Optional equipment

Assistance system addedVIEW fork arm camera

05.22

Operating instructions

en-GB

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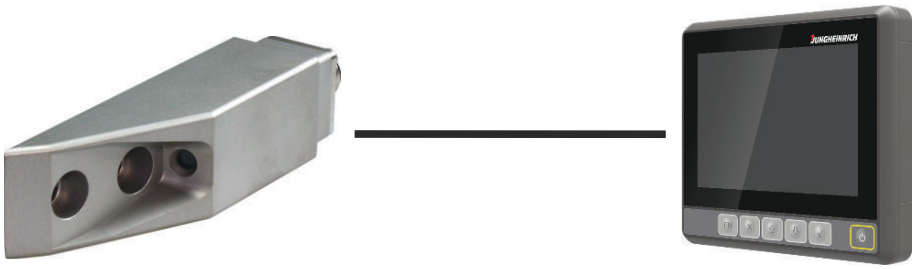
addedVIEW



JUNGHEINRICH

Foreword

Notes on the operating instructions

Safe operation of the forklift truck with assistance system requires the application of expertise contained in these ORIGINAL OPERATING INSTRUCTIONS. The information is presented in a precise and clear manner. The chapters are arranged by letter and the pages are numbered continuously.

These ORIGINAL OPERATING INSTRUCTIONS serve as a supplement to the ORIGINAL OPERATING INSTRUCTIONS of the forklift truck.

Our forklift trucks and assistance systems are subject to ongoing development. We reserve the right to alter the design, features and technical aspects of the equipment. No guarantee of particular features of the equipment can therefore be assumed from the content of these operating instructions.

Safety notices and text mark-ups

Safety instructions and important explanations are indicated by the following graphics:

⚠ DANGER!

Indicates an extremely hazardous situation. Failure to comply with this instruction will result in severe irreparable injury and even death.

⚠ WARNING!

Indicates an extremely hazardous situation. Failure to comply with this instruction may result in severe irreparable injury and even death.

⚠ CAUTION!

Indicates a hazardous situation. Failure to comply with this instruction may result in slight to medium injury.

NOTICE

Indicates a material hazard. Failure to comply with this instruction may result in material damage.

➔ Used before notices and explanations.

●	Indicates standard equipment
○	Indicates optional equipment

Manufacturer of the assistance system

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Contents

A Important fundamental information

1 General

The assistance system must be used, operated and maintained in accordance with these operating instructions. Any other type of use is beyond the scope of application and can result in accidents and personal injury as well as damage to forklift trucks or property.

The Jungheinrich assistance system supports the operator, but does not release him from his responsibility:
When using the assistance system, responsibility for the safe operation of the truck lies with the operator. The operator must also be familiar with the system amenities, as well as potential hazards in the event of a failure. The operator remains obligated to monitor the environment and control the truck at all times.

2 Responsibilities

2.1 Instructions for the operator

In principle, assistance systems cannot fulfil a safety function, which means that they are not necessary for the safe operation of the forklift truck. Assistance systems must not be seen as a guarantee for the safe operation of the forklift truck, but should only be used to support the safe operation of the forklift truck.

Assistance systems help operators of forklift trucks to reduce the risk of accidents depending on the operational environment.

When retrofitting an assistance system, a risk assessment must be carried out (in accordance with the EU Work Equipment Directive, and in Germany in accordance with Section 3 of the Ordinance on Industrial Safety and Health (BetrSichV)). The preparation of the assessment is part of the occupational health and safety obligations of the operator of the forklift truck.

2.2 Risk assessment by the operator

The risk assessment must take into account the following hazardous situations in particular and implement appropriate safety measures:
- Check whether the assistance system is used only for support and not as a replacement for safety measures and safety equipment;
- Check whether hazards can arise from installing the assistance system;
- Check whether the operational limits of the assistance system are complied with;
- Check whether there is a risk of accidents due to faults or malfunctions in the assistance system;
- Check whether there is a risk of accidents due to unauthorised use of the assistance system;
- Analyse the dangers of damage and other defects in the assistance system and determine suitable test intervals (at least once a year);
- Analyse the danger due to improper use:
  - Compliance with the limits of the individual system components
- Check whether the operator could become too reliant on the device and thus possible dangers could arise if it fails. Provide instruction for the truck owner and regular training.

⚠ WARNING!

Maintenance personnel without appropriate training or instruction

Maintenance personnel charged with servicing or repairing the assistance system must be in an appropriate mental and physical condition, possess the requisite knowledge and be trained in its safe operation.

- ▶ Maintenance personnel must be advised of the aforementioned points on an annual basis.
- ▶ The completed and successful instruction of the maintenance personnel must be documented in writing.

3 Adding attachments and/or optional equipment

The attachment or installation of additional equipment that affects or supplements the functionality of the assistance system requires written permission from the manufacturer. Approval from the local authority may also be required.
Local authority approval, however, does not substitute the manufacturer's approval.

4 Legal information

These ORIGINAL OPERATING INSTRUCTIONS constitute part of the assistance system.

These operating instructions must not be duplicated, distributed, altered, transmitted or passed on to third parties, either in whole or in part, without the express written permission of the manufacturer.

These operating instructions must be retained for the entire service life of the assistance system and updated where necessary.

Warranty claims will **not** be accepted by the manufacturer in any of the following cases:

- Insufficient qualification or authorisation of persons working on or with the assistance system.
  For example: Lacking qualification or authorisation for maintenance or repair work.
- Improper use of the assistance system.
- Failure to observe the general advice regarding the correct operation of the assistance system contained in these operating instructions.
- Failure to perform maintenance or repair work on the assistance system or performing such work incorrectly.
- Unauthorised modifications to the assistance system.
- Fitting of spare or wear parts that have not been approved for use.

5 Compliance with operating instructions

These operating instructions constitute part of the assistance system. The operating instructions must always be stored at a freely accessible location within the vicinity of the assistance system.

It must be ensured that all persons (operators or specialist personnel) conducting work on the assistance system have access to the operating instructions at all times. This applies throughout the entire service life of the assistance system.

When supplements or amendments to these operating instructions are distributed, these must be stored with the operating instructions.

In addition to the operating instructions, instruction manuals pursuant to the Occupational Safety and Health Act and the Work Equipment Ordinance (accident prevention regulations of the trade associations) must also be made available.

	**Observe the operating instructions** – Description: Failure to observe the information in the operating instructions, particularly the warnings and safety advice, can result in personal injury or material damage. – Behaviour: The operating instructions, and the warnings and safety information in particular, must be complied with.

6 Figures in these operating instructions

The figures used in these operating instructions are provided for illustration purposes only and may differ from the supplied assistance system.

B Description of the assistance system

1 Application

addedVIEW assistance system

The assistance system supports the operator with the correct use and application of the forklift truck, but does not release him from his duty and responsibility. The operator remains obligated to monitor the environment and control the forklift truck throughout the entire usage period.

The assistance system improves the operator's existing view by providing additional views.

The assistance system does not feature any safety functions and does not interfere with the safety functions of the truck.

The assistance system does not release the operator from his duty to observe the applicable safety regulations for truck operation – refer to the truck operating instructions, e.g. with regard to visibility when driving.

Assistance system, equipped with addedVIEW fork-arm camera

A display shows processed video data from a high-resolution digital fork arm camera.

➔ The video data can be displayed mirrored. The mirrored display can be activated or deactivated by the manufacturer's customer service.

Optionally, the display can be enhanced with overlays such as virtual aids, a virtual line laser, detected barcodes and QR codes, or information from a warehouse management system.

The addedVIEW fork-arm camera assistance system can be operated in parallel with the following assistance systems without any restrictions:
– zoneCONTROL
– addedVIEW multi-purpose camera
– addedVIEW 360° camera system
– Compatible custom-built cameras or variants

A simultaneous three-camera display (multi-display) with one fork-arm camera using both the "virtual line laser" and "recognition of barcodes and QR codes" options, together with two additional cameras, is not possible.

The addedVIEW fork-arm camera assistance system can be operated in parallel with the following assistance systems with restrictions:

– addedVIEW person detection camera, without video recording activated
  - No simultaneous three-camera display (multi-display) with at least one person detection camera and fork-arm camera with activated option "virtual line laser" or "recognition of barcodes and QR codes"
– addedVIEW person detection camera, with video recording activated
  - No simultaneous display (multi-display) of fork-arm camera and person detection camera
  - Restriction for addedVIEW fork-arm camera:
    The virtual line laser option cannot be activated or used; the barcode and QR code recognition option cannot be activated or used.
  - No simultaneous display (multiple display) of three Cameras.

➔ With appropriate equipment (○) and sufficiently up-to-date software, up to seven camera inputs can be used in parallel, as long as the assistance system is not overloaded. There may be restrictions on the use of additional functions.

Parallel use of multiple fork-arm cameras is not possible.

When multiple assistance systems are operated in parallel, they must be configured for this purpose with their functions.

2 Assemblies and Functional Description

The display and processing unit of the assistance display is mounted in the field of view of the operator. The assistance display is operated via the touchscreen and the front buttons. The assistance system is configured via a PIN-protected user interface on the assistance display.

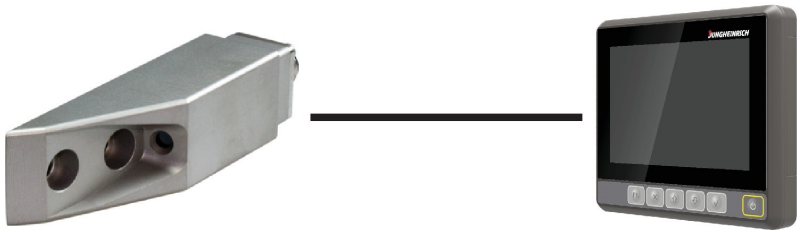
addedVIEW fork arm camera: The digital fork arm camera is located on the inside of the right fork arm and captures the tips of both fork arms as well as the area in between.

The transfer and processing of the video data can result in delays of up to 200 ms.

A compatible forklift truck can be connected to the assistance system via a corresponding coupling (○). On the assistance display, camera connections or projections to be displayed can be switched and changed automatically (○).

addedVIEW assistance system, equipped with addedVIEW fork arm camera

Item	Description
1	Digital fork arm camera
2	Assistance display



1 2

Assistance display

Item	Description
3	Capacitive touchscreen
4	For software versions prior to B55, or for a version without standby mode: – Unassigned button For software version B55 and later, for a version with standby mode (○): – Press the button to activate the display for 5 minutes in standby mode. ➔ Five minutes after the last operation, the display will be switched off again in standby mode. ➔ When the display is activated, settings can be adjusted on the assistance display or event messages can be read.
5	Front-button keypad

3 Technical Specifications

➔ Technical modifications and additions reserved.

3.1 Product Specifications

Assistance display	
Dimensions (width x height x depth[1])	200 mm x 162 mm x 38 mm
Protection rating	IP64 (EN 60529)
Permissible temperature range	-28°C to +50°C
Operating voltage	24V (16.8V–31.2V)
Display diagonal	178mm (7")
Type of display	Matt, low-reflection, LED-backlit
Display resolution	1280pixels x 800pixels (colour)
Brightness	≥ 450cd/m²
Contrast	≥ 800:1
Viewing angle (horizontal / vertical)	176° / 176°
Touchscreen	Capacitive [2]
[1] without connector plug	
[2] The touchscreen can be used only to a limited extent when wearing gloves.	

Digital fork-arm camera	
Dimensions (width x length x height)	Max. 32mm x 32mm x 230mm
Protection type (with plug connected)	IP68 (EN 60529) IP69K (EN 60529, ISO 20653)
Camera resolution	1920 pixels x 1080 pixels (Full HD)
Inclination (angle of the camera axis in the housing)	15°

Barcode and QR code recognition (○)	
Types of recognisable barcode	– Code128 – Code39 – Interleaved2of5
Types of recognisable QR code	– QR code model 1 – Micro QR code
Module widths of barcodes and QR codes to be read	0.7mm - 1.2mm
Required lighting in place of use	At least 55 lux
Working distance between tip of fork arm and pallet (or barcode / QR code) for reliable detection function	20cm - 30cm
Requirements of truck terminal	– Wireless terminal client version 1.38.0.0 or higher – WMS from version 7.1c
Network connection to the truck terminal	Network cable – CAT6 S/FTP • 1.2 m: 52322769

3.2 Conditions of use

⚠ WARNING!

Operation under extreme conditions

Using the assistance system outside the conditions described can lead to malfunctions and accidents.

- ▶ Usage under extreme conditions, in particular in very dusty or corrosive environments, is not permitted.
- ▶ Use in potentially explosive atmospheres is prohibited.
- ▶ It is forbidden to operate the truck terminal near unprotected active components of electrical equipment.
- ▶ In adverse weather conditions (thunder, lightning), a forklift truck with an assistance system must not be operated outside or in hazardous areas.

- – Operation in industrial and commercial environments.
- – Permissible temperature range: -28 °C up to +50 °C at a relative air humidity of 10 % up to 95 %, non-condensing.
- – The forklift truck cannot be used in areas at risk of explosion.

The components of the assistance system can be used for cold store applications up to -28 °C. Special approval from the manufacturer is needed for permanent cold store interchangeable inserts.

Observe the permissible temperature range of the forklift truck. The permissible range of the assistance system application temperature does not increase the permissible range of the forklift truck application temperature.

3.3 Open-source licences

Parts of the assistance system and/or related programs contain Open-source software (OSS) in the form of applications or components.

Licensing terms

An overview of the Open-source software (OSS) used is publicly and freely available online with details of the respective copyright notices and licence texts:
https://www.jungheinrich.de/open-source-assistance-systems

C Operation

1 General

⚠ WARNING!

Risk of collision when operating the assistance system

Operation of the assistance system during travel or hydraulic operations can lead to collisions with persons and objects.

- ▶ Do not operate the assistance system during travel or hydraulic operations.
- ▶ Prior to operation, adapt the assistance display (●) and forklift truck terminal (○) holders to the operator so that injuries during normal operation are excluded.
- ▶ Prior to operation, adjust the driver's seat to avoid striking the assistance display (●) or forklift truck terminal (○) during normal operation, ensuring that the forklift truck can still be safely operated.

⚠ WARNING!

