RadarEye®

Sets with 7” and 12” Monitor

User manual
No. UM0972110 A 01

08/2013
English

Set with 7” Monitor

Set with 12” Monitor

ORLACO
Specialised Camera Solutions

User Manual

Sets with 7” and 12” Monitor

RadarEye®

Manual No. IM0972110, A 01

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1. Introduction

Check with Orlaco which language versions are available. This manual contains user instructions. Used photographs and illustrations give general information and may differ from the products you use.

Contact your Orlaco dealer if you have questions, additional information, or want to make changes that are not described in this manual.

The camera/Monitor systems from Orlaco comply with the latest CE, ADR, EMC and mirror-directive regulations. All products are manufactured in accordance with the ISO 9001 quality management system, ISO/TS16949 quality automotive and ISO 14001 environmental management systems.

Available documentation

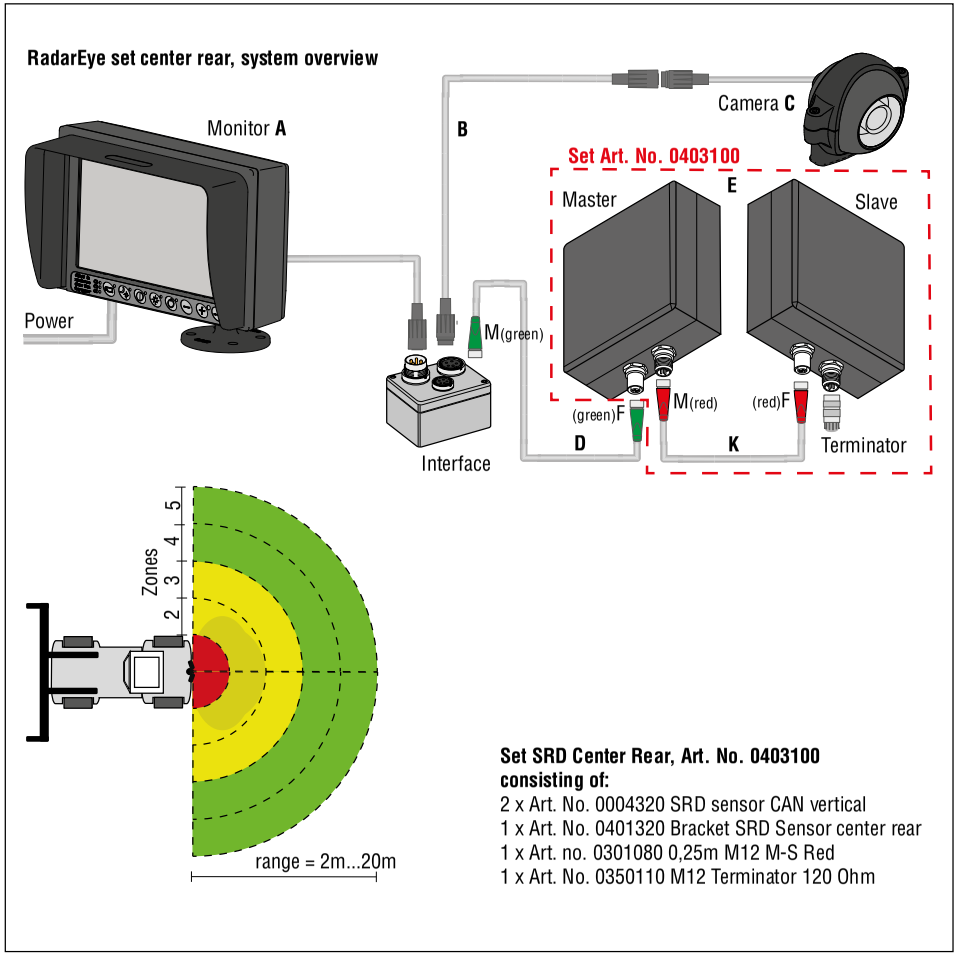
System Manual IM0974110 for installation.
Data sheet DS0208371 Monitor 7” LEDD CAN SRD 6
Data sheet DS0208871 Monitor 7” RLED CAN SRD R6
Data sheet DS0209110 Monitor 7” RLED CAN SRD 4 CAM 7-4
Data sheet DS0411300 Set Monitor 12” RLED CAN SRD R6

Release notes

R1-0. First issue, August 2013.
R1-1. Article names changed, October 2013.
R1-2. Chapter 7 added, November 2013.
R1-3. Multiple text changes, March 2014.
R1-4. Added Barcode, May 2015.
R1-5. Text Chapter 5 added, May 2017.

