

Video-inserter VL1-MBN4

Compatible with **Mercedes Benz** vehicles
with Comand APS HD NTG3, Comand APS NTG4,
Audio20 NTG4 and Audio50 APS NTG4 infotainment
with 10pin LVDS connector at the monitor



examples

Video-inserter with 2 video + 1 rear-view camera input and CAN control

Product features

- Video-inserter for factory-infotainment monitors
- 1 CVBS Rear-view camera video-input
- 2 CVBS video-inputs for after-market devices (e.g. DVD-Player, DVB-T tuner, ...)
- Automatic switching to rear-view camera input on engagement of reverse gear
- Video-in-motion (ONLY for connected video-sources)
- Video-inputs PAL/NTSC compatible

Contents

1. Prior to installation

- 1.1. Delivery contents
- 1.2. Checking the compatibility of vehicle and accessories
- 1.3. Connectors – video interface
- 1.4. Dip-switch settings
 - 1.4.1 Enabling the interface's video inputs (dip 2-3)
 - 1.4.2 Rear-view camera setting (dip 5)
 - 1.4.3 Monitor selection (dip 7-8)

2. Installation

- 2.1. Place of installation
- 2.2. Connection scheme
- 2.3. Connection – 6pin interface cable
- 2.4. Connection - the factory monitor
- 2.5. Connection – video sources
 - 2.5.1 Video-sources to AV1 and AV2
 - 2.5.2 Audio-switch and audio-insertion
 - 2.5.3 After-market rear-view camera
 - 2.5.3.1 Connection – video signal of the rear-view camera
- 2.6. Connection - video-interface and external keypad
- 2.7. Picture settings

3. Interface operation

4. Specifications

5. Frequently asked questions

6. Technical Support

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. This product should only be used while standing or to display fixed menus or rear-view-camera video when the vehicle is moving, for example the MP3 menu for DVD upgrades.

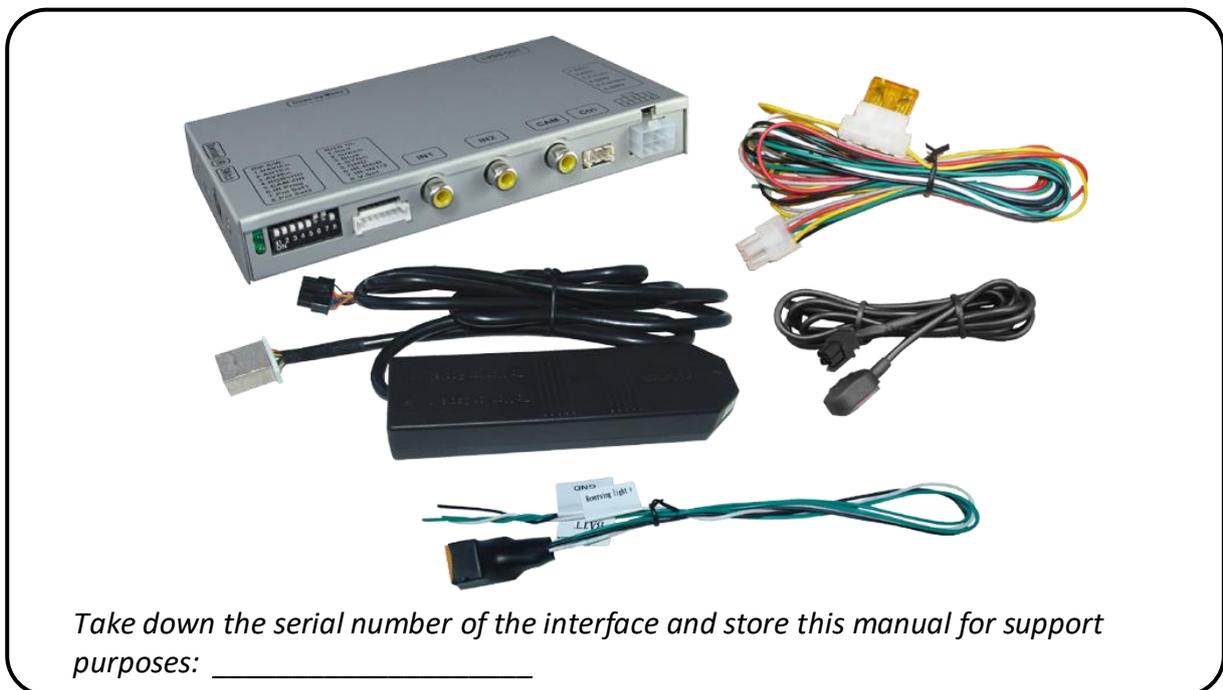
Changes/updates of the vehicle's software can cause malfunctions of the interface. We offer free software-updates for our interfaces for one year after purchase. To receive a free update, the interface must be sent in at own cost. Labor cost for and other expenses involved with the software-updates will 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

