

v.LiNK Video-inserter

VL3-SC15

Compatible with Volvo vehicles with Sensus Connect systems with 12.3" Touch-Monitor

Video-inserter with 2 video + rear-view camera input

Product features

- **Video-inserter for factory systems**
- **2 CVBS video-inputs for after-market devices (e.g. DVD-Player, DVB-T tuner, ...)**
- **Rear-view camera CVBS video-input**
- **Automatic switching to rear-view camera input on engagement of the reverse gear**
- **Activatable parking guide lines for rear-view camera (vehicle specific restrictions possible)**
- **Video-in-motion (ONLY for connected video-sources)**
- **Compatible with factory rear-view camera**
- **Video-inputs NTSC compatible only**

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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 place of installation must be free of moisture and away from heat sources.

1.1. Delivery contents



Take down the serial number of the interface and store this manual for support purposes: _____

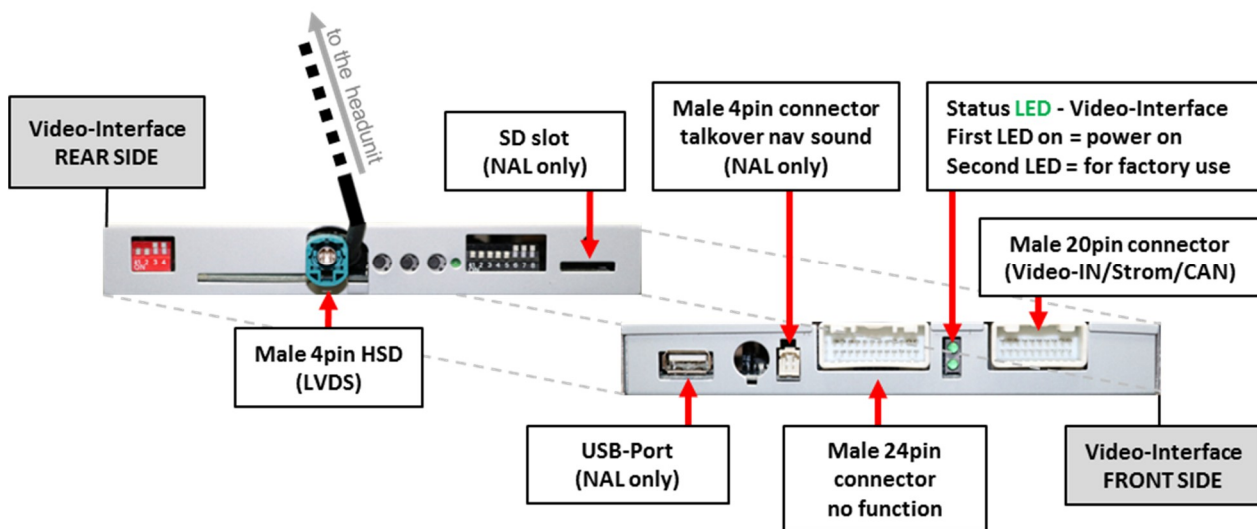
1.2. Checking the compatibility of vehicle and accessories

Compatibility		
Brand	Compatible vehicles	Compatible systems
Volvo	XC90 from model year 2015	Sensus Connect with 12.3" monitor

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>Connecting 2 AV-sources</i>	If 2 AV-sources shall be connected to the infotainment the optional audio switch SW-A2X1 is available. It is controlled by the video interface.
<i>Video sources</i>	NTSC video sources compatible only.
<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. To delay the switch-back an additional electronic part is required.

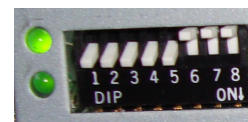
1.3. Connection Video-Interface

The video-interface converts the connected after-market sources video signals into a LVDS signal which is inserted in the factory monitor using separate trigger options and it reads 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 (black)

Some settings have to be selected by the 8 dip-switches at the video-interface. Dip position down is ON and position up is OFF.



Dip	Function	ON (down)	OFF (up)
1	No function	-	set to OFF
2	CVBS AV1-input	enabled	disabled
3	CVBS AV2-input	enabled	disabled
4	No function	-	set to OFF
5	Rear-view cam type	after-market	factory or none
6	No function	-	set to OFF
7	No function	-	set to OFF
8	No function	-	set to OFF

See following chapters for detailed information.

1.4.1. Enabling the interface’s video inputs (dip 2-3)

Only the enabled video inputs can be accessed when switching through the interface’s video sources. It’s recommended to enable only the required inputs for the disabled will be skipped when switching through the video-interfaces inputs.

1.4.2. Rear-view camera setting (dip 5)

If set to OFF, the interface switches to factory LVDS picture while the reverse gear is engaged to display factory rear-view camera or factory optical park system picture.

If set to ON, the interface switches to its rear-view camera input “Camera-IN” while the reverse gear is engaged.

Note: Dip 4, 6, 7 and 8 are without function and have to set to OFF.

1.5. Settings of the 4 Dip switches (CAN function - red)

Dip position down is ON and position up is OFF.

