Video-inserter

VL2-CCC

BMW monitors
with 10pin LVDS connector

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

Version 28.07.2015

Contents

Legal Information

The driver must not be distracted by moving pictures. By law, watching mobbing pictures while driving is prohibited. We do not accept any liability for material damage or personal injury resulting, directly or indirectly, from the installation or the operation of this TV-free interface. This Interface should only be used to display fixed menus or rear-view-cam pictures when the vehicle is moving, for example the MP3 menu for DV upgrades.

Information

Changes of the vehicle software can cause malfunctions of the interface. We offer free software-updates for interfaces for one year after purchase. To receive a free update, the interface must be sent in at own cost. Labor cost for and other expenses involved with the software-updates will not be refunded.

Product features

- RGB-input for after-market navigation
- 2 video-inputs for after-market devices (e.g. DVD-Player, DVB-T tuner, …)
- Built-in audio-switch
- Rear-view camera input, automatically switching
- Factory rear-view camera compatible
- Switching of video through factory infotainment buttons
- Switching of video through external switch
- PAL/NTSC input compatible
- Ultra-wide picture mode 24:9 (only BMW with ultra-wide screen 8.8”)
- Wrong-plugging circuit protection

1. Prior to installation

Read the manual prior to installation.
Technical knowledge is necessary for installation. The place of installation must be free of moisture and away from heat sources.

1.1. Delivery contents

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

1.2. Checking the compatibility of vehicle and accessories

Requirements

General	Monitor with 10pin LVDS video connector
Vehicle	3series (E90/91/92), 5series (E60/61), 6series (E63/64), X5 (E70), X6 (E71), and other vehicles
Navigation/Radio	Professional Navigation CCC Business Navigation M-ASK up to about 2009 Radio with colour screen

Limitations

Ultra-wide mode	Only available for ultra-wide screens 8.8”
Video only	The interface inserts ONLY video into the infotainment, for sound use the FM-modulator or factory AUX which can be coded by dealership or our OBD-coders if not already available in the vehicle or the AUX-in interface AUX-110 or a Dension gateway 500.
Factory-OPS-display	While reverse gear is engaged ONLY the picture of the after-market rear-view camera is visible!

1.3. Dip-switch settings

With the video interface boxes dip-switches it is possible to select vehicle/navigation the interface is to be installed in (dip 6 to 8), to dis- or enable the interfaces inputs (dip 1 to 3) and to preselect the type of camera which is (to be) installed (dip 5).
Dip position down is ON and position up is OFF.

1.3.1. Vehicle selection (dip 6-8)

Choose the vehicle/navigation/monitor the interface is to be installed to and set dip 6 through 8 according to the below table.

Vehicle/Navigation	Dip 6	Dip 7	Dip 8
BMW CCC with 8.8” ultra-wide monitor	OFF	ON	ON
BMW CIC with 6.5” monitor	OFF	ON	OFF

1.3.2. Enabling the interface's video inputs (dip 1-3)

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

Dip	Video-input	ON (down)	OFF (up)
Dip 1	RGB	enabled	disabled
Dip 2	Video IN1	enabled	disabled
Dip 3	Video IN2	enabled	disabled

1.3.3. Rear-view camera settings (dip 5)

Depending on whether no camera, after-market camera or factory camera shall be used, dip 5 must use different settings. If set to OFF, the interface switches to factory LVDS picture when the reverse gear is engaged to display factory rear-view camera or factory PDC picture.

Rear-view camera type	Dip 5
None	OFF
Factory	OFF
After-market	ON

Note: If the Can-bus does not work while connecting an after-market rear-view camera, cut the green cable of the 6pin to 8pin cable at the black 8pin connector and connect it to the reverse gear light (+12V). For this use a relay because the reverse gear light of the vehicle is clocked (relay AC-RW1230 and AC-RS5 optional available).