Risk of collision due to restricted visibility or distraction

The assistance display and optional forklift truck terminal can restrict the operator's view depending on the mounting position. A restricted view or distraction can lead to collisions with persons and objects.

- ▶ Increased attention required during travel and hydraulic operations.
- ▶ Ensure that the operating area and working area are clear.
- ▶ Adjust your travel speed and load handling according to the visibility conditions.
- ▶ Do not change the mounting position of the assistance display and forklift truck terminal (○).
- ▶ Do not cover the assistance display or the truck terminal (○).
- ▶ Check the secure installation of the assistance display, truck terminal (○), bracket and accessories on a weekly basis.

⚠ WARNING!

Danger of collision due to malfunction, impaired view or overfamiliarity

In the case of malfunctions of the assistance system, the image on the assistance display may be reduced or may no longer be updated. Operating the forklift truck based solely on the assistance display and without a direct view of the operating and working area or a lack of attention due to overfamiliarity can result in collisions with persons and objects.

- ▶ Increased attention required during travel and hydraulic operations.
- ▶ When operating the forklift truck, check the visible operating and work area as well as checking the assistance display to avoid lack of attention caused by overfamiliarity.
- ▶ Adjust your travel speed and load handling according to the visibility conditions.
- ▶ If a malfunction of the assistance system is sufficiently serious to render subsequent operation of the truck impossible, mark the truck accordingly and take it out of service. Do not return the truck to service until you have identified and rectified the fault.

⚠ WARNING!

Risk of collision when operating the truck based solely on an indirect view

Rapid changes in temperature with temporary fogging of the camera lenses, unfavourable light conditions (glare due to scattered light, darkness) or environmental conditions (heavy rain, fog, lack of contrast or distinguishable structures) can result in persons or objects no longer being recognisable as such on the display.

Objects outside the recorded areas as well as above the cameras do not appear on the display.

Operating the forklift truck based solely on the assistance display and without a direct view of the operating and working area can result in collisions with persons and objects.

- ▶ Increased attention required during travel and hydraulic operations.
- ▶ When operating the truck based on the assistance display, you must also check the direct view of the operating and working area.
- ▶ Adjust your travel speed and load handling according to the visibility conditions.

NOTICE

Changed camera position due to effects on the housing of the fork arm camera

If the housing is subjected to force, the fork arm camera can change its position and orientation, for example due to falling objects, incorrectly picking up loads or ramming pallets.

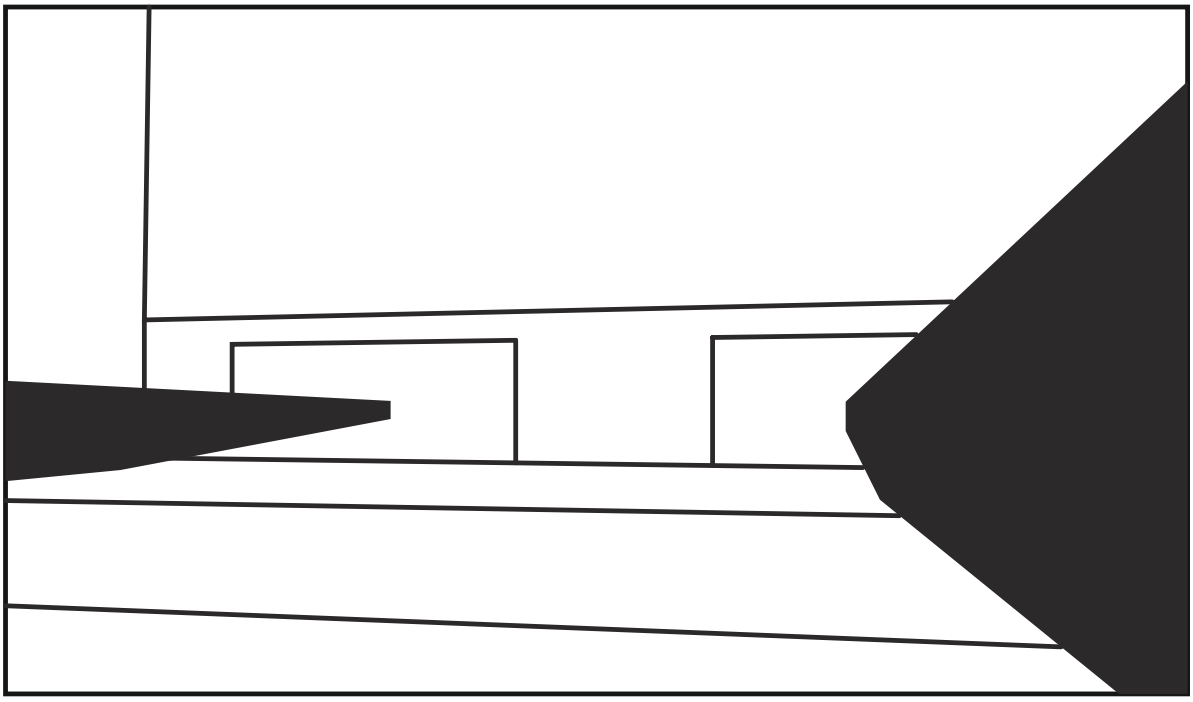
- ▶ Avoid violent impacts on the housing of the fork arm camera.
- ▶ After violent impact, check the housing of the fork arm camera for damage. If necessary, calibrate the virtual line laser (○) – see page 32.
- ▶ Do not continue to operate a damaged or misaligned fork arm camera. Contact the manufacturer's customer service department.

NOTICE

Perspective-distorted video signal from the fork arm camera

The fork arm camera mounted on the side of a fork arm delivers a perspective-distorted video signal: Fork arms and size ratios on the right side of the picture differ from those on the left side of the picture. Perspective distortion decreases with increasing distance.

- ▶ When unstacking with the aid of the fork arm camera, place the fork arms horizontally if possible to avoid subsequent corrections when inserting the fork arms into the pallet.



2 Switching On and Off

NOTICE

Risk of material damage due to condensation

Rapid changes in temperature can result in the formation of condensation and damage to the assistance display.

▶ Only switch on the truck once the assistance display has adapted to the ambient temperature.

For software version B55 and later, for a version with standby mode (○):
Pressing the right button on the keypad of the assistance display activates the display for 5 minutes in standby mode. Five minutes after the last operation, the display will be switched off again in standby mode.

▶ When the display is activated, settings can be adjusted on the assistance display or event messages can be read.

2.1 Standard equipment

After the truck emergency disconnect switch has been released, the required supply voltage is made available. The assistance display and other components on the truck are switched on when the truck is switched on.

Standard version: The activated assistance display starts up and a signal tone sounds to check the function of the internal loudspeaker.

Version with standby mode (○): The activated assistance display immediately begins the start-up procedure, even without activating the display. After switching on by means of the key switch or keyless access system, the start-up procedure is completed, the display is activated and a signal tone sounds to check the function of the internal loudspeaker.

After the start-up procedure is completed, the assistance display is ready for operation.
If the start-up procedure is not completed after 120 seconds at the latest or there is no tone and even switching off and then on again does not fix the problem, there is a fault (see page 51).

Version with standby mode (○): Switching off via key switch or keyless access system deactivates the display.

The assistance display and other components can be switched off only by actuating the truck emergency disconnect switch.

Restarting is possible only by actuating and releasing the emergency disconnect switch and switching on the truck.

2.2 Optional equipment

The required supply voltage is available as soon as the battery is connected to the truck and activated. The assistance display and other components of the assistance system on the truck are then already activated, regardless of whether the truck is switched on or the emergency disconnect switch is released.

Standard version: The activated assistance display starts up and a notice tone sounds to check the function of the internal loudspeaker.

Version with standby mode (○): The activated assistance display immediately begins the start-up procedure, even without activating the display. After switching on by means of the key switch or keyless access system, the start-up procedure is completed, the display is activated and a notice tone sounds to check the function of the internal loudspeaker.

After the start-up procedure is completed, the assistance display is ready for operation.
If the start-up procedure is not completed after 120 seconds at the latest or there is no tone and even switching off and then on again does not fix the problem, there is a fault (see page 51).

Version with standby mode (○): Switching off via key switch or keyless access system deactivates the display.

The assistance display and other components can be switched off only by disconnecting or deactivating the truck battery.

A restart is only possible by disconnecting or deactivating the truck battery and subsequently connecting and activating it.

3 Displays and Controls

In the activated addedVIEW assistance system equipped with addedVIEW fork arm camera, the video data of the selected digital camera is displayed by default, unless otherwise configured.

The assistance display keypad can be used to switch manually to another camera (○) or to the home page of the configuration view.

Select, activate or deactivate the options available (○) by pressing the touchscreen.

➔ Extended options are shown greyed out if they are not available for the specific equipment.

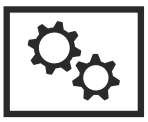
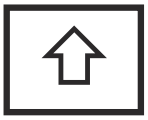
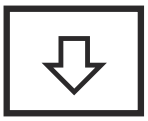
Extended functions are available when the assistance system is appropriately coupled (○) to the truck:
– Automatic camera image cut-off: Outside the set speed limits, the camera image display is automatically switched off and replaced by an icon.
– Automatic changeover of camera images: If several addedVIEW cameras or camera systems are available and the "Auto" camera display (○) is activated, the "Auto" camera display automatically switches to the corresponding camera image when set speed ranges are reached.

In the event of a fault, the camera image display is switched off and replaced by an icon. A fault message is displayed – see page 51. An error code contains information about the error state for the customer service department.

➔ In the case of a faulty coupling (○) with the truck, no overlays are displayed and the cameras to be displayed are no longer selected automatically.

3.1 Button allocation of the display

Keypad of the assistance display

Symbol	Function
	Function level: – Change to the home page of the configuration view
	Cancel
	Manually changing of the camera connections to be displayed ➔ A black screen is briefly displayed when switching. ➔ When switching to an unoccupied port or a failed camera, a notification icon appears.
	
	Select / confirm

➔ The available functions of the buttons depend on the settings and the current operating situation or operating mode.

Buttons on the configuration screens of the assistance display

➔ The buttons on the configuration screens of the assistance display can only be operated via the touchscreen.

Symbol	Function
	Back: – Change to the previous configuration view
	Cancel: – Exit the configuration view
	Select / confirm: – Activate the function or component – Complete the PIN entry
	Correction: – Delete the last digit of the PIN entry

Symbol	Function
	Update / refresh: – Start procedure
	Edit: – Change object
	Delete: – Remove object
	Add: – Add new object

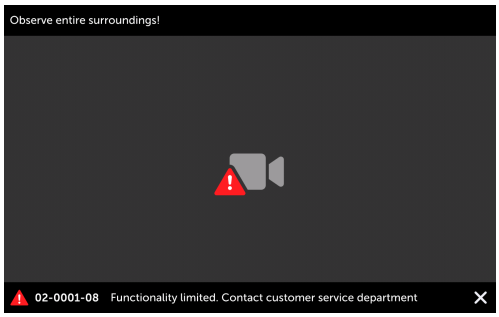
3.2 Displays

When the assistance system is appropriately coupled (○) to the truck, one or more cameras are displayed according to the configuration when driving forwards and backwards below the set speed limits for automatic cut-off (see page 45).

Outside the set speed limits and with appropriately coupling (○) to the truck, the camera display is automatically switched off by the system and replaced by a icon. This icon is also displayed for other intentional, system-initiated deactivations.

If there are multiple cameras, the display shown within the set speed limits can be selected via the keypad of the assistance display.

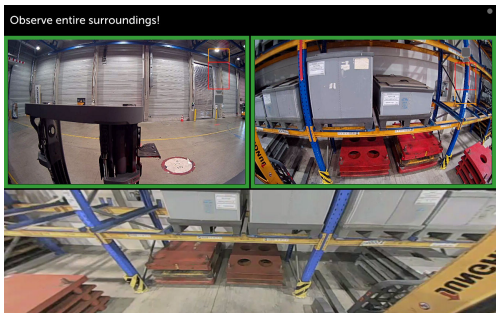
If the camera data stream is interrupted or if the camera cables or connectors are damaged or broken, a warning icon is displayed instead of the camera image see page 51.



Multiple display (split view)

If the assistance system software is sufficiently up to date, split views can be configured that display customised video images from two or three cameras simultaneously.

Of the up to three cameras displayed simultaneously, a maximum of two can be person detection cameras.



3.3 Control display

⚠ WARNING!

Risk of collision due to malfunction of the assistance display

Malfunctions of the assistance system can cause the assistance display to no longer be updated. The pulsating control display remains off or behaves in an unexpected way.

- ▶ Check the status of the assistance display when the truck is switched on.
- ▶ Increased attention required during travel and hydraulic operations.
- ▶ When operating the truck based on the assistance display, you must also check the direct view of the operating and working area.
- ▶ Adjust your travel speed and load handling according to the visibility conditions.
- ▶ If a malfunction of the assistance system is sufficiently serious to render subsequent operation of the truck impossible, mark the truck accordingly and take it out of service. Do not return the truck to service until you have identified and rectified the fault.

The control display in the upper right corner of the assistance display shows a grey dot pulsing every 1.6 seconds.

If the pulsating dot fails to appear, there is a fault in the assistance display. As soon as the assistance system detects the fault, it triggers a restart.

System faults and malfunctions – see page 51.

3.4 Monochrome Display

If required, a monochrome display of the camera image can be activated or deactivated to switch between a colour image and a greyscale image.

