Video inserter
CI-RL4-UCON8-AO

Compatible with
Dodge and Jeep vehicles
with Uconnect 8.4AN/RA4 and 8.4A/RA3 systems

Video inserter for front and rear-view camera and two additional video sources

Product features

- **Video inserter for factory infotainment systems**
- **1 CVBS input for rear-view camera**
- **1 CVBS input for front camera**
- **2 CVBS video inputs for retrofit devices (e.g. USB player, DVB-T2 tuner)**
- **Automatic switchover to rear-view camera input when reverse gear is engaged**
- **Automatic front camera switch while reverse gear is engaged for 10, 15 or 20 seconds**
- **Guide lines for rear-view camera can be activated (not available for all vehicles)**
- **Video-in-motion (ONLY for connected video-sources)**
- **NTSC-compatible video inputs**

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Legal notice

The driver must not be distracted, either directly or indirectly, by moving pictures while driving. In most countries/states, this is prohibited by law. We therefore accept no liability for property damage 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 menu on DVD players) or pictures from the rear-view camera 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, if available. The interface must be sent in free of charge for the update. Costs for installation and removal will not be reimbursed.

1. Before installation

This manual should be read before installation. Specialist knowledge is required for installation. The interface must be installed in a location where it will not be exposed to moisture or heat.

1.1. Scope of delivery

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

_____

1.2. Check the interface compatibility with the vehicle and accessories

Requirements

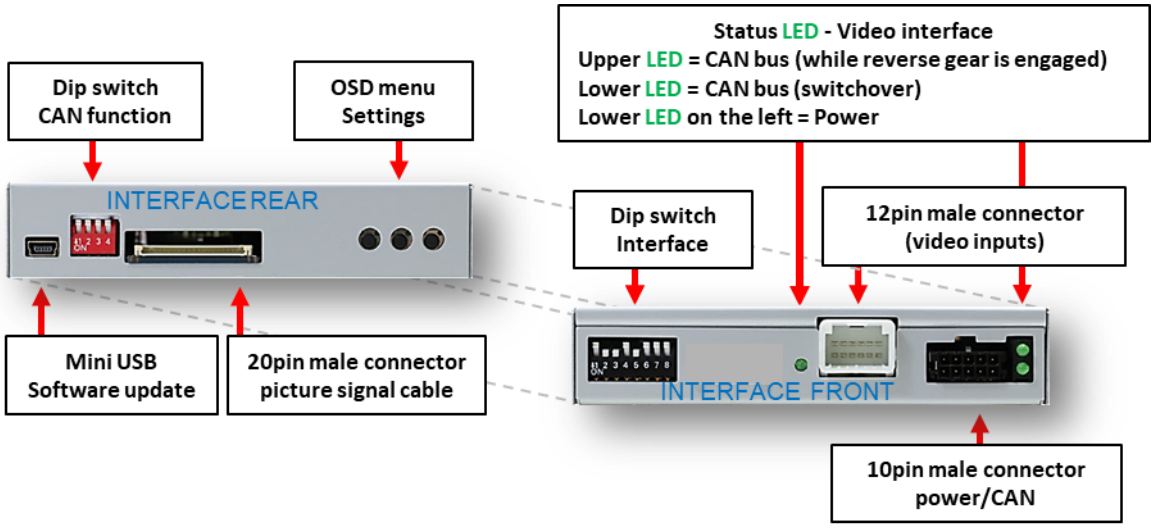
Brand	Compatible models	Compatible systems
Dodge	RAM 1500/2500/3500 model years 2013-2018, Challenger model years 2015-2017, Charger model years 2015-2017, Durango model years 2014-2017, Viper model years 2013-2017 and other vehicles with	Uconnect 8.4AN/RA4 and 8.4A/RA3, 8.4-inch monitor with all-in-one head unit
Jeep	Cherokee model years up to 2018, Grand Cherokee model years 2014-2017 and other vehicles with	Uconnect 8.4AN/RA4 and 8.4A/RA3 8.4-inch monitor with all-in-one head unit

Limitations

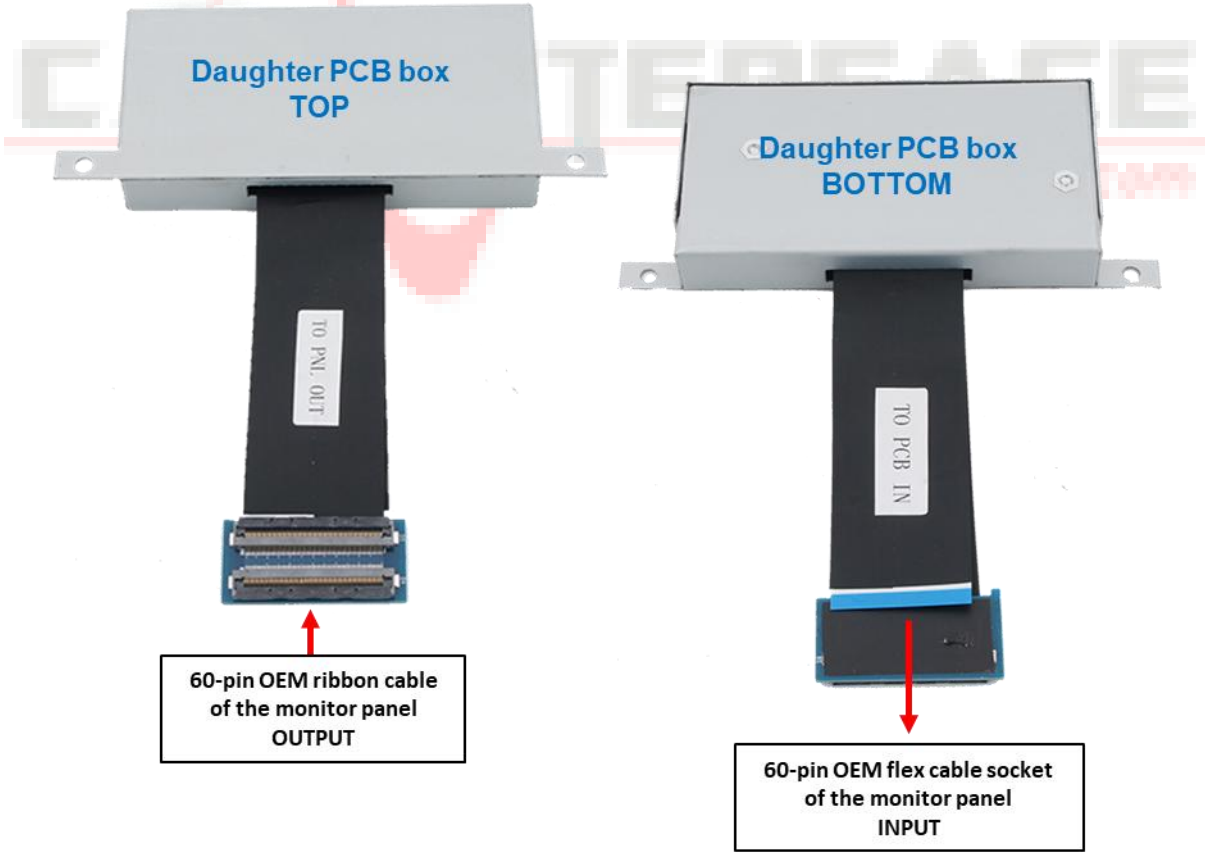
Video only	The interface inserts ONLY video signals into the infotainment system. To insert audio signals, a factory audio AUX input or an FM modulator can be used. If two AV sources are connected, additional electronics are required for audio switching.
Factory rear-view camera	Automatic switching to rear-view camera only as long as reverse gear is engaged. Additional electronics are required to delay the switchback.
Aftermarket front camera	Switching to the front camera occurs automatically after reverse gear has been engaged for 10, 15 or 20 seconds (adjustable). Manual switching to the front camera is also possible using the keypad.
Distance lines	The display of distance lines does not work in all vehicles.
Video input signal	Only NTSC video sources are compatible.

1.3. Connections – video interface

The video interface converts the video signals from the after-market sources into the image signal required by the factory monitor, which is inserted into the factory monitor via various switching options.



1.4. Connections - daughter PCB



1.5. Dip switch settings

1.5.1. 8 DIP – black

Some settings must be made using the dip switches on the video interface.

The DIP position "down" is ON and the position "up" is OFF.

Dip	Function	ON (down)	OFF (up)
1	**Front camera**	activated*	deactivated
	Power supply output (red wire)	+12V (max. 3A) when reverse gear is engaged, including 10, 15 or 20 seconds of delay and +12V when the front camera is selected manually using the keypad	+12V (max. 3A) ACC
2	**CVBS AV1 input**	activated	deactivated
3	**CVBS AV2 input**	activated	deactivated
4	**No function**		Set to OFF
5	**Type of rear-view camera**	Aftermarket	Factory or none
6	**No function**		Set to OFF
7	**Distance lines**	activated	deactivated
8	**No function**		Set to OFF

Power reset interface after each dip change to activate changes!

*Switching to the front camera only occurs automatically after reverse gear has been engaged for 10, 15 or 20 seconds (adjustable).

Detailed information can be found in the following chapters.

1.5.1.1. Activation of the front camera input (dip 1)

When the DIP switch is set to ON, the interface switches from the rear-view camera to the front camera input for 10, 15 or 20 seconds (adjustable in the OSD menu) after reverse gear is engaged. In addition, it is possible to switch manually to the front camera input using a keypad (short press) from any picture mode.

