



REVERSING CAMERA · RV SERIES

CAMERA MANUAL

Installation, wiring diagrams and settings for Cartronix reversing cameras and standard aftermarket cameras

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Foreword

Dear customer,

Congratulations on your purchase and thank you for choosing a Cartronix product. Please read this manual carefully before using the product. This manual guides you through the installation of your reversing camera. Only then can you use the product optimally and safely.

This manual has been compiled with the greatest care by Cartronix staff who have been familiar with our products for many years.

Cartronix grew out of a passion for in-car ambience, combined with an eye for safety, comfort and the look of the interior. The range includes car radios, navigation systems, reversing cameras and related accessories. By focusing on one product segment – car audio multimedia and navigation – Cartronix products feature the latest technologies.

For further support, please visit the official Cartronix website: www.cartronix.eu, or contact us by e-mail at info@cartronix.eu.

We hope you enjoy your new reversing camera.

Your Cartronix Team

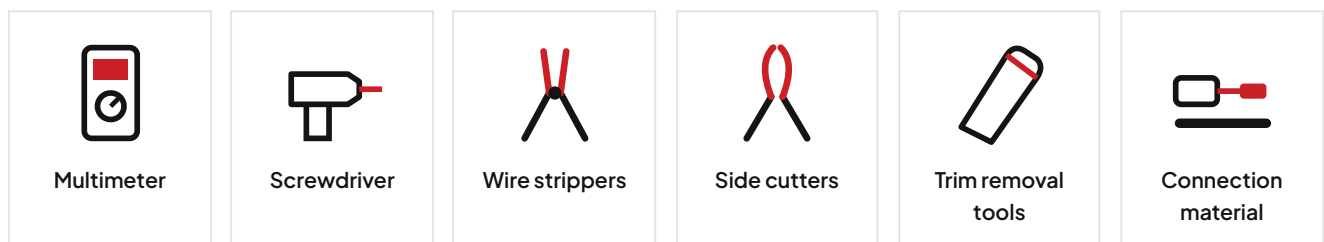
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1.1 Tools required

This chapter explains how to connect a reversing camera. Caution: a camera is not supplied with the car radio as standard. These instructions are intended for the installation of Cartronix cameras and all standard aftermarket reversing cameras. Does the camera you bought elsewhere differ from what we describe here? Then contact the camera supplier for installation instructions.

We do not work with wireless cameras ourselves, as their quality is extremely disappointing. We therefore do not explain the installation of a wireless camera.

To install the reversing camera you will often need the following tools. The trim removal tools are not essential, but prevent damage to the interior because they are flexible and made of plastic.

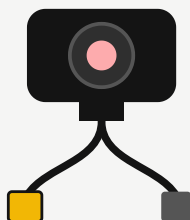


There are various ways to join electrical wires. The principle is that the wires are joined so that they cannot come loose and cannot touch other wires or the chassis. Camera wires are often very thin; take this into account when choosing connection material. The automotive sector offers various insulating tapes, including from the Tesa brand, which can also be used as connection material. Soldering the wires is also an option to consider.

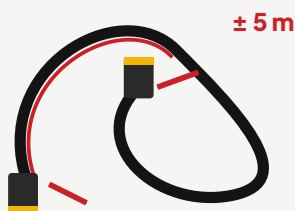
The multimeter, trim removal tools and connection material are not always needed.

1.2 The reversing camera

In most cases the reversing camera consists of 3 parts:



- 1** The camera with a power plug and a video plug attached



- 2** A video cable of approximately 5 metres (Pro series: 10 metres) with a video plug at both ends and a red wire



- 3** A power cable

Caution: products and cables may differ from the illustrations.



These guide lines are only an indication: never rely solely on the camera. Factors such as the width of your vehicle and the position of the camera can affect the accuracy of the lines.

