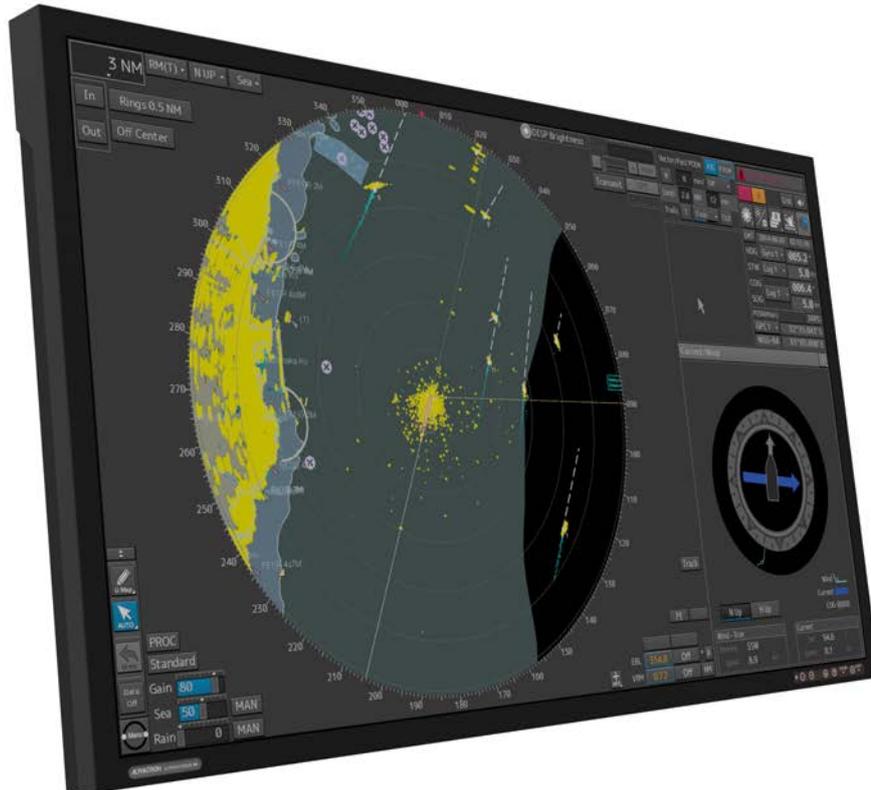




ALPHATRON
Marine



AlphaScreen 46

LCD Monitor

Installation and Operation Manual

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I Preface

This document describes the functionality, the intended use and the most important product specifications of the AlphaScreen 46.

The contents have been examined to verify the hardware and software described herein.

Because of clarity, the document does not contain all the detailed information about this product.

With respect to hardware and/or software, customized versions may be made.

I.1 Revision History

A Summary of changes compared to the first issue.

Revision No.	Description	Date
V1.0	First Draft	15 July 2015
V1.1	First Issue	25 April 2017
V1.2	Add Annex A	27 September 2018

I.2 Glossary

Definitions used in this manual are shown in the list of Definitions. See *Table 1: Definitions* on page 4.

Auto Adjustment	A function that automatically adjusts the clock, phase, and screen position of the monitor to their ideal levels. Auto Adjustment is activated through the monitors' OSD menu. (applicable only for analog signal input.)
Auto Back-light Brightness Stabilization	A drift correction circuit that stabilizes the screen brightness level within minutes after start-up or coming out of power saving mode.
Back-light	The light source positioned behind the LCD panel which illuminates the display screen. The Raptor monitor uses three replaceable trays containing the back lights.
(Pixel) Clock	The analog signal input monitor needs to reproduce a clock of the same frequency as the dot clock of the graphics system in use, when the analog signal is converted to a digital signal for image display. This is called clock adjustment. If the clock frequency is not set correctly, some vertical bars appear on the screen.
Color Temperature	Color temperature is a method to measure the white color tone, generally indicated in degrees Kelvin. The screen becomes reddish at a low temperature, and bluish at a high temperature, like the flame temperature. <ul style="list-style-type: none"> • 5000 K: Slightly reddish white • 6500 K: White referred to as daylight-balanced color • 9300 K: Slightly bluish white
CR (Contrast Ratio)	Is the relation of the luminous density between the brightest "white" and the darkest "black" which can be generated on a monitor.
DDC (Display Data Channel)	A communication channel for the transmission of information between the display monitor and the PC that allows for automatic configuration of the hardware. In other words, "Plug and Play" compatibility.
Dot Pitch	The distance from the center of one pixel to the center of the next closest pixel of the same color. Pixel pitch gives a general idea of the monitor's ability to produce sharp images; the smaller the pixel pitch, the sharper the image.

DVI (Digital Visual Interface)	DVI is a digital interface standard. DVI allows direct transmission of the PC's digital data without loss. This adopts the TMDS transmission system and DVI connectors. There are two types of DVI connectors. One is a DVI-D connector for digital signal input only. The other is a DVI-I connector for both digital and analog signal inputs.
ECDIS (Electronic Chart Display and Information System)	Electronic navigation system for the maritime patch.
EDID (Extended Display Identification Data)	A data structure provided by a monitor to describe its capabilities to a video source (e.g. graphics card).
Gain	Is used to adjust each color parameter for red, green and blue. An LCD monitor displays the color by the light passing through the panel color filter. Red, green and blue are the three primary colors. All the colors on the screen are displayed by combining these three colors. The color tone can be changed by adjusting the light intensity (volume) passing through the filter of each color.
Gamma	The relationship between inputs in the computer and the brightness or luminance displayed on the monitor. Gamma is: Brightness (Luminance) = Constant x input-gamma. While gamma has no effect on black or white, it does affect grey or mid-tones. If the gamma level of the monitor is set too high, mid-tones will appear too dark. Conversely, if gamma is set too low, mid-tones will appear too light.
Kelvin	The 'Kelvin' is a unit of measurement for temperature. It is one of the seven base units in the International System of Units and is assigned the unit symbol K.
LCD (Liquid Crystal Display)	A Liquid Crystal Display is a non-emission display. The active element on an AlphaScreen 46 monitor is a Twisted-Neumatic (TN), Vertically Aligned (VA) or In-Plane Switching (ISP) liquid crystal.
LED (Light Emitting Diode)	Light Emitting Diodes, these are used for signaling statuses of hardware and software signals to the user.
Luminance	The quality of the amount of radiating light perceived to be emitted from the display. This varies from a minimum for a very dim appearance to a maximum for a very bright appearance.
Management Information Base (MIB)	A virtual database used for managing the entities in a communications network. Most often associated with the Simple Network Management Protocol (SNMP).
MODBUS	A simple and robust communications protocol, commonly used for connecting industrial electronic devices.
Phase	Phase means the sampling timing to convert the analog input signal to a digital signal. Phase adjustment is made to adjust the timing. It is recommended that phase adjustment be made after the clock is adjusted correctly.
Refresh Rate	The frequency with which the entire image on the screen is redrawn. The refresh rate is measured in hertz, therefore, a refresh rate of 60 Hz, means the image is redrawn 60 times per second.
Resolution	The LCD panel consists of numerous pixels of specified size, which are illuminated to form images. This monitor consists of horizontal 1920 pixels and 1080 vertical pixels). At a resolution of 1920 x 1080 all pixels are illuminated as a full screen (1:1).
Response Time	The amount of time measured in milliseconds (ms) it takes a pixel to go from black to white and back to black again. Faster response times minimize ghosting and blurring on a monitor displaying moving images. They are indicated by reduced time measurements in product specifications. Although cited, black-to-white-to-black response time is not the ideal indicator of a monitor's ability to play moving images smoothly, since it doesn't measure the transition time between gray-to-gray mid-tones included in all color images. Therefore, gray-to-gray mid-tones response time is the better metric of a monitor's performance to play motion pictures.

