

Video inserter

VL7-NBT2

Compatible with

BMW vehicles F and G-series
with NBT2 and 6.5, 7, 8.8 and 10.25inch monitor and HSD+2 plug

Mini vehicles
with NBT2 6.5inch monitor or NBT2 EVO 8.8inch monitor



example

*Modified manual with new
product restrictions!*

Product features

- Video-inserter for factory-infotainment systems
- CVBS input for rear-view camera
- CVBS input for front camera
- 1 CVBS video-input for after-market video-sources (e.g., USB-Player, DVB-T2 Tuner)
- Automatic switching to rear-view camera input on engagement of reverse gear
- Automatic switching to front camera for 10seconds after disengaging reverse gear (not available for all vehicles)
- Dynamic driving-path lines for rear-view camera (not available for all vehicles)
- Factory PDC display with after-market RVC (not available for all vehicles)
- Video-in-motion (ONLY for connected video-sources)
- Video-inputs NTSC compatible

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Legal Information

By law, watching moving pictures while driving is prohibited, the driver must not be distracted. We do not accept any liability for material damage or personal injury resulting, directly or indirectly, from installation or operation of this product. Apart from using this product in an unmoved vehicle, it should only be used to display fixed menus or rear-view-camera video when the vehicle is moving (for example the MP3 menu for DVD upgrades).

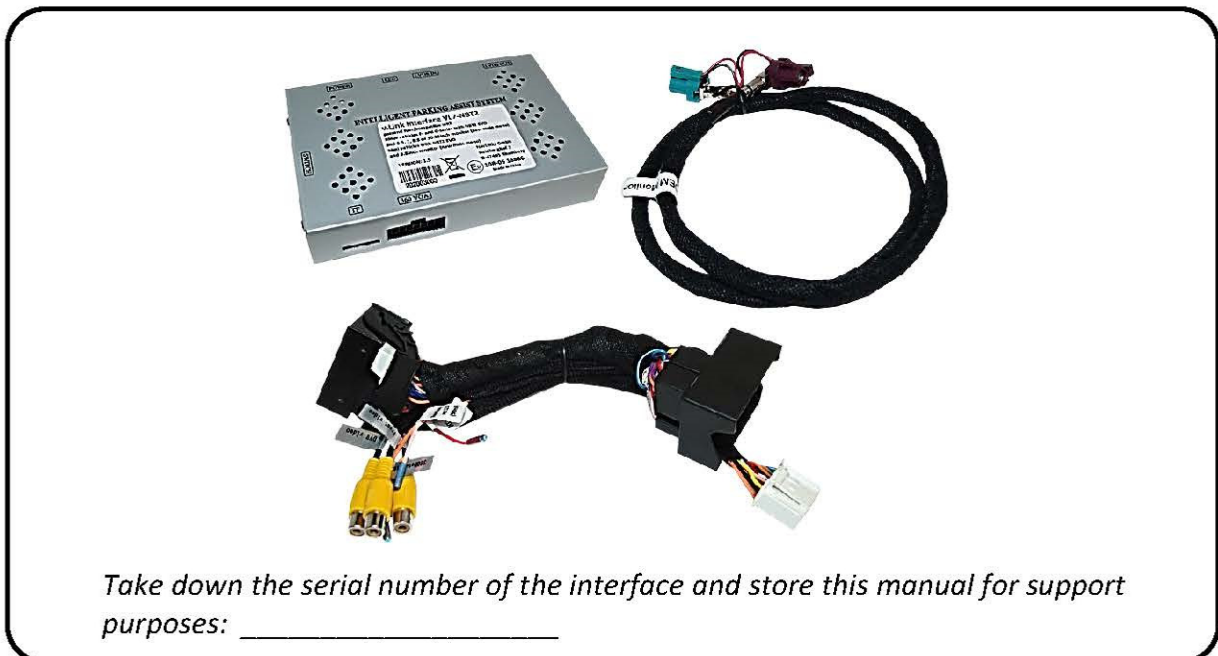
Changes/updates of the vehicle's software can cause malfunctions of the interface. Up to one year after purchase we offer free software-updates for our interfaces. To receive a free update, the interface has to be sent in at own cost. Wages for de-and reinstallation and other expenditures involved with the software-updates will not be refunded.

1. Prior to installation

Read the manual prior to installation. Technical knowledge is necessary for installation. The video interface's place of installation must be free of moisture and away from heat sources.

Before the final installation in the vehicle of the video sources, we recommend a test-run to ensure the compatibility of vehicle and interface. Due to changes in the production of the vehicle manufacturer there's always a possibility of incompatibility.

1.1. Delivery contents



1.2. Checking the compatibility of vehicle and accessories

Requirements

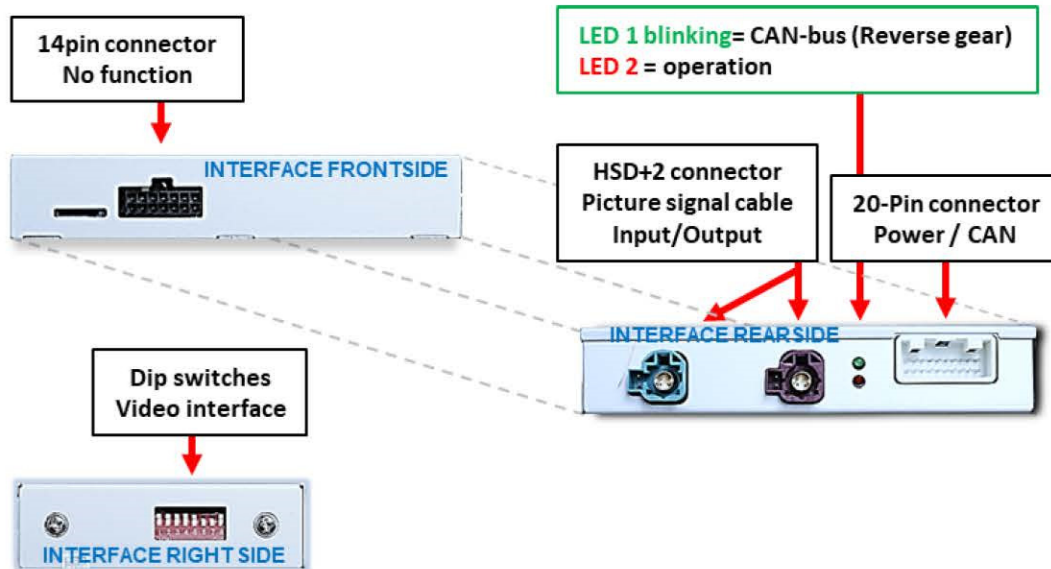
Brand	Compatible vehicles	Compatible systems
BMW	F-series vehicles from about 05/2016 and G-series vehicles with NBT2 (New main menu + flatter iDrive)	Radios, S606A Business Navigation, S6UNA Navigation, S6U2A Live Cockpit Plus, S609A Professional Navigation, S6UPA Navigation Plus - NBT2 EVO with 6.5, 7, 8.8 and 10.25inch monitor <i>Since 2019, BMW has been gradually converting its vehicles from NBT2 to MGU. Visually, NBT2 is difficult to distinguish from MGU. Send us the vehicle identification number for verification in an enquiry, please.</i>
Mini	from about 2016/2017	6FPA Visual Boost NBT2 with 6.5inch monitor or 609 Professional Navigation NBT2 Evo with 8.8inch monitor (new main menu)

Limitations

<i>Video only</i>	Interface inserts ONLY video signals into the infotainment. For inserting Audio signals either the possibly existing factory audio-AUX-input or a FM-modulator can be used.
<i>Factory rear-view camera</i>	Automatic switching to the factory rear-view camera does not work from the video mode of a video source connected to the video input of the interface.
<i>After market front camera</i>	Front camera will automatically be switched for 10 seconds after disengaging the reverse gear, if the reversing signal has been detected via CAN bus.
<i>Reverse signal analogue</i>	When using an analogue reversing signal, the front camera input has no function and the front camera can only be connected to the DVR input and selected manually.
<i>Reverse signal via CAN</i>	When using the R-gear detection via CAN bus, this can fail, e.g., after vehicle updates, and a subsequent analogue connection will become necessary.
<i>Dynamic guidelines</i>	Displayed dynamic guidelines are not available in all vehicles.
<i>Factory PDC display</i>	Factory PDC display does not work in all vehicles.
<i>Image formats</i>	On 8.8inch and 10.25inch monitors, the image formats of DVR video input and front camera will only be displayed in full screen (stretched)!
<i>Video input signal</i>	Only NTSC video sources compatible.
<i>Factory picture signal cable</i>	It might be required to detach the factory HSD+2 cable from taping on the monitor side to reach to a space where the interface box can be installed. An optionally available CAB-HSD2-MF100WB cable can be used instead.