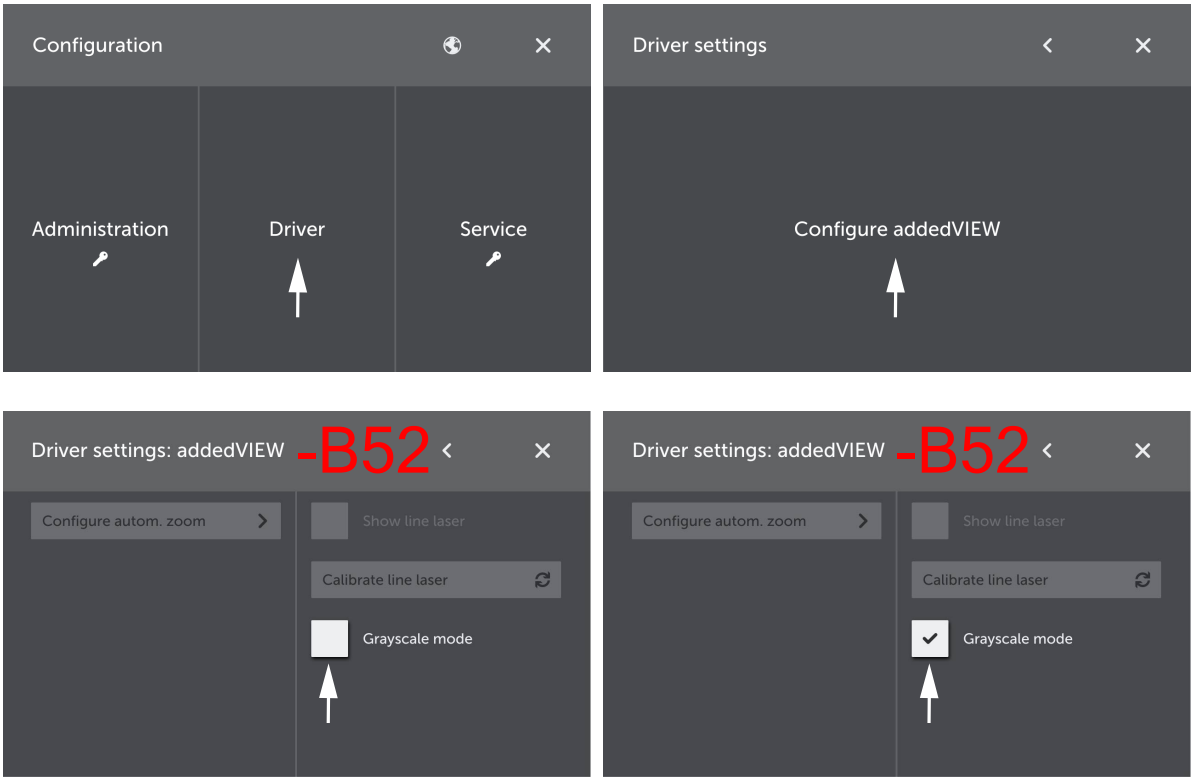
Displayed messages, symbols and optional overlays such as virtual aids, recognised barcodes, QR codes or information from a warehouse management system are also shown unchanged in colour on the greyscale image and may therefore be more clearly visible.

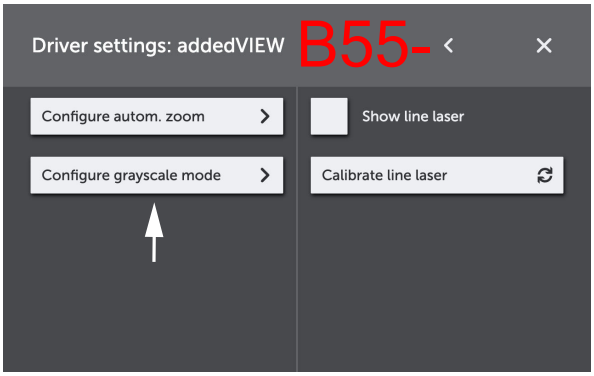
Activating the monochrome display

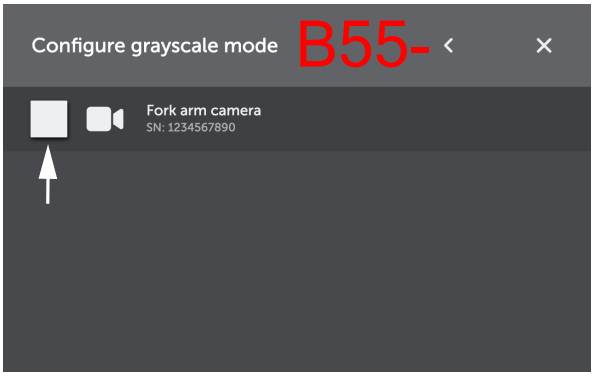
Procedure

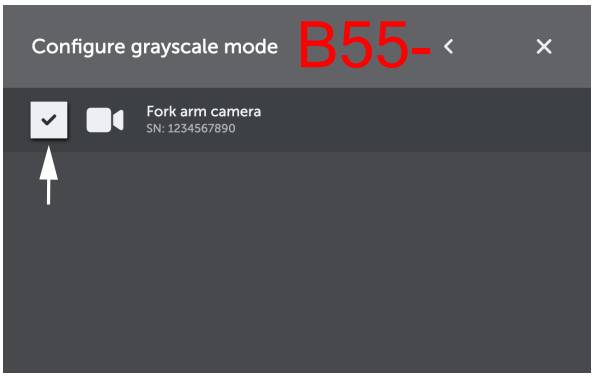
- Call up the home page of the configuration view via the keypad of the assistance display – see page 25.
- In the middle, actuate the button for driver settings.
- Press the button to configure addedVIEW.
- Up to software version B52:
  - Activate greyscale image.
- From software version B55:
  - Press the button to configure the greyscale image.
  - Select cameras for greyscale display.

Monochrome display is activated.




Driver settings: addedVIEW
B55-
Configure autom. zoom
Show line laser
Configure grayscale mode
Calibrate line laser


Configure grayscale mode
B55-
Fork arm camera
SN: 1234567890


Configure grayscale mode
B55-
Fork arm camera
SN: 1234567890

3.5 Tamper and failure protection

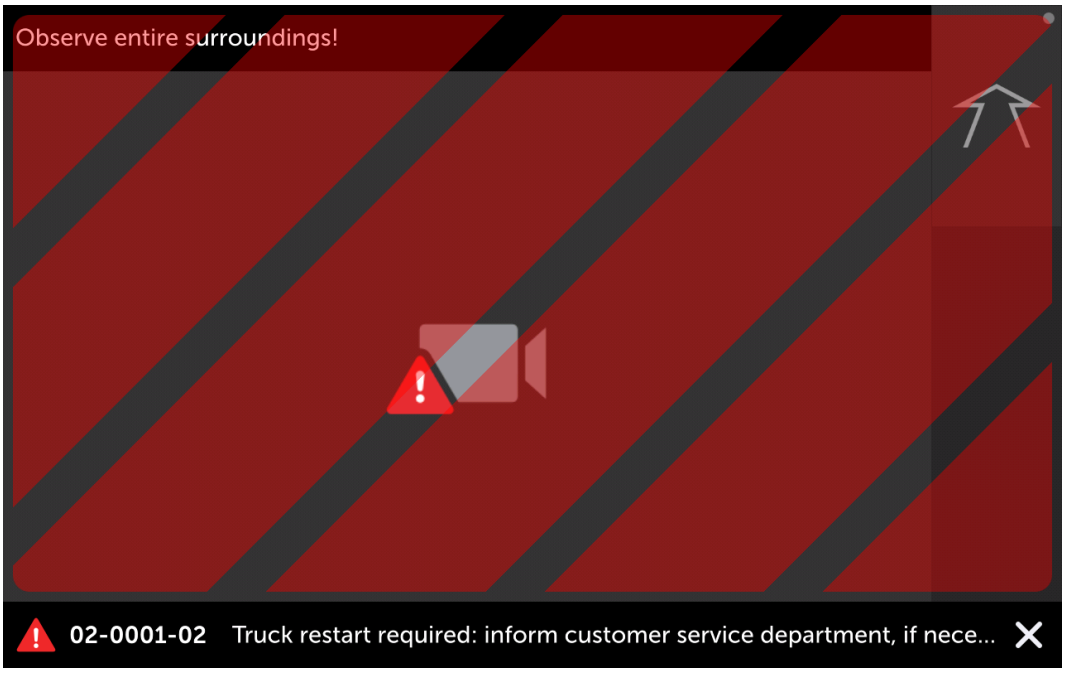
The tamper and failure protection is activated by the factory manager – see page 44.

When the tamper and failure protection function is activated, some of the faults or malfunctions also lead to a different display on the assistance display and to repeated warning tones to draw attention to possible failures and tampering: On the assistance display, a large red hatched area appears clearly visible and semi-transparent, while other displays remain recognisable. In addition, clearly audible warning tones are played repeatedly every eight seconds.

Possible causes of the faults and malfunctions considered:
- Cable or plug connections damaged, disconnected or short-circuited
- Components defective or not ready for operation
- Configuration error or communication error in the connection of the assistance interface
- Internal communication errors, software errors or hardware errors

Remedial actions:
- Switch off the truck, actuate and release the emergency disconnect switch, switch on the truck.
- Check components for visible damage.
- Check cables and connectors for visible damage.
- Park the truck securely if necessary.
- Contact the manufacturer's customer service department.

Troubleshooting: see page 51.



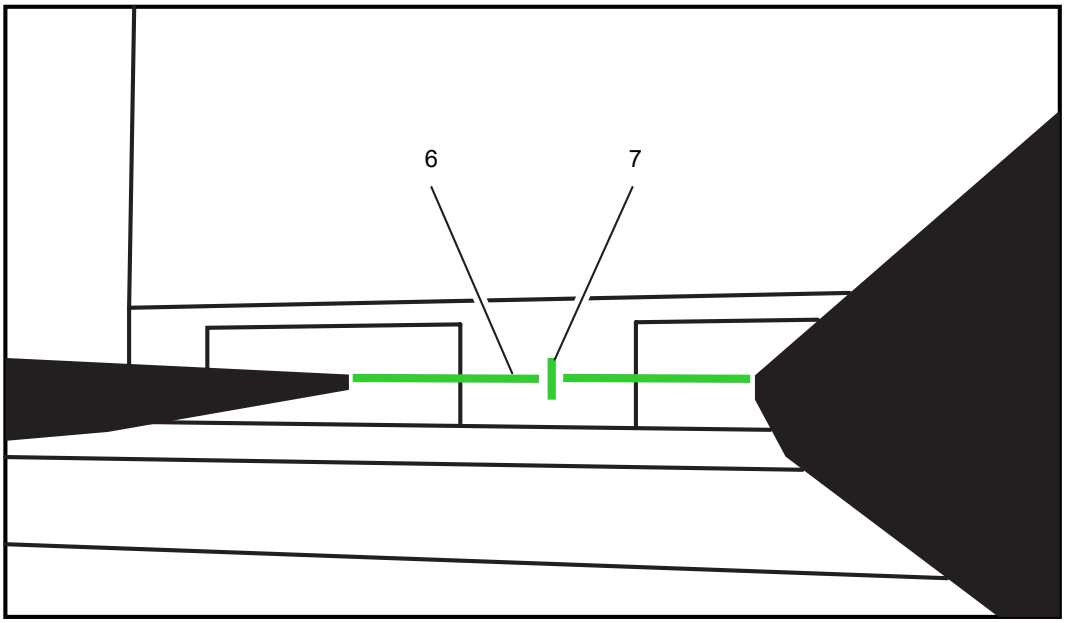
4 Virtual Line Laser

➔ Optional, for addedVIEW assistance system equipped with addedVIEW fork arm camera

➔ Note the restrictions – see page 11:
When operating in parallel with the addedVIEW person detection camera assistance system with video recording activated, the "virtual line laser" option cannot be activated or used.

To support unstacking operations, a virtual line laser in the form of a horizontal line (6) can be shown on the assistance display between the fork tips in the video image from the digital fork arm camera.

A vertical mark (7) after successful calibration serves as an orientation guide for the central web of the pallet, but does not adjust to the central web of the pallet. The vertical mark is not intended to be aligned continuously with the central web of the pallet.



The virtual line laser display is generated using image processing that detects the fork tips in the image. The display of the virtual line laser is independent of the inclination of the mast or fork arms and the distance to the rack, pallet or load.

After the start-up procedure has been completed, the assistance system automatically attempts to calibrate the virtual line laser.

During calibration, the fork arms must not be covered in the camera field of view.

Calibration may require up to 45 seconds of moving camera images or any camera movements before sufficient video data is available.

➔ No special camera movements are required for calibration; lifting or lowering the load handler or normal driving with the truck is sufficient.

After changing the fork spread, for example after using a fork positioner or after manually adjusting one or both fork arms, recalibrate the virtual line laser by either restarting or calibrating manually via the assistance display.

The display of the virtual line laser can be activated or deactivated via the assistance display. The status of the line laser is shown on the display.

	Grey horizontal line with dot-shaped mark: Virtual line laser is not calibrated or not yet calibrated.
	Green horizontal line with vertical mark: Virtual line laser has been successfully calibrated.
	Grey horizontal line with red cross, shown for 15 seconds: Calibration of the virtual line laser has failed three times.

