
20BR	LA71	Left Brake /Tail Lamp
22BR	MA57	High Mounted Brake Light
25KZL	HA59	Left License Plate
29RFL	RA64	Right Back-up Lamp
30FR	LC72	Left/Right Front Foot well Lamp
17TFL	KC3	Unused
27NSL	RC6	Unused
21BR	RC8	Unused
28RFL	LC11	Unused
32AMBL	2C35	Unused
33AMBL	3C36	Unused
34AMBL	4C37	Unused
31AMBL	1C61	Unused
14AL	LB6	Unused
15AL	RB44	Unused

Table 5B

Leuchte-set designations: MBQ platform vehicles (thanks TBX)

Leuchte-set Name	VW Golf 7 AU	Audi A3 8V	Seat Leon 5F	VW Polo 6C
Leuchte 0 BLK VL B36	Indicator front left (headlamps)	Indicator front left (headlamps)	Indicator front left (headlights), at FR & Cupra: LED	
Leuchte1BLK VRB20	Indicator front right (headlamps)	Indicator front right (headlamps)	Indicator front right (headlights), at FR & Cupra: LED	
Leuchte2SL VLB10	Daytime Running Lights left (headlamps)	Daytime Running Lights left (headlamps)	Daytime Running Lights left (headlamps)	
Leuchte3SL VRB21	Daytime running lights right (headlamps)	Daytime running lights right (headlamps)	Daytime running lights right (headlamps)	
Leuchte4TFL LB4	Daytime running supply left	Daytime running supply left	Daytime running supply left	
Leuchte5 TFL RB32	Daytime running supply right	Daytime running supply right	Daytime running supply right	
Leuchte6ABL LC5	Dipped beam Left Front (headlamps), halogen / xenon	Dipped beam Left Front (headlamps), halogen / xenon / LED	Dipped beam Left Front (headlamps), halogen / LED	
Leuchte7ABL RB1	Dipped beam front right (lights), halogen / xenon	Dipped beam front right (lights), halogen / xenon / LED	Dipped beam front right (lights), halogen / LED	
Leuchte8FL LB39	Parking light Left Front (headlamps) [stand light spot]	Ambient lighting (1)	Main beam left (headlamps)	
Leuchte9FL RB2	Parking light, front right (headlamps) [stand light spot]	Ambient lighting (2)	High beam right (headlamps)	

DVS

Leuchte-set Name	VW Golf 7 AU	Audi A3 8V	Seat Leon 5F	VW Polo 6C
Leuchte10SHUTTER LB23	Highbeam Shutter Left Front (headlamps)	Highbeam Shutter Left Front (headlamps)	Highbeam Shutter Left Front (headlamps)	
Leuchte11SHUTTER RB22	Highbeam Shutter Right Front (headlamps)	Highbeam Shutter Right Front (headlamps)	Highbeam Shutter Right Front (headlamps)	
Leuchte12NL LB45	Fog lights, front left (optional)	Fog lights, front left (optional)	Fog lamp / turning lights, front left (optional)	
Leuchte13NL RB5	Fog light, front right (optional)	Fog light, front right (optional)	Fog lamp / turning lights, front right (optional)	
Leuchten14AL LB6	not used	not used	not used	
Leuchte15AL RB44	not used	not used	not used	
Leuchte16BLK SLB35BLK SL KC9	Indicator rear left (inside) (LED rear lights)	Indicator rear left (inside) (taillights)	Red ambient lighting in the interior (doors)	
Leuchte17TFL R BLK SRB3TFL R BLK SR KC3	Indicator rear right (inside) (LED rear lights)	Indicator rear right (inside) (taillights)	White ambient lighting in the interior (doors)	
Leuchte18BLK HLA60	Indicator rear left (outside) (taillights)	Indicator rear left (outside) (taillights)	Indicator rear left (rear lights)	
Leuchte19BLK HRC31	Indicator rear right (outside) (taillights)	Indicator rear right (inside + outside) (taillights)	Indicator rear right (tail lights)	
Leuchte20BR LA71	Parking light / brake light, rear left (rear lights)	Brake light, rear left (outside) (taillights)	Brake light, rear left (rear lights)	
Leuchte21BR RC8	Parking light / brake light, rear right (tail lights)	Brake light, rear right (outside) (taillights)	Brake light, rear right (tail lights)	Brake light, rear right (tail lights)
Leuchte22BR MA57	Brake light, rear center (third stop light)	Brake light, rear center (third stop light)	Brake light, rear center (third stop light)	
Leuchte23SL HLC10	Parking light, rear left inside (taillights)	Parking light, rear left (inside + outside) (taillights)	Parking light, rear left outside (rear lights) [LED strip]	
Leuchte24SL HRA65	Parking light, rear right inside (taillights)	Parking light, rear right (inside + outside) (taillights)	Parking light, rear right outside (rear lights) [LED strip]	

