

## Video inserter

### VL7-NBT2-I3

Compatible with

## BMW i3 vehicles

with S606A Business Navigation NBT2-EVO and 6.5inch monitor  
or S609A Professional Navigation with 10.25inch monitor



example

**Video-inserter for one rear-view camera, one front camera  
and one additional video input**

#### Product features

- Video-inserter for factory-infotainment systems
- CVBS Input for one rear-view camera
- CVBS Input for one 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 the reverse gear
- Automatic switching to front camera for 10 seconds after disengaging reverse gear
- 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).

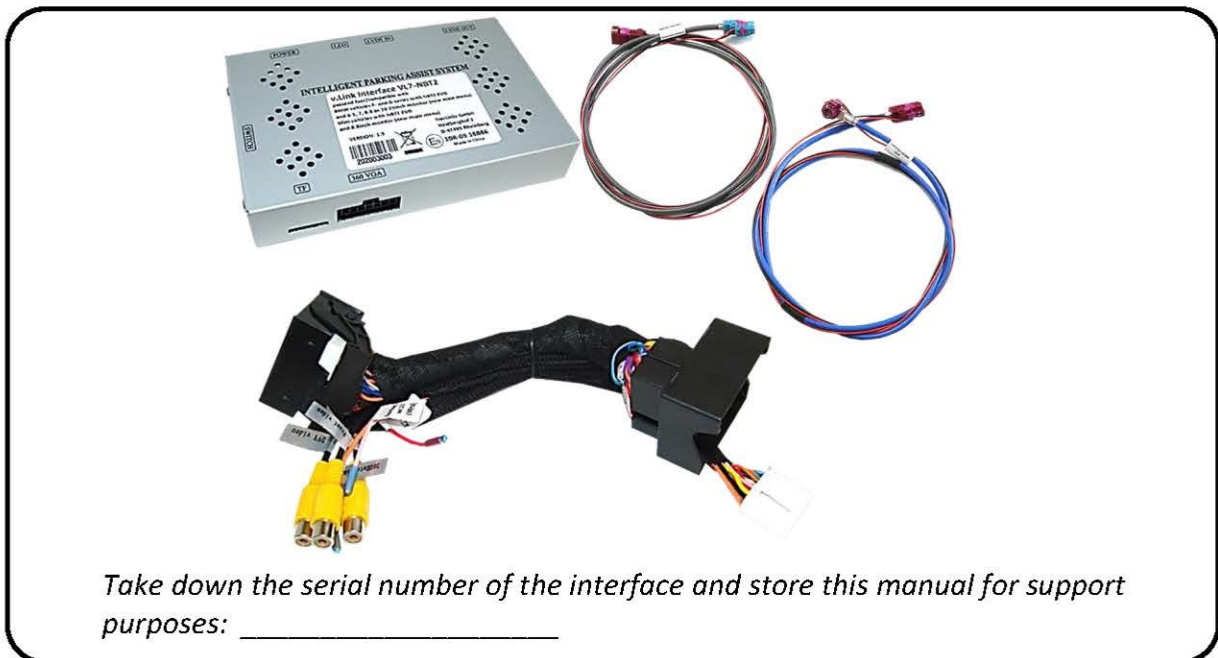
Changes/updates of the vehicle's software can cause malfunctions of the interface. Up to one year after purchase we offer free software-updates for our interfaces. To receive a free update, the interface has to be sent in at own cost. Wages for de-and reinstallation and other expenditures involved with 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
<b>BMW</b>	i3 (I01 LCI) since 11/2017	S609A Professional Navigation - NBT2 EVO with 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>
<b>BMW</b>	i3 (I01 LCI) since 11/2018	Radios, S606A Business Navigation NBT2 EVO with 6.5inch 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>

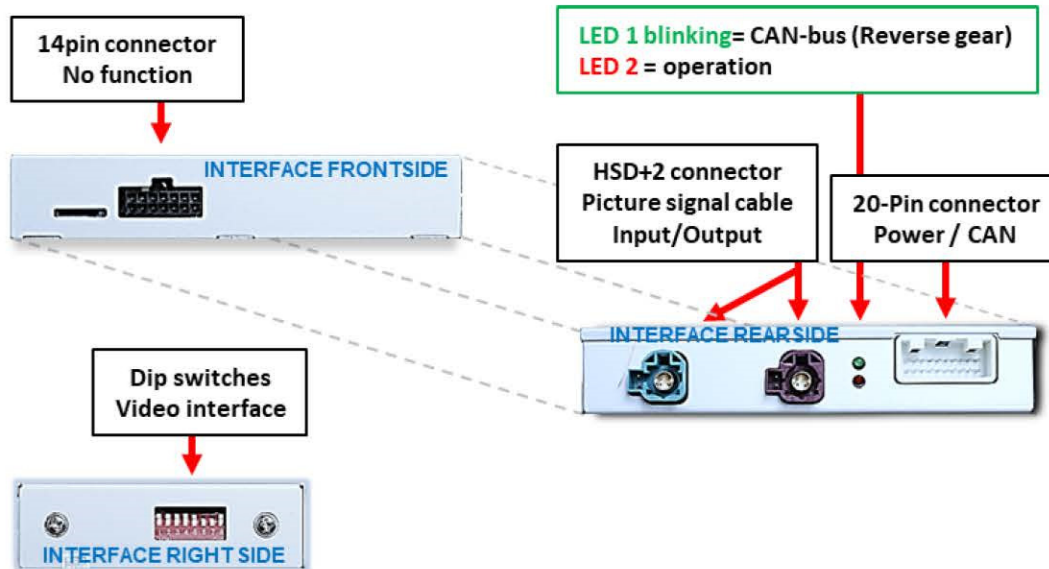
### Limitations

<i>Video only</i>	The 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>	The front camera will automatically be switched for 10 seconds after disengaging the reverse gear. A manually front camera switching is also possible for 7 seconds.
<i>Dynamic guidelines</i>	Displayed dynamic guidelines are not available in all vehicles.
<i>Factory PDC display</i>	The factory PDC display does not work in all vehicles.
<i>Image formats</i>	On 10.25inch monitors, the image formats of the inserted video sources will only be displayed in full screen (stretched)!
<i>Video input signal</i>	Only NTSC video sources compatible.