Vehicle/Navigation	Dip 1	Dip 2	Dip 3	Dip 4
All vehicles	OFF	OFF	OFF	OFF



2. Installation

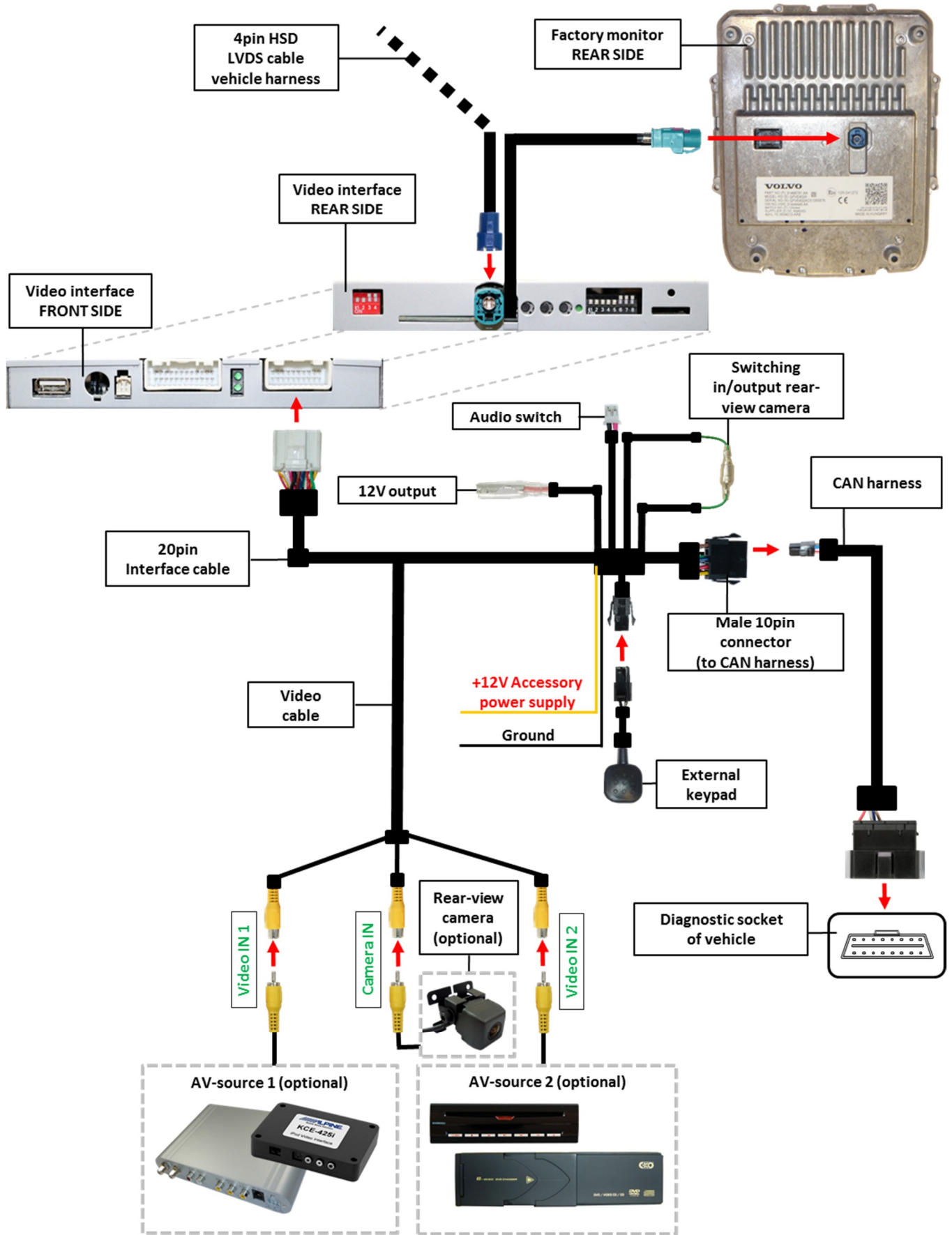
Switch off the ignition and disconnect the vehicle's battery! The interface needs a permanent 12V source. If -according to factory rules- a disconnection of the battery has to be avoided, it should be sufficient to use the vehicle's sleep-mode. In case, the sleep-mode doesn't succeed, the battery has to be disconnected with a resistor lead.

The Interface needs a permanent power supply! If power isn't directly taken from the battery, the connection's power has to be checked for being start-up proven and permanent.

2.1. Place of installation

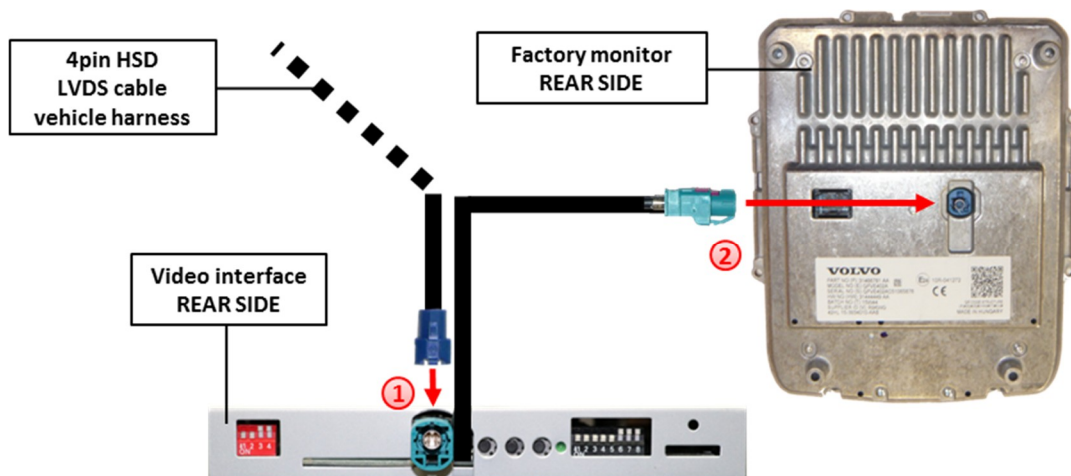
The interface is installed on the backside of the monitor and at the diagnostic socket.

