Video inserter
HDV-MBMC / HDA-MBMC

Compatible with
Mercedes Benz
Actros 5 and Arocs vehicles
with Multimedia Cockpit with 10.25 inch monitor and 31pin radio connector

Example

Attention!
Video signal type of each video source must be preset in OSD-menu of corresponding video-input.

Product features

- **1 x CVBS/AHD input for rear-view camera**
- **1 x CVBS/AHD input for front camera**
- **2 x CVBS/AHD input for side cameras or additional after-market video-sources (e.g. USB-AV player, DVB-T2 tuner, etc.)**
- **All inputs NTSC and PAL compatible**
  Supported AHD resolutions 720p NTSC (30Hz)**, 720p PAL** (25Hz)**, 960p NTSC** (30Hz)**, 960p PAL** (25Hz)**, 1080p NTSC** (30Hz)**, 1080p PAL** (25Hz)
- **HDV-MBMC only: 1 HDMI input for HD rear-view camera or other HDMI source (e.g. iOS/Android device, laptop, streaming stick, DVB-T2 tuner, etc.)**
  Supported HDMI resolutions 720p NTSC (60Hz)**, 720p PAL** (50Hz)**, 1080p NTSC** (60Hz)**, 1080p PAL** (50Hz)
- **HDV-MBMC only: Analogue audio output for HDMI source**
- **Automatic switching to rear-view camera input while reverse gear is engaged**
- **Automatic front camera shift after reverse gear for 5, 10, 15 or 20 seconds**
- **Adjustable guide lines (fixed or movable) can be activated for rear-view camera (movable guide lines not available for all vehicles)**
- **Free picture while driving (only for inserted video sources)**

Table of contents

Legal notice

The driver must not be distracted either directly or indirectly by moving pictures while driving. This is prohibited by law in most countries/states. We therefore exclude all liability for damage to property and personal injury caused directly or indirectly by the installation and operation of this product. This product is only intended for displaying stationary menus (e.g. MP3 menu of USB devices) or pictures from (rear-view) cameras while driving, in addition to operation when stationary.

Changes/updates to the vehicle software may impair the functionality of the interface. Software updates for our interfaces are provided to customers free of charge for up to one year after purchase of the interface. The interface must be sent in free of charge for the update. Costs for installation and removal will not be reimbursed.

1 Before installation

These instructions must be read before installation. Specialist knowledge is required for installation. The installation location of the interface must not be near sources of moisture or heat.

Before final installation in the vehicle, we recommend a test run after connection to ensure that the vehicle and interface are compatible. Due to production-related changes made by the vehicle manufacturer, there is always the possibility of incompatibility.

1.1 Scope of delivery

Note the serial number of the interface and keep the instructions for support purposes: _____

1.2 Check interface compatibility with vehicle and accessories

Requirements

Manufacturer	Compatible vehicle models	Infotainment
Mercedes Benz	Actros 5 from MY 2018 Arocs from MY 2020	Multimedia cockpit with 10.25 inch monitor *with navigation or without navigation and with 31pin radio connector**

** The Multimedia Cockpit with 10.25 inch monitor is available with and without navigation. With navigation always has the 31pin radio connector, without navigation has either the 31pin or a 26pin radio connector. For the variant with 26pin radio male connector, the Male connector&Play cable set with the article number PNP-MBUX26P is optionally available. Alternatively, the 31pin version HDV-MBMC / HDA-MBMC can also be used for the 26pin version by disconnecting the 31pin male connector and female connector of the Male connector&Play cable set and installing the open cable ends on the factory harness - this option is described as a "special case" in these instructions.*

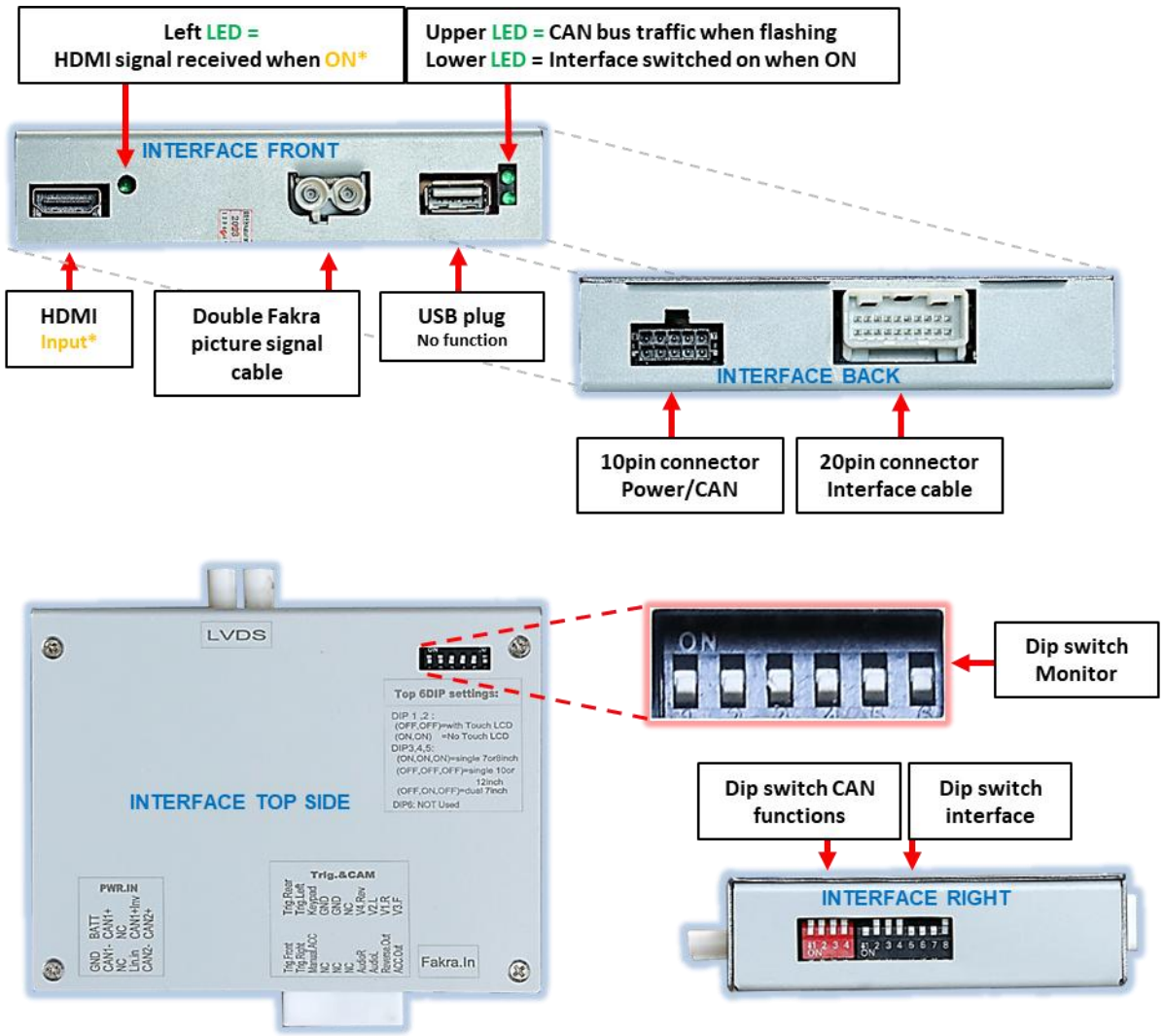
1.3 Limitations

Limitations

CAN bus compatibility	The CAN bus compatibility of the interface may be restricted in some vehicles, either completely or for individual functions. This may be noticeable both during installation and later. The interface with all video inputs can be operated with analogue switching signals without connection to the vehicle CAN bus. In this case, individual additional functions are omitted, see *chapter 2.4.2 Analogue connection without CAN bus*.
Video only	Interface **does not feed** in **any audio signals.** To feed in audio signals, any existing factory audio AUX input or optional products must be used (e.g. FM modulator). For HDMI source, the audio is output via an analogue audio output (3.5mm jack socket).
Factory rear-view camera	Automatic switchover to rear-view camera input only takes place as long as reverse gear is engaged. Optional accessories are required for different switching times.
After-market front camera	Switching to front camera takes place automatically after reverse gear is engaged for 5, 10, 15 or 20 seconds (depending on the OSD menu setting). Manual switching to front camera is also possible via the external keypad.
Guide lines for rear-view camera	If the vehicle CAN bus is not fully compatible with the interface or if the connection is analogue, the moving guide lines function cannot be used.

1.4 Boxes and connections - Interface

The interface converts video signals from after-market sources into a video signal compatible with the factory head unit. This is fed into the factory monitor via various switching options. The interface also reads digital signals from the vehicle CAN bus and uses them for its own functions.



*** HDMI input only available with HDV-MBMC**

1.5 Settings – switch bench of 8 dip switches (interface functions)

Interface box, right side, black

Dip position **UP = OFF** and **DOWN = ON**

Dip	Function	ON (down)	OFF (up)
1	Video 1 / V1-Left	activated	deactivated
2	Video 2 / V2-Right	activated	deactivated
3	Front camera / V3 front	activated *	deactivated
4	Type of rear-view camera (V4-Rear)	After-Market	Plant or none
5	Connection type of the After-market rear-view camera*	HDMI*	V4 reverse (CVBS/AHD)
6	HDMI **input***	activated	deactivated
7	Monitor selection	-	10.25 inch monitor
8	Monitor selection	-	10.25 inch monitor

Power reset interface after each dip change to activate changes!

* Switching to front camera occurs automatically for 5, 10, 15 or 20 seconds (depending on the OSD menu setting) after shifting into reverse gear.

* With HDA-MBMC, dip 5 and dip 6 have no function. Set both to **OFF.**

See following chapters for detailed information about 8dip switch bench.

1.5.1 Interface video inputs V1-Left and V2-Right (Dip 1-2)

With Dip 1 (Dip 2) = **ON**, the CVBS/AHD input **V1-Left** (**V2-Right**) is activated for side camera or other video sources. Only activated video inputs can be accessed - both with automatic and manual switching. It is recommended to only activate used inputs, to avoid accidental switching.

1.5.2 Front camera input V3-Front (Dip 3)

If Dip 3 = **ON,** the interface switches to the CVBS/AHD front camera input **V3-Front** after the reverse gear has been selected. In addition, manual switching to the front camera input is possible from any picture mode using an external keypad (short press).

In the OSD menu settings, the automatic display time of the front camera can be selected between 5; 10; 15 or 20 seconds or switched off. Another video source could then also be connected to instead of a front camera.

1.5.3 Rear-view camera settings (dip 4)

If Dip 4 = **OFF,** the interface switches to the factory image for the existing factory rear-view camera or factory PDC display as long as reverse gear is engaged.
If Dip 4 = **ON,** the interface switches to its CVBS/AHD rear-view camera input **V4-Reverse** (provided Dip 5 is set to **OFF**) or the **HDMI input*** (provided Dip 5 and Dip 6 are set to **ON**) when reverse gear is engaged.

Note: **V4 reverse** remains without function when dip 5 = ON, using an HDMI camera.

1.5.4 Connection type of the rear-view camera (Dip 5)

Dip 5 = **ON** selects the **HDMI input*** as the rear-view camera input. In addition, the **HDMI** input must be activated with dip 6 = **ON**. Dip
5 = **OFF** selects the **V4-Reverse** input as the rear-view camera input.

Note: The automatic switchover to the front camera for the preset time is available in both cases after reverse gear is engaged.

1.5.5 HDMI input* (Dip 6)

With dip 6 = **ON**, the **HDMI** input* is activated and can be used for various HDMI sources (e.g. rear-view camera or 360° camera system, smartphone, laptop, streaming stick, DVB-T2 tuner, etc.) . For rear-view camera/360° camera system, dip 5 = **ON**.
With dip 6 = **OFF,** the **HDMI** input* is deactivated.

1.5.6 Monitor selection (Dip 7+8)

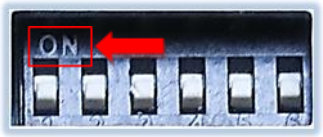
Dip 7+8 = **OFF** for 10.25 inch monitor.

*** HDMI input only available with HDV-MBMC**

Power reset interface after each dip change to activate changes!

1.6 Settings – Switch bench of 6 dip switches (monitor definition)

Interface box, top side, black



Attention!
Flip the dip switches very carefully with a micro tool.

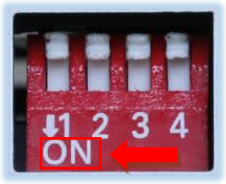
Attention: In contrast to the other switch benchs (8 and 4), the dip position for the 6 is UP = ON and DOWN = OFF!

Monitor size	Dip 1	Dip 2	Dip 3	Dip 4	Dip 5	Dip 6
10.25 Monitor Actros 5 Multimedia Cockpit **with navigation**	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**	**OFF**

In the event of picture or touch problems, also try the other dip switch settings!
Power reset interface after each dip change to activate changes!

