

# Product

# DATA

Data sheet no DS0208602 EN  
2010 • R1-0

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## Display 7" RLED R 2



Article no 0208602

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# Product

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Data sheet no DS0146000 EN  
2011 • R 1-8

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## Camera CMOS 78°/115° PAL



Article no 01460\*0

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# Technical Specifications

## Camera CMOS 78°/115° PAL

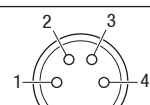
<b>Article number</b>	<b>0146000</b>	<b>0146060</b>
<b>Description</b>	CMOS 78° PAL	CMOS 115° PAL
<b>Horz. lens angle</b>	78°	115°
	Standard set to direct-view.	
<b>Sensor element</b>	1/4" 4:3 VGA <b>CMOS</b> digital image sensor	
<b>Active Pixels</b>	640H x 480V,	
<b>TV System</b>	Interlaced PAL 25fps 720H x 576V (Active 720 x 480). Set Orlaco display to cinema mode for correct viewing.	
<b>Video</b>	1Vtt in 750hm.	
<b>Light sensitivity</b>	<0,25lux	
<b>Dynamic Range</b>	>70dB	
<b>Frame rate</b>	50 frames/s	
<b>Pixel size</b>	5,6µm x 5,6µm	
<b>Shutter</b>	Electronic rolling shutter (ERS)	
<b>Features</b>	Auto Exposure (AE), Auto white balance (AWB), Auto Black Reference (ABR), Auto Flicker Avoidance, Auto Color Saturation.	
<b>Housing</b>	Anodised aluminium, black, UV resistant, light fastness >8, corrosion proof according IEC 60068-2-52 salt mist, cyclic.	
<b>Ingress protection</b>	IP68 according to IEC 60529 (up to 10 m under water). IP69k according to DIN 40050-9: camera can withstand a high pressure cleaning with water: 14-16L/min. 80°C and 100 bars flow.	
<b>Nitrogen filled</b>	Filled with overpressure 1 bar.	
<b>Lens glass</b>	Chemically hardened, toughed, tempered float glass: 5 to 7 times stronger than ordinary glass, protected against acid: class 2-3; DIN 12116, passed flying stone test.	
<b>Mounting hardware</b>	Standard stainless steel.	
<b>Shock constancy</b>	Shock and vibration resistant for usage on trucks, cranes, fork-lifts, maritime applications, machinery. Random vibration test 15,3Grms at frequency: 24 to 2000, PSD (g <sup>2</sup> /Hz) 0,04 to 0,10.	
<b>Camera bracket</b>	Material: glass reinforced polyamide, test: 50 Nm at -40°C to +85°C.	
<b>Weight</b>	0,21kg, 0,29 in standard packing.	
<b>Truck use</b>	Withstand all fluids and materials used in and around trucks like: ammonia solution 5%, ethanol 80-100%, isopropanol 5-10%, soapy water (min. 50% soap per volume), alkaline degreasing compounds (used in high pressure washing equipment).	
<b>Power input</b>	12..30V/DC.	
<b>Power consumption</b>	Heating off: 1,2W at 24V; Heating on (max. Power at -40°C): 3,6W at 24V.	
<b>Transient protection</b>	Camera may be powered directly from 12v or 24v battery without additional electrical protection since camera has an integrated circuit that protects the camera against over- and undervoltage, spikes, ripples and loaddumps.	
<b>Heater</b>	2,4W max. Puls Width Modulated, activated from +30°C (min) to -40°C.	
<b>Inrush current</b>	With and without heating: 0,7A at 24V, t=2ms.	
<b>Operating temperature</b>	-40°C to +85°C.	
<b>Storage temperature</b>	-40°C to +125°C.	
<b>Connectors</b>	0,5m cable with 4p male connector (camera power input and video output).	
<b>Approvals</b>	EMC in compliance with 72/245/EC, 95/54/EC. Mirror directive 2003/97/EC, 2005/27/EC.	
<b>Min. cable bend radius</b>	50mm.	

If a non-Orlaco display does not have Cinema mode it is advised to work in NTSC mode.

If you use an Orlaco display by selecting camera 2 or 3 without using switcher or quad module may result in a scrambled display. When using more than 1 camera always use the switcher or quad module.