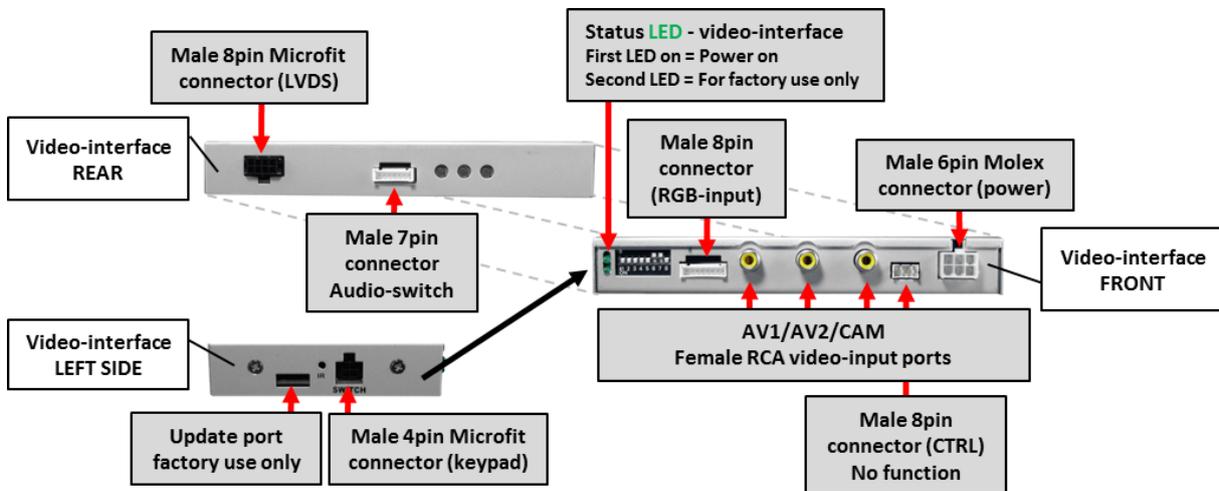


1.2. Checking the compatibility of vehicle and accessories

Requirements		
Brand	Model	Navigation
Mercedes Benz	C-class (W204) from 03/2007 till 02/2011, CL-class (C216) from 01/2006 till 05/2009, CLC-class (CL203) from 09/2008, E-class (W212) from 04/2009 till 05/2011, E-class Coupe (W207) from 05/2009 till 05/2011, CLS-Coupe (C218) from 01/2011 till 05/2011, GLK-class (X204) from 09/2008, S-class (W221) from 10/2005 till 05/2009, SLS (C197) from 03/2010	Comand APS HD NTG3, Comand APS NTG4, Audio20 NTG4, Audio50 APS NTG4 <i>with 10pin LVDS connector on the monitor</i>
Limitations		
<i>Video only</i>	The interface inserts ONLY video signals into the infotainment. For sound use the possibly existing factory-audio-AUX-input or a FM-modulator. If 2 AV sources shall be connected, the CAB-FV-AUDIO audio cable is optionally available for audio switching.	
<i>Factory rear-view camera</i>	Automatic switch-back from inserted video to factory rear-view camera only while reverse gear is engaged. To delay the switch-back time, additional electronics is required.	

1.3 Connectors – Video interface

The video-interface converts the connected after-market sources video signals to an LVDS signal which is the inserted into the factory monitor on certain trigger options.



1.4 Dip-switch settings

Some settings must be selected by the dip-switches on the video-interface. Dip position down is ON and position up is OFF.



Dip	Function	ON (down)	OFF (up)
1	No function		set OFF
2	CVBS AV1-input	enabled	disabled
3	CVBS AV2-input	enabled	disabled
4	No function		set OFF
5	Rear-view cam type	after-market	factory or none
6	No function	-	set OFF
7	Monitor selection	Try all 4 possible combinations of dip 7 and 8 to find the best picture (quality and size)	
8			

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

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 is 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 CAM while the reverse gear is engaged.

1.4.3. Monitor selection (dip 7-8)

Dip 7 and 8 are for monitor-specific video settings which cannot be predicted as even within the same head-unit version, the monitor specifications may vary. It is necessary to try all possible combinations (both OFF, both ON, 7 OFF and 8 ON, 7 ON and 8 OFF) - while a working video source is connected to the chosen input of the interface - to see which combination gives the best picture quality and size (some may give no picture). It is possible to first hot plug through the dip combinations, but if you do not experience any change of picture after trying all 4 options, retry and disconnected the 6pin power plug of the video-box between every change of the dip setting.