RoHS (Restriction of Hazardous Substances)	A European Union directive that stands for "the restriction of the use of certain hazardous substances in electrical and electronic equipment". The six restricted substances are lead, mercury, cadmium, hexavalent chromium, PBDE (polybrominated diphenylethers), and PBB (polybrominated biphenyls). RoHS went into effect in July 2006 and applies to most electrical and electronic equipment manufactured and imported into the EU. All AlphaScreen 46 monitors and accessories manufactured after June 2006 are RoHS compliant.
RS232 (Recommended Standard 232)	The traditional name for a series of standards for serial binary single ended data and control signals connecting between DTE (data terminal equipment) and DCE (Data Communication Equipment).
RS422 (Recommended Standard 422)	A technical standard that specifies electrical characteristics of a digital signaling circuit.
RS485 (Recommended Standard 485)	A technical standard that specifies electrical characteristics of a digital signaling circuit.
RTU: Remote Terminal Unit	A MODBUS variation and a control engineering Instrument of a remote control.
TCP/IP: (Transmission Control Protocol /Internet Protocol)	Is a protocol-family for the mediation and the transport of data packet on a local area network.
T.M.D.S. (Transition-Minimized Differential Signaling)	A signal transmission system for digital interface.
VESA DPMS (Video Electronics Standard Association - Display Power Management Signaling)	Is an association that promotes the standardization of signals transmitted by computers in order to achieve less power consumption by monitors.
VGA (Video Graphics Array)	Is an analog picture transmission standard for plug and cable splice between graphic card and display.
Viewing Angle	The maximum angle measured in degrees at which an LCD monitor's screen can be viewed at a minimally acceptable level. A viewing angle is a measure of the contrast ratio and usually corresponds to a contrast ratio of 10:1 or 5:1.

Table 1: Definitions

1.3 Index of Images

This chapter provides a quick reference to the main images in this manual.

1. Location of labels *Figure 1: Product Labeling* on page 11.
2. Location of the Interfaces *Figure 4: Location of the Interfaces* on page 12.
3. OSD Keyboard *Figure 9: OSD Keyboard* on page 17.
4. OSD menu *Figure 10: Main OSD Menu* on page 18.
5. Mechanical dimensions *Figure 12: Mechanical Dimensions* on page 30.
6. Mounting options of the monitor *Figure 13: Mounting options of the Device* on page 31.
7. Reverse side placement of all around seal *Figure 14: Reverse side placement of all around seal* on page 32.

II Caution

To safely install and operate this instrument, so as not to adversely affect the warranty, the WARNINGS and CAUTIONS must be adhered to.



- WARNING - Clarification
- Indicates potential risk of injury or death to users of the product.



- WARNING
- Do not disassemble or modify the equipment. Failure to observe this instruction may cause a fire, electric shock, or equipment failure.



- WARNING
- If there is smoke, odor, or noise development disconnect the device from the power supply and notify Alphasatron Marine.



- WARNING
- Do not scratch, damage, modify, heat, pull, excessively bend, or heavily load the power supply cable. It may cause a fire, or electric shock.



- WARNING
- Observe proper lifting technique when moving instrument. Refer to chapter SPECIFICATION for weight.



- WARNING
- The operator of the complete system is responsible for maintaining electromagnetic compatibility according to EMC regulations.



- WARNING
- Comply with all shielding measures according to the country-specific EMC directives.



- WARNING
- The device must be plugged into a properly grounded socket.



- WARNING
- The permissible leakage current is not exceeded in the first case of an error. To achieve maximum electrical safety, an additional grounding wire has to be used to ground the device properly.



- CAUTION - Clarification
- Indicates potential risk of damage to equipment.



- CAUTION - Components
- Use only components that have been provided or recommended (e.g., screws). Using other or non-original parts may cause injury and the device could be damaged.



- CAUTION
- The product contains precision components. To avoid damage, handle with care.
- During transportation of the product follow the instructions in chapter TRANSPORTATION.
- Retain original transport boxes for re-use if the product is to be transported again. The warranty will be void when the product is improperly packed.



- CAUTION
- Do not allow the Display Unit to fall or immerse into water. The equipment can be damaged.



- CAUTION
- When cleaning the surface, do not use any organic solvent such as thinner or benzene. Otherwise, the paint and markings on the surface may get damaged. For cleaning the surface, remove the dust and debris and wipe with a clean dry cloth.



- CAUTION
- Any modification to this equipment without prior written permission from ALPHATRON MARINE will void the warranty.



- CAUTION
- If the product is placed in an enclosed space, allow for sufficient ventilation and air circulation for cooling.



- CAUTION
- Avoid placement in the immediate vicinity of heat-producing equipment and/or flammable environments.



- CAUTION
- Condensation may form in and on the device if it is placed in a room with a higher or increasing ambient temperature. Wait until the condensation has evaporated before powering up the device.



III Introduction

This high-quality monitor has been designed specifically for the maritime sector and has been tested in accordance with international standard IEC 60945.

The high resolution, superior brightness and wide viewing angle ensure very good readability. The frontage is IP 55-compliant with regards to water protection.

1 Installation Instructions

This chapter explains the installation process from unpacking to connecting the monitor.

1.1 Transportation

The AlphaScreen 46 is a sensitive instrument and must be handled with care if it is transported, or moved.

As long as the product is packed in its standard Alpatron Marine box it can be transported anywhere at any distance.

- During transport protect boxes from moisture, movement and fall.
- During transport handle boxes with care and in accordance with instructions on the box.
- During transport ambient temperature should be between range of -20 ~ 70 °C (-4 ~ 158 °F).

1.2 Unpacking and Checking

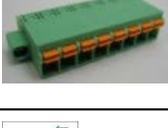
Unpack and check the individual parts.

Refer to Cautions with regard to placement.

1. Carefully unpack all of the parts that have been supplied.
2. Check to make sure that all of the components are complete.
3. Check to see if any of the components have visible transportation damages.
4. Contact Alpatron Marine when damage has been discovered.



Note Should any defects be discovered, notify the service department stated in the bill of lading. Have ready the bill of lading number, the serial number and a description of the defect.

