86168GB- 50
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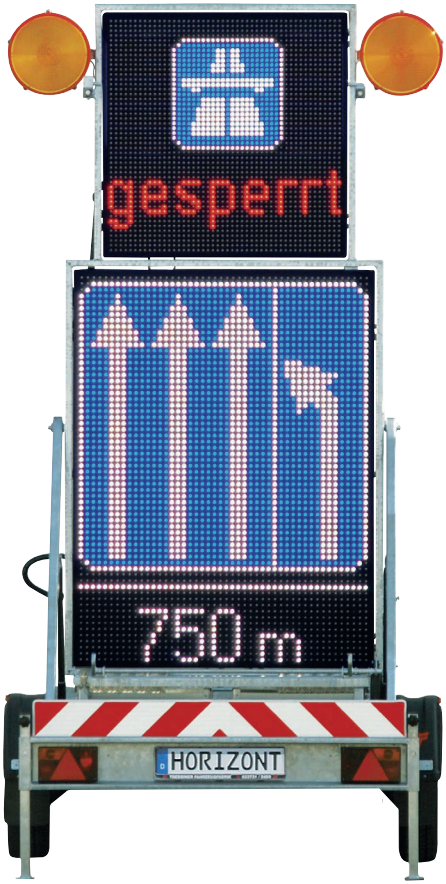
USER MANUAL

LED VMS TRAILER

E1 **10R-023982**



SICHERHEIT AUF ALLEN WEGEN

horizont group gmbh
Traffic Safety

Postfach 1340
34483 Korbach

Homberger Weg 4-6
34497 Korbach
GERMANY

Telefon: +49 (0) 5631 565-200
Telefax: +49 (0) 5631 565-248

traffic@horizont.com
www.horizont.com

horizont

Table of contents

Subject to technical alterations!

Variable Message Sign-Trailer, LED

Due to the active performance of the traffic signs, enhanced by two high intensity LED warning lights top left and right, motorists pay full attention on danger spots ahead.

The VMS-Trailer can be used for many different applications and programmed according to your individual requirements.
A wide selection of road signs, guiding arrow signs and/or text messages can be programmed, which enables the user to respond to almost all traffic situations.
All signs are displayed by high intensity LEDs, bright and clearly visible.

„A picture is worth a thousand words“

As often warning texts displayed might not be immediately intelligible to all road users VMS boards can help to save lives - enabling even foreign language speaking motorists to prepare for particular traffic conditions.

Sign selection as well as entire operation of the VMS trailer is very easy via a remote hand set/ tablet.

The complete board, a frame carrying the upper- and lower boards, is raised / lowered by an electric actuator and is also electrically locked in its final position during operation or transport.

For short term use, i.e. trailer firmly coupled to a towing vehicle, it is not necessary to use jacks. The driver doesn't have to get out of the towing vehicle - no manual work has to be carried out as the operation can be entirely executed right from the driver's cab.

Due to the compact body of the VMS trailer it can be moved very easily and can be towed even with light vehicles and also be carried by other warning trailers.

Advantages

- up to 4 different visual displays simultaneously
- standard traffic signs
- simultaneous display of animated signs and text
- continuous light, flashing light, animated signs or running texts
- RGB board
- each LED is encapsulated in its own lens, ensuring optimum visibility

(no front screen, causing interfering reflections)

- freely programmable
- memory capacity for up to 1,500 signs and texts,
- nine brightness levels and automatic brightness adjustment via photo sensor
- start up and operation while driving, at speed Vmax 80 km/h with DIN towing eye
- with ball head coupling speed Vmax 40km/h (if a minimum drawbar capacity of 25kg is maintained)
- additional warning effect provided by two advance LED warning lamps
- wireless touch screen radio remote control or tablet remote control

1. Remote control Touchscreen

for max. 1.500 Signs and texts

1.1. General survey

1.2. Switch on

Press the “Power” key  for more than 5 secs in order to switch on both, the remote control as well as the VMS trailer itself. After switch-on and the synchronisation procedure has been completed (‚progress bar‘) the start screen appears (see 1.3.0.).

Pressing the „Power “key again for more than 5 secs will switch off the remote control.

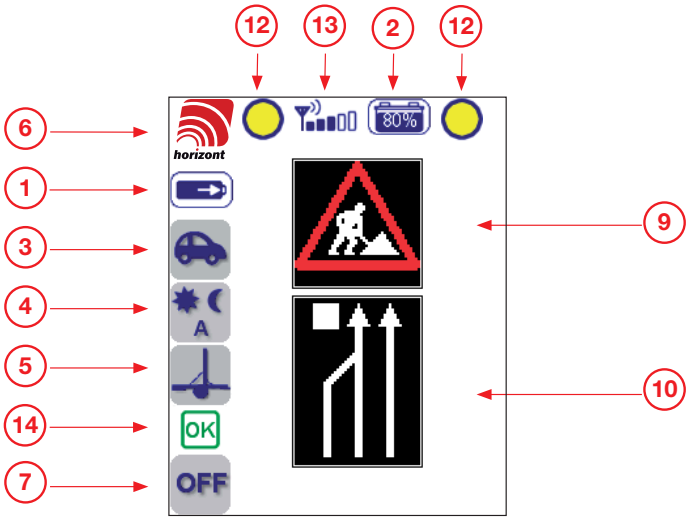
For energy-saving reasons, the remote control also switches off after a certain period of inactivity if it is not placed in the charging cradle.
Press the „Power“ key again to re-synchronise the remote control with the trailer.

1.3. Operation

Switching between the different communication modes (radio / cable), for remote controls offering both options, may only be executed in the main menu (see 1.3.1.).

Note: When operating in cable mode, the LED boards switch off with a delay of up to 10 seconds after the remote control.

1.3.1. Main Menue



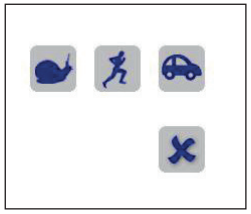
1.3.2. Battery capacity remote control (1)

The symbol indicates the current capacity of the remote control batteries. When the batteries are fully charged, the capacity is sufficient for continuous operation for 5 hours. The actual operating time depends on the backlight setting, which changes every time the screen is touched. For longer operating times, the remote control must be placed in the charger for charging.

1.3.3. Battery capacity VMS Trailer (2)

The symbol indicates the current capacity of the batteries of the VMS trailer. When the batteries are fully charged, the capacity is sufficient for continuous operation for up to 48 hours. The actual operating time depends on the choice of traffic signs (number of LEDs) and the brightness level selected.

1.3.4. Submenu' Alternation frequency different (3)



→ 15 changes per minute

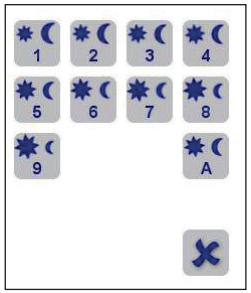
→ 30 changes per minute

→ 60 changes per minute

→ without saving any changes, back to the main menu

After start-up the following parameter is set .

1.3.5. ‚Submenu' Luminous intensity (4)

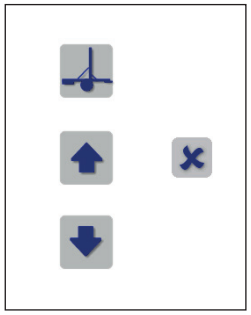


In this menu, the illuminance of the LED board can be defined. The setting can be manually adjusted between 1 (minimum illuminance) and 9 (maximum illuminance).
If you select A = automatic, the illuminance is automatically adjusted to the ambient lighting conditions via photo sensor.

→ without saving any changes, back to the main menu

After start up the following parameter is set ‚A = Automatic'

1.3.6. ‚Submenu' Raising and lowering LED board (5)

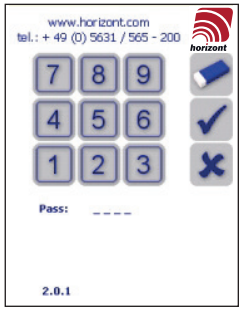


→ Raise board
(Release key in case of danger !!!)

→ Lower board
(Release key in case of danger !!!)

→ without saving any changes, back to the main menue

1.3.7. ‚Submenu' Special parameters (6)



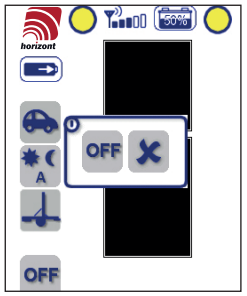
For service purposes, you can leave the operational programme for the LED boards in this menu. Please use this section only when instructed to do so by the manufacturer.

→ Delete the chosen code

→ Confirm code

→ without saving any changes, back to the main menue

1.3.8. ‚Submenu' Switch off (7)



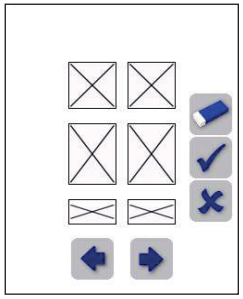
To switch off the LED panel, press the key OFF - beneath the horizont logo once. In the subsequently appearing submenu choose ✕ to get back to the main menue or press OFF again to switch off the LED board as well as the remote control.