DVSI

Leuchte-set Name	VW Golf 7 AU	Audi A3 8V	Seat Leon 5F	VW Polo 6C
Leuchte25KZL HA59	License plate light	License plate light	License plate light	
Leuchte26NSL LA72	Rear fog light Rear left inside (taillights)	Rear fog lights, rear left (rear lights)	Parking light, rear left inside (rear lights) [LED strip]	
Leuchte27NSL RC6	Stand lights behind both inside (LED taillights)	Rear fog light, rear right (tail lights)	Parking light, rear right inside "LED Strip" (tail lights) [LED strip]	
Leuchte28RFL LC11	Reversing light, rear left inside (taillights)	Reversing light, rear left (rear lights)	Rear fog lights (rear lights)	
Leuchte29RFL RA64	Reversing light, rear right inside (taillights)	Reversing light, rear right (tail lights)	Reversing light (tail light)	
Leuchte30FR LC72	Footwell lighting	Footwell lighting	Footwell lighting	
Leuchte31AMBL 1C61	not used, ambient lighting	not used, ambient lighting	not used, ambient lighting	
Leuchte32AMBL 2C35	not used, ambient lighting	not used, ambient lighting	not used, ambient lighting	
Leuchte33AMBL 3C36	not used, ambient lighting	not used, ambient lighting	not used, ambient lighting	
Leuchte34AMBL 4C37	not used, ambient lighting	not used, ambient lighting	not used, ambient lighting	
Leuchte 0 BLK VL B35				Indicator front left (headlamps)
Leuchte1BLK VRB23				Indicator front right (headlamps)
Leuchte2SL VLB22				Parking light Left Front (headlamps)
Leuchte3SL VRB26				Parking light, front right (headlamps)
Leuchte4TFL LB43				Daytime running lights, front left (headlamps)
Leuchte5 TFL RB6				Daytime running lights, front right (headlamps)
Leuchte6ABL LB44				Low beam Left Front (headlamps)

DVF

Leuchte-set Name	VW Golf 7 AU	Audi A3 8V	Seat Leon 5F	VW Polo 6C
Leuchte7ABL RB5				Dipped beam front right (headlamps)
Leuchte8FL LB42				Main beam left (headlamps)
Leuchte9FL RB7				High beam right (headlamps)
Leuchte10SHUTTER LRB45				not used
Leuchte11WARNBLK TASTERC54				Hazard warning button
Leuchte12NL LB40				Fog lamp / turning lights, front left (optional)
Leuchte13NL RB3				Fog lamp / turning lights, front right (optional)
Leuchten14LOCKUNLOCKC61				Button door lock inside (unconfirmed)
Leuchte15 SAFE LED C55				Red central locking LED (unconfirmed)
Leuchte16BLK SLC11				LED Mirror left turn signal, LED
Leuchte17 BLK SR A72				LED Right turn signal mirrors, LED
Leuchte18BLK HLA71				Indicator rear left (rear lights)
Leuchte19BLK HRC10				Indicator rear right (tail lights)
Leuchte20BR LA70				Brake light, rear left (rear lights)

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Leuchte-set Name	VW Golf 7 AU	Audi A3 8V	Seat Leon 5F	VW Polo 6C
Leuchte22BR MC9				Brake light, rear center (third stop light)
Leuchte23SL HLC7				Parking light, rear left (rear lights)
Leuchte24SL HRA69				Parking light, rear left (rear lights)
Leuchte25KZL HA6				License plate light
Leuchte26NSL A65				Rear fog lights (rear lights)
Leuchte27 KL58XS C67				Interior Lighting Dimmer (unconfirmed)
Leuchte28RFL C3				Reversing light (tail light)
Leuchte29 KL30G A69				Terminal 30G? (Unconfirmed)
Leuchte30 INNENLICHT A68				Indoor lighting (unconfirmed)
Leuchte31AMBL 1C65				not used, ambient lighting
Leuchte32AMBL 2C64				not used, ambient lighting
Leuchte33AMBL 3C72				not used, ambient lighting
Leuchte34AMBL 4C71				not used, ambient lighting

Table 5C

DV52

Leuchte Programming:"Alpha" channels - permissible settings

ID	Setting (German	Setting (English)	Note (TBAx)
1	nicht aktiv	not active	Lamp off or, no function
2	aktiv 100%	active 100%	Light is always on (override)
3	Blinken links Hellphase	Flashing left light phase	- -
4	Blinken links Dunkelphase	Flashing left dark phase	- -
5	Blinken rechts Hellphase	Flashing right light phase	- -
6	Blinken rechts Dunkelphase	Flashing right dark phase	- -
7	Blinken links aktiv (beide Phasen)	Flashing left active (both phases)	- -
8	Blinken rechts aktiv (beide Phasen)	Flashing right active (both phases)	- -
9	Standlicht allgemein (Schlusslicht; Positionslicht; Begrenzungslicht)	Parking light general (bottom; position light, parking light)	- -
10	Parklicht links (beidseitiges Parklicht aktiviert li & re)	Left parking light (two-sided parking light activated left & right)	- -
11	Parklicht rechts	Right parking light	- -
12	Abblendlicht links	Left dipped beam	- -
13	Abblendlicht rechts	Right dipped beam	- -
14	Fernlicht links	Main beam left	- -
15	Fernlicht rechts	High beam right	- -
16	Lichthupe generell	Flash generally	Flashes no matter what light
17	Lichthupe bei bereits aktivem Abblendlicht oder bereits aktivem Dauerfahrlicht	Flasher with already active dimmed headlights or already active long-term driving light	Headlight flasher only with active low beam
18	Lichthupe bei nicht aktivem Abblendlicht oder bereits aktivem Dauerfahrlicht	Flasher with not active dimmed headlights or already active long-term driving light	If no low beam headlight flasher is on
19	Nebellicht links	Fog light left	- -
20	Nebellicht rechts	Fog light right	- -
21	Tagfahrlicht	Daytime running lights	- -
22	Dauerfahrlicht	Daytime running lights (Long-term driving light)	Function only if daytime running light is coded
23	Abbiegelichts rlinks	Cornering light left	- -
24	Abbiegelichts rechts	Cornering light right	- -
25	Bremslicht	Brake light	- -
26	Rückfahrlicht	Reverse light	Light activated when reverse gear is engaged
27	Nebelschlusslicht wenn kein Anhaenger gesteckt	Rear fog light when no trailer plugged	- -
28	Nebelschlusslicht wenn kein Anhaenger gesteckt und Rechtsverkehr	Rear fog light when no trailer attached and right-hand traffic	- -
29	Nebelschlusslicht wenn kein Anhaenger gesteckt und Linksverkehr	Rear fog light when no trailer attached and left-hand traffic	- -
30	Fernlicht über Assistent aktiviert	High beam assistant activated	Additional light when the DLA has the high beam activated
31	Coming Home oder Leaving Home aktiv	Coming Home Leaving Home or active	Activates the light for CH / LH
32	Standlicht vorn (Positionslicht; Begrenzungslicht)	Standlicht vorn (Positionslicht; Begrenzungslicht) Auxiliary light (position light, parking light)	Light active only when explicitly the parking light is activated by control dial
33	Nebelschlusslicht auch wenn ein Anhaenger gesteckt	Rear fog light even when trailer fitted	- -
34	Heckdeckel offen	Trunk lid open	- -
35	Heckdeckel geschlossen	Trunk lid closed	- -
36	CCP-Lichtfunktion: Nach Kl.30-Reset auf 0 initialisiert und ueber CCP aenderbar	CCP Light Function: After reset terminal 30 is initialized to 0 and can be changed via the CCP	**??? ???**
37	Quittierungsfunktion 1	Acknowledge 1	**??? ???**
38	Klemme 30G	Terminal 30G	Plus battery, switched
39	Dimmung Klemme 58xs	Dimming terminal 58xs	Dimming via pushbutton lighting???
40	Dimmung Klemme 58xt	Dimming terminal 58xt	Dimming via pushbutton lighting???