## 1.3. Connectors – video interface

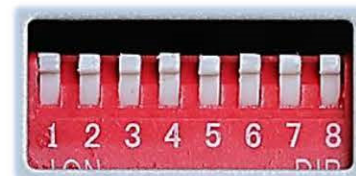
The video-interface converts the video signals of connected after-market sources in a factory monitor compatible picture signal which is inserted in the factory monitor, by using separate trigger options. Further it reads the vehicle's digital signals out of the vehicle's CAN-bus and converts them for 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 - dips1-3

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

vehicle - and monitor selection	Dip-1	DIP-2	Dip-3
i3 with 10.25inch monitor	ON ↓	ON ↓	ON ↓
i3 with 6.5inch monitor	OFF ↓	OFF ↑	ON ↓

If the above mentioned switch positions of Dip1-Dip3 generate system errors or do not show a satisfying picture (no picture, black picture, incorrect picture size) please also try all other combinations of the 3 Dip switches!

## 1.4.2. Settings – dips4-8

Dip switches for switching functions, (dip4 to dip8)

Dip	Function	ON ↓	OFF ↑
4	Factory PDC for after-market rear-view camera	disabled*	enabled
5	Video in (setting 1)	enabled	disabled
6	Video in (setting 2)	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** (bottom).

\*\*The front camera will automatically be switched for 10 seconds after disengaging the reverse gear.

### 1.4.2.1. Deviating dip-switch combinations for manual switching to after-market camera (not via CAN-BUS)

Dip-switches	Dip-4	DIP-8
Manually activated by orange wire*	OFF ↑	ON ↓

\* In this case the factory PDC display cannot be deactivated

See the following chapters for detailed information.

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

## 1.4.3. Explanation of the individual dipswitch functions

### 1.4.3.1. Vehicle and monitor selection (Dip1-3)

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

### 1.4.3.2. Activating the factory PDC display (Dip-4)

Dip 4 is used to activate the factory PDC display (if available) when retrofitting an after-market rear view camera. When Dip switch is set to **OFF**, the factory PDC display is shown on the right side of the display. With Dip switch position **ON**, the factory PDC display is not shown.

**Exceptional case:** A manual switching to an after-market camera (by orange cable) only works with the following combination of dip-4 and dip-8:

**Dip-4 switch position = OFF / Dip-8 switch position = ON**

**In this case the factory PDC display cannot be deactivated!**



**Before installing the interface, the factory PDC display must be activated and visible in the middle of the screen!**

**Note:** If a factory rear view camera is installed, Dip 4 must be set to ON (bottom).

**Note:** If there is no communication between interface and the vehicle's CAN-bus (several vehicles aren't compatible), the PDC can't be shown during the vehicle's operation!

### 1.4.3.3. Activating the video input (Dip 5+6)

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

Dip	Function	ON ↓	OFF ↑
5	Video in (setting 1)	enabled	disabled
6	Video in (setting 2)	enabled	disabled

### 1.4.3.4. Activating the front camera input (Dip 7)

Dip 7 is used to activate the front camera input. With Dip switch position **ON**, the interface switches from the rear camera to the front camera input for 10 seconds after the reverse gear has been engaged.

Dip-switch position **OFF** deactivates the front camera input.

## 1.4.3.5. Rear-view camera settings (Dip 8)

Dip 8 is used to set the type of rear view camera. Dip switch position **ON** switches the interface to factory picture of an existing factory rear view camera as long as reverse gear is engaged.

Dip switch position **OFF** switches the interface to the rear view camera input as long as reverse gear is engaged.

**Exceptional case:** A manual switching to an after-market camera (by orange cable) only works with the following combination of dip-4 and dip-8:

