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CAREYE® SAFETY ANGLE TURN ASSIST



INSTALLATION MANUAL

MONITOR 10" - 16:9



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■ CONTENT

GENERAL NOTES 03

SAFETY INSTRUCTIONS 04

Important documents..... 08

Function description and function modules..... 12

Components - Monitors 14

Installation - Monitors..... 18

Electrical connection..... 19

Operation and use..... 25

Components overview 26

General informations..... 28

CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION AND INSTRUCTION MANUAL

■ GENERAL NOTES

Read this manual carefully, it contains important information and notes on assembly, commissioning and safe operation.

Pay particular attention to the following markings:



Information that serves the proper operation and handling is shown with this symbol. Non-observance may lead to damage or functional restrictions.



Warnings are information that is of particular importance for proper operation and safe handling. These are shown with this symbol.



Hazards that may expose the user to particular danger are indicated with this symbol.

■ SAFETY INSTRUCTIONS

ABOUT CAREYE® SAFETY ANGLE



- The CAREYE® SAFETY ANGLE system is an assistance system to support the driver. The responsibility for monitoring remains with the driver.
- CAREYE® SAFETY ANGLE is not a direct replacement for the rear-view or exterior mirror system and, due to the variety of situations in road traffic, cannot provide any guarantee regarding the detection rate or error detection rate in operation.
- CAREYE® SAFETY ANGLE is a driving assistance system and therefore serves to support the driver, but in no way represents an automation system. CAREYE® SAFETY ANGLE is designed as a retrofit device for actively warning the driver of potentially dangerous situations. The detection and false alarm rates of the system depend on the installation and the current environmental conditions. No warranty is given by the manufacturer for the situation-related detection or the analysis behavior of the "artificial intelligence" used in the CAREYE® SAFETY ANGLE.
- All components are intended exclusively for the intended use.

CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION AND INSTRUCTION MANUAL

■ Safety Instructions

INSTALLATION



- Installation must be carried out by registered workshops for motor vehicles or commercial vehicles or by authorized workshops, otherwise warranty claims will become void.
- Only install and operate the TIC box, the monitors and the signal elements in a dry and dust-free environment, away from impact areas or the deployment area of an airbag.
- Take care not to damage any important parts or injure any cables or hoses during installation preparations (e.g. drilling holes) and installation.
- The operating temperature is between -20°C and +70°C, the humidity between 20% and 80% (non-condensing).
- Mount the devices securely and tightly according to the section "Mounting". Remove any protective films before commissioning.
- Connect all components only to the vehicle's electrical system with a nominal voltage of 12 to 24 VDC. Ensure the correct polarity of the supply voltage.
- Manual control devices, indicator lamps and displays in the passenger compartment must not be covered by the monitor and signal transmitter.
- During all activities, ensure your personal safety, the safe use of tools and aids, and the securing of the vehicle.

■ Safety Instructions

OPERATION



- Operate the components only on the vehicle electrical system with 12 to 24 VDC nominal voltage of the vehicle.
- Observe the mechanical, electrical and climatic operating conditions.
- Do not use the devices if they show visible damage.
- Protect the cables from heat, sharp edges and aggressive substances such as oils or fuels.
- Do not extend cable connections independently, individual cable sets are available on request.
- Keep the components away from strong electric and magnetic fields.
- Do not use any components other than those supplied, do not plug in any third-party devices.
- Do not glue parts at the components, the solvent could damage the surfaces.
- Make sure that the viewing glasses of the camera(s) are clean and free from scratches, cracks or stone chips. The functioning of the entire system is largely dependent on the quality of the camera images. In the event of a defect or if the viewing glass is cloudy, for example, the camera must be replaced.
- Interrupt the power supply immediately if liquids or foreign bodies have penetrated the devices.
- Do not use the devices in areas with a high risk of explosion.

CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION AND INSTRUCTION MANUAL

■ Safety Instructions

CLEANING AND MAINTENANCE



- The camera(s) are splash-proof - but avoid spraying them directly with a high-pressure cleaner.
- Replace defective, damaged or kinked cables immediately.
- Do not attempt to service the product yourself, as opening it may expose you to dangerous electrical voltages or other hazards. Opening the equipment will void the warranty.
- Regularly check the functions and condition of the components of the turn assistant. In the event of defects, recognizable damage or wear, the product can no longer be used or used safely. Have it repaired immediately.
- Clean the monitors and the signal elements only with a soft, clean and dry cloth. Never use solvents, oils or other cleaning agents.
- Disconnect the power supply during cleaning or maintenance activities.
- Use only original spare parts and have repairs carried out only in specialist workshops authorized by EYYES.
- EYYES accepts no liability for damage caused by failure to observe this manual. This manual is part of the product.

CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION AND INSTRUCTION MANUAL

■ IMPORTANT DOCUMENTS

The following documents are important components of the products, which must be observed accordingly.

DOCUMENT	Installation and Instruction Manual Control Box and Cameras (Part M)
CONTENT	<ul style="list-style-type: none"> ■ Safety instructions ■ Function descriptions ■ Component description ■ Assembly ■ Connection ■ Configuration ■ Operation and use ■ System check ■ Parts overview
ENCLOSED	SET TIC Box TATIC
NOTES	Carry in the vehicle not required



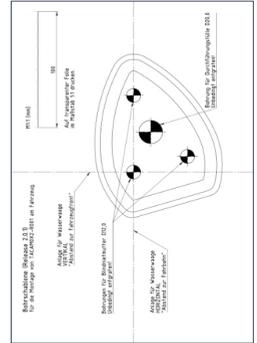
DOCUMENT	Instruction manual (Part B)
CONTENT	<ul style="list-style-type: none"> ■ Safety Instructions ■ Function Instruction ■ Operating and use ■ System Check
ENCLOSED	SET TIC Box TATIC
NOTES	Carry in the vehicle required



CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION AND INSTRUCTION MANUAL

■ Important documents

DOCUMENT	Drilling template
CONTENT	Drilling template for the camera base
ENCLOSED	Camera TACAM
NOTES	---



CAREYE® SAFETY ANGLE - TURN - ASSIST
 INSTALLATION AND INSTRUCTION MANUAL

■ Imported documents

DOCUMENT	Installation manual steering angle sensor (Part L)
CONTENT	<ul style="list-style-type: none"> ■ Safety instructions ■ Function descriptions ■ Component description ■ Installation ■ Connection ■ Commissioning ■ Parts overview
ENCLOSED	Steering angle sensor TASEN
NOTES	Carry in the vehicle not required



DOCUMENT	Installation manual Monitor 10 oder 12" (Part D)
CONTENT	<ul style="list-style-type: none"> ■ Safety instructions ■ Function descriptions ■ Component description ■ Installation ■ Connection ■ Commissioning ■ Parts overview
ENCLOSED	Monitor TAMON
NOTES	Carry in the vehicle not required



■ FUNCTION DESCRIPTION AND FUNCTION MODULES

As part of the CAREYE® product suite, the SAFETY ANGLE variant offers a flexible, expandable and safe system for use as an TURN ASSISTANT / BLIND SPOT ASSISTANT with proven safety functions.

The TURN ASSISTANT - also called ASSISTANT FOR THE BLIND SPOT - is suitable as a retrofit solution or for new vehicles, for example commercial vehicles or special and emergency vehicles that have particularly vulnerable areas.

CAREYE® SAFETY ANGLE detects people and cyclists on the basis of artificial intelligence and warns the driver reliably and in real time. Objects that are not relevant are recognized as such and included in the evaluation, thus reducing warnings to the lowest possible level.

The basic version of CAREYE® SAFETY ANGLE as an TURN ASSISTANT consists of the central interface and controller box (TIC box), the signal element and 2 digital camera sensors.

The TIC box processes these camera signals, detects and classifies objects and provides the necessary interfaces for connection to the vehicle electronics. Due to its compact design, the TIC box can be easily mounted indoors.