Item	Description/Remark	Article No.
	1 pcs of power cable European type „Schuko“ to IEC (C13) with IEC LOCK, Length 2.0m	CO 013-NC
	1 pcs of 3-pin Terminal Block (Phoenix FKCN 2,5/ 3-STF-5,08) note: already plugged into the monitor	CON-508-03STF24-001
	1 pcs of 6-pin Terminal Block (Phoenix FKCN 2,5/ 6-STF-5,08) note: already plugged into the monitor	CON-508-06STF24-001
	1 pcs of 8-pin Terminal Block (Phoenix FKCN 2,5/ 8-STF-5,08) note: already plugged into the monitor	CON-508-08STF24-001
	1 pcs of “Operator Manual and Product Specification”	

1.3 Product Labeling

Label types and positions on the AlphaScreen 46 are defined as below:

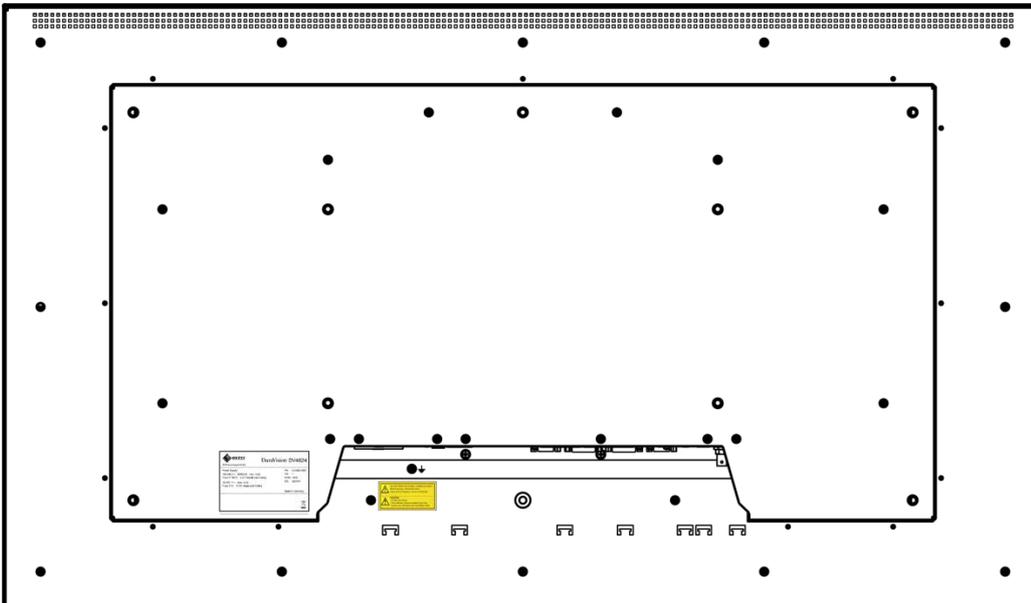


Figure 1: Product Labeling

On the back of the screen an Electrical Label and a Caution Label are adhered.

Power Supply: 100-240 V~; 50/60 Hz; max. 1.2A	PN: DV4624-002
Fuse (F1&F2): 5 AT double pole fusing	VN: 3
18-36V ---; max. 5.5A	DOM: 1541
Fuse (F3): 10 AF single pole fusing	SN: 276325
Compass Safe Distance: Standard: 5,10m - Steering: 2,90m	

Figure 2: Electrical Label



Figure 3: Caution Label

1.4 Warning Notice

- CAUTION - Components
- Use only components that have been provided or recommended (e.g., screws). Using other or non-original parts may cause injury and the device could be damaged.
- WARNING - Lifting
- Observe proper lifting technique when moving instrument. Refer to chapter *SPECIFICATION* for weight.
- CAUTION - Water
- Do not allow the Display Unit to fall or immerse into water. The equipment can be damaged.

- CAUTION - Ventilation
- If the product is placed in an enclosed space, allow for sufficient ventilation and air circulation for cooling.
- CAUTION
- Avoid placement in the immediate vicinity of heat-producing equipment and/or flammable environments.

1.5 Interfaces

This chapter covers the location of the interfaces and the devices that can be connected to the monitor.

1.5.1 Definition of the Interfaces

This drawing shows the locations of the interfaces.

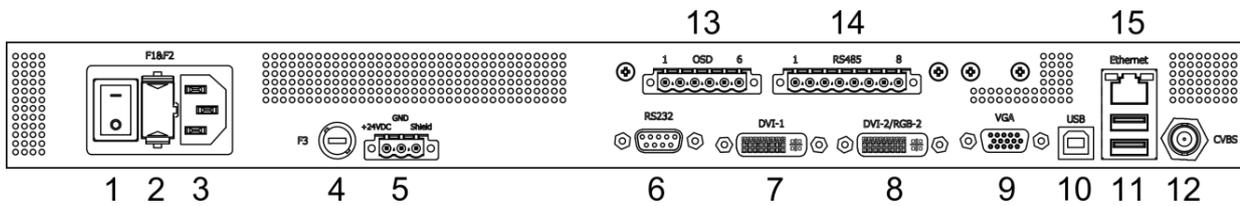


Figure 4: Location of the Interfaces

1	AC main switch
2	AC fuse, voltage input
3	AC voltage supply
4	DC fuse, voltage input
5	DC voltage supply
6	RS232 interface
7	DVI-1 input
8	DVI-2 / RGB-2 input
9	RGB-1 (VGA) input
10	USB (upstream) interface
11	2 x USB (downstream) interfaces
12	CVBS input
13	External keyboard interface
14	RS485 interface
15	Ethernet interface

Table 2: Definition of Interfaces

1.5.2 RS232 Interface

This chapter provides information regarding type of plug and counter plug to use for this interface.

Plug Type	Counter Plug
D-Sub 9 pin socket	D-Sub 9 pin plug

Table 3: Plug Connector

Pin	Signal
1	-
2	TXD (output)
3	RXD (input)
4	-
5	GND
6	n.c. / color sensor power supply voltage
7	-
8	n.c. / color sensor power supply voltage
9	-

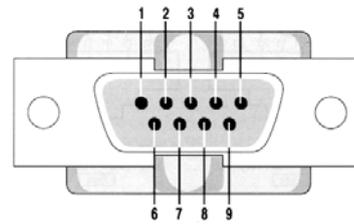


Figure 5: D-Sub 9 pin plug

Table 4: Pin Arrangement

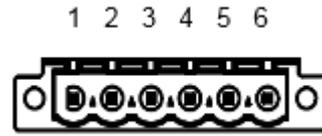
1.5.3 Interface for External Keyboard

The OSD menu can be operated from an external keyboard. This interface is galvanically isolated from the monitor's power supply and PE.

Manufacturer	Plug type	Plug type
Phoenix Contact	CC2.5/6-GF-5.08	FKCN 2.5/ 6-STF-5.08

Table 5: Plug Connector

Pin	Signal
1	Key 1 (+ / up)
2	Key 2 (- / down)
3	Key 3 (Menu)
4	Key 4 (Select)
5	Key 5 (Power)
6	GND


Figure 6: Plug Connector
Table 6: Interface for external keyboard

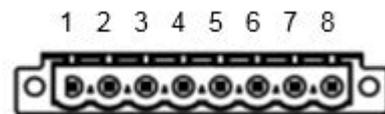
1.5.4 RS485 Interface

This interface is galvanically isolated from the monitor's power supply and PE.

Manufacturer	Plug type	Counter plug
Phoenix Contact	CC-2.5/8-GF-5.08	FKCN 2.5/ 8-STF-5.08

Table 7: Plug Connector

Pin	Signal
1	TX (A) + (output)
2	TX (B) – (output)
3	TX (C)
4	Shielding (connection to the housing)
5	RX (A) + (input)
6	RX (B) – (input)
7	RX (C) GND
8	Shielding (connection to the housing)


Figure 7: Plug Connector
Table 8: Plug Connector

1.5.5 DC Voltage Supply

The 24VDC voltage supply connection is galvanically isolated from the housing and other interfaces.

