

## Video inserter

### VL7-RTI11-7

Compatible with

### Volvo vehicles

with **RTI 2011** infotainment and 7 inch monitor



example

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

#### Product features

- Video-inserter for factory-infotainment systems
- 1 CVBS rear-view camera video-input
- 1 CVBS video-input for after-market devices (e.g. USB-Player, DVB-T2 tuner, ...)
- Automatic switching to rear-view camera input on engagement of the reverse gear
- Dynamic parking guide lines for rear-view camera (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).

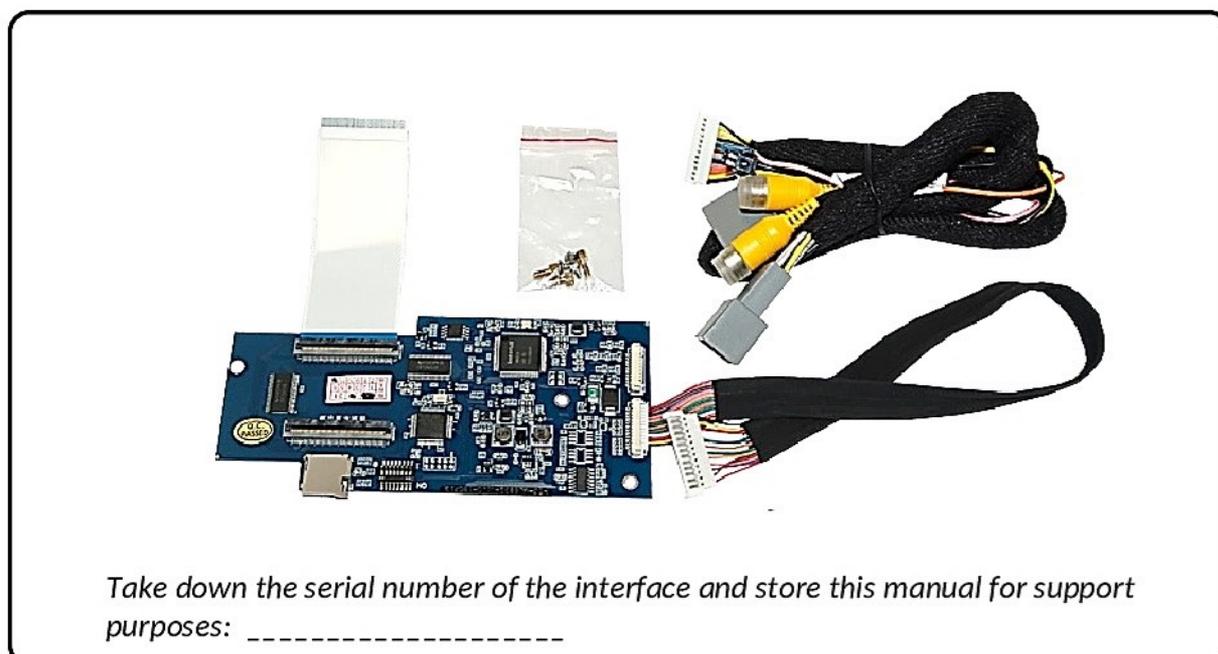
Changes/updates of the vehicle's software can cause malfunctions of the interface. Up to one year after purchase we offer free software-updates for our interfaces. To receive a free update, the interface has to be sent in at own cost. Wages for de-and reinstallation and other expenditures involved with 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