Description of the front camera power supply: see chapter "Power supply output".

1.5.1.2. Activation of the interface video inputs (Dip 2-3)

Only the activated video inputs can be accessed when switching to the video sources. It is recommended to activate only the required inputs. The deactivated inputs are skipped when switching.

1.5.1.3. Rear-view camera settings (Dip 5)

When the DIP switch is set to OFF, the interface switches to the factory picture for the existing factory rear-view camera as long as reverse gear is engaged.
When the dip switch is set to ON, the interface switches to the rear-view camera input "Camera-IN" as long as reverse gear is engaged.

1.5.1.4. Activation of guide lines (Dip 7)

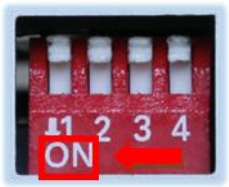
When the dip switch is set to ON, the guide lines are shown on the display.
When the dip switch is set to OFF, the guide lines are not displayed.

Note: If the interface receives no or incomplete data from the vehicle CAN bus (some vehicles are not compatible), guide lines for the rear-view camera cannot be shown, even if they appear once on the display after a power-off!

Note: Dips 6 and 8 have no function and must be set to **OFF**.

After each change to the dip switch setting, a power reset of the video interface must be performed!

1.5.2. 4 Dip – red



The dip switches on the CAN box can be used to select the vehicle or the head unit in which the interface is to be installed.

Dip position "down" is **ON** (down) and position "up" is **OFF**.

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

2. Installation

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

As with any installation of retrofit devices, a quiescent current test must be carried out on all retrofitted devices after installation to ensure that the devices switch to standby mode when the vehicle is in sleep mode.

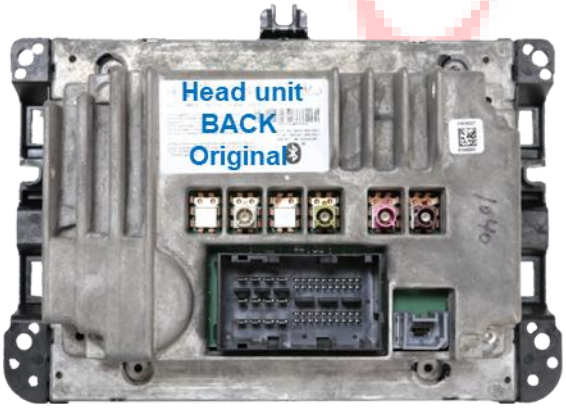
Before final installation, we recommend a test run to ensure that the vehicle and interface are compatible. Due to changes in the vehicle manufacturer's production, there is always the possibility of incompatibility.

2.1. Installation location

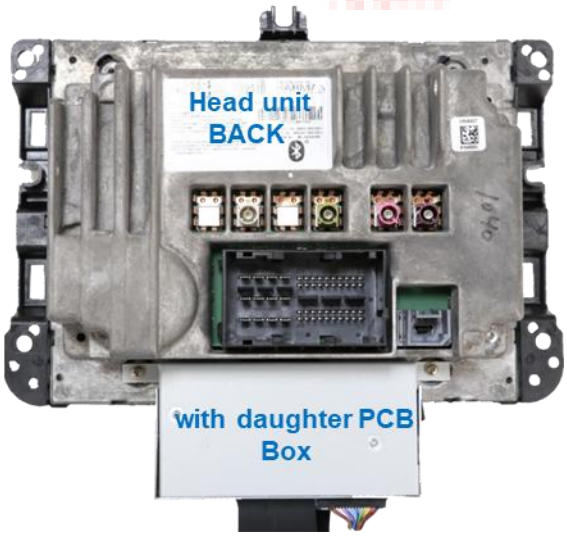
The video interface is installed behind the factory head unit, depending on the space available.

The daughter PCB is mounted on the rear of the head unit. The connection is made in the video cable between the monitor panel and the head unit main board.