2.2 Connection schema



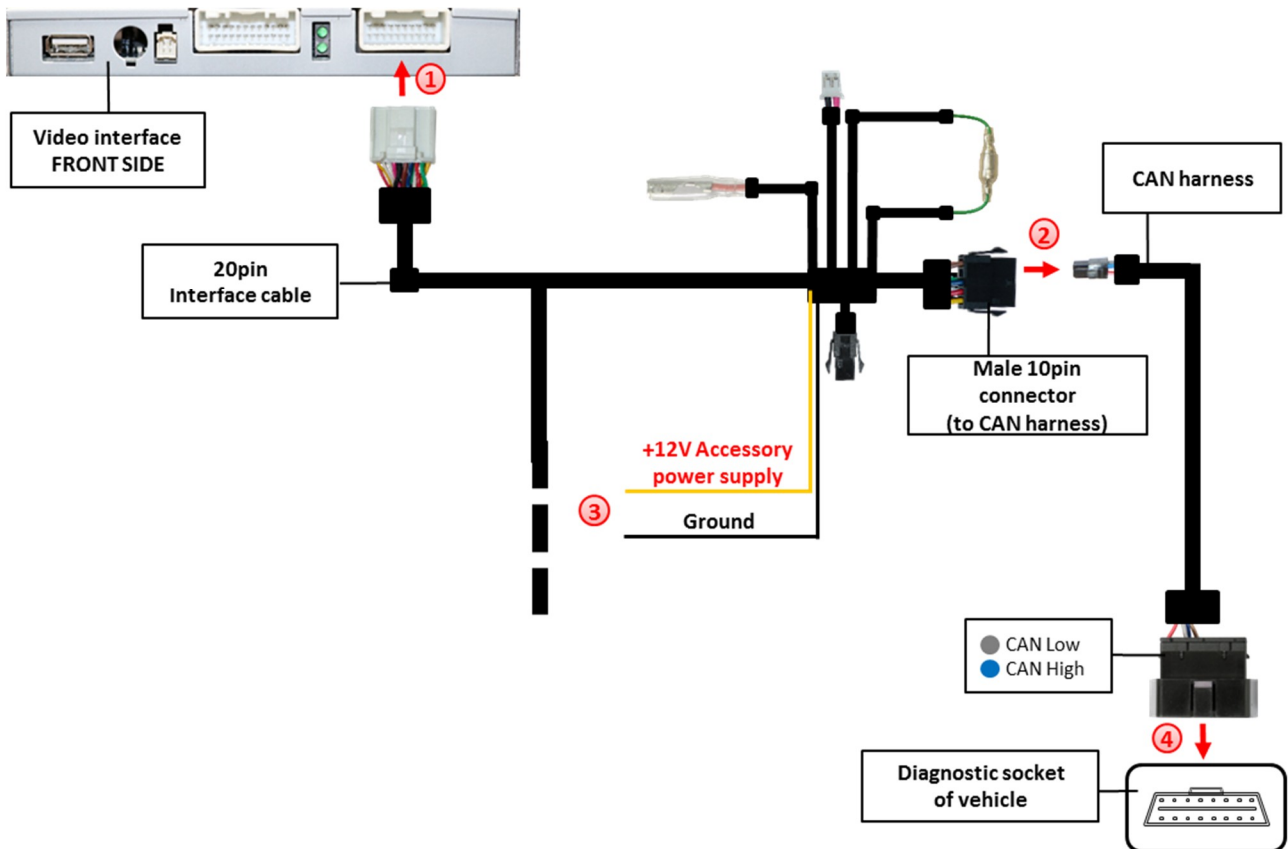
2.3. Connections to the monitor

Remove the monitor.



- ① Remove the **blue** female 4pin HSD LVDS connector from the rear of the factory monitor and connect it to the **waterblue**-coloured male 4pin HSD LVDS connector of the interface-box.
- ② Connect the **waterblue**-coloured female 4pin HSD LVDS connector of the 4pin HSD LVDS cable to the **blue** male 4pin HSD LVDS connector of the factory monitor.

2.4. Connection of power and CAN-bus



- ① Connect the interface cable’s female 20pin connector to the male 20pin connector of the video-interface.
- ② Connect the female 4pin connector of the CAN harness to the male 10pin connector of the interface cable
- ③ Connect the single, black wire “GND” of the PNP harness to the vehicle’s negative ground and connect the single yellow wire “ACC” of the 20pin interface to +12V accessory power supply.
- ④ Connect the male diagnostic connector of the CAN harness to the diagnostic socket of the vehicle.

Note: Only CAN-High and CAN-Low are connected by the male diagnostic connector of the CAN harness, so we recommend to connect the two cables behind the diagnostic socket in the vehicle.

