BMW Exx NBT Retrofit Adapter

Brief Overview and Schematic Diagrams

Revision 3 01/2016

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Disclaimer

BMW Exx NBT Retrofit Adapter designed for matching NBT Head Unit (hereinafter HU) and BMW Exx cars when retrofitting. It eliminates all electrical incompatibilities. However, there still a plenty of mechanical incompatibilities due to differences of NBT and factory installed HU. Fixing those issues can be done in many ways in order to satisfy user's requirements.

Functionality

NBT navigation activation function, allows activate the navigation device when retrofitting car with NBT.

Activation of the built-in SVS voice control.

Activation of the Internet access or BMW Online in motion.

DSC and SZL modules protocol matching for correct functioning of the navigation system.

Matching PDC or RPDC parking sensors modules with NBT HU with retaining full functionality.

Matching RFK or TRSVC camera with NBT HU with retaining full functionality.

Rear view camera emulation for all BMW E series cars allows you to install any rearview camera from third-party manufacturer.

Dynamic parking lines support when retrofitting with rearview camera from third-party manufacturer.

Exx and Fxx head unit front panel Support with maintaining full functionality.

ZBE3 I-Drive controller support with Touch function.

Map based road Speed Limit Information (can be displayed on E70/ E71 Instrument Cluster and Head-Up Display or NBT CID display (for E6x,E9x only on NBT CID display))

Climate controls and statuses indication.

Video in motion function (VIM), allowing passengers to watch video while driving.

Table 1 Selection guide

	BMW Exx NBT Retrofit Adapter	Extended BMW Exx NBT Retrofit Adapter	BMW Exx MOST NBT Retrofit Adapter	BMW Exx IBUS NBT Retrofit Adapter	Extended BMW Exx IBUS NBT Retrofit Adapter	Range Rover MOST NBT Retrofit Adapter	Standalone BMW NBT Retrofit Adapter
BMW E6x,	+	+	+				
BMW E7x	+	+	+				
BMW E9x	+	+					
BMW E38, E39, E46, E53, Range Rover L30				+	+		
Range Rover L332 (Harman Kardon)						+	

Table 2 Supported functions

	Full NBT functionality	NBT HW21/ HW31 support	Head-up display support	Speed limit info support	Dynamic guidelines support	CIC/MASK front panel support	Fxx front panel support	Rear View Camera Support	Front View Camera Support
BMW Exx NBT Retrofit Adapter	+	+		+		+		+	+
Extended BMW Exx NBT Retrofit Adapter	+	+		+	+	+	+	+	+
BMW Exx MOST NBT Retrofit Adapter	+	+	+	+		+		+	
BMW Exx IBUS NBT Retrofit Adapter	+	+		+				+	+
Extended BMW Exx IBUS NBT Retrofit Adapter	+	+		+	+	+	+	+	+
Range Rover MOST NBT Retrofit Adapter	+	+		+				+	
Standalone BMW NBT Retrofit Adapter	+			+				+	+

