

WWW.EYYES.COM

CAREYE® SAFETY ANGLE TURN-ASSIST



INSTALLATION MANUAL



Document: **S06-011_xx_EN CarEye Safety Angle Teil B**

Version: **3.0.2**

Article: **BT-DOC-00221**

EYYES GmbH

Im Wirtschaftspark 4
3493 Gedersdorf
Österreich

office@eyyes.com
www.eyyes.com

■ CONTENTS

GENERAL NOTES 03

SAFETY INSTRUCTIONS 04

Important documents..... 08

Function description and function modules..... 12

Field of application 14

Operation and use..... 19

System check and troubleshooting 24

General information..... 25

■ 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 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.

■ 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 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



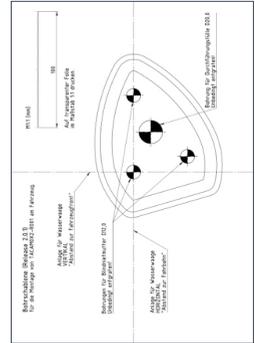
DOCUMENT	Instruction manual (Part B)
CONTENT	<ul style="list-style-type: none"> ■ Safety Instructions ■ Function Instruction ■ Operating and use ■ System Check
ENCLOSED	SET TIC Box TATIC
NOTES	Carry in the vehicle required



CAREYE® SAFETY ANGLE - TURN-ASSIST INSTRUCTION MANUAL

■ Important documents

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



CAREYE® SAFETY ANGLE - TURN-ASSIST
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



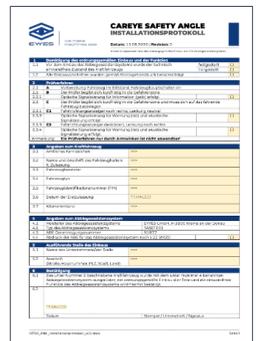
CAREYE® SAFETY ANGLE - TURN-ASSIST INSTRUCTION MANUAL

Imported documents

DOCUMENT	CarEye Safety Angle General operating permit
CONTENT	ABE and field of applicatio
ENCLOSED	SET TIC Box TATIC
NOTES	Carry in the vehicle not required



DOCUMENT	CarEye Safety Angle installations protokoll
CONTENT	Logging of the measures in the course of assembly/installation by the installing workshop. This protocol can also be completed electronically.
ENCLOSED	SET TIC Box TATIC
NOTES	Return of the protocol to EYES.



■ 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.



■ 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

■ FIELD OF APPLICATION

The CAREYE® SAFETY ANGLE turn-off assistant is intended for all commercial vehicles in classes N2 and N3 and for all buses in classes M2 and M3 with more than nine seats including the driver's seat.

An additional steering angle sensor and the turn signal are required for the function of the turn-off assistant.

When using a tilt sensor as a steering angle sensor, please note:

- The tilt sensor is used for vehicles with mechanical steering systems (with or without power assist).
- The mechanical steering force transmission must be provided by a steering column lever that can be moved in a vertical plane; the tilt sensor must be mounted there
- Application on vehicles with a steering system without a vertically movable pitman arm as well as on horizontally movable components such as steering or track rods is not possible.

The system must be completely installed on the vehicle in which the driver contains the warning. In addition to the installation instructions, the following installation conditions must be observed in particular.



■ Field of application



The Wing type camera must be

- at a mounting height of between 2,300 and 3,800 mm,
- at a mounting distance from the front of the vehicle of between 1,200 and 1,800 mm

be mounted on the passenger compartment or on the body of the vehicle. Care must be taken to ensure that no component protrudes more than 100 mm beyond the outer edge of the vehicle.

It must be ensured that

- the Wing is horizontal to the ground,
- the wing is aligned at 90° to the vehicle axis,
- the mounting position is on as level a surface as possible.

Please ensure that the Wing does not impair direct or indirect vision and that the function of any existing sensors or elements is not impaired.

CAREYE® SAFETY ANGLE - TURN-ASSIST INSTRUCTION MANUAL

■ Function modul BLIND SPOT ASSISTANT - RIGHT

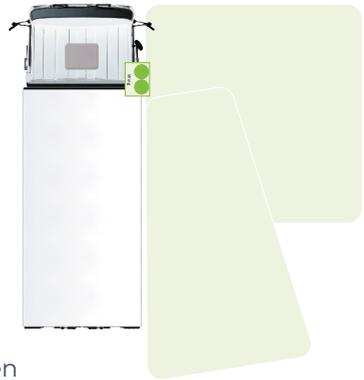
The "**Blind Spot Assistant BSS**" package for the right side represents the basic package of the CAREYE® SAFETY ANGLE. As a turn assistant, it enables monitoring of the right blind spot.

This represents the system basis and monitors the right lateral area of the vehicle, starting from the front of the vehicle as required, for example, in the Traffic Bulletin of the Federal Ministry of Transport and Digital Infrastructure of the FRG) and in the UN-ECE proposal for Blind Spot Assist.