2. Installation

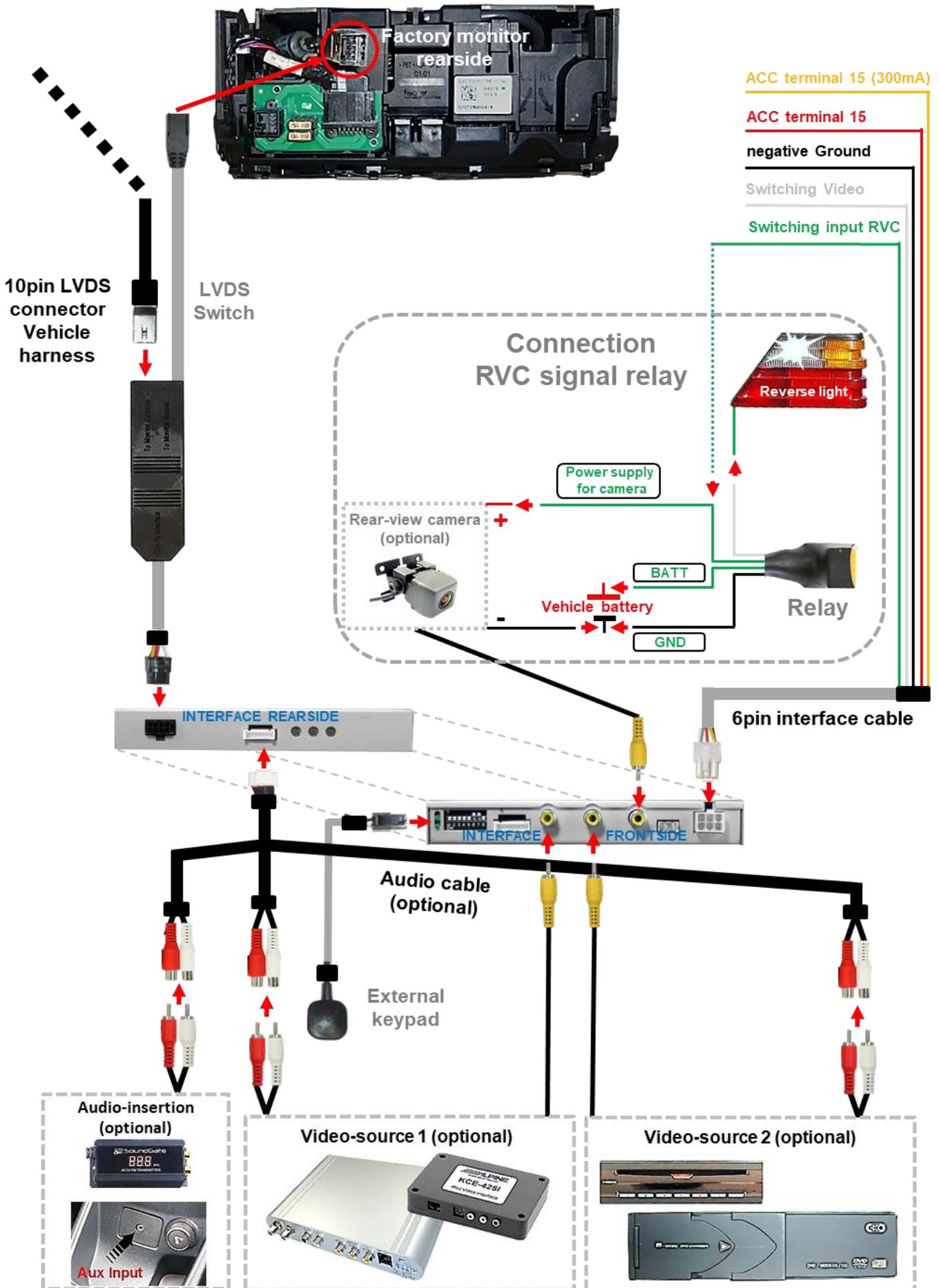
Switch off ignition and disconnect the vehicle's battery! The interface needs a permanent 12V source. If according to factory rules disconnecting the battery is to be avoided, it is usually sufficient to put the vehicle in sleep-mode. In case the sleep-mode does not show success, disconnect the battery with a resistor lead.

If power source is not taken directly from the battery, the connection has to be checked for being start-up proven and permanent.

