User Reference Manual

DuraMON15 LED

Disclaimer

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Image sticking: If the monitor is operated with static images (logo's etc) it will inevitably lead to images sticking on the display (like on old CRT's). This is not a permanently situation and can be removed by operating the monitor with a completely black screen.

FCC Warning

Computing devices and peripherals generate and radiate radio frequency energy, and if not installed and used in accordance with the instructions advised by ISIC A/S, it may cause interference to radio communication.

The DuraMON series, manufactured by ISIC A/S, is designed to comply with the emerging generic EEC standards, that cover applications in maritime environment.

Classification

The monitor is classified as "protected from the weather" according to IEC 60945 ed.4 (former class b).

Approvals

Approval according to IACS E10 ed. 5 and IEC 60945 ed. 4, Maritime navigation and radio communication equipment and systems – General requirements.

ISIC A/S is complying with the WEEE directive within the European Union, stating that electronic and electric products must be collected separately.
Products are marked according to the directive.

Table of Contents

1   Features

Congratulations on your purchase of a DuraMON product. This short form manual is designed to get you started working with your new DuraMON.

The DuraMON series of monitors are all made as rugged monitors especially designed for the demanding operating conditions at sea.

The DuraMON series are tested for full compliance to marine-standards IACS E10 and IEC 60945. The monitor comes with excellent brightness and contrast levels that ensure a good readability thus making it very eye-friendly. For the best picture quality, always use a double shielded DVI cable with ferrites, like the one supplied with the monitor.

Backlight LED technology
Direct dimming control (0-100%) from UP/DOWN buttons.
Full settings control via menu and limited settings over serial link or DDC.
Anti-glare coated glass.
IP65 protection and liquid resistant front.
It is important to notice that, when powered off, the product still consumes some power from the mains. To cut off the power from the product it is necessary to unplug its power cord from the mains.

2 General considerations on Installation and Operation

The DuraMON is designed to work at conditions according to IEC 60945. However, keeping the temperature and vibration level at a minimum will extend the life time of the product. ISIC recommend operating this product at normal room temperature (20-25 °C), with the lowest level of vibration and humidity.

Installation of the DuraMON

In order to obtain the best possible operating conditions, please note the following precautions.

- Room for cooling.
  When designing the cabinet/console for the DuraMON, please ensure that air can flow freely around the cabinet, in order to avoid any unnecessary rise in temperature. If it is not possible to have an adequate natural airflow, use a fan to force the airflow to be higher.

- Mounting positions
  To obtain adequate cooling by convection ISIC recommends that the DuraMON is mounted at least 30 degrees from horizontal. If this is not possible, forced cooling must be applied directly to the unit in order not to overheat it.

- Sunlight
  If the unit can be exposed to direct sunlight, there is a potential risk that the unit can be overheated. Please take measures to prevent direct sunlight. Do also consider forced cooling on the back of the unit.
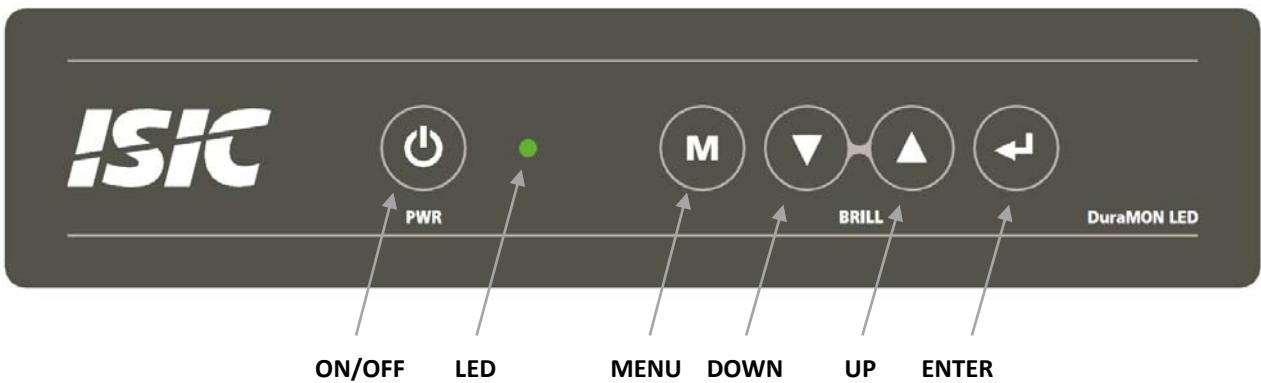
3   DuraMON connections

Below is a view of connections to the monitor. The default inputs are: power, RS-232, DVI and VGA.

