MirrorEye MP

System manual
No. SM0974205 A 09

Set MirrorEye MP;
Art. No. 0415005

Set MirrorEye MP RHD + S;
Art. No. 0415015

Set MirrorEye MP LHD + S;
Art. No. 0415025

05/2019
English

Stoneridge | ORLACO

MirrorEye MP

Manual No. SM0974205, A 09

Set MirrorEye MP; Art. No. 0415005
Set MirrorEye MP RHD + S; Art. No. 0415015
Set MirrorEye MP LHD + S; Art. No. 0415025

Safety

In order to guarantee safe operation, these safety instructions must be read before you start using this equipment.

- Do not open the enclosure. This can cause damage, short-circuiting or electrical shocks.
- Do not expose the equipment to extreme temperatures. This can cause deformation of the enclosure or damage to internal components.
- Repairs may only be undertaken by Stoneridge/Orlaco.
- The equipment must be assembled as shown in this manual.
- If there have been alterations or changes to this equipment that have not been specifically approved by Stoneridge/Orlaco, use of this equipment is not permitted.
- The use of this system while driving is only permitted by persons who are (legaly) authorized to operate the vehicle and are considerd fysical capable of driving a vehicle.
- Note that regulations must be obliged on all times.
- Check proper functioning of the system before driving.

Preface

Before you start installing this equipment, please read this manual carefully and follow all instructions. This system manual describes the functions of the equipment, outlines the connection options and explains how to put the equipment into operation. We recommend that you keep this manual in a safe place for reference purposes.

If you have any questions or issues concerning the operation of this equipment, consult the relevant section in the manual or contact Stoneridge/Orlaco.

All data is subject to change without notice. All dimensions are for commercial use only. Camera/monitor systems from Stoneridge/Orlaco comply with the latest CE, ADR, EMC, and mirror regulations, where applicable. All products are manufactured in accordance with an ISO 9001 quality management system, an IATF 16949 automotive quality management system, and an ISO 14001 environmental management systems, where applicable.

MirrorEye set, Art. No. 0415005

MirrorEye set, Art. No. 0415015

MirrorEye set, Art. No. 0415025

Also refer to the following documents

Data sheet DS0965012
DS0965013
DS0965014
User Manual UM0972205
User Manual UM0972206

Contents Page

Checking Field of view Remark

Before driving it's mandatory for the operator of the vehicle to check if the legally prescribed field of view is displayed on the monitor.

Display of the system Warnings

The system is designed to meet legal requirements and to provide the most accurate representation of a situation. However, the operator must be aware that due to system properties a situation might be represented differently than expected.

The operator remains at all times responsible for the safe operation of the vehicle and the assessment of situations during driving and manoeuvering.

When the system shows a completely white screen please powercycle the system to restore it in working order.

1. UNECE R46 regulation

Uniform provisions concerning the approval of devices for indirect vision and of motor vehicles with regard to the installation of these devices.

The MirrorEye system is developed as a mirror replacement as mentioned in UNECE R46 regulation. In order to use the MirrorEye system as a mirror replacement the installation needs to be approved by the authorized body.

Warning:
Without installation- or type approval it's prohibited to use the MirrorEye system without mirrors mounted on the vehicle.

Remark:
When mirrors are replaced by the MirrorEye system; installation approval according to R46 is required.

For legal requirements see:
https://www.unece.org/fileadmin/DAM/trans/main/wp29/wp29regs/2018/R046r6am4e.pdf

The positioning and placement of the cameras and monitors is essential for a proper use of the system.
Without a correct installation the installation approval is not possible.

2. Introduction

The MirrorEye system is a camera monitoring system, designed to replace conventional class II and class IV rear-view mirrors on vehicles. The MirrorEye MP system complies with the regulations as described in R46R6.

System Description

The function of the MirrorEye system is to provide the operator with the legally required class II, IV fields of view. See Figure 1.

Class II

In accordance with R46R6, a class II field of view for the main rear-view device provides the operator rear vision along the length of the vehicle towards the horizon.

Class IV

In accordance with R46R6, a class IV field of view for the wide-angle view device provides the operator wide-angle rear vision along the length of the vehicle.

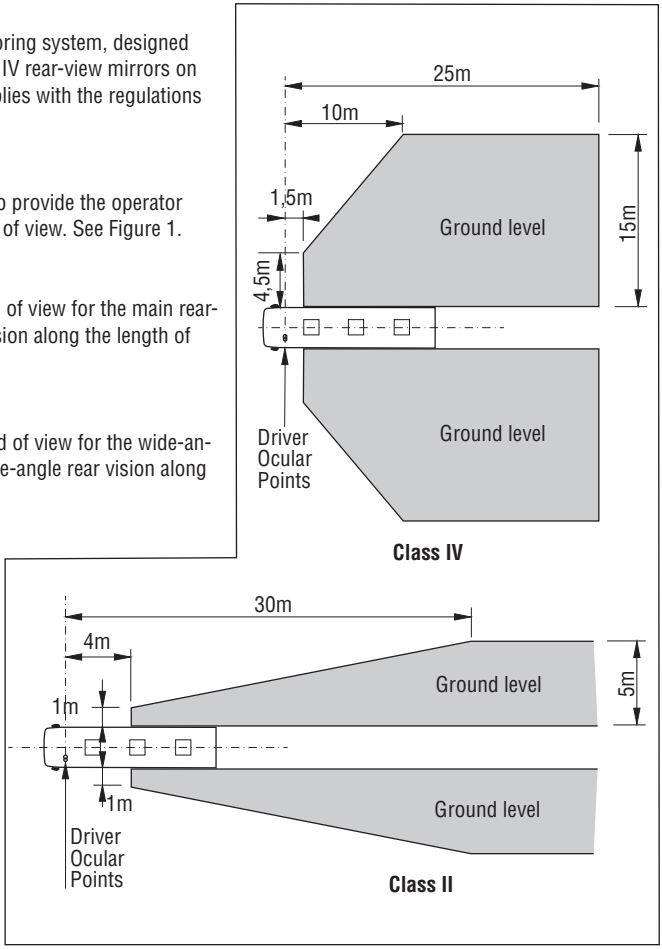


Figure 1

2.1. Surveillance camera.

The suffix "+ S" denotes mechanical variants of the camera housing that allow the use of a standalone surveillance camera. This camera has to comply to the 2.5mm radius requirement of the R46R6. This surveillance camera is not included in this certification.