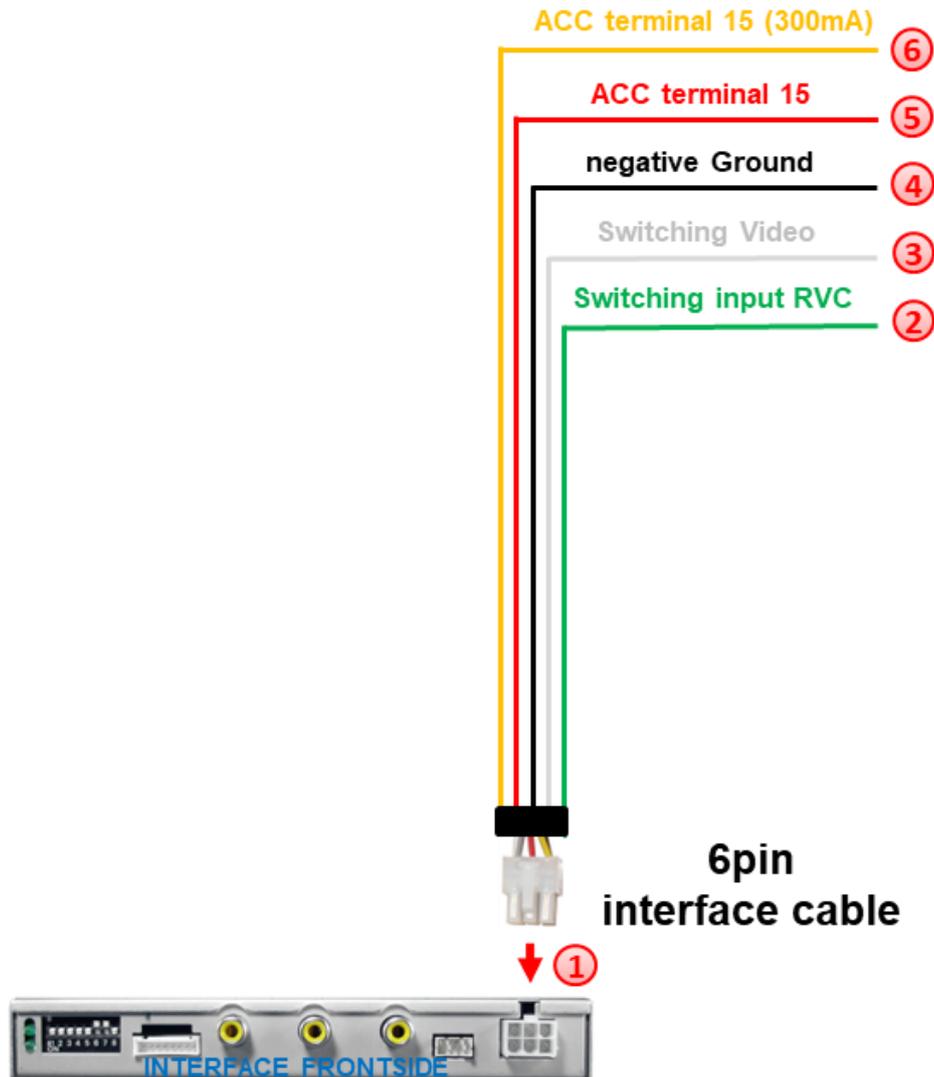
2.1. Place of installation

The interface is installed on the **backside of the vehicle's monitor**.