1.3. Connectors – video interface

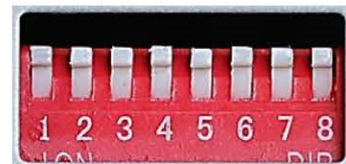
The video-interface converts the video signals of connected after-market sources in a factory monitor compatible picture signal which is inserted in the factory monitor, by using separate trigger options. Further it reads the vehicle's digital signals out of the vehicle's CAN-bus and converts them for the video interface.



1.4. Settings of the 8 dip-switches

Some settings have to be selected by the dip-switches of the video interface.

Dip position down is **ON** and position up is **OFF**.



After each dip-switch-change a power-reset of the Interface-box has to be performed!

1.4.1. Settings – dip 1-3

Dip-switches 1 to 3 are used for basic adjustment for the compatible vehicle types and monitor sizes (set according to below table).

vehicle - and monitor selection	Dip 1	Dip 2	Dip 3
1, 2, 3, 4 series, X3, X4 with 8.8inch monitor WITH factory rear-view camera	OFF ↑	OFF ↑	OFF ↑
1, 2, 3, 4 series, X1, X3, X4 with 8.8inch monitor WITHOUT factory rear-view camera Mini with 8.8inch monitor	ON ↓	OFF ↑	OFF ↑
5series with 8.8inch monitor WITH factory rear-view camera	OFF ↑	ON ↓	OFF ↑
5series with 8.8inch monitor WITHOUT factory rear-view camera	ON ↓	ON ↓	ON ↓ OFF ↑
MINI with 6.5inch monitor variant ¹ MINI with 6.5inch monitor variant ²	OFF ↑	ON ↓ OFF ↑	ON ↓
1, 2, 3, 4 series, i3, X1	OFF ↑	OFF ↑	ON ↓
5serie and 7series, X5, X6 with 10.25inch monitor	ON ↓	ON ↓	ON ↓
X1 with 10.25inch monitor	ON ↓	OFF ↑	ON ↓

Varies depending on Equipment



Note: In case of a not working or unsatisfying image display (no picture, black picture, incorrect picture size), try all other combinations of dip 1-3.

After each dip-switch-change a power-reset of the Interface-box has to be performed!

1.4.2. Settings – dip 4-8

Dip-switches for switching functions, (dip 4 to dip 8)

Dip	Function	ON ↓	OFF ↑
4	After-market rear-view camera video mode	full-screen*	with factory PDC
	Picture settings mode	settings not possible	settings possible
5	DVR Video in (set 5 and 6)	enabled	disabled
6	DVR Video in (set 5 and 6)	enabled	disabled
7	Front camera	enabled**	disabled
8	Rear-view cam type	factory or none	after-market

*For factory rear view camera, dip 4 must be set to **ON** (down).

**Interface will switch automatically to front camera input for 10 seconds after disengaging reverse gear.

After each dip-switch-change a power-reset of the Interface-box has to be performed!

1.4.2.1. Deviating dip-switch combination for switching to after-market camera with analogue connection (not by CAN-bus)

Dip-switches	Dip 4	Dip 8
Analogue R-gear signal connection by orange wire*	OFF ↑	ON ↓

* In this case the full-screen picture of after-market camera is not possible.

After each dip-switch-change a power-reset of the Interface-box has to be performed!

1.4.3. Explanation of the individual dip-switch functions

1.4.3.1. Vehicle and monitor selection (dip 1-3)

Dip-switches 1 to 3 are used for basic adjustment for the compatible vehicle types and monitor sizes (make settings according to the table).



Note:

In case of a not working or unsatisfying image display (no picture, black picture, incorrect picture size), try all other combinations of dip 1-3.

1.4.3.2. Rear-view camera display format and picture settings mode (dip 4)

Dip 4 is used to choose between after-market camera full-screen display and display with the factory PDC display (if available for the very vehicle). When dip 4 is set to **OFF**, the factory PDC display is shown on the right side of the after-market camera. With dip 4 set **ON**, the after-market camera is shown full-screen and the factory PDC display is not shown.

In case of (partly) incompatible CAN-bus messages, PDC cannot be displayed.

Values of picture settings can only be changed while dip 4 is set **OFF**. After adjustments, full-screen mode can be chosen.



Notes:

- If a factory rear-view camera is installed, dip 4 must be set to **ON**.
- For analogue R-gear signal connection by orange wire, dip 4 must be set **OFF**.

1.4.3.3. Activating the DVR video input (dip 5+6)

Dip-switches 5 and 6 (de)activate the DVR video input - it is necessary to set both dip-switches according to the table:

	Dip	Function	ON ↓	OFF ↑
If	5	DVR Video in (set 5 and 6)	enabled	disabled
	6	DVR Video in (set 5 and 6)	enabled	disabled

DVR Video input is not used, we recommend to disable it to avoid accidental activation.

1.4.3.4. Activating the front camera input (dip 7)

Dip 7 is used to (de)activate the front camera input. With dip 7 **ON**, the interface switches from rear-view camera to front camera input for 10 seconds after reverse gear has been disengaged. Dip 7 **OFF** deactivates the front camera input.



Note: If analogue R-gear connection is used, the front camera input cannot be used. In this case, the front camera must be connected to the DVR video input and can only be selected manually.

1.4.3.5. Rear-view camera settings (dip 8)

Dip 8 is used to set the type of rear-view camera. Dip 8 **ON**, when R-gear is engaged, keeps the factory picture selected, thus the picture of the factory rear-view camera if installed. Dip 8 **OFF** switches the interface to the rear-view camera input as long as reverse gear is engaged and the vehicle R-gear message is CAN-bus compatible with the interface.



Note: Automatic switching to factory rear-view camera does not work while DVR video input is selected.

2. Installation

To install the interface, first switch off the ignition and disconnect the vehicle's battery. Please read the owner's manual of the car, regarding the battery's disconnection! If required, enable the car's Sleep-mode (hibernation mode) In case the sleep-mode does not succeed, the disconnection of the battery can be done with a resistor lead.