3. System descriptions

Set MirrorEye MP, Art. No. 0415005
System overview

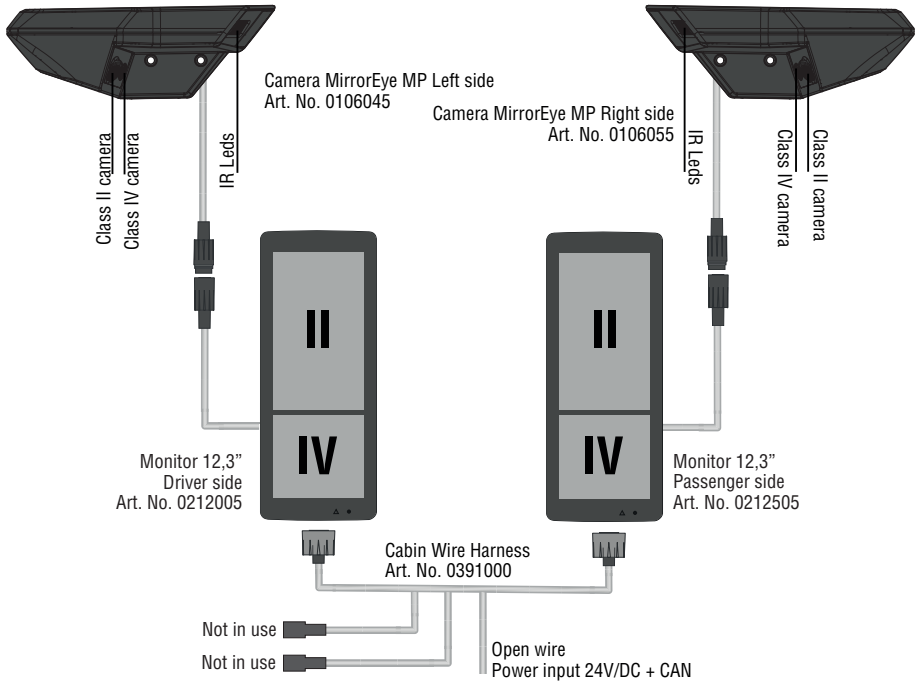


Figure 2

3.1. System view Set MirrorEye MP, see figure 2.
The MirrorEye system set consists of:

- Two Camera units; each including two image sensors for class II/IV field of view, video processor, video channel transceiver with bidirectional communication, heating and covers. All cameras are mounted outside the vehicle. One camera on the left and one camera on the right.

- Two monitor units each with a 12.3-inch display for class II/IV image, video channel receiver with bidirectional communication, monitor processor, diagnostics, CAN communication with vehicle, MirrorEye internal CAN communication and housing. Mounted inside the Vehicle.

- Cabin Wire Harness. The cable cabin harness is the connection harness for the system to the vehicle with power and ground wires. The harness has connectors on each side to connect the two monitors. Other connections are the CAN communication wires and the connection to the service tool. See also figure 7, page 10.

Set MirrorEye MP RHD + S , Art. No. 0415015
System overview

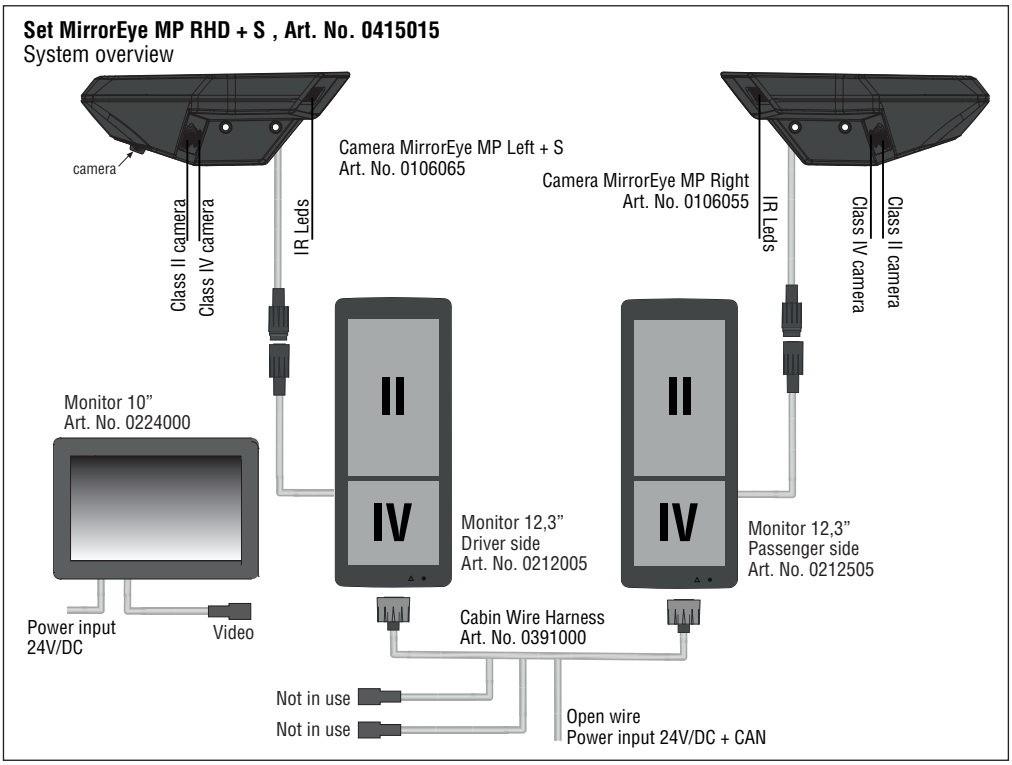


Figure 3

3.2. System view Set MirrorEye MP RHD + S, see figure 3.
The MirrorEye system set consists of:

- Two camera units; each having two image sensors for class II / IV field of view, in which the left-hand camera also has an additional camera, video processor, video channel transceiver with bidirectional communication, heating and covers. One camera unit mounted left outside on the Vehicle and one camera mounted right outside of the Vehicle.