**Dip-4 switch position = OFF / Dip-8 switch position = ON**

**In this case the factory PDC display cannot be deactivated!**

**Note:** 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.

## 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.**

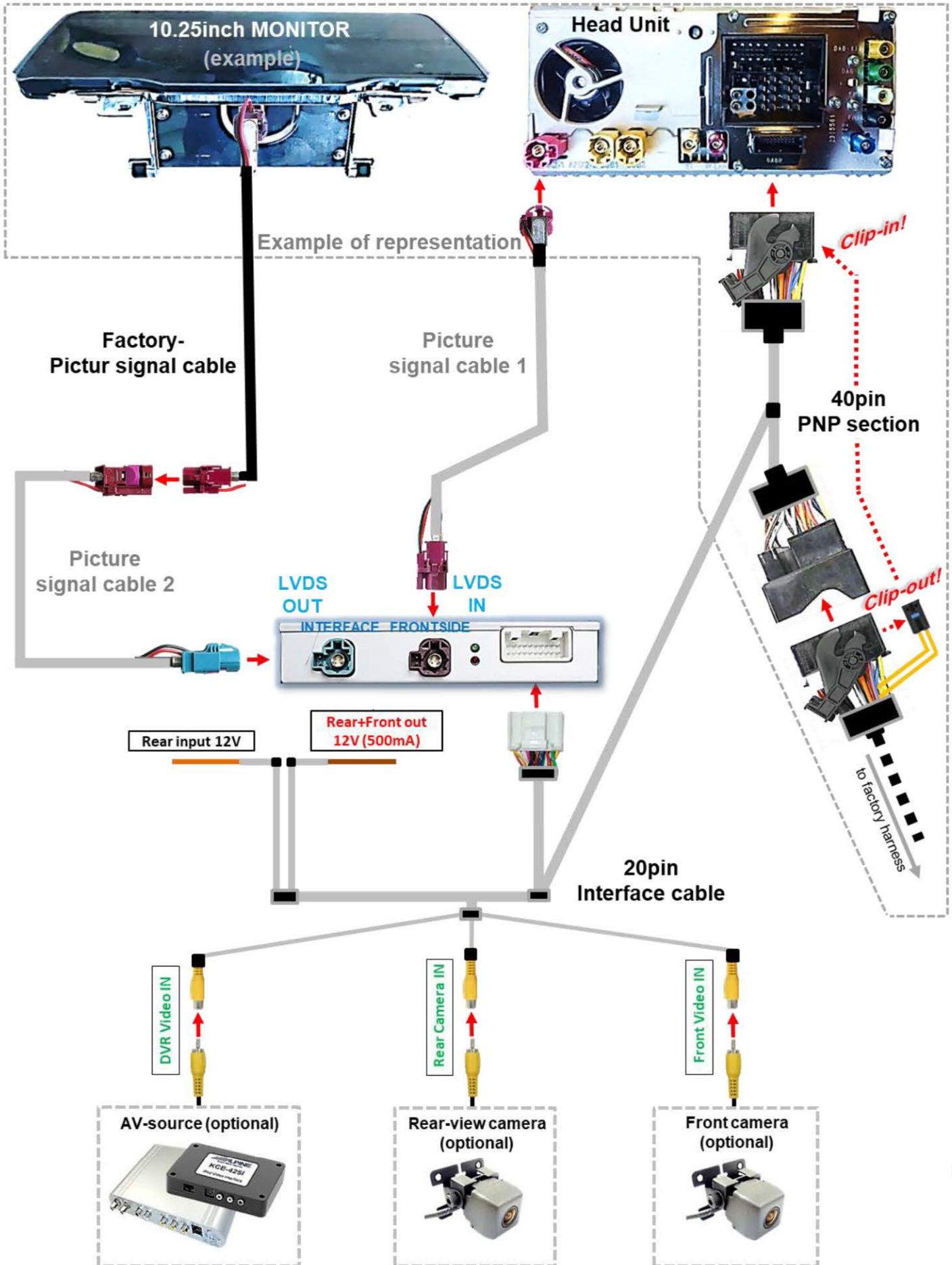
### 2.1. Place of connection

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

In BMW i3 the head-unit is located in the rear of the vehicle under the rear-seat.