**\*Power input**  
Below 6V: camera is non functional. Between 6V and 7V: camera is functional but heating element is not able to activate. Above 7V: heating element is automatically activated and is at 20% of its capacity. At 8V the camera is fully functional and the heating is at 40% of its capacity. At 12V the heating is at 100% capacity. Between 12V and 33V camera and heating element are fully functional. Above 33V the overvoltage protection is activated and camera plus heating element are switched off. This overvoltage-protection is deactivated below 32V.

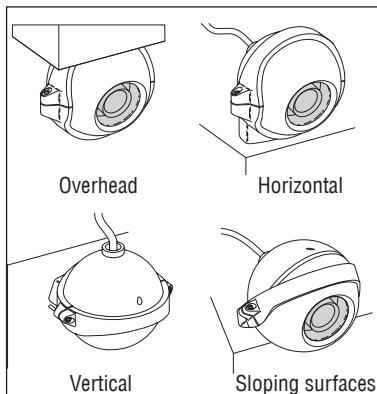
### Soldering side of male connector (1312001)



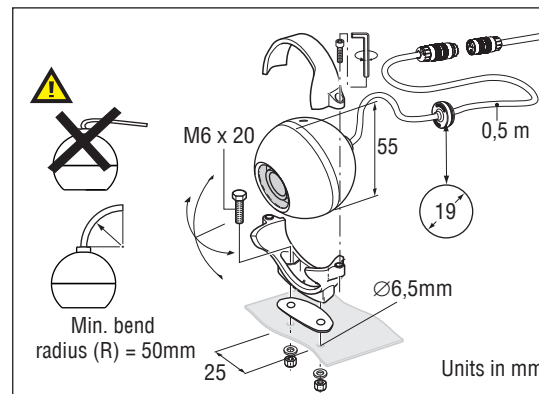
- 1 = Coax core (Video signal)
- 2 = Coax screen (Video GND)
- 3 = Red (24V/DC)
- 4 = Black (0V)
- Shielding N.C.

## Installation

### Universal camera Bracket



### Camera attachment and dimensions



All data subject to change without notice. All dimensions are for commercial purpose only.  
The camera/display 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 14001 environmental management systems and all Ex products with the IECEx scheme and ATEX directives.



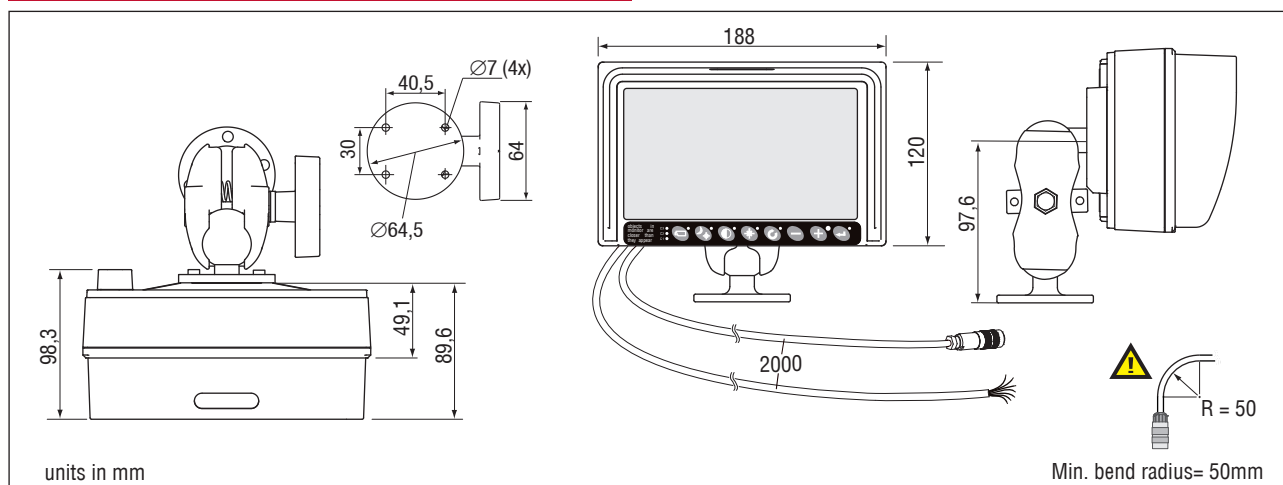
[www.orlaco.com](http://www.orlaco.com)