- Two Monitor units each with a 12.3-inch Monitor for class II/IV image, video channel receiver with bidirectional communication, Monitor processor, diagnostics, CAN communication with vehicle, MirrorEye internal CAN communication and housing. Mounted inside the Vehicle.

- The additional camera will be displayed on a separate monitor.

- Cabin Wire Harness. The cable cabin harness is the connection harness for the system to the vehicle with power and ground wires. The harness has connectors on each side to connect the two monitors. Other connections are the CAN communication wires and the connection to the service tool. See also figure 7, page 10.

- Cable 2m UNI DigiCoax with molded M16 4p connectors + Coax.

Set MirrorEye MP LHD + S , Art. No. 0415025
System overview

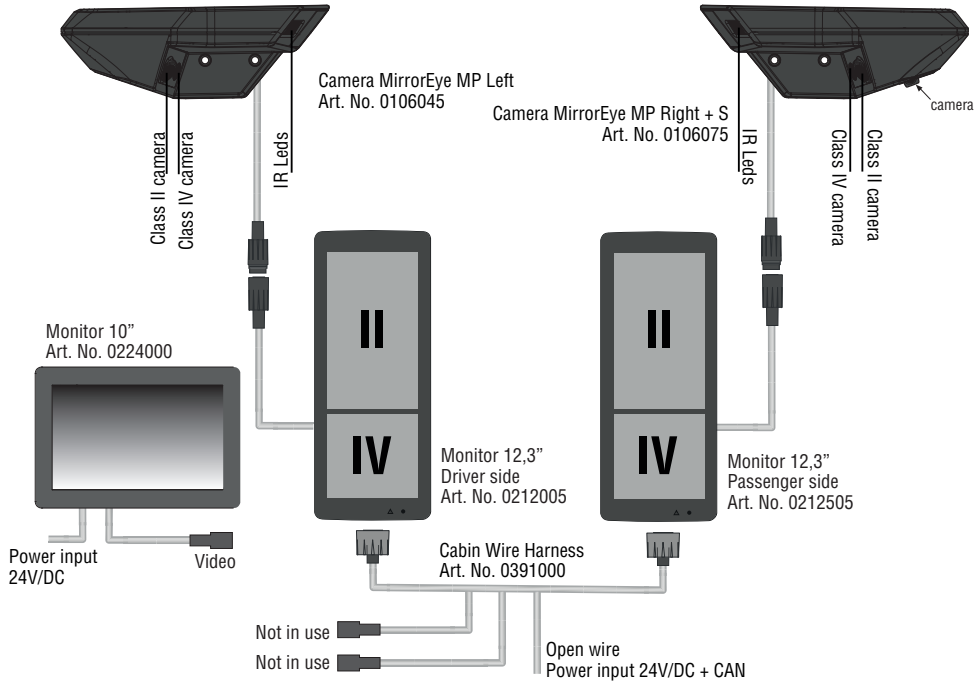


Figure 4

3.3. System view Set MirrorEye MP LHD + S, see figure 4.
The MirrorEye system set consists of:

- Two camera units; each having two image sensors for class II / IV field of view, in which the right-hand camera also has a additional camera, video processor, video channel transceiver with bidirectional communication, heating and covers. One camera unit mounted left outside of the Vehicle and one camera mounted right outside of the Vehicle.

- Two Monitor units each with a 12.3-inch Monitor for class II/IV image, video channel receiver with bidirectional communication, Monitor processor, diagnostics, CAN communication with vehicle, MirrorEye internal CAN communication and housing. Mounted inside the Vehicle.

- The additional camera will be displayed on a separate monitor.

- Cabin Wire Harness. The cable cabin harness is the connection harness for the system to the vehicle with power and ground wires. The harness has connectors on each side to connect the two monitors. Other connections are the CAN communication wires and the connection to the service tool. See also figure 7, page 10.

- Cable 2m UNI DigiCoax with molded M16 4p connectors + Coax.