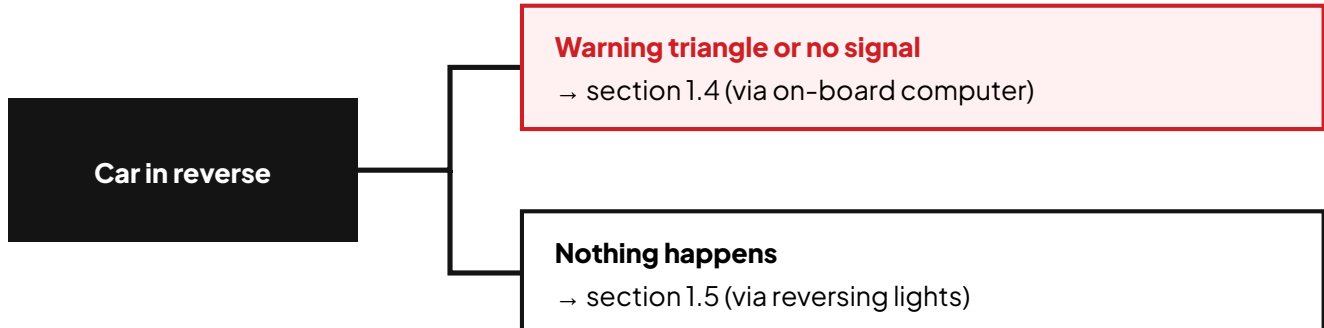
1.3 Determining the connection

Now that all materials are identified and the reversing camera is complete, we move on to an important step: determining how to connect it. There are 2 ways to connect. Both are explained in sections 1.4 and 1.5. The connection method depends on the type of car and the type of car radio.

The situation in section 1.4 is the simplest option, but only possible in computer-controlled cars that communicate with the car radio via the CAN bus. In some newer cars the on-board computer knows when the car is put into reverse. The camera only switches on once the on-board computer detects this. In that case power from the reversing light is not needed and the car radio's power supply is sufficient. To find out whether this applies, follow the steps below.

How do I determine the connection method?

- 1 Connect the car radio in the car.
- 2 Switch on the ignition and start the engine.
- 3 Put the car into reverse gear.
- 4 Does the screen switch to a screen with a warning triangle or the message *no signal*? Then the car radio is computer-controlled and you follow the installation in section 1.4.
- 5 Does nothing happen when reversing? Then follow the installation in section 1.5.



1.4 Reversing camera via on-board computer

This step-by-step guide explains how to connect the reversing camera to the car radio with the CAN bus as the power source. We take power from the car radio, because the car radio knows when the car is put into reverse. The wiring diagram is on the next page.

Caution: this guide is based on an actual installation. We advise trying out the installation first without actually concealing the cables. Once everything has been tested and works, you can proceed to the final connection.

