Video inserter

CI-HDV-IVI16 / CI-HDA-IVI16

Compatible with
Opel vehicles with IVI-R2
multimedia navigation system with 16inch touch monitor
Renault vehicles with Open R-Link
with vertical 10.4inch touch monitor

Examples

Attention!
The video signal type for each video source must be defined in the OSD menu of the 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 devices, DVB-T2 tuner, etc.)**
- **All inputs are compatible with NTSC and PAL**
  Supported AHD resolutions 720p NTSC (30Hz)**, 720p PAL** (25Hz)**, 960p NTSC** (30Hz)**, 960p PAL** (25Hz)**, 1080p NTSC** (30Hz)**, 1080p PAL** (25Hz)
- **HDV-IVI16 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-IVI16 only: Analogue audio output for the HDMI source**
- **Automatic switchover to rear-view camera input while reverse gear is engaged**
- **Automatic front camera switching while reverse gear is engaged for 5, 10, 15 or 20- second intervals**
- **Adjustable guide lines (fixed or movable) for rear-view camera can be activated (movable guide lines not available for all vehicles)**
- **Picture free while driving (ONLY for fed-in video sources)**

Table of contents

Legal notice

The driver must not be distracted directly or indirectly by moving pictures while driving. In most countries/states, this is prohibited by law. We therefore accept no liability for damage to property or personal injury caused directly or indirectly by the installation and operation of this product. In addition to operation when stationary, this product is only intended for displaying static menus (e.g. MP3 menus from USB devices) or pictures from (rear-view) cameras while driving.

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 interface must not be installed 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 by the vehicle manufacturer, there is always the possibility of incompatibility.

1.1 Scope of delivery

Make a note of the interface serial number and keep the instructions for support purposes: _____

1.2 Checking the interface compatibility with the vehicle and accessories

Requirements

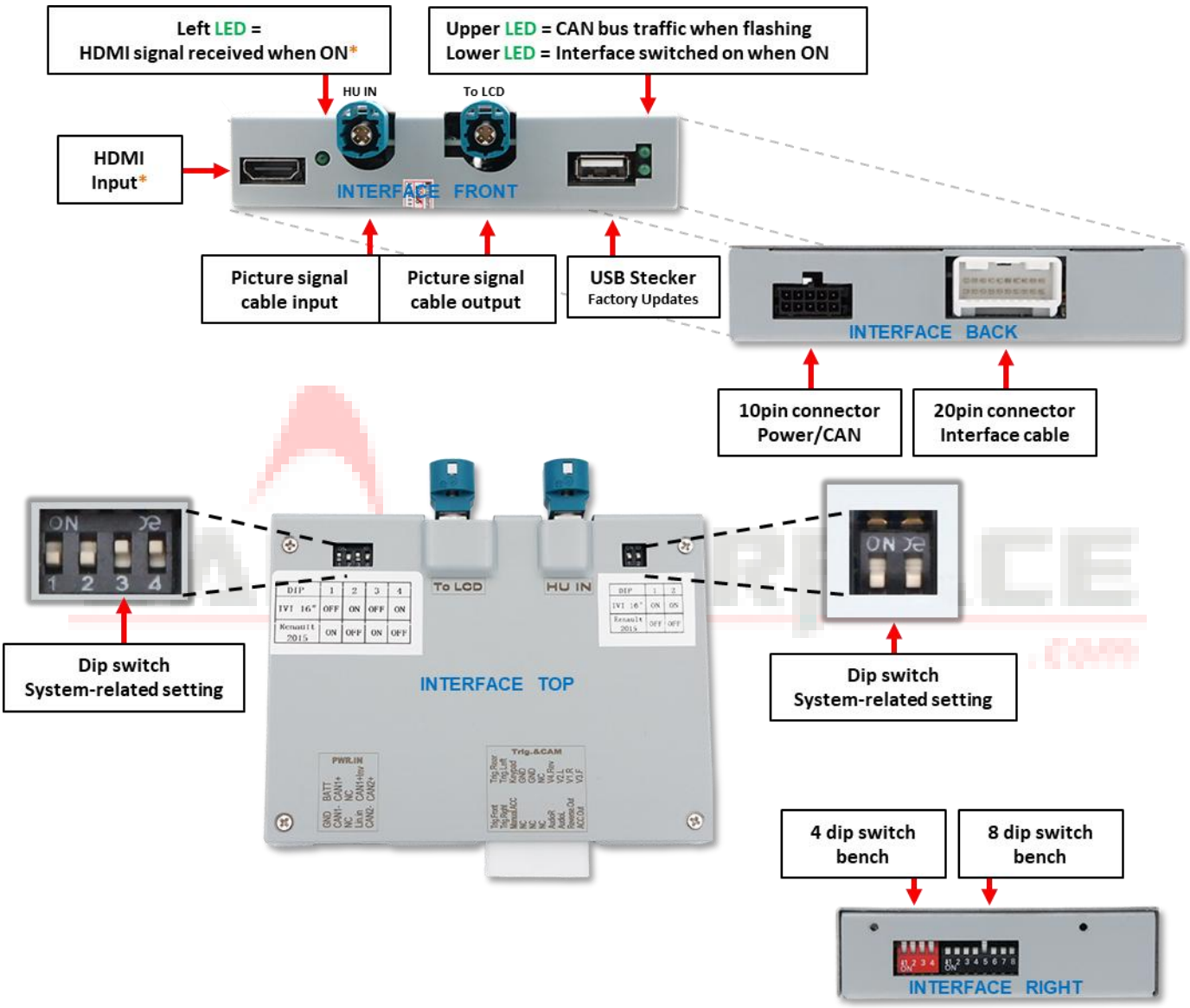
Manufacturer	Compatible vehicles	Compatible systems
Opel	Grandland B from approx. 09/2024	IVI-R2 – Multimedia navigation system with 16inch touch monitor
Renault	Captur II facelift from approx. 06/2024 Symbioz from approx. 09/2024	Open R-Link with vertical 10.4inch touch monitor

Limitations

CAN bus compatibility	The CAN bus compatibility of the interface may be restricted for some vehicles, either completely or for individual functions. This may become apparent during installation or at a later date. The interface with all video inputs can be operated with analogue switch signals without being connected to the vehicle's CAN bus. In this case, individual additional functions are not available, see chapter*2.4.3 Analogue connection without CAN bus* Analogue connection IVI R2 with 16inch monitor without CAN bus .
Video only	interface **does not** feed in **any** audio signals. To insert audio signals, any existing factory audio AUX input or optional products must be used (e.g. FM modulator). For an inserted HDMI source, audio is output via an analogue audio output (3.5 mm jack socket).
Factory rear-view camera	Automatic switching to rear-view camera input only occurs while reverse gear is engaged. Optional accessories are required for different switching times.
Aftermarket front camera	Switching to the front camera occurs automatically after reverse gear has been engaged for 5, 10, 15 or 20 seconds (depending on the OSD menu setting). Manual switching to the 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 an analogue connection is used, the movable guide lines function cannot be used.

1.3 Boxes and connections – interface

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



*** HDMI input only available with HDV-IVI16**

Interface box, right side, black

1.4 Settings – 8 dip switch bench (interface functions)

Dip position **UP = OFF (up)** and **DOWN = ON (down)**

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 Reverse)	Aftermarket	Factory or none
5	Connection type of the Aftermarket rear-view camera*	**HDMI***	V4 Reverse (CVBS/AHD)
6	**HDMI** input*	Enabled	deactivated
7	No function	-	Set to OFF
8	Vehicle: Left-hand or right-hand drive	Steering wheel on the right-hand side (UK, etc.)	Steering wheel on the left hand side

Power reset interface after each dip change to activate changes!

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

* On the **HDA-IVI16**, dip switches 5 and 6 have no function. Set them to **OFF**.

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

1.4.1 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 the side camera or other video sources. Only activated video inputs can be accessed – both with automatic and manual switching. It is recommended to activate only inputs that are in use, to avoid accidental switching.

1.4.2 Front camera input "V3 front" (Dip 3)

When Dip 3 = **ON**, the interface switches to the CVBS/AHD front camera input **V3-Front** after reverse gear is engaged. In addition, manual switching to the front camera input is possible from any picture mode via 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. Then another video source could also be connected to instead of a front camera.

1.4.3 Rear-view camera settings (Dip 4)

When 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.
With Dip 4 = **ON**, the interface switches to its FBAS/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 inactive when Dip 5 = ON and an HDMI camera is used, resulting in no function.

1.4.4 Rear-view camera connection type (Dip 5)

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

Note: Automatic switching to the front camera for the preset time occurs in both cases after reverse gear is engaged.

1.4.5 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 must also be set to **ON**.
With Dip 6 = **OFF,** the **HDMI** input* is deactivated.

Note: Dip 7 has no function and must be set to OFF.

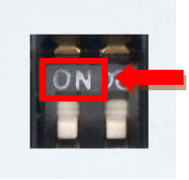
1.4.6 Vehicle selection: Left-hand or right-hand drive (Dip 8)

Dip 8 is used to set whether the vehicle's steering wheel is on the left or right side (e.g. in the UK). Dip 8 = **ON** for **right-hand drive**, Dip 8 = **OFF** for **left-hand drive**.

Power reset interface after each dip change to activate changes!

*** HDMI input only available with HDV-IVI16**

1.5 Settings – 2 dip switch bench (system-related setting)



Interface box, top, black

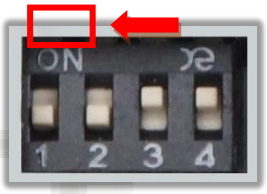
Monitor size	Dip 1	Dip 2
IVI-R2 with 16inch monitor	ON ↑	ON ↑
Open R-Link with vertical 10.4inch monitor	OFF ↓	OFF ↓

Please note: Unlike the other switch banks (8 dip switch bench and 4 dip switch bench), the dip position UP = ON and DOWN = OFF for the 2 dip switch bench!

Interface box, top, black

Power reset interface after each dip change to activate changes!

1.6 Settings – 4 dip switch bench (system-related setting)



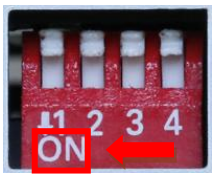
Please note: Unlike the other switch banks (8-way and 4-way) the 4-way switch bank has the DIP position UP = ON and DOWN = OFF on the top!

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

Head unit/monitor size	Dip 1	Dip 2	Dip 3	Dip 4
IVI-R2 with 16inch monitor	OFF ↓	ON ↑	OFF ↓	ON ↑
Open R-Link with vertical 10.4inch monitor	ON ↑	OFF ↓	ON ↑	OFF ↓

Power reset interface after each dip change to activate changes!

1.7 Settings – 4 dip switch bench (CAN bus)



Interface box, right side, red

Set the DIP switch positions according to the following table.
Dip position UP = OFF (up) and DOWN = ON (down)

Dip	Function	ON (down)	OFF (up)
1	No function	-	Set to OFF
2	No function	-	Set to OFF
3	No function	-	Set to OFF
4	No function	-	Set to OFF

Power reset interface after each dip change to activate changes!

2 Installation

Switch off the ignition and disconnect the vehicle battery in accordance with the manufacturer's instructions!
If the vehicle battery must not be disconnected according to the manufacturer's specifications, it is usually sufficient to put the vehicle into sleep mode. If this does not work, disconnect the vehicle battery using 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 any installation of retrofit devices, a quiescent current test of all retrofitted devices must be carried out after installation to ensure that the devices switch to standby mode when the vehicle is in sleep mode.