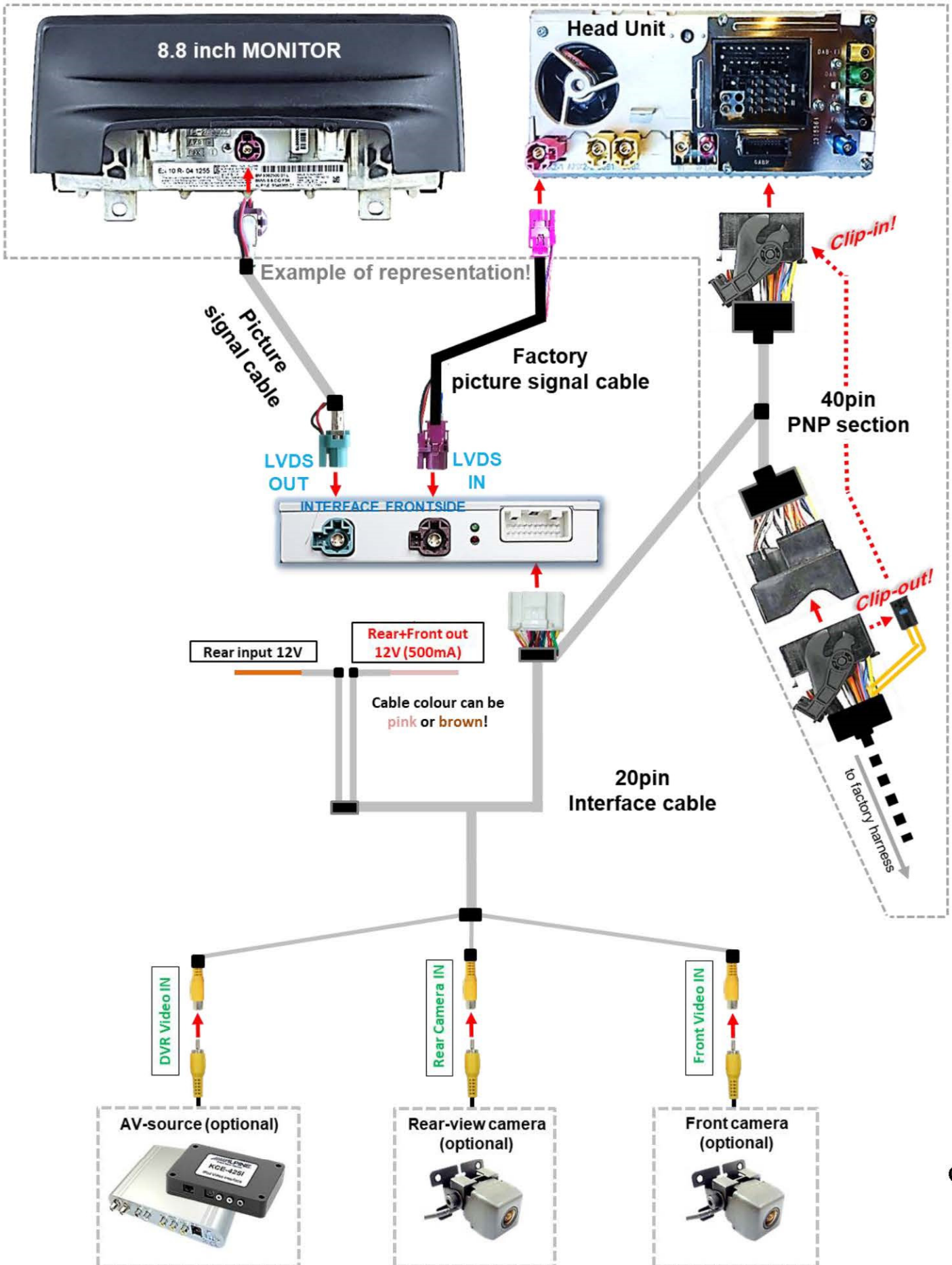
As with any installation of retrofit equipment, a stand-by test is necessary after the installation of the video interface, to ensure that the unit also switches off after reaching the vehicle's sleep mode.

Before the final installation, we recommend a test-run of the interface. Due to changes in the production of the vehicle manufacturer, there's always the possibility of incompatibility.

2.1. Place of connection

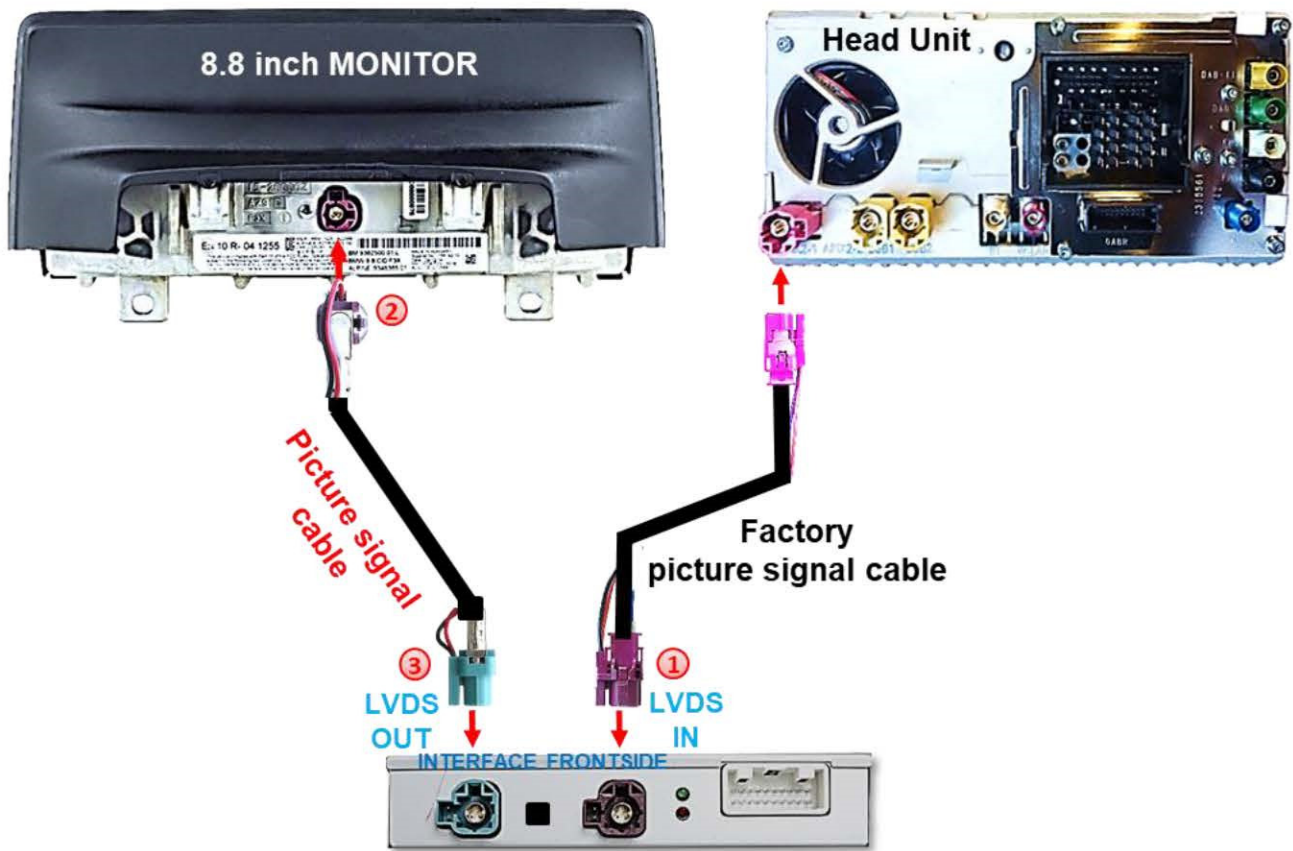
The video interface has to be connected to the factory head-unit and to the factory monitor.

2.2. Connection schema



2.3. Connections to factory head-unit and monitor

2.3.1. Connection - picture signal cables



- 1 Disconnect female bordeaux HSD+2 connector of factory picture signal cable **at rear-side of monitor** and connect to male bordeaux HSD+2 connector „LVDS IN“ of video interface.
- 2 Connect female angled bordeaux HSD+2 connector „To vehicle monitor“ of enclosed picture signal output cable to monitor's male bordeaux HSD+2 connector.
- 3 Connect female straight water-blue HSD+2 connector of enclosed **picture signal cable** to water-blue male HSD+2 connector „LVDS OUT“ of video interface.

Notes:

- The HSD+2 picture signal cable's connecting direction can be exchanged if there is no mounting space for the angled connector on the monitor side.
- It might be required to detach the factory HSD+2 cable from taping on the monitor side to reach to a space where the interface box can be installed. An optionally available CAB-HSD2-MF100WB cable can be used instead.
- The colours of the HSD+2 connectors at head unit may vary.