RS-232   **VGA**   **DVI**   **POWER**

4   DuraMON front panel controls

ON/OFF   **LED**   **MENU** **DOWN**   **UP**   **ENTER**

ON/OFF:
This button is used to turn the product on or off. Pressing it will toggle the power. .

LED:
The LED will change color from green to red to indicate power down. LED brightness will decrease with decreasing backlight brightness.
If there is no active input signal, the monitor will display a dialog box to inform the user to check the signal cable.

MENU:
Pressing this button the OSD menu will appear. See OSD section for details.

UP/DOWN:
Used to adjust backlight brightness or to navigate and adjust settings in menus.

ENTER:
This button is used to confirm selections in the OSD menu. If Source isn't set to AUTO in the OSD, use this button to switch to an active source.

5   OSD

With the OSD (On Screen Display) you can modify the settings and control the special features of the DuraMON as described on the next pages.

To enter the OSD press "MENU" button.

To navigate the OSD use the "UP" and "DOWN" buttons and press "ENTER" to select a specific setting. To return a previous menu point, press the "MENU" button.

PICTURE	
PICTURE Brightness 50 Contrast 50 Sharpness 2 H Position 50 V Position 50 Clock 50 Phase 55 1280x1024 60Hz	**Brightness:** Use to adjust the Backlight Brightness. Increasing the value will increase the luminance. Decreasing it will decrease the luminance. Be aware that low luminance may inhibit visibility of information on the screen, particularly at night. Default value = 90 **Contrast:** Use to adjust the Contrast. Increasing the value will increase the visibility of dark details in the picture. Decreasing the value will decrease the visibility of dark details in the picture. Be aware that too high or low contrast may inhibit visibility of information on the screen, particularly at night. Default value = 50 **Sharpness:** Use to adjust the Sharpness of the picture. Increasing the value will make the picture more detailed. Decreasing the value will make the picture less detailed. Default value = 2 **H Position (VGA only):** Use to adjust the position of the signal left or right. Increase the value to move the picture right. Decrease the value to move the picture left. Default value = 50 **V Position (VGA only):** Use to adjust the position of the signal up or down. Increase the value to move the picture up. Decrease the value to move the picture down. Default value = 50
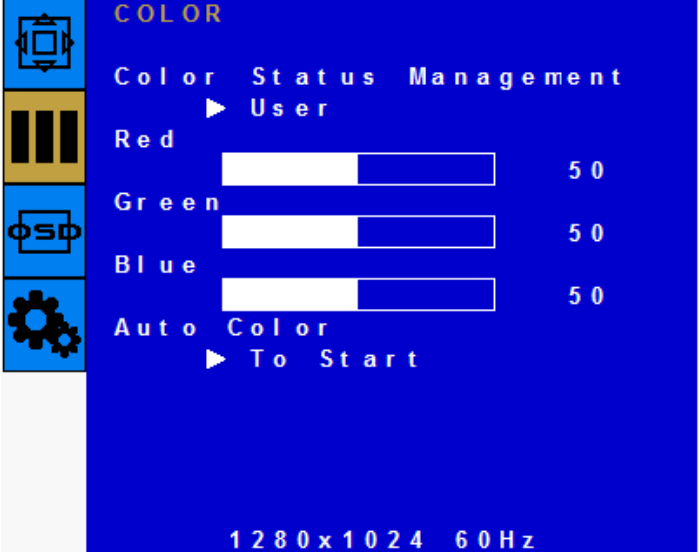
	Clock (VGA only): Use to adjust the frequency of the clock signal. Default value = 50 Phase (VGA only): Use to adjust the clock phase. Adjusting this value will remove shadows in the picture. Default value = Auto detected