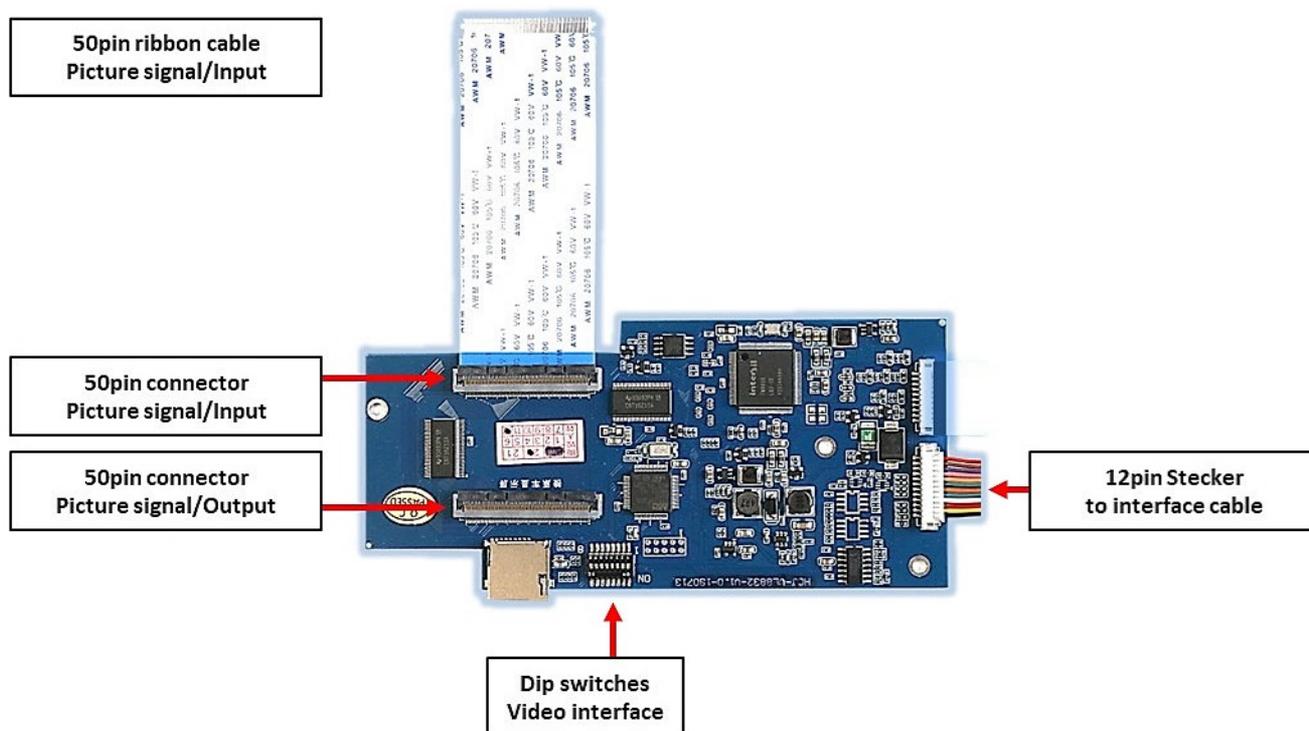
Requirements		
Brand	Compatible vehicles	Compatible systems
<b>VOLVO</b>	Vehicles since model year 2011	RTI 2011 infotainment with 7inch monitor and infotainment without internet button

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>	Automatically switching-back from inserted video to factory rear-view camera is only possible while the reverse gear is engaged (no delay of the switching possible). 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>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>Video input signal</i>	Only NTSC video sources compatible.

## 1.3. Connectors - daughter PCB

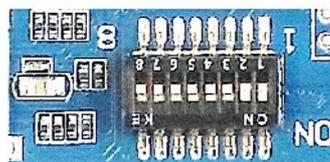
The video-interface converts the video signals of connected after-market sources in a factory monitor compatible picture signal which is inserted in the factory monitor, by using separate trigger options. Further it reads the vehicle's digital signals out of the vehicle's CAN-bus and converts them for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



## 1.4. Settings of the 8 Dip switches

Some settings have to be selected by the dip-switches of the daughter PCB.

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



**After each Dip-switch-change a power-reset has to be performed!**



**Attention: Before reclosing the monitor, all functions must be tested after the connection, otherwise the dip switches are no longer accessible!**

## 1.4.1. Settings - dips1-3

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

If	vehicle selection	Dip-1	DIP-2	Dip-3
	V60/S60L 2011-2014, XC60 2013-2014	OFF ↑	OFF ↑	OFF ↑
	V40/S40 2011-2014	ON ↓	ON ↓	OFF ↑
	S80L 2011-2014 XC60 2011-2012	OFF ↑	OFF ↑	ON ↓

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	Moving guide-lines	disabled	enabled
6	No function		set to OFF
7	Video input	enabled	disabled
8	Rear-view camera activation	analogue	CAN-Bus

See the following chapters for detailed information.

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



**Attention: Before reclosing the monitor, all functions must be tested after the connection, otherwise the dip switches are no longer accessible!**

## 1.4.3. Explanation of the individual dipswitch functions

### 1.4.3.1. Vehicle 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.

### 1.4.3.3. Activating the moving guide-lines (Dip 5)

Dip switch 5 activates the moving guide-lines. To show the guidelines, the camera picture must be shown on the monitor display.

### 1.4.3.4. Activating the video input (Dip 7)

Dip 7 is used to activate the front camera input:

- Dip switch position **ON** activates the input.
- Dip-switch position **OFF** deactivates the input.

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

Dip 8 is used to select the rear view camera activation:

- Dip switch position **ON** is used for analogue activation (via orange cable) as long as reverse gear is engaged.
- Dip switch position **OFF** is used for activation via CAN bus as long as reverse gear is engaged.

Dip6 is out of function and has to be set to OFF.