Manufacturer	Plug type	Manufacturer Plug type Counter plug
Phoenix Contact	CC 2.5/3-GF-5.08	FKCN 2.5/ 3-STF-5.08

Table 9: Plug Connections

Pin	Signal
1	+24VDC
2	GND
3	Shielding (connection to the housing)

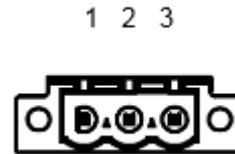


Figure 8: Pin Arrangement

Table 10: Pin Arrangement

1.6 Electrical Installation

Carefully read the following warning and safety instructions before you begin the electrical installation.

If these guidelines are not observed, the device could malfunction, possibly causing a fire or electric shock.

-  • WARNING
- The operator of the complete system is responsible for maintaining electromagnetic compatibility according to EMC regulations.
-  • WARNING
- Comply with all shielding measures according to the country-specific EMC directives.
-  • WARNING
- The device must be plugged into a properly grounded socket.
-  • WARNING
- The permissible leakage current is not exceeded in the first case of an error. To achieve maximum electrical safety, an additional grounding wire has to be used to ground the device properly.
-  • CAUTION
- Condensation may form in and on the device if it is placed in a room with a higher or increasing ambient temperature. Wait until the condensation has evaporated before powering up the device.
-  • CAUTION
- Protect from the weather.
-  • CAUTION - Cleaning
- When cleaning the surface, do not use any organic solvent such as thinner or benzene. Otherwise, the paint and markings on the surface may get damaged. For cleaning the surface, remove the dust and debris and wipe with a clean dry cloth>

1.6.1 Ergonomics

For optimum viewing it is important to ergonomically install the screen correctly.

An excessively dark or bright screen may affect your eyes. Adjust the brightness of the monitor according to the environmental conditions.

1. Adjust the brightness of the monitor according to the environmental conditions.



Note For ECDIS applications, the minimum recommended viewing distance is as follows: (IEC62288, Part 7.5 Screen resolution), 46" TFT Pixel pitch: 0.53025 (H) x 0.53025 (W) [mm] = Recommended Viewing Distance: 1.823 m

1.7 Connecting the Device

The power supply of the device works with 100-230 VAC and/or 24 VDC via the connectors provided.

1. Check whether the plugs for the DVI, VGA and CVBS signal are correctly plugged in and tightly fastened.
2. Connect the device to the power supply.

As soon as a valid signal is recognized, the source of the signal appears on the display screen.



Note The device should be allowed to warm-up for at least 30 minutes before you begin to do any calibrating or adjustments.

2 Operation

This chapter describes MENU handling, RADAR settings, CALIBRATION and TROUBLESHOOTING.

2.1 OSD - Menu

The “On-Screen Display” (OSD) is a menu system shown on the display screen. All settings and adjustments to the monitor can be made with the help of the menu system and the operating elements described.

The OSD Keyboard is placed at the front panel and is operated with four buttons (plus additional On/Off button). Two status LED's indicate monitor operating status. The ambient light sensor placed at the left side is not implemented in the monitor application. See *Figure 9: OSD Keyboard* on page 17.



Figure 9: OSD Keyboard

The OSD can be also operated with four buttons (plus additional On/Off button) that are connected via a special interface. See *Table 6: Interface for external keyboard* on page 14.

Essentially there are two OSD menu's available:

1. Quick OSD menu:

The most important parameters, e.g. back-light brightness, or signal source can be preset here for quick access.

2. Main OSD menu:

All settings, configurations, measurements and calibrations can be made here.



Note Blocked OSD access (OSD lockout).

- When OSD lockout is enabled, an access code is needed to get into the OSD every time you try to open it.
- After entering the access code, the OSD opens; however, the OSD lockout remains active.
- To permanently enable OSD, the OSD lockout has to be deactivated in the OSD “SETUP”.



Note Delayed monitor On/Off-Sequence.

- When switching “On” or “Off” the monitor via the OSD press the button for around 2...3 seconds.
- This prevents the monitor from switching “Off” if the operator touches the On/Off-button unintentionally.

2.2 LED Indicator

The two LED's on the front OSD keyboard indicate following status:

LED	Status	Description
CALIB	On	If backlight brightness is set to one of the four predefined ECDIS-modes the LED is On.
	Off	For any other backlight brightness setting the LED is Off.
STAT	On	Monitor powered On with valid input signal or Monitor powered On and is waiting for valid input signal (only if DPMS is set to Off)
	Off	No Power, Monitor powered Off
	Blinking	Monitor powered On, no signal (only if DPMS is set to On)

2.3 Quick OSD Menu

Use the quick OSD Menu to quickly get started:

1. Press the ▼ or ▲ button to call up the “Backlight” Quick OSD Menu to change backlight brightness and also to change backlight brightness.

Note 0.5 .. 400 cd/m² if “Backlight Controller is set to “On”, or 0 .. 100 if “Backlight Controller is set to “Off”.

2. Press the ↵ button to call up the “Signal Source” Quick OSD Menu or the PiP OSD menu if monitor is in PiP-mode.
3. Press the ▼ or ▲ button to select the input source and quit your choice by pressing the ↵ button.

2.4 Main OSD Menu

Structure of the OSD menu. Depending on the input signal displayed (DVI, RGB (VGA) or CVBS), different parameters can be set.



Figure 10: Main OSD Menu

2.5 Main Menu - Picture 1 (DVI-1, DVI-2)

This chapter explains the settings of parameters in the main window for DVI-1 and DVI-2.

Parameter	Setting	Description
Focus	Main Window (1) / PiP Window (2)	Determines in which window (Main/ PiP) a setting should be made.
Back-light	0 ~ 100	Brightness in % -> back-light regulator = Off.
	0.5 ~ 400	Brightness in cd/m ² - > backlight regulator = On.
f(T): BL real [%]		Back-light brightness in %.
		The display is shown only when the backlight brightness is reduced due to a higher operating temperature.
Brightness	0 ~ 100	Setting the brightness (default value: 50) ¹
Contrast	0 ~ 100	Setting the contrast(default value: 50) ¹

Table 11: Main Menu - Picture 1 (DVI-1, DVI-2)

Note ¹ Important: Adjusting the brightness and the contrast changes the image information displayed, i.e., improper adjustments can distort the information displayed or it may no longer be visible.

2.6 Main Menu - Picture 1 (RGB-1 (VGA) / RGB-2)

This chapter explains the settings of parameters in the main window for RGB-1 and RGB-2.

Parameter	Setting	Description
Focus	Main Window (1) / PiP Window (2)	Determines in which window (Main/ PiP) a setting should be made.
Back-light	0 ~ 100	Brightness in % -> back-light regulator = Off.
	0.5 ~ 400	Brightness in cd/m ² -> backlight regulator = On.
f(T): BL real [%]		Back-light brightness in %.
		The display is shown only when the backlight brightness is reduced due to a higher operating temperature.
Phase	0 ~ 63	Setting the phase.
Brightness	0 ~ 100	Setting the brightness ²
Contrast	0 ~ 100	Setting the contrast ²
Auto adjust		Automatic adjustment of image position, frequency and phase relative to the applied RGB analog signal.
H Position	0 ~ 100	Setting the horizontal image position
V Position	0 ~ 100	Setting the vertical image position
Frequency		Setting the scanning frequency/pixel rate

Table 12: Main Menu - Picture tab 1 (RGB-1 (VGA) - RGB-2)



Note ² Important: Adjusting the brightness and the contrast changes the image information displayed, i.e., improper adjustments can distort the information displayed or it may no longer be visible.