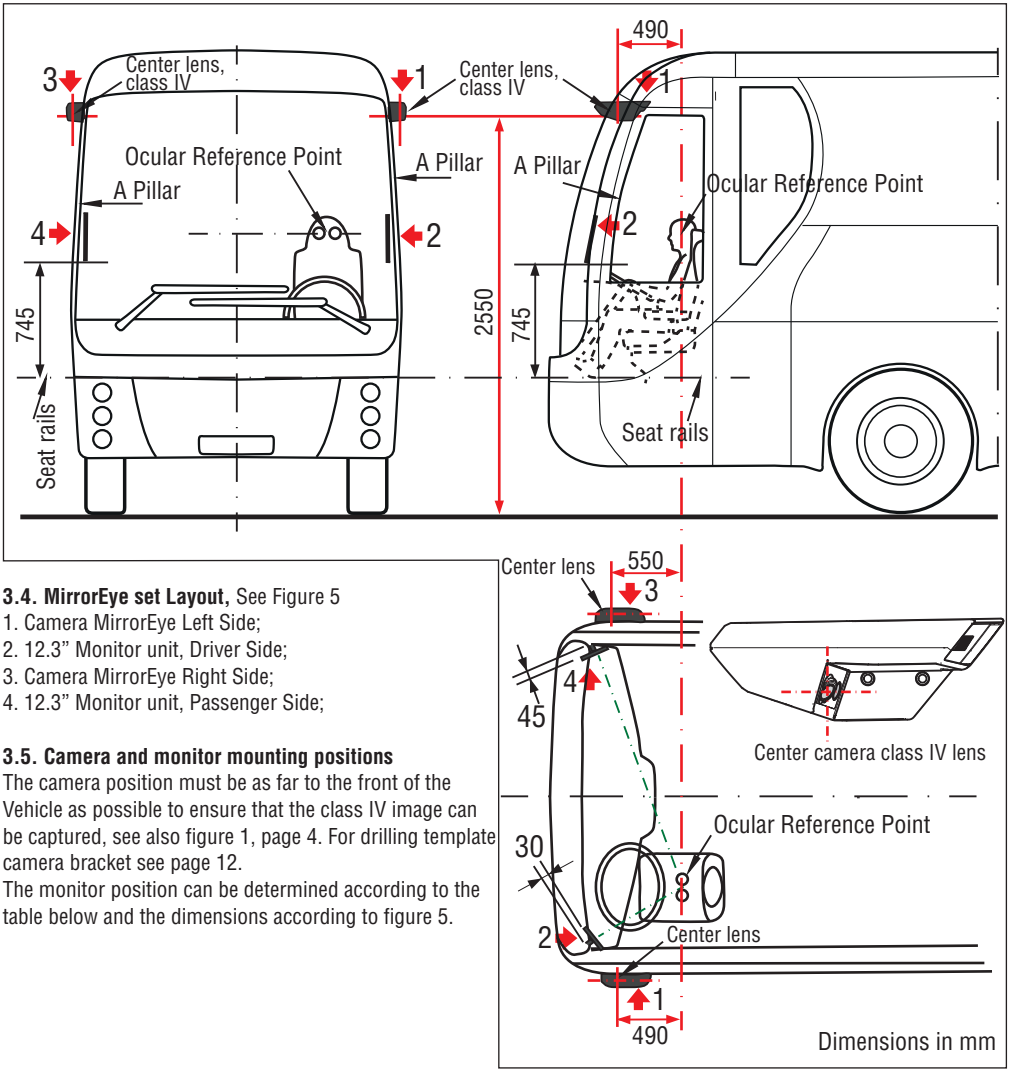


Figure 5

3.4. MirrorEye set Layout, See Figure 5
1. Camera MirrorEye Left Side;
2. 12.3" Monitor unit, Driver Side;
3. Camera MirrorEye Right Side;
4. 12.3" Monitor unit, Passenger Side;

3.5. Camera and monitor mounting positions
The camera position must be as far to the front of the Vehicle as possible to ensure that the class IV image can be captured, see also figure 1, page 4. For drilling template camera bracket see page 12.
The monitor position can be determined according to the table below and the dimensions according to figure 5.

Installation requirement

Class	Location	Monitor	Design viewing angle horizontal	Design viewing angle vertical	Distance ORP to monitor
Class II	driver	12,3"	0°	-11°	0,815m
Class IV	driver	12,3"	0°	11°	0,80m
Class II	passenger	12,3"	0°	-6°	1,225m
Class IV	passenger	12,3"	0°	6°	1,22m

3.6. MirrorEye installation

3.6.1. Distance lines.

The distance lines are not visible by default but can be programmed and set according to rules, see instruction manual UM0972206. This setting can only be done by your dealer. Distance lines can be progammed on both the driver-side monitor and the passenger-side monitor. See Figure 6.
These distance lines are designed to be able to determine the distance from other traffic on the road and to help the operator change lanes safely.
There are 3 programmable distance lines (A, B and C).

The settings remain stored after power down. It is the responsibility of the dealer to make sure that they have a process in place to make sure that the distance lines are calibrated properly according to the description above and that this process is repeatable. Stoneridge-Orlaco is not responsible for any errors in the calibration of the distance lines.
The distance lines must be assessed during vehicle installation approval.

3.6.2. Maintenance instructions

Stoneridge-Orlaco advises the operator and/or owner of the vehicle to regularly check the calibration of the distance lines. Besides this Stoneridge-Orlaco strongly advises to check the calibration when the vehicle is at a service station for servicing

Advise:
We strongly advise to contact your Stoneridge–Orlaco dealer for detailed instructions regarding the installation.

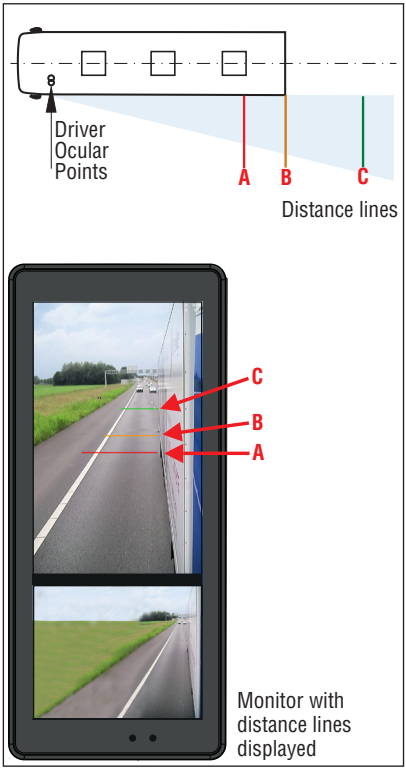


Figure 6

4. Cabin Wire Harness electrical connections

The MirrorEye MP Set must be connected by trained electricians. Under **no** circumstances should you make connections that are **not** described in this manual.