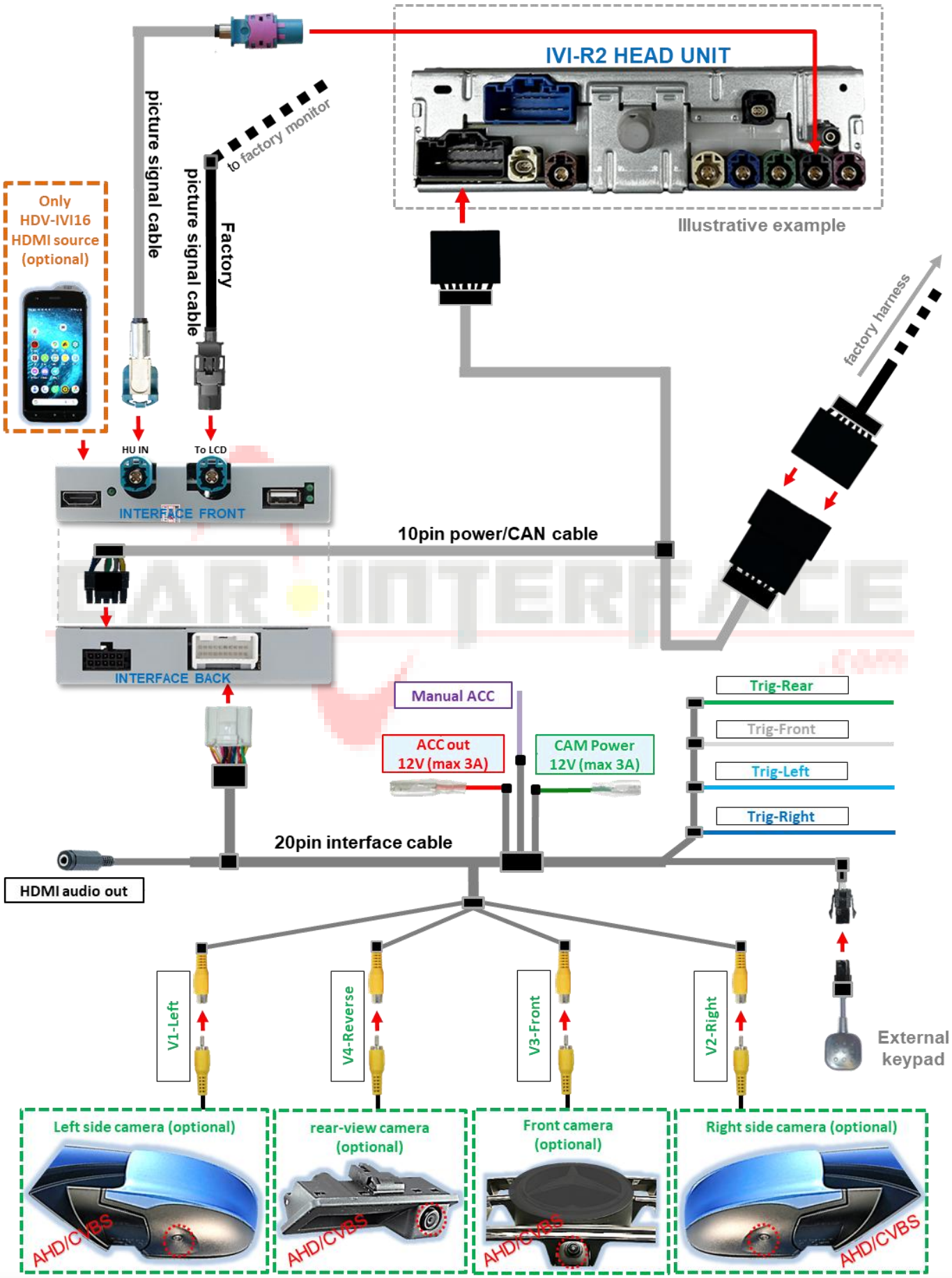
2.1 Place of connection

The video interface is connected to the rear of the head unit.

IVI-R2

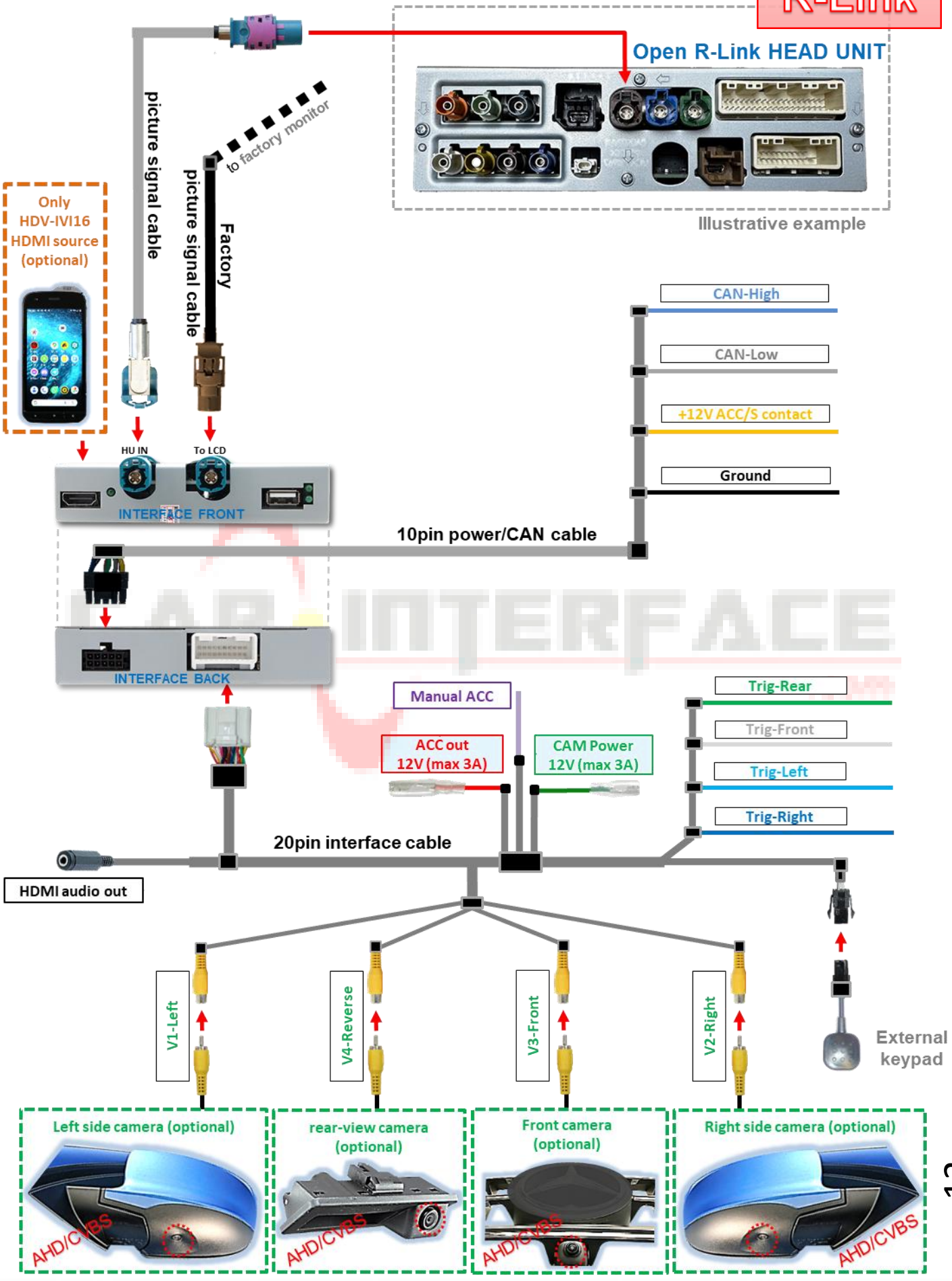
2.2 Connection schema

2.2.1 Connection schema IVI R2 with 16inch monitor



Open R-Link

2.2.2 Connection schema Open R-Link with vertical 10.4inch monitor

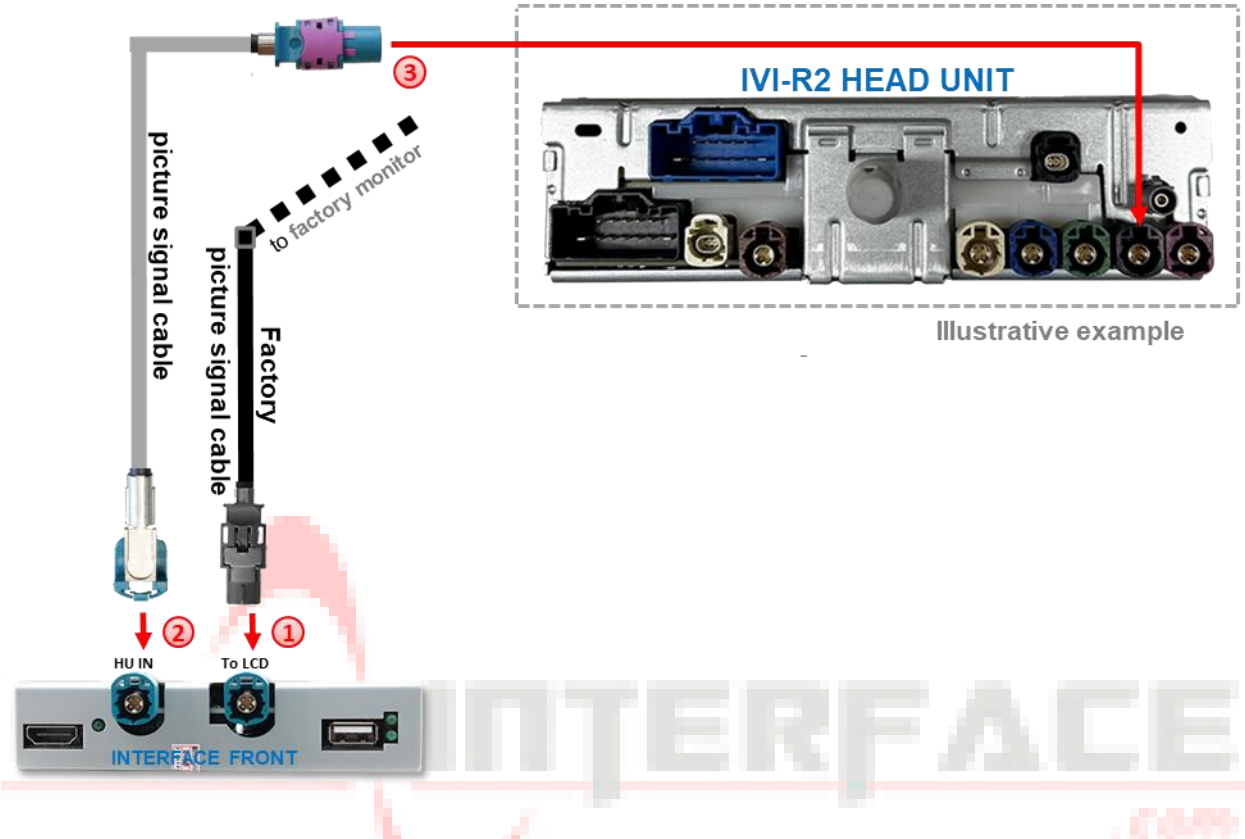


2.3 Connection – picture signal cable

2.3.1 Connection IVI R2 with 16inch monitor – picture signal cable

IVI-R2

Remove the head unit.

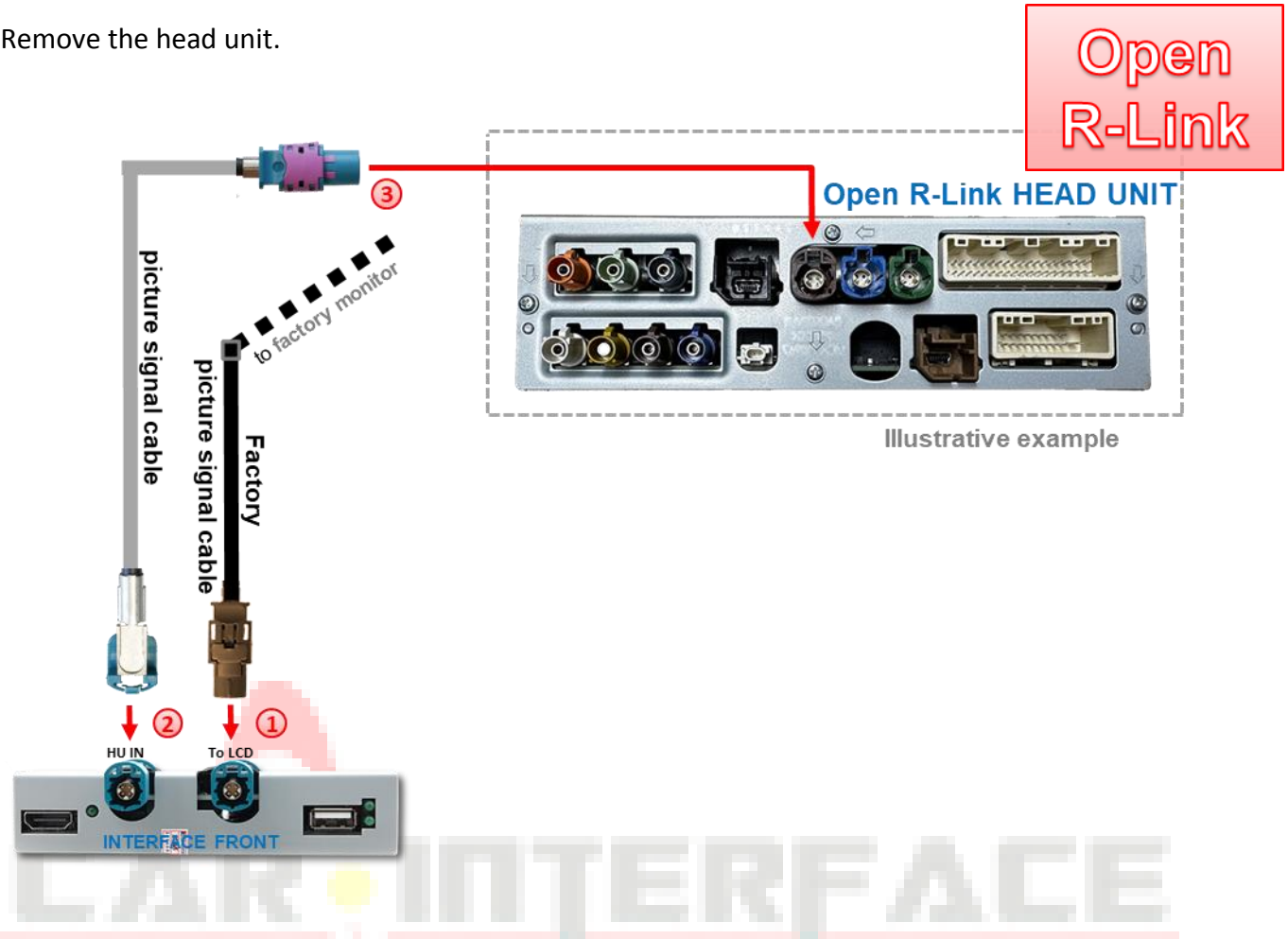


1. Unplug the **black** HSD female connector (colours may vary) of the factory picture signal cable on the rear of the head unit and connect it to the **aqua blue** HSD male connector "**To LCD**" of the interface.
2. Connect the **aqua blue** angled HSD female connector of the picture signal cable to the **aqua blue** HSD male connector "**HU IN**" on the interface.
3. Connect the **aqua blue** non-angled HSD female connector of the picture signal cable to the **black** HSD male connector of the head unit.