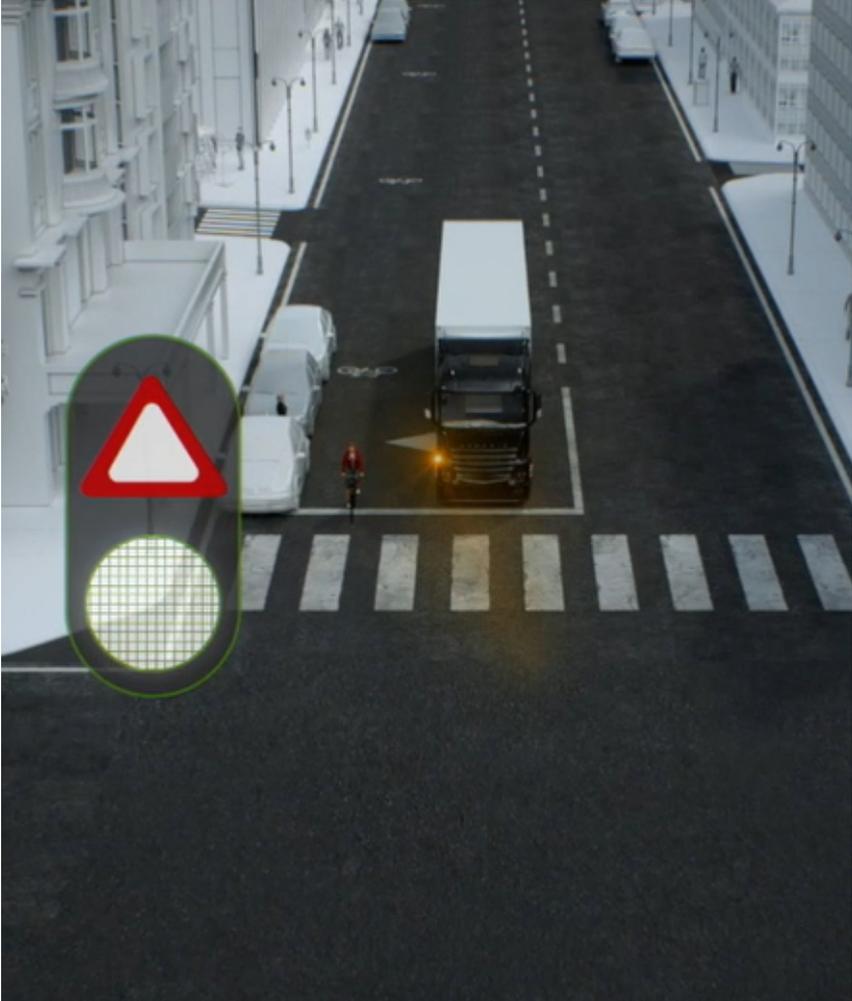
The cornering assistant is active at a speed of 0 to 30 km/h.

An "information" (yellow display) occurs when a person or cyclist(s) is detected in the monitored area.

A "warning" (red display and warning tone) is issued when a moving vehicle (> 0 km/h) is detected and a collision with a person or a cyclist is imminent.



■ **Function modul**
Blind spot assistant - right



CAREYE® SAFETY ANGLE - TURN-ASSIST INSTRUCTION MANUAL

■ OPERATION AND USE

SYSTEM READINESS FOR OPERATION

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 starts up automatically and is ready for operation. The system cannot be deactivated or adjusted by the operator; it is always in operation.

The readiness for operation after the system has been started up is indicated as follows on all connected signal elements and monitors:

- by the permanently lit green POWER LED on the front of the TIC BOX,
- by the ACTIVE LED on the front of the TIC BOX flashing green briefly and permanently,
- by three short beeps of the signal elements in rapid succession,
- by three short flashes of the yellow and red warning indicators,
- the optional monitors show a picture.



If the system is not ready for operation - i.e. during commissioning or operation - an error signal is generated:

- no or deviating display of the POWER LED and/or ACTIVE LED on the front of the TIC BOX,
- by a continuous tone of the signal element for 5 seconds,
- by continuous illumination of the yellow warning indicator,
- in case of visual impairment, e.g. falling below the minimum ambient illumination of 15lx, only the yellow LED lights up, no warning tone is emitted.



CAREYE® SAFETY ANGLE - TURN-ASSIST INSTRUCTION MANUAL

■ Operation and use

VERIFICATION OF FUNCTIONALITY

During operation, the proper function of the system is continuously checked.

If the system is functioning properly, the yellow and red warning indicators are briefly activated when the turn-off criterion is met - from >0 to 30 km/h and when driving straight ahead with the right turn signal activated and when driving around curves with the right turn signal activated or without it.

The duration of this check signal is 0.1 seconds.



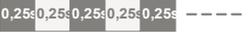
If two signal elements are installed, the previously described messages are output on the respective assigned signal elements (left/right).