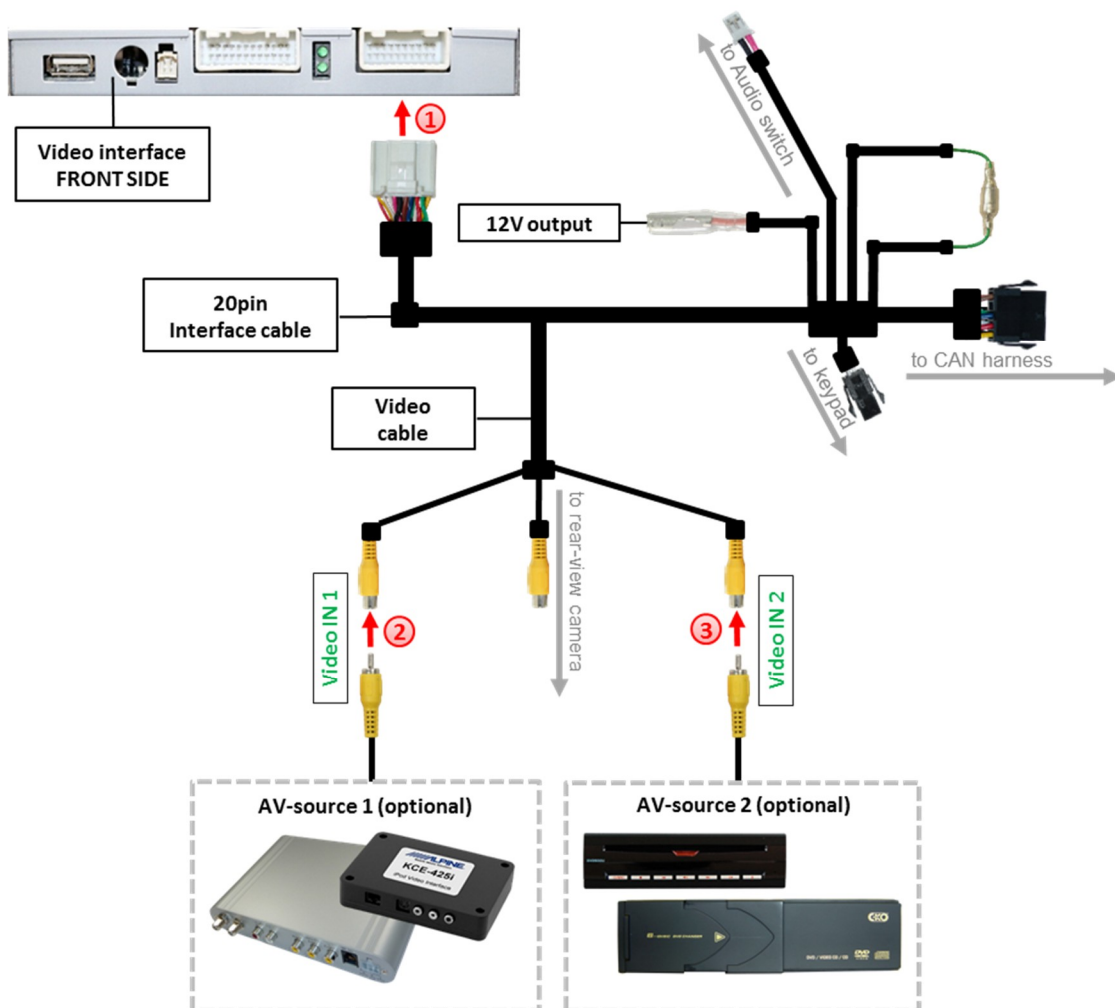
2.5. Connecting video sources

It is possible to connect two after-market AV-sources and an after-market rear-view camera to the video-interface.

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

Note: The single grey wire and the single white wire are out of function and should be isolated.