Note: Depending on the installation conditions, the supplied picture signal cable may also be installed twisted with regard to its HSD female connectors.

2.3.2 Open R-Link connection with vertical 10.4inch monitor – picture signal cable

Remove the head unit.



1. Unplug the **brown** HSD female connector (colours may vary) of the factory picture signal cable on the rear of the head unit and connect it to the **aqua blue** HSD male connector "**TO LCD**" on the interface.
2. Connect the **aqua blue** angled HSD female connector of the picture signal cable to the **aqua blue** HSD male connector "**HU IN**" on the interface.
3. Connect the **aqua blue** straight HSD female connector of the picture signal cable to the **brown** HSD male connector of the head unit.

Note: Depending on the installation conditions, the supplied picture signal cable may also be mounted twisted with regard to its HSD female connectors.

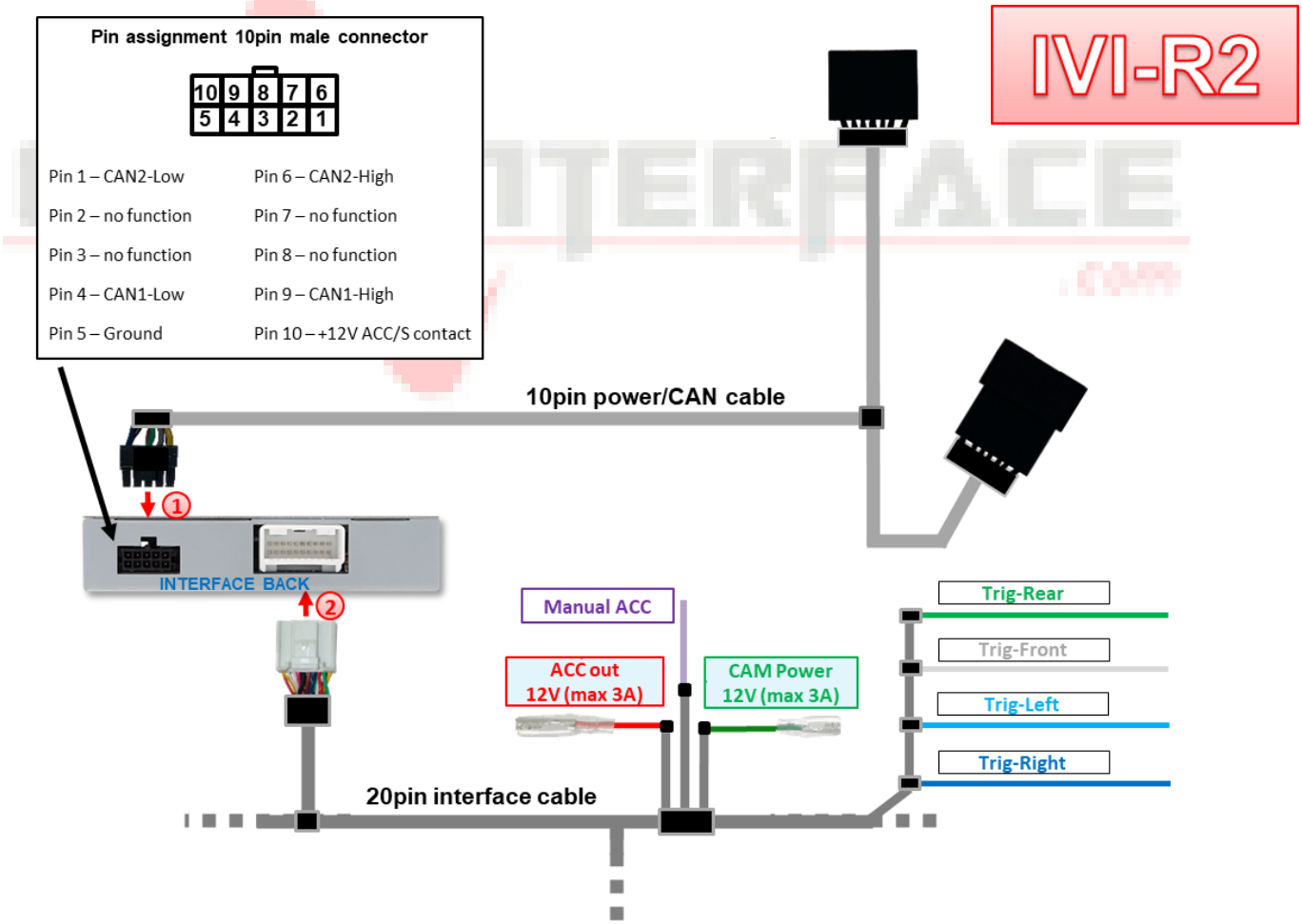
2.4 Connection – cable sets, power supply and CAN bus or analogue without CAN bus

The interface can be integrated via CAN bus or operated completely analogue without connection to the CAN bus.
When integrated via CAN bus, the interface is switched on via this bus and reverse gear signals and turn signals are usually detected from this. In some vehicles, movable guide lines can then also be displayed based on the CAN bus steering signals.

In exceptional cases, CAN communication is not (fully) compatible. If no interface LED lights up after connecting the 10pin power/CAN cable set with the ignition switched on, the analogue connection described below must be made. The analogue connection is also possible in order to avoid a possible subsequent CAN bus incompatibility. In this case, the interface must be switched on and switched to its inputs via +12V switch inputs.

The display of movable guide lines for the rear-view camera is not available with an analogue connection.

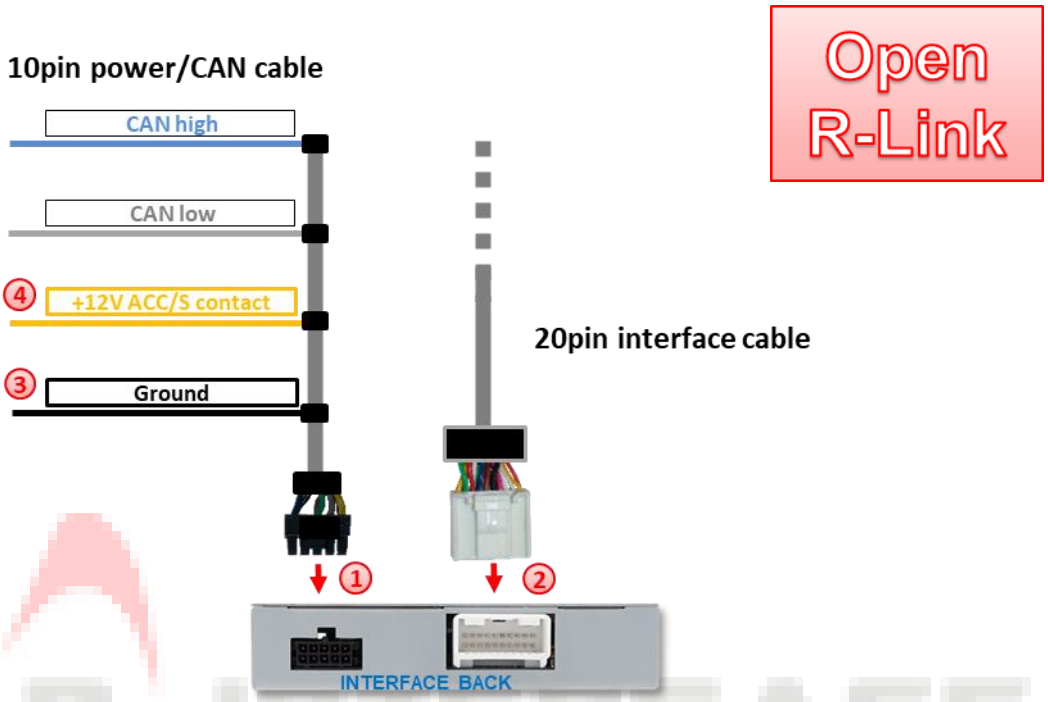
2.4.1.1 Connection IVI R2 with 16inch monitor – cable sets, power supply and CAN bus or analogue without CAN bus



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

2.4.1.2 Open R-Link with vertical 10.4inch monitor – cable sets, power supply and CAN bus or analogue without CAN bus

Regardless of whether the connection is made with CAN bus or analogue without CAN bus, the **black ground wire** and the **yellow +12V ACC/S contact wire** of the **10pin power/CAN cable** must always be connected.



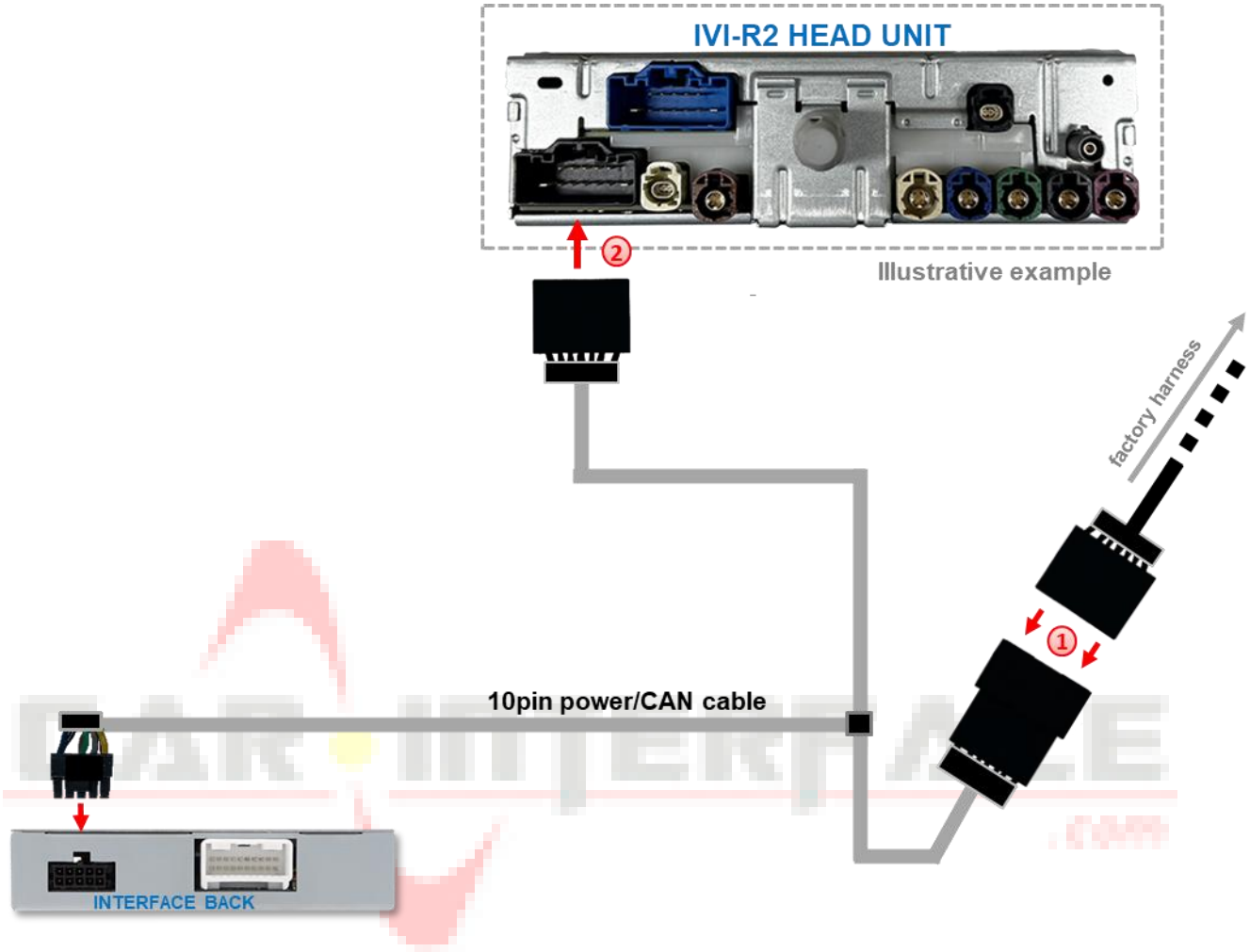
1. Connect the 10pin female connector of **the 10pin power/CAN cable** to the 10pin male connector of the interface.
2. Connect the 20pin female connector of **the 20pin interface cable** to the 20pin male connector of the interface.
3. Connect the black ground wire of **the 10pin power/CAN cable** to the vehicle ground.
4. Connect **the yellow +12V ACC/S contact wire** of **the 10pin power/CAN cable** to **+12V ACC (terminal 15r) or S contact (terminal 86s)** of the vehicle.