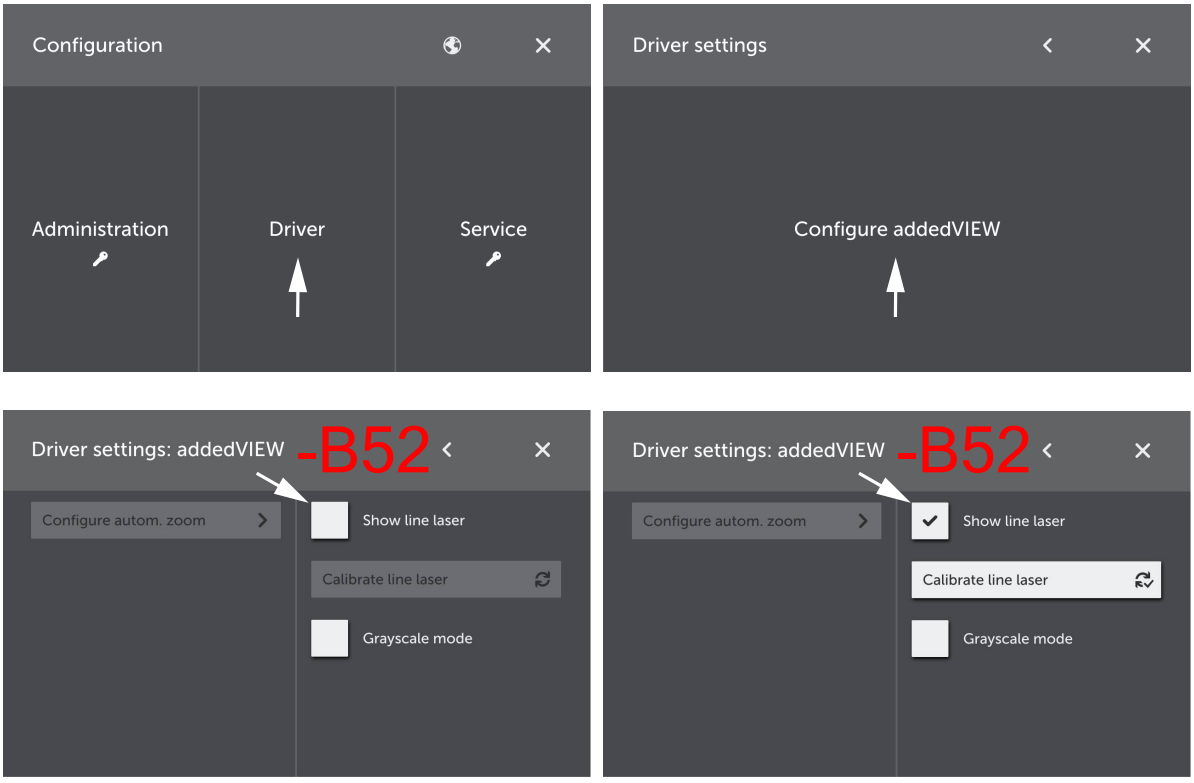
Causes of errors during calibration:
– Time for calibration too short
– Too little movement in the video data, e.g. due to insufficient camera movement or too homogeneous a background
– Fork arms not sufficiently detected due to incidence of light or shadows

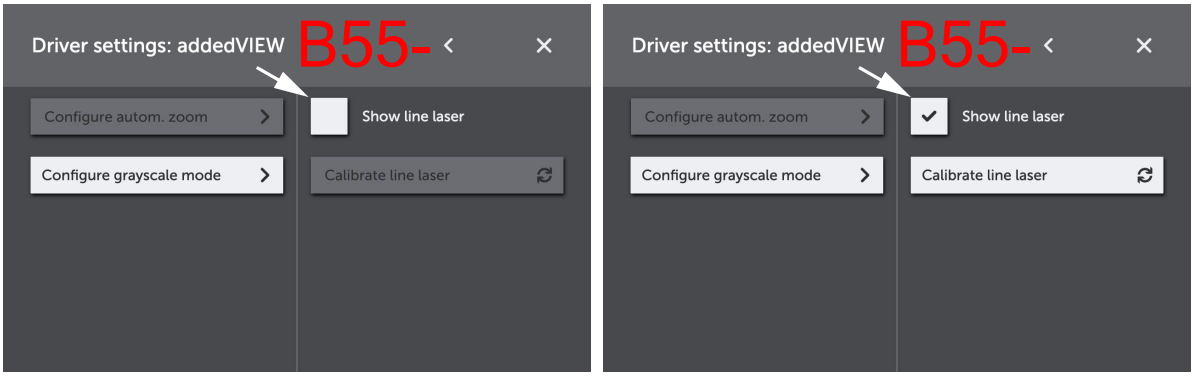
Activating the display of the virtual line laser

Procedure

- Call up the home page of the configuration view via the keypad of the assistance display – see page 25.
- In the middle, actuate the button for driver settings.
- Press the button to configure addedVIEW.
- Activate the setting to show the virtual line laser.

Display of the virtual line laser is activated.





Calibrating the virtual line laser after completing the start-up procedure of the assistance display

Requirements

– No load picked up with the load handler.

Procedure

- Move the industrial truck or lift and lower the load handler until the virtual line laser appears in the video image of the digital fork arm camera in the form of a green horizontal line between the fork tips with vertical mark.

Virtual line laser is calibrated.

Manually triggering calibration of the virtual line laser

Requirements

– No load picked up with the load handler.

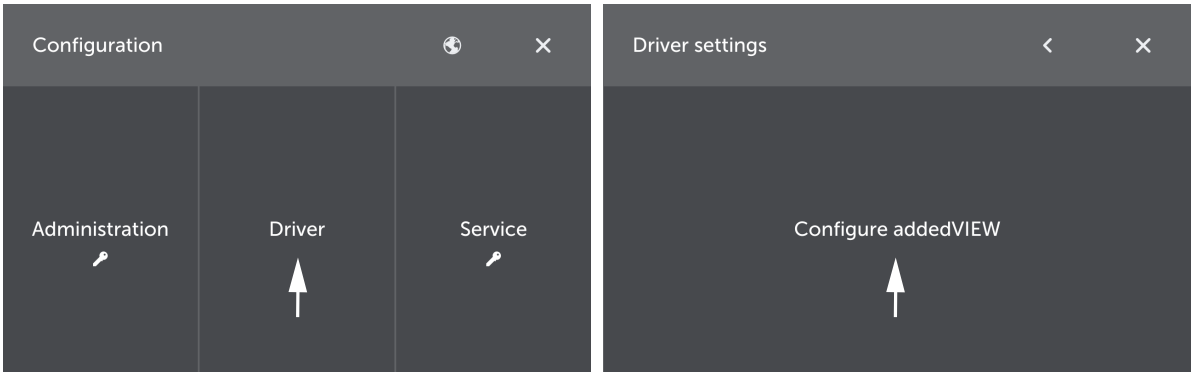
Procedure

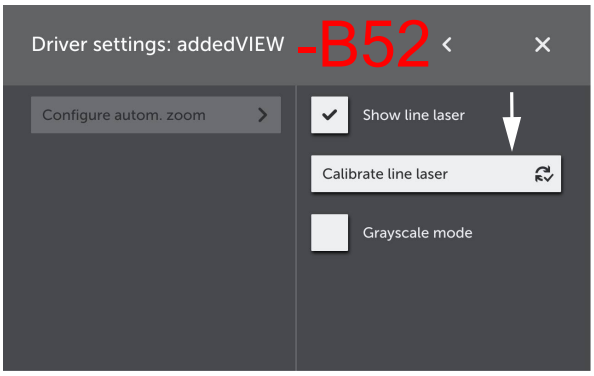
- Call up the home page of the configuration view via the keypad of the assistance display – see page 25.
- In the middle, actuate the button for driver settings.
- Press the button to configure addedVIEW.
- Press to calibrate the line laser display.

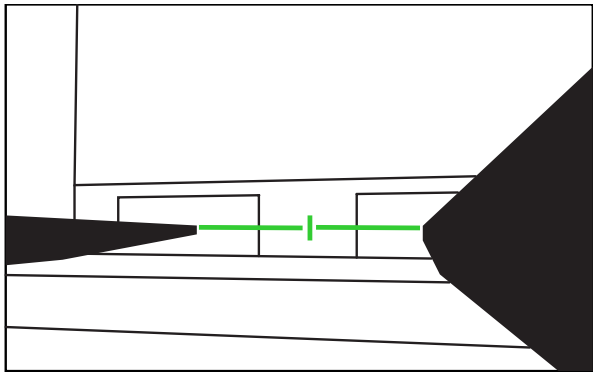
Calibration of the virtual line laser is triggered.

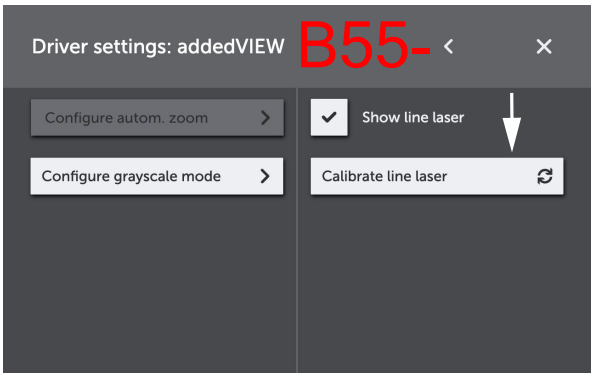
- Move the industrial truck or lift and lower the load handler until the virtual line laser appears in the video image of the digital fork arm camera in the form of a green horizontal line between the fork tips with vertical mark.

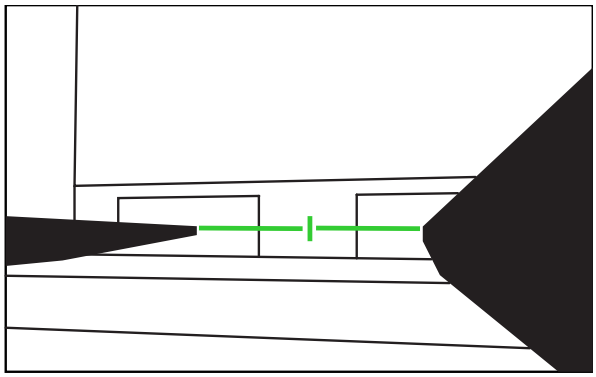
Virtual line laser is calibrated.




Driver settings: addedVIEW
-B52
Configure autom. zoom
Show line laser
Calibrate line laser
Grayscale mode




Driver settings: addedVIEW
B55-
Configure autom. zoom
Show line laser
Configure grayscale mode
Calibrate line laser



5 Recognising barcodes and QR codes

Optional, for addedVIEW assistance system equipped with addedVIEW fork arm camera

Observe technical specifications – see page 15.

Note the restrictions – see page 11:
When operating in parallel with the addedVIEW person detection camera assistance system with video recording activated, the "recognition of barcodes and QR codes" option cannot be activated or used.

For the recognition of barcodes and QR codes and for connection to a warehouse management system, a suitable truck terminal with licensed middleware Logistics Interface is required.

The middleware Logistics Interface is available in the download area:
https://www.jungheinrich.de/services/downloads
The installation instructions for the Logistics Interface are available in the service area as a "Logistics Interface" search result:
https://www.jungheinrich.de/services/betriebsanleitungen
Installation enquiries can be directed to the relevant support team:
LS-support-interfaces@jungheinrich.de

To support order control and processing, fixed identifiers (barcodes and/or QR codes) are recognised in the video data of the fork-arm camera, e.g. those on rack frames. Recognised identifiers are marked on the assistance display. Marked identifiers can be selected by touchscreen or by control on the industrial truck and passed on to the warehouse management system. If several identifiers are recognised at the same time, the identifier to be passed on can be selected via touchscreen only.

Identifiers turned on their side or upside down are not recognised.

To avoid delays and incorrect operation, the definition of the barcodes and/or QR codes to be recognised should be limited to the types used for the desired application.

Aligning the fork arm camera

Raise and lower the load handler until recognised identifiers (barcodes and/or QR codes) are marked in colour in the displayed camera image of the fork arm camera.

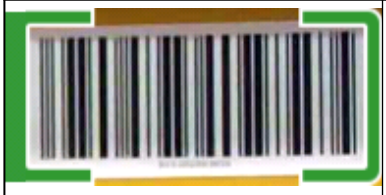
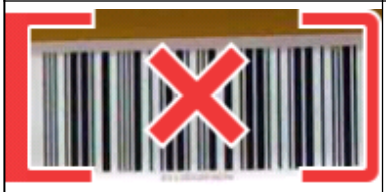
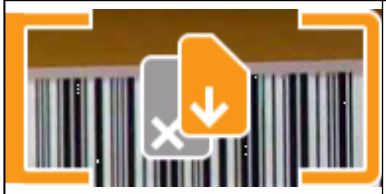
Basic scan

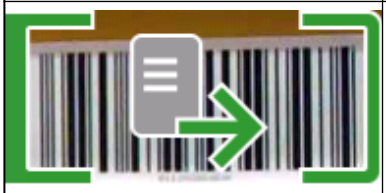
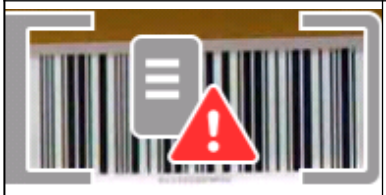
Static filters: In the field of view of the fork-arm camera, identifiers that match the settings of the Logistics Interface are outlined in green.

There is no indication as to whether the warehouse management system accepts or rejects the passed-on identifier.

Intelligent scan

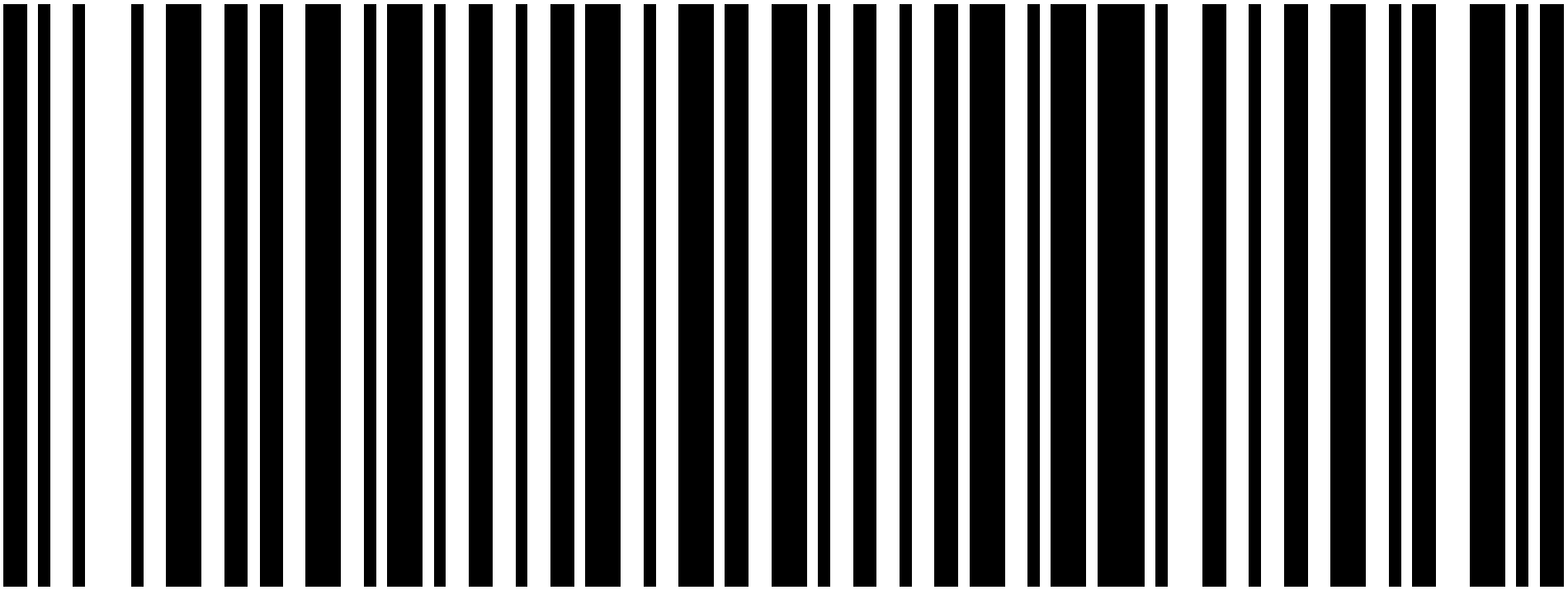
Dynamic filters: In the field of view of the fork arm camera, identifiers that correspond to the current request from the warehouse management system are outlined in green. Identifiers that do not correspond to the current request from the warehouse management system are outlined in red and cannot be selected, or are outlined in orange but can still be selected (override).