COLOR	
COLOR Color Status Management ▶ User Red 50 Green 50 Blue 50 Auto Color ▶ To Start 1280x1024 60Hz	Color Status Management Use to adjust the color temperature of the picture. Default value = User Red (VGA only): Use to adjust the Red gain. Increase the value to make the picture more reddish. Decrease to make it less reddish. Default = 50 Green (VGA only): Use to adjust the Green gain. Increase the value to make the picture more greenish. Decrease to make it less greenish. Default = 50 Blue (VGA only): Use to adjust the Blue gain. Increase the value to make the picture more bluish. Decrease to make it less bluish. Default = 50 Auto Color (VGA only): Use to auto adjust the ADC values for Red, Green and Blue.

OSD

Language:
Use to change the OSD language.
Default: English

H Position:
Use to adjust the position of the OSD menu left or right. Increase the value to move the OSD right. Decrease the value to move the OSD left.
Default value = 50

V Position:
Use to adjust the position of the OSD menu up or down. Increase the value to move the OSD up. Decrease the value to move the OSD down.
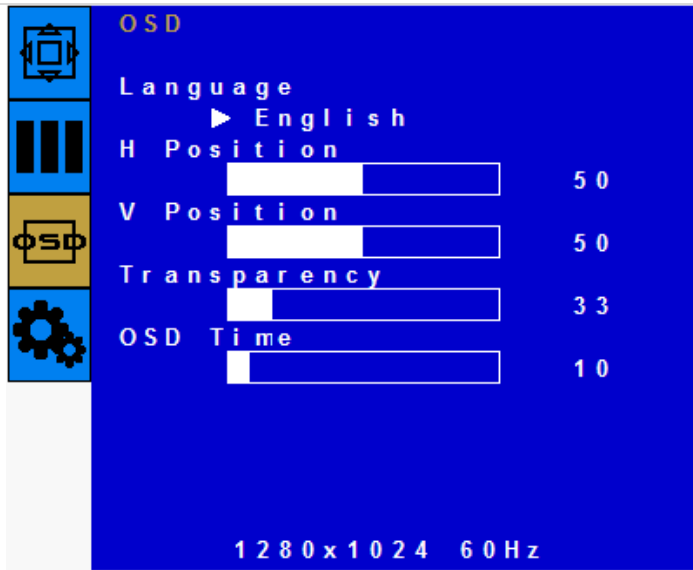Default value = 50

Transparency:
Use to adjust the transparency of the OSD menu. Decreasing the value will make the OSD more transparent. Increasing the value will make the OSD more solid.
Default value = 33

OSD Time:
Use to select how long time the OSD menu will be displayed. When no actions have been carried out in the specified time, the OSD menu will be removed.
Default value = 10 seconds

SETUP

Source:
Use to change the active source. Selecting AUTO will scan for an active signal. If both VGA and DVI signal are found, DVI will be preferred.
Default = Auto

Factory Reset:
Use to restore all settings to the default values. By activating this function, all settings made by the user will be lost and the monitor will be brought back to known operating conditions.

	Aspect: Use to select if aspect ratio should be applied to the picture. Off will stretch the picture to fill the screen. On will fill the screen, but keep the aspect ratio. This will result in black bands on the border of the screen. Default = Off Set ID: Use to enable/disable serial communication through the RS-232 port. Enabling it will allow the user to control settings in the monitor. See the "DuraMON communication protocol" section for details. Default = Off

6   Serial connection pin-out

The pin-out of the serial port SUB-D connector on the rear side of the DuraMON is as below:

Pin	RS-232
	SUB-D 9-pol female
1	
2	TX
3	RX
4	
5	GND
6	
7	
8	
9	

7   DuraMON communication protocol

To control the DuraMON from a PC the commands below has to be used.