2.5.1. Video-sources to Video IN1 and Video IN2

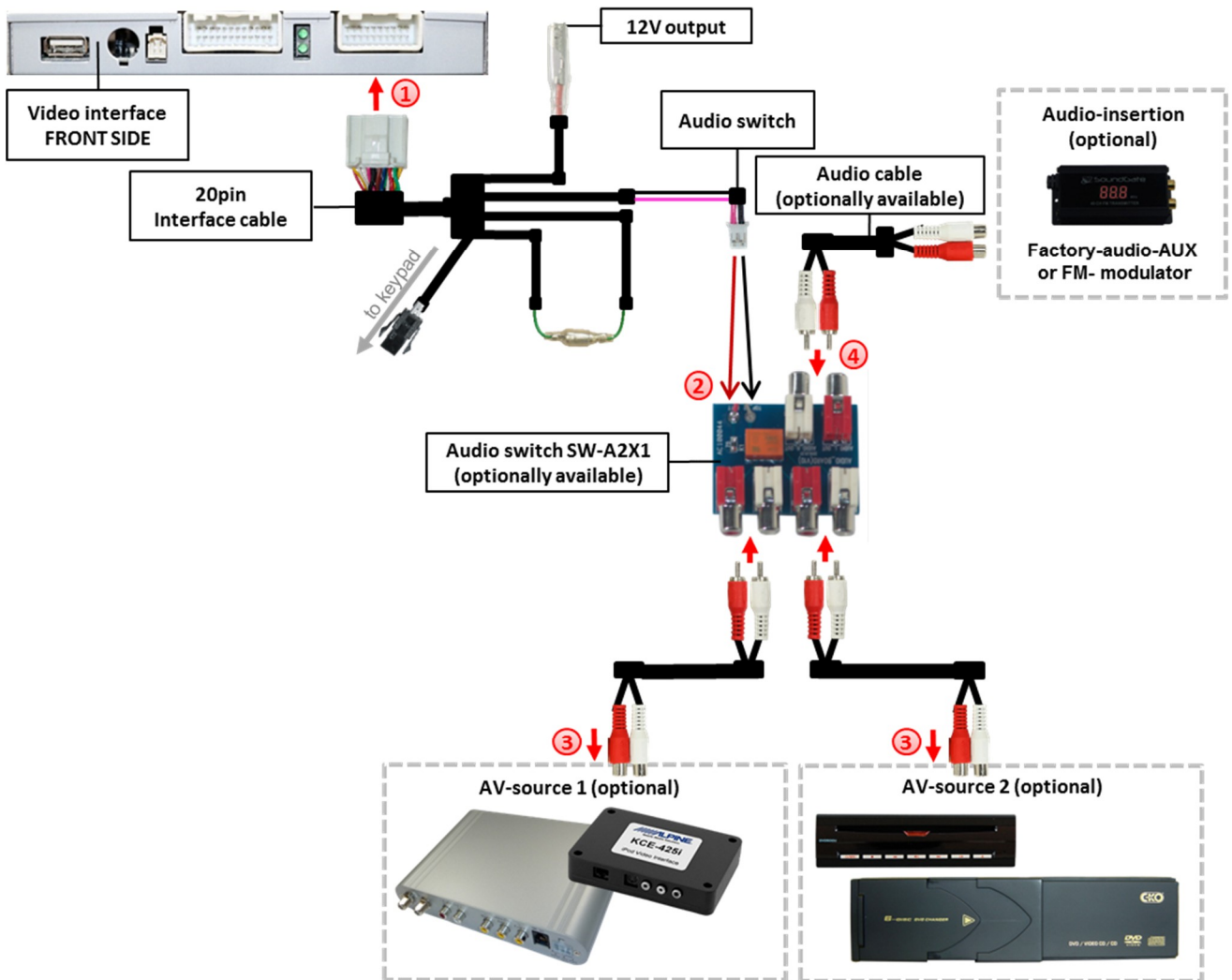


- ① Connect the interface cable's female 20pin connector to the interface's male 20pin connector.
- ② Connect the video RCA of the AV-source 1 to the female RCA connector "VideoIN1" of the video cable.
- ③ Connect the video RCA of the AV-source 2 to the female RCA connector "Video -IN2" of the video cable.

2.5.2. Audio-switch and audio insertion

This interface can only insert video signals into the factory infotainment and switch audio signals. If an AV-source is connected to AV1 or AV2, the audio insertion has to be done by the factory audio AUX input or a FM-modulator to which the interface's sound-switch output is connected. The inserted video-signal can be activated simultaneously to each audio-mode of the factory infotainment.

Note: If 2 AV sources shall be connected, the optionally available audio switch SW-A2X1 has to be connected. While the interface is switched from AV 1 to AV 2, the audio signal will automatically be switched to the right source.



- ① Connect the interface cable's female 20pin connector to the male 20pin connector of the video-interface.
- ② Connect the interface cable's drilled pink- and black-coloured wires to the audio switches power input. Connect the pink wire to the input "BATT" and the black one to the grey wire beside.
- ③ Connect the audio-RCA of the AV-source 1 and the AV source 2 to the female RCA port "AUDIO-IN1" and "AUDIO-IN2" of the audio switch.
- ④ Connect the audio-RCA of the factory-audio-AUX-input or the FM-modulator to the female RCA port "AUDIO-OUT" of the audio switch.

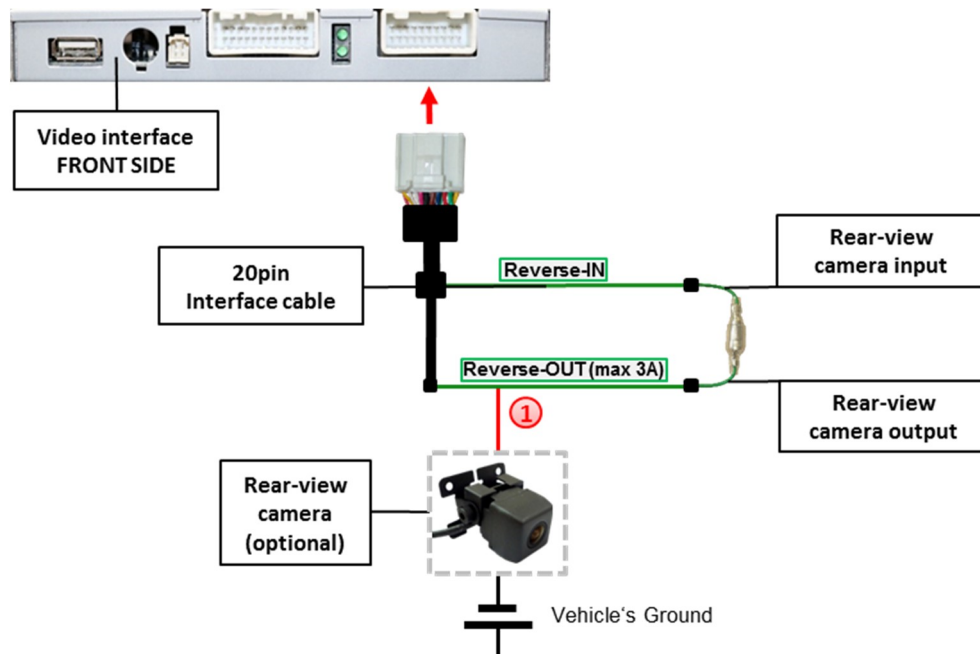
2.5.3. After-market rear-view camera

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. If the video interface receives a signal of the reverse gear, the green wire “Reverse-OUT” of the 20pin cable should carry +12V while the reverse gear is engaged.

Note: Do not forget to set dip5 of the video-interface to ON before testing.

2.5.3.1. Case 1: Video interface receives the reverse gear signal

If the video interface delivers +12V on the green wire of the 20pin cable when reverse gear is engaged, it will automatically be switched to the rear-view camera input CAM while reverse gear is engaged.