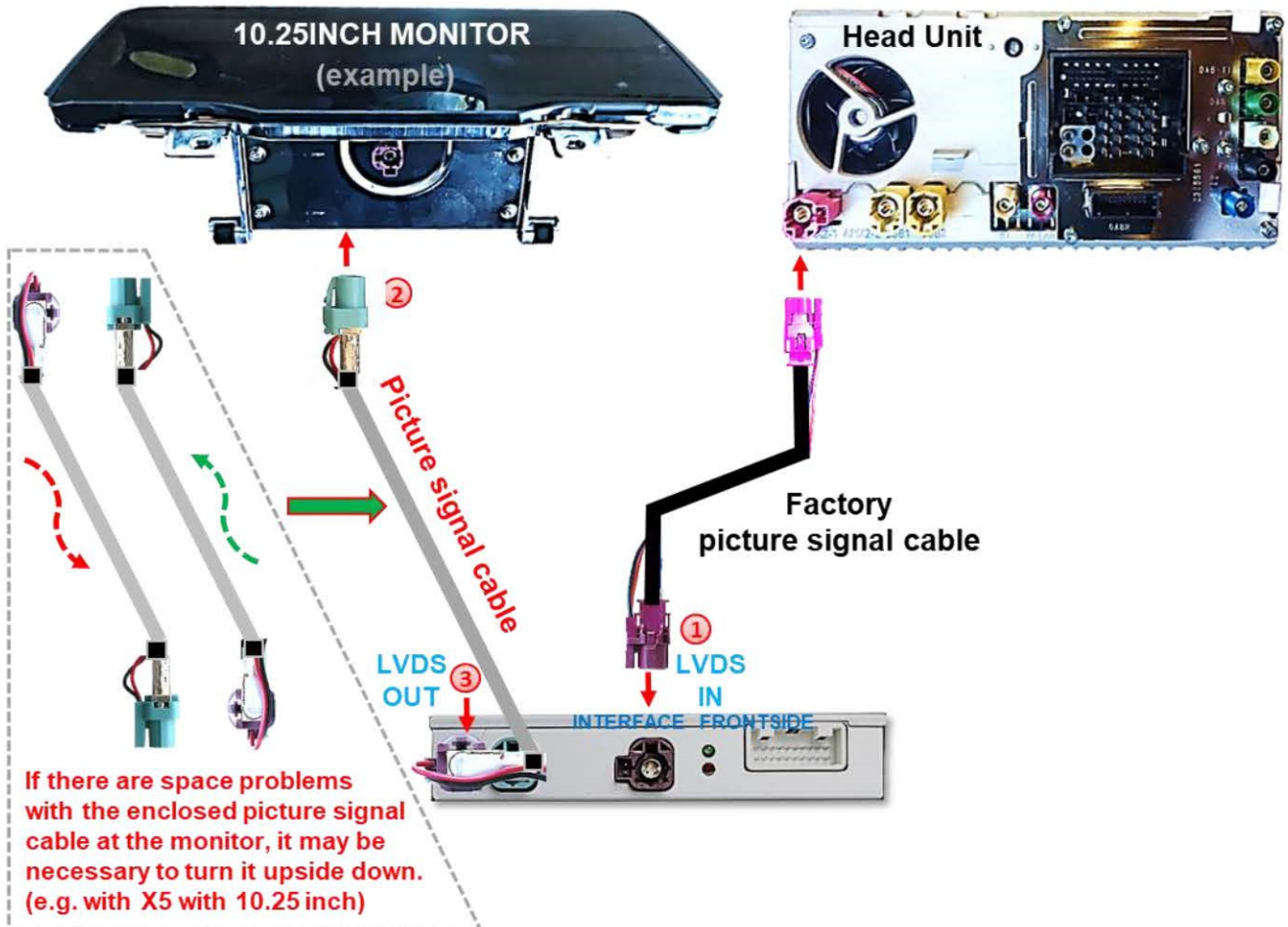


Mixing up/interchanging the connections of „LVDS IN“ and „LVDS OUT“ will cause disfunction or even damage to the system!

2.3.1.1. Special case - space problems with the monitor connection

The picture signal cable's connecting direction doesn't have an impact on the system's function, so that the angled and not-angled HSD+2 connectors are allowed to be interchanged, depending on the HSD+2 connectors mounting space.

Possible special case for X5 with 10.25 inch



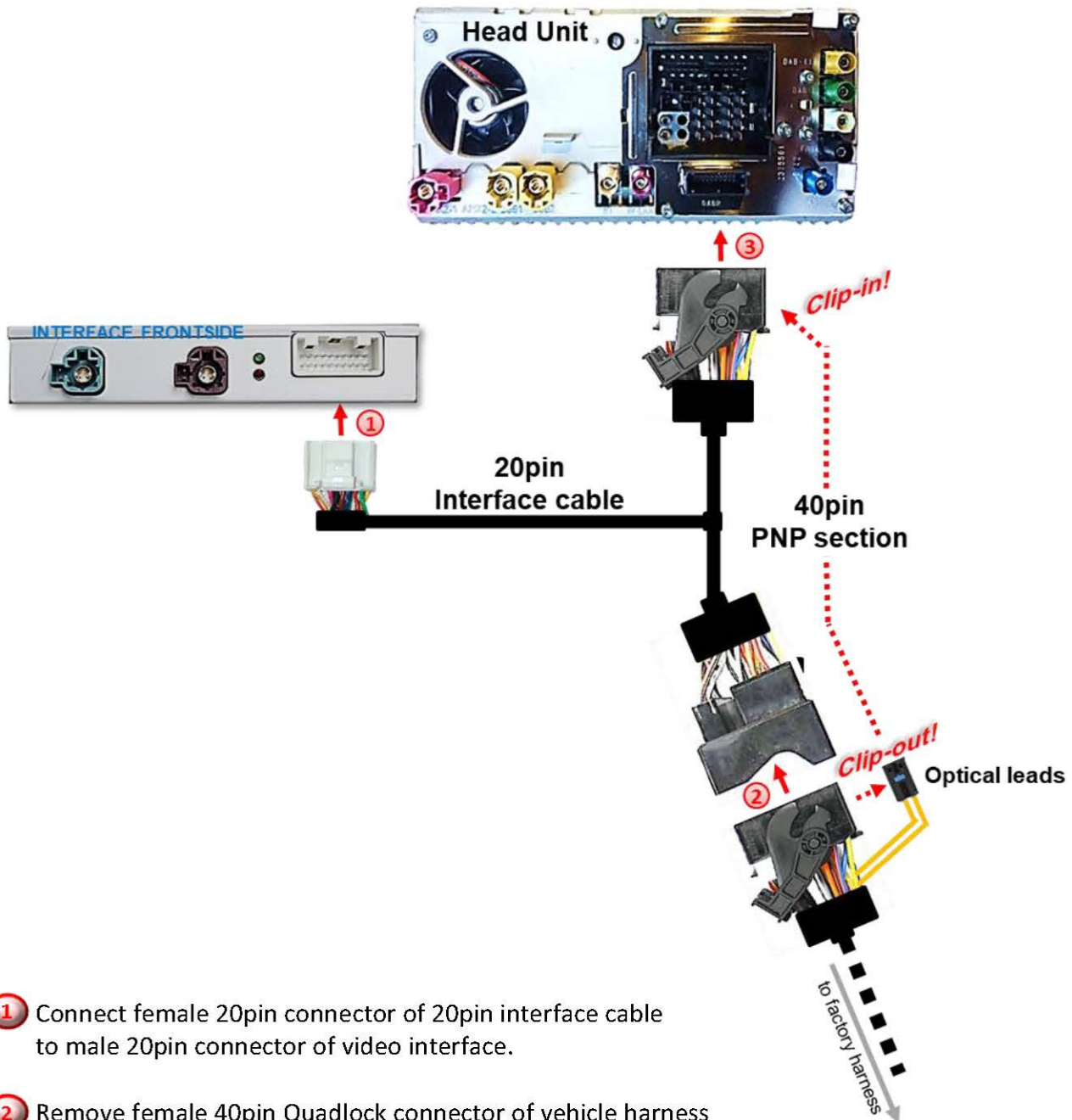
- 1 Disconnect factory picture signal cable's female bordeaux HSD+2 connector **at rear-side of monitor** and connect to male bordeaux HSD+2 connector „LVDS IN“ of video interface.
- 2 Turn enclosed picture signal cable upside-down and connect straight water-blue HSD+2 connector of enclosed picture signal cable to male bordeaux HSD+2 connector of monitor.
- 3 Connect angled bordeaux HSD+2 connector of enclosed picture signal cable to male water-blue HSD+2 connector „LVDS OUT“ of video interface.