**Note:** Automatic switching to the factory rear-view camera may 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.**

**If the necessary stabilized power supply for the interface is not taken directly from the battery, the chosen connection has to be checked for being constantly stable.**

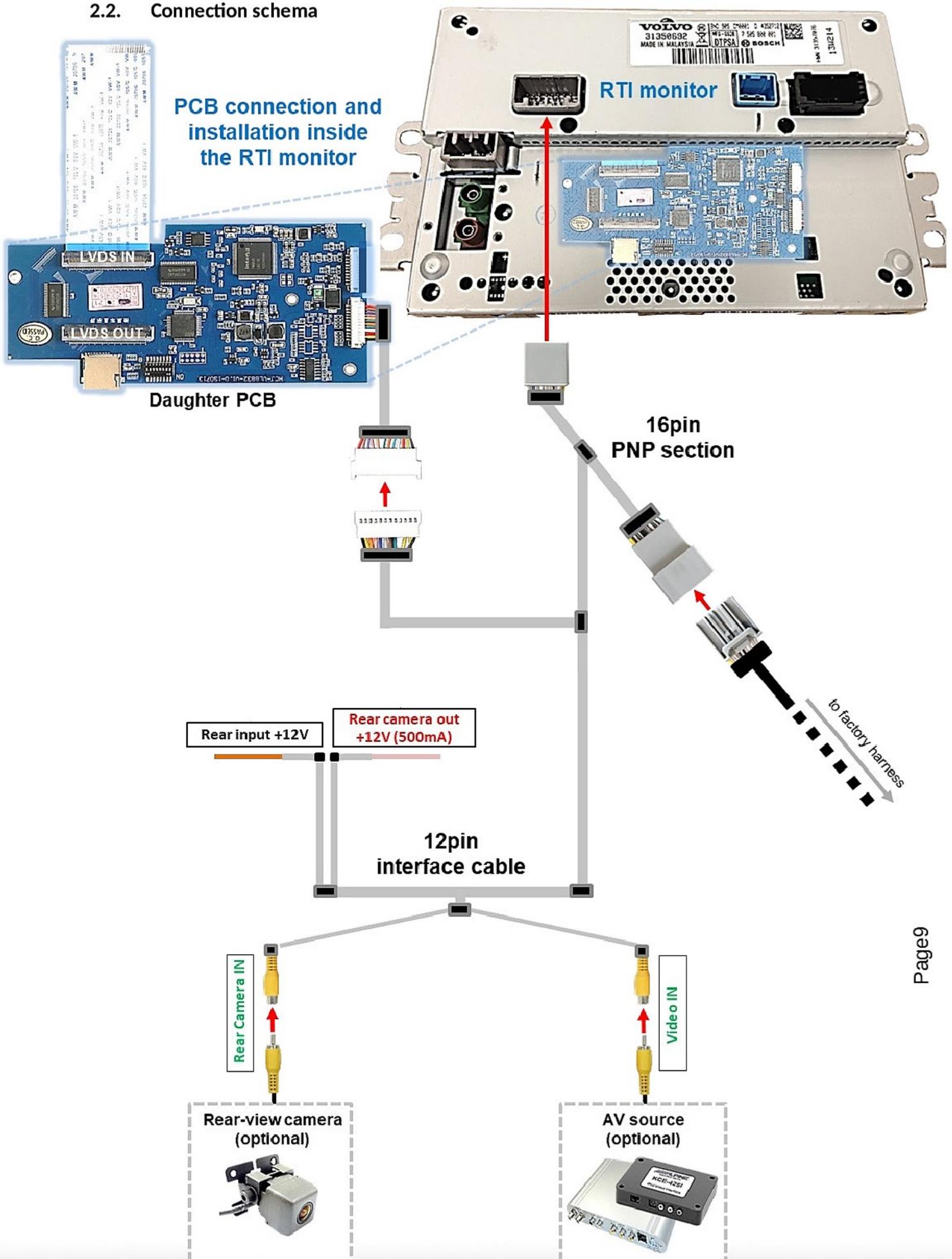
**The interface needs a permanent 12V source!**