Common part

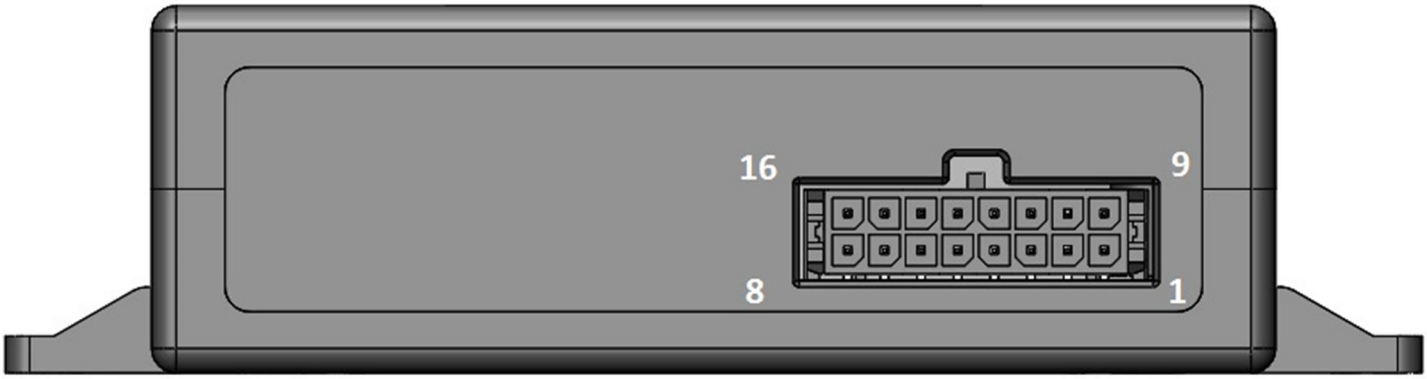


Fig 1a Microfit connector (XP5) pin numbering

BMW Exx NBT Retrofit Adapter

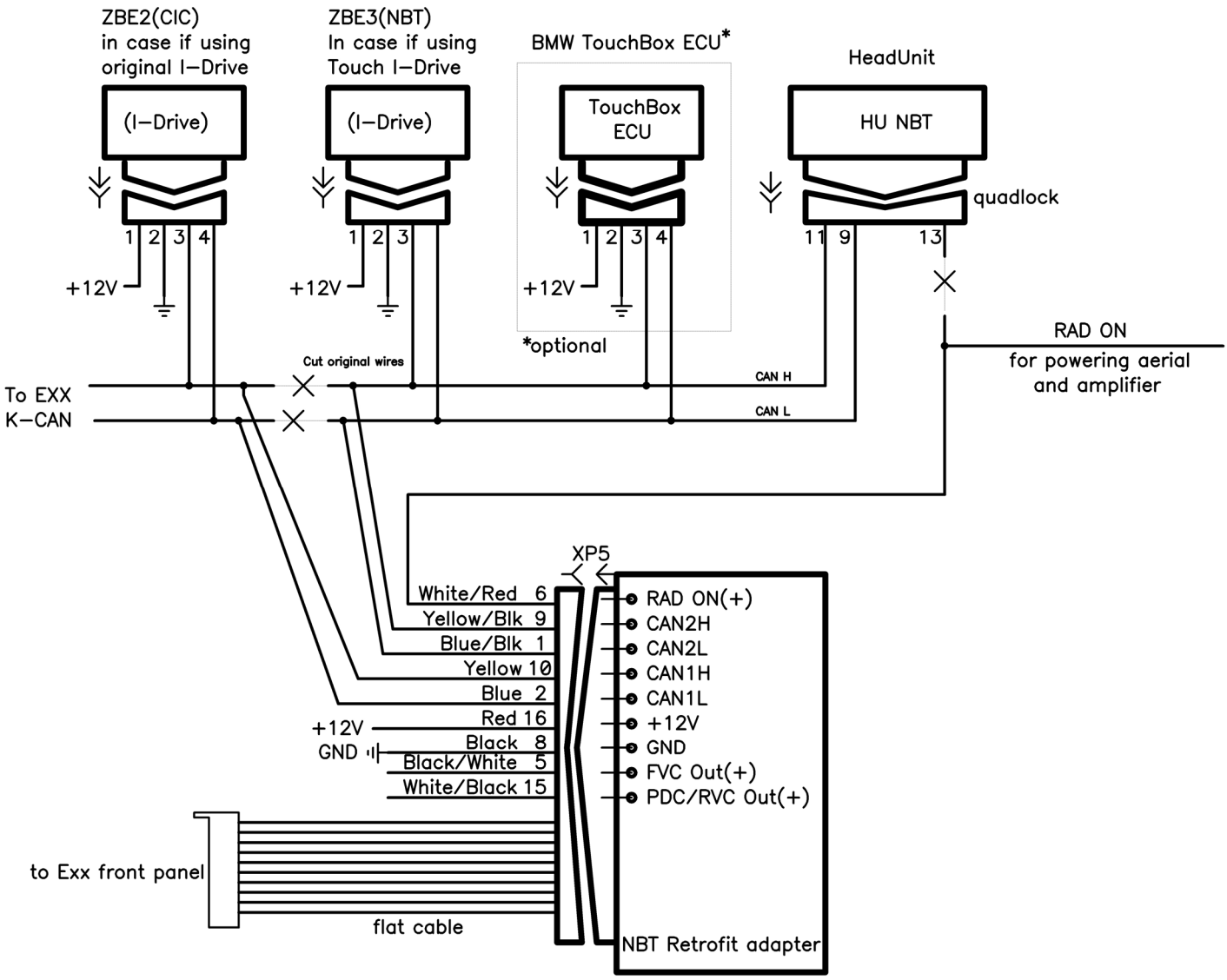


Fig 2a BMW Exx NBT Retrofit basic connection schematic

Extended BMW Exx NBT Retrofit Adapter

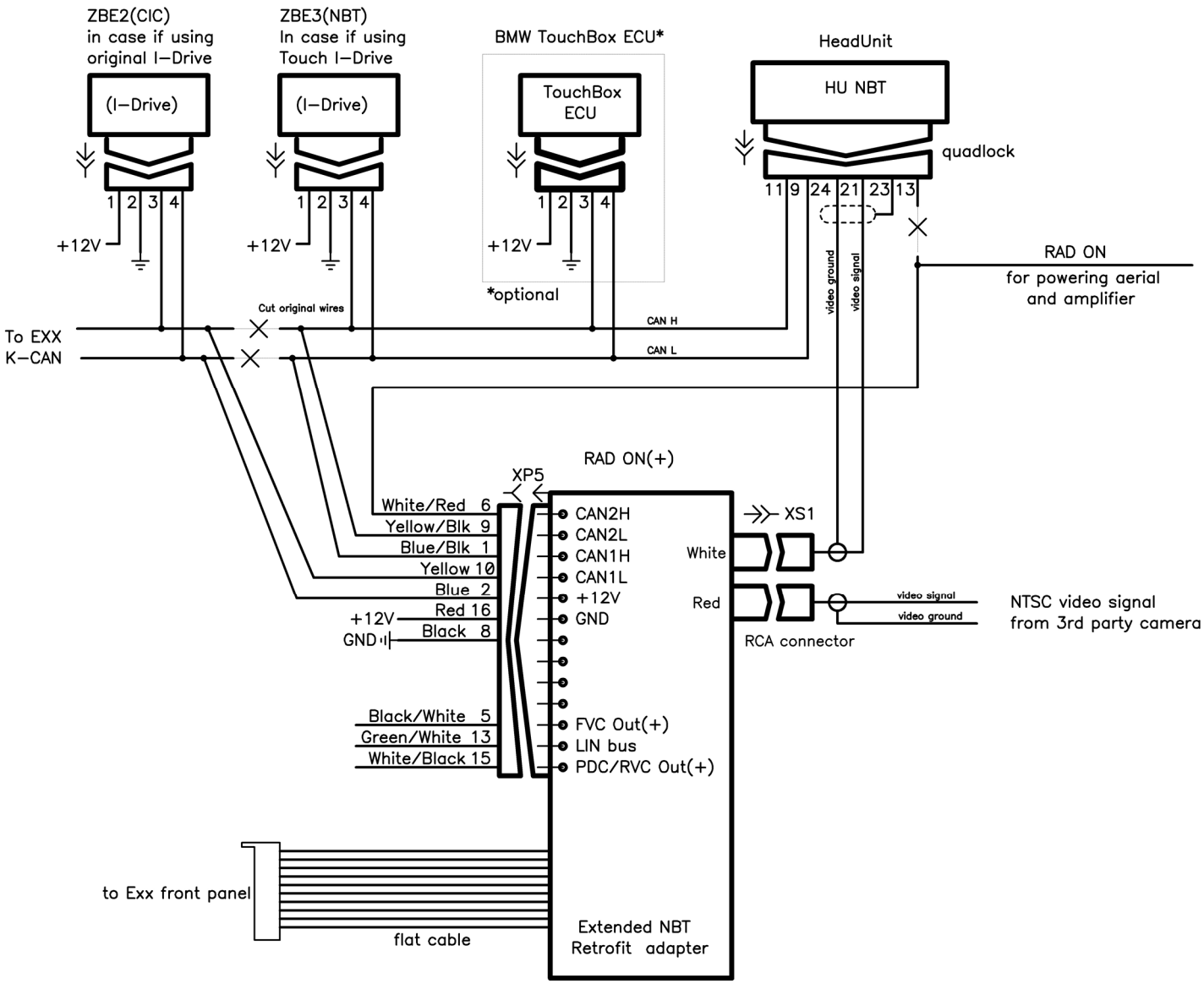


Fig 2b Extended BMW Exx NBT Retrofit basic connection schematic

BMW Exx MOST NBT Retrofit Adapter

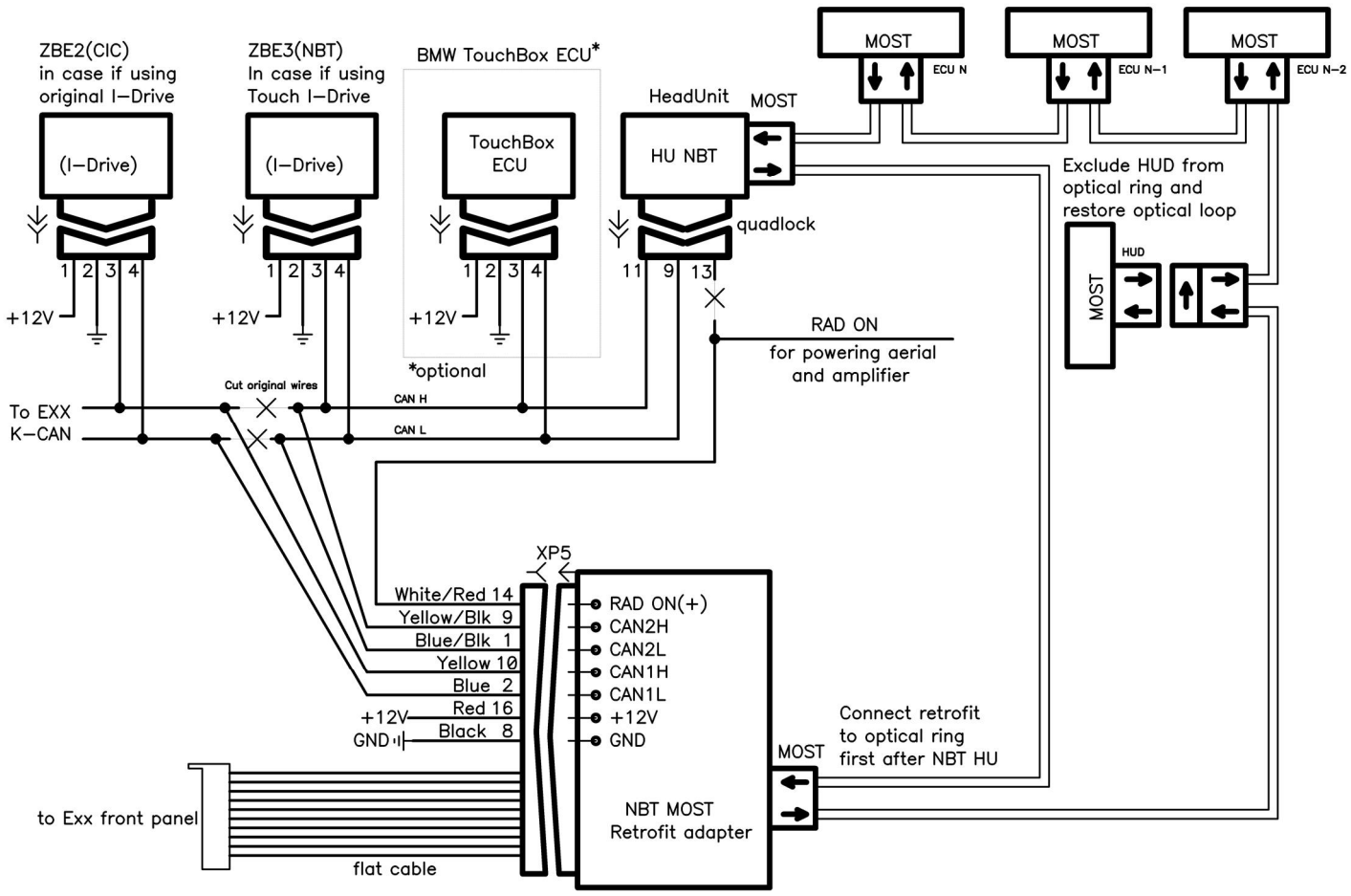


Fig 2c BMW Exx MOST NBT Retrofit basic connection schematic

Exclude HUD from optical ring and restore optical loop. Connect NBT MOST Retrofit Adapter to optical ring first after NBT HU.