Note: The colours of the HSD+2 connectors at head unit may vary.



Mixing up/interchanging the connections of „LVDS IN“ and „LVDS OUT“ will cause disfunction or even damage to the system!

2.4. Connection – Quadlock/CAN



- 1 Connect female 20pin connector of 20pin interface cable to male 20pin connector of video interface.
- 2 Remove female 40pin Quadlock connector of vehicle harness from rear-side of head-unit and connect to male 40pin Quadlock connector of 40pin PNP section.
- 3 Connect opposite female 40pin Quadlock connector of t40pin PNP section to male 40pin Quadlock connector at rear-side of head unit.

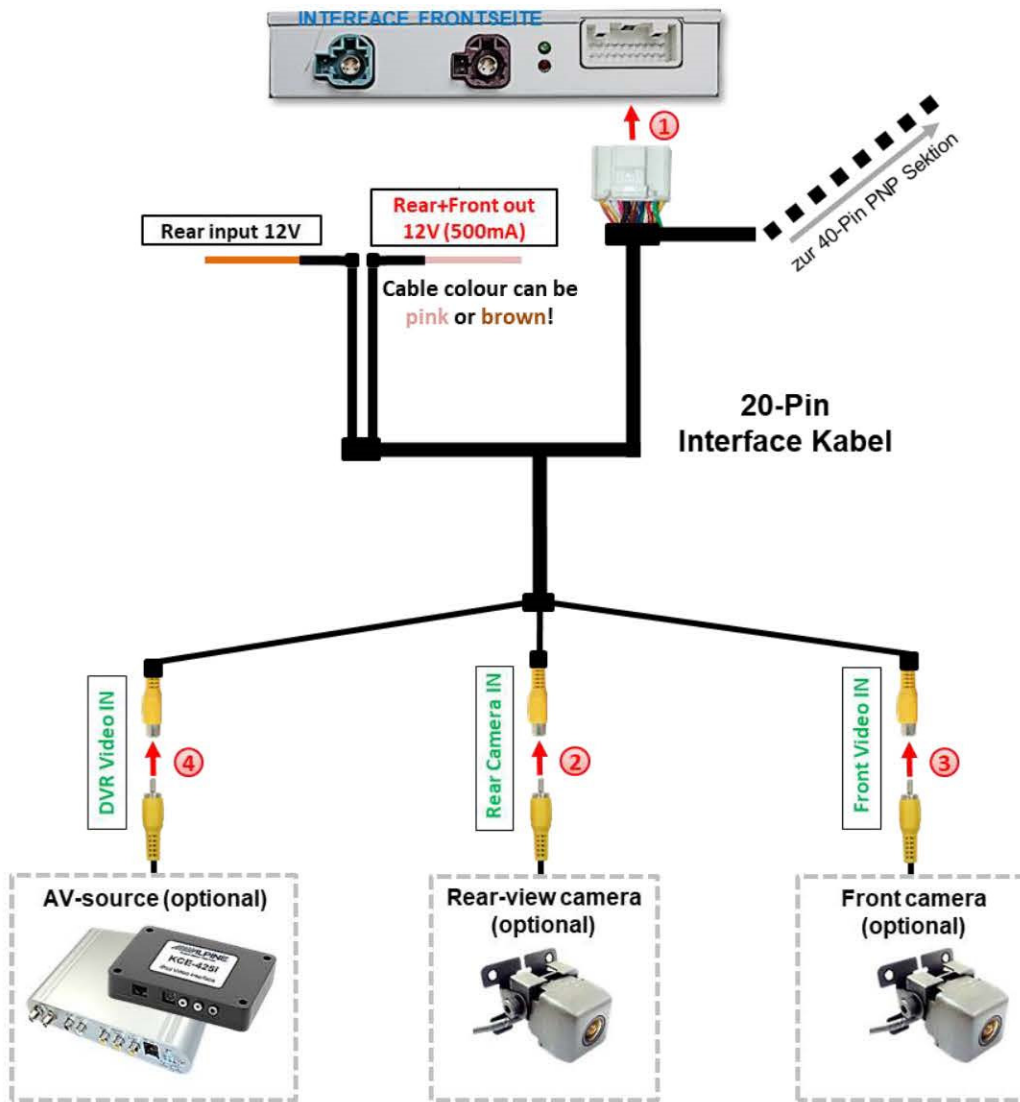


Attention: If the factory Quadlock connector is equipped with optical leads, these must be clipped out there and transferred to the female 40-pin Quadlock connector of the 40-pin PNP section!

2.5. Connection - video sources

It is possible to connect an after-market rear-view camera, an after-market front camera and one more after-market video source to the video-interface.

Before a final installation of the video sources, we recommend a test-run to ensure the compatibility of vehicle and interface. Due to changes in the production of the vehicle manufacturer there's always a possibility of incompatibility.



- 1 Connect 20pin interface cable's female 20pin connector to male 20pin connector of video-interface.
- 2 Connect male video RCA of rear-view camera to female RCA connector "Rear Camera IN" of 20pin interface cable.
- 3 Connect male video RCA of front camera to female RCA connector "Front Video IN" of 20pin interface cable.
- 4 Connect male video RCA of additional video source to female RCA connector "DVR Video IN" of 20pin interface cable.

2.5.1. Audio-insertion

This interface is only able to insert video signals into the factory infotainment. If an AV-source is connected, the audio insertion has to be done by the factory audio AUX input or an FM-modulator. The inserted video-signal can be activated simultaneously to each audio-mode of the factory infotainment.