Note: Connection to the +12V battery (terminal 30) is also technically possible. However, in the event of (partial) CAN bus incompatibility or a defect, it cannot be ruled out that the interface will not switch off in sleep mode. Connection to the +12V battery (terminal 30) is at your own risk!

2.4.2 Connection with CAN bus

2.4.2.1 Connection IVI R2 with 16inch monitor with CAN bus

IVI-R2

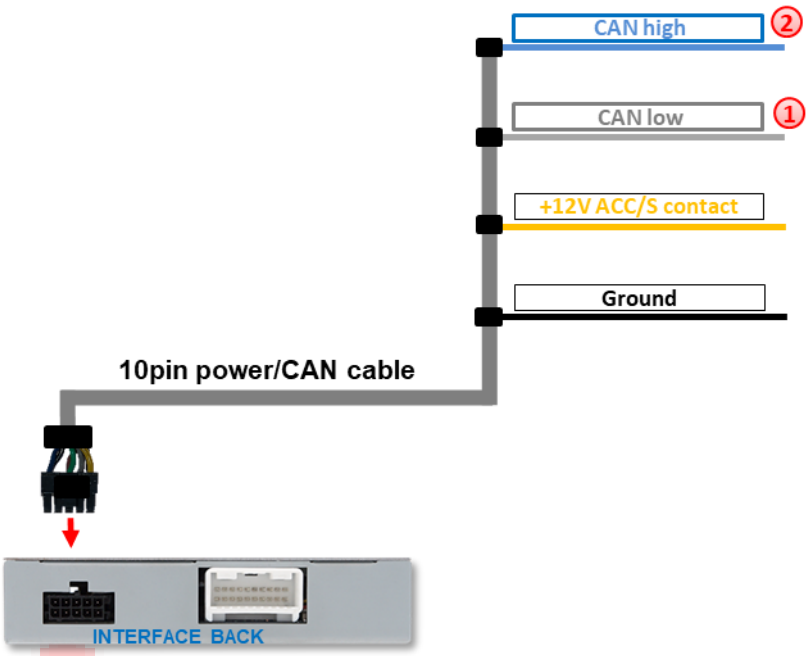


1. Unplug the 12pin female connector of the vehicle wiring harness on the back of the head unit and connect it to the black 12pin male connectors of the **10pin power/CAN cable**.
2. Connect the opposite black 12pin female connectors of the **10pin power/CAN cable** to the previously disconnected 12pin male connector of the head unit.

Caution!
In exceptional cases, CAN communication is not (fully) compatible. If, after connecting the 10pin power/CAN cable set with the ignition switched on, no interface LED lights up, the analogue connection described below must be made.

2.4.2.2 Connection Open R-Link with vertical 10.4inch monitor with CAN bus

Open R-Link



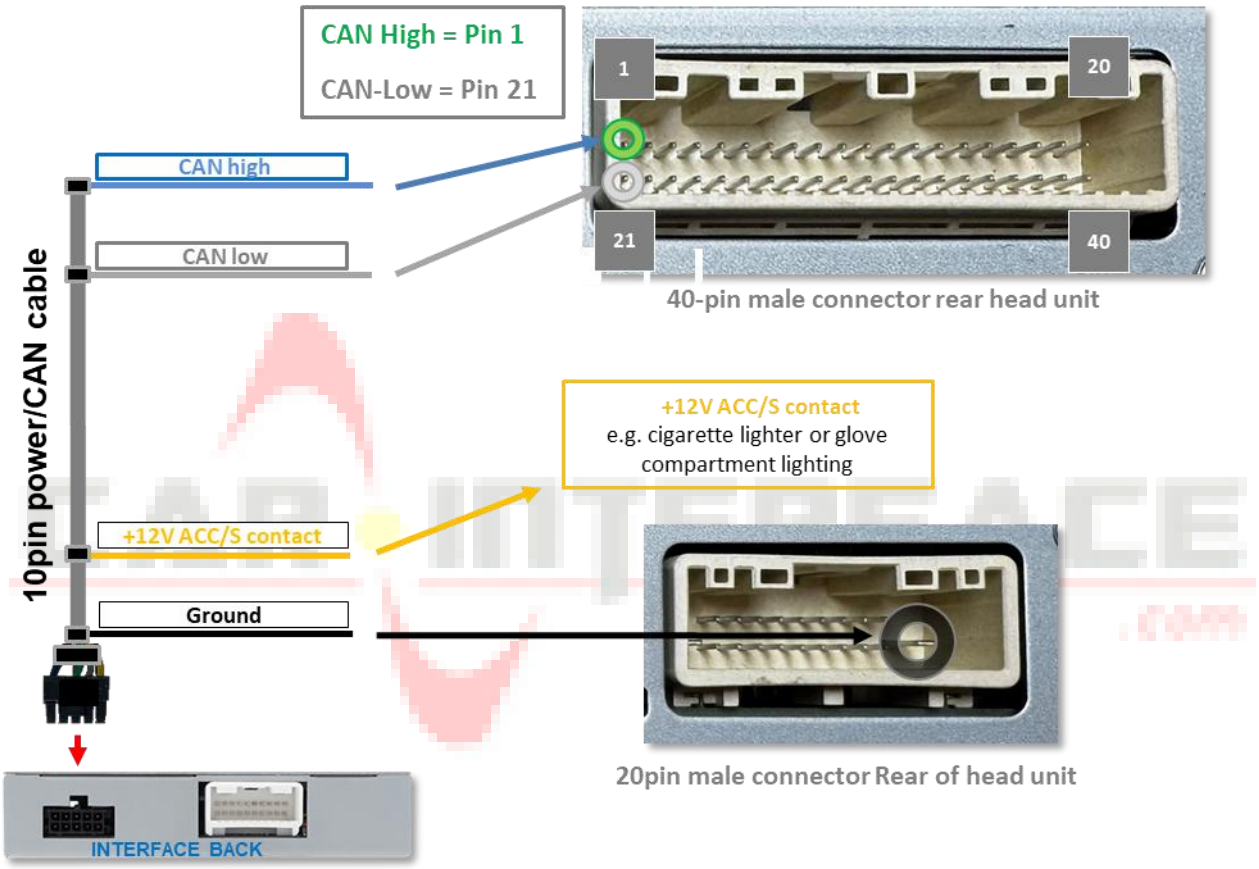
1. Connect the grey wire of the 10pin power/CAN cable to the vehicle's CAN Low (see possible places of connection below).
2. Connect the blue wire of the 10pin power/CAN cable to the vehicle's CAN High (see possible places of connection below).

Caution!
In exceptional cases, CAN communication is not (fully) compatible. If, after connecting the 10pin power/CAN cable set with the ignition switched on, no interface LED lights up, the analogue connection described below must be made.

2.4.2.2.1 Place of connection for power/CAN Open R-Link with vertical 10.4inch monitor

Open R-Link

Open R-Link head unit



40-pin male connector rear head unit

20pin male connector Rear of head unit

Please note: Cable colours in the vehicle may vary!

Note: Connection to a +12V battery (terminal 30) is also technically possible. However, in the event of (partial) CAN bus incompatibility or a defect, it cannot be ruled out that the interface will not switch off in sleep mode. Connection to a +12V battery (terminal 30) is at your own risk!

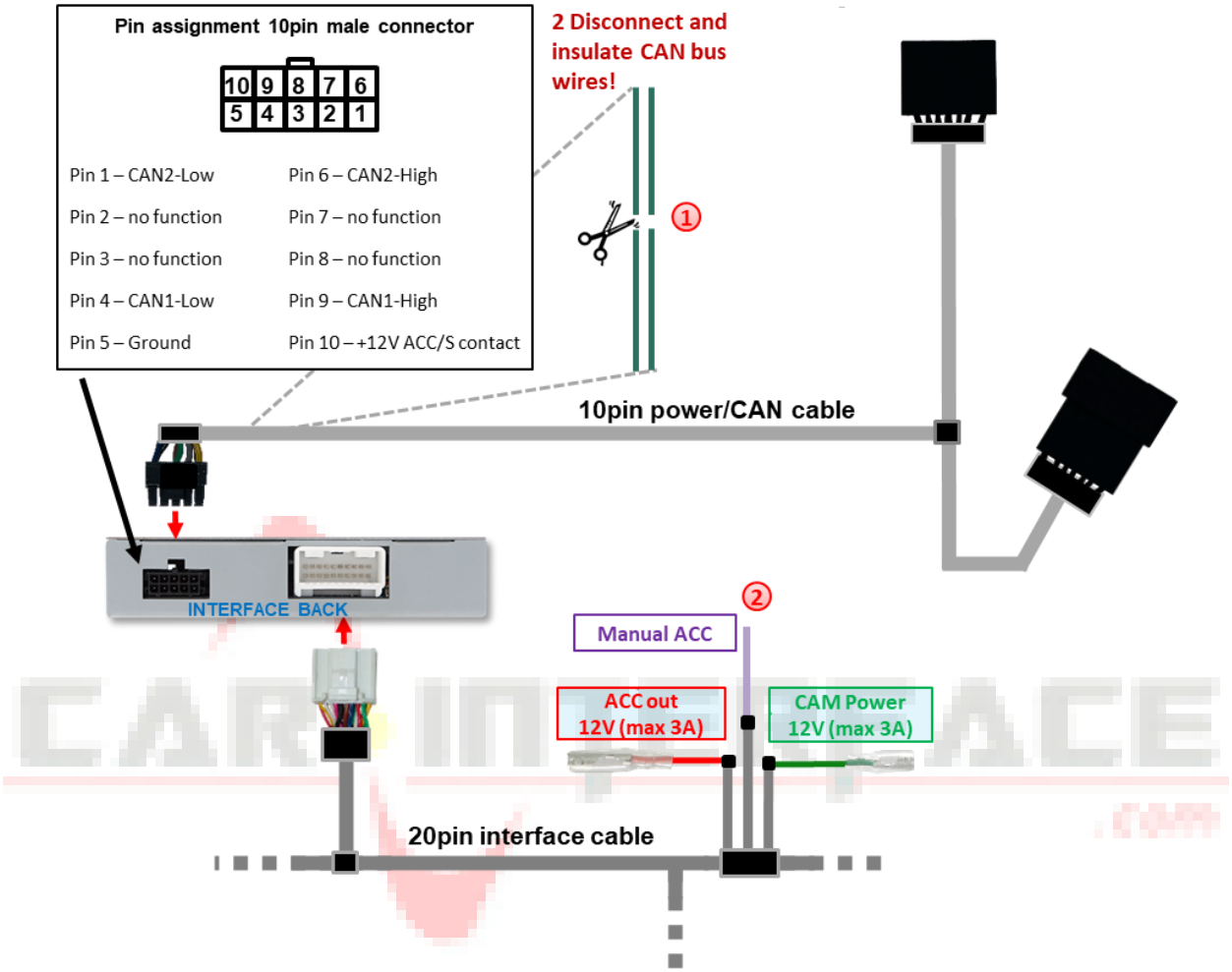
Attention!
In exceptional cases, CAN communication is not (fully) compatible. If no interface LED lights up after connecting the 10pin power/CAN cable set with the ignition switched on, the analogue connection described below must be made.

2.4.3 Analogue connection without CAN bus

IVI-R2

2.4.3.1 Analogue connection IVI R2 with 16inch monitor without CAN bus

For analogue connection, the two CAN wires of the 10pin power/CAN cable are not connected – to do this, the two wires of the 10pin power/CAN cable must be separated!



1. Separate and insulate the two CAN bus wires (**both green**) of the 20pin interface cable approx. 4-5 cm behind the black male connector.

2. Connect the purple **Manual ACC** wire of the 20pin interface cable to **the +12V S contact (terminal 86s) or ACC terminal 15r** (e.g. cigarette lighter, glove compartment light).