DV52

ID	Setting (German	Setting (English)	Note (TBAx)
41	Klemme 15 mit Nachlauf bis Fahrzeugstillstand	Terminal 15 with follow-up vehicle standstill	Illuminates when the ignition is on, or the vehicle rolls (without ignition)
42	Innenlicht	Interior light	lights when the interior light is on is
43	Kofferraumlicht	Trunk light	lights when the boot lid is opened and the interior lighting is active
44	Fussraumlicht	Footwell light	- -
45	Ambientelicht 5	Ambient lighting 5	Ambient lighting
46	Ambientelicht 1	Ambient lighting 1	Ambient lighting
47	Ambientelicht 2	Ambient lighting 2	Ambient lighting
48	Ambientelicht 3	Ambient lighting 3	Ambient lighting
49	Ambientelicht 4	Ambient light 4	Ambient lighting
50	Umfeldbeleuchtung	Ambient lighting	- -
51	Tuerausstiegslicht hinten links	Door entry light rear left	- -
52	Tuerausstiegslicht hinten rechts	Door entry light rear right	- -
53	Fahrzeug mit Automatik Start-Stopp ist im Stopp-Modu(s)	Vehicle with automatic start-stop is in stop Modu (s)	lights when the St / St-automatic partially disabled the engine
54	Klemme 75 Variante a_vfzg	Terminal a_vfzg 75 variant	**??? ???**
55	Tuerausstiegslicht vorne links	Door entry light front left	- -
56	Tuerausstiegslicht vorne rechts	Door entry light front right	- -
57	Tuerausstiegslicht links	Door entry light left	- -
58	Tuerausstiegslicht rechts	Door entry light right	- -
59	beidseitiges Dauerparklicht	sided permanent parking light	works if both sides permanent parking light is only coded
60	Klemme 75 Variante vfzg	Terminal 75 variant vfzg	**??? ???**
61	Blinken links aktiv (beide Phasen);Auf- und Abdimmend mit p_t_blinken_rampe	Flashing left active (both phases);Dimming up and down with p_t_ flash ramp	Flashing left with gradual dimming to the target value
62	Blinken rechts aktiv (beide Phasen); Auf- und Abdimmend mit p_t_blinken_rampe	Flashing right active (both phases);Dimming up and down with p_t_ flash ramp	Flashing right with gradual dimming to the target value
63	Schlusslicht aktiv ohne Bremslicht aktiv;ist deaktiviert;wenn Bremslicht aktiv ist !!!	Taillight active without brake light active; is disabled; if the brake light is active !!!	Tail light is slowed if not
64	Aktive Blinkfunktion hat ein auf 1 gesetztes zugeordnetes Bit in pa_dynamisch_blinken	Active flashing function has a set to 1 bit associated in pa_ dynamic_flash	see adaption channels "Dynamic flash modes"
65	Motorraumlicht	Engine compartment light	lights when the bonnet is open
66	Fahrzeug ist nicht fahrbereit (Motor läuft nicht; Elektroantrieb nicht aktiv o.ä.)	Vehicle is not roadworthy (electric drive not active or similar, engine is not running)	lights when ignition on, but the engine is
67	Handbremse ist angezogen	Hand brake is applied	(Also applies to the EPB)
68	Klemme 15 ohne Nachlauf	Terminal 15 without running	
69	Debug-Lichtfunktion (in Anlehnung an CCP)	Debug light function (based on CCP)	
70	Debug-Lichtfunktion Fehlerspeicher	Debug light function error memory	
71	Versorgungsbedarf der LCM Module	Supply requirements of the LCM modules	
72	Terminal 58xd dimmer	Terminal 58xd dimmer	
73	Zuschaltung Trennrelais für 2. Batterie	Switching cut-off relay for 2nd battery	