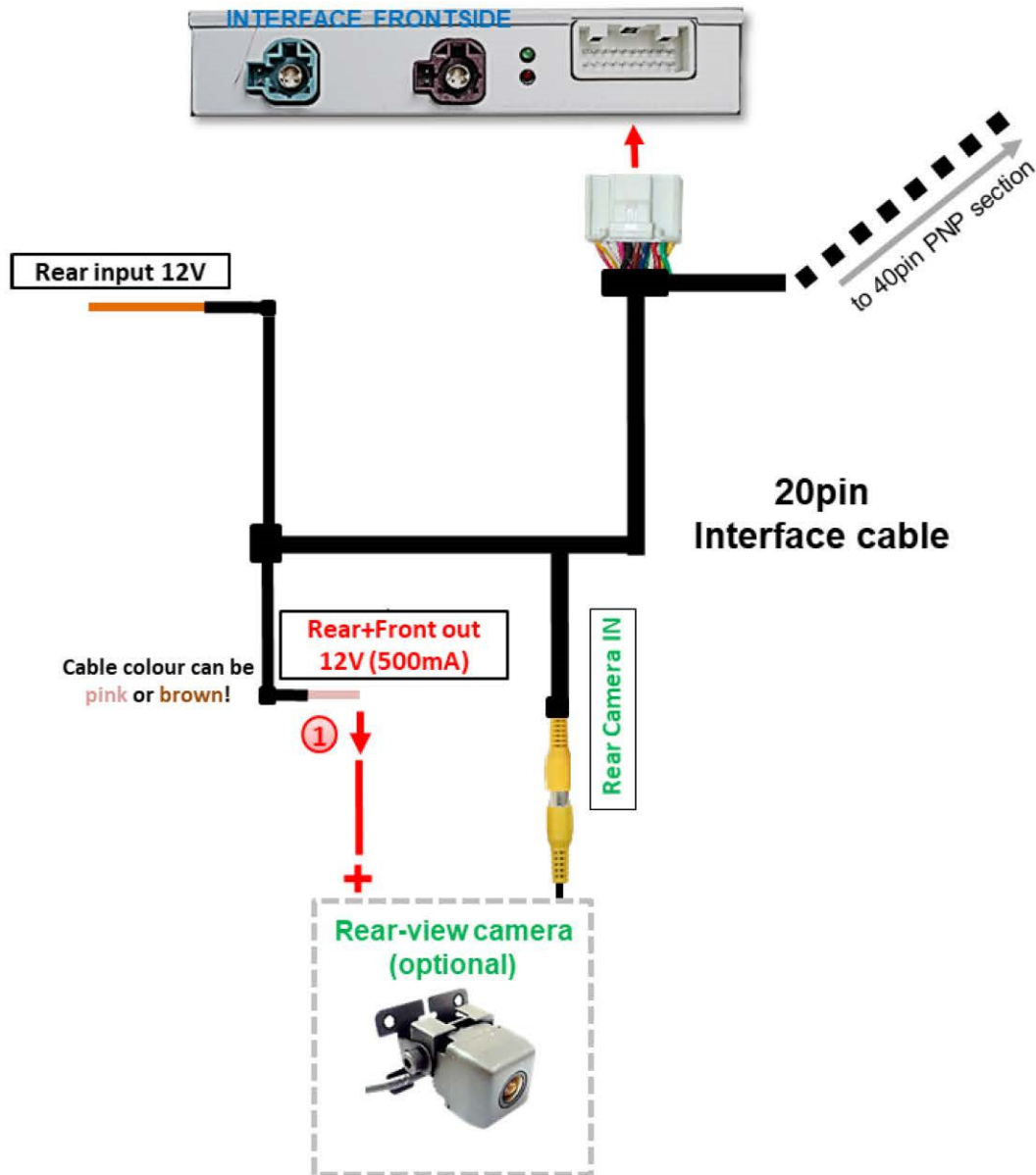
2.5.2. After-market rear-view camera

If the R-gear detection of the interface is used via CAN bus, the recognition may no longer be possible under certain circumstances (e.g., after a software update by the vehicle manufacturer). In this case, **ex post** an analogue R-gear signal, e.g., from the reversing light, must be connected via a relay.

Some vehicles also have a different and therefore incompatible reverse code on the CAN-bus. Therefore, we recommend the analogue connection.

2.5.2.1. RVC Case 1: Reverse gear signal from CAN-bus

On the 20pin interface cable, if the interface delivers +12V on the pink (or brown) output wire "Rear+Front out" while reverse gear is engaged, the video interface will automatically switch to the rear-view camera input "Rear Camera IN" while the reverse gear is engaged.

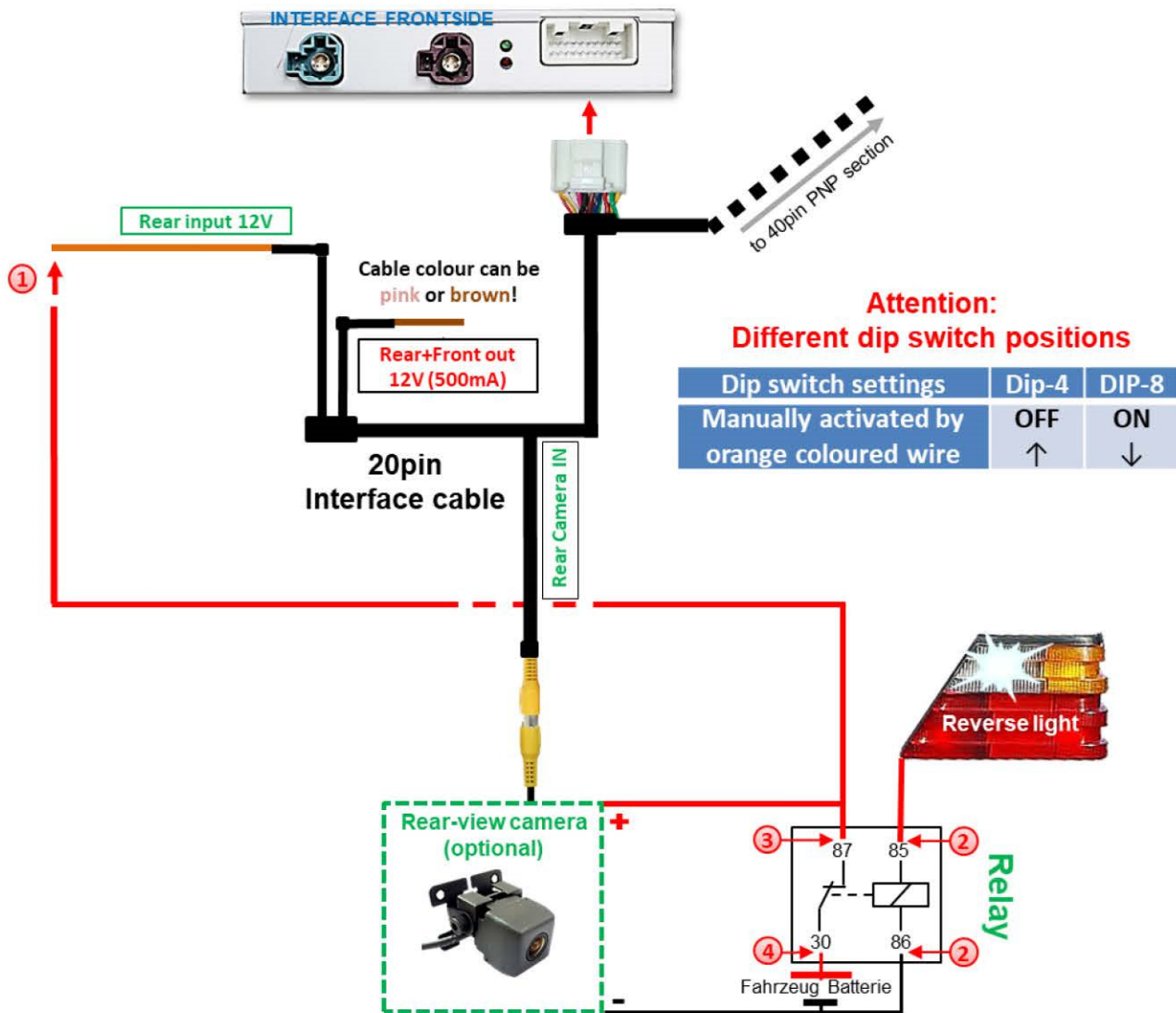


- 1 The pink (or brown) wire of the 20-pin interface cable „Rear+Front out“ can be used as power supply for front and rear-view camera. It carries +12V (max. 500mA) when reverse gear is engaged with additional 10 seconds after reverse gear is disengaged.

2.5.2.2. RVC Case 2: Reverse gear signal analogue connection

For desired analogue R-gear connection or if the video interface does not deliver +12V on the pink (or brown) wire “Rear+Front out” of the 12pin cable when reverse gear is engaged (not all vehicles are compatible), an external switching signal from the reverse gear light is required. As the reverse gear light’s power supply isn’t voltage-stabile all the time, an ordinary open relay (e.g., AC-RW-1230 with wiring AC-RS5) or filter (e.g., AC-PNF-RVC) is required. The diagram on the next page shows the connection type of the relay.