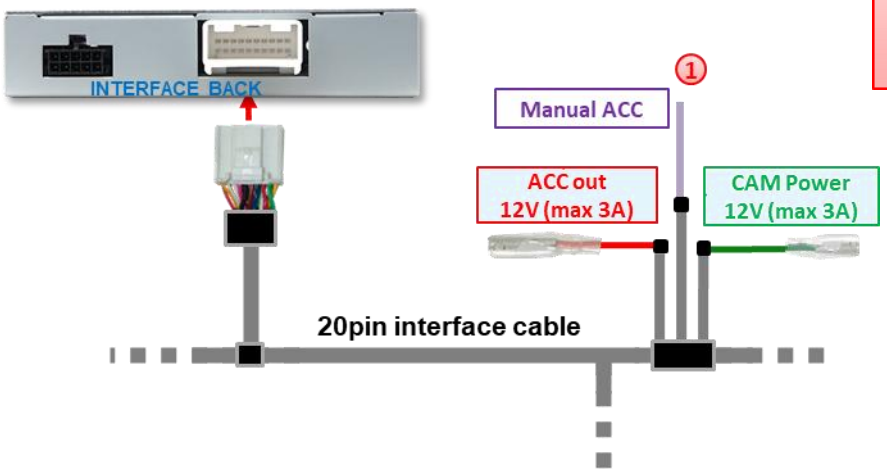
Notes

- The screen is only switched on as long as the video interface is switched on via +12V to **Manual ACC**. Otherwise, the factory picture is also black.
  When selecting the switch-on signal, check whether the factory picture is available in all desired operating states.
- The display of driving lines is not available with an analogue connection.
- If the interface is connected via analogue (without CAN bus), the rear-view camera and side cameras must also be connected via analogue.
  See points:
  2.6.2Case 2: Reverse gear signal from analogue signal
  2.8.2Case 2: turn signals from analogue signal

2.4.3.2 Analogue connection Open R-Link with vertical 10.4inch monitor without CAN bus

With an analogue connection, the **blue CAN high wire** and **grey CAN low wire** of the **10pin power/CAN cable** are not connected.

Open R-Link



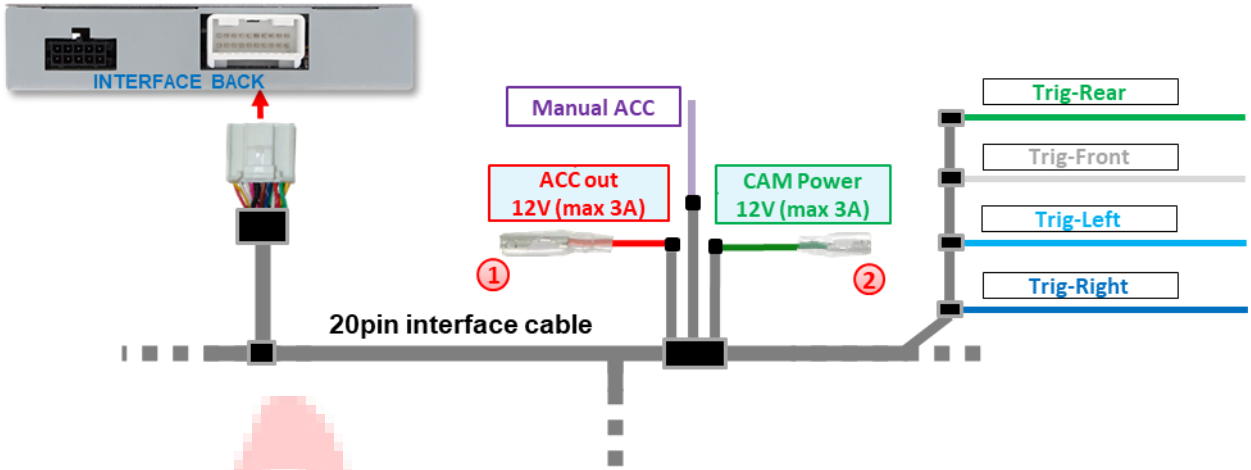
1 Connect the purple **Manual ACC** wire of **the 20pin interface cable** to **the +12V S contact (terminal 86s) or ACC terminal 15r** (e.g. cigarette lighter, glove compartment light).

Notes

- The screen is only switched on as long as the video interface is switched on via +12V to **Manual ACC**. Otherwise, the factory picture is also black.
  When selecting the switch-on signal, check whether the factory picture is available in all desired operating states.
- The display of driving lines is not available with an analogue connection.
- If the interface is connected via analogue (without CAN bus), the rear-view camera and side cameras must also be connected via analogue.
  See points:
  2.6.2Case 2: Reverse gear signal from analogue signal
  2.8.2Case 2: turn signals from analogue signal

2.5 Power supply outputs

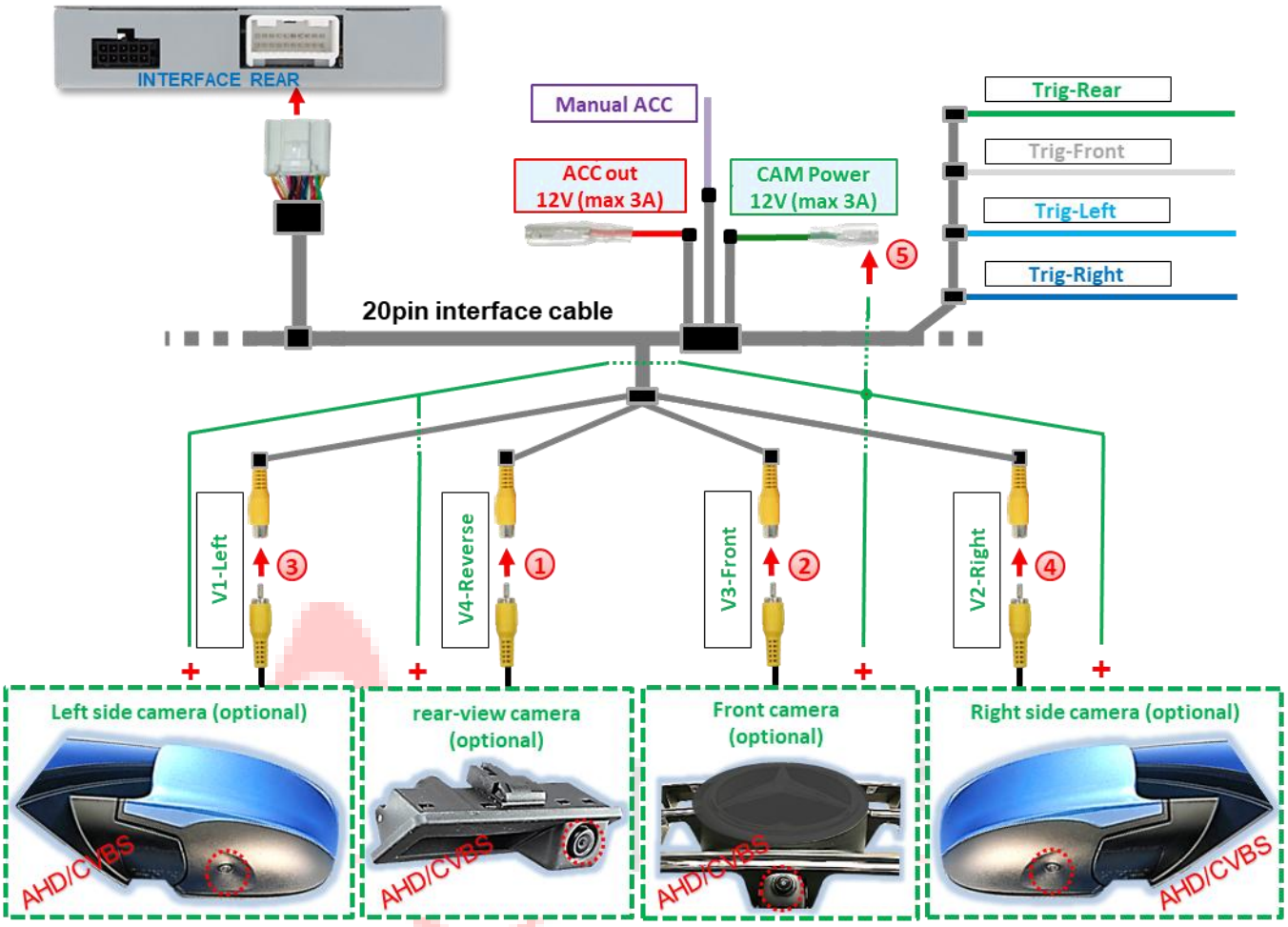
The two **red** and **green** power supply lines **ACC out 12V (max 3A)** and **CAM Power 12V (max 3A)** of the 20pin interface cable can either be used as ACC power supply for the **V1-Left**, **V2–Right**, **V3–Front or HDMI** input* connected **external video sources** (e.g. iOS/Android devices, laptop,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



1. **External video sources** (not cameras) can be powered via the red **ACC out 12V (max 3A)** power supply line of the 20pin interface cable.
   The wire carries a **continuous** +12V ACC switching output current while the interface is switched on *(see the following chapters for connection diagrams)*.
2. **Aftermarket cameras** (e.g. rear, side and front cameras) can be powered via the green **CAM Power 12V (max. 3A)** power supply line of the 20pin interface cable. The wire carries **+12V switching output current** 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 lines *(see the following chapters for connection diagrams)*.

*** HDMI input only available with HDV- IVI16**

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

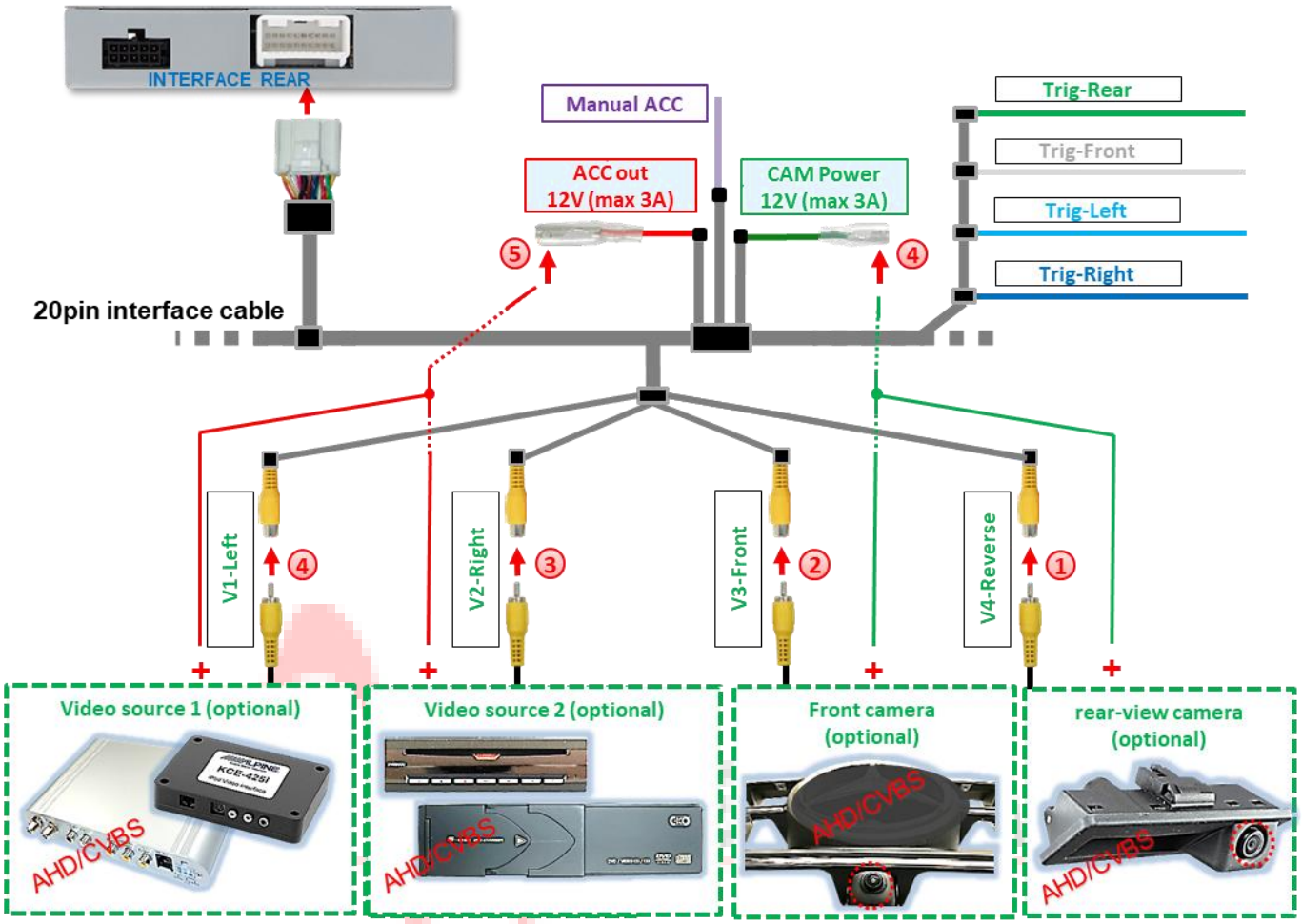


1. Connect the RCA male connector of the rear-view camera to the RCA female connector **V4-Reverse** of the 20pin interface cable.
2. Connect the RCA male connector of the front camera to the RCA female connector **V3-Front** of the 20pin interface cable.
3. Connect the RCA male connector of the left 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 aftermarket cameras to **the green wire. CAM Power 12V (max 3A)** of the 20pin interface cable.

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

Attention!
The video signal type of each video source must be defined in the OSD menu of the 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. Connect the power supply for aftermarket cameras to **the green wire of the CAM Power 12V (max 3A)** of the 20pin interface cable.
5. Connect the power supply for video sources to **the red wire ACC out 12V (max 3A)** of the 20pin interface cable.