BMW Exx IBUS NBT Retrofit Adapter

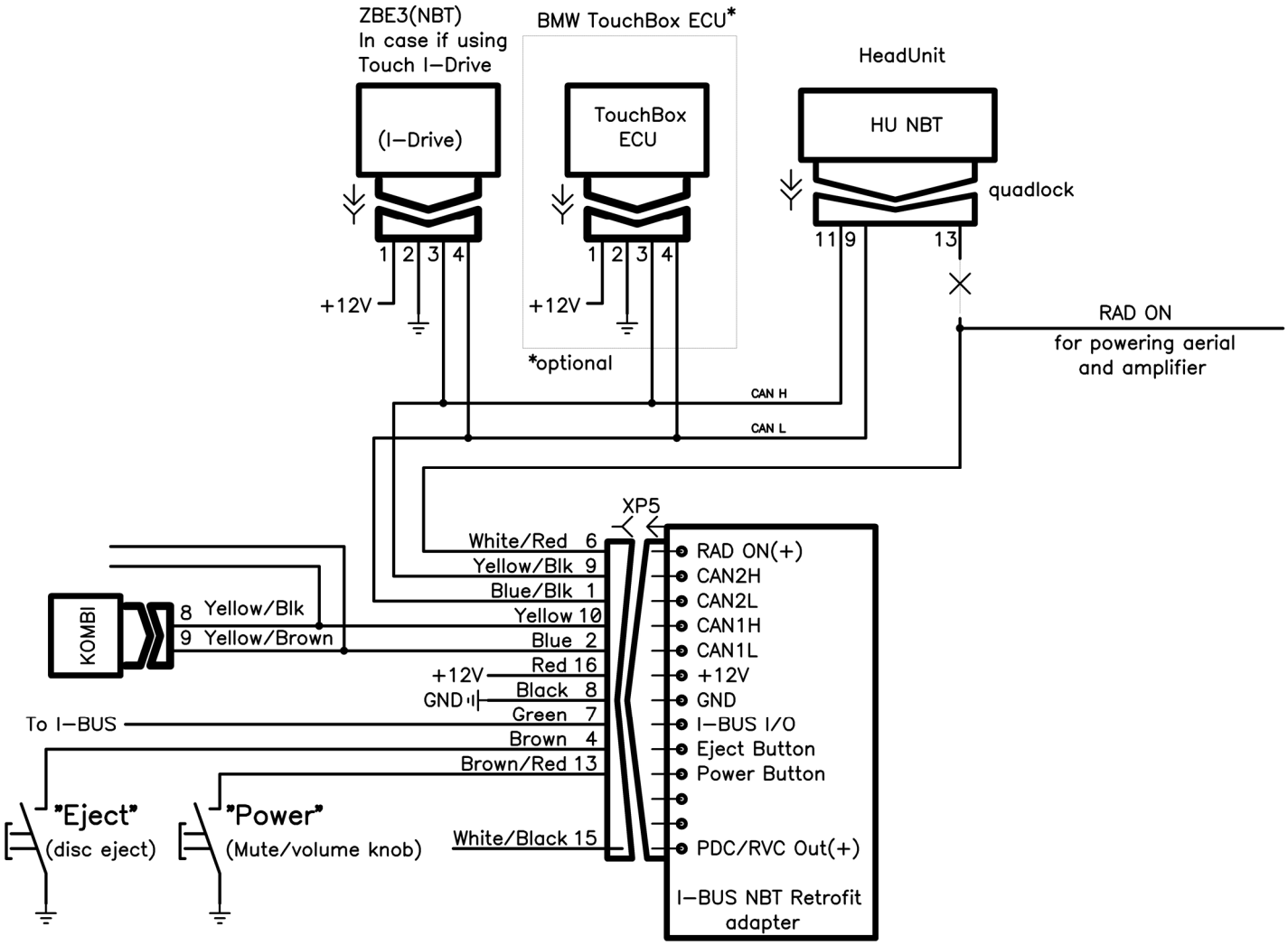


Fig 2d BMW Exx IBUS NBT Retrofit basic connection schematic

Extended BMW Exx IBUS NBT Retrofit Adapter

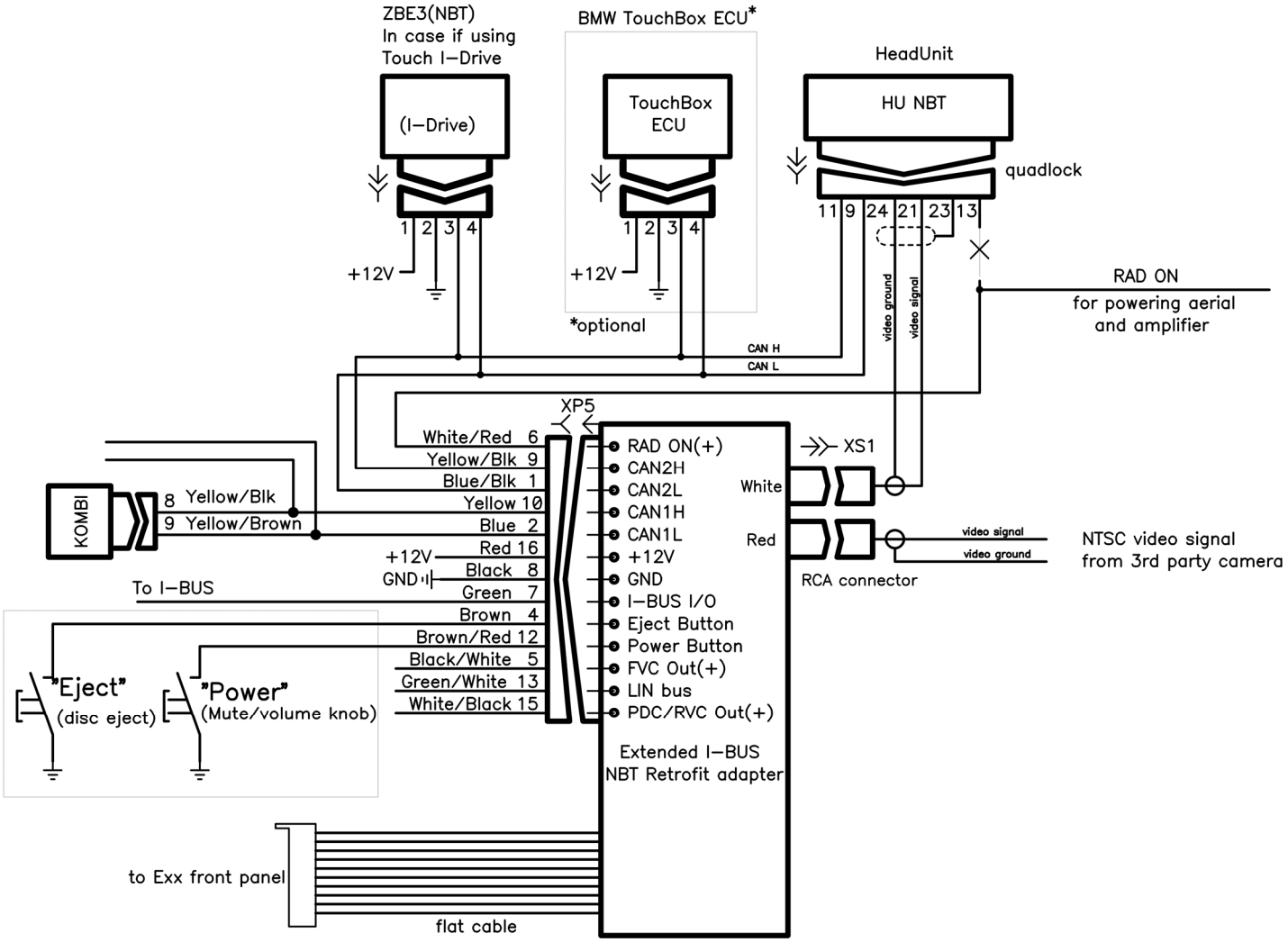


Fig 2e Extended BMW Exx IBUS NBT Retrofit basic connection schematic

Standalone BMW NBT Retrofit Adapter

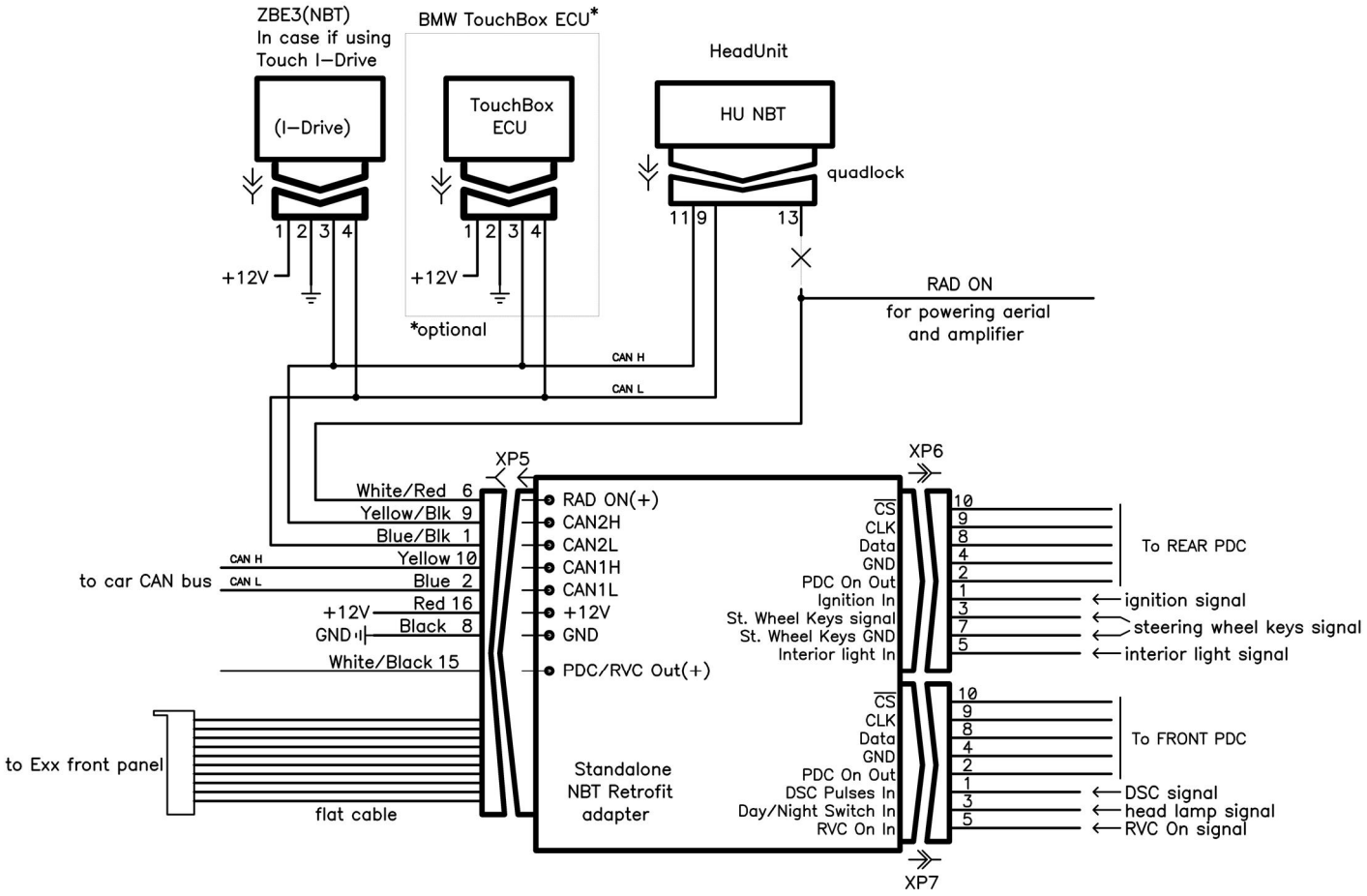


Fig 2f Standalone BMW NBT Retrofit basic connection schematic

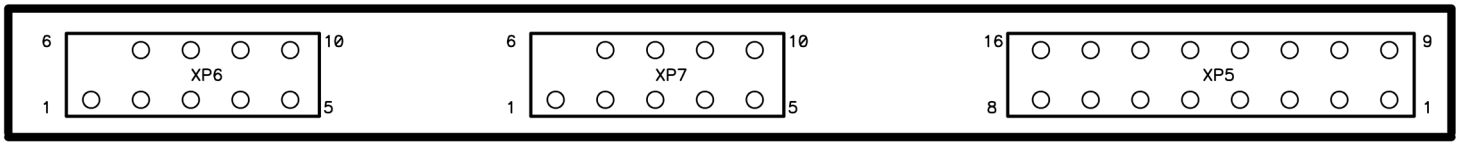


Fig 2g Standalone BMW NBT Retrofit connectors view

Front Panel

BMW Exx NBT Retrofit support several types of front panels (see table 2):

- Exx CIC front panel
- Exx CHAMP front panel
- Fxx front panel
- external discrete keys

Exx panels connected to 10 pin MicroMatch connector in NBT Retrofit harness (see Fig 2a).

Fxx panels connected to power and LIN bus (from NBT Retrofit adapter) (see Fig 2c).

Modules without front panel support have external discrete keys input. Some modules have support both front panel and discrete keys support (see table 2).