2.7 Main Menu - Picture 1 (CVBS)

This chapter explains the settings of parameters in the main window for CVBS.

Parameter	Setting	Description
Back-light	0 ~ 100	Brightness in % -> back-light regulator = off
	0.5 ~ 400	Brightness in cd/m ² -> backlight regulator = on
f(T): BL real [%]		Back-light brightness in %.
		The display is shown only when the back-light brightness is reduced due to a higher operating temperature.
Brightness	0 ~ 100	Setting the brightness (default value: 50) ³

Parameter	Setting	Description
Contrast	0 ~ 100	Setting the contrast (default value: 50) ³
H Position	0 ~ 100	Setting the horizontal image position
V Position	0 ~ 100	Setting the vertical image position
Hue	0 ~ 100	Setting the hue. Just for NTSC signal
Saturation	0 ~ 100	Setting color saturation

Table 13: Main menu - Picture tab 1 (CVBS)


Note ³ Important: Adjusting the brightness and the contrast changes the image information displayed, i.e., improper adjustments can distort the information displayed or it may no longer be visible.

2.8 Main Menu – Picture 2 (DVI-1, DVI-2, RGB-1, RGB-2, CVBS)

This chapter explains the settings of parameters in the main window for DVI-1, DVI-2, RGB-1, RGB-2 and CVBS.

Parameter	Setting	Description
Focus	Main Window (1) / PIP Window (2)	Determines in which window (main/ PIP) a setting should be made.
ECDIS mode	Custom	Setting the ECDIS operating status.
	Day	Only available when the function “ECDIS & Radar” in the Main menu – Setup is enabled, see <i>Table 16: Main menu - Setup</i> on page 22.
	Dusk	
	Night	
Scaling	One to One	For DVI-1, DVI-2, RGB-1, RGB-2.
	Fit to aspect ratio	Only available for the main window and when the signal resolution is less than or more than 1920 x 1080 pixels (native resolution).
	Fill screen	
	One to One	For CVBS.
Fit to aspect ratio	Only available for the main window and when the signal resolution is less than or more than 1920 x 1080 pixels (native resolution).	
Fill screen		
Picture in Picture (PiP)	Off / On	Activates the PIP window, see <i>Table 15: Sub - menu - PIP</i> on page 21.
Color Temperature	9500 Kelvin 7500 Kelvin 5500 Kelvin User	Setting the color temperature. (factory setting = 7500k). This menu item is not visible when gamma = “calibrated” is selected or the “ECDIS & Radar” function in the Main menu – Setup is activated, see <i>Table 16: Main menu - Setup</i> on page 22.

Parameter	Setting	Description
Gamma	Variable (2.2) Calibrate (G:2.2, x:0.300, y:0.310)	The "calibrate" setting is possible only after a gamma calibration is carried out. This menu item is not visible when the "ECDIS & Radar" function in the Main menu – Setup, see <i>Table 16: Main menu - Setup</i> on page 22.
Calibrate & Measure	Analog RGB Backlight sensor Gamma & color Brightness/color measurements	This function is used to calibrate the analog RGB input channels, the backlight brightness and the gamma or color temperature. Brightness and color measurements as well as the gamma and color calibration can be made with the Calibration Sensor.

Table 14: Main menu - Picture tab 2 (DVI-1, DVI-2, RGB-1, RGB-2, CVBS)

2.8.1 Sub-Menu - Picture in Picture (PIP)

This chapter provides information regarding the possible settings in the PIP - menu.

Parameter	Setting	Description
PIP	On/Off	Turns the PIP window on or off.
Source Main Window	DVI-1	When selecting the source, the following limitations apply:
	DVI-2	
	RGB-2	
	VGA	
	CVBS	
Source PiP Window	DVI-1	One source (either the main window or the PIP window) has to be DVI-1.
	DVI-2	
	RGB-2	
	VGA	
	CVBS	
Source Swap (Main<->PiP)		Swaps the signal source between the main window and the PIP window.
Frame-lock	Source Main Window	This function determines for which window the frame lock function will be used.
Reference	Source PIP Window	This function should be used for the window where moving images (e.g., from a camera) are displayed.
Auto adjust		Only available for RGB-1(VGA) or RGB-2.

Parameter	Setting	Description
		This function starts the automatic image balance of the frequency, phase and image position of the analog image signal displayed.
PIP Adjustment	PIP size	Setting the properties of the PIP window.
	PIP H Position	
	PIP V Position	
	PIP Transparency	

Table 15: Sub - menu - PIP

2.9 Main Menu – Setup

This chapter explains the settings in the Main Menu.

Parameter	Setting	Description
Back-light Controller	Off/On	Enables the automatic back-light brightness stabilizer. Visible only when the back-light regulator is calibrated and the “ECDIS & Radar” = Off.
ECDIS & Radar	Off/On	Turns the ECDIS & Radar properties on/off. This function can be turned on only when the appropriate calibrations and settings such as the following have been made: <ul style="list-style-type: none"> • Back-light calibration • Gamma & color calibration • Back-light regulator = On See <i>ECDIS - Radar Settings</i> on page 27
DPMS	Off/On	Display Power Management System If the DPMS function is enabled, the back-light is turned off when there is no image signal.
OSD		OSD Settings <i>Sub-Menu – OSD</i> on page 23
Source		Selects the input signal (DVI-1, RGB-1, ...) that should be taken into account in the automatic source search, see <i>Sub-Menu – Source</i> on page 23

Parameter	Setting	Description
Language	English German Spanish French	Selects the OSD language
Test pattern		Displays various test images
Factory/User Settings		Saves user settings and resets to factory or user settings.

Table 16: Main menu - Setup

2.9.1 Sub-Menu – Source

This chapter provides settings information regarding the Source parameters.

Parameter	Setting	Description
Source Scan	Off/On	Automatic source scan.
Scan DVI-1	Off/On	Includes the respective input signal (source) during the automatic source scan.
Scan DVI-2	Off/On	
Scan RGB-2	Off/On	
Scan VGA	Off/On	
Scan CVBS	Off/On	

Table 17: Sub-menu - Source

2.9.2 Sub-Menu – OSD

This chapter provides settings information regarding the parameters of the OSD sub-menu.

Parameter	Setting	Description
Transparency	0 ~ 100	Settings of the OSD window transparency.
OSD Timeout [sec]	15 ~ 60	Display time of the OSD after the last time the button was pressed. Default: 45 sec.
OSD Lock	Off/On	OSD lock (de-)activate. (Default access code: 1 2 3 4). The OSD lock remains enabled until the menu item is deactivated.

Parameter	Setting	Description
Key Lock	Off/On	Locking keyboard input for OSD operations. To deactivate the keyboard lock, when the monitor is being powered up (turning on the power supply), the “down/-” button must be pressed until a confirmation window appears in the lower right-hand corner of the screen.
OSD Access Code		Defines a new OSD access code.

Table 18: Sub-menu - OSD

2.10 Main Menu – Communication

This chapter provides settings information regarding the parameters in the Main Communications Menu.

Parameter	Setting	Description
RS232 Interface	Standard SCOM	Sets the RS232 interface communication.
RS485 Interface	MODBUS SCOM	Sub-menu MODBUS – see <i>Table 20: Sub-menu - MODBUS interface (RS485/422)</i> on page 25.
SNMP		Sub-menu SNMP, see <i>Table 21: Sub-menu - SNMP (Ethernet)</i> on page 25.
Restart SNMP / RS485 Communication.		Restart the communication interface to accept the MODBUS and SNMP settings.