The cameras are installed in suitable positions on the outside of the vehicle. The heated cameras are available as a compact surface-mounted version or as a stable camera arm. Thanks to its ergonomic and safe design, this camera arm enables optimum observation of what is happening alongside the vehicle - even with bodies wider than the cab - and of the blind spot.



CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION AND INSTRUCTION MANUAL

■ Function description and function modules

If a person or a cyclist is detected in the danger zone when turning, the driver is warned by the optical signal indicator and additionally with a loud sound generator.

The system activates automatically by evaluating the speed of the vehicle, the activated direction indicator and the steering angle. There is no warning when the hazard warning lights are used.

Optionally, light-intensive displays with different diagonals can be used to additionally display the camera images including the detected objects and persons in the danger zone.

Furthermore, the TIC box can be the future-proof central control unit for additional safety and comfort functions available to the drivers:

- the rear view camera with automatic activation as a rear view assistant

■ COMPONENTS - MONITORS

The optionally available CAREYE® Safety Angle monitors provide a view of the monitored areas, displayed depending on the function package.

The high resolution ensures very good images of what is happening, the high viewing angle ensures excellent readability.

The power supply is provided via the cable set of the TIC box, thus reducing the installation effort to a minimum.

Each monitor is supplied with the necessary cable set for connection to the TIC Box and the power supply.

In addition, an adjustable ball head mount or a pan/tilt mount for secure mounting of the monitor, for example on the A-pillar, is optionally available.



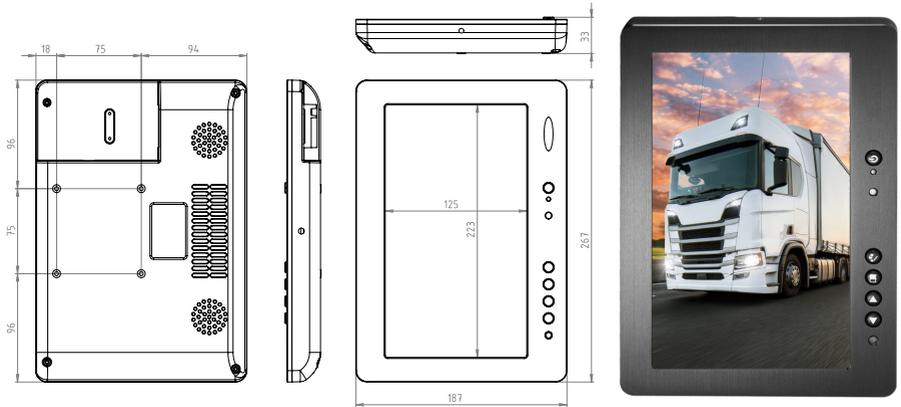
The monitor is an optional addition to the CarEye Safety Angle turn-off assistance system. Please also refer to the document Installation and Instruction Manual Part M.



CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION AND INSTRUCTION MANUAL

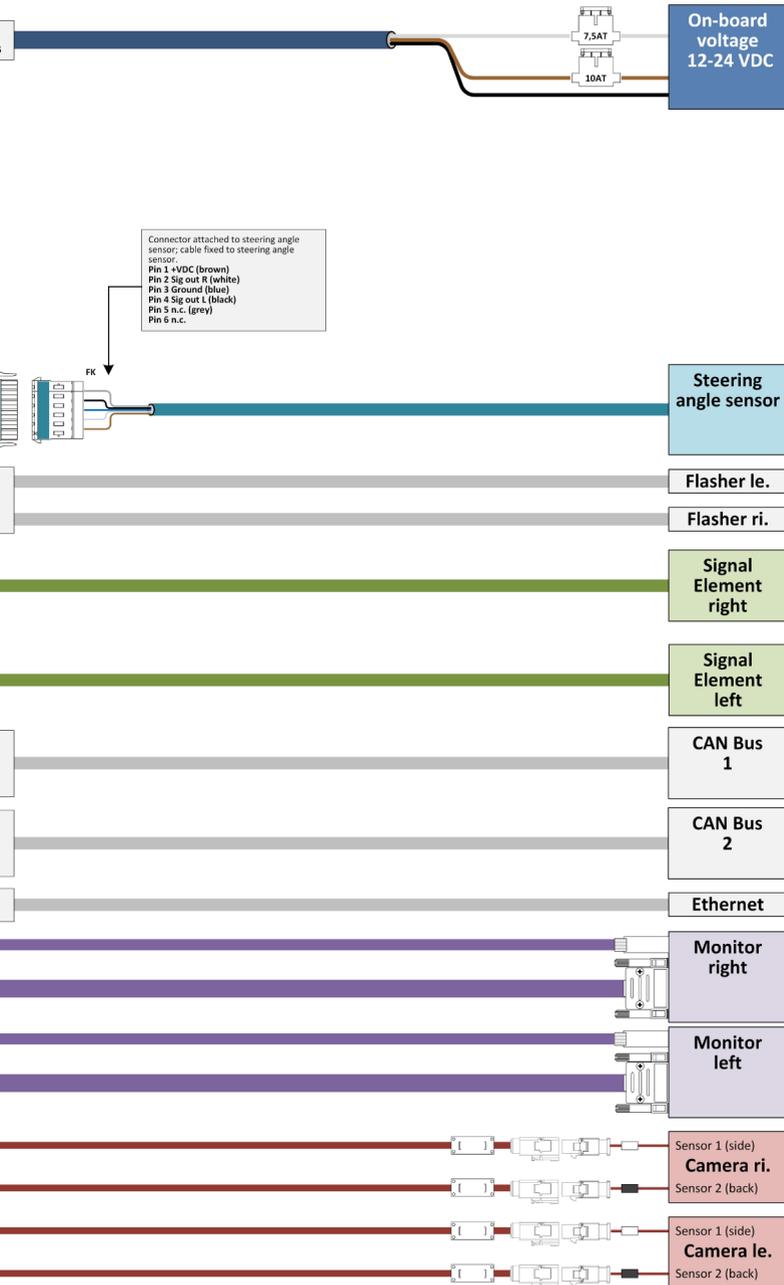
■ Components - Monitors

TECHNICAL DATA



Description	TAMON100-0001 10,1" Monitor with 16:9 format
Resolution Display	1.024 x 600 px
Brightness & Contrast	1.000 cd/m ² ; 600:1
Viewing angle	140°/120° (long side/short side)
Power Supply	12 up to 24 VDC nominal voltage
Power consumption	<20 W
Environmental conditions	-20°C up to +70°C; Storage -30°C up to +80°C
Dimensions	267 x 187 x 33 mm (H x B x T)
Weight	1.500 g, Without mounting bracket

CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION AND INSTRUCTION MANUAL



LEGEND

- Scope of delivery TIC Box
- Scope of delivery cable set TIC Box
- Scope of delivery cameras
- Scope of delivery Cordsets Cameras
- Scope of delivery steering angle sensor
- Scope of delivery signal elements
- Scope of delivery monitors
- Scope of delivery Cordsets Monitors
- not included in delivery

CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION AND INSTRUCTION MANUAL

■ INSTALLATION - MONITORS

GENERAL

The optional TAMON monitors are designed for mounting on the right side for the right turn assist or on the left side for the left turn assist. Mounting is possible on the A-pillar or on the dashboard. Use all 4 screw-on points, the maximum screw-in depth of the M4 screws is 6 mm. When mounting the monitors, make sure that the screws are securely fastened.

The monitor for the right-hand turn-off assistant must be mounted at least 30 degrees to the right of the commercial vehicle driver's line of vision.



Observe the following regulations:

- There must be no impairment of indirect vision by components such as monitors, cameras and sensors.
- The impairment of the driver's view due to the installation of a system for indirect vision must be kept to a minimum.