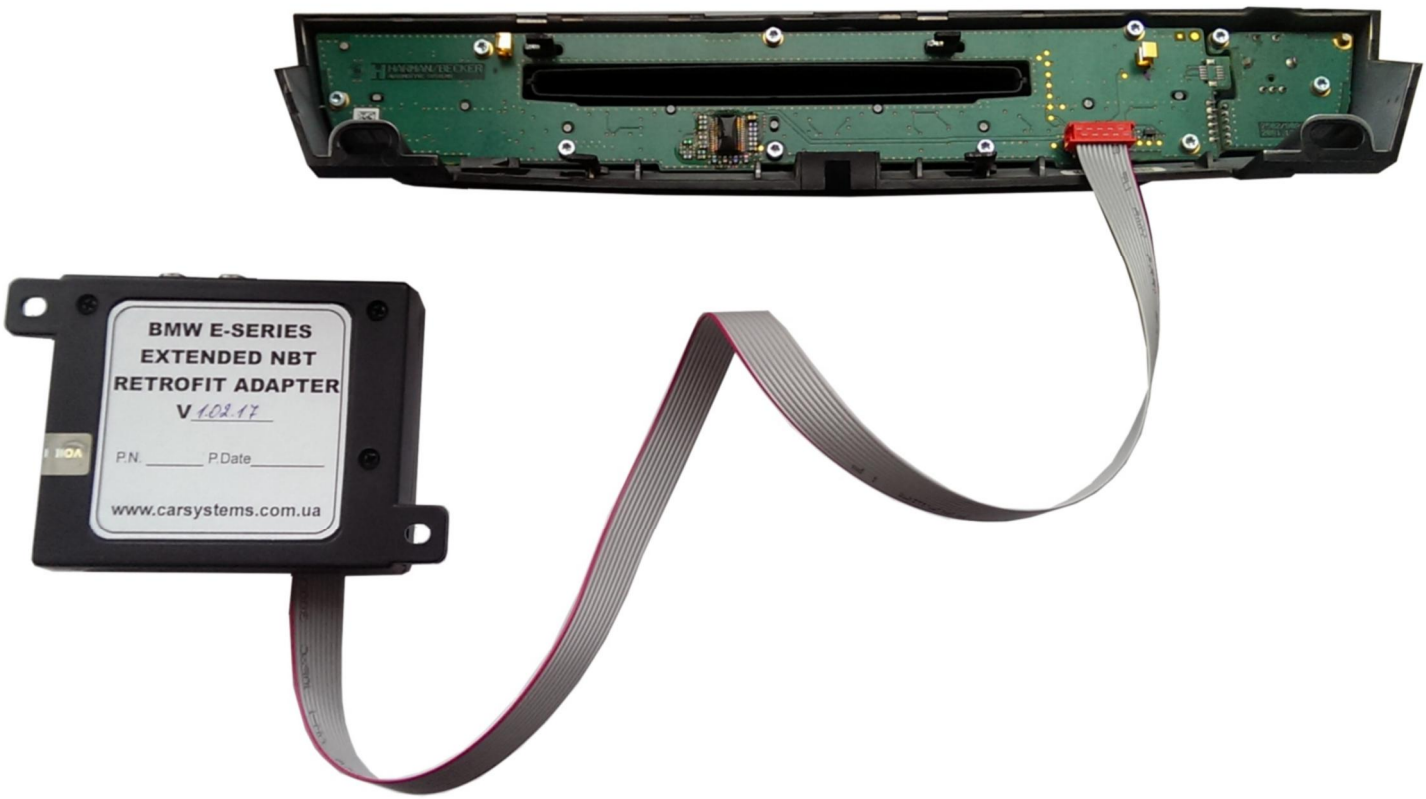


Fig 3a Exx front panel connection

Fig 3b Fxx front panels

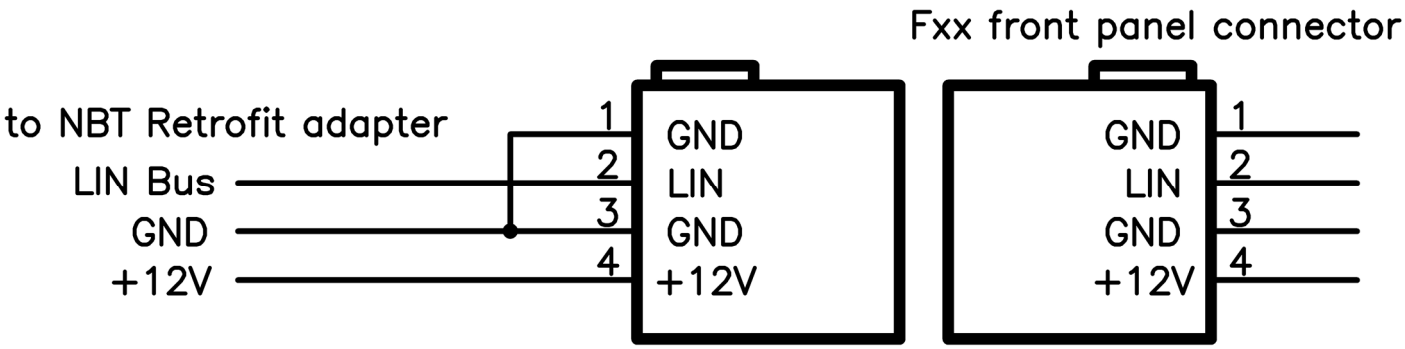


Fig 3c Fxx front panel connection

Rear View Camera (RVC)

BMW Exx NBT Retrofit support several types of Rear View Cameras:

- BMW RFK
- BMW TRSVC
- BMW ICAM
- 3rd party NTSC rear view camera

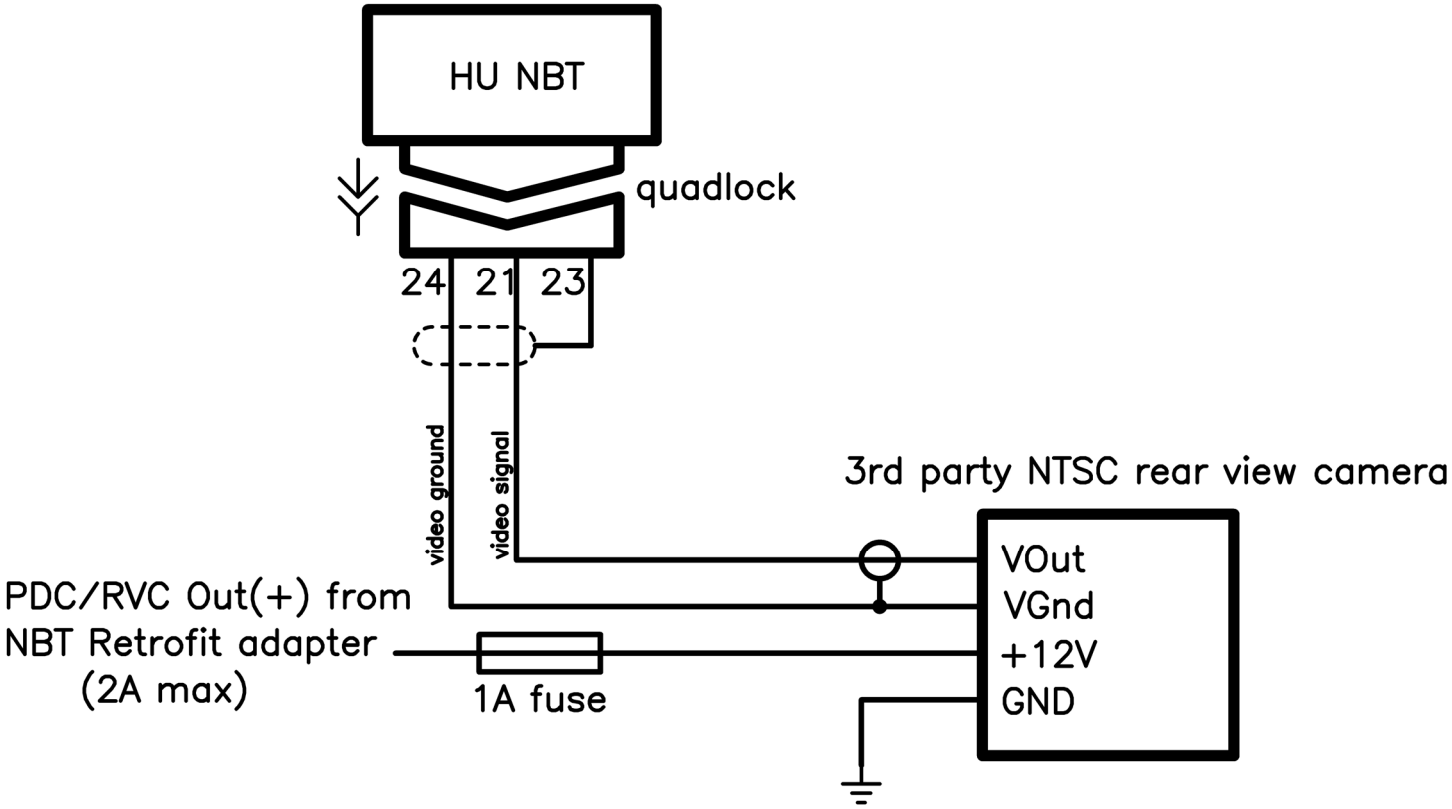


Fig 4 Third party NTSC rear view camera connection schematic

RVC can be powered from NBT Retrofit's PDC/RVC Out (+) as well as from other power source. However, make sure that RVC powered from stable +12V. Do not power RVC from rear lights!

Front View Camera (FVC)

BMW Exx NBT Retrofit supports 3rd party Front View Camera

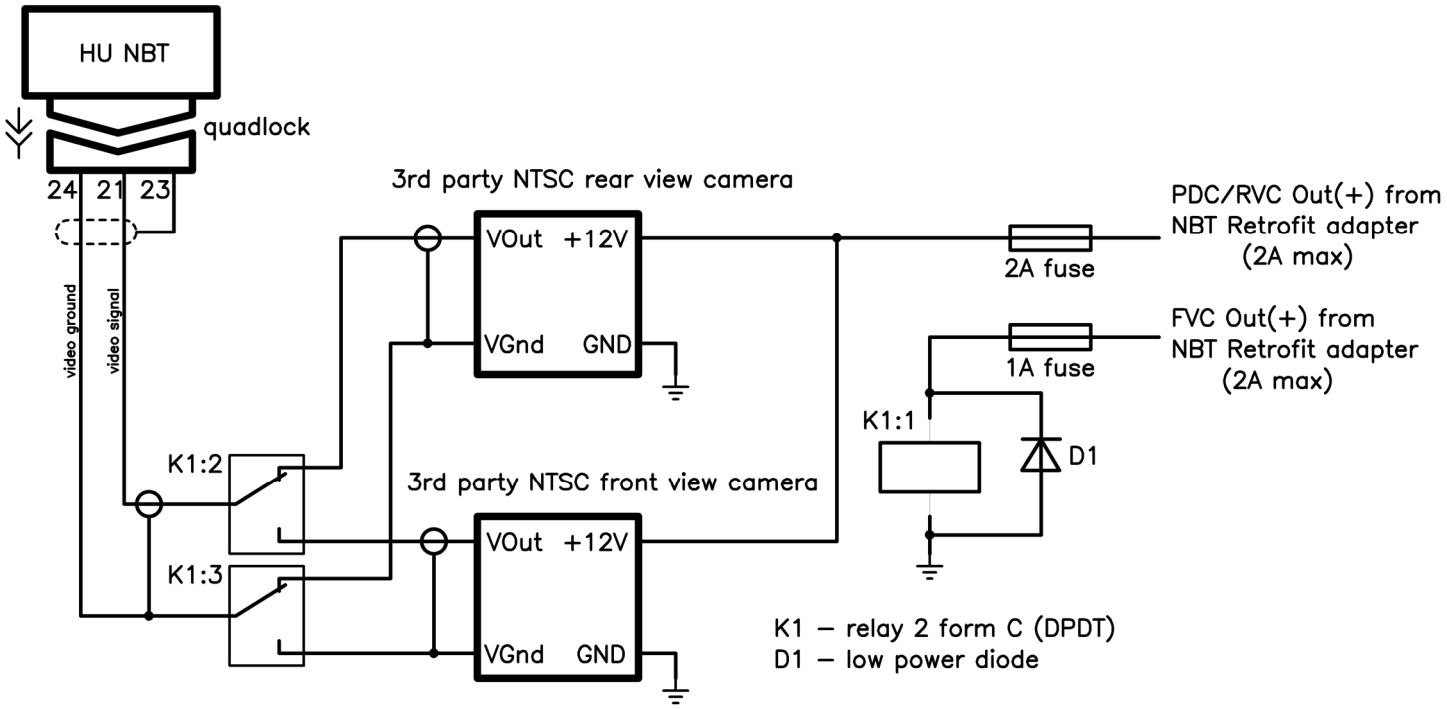


Fig 5 Third party NTSC front view camera connection schematic

Parktronic

BMW Exx NBT Retrofit support several types of PDCs:

- BMW PDC
- BMW RPDC (integrated in JBE module, on LCI E70/E71 cars)
- 3rd party PDC (Steelmate PTS400M6)

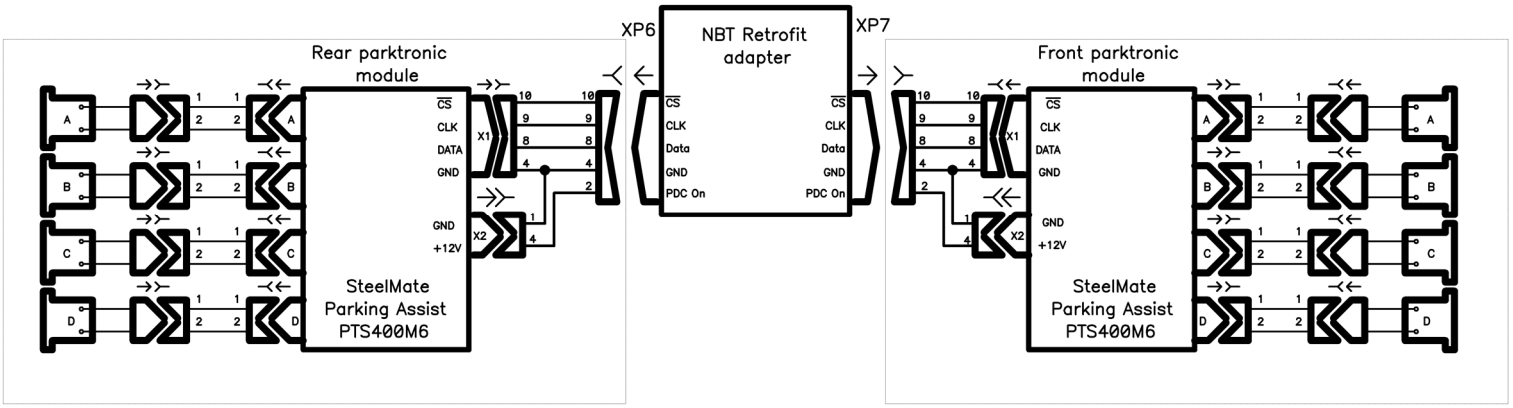


Fig 6 PTS400M6 PDC connection schematic

Appendix A

NBT pinout

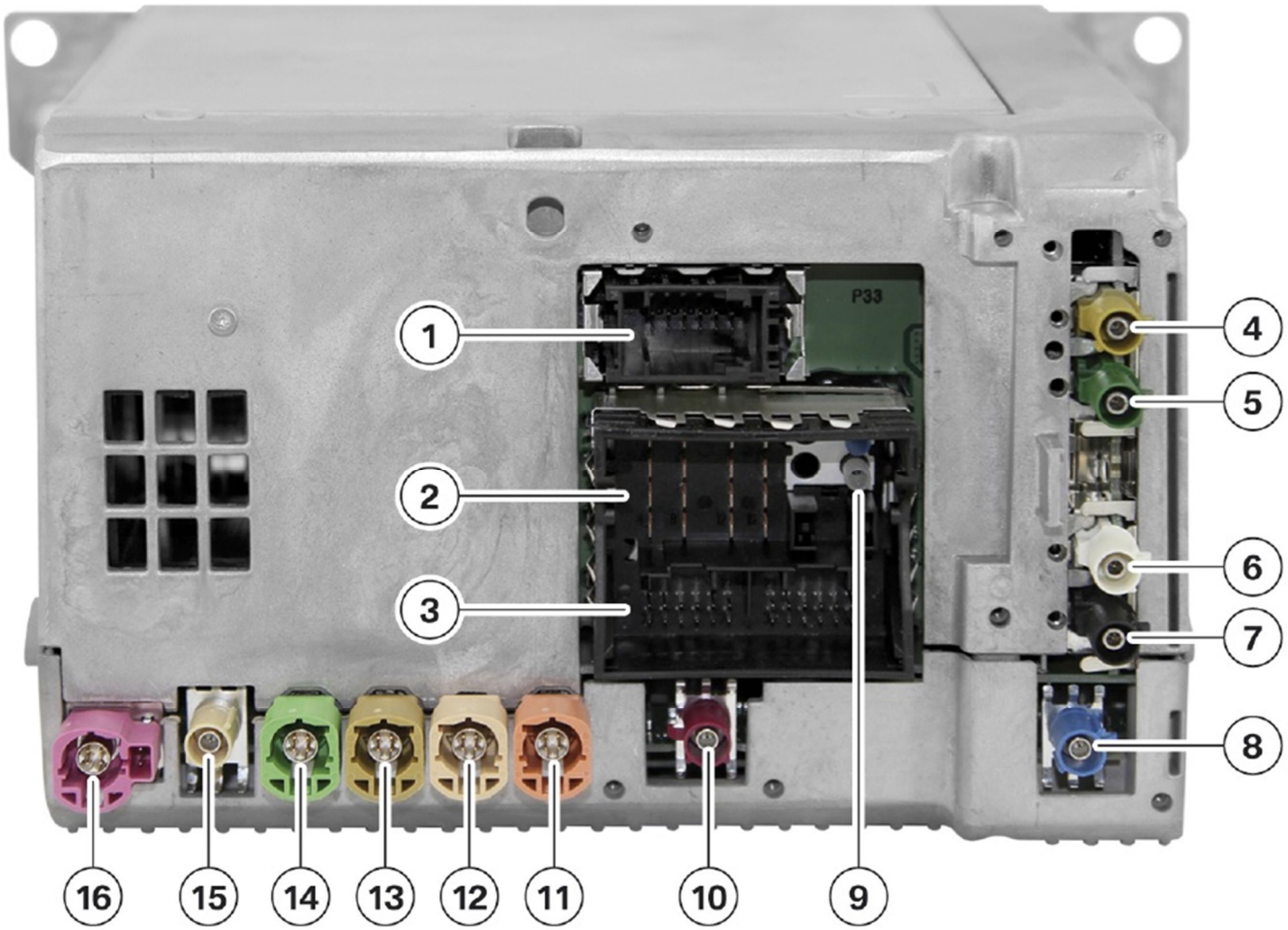


Fig 7 NBT rear view with connections

Table 3 NBT connections description

Index	Explanation
1	FBAS 3 and 4 for additional video sources in the vehicle
2	NF for the speakers, telephone mute, K-CAN, voltage supply
3	Micro 1 and 2; Aux-In, FBAS 1 and 2
4	DAB band 3 aerial, color code curry
5	DAB L band aerial, color code green
6	FM2, color code white
7	AM/FM1; color code black
8	GPS aerial, color code blue
9	Media Oriented System Transport bus
10	Preparation of WLAN aerial; color code burgundy
11	Ethernet connection for RSE, color code orange
12	USB1 connection; customer access at AUX-In USB socket in the center console (also for data imports/exports); color code beige
13	USB2 connection; connection for customer Smartphone via telephone base plate; color code curry
14	USB3 connection; Telematic Communication Box TCB color code light green
15	Bluetooth aerial connection; color code beige
16	APIX connection and voltage supply of the central information display; color code violet