Display	Frame colour	Meaning
	Green	Static filters: – Identifier matches the settings of Logistics Interface. – Identifier can be selected.
	Green	Dynamic filters: – Identifier corresponds to the current request from the warehouse management system. – Identifier can be selected.
	Red	Dynamic filters: – Identifier does not correspond to the current request from the warehouse management system. – Identifier cannot be selected.
	Orange	Dynamic filters: – Identifier does not correspond to the current request from the warehouse management system. – Identifier can still be selected (override).
[1] Display is reset after 5 seconds.		

Display	Frame colour	Meaning
	Green	Identifier has been selected and is currently being transmitted to the Logistics Interface.
	Green	Selected identifier was successfully transmitted. [1]
	Grey	Timeout error: – Selected identifier was not successfully transmitted. [1]
	Grey	Other fault: – Selected identifier was not successfully transmitted. [1]
[1] Display is reset after 5 seconds.		

Test barcode

The following image can be used horizontally aligned to test the ability of the fork arm camera to recognise a Code128 barcode.



128-08-08

6 System settings

In order to protect the factory manager PIN and equipment-related settings from unauthorised changes, the factory manager PIN should be changed during initial start-up.

➔ Delivery setting for factory manager PIN: 1111
The factory manager PIN can be set by the manufacturer's customer service department.

Configuration views

Options on the home page of the configuration screen:
– Select the language to use on the screens
– Access to administration mode (equipment-related settings, factory manager PIN)
– Access to operator settings (configuration views)
– Access to service mode

➔ Access to administration mode is protected (factory manager PIN required).

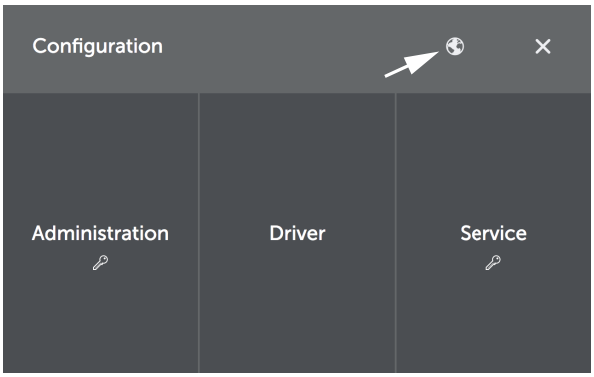
➔ Access to service mode is protected. The settings can be configured by the manufacturer's customer service department.

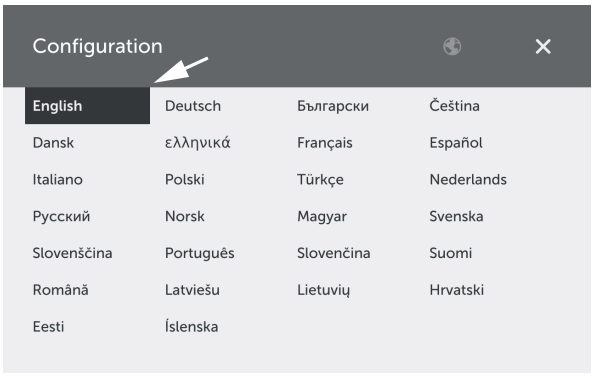
Select the language to use on the screens

Procedure

- Press the globe icon in the upper right corner of the header.
- Select the desired language from the list.

The desired language is selected.



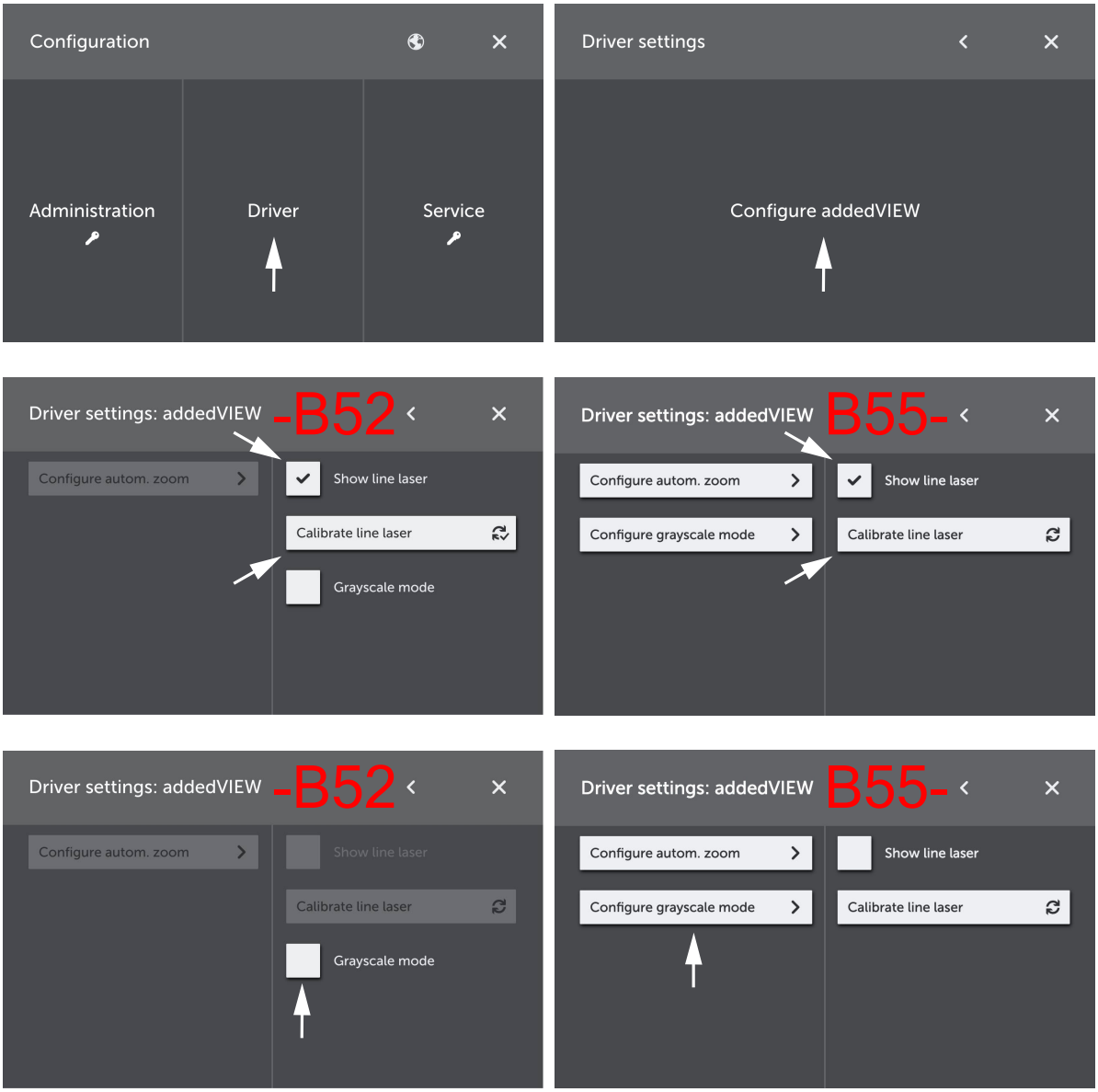


Adjustment of available options for equipment with addedVIEW fork arm camera

Procedure

- In the middle, actuate the button for driver settings.
- Press the button for addedVIEW.
- Optionally activate, deactivate or set one or more of the options if they are available:
  - Virtual line laser display (○) – see page 32
  - Start calibration of the virtual line laser display (○) – see page 32
  - Display of the camera image in greyscale – see page 29

The available options are adjusted.



Note the restrictions – see page 11:
When operating in parallel with the addedVIEW person detection camera assistance system with video recording activated, the "virtual line laser" option cannot be activated or used.

Administration mode

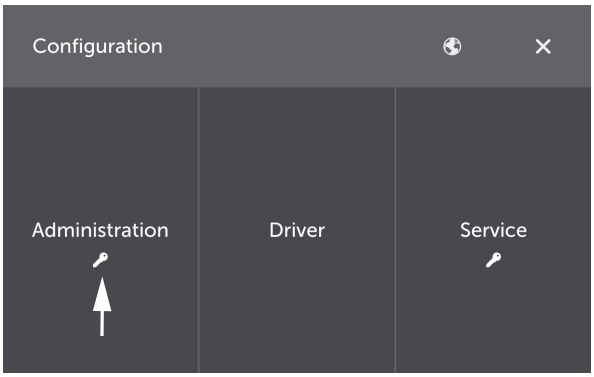
Access to administration mode is protected (factory manager PIN required).

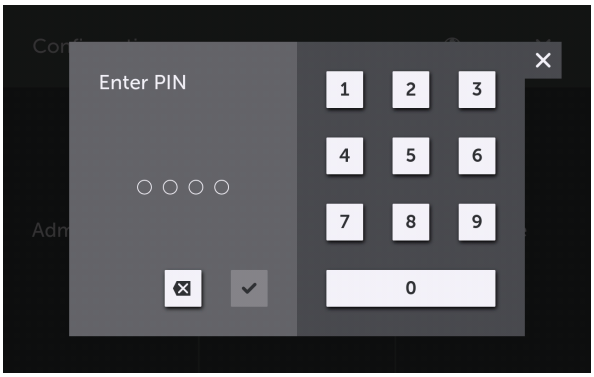
Options in administration mode:
– Configure addedVIEW (equipment-related settings)
  • Automatic camera image cut-off (○) – see page 45
  • Automatic changeover of camera images (○) – see page 48
– Configure zoneCONTROL (equipment-related settings)
– General settings
  • Tamper and failure protection
  • Change the factory manager PIN (via touchscreen)

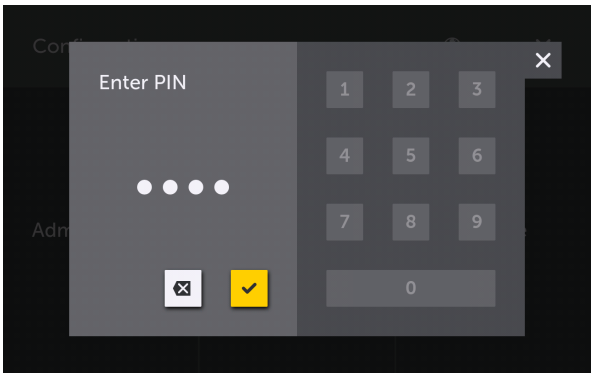
Click to access

Procedure
• Press the protected button for administration mode on the left.
• Enter the factory manager PIN and complete the entry.

Access is permitted.





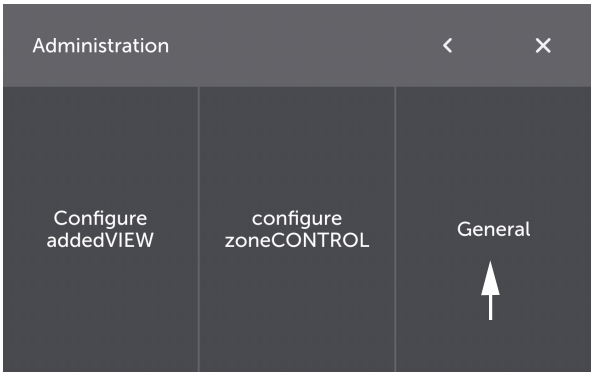


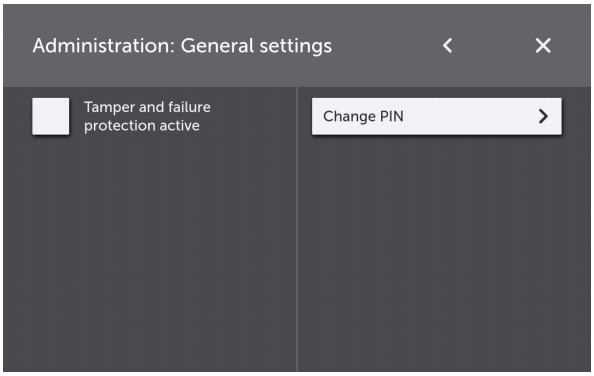
"General settings" configuration view opened

Requirements
– Access to administration mode enabled

Procedure
• Press the right-hand button to open the "General settings" configuration view.

Configuration view has been opened.





Changing the factory manager PIN

Requirements

– Access to administration mode enabled
– "General settings" configuration view opened

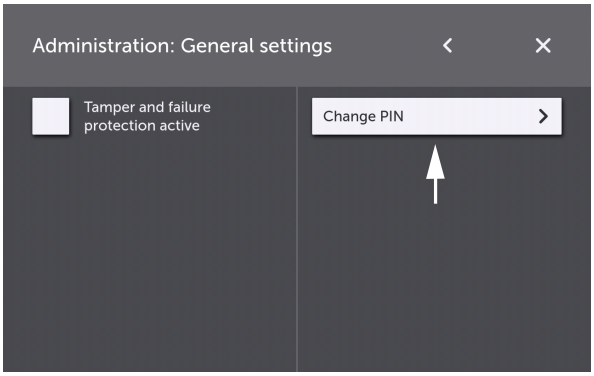
Procedure

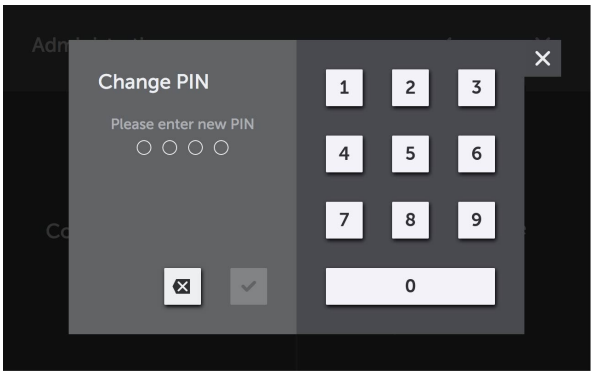
- Press the button on the right to change the PIN.
- Enter the new factory manager PIN and complete the entry.
- To confirm, re-enter the new factory manager PIN and complete the entry.