CAREYE® SAFETY ANGLE - TURN-ASSIST INSTRUCTION MANUAL

■ Operation and use

TURN ASSIST RIGHT

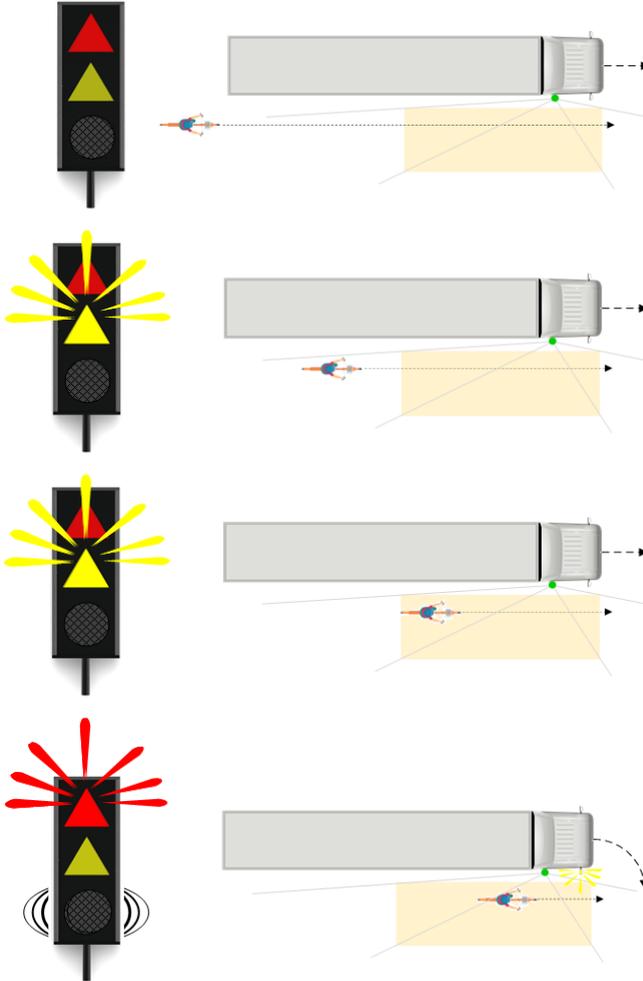
Monitoring area	right
Speed	0 up to 30 km/h
Direction	forward
Signal element right optical information yellow flashing	upon detection of an object within the monitored area 
Signal element right optical warning red flashing	When an object is detected within the monitored area and there is a risk of collision (sequence duration can be set) 
Signal element right acoustic warning	When an object is detected within the monitored area and there is a risk of collision (sequence duration can be set) 
Monitor right yellow marking	upon detection of an object within the monitored area
Monitor right red marking	When an object is detected within the monitored area and there is a risk of collision.



For the detection of cornering, the direction of travel and the set turn signal, the respective required and switched-on CAN bus signal is necessary. Alternatively, these criteria can also be read in and processed as digital input signals. The optical and acoustic warning signals are output continuously during the hazardous situation.

■ Operation and use

TURN ASSIST RIGHT



CAREYE® SAFETY ANGLE - TURN-ASSIST INSTRUCTION MANUAL

■ Operation and use

MONITOR - TURN ASSIST RIGHT (OPTIONAL)

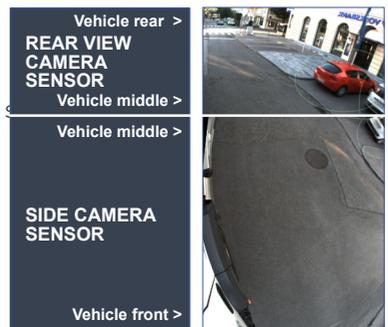
The system does not have any setting options in operational mode. When the vehicle is started or the ignition is switched on, the entire CAREYE® SAFETY ANGLE system starts up automatically and is ready for operation.

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)



■ SYSTEM CHECK AND TROUBLESHOOTING

Regularly check the functionality of the system:

- Test the function of the detection by simulating the typical situation in road traffic including a turn and the use of the turn signal,
- Check the functionality of the signal generator (3x signal tone and flashing at system start),
- Check the functionality of the monitor and its image quality,
- Pay attention to the tightness of the camera by visual inspection. Check whether water has penetrated,
- Regularly clean the camera's viewing windows using a soft cloth,
- Check the cables for chafing.

Information on troubleshooting can be found in the FAQ section at <https://www.abbiegeassistenz.at/faq-csa>.



■ GENERAL INFORMATION

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.

■ General Information

ENTSORGUNG

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

This document has been prepared with the greatest possible care; however, due to continuous further development, information may no longer correspond to the current development status of the products. EYYES GmbH reserves the right to change the information without prior notice. EYYES GmbH assumes no liability for incidental or consequential damages resulting from the use of this document. EYYES GmbH retains the copyright to this document, which may not be reproduced without prior written permission from EYYES GmbH.

TERMS OF BUSINESS

Our General Terms and Conditions apply to these products:
<https://www.abbiegeassistant.at/agbs-produktlieferungen>



■ General Information

E-MARK

 10 R - 05 9009

ABE NUMBER

KBA91877

EYYES GmbH

Im Wirtschaftspark 4
3493 Gedersdorf
Österreich

office@eyyes.com
www.eyyes.com