The components for the installation of the monitor consists of:

- 1 Monitor with VESA Screw-on points 75 x 75 mm
- 1 Monitor-cable set VIDEO
- 1 Monitor-cable set POWER
- Optional: 1 monitor bracket

CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION AND INSTRUCTION MANUAL

■ ELECTRICAL CONNECTION

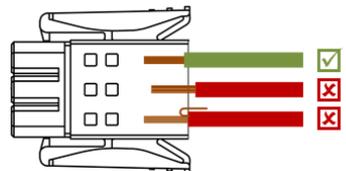
GENERAL

- The most cable sets are pre-configured and provided with permanently mounted plug connections, do not shorten them:
 - Cable set signal element, an extension cable is optionally available for this purpose,
 - Cable set Monitor,
 - Cable set Kamera.
- The following cable sets can be shortened to the required length:
 - Cable set for power supply, shortening on the side of the open end,
 - Cable set for steering angle sensor, shortening on the side of the open end. The plug connection with spring clips for self-assembly is included.
- The following cable connections must be made during installation; no cable sets are supplied for this purpose:
 - Turn signal if this is not available via the CAN bus. The plug connection with spring terminals is preassembled on the side of the TIC box.
 - CAN bus, the plug connections with spring terminals for self-assembly are enclosed.



When using the spring terminals, make sure that no strands or wires protrude from the body of the connector and that the insulation extends into the connector.

The enclosed connectors with spring clamps allow easy assembly without tools. They are designed for a **conductor cross-section of 0.2 to 0.5 mm²**.



■ Electrical connection

POWER SUPPLY - PWR

- Connect the steady plus, the ignition plus and the ground to the terminals provided for this purpose, but ensure that the voltage is not present at the start of assembly and do not connect the voltage supply until the assembly work has been completed.
- Ensure the supply voltage range with a nominal voltage of 12 VDC to 24 VDC.
- Use the enclosed fuse holders and fuses if no fused circuits are available.
The continuous positive must be fused with 10 AT, the ignition positive must be fused with 7.5 AT.



Make sure that the connection to the on-board power supply is correct; if the polarity is reversed, the entire system can be damaged.

The "TATIC cable set" set is available for the power supply. This consists of:

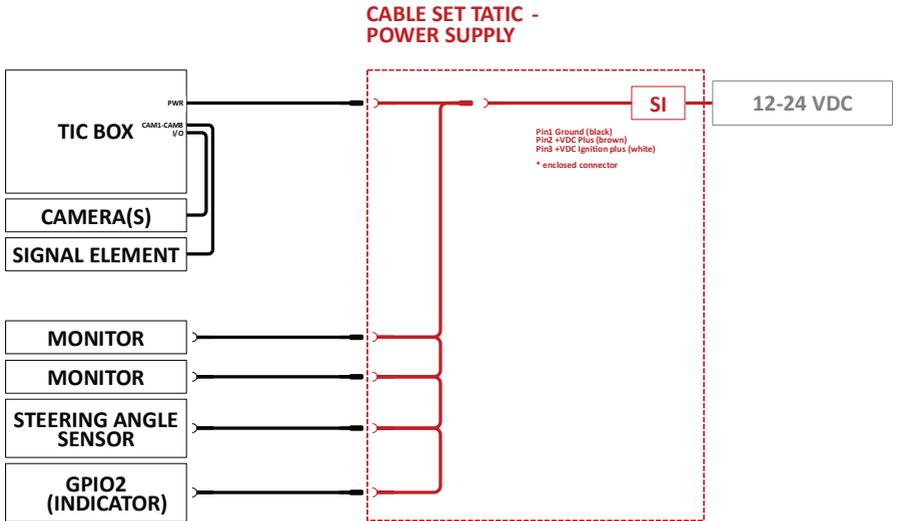
- the standard cable set incl. fuse holder and fuses
- the distribution cable, which provides a plug connection for the TIC box, the monitors and the steering angle sensor
- the adapter cable for connecting the two turn signals if this criterion is not provided via the CAN bus.



CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION AND INSTRUCTION MANUAL

■ Electrical connection

POWER SUPPLY - PWR



CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION AND INSTRUCTION MANUAL

■ Electrical connection

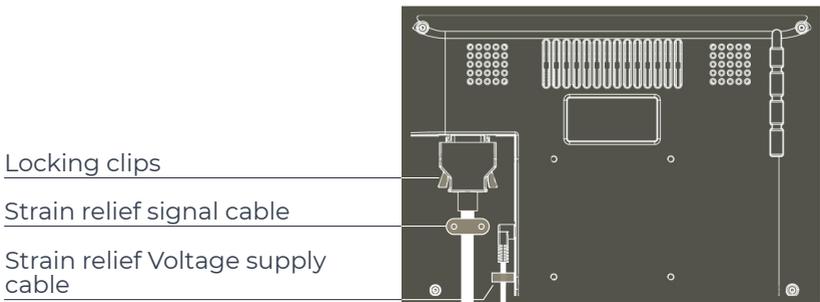
MONITORS - MON1 AND MON2

- Connect the signal line of the monitors to the configured ports MON1 (turn assistant right) and MON2 (turn assistant left) of the TIC box.
- Connect the voltage supply of the monitors to the TATIC voltage supply cable set.
- The cable for the power supply of the monitor can be shortened. After shortening, mount the 3-pin plug connector. The spring clips enable easy mounting without tools.

PIN	DESCRIPTION	COLOR WIRES
1	Ground	Blach (shield)
2	nc	Not connected
3	Ignition Plus	Red (Inner conductor)



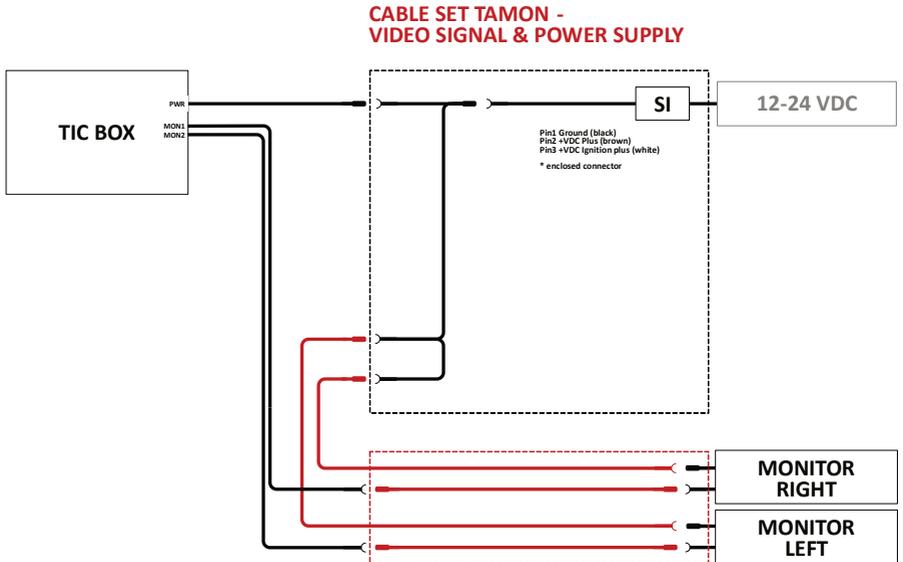
- Ensure that the plug connections are securely held, use the strain reliefs.



CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION AND INSTRUCTION MANUAL

■ Electrical connection

MONITORS - MON1 AND MON2



■ Electrical connection

IMPORTANT NOTES



The CAREYE® SAFETY ANGLE system or its components must be installed and wired in such a way that they start up automatically when the ignition is switched on. Under no circumstances may the entire system or parts of it be switched off or implemented.



Only use the cables supplied, special lengths are available if required.

Do not shorten or extend any cables with the exception of the cable for the power supply and the steering angle sensor.

Make sure that the cables are secured against pulling, if necessary tie them together with cable ties to provide strain relief.

Avoid drilling holes with sharp burrs and make sure that the cables do not rub against sharp edges.

When laying the cables, take care not to crush or otherwise damage them.

Protect the cables from sharp edges and corners and do not lay them over them.

Observe the minimum bending radius of the cables and do not go below 7.5 times the outer diameter of each cable.