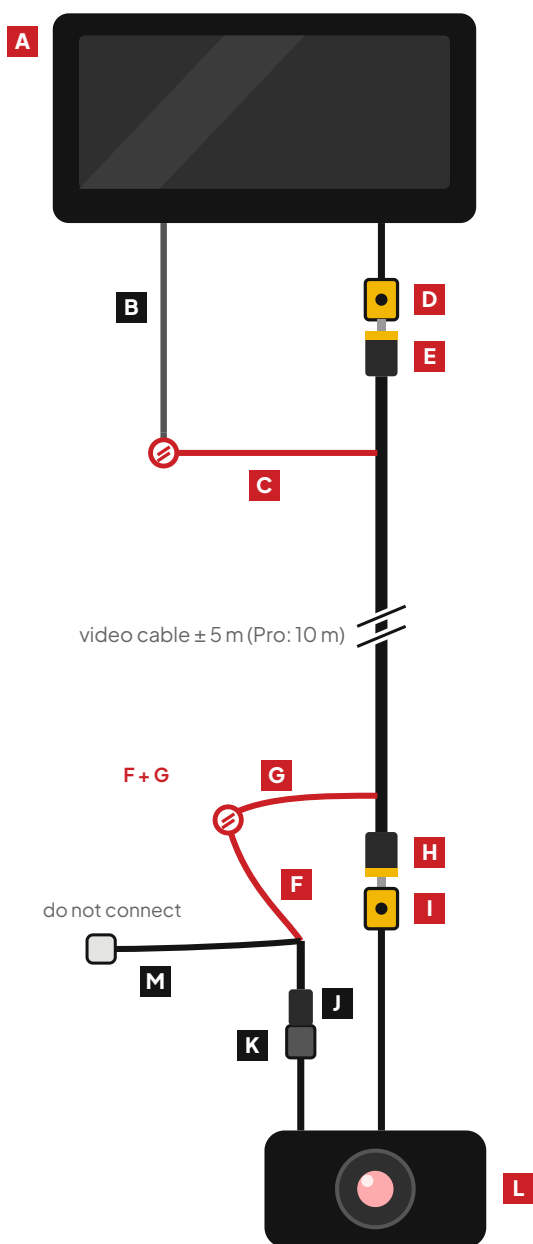
- 1 Switch off the car's ignition and remove the car radio (A).
- 2 Locate the reverse signal wire (B) of the car radio and strip it.
- 3 Then locate the RCA input for the camera (D). This is often labelled *Cam-in*, *Rear-cam* or *CVBS-in*.
- 4 Take the long video cable of the reversing camera and connect the RCA plug (E) to the camera input (D) of the car radio. Also connect the red wire (C) to the reverse wire (B).
- 5 Then route the video cable behind the panels in the car. Determine what is and is not possible. The cable can often be routed along the door trims. Use trim removal tools to remove panels without damaging them. Bring the RCA plug (H) and the red wire (G) to where the camera will be mounted. Do you have a van, delivery van or commercial vehicle? Then extend the video cable if necessary or use a longer video cable.
- 6 Mount the reversing camera in the desired position and feed cables (I) and (K) towards (G) and (H). Connect plugs (H) and (I) to each other.
- 7 Take the camera's power cable (J) and connect it to the camera's power input (K).



Caution: in the next step you switch the ignition back on. Make sure all wires are connected and that no stripped cables can touch other cables or the chassis.

- 8 Then strip wire (F) and wire (G).
- 9 Connect (F) and (G) to each other and neatly conceal all cables where they are not visible and cannot break. Wire (M) is not connected; make sure it cannot touch the chassis or another cable.
- 10 Switch the ignition back on. The installation is now complete.

Connecting the reversing camera via the radio's power supply



- A** Car radio/monitor
- B** Reverse/cam power signal wire
- C** Power wire + in video cable
- D** Cam-in RCA input
- E** Video cable RCA output
- F** Power wire + camera
- G** Power wire + in video cable
- H** Video cable RCA output
- I** Camera video output
- J** Camera power cable
- K** Camera power input
- L** Camera
- M** Power wire – camera

1.5 Reversing camera via reversing lights

This step-by-step guide explains how to connect the reversing camera to the car radio with the reversing lights as the power source. We take power from the reversing lights, because we want the camera to work only when actually reversing and then to appear on screen automatically. The wiring diagram is on the next page.

Caution: this guide is based on an actual installation. We advise trying out the installation first without actually concealing the cables. Once everything has been tested and works, you can proceed to the final connection.

- 1 Switch off the car's ignition and remove the car radio (A).
- 2 Locate the reverse signal wire (B) of the car radio and strip it.
- 3 Then locate the RCA input for the camera (D). This is often labelled *Cam-in*, *Rear-cam* or *CVBS-in*.
- 4 Take the long video cable of the reversing camera and connect the RCA plug (E) to the camera input (D) of the car radio. Also connect the red wire (C) to the reverse wire (B).
- 5 Then route the video cable behind the panels in the car. Determine what is and is not possible. The cable can often be routed along the door trims. Use trim removal tools to remove panels without damaging them. Bring the RCA plug (H) and the red wire (G) to where the camera will be mounted. Do you have a van, delivery van or commercial vehicle? Then extend the video cable if necessary or use a longer video cable.
- 6 Mount the reversing camera in the desired position and feed cables (I) and (K) towards (G) and (H). Connect plugs (H) and (I) to each other.
- 7 Take the camera's power cable (J) and connect it to the camera's power input (K).