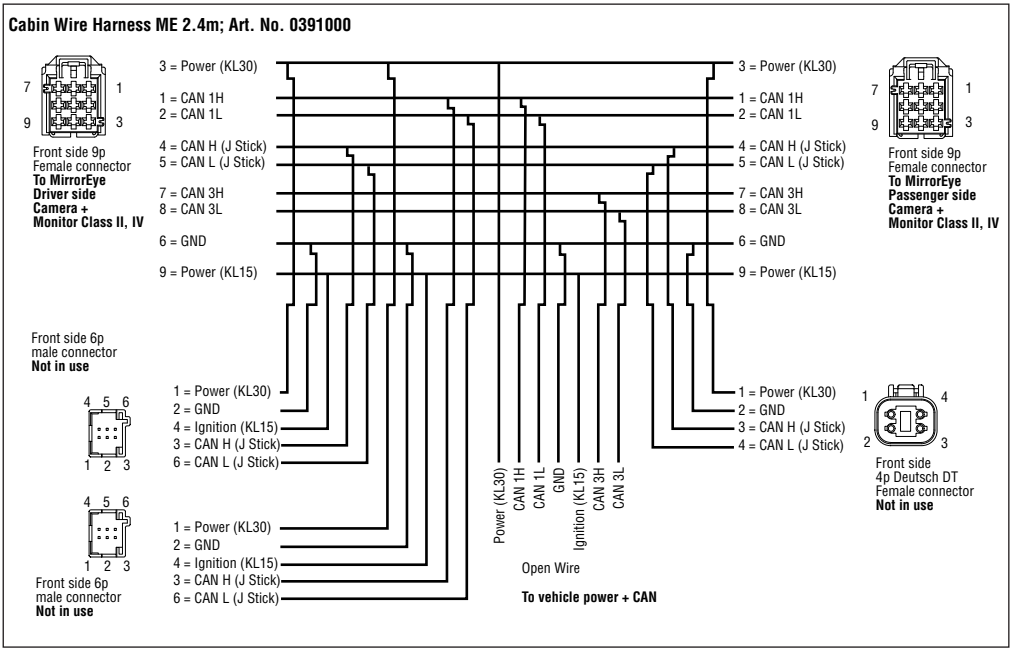


Figure 7

5. Dimensions

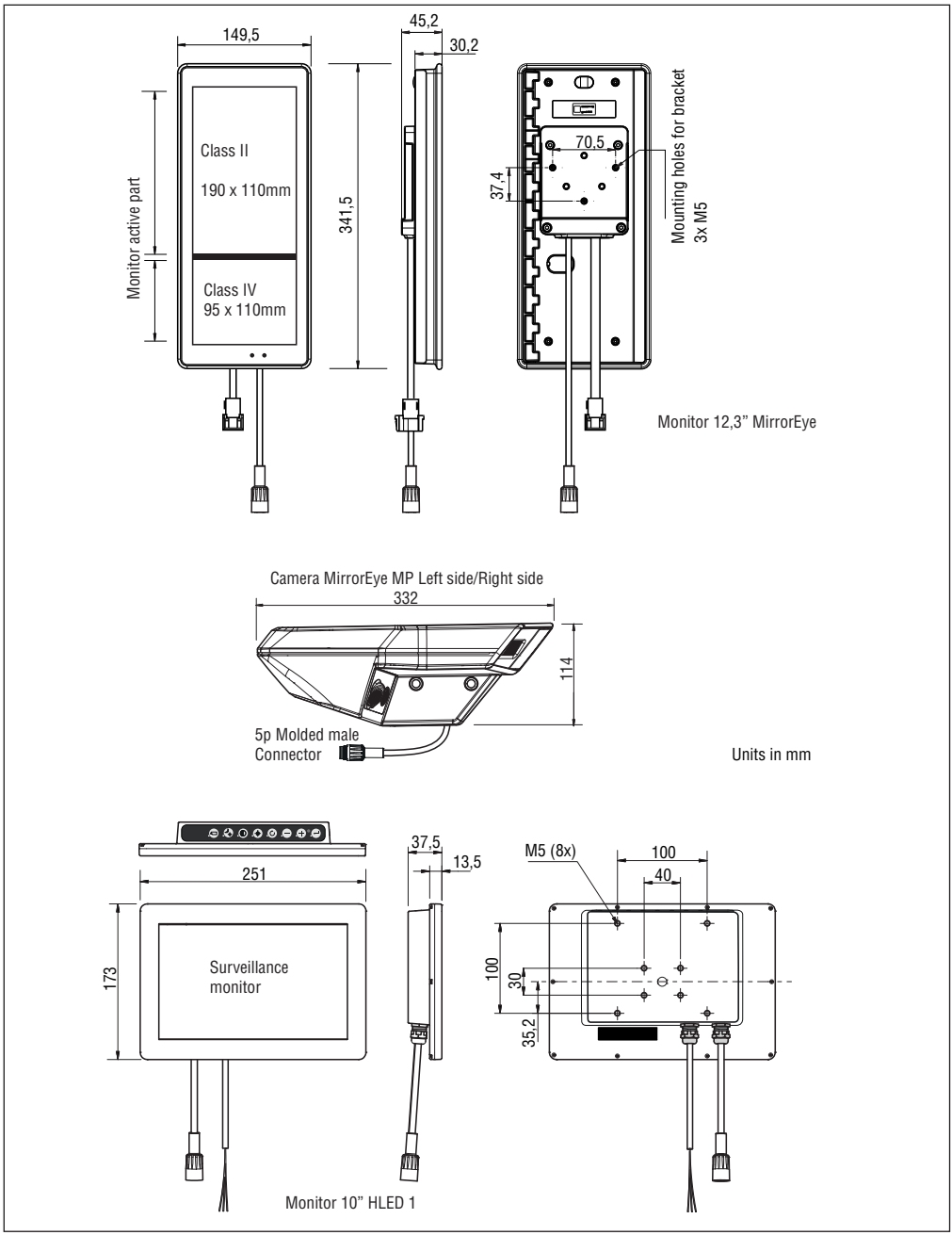


Figure 8

6. Drilling template

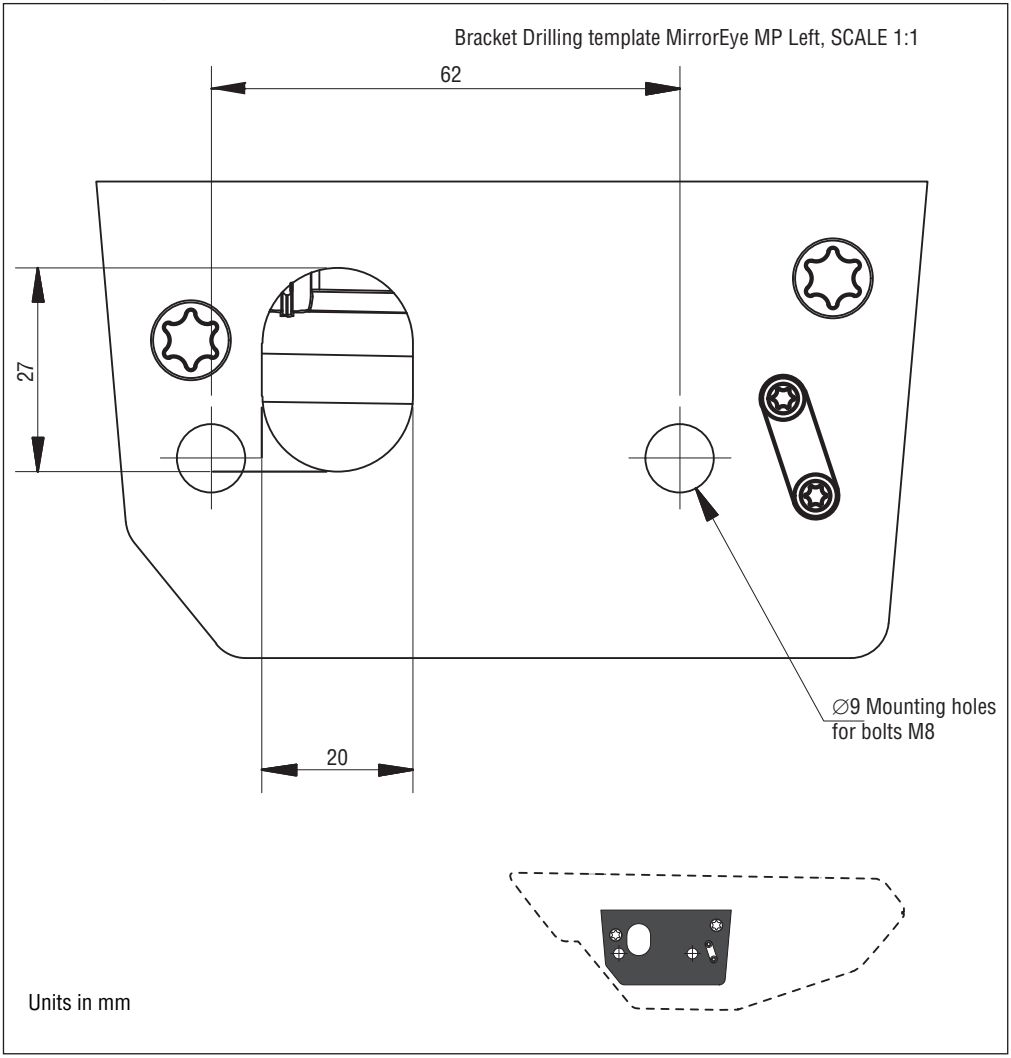


Figure 9

7. Technical specifications

7.1. Technical specifications Art. No. 0415005; Set MirrorEye MP

Camera Units

	Camera MirrorEye MP Left	Camera Mirror Eye MP Right
Article numbers	**0106045**	**0106055**
Camera module	Two image sensors for Class II/IV view, 1.4MP.	
Video stream	Uncompressed over Coax cable (3Gbps).	
Night Vision	Active Day/Night filter + IR LED.	
Ingress protection	IP69K	
Optic	Class II H/V: 17,8/37,6 deg. Class IV H/V: 56,5/61,5 deg.	
Weight	1,66Kg/part. (Incl. cable)	

Monitor 12,3" MirrorEye

	Monitor driver side	Monitor passenger side
Article numbers	**0212005**	**0212505**
Backlight	TFT LED	
Luminance	Min 800cd/m^2	
Display module	12,3" (diagonal size), 720 x 1223 pixels for Class II image, 720 x 617 pixels for IV image.	
Bracket	Universal fastening for easy assembly to most vehicles.	
Ingress protection	IP54	
Communication cam.-mon.	High speed bi-directional over Coax cable, operational with active video channel.	
Aspect ratio	Portrait 3 : 8.	
Frame rate	60 fps.	
Weight	1,92Kg/part. (Incl. cable)	

Cable Cabin Harness ME 2.4m

Article number	**0391000**
Electrical connections	The cable cabin harness is the connection harness for the system to the vehicle with power and ground wires. The harness has connectors on each side to connect the two monitors. Other connections are the CAN communication wires and the connection to the service tool.
Lenght	2.4m

General

	Mechanical tested and suitable for automotive applications.
Operating temperature	-40°C - +85°C, (max +40°C with IR illumination).
Power supply	24V.
Power consumption	Max 96W, 4A@24V. We advise to use a fuse of 10A.
Documentation	User Manual UM0972205, UM0972206 and System Manual SM0974205.
Product identification	C-03:M-02:O-02:S-04:V-02.