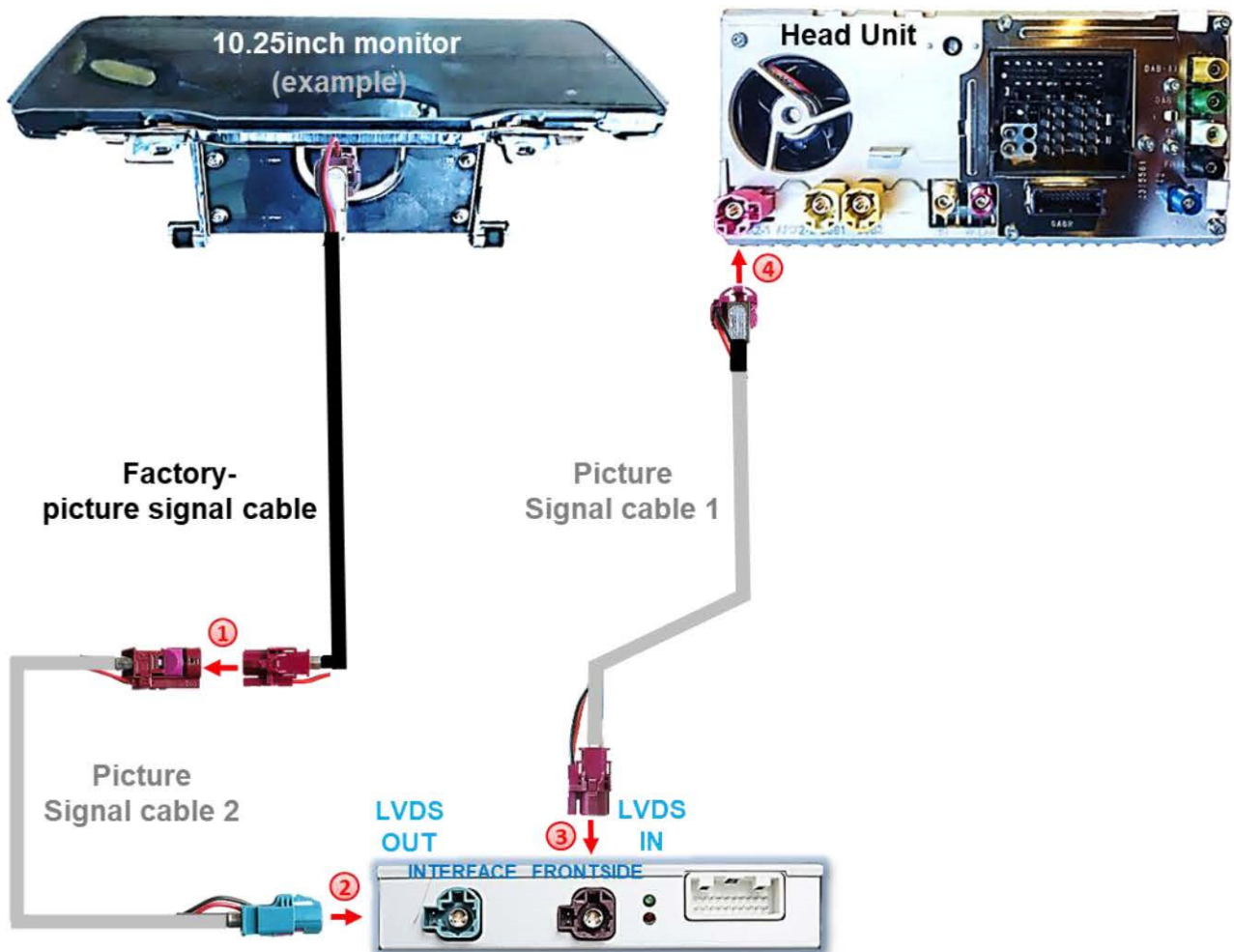


## 2.2. Connection schema



## 2.3. Connections to factory head-unit and monitor

### 2.3.1. Connection - picture signal cable



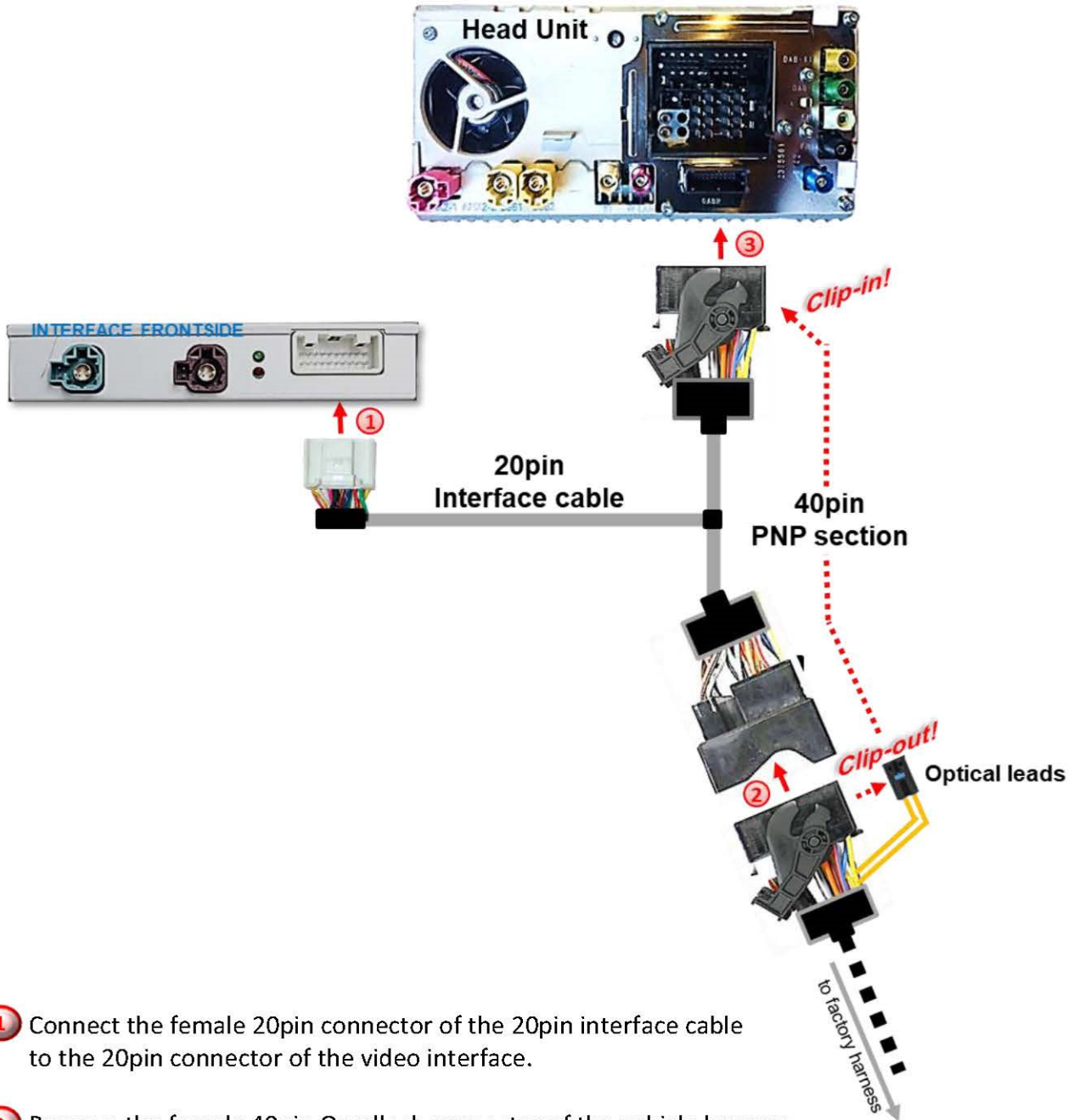
- 1 Disconnect the factory picture signal cable's bordeaux coloured female HSD+2 connector from the rear-side of the head-unit and connect it to the male bordeaux coloured HSD+2 connector of the enclosed picture signal cable 2.
- 2 Connect the opposite female waterblue coloured HSD+2 connector of the enclosed picture signal cable 2 to the male waterblue coloured HSD +2 connector „LVDS OUT“ of the video interface.
- 3 Connect the straight female bordeaux coloured HSD+2 connector of the enclosed picture signal cable 1 to the bordeaux coloured male HSD+2 connector „LVDS IN“ of the video interface.
- 4 Connect the opposite female bordeaux coloured HSD+2 connector to the previously become free male HSD+2 connector at the head-unit's rear side.