Caution: in the next step you switch the ignition back on. Make sure all wires are connected and that no stripped cables can touch other cables or the chassis.

- 8 Locate the reversing light wires (O and P). Use the multimeter if necessary. Switch on the ignition and put the car in reverse; often the engine does not need to be started. If it does, make sure someone is in the car to prevent it from moving. Distinguish between + and -.
- 9 Once the correct cables have been found, switch the car off completely again.
- 10 Then strip wires (G), (M), (F), (O) and (P) and connect (O) and (M) to each other.
- 11 Connect (P) to (F) and (G).
- 12 Switch the ignition back on and put the car in reverse to test the camera. If everything works, neatly conceal all cables.

1.6 Adjusting resolution settings

With some reversing cameras it may be necessary to adjust the car radio's resolution settings. This is because certain cameras contain a specific sensor that offers different image quality and performance than the standard CVBS settings.

It is important to choose the correct resolution settings to make optimal use of the camera. This ensures a clear and stable image, which is essential for safe and reliable operation of the system.

An example is all cameras in the Cartronix Pro series, which are equipped with an AHD 1080 25fps sensor. These sensors offer superior image quality and a higher frame rate, resulting in a smoother and more detailed image. To benefit from this, the car radio's resolution settings must be set to AHD 1080 and 25 frames per second.

If the resolution settings are incorrect, this can lead to image problems, even if the camera is connected correctly:

- no image or a black screen
- grey/black/white moving lines on the screen
- an image broken up into square blocks

These problems arise because the car radio cannot correctly process the incoming video signal due to the wrong resolution settings.

1.6.1 When is adjusting resolution settings necessary?

Adjusting the resolution settings is necessary when you use a reversing camera with a sensor offering higher performance and image quality than standard cameras, such as the models in the Cartronix Pro series with AHD 1080p at 25 frames per second. If your car radio's settings do not match the camera's specifications, you may experience the image problems above.



Caution: if you have none of the faults mentioned above and your camera works correctly, do not change any settings!

1.6.2 How to adjust the setting

Exactly where the camera setting is located differs per brand and type of car radio. Therefore always consult your car radio's manual. Broadly speaking, it works as follows:

- 1 Put the car in park, switch off the engine and switch on the car radio.
- 2 Open the car radio's settings. The camera setting is often found under *Factory settings*, *Car settings* or *Video*.
- 3 Are you asked for a code? You will find this code in your car radio's manual or can obtain it from the car radio supplier.
- 4 Look for the camera format option, for example *Camera Type*, *Reversing Camera Format* or *Reverse camera settings*. Sometimes you must first choose SD or HD.
- 5 Choose the correct resolution for your camera (see section 1.8) and confirm.
- 6 Restart the car radio so that the change takes effect.
- 7 Put the car in reverse and check whether the image is now clear and stable.

Do you have a different type of radio? Then ask the car radio supplier for the settings.