2.2. Connection scheme



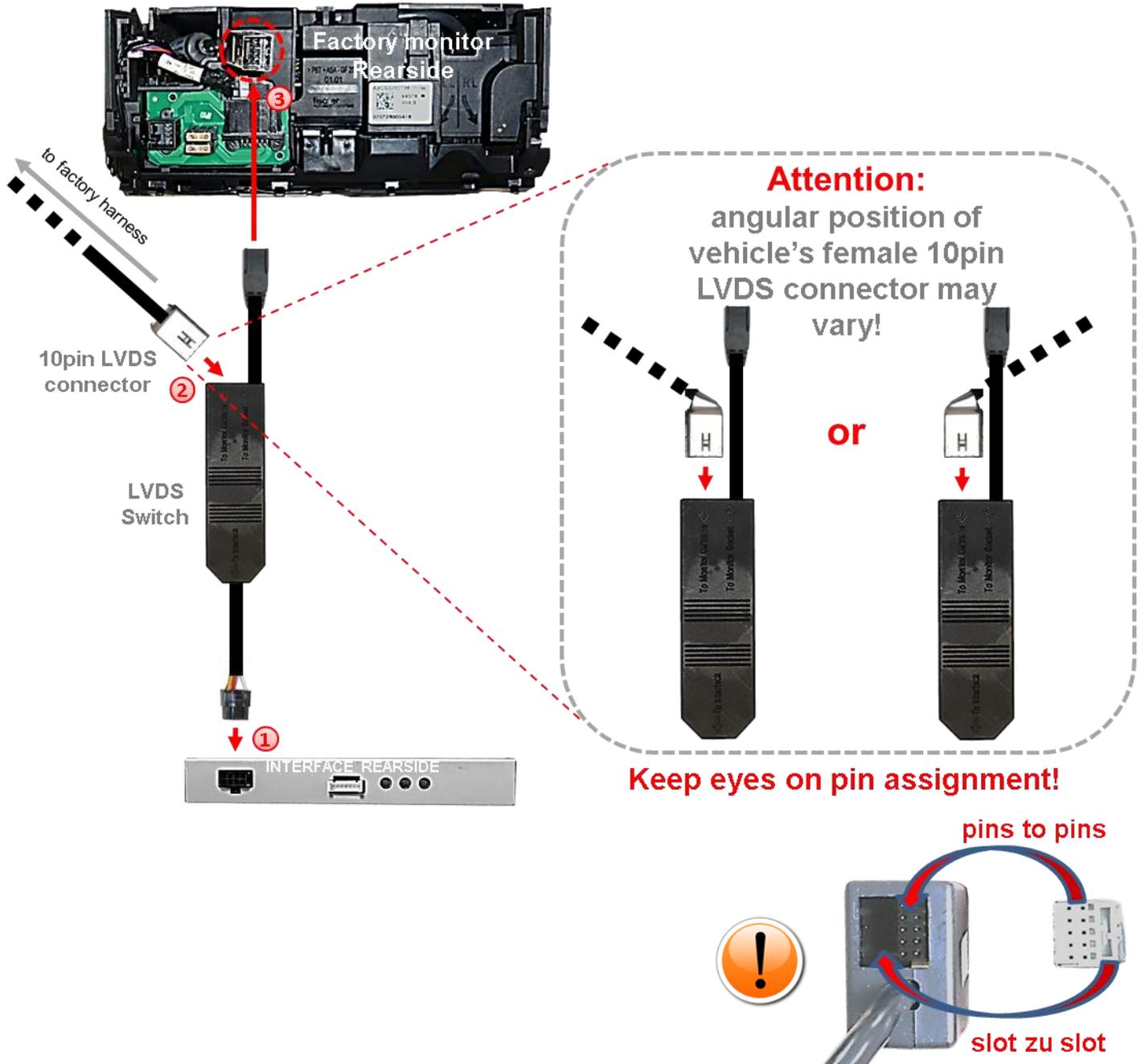
2.3. Connection – 6pin interface cable



- ① Connect the white female 6pin connector of the 6pin interface cable to the male 6pin connector of the video interface.
- ② Connect the green wire of the 6pin interface cable to +12V of the reverse gear signal. (e.g. reversing light).
- ③ If desired, the white wire of the 6pin interface cable can be used alternatively to the external button to switch the video sources (12V pulse for 2-3 seconds).
- ④ Connect the black wire of the 6pin interface cable to vehicle ground.
- ⑤ Connect the red wire of the 6pin interface cable to +12V ACC terminal 15.
- ⑥ Connect the yellow wire of the 6pin interface cable to +12V ACC (300mA).

Note: The connection of the green wire (Reverse signal) will be described in chapter “After-market rear-view camera”. The white wire, can be used by +12V impulse to switch the enabled video sources , same as the keypad (see chapter “video interface-operation”).

2.4. Connection - factory monitor



- ① Connect 10pin Microfit connector of the LVDS Switch to the 10pin Microfit connector of the video-interface.
- ② Disconnect the vehicle harness' 10pin LVDS connector at the rear-side of the factory monitor and connect it to the male 10pin connector of the LVDS switch-box.



Attention: The angle position of the factory female 10pin LVDS connector's cable may vary and moreover the connection isn't non-interchangeable! Pay attention to a correct connection of the 10 pins inside!

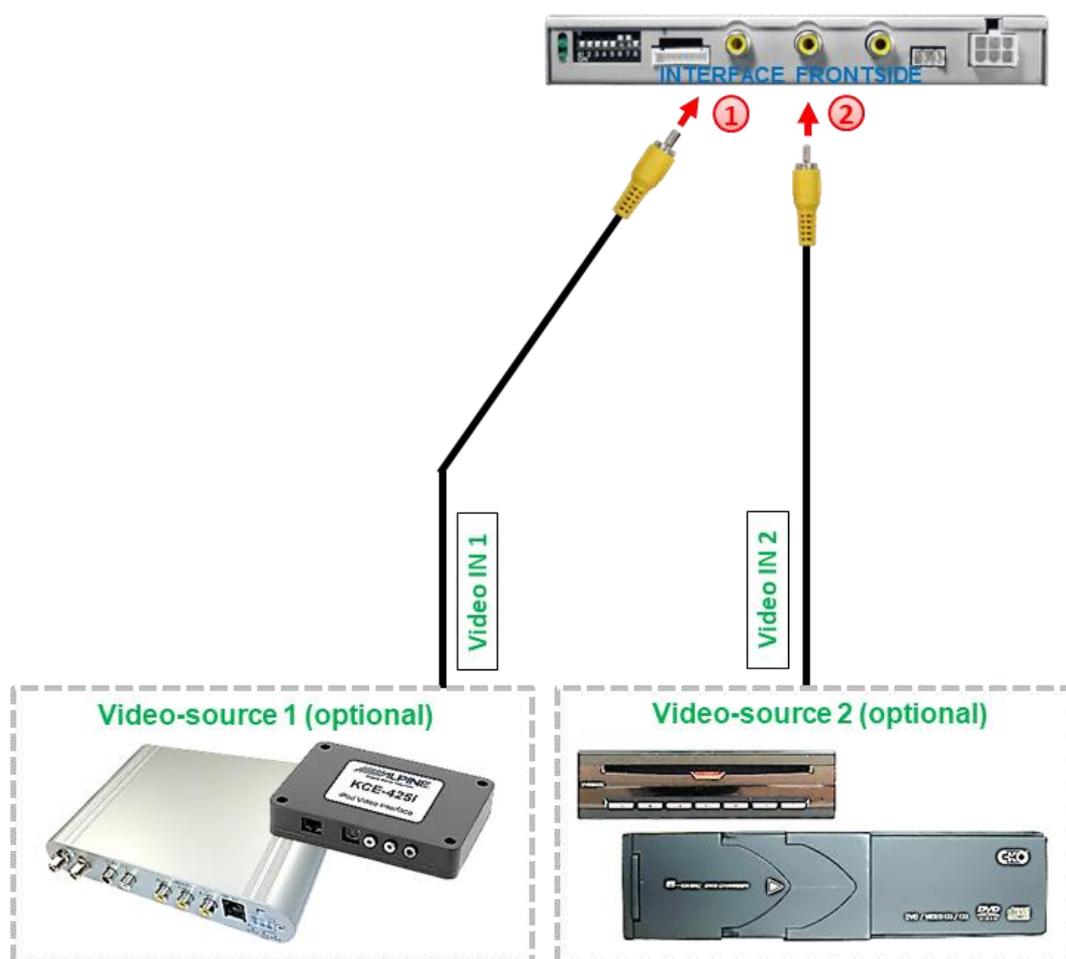
- ③ Connect the female 10pin LVDS connector to the previously become free 10pin LVDS connector of the factory monitor