1.7 Settings – Switch bench of 4 dip switches (CAN function - red)

Interface box, right-hand side, red



Set the DIP switch positions according to the following table.

Dip position UP=OFF and DOWN=ON

Vehicle/Navigation	Dip 1	Dip 2	Dip 3	Dip 4
Actros 5 Multimedia Cockpit **with navigation**	**OFF**	**OFF**	**OFF**	**OFF**

Power reset interface after each dip change to activate changes!

2 Installation

Switch off the ignition and disconnect the vehicle battery according to the factory specifications!
If the vehicle battery must not be disconnected according to the factory specifications, in most cases it is sufficient to put the vehicle into sleep mode. If this does not work, disconnect the vehicle battery with a resistor cable.

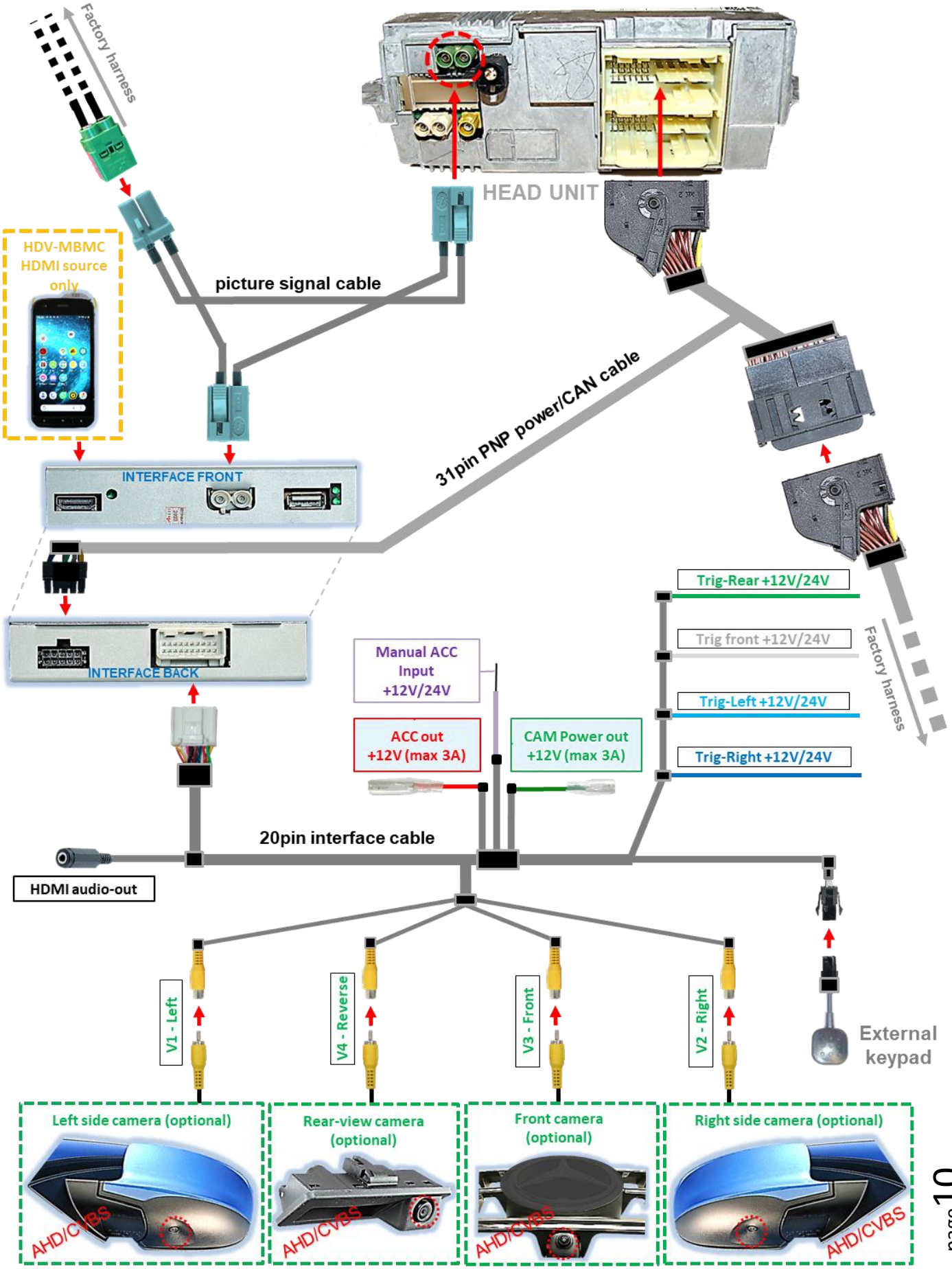
Before final installation, we recommend a test run of the interface with all connected devices to ensure that all parts are compatible. Due to possible changes in the vehicle manufacturer's production at any time, incompatibility can never be ruled out.

As with every installation of after-market devices, a quiescent current test of all after-market devices must be carried out after installation to ensure that the devices are switched off to standby mode in vehicle sleep mode.

2.1 Place of connection

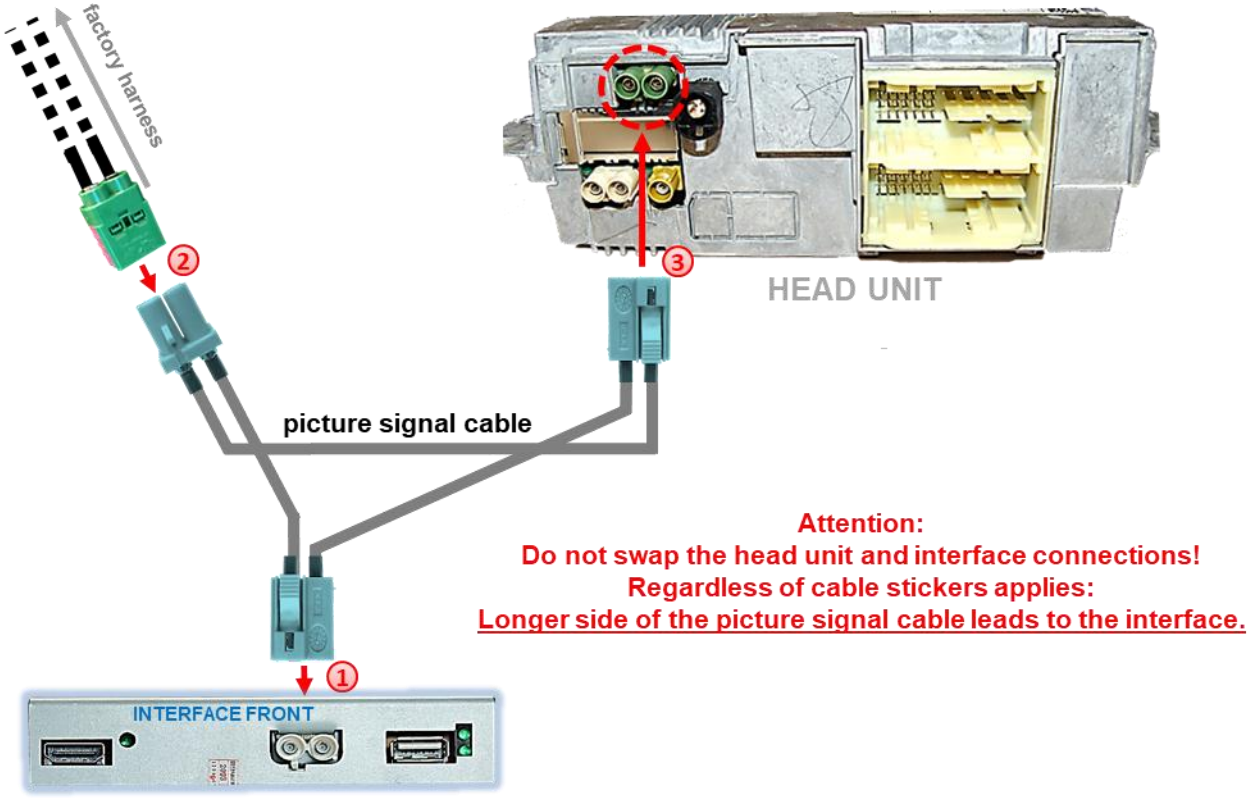
The video interface is installed on the passenger side above the footwell near the head unit and connected to the factory head unit.

2.2 Connection schema



2.3 Connection - picture signal cable

Attention: The picture signal cable is only connected to the double Fakra of the head unit, even if it is only used on one side!



1. Connect the water blue double Fakra female connector of the supplied picture signal cable to the double Fakra male connector of the video interface.

2. Disconnect the double Fakra female connector of the factory picture signal cable from the **green** double Fakra male connector of the head unit and connect it to the water blue double Fakra male connector of the picture signal cable supplied.

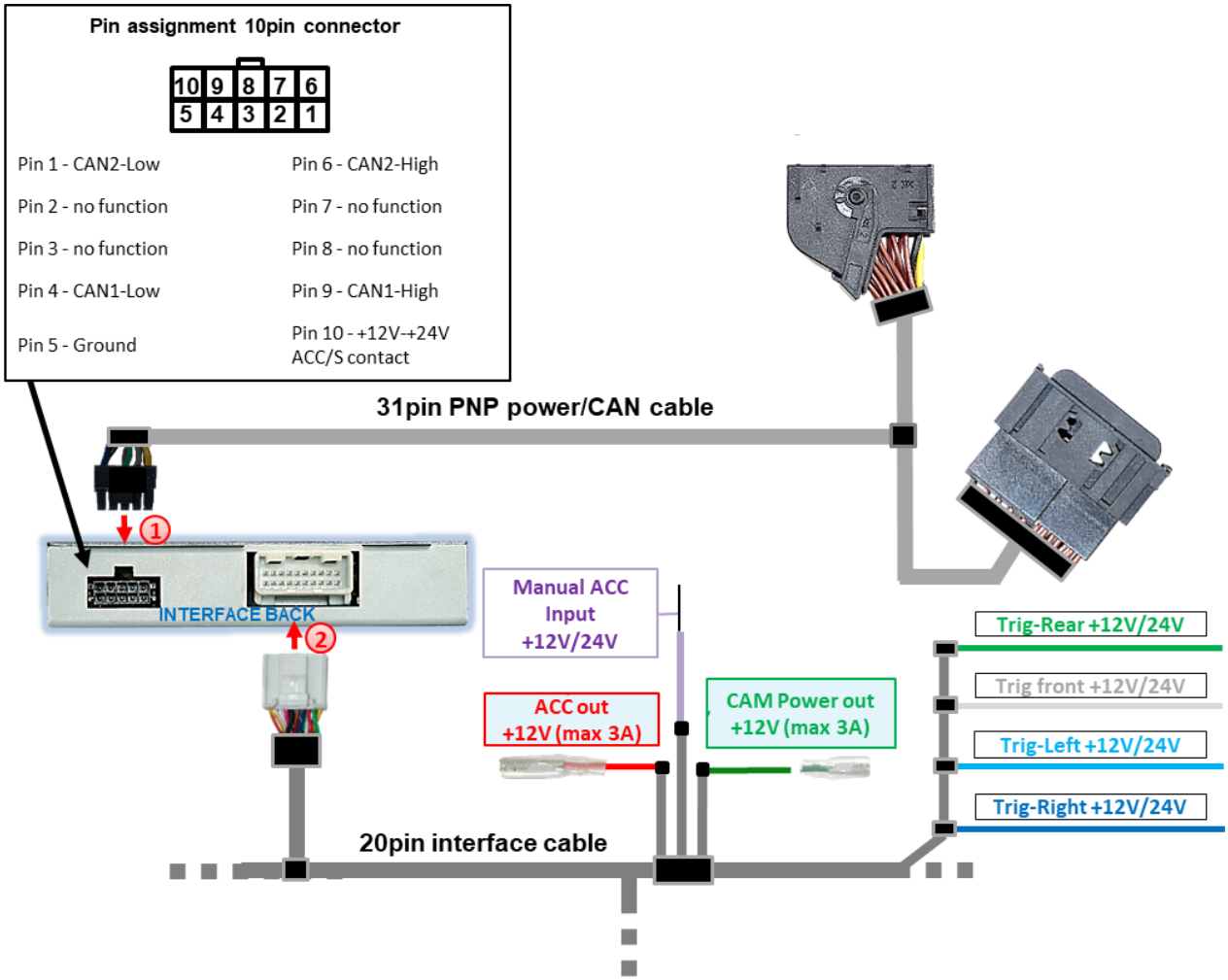
3. Connect the water blue double Fakra female connector of the supplied picture signal cable to the **green** double Fakra male connector of the head unit.

2.4 Connection - cable sets, power supply and CAN bus or analogue without CAN bus

The interface can be integrated via CAN-bus as well as operated in analogue mode without CAN-bus connection.