2. RadarEye® set configuration

Set Article No. 0403100 Set SRD Center Rear, consisting of 2 wide beam Sensors (70° beam width, 11° beam height) that work together to guard a wide area, see figure 1.

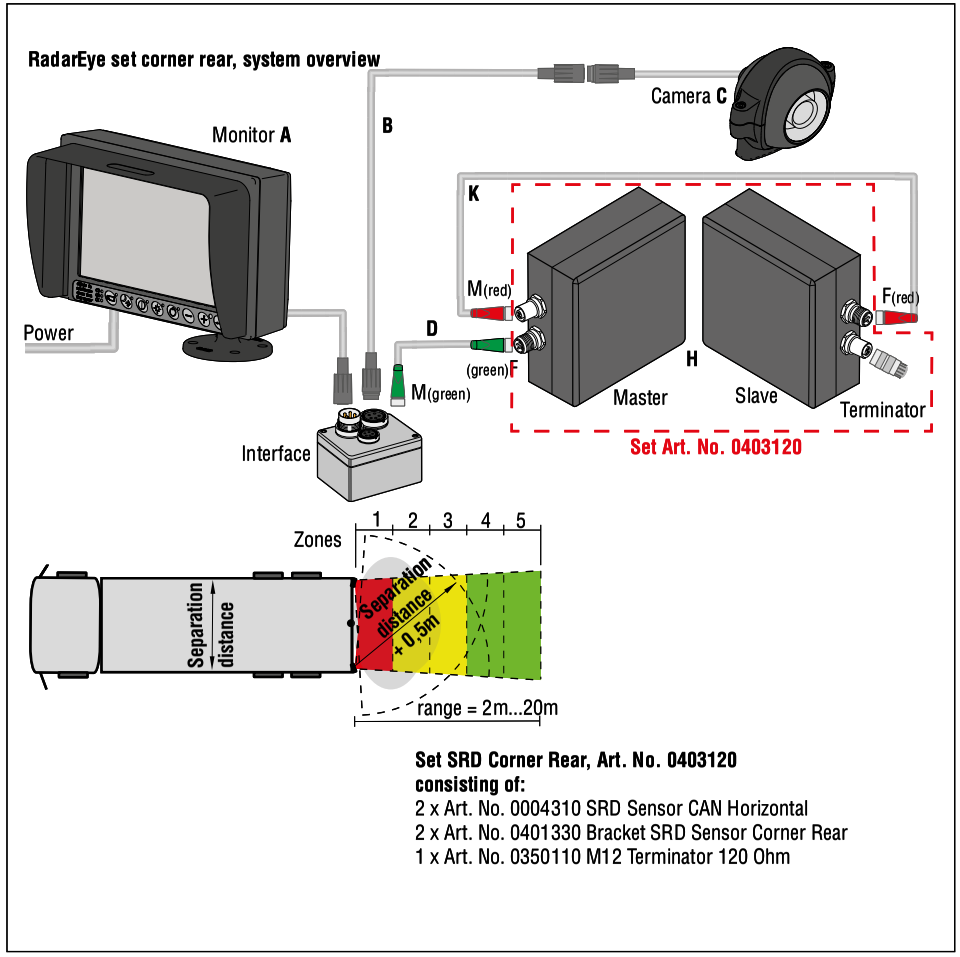


Set SRD Center Rear, Art. No. 0403100
consisting of:
2 x Art. No. 0004320 SRD sensor CAN vertical
1 x Art. No. 0401320 Bracket SRD Sensor center rear
1 x Art. no. 0301080 0,25m M12 M-S Red
1 x Art. No. 0350110 M12 Terminator 120 Ohm

Figure 1

Explanation
A - Monitor
B - Camera Cable
C - Camera
D - Radar Cable
E - Radar Set, center rear
K - Radar connecting cable

Set Article No. 0403120 Set SRD Corner Rear, consisting of 2 wide beam Sensors (70° beam width, 11° beam height) that work together to guard a rectangular area, see figure 2.