Table 19: Main menu - Communication

2.10.1 Sub-Menu – MODBUS Interface (RS485/422)

This chapter provides settings information regarding the parameters of this Modbus Interface.

Parameter	Setting	Description
Slave Address	1 - 254	Defines a MODBUS slave address.
Baud rate	19200 Baud 9600 Baud	Transmission speed for the RS 485/422.
Parity	Even Odd Off	Parity check configuration.
Bus Mode	Two-wire: Four-wire:	Selection of the bus topology. Half-duplex/full-duplex.
Bus Termination	Off/On	Final termination of the bus system. As far as is possible, termination should be activated on the last bus device.

Table 20: Sub-menu - MODBUS interface (RS485/422)

2.10.2 Sub-Menu – SNMP (Ethernet)

This chapter provides setting information regarding SNMP parameters.

Parameter	Setting	Description
IP Address	xxx xxx xxx xxx	Configuration of the network interface.
Subnet Mask	xxx xxx xxx xxx	
Standard Gateway		
Primary DNS Server		
GET Community String		SNMP Community string for GET inquiry.
SET Community String		SNMP Community string for SET inquiry.

Table 21: Sub-menu - SNMP (Ethernet)

2.11 Main Menu – Information

This chapter provides information regarding the functions in the Main Menu.

Function	Description
Selected Source	Active signal source (DVI-1, DVI-2, VGA, RGB-2, CVBS).
Resolution (H x V)	Picture resolution of the active signal source.
Total (H x V)	Display of the total number of pixels per line and lines per picture.
Horiz. Frequency [Hz]	Horizontal frequency of the active signal source.
Vert. Frequency [Hz]	Vertical frequency of the active signal source.

Function	Description
Timing Index	Index of the active signal source from the internal timing table.

Table 22: Page 1/5: (Information to the active input signal)

Function	Description
Selected Source	Active signal source (DVI-1, DVI-2, VGA, RGB-2, CVBS).
Resolution (H x V)	Picture resolution of the active signal source.
Total (H x V)	Display of the total number of pixels per line and lines per picture.
Horiz. Frequency [Hz]	Horizontal frequency of the active signal source.
Vert. Frequency [Hz]	Vertical frequency of the active signal source.
Timing Index	Index of the active signal source from the internal timing table.

Table 23: Page 2/5: Source PiP Window (Information to the active input signal)

Function	Description
Temperature [°C]	Internal temperature of the monitor.
Power Surplus Backlight [%]	Power reserve of the back-light for the currently set brightness level.
Power Supply 1 (AC)	Supply voltage on the AC input applied.
Power Supply 2 (DC)	Supply voltage on the DC input applied.

Table 24: Page 3/5: System (Information on the internal operating conditions)

Function	Description
Monitor	Operating hours counter.
Back-light	Operating hours counter for the back-light.
Power Supply 1 (AC)	Operating hours counter power supply 1 (AC).
Power Supply 2 (AC)	Operating hours counter power supply 2 (AC).

Table 25: Page 4/5: On Time (Hours)

Function	Description
Firmware Version	Firmware version of the monitor.

Function	Description
Serial number	Serial number of the monitor. (Always provide this number when contacting ALPHATRON MARINE).

Table 26: Page 5/5: Version

2.12 Main Menu – Self-Test

This sub-menu shows the detailed results of the internal monitor self-test. It is used by service personnel for purposes of analysis.



Note There are no detailed results shown!

2.13 ECDIS - Radar Settings

This monitor features an ECDIS-compatible operating mode to display colors corresponding to the image content (nautical charts) according to the specifications of the IHO (International Hydrographic Organization).

This operating mode can be enabled only when the following preconditions are in place:

- The monitor is calibrated with gamma 2.2 and the white point $x=0.300$, $y=0.310$.
- The back-light sensor is calibrated.

These requirements have been met at the time of delivery.



Note When ECDIS mode is enabled, no changes can be made to the color temperature, gamma and back-light controller.



Note For the correct representation of ECDIS image files, there are corresponding color tables for the three operating conditions of DAY, DUSK and NIGHT. The respective RGB values for the color tokens from the S-52 "Presentation Lib" are recorded in these tables.



Note To obtain these tables, please contact ALPHATRON MARINE.

2.14 Monitor Calibration

To be able to use the monitor as an ECDIS-compliant display it has to be set as described in *ECDIS - Radar Settings* on page 27.

Prior to calibration operate the monitor for at least two hours at a medium back-light brightness level. Place the color sensor in the middle of the screen, see *Figure 11: Color Sensor placement* on page 27.

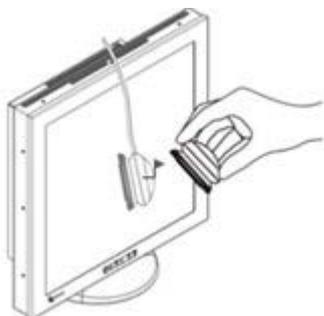


Figure 11: Color Sensor placement

A color sensor that is connected to the DV4624 via the RS232 interface is required to perform this calibration. Control of the calibration process is done through the monitor itself and can be started using the OSD. No additional hardware or software is necessary.

All necessary calibrations were done at the factory. Recalibration may be required to compensate for variations in color and gamma characteristics, due to e.g. age, and to ensure ECDIS compatibility.



Note Start individual calibrations like *Analog RGB*, *Back-light Sensor* and *Gamma Color* in the OSD sub-menu “Picture 2 / Calibrate and Measure”, see *Table 14: Main menu - Picture tab 2 (DVI-1, DVI-2, RGB-1, RGB-2, CVBS)* on page 20.

2.14.1 Calibrating the RGB Input Channel RGB-1 (VGA) and RGB-2

1. Execute this adjustment in the final application to compensate for the influences from transfer cable and graphic cards.



Note The signal differences between red, green and blue signals are compensated for to make this adjustment.

2. Display a white image (100%) on an imaging computer system.
3. The OSD performs the calibration procedure with the corresponding instructions.

2.14.2 Calibrating the Back-Light Sensor

The back-light sensor in the device ensures that the cd/m² brightness level set in the OSD is correctly transmitted and remains unchanged during operation.

1. Use an external brightness measuring device, to run the calibration.



Note The OSD differentiates between brightness level set in the OSD and the Color Sensor.

2. The OSD performs the calibration procedure with the corresponding instructions.

2.14.3 Calibrating Gamma & Color

Gamma and color (white point) must be correctly calibrated to operate the monitor in the ECDIS or radar mode.

1. Preset the correct color coordinate (white point) of X=.300, Y=.310 and a gamma of 2.2.



Note If other values are used, the monitor cannot be set in the ECDIS or radar mode.

2. The OSD performs the calibration procedure with the corresponding instructions.

2.15 Serial Communication Interfaces

The monitor has several serial interfaces that are controlled via the monitor or can be used to retrieve status information, like:

- RS-485 and RS-422
- RS-232
- USB
- Ethernet

Different protocols are available for communication via these interfaces.

1. Communication via the RS232, RS485 and USB is based on the MODBUS standards.



Note The format is identical for all three interfaces.

2. For communication via the Ethernet interface, the SNMP protocol is available.



Note The detailed description of each of the communication protocols is available in separate documents available from ALPHATRON MARINE

2.16 Troubleshooting

This chapter provides information concerning fault finding and fixing.