2.5. Connection - video sources

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

Before final installation we recommend a test run to make sure that vehicle and interface are compatible. Due changes within the production line of the vehicle manufacturer the risk of incompatibility always exists.

2.5.1. Video-sources to AV1 and AV2



- ① Connect video RCA of the AV-source 1 to the female RCA connector AV 1 of the video interface.
- ② Connect video RCA of the AV-source 2 to the female RCA connector AV 2 of the video interface.

2.5.3 Audio-switch and audio insertion

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

Connection of 1 AV source

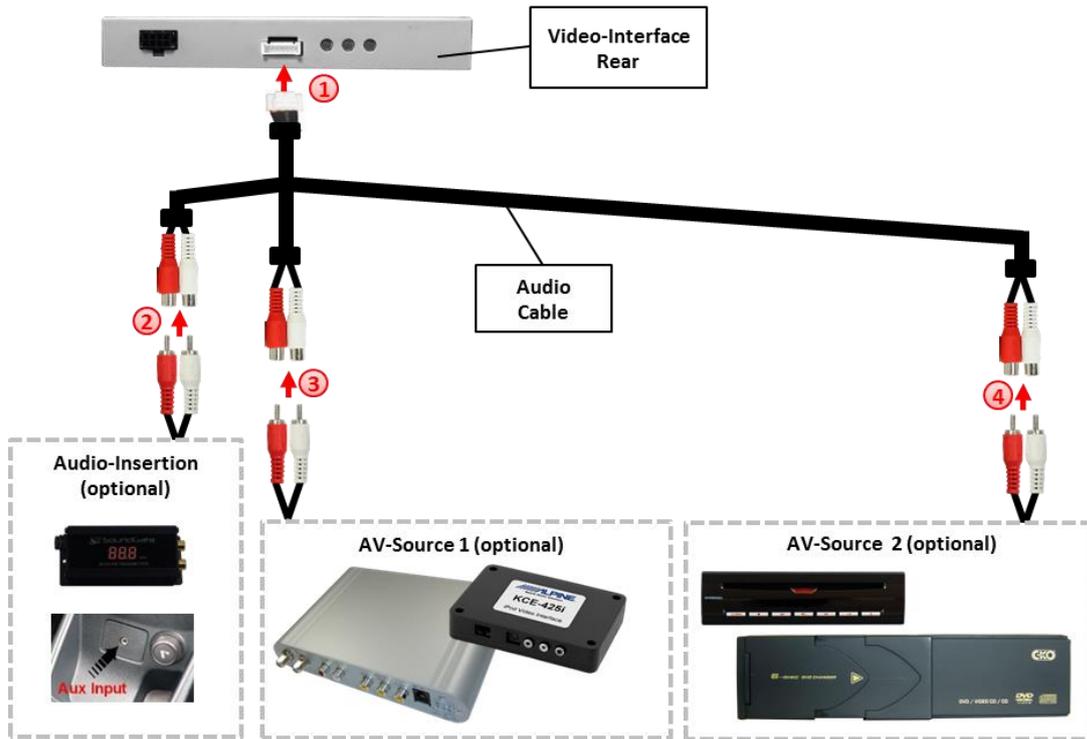
If only one AV-source shall be connected, it is possible to connect the audio output of the AV-source directly to the point of audio-insertion (e.g. to the factory AUX input).

Connection of 2 AV sources

This interface has an integrated audio switch for switching the audio signals. If two AV sources are connected, the audio output of the AV sources is connected to the point of audio-insertion via the optionally available audio cable CAB-FV-AUDIO (e.g. to the factory AUX input). When switching the video interface from AV1 to AV2, the audio signal is also switched automatically.