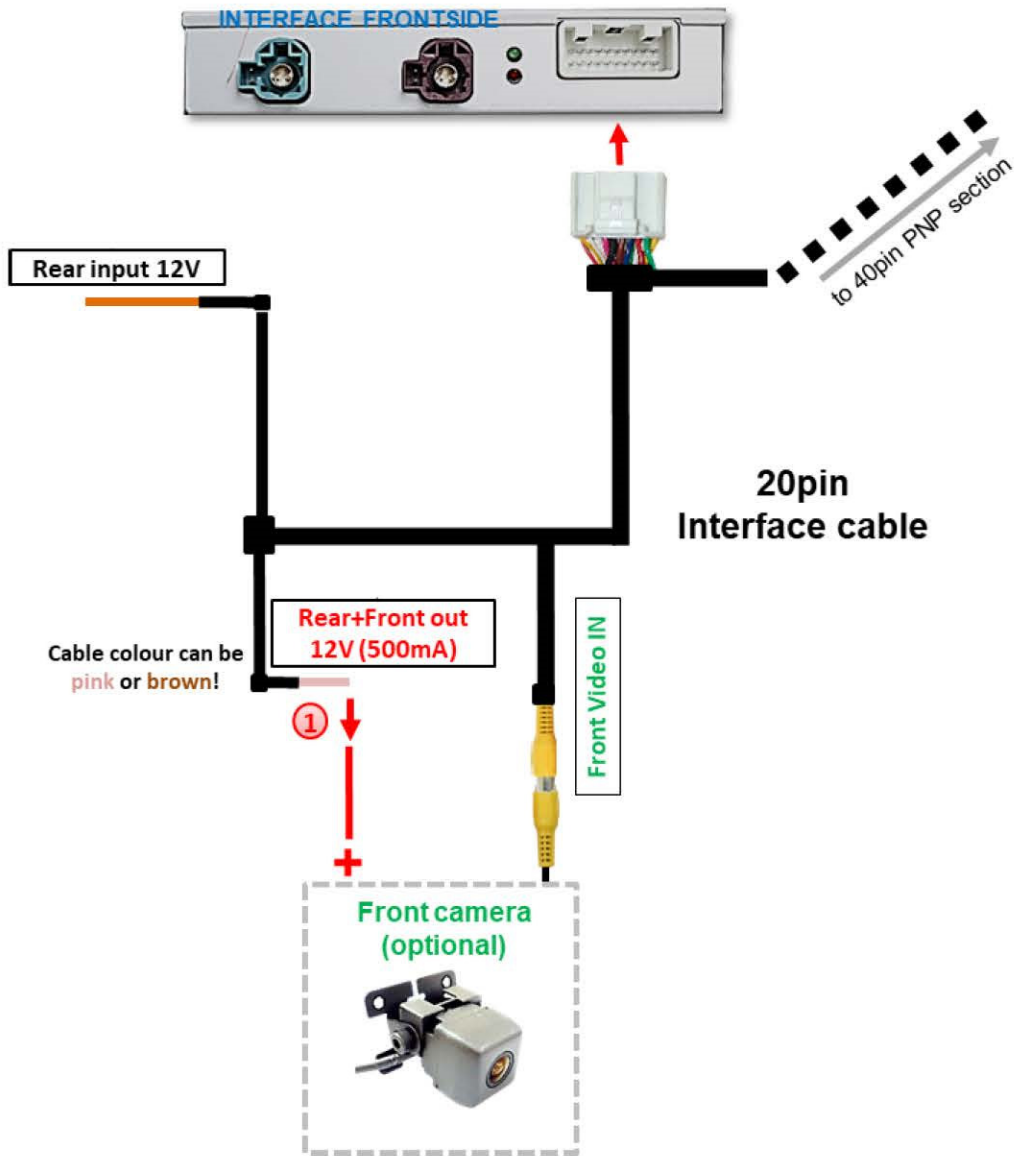
Deviating dip-switch positions must be observed!



- ① Connect 20pin interface cable’s orange input wire “Rear input 12V” to output connector (87) of relay.
- ② Connect reverse light’s power-wire to coil (85) and vehicle’s ground to coil (86) of relay.
- ③ Connect output connector (87) of relay to rear-view camera’s power wire to the orange “Rear input 12V” wire.
- ④ Connect stabile and permanent +12V to the relay’s input connector (15 or 30).

2.5.3. After-market front camera

2.5.3.1. Front cam case 1: Reverse gear signal from CAN-bus

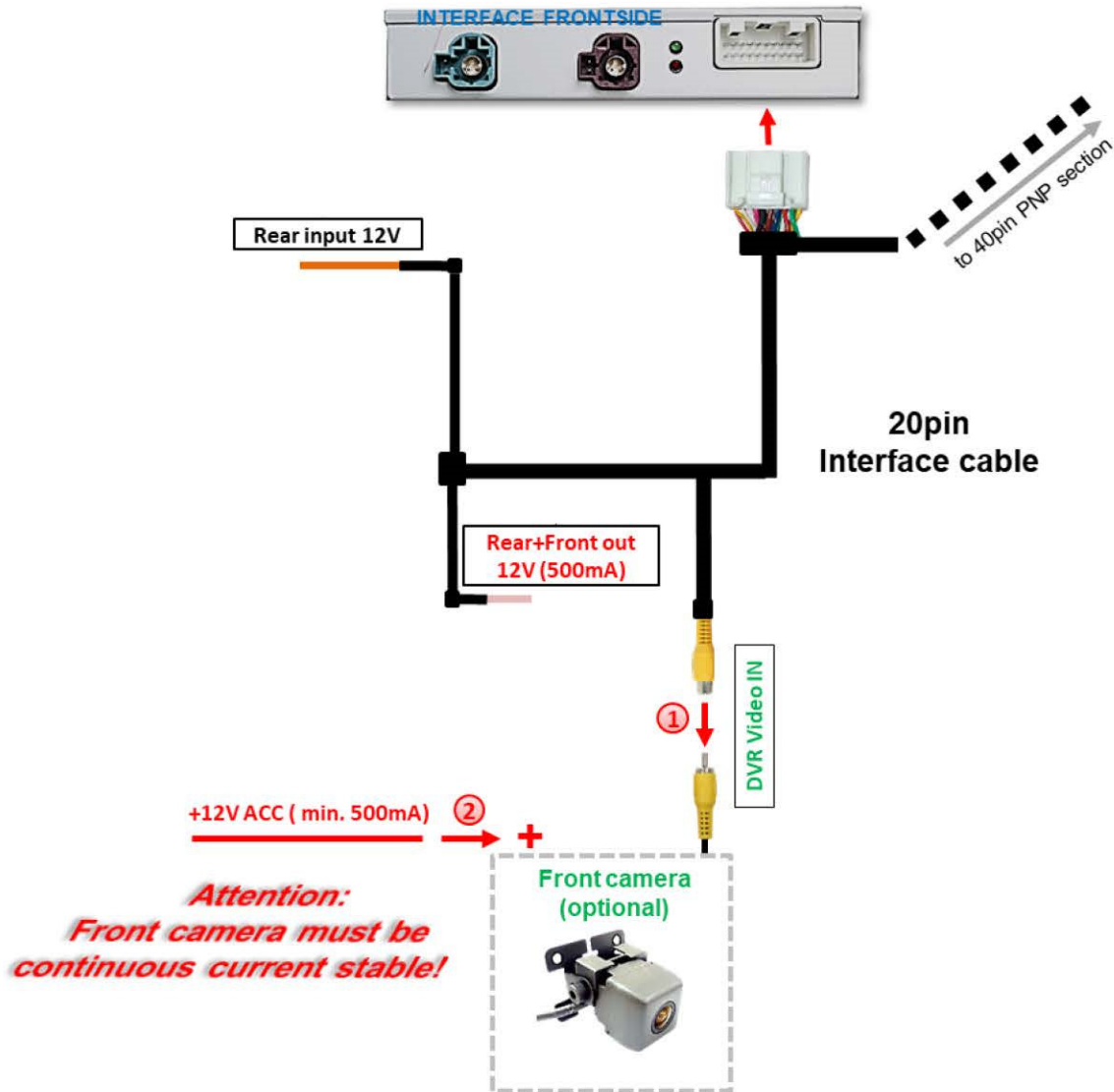


- ① The pink (or brown) wire of the 20pin interface cable „Rear+Front out“ can be used as power supply for front and rear camera. It carries +12V (max. 500mA) when the reverse gear is engaged plus 10 seconds after reverse gear is disengaged.

Note: In addition, manual switching to the front camera input is possible via the BACK button of the iDrive (long press) from any picture mode. The switchover takes place for 7 seconds, the pink (or brown) wire gives +12V, too.