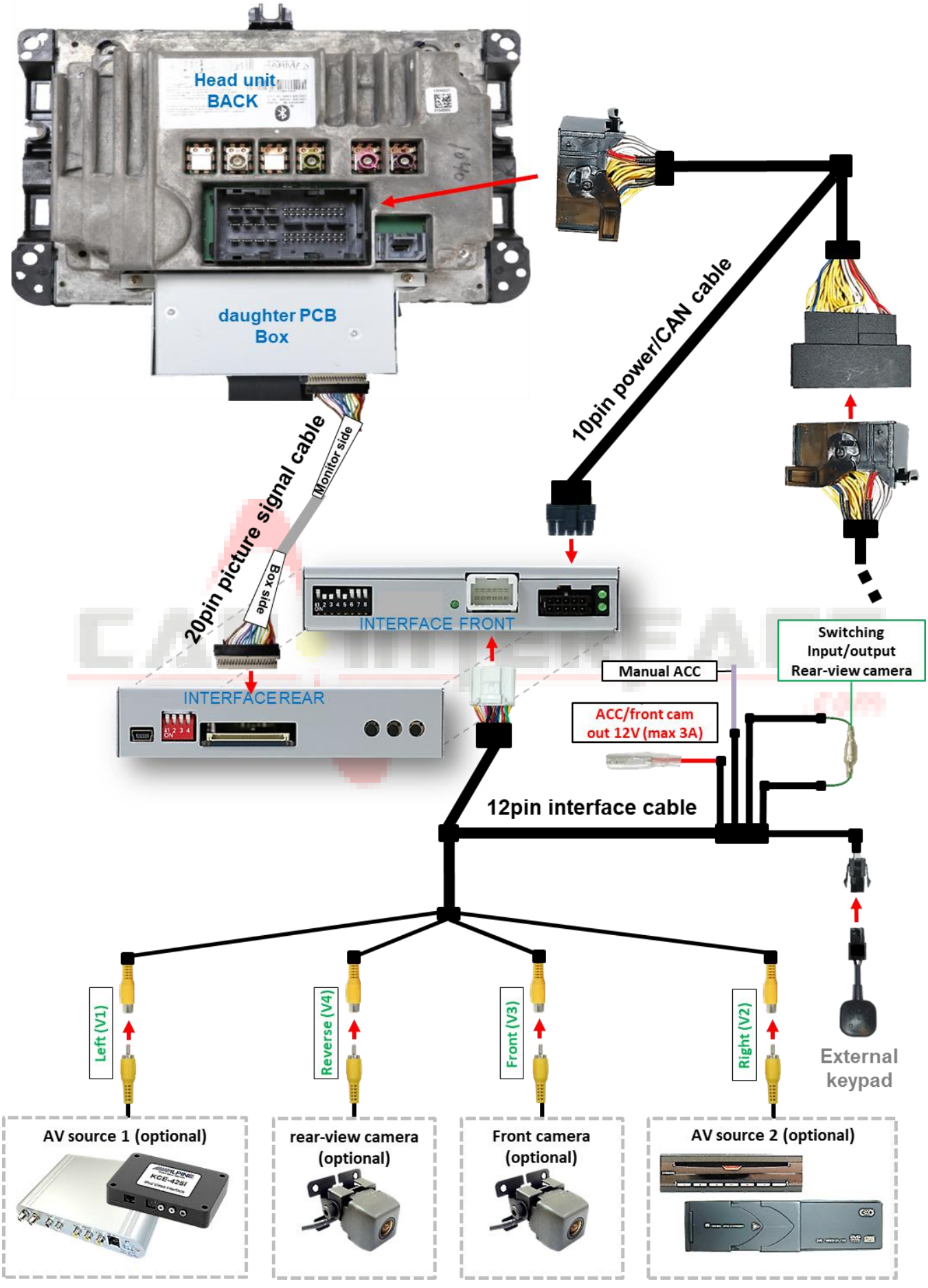
Before



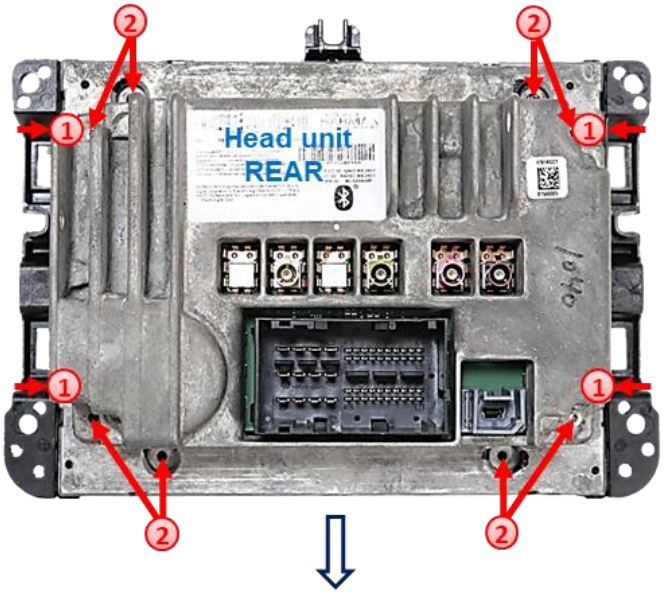
After



2.2. Connection schema

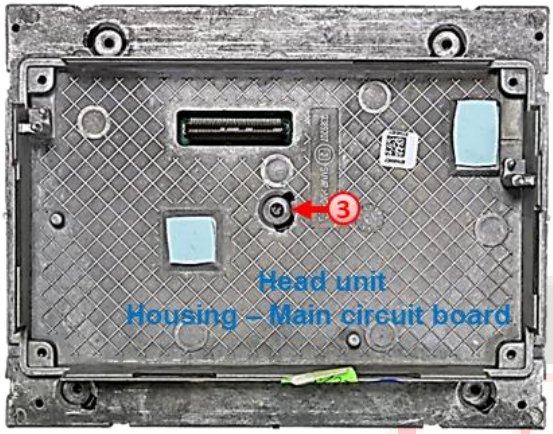


2.3. Installation – daughter PCB

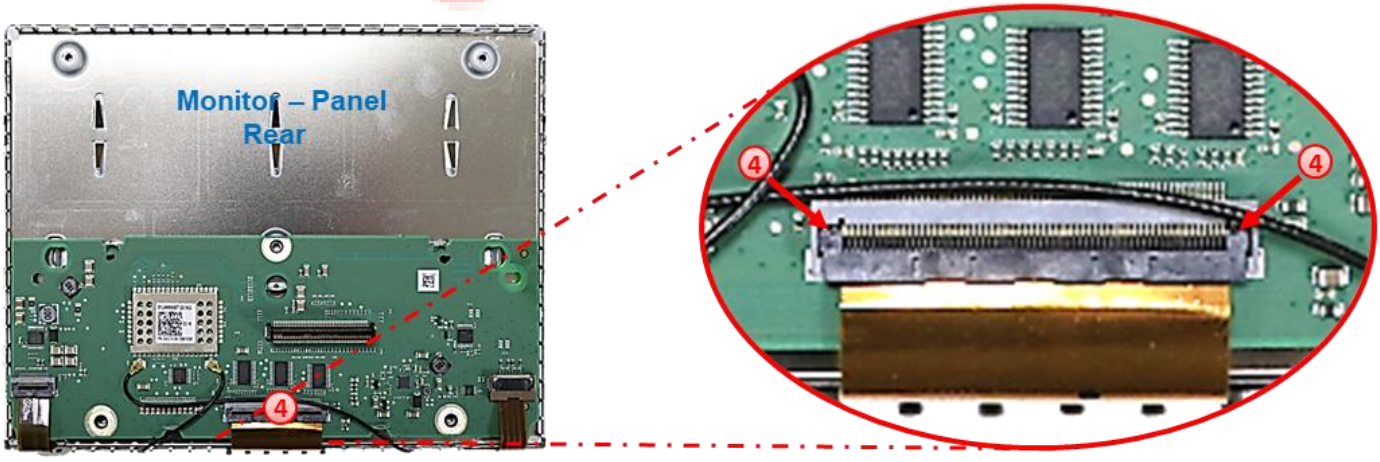


1 Remove the head unit and dismantle the plastic frame attached to the head unit with 4 Torx (T10) screws.

2 Remove the 8 Torx (T10) screws from the rear part of the head unit and disconnect it together with the main circuit board inside from the head unit main circuit board housing and set it aside.

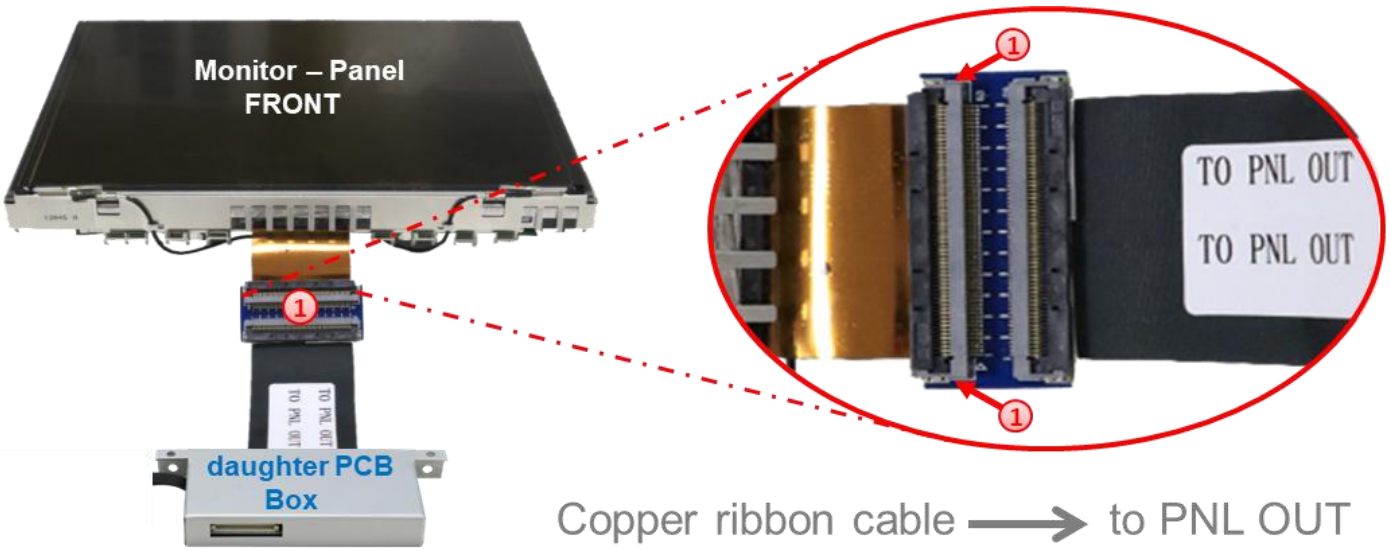


3 Unscrew the Torx (T10) screw in the centre of the head unit main board housing and carefully separate it from the monitor to expose the monitor panel with its copper-coloured picture ribbon cable.



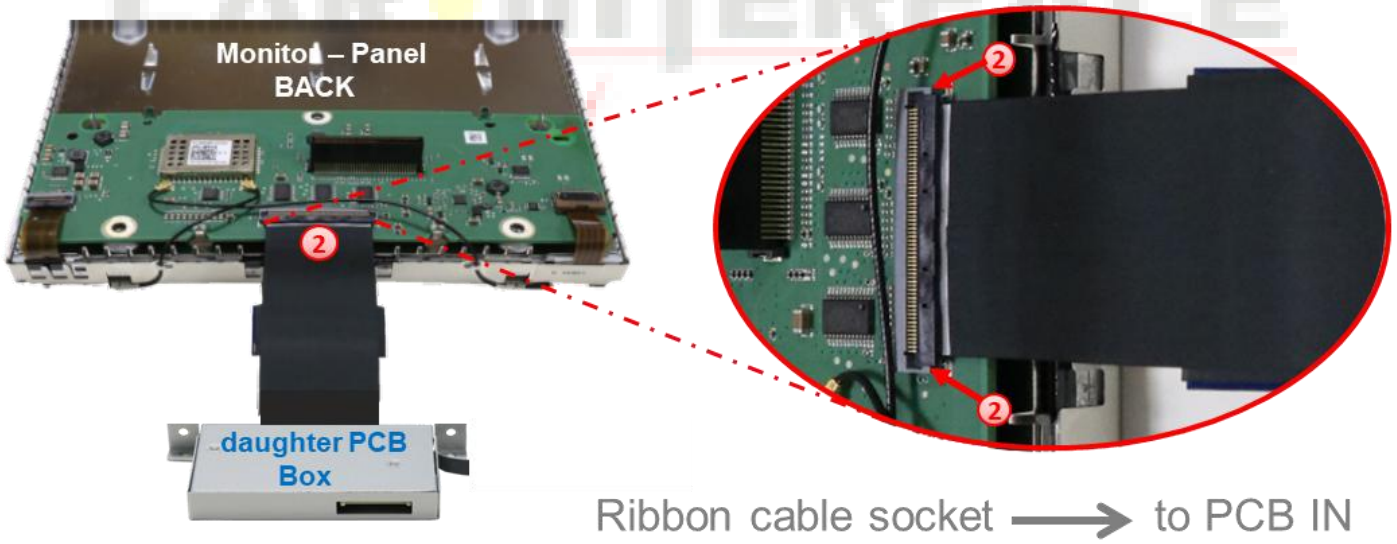
4 Carefully unclip the copper-coloured 60pin ribbon cable connected to the ribbon cable socket of the monitor panel and remove it.

Caution: To avoid damaging the sensitive conductor tracks, the mounted ribbon cables must be handled with care.



1 Turn the monitor panel around and connect the previously exposed copper-coloured ribbon cable of the monitor panel to the pre-mounted 60pin flex ribbon cable connector **"TO PNL OUT"** of the daughter PCB box and clip it in (observe the following warnings!).

Caution: Due to the very short original ribbon cable, there is only limited space available for installation!



2 Turn the monitor panel around again and connect the pre-assembled 60pin ribbon cable **"TO PCB IN"** of the daughter PCB box to the previously exposed ribbon cable socket of the monitor panel (observe the following warnings!).

After checking the ribbon cable installation, reinstall the head unit, including the head unit frame, in reverse order.