Attention: The audio cable CAB-FV-AUDIO shown in the diagram is not included in the delivery contents and is optionally available!



- ① Connect female 7pin connector of the audio cable to male 7pin connector of the video-interface.
- ② Connect the audio-RCA of the possibly existing factory AUX-input or the FM-modulator to the female RCA port AV-Out of the audio cable.
- ③ Connect the audio-RCA of the AV-source 1 to the corresponding AV1 RCA ports of the audio cable.
- ④ Connect the audio-RCA of the AV-source 2 to the corresponding AV2 RCA ports of the audio cable.

Pin definition 7pin connector

Audio pins	Definition
1/2	Audio input signal R/L of source AV2
3/4	Audio input signal R/L of source AV1
5/6	Audio output signal R/L for factory audio AUX or FM-modulator
7	Ground

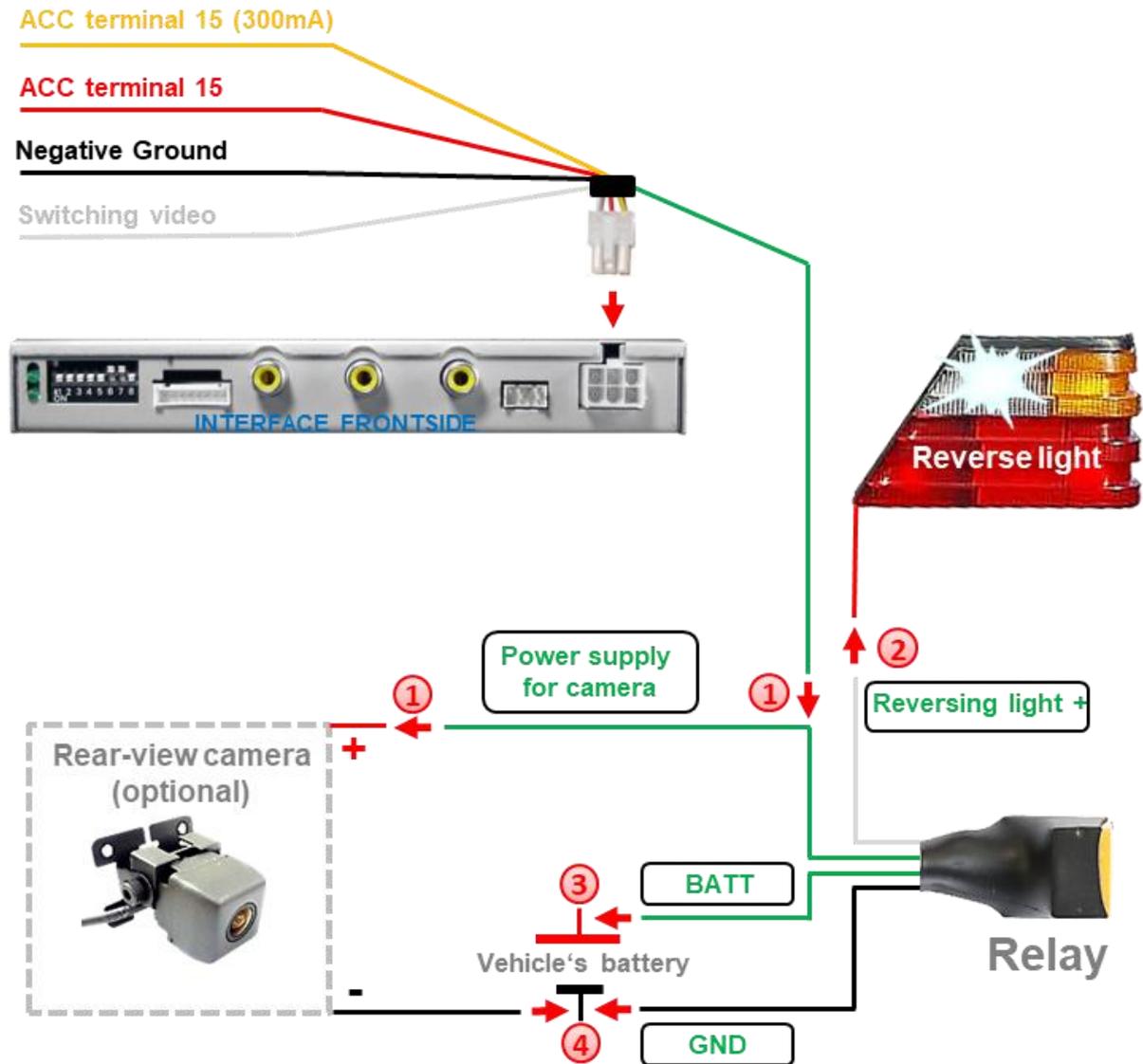


Attention: The audio cable CAB-FV-AUDIO shown in the diagram is not included in the delivery contents and is optionally available!