Appendix B

NBT EVO pinout

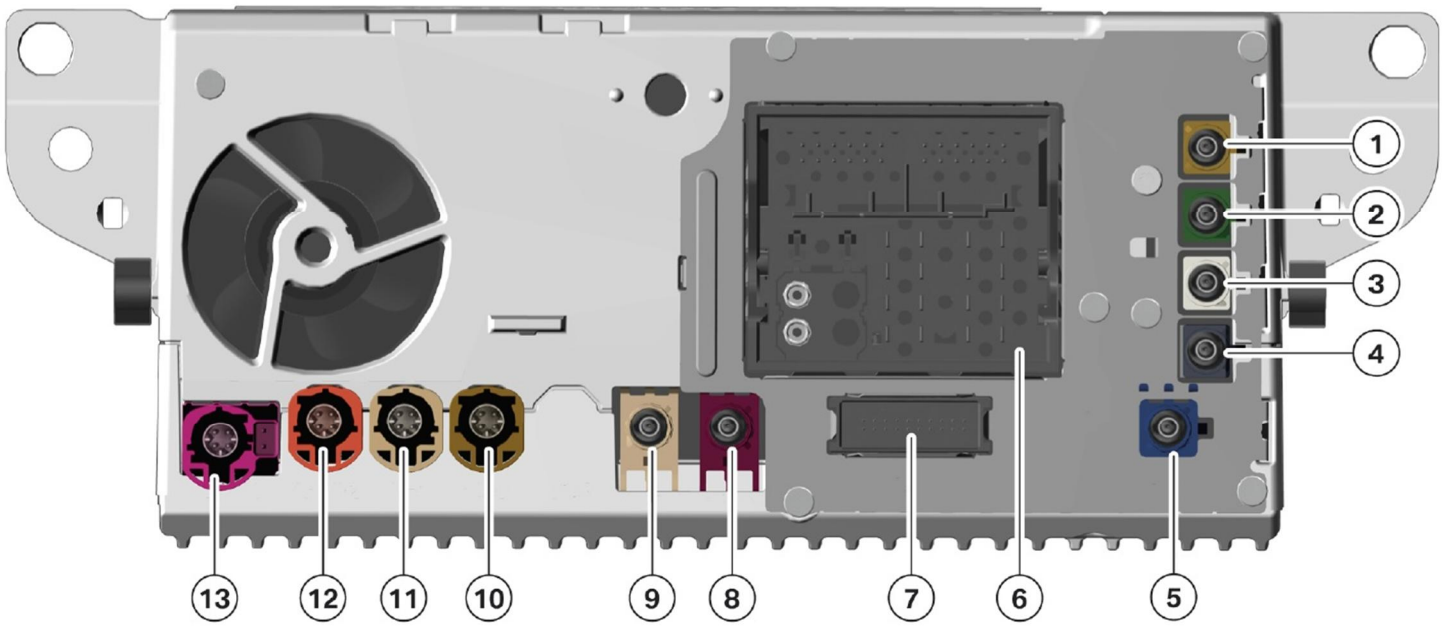


Fig 8 NBT EVO rear view with connections

Table 4 NBT EVO connections description

Index	Explanation
1	DAB band 3 aerial, color code curry
2	DAB L band aerial, color code green
3	FM2, color code white
4	AM/FM1; color code black
5	GPS aerial, color code blue
6	Main connector
7	OABR connector; Telematic Communication Box 2 (TCB2) connection
8	WLAN aerial connector for Wi-Fi®Direct connections; color code burgundy
9	Bluetooth aerial connection; color code beige
10	USB2 connection; connection for customer Smartphone via telephone base plate; color code curry
11	USB1 connection; customer access at AUX-In USB socket in the center console (also for data imports/exports); color code beige
12	APIX connection of the Instrument Cluster (KOMBI)
13	APIX connection and voltage supply of the central information display; color code violet