Set SRD Corner Rear, Art. No. 0403120
consisting of:
2 x Art. No. 0004310 SRD Sensor CAN Horizontal
2 x Art. No. 0401330 Bracket SRD Sensor Corner Rear
1 x Art. No. 0350110 M12 Terminator 120 Ohm

Figure 2

Explanation
A - Monitor
B - Camera Cable
C - Camera
D - Radar Cable
H - Radar Set, corner rear
K - Radar connecting cable

3. Monitor settings

3.1. Orlaco 7" and 12" Monitor keyboard

Button No. 1 = Camera selection
Button No. 2 = Auto LCD Backlight Control/Day/Night modes
Button No. 3 = Contrast
Button No. 4 = Brightness
Button No. 5 = Option/previous menu
Button No. 6 = Selection/setting -
Button No. 7 = Selection/setting +
Button No. 8 = Enter/Standby

3.2. Service menu

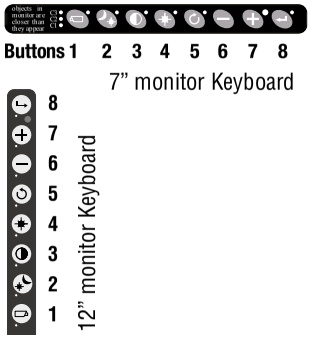
Adjustment of the monitor settings is done via the service menu. To open the service menu, simultaneously press the camera selection button (1), the minus button (6) and the plus button (7) (see Figure 3). The (monitor) Service menu (see Figure 4) will appear. The following buttons are used to navigate through the menus:
5 - Option/previous menu: Return to the previous menu.
6 - Minus: Go to the next menu option.
7 - Plus: Go to the previous menu option.
8 - Enter: Select or enable the chosen option.

3.3 Internal Buzzer

The monitor is equipped with an internal buzzer.
To adjust the volume of the settings (see figure 5). Select the keyboard menu (see figure 6). Select Beeper Volume to adjust. Default setting of the volume is 100 (see figure 7).

Keyboard sound to ALM (Alarm) as default.
When the system is equipped with an external loudspeaker (part # 0504820) and you want to de-activate the internal buzzer, open the service menu and go to system settings (see figure 5). Select the keyboard menu. (see figure 6).

Settings of the external speaker are done in the radarmenu, see chapter 4.4.3.



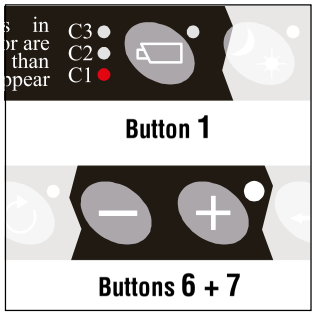


Figure 3

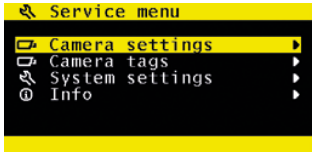


Figure 4

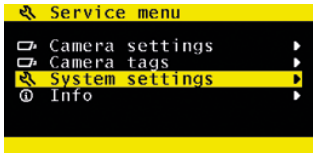


Figure 5

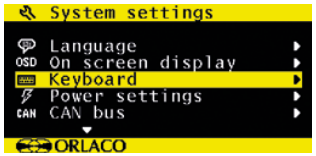


Figure 6

4. Radar settings

4.1. Program the Sensor

Each Sensor needs to be programmed. Programming needs to be done with only **one** sensor connected to the monitor (via the interface).

Open the service menu and go to system settings (see figure 5). Select the Radar setup menu (see figure 8). Select the Sensor Settings menu. (see figure 9).

A warning is shown in the monitor (see figure 10):
If more Sensors are connected and you enter the sensor settings, the Sensor with the lowest ID (= sensor direction) is detected.
When Sensor have the same ID (= sensor direction) and sensor settings are entered, shown radar type = 50. Never change this when more than one Sensor is connected.
Changing the range will be applied at all Sensors with the lowest and same ID.

4.1.1. Change sensor dir (see figure 12)

The sensor direction is the position of the Sensor (or master/slave pair) on the vehicle. As a guideline their positions are according to the setup shown in figure 12.
A master/slave pair must be programmed with the same sensor direction.
Default sensor direction is 1.