1 Mount the daughter PCB box to the rear of the head unit using the screws provided.

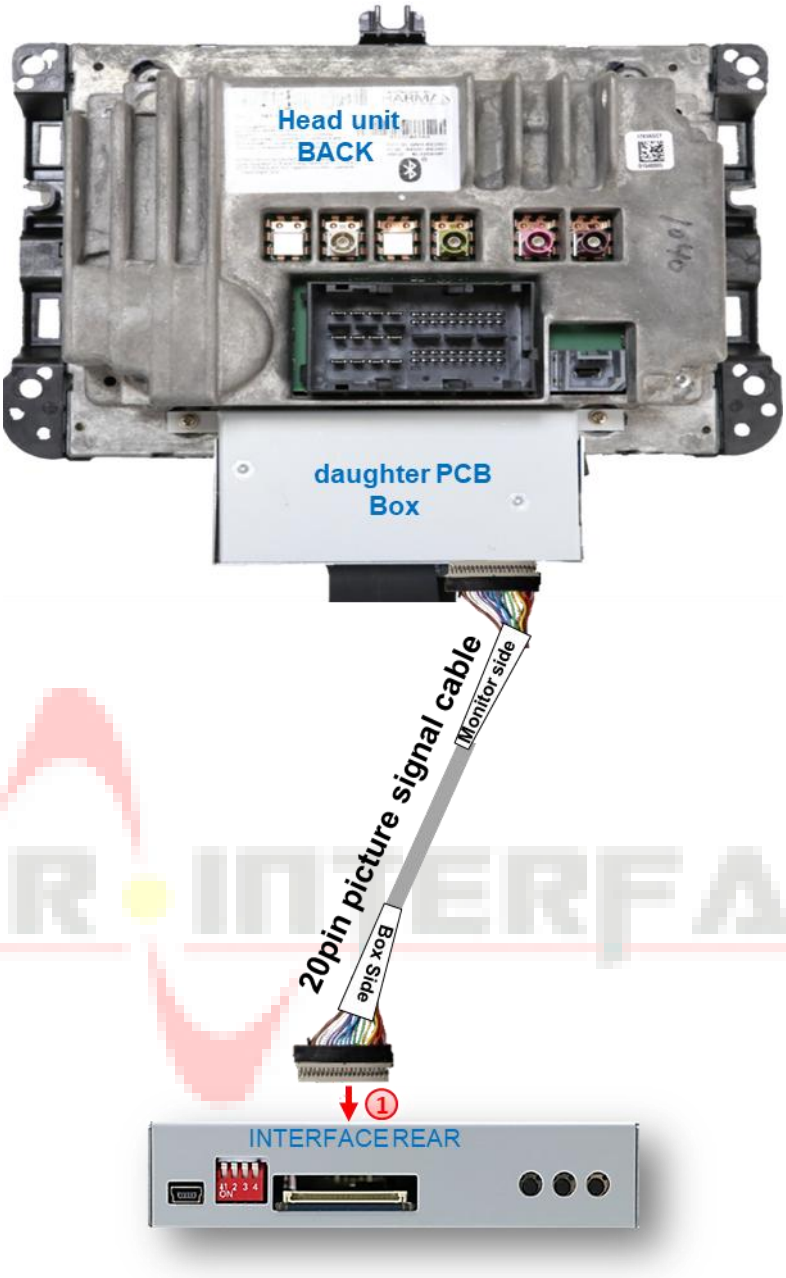
Note: If the ribbon cables come into contact with the housing parts after installation, protect them from damage with insulating material.

2.3.1. Warnings regarding ribbon cable installation

1) The contact ends of the ribbon cable must always be clipped in precisely on both sides, i.e. at right angles, as even the slightest angle changes can lead to faulty contact and short circuits.

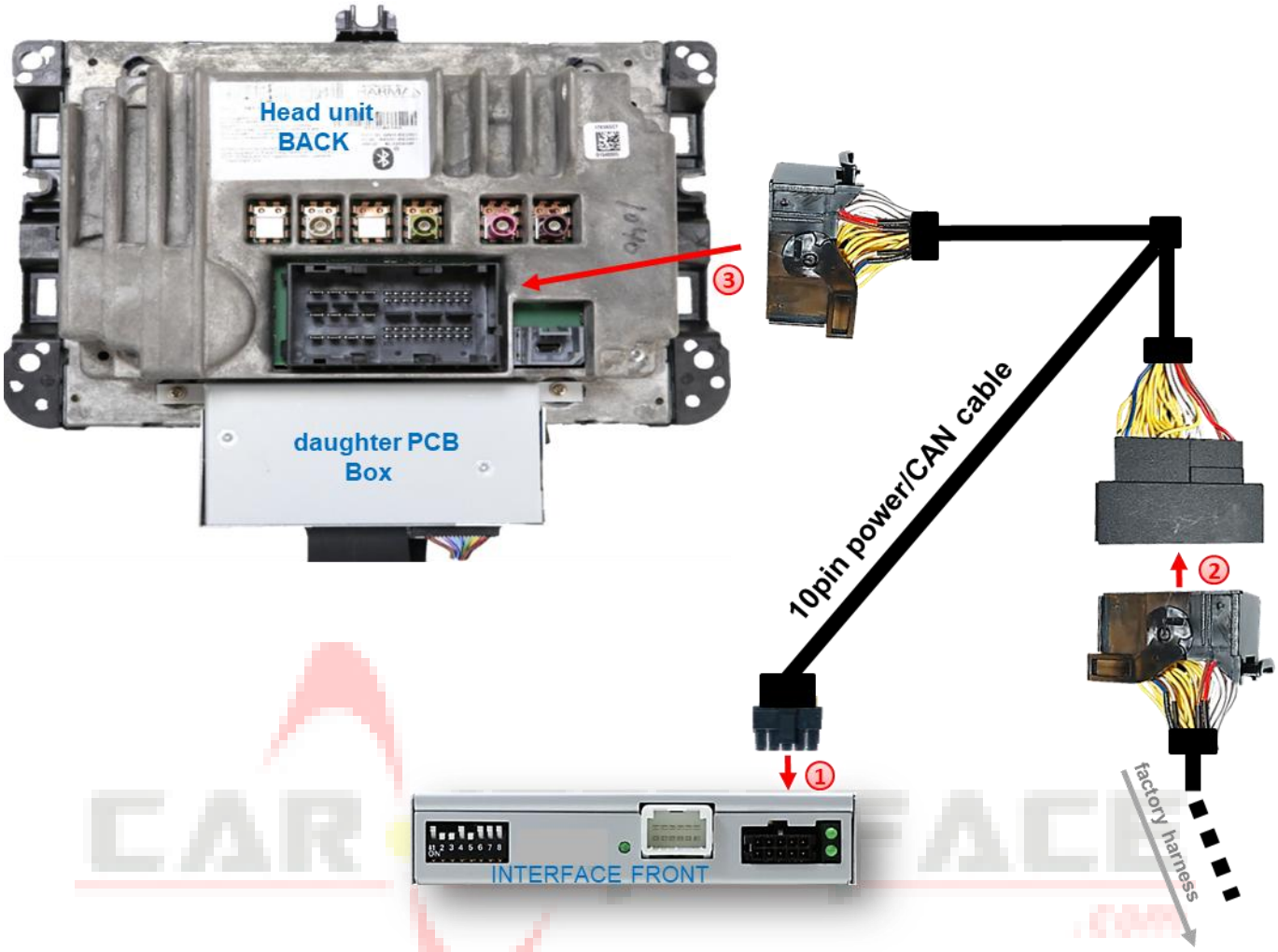
2) The contact sides of the ribbon cable must always correspond to the contact side of the connectors in terms of installation position.

2.4. Connection – picture signal cable



1 Connect the 20pin "box side" female connector of the 20pin picture signal cable pre-mounted on the daughter PCB to the 20pin male connector of the video interface.

2.5. Connection – 10-pin power/CAN cable



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

2. Unplug the 52pin female connector of the vehicle wiring harness on the rear of the head unit and connect it to the 52pin male connector of the 10pin power/CAN cable.