Appendix C

NBT coding

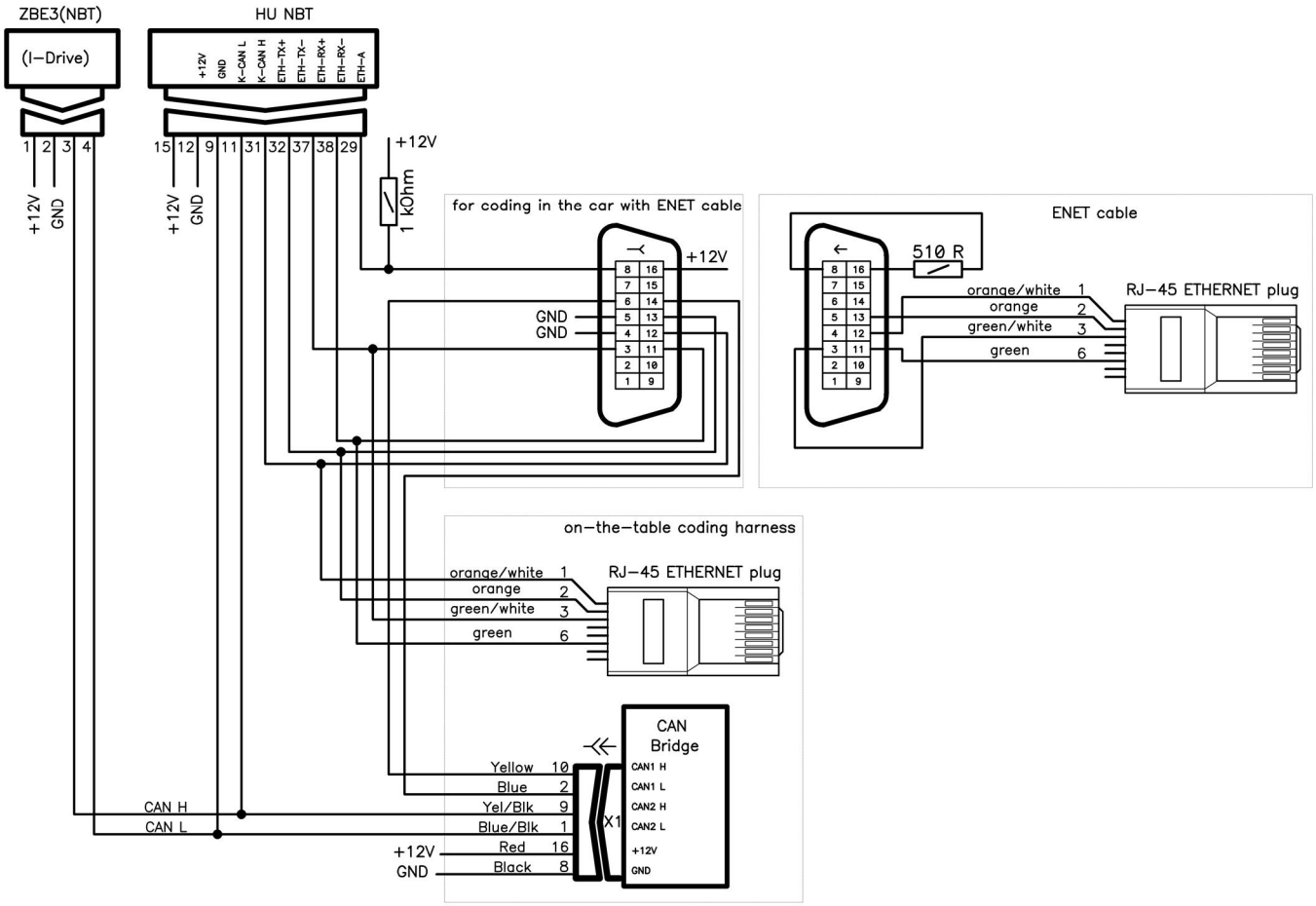


Fig 9 NBT coding connection schematic

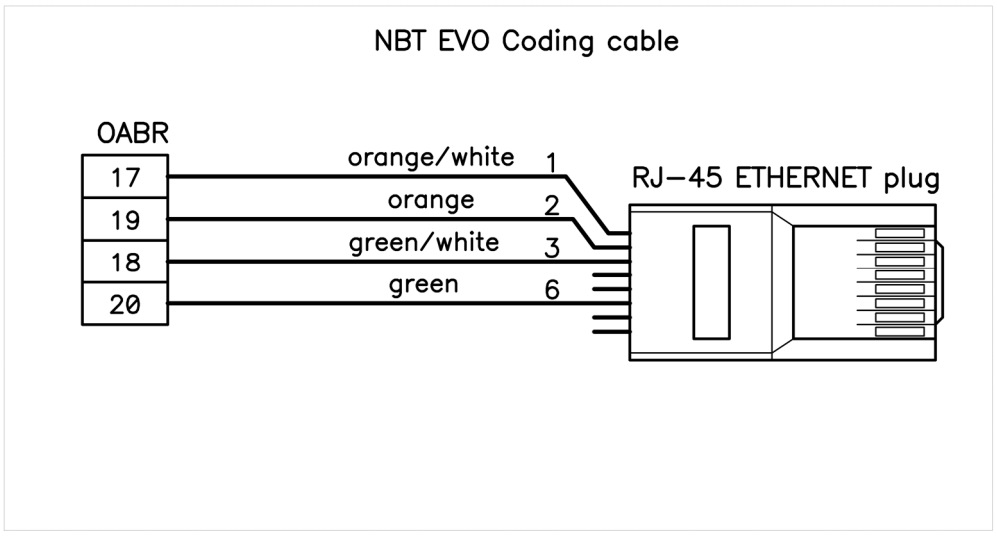


Fig 10 NBT EVO coding connection schematic

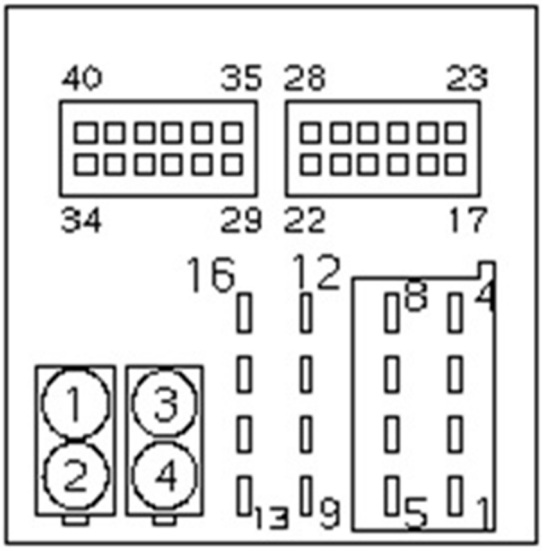


Fig 11a NBT HU pinout

Table 5a NBT HU pinout description

Pin No.	Description	Pin No.	Description
1	LF - Rear Right (+)	21	FBAS (+) (TRSVC)
2	LF - Front Right (+)	22	MIC 1 (-)
3	LF - Front Left (+)	23	FBAS Shield (TRSVC)
4	LF - Rear Left (+)	24	FBAS (-) (TRSVC)
5	LF - Rear Right (-)	25	MIC 2 Shield
6	LF - Front Right (-)	26	FBAS Shield (BASEPLATE)
7	LF - Front Left (-)	27	FBAS (-) (BASEPLATE)
8	LF - Rear Left (-)	28	FBAS (+) (BASEPLATE)
9	CAN LOW	29	ETH_A (OBD 8)
10	NOT USED	30	AUX IN Left
11	CAN HIGH	31	ETH_TX+ (OBD 12)
12	GND	32	ETH_TX- (OBD 13)
13	RADIO ON (CIC)	33	MIC 1 Shield
14	NOT USED	34	NOT USED
15	POWER 12v - Terminal 30 - 20Amp	35	AUX IN Right
16	NOT USED	36	AUX IN GND
17	MIC 1 (+)	37	ETH_RX+ (OBD 3)
18	MIC 2 (+)	38	ETH_RX- (OBD 11)
19	MIC 2 (-)	39	AUX Shield
20	NOT USED	40	NOT USED

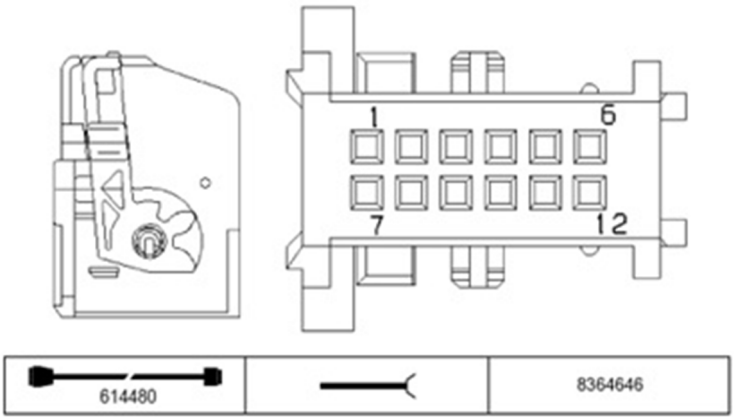


Fig 11b NBT HU pinout

Table 5b NBT HU pinout description

Pin No.	Description
1	FBAS Shield (DVD)
2	FBAS - (DVD)
3	FBAS - (TV)
4	
5	
6	
7	FBAS + (DVD)
8	FBAS + (TV)
9	FBAS Shield (TV)
10	
11	
12	

Table 6 Basic coding parameters for NBT HU

	Parameter	Value	Note
1	AUTOLIMITER	gen_1	
2	BASIS_KOMBI_MMI_LIST	aktiv	
3	BAUREIHE	depending car	
4	CALMING_KOMBI	nicht_aktiv	
5	CAMERA_SYSTEM	trsvc	
6	CAN__ANSCHLUSS_HEADUNIT	hu_an_body_can	
7	CHECKBOX_TP	aktiv	
8	COMMUNICATION_PARKMASTER	gen2	
9	DAYDRIVING_LIGHT	standard	
10	EFF_DYN_SPORT_CID	aktiv	
11	EFF_DYN_SPORT_UNIT	aktiv	
12	EINHEITEN_MASTER	kombi_l6_new	
13	EXTERNER_MOST	aktiv	
14	EXTERNE_MOST_DIAG	aktiv	