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

### 2.1. Place of installation

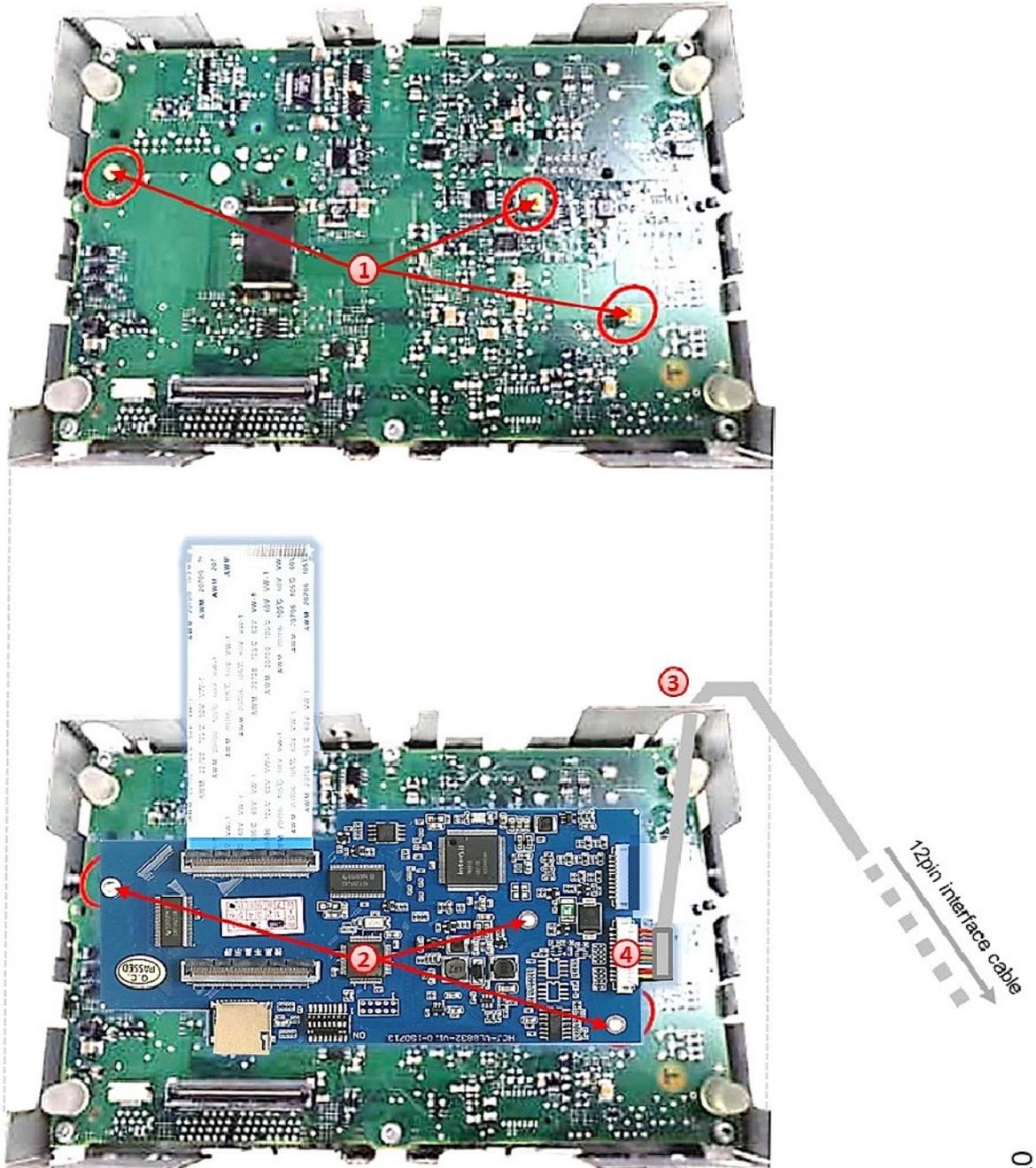
The daughter PCB has been prepared to be installed inside the factory monitor housing.