Depending on the selected settings in Signload (see 4.4.2.3) different "Switch OFF" modes will be activated after choosing to switch the board off - once the LED board has been completely lowered and locked in transport position:

- the LED board as well as the remote control are automatically switched off !
- A pop up window appears asking whether you want to switch off the system 

- A countdown timer starts counting down from 60 min to 0 (having chosen the default settings in Signload). In the case of inactivity, after counting down to 0:00 min, the system is switched off.
- Choosing OFF will switch off the LED board as well as the remote control immediately.
- If the message is cancelled by „X", the window reappears after 5 minutes if no entries were made.

1.3.9. Select signs



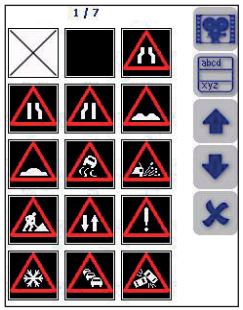
In this menu, both layers of the LED board, as well as the text fields, are displayed as symbols (left column = 1st layer, right column = 2nd layer). Touching the corresponding symbol will start the respective submenu

- ☒ → Input, upper board (9)
- ☒ → Input, lower board (10)
- ☒ → Input, text field (11)

- → Delete chosen signals
- → Transfer chosen signals to LED board (see 1.3.17)
- → Quit menue
- → Switch between the 10 last activated sequences (scroll to the left)
- → Switch between the 10 last activated sequences (scroll to the right)

1.3.10. Input upper board (9)

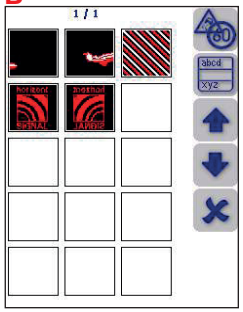
A



By touching one of the displayed signs/texts this selection is transferred to the combination preview (see 8) and an automatic switch to this menu is effected

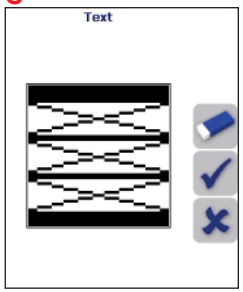
- → Switch to menu „Animated sings", upper board (see 9B)
- → Switch to menu "Enter texts", upper board (see 9C)
- → Scoll up in preview
- → Scroll down in preview
- → Quit menu

B



- → Switch to menu „Static signs" upper board (see 9A)
- → Switch to menu „Enter texts" upper board (see 9C)
- → Scroll up in preview
- → Scroll down in preview
- → Quit menu

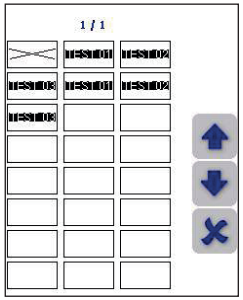
C



For text input, the upper panel is divided into three fixed lines. Select the line you want to edit by touching it. This takes you to the text selection screen (see 9D)

- → Delete all chosen texts
- → Transfer of selected texts to the combination preview (see 8) and automatic switch to this menu
- → Quit menu

D

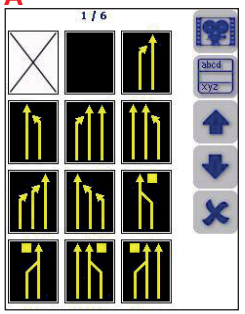


By touching one of the displayed texts, it is transferred to menu 9C and an automatic switch to this menu is effected.

- → Scroll up in preview
- → Scroll down in preview
- → Quit menu

1.3.11. Input lower board 10

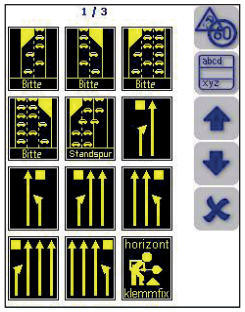
A



By touching one of the displayed signs/texts this selection is transferred to the combination preview (see 8) and an automatic switch to this menu is effected.

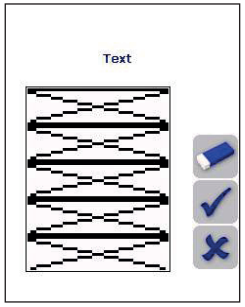
- → Switch to menu „Animated signs“, lower board (see 10B)
- → Switch to menu „Enter texts”, lower board (see 10C)
- → Scroll up in preview
- → Scroll down in preview
- → Quit menu

B



- → Switch to menu „Static signs“, lower board, (see 10A)
- → Switch to menu „Enter texts“, lower board, (see 10C)
- → Scroll up in preview
- → Scroll down in preview
- → Quit menu

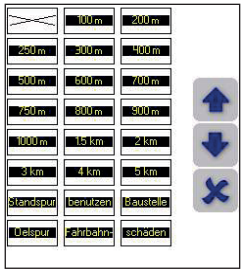
C



For text input, the lower board is divided into 5 fixed lines. Select the line you want to edit by touching it. This takes you to the text selection screen (see 10D).

- → Delete all chosen texts
- → Transfer of selected texts to the combination preview (see 8) and automatic switch to this menu
- → Quit menu

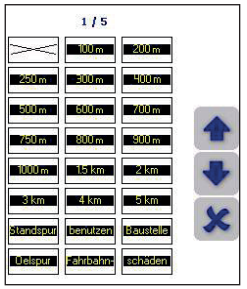
D



By touching one of the displayed texts, it is transferred to menu 10C and an automatic switch to this menu is effected.

- → Scroll up in preview
- → Scroll down in preview
- → Quit menu

1.3.12. Input text 11



Touching one of the displayed texts this selection is transferred to the combination preview (see 8) and an automatic switch to this menu is effected.

- → Scroll up in preview
- → Scroll down in preview
- → Quit menu

1.3.13. Status display advance warning lamps, MS 340LED 12

Display advance warning lamps MS340 LED .

Advance warning lamps ON

Advance warning lamps OFF

1.3.14. Radio communication 13

Display radio reception quality

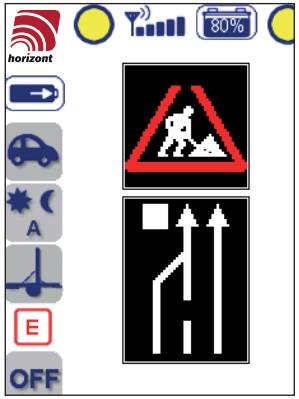
As long as there is no radio reception between the LED board and the remote control, this symbol is displayed in the centre of the screen. Press the symbol to return to the menu.

Indicator, showing that the remote control is working via cable connection.

Possible reasons for bad / no radio reception:

LED board is not switched ON	→ Switch OFF the remote control Swich ON the LED board and re-start the remote control
Distance between LED board and remote control is too big	→ Reduce distance

1.3.15. Status display



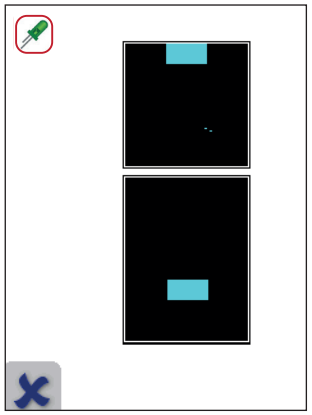
Any malfunction occurring on the LED board will be indicated quickly and clearly by the icon E displayed on the left side of the main menu.

In addition, a pop up menu, displayed by a caution mark will appear and on the right-hand side of the main menu the physical error will be displayed with any faulty LEDs if applicable.

From a technical point of view, LED errors are detected and displayed down to individual LEDs. In addition, errors relating to the power supply as well as communication errors are displayed. It may therefore happen that the display in the remote control shows defective modules due to a detected communication failure, but the real display still seems to work perfectly for the user.

It is also possible that an error is displayed on multicolour displays, the defective LEDs, however, are not activated in the selected signal aspect, as this colour is currently not being used.

Each time the LED panel is restarted, the error counter is reset. The warning described above always occurs if this counter is increased by additional system deteriorations.



To check the detected failures, click on E to access the status display menu. In this menu the selected signals are hidden and you can clearly see where the faults were detected.

If other errors have been detected in addition to the display, you are informed about them in the left-hand area of this sub-menu.

Depending on the settings in Signload, an acoustic signal sounds in case of errors, warnings and interrupted connections.

	Defective LEDs on one or more LED panels Possible causes: - failure of individual LEDs - power supply failure of the LEDs on a module - power supply failure of the LED drivers on a module - communication failure - interruption of flat ribbon cable (see E1) - communication failure - network cable interruption (see E2)
	Communication failure on one or more LED panels - Interruption of flat ribbon cable Possible causes:: - interruption between the data conversion module and the first LED module in a row - interruption between the individual modules of a row - missing jumper on the last module in a row - interruption of communication between panel controller and data conversion module (see E2)
	Communication failure - Interruption of network cable Possible causes: - interruption of the network connection between the main processor of the board and the data conversion module - communication error in the data conversion module - communication error in the central processor of the board
	Communication error - Advance warning lamps Possible causes: - interruption of data communication between the central processor of the board and the controller of the advance warning lamps - communication error in the controller of the advance warning lamps - communication error in the network splitter - communication error in the central processing unit of the board
	Communication error - Actuator control Possible causes: - interruption of data communication between the central processing unit and the actuator control unit - communication error in the actuator control unit - communication error in the central processing unit of the board

1	Communication error - brightness sensor 1 (no jumper) Possible causes: - Interruption of data communication between the main control and brightness sensor 1 - Communication error in brightness sensor 1 - Communication error in the network distributor - Communication error in the main control.
2	Communication error - brightness sensor 2 (jumper PIN1 and PIN 8). Possible causes: - Interruption of data communication between the main board and brightness sensor 2 - Communication error in brightness sensor 2 - Communication error in the network distributor - Communication error in the main board.
+	Communication error - additional sensors

1.3.16. Operating hours metre

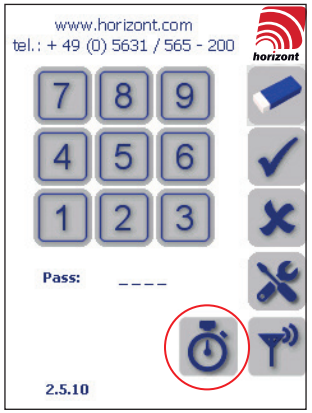
To open the operating hours meter, proceed as follows:

1. click on the horizont logo (see figure 1.3.16a)
2. click on the operating hours meter symbol (see figure 1.3.16b)

In this menu you will be shown the total operating hours as well as the hours during which the panel has been operated with low voltage.