Table 6

DV52

Leuchte Programming: "Lasttyp" channels - permissible settings

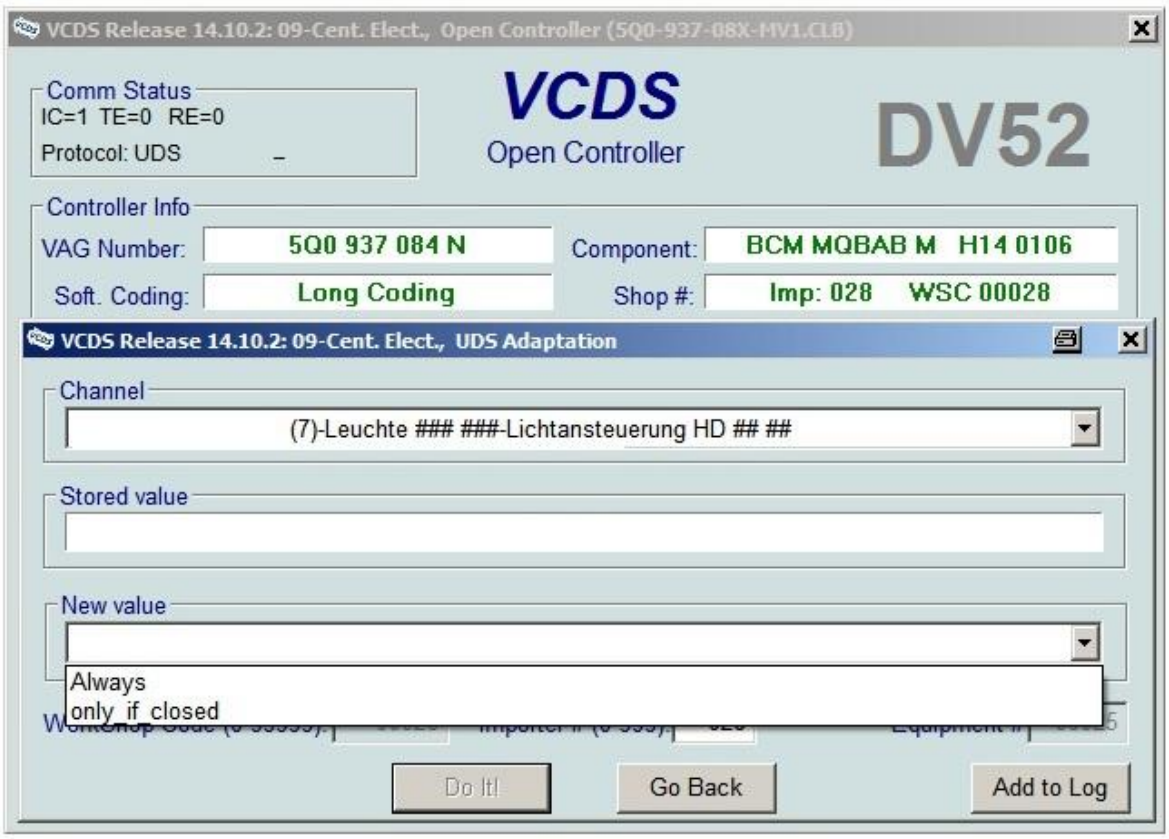
Setting		Setting (English)	
1	LED Tagfahrlichtmodul Versorgung	1	LED daytime running light module supply
2	Shutter; Diagnosesensierung für "LED low"	2	Shutter; diagnosis sensing for "LED low"
3	Xenon Abblendlicht	3	Xenon low beam
4	LED Tagfahrlichtmodul Signal	4	LED Daytime running light module signal
5	LED Abblendlicht	5	LED low beam
6	LED Lichtmodul	6	LED light module
7	Reserved_07	7	Reserved_07
8	allgemeine Glühlampe 12W	8	general incandescent lamp 12W
9	allgemeine Glühlampe 27W; auch H15	9	general incandescent 27W; and H15
10	allgemeine Scheinwerfer	10	general headlights
11	Abblendlicht	11	Low beam
12	Blinkleuchten	12	indicator lights
13	Bremsleuchten	13	brake Lights
14	kombinierte Blink- Bremsleuchten	14	combined flashing brake lights
15	allgemeine Gluehlampe 6W; auch H6W	15	general Bulb 6W; also H6W
16	2* 3W	16	2* 3W
17	4* 3W	17	4* 3W
18	2* 5W	18	2* 5W
19	3* 5W	19	3* 5W
20	4* 5W	20	4* 5W
21	2* 13W Blinker	21	2 * 13W indicator
22	2* 16W Blinker	22	2* 16W indicator
23	allgemeine Scheinwerfer	23	general headlights
24	2* 5W KZL + LED Sidemarker	24	2* 5W KZL + LED Side markers
25	allgemeine Glühlampe innen- oder Außenlicht	25	general incandescent indoor or outdoor light
32	allgemeine LED bis 12W	32	general LED to 12W
33	LED -Modul Blinkleuchten	33	LED module indicator lights
34	LED Bremsleuchten	34	LED brake lights
35	kombinierte LED Blink-Bremsleuchten	35	combined LED flashing brake lights
36	LED Kleinleistung	36	LED low power
37	allgemeine LED bis 12W	37	general LED to 12W
38	LED Blinkleuchten	38	LED indicator lights
39	LED Bremsleuchten	39	LED brake lights
40	allgemeine LED	40	general LED
41	LED Kleinleistung	41	LED low power
42	LED dritte Bremsleuchte	42	LED third brake light
43	allgemeine LED	43	general LED
44	LED Fußraum- oder -Innenleuchte	44	LED footwell- or -Interior light
45	allgemeine LED bis 6W	45	general LED to 6W
46	LED Kleinleistung	46	LED low power