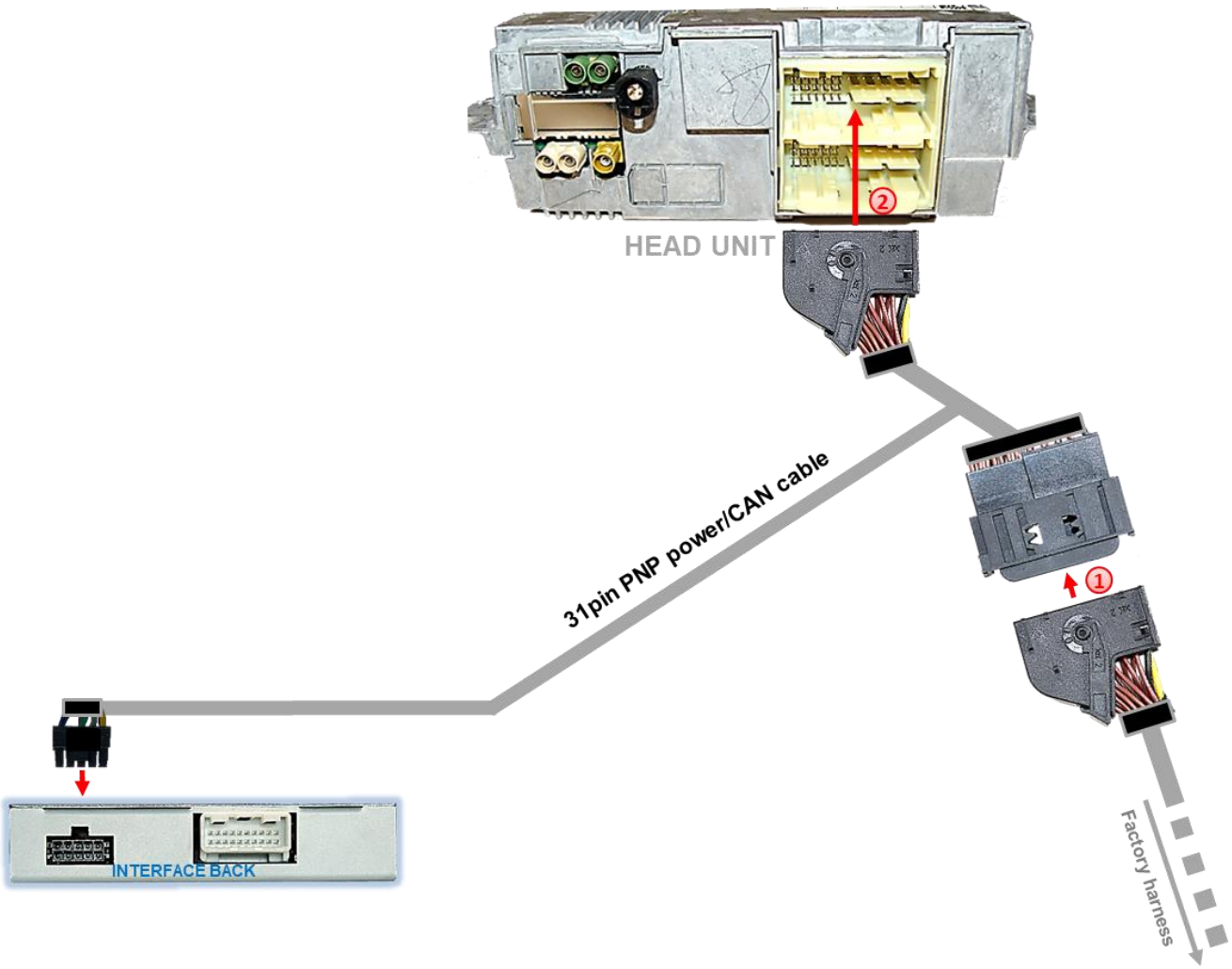
When integrated via CAN-bus, the interface is switched on by the vehicle CAN-bus and R-gear signal and turn signals are usually recognized. In some vehicles also movable guide lines can be displayed, using CAN-bus steering signals and parking sensor data.

In exceptional cases, CAN communication is not (fully) compatible. If no interface LED lights up after connecting the 31pin PNP power/CAN cable when the ignition is switched on, the analogue connection described below must be made. The analogue connection is also possible to avoid a possible subsequent CAN bus incompatibility. In this case, the interface must be both switched on and switched to its inputs via +12V switching inputs.
The display of movable guide lines for the rear-view camera is omitted with an analogue connection.



1. Connect the 10-pin female connector of the 31pin PNP power/CAN cable to the 10-pin male connector of the interface.
2. Connect the 20pin female connector of the 20pin interface cable to the 20pin male connector of the interface.

2.4.1 Connection with CAN bus



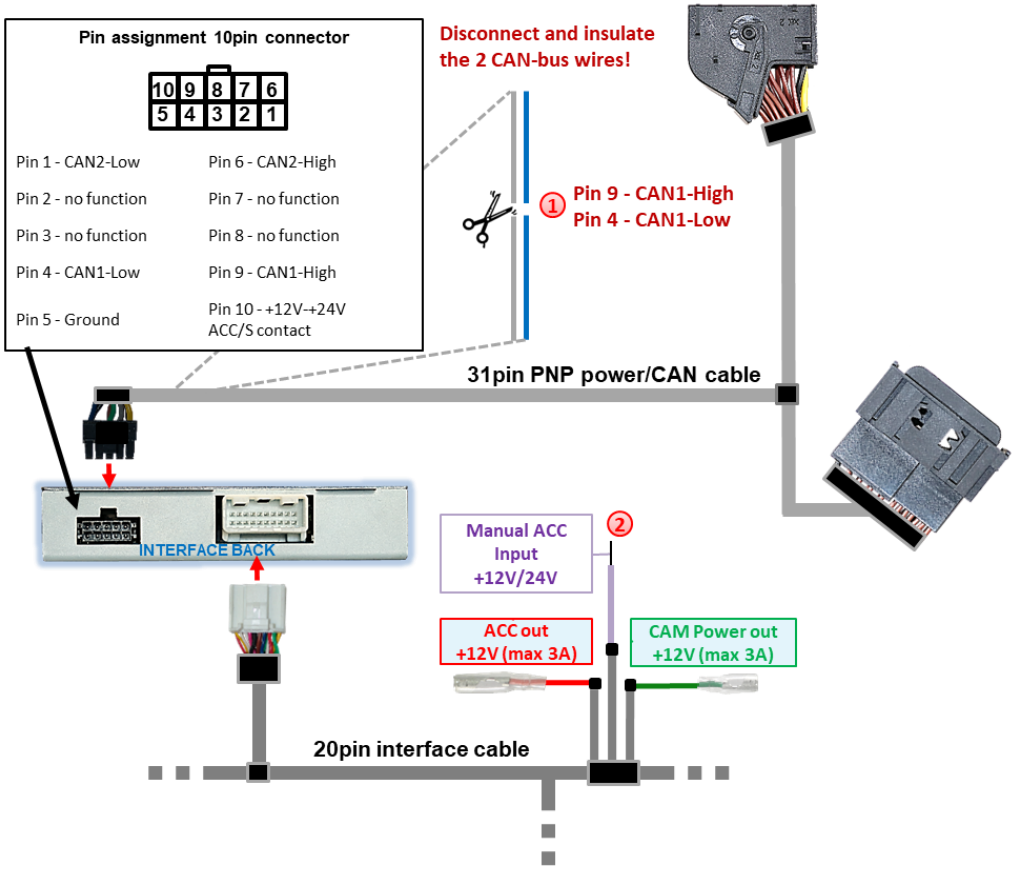
① Disconnect the 31pin female connectors of the vehicle wiring harness at the rear of the head unit and connect them to the 31pin connectors of the **31pin PNP power/CAN cable.**

② Connect the 31pin female connectors of the **31pin PNP power/CAN cable** to the previously vacated 31pin connector of the head unit.

Attention!
In exceptional cases, CAN communication is not (fully) compatible. If no interface LED lights up after connecting the 31pin PNP power/CAN cable set when the ignition is switched on, the analogue connection described below must be made.

2.4.2 Analogue connection without CAN bus

With an analogue connection, the two CAN wires of the 31pin PNP power/CAN cable are not connected - the two wires of the 31pin PNP power/CAN cable must be disconnected for this!



1. Disconnect and insulate the 2 CAN bus wires (grey, blue) of the 31pin PNP power/CAN cable approx. 4-5 cm behind the black connector.

2. Connect the violet wire **Manual ACC** of the 31pin PNP power/CAN cable to the **+12V-+24V S-contact (terminal 86s) or ACC terminal 15r** (e.g. cigarette lighter, glove compartment lighting).

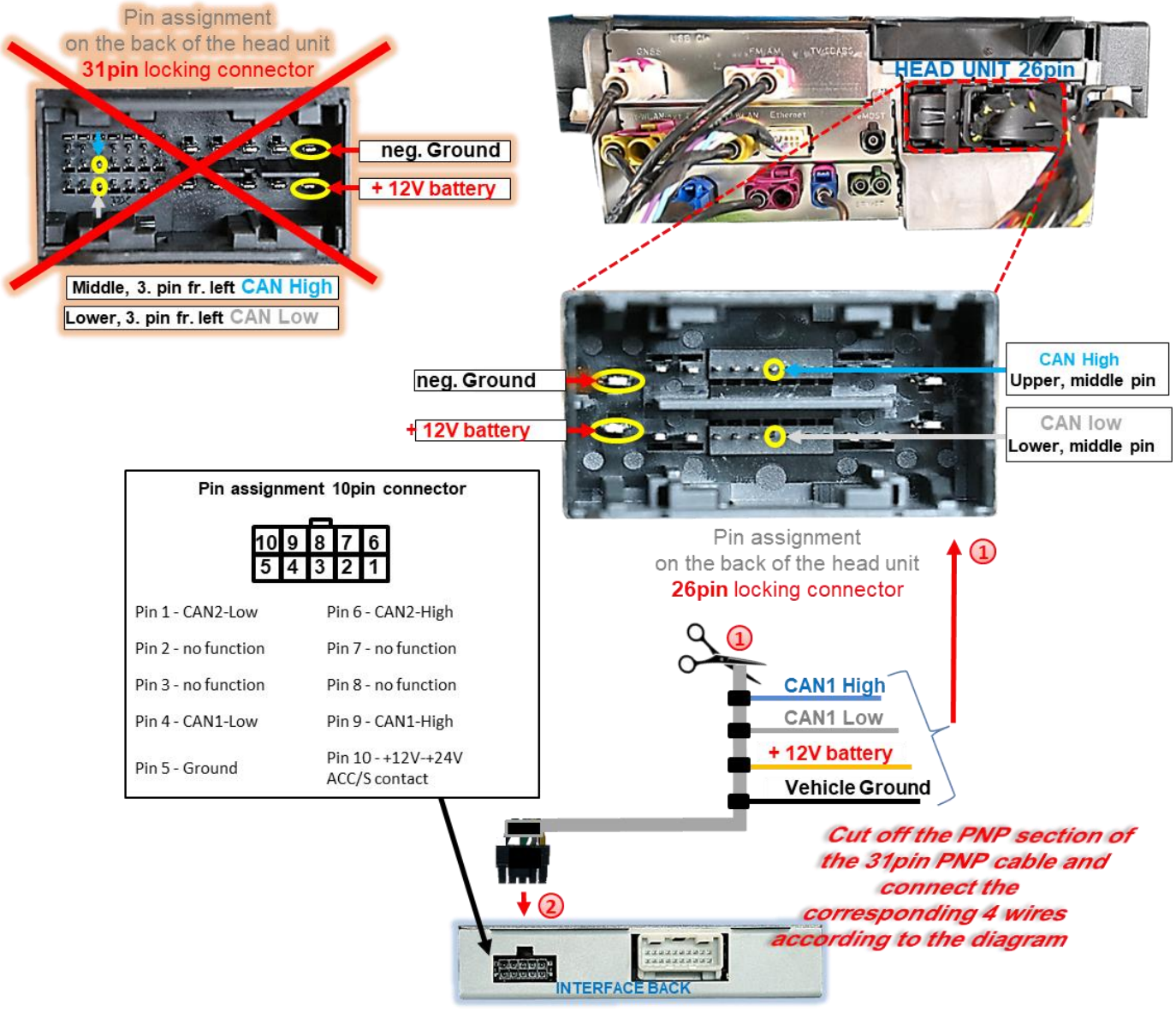
Notes

- The screen is only switched on as long as the video interface is switched on via +12V-+24V on **Manual ACC.** Otherwise, the factory picture is also black.
  When selecting the switch-on signal, it must be checked whether the factory picture is available in all desired operating states.
- The display of movable guide lines for the rear-view camera is omitted with an analogue connection.
- If the interface is connected analogue (without CAN bus), the rear-view camera and side cameras must also be connected analogue.
  See points:
  2.6.2 Case 2: Reverse gear signal from analogue signal
  2.8.2 Case 2: Turn signals from analogue signal

2.4.3 Special case head unit with 26pin connector

In exceptional cases, the manufacturer has installed head units with 26pin connectors (instead of 31pin connectors). In this case, the 26pin locking female connector of the factory harness remains connected in the 26pin locking male connector of the factory head unit and the corresponding power and CAN wires of the enclosed 31pin PNP power/CAN cable are connected to the factory harness. To do this, the unused PNP section of the enclosed 31pin PNP power/CAN cable must be disconnected.