To quit the submenus, press  until you are back in the main menu.

Figure 1.3.16a



Fgure1.3.16b

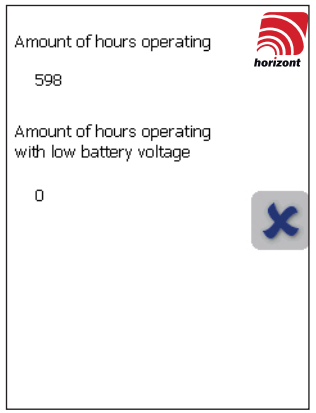
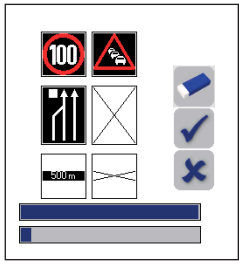


Figure 1.3.16c

1.3.17. Data transmission to LED board



Two progress bars appear during transmission. The upper one shows the progress of the transmission of single images, while the lower one shows the progress of the total transmission.

1.3.18 Problems while establishing the radio connection

If no radio connection can be established between the radio remote control and the LED panel, this is indicated by a pop-up menu

There are three possible reasons for this and they can be solved as follows:
Follow the instructions in the table and then click on the pop-up window.

Reason	Solution
Distance between remote control and LED panel is too far.	Shorten the distance between the radio remote control and the LED panel.
External interference (e.g. radio interference, high-voltage power lines, etc.	Try to establish the radio connection again by clicking on the pop-up menu.
Main switch of the LED board not switched on.	Switch off the radio remote control via ‚OFF', then switch on the LED board via the main switch and restart the radio remote control.

1.4 Charging cradle for remote control

If the charging cradle is properly connected to the supply voltage (12 - 28 VDC) and the remote control is correctly inserted, the LED (A) lights up.

Red LED (A) Remote control is charging (charging time max. 3-4 h)

Green LED (A) Trickle charge of the remote control (Operating time for continuous operation approx. 5-6h)

Remove the remote control:
By sliding the remote control in the direction of the green arrow, the remote control can be removed

Inserting the remote control:
1. Insert the remote control into the upper part of the charging cradle.
2. Slide the remote control including the upper part of the charging cradle upwards (green arrow).
3. Insert the lower part of the remote control into the charging cradle.
4. Close the charging cradle (blue arrow).

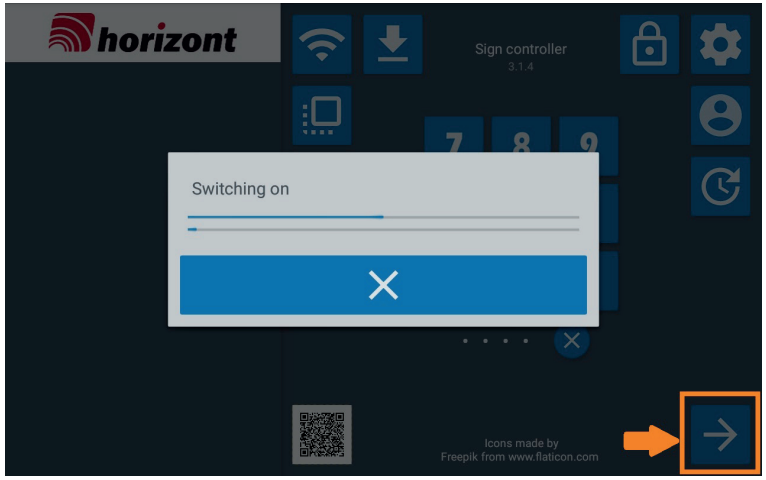
2. Tablet remote control

2.1. Overview

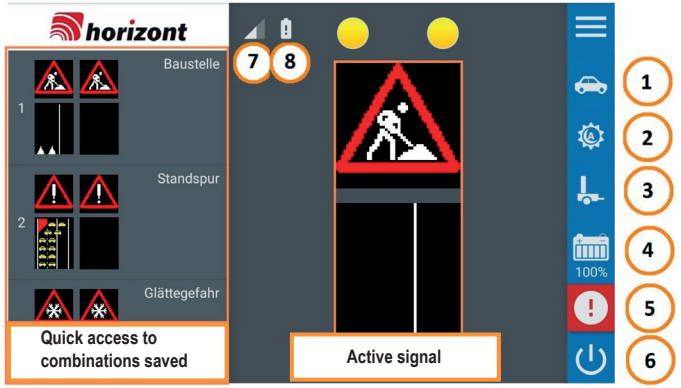
2.2. Switch ON

To switch on the tablet, press the on/off button once. The programme automatically starts the connection with the LED board, otherwise press the arrow once in the bottom right-hand corner.

Only the SiCo app can be run on the tablet.



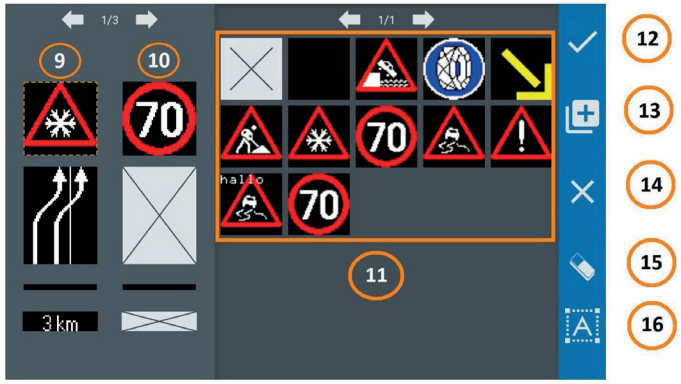
2.3. Main Menu



In the main menu, the activated signal image is displayed in the center and can be changed by tapping on the display area. In the left-hand area, stored signal image combinations can be activated. The right menu bar lists various submenus which can be called up by tapping on the symbols (1) to (3).
The remaining battery capacity is indicated by the battery symbol (4).If an error has occurred, a red warning symbol appears indicating malfunction of the LED board (5).The LED panel can be switched off via (6). Symbol 7 shows the signal quality of the wireless connection between the board and the tablet. Symbol 8 shows the remaining battery capacity of the tablet.

2.4. Submenu “Signal image selection”

By pressing on the activated signal image, a submenu containing the signal image selection is opened.

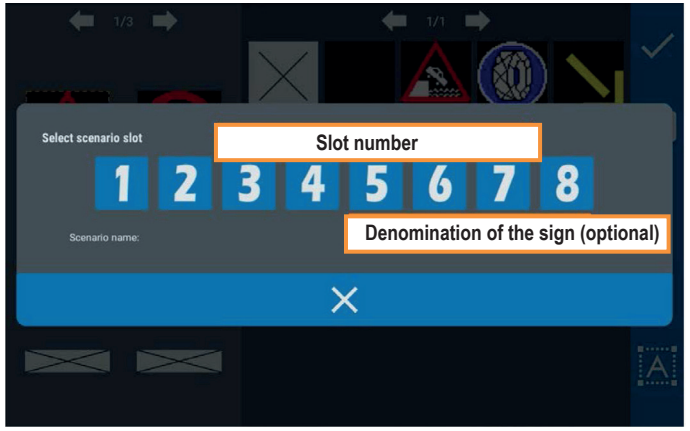


In the left hand section, two interchangeable images (9 &10) can be selected for both, upper and lower board. The alternating rate of the images is selected in the main menu (1).If only one image or an animation shall be displayed, the second layer (10) can be deactivated. The navigation arrows located above the signal images are used for scrolling through the already activated traffic signs. In order to select signal images, select a sign in layer 9 or layer10. The currently selected sign is indicated by an orange dashed outline (see upper sign in 9). By selecting signal images (as per picture 11), the selected sign will be displayed in the left hand column (9).You can also delete signs during the selection process by pressing on the rubber on the right bar (15).

To scroll through the signal images (11), press the arrow keys or swipe your finger to the left and right. The content can be saved for quick activation (13), discarded with (14) or saved with (12).