Problem	Cause	Solution
No image when the monitor is powered up	No input signal to DVI-x, RGB-x or CVBS	Connect the appropriate input signal.
	Incorrect OSD setting	Check the source selection.
	Too little back-light brightness	Increase the back-light brightness level.
	No voltage supply	Connect the corresponding voltage to either the AC or DC input.

Table 27: Troubleshooting



Note Contact your sales representative if the device is not operating normally.

3 Specifications

This chapter details the specific characteristics of the monitor.

3.1 Mechanical Specifications

Dimensions of the monitor.

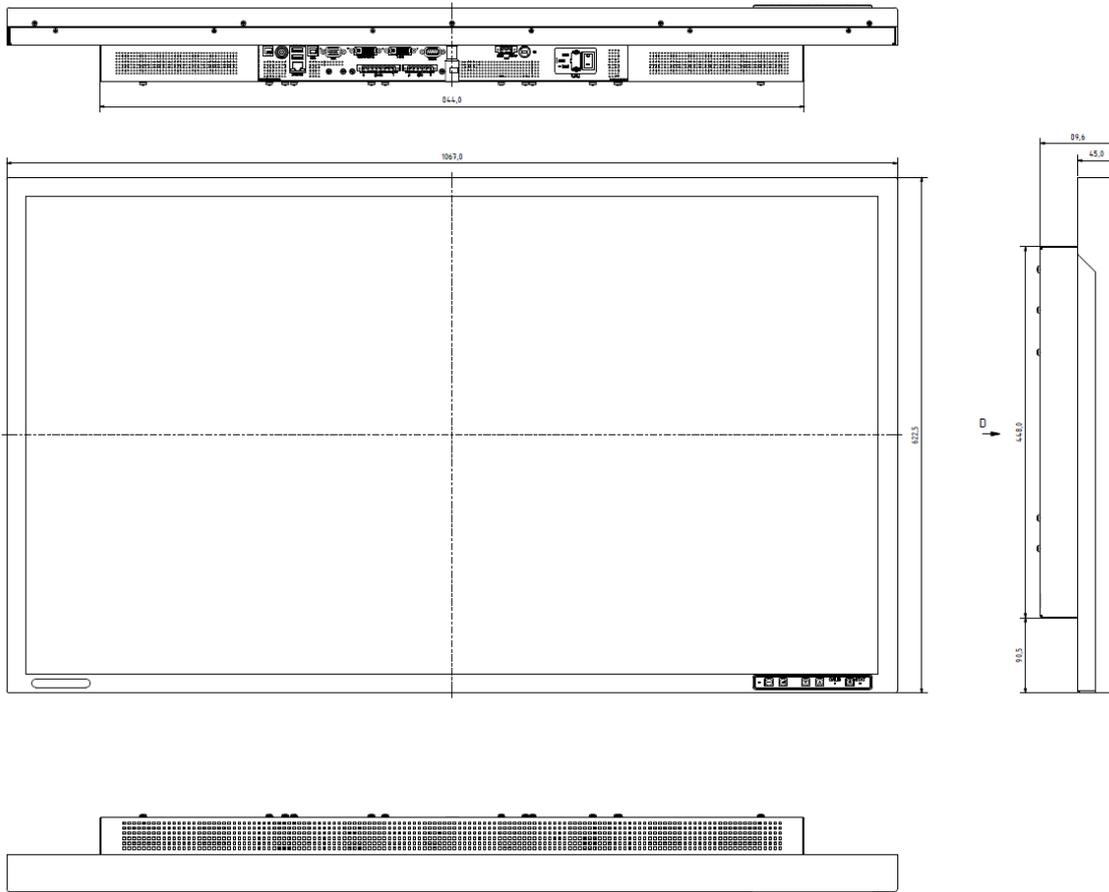


Figure 12: Mechanical Dimensions

3.2 Monitor Mounting Options

Installation requires M8 screws with a 1.25 mm thread pitch.