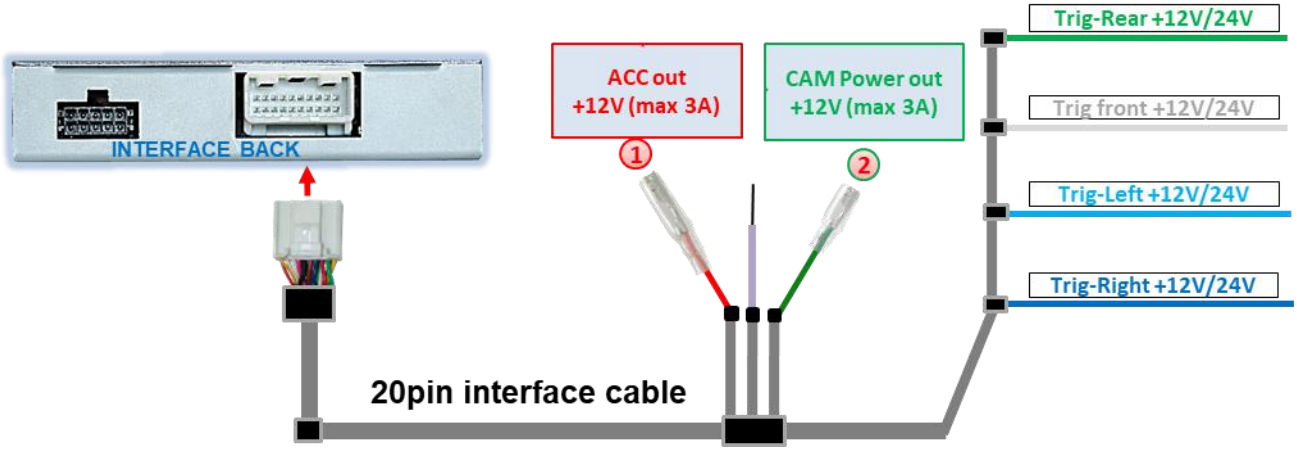
The pin assignment of the locking male connectors is shown in the diagram below.



1. Cut off the PNP section of the 31pin PNP power/CAN cable, expose the CAN and power wires on the remaining 10-pin wiring harness and connect them to the factory harness as shown in the diagram above.
2. Connect the 10-pin female connector of the connected cables to the 10-pin male connector of the video interface.

2.5 Power supply outputs

The two **red** and **green** power supply wires **ACC out 12V (max 3A)** and **CAM Power 12V (max 3A)** of the **20pin interface cable** can either be used as ACC power supply for the **external video sources** (e.g. iOS/Android devices, laptop, streaming stick, DVB-T2 tuner) connected to **V1-Left**, **V2-Right**, **V3-Front or HDMI** input * , or as power supply for the after-market cameras (e.g. side, front and rear view camera) connected to **V1-Left**, **V2-Right**, **V3-Front**, **V4-Reverse** or **HDMI** input* (e.g. side, front and rear-view cameras).

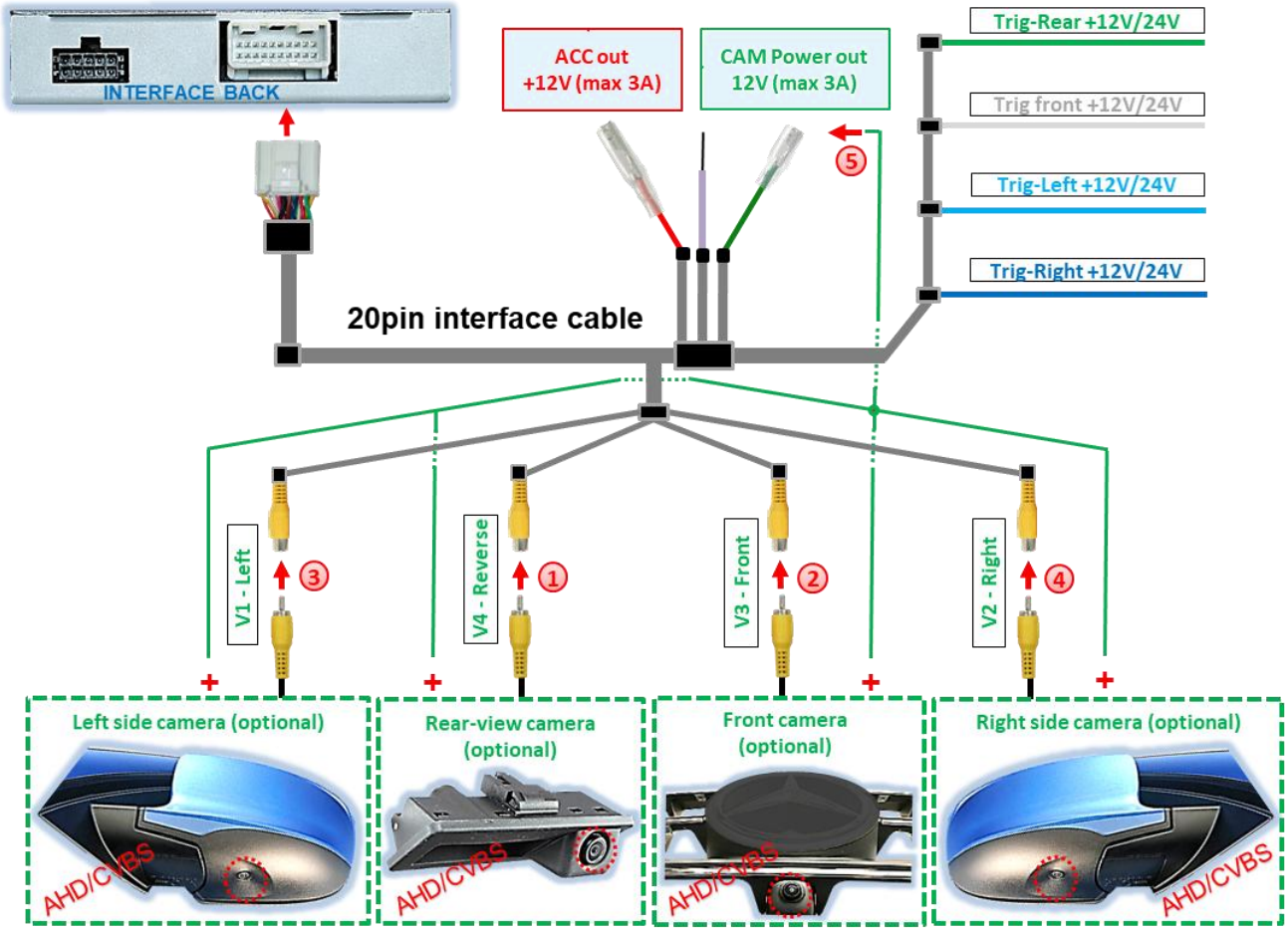


1 **External video sources** (no cameras) can be supplied with power via the red **ACC out 12V (max. 3A)** power supply wire of the **20pin interface cable**.
The wire carries a **permanent** +12V ACC DC voltage as soon as the interface is switched on *(see the following chapter for connection diagrams)*.

2 The power supply for **after-market cameras** (e.g. reversing, side and front cameras) can be provided via the green power supply wire **CAM Power 12V (max 3A)** of the **20pin interface cable.** The wire carries **+12V DC voltage** only as long as one of the camera inputs is displayed, regardless of whether the connection is made via the vehicle CAN bus or via one of the trigger wires *(see the following chapter for connection diagrams)*.

*** HDMI input only available with HDV-MBMC**

2.5.1 Connection and power supply - Video sources
Rear-view camera, front camera and 2 side cameras

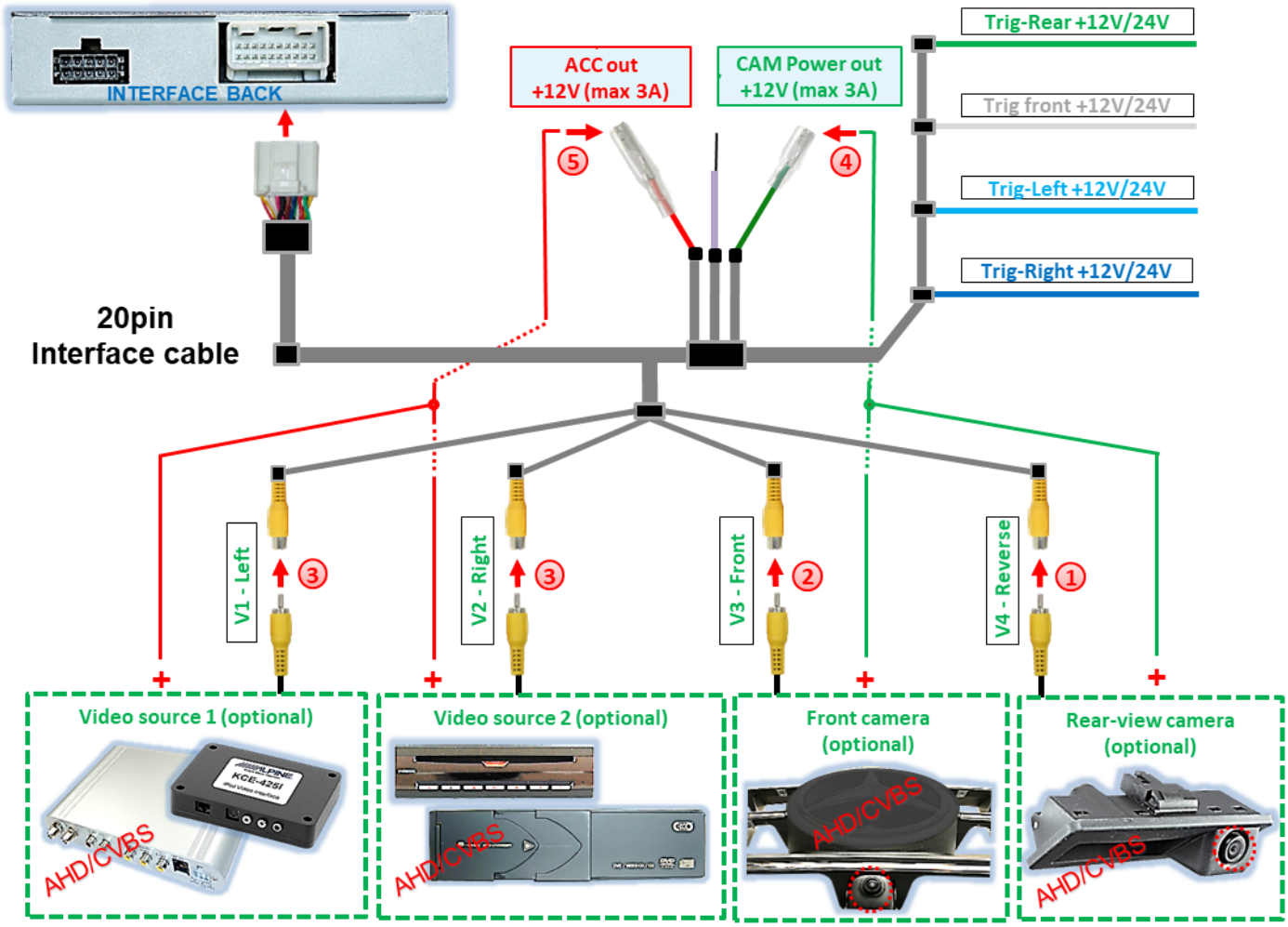


1. Connect the RCA male connector of the rear-view camera to the RCA female connector **V4 reverse** of the **20pin interface cable.**
2. Connect the RCA male connector of the front camera to the RCA female connector **V3 front** of the **20pin interface cable.**
3. Connect the RCA male connector of the left side camera to the RCA female connector **V1-Left** of the **20pin interface cable.**
4. Connect the RCA male connector of the right side camera to the RCA female connector **V2-Right** of the **20pin interface cable.**
5. Connect the power supply for all after-market cameras to the **green CAM Power 12V (max 3A) wire** of the **20pin interface cable.**

Note: The type of camera selection (via vehicle CAN bus or trigger wires) can be preset individually for each input in the OSD menu settings.

Attention!
Video signal type of each video source must be preset in OSD-menu of corresponding video-input.