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

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

## 2.4. Connection – Quadlock/CAN



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



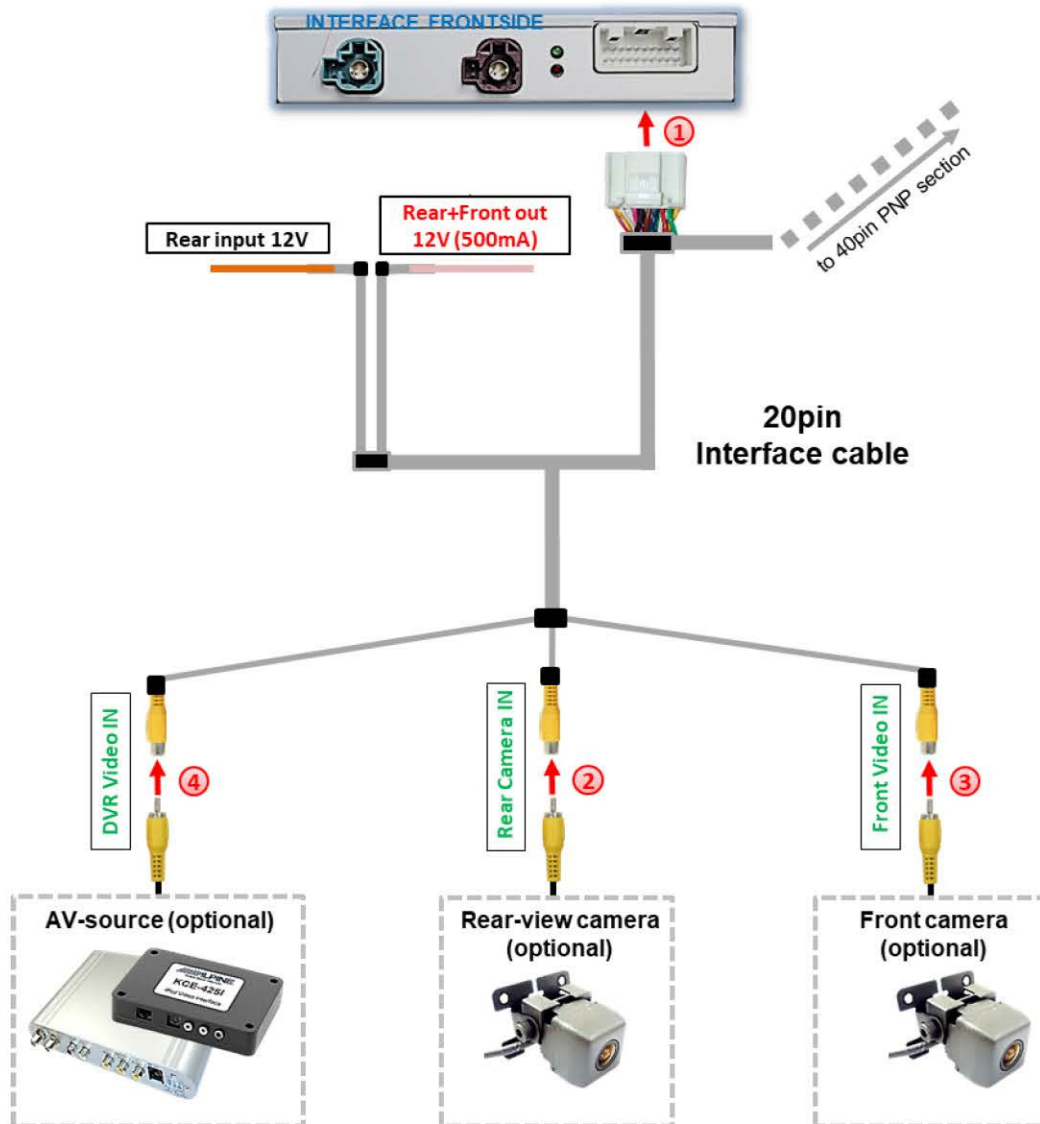
**Attention:** If the factory Quadlock connector is equipped with optical leads, these must be clipped out there and transferred to the female 40-pin Quadlock connector of the 40-pin PNP section!