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

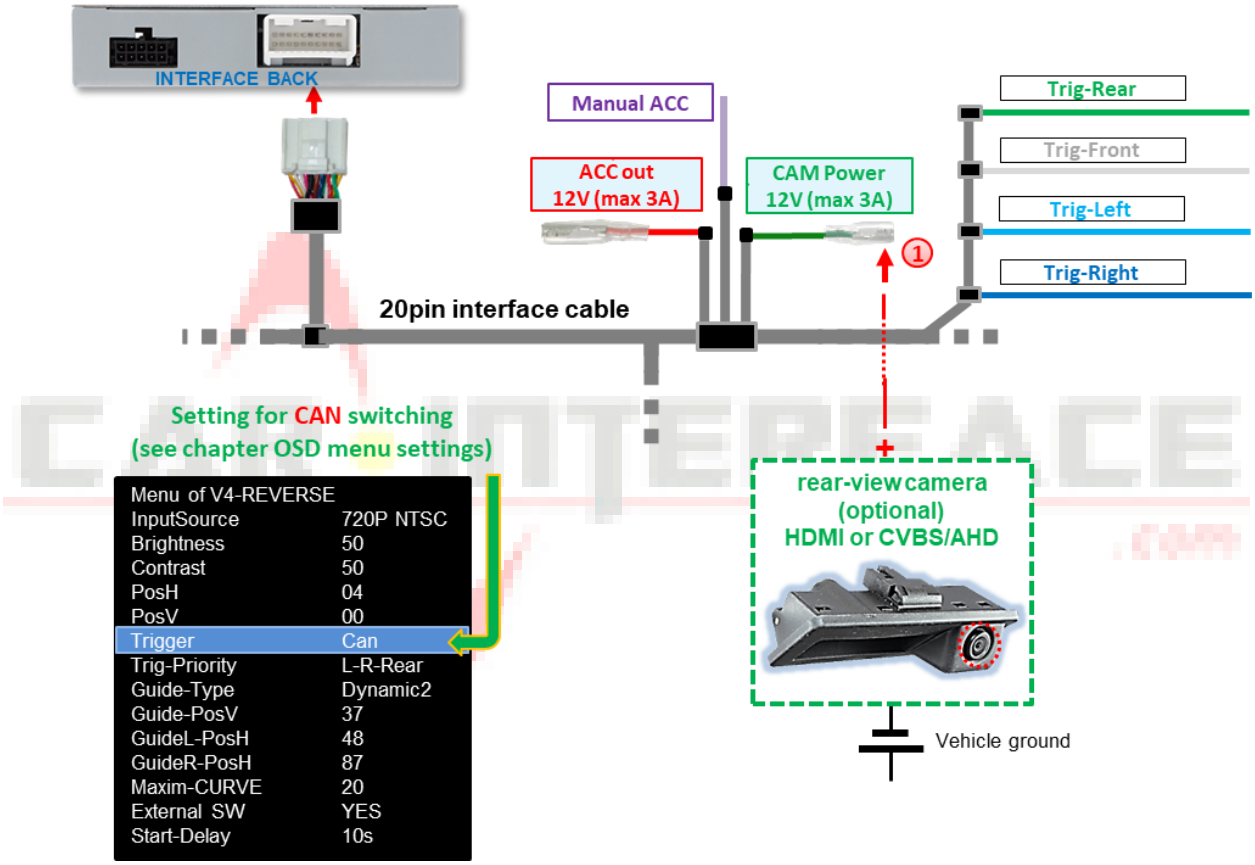
Attention!
The video signal type of each video source must be defined in the OSD menu of the corresponding video input.

2.6 Aftermarket rear-view camera

Automatic switching to the rear-view camera can be done 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 interface connection has been made with the CAN bus. Furthermore, the vehicle CAN bus reverse gear signal and detection by the interface must be compatible. The interface then supplies +12V on the **green wire CAM Power 12V (max 3A)** of the **20pin interface cable** while reverse gear is engaged, and the interface automatically switches to the rear-view camera input **V4-Reverse** or the **HDMI**- input*.
See also chapter1.4 Settings – 8 dip switch bench (interface functions) .



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

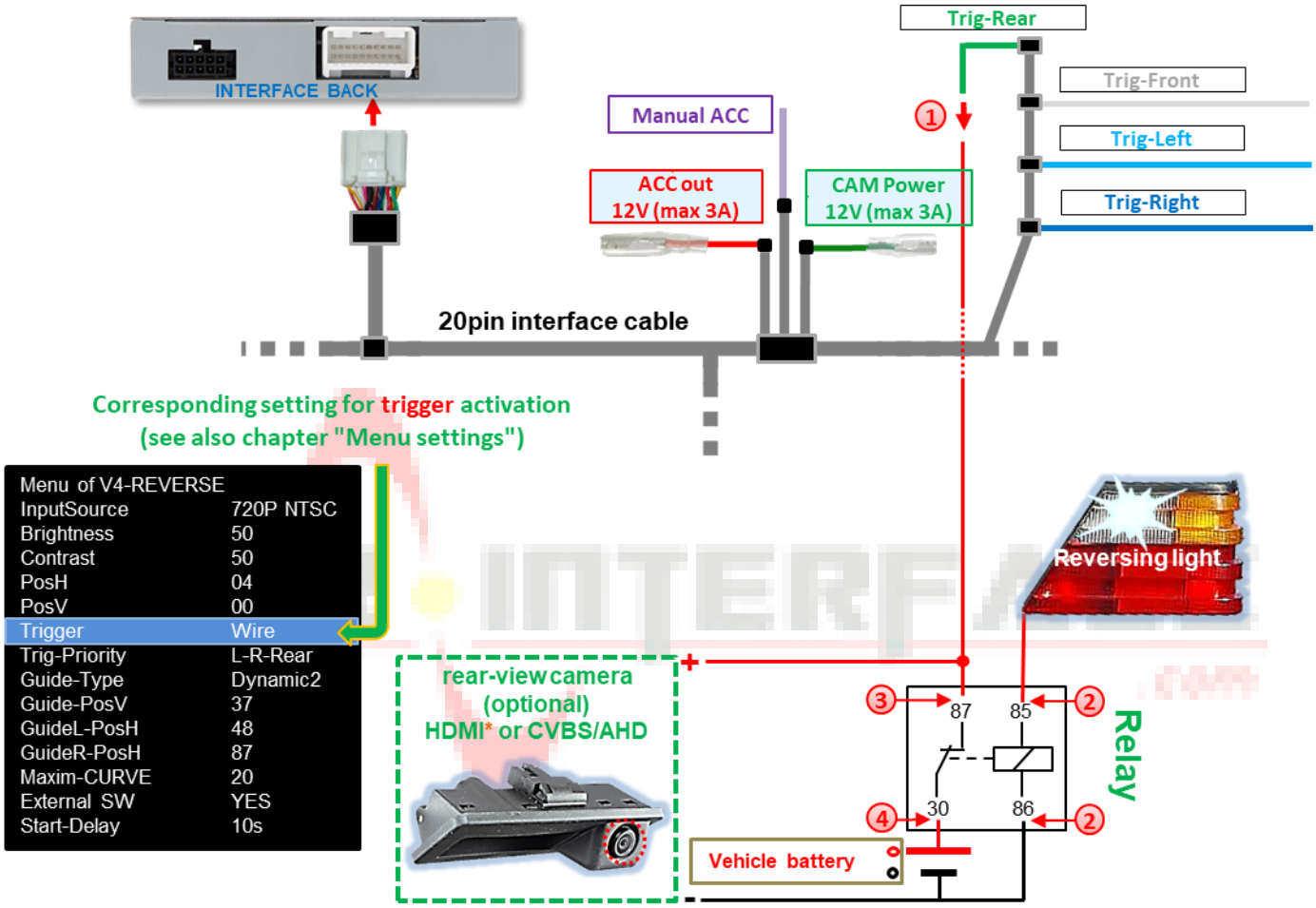
Notes

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

*** HDMI input only available with HDV-IVI16**

2.6.2 Case 2: Reverse gear signal from analogue signal

If the interface is connected without a CAN bus or if the interface does not supply +12V to the **green CAM Power 12V (max 3A) wire** of the 20-pin interface cable while reverse gear is engaged (not all vehicles are compatible), an external switch signal from the reversing light is required. As the reversing signal contains electronic interference, a normally open relay (e.g. AC-MR-312 or AC-MR-201) or a noise filter (e.g. AC-PNF-RVC) is required. The following diagram shows the use of a normally open relay.

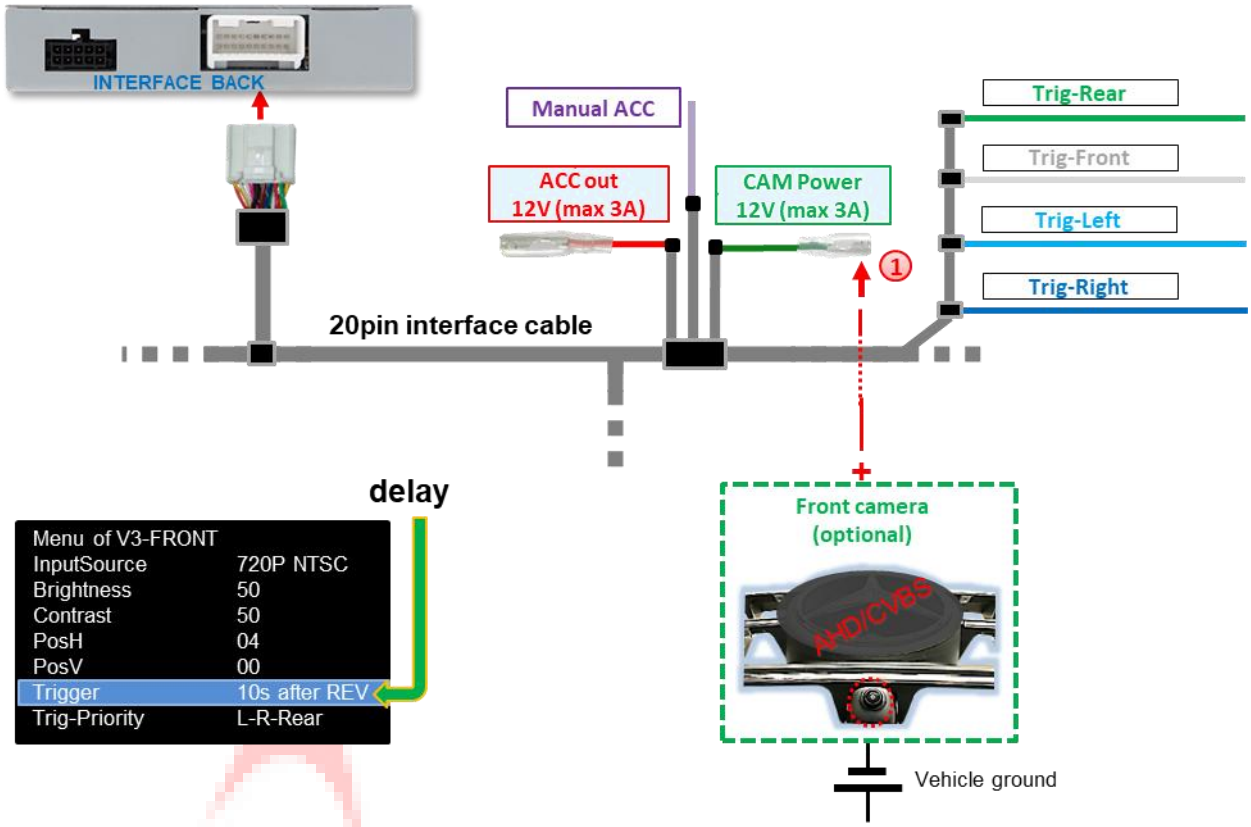


1. Connect the **green wire Trig-REAR** to the output terminal (87) of the relay.
2. Connect the reversing light power cable to the switching coil terminal (85) and the vehicle ground to the switching coil terminal (86) of the relay.
3. Connect the rear-view camera power supply wire to the output terminal (87) of the relay, in addition to the **green Trig-REAR wire.**
4. Connect the +12V continuous current to the input terminal (30) of the relay.

Note: For analogue connection, set the "Trigger" menu item in the OSD menu to "Wire"!

*** HDMI input only available with HDV-IVI16**

2.7 Aftermarket front camera



1 The **green wire CAM Power 12V (max. 3A)** can be used to power the front camera (and all other cameras connected to the video inputs). This only carries current for the duration of any camera activation (some cameras are not stable with continuous current). The prerequisite is that Dip 3 = **ON** (black 8 dip switch bench). The **green wire** then supplies +12V (max. 3A) as power for the front camera as long as the front camera input is displayed.
The delay time can be individually selected for **5**, **10**, **15** or **20** seconds in the OSD menu settings of the front camera.

Switching to the front camera after reverse gear is engaged for the time set in the OSD menu occurs when a reverse gear signal is received from the CAN bus and with an analogue connection.