4.1.1.1. Connect switch wires (see figure 12)

Sensor direction 1, 11 and 12 (front radars) can be switched or activated by with the brown switch wire.
Sensor direction 5, 6 and 7 (rear radars) can be switched or activated with the blue switch wire
Sensor direction 2,3,4 and 8,9,10 can be blocked with a speed signal on the grey switch wire.
For settings of the switch wires, see chapter 4.4.2

4.1.2. Change radar type

The type of the Sensor can be programmed. This determines which function the Sensor has in the system. The default Sensor type is 2.
Possible settings are:
1 = Slave to a dual sensor master (type 2 or 3)
2 = Master for corner rear setup (AND function)
3 = Master for center rear setup (OR function)
4 = Single master Sensor, not paired
5 = Single slave Sensor, paired with type 4.

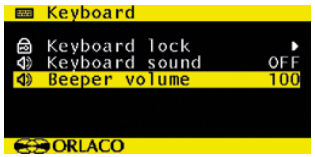


Figure 7

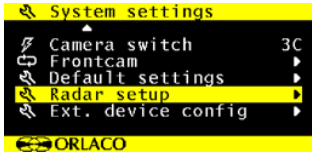


Figure 8

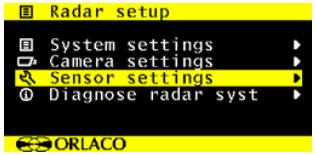


Figure 9

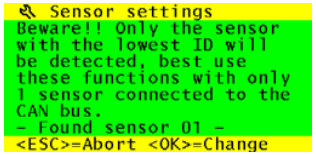


Figure 10

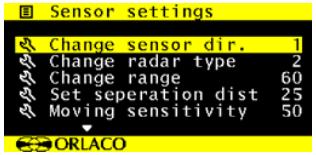


Figure 11

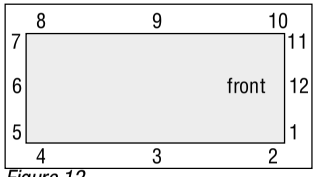


Figure 12

4.1.3. Change range
Set the range of detection. The range can be set from 20-200 decimeter, these are divided into 5 equally sized segments (see figure 13). The default detection range is 6m (60).

4.1.4 Set separation dist
Set the separation Distance. This is the distance between a master and slave.
It can only be set or changed when radar type 2 is selected, master for corner rear setup. The default separation distance is 2,5m (25). Max separation distance is 4,0m (40).

4.1.5 Moving sensitivity and non-moving sensitivity
Moving sensitivity and non-moving sensitivity are not used in the current software.

4.2. Connecting Cameras and Sensors
The connection between cameras and sensor is programmed in the Radar menu. The camera is “connected” to the sensor direction, programmed in the Sensor(s).

Open the service menu and go to system settings (see figure 5). Select the Radar setup menu (see figure 8). Select the Camera settings menu. (see figure 14).

There can be three (View 1-3) sensor directions connected to one camera. The number indicates the direction where the sensor is looking as per the “clockwheel” convention. Default view 1 for Cam 1 is set to sensor direction 6, see figure 15.

Setting up Cam 1 to look at sensor 6 means that camera 1 is looking in the same (rear) direction as sensor 6 and that the monitor will switch to camera 1 as soon as sensor(s) 6 detects an object (see figure 15).

Setting up Cam 1 to look at sensors 5, 6 and 7 mean that camera 1 is looking in the same (rear) direction as sensor 5, 6 and 7 and that the monitor will switch to camera 1 as soon as either (or all) sensor 5, 6 or 7 detect an object (see figure 16).

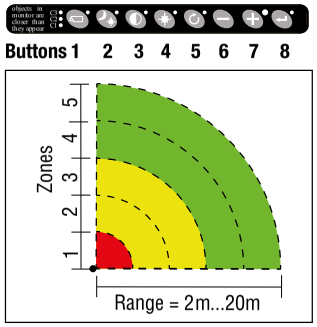


Figure 13

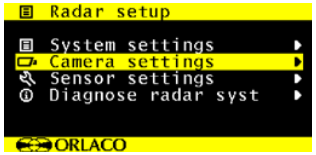


Figure 14

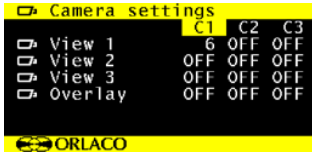


Figure 15

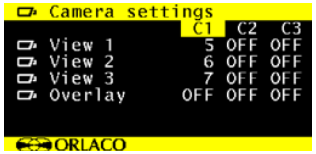


Figure 16

4.3. Overlays
The standard visible warning is with colored dots in the above right corner in the monitor, see figure 17. It is possible to change this to an overlay.