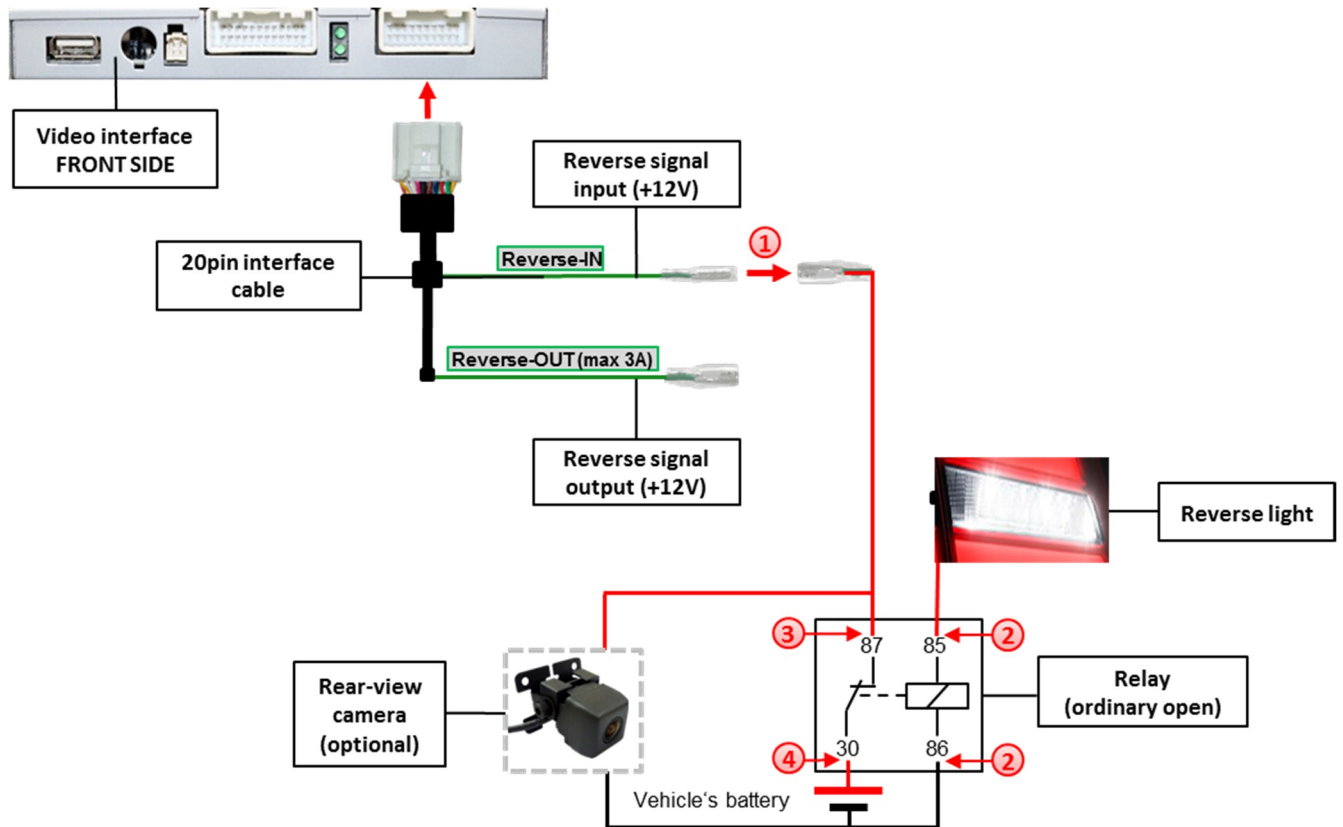


- ① The 12 V power supply for the rear-view camera (max 3A) has to be taken from the green wire of the 20pin cable to avoid an unnecessary permanent power supply to the camera electronic.

For the operation, both green cables “Reverse-IN” and “Reverse-OUT” have to stay connected.

2.5.3.2. Case 2: Video interface does not receive the reverse gear signal

If the video interface does not deliver +12V on the green wire of the 20pin 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 below shows the connection type of the relay.

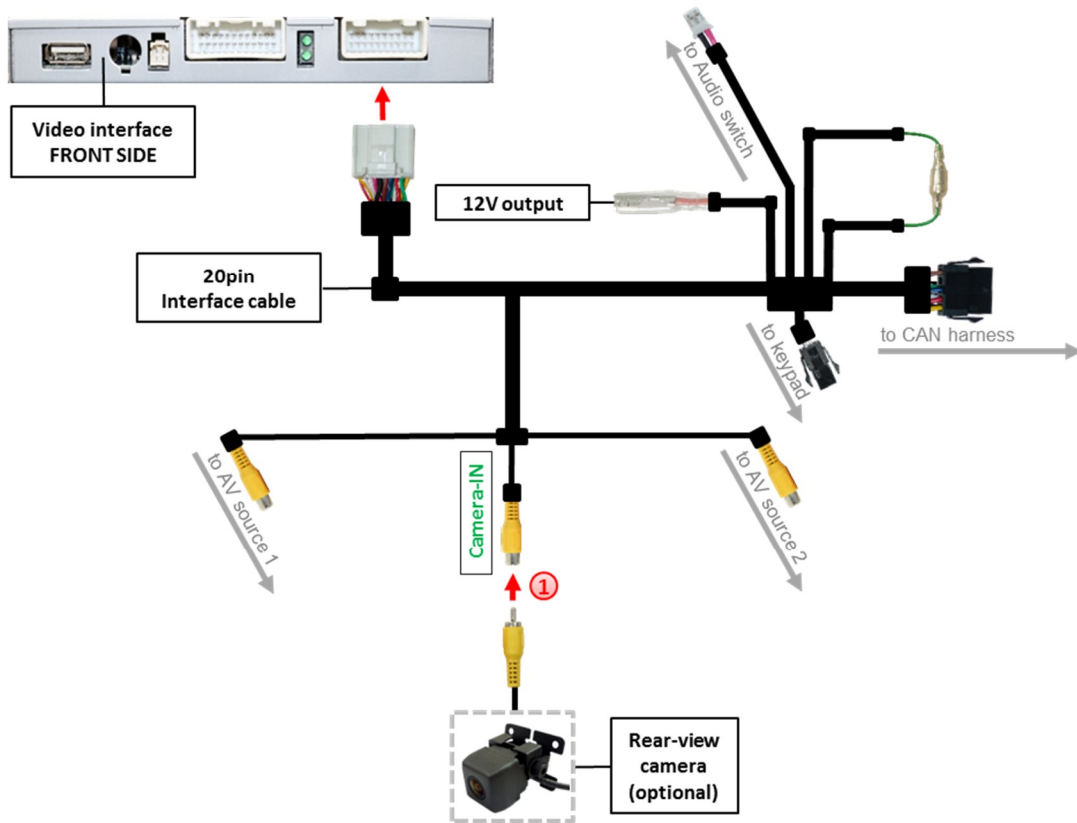


- ① Disconnect the green cable's preconnected male- and female connectors of the 20pin cable and connect the green input cable "Reverse-IN" to the output connector (87) of the relay.