	Function	BYTE0	BYTE1	BYTE2	BYTE3	BYTE4	BYTE5
		Length	Set ID	CMD1	CMD2	CMD3	Checksum
POWER BUTTON	Power On/Off	6	0	'K' (0x4B)	'P' (0x50)	'W' (0x57)	0x08
MENU BUTTON	Menu/Exit	6	0	'K' (0x4B)	'M' (0x4D)	'N' (0x4E)	0x14
ENTER BUTTON	Enter	6	0	'K' (0x4B)	'M' (0x4D)	'O' (0x4F)	0x13
UP BUTTON	Up	6	0	'K' (0x4B)	'M' (0x4D)	'U' (0x55)	0x0D
DOWN BUTTON	Down	6	0	'K' (0x4B)	'M' (0x4D)	'D' (0x44)	0x1E

Checksum : BYTE0 + BYTE1 + BYTE2 + BYTE3 + BYTE4 + BYTE5 = 0

Example:

Decrement backlight level one step (when no OSD is active):

BYTE0	BYTE1	BYTE2	BYTE3	BYTE4	BYTE5
0x06	0x00	0x4B	0x4D	0x44	0x1E

Reply from Monitor:

BYTE0	BYTE1	BYTE2	BYTE3	BYTE4	BYTE5
0x64	0x6F	0x77	0x6E	0x0D	0x0A

8 DDC/CI commands

To avoid the additional serial cable it is also possible to control the DuraMON through a DDC/CI (Display Data Channel Command Interface) integrated in the DVI cable/connector.

Data format:

BYTE0	BYTE1	BYTE2	BYTE3	BYTE4	BYTE5	BYTE6	BYTE7
DEST	SOURCE	LENGHT	SET_VCP	VCP	R/W	VALUE	CHK

DEST	Destination address
SOURCE	Source address
LENGTH	Length
SET_VCP	Set VCP Feature COMMAND
VCP	VCP command to use
R/W	Read or Write
VALUE	Value
CHK	Checksum

8.1 VCP functions

VCP 10h (Backlight brightness)
Value range: 0x00 – 0x5A

Example:
Set Backlight brightness to 0x5A (90%):

BYTE0	BYTE1	BYTE2	BYTE3	BYTE4	BYTE5	BYTE6	BYTE7
0x6E	0x51	0x84	0x03	0x10	0x00	0x5A	0xF2

VCP 12h (Contrast)
Value range: 0x00 – 0x64

Example:
Set Contrast to 0x32 (50%):

BYTE0	BYTE1	BYTE2	BYTE3	BYTE4	BYTE5	BYTE6	BYTE7
0x6E	0x51	0x84	0x03	0x12	0x00	0x32	0x98

9 Technical specifications DuraMON15 LED

DuraMON LED

Display sizes:	**15" LCD (TFT)**				

Display properties:	**Size – Active area (Aspect)**	**Luminance**	**Contrast**	**Resolution**	**View angle (L/R/T/B)**
Standard Display:	**15" - 304 x 228 mm (4/3)**	**400 Cd/m^2**	**700:1**	**1024 x 768**	**80/80/80/60**
Wide angle Display option:	**15" - 304 x 228 mm (4/3)**	**350 Cd/m^2**	**1000:1**	**1024 x 768**	**85/85/85/85**

Materials:	**Front: Sea Water Resistant Aluminium w. black power coating RAL 9005**
	Rear: Sea Water Resistant Aluminium w. black power coating RAL 9005
Window:	**Anti Reflection coated front glass**
Protection:	**IP65 front – IP20 rear**

DuraMON LED I/O

Video inputs:	RGB :	Analogue 0.7 Vpp positive at 75Ω, Separate sync or sync on green Generally all VESA compatible video modes are supported up to 165MHz (up to UXGA 60Hz and WUXGA 60Hz reduced blanking). Horizontal sync: 15-100 kHz (automatic) Vertical sync: 30-85 Hz up to 1280x1024 30-60 Hz up to 1920x1200
	DVI:	Generally all VESA compatible video modes are supported up to 160MHz (up to UXGA 60Hz and WUXGA 60Hz reduced blanking). Special modes supported on request.
		Option available for extra DVI, RGB (in/out) and/or S-video and Composite video
Control inputs:	**1x RS232 – for remote control**	
	Option available for Touch 1x RS232	