Table 7

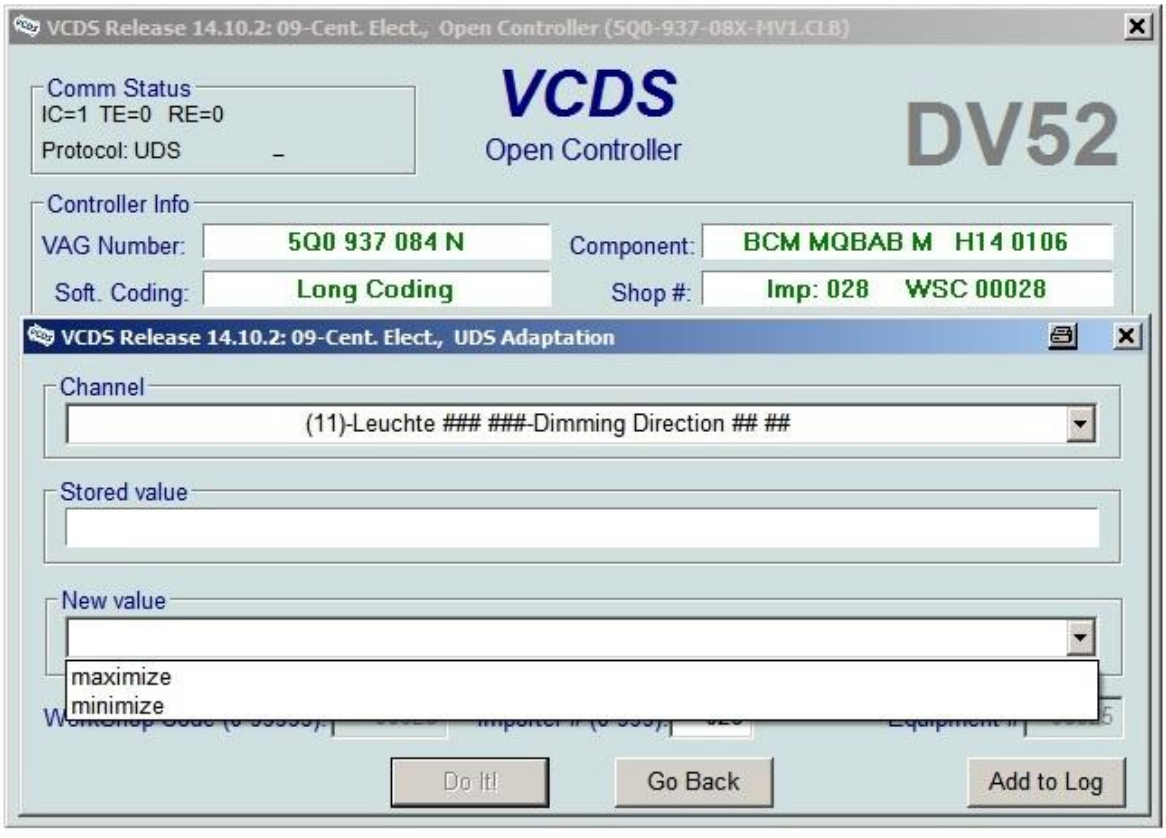
DVS2

Leuchte Programming: Permissible settings-VCDS screen shots

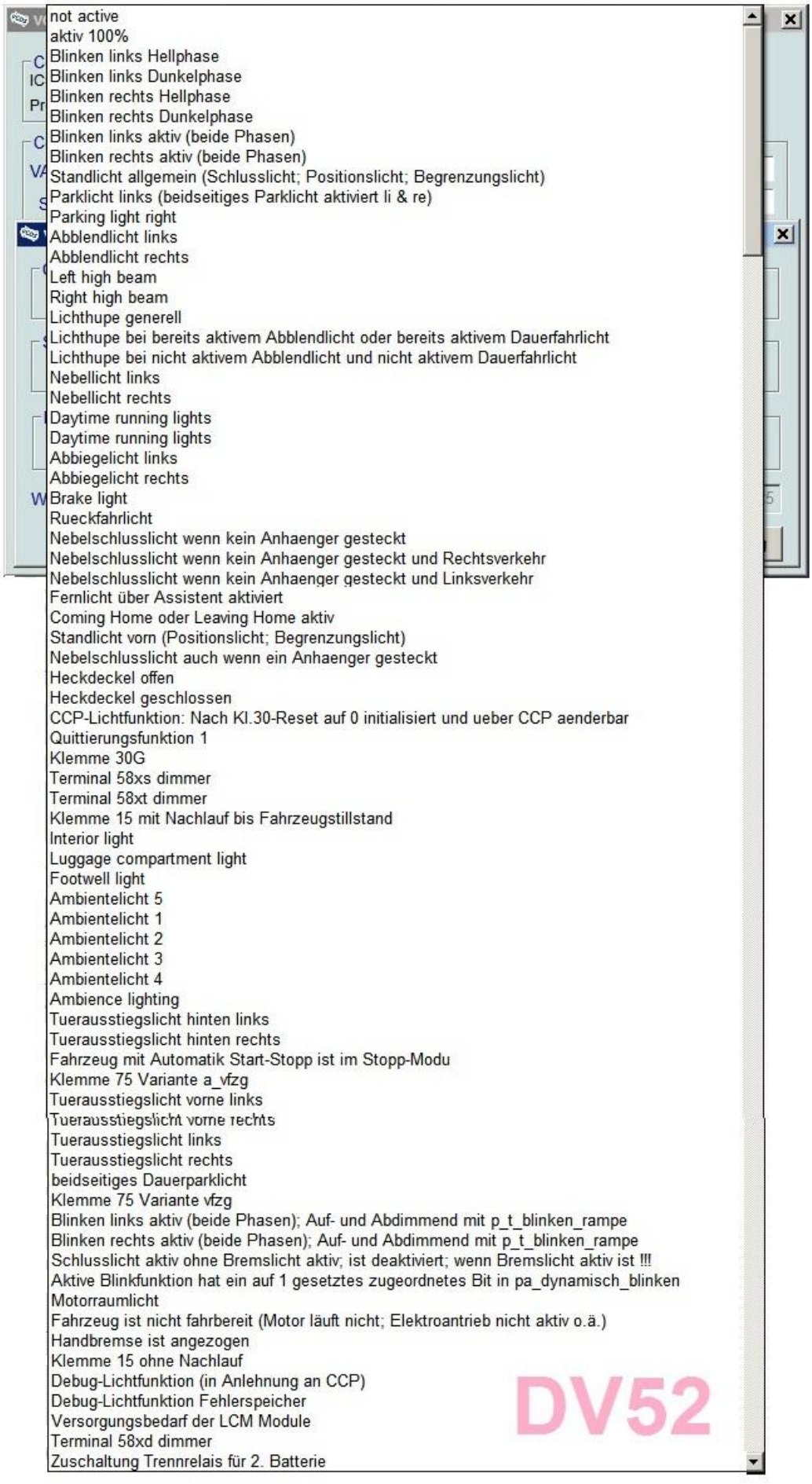