15	GATEWAYTABLE	table_5	
16	GPS_FROM_NAVI	aktiv	
17	GYRO_INTERN	nicht_aktiv	
18	KOMBI_CIC	kombi_low	
19	L4_L6_KOMMUNIKATIONSSCHALTER	L6_aktiv	
20	LOUPE_TACHO_KOMBI	nicht_aktiv	
21	MACRO_PDC	aktiv	
22	MACRO_PMA_AUSPARKEN	nicht_aktiv	

23	MACRO_PMA_EINPARKEN	nicht_aktiv	
24	MACRO_RV_C:	aktiv	
25	MICROPHONE_NUMBER	wert_1	
26	MICROPHONE_POSITION	wert_03	
27	MICROPHONE_SENSITIVITY	L4_mic	
28	OELSTANDSMENUE	aktiv	
29	OELSTAND_OENS	aktiv	
30	PDC_3D	nicht_aktiv	
31	PDC_DIRECTION	vertikal	
32	PDC_FLANKENSCHUTZ	nicht_aktiv	
33	PDC_SENSOR_HINTEN	4_sensoren	
34	PDC_SENSOR_VORN	4_sensoren	
35	PIA_PORTIERUNGSMASTER	aktiv	
36	PRODUKTLINIE	lg	
37	SETTINGS_INFO_DISPLAY	nicht_aktiv	
38	SLI_NAVI_DISPLAY	aktiv	
39	SYSTEM_GPS_RECEIVER	aktiv	
40	TEILNETZBETIEB:	nicht_aktiv	
41	TEILNETZBETRIEB	nicht_aktiv	
42	TRSVC:	wert_41	
43	VIDEO_WATCHDOG_REARVIEW	nicht_aktiv	

In table 3 listed basic coding parameters. Fine coding settings may be needed in some cases.

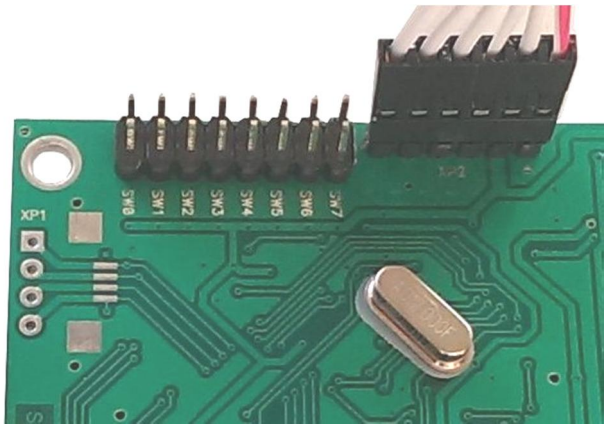
Appendix D

[Switches designation]

Table 7 Switches designation for BMW Exx NBT Retrofit Adapter, Extended BMW Exx NBT Retrofit Adapter, BMW Exx MOST NBT Retrofit Adapter

var A	SW0	SW1	SW2	SW3	SW4	SW5	SW6	SW7
var B	1	2	3	4	5	6	7	8
ON	Track Up/Track Down buttons swapping ON (CCC style)	SLI functionality ON	PDC to RPDC protocol conversion ON	RPDC emulation ON	RFK to TRSVC protocol conversion ON	TRSVC emulation ON	NiVi Display On from SonderFunction2 Key	SonderFunction 1/2 keys swap On
OFF	Track Up/Track Down buttons swapping Off (CIC style)	SLI functionality Off	PDC to RPDC protocol conversion Off	RPDC emulation Off	RFK to TRSVC protocol conversion Off	TRSVC emulation Off		SonderFunction 1/2 keys swap Off

var A



var B