## 2.2. Connection schema



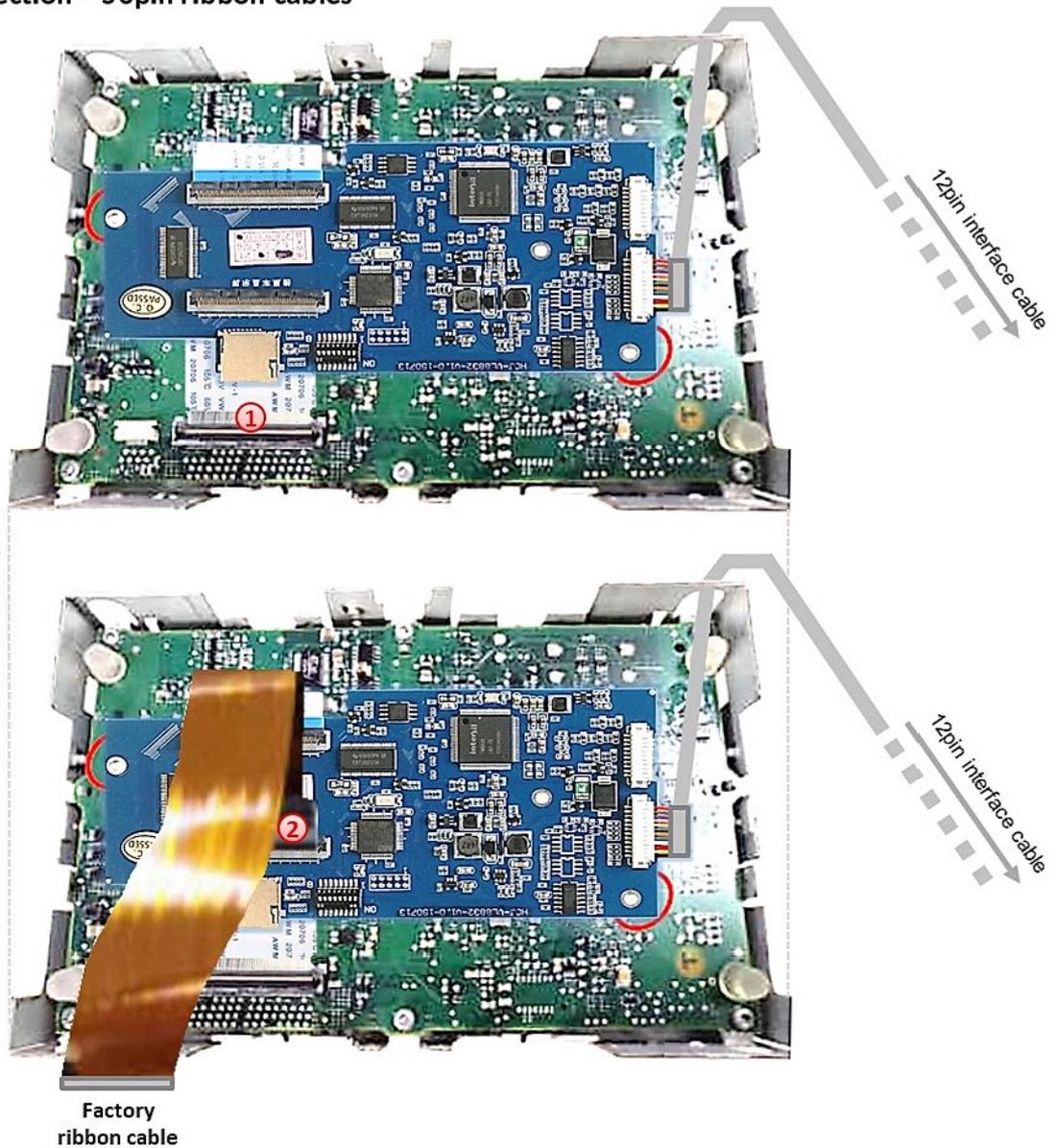
## 2.3. Installation - Daughter PCB

Bend open the side tabs on the monitor housing and open the housing.



- 1 Unscrew the three original screws of the factory mainboard and replace them with the three enclosed brass spacers.
- 2 Position the daughter PCB with its holes on the factory mainboard and fix it to the previously mounted brass spacers, using the supplied Phillips screws.
- 3 Lead the 12pin female connector of the 12pin interface cable through the corresponding housing opening, as shown in the picture.
- 4 Connect the female 12pin socket of the 12pin interface cable to the male 12-pin connector of the daughter PCB.