2.5.2 Connection and power supply - video sources
Rear-view camera, front camera and 2 video sources



1. Connect the RCA male connector of the rear-view camera to the RCA female connector V4-Reverse of the 20pin interface cable .
2. Connect the RCA male connector of the front camera to the RCA female connector V3-Front of the 20pin interface cable.
3. Connect the RCA male connectors of video sources 1 and 2 to the RCA female connectors V1-Left and V2-Right of the 20pin interface cable.
4. The power supply for after-market cameras on the **green CAM Power 12V cable (max 3A)** of the 20pin interface cable.
5. Connect the power supply for video sources to the **red cable ACC out 12V (max 3A)** of the 20pin interface cable.

Note: The type of camera selection (via vehicle CAN bus or trigger wires) can be preset **individually** for each input in the OSD menu settings.

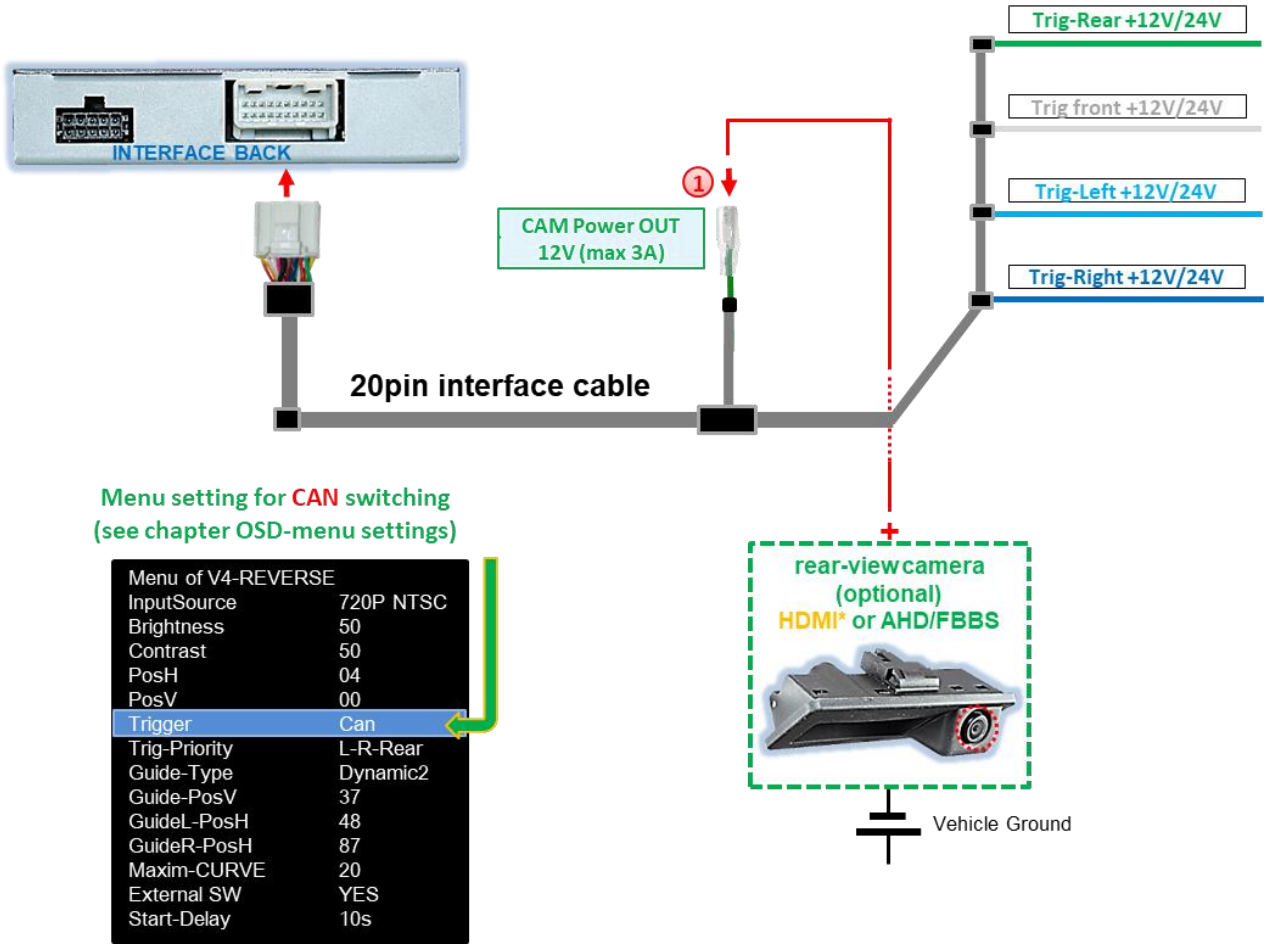
Attention!
Video signal type of each video source must be preset in OSD-menu of corresponding video-input.

2.6 After-market rear-view camera

Automatic switching to rear-view camera can be carried out via the CAN bus or an analogue reverse gear signal.

2.6.1 Case 1: Reverse gear signal from CAN bus

The basic requirement is that the connection of the interface is made with CAN bus. Furthermore, the vehicle CAN bus reverse gear signal and detection by the interface must be compatible. Then the interface supplies +12V power supply while reverse gear is engaged on the **green wire CAM Power 12V (max 3A)** of the 20pin interface cable and the interface automatically switches to the rear-view camera input V4-Reverse or the HDMI- input *.
See also chapter 1.5 Settings – switch bench of 8 dip switches (interface functions).



1 The +12V power supply for the after-market rear-view camera can be provided via the **green cable CAM Power 12V (max 3A)** of the 20pin interface cable, as this cable only carries current while the camera inputs are switched on (some cameras are not suitable for continuous operation).

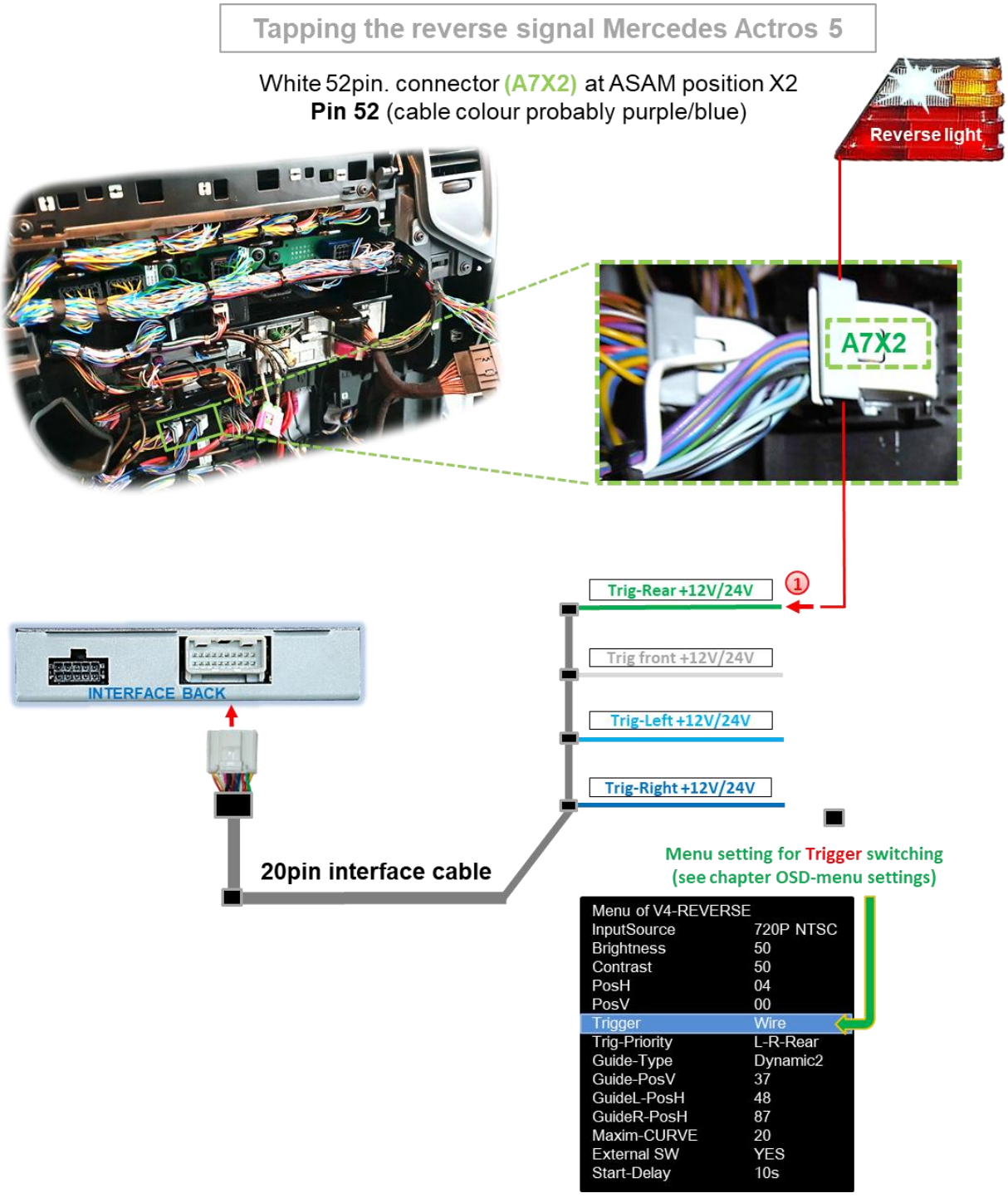
Notes

- If the HDMI input* is defined as the rear-view camera input, the **V4 reverse** input has no function!
- If the reverse gear detection of the interface on the CAN bus does not work , the reverse gear signal must be connected analogue.

*** HDMI input only available with HDV-MBMC**

2.6.2 Case 2: Reverse gear signal from analogue signal

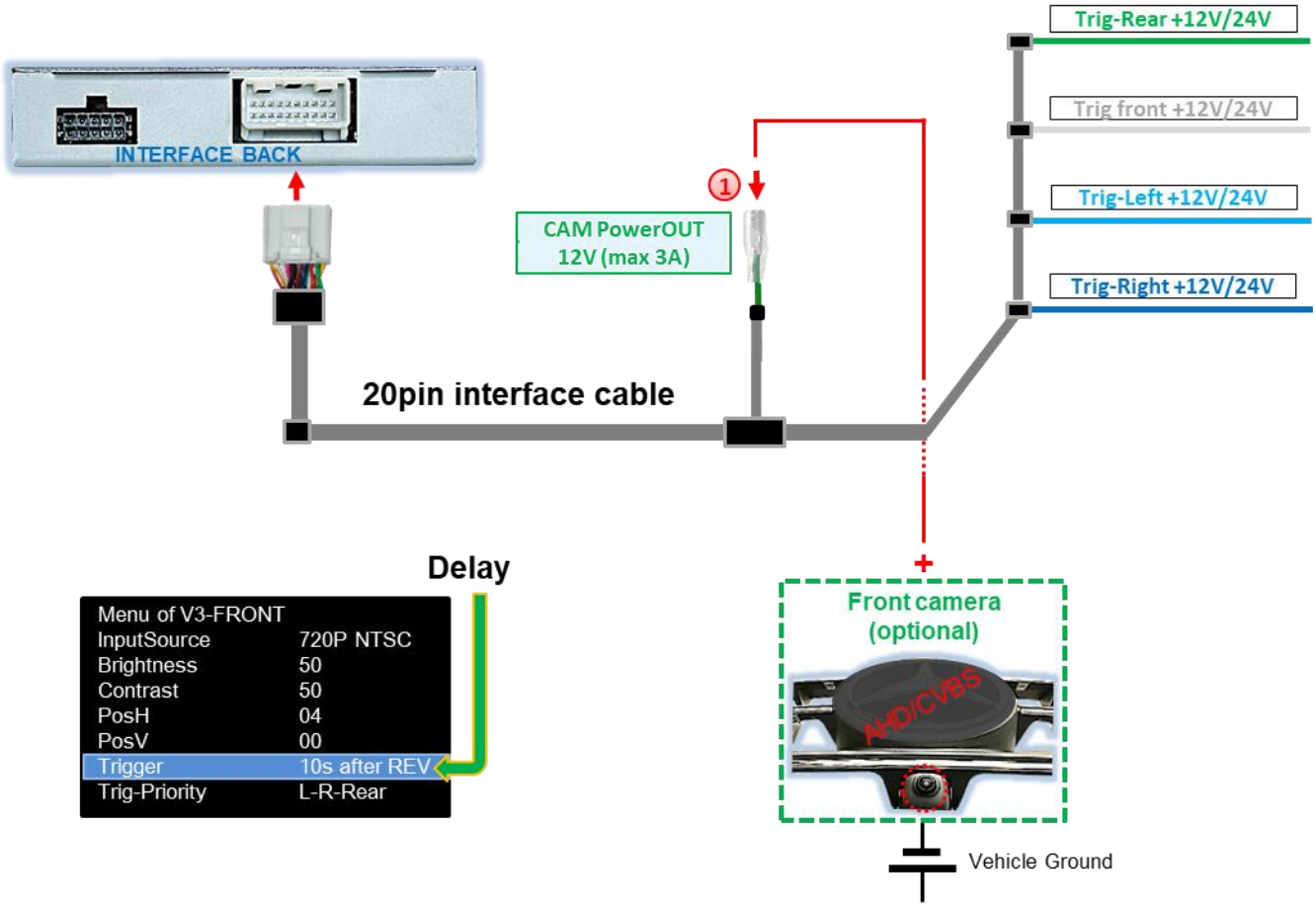
When connected the interface without CAN bus or when connected with CAN bus, if reverse gear is engaged and the interface does not provide +12V on the **green wire CAM Power 12V (max 3A)** of the **20pin interface cable** (not all vehicles are compatible), an external +12V to +24V DC switching signal from the reversing light is required.