3. Connect the 52pin female connector of the 10pin power/CAN cable to the 52pin male connector of the head unit.

Check 1

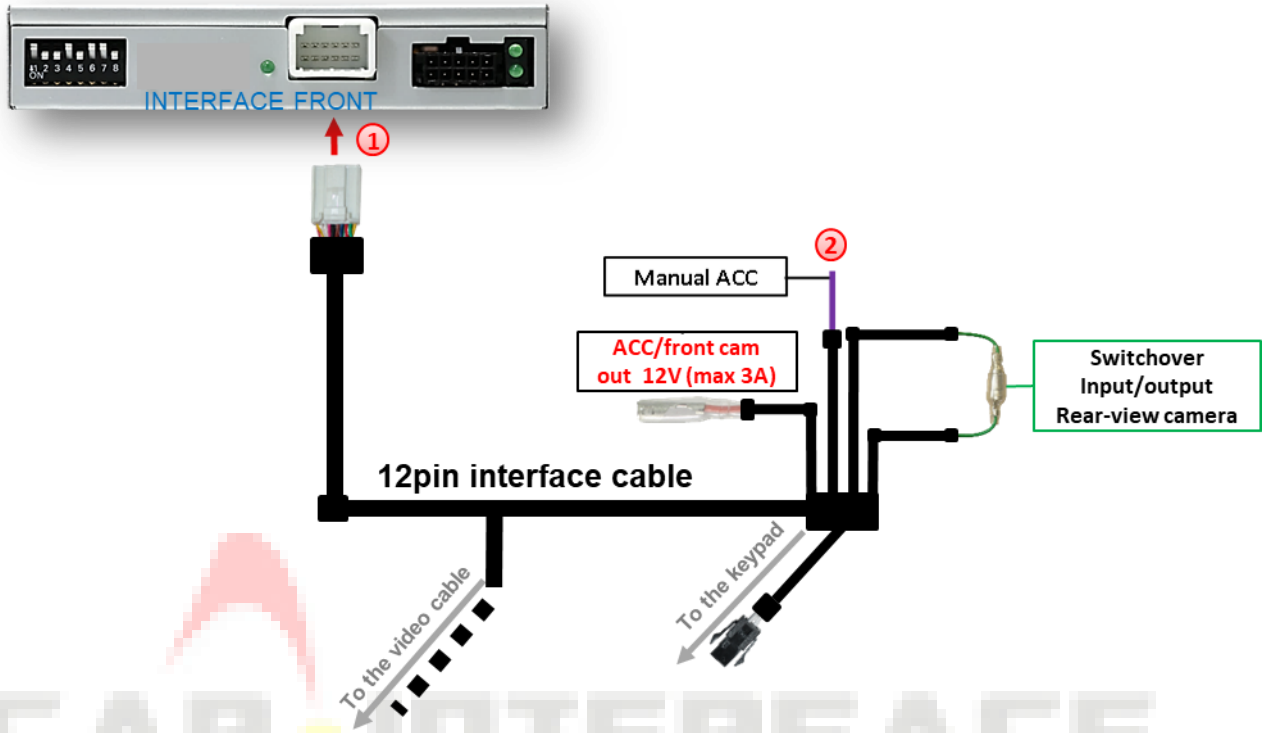
In exceptional cases, CAN communication is not successful. If, after connecting the PNP cable set with the ignition switched on, no interface LED lights up, the analogue power supply must also beconnected! (see following chapter)

Check 2

In exceptional cases, the power supply to the interface is not interrupted in sleep mode. If the interface LEDs continue to light up even when the vehicle is in sleep mode, please contact support!

2.6. Analogue power supply

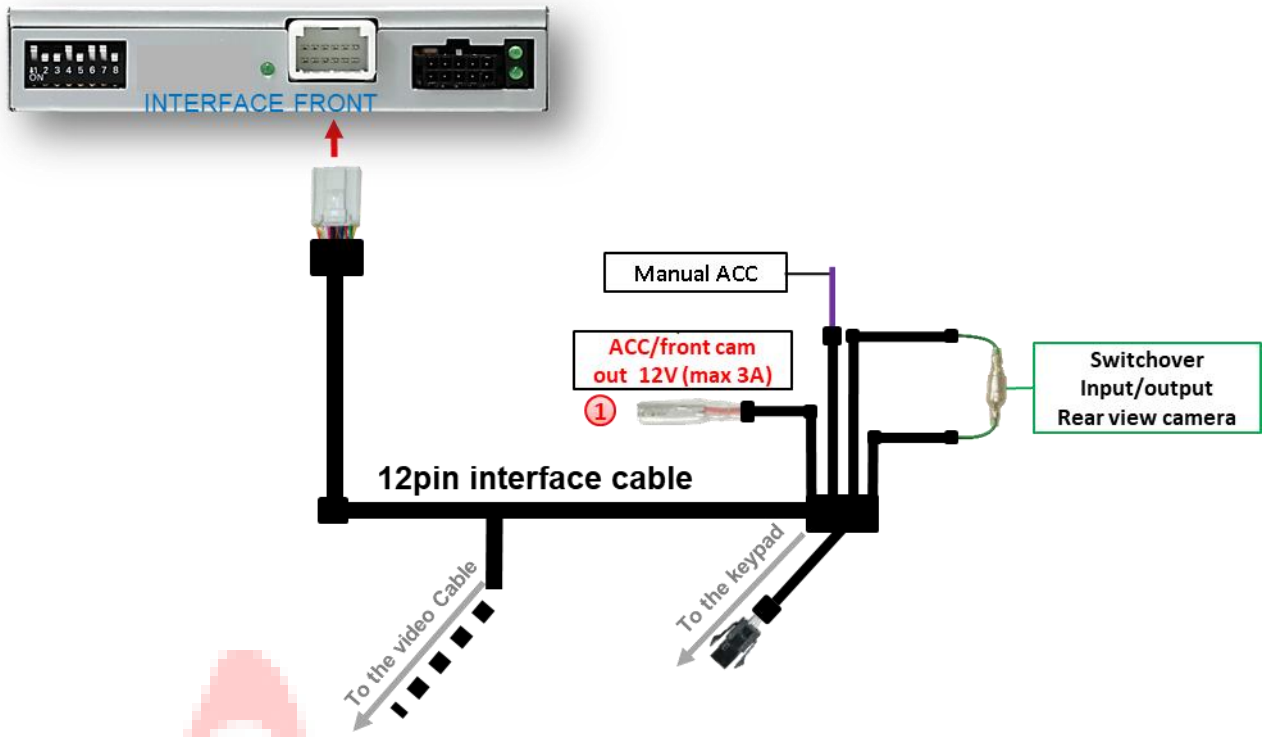
If no interface LED lights up after connecting the PNP cable set with the ignition switched on, the analogue power supply described below must also be connected.



1. Connect the 12pin female connector of the 12pin interface cable to the 12pin male connector of the video interface.

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

2.7. Power supply output



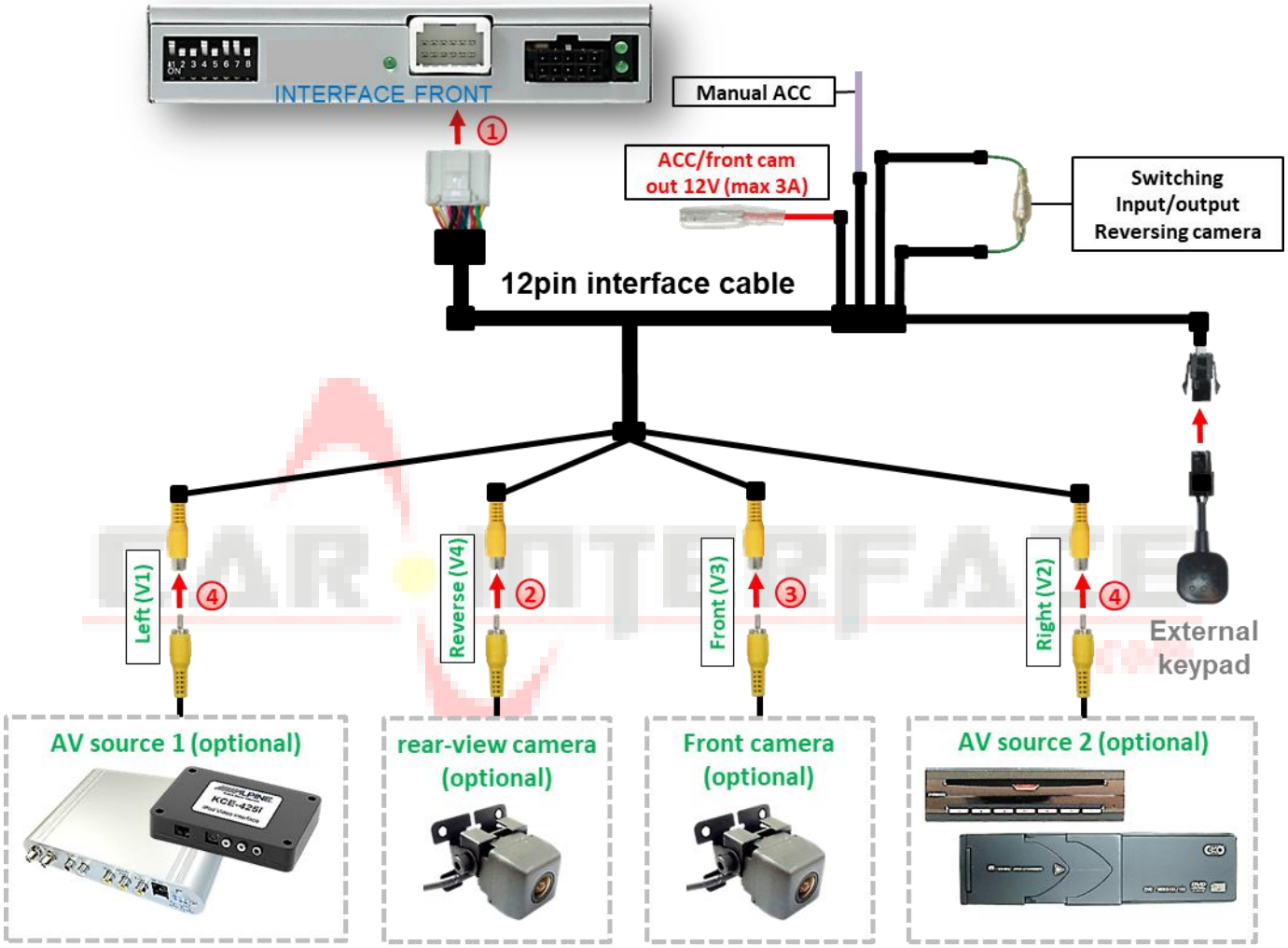
1 The red power supply output **ACC/front cam out 12V (max 3A)** can be used to supply power to an external source and has a different assignment depending on the position of DIP switch 1 (the black 8 DIPs):

Dip	Function
Dip 1 **ON**	+12V (max. 3A) when reverse gear is engaged, plus 10, 15 or 20 seconds of delay after reverse gear has been disengaged, and +12V when the front camera is selected manually using the keypad (short press)
Dip 1 **OFF**	+12V permanent (max. 3A) ACC

2.8. Connection - Video sources

It is possible to connect an aftermarket rear-view camera, an aftermarket front camera, and two additional aftermarket video sources to the video interface.