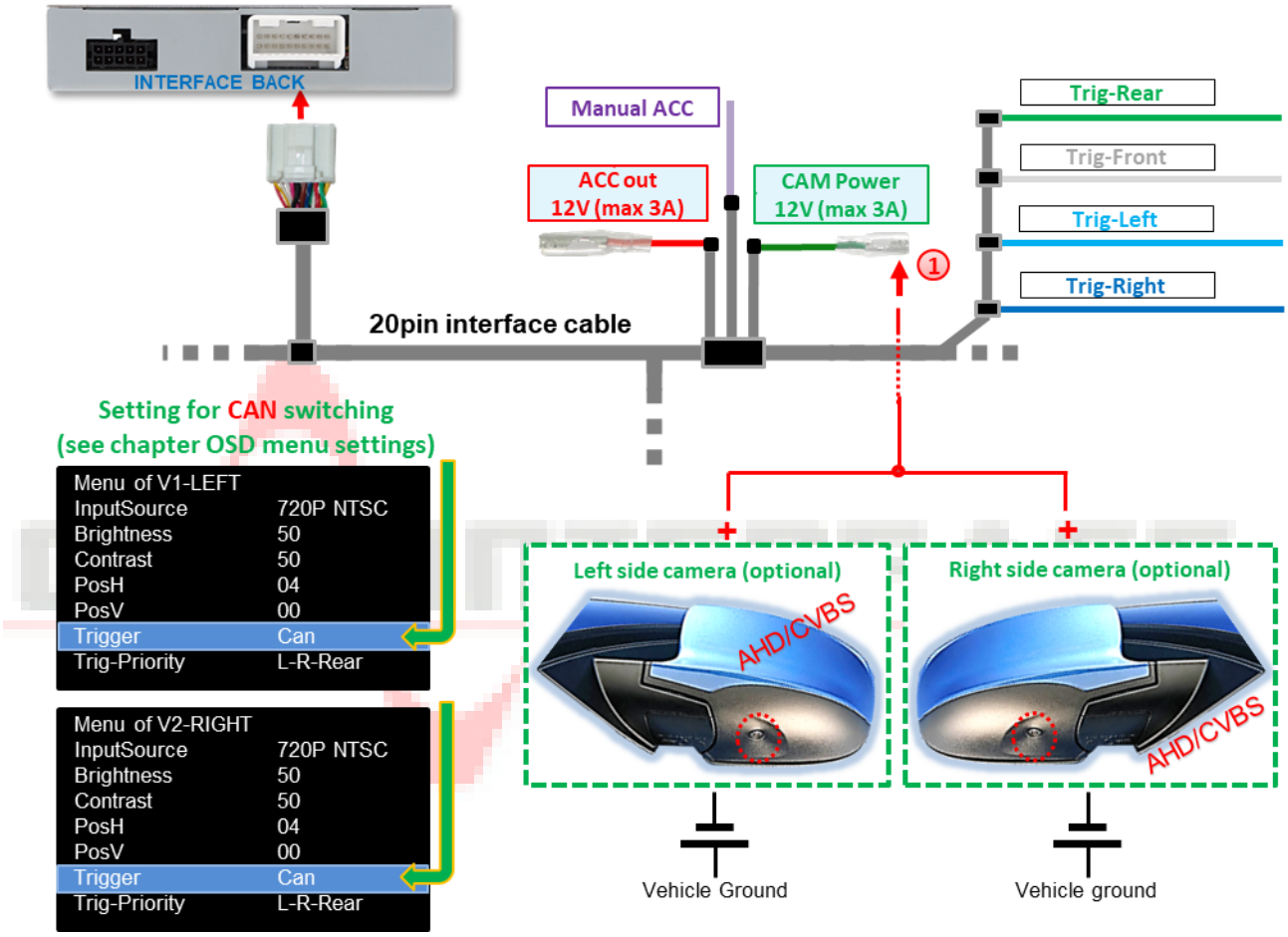
Note: In addition, manual switching to front camera input (short press) is possible from any picture mode using an external keypad (see chapter*3 Operating the video interface*).

2.8 Aftermarket side cameras

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

2.8.1 Case 1: Turn signals from CAN bus

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

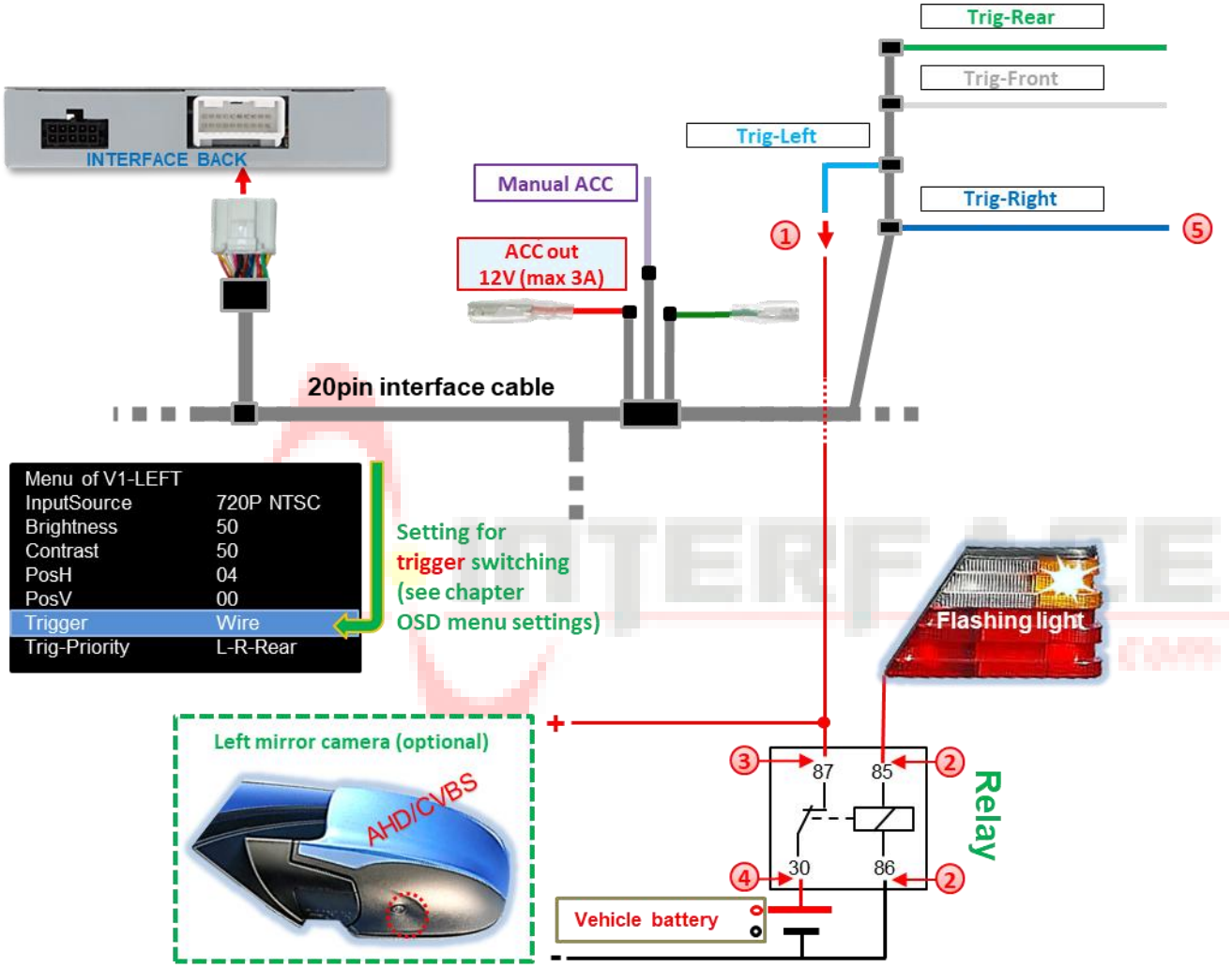


1 Power for the side cameras can be supplied via **the green CAM Power 12V wire (max 3A)** of the **20pin interface cable**, as this wire only carries current when the camera is activated (some cameras are not stable under continuous current).

Note: If the interface's flashing signal detection on the vehicle CAN bus does not work, the turn signals must be connected in an analogue manner.

2.8.2 Case 2: turn signals from analogue signal

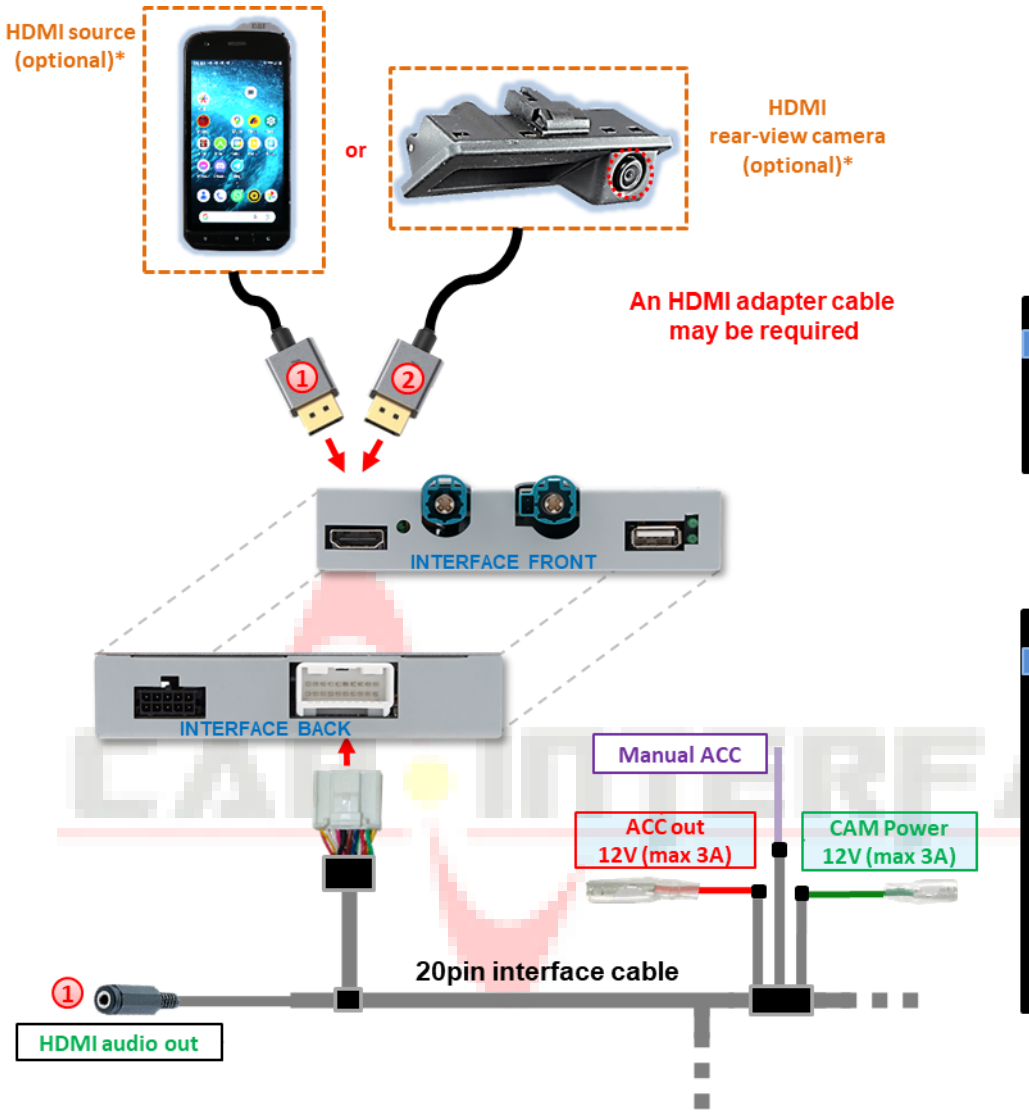
If the interface is connected without a CAN bus or if the turn signals from the vehicle CAN bus are not recognised when the interface is connected with a CAN bus, analogue activation of the side camera inputs is possible via the +12V switching input lines **Trig-Left** and **Trig-Right**. An external switching signal from the turn signal bulbs is required to switch to the side camera inputs. Since turn signals may contain electronic interference, a normally open relay (e.g. AC-RW-1230 with AC-RS5 cabling) or a noise filter (e.g. AC-PNF-RVC) is required for each input. The diagram below shows the use of a normally open relay.



1. Connect the **light blue wire Trig-Left** to the output terminal (87) of the relay.
2. Connect the indicator cable of the left indicator to the relay's switching coil terminal (85) and the vehicle ground to the relay's switching coil terminal (86).
3. Connect the left side camera power cable to the output terminal (87) of the relay, in addition to the **light blue wire Trig-Left**.
4. Connect the +12V continuous current to the input terminal (30) of the relay.
5. The same connection method applies to the right side camera via the **dark blue Trig-Right wire**.