1 Connect the **green Trig-Rear wire** of the 20pin interface cable **"Reverse-signal input +12V - +24V "** to the corresponding pin with the vehicle's reverse signal

Note: The 52-pin connector A7X2 is located near the head unit for tapping the reversing signal. The 24V reversing signal is located on **pin 52** of the connector.

2.7 After-market front camera



1 The **green CAM Power 12V (max 3A) cable** can be used to supply power to the front camera (and all other cameras connected to the video inputs). This is only energised for the duration of any camera activation (some cameras are not suitable for continuous operation). The prerequisite is that dip 3 = **ON** (black switch bank of 8 dip switches). The delay time can be individually selected for **5**, **10**, **15** or **20** seconds in the OSD menu settings of the front camera.

Switchover to front camera after reverse gear has been engaged for the time set in the OSD menu takes place with reverse gear signal from CAN bus and with analogue connection.

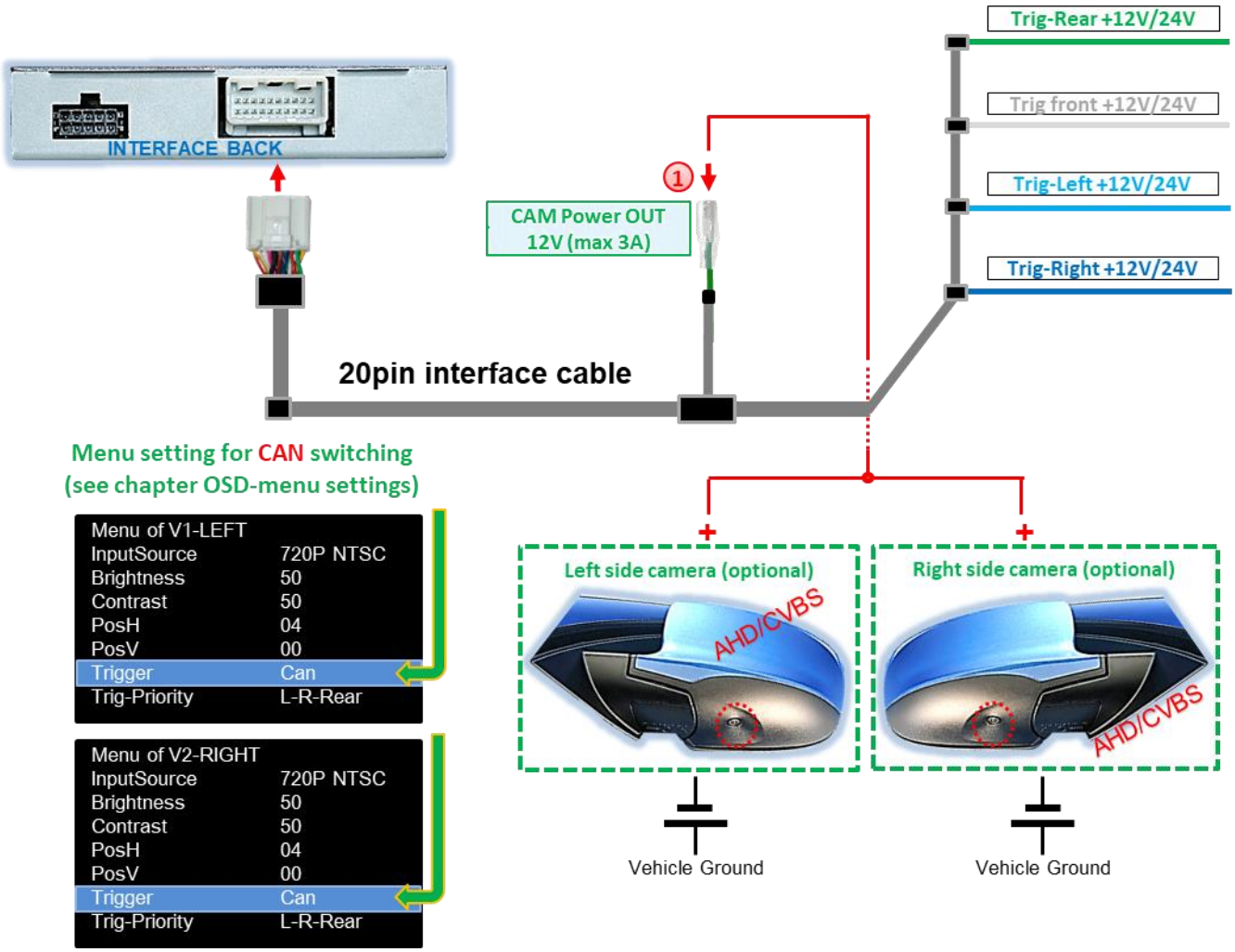
Note: In addition, manual switching to front camera input (short press) is possible from any picture mode using an external keypad *(see chapter 3 Operating the video interface)*.

2.8 After-market side cameras

Side cameras can be connected with selection via CAN bus or analogue signals.

2.8.1 Case 1: Turn signals from CAN bus

The basic requirement is that the connection of the interface is made with CAN bus. Furthermore, vehicle CAN bus turn signals and their recognition by the interface must be compatible. Then +12V is present on the **green CAM Power 12V wire (max 3A)** of the 20pin interface cable for the duration of turn signal operations.



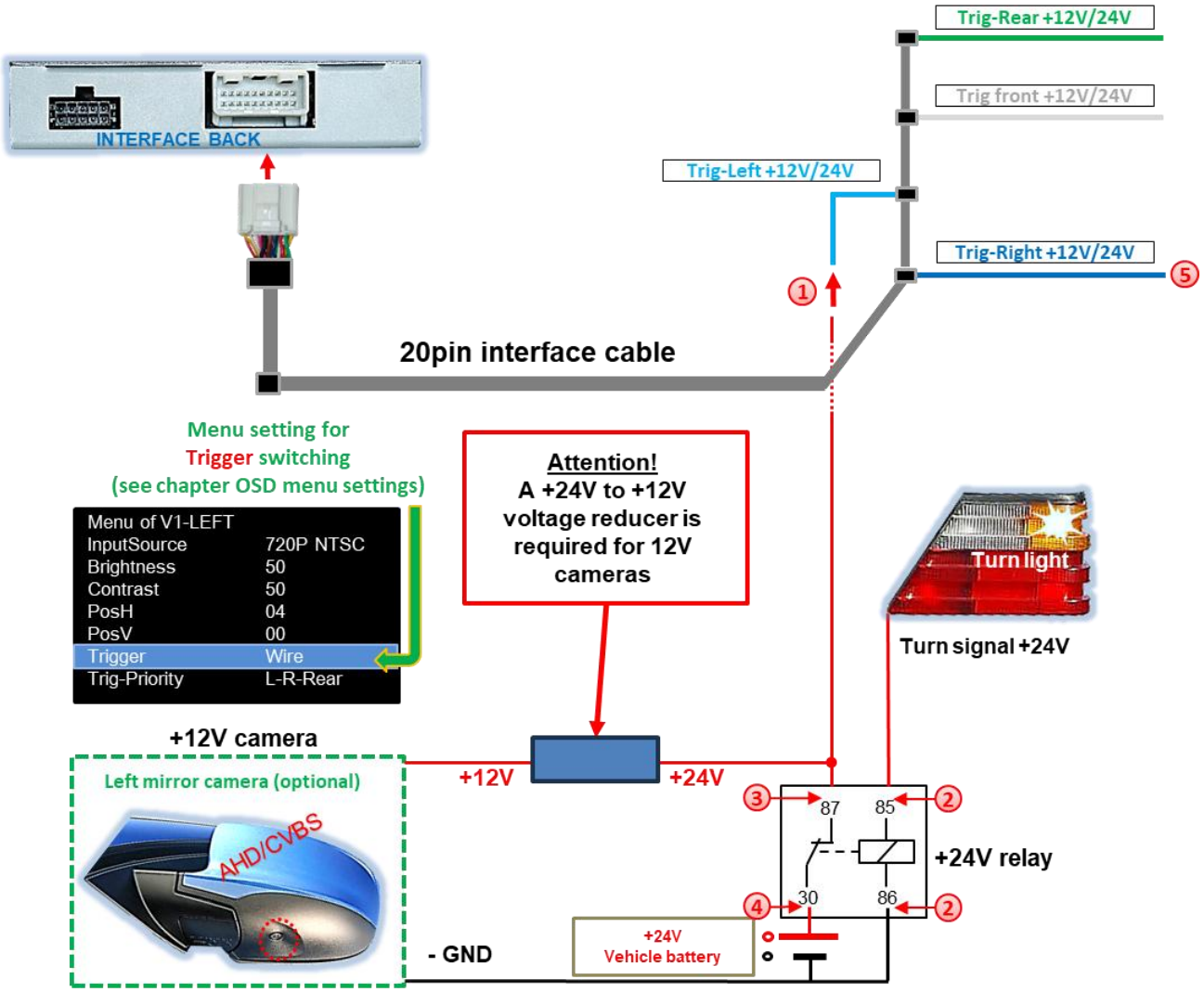
1 The power supply for the side cameras can be provided via the **green CAM Power 12V (max 3A)** of the 20pin interface cable, as this wire only carries power during camera activations (some cameras are not continuously current-stable).

Note: If the turn signal detection of the interface on the vehicle CAN bus does not work, the turn signals must be connected in analogue form.

2.8.2 Case 2: Turn signals from analogue signal

When the interface is connected without CAN bus or when the interface is connected with CAN bus and the turn signals from the vehicle CAN bus are not recognised, analogue activation of the side camera inputs is possible via the +12V/24V switching input wires **Trig-Left** and **Trig-Right.** An external switching signal from the turn signal bulbs is required to switch to the side camera inputs. As turn signals may contain electronic interference, a normally open relay or a noise filter is required for each input. The diagram below shows the use of a normally open relay

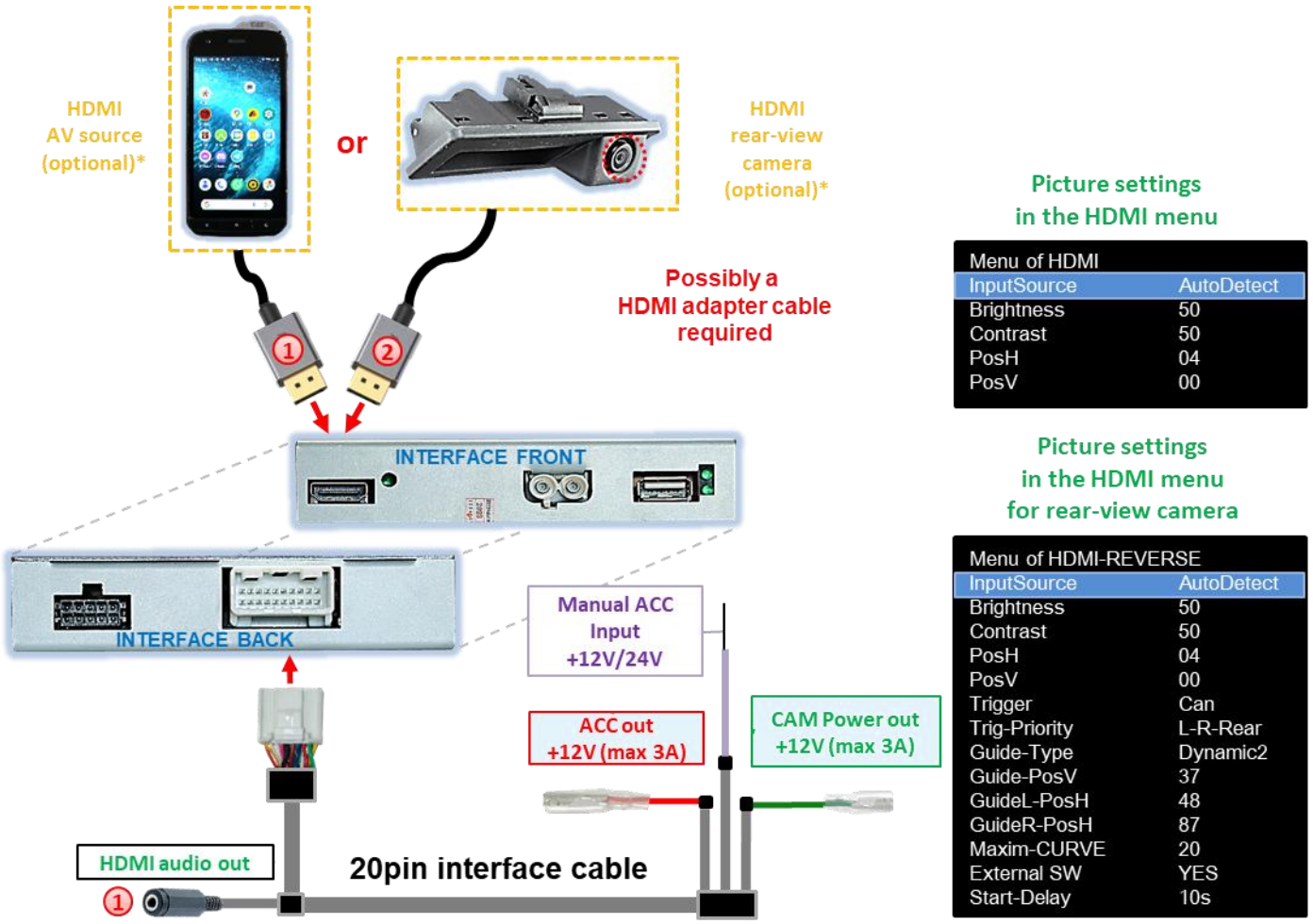
Note: When using +12V cameras, a +24V to +12V voltage reducer **must** also be installed, as shown in the diagram below.