Note: Not least to avoid short circuits, the best solution should be, to crimp a male 4mm connector to the relay's output cable and connect it to the green cable's female 4mm connector. The output-cable "Reverse-OUT" remains disconnected as it's out of function.

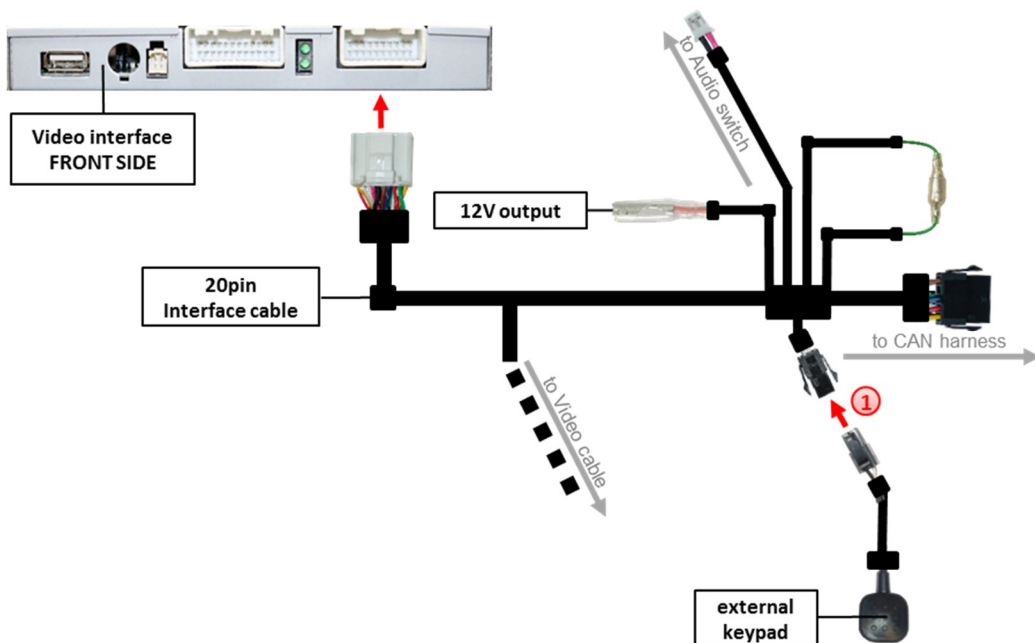
- ② Connect the Reverse light's power-cable to coil (85) and the vehicle's ground to coil (86) of the relay.
- ③ Connect the output connector (87) of the relay to the rear-view camera's power-cable, like you did it to the green "Reverse-IN" cable before.
- ④ Connect permanent power / 12V to the relay's input connector (30).

2.5.3.3. Video signal connection for the rear-view camera



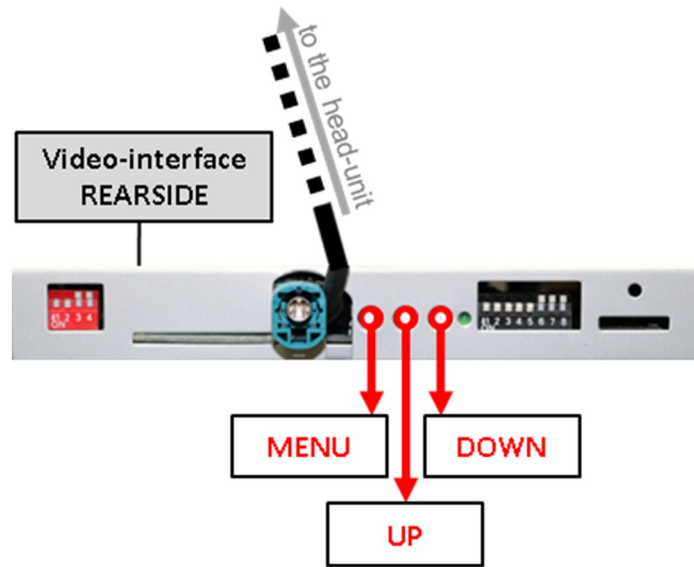
- ① Connect the video-RCA of the after-market rear-view camera to the female RCA port "Camera-IN" of the video-cable.

2.6. Connecting video-interface and keypad



- ① Connect the keypad's female 4pin connector to the video-interface's male 4pin connector.

2.7. Picture settings and guide lines

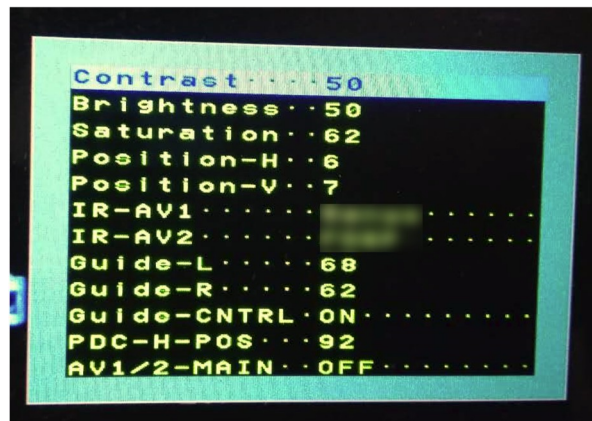


The picture settings are adjusted by the 3 buttons on the video-interface. Press the MENU button to open the OSD settings menu or to switch to the next menu item. Press UP and DOWN will change the selected value. The buttons are embedded in the housing to avoid accidental changes during or after installation. The picture settings have to be done separately for RGB, AV1 and AV2 while the corresponding input is selected and visible on the monitor.