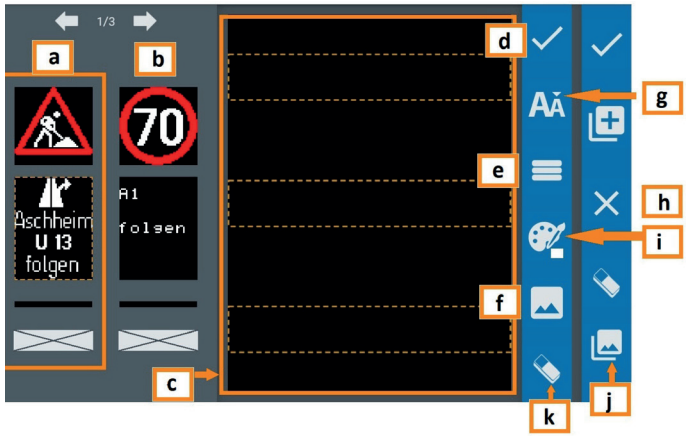
2.5. Quick access (13)

When saving in the Quick Slot (13), a new window opens asking the user to assign a number to the selected content. Optionally, the user can also assign a name to the defined combination, which must be done before selecting the slot number.



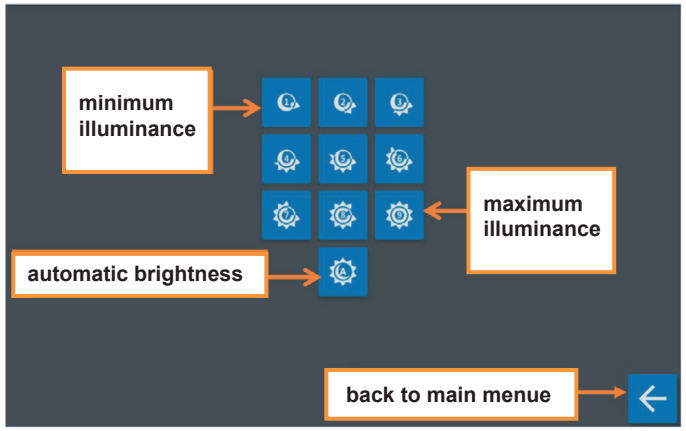
2.6. Submenu “Text creation” (16)

In addition to pre-installed content, free text entry is possible. By pressing the text entry button (16) in submenu „Signal image selection“ a new text entry form will open.



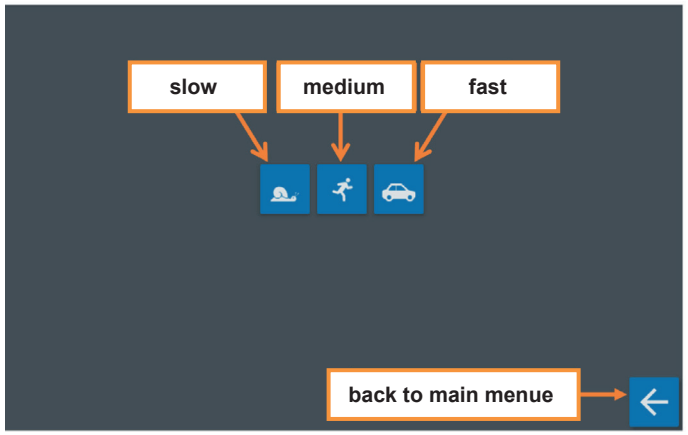
A preview of the currently selected content is displayed in the left hand side of the screen (a and b). Free texts can be entered in the centre of the screen **(c)** . Text can be entered and edited with button **(e)** (text fields per sign) and button **(f)** (text size). To enter a coloured text, the text colour must first be selected with **(i)**. To start text entry, click on one of the dashed orange rectangles **(c)**. This opens the Android® keyboard. To delete the complete text entered, press **(k)**.By means of button **(f)** you can also add a sign to the next which will be displayed underneath the text. After the text has been entered, it can be saved with **(d)**, deleted with **(h)** or discarded with **(j)** .Having saved your text with **(e)** the text will be displayed on the selected board.

2.7. Submenu ‘Luminous intensity’ (2)



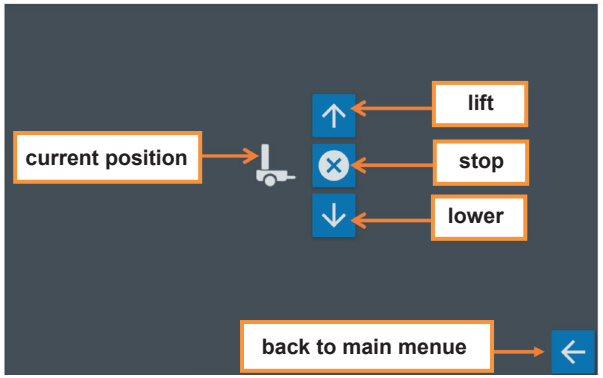
Press key (2) in the main menu to enter the submenu ‚Luminous intensity‘. Here you can adjust the luminous intensity either manually in steps from 1 to 9 or choose for automatic luminous intensity. We recommend using the automatic brightness, as this provides the optimum brightness for the ambient lighting conditions

2.8. Submenu “Alternation frequency animated signs” (1)



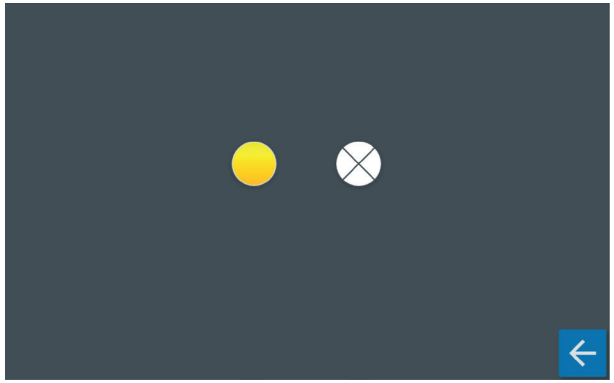
Press key (1) in the main menu to enter the submenu for setting the alternation frequency for animated signs. Animation speed can be set to slow, medium or fast.

2.9. Submenu ‘ Lift / lower LED board 3



Press key (3) in the main menu to enter the submenu for lifting and lowering the LED board

2.10. Advance warning lamps, MS340

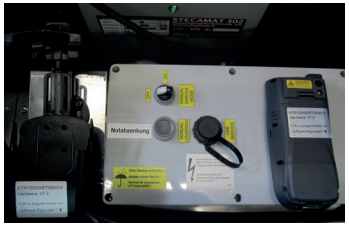


The advance warning lamps can be switched ON/OFF by pressing the corresponding symbols in the main menu.

2.11. Submenu ‚Fault indication LED boards 5

Any malfunction will be displayed in this submenu.

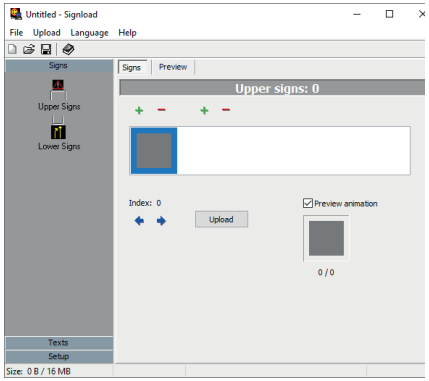
3. Signload programme for transferring signs



Depending on the type of remote control (Touchscreen or Tablet remote control) the chassis identification number (WTR…), the hardware version of board as well as the SignLoad version are indicated on the back side of the remote control. In addition to the SignLoad version shown, the programme itself has another sub-version number. This sub-version number is incremented in the event of programme modifications and new LED board combinations.

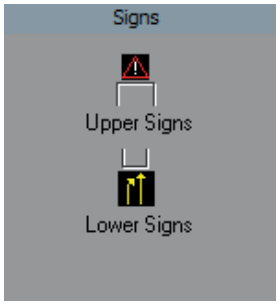
Signload is downwards compatible, which means you can use any higher version upwards from the sub-version number provided at the time of delivery.

3.1. General information



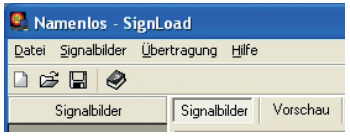
The SignLoad programme enables you to transfer data from the PC to the LED board and the remote control.
On the left side of the user interface you can select the required function and on the right side you carry out the tasks.
On the left side of the user interface, you can choose between three functional groups:
SIGNS, TEXTS and **SETUP.**

3.2. Function group - SIGNS



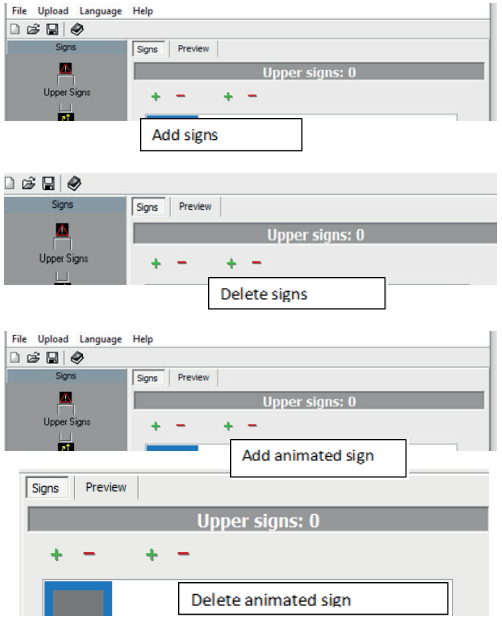
Add or remove traffic signs and animated signs for the freely programmable memory space of the upper board. Press key Upload in order to transfer all data to the remote control or memory card (see 3.5.)).