There are 5 pre-programmed overlays which are designed to match with a system setting and installation of the camera and Sensors.

Each overlay is designed to match with a camera with an opening angle of 118 degrees.
Selected overlay is displayed on view 1, see figure 18.
Changing from the dots to an overlay can be done per camera and is done in the camera settings in the Radar setup menu.

Open the service menu and go to system settings (see figure 5).
Select the Radar setup menu (see figure 8).
Select camera settings.
Select Overlay (see figure 18).

Overlay 1.

System:	RadarEye® set corner rear
Example application:	Lorry with camera at the top of the roof.
Mounting height camera:	3900mm
Camera rotated down:	42° (Bumper of lorry is shown)
Separation distance:	2750mm
Detection range:	6000mm

Overlay 2.

System:	RadarEye® set corner rear
Example application:	Lorry with camera at the bumper.
Mounting height camera:	1000mm
Camera rotated down:	42° (Bumper of lorry is shown)
Separation distance:	2750mm
Detection range:	6000mm

Overlay 3.

System:	RadarEye® set center rear
Example application:	Dumptruck with camera at the bumper.
Mounting height camera:	1600mm
Camera rotated down:	78°
Detection range:	10000mm


Figure 17

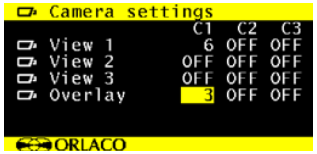
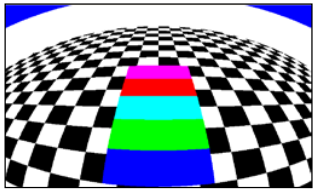
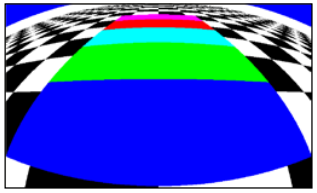
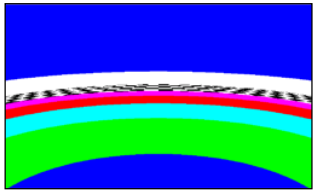


Figure 18

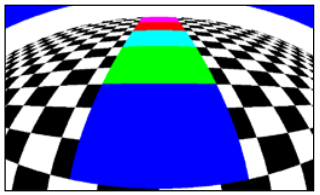

Overlay 1


Overlay 2


Overlay 3

Overlay 4.

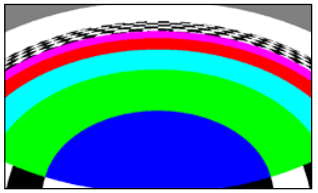
System:	RadarEye® set corner rear
Example application:	Wheelloader with camera at the motorcover.
Mounting height camera:	2600mm
Camera rotated down:	42º
Separation distance:	3100mm
Detection range:	15000mm



Overlay 4

Overlay 5.

System:	RadarEye® set center rear
Example application:	Reachstacker with camera at the counterweight
Mounting height camera:	2500mm
Camera rotated down:	45º
Detection range:	10000mm



Overlay 5

The colors of the displayed overlay differ from the shown pictures: Zone 5 and 4 are green, zone 3 and 2 are yellow and zone 1 is red. The camera must be positioned according to the chosen setup and overlay.

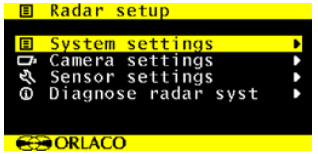


Figure 19

4.4. System settings

In the system setting menu, the start of the audible warnings, the activation of the switch wires and the settings of the external buzzer (optional) can be done.

4.4.1. Setting zone to start the audible warning

The detection range, chapter 4.1.3, is automatically divided into 5 equally sized segments. In this menu the zone where the audible warning is active can be set.
Open the service menu and go to system settings (see figure 5).
Select the Radar setup menu (see figure 8).
Select the Systems settings menu. (see figure 19).
Choose a zone by 'buzzer starts at' (see figure 20). There are five zones to be set.

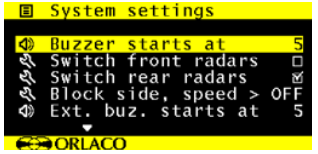


Figure 20

See chapter 3.3. for an explanation for the adjustment of the volume of the internal buzzer.