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

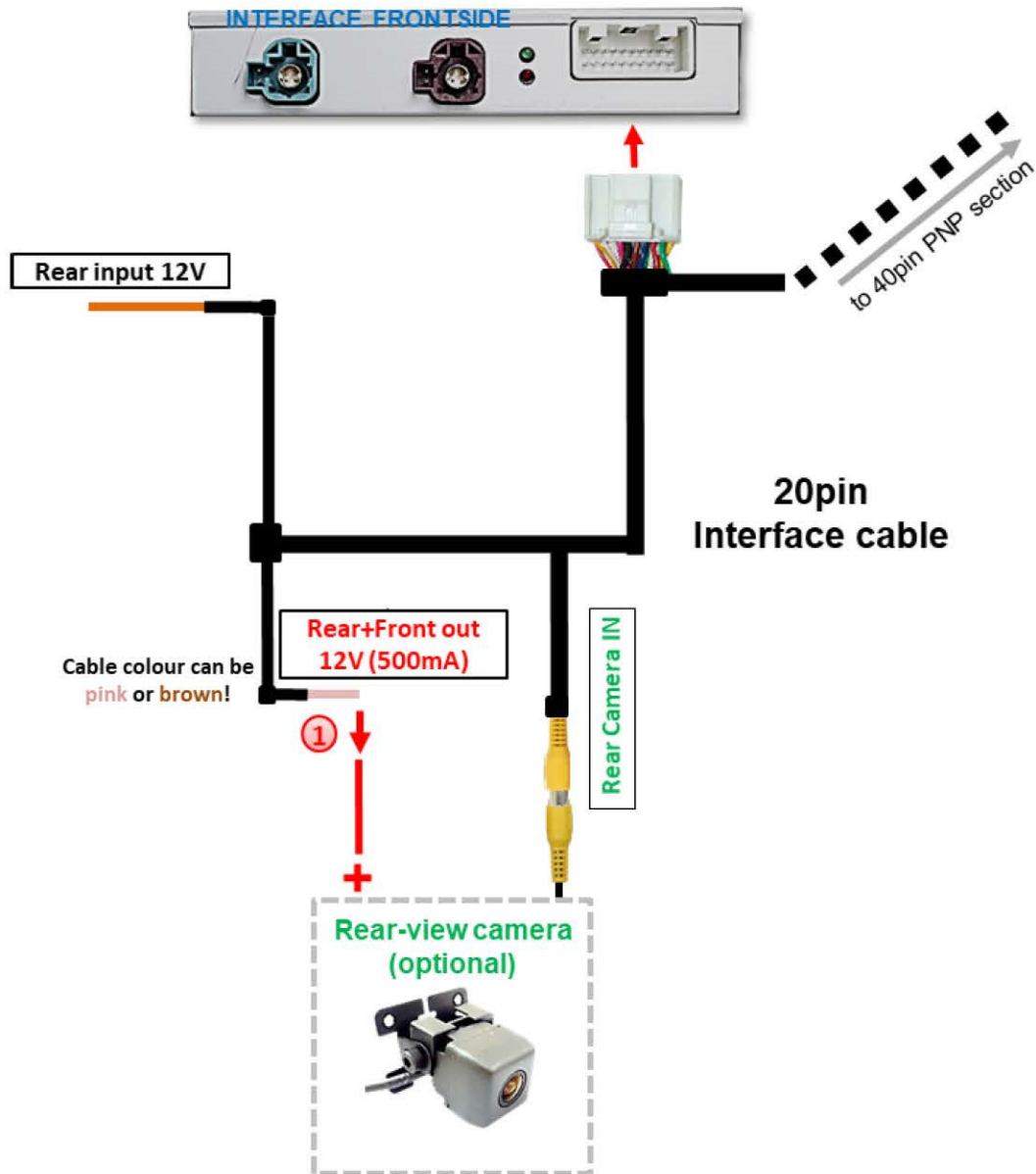
## 2.5.2. After-market rear-view camera

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. Below are the two different ways to install it.

## 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.

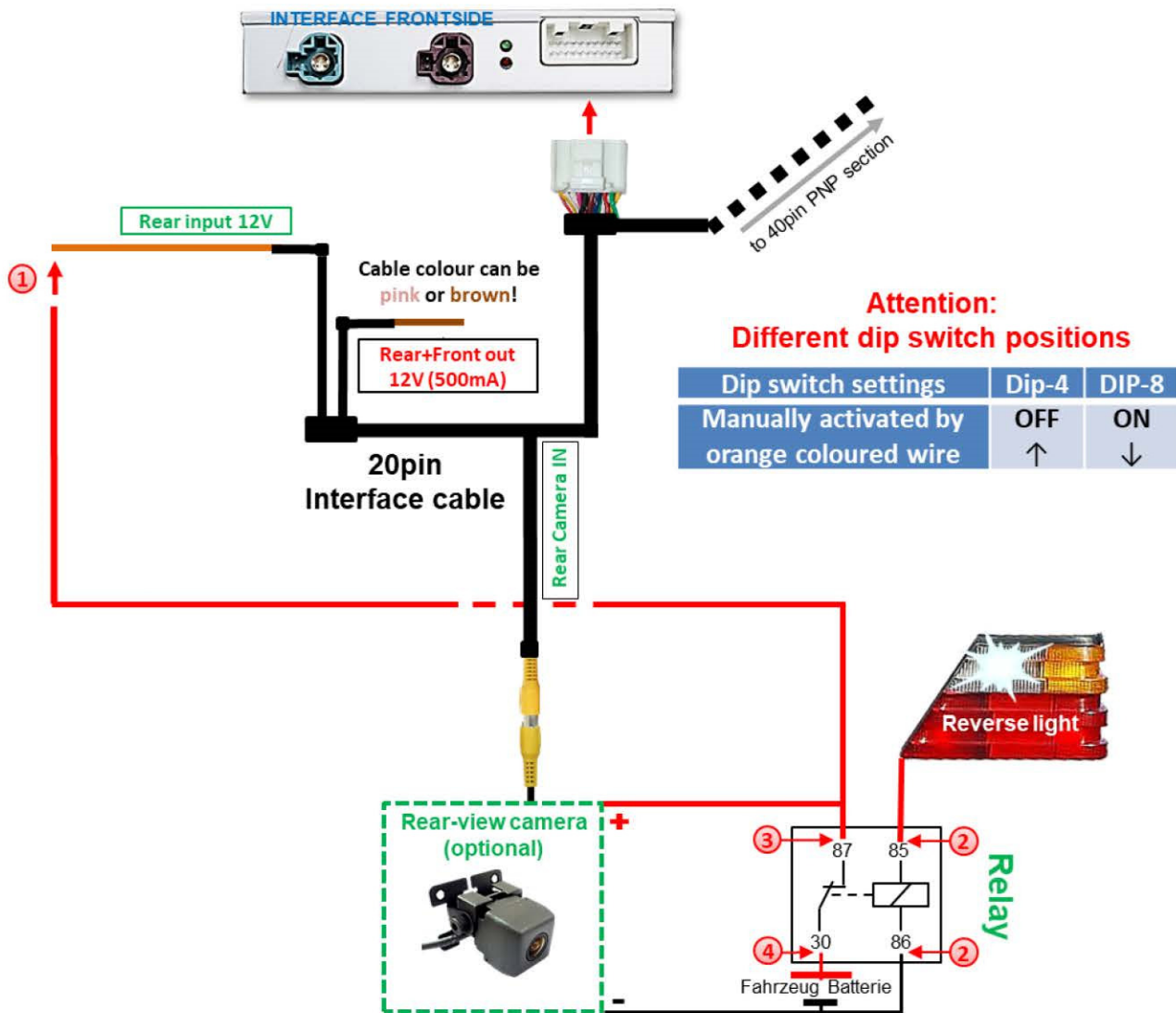


- 1 The pink (or brown) wire of the 20-pin interface cable „Rear+Front out“ can be used as power supply for front and rear-view camera. It carries +12V (max. 500mA) when reverse gear is engaged with additional 10 seconds after reverse gear is disengaged.