## 2.3.1. Connection - 50pin ribbon cables

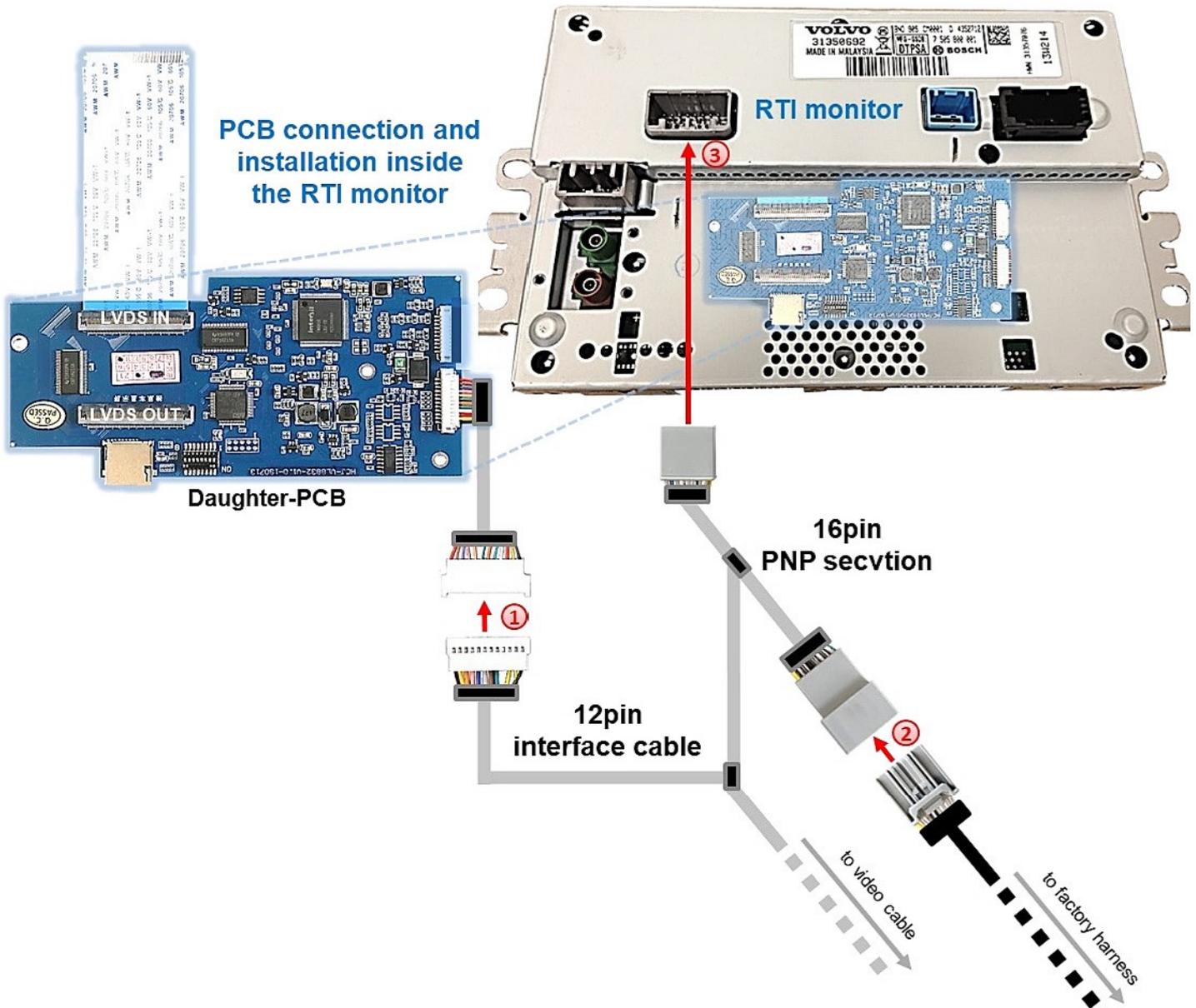


- 1 Pass the pre-connected 50pin ribbon cable of the daughter PCB under the installed daughter PCB and connect it to the ribbon cable base of the factory mainboard, after previously having disconnected the copper-coloured 50pin factory ribbon cable there.
- 2 Connect the previously disconnected copper-coloured 50-pin factory ribbon cable to the free ribbon cable base of the daughter PCB and lock the closure.

## 2.3.2. Warning notes, concerning the installation of ribbon cables:

- 1) The contacting ends of ribbon cables always have to be installed in a straight and precise 180° position to the connector. Each deviation from a perfect contact position will cause faulty contact and even danger of short circuit
- 2) The ribbon cable's contacting side always has to correspond to the contacting side of the connector, concerning the mounting position.
- 3) Avoid cable contusion or cable injury caused by sharp-edged metal.