4.4.2. Settings of the switch wires

As explained in chapter 4.1.1.1
The sensor directions can be activated via a switch wire. See figure 21.

When switch front radars is on (figure 21) sensor directions 1, 11 and 12 are only active when the brown switch wire is "high".

When switch rear radars is on (figure 21) sensor directions 5, 6 and 7 are only active when the blue switch wire is "high"(Default).

With the option Block side (figure 22), speed > sensor directions 2,3,4 and 8,9,10 are blocked with a speed signal on the grey switch wire.
The speed is adjustable: OFF,5,10,15,20,25,30,35,40,45,50 km/h.

For example

When RadarEye® is applied in a rearview system, set sensor direction to 5,6 or 7 and connect the blue wire to the reverse signal. Camera is always active, but RadarEye® is only active when reverse is active.

How to set the Tacho Pulses

Select system settings. Press enter to open the 'System settings' menu. See figure 8. Use the minus (6), or the plus key (7) to go to the option Front Camera. This option opens the front camera sub menu of the monitor.
This offers the option **Pulses per metre;**
Set the amount of pulses per metre that is sent to the monitor of the tacho switching wire (AUX1, grey), see also Frontcam Manual IM0993850.

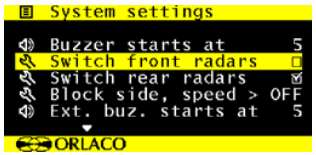


Figure 21

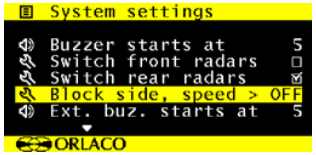


Figure 22

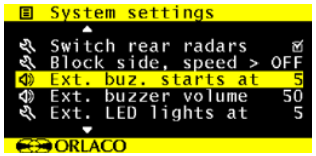


Figure 23

4.4.3. External speaker settings

Optional the Interface Box with Ext. speaker CAN/SRD/camera is available Art. No. 0504820. This is an interface box with external speaker and a LED light. For this external speaker, the settings can be adjusted. See figure 23.

Ext. buz. start at:
The zone where the audible warning on the external speaker starts can be adjusted.

Ext. buzzer volume:
Adjusting the volume of the external speaker.

Ext. LED lights at:
The zone where the visible LED warning on the external speaker starts can be adjusted.

4.4.4. External messages

The optional, Interface Box with Ext. speaker CAN/SRD/camera; Art. No. 0504820 has the possibility to send out external signals about the detection.
These signals are RS232 en RS485 stop indications output.

There is also a possibility to connect an external indicator (for example tower light). This external device is switched via a relais in the Interface Box with Ext. speaker CAN/SRD/camera; Art. No. 0504820.
Settings of the relais are done in the systems setting in the radar menu, See figure 24:

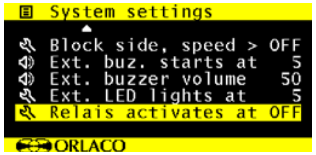


Figure 24

Relais activates at:
The zone where the signal output on the relais starts can be adjusted.

More info about the external messages and connections can be found in the datasheet and system manual.

Orlaco Radar monitor will report the detected zone 10 times per second on the RS232 interface.

RS232 parameters: 9600 baud, 8 bits, no parity.

The following packet will be sent: 0x80 0x01 0x40 0x03 <Status> <Zone> 0xFF, no packet within 200ms indicates total radar system failure.

The Status byte can have the following values:

Status value		Meaning
<Status> = 0	=>	No Error
<Status> = 1	=>	Error detected, zone detection not reliable

The Zone byte can have the following values:

Zone value		Meaning
<Zone> = 0	=>	No Object
<Zone> = 1	=>	Closest zone (Red)
<Zone> = 2	=>	Yellow
<Zone> = 3	=>	Yellow
<Zone> = 4	=>	Green
<Zone> = 5	=>	Farthest zone (Green)

NOTE:
ORLACO PRESENTS THE RADAR SIGNAL AVAILABLE, BUT WILL NOT BE LIABLE IF IT IS USED TO INTERVENE IN THE MACHINE.

5. Diagnostics

This will give you an overview of the RadarEye® system.

Open the service menu and go to system settings (see figure 5). Select the Radar setup menu (see figure 8). Select the Diagnose radar syst. menu (see figure 25).