2.5.3.2. Front cam case 2: Reverse gear signal analogue connection

With analogue connection of the reversing signal, the front camera input cannot be used. In this case, the front camera must be connected to the DVR video input and can only be selected manually. Furthermore, the automatic switching to the front camera after disengaging reverse gear is not possible and the wire "Rear+Front out" cannot be used as power supply.



- 1 Connect male video RCA of front camera to cinch connector "DVR Video IN" of 20-pin interface cable.
- 2 Connect power supply of front camera to +12V ACC (min. 500mA)

Note: Due to the ACC power supply, the camera must be continuously current stable to avoid damage due to overload.

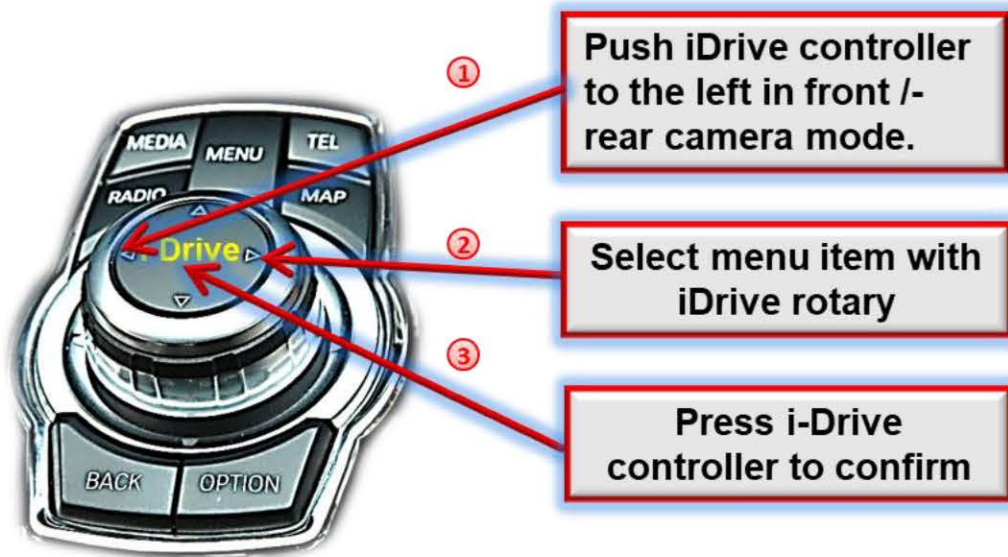
2.6. Picture settings in the menu



To enter the menu, the front or rear camera image must be shown on the display.

Note: Dip 4 must be OFF to change the picture settings!

Selecting the menu settings



- 1 Push the iDrive controller to the left. The menu picture appears on the monitor.
- 2 Select the corresponding menu item with the controller rotary.
- 3 Press the iDrive controller to confirm.

2.7. Adjusting the driving-path lines

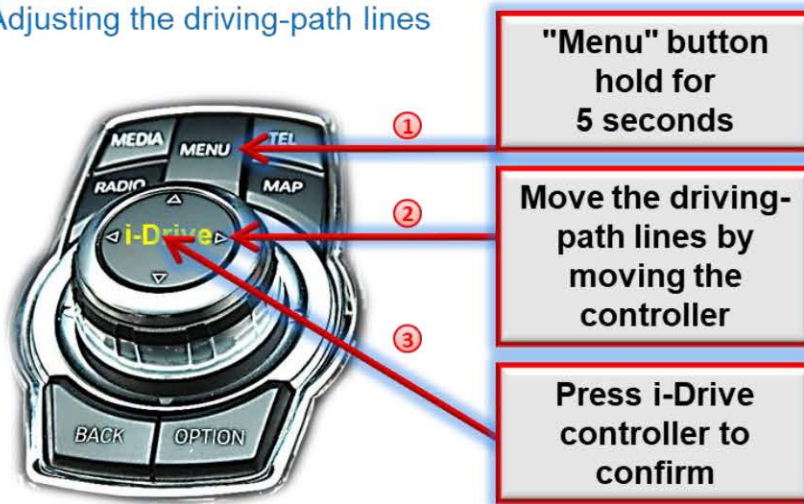


The display of the driving-path lines does not work in all vehicles. The adjustment of the driving-path lines does not work in all vehicles where the lines are displayed.

Note: During the adjustment of driving-path lines, Dip-6 must be set to **ON**. To adjust the driving-path lines, the reverse gear must be engaged. Move the steering wheel to see the changes.

2.7.1. By iDrive buttons

Adjusting the driving-path lines



While adjusting the driving-path lines, Dip-6 must be set to "ON"!



- 1 Press and hold the Menu button on the iDrive for 5 seconds.
- 2 Use the cursor keys "up"- "down"- "right"- "left" to move the driving-path lines in the corresponding direction.
- 3 Press the iDrive controller to confirm the position.

In case values cannot be changed, the system supports an automatic picture adjustment.

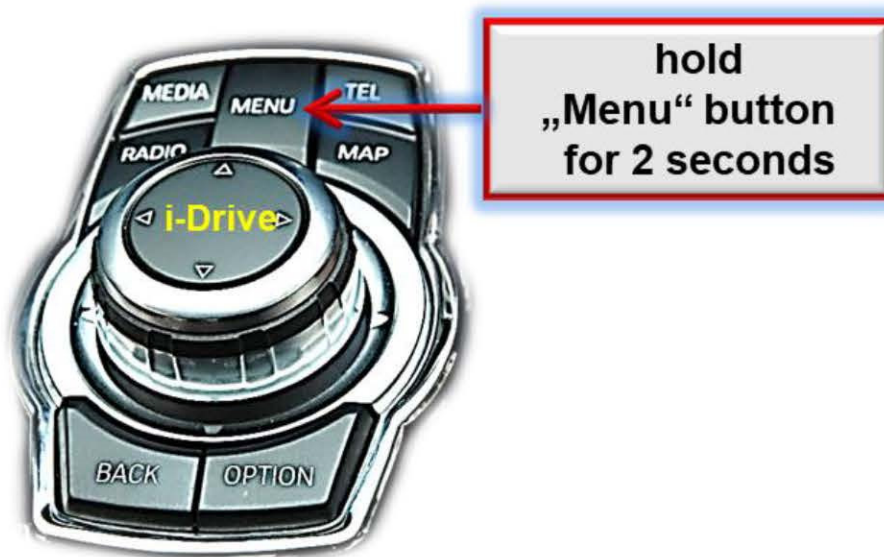
2.7.2. By touchscreen (only if supported)

For vehicles with factory touchscreen, touch the display at any point for 20 seconds. Then push the controller "up"- "down"- "right"- "left" to move the driving-path lines in the corresponding direction as required.

3. Interface operation

The factory iDrive button can be used to manually switch to an after-market video source, activated on the interface (e.g., USB-player, DVB-T2 tuner).

switching to a video source



Pressing the Menu button on the iDrive for 2 seconds, switches the input from the factory video to the video source that has been inserted in the interface. If the input is activated by dip-switch setting (dip 5 = ON and dips 6 = ON), the sequence is as follows:

Factory video → DVR Video IN 1 → factory video

Each press will switch between the factory video and the activated video source.

In addition, a long press of the "Back" button on the iDrive switches to the front camera for 7 seconds (only with R-gear detection via CAN bus!).

4. Specifications

BATT/ACC range	9V – 16V
Stand-by power drain	2mA
Power	450mA @12V
Video input formats	NTSC
Temperature range	-20°C to +70°C
Dimensions Interface box	130 x 88 x 25 mm (W x D x H)

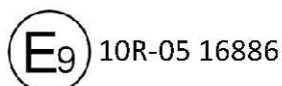
5. Technical Support

Please note that direct technical support is only available for products purchased directly from NavLinkz GmbH. For products bought from other sources, contact your vendor for technical support.

NavLinkz GmbH
distribution/tech dealer-support
Heidberghof 2
D-47495 Rheinberg

Tel +49 2843 1759500

Email mail@navlinkz.de



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