DuraMON LED Power Supply Options

Standard:	**90-264Vac. 50-60Hz Input**
Optional:	**18-36Vdc Input**

Size	**P_{TYP} (Watt)**	**P_{MAX} (Watt)**
15"	**20**	**35**

DuraMON LED Environmental Conditions

Operating Temperature:	**-15 to 55 °C**
Storage Temperature:	**-25 to 70 °C**
Relative Humidity:	**8 to 90 %**

DuraMON LED Approvals

CE Mark:	**EN61000-6-2 & EN61000-6-4**
Marine:	**IACS E10 Rev. 5 & IEC 60945 Ed. 4**
	For marine class approvals – see www.isic-systems.com

DuraMON LED Physical dimensions

Size:	**406 (W) x 342 (H) x 64 (D)**
Weight:	**4.1 kg.**
Bracket:	**Desk / wall / roof bracket and IP22 rear-cover available (optional extra)**

ISIC

10 Mechanical outline DuraMON15 LED

386

15

4 x M6

313

222

356

45,5

Recommended panel cut out

63,9

10

27

352

4 x Ø7
⌴ Ø12 ⩛ 6,5

342

222

60

386

406

309

80

16,5

Angle, straightness and flatness: DS/ISO 2768-H

Units: mm	General tolerances: ± 0,2 Hole position: ± 0,1		Projection method:		Drawing size: A2
			Designed by	pas	29-02-2012
			Approved by	PAS	01-10-2012

ISIC A/S, Edwin Rahrs Vej 54, DK-8220 Brabrand, Tlf.: +45 70207077, Web: www.isic.dk

Subject: Mechanical outline 15" DuraMON LED	Scale: 1:4	Drawing no. 05536-000	Rev: A
		Replaces:	

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11 Compass safe distance

Test object / condition	Minimum Compass safe distance [cm] (5.4°/H deviation or a horizontal magnetic flux of 0.094µT)	Minimum Compass safe distance [cm] (18°/H deviation or a horizontal magnetic flux of 0.313µT)
DuraMON15 LED	165	110

12 Power Consumption

Test object / condition	Ptyp	Pmax
DuraMON15 LED	20	35

In rush current ac: 100A max at 240 VAC.

13 Troubleshooting

Problem	Cause	Solutions
No picture on display	Backlight level set to minimum	Increase backlight
	Monitor turned off	Turn on the monitor
	No input signal present	Apply signal
	No power cord connected	Apply power
Buttons on front doesn't work	No power cord connected	Apply power
	Keypad defect	Please do not try to open the unit. Send it to ISIC A/S for repair.

14 Servicing the unit

In case that the unit still fails after following the troubleshooting send the unit to ISIC for repair. There are no user serviceable parts inside.

15 Terms, Acronyms and abbreviations

Communication protocol:	A serial link to control various settings in the monitor
DVI:	Digital Visual Interface
IP20:	International Protection Rating (protected against objects with a size larger than 12.5mm)
IP65:	International Protection Rating (dust tight and protected against water jerks)
OSD:	On Screen Display
VGA:	Video Graphics Array

16 ISIC info / Support

In case you have inquiries or problems with your DuraMON, you have a number of possibilities to get support.

Company name: ISIC A/S

Head office: Edwin Rahrs Vej 54
DK – 8220 Brabrand
Denmark

Shipping address: Holmstrupgaardvej 5
DK-8220 Brabrand
Denmark

Telephone: +45 70 20 70 77
Fax: +45 70 20 79 76

Mail: mail@isic-systems.com
www: www.isic-systems.com

VAT number: DK 16 70 45 39

Bank Name/Address: Handelsbanken A/S
Havneholmen 29
DK – 1561 København V
Denmark

Bank Code: 0892
SWIFT: HANDDKKK
IBAN for DKK: DK53 0892 0001 0159 69
IBAN for EUR: DK48 0892 0003 0026 19
IBAN for USD: DK26 0892 0003 0026 27

Contacts:
RFQ's: By fax to +45 70 20 79 76
By mail to sales@isic-systems.com

Orders: By fax to +45 70 20 79 76
By mail to orders@isic-systems.com

Support: Via homepage www