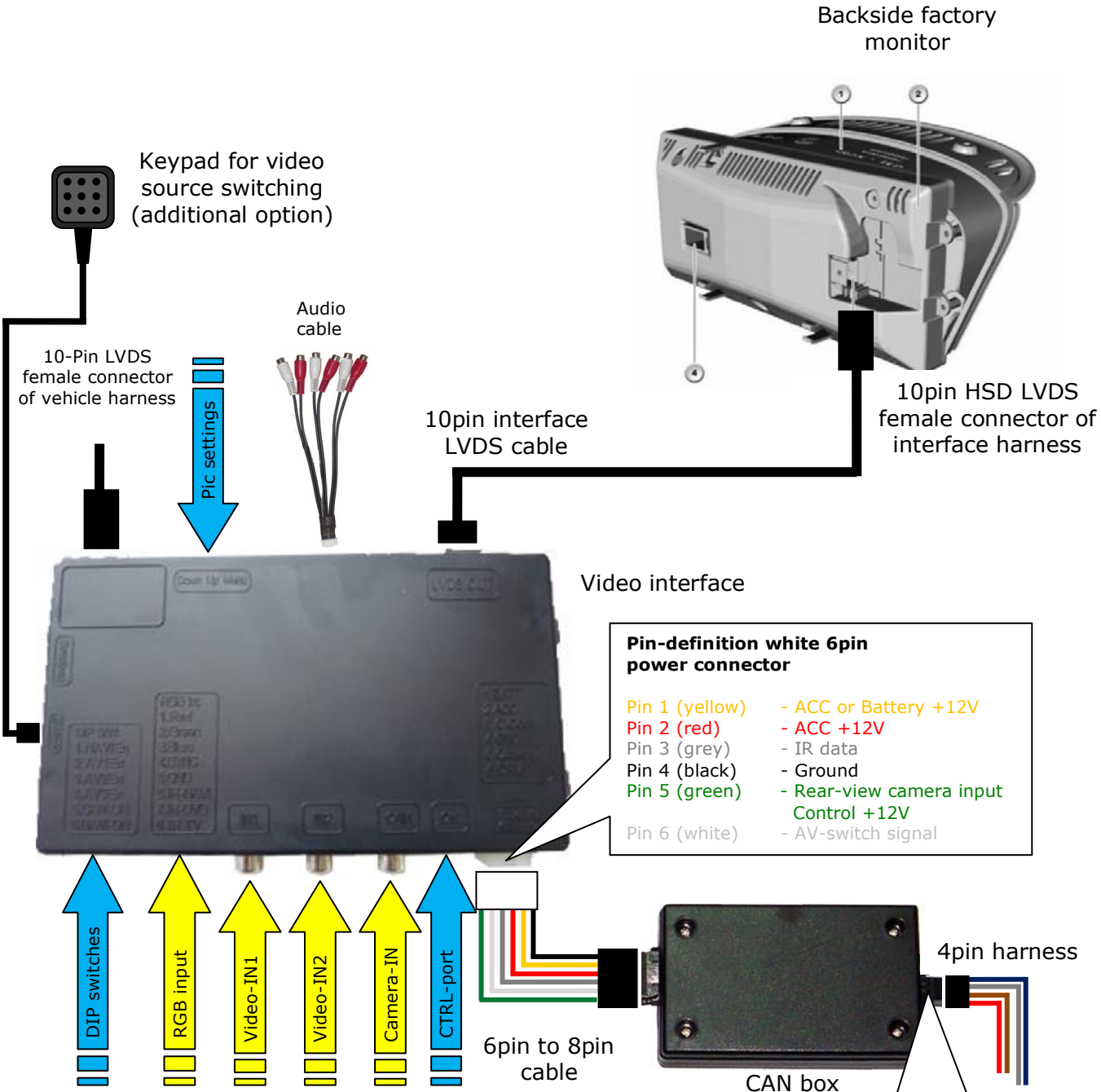
2. Installation

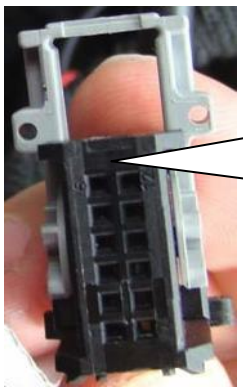
Switch off ignition and disconnect the vehicle's battery! The interface needs a permanent 12V source. If according to factory rules disconnecting the battery is to be avoided, it is usually sufficient to put the vehicle is sleep-mode. In case the sleep-mode does not show success, disconnect the battery with a resistor lead.
If power source is not taken directly from the battery, the connection has to be checked for being start-up proven and permanent.

2.1. Place of installation

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

2.2. Connections





Pin-definition 12pin power connector of factory monitor

Pin 2 (**violet/red**)	- Battery+12V
Pin 3 (**black/brown**)	- Ground
Pin 6 (**yellow**)	- CAN low
Pin 5 (**black**)	- CAN high

CAN wires are twisted.

Pin-definition black 4pin power connector

Pin 4 (red)	- Battery+12V
Pin 2 (brown)	- Ground
Pin 1 (grey)	- CAN low
Pin 3 (blue)	- CAN high

No liability for vehicle wire colors and pin definition!
Possible changes by the vehicle manufacturer. The given information must be verified by the installer.

2.3. Installation procedure – function check

Follow the below procedure using the "Connections" scheme from chapter 2.2. as reference. Before the installation of the sources and the interface we recommend a first quick connection of the interface and test run to ensure that vehicle and product are compatible. Due to changes in production of the vehicle manufacturer there is always the possibility of incompatibility.