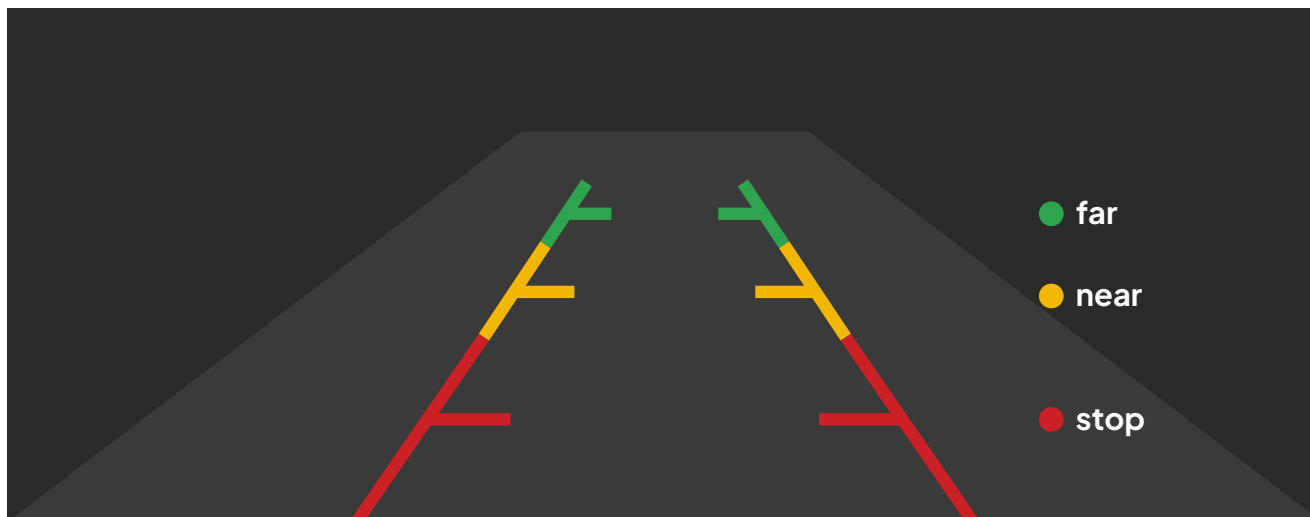
Cartronix CTX-11 series

Cartronix car radios in the CTX-11 series are equipped with chipsets that automatically detect the resolution of the connected camera. You then do not need to make manual adjustments when installing a camera from the Cartronix RV series.

Problems persist? Then contact the supplier's customer service or consult a specialist.

1.7 Guide lines

Some reversing cameras offer guide lines that indicate the distance to an obstacle, object or other road user. These guide lines help you estimate the distance while reversing, so that you can manoeuvre better in tight spaces.



These guide lines are only an indication: never rely solely on the camera. Factors such as the width of your vehicle and the position of the camera can affect the accuracy of the lines.

The guide lines are static and do not turn with the steering wheel. They always remain in the same direction, regardless of the position of your wheels. Therefore always use your mirrors and your own observation as well.

1.8 Cartronix RV series resolution specifications

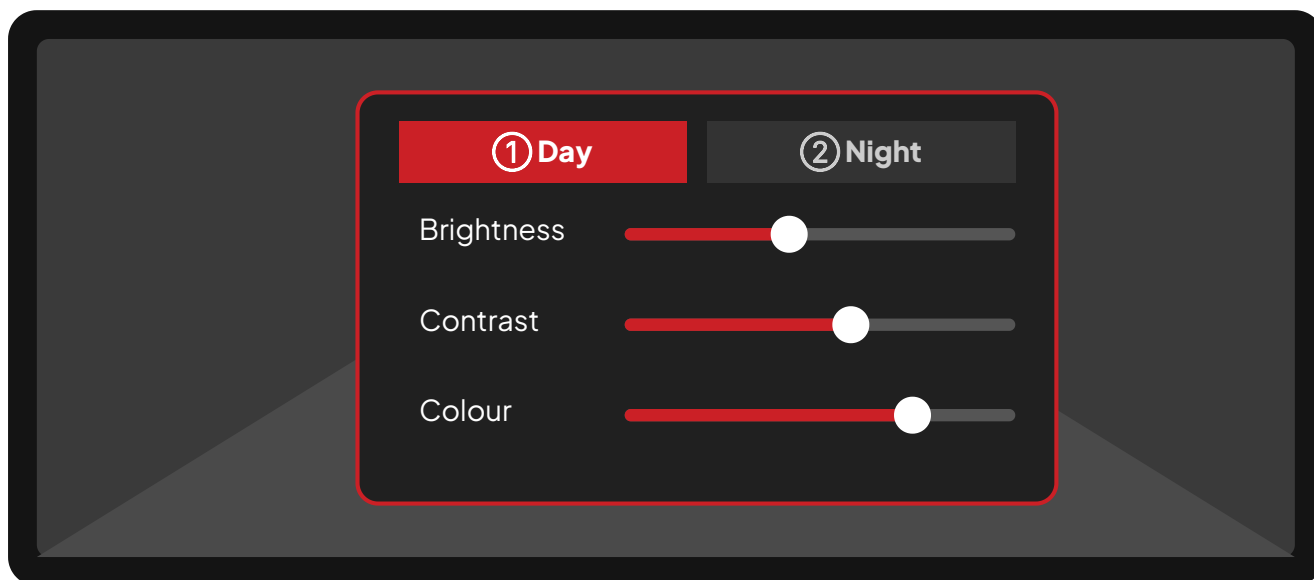
This table shows the sensor and resolution settings of the Cartronix RV series, so you can quickly find the right setting for optimal image quality.