Note: Before final installation, we recommend a test run to ensure that the vehicle and interface are compatible. Due to changes in the vehicle manufacturer's production, there is always the possibility of incompatibility.



1. Connect the 12pin female connector of the 12pin interface cable to the 12pin male connector of the video interface.

2. Connect the video RCA of the rear view camera to the RCA female connector **"Reverse V4"** of the 12pin interface cable.

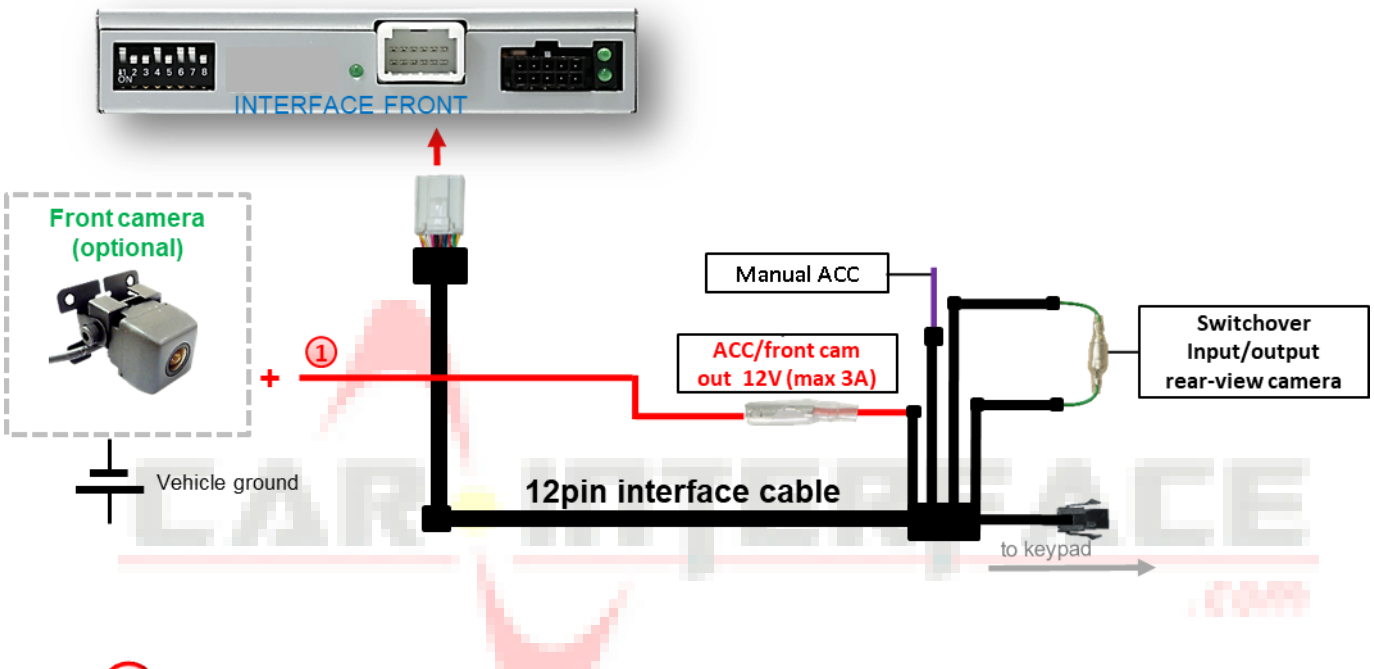
3. Connect the video RCA of the front camera to the RCA female connector **"Front V3"** of the 12pin interface cable.

4. Connect the video RCA of video-sources 1 +2 to the RCA female connectors **"Left V1"** and **"Right V2"** of the 12pin interface cable.

2.8.1. Audio insertion

This interface can only insert video signals into the factory infotainment system. If an AV source is connected, the audio insertion must be made via the factory AUX input or an FM modulator. The input video signal can be activated in parallel with any audio mode of the factory infotainment system. If two AV sources are connected to the infotainment system, additional electronics are required for audio switching.

2.8.2. Aftermarket front camera



1 The red switch output **ACC/front cam out 12V (max. 3A)** can be used to supply power to the front camera. If Dip 1 is set to ON (the black 8 dips), the switch output +12V (max. 3A) is activated when reverse gear is engaged, plus a delay of 10, 15 or 20 seconds after reverse gear is disengaged.

Note: It is also possible to switch manually to the front camera input using a keypad (short press) from any picture mode. The switch output then also supplies +12V (if Dip 1 is set to ON and the front camera input is selected).

Caution: Pressing the external keypad for too long will switch the video source!

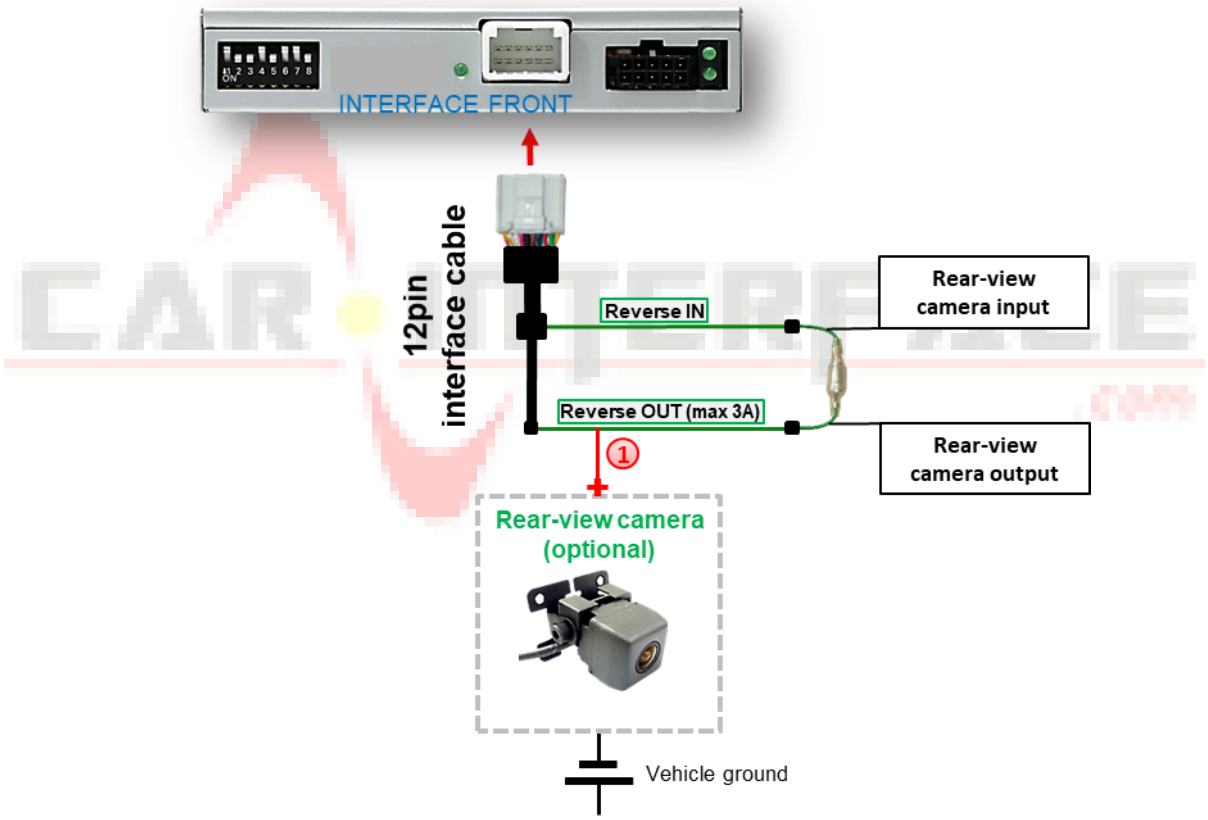
2.8.3. Aftermarket rear-view camera

Some vehicles have a different reverse gear code on the CAN bus, which is not compatible with the CAN of the video interface. Therefore, there are two different installation options. When the video interface receives a reverse gear signal, +12V must be applied to the green "Reverse-OUT" wire while reverse gear is engaged.

Note: Before testing, do not forget to set Dip 5 of the video interface to ON.