## 2.4. Connection - 16pin PNP section

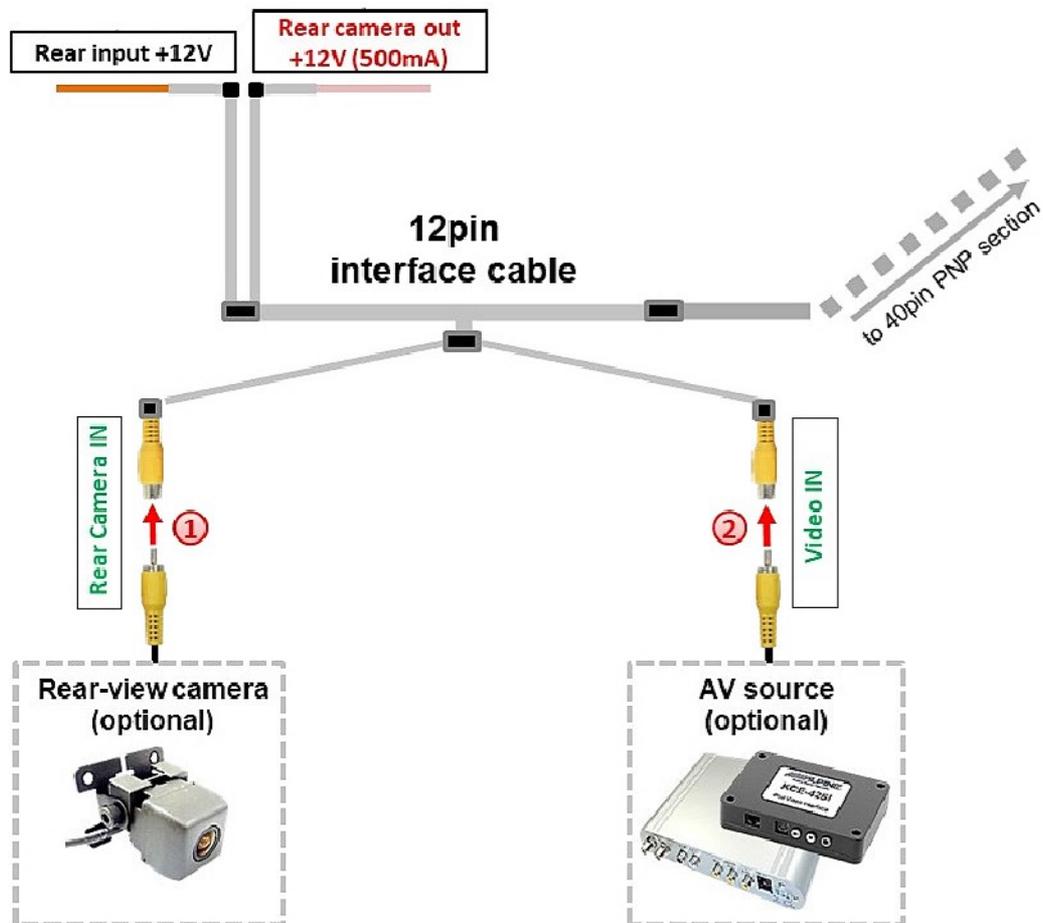


- 1 Connect the female 12pin connector of the 12pin interface cable to the male 12pin connector of the picture signal cable which is pre-connected at the daughter PCB.
- 2 Disconnect the female 16pin connector of the vehicle harness at the rear-side of the monitor housing and connect it to the 16pin PNP section's male 16pin connector.
- 3 Connect the PNP section's opposite female 16pin connector to the previously become free male 16pin connector at the rear-side of the monitor housing.

## 2.5. Connection - video sources

It is possible to connect one after-market rear-view camera and one 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 video RCA of the rear.view camera to the female RCA connector "Rear Camera IN" of the 12pin interface cable.
- 2 Connect the video RCA of the video source to the 12pin interface cable's female RCA connector "Video IN".

## 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.

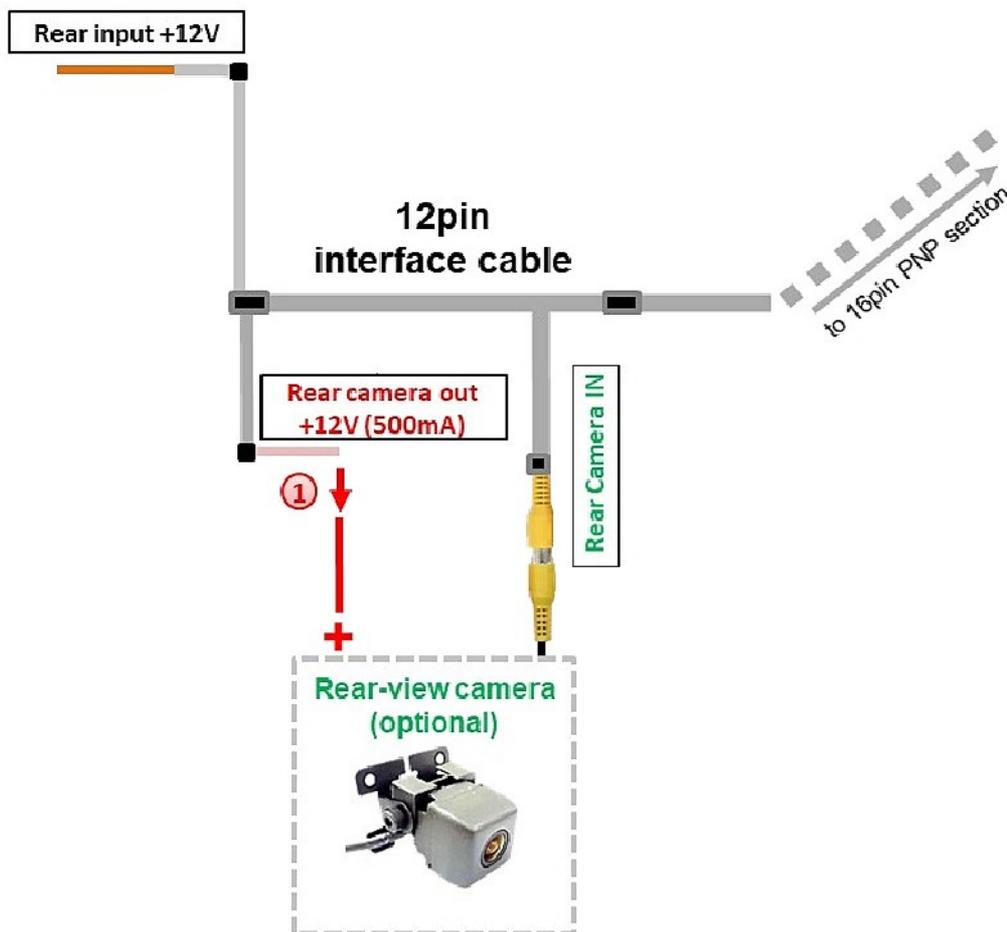
## 2.5.2. After-market rear-view camera

Some vehicles have a different reverse gear code on the CAN-bus which the video-interface is not compatible with. Therefore, there are two different ways of installation

**Note:** Do not forget to set video interface's dip8 to **OFF** before testing.

### 2.5.2.1. Case 1: Interface receives the reverse gear signal

If the interface delivers +12V on the green output wire of the 20pin interface cable 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.