Add or remove traffic signs and animated signs for the freely programmable memory space of the lower board. Press key Upload in order to transfer all data to the remote control or memory card (see 3.5.)



In the upper part of the screen you will find a separate ‚Preview' tab for the upper and lower board. You will see the preview of all signal signs selected for the corresponding board. By clicking on ‚Print' you can also print the preview. Print

3.2.1. Traffic sign set for the upper LED



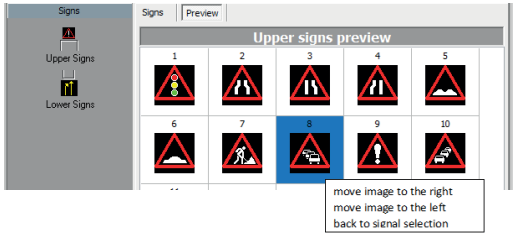
In order to add or delete signs in your sign set for the upper LED board, choose "Signs" and then "Upper Signs" on the left hand section. In order to add a new sign, choose the desired sign and press on key "+".
In order to delete a sign, choose the corresponding sign and press on key "-" .
In order to create a new animated sign please proceed as follows:
1. Add a new sign (first sign of the animation) by clicking on the left hand „+" key.
2. Add all further signs of the animation by means of the right hand „+" key (you can add several signs at once by marking them in the preview).
A preview of your animation will be shown automatically. In order to delete single signs from an animation, chose the sign you want to delete from the preview (highlighted in blue) and press the right hand „-" key.
To scroll within the preview use the arrow keys underneath.

3.2.2. Traffic Sign set for the lower LED board

Choose "Signs" and then "Lower signs" in the left hand column to add or delete traffic signs and animated signs for the lower board. Proceed as described in 3.2.1. in order to create traffic signs and animated signs for the lower board.

3.2.3. Preview sign set for the upper board – Printable

Showing all signs of the upper board.
If needed you can also print the preview



In order to print your preview, press Print

You can change the position of the sign in the preview by selecting the sign and moving it via the pull-down menu (right mouse button).

3.2.4. Preview sign set for the lower board

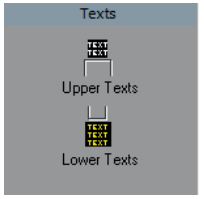
The same functionality exists here as with the print preview for the upper board (see 3.2.3.))

3.3. Function group - TEXTS

3.3.1. General information

On the upper board you can display a text message of up to three lines instead of a sign (see 1.3.9).
On the lower panel you can display a text of up to five lines instead of a sign (see 1.3.10), or overlay a single-line text on a selected sign in the lower area (see 1.3.12

3.3.2. Add or delete texts



Texts upper board

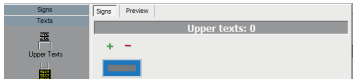
Add a text to the sign set of the upper board

Delete a text from the sign set of the upper board

Texts lower board

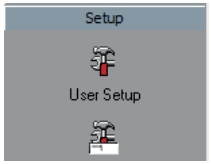
Add a text to the sign set of the lower board

Delete a text from the sign set of the lower board



Click on „Preview" to see all texts for the corresponding board.
Press Print in order to print the preview

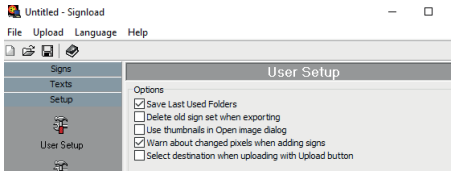
3.4. Function group - SETUP



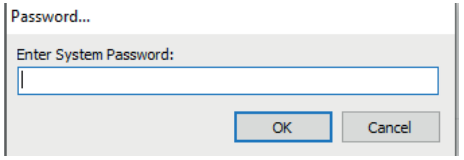
Select the COM port of your PC for communication and the menu language with the LED board and save these settings (see 3.4.1.).

Within this menu system settings can be changed and should therefore not be entered for normal operations but only on request (protected by the password ‚horizont') (see 3.4.2.).

3.4.1. User Setup



3.4.2. System Setup

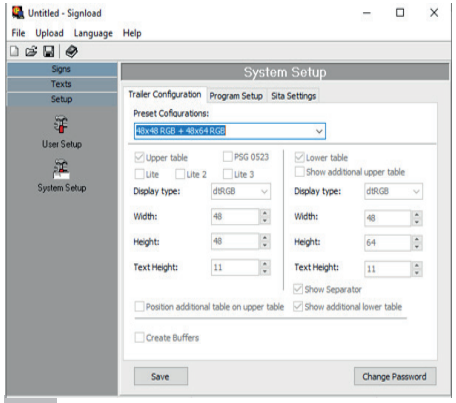


Enter your password
(By default the standard password is set to ‚horizont'.)

Within in this menu the following settings can be made:
- Change system password
- Select specifications corresponding to your VMS-Trailer / LED boards

Only trained personnel should carry out these modifications !

3.4.2.1. Trailer Configuration



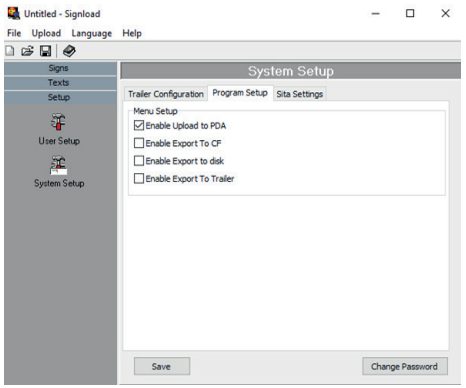
Select the LED boards (trailer) you wish to programme via the list of pre-set configurations.

The pre-set configurations in the list are structured as described in the below example:

48x48R20_RGB+48x64R25_W

48x48 ... - ... WxH of pixels for the upper board
R20 ... - ... RGrid dims. of the upper board (20mm)
RGB ... - ... LED-colour of upper board (RGB +
48x64 ... - ... WxH of pixels for the lower board
R25 . ... - ... Grid dims. of the lower board (25mm)
W ..... - ... LED colour of the lower board (white)
(latest version of Trailers are only RGB)

3.4.2.2. Programme Setup



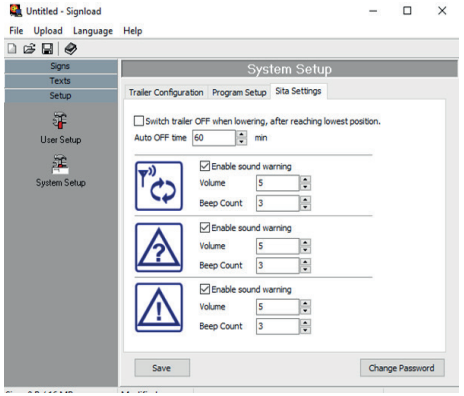
Choose your remote control:

Enable Upload to PDA when using a Touchscreen-remote control (see 3.5.)

Enable Export to CF (old versions, working with 7-Segment remote control)

3.4.2.3. Application settings

In this menu you can configure settings for the user interface of your touchscreen remote control, which are transferred to the remote control together with the sign set.



Possible settings:
- automatic system switch-off when lower end position is reached ①
- operator is asked whether he wants to switch off the system when the lower end position is reached.
- setting period of time after which the system is switched off if there is no activity by the operator ②
- activation of an acoustic warning signal in case of connection problems ③
  Volume as well as the number of beeps can be adjusted.

- activate an acoustic signal in case of loss of signal connection to the LED board.
  · Volume and number of beeps can be adjusted ④
- activate an acoustic signal when a fault occurs in the LED board
  · Volume and number of beeps can be adjusted ⑤

3.5. Transfer of sign sets to the touchscreen remote control

Before the first transmission, install the supplied communication software according to your operating system.

Windows7	->	Windows mobile centre
Windows8	->	Windows mobile cenre

Windows10 -> Windows mobile centre

Once the connection cable has been plugged in via USB to the computer with Windows 10 operating system and the remote control has been properly connected and switched on, the following window appears (Example: Windows10)

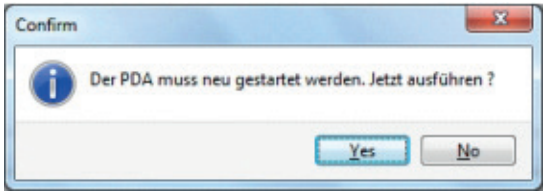
You can specify here whether you want to create a ‚partnership'. In this case, the computer and the remote control are synchronised (appointments, tasks,...) as soon as they are connected.