2.8.3.1. Case 1: Interface receives the reverse gear signal

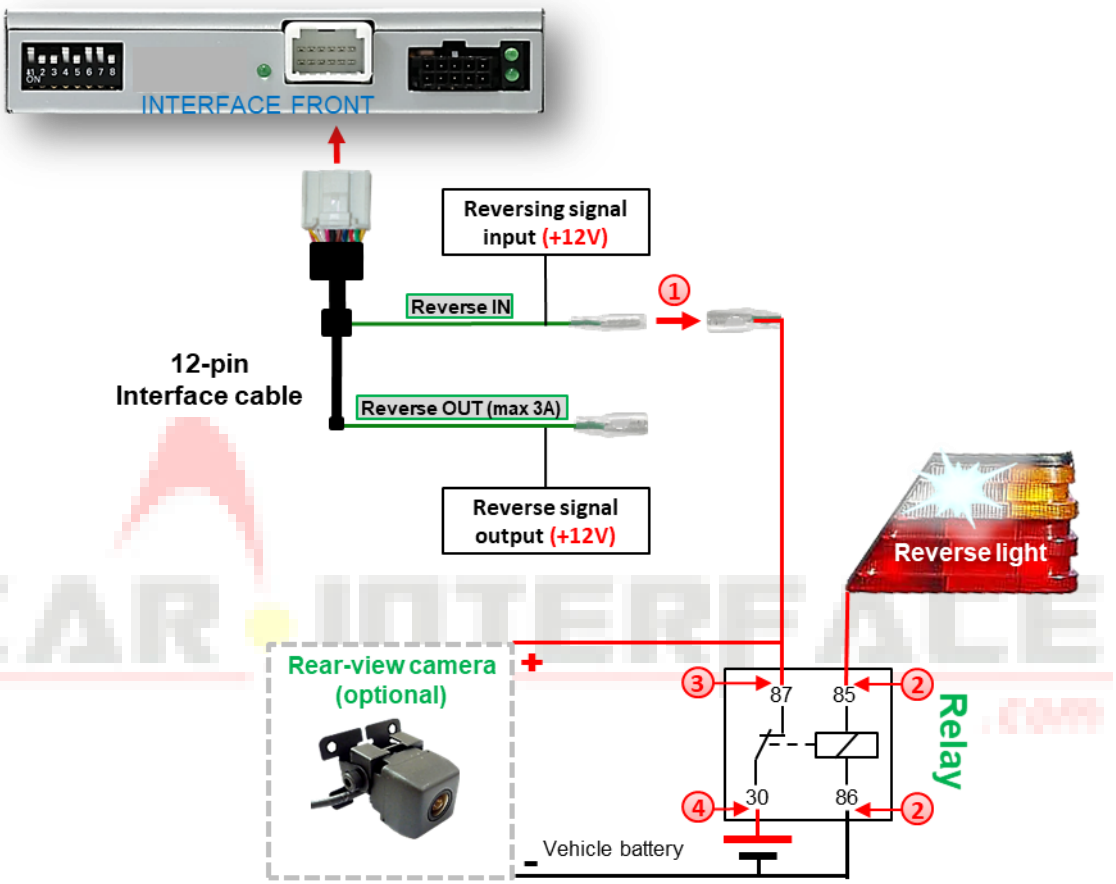
If the interface receives +12V on the green wire of the 12pin interface cable while reverse gear is engaged, it automatically switches to the rear-view camera input "Camera IN" when reverse gear is engaged.



1 The 12V power supply for the aftermarket rear-view camera (max. 3A) is provided by connecting to the green **"Reverse-OUT"** wire of the 12pin interface cable to avoid unnecessary continuous operation of the camera electronics.
The two green cables **"Reverse-IN"** and **"Reverse-OUT"** must remain connected to each other for operation.

2.8.3.2. Case 2: Interface does not receive a reverse gear signal

If the video interface does not receive +12V on the green wire of the 12pin interface cable while reverse gear is engaged (not all vehicles are compatible), an external switch signal from the reversing light is required. Since the power supply to the reversing light is not always voltage-stable, a standard normally open relay (e.g. AC-RW-1230 with AC-RS5 cabling) or a noise filter (e.g. AC-PNF-RVC) is required. The diagram below shows the connection diagram for the relay.



1. Disconnect the male connector and female connector of the green cable connection of the 12pin interface cable from each other and connect the green input cable **"Reverse-IN"** to the output terminal (87) of the relay.

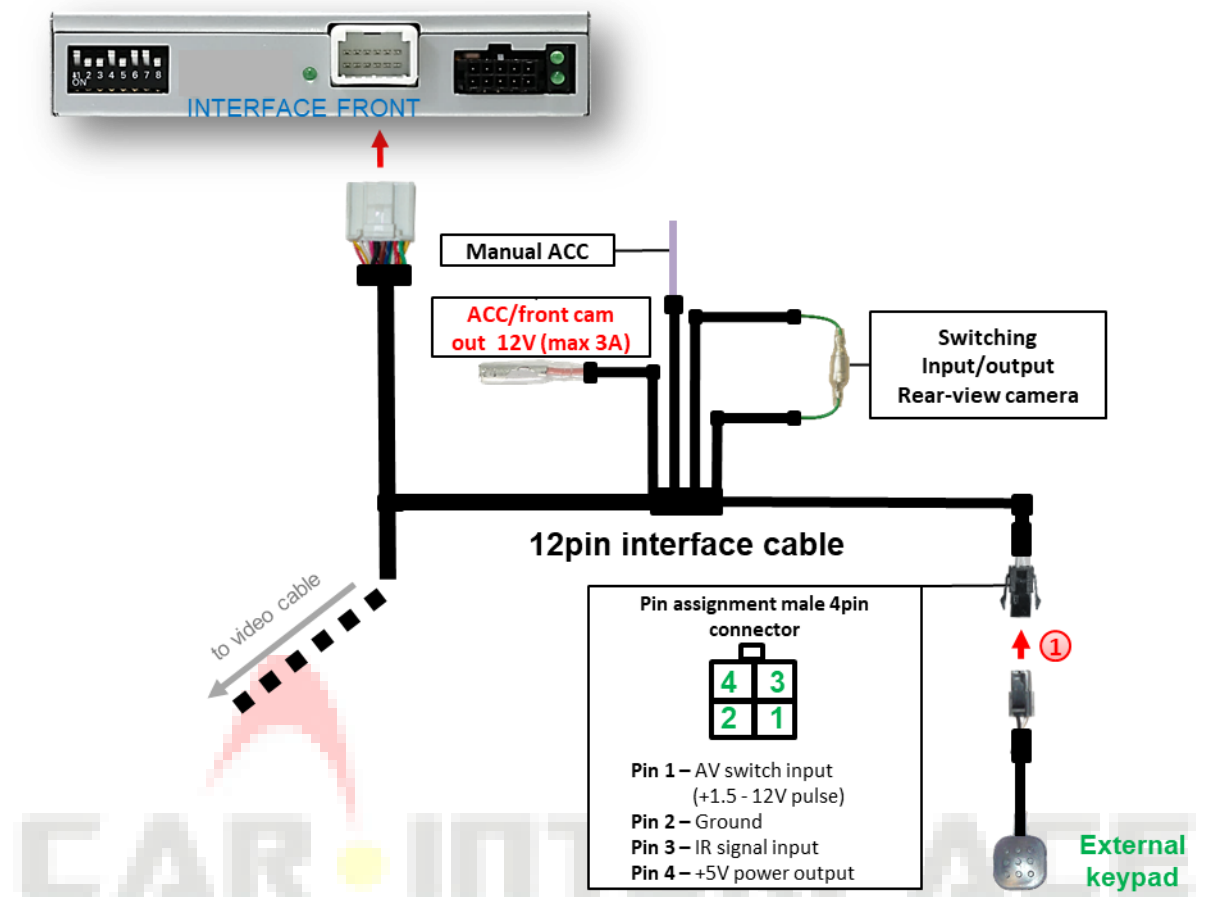
   Note: The best connection solution would be to crimp a 4 mm round plug onto the relay output cable and connect it to the 4mm female connector on the green cable, not least to avoid short circuits.
   The **"Reverse-OUT"** output cable has no function and remains unconnected.

2. Connect the reversing light power cable with switch coil (85) and the vehicle ground to the switch coil (86) of the relay.

3. Connect the rear-view camera power cable to the output terminal (87) of the relay as previously done with the green **"Reverse IN"** cable.

4. Connect the +12V continuous voltage to the input terminal (30) of the relay.

2.9. Connection – external keypad



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

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 video interface.

3. Operating the interface

3.1. Via steering wheel button

The volume button on the right-hand side of the steering wheel can be used to switch between activated video sources on the interface. If all inputs are activated via the dip switch setting, the order is as follows:

Factory video → Video IN 1 → Video IN 2 → Factory video

Each press switches to the next activated input. Non-activated inputs are skipped.

Switching via vehicle buttons does not work in all vehicles. In some vehicles, the external keypad must be used.

3.2. Via external keypad

The external keypad can be used as an alternative or in addition to the button described above to switch between activated inputs, but should always remain connected to the interface for support purposes, even when not in use.

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

When pressed and held (2-3 seconds), the external keypad switches the input from the factory video to the fed video sources. Each press (2-3 seconds) switches to the next activated input.

If all inputs are activated, the order is:

Factory video → Video IN1 → Video IN2 → Factory video → …

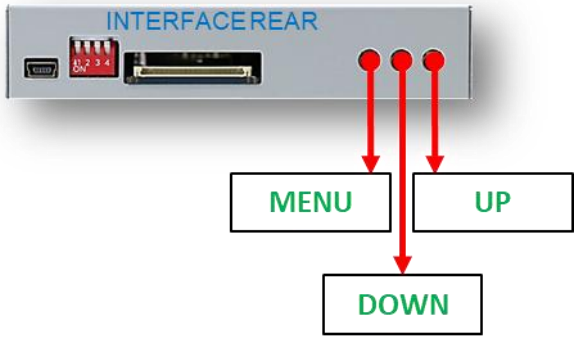
Non-activated inputs are skipped.

Note: The interface switches **after** the keypad **is released** (after a long press).