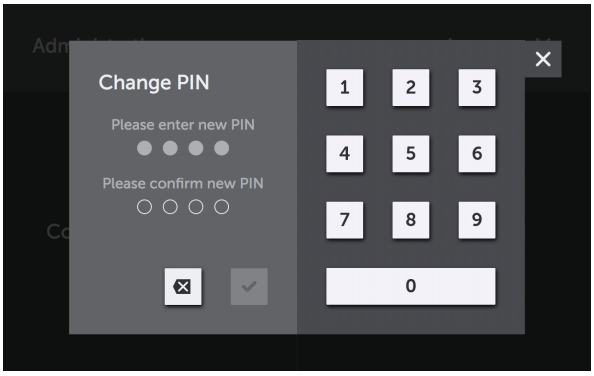
If the new factory manager PIN does not match the one initially entered, repeat the entry again. The factory manager PIN cannot be changed without consent.

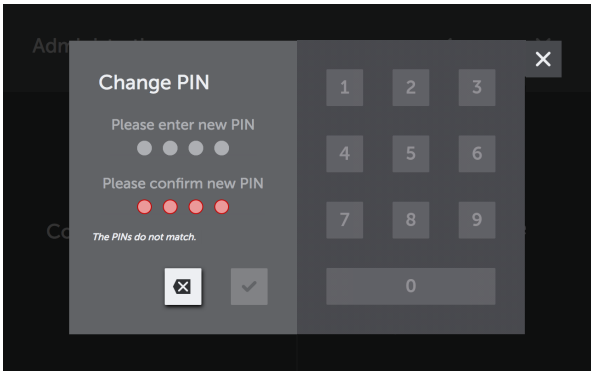
The factory manager PIN is changed.

The input process can be aborted at any time using the button on the top right of the numeric keypad.









6.1 Tamper and failure protection

Activating tamper and failure protection

Requirements

– Access to administration mode enabled
– "General settings" configuration view opened

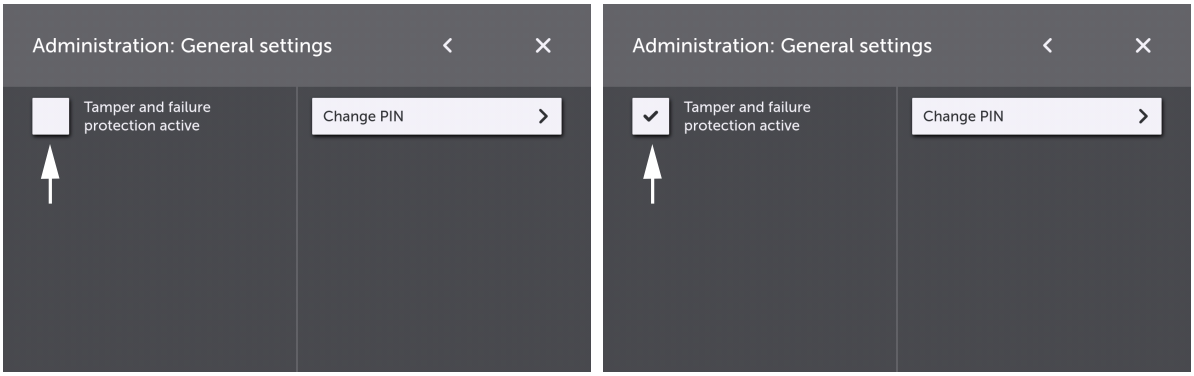
Procedure

• Press the button on the left to activate the tamper and failure protection.

Tamper and failure protection is activated.

Pressing the button again deactivates the tamper and failure protection.

Functionality of the tamper and failure protection: see page 31.



6.2 System configuration

Opening the addedVIEW configuration view

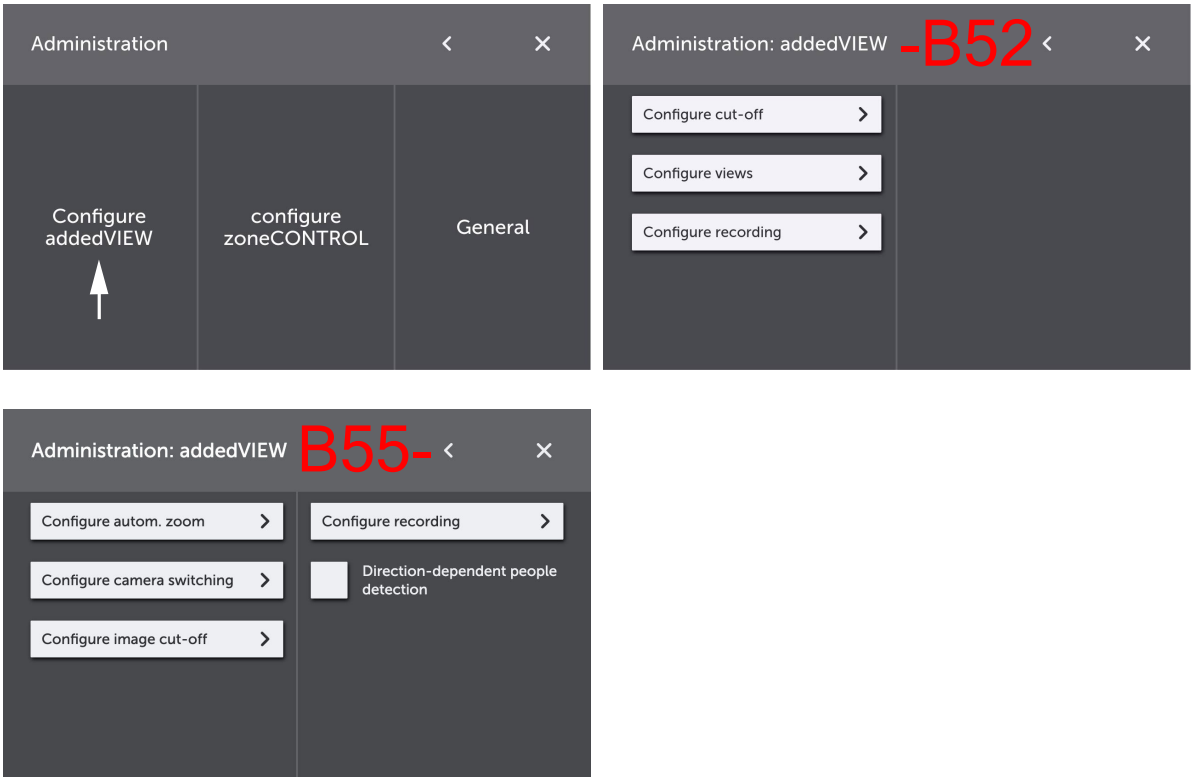
Requirements

– Access to administration mode enabled

Procedure

- Press the left-hand button to open the addedVIEW configuration view.

Configuration view has been opened.



6.2.1 Automatic Camera Image Cut-off

Configuring the automatic camera image cut-off (○)

Requirements

– The assistance system must be appropriately coupled (○) to the truck
– Access to administration mode enabled
– Configuration view opened

Procedure

- Press the button on the left to configure the camera image cut-off.
- Press the button on the right to enter the speed for the camera image cut-off.
- Enter and confirm the speed for the camera image cut-off.

➔ A whole-number value from 2 km/h to 10 km/h can be entered.

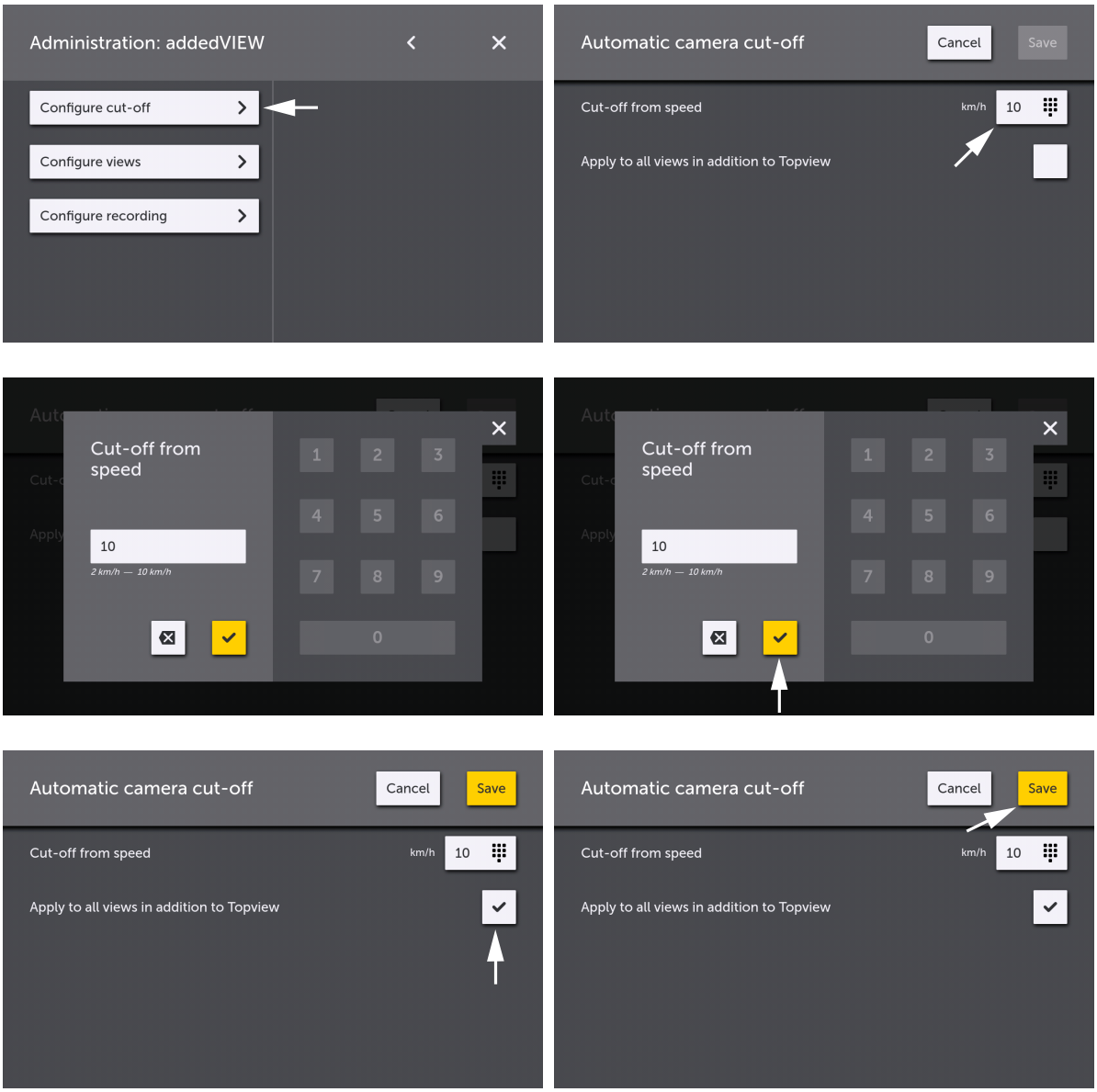
- Activate the button on the right so that the camera image cut-off affects all camera images.

➔ If the button is deactivated, the camera image cut-off affects only the "top camera", "top/front camera" and "top/rear camera" projections of the addedVIEW 360° camera assistance system.

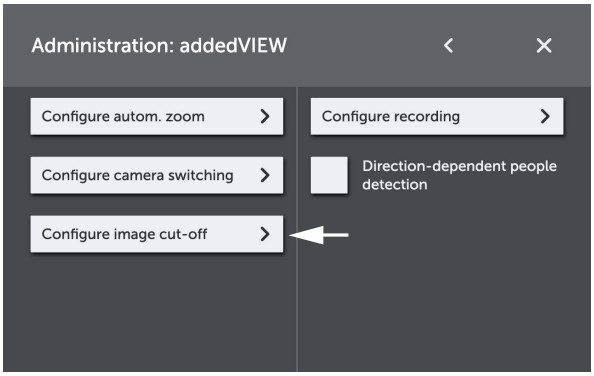
- Press the button on the right to save the configuration.

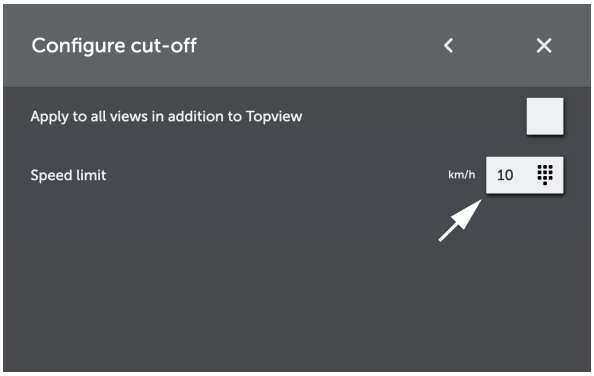
Automatic camera image cut-off is configured.