We recommend not defining a ‚partnership' and establishing the connection manually each time

The following message appears on the computer:

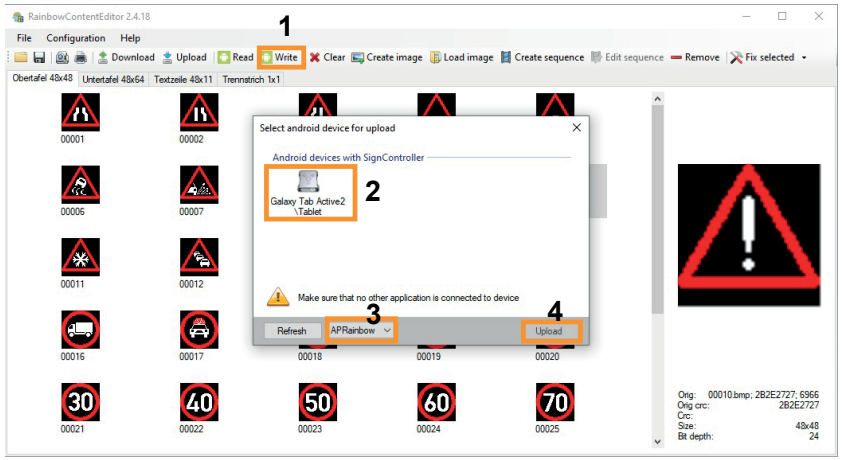
Before transferring a sign set to the remote control, the corresponding pre-settings (see 3.4.2.2.) must be specified.

After successfully transferring the sign set, a pop-up window appears asking you to restart the remote control. Confirm with YES.



4. RCE program for transferring signal images to the tablet

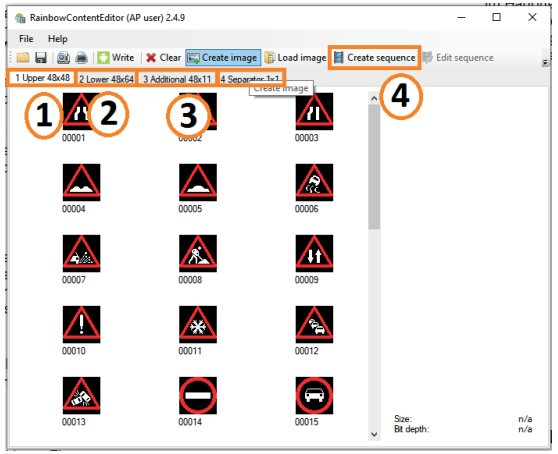
The RCE program enables the transfer of new images or complete data sets to the tablet. This is done by connecting the table via the USB-C port. Drivers do not have to be installed. To load new signal images onto the tablet, open the RCE program supplied. to write (1), press on the symbol. In the new dialogue window, select the tablet (2) and select the APRainbow processor (3). Finally press (4) to transfer the loaded character set to the tablet.



4.1. Main Menu

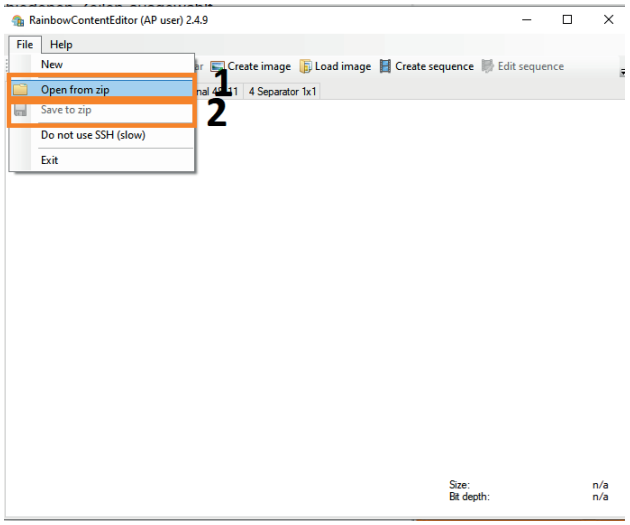
In the main screen choose between the tabs 1, 2 or 3, in order to see the signs saved on the upper board (1), on the lower board (2) and on the text field (3) of the lower board. Additional signs can be added by drag & drop.

Animations can be created by clicking on „Create sequence" (4).



4.2. Uploading or saving sign sets

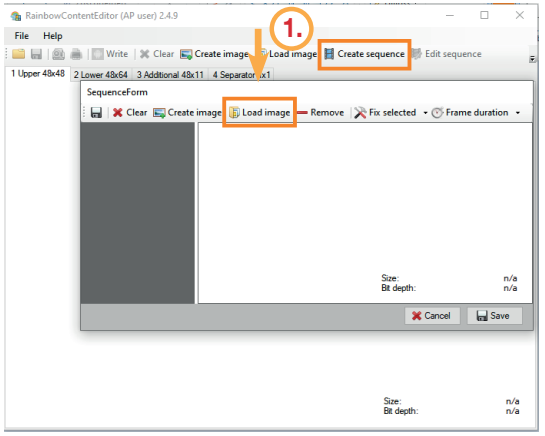
In order to upload existing sign sets to the programme or to save newly created sign sets proceed as follows: for uploads, select „File->Open from zip“(1). and select the sign set of your choice.
In order to save a sign set select „Save to zip“ (2).

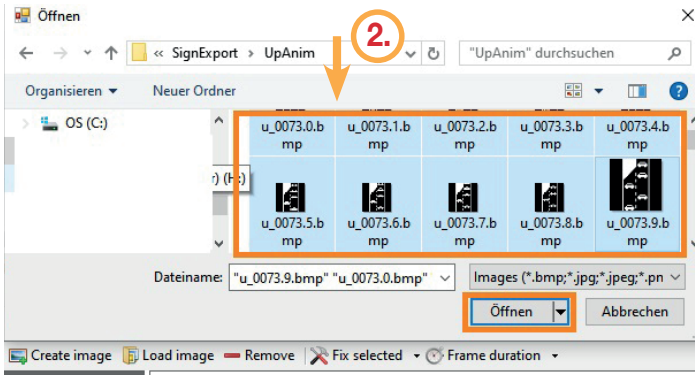


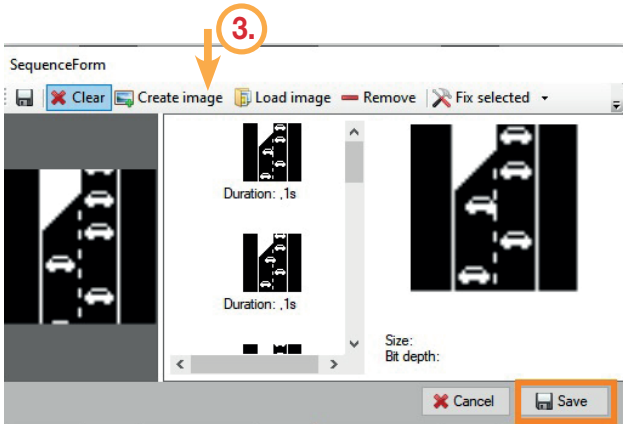
4.3. Create animated signs

To create animated signs proceed as follows:
open „Create sequence“ in the main menu and select single images with „Load image“ (1) or simply drag max. 10 images into the current window (2).

After checking the sequence, save the animation with “Save sequence”.







5. Battery guard

5.1. Technical details battery guard

To protect the batteries from deep discharge, threshold values for user warning and component shut-down are integrated in the controller according to the following table:

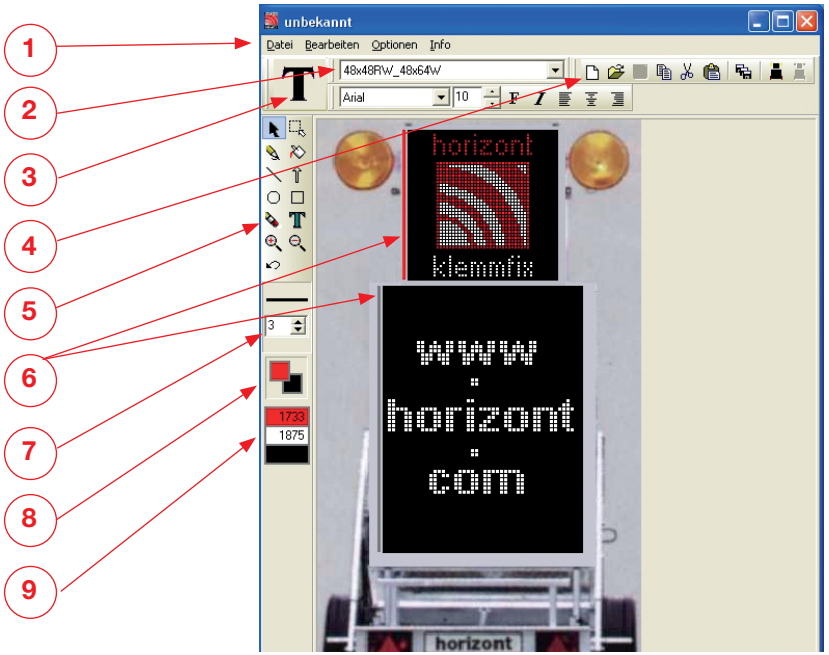
Falling below the threshold of:	Description
11,5 V	Warning via remote control, HOT and optional external low voltage indicator
11,0 V	LED board is switched OFF / no signal displayed
10,9 V	MS 340 advance warners switch OFF

6. Sign creation programme ‘LED-Tafel’

Our LED boards come equipped with a sign creation programme „LED-Tafel“ which allows to easily create traffic signs for LED boards and modify already created ones. The programme carries out all necessary checks (sign size, colour maximum number of LEDs used).

During installation, the programme automatically adopts the set system language of your PC, which can, however, be changed later in the menu bar.

After starting the programme, the following screen appears:



8-bit Farbauflösung oder PAint verwenden!

6.1. 8.1. Menu bar (1)

The following options are available:

Open and save signal images, select your panel size / version, display an auxiliary grid or select the user language (German, English or French).