# Technical Specifications

## Display 7" RLED R 2

<b>Article number</b>	<b>0208602</b>
<b>Cables / Connectors</b>	2m multicable (power) open wired, 2m multicable (video) with 4p female IP67 Gold connector. Art. No.: 8976210
<b>Bracket</b>	A clamping user-adjustable mounting bracket is supplied. Art. No.: 2015500
<b>Weight</b>	1,8kg (LCD, bracket, cables and connectors)
<b>Type:</b>	Automotive 7inch TFT liquid crystal display module LED backlight.
<b>Resolution:</b>	WVGA 800xRGBx480 pixels.
<b>Viewing:</b>	70° horizontal and 60° vertical (@ CR≥10).
<b>LED Life Time</b>	30000 Hrs.
<b>Typical performance:</b>	Center luminance of white: 600cd/m2, Contrast ratio 650:1, Response time 5 ms (Tr).
<b>Software menu:</b>	Full On-Screen-Display (OSD) functionality in 13 languages: Danish, Dutch, English, Finnish, French, German, Italian, Norwegian, Polish, Portuguese, Spanish, Swedish, Turkish.
<b>ABC mode:</b>	Improved Auto Brightness Control (ABC) including one-touch day/night setting and adjustable minimum and maximum levels for automatic control.
<b>Operating temperature:</b>	-40°C ..+85°C.
<b>Input voltage range:</b>	12...60V +/-10%.
<b>Power consumption:</b>	5W@12V, 4.8W@24V, 6.6W@60V.
<b>Protection:</b>	>70V overvoltageprotection, <10V undervoltageprotection, protected against loadumps, spikes and surges, reverse polarity on all wiring.
<b>Power-output:</b>	12.8V/DC 2,2A +/-10% for powering cameras and other peripherals.
<b>Video input</b>	1Vtt, 75Ω, Pal 50 Hz, 4,43MHz colour sub carr. NTSC 60 Hz, 3,58MHz colour sub carr.
<b>Surface:</b>	Hard coating (3H), with AG LR (Low Reflection) polarizer.
<b>Housing:</b>	Color Black, material: aluminium & high impact automotive synthetic thermoplastic polymer.
<b>Shock test:</b>	According IEC60068-2-27, According IEC60068-2-29.
<b>Vibration:</b>	According IEC60068-2-6, According IEC60068-2-34.
<b>Protection:</b>	IP67 according IEC60529.
<b>Salt spray test:</b>	According IEC60068-2-52.
<b>Chemical resistance:</b>	Hydraulic oils based on mineral oil, Brake fluid DOT4, Salt solution (5-percent), sugar solution (satisfied), Cleaning agent, Acetone, Synthetic resin dilution, Coca Cola, Bio-Diesel, FAM test fuel, Windscreen washer fluid, Glass cleaner, Alcohol, Interior cleaner, Bio oils, Sulphuric acid (25-percent), Lactic acid (90-percent).
<b>Temperature /humidity test:</b>	According IEC60068-2-1/2/3/14/30/38.
<b>Quality &amp; environment:</b>	Units are manufactured by Orlaco in the Netherlands; ISO 9001:2000, ISO14001: 2004.
<b>EMC certification:</b>	On-road trucks: 2004/104/EC (Europe) / UN Regulation 10 (USA), Heavy equipment: ISO13766 (Europe) / FCC (USA), Forklift trucks: EN12895 (Europe) / UN Regulation 10 (USA), Railway: EN50121-3-2(Europe), Construction machinery: EN13309, Maritime: L'loyds register / EN60945.
<b>Dangerous goods:</b>	ADR (2009) sections 9.2.2., 9.3.7. and 9.7.8., directive 94/9/EEC & 95/54/EEC, VdTÜV-leaflet 5205, issue 10.08.
<b>FCC:</b>	This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.
<b>Earth-Moving heavy equipment:</b>	98/37/EC amended by 2006/42/EC as implemented by EN474-X: 2006 referring to: ISO 5006:2006 Operator's field of view), ISO 16001:2008 Earth-moving machinery -- Visual aids ISO 13766:2006 Electro magnetic compatibility, ISO 13849-1:2008/Cor 1:2009 Safety of machinery. Each product is delivered with a User manual, Installation manual and Declaration Of Conformity (DOC).

## Dimensions



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