 **Note** The maximum screw depth is 16 mm.

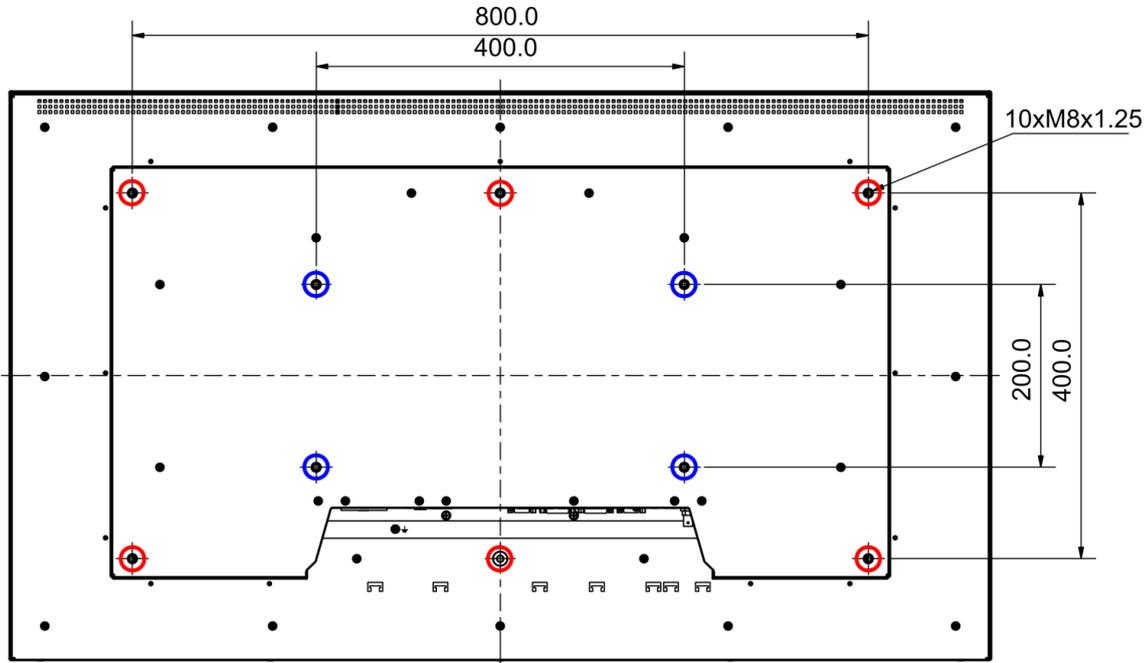


Figure 13: Mounting options of the Device

3.3 Sealing the Rear of the Device

To be IP55 compliant the monitor requires to be water resistant

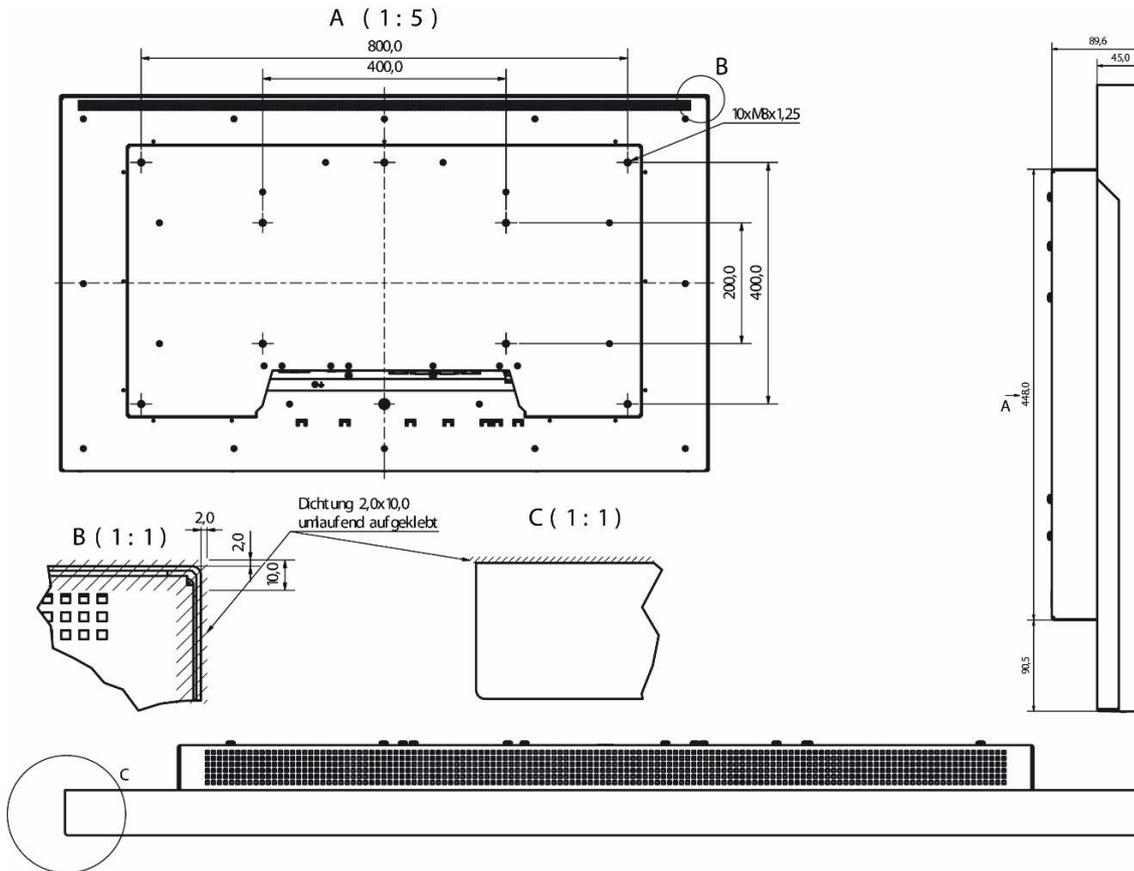


Figure 14: Reverse side placement of all around seal

1. Install seal between the front cover and mounting location for use in areas requiring an IP55 rating.
2. Glue fix 2x10mm sealing tape around the entire back edge, see

3.4 Display Module

This chapter explains the values of the various parameters of the monitor.

Parameter	Values
Model	Active Matrix TFT-LCD
Size	46.0" / 116.8 cm
Resolution / pixel aperture	1920 x 1080 / 0.4845 mm ²
Viewing angle (h/v)	178 ° /178 °
Contrast	4,000:1 (type)
Colors	1073.7 million
Brightness	700 cd/m ² (type)
Backlight	LED (Edge-Light)

Parameter	Values
Pixel error class	Class II (ISO 9241)

Table 28: Display Module

3.5 Voltage Supply

This chapter provides an overview of Input Voltage and Power Consumption of the monitor.

Parameter		Values
AC input voltage		90 - 264 VAC, 47 - 63 Hz
Fuse		2 x 5 A
Power consumption	Maximum	110 W (Brightness =. 100% w/o BL-Reg.)
	Typical	35 W (Brightness = 80 cd/m ²)
	Standby mode	4 W
DC input voltage		18 - 36 VDC
Fuse		10A
Power consumption (supply: 24 VDC)	Maximum	100 W (Brightness =. 100% w/o BL-Reg.)
	Typical	30 W (Brightness = 80 cd/m ²)
	Standby mode	2W

Table 29: Voltage supply

3.6 Digital Signal Input (DVI-1, DVI-2)

This chapter provides information with regards to Input Signal and Digital Clock.

Parameter	Values
Input signal	Signal link T.M.D.S. DVI Rev. 1.0 compliant
Pixel clock	25 ~ 155 MHz

Table 30: Digital signal input (DVI-1, DVI-2)

3.7 Analog Signal Input (RGB-1(VGA) / RGB-2)

This chapter provides information regarding signal levels, frequencies and impedance.

Parameter	Values
Signal level (RGB)	0.7 Vpp / 1 Vpp (when Sync on green)
Band width	500 MHz (-3 dB)
Impedance RGB input	75 Ω

Parameter	Values
Synchronization	Separate sync, composite sync to H, Composite sync to green
Impedance H/V input	470 Ω
Pixel frequency	25 ~ 155 MHz
H frequency	15 ~ 100 MHz
V frequency	50 ~ 100 MHz

Table 31: Analog signal input (RGB-1(VGA) / RGB-2)

3.8 Video Signal Input (CVBS)

This chapter provides information regarding signal input for CVBS.

Parameter	Values
Signal level	1.0 Vpp
Impedance	75 Ω
Input type	Differential
V frequency	50 / 60 Hz
H frequency	15.625 / 15.734 kHz
Coding	PAL, NTSC, SECAM

Table 32: Video signal input (CVBS)

3.9 Compass – Safe Distance

This chapter provides information regarding safe distances to compasses.

Parameter	Values
Safety distance to:	
Standard magnetic compass	5.10m
Controlling magnetic compass	2.90 m
Reduced safety distance to:	3.10 m
Standard magnetic compass	
Controlling magnetic compass	1.75 m

Table 33: Compass - safety distance

3.10 Environmental Requirements

This chapter provides requirements for safe operating and storage conditions.

Parameter	Values
Operating temperature	-15 ~ 55 °C (5 ~ 131 °F)
Storage temperature	-20 ~ 70 °C (-4 ~ 158 °F)
Humidity	≤95% (no condensation)

Table 34: Environmental requirements

3.11 Physical Properties

This chapter provides information regarding the physical properties of the monitor.

Parameter	Values
Dimension	1067 x 622.5 x 94 mm
Weight (net)	31 kg / 68 lbs.
Device protection	IP55 front
	IP20 back
Protective screen	4 mm (T92) ESG
Housing material	Stainless steel
Housing color	Munsell Color N2.5 (black)

Table 35: Physical properties

3.12 Packing

This chapter provides information regarding size and weight of packaged product.

Parameter	Values
Size (W x H x D)	1195 x 780 x 320 mm
Weight (gross)	34kg

Table 36: Packing

3.13 Authorizations

This chapter provides information regarding compliance with standards.

Standards & Certificates	
IEC 60945 (ed.4) (EN60945:2002)	
DNV GL	

Table 37: Authorizations



3.14 Annex A

The Displays could be used in combination with the following MFD, Radar, and ECDIS equipment:

Device	Type	NB	Type Approval
Radar	JRC JMR-9200	0168	BABT-MED-000060
ECDIS	JRC JAN-9201	0168	BABT-MED-000062

Table 38: The AlphaScreen 46 (Eizo DuraVision DV4624-002)

All over the world,
close to the customer

JRC/Alpatron Marine B.V.

Schaardijk 23 (harbor 115)
3063 NH Rotterdam
The Netherlands
T +31 10 453 4000
F +31 10 453 4010
service@jrc.am
www.jrc.am

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