Note: The OSD menu is only shown when a working video source is connected to the selected video-input of the interface.

The following settings are available:

- Contrast
- Brightness
- Saturation
- Position H (horizontal)
- Position V (vertical)
- IR-AV1 (out of function)
- IR-AV2 (out of function)
- Guide-lines left
- Guide-lines right
- Guide-CNTRL (guide lines ON/OFF)
- PDC-H-POS (out of function)
- AV1/2-MAIN (out of function)



Note: If the CAN-box does not support the vehicle, the guide-lines cannot be used.

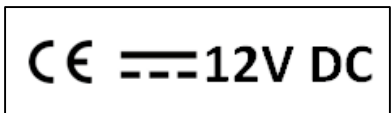
3. Interface operation

3.1. By keypad

The interface's enabled inputs can be switched by the external keypad.

4. Specifications

BATT/ACC range	7V - 25V
Stand-by power drain	<10mA
Power	0.4A @12V
Video input	0.5V – 2V
Video input formats	NTSC
RGB-video amplitude	0.5V with 75 Ohm impedance
Temperature range	-40°C to +85°C
Dimensions Video-Box	158 x 23 x 91 mm (W x H x D)



5. FAQ – Trouble shooting Interface functions

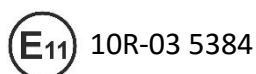
For any troubles which may occur, check the following table for a solution before requesting support from your vendor.

Symptom	Reason	Possible solution
No picture/black picture (factory picture).	Not all connectors have been reconnected to factory head-unit or monitor after installation.	Connect missing connectors.
	No power on CAN-bus box (all LED CAN-bus box are off).	Check power supply of CAN-bus box. Check CAN-bus connection of CAN-bus box.
	CAN-bus box connected to CAN-bus in wrong place.	Refer to the manual where to connected to the CAN-bus. If not mentioned, try another place to connect to the CAN-bus.
	No power on video-interface (all LED video-interface are off).	Check whether CAN-bus box delivers +12V ACC on red wire output of 8pin to 6pin cable. If not cut wire and supply ACC +12V directly to video-interface.
No picture/black picture/white picture (inserted picture) but factory picture is OK.	No picture from video source.	Check on other monitor whether video source is OK.
	No video-source connected to the selected interface input.	Check settings dips 1 to 3 of video interface which inputs are activated and switch to corresponding input(s).
	LVDS cables plugged in wrong place.	Double-check whether order of LVDS cables is exactly connected according to manual. Plugging into head-unit does not work when the manual says to plug into monitor and vice versa.
Inserted picture totally wrong size or position.	Wrong monitor settings of video-interface.	Try different combinations of dips 7 and 8 of video-interface. Unplug 6pin power after each change.
Inserted picture double or 4 times on monitor.		
Inserted picture distorted, flickering or running vertically.	Video sources output set to AUTO or MULTI which causes a conflict with the interfaces auto detection.	Set video source output fixed to PAL or NTSC. It is best to set all video sources to the same standard.
	If error occurs only after source switching: Connected sources are not set to the same TV standard.	Set all video sources to the same standard.
	Some interfaces can only handle NTSC input.	Check manual whether there is a limitation to NTSC mentioned. If yes, set source fixed to NTSC output.
Inserted picture b/w.	Picture settings have not been adjusted.	Use the 3 buttons and the interface's OSD to adjust the picture settings for the corresponding video input.
Inserted picture qual. bad.		
Inserted picture size slightly wrong.		
Inserted picture position wrong.		
Camera input picture flickers.	Camera is being tested under fluorescent light which shines directly into the camera.	Test camera under natural light outside the garage.
Camera input picture is bluish.	Protection sticker not removed from camera lens.	Remove protection sticker.

Symptom	Reason	Possible solution
Camera input picture black.	Camera power taken directly from reverse gear lamp.	Use relay or electronics to "clean" reverse gear lamp power. Alternatively, if CAN-bus box is compatible with the vehicle, camera power can be taken from green wire of 6pin to 8pin cable.
Camera input picture has distortion.		
Camera input picture settings cannot be adjusted.	Camera input picture settings can only be adjusted in AV2 mode.	Set dip 3 of video-interface to ON (if not input AV2 is not already activated) and connect the camera to AV2. Switch to AV2 and adjust settings. Reconnect camera to camera input and deactivate AV2 if not used for other source.
Graphics of a car in camera input picture.	Function PDC is ON in the interface OSD.	In compatible vehicles, the graphics will display the factory PDC distance. If not working or not wanted, set interface OSD menu item UI-CNTRL to ALLOFF.
Chinese signs in camera input picture	Function RET or ALL is ON (function for Asian market) in the interface OSD.	Set interface OSD menu item UI-CNTRL to ALLOFF or PDCON.
Not possible to switch video sources by OEM button.	CAN-bus interface does not support this function for vehicle.	Use external keypad or cut white wire of 6pin to 8pin cable and apply +12V impulses for AV-switching.
Not possible to switch video sources by external keypad.	Pressed too short.	For video source switching a longer press of about 2.5 seconds is required.
	SW-version of interface does not support external keypad.	Use OEM-button or cut white wire of 6pin to 8pin cable and apply +12V impulses for AV-switching.
Interface does not switch to camera input when reverse gear is engaged.	CAN-bus interface does not support this function for the vehicles.	Cut the green wire of the 6pin to 8pin cable and apply +12V constant from reverse gear-lamp signal. Use relay to "clean" gear lamp power.
Interface switches video-sources by itself.	CAN-bus interface compatibility to vehicle is limited.	Cut the grey wire of 6pin to 8pin and isolate both ends. If problem still occurs, additionally cut the white wire of 6pin to 8pin cable and isolate both ends.

6. Technical Support

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



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