1. Connect the **light blue cable Trig-Left** to the output terminal (87) of the relay.
2. Connect the flashing light power cable of the left-hand flashing light to the switching coil terminal (85) of the relay and the vehicle ground to the switching coil terminal (86) of the relay.
3. Connect the left side camera power cable to the output terminal (87) of the relay, in addition to the **light blue Trig-Left cable**.
4. Connect continuous current +24V to input terminal (30) of the relay.
5. The same connection method applies to the right side camera via the **dark blue Trig-Right cable.**

2.9 HDMI rear-view camera or other HDMI sources (HDV-MBMC only)

The HDMI input* of the interface can generally be used for any video source connected to it with an HDMI output (e.g. rear-view camera, 360° camera system or other video source such as smartphone, laptop, streaming stick DVB-T2 tuner, etc.).



Picture settings in the HDMI menu

Menu of HDMI	
InputSource	AutoDetect
Brightness	50
Contrast	50
PosH	04
PosV	00

Picture settings in the HDMI menu for rear-view camera

Menu of HDMI-REVERSE	
InputSource	AutoDetect
Brightness	50
Contrast	50
PosH	04
PosV	00
Trigger	Can
Trig-Priority	L-R-Rear
Guide-Type	Dynamic2
Guide-PosV	37
GuideL-PosH	48
GuideR-PosH	87
Maxim-CURVE	20
External SW	YES
Start-Delay	10s

1 If an optional HDMI video source is connected to the HDMI input*, the picture shown on the display of the source (e.g. smartphone, laptop, etc.) is mirrored on the vehicle monitor. Other sources (e.g. streaming stick, DVD player, DVB-T tuner, etc.) can also be displayed on the vehicle monitor. The video source can be supplied with power via the **red ACC out 12V(max3A) cable**. HDMI **audio signals** are output via the 3.5 mm jack female connector **HDMI audio** out * of the **20pin interface cable**. *See the following chapter 2.10 Audio* .

2 If a rear-view camera or a 360° camera system is connected to the HDMI input* (activated via CAN bus or analogue), the picture from the rear-view camera is displayed for the preset time when reverse gear is engaged and, after it has been laid out, the picture from a front camera connected to the front camera input **V3-Front is** also displayed. Power can be supplied via the **green cable CAM Power 12V(max3A)** .

*** HDMI input and HDMI audio out only available with HDV-MBMC**

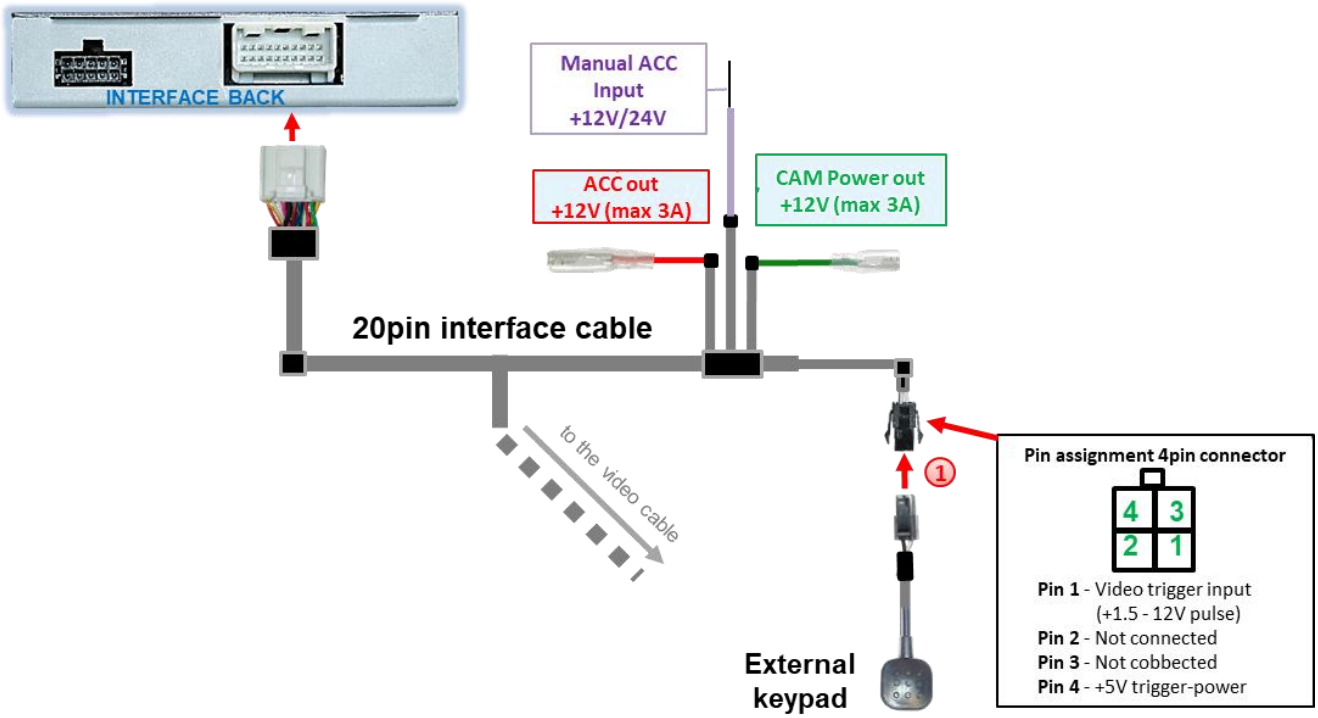
2.10 Audio insertion

The interface can only insert video signals into the factory infotainment.
Audio signals from the **HDMI input*** are output via the 3.5mm jack female connector **HDMI audio out*** of the interface. For all connected AV sources, their audio output must be connected to the factory AUX input (if available) or an optional audio feeder (e.g. AUX-UNI0x, FM modulator). If several AV sources are connected to the infotainment, an additional audio switch may be necessary.

Inserted Video signals can be activated in parallel to any audio mode of the factory infotainment system.

*** HDMI input and HDMI audio out only available with HDV-MBMC**

2.11 Connection - video interface and external keypad



1 Connect the 4-pin female connector of the external keypad to the 4-pin male connector of the **20pin interface cable.**

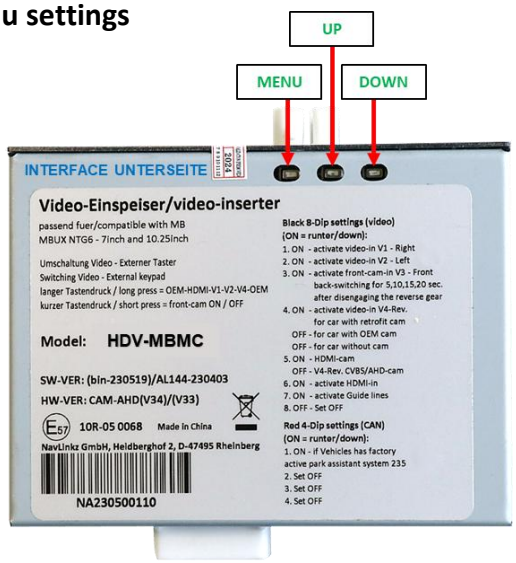
Note: Even if the keypad is not required for switching multiple sources, it is strongly recommended that it is connected to the interface and remains invisible. The keypad should then not be installed "pressed".

Optional: Instead of the external keypad, the interface can also be operated using the optionally available remote control 'HDA-RC'. This enables direct selection of the video/camera inputs and more convenient changing of settings in the respective OSD menus.

Remote control 'HDA-RC' optionally available

* The remote control is compatible with all HDA and HDV interfaces that are labelled with 'RC' at the end of the software version.

2.12 OSD menu settings



Attention!
Video signal type of each video source must be preset in OSD-menu of corresponding video-input.

OSD menu settings can be changed using the 3 keypads on the back of the interface. MENU opens the OSD settings menu or moves the cursor to the next menu item. UP (UP) and DOWN (DOWN) change the values of the current menu item.

The individual OSD settings menu of each video input can only be called up while it is displayed, regardless of whether a video source is connected.

The following setting options are available in the OSD setting menus of the 5 video inputs:

Menu V1-Left (V2-Right)

Switch bench of 8 dip switches Dip 1 (Dip 2) = ON

Menu of V1-LEFT	
InputSource	720P NTSC
Brightness	50
Contrast	50
PosH	04
PosV	00
Trigger	Can
Trig-Priority	L-R-Rear

Menu of V2-RIGHT	
InputSource	720P NTSC
Brightness	50
Contrast	50
PosH	04
PosV	00
Trigger	Can
Trig-Priority	L-R-Rear

Input Source Video-signal type for video-source(s) connected to **V1-Left (V2-Right)**.
This setting **must** be preset for correct video playback.
The following video-source signal types can be selected:
CVBS video-sources: **NTSC, PAL**
AHD video-sources: **720p NTSC, 960p NTSC, 1080p NTSC, 720p PAL, 960p PAL, 1080p PAL**

Brightness Brightness

Contrast Contrast

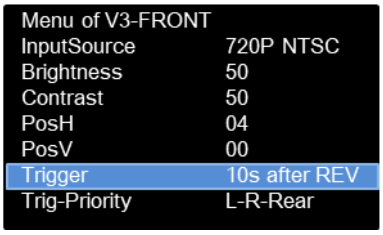
Pos H Horizontal image position

Pos V Vertical image position

Trigger Type of selection of video input **V1-Left (V2-Right)**
"CAN" function for side cameras via CAN bus. Selection of the video input **V1-Left (V2-Right)** when activating the blink signal left (right). The prerequisite is that the blink signal is recognised by the interface on the vehicle CAN bus. Manual selection of this input using an external keypad does not work with this setting.
"Wire" function for other video sources or side cameras without CAN bus. The video input **V1-Left (V2-Right)** is selected exclusively via the **light blue** (**dark blue**) **Trig-Left** (**Trig-Right**) wire or manually via an external keypad.

Trig-Priority Switching priority when switching signals are present for multiple inputs simultaneously (CAN bus or analogue +12 V triggers). The signal with the highest priority is displayed:
L-R-Rear: ***V1-Left*** → ***V2-Right*** → ***V4-Reverse***
Rear-R-L: ***V4-Reverse*** → ***V2-Right*** → ***V1-Left***

Menu V3 front **Switch bench of 8 dip switches** Dip 3 = ON



Input Source Video-signal type for video-source(s) connected to **V3-Front**.
This setting **must** be preset for correct video playback.
The following video-source signal types can be selected:
CVBS video-sources: **NTSC, PAL**
AHD video-sources: **720p NTSC, 960p NTSC, 1080p NTSC, 720p PAL, 960p PAL, 1080p PAL**

Brightness Brightness

Contrast Contrast

Pos H Horizontal image position

Pos V Vertical image position

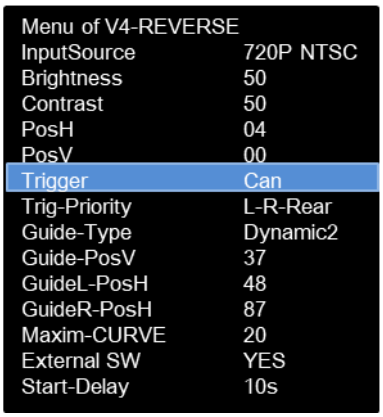
Trigger Type of selection of video input **V3 front**.
"Delay" function for front camera. The "**Delay"** setting is used to determine the automatic switching of a front camera connected to the V3 **front input** after reverse gear is engaged and its display duration on the display. Available are 5s after REV, 10s after REV, 15s after REV, 20s after REV.
"Wire" function for other video sources. If another video source is to be connected to **V3-Front** instead of a front camera, select the "Wire" setting. This switches off the "**Delay"** function and the input can only be selected via the white Trig-Front wire or manually via an external keypad.