Compliance	R46R6 R10R5 ISO-16750:2006-2012 ergonomic requirements RoHS Vibration resistance camera unit: 3G

7.2. Technical specifications, Art. No. 0415015; Set MirrorEye MP RHD + S

Camera Units

	Camera MirrorEye MP Left + S	Camera Mirror Eye MP Right
Article numbers	**0106065**	**0106055**
Camera module	Two image sensors for Class II/IV view, 1.4MP. Additional camera.	Two image sensors for Class II/IV view, 1.4MP.
Video stream	Uncompressed over Coax cable (3Gbps).	Uncompressed over Coax cable (3Gbps).
Night Vision	Active Day/Night filter + IR LED.	Active Day/Night filter + IR LED.
Ingress protection	IP69K	IP69K
Optic	Class II H/V: 17,8/37,6 deg. Class IV H/V: 56,5/61,5 deg. Class S H/V: 120/74 deg.	Class II H/V: 17,8/37,6 deg. Class IV H/V: 56,5/61,5 deg.
Weight	1,86Kg/part. (Incl. cable)	1,66Kg/part. (Incl. cable)

Monitor 12,3" MirrorEye

	Monitor driver side	Monitor passenger side
Article numbers	**0212005**	**0212505**
Backlight	TFT LED	
Luminance	Min 800cd/m^2	
Display module	12,3" (diagonal size), 720 x 1223 pixels for Class II image, 720 x 617 pixels for IV image.	
Bracket	Universal fastening for easy assembly to most vehicles.	
Ingress protection	IP54	
Communication cam.-mon.	High speed bi-directional over Coax cable, operational with active video channel.	
Aspect ratio	Portrait 3 : 8.	
Frame rate	60 fps.	
Weight	1,92Kg/part. (Incl. cable)	

Monitor 10" HLED 1

Monitor for additional camera

Article number	**0224000**
Specifications	See DS0962201

Cable Cabin Harness ME 2.4m

Article number	**0391000**
Electrical connections	The cable cabin harness is the connection harness for the system to the vehicle with power and ground wires. The harness has connectors on each side to connect the two monitors. Other connections are the CAN communication wires and the connection to the service tool.
Lenght	2.4m

Cable 2m UNI Digicoax

Article number	**0311010**
Specifications	See DS0960131

General

Mechanical tested and suitable for automotive applications.