- Short press of the keypad (only possible if Dip 1 is ON)

When pressed briefly, the external keypad switches from the factory video to the front camera input and back again.

4. Image settings

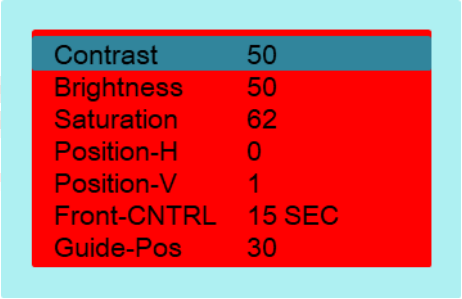


The image settings can be changed using the 3 buttons on the back of the interface box. Pressing the left button opens the OSD settings menu or switches to the next menu item; the other two buttons change the corresponding settings. The image settings must be selected while the corresponding input is selected and visible on the monitor.

Note: The OSD settings menu is only displayed if a functioning video source is connected to the selected input.

The following settings are available:

Contrast	=	Contrast
Brightness	=	Brightness
Saturation	=	Saturation
Position H	=	Horizontal image position
Position V	=	Vertical image position
Front CNTRL	=	Front camera return Duration adjustable to 10, 15 or 20 seconds (10 seconds is preset)
Guide position	=	Position of the guide lines



Note: When adjusting the rear-view camera picture, reverse gear must be engaged.

5. Specifications

BATT/ACC range	7V - 25V
Stand-by power drain	4mA
Power consumption	150mA
Video input	0.7V - 1V
Video input formats	NTSC
RGB video amplitude	0.7V with 75 Ohm impedance
Temperature range	-40°C to +85°C
Dimensions of interface box	116 x 25 x 90 mm (W x H x D)
Dimensions of daughter PCB box	103 (132 with retaining wing) x 16 x 53 mm (W x H x D)

6. FAQ – Fehlersuche Interface Funktionen - allgemein

Schauen Sie bei möglicherweise auftretenden Problemen zuerst nach einer Lösung in der Tabelle, bevor Sie ihren Verkäufer kontaktieren.

Problem	Mögliche Ursache	Lösung
Kein Bild/schwarzes Bild (Werksbild)	Nicht alle Stecker wurden wieder an der Werks-Head-Unit oder dem Monitor nach dem Einbau angeschlossen.	Die fehlenden Stecker verbinden.
	An der CAN-Bus Box liegt kein Strom an (alle LED der Box sind aus).	Die Stromversorgung sowie den Anschluss der CAN-Bus Box überprüfen.
	CAN-Bus Box wurde an einer falschen Stelle am CAN-Bus angeschlossen.	Der Anleitung entnehmen, an welcher Stelle an den CAN-Bus angeschlossen wird. Ist nichts erwähnt, eine andere Stelle für den Anschluss testen.
	Am Video-Interface liegt kein Strom an (alle LED am Interface sind aus).	Überprüfen, ob die CAN-Bus Box +12V Zündung auf das rote Kabel des 8-Pin auf 6-Pin Kabel ausgibt. Falls nicht, das rote Kabel durchtrennen und +12V Zündung direkt auf das Video-Interface geben.
Kein Bild/schwarzes Bild/weißes Bild (eingespeistes Bild), aber Werks-Bild ist OK.	Kein Bild der Videoquelle	Die Videoquelle mit einem anderen Monitor überprüfen.
	Keine Videoquelle am gewählten Eingang angeschlossen	Die Einstellungen der Dips 1-3 überprüfen, welche Eingänge aktiv sind und schalten auf die dazugehörigen Eingänge umschalten.
	LVDS Kabel falsch angeschlossen	Überprüfen, ob das LVDS Kabel exakt an der in der Anleitung erwähnten Stelle angeschlossen ist. Ein Anschluss an die Head-Unit funktioniert z.B. nicht, wenn in der Anleitung der Anschluss an den Monitor vorgegeben wird.
Eingespeistes Bild hat die falsche Größe oder Position. (große Abweichung)	Falsche Monitoreinstellungen am Video-Interface	Verschiedene Stellungen der Dips 7 und 8 testen. Nach jeder Änderung ein Power-Reset durchführen (6-Pin Stromstecker 1x kurz entfernen).
Eingespeistes Bild wird doppelt oder vierfach angezeigt.		
Eingespeistes Bild ist gestört, flackert oder läuft vertikal.	Ausgang der Videoquelle steht auf AUTO oder Multi was einen Konflikt mit der automatischen Erkennung des Video-Interface verursacht.	Alle Videoquellen fest auf PAL oder NTSC einstellen. Es wird empfohlen, alle Quellen auf denselben TV Standard zu stellen.
	Wenn der Fehler nur nach dem Wechseln der Quelle auftritt, entsprechen die Quellen nicht demselben TV Standard.	Alle Videoquellen auf denselben TV Standard einstellen.
Eingespeistes Bild ist s/w.	Einige Video-Interfaces können nur eine NTSC Eingabe verarbeiten.	In der Anleitung überprüfen, ob eine Einschränkung auf NTSC erwähnt wird. Falls ja, ändern den Ausgang der Quelle auf NTSC einstellen.

Problem	Mögliche Ursache	Mögliche Lösung
Eingespeiste Bildqualität ist schlecht	Bildeinstellungen wurden nicht angepasst	Die 3 Schalter und das OSD-Menü des Interface nutzen, um die gewünschten Bildeinstellungen der jeweiligen Videoquelle einzustellen.
Eingespeiste Bildgröße ist leicht falsch		
Eingespeiste Bildposition ist leicht falsch.		
Eingespeistes Kamerabild flackert.	Die Kamera wird unter fluoreszierendem Licht getestet, welches direkt in die Kamera einfällt.	Die Kamera unter Tageslicht außerhalb der Werkstatt testen.
Eingespeistes Kamerabild ist bläulich.	Der Schutzaufkleber von der Kameralinse wurde nicht entfernt.	Den Schutzaufkleber entfernen.
Eingespeistes Kamerabild ist schwarz.	Kamerastrom direkt von der Rückfahrlampe abgegriffen.	Einen Strom-Entstörfilter oder ein Relais für die Spannung der Rückfahrlampe nutzen. Alternativ kann die Stromversorgung der Kamera von der grünen Leitung des 6-Pin auf 8-Pin Kabels abgegriffen werden, wenn die CAN-Bus Box mit dem Fahrzeug kompatibel ist.
Eingespeistes Kamerabild ist gestört.		
Einstellungen des eingespeisten Kamerabildes können nicht angepasst werden.	Einstellungen des eingespeisten Kamerabilds können nur im AV2 Modus angepasst werden.	Dip 3 der Interface-Box auf ON stellen (falls der Eingang AV2 nicht aktiviert ist) und Kamera mit diesem Eingang verbinden. Interface auf AV2 umschalten und Bild-einstellungen anpassen. Verbinden Sie die Kamera nun wieder mit dem Kamera Eingang und schalten AV2 aus, sofern dieser nicht für eine andere Quelle genutzt wird.
Im eingespeisten Kamerabild ist ein Auto als Grafik.	Funktion UI-CNTRL im Interface OSD steht auf PDCON.	Bei vorhandenem Werks-PDC wird bei kompatiblen Fahr-zeugen der Abstand in der Grafik eingeblendet. Falls nicht funktionierend oder nicht gewünscht, im Interface OSD Menüpunkt UI-CNTRL auf ALLOFF stellen.
Im eingespeisten Kamerabild sind chinesische Zeichen.	Funktion UI-CNTRL im Interface OSD steht auf RETON oder ALLON.	Im Interface OSD den Menüpunkt UI-CNTRL auf ALLOFF oder auf PDCON stellen.
Es ist nicht möglich die Videoquelle über die Werkstasten umzuschalten.	CAN-Bus Interface unterstützt diese Funktion für dieses Fahrzeug nicht.	Den externen Taster nutzen oder die weiße Leitung am 6-Pin auf 8-Pin Kabel durchtrennen und auf diese +12V Impulse geben zum Umschalten auf die Videoquelle(n).
	Zu kurz gedrückt.	Zum Wechseln der Videoquelle wird ein Tastendruck von mindestens 2.5 Sekunden benötigt.
Es ist nicht möglich die Videoquelle über den externen Taster umzuschalten.	SW-Version unterstützt keinen externen Taster.	Die Werkstasten zur Umschaltung nutzen oder die weiße Leitung am 6-Pin auf 8-Pin Kabel durchtrennen und auf diese +12V Impulse geben zum Umschalten auf die Videoquelle(n).
Das Interface schaltet nicht automatisch auf das Bild der Rückfahrkamera, wenn der Rückwärtsgang eingelegt wird.	CAN-Bus Interface unterstützt diese Funktion für dieses Fahrzeug nicht.	Die grüne Leitung am 6-Pin auf 8-Pin Kabel durchtrennen und konstante +12V von der Rückfahrlampe auf das Kabel geben. Ein Relais zur Entstörung des Stroms der Rückfahrleuchte verwenden.
Das Interface wechselt die Videoquelle von allein.	CAN-Bus Box Kompatibilität zum Fahrzeug ist eingeschränkt.	Die graue Leitung am 6-Pin auf 8-Pin Kabel durchtrennen und beide Enden isolieren. Wenn das Problem weiterhin besteht, ebenfalls die weiße Leitung durchtrennen und beide Enden isolieren.

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