Trig-Priority Switching priority when switching signals are present for multiple inputs simultaneously (CAN bus or analogue +12 V triggers). The signal with the highest priority is displayed:
L-R-Rear: ***V1-Left*** → ***V2-Right*** → ***V4-Reverse***
Rear-R-L: ***V4-Reverse*** → ***V2-Right*** → ***V1-Left***

Menu V4 reverse

Switch bench of 8 dip switches Dip 4 = ON, Dip 5 = OFF, Dip 6 = OFF

V4-Reverse input has no function if **HDMI input*** is defined as rear-view camera input (Dip 5 = ON).



Input Source Video-signal type for video-source(s) connected to **V4-Reverse**.This setting **must** be preset for correct video playback.
The following video-source signal types can be selected:
CVBS video-sources: **NTSC, PAL**
AHD video-sources: **720p NTSC, 960p NTSC, 1080p NTSC, 720p PAL, 960p PAL, 1080p PAL**

Brightness Brightness

Contrast Contrast

Item H Horizontal image position

Item V Vertical image position

Trigger Type of selection of rear-view camera input **V4 reverse**.
"CAN" function with CAN bus connection. With the "**CAN**" setting, the system automatically switches to **V4 reverse** for CVBS/AHD rear-view camera when reverse gear is engaged. The interface must recognise the reverse gear in the CAN bus.
"Wire" function with analogue connection. The selection of a rear-view camera connected to the **V4 reverse** via the **green Trig-Rear wire** is possible with both the "**Wire**" and "**CAN**" settings. We recommend to set "**Wire**" for analogue (reverse signal) connection.

Switch bench of 8 dip switches Dip 4 = ON, Dip 5 = OFF, Dip 6 = OFF

Trig-Priority Switching priority when switching signals are present for multiple inputs simultaneously (CAN bus or analogue +12 V triggers). The signal with the highest priority is displayed:
L-R-Rear: ***V1-Left*** → ***V2-Right*** → ***V4-Reverse***
Rear-R-L: ***V4-Reverse*** → ***V2-Right*** → ***V1-Left***

Guide Type Setting 6 different angles of the guide lines for the rear-view camera
Moving guide lines **Dynamic 1-6**
Fixed guide lines **Fixed 1-6**
No guide lines **OFF**

Guide Pos. V Vertical position of the auxiliary wires **00-69**

Guide L Pos.H Horizontal position of the left auxiliary wire **00-90**

Guide R Pos.H Horizontal position of the right-hand auxiliary wire **00-121**

Maxim. Curve Radius of the auxiliary wires **01-20**

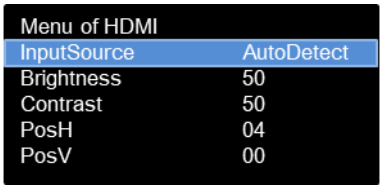
External SW Selectable via external keypad **V4 Reverse**
YES: *Factory video* → ***HDMI**** → ***V1-Left*** → ***V2-Right*** → ***V4-Reverse*** → *Factory video*
NO: *Factory video* → ***HDMI**** → ***V1-Left*** → ***V2-Right*** → *Factory video*

Start-Delay Switch delay of the interface at start-up. This function is technically necessary in some vehicles, as otherwise the factory system may malfunction (e.g. black screen, touch problems). The following options are available (in seconds):
5s/6s/7s/8s/9s/10s/12s/15s/20s
Changing the default settings may cause malfunctions!

*** HDMI input only available with HDV-MBMC**

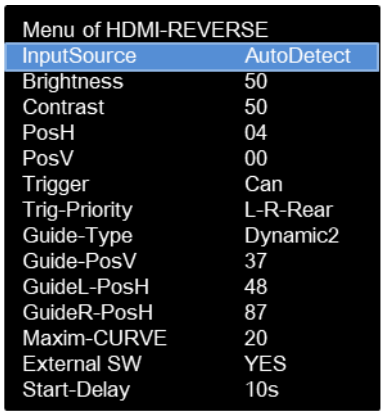
Menu HDMI* **Switch bench of 8 dip switches** (dip 4 = ON, dip 5 = **ON/OFF**, dip 6 = ON)

HDMI AV input (Dip 5 – OFF)



InputSource	The picture resolution of connected HDMI sources is detected automatically.
Brightness	Brightness
Contrast	Contrast
Item H	Horizontal image position
Item V	Vertical image position

HDMI rear-view camera input (Dip 5 = ON)



InputSource	The picture resolution of connected HDMI sources is detected automatically.
Brightness	Brightness
Contrast	Contrast
Pos. H	Horizontal image position
Pos. V	Vertical image position
Trigger	Type of selection of rear-view camera input HDMI-REV. **"CAN" function with CAN bus connection**. With the "**CAN**" setting, the system automatically switches to HDMI* for HDMI rear-view camera when reverse gear is engaged. The interface must recognise the reverse gear in the CAN bus. **"Wire" function with analogue connection**. The selection of a rear-view camera connected to the HDMI* via the **green Trig-Rear wire** is possible with both the "**Wire**" and **"CAN"** settings. It is recommended to set **"Wire"** for analogue (reversing signal) connection.
Trig-Priority	Switching priority when switching signals are present for multiple inputs simultaneously (CAN bus or analogue +12 V triggers). The signal with the highest priority is displayed: **L-R-Rear:** ***V1-Left*** → ***V2-Right*** → ***V4-Reverse*** **Rear-R-L:** ***V4-Reverse*** → ***V2-Right*** → ***V1-Left***
Guide Type	Setting 6 different angles of the guide lines for the rear-view camera Moving guide lines **Dynamic 1-6** Fixed guide lines **Fixed 1-6** No guide lines **OFF**
Guide Pos. V	Vertical position of the guide lines **00-69**
Guide L Pos.H	Horizontal position of the left hand guide line **00-90**
Guide R Pos.H	Horizontal position of the right-hand guide line **00-90**
Maxim. Curve	Radius of the guide lines **01-20**
External SW	Selectable via external keypad **V4 Reverse** **YES**: *Factory video* → ***HDMI**** → ***V1-Left*** → ***V2-Right*** → ***V4-Reverse*** → *Factory video* **NO**: *Factory video* → ***HDMI**** → ***V1-Left*** → ***V2-Right*** → *Factory video*
Start-Delay	Switch delay of the interface at start-up. This function is technically necessary in some vehicles, as otherwise the factory system may malfunction (e.g. black screen, touch problems). The following options are available (in seconds): **5s/6s/7s/8s/9s/10s/12s/15s/20s** Changing the default settings may cause malfunctions!

Notes: **V4-Reverse** input has no function if the **HDMI input*** is defined as a rear-view camera input (dip 5 = **ON**).

*** HDMI input only available with HDV-MBMC**

3 Operating the video interface

The external keypad can be used to switch all activated inputs.

- Long press of the keypad (2-3 seconds)

The external keypad switches from factory video to the first activated interface video input with a long press (2-3 seconds). Each further long press switches an activated interface video input until the last press switches back to factory video. Deactivated inputs are skipped. If all inputs are activated using the corresponding dip switch, the sequence is as follows:

*Factory video → **HDMI*** → **V1-Left** → **V2-Right** → **V4-Reverse**** → *Factory video*

*** HDMI input only available with HDV-MBMC**

****V4-Reverse*** can only be selected via the external keypad if the "External SW" function is set to "Yes" in the **V4-Reverse** menu.

- Briefly press the keypad (only possible if dip 3 is ON)

The external keypad switches from the current video mode to the front camera input when pressed briefly to input **V3-Front** and back to the previous video mode when pressed briefly again .

Note: Even if the keypad is not required for switching multiple sources, it is strongly recommended that it is connected to the interface and remains invisible. The keypad should then not be installed "pressed".

3.1 Optional: Operating the video interface via the 'HDA-RC' remote control

Instead of the external keypad, the interface can also be operated using the optionally available 'HDA-RC' remote control.* This allows direct selection of the video/camera inputs and more convenient changing of settings in the respective OSD menus.

Remote control 'HDA-RC' optionally available

* The remote control is compatible with all HDA and HDV interfaces that are labelled with 'RC' at the end of the software version.

4 Specifications

BATT/ACC range	9V - 16V
Stand-by power drain	approx. 2mA
Power consumption	350mA @12V
Video input	0.7V - 1V
Video input signal types	CVBS/AHD/HDMI **(HDV version only)**
Signal standards CVBS/AHD	NTSC/PAL
Temperature range	-40°C to +85°C
Video box dimensions	117 x 25 x 109 mm (W x H x D)

5 FAQ - Troubleshooting Interface functions - product-specific

Problem	Possible cause	Solution
Malfunction or no picture	Video-signal type of video-source not defined in OSD-menu of the corresponding video input	See chapter *2.12 OSD menu settings* - Menu of the respective input

6 FAQ - Troubleshooting Interface functions - general

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

Symptom	Possible 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.
	CAN-bus wires connected to CAN-bus in wrong place.	Refer to the manual where to connect 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 power connection of 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 5 of 8dip bench of video interface which inputs are enabled and switch to corresponding input(s).
	Setting of video signal type of active video input is not equal to video signal type of connected video-source.	Set the video signal type of the video source correctly in the OSD menu of the corresponding input.
	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 settings of video-interface.	Verify the vehicle-specific dip switch position in the instructions. If necessary, test different positions of the vehicle-specific dip switches. Perform a power reset after each change (briefly remove the black 10-pin micro-fit power socket once).
Inserted picture double or multiple 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.	(Only concerns video-sources with selectable output – e.g., DVD-Players, TV-Tuners, etc.) Set video source output fixed to PAL or NTSC. It is best to set all video sources to the same video signal type output.
	If error occurs only after source switching: Connected sources are not set to same video signal type output.	Set all video sources to the same video signal type output.
Inserted picture b/w.	Setting of video signal type of active video input is not equal to video signal type of connected video-source.	Set the video signal type of the video source correctly in the OSD menu of the corresponding input.

Symptom	Possible reason	Possible solution
Only on first inserted video activation after IGN on, the inserted picture is distorted.	Menu item *Trigger* of the corresponding video-input is set to *CAN-bus* though analogue signal triggering is used.	Open OSD-menu of corresponding video input and set the menu item *Trigger* to *Wire.*
Inserted picture qual. bad.	Picture settings have not been adjusted.	Use the 3 switches on interface-box or optional HDA-RC cable remote control to set the desired picture settings for the respective video source in the OSD menu of the interface.
Inserted picture size slightly wrong.		
Inserted picture position wrong.		
Camera input picture flickers.	Camera is being tested under fluorescent light (neon).	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.
Camera input picture black.	Camera power taken directly from reverse gear lamp.	Use relay or electronic filter to "clean" reverse gear lamp power. Alternatively, camera power can be taken from green wire CAM Power.
Camera input picture has distortion.		
Switching to inserted video does not work after IGN on or vehicle startup- temporary.	Interface has a start-up delay during which, after interface start-up for certain time, there is no switching to inserted video. Required to prevent the factory system from crashing.	In OSD menu of V4, default delay can be shortened time in menu item *StartDelay*, this might especially make sense on installations without connection to CAN-bus. Note: Too short *StartDelay* setting can cause (sporadically) black-screen of factory picture or loss of factory touch-screen control.
Not possible to switch video sources by OEM button.	Function not supported in this vehicle.	Use external keypad 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.
Interface does not switch to reverse camera input when reverse gear is engaged or does not switch to side camera input(s) when turn signal in on.	Video-input is not enabled.	Enable corresponding inputs (dips 1 to 5 of 8dip bench).
	CAN-bus of vehicle not fully compatible with interface. Function not supported.	Follow the manual for R-gear signal or turn signal from analogue signal.
	Menu item *trigger* in the OSD of the video-input was set to *Wire.*	Switch on corresponding input by external button or 12V to corresponding trigger input. Open OSD-menu of corresponding video input and set the menu item *Trigger* to *CAN bus.*
OSD-menu of interface cannot be accessed/opened.	No inserted video input of interface is active, factory picture is displayed.	Each video input of interface has its own OSD with its own settings. The OSD for each input can only be opened when the input is displayed.

7 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.

For any support requests make sure to at least prepare:

- Product code and serial number of all involved products
- Vehicle data such brand, model, year of production, VIN, infotainment model

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