Leuchte Programming - Heckdeckel (HD) channel settings



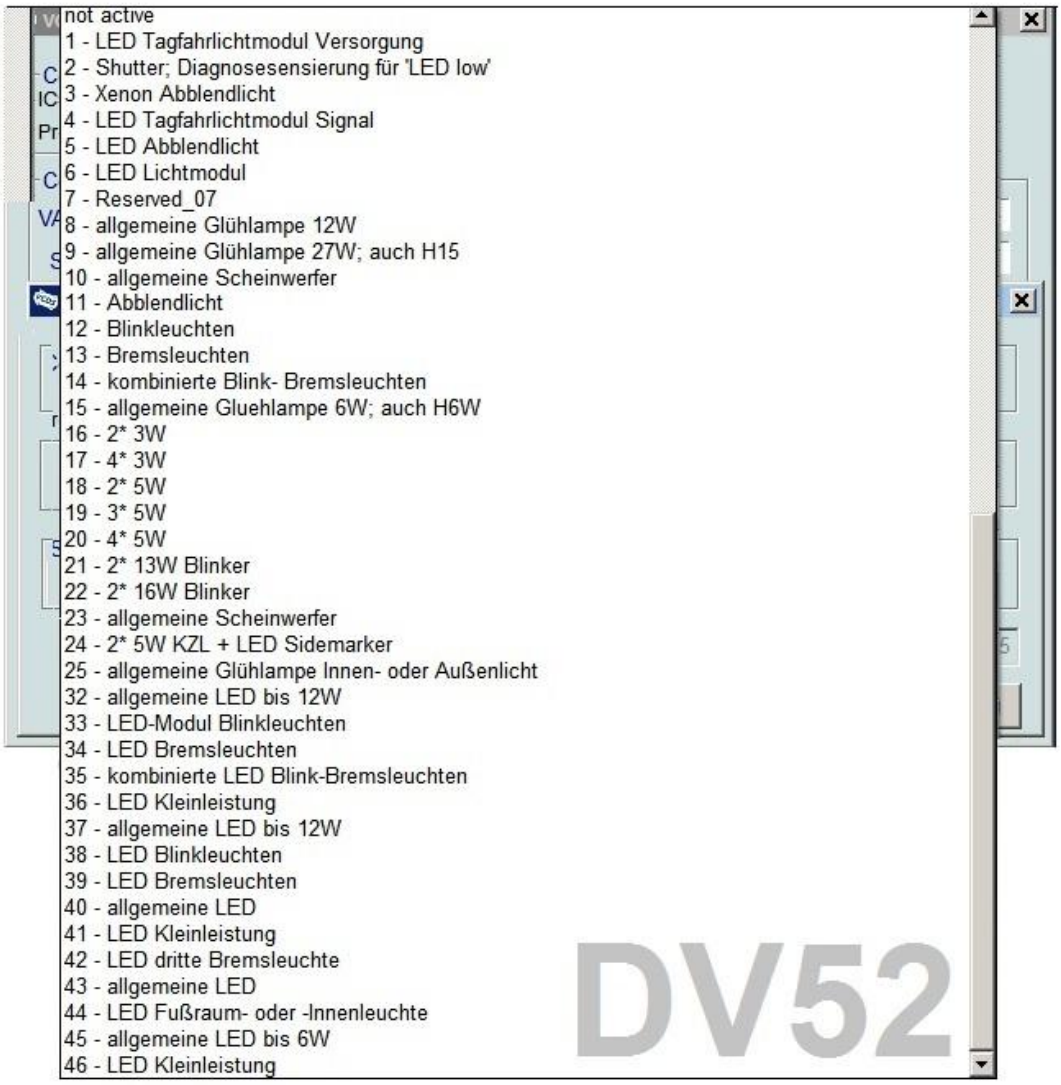
Leuchte Programming - Dimming Direction channel settings