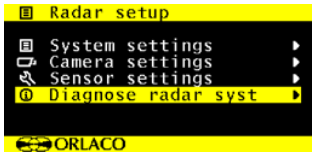


Figure 25

When activating the Diagnose radar syst menu the shown mode is Zone.
With the enter button (8) you can change mode to: **Zone**, **Type**, **Range** and **Distance** (see figure 26).

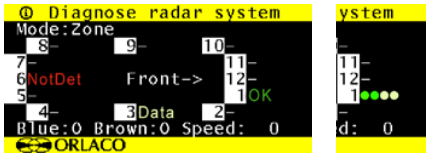


Figure 26

–	Indicates that that specific sensor is not used/ allocated to a camera.
OK	Allocated and connected sensor (OK = no object in range) or the distance to the object in range with colored dots.
Data	Means that data is received from that sensor. However, the sensor is not allocated to a camera.
NotDet	Means that the sensor is allocated to a camera, however, no data is received from a sensor with that ID.
Err01	Means there is no communication between Master and Slave

When a Master-slave pair is connected:
In diagnostics mode **Type;** only the Master type is shown (2 or 3).
In diagnostics mode **Range;** the range of the master-slave pair is shown.
In diagnostics mode **Distance;** only the distance of the master is shown.

6. Operation

6.1. RADAR OK displayed

All measurable parameters and the flow of data from all connected sensors are diagnosed and OK. There is no fault message detected from the sensors and the sensors are operative, there are no measurable sensor errors and detections of objects.
The range indicator in the display gives the operator a relative distance measurement to the closest detected object. Indicate 5 dots operate from the left (green) to right (red), with a closer object resulting in more dots. See figure 27.

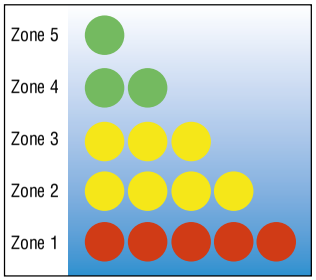


Figure 27

The buzzer sounds audible tones to alert the operator to obstacles. The buzzer tone rate will increase as the vehicle gets closer to an object.

6.2. Temporarily switch sound off (detection)

Press on the 'Option/previous' button(5) to put the buzzer off and the camera locked. (when a object disappears the system will reboot automatically).

6.3. Check views displayed

When "check views" is displayed in the monitor, RadarEye® has detected an object but camera is manually locked. The LED next to button 1 is blinking.

6.4. Sensor Failure

If the buzzer sounds and a red cross is displayed; the sensor has failed. Please check the Sensor or connections.

7. Overview of menus

Service menu

Camera- + Minus- and Plus buttons

- Service menu
  - Camera settings *
  - Camera tags *
  - System settings
  - Info
- System settings
  - Language *
  - On screen display *
  - Keyboard *
  - Power settings *
  - CAN-bus *
  - LCD-Backlight *
  - Scanning *
  - Camera switch *
  - Frontcam *
  - Default settings *
  - Radar setup
  - Ext. device config *
- Radar setup
  - System settings
  - Camera settings
  - Sensor settings
  - Diagnose radar syst
- System settings
  - Buzzer starts at → OFF, 1, 2, 3, 4, 5
  - Switch front radars → ON/OFF
  - Switch rear radars → ON/OFF 40, 45, 50
  - Block side speed > → OFF, 5, 10, 15, 20, 25, 30, 35
  - Ext. buz. start at → OFF, 1, 2, 3, 4, 5
  - Ext. buzzer volume → 0-100
  - Ext. LED lights at → OFF, 1, 2, 3, 4, 5
  - Relais activates at → OFF, 1, 2, 3, 4, 5
- Camera settings
  - View 1 → OFF, 1-12
  - View 2 → OFF, 1-12
  - View 3 → OFF, 1-12
  - Overlay → OFF, 1, 2, 3, 4, 5
- Sensor settings
  - Change senser dir. → 1-12
  - Change radar type → 1-7
  - Change range → 20-200
  - Set separation dist → 10-40
  - Moving sensitivity → 0-100
  - Non-moving sens. → 0-100
- Diagnose radar syst
  - Zone
  - Type
  - Range
  - Distance

*These menus are explained in the User Manual UM0972080

ORLACO

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

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

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

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

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