6.2. Choose type and size of your VMS board (2)

Select the LED panel for which you want to create new signs in this menu.
Please see below an example (as in picture above) how the designation of the VMS-boards is set up:

48x48R20_RGB + 48x64R25_W

48x48 - stands for wxh of pixels of the upper board
R20 - stands for the grid of the upper board (20mm)
RGB - stands for the colours of the upper board LEDs
+
48x64 - stands for wxh of pixels of the lower board
R25 - stands for the grid of the lower board (25mm)
W - stands for the colour of LEDs of the lower board (white)

6.3. Additional texts (3)

(Only for touchscreen remote controls!!)

With this tool, depending on you VMS board you can create line texts or symbols for the touchscreen remote control. After transferring them with SignLoad (see 2.3.2.), these texts can be selected in the different lines on the touch screen remote control (see 1.3.10 or 1.3.11). The arrangement of the texts on the touch screen remote control does not have to correspond to the arrangement during creation

6.4. Toolbar (4)

The toolbar allows you to quickly clear the two windows representing the LED boards, open files, save files, select the font, etc

6.5 Tools (5)

Pointer	Move selected elements
Marker:	Mark a specific area
Line:	Create freehand lines or individual points
Filling tool:	Fill a specific area with colour
Rubber band:	Draw a line, keeping the left mouse key pressed
Directional arrow	Draw a directional arrow, keeping the left mouse key pressed
Circle:	Draw a circle, keeping the left mouse key pressed
Square:	Draw a square, keeping the left mouse key pressed
Rubber:	Erase
Text:	Add text (during input, the text flow, text type and position can be changed. After switching to another tool, this is no longer possible.)
Enlarge:	Enlarge the screen area
Reduce:	Reduce the screen area
Undo:	Undo last change

6.6. Operational area (6)

The red bar on the left side of the symbolic VMS-trailer indicates the board you are currently editing. You can draw or write text in this area. Boards can be selected with the pointer.

6.7. Line width (7)

Setting the line width for the tools.

6.8. Colours (8)

Showing the currently selected colours of characters and background

6.9. Choose colour and quantity of pixels (9)

In order to choose the colour of LEDs please proceed as follows:
Click with the left mouse key on the colour you want to use for creating signs.
Click with the right mause key on the colour you want to use as background colour.
Colours which may not be used, will be blocked.

7. Safety instructions

7.1 Lowering the upper board “manually”

You will find the push button for lowering the board “manually” on the lid of the relay box inside the battery box. By means of this button, you can lower the board even if the batteries are on low voltage or in case the remote control or the main CPU do not work.
The emergency lowering is equipped with the ‚dead man‘s circuit‘, i.e. as soon as the button is released, the actuator stops.
During emergency lowering, depending on it‘ s position, the panel is unlocked, lowered and locked again in the transport position.

Also during emergency lowering, make sure that there are no persons or objects in the moving range of the panel.

There are also a switch and a network connection for service purposes on the lid of the relay box. The switch turns on the panel‘s CPU independently of the remote control. The network socket is used to connect a service computer.

7.2 Protect electronics from moisture

To avoid short circuits, make sure that the lids of the battery boxes are closed, especially during rain.

8. Basic safety instructions

8.1 Intended use

Mobile advance warning trailers (VMS-trailers) are used in accordance with the German guidelines for safety at worksites of shorter duration (RSA). The active display of the traffic signs, supported by two long-distance warning lamps (MS 340 LED/flash) in the upper corners, particularly draws the attention of road users to danger spots ahead.

Due to the free programming of the LEDs, the advance warning sign can be used for a wide variety of applications.

The VMS trailer can be used for working sites when parked and secured with the parking brake, support wheel, rear outriggers and brake shoes, as well as in combination with a towing vehicle.

Using a ball hitch, driving with the LED board unfolded is permissible up to a maximum speed of 40 km/h (with a minimum support load of 25 kg). With a DIN towing eye a maximum speed of 80 km/h is permissible. The electronic system is used to raise and lower the LED board and to lock it in the raised and lowered position.

The LED panel may only be moved (raised or lowered) when the vehicle is parked.

The operational safety of the VMS trailer is only guaranteed when used as intended.

It can be used throughout the year up to normal wind speeds of 50 km/h (when stationary) on federal motorways

8.2 Improper use

It is not allowed to
- transport loads using the LED panel or on the platform
- lift loads using the LED panel
- use or transport LED board when not locked
- driving with the LED board raised at a speed of more than 40 km/h

8.3 Malfunctions in the electro-mechanical system

In the event of a malfunction of an adjusting actuator, the main switch has to be set to „0FF“ or “O”.

The malfunction may only be repaired by authorised specialist personnel. Under no circumstances should you attempt to carry out repairs at the place of use.

8.4 Unauthorised conversion and spare parts

Modification or alterations to the VMS trailer are only permitted with the written approval of the manufacturer. If required, only original parts from the manufacturer may be used to maintain the functionality and safety of the trailer. Use of any other parts will result in cancellation of liability for any resulting consequences..

8.5 Product surveillance

To enable us to continue providing you with safe products in the future, please notify us if you discover:

- malfunctions of the actuators or
- malfunctions in the electromechanical system of the trailer
- malfunctions or failure of the LED boards or the remote control
- problems or dangerous situations when using the VMS-trailer

9. Special safety instructions

9.1 Coupling head

After each coupling, ensure that the ball hitch is correctly seated on the ball of the towing vehicle. If not properly coupled, the trailer may detach from the towing vehicle posing a risk of accident.A pivoting range of +- 25° vertically and +-20° horizontally must be observed.

Exceeding this range will overload the components.

Wear indication

A wear indicator on the coupling handle shows whether or not the wear limit of the coupling ball of the towing vehicle or the coupling of the trailer has been reached. To do so, couple the coupling ball to the towing vehicle and drive the vehicle and trailer approx. 500 m.

The driving motion causes the coupling mechanism to adjust itself to the maximum.

Then check wear as follows:

- If the green indicator is visible on the coupling handle when coupled, the towing ball coupling is in new condition or the wear of the trailer coupling is within the permissible limits .
- If the green indicator on the coupling handle is completely covered when coupled or only the red indicator is visible, have the tow ball coupling and trailer ball need to be checked immediately.

Have the worn part replaced immediately!

9.2 Parking brake

Always pull the trailer‘s parking brake when parking.
If the trailer is detached from the towing vehicle, the trailer must also be secured with the two wheel chocks.

Until the full braking force is reached, the trailer can move back approx. 25 cm! Therefore allow sufficient distance when parking.

9.3 Breakaway cable

The breakaway cable acts as an emergency brake for the trailer equipped with parking brake.

In order for the emergency brake to work properly, it is essential that it is threaded into the respective breakaway cable guide. The breakaway cable must not wrap around the support wheel, otherwise the emergency brake will not work. It must also be ensured that the length of the breakaway cable is sufficient when driving around bends. Otherwise the brake may start to engage.

9.4 Drawbar height adjustable

The safety regulations have to be checked before every trip. In particular, make sure that the toothed pulleys engage without play so that driving stability and road safety are guaranteed. The locking toggle must be secured with a cotter pin.
Only adjust the height at the handle - risk of accident!

If the adjustable drawbar remains set at a certain coupling height over a longer period of time, so-called „fretting corrosion“ can occur in the toothed disc connection. This results in the tooth lock washers corroding. To prevent this, the toothed disc connections must be cleaned regularly (every 6 months) and a water-repellent grease has to be applied

9.5 Support wheel

Depending on the version, the jockey wheel is attached to the towing device by means of a clamp or firmly bolted.

For jockey wheels with a clamp, it is essential to pay attention to the drawbar load of the trailer when loosening the clamp. There is a risk of jamming and hitting.

When raising the jockey wheel for travel, make sure that

- in the case of lightweight support wheels, the lower part is fitted into the groove of the tube and turned firmly upwards.
- in the case of automatic jockey wheels, the jockey wheel is folded in and turned in tightly. Pay attention to the position of the wheel. The wheel or the support must not impair the mobility of the brake linkage.

If the support wheel is swung up over the support shoe under load, there is a risk of injury.

9.6 Wheels and tyres

Check the wheel bolts for tightness at regular intervals.

After changing the wheel, it is essential to check the wheel again for tightness after approx. 500 km.

Remember that the driving behaviour of the trailer also depends on the correct inflation pressure of the tyres. The inflation pressure of the tyres should be checked about every 2 weeks. The inflation pressure needs to be checked when the tyres are cold.

The following values apply to the tyres we use:

155 R13C 8PR	:	3.50 bar
165/80 R13	:	2.60 bar

9.7 Safety mechanism

The main switch is located on the right-hand side in the direction of travel in the right-hand battery box (depending on version).
To disconnect the power supply circuit for electrical displays (LED panels, advanced warning lamps (MS340), remote control) as well as for the actuators, simply turn the main switch key anticlockwise to the „0“ / „OFF“ position.
For the operation of the electromechanical system, a control system is used which only reacts upon a permanent pressure on the corresponding function keys of the remote control. If the key contact of the operator with the remote control is interrupted during a process of actuation, the LED panel immediately stops in its current position.