- Switch off ignition and disconnect vehicle's battery
- Remove vehicle monitor
- Disconnect 12pin power connector from backside of factory monitor
- Connect 4pin CAN box harness to 12pin power connector of factory harness
- Reconnect 12pin power connector to factory monitor
- Plug 4pin harness into CAN box
- Plug 8pin female connector of 6pin to 8pin cable into CAN box
- Transfer vehicle harness' 10pin LVDS connector from factory monitor to interface's male 10pin connector port
- Connect video-interface LVDS output and factory monitor's 10pin LVDS port using the 10pin interface LVDS cable
- Plug 6pin female connector of "6pin to 8pin cable" into video interface
- Plug keypad into "Switch" connector. Even if the keypad shall not be used, its installation (e.g. in a hidden spot) is recommended for support reasons
- If 2 audio sources shall be used, connect it according to chapter 2.6.
- Reconnect battery and turn on ignition
- Check LEDs on CAN box and video interface, one on each must be on
- Try to activate video sources by infotainment buttons (see chapter 3.1.) and by keypad (see chapter 3.2.), using a test picture source
- If camera is (to be) connected try to engage reverse gear with test picture source connected
- If 2 audio sources shall be used, connect the audio wires and check the audio function
- **ONLY after positive function check proceed with final installation of the video sources!**
- After installation and connection of the real video source(s), adjust picture settings (see chapter 2.4.)

2.4. Picture settings

After installing the sources the picture settings can be changed using a pen on the buttons of the video interface. Press the MENU button to open settings menu on the OSD and to switch to the next setting. UP and DOWN change the corresponding values. The buttons are embedded in the housing to avoid accidental changes during or after installation.

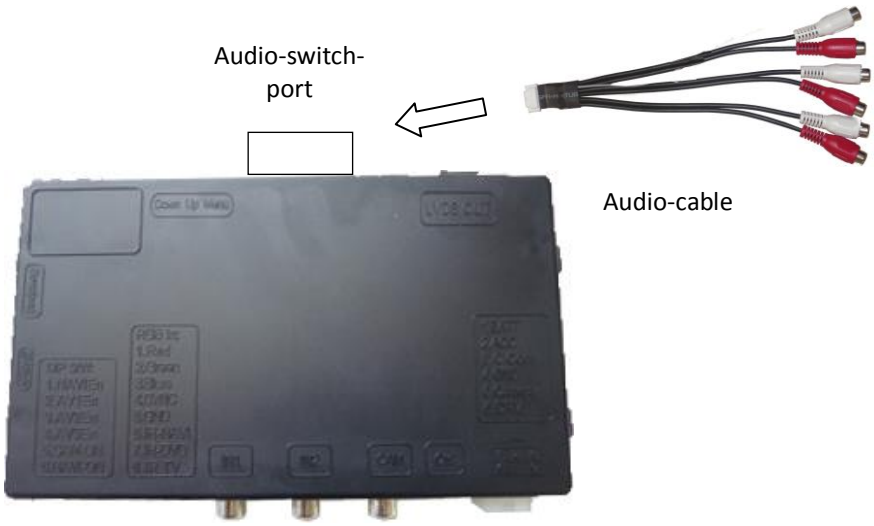
2.5. Audio insertion

This interface can only insert video into the factory infotainment. The video can be activated to any audio mode of the factory infotainment. If an AV-source is to be connected, the source's video out is connected to the video IN1 of the video interface and the source's audio out to the audio insertion. Audio insertion is possible by the AUX-in interface AUX-110, factory audio AUX input, a Dension Gateway 500 or FM-modulator. The factory audio AUX might be already available in the vehicle. If not, on most infotainments which are compatible with this video interface, it can be coded by the dealership or by using one of our OBD-CCC-X-xx coders.

2.6. Connecting 2 AV-sources

If two AV-sources shall be connected, connect the included audio cable to audio-switch-port of the video interface. When switching the video interface from video-IN1 to video-IN2, the audio will also automatically be switched.

Audio pins	Definition
1/2	Audio input signal R/L of source IN2
3/4	Audio input signal R/L of source IN1
5/6	Audio output signal L/R of factory audio AUX, AUX-110, Dension Gateway 500 or FM-modulator
7	Ground
8	No function



3. Interface operation

3.1. By factory infotainment buttons

Some of the factory buttons can be used to execute interface functions.

Press knob to the left (more than 1 second) to activate the interface video. Each press (more than 1 second) will switch to the next enabled input. If all inputs are enabled the order is:

Factory video → RGB-in → video IN1 → video IN2 → factory video →…

Inputs which are not enabled are skipped. If the audio cable is connected, when switching from video IN1 to video IN2, also the sound will be switched.

3.2. By keypad

Alternatively or additionally to the factory infotainment buttons the interface's keypad can be used to execute interface functions.

Press keypad – video input switching, like press knob to the left, see chapter 3.1.

4. Specifications

BATT/ACC range	7V ~ 25V
Power	0.3A @12V
Video input	0.7V~1V
Video input formats	PAL/NTSC
Weight	195g
Dimensions (box only) B x H x T	182 x 24 x 100 mm

CE ⎓12V DC

5. Frequently asked questions

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

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

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

6. Technical Support

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

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