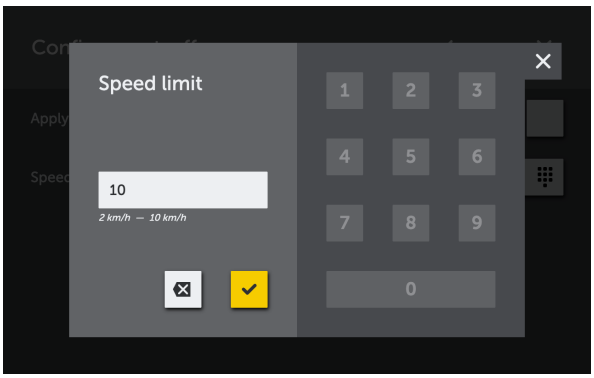
Before software B55

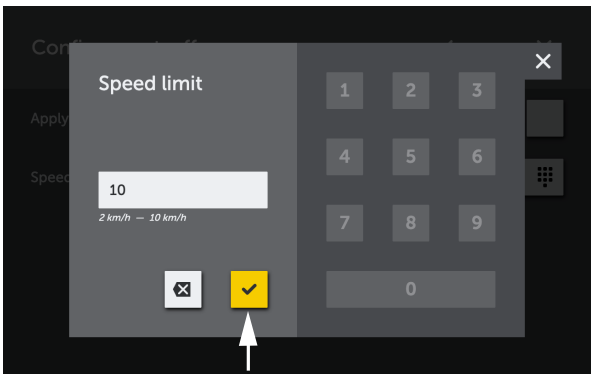


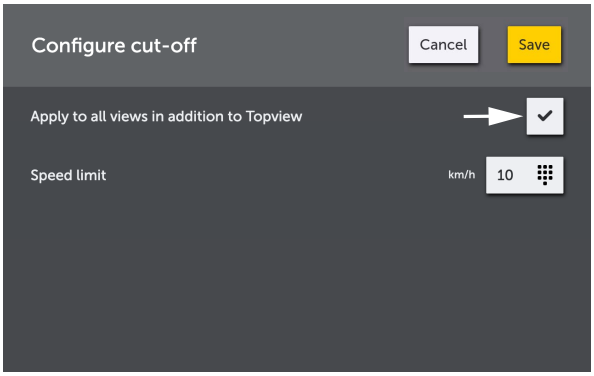
From software B55 onwards

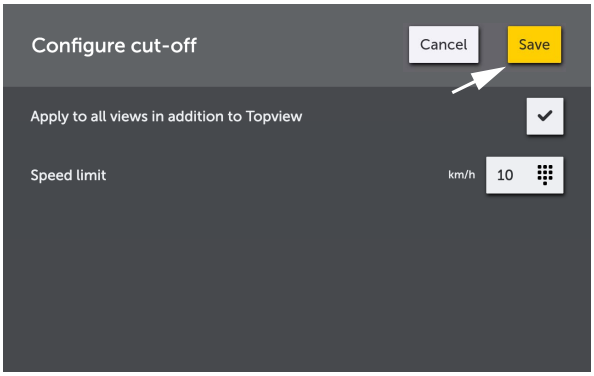












6.2.2 Automatic Changeover of Camera Images

If several addedVIEW cameras or camera systems are appropriately coupled to the truck (○) and the "Auto" camera display (○) is activated, the "Auto" camera display automatically switches to the corresponding camera image when set speed ranges are reached.

A black screen is briefly displayed when switching.

Configure the automatic changeover of camera images (○)

Requirements

– The assistance system must be appropriately coupled (○) to the truck
– Access to administration mode enabled
– Configuration view opened

Procedure

- Press the button on the left to configure the camera images.
- Activate the button for automatic changeover of camera images.
- Press the button underneath this to configure automatic changeover.
- Existing settings for automatic changeover are displayed with camera and speed range.

  Press a button on the left to create another setting, or one of the buttons on the right to edit or delete the corresponding setting.
- When creating or editing a setting, select the desired camera and the upper and lower speed of the speed range. Then press the button in the top-right to save the setting.

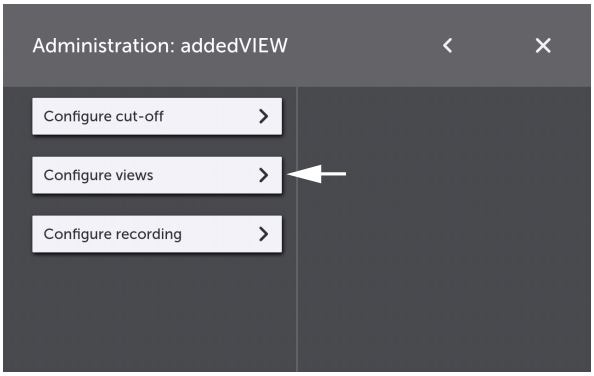
➔ In undefined speed ranges, the previous camera continues to be displayed.

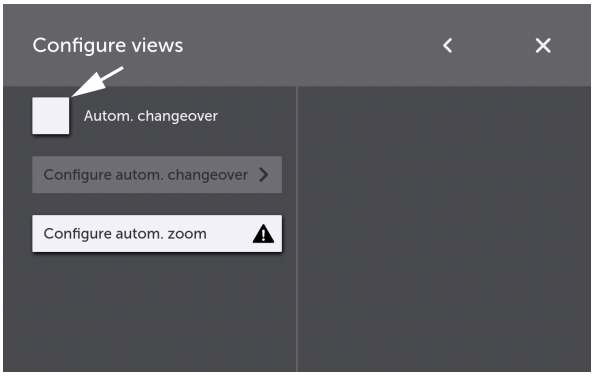
- From software version B55 onwards, when configuring automatic switching, you can choose between the display of a single camera or a multiple display (split view):
  - Single camera display
  - Multiple display (split view): simultaneous display of the customised views from two Cameras.
  - Multi-display (split view): simultaneous presentation of the customised views from three Cameras.
- If necessary, create or edit further settings for automatic changeover.

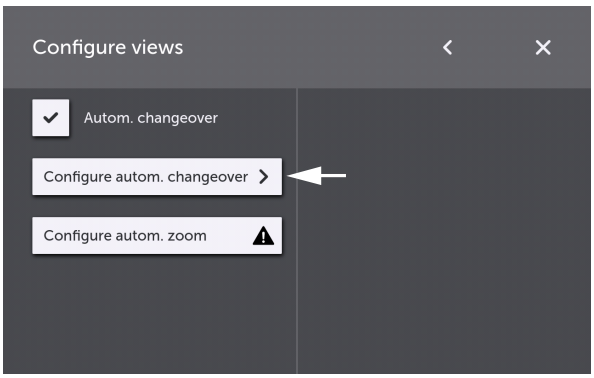
Automatic changeover of camera images is configured.

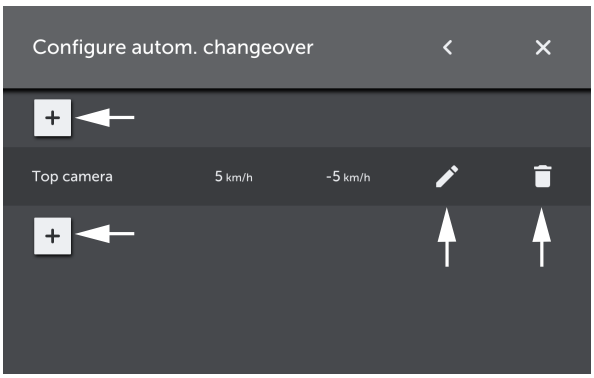
➔ After completing the configuration, perform a test drive to verify that the configured automatic switching corresponds to the desired behaviour.

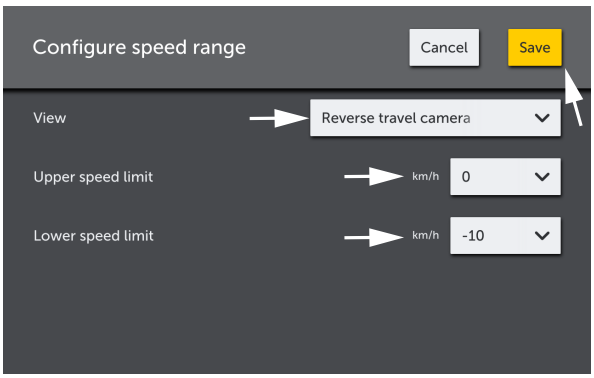
Before software B55

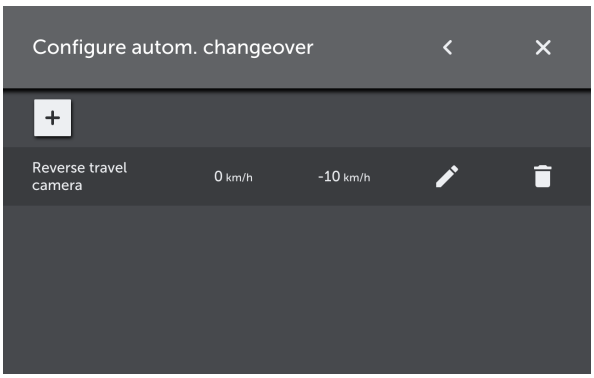




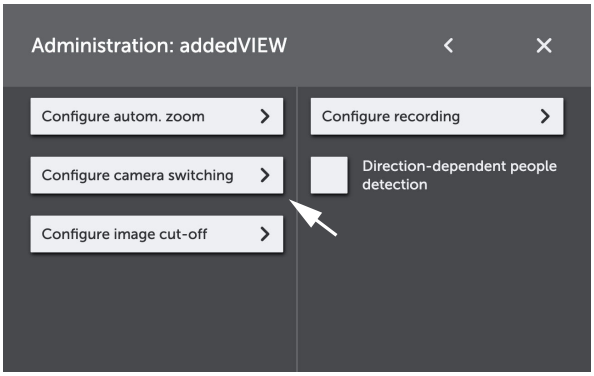


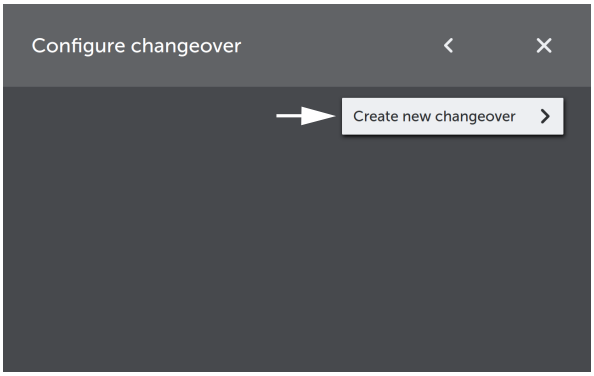


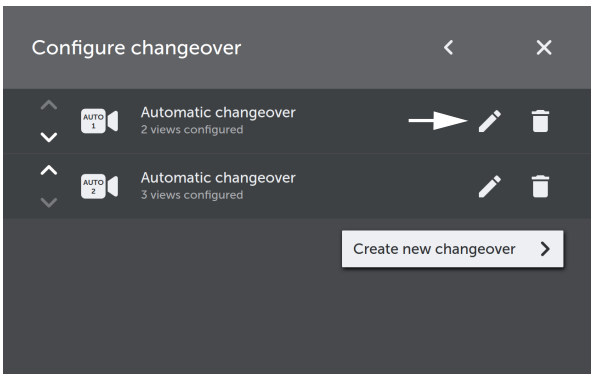


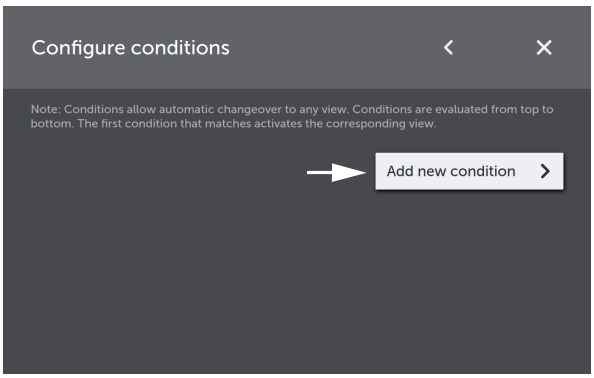


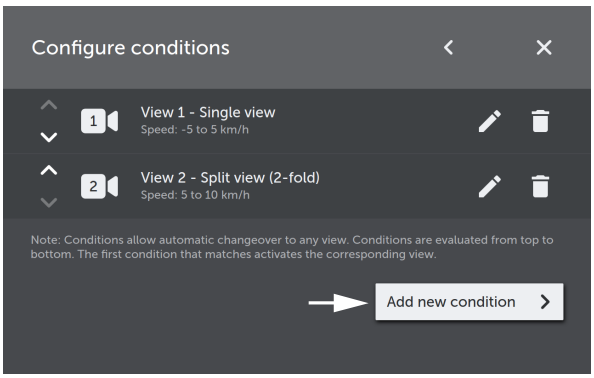
From software B55 onwards

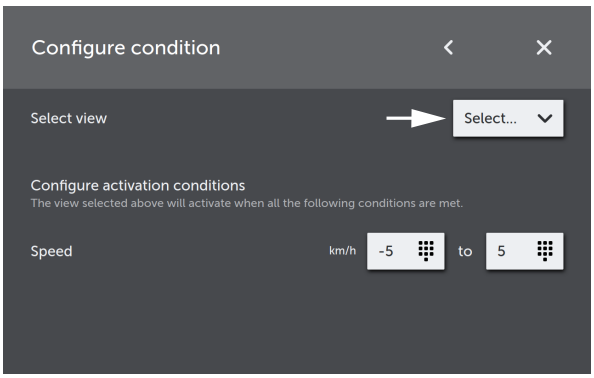


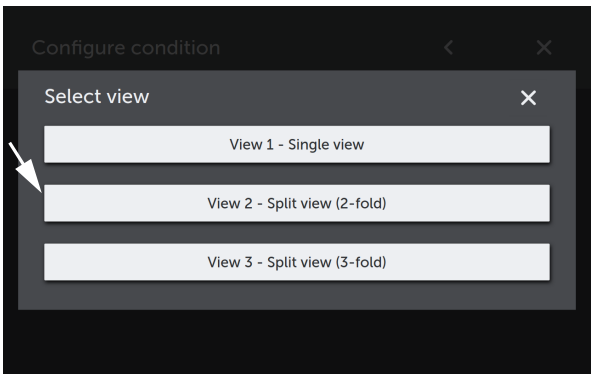


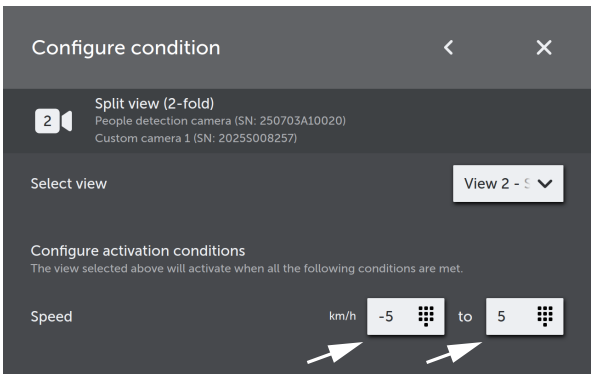












7 Troubleshooting

This chapter enables the operator to localize and rectify basic faults or the results of incorrect operation himself. When trying to locate a fault, adhere to the remedial action in the order shown in the table.