2.9 HDMI rear-view camera or other HDMI sources (HDV-IVI16 only)

HDMI input * The interface can generally be used for any video source with an HDMI output (e.g. rear-view camera, 360° camera system or other video sources such as smartphones, laptops, streaming sticks, DVB-T2 tuners, 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 displayed on the source's screen (e.g. smartphone, laptop, etc.) will be mirrored on the vehicle monitor. Other sources (e.g. streaming stick, DVD player, DVB-T tuner, etc.) can also be played back on the vehicle monitor. The video source can be powered via the **red wire ACC out 12V (max. 3A)** cable.
   Received audio signals are output via the 3.5 mm jack socket **HDMI audio out*** of the 20pin interface cable. *(See the following chapter2.10 Audio insertion .)*

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 when reverse gear is engaged, and after disengagement, the picture from a front camera connected to the front camera input **V3-Front** is also displayed for the preset time. Power can be supplied via the **green wire CAM Power 12V (max 3A)** .

*** HDMI input only available with HDV-IVI16**

2.10 Audio insertion

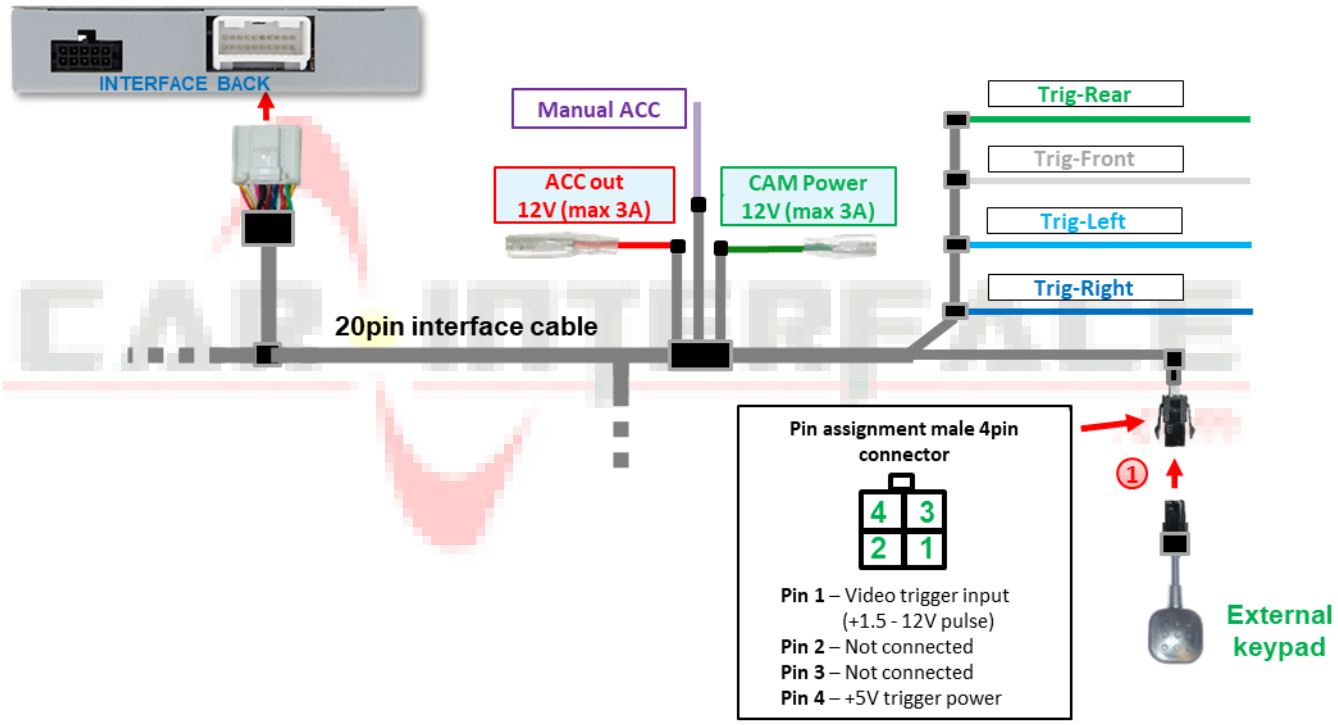
The interface can only insert video signals into the factory infotainment system. For all connected AV sources, their audio output must be connected to the factory AUX input (if available) or an optional audio feeder (e.g. FM modulator).

Audio signals from **the HDMI input*** are output via the 3.5 mm jack socket **HDMI audio out** on the interface. In this case, the **HDMI audio out** of the interface must be connected to the factory AUX input (if available) or an optional audio feeder (e.g. FM modulator).

If several AV sources are connected to the infotainment system, an additional audio switch may be necessary. Input video signals can be activated in parallel with any audio mode of the factory infotainment system.

*** HDMI input only available with HDV-IVI16**

2.11 Connection - Video interface and external keypad



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

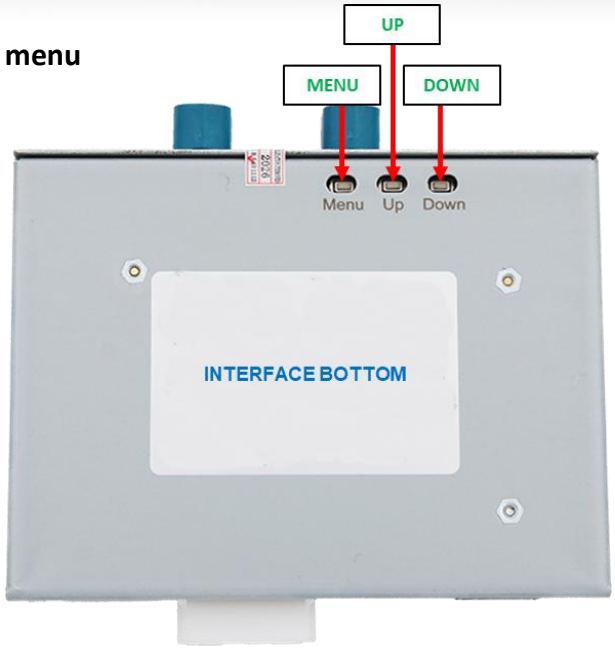
Note: Even if the keypad is not required for switching between multiple sources, it is strongly recommended that the keypad be connected and remain hidden on the interface. The keypad should not be installed in a "pressed" position.

Optional: 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 the settings in the respective OSD menus.

"HDA-RC" remote control optionally available

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

2.12 settings OSD menu



Attention!
The video signal type for each video source must be defined in the OSD menu for the corresponding video input.

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

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

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

8pin DIP switch bank DIP 1 (DIP 2) = ON

Menu V1-Left (V2-Right)

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 input signal type for video source connected to **V1-Left (V2-Right)**.
This **must** be defined for correct image reproduction.
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

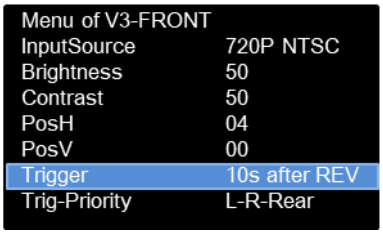
Pos. H Horizontal image position

Pos. V Vertical image position

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

Trig priority Priority of switching when switch signals are present for several inputs at the same time (CAN bus or analogue +12 V trigger). 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 **8 dip switch bench** Dip 3 = ON



Input Source Video input signal type for video source connected to **V3 front**.
This **must** be defined for correct image reproduction.
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

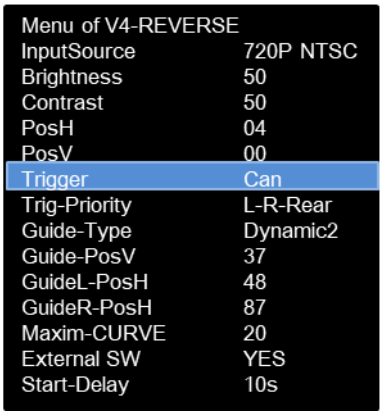
Pos. V Vertical image position

Trigger Type of selection for video input **V3 front**.
Delay function for front camera. The delay setting determines the automatic switching of a front camera connected to the V3 front input after reverse gear is engaged, as well as its display duration on the screen. 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 deactivates the "Delay" function and the input can only be selected via the white Trig-Front wire or manually via an external keypad.

Trig priority Priority of switching when switch signals are present for several inputs at the same time (CAN bus or analogue +12 V trigger). 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***

V4-Reverse menu **8 dip switch bench** Dip 4 = ON, Dip 5 = OFF, Dip 6 = OFF

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



Input Source Video input signal type for video source connected to V4 Reverse. This **must** be defined for correct image reproduction . The following video source signal types can be used :
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 for 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. This requires the interface to recognise reverse gear in the CAN bus.
"Wire" function with analogue connection. A rear-view camera connected to the V4 Reverse can be selected via the green Trig Left wire using either the **"Wire"** or **"CAN"** setting. We recommend setting **"Wire"** for analogue (reversing signal) connections.

Trig priority Priority of switching when switch signals are present for several inputs at the same time (CAN bus or analogue +12 V trigger). 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 of 6 different angles for the guide lines for the rear-view camera
Movable 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 guide line **00-90**

Guide R Pos.H Horizontal position of the right guide line **00-121**

Maximum CURVE Radius of the guide lines **01-20**

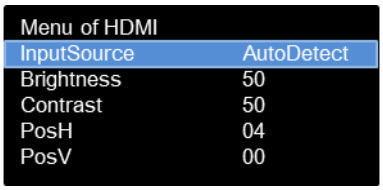
External SW Selectable via external keypad V4 Reverse
YES: *Factory video → HDMI* → V1-Left → V2-Right → V4-Reverse → Factory video*
NO: *Factory video → HDMI* → V1-Left → V2-Right → Factory video*

Start delay Switchover delay of the interface at start-up. This function is technically necessary in some vehicles, as otherwise malfunctions of the factory system may occur (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 lead to malfunctions!

*** HDMI input only available with HDV-IVI16**

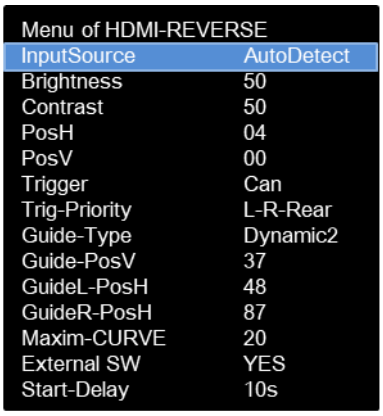
HDMI menu* **8 dip switch bench** (DIP 4 = ON, DIP 5 = **ON/OFF**, DIP 6 = ON)

HDMI AV input (Dip 5 = OFF)



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

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



InputSource	The picture resolution of connected HDMI sources is automatically detected.
Brightness	Brightness
Contrast	Contrast
Pos. H	Horizontal image position
Pos. V	Vertical image position
Trigger	Type of selection for rear-view camera input **HDMI-REV**. **"CAN" function with CAN bus connection**. With the "CAN" setting, the system automatically switches to **HDMI*** for the HDMI rear-view camera when reverse gear is engaged. This requires the interface to recognise reverse gear in the CAN bus. **"Wire" function with analogue connection**. A rear-view camera connected to **HDMI*** can be selected via the **green Trig Rear wire** using either the **"Wire"** or **"CAN"** setting. We recommend setting **"Wire"** for analogue (reversing signal) connections.
Trig priority	Priority of switching when switch signals are present for several inputs at the same time (CAN bus or analogue +12 V trigger). 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 of 6 different angles for the guide lines for the rear-view camera Movable guide lines **Dynamic 1-6** Fixed guide lines **Fixed 1-6** No guide lines **OFF**
Guide pos. V	Vertical position of guide lines **00-69**
Guide L Pos.H	Horizontal position of the left guide line **00-90**
Guide R Pos.H	Horizontal position of the right guide line **00-121**
Maximum 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	Switching delay of the interface at start-up. This function is technically necessary in some vehicles, as otherwise malfunctions of the factory system may occur (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 lead to malfunctions!

Notes: **V4 reverse** input is no function when the **HDMI input*** is defined as the rear-view camera input (Dip 5 = **ON**).

*** HDMI input only available with HDV-IVI16**

3 Operating the video interface

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

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

When pressed and held (2-3 seconds), the external keypad switches from the factory video to the first activated interface video input. Each additional long press switches to the next activated interface video input until the last one is reached, at which point it switches back to the factory video. Deactivated inputs are skipped. If all inputs are activated via the corresponding dip switch, the order is as follows:

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

*** HDMI input only available with HDV-IVI16**

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

- Short press of the keypad (only possible if Dip 3 is set to ON)

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

Note: Even if the keypad is not needed to switch between multiple sources, it is strongly recommended that the keypad be connected and remain hidden on the interface. The keypad should then not be installed in a "pressed" position.

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

"HDA-RC" remote control optionally available

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

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

4 Specifications

BATT/ACC range	9V - 16V
Stand-by power drain	approx. 1mA
Power consumption	approx. 350mA @12V
Video input	0.7V - 1V
Video input signal types	**FBAS/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 110 mm (W x H x D)

5 FAQ – Troubleshooting Interface functions – product-specific

Problem	Possible cause	Solution
Vehicle battery discharges	Power connection made to battery terminal 30	See chapter*2.4.1.2 Open R-Link with vertical 10.4inch monitor – cable sets, power supply and CAN bus or analogue without CAN bus* – connection of the 10pin power/CAN cable
Malfunction or no picture	Video input signal type for video source not defined in the OSD of the respective video input	See chapter *2.12 settings OSD menu* - menu of the respective input