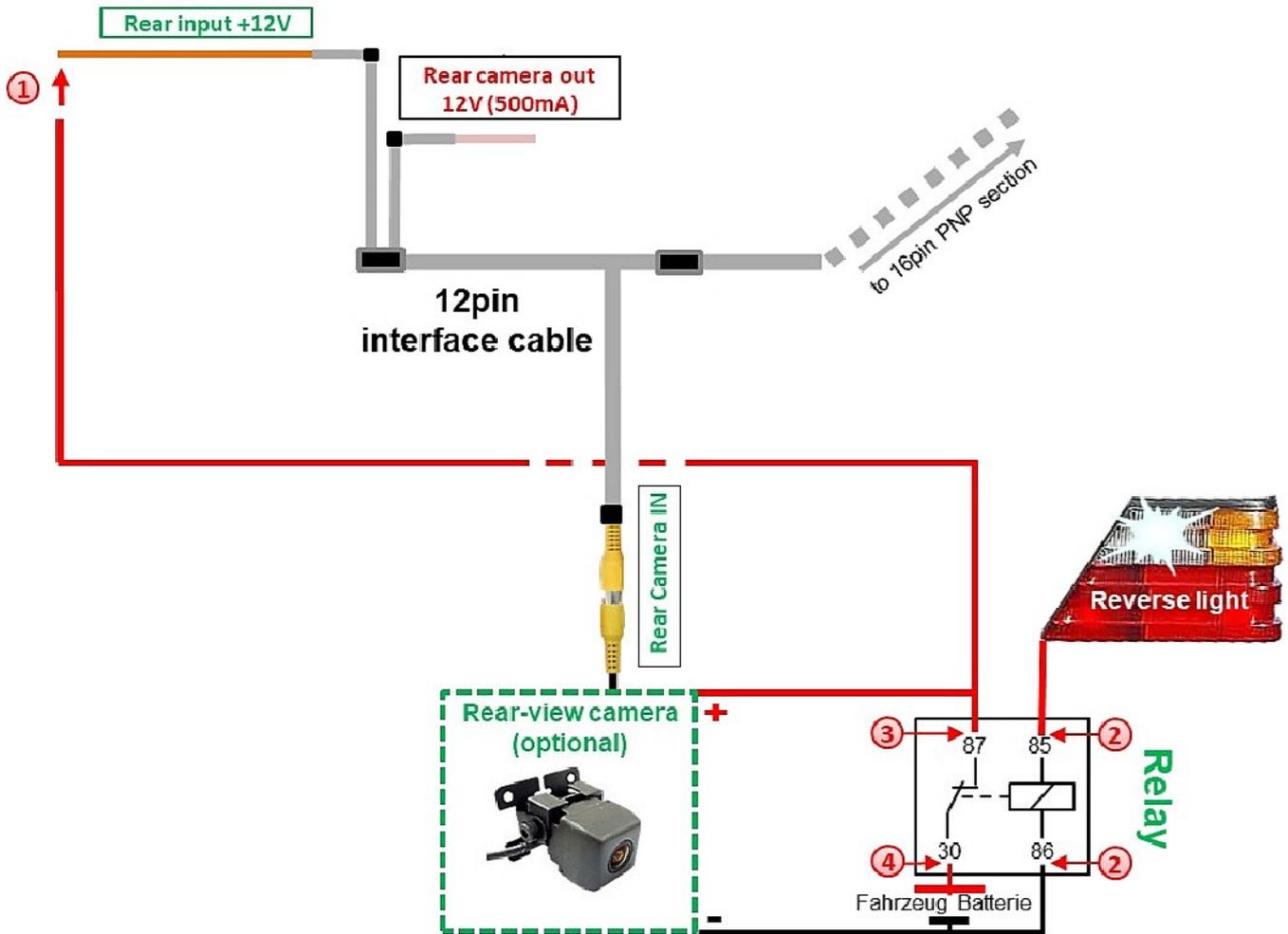


- 1 The red wire of the 20-pin interface cable **"Rear+Front out"** is used for the power supply of the rear-view camera. It carries +12V (max. 3A) when the reverse gear is engaged with additional 10 seconds after the reverse gear is again engaged.

## 2.5.2.2. Case 2: Interface does not receive the reverse gear signal

If the video interface does not deliver +12V on the green wire 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-stable 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 the 12pin interface cable's orange coloured input cable "Rear input 12V" to the output connector (87) of the relay.
- ② Connect the Reverse light's power-cable to coil (85) and the vehicle's ground to coil (86) of the relay.
- ③ Connect the output connector (87) of the relay to the rear-view camera's power-cable, like you did it to the green "Rear input 12V" cable before.
- ④ Connect stable and permanent +12V to the relay's input connector (30).

## 3. Interface operation

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



Pressing the **NAV** button on the infotainment panel for 2 seconds, switches the input from the factory video to the video source.

If the input is activated by dip switch setting (dip7), the sequence is as follows:

*Factory video → Video IN → 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	70mA @12V
Video input formats	NTSC
Temperature range	-20°C to +70°C
Dimensions daughter PCB	140 x 65 x 5 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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