Operating temperature	-40°C - +85°C, (max +40°C with IR illumination).
Power supply	24V.
Power consumption	Max 96W, 4A@24V. We advise to use a fuse of 10A.
Documentation	User Manuals UM0972205, UM0972206 and System Manual SM0974205.
Compliance	R46R6 R10R5 ISO-16750:2006-2012 ergonomic requirements RoHS Vibration resistance camera unit: 3G

7.3. Technical specifications, Art. No. 0415025; Set MirrorEye MP LHD + S

Camera Units

	Camera MirrorEye MP Left	Camera Mirror Eye MP Right + S
Article numbers	**0106045**	**0106075**
Camera module	Two image sensors for Class II/IV view, 1.4MP.	Two image sensors for Class II/IV view, 1.4MP. Additional camera
Video stream	Uncompressed over Coax cable (3Gbps).	Uncompressed over Coax cable (3Gbps).
Night Vision	Active Day/Night filter + IR LED.	Active Day/Night filter + IR LED.
Ingress protection	IP69K	IP69K
Optic	Class II H/V: 17,8/37,6 deg. Class IV H/V: 56,5/61,5 deg.	Class II H/V: 17,8/37,6 deg. Class IV H/V: 56,5/61,5 Class S H/V: 120/74 deg.
Weight	1,66Kg/part. (Incl. cable)	1,86Kg/part. (Incl. cable)

Monitor 12,3" MirrorEye

	Monitor driver side	Monitor passenger side
Article numbers	**0212005**	**0212505**
Backlight	TFT LED	
Luminance	Min 800cd/m^2	
Display module	12,3" (diagonal size), 720 x 1223 pixels for Class II image, 720 x 617 pixels for IV image.	
Bracket	Universal fastening for easy assembly to most vehicles.	
Ingress protection	IP54	
Communication cam.-mon.	High speed bi-directional over Coax cable, operational with active video channel.	
Aspect ratio	Portrait 3 : 8.	
Frame rate	60 fps.	
Weight	1,92Kg/part. (Incl. cable)	

Monitor 10" HLED 1

Monitor for additional camera

Article number	**0224000**
Specifications	See DS0962201

Cable Cabin Harness ME 2.4m

Article number	**0391000**
Electrical connections	The cable cabin harness is the connection harness for the system to the vehicle with power and ground wires. The harness has connectors on each side to connect the two monitors. Other connections are the CAN communication wires and the connection to the service tool.
Lenght	2.4m

Cable 2m UNI Digicoax

Article number	**0311010**
Specifications	See DS0960131

General

Mechanical tested and suitable for automotive applications.

Operating temperature	-40°C - +85°C, (max +40°C with IR illumination).
Power supply	24V.
Power consumption	Max 96W, 4A@24V. We advise to use a fuse of 10A.
Documentation	User Manuals UM0972205, UM0972206 and System Manual SM0974205.
Compliance	R46R6 R10R5 ISO-16750:2006-2012 ergonomic requirements RoHS Vibration resistance camera unit: 3G

8. Potential failures:

Symptom	Action driver
1. Black screen	1. Driver should stop the vehicle in a safe manner, as soon as possible.
2. Blue screen	2. Driver should stop the vehicle in a safe manner, as soon as possible.
3. Overlay menu not available	3. Driver should assess the problem and stop vehicle if necessary.
4. Test pattern shown	4. Driver should stop the vehicle in a safe manner, as soon as possible.
5. Mirrored image	5. Driver should stop the vehicle in a safe manner, as soon as possible.
6. Flipped image	6. Driver should stop the vehicle in a safe manner, as soon as possible.
7. Full in screen deformation of image	7. Driver should stop the vehicle in a safe manner, as soon as possible.
8. Partly in screen deformation of image	8. Driver should assess the problem and stop vehicle if necessary.
9. Color representation of image wrong	9. Driver should assess the problem and stop vehicle if necessary.
10. Incorrect image cropping and scaling	10. Driver should assess the problem and stop vehicle if necessary.
11. Incorrect image sharpness	11. Driver should assess the problem and stop vehicle if necessary.
12. Corrupted image stream due to Electric Magnetic Interference (EMI)	12. Driver should assess the problem and stop vehicle if necessary
13. Wrong placement of camera views on monitor	13. Driver should assess the problem and stop vehicle if necessary.
14. Image too bright	14. Driver should assess the problem and stop vehicle if necessary.
15. Image too dark	15. Driver should assess the problem and stop vehicle if necessary.

If the above mentioned failures occur, the operator must stop the vehicle and must not resume driving until the failures are resolved.

In the event of MirrorEye system failure, please contact your dealer.

8.1. Monitor LED status indicator

The 12,3" monitor has a red LED status indicator. See Figure 10. This LED will be activated in the following situations:

- MirrorEye Monitor in reset.
- MirrorEye video stream failure.
- MirrorEye Monitor TFT panel failure.
- MirrorEye Monitor boot failure.

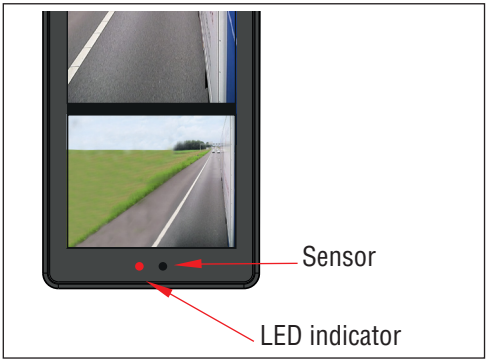


Figure 10

9. MirrorEye Settings menu

The Menu of the MirrorEye system can only be accessed via a vehicle controller and by a dealer. In this menu, the distance lines can be programmed as well as other features of the MirrorEye system.
See manual UM0972206.