If, after carrying out the following remedial actions, operation of the assistance system cannot be restored, or if a fault in the electronics system is displayed with a corresponding error code, contact the manufacturer’s customer service department.

Troubleshooting must only be performed by the manufacturer’s customer service department. The manufacturer has a customer service department specially trained for these tasks.

In order for the customer service department to react quickly and specifically to the fault, the following information is essential:
– Type and version of the affected component
– Serial number of the affected component (if available)
– Forklift truck serial number
– Error number (if displayed)
– Fault description
– Current location of forklift truck with faulty assistance system

Note the restrictions – see page 11:
When operating in parallel with the addedVIEW person detection camera assistance system with video recording activated, the "virtual line laser" and "recognition of barcodes and QR codes" options cannot be activated or used.

When the tamper and failure protection function is activated, some of the faults or malfunctions also lead to a different display on the assistance display and to repeated warning tones – see page 31.

Special equipment: The required supply voltage is available as soon as the battery is connected to the truck and activated. The assistance display and other components of the assistance system on the truck are then already activated, regardless of whether the truck is switched on or the emergency disconnect switch is released.
The assistance display and other components can be switched off only by disconnecting or deactivating the truck battery.
A restart is only possible by disconnecting or deactivating the truck battery and subsequently connecting and activating it.

Messages shown on the assistance display

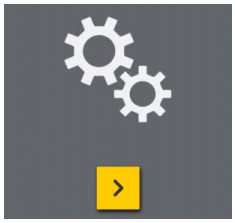
Content of displayed message	Corrective measures
– Truck restart required.	– Switch the truck off and on again. – Contact the manufacturer's customer service department.
– Switch off the assistance display.	– Park the truck securely if necessary. – Contact the manufacturer's customer service department.
– Functionality limited. – Assistance system shutting down.	– Park the truck securely if necessary. – Contact the manufacturer's customer service department.
Other error messages and other faults on the assistance display or system behaviour without an error message being displayed	– Switch the truck off and on again. – Check components for visible damage. – Check cables and connectors for visible damage. – Note the error message if displayed. – Contact the manufacturer's customer service department.

Faults and malfunctions

If necessary, park the truck securely.

If a malfunction of the assistance system is sufficiently serious to render subsequent operation of the truck impossible, mark the truck accordingly and take it out of service. Do not return the truck to service until the fault has been identified and rectified.

Fault	Possible cause	Actions
Nothing shown on assistance display	– Truck not switched on	– Switch on the truck. – Contact the manufacturer's customer service department.
	– Truck fuse faulty	– Check the truck fuses and replace if necessary. – Contact the manufacturer's customer service department.
	– Damage	– Check components for visible damage. – Check cables and connectors for visible damage. – Contact the manufacturer's customer service department.
No pulsating control display (see page 28) on the assistance display	– Malfunction of the assistance display	– If the assistance system detects the fault, it independently triggers a restart. – Switch off the industrial truck, press and release the EMERGENCY STOP, then switch the industrial truck back on. – Contact the manufacturer's customer service department.
Endless restarting	– Fault. The assistance system detects a fault and independently triggers a restart. The process repeats endlessly.	– Switch off the industrial truck, press and release the EMERGENCY STOP, then switch the industrial truck back on. – Contact the manufacturer's customer service department.

Fault	Possible cause	Actions
 Warning icon is displayed, limited functionality: Functions dependent on the coupling via assistance interface (○) are not executed.	– No communication between assistance display and assistance interface of the industrial truck control unit – Damage – Faulty coupling with the truck	– Switch off the industrial truck, press and release the EMERGENCY STOP, then switch the industrial truck back on. – Check cables and connectors for visible damage. – Contact the manufacturer's customer service department.
 Icon is displayed, functions are not executed	– Installation of the assistance system in the forklift truck has not been completed – Assistance system not activated in the assistance display	– Contact the manufacturer's customer service department.
 Icon displayed instead of camera image	Intentional system-initiated shutdown of camera displays – For example, when the “automatic shutdown” function is triggered, with a corresponding coupling (○) to the industrial truck and the travel speed is outside the set speed limits.	– If necessary, check the speed limits settings for automatic shut-off and adjust them if required.
 Icon (with yellow warning sign) shown instead of camera image	– Fault: Camera data stream briefly interrupted (less than 1 second up to 30 seconds) – Cable or plug connections on the camera damaged	– Check components for visible damage. – Check cables and connectors for visible damage. – Contact the manufacturer's customer service department.
 Icon (with red warning sign) shown instead of camera image	– Malfunction: Camera data stream permanently interrupted (30 seconds or longer) – Camera cables or connectors damaged or disconnected	– Check components for visible damage. – Check cables and connectors for visible damage. – Contact the manufacturer's customer service department.

Fault	Possible cause	Actions
Camera image is not displayed	– Camera not selected – Malfunction of the assistance display – Camera not configured – Camera or camera connection damaged	– Select the camera using the keypad of the assistance display. – Switch the truck off and on again. – Contact the manufacturer's customer service department.
Automatic changeover (○) of the cameras does not work	– Another display selected without automatic changeover – Automatic changeover (○) not set correctly – Malfunction of the assistance display – The coupling (○) of the assistance system to the forklift truck malfunctions – Coupling (○) on the truck not activated or set	– Select "Auto" camera display with automatic changeover. – Switch off the industrial truck, press and release the EMERGENCY STOP, then switch the industrial truck back on. – Contact the manufacturer's customer service department.
Virtual line laser does not work	– Function not activated – Malfunction of the assistance display – Lens dirty – Camera damaged	– Check system settings. – Switch off the industrial truck, press and release the EMERGENCY STOP, then switch the industrial truck back on. – Clean lens. – Contact the manufacturer's customer service department.
Virtual line laser is not displayed correctly	– Spread of the fork arms changed – Function not recalibrated	– Recalibrate function.
Recognition of barcodes or QR codes is not working.	– Function not activated – Malfunction of the assistance display – Truck terminal not activated – Malfunction of the truck terminal – Connection to truck terminal disrupted – Lens dirty – Camera damaged	– Switch off the industrial truck, press and release the EMERGENCY STOP, then switch the industrial truck back on. – Activate truck terminal – Check the connection to the truck terminal for visible damage. – Clean lens. – Contact the manufacturer's customer service department.

D Repairs

1 Spare Parts

NOTICE

Only original spare parts are subject to the manufacturer's quality control. To ensure safe and reliable operation, use only the manufacturer's spare parts.

2 Operational Safety and Environmental Protection

The inspections and maintenance tasks listed in chapter "Maintenance, Inspection and Changing of Maintenance Parts Requiring Replacement" must be performed according to the defined service intervals – see page 63.

The manufacturer recommends the replacement of the maintenance parts also listed in chapter "Maintenance, Inspection and Changing of Maintenance Parts Requiring Replacement" according to the specified replacement intervals – see page 64.

⚠ WARNING!

Risk of accidents and damage to components

Any modification to the truck, in particular the safety mechanisms, is prohibited. Do not alter the truck's operating speeds under any circumstances.
Do not bond the front window with adhesive.

Exception: Operating companies should only make changes or have changes made to powered industrial trucks if the manufacturer is no longer operating in the field and there is no successor to the business; operating companies must however:

– Ensure that the changes to be made are planned, tested and performed by a specialist engineer in industrial trucks taking safety into account.
– Keep permanent records of the construction, tests and completion of changes
– Carry out and have authorised the respective changes to the capacity data plates, decals and stickers as well as the operating instructions and workshop manuals
– Attach a permanent and clearly visible marking to the truck indicating the types of changes made, the date of the changes and the name and address of the organisation responsible for the work.

3 Consumables

Order no.	Supplied quantity	Description	Used for
51033198	400 ml	Cleaning agent LOCTITE SF 7063	Cleaning of camera lenses ➔ Contains solvents ➔ Observe safety data sheet!
		Cotton buds	Camera lens cleaning (wet cleaning only)
51224491	750 ml	Glass cleaner (containing ethanol)	Cleaning the touchscreen of the assistance display
		Cleaner with approx. 5% alcohol content for TFT displays	
51085537	1x	Cleaning cloth (lens cloth)	Cleaning the touchscreen of the assistance display (wet cleaning only)
		Soft cotton cloth, microfibre cloth or soft disposable paper towel	

➔ Do not expose solvent-based cleaning agents to temperatures above 50 °C.

➔ Store LOCTITE SF 7063 in safe locations at temperatures between 8 °C and 28 °C. Optimum storage is between 8 °C and 21 °C.

4 Maintenance and repairs

⚠ WARNING!

Fire, injury and poisoning caused by solvent-based cleaning agents

Solvent-based cleaning agents or their vapours may cause injury or poisoning on contact or inhalation.

Solvent-based cleaning agents or their vapours may ignite when handling hot machine parts, open flames, or flammable electrical equipment.

- ▶ Observe the safety data sheet of the cleaning agent.
- ▶ Wear personal protective equipment (such as solvent-proof gloves and goggles).
- ▶ When handling the cleaning agent, avoid skin contact, eye contact, inhalation and ingestion. If the cleaning agent comes into contact with the skin, wash with running water and soap. Consult a doctor if necessary.
- ▶ Do not smoke when handling solvent-based cleaning agents.
- ▶ When handling solvent-based cleaning agents, keep suitable fire-fighting equipment at hand.

Park the forklift truck securely before carrying out any maintenance work, see operating instructions of forklift truck.

Maintenance to be performed by the operator:
- Check the secure installation of the assistance display, component holder and accessories on a weekly basis.
- Clean the lenses of the cameras regularly, see page 59.
- If necessary, clean the touchscreen of the assistance display, see page 60.

4.1 Clean the lens

NOTICE

Risk of material damage when cleaning the lens

Dry cleaning carries the risk of static electricity, causing dust to be increasingly drawn to the lens of the camera and scratching the lens. A scratched lens will result in faults. A camera with a scratched lens needs to be replaced.

- ▶ Do not de-ice the lens by mechanical means.
- ▶ Always clean the lens with a damp cloth. Use only the prescribed cleaning agent to clean the lens.
- ▶ Observe the instructions for cleaning the lens. Do not use other cleaning methods, otherwise the lens could get scratched.

NOTICE

Risk of material damage due to solvent-based cleaning agent

The solvent-based cleaning agent LOCTITE SF 7063 can attack certain plastics and coatings.

- ▶ Do not use LOCTITE SF 7063 for components other than the lens of the camera without special approval.

Clean lenses of the camera

Requirements

– Forklift truck parked securely

Procedure

- Dampen a clean cotton bud with the recommended cleaning agent LOCTITE SF 7063, and clean the lens glass with gentle circular motions.
- If the lens glass is still damp, wipe with a clean cotton bud to remove contaminants and excess detergent.
- Repeat procedure if necessary.
- Dispose of used cotton buds appropriately.
- Before restarting the forklift truck, ensure that any residual cleaning agent on the lens is completely dry.

The lens of the camera is cleaned.

4.2 Cleaning the touchscreen

NOTICE

Information on cleaning the touchscreen

To clean the touchscreen, use a dust-free cloth soaked in a small amount of cleaning agent. After cleaning, wipe dry with a clean cloth.

▶ Before cleaning, disconnect the assistance display from the supply voltage by switching off the truck.

▶ Use only suitable cleaning agents. Do not use water.

▶ Use only clean, soft cotton cloths, microfibre cloths or new soft, disposable paper towels as the touchscreen may scratch.

▶ Do not apply cleaning agent directly to the touchscreen; apply to the clean, soft cotton cloth, microfibre cloth or new soft, disposable paper towel.

5 Disposal

NOTICE

- ▶ The components must be collected separately from domestic and commercial waste and either recycled or disposed of in the correct manner.
- ▶ Old components must be dealt with by your company’s disposal department (if available), who will arrange to have it removed by special disposal companies
- ▶ As a rule, it is also possible to return the old components to the manufacturer. In this case, you should contact the manufacturer's customer service department. Any special arrangements must be observed.

According to the European WEEE Directive (2012/19/EU), electric and electronic equipment must be collected separately from municipal waste and either recycled or disposed of in the correct manner. This is because hazardous substances can cause lasting damage to personal health and the environment if disposed of in an incorrect manner.

For further information, contact the specialist disposal companies or relevant local authorities.

Packaging must be disposed of separately. Paper, cardboard and plastic should be recycled.

E Maintenance, Inspection and Changing of Maintenance Parts Requiring Replacement

⚠ WARNING!

Lack of maintenance can result in accidents

Failure to perform regular maintenance and inspections can lead to the failure of assistance systems and poses a potential hazard to personnel and equipment.

▶ Thorough and expert maintenance and inspections are among the most important prerequisites for safe operation of the assistance system.

NOTICE

The application conditions of an assistance system have a considerable impact on the wear of the components of the assistance system. The following service, inspection and replacement intervals are based on single-shift operation under normal operating conditions. They must be reduced accordingly if the equipment is to be used in very dusty conditions, sharp temperature fluctuations or multiple shifts.

▶ To prevent damage due to wear, the manufacturer recommends an on-site application analysis to agree on appropriate intervals.

The following chapter defines the tasks to be performed, the respective intervals to be observed and the maintenance parts for which replacement is recommended.

1 Maintenance Contents addedVIEW

Issued on: 2024-09-02 16:30

1.1 Owner

To be performed every 50 service hours, but at least once a week.

1.1.1 Maintenance contents

1.1.1.1 Standard equipment

System components
Clean the camera.
Clean the display.

1.1.2 Inspection contents

1.1.2.1 Standard equipment

The following points must be checked:

1.1.2.2 Optional Equipment

The following points must be checked:

1.2 Customer Service

In accordance with the addedVIEW service interval, to be performed every 1000 service hours, but at least once a year.

1.2.1 Maintenance contents

1.2.1.1 Standard equipment

System components
Clean the camera.
Clean the display.

1.2.2 Inspection contents

The following points must be checked:

1.2.2.1 Standard equipment

Electrical system
Check electrical wiring for damage (insulation damage, connections) and check whether the fuse ratings are correct

System components
Check camera is securely attached, test and check for damage
Check display is securely attached, test and check for damage
Display and system behaviour on the truck for plausibility.

1.2.3 Maintenance parts

The manufacturer recommends the replacement of the following maintenance parts at the specified intervals.