9.8 Special hazards during operation

Coupling

- When hitching, follow the instructions on the handle of the ball hitch
- Open the coupling of the trailer
- Place the coupling on the greased ball of the towing vehicle. It must engage audibly
- Pull up or turn up all the support devices and secure them, if necessary. The jockey wheel must point to the rear and has to be cranked up (automatic jockey wheel) or pulled up as far as it will go. (Observe safety instructions)
- Release the handbrake and attach the breakaway cable to the towing vehicle (Observe safety instructions)
- Connect the electrical system and check the functionality of the lights, brake lights and indicatosr

After hitching, always ensure that the coupling was carried out properly.

Positioning of the trailer

Attention! When parking the VMS - trailer alone, the parking brake must be engaged, the rear supports have to be lowered and the support wheel has to be weighted by means of the height adjustment before operation in order to avoid tipping over or moving the trailer. On slopes and inclines, the use of the wheel chocks is also required.

Before operating the system, remove the remote control from the battery box.

In case you work with a remote control connected via cable, pull the cable through the guide loop on the right rear joint strut, unroll the cable and position yourself in a way enabling you to watch the approaching traffic. Only in this way accidents with a potentially fatal outcome can be avoided.

For reliable visibility of the activated traffic sign on the LED panel, a distance of approx. 5 - 8 m to the LED panel is required.

When raising the LED panel up from transport position to operating position, a sufficient safety distance must be maintained, as loose objects may fall down, posing a risk of injury to people standing close by. The LED board always has to be locked in the lowered as well as in the lifted position.

While driving

When using the VMS-board while being towed, the maximum permissible speed is 70km/h (with a minimum drawbar load of 25kg) using a ball hitch. Using a DIN towing eye, the maximum permissible speed is 100 km/h.

Always ensure that the LED panel is locked in the upright position (see chapter 1.1 Intended use). You should not carry out any changes on the signal being displayed on the LED panels while driving, since it is not possible to check the actual traffic signs on the LED panel from the towing vehicle..

Lifting or lowering the LED panel while driving is prohibited!
(See chapter 1.1 Intended use).

When driving with the LED board lifted up, pay attention to the clearance height.

Height transport position approx.1.34 m (top edge)

Height working position approx. 3.84 m (top edge)

Safety precautions in case of danger

In the event of malfunctions in the operating process of the actuators, failure of the lifting or lowering process, etc., the electromechanical system must be switched off via the main switch in the right-hand battery box. The system must also be switched off immediately in the event of other hazards, e.g. smoke developing in the control system or after a rear-end collision.

10. Operation

10.1 Safety instructions

-> See general and specific safety instructions in chapters 1 and 2 of this manual.

10.2 Requirements on the operating personnel

Mobile Warning Trailers may only be operated by trained personnel who have completed their 18th year of age.

Trained personnel are persons who:

- have read and understood the operating instructions
- are familiar with the RSA (guidelines for securing work sites on roads) and the safety rules for road maintenance
- have received instruction from the manufacturer or an authorised person

The manufacturer accepts no liability for physical or material damage caused by improper use, non-compliance with the operating instructions or failure to follow the maintenance instructions

10.3 Before starting

Before each trip, it is essential to follow the „Checklist before starting“ – you will find the list at the end of this manual, page 39.

10.4 Positioning of the trailer

The VMS- trailer has to be set up in accordance with the currently valid RSA and StVO (Germany) , respectively currently valid regulations in your country.

After parking and aligning (without towing vehicle), the parking brake must be applied, the wheel chocks placed behind the wheels and the rear supports extended

11. Malfunctions in the electromechanical system, troubleshooting and remedy

After each repair, the result has to be proven by a functional test!

☹ Despite pressing the function keys „LIFT“ or „Lower“, the board does not move:

☺ -> Rechargeable batteries completely discharged
Re-charge the batteries – use the emergency (manual) lowering to lower the board

☺ -> Disconnected power supply
check the terminals of the batteries
check the fuses

☺ -> Main switch was not switched on
check the main switch in the control box for the „ON-I“ position

☺ -> ((in case of using a radio remote control)
batteries of the remote control are discharged

Under no circumstances should you attempt to carry out repairs at the site of use. The mobile advance warning sign is to be set in transport condition via the manual operation of the lifting motor

☹ Short circuits may occur

Manual operation by hand crank

The hand crank can be used in the event of a power failure. The cover for the hexagon socket spanner must be unscrewed before using the hand crank. Torque of hand crank max. 16 Nm (at maximum load). Movement of piston rod eye per turn.

Note:

- The power supply must be disconnected during manual operation.
- If the actuator is operated via the hand crank, this must be done manually or extremely carefully with a machine, otherwise there is a risk of being overloaded and the actuator may be damaged.

12. Maintenance

Care and maintenance are indispensable to maintain the functionality

In the winter months (environmental influences that contribute to wear) maintenance has to be intensified and extended.The necessary maintenance work for the ball coupling, DIN towing eye, overrun device, height-adjustable towing device, axle, brake and adjustment drive as well as for special equipment (such as power generators) are described in the operating instructions supplied to you by the manufacturers of these parts. These maintenance tasks are therefore not listed again in section 14.1.We recommend having the vehicle‘s technical, electrical and electronic parts checked by a specialist workshop after 1500 km or after 6 months. However, this does not replace the prescribed

maintenance work. Repair work should only be carried out at the manufacturer‘s workshop

12.1 Mechanical maintenance plan

Frequency: 1 = daily/ 2 = weekly/ 3 = monthly/ 4 = semi-annually/ 5 = annually/ 6 = when required

Component	Check (frequency)	Cleaning (frequency))	Greasing (frequency)	Notes
Main Switch	X (1)	X (4)	Polfett (4)	
Gas spring with clevises	X (1)	X (3)	X (3)	
Adjustment drive bearing bolts	X (1)	X (3)	X (3)	
Frame parts	X (1)	X (6)		
Joint strut holder	X (1)	X (5)	X (5)	To do this, loosen, clean, grease and screw back on the joint strut holder individually
Lighting system	X (1)	X (6)		
Cables and cable connections	X (1)	X (6)	X (6)	Apply terminal grease to battery terminals
Supports and support wheels	X (1)	X (6)	X (4)	
Wheels and tyres	X (1)	X (6)		Air pressure see 11.6 (page 36)

12.2 Maintenance tips

Use in winter

In winter, ice and snow must be removed before use. The retaining hinges of the top panel and the adjustment drive must be checked for mobility (use de-icing agents if necessary).

Cleaning:

We recommend cleaning by hand with commercially available car care products. Do not use steam or high-pressure equipment. ! No car wash!

13. Repair

In the event of problems or defects, only authorised specialists are authorised to work on the electromechanical system. Further documents required for repair and maintenance work can be requested via a workshop manual.

Replacing the actuator unit::

Only original parts may be used.

-> See workshop manual

14. Checklist before departure!

1. Batteries charged ? Are they properly connected and firmly anchored in their holder?
2. Batteries disconnected from the charging cord?
3. Is the battery box closed and locked ?
4. Visual inspection of the actuators and electrical cables for damage.
5. Is the tommy nut for height adjustment of the drawbar tight and secured?
6. Is the ball coupling correctly seated and the breakaway cable is properly secured?
7. Retract the support wheel and release the parking brake
8. Retract the rear supports of the trailer
9. Check the tyres (pressure and condition) and the fastening of the breakaway cable to the towing device, if necessary remove the brake shoes
10. Visual inspection of the LED panels for loose objects
11. Switch on the main switch in the right battery box
12. Switch on the remote control
13. Carry out the lifting and lowering procedure of the LED-panels
14. Checking the electromechanical locking of the LED-panels in folded down or folded up position
15. Check of the function of the control lamps on the remote control
16. Checking the charging status of the batteries
17. Check of the advance warning lights and the LED fields / active display of the traffic signs on the upper and lower panel (faultlessness, colours)

horizont Traffic Safety

wishes you a safe journey

15. Maintenance schedule

MECHANICAL

What?	When?	How?
rear wall cover and closures	**before** each use	visual control
cover seals and PG screw connections as well as MS340 closures	**before** each use **or weekly**	visual control
all movable joint and hinge parts as well as bolts of the motors	**before** each use **or monthly**	visual control check movability grease / oil
support wheel clamp and bolt for rear supports	**before** each use	stability grease / oil
parking brake	**before** each use	functional test grease / oil lever joints
	every 6 month	grease / oil ropes
tyres / wheels	**before** each use	
gas struts	monthly	clean the push rod
	every 6 month	grease fastening
height adjustable drawbar	**before** each use	check fastening
	every 6 month	grease hinges

EELECTRONICAL

What?	When?	How?
check the battery charge level with an acid tester	**before** each use	check each cell with a tester
battery level of the remote control	**before** each use	switch-on control
pole terminals clean and tight	**before** each use	13mm screwdriver/wire brush/pole grease
cable and hose connections from battery and relay box to LED panels	**before** each use	visual control
check plug-in and screw connections on the relay and main board for tightness	once in a quarter	slotted screwdriver cross-head screwdriver visual wiggle test
performance tests: - all actuators / sensors - radio initialisation - MS-340 lamps - Signal image settings LED panels - Emergency lowering	**before** each use or monthly	visual check for correct operation

When regularly maintained, our device provides you with safety and functionality. Adherence to the maintenance schedule avoids unnecessary damage and maintains the value of your investment.

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