Leuchte Programming - Alpa channel settings

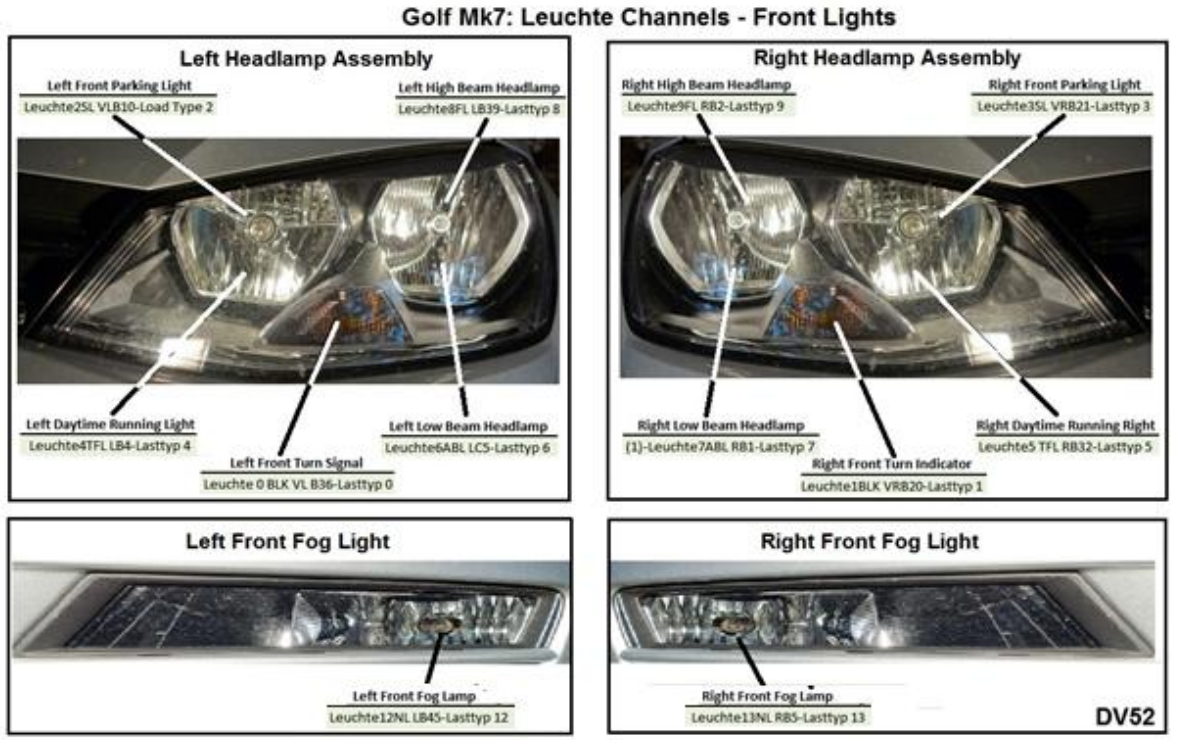


Leuchte Programming - Lasttyp channel settings



DV52

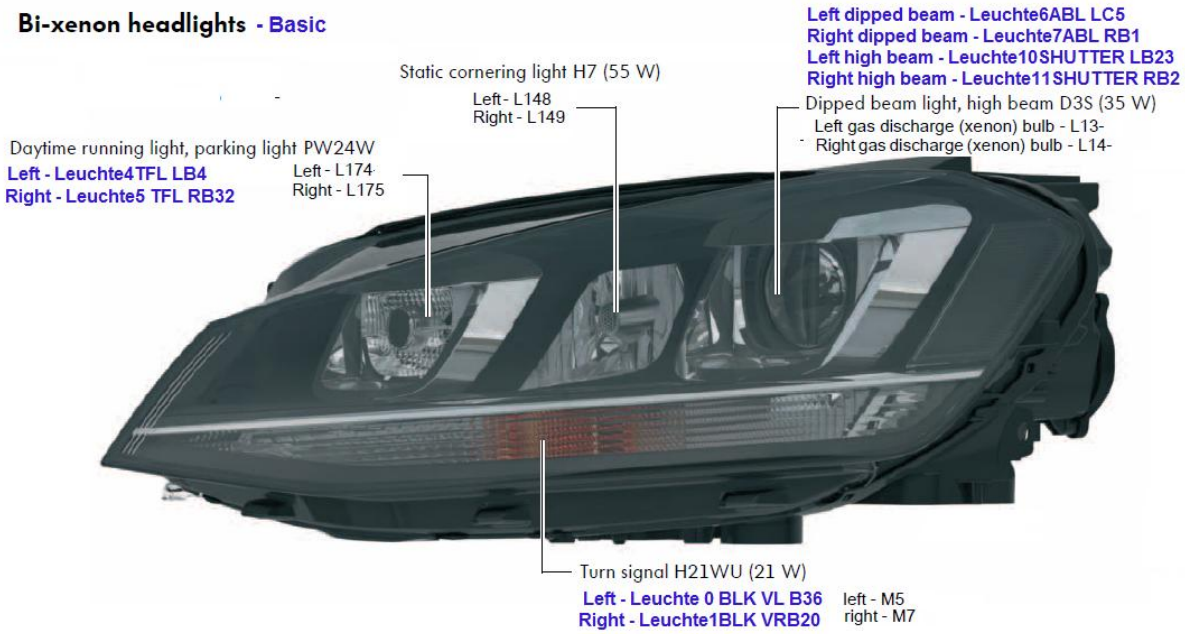
Leuchte Programming: Lamp positions (incandescent) -Pictorial