## 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.

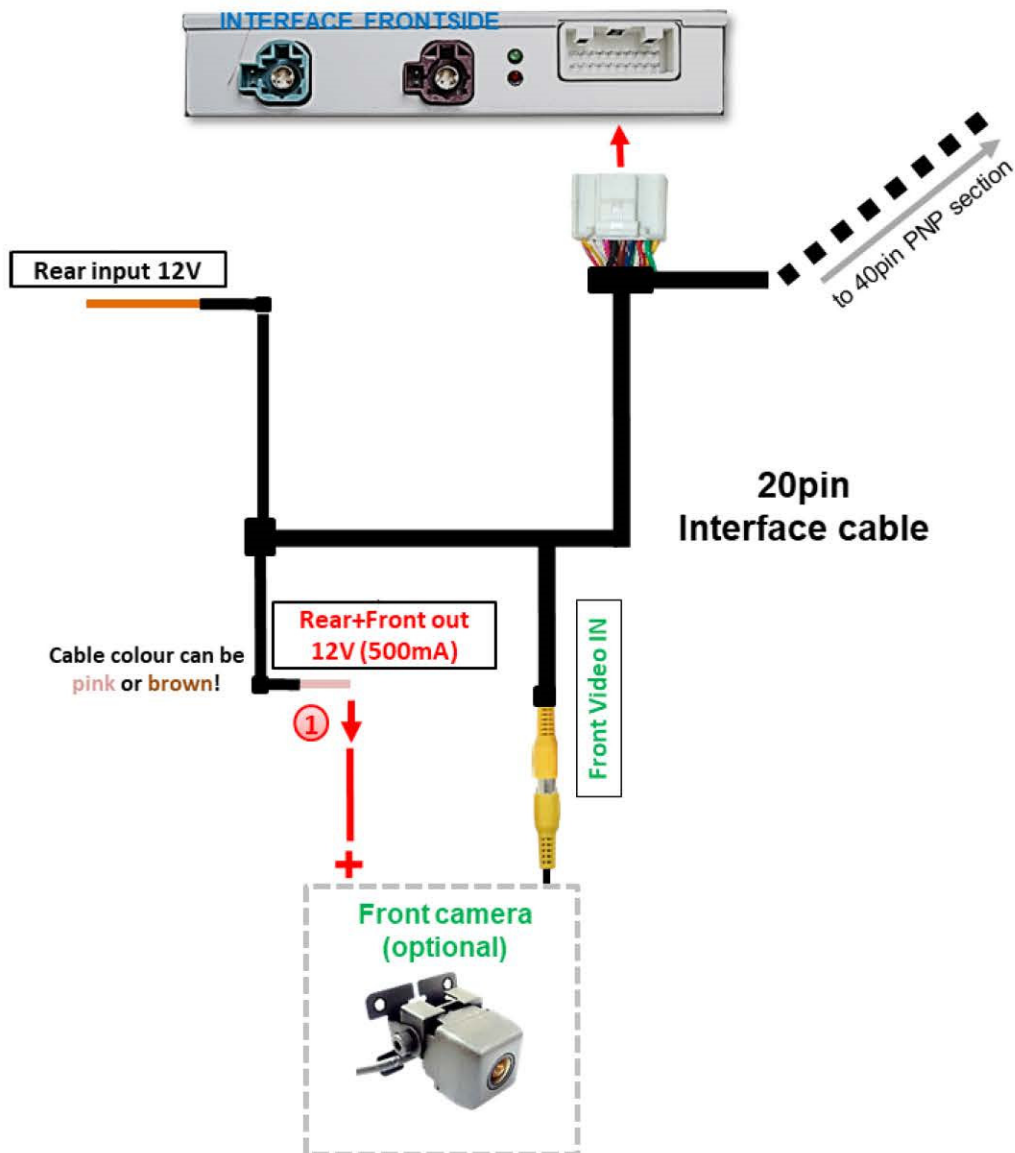
**Deviating dip-switch positions must be observed!**



- 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



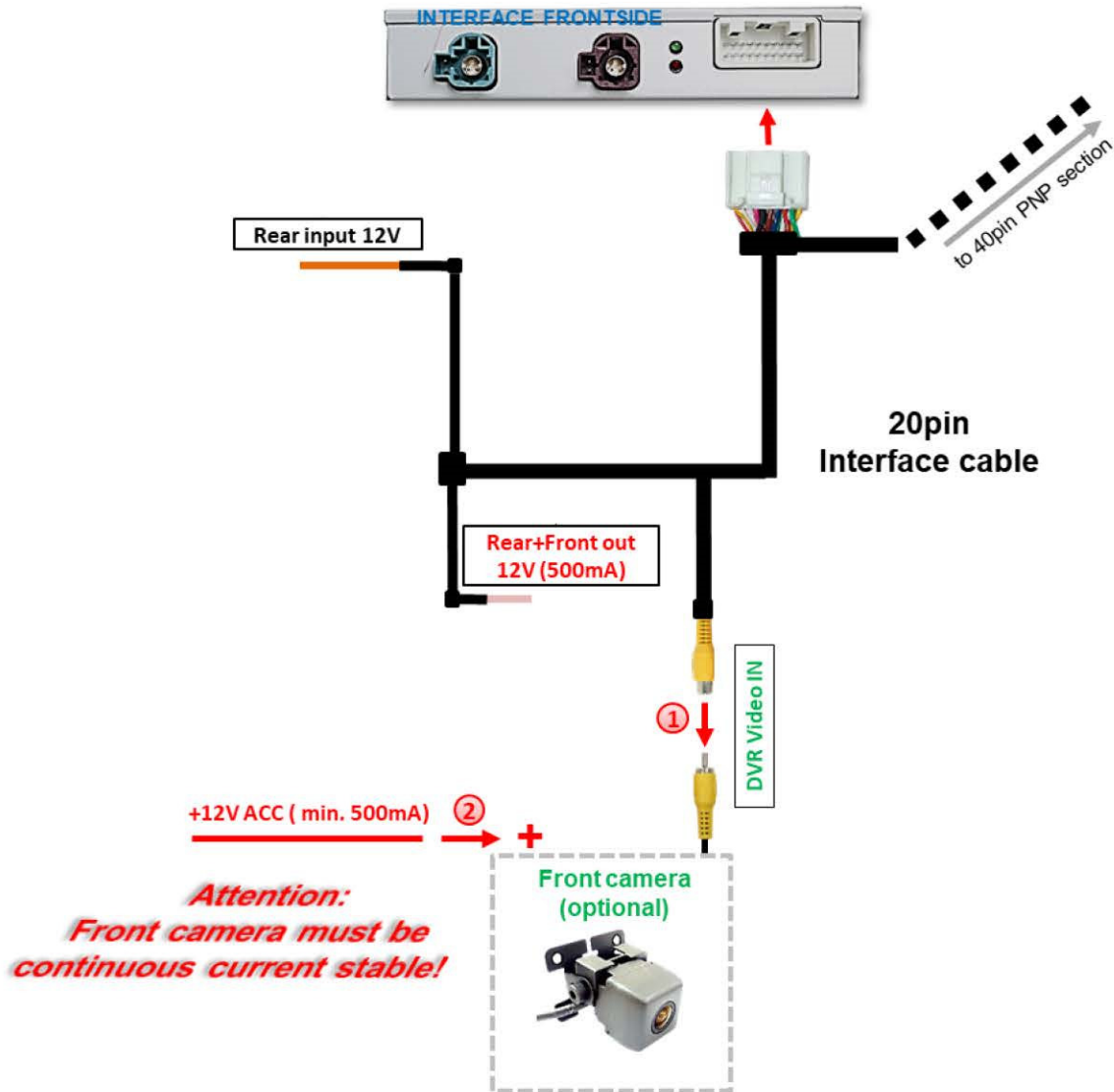
- 1 The pink (or brown) wire of the 20pin interface cable „Rear+Front out“ can be used as power supply for front and rear camera. It carries +12V (max. 500mA) when the reverse gear is engaged plus 10 seconds after reverse gear is disengaged.