2.5.4. After-market rear-view camera

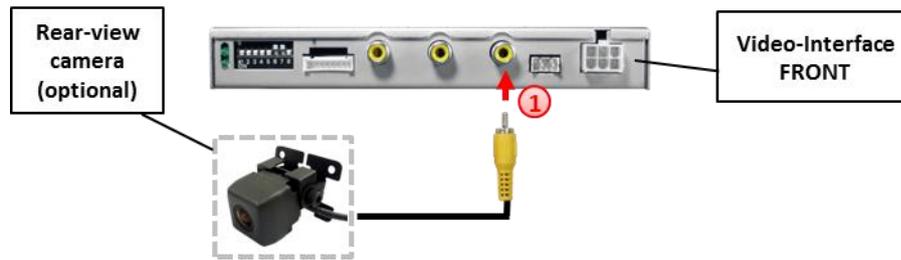
VL1-MBN4

Connection – RVC signal relay



- 1 Connect the rear-view camera's power cable and the green coloured cable of the 6pin cable both to the relay's green coloured output cable "Power supply for camera".
- 2 Connect the reverse light's power cable to the relay's white coloured cable "Reverse light".
- 3 Connect +12V permanent battery power to the relay's green coloured input cable "BATT".
- 4 Connect the relay's black coloured Power cable "GND" and the rear-view camera's negative cable both to the vehicle's negative Ground.

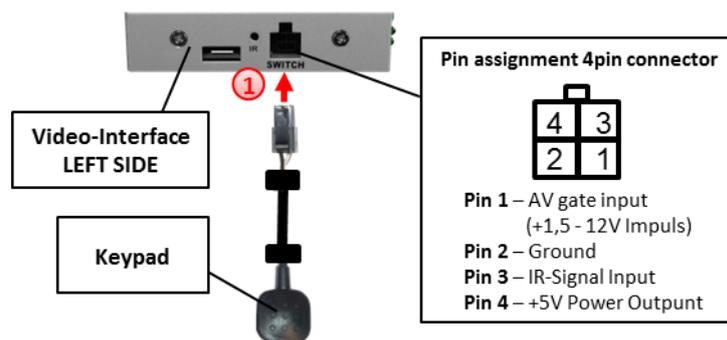
2.5.4.1 Connection – video signal of the rear-view camera



- 1 Connect the video-RCA of the after-market rear-view camera to the female RCA port of the video-interface which is labeled as CAM.

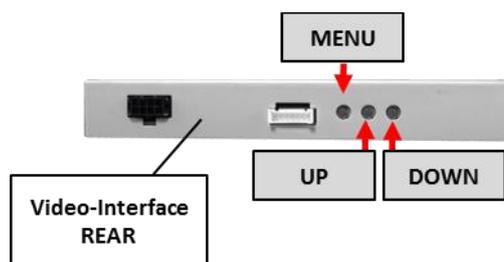
Note: Picture settings for CAM input must be done in AV2.

2.6. Connecting video-interface and keypad



- 1 Connect the female 4pin Microfit connector of the keypad to the male 4pin Microfit connector of the video-interface.

2.7. Picture Settings



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 change the selected value. The buttons are embedded in the housing to avoid accidental changes during or after installation. Picture settings must be done separately for RGB, AV1 and AV2 while the corresponding input is selected and visible on the monitor. AV2 and CAM share the same settings which must be adjusted in AV2.

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:

- Brightness
- Contrast
- Saturation
- Position H (horizontal picture position)
- Position V (vertical picture position)



3. Switching the video sources

Der externe Taster kann zur Umschaltung der aktivierten Eingänge verwendet werden.

Durch einen **langen Druck (2-3 Sekunden)** wird zum nächsten aktivierten Video Eingang gewechselt. Wenn alle Eingänge aktiviert sind, ist die Reihenfolge:

Werks-Video → Video IN1 → Video IN2 → Werks-Video →...

Nicht aktivierte Eingänge werden übersprungen. Wenn die Quellen auch am Audio-Kabel des Video-Interface angeschlossen sind, wird beim Umschalten von **Video-IN1** auf **Video-IN2** auch das Audio-Signal automatisch umgeschaltet.

3.1. Über weiße Leitung des 6-Pin Kabels

Die weiße Leitung des 6-Pin Kabels kann alternativ oder zusätzlich zur Umschaltung der aktivierten Eingänge verwendet werden (mit +5V oder +12V Impuls).

4. Specifications

BATT/ACC range	7V - 25V
Stand-by power drain	6mA
Power	170mA @12V
Video input	0.7V - 1V
Video input formats	PAL/NTSC
RGB-Video amplitude	0.7V with 75 Ohm impedance
Temperature range	-40°C to +85°C
Dimensions video-box	152 x 21 x 90 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 from lens.

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" R-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 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 17595 00
 Email mail@navlinkz.de

 10R-03 5384

Made in China