Camera model number	Resolution setting	Camera model number	Resolution setting
RV-300	CVBS	RV-370	CVBS
RV-300-Pro	AHD-PAL 1080 25fps	RV-370-Pro	AHD-PAL 1080 25fps
RV-310	CVBS	RV-380	CVBS
RV-310-Pro	AHD-PAL 1080 25fps	RV-380-Pro	AHD-PAL 1080 25fps
RV-320	CVBS	RV-390	CVBS
RV-320-Pro	AHD-PAL 1080 25fps	RV-390-Pro	AHD-PAL 1080 25fps
RV-330	CVBS	RV-400	CVBS
RV-330-Pro	AHD-PAL 1080 25fps	RV-400-Pro	AHD-PAL 1080 25fps
RV-340	CVBS	RV-410	CVBS
RV-340-Pro	AHD-PAL 1080 25fps	RV-410-Pro	AHD-PAL 1080 25fps
RV-350	CVBS	RV-420	CVBS
RV-350-Pro	AHD-PAL 1080 25fps	RV-420-Pro	AHD-PAL 1080 25fps
RV-360	CVBS	RV-SP series	AHD-PAL 1080 25fps
RV-360-Pro	AHD-PAL 1080 25fps		

Caution: we cannot determine the resolution settings of other cameras. You can request these from the supplier of the camera concerned.

1.9 Editing camera settings

On some car radios you can adjust various settings for the reversing function, especially the brightness and colour scheme of the image. To do so, put the car in reverse so that the camera image appears on the screen, and tap the screen twice. A pop-up will then appear as in the illustration below.



The settings can be adjusted for day and night: option 1 controls the daytime settings, option 2 the night-time settings.

Caution: not every car radio and camera supports this option.

1.10 Troubleshooting

Is the camera not working as expected? First go through this table. The letters refer to the wiring diagrams in sections 1.4 and 1.5.

Fault	Possible cause	Solution
Screen does not switch to camera image	Reverse wire (B) not connected to the red wire (C)	Check connection B–C and the ignition (see 1.3).
Warning triangle or <i>no signal</i>	Camera receives no power or the RCA plugs are loose	Check F–G (1.4) or P–F–G (1.5) and RCA plugs E–D and H–I.
Black screen	Wrong resolution setting or no video signal	Check the setting (1.6 and 1.8) and the RCA connections.
Moving lines or blocks in the image	Resolution setting does not match the camera	Choose the correct resolution from the table in 1.8.
Image flickers or drops out	Reversing light voltage not constant	Fit a capacitor/voltage filter, e.g. CTX-3409 (see 1.5.1).
Image too dark or too bright	Day/night image settings	Adjust brightness and contrast (see 1.9).
Blurred image	Dirty lens or protective film	Remove the film and clean the lens (see 1.11).

1.11 Maintenance

- Clean the lens regularly with a soft, damp cloth. Do not use abrasives or aggressive cleaning agents.
- Never aim a pressure washer directly at the camera or the cable grommet.
- After winter, check that the camera is still firmly attached and the cables are not damaged.

1.12 Warranty and service

Your Cartronix camera is covered by the statutory warranty. Keep your proof of purchase, such as an invoice or order confirmation. Damage caused by incorrect connection, installation or damage to the cables is not covered by the warranty.

Does the camera unexpectedly not work after following this manual? Then contact the customer service of the supplier where you bought the camera. They can help you further.

Contact

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Do not dispose of electrical appliances with household waste. Take the camera to a collection point for electrical appliances.

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