**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 rear camera image must be shown on the display.

### Selecting the menu settings



- 1 Press the cursor to the left. The menu picture appears on the monitor.
- 2 Select the corresponding menu item with the cursor wheel.
- 3 Press the I-Drive button to confirm.

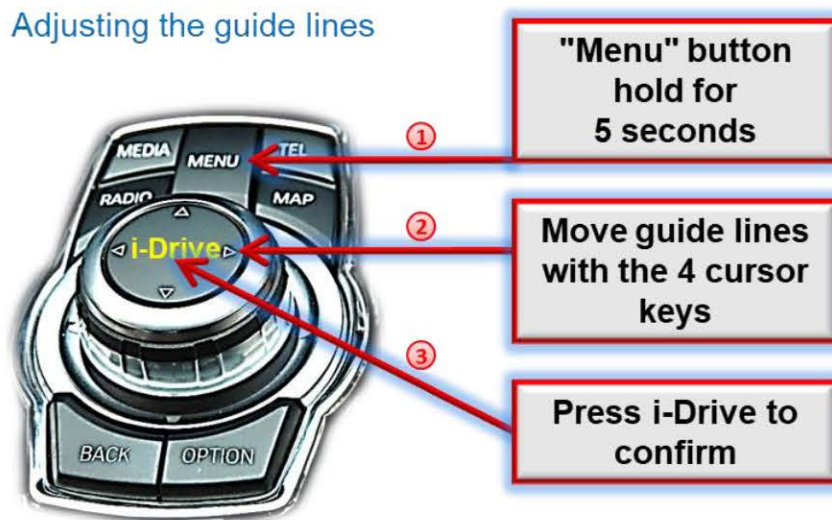
## 2.6. Adjusting the dynamic guide lines



The display of the dynamic guide lines does not work in all vehicles. The adjustment of the dynamic guide lines does not work in all vehicles where the lines are displayed.

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

### 2.6.1. By i-Drive buttons



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

- 1 Press and hold the Menu button on the i-drive for 5 seconds.
- 2 Use the cursor keys "up"- "down"- "right"- "left" to move the guide lines in the corresponding direction.
- 3 Press the i-Drive button to confirm the position.

In case of unchangeable values, the system supports an automatic picture adjustment.

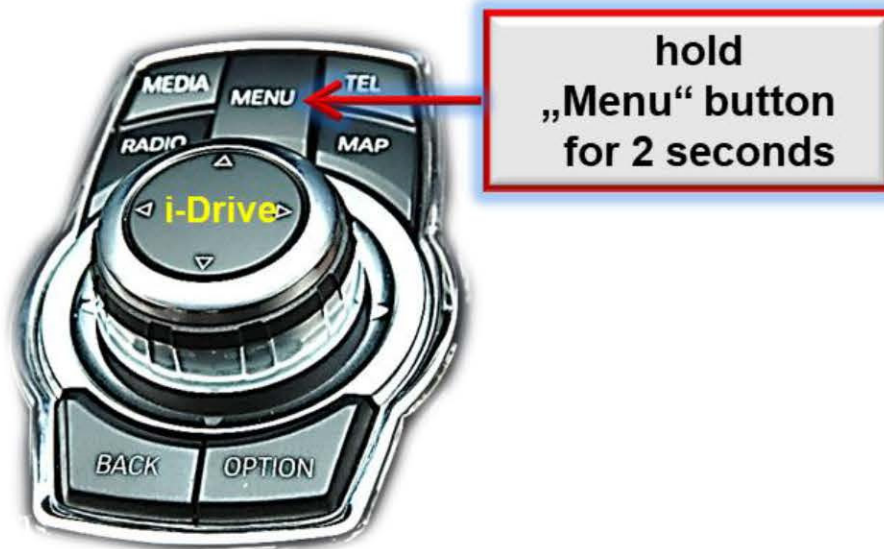
### 2.6.2. By touchscreen (only if supported)

For vehicles with factory touchscreen, touch the display at any point for 20 seconds. Then use the 4 arrow keys "up"- "down"- "right"- "left" to move the guide lines in the corresponding direction as required.

## 3. Interface operation

The factory i-Drive 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 i-Drive 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 dip6 = ON), the sequence is as follows:

*Factory video → Video IN 1 → factory video*

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



## 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)

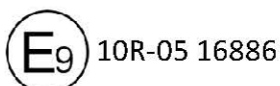
## 5. Technical Support

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.

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