Do not expose the cabling to heat or aggressive substances such as oils or fuels. Replace defective, damaged or kinked cables immediately.

Operate only the intended and supplied components and devices in the CAREYE® SAFETY ANGLE system.

CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION AND INSTRUCTION MANUAL

■ OPERATION AND USE

OPERATIONAL READINESS OF THE SYSTEM

The system does not have any setting options in operational mode. When the vehicle is started or the ignition is switched on, the entire CAREYE® SAFETY ANGLE system automatically starts up and is ready for operation.

The system cannot be deactivated or adjusted by the driver; it is always in operation.

Monitoring area	right
Criteria	Detected cornering on the right up to a radius of 10 meters OR set right turn signal.
Speed	0 up to 30 km/h
Direction	forward
Monitor left yellow frame	Detection active, nichts detected
Monitor right orange frame	Detection active, object NOT detected
Monitor right no frame	Detection not active

The monitor shows the images of both camera sensors of the Wing.

These images are split in the ratio 1/3 (rear camera sensor) and 2/3 (side camera sensor).



CAREYE® SAFETY ANGLE - TURN - ASSIST
 INSTALLATION AND INSTRUCTION MANUAL

■ COMPONENTS OVERVIEW

MONITORS

ARTICLE-NR.	DESCRIPTION	FIGURE
CS-SET-0017x	SET Monitor TAMON100-0001-xx 16:9, 10" Monitor Format 16:9, 10" (1)	
BT-DOC-0023x	Installation manual part D (1)	
CS-SET-0018x	SET Monitor Cable set VIDEO TACAB007-0030-xx Cable set video signal for TAMON100-0001-xx, 300 cm (1)	
CS-SET-0019x	SET Monitor Cable set POWER TACAB008-0030-xx Cable set Power for TAMON100-0001-xx, 300 cm (1)	



CAREYE® SAFETY ANGLE - TURN - ASSIST
 INSTALLATION AND INSTRUCTION MANUAL

■ Components overview

MONITORS - ACCESSORIES

ARTICLE-NR.	DESCRIPTION	FIGURE
CS-SET-0012x	Ball head bracket TAACC001-0001-xx Ball head bracket for the monitor 8:3 and 16:9	
CS-SET-0013x	Pan/Tilt mount TAACC001-0002-xx Pan/Tilt mount for the monitor 8:3 and 16:9	



■ GENERAL INFORMATIONS

SYSTEM LIMITS

The turn-off assistant has been tested on the basis of legal requirements. Please bear in mind that, despite the sophisticated technology, this is an assistance system and must be used as such.

If visibility conditions are such that safe driving is not possible - for example fog, heavy rain or snowfall - this can affect the function of the system.

In addition, the cameras or the protective camera glass on them must be cleaned of dirt.

Objects outside the field of view cannot be detected by the system. If there is extraneous glare, e.g. from a vehicle approaching from behind, object detection can be delayed or disturbed. In the case of very small or thin objects such as strings, ribbons or wires - especially with a color-like background - object detection may be delayed or the object may not be detected.

STORAGE AND DISPOSAL OF THE PACKAGING

Store the in the components only in the original and, if possible, closed boxes of the delivery.

The recommended storage temperature is between 19° and 23°C, humidity 45-65%.

Protect the components from liquids, shock-like temperature changes, intense sunlight, dust, aggressive atmosphere and mechanical impact. Do not store the components in the direct area of a heating fan.

Shelf life of corrugated cardboard is one (1) year under good environmental conditions. Avoid stacking the boxes during storage. **There is a danger of cutting at the edges of the corrugated board!**

The material of the packaging is recyclable, use the area-wide systems for disposal.

CAREYE® SAFETY ANGLE - TURN - ASSIST INSTALLATION AND INSTRUCTION MANUAL

■ General informations

DISPOSAL

The correct collection of defective components enables valuable raw materials to be recycled. Therefore, observe the relevant and national regulations for the disposal of electronic waste; do not dispose of it in the residual waste under any circumstances.

ABOUT THIS DOCUMENT

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