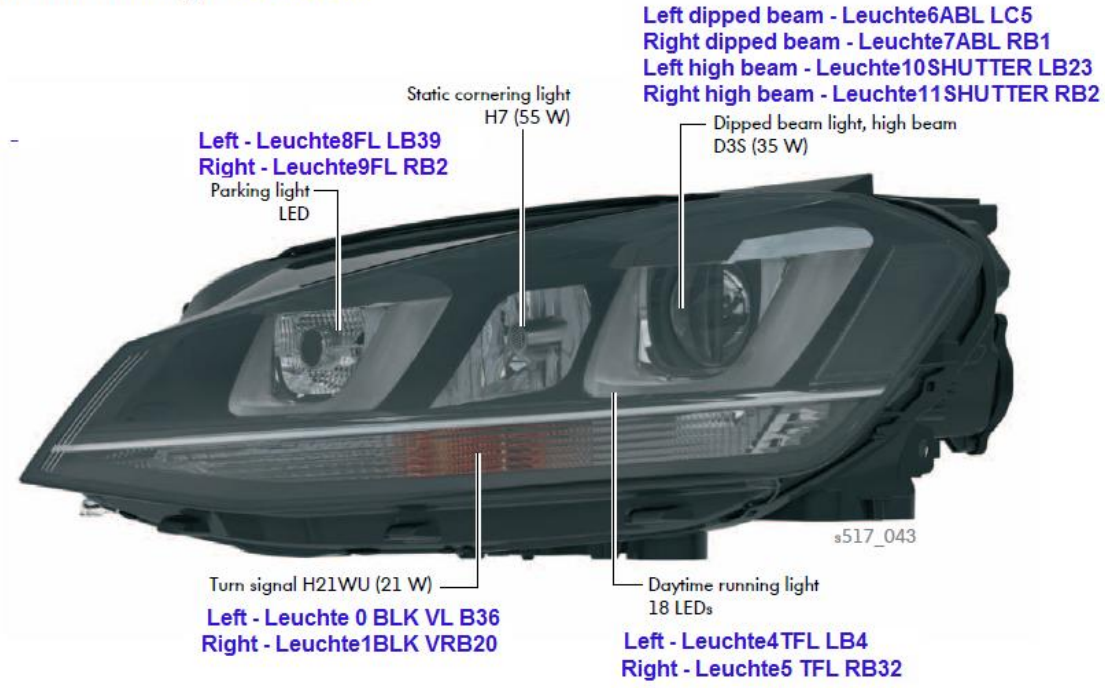
[1] Diagram altered 4/04/2015 - error showing Right rear-outside light as *Leuchte20BR LA71-Lasttyp 20* corrected (should have been Leuchte21BR RC8-Lasttyp 21) - thanks MRG_AU

Leuchte Programming: Lamp positions (Xenon/LED) -Pictorial

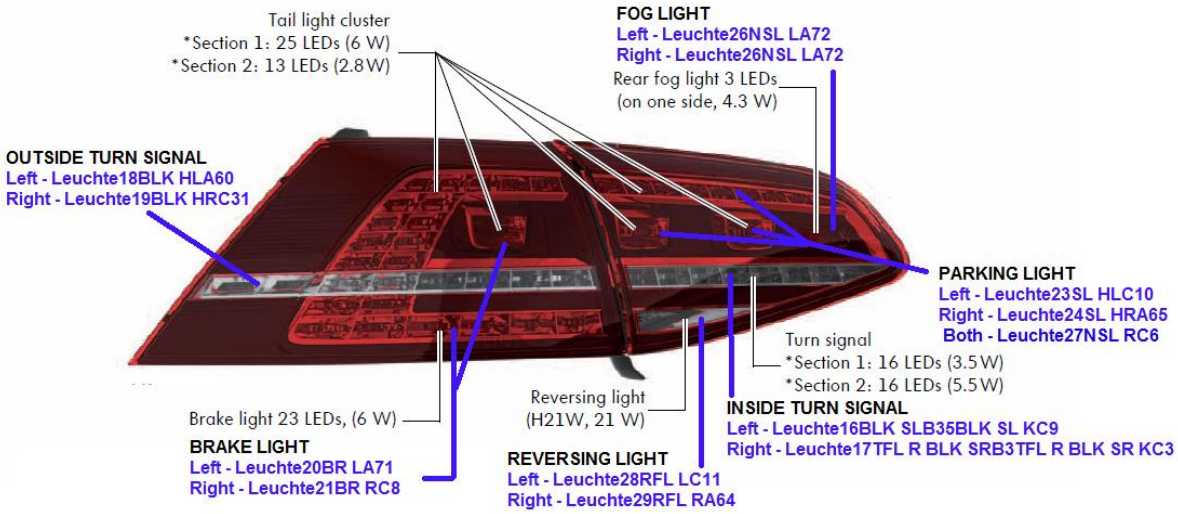
Bi-xenon headlights - Basic



Bi-xenon headlights Premium



LED Tail lights



*Section 1 = outer tail light cluster; **Section 2 = tail light cluster in the tailgate

DV5