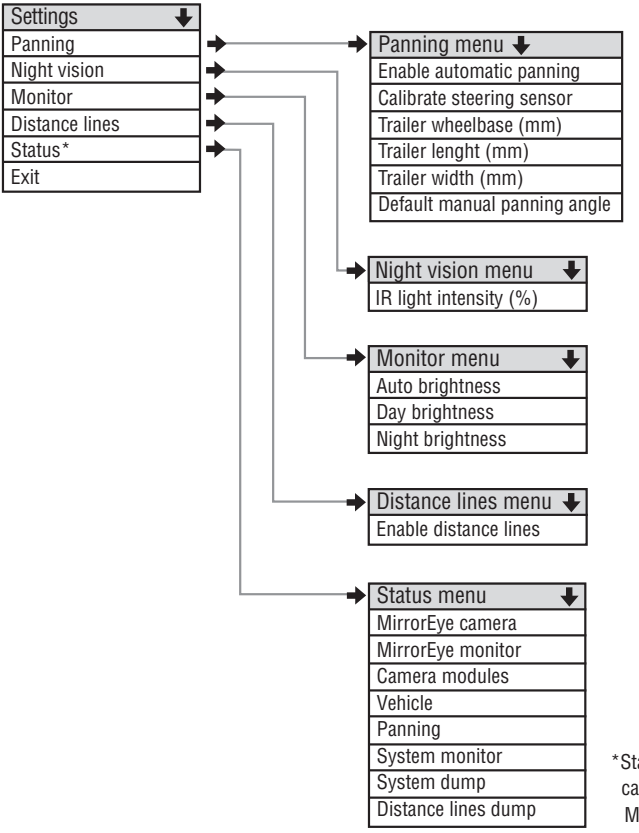
Functions of the buttons:

Button **1:** Day/night both sides
Button **2:** Not applicable
Button **3:** Manual monitor brightness adjustment
Button **4**: Driver side, Menu (long push)
Button **5:** Passenger side, Menu (long push)
Press on turning knob: Enter, changes are stored

N.B. Panning is not supported.
Other available info in the menu is described in the next chapter.

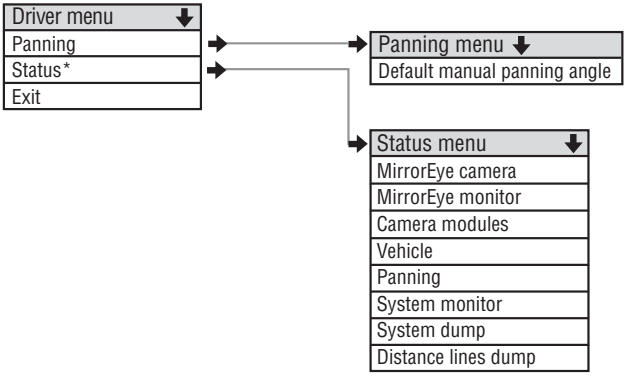
9.1. Menu

Driver side



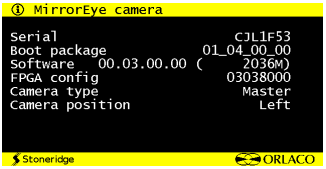
*Status menu: Shows system information that can be requested in case of a service call. More details see Chapter 9.2. next page.

Passenger side



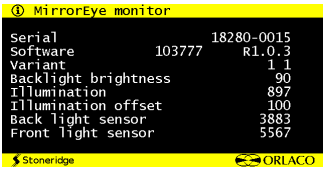
9.2. Status menus

Example of system information



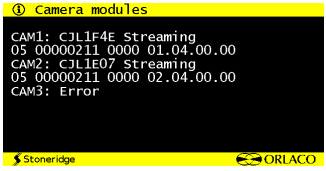
MirrorEye camera

Example of system information



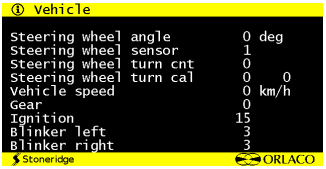
MirrorEye monitor

Example of system information



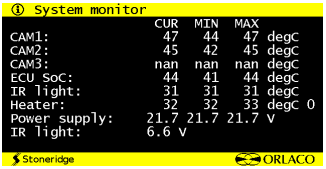
Camera modules

Example of system information



Vehicle

Example of system information



System monitor

Example of system information

System dump

10. Maintenance and cleaning

Passive cleaning ensures that the camera lenses stay clean, using a coating on the glass.
Automatic heating ensures that the camera lenses stay clear of ice and fog by evaporating water from the front of the camera lenses.
Use a high-quality, safe detergent and a soft cloth to remove dirt and debris from the lenses.

Do not clean this product using aggressive chemicals or abrasive cleaning agents.

11. Disposal

Disassembly, removal and disposal. Local regulations for dealing with waste must be followed when disposing of disassembled components or entire units.

12. General terms and conditions

Stoneridge/Orlaco Products BV is not liable for damage resulting from inadequate servicing, incorrect usage or alterations made to the equipment without informing the manufacturer in writing.

Stoneridge/Orlaco reserves the right to make changes to components at any time without informing customers beforehand or directly. All dimensions given are for commercial purposes.

For information regarding repairs that is not covered in this manual, please contact the Stoneridge/Orlaco Products BV service department.

This manual has been prepared with all due care and attention. However, Stoneridge/Orlaco cannot be held responsible for any errors in this manual or any consequences thereof.

13. Revision History

Revision A 01. First issue, May 2019.
Revision A 02. Specifications + article numbers changed, January 2020.
Revision A 03. New issue, February 2020.
Revision A 04. LED indicator added, March 2020.
Revision A 05. Text Surveillance camera added, March 2020.
Revision A 06. Text changes, March 2020.
Revision A 07. Menu changes, May 2020.
Revision A 08. Text changes, June 2020.
Revision A 09. Article names changed, June 2020.

ORLACO

Orlaco is a Manufacturing company that specializes in making cameras and monitor systems for commercial vehicles, fork-lift trucks, cranes, off shore and maritime.

Our objective is to design and produce camera systems for the professional market that improve the drivers' view and increase operating efficiency.

At our facility in Barneveld we locate our design, manufacturing, warehousing and service department.

Vision is our mission®. Orlaco therefore deploys the development, manufacture, supply and service of camera and Monitor systems that will improve safety and efficiency of all vehicles, machinery and vessels.
Our systems give the end user a view on each blind spot and will create comfort and improved working conditions. Our active approach will support market demands and innovations and will lead to enthusiastic ambassadors in the market; our customers.

For more information: www.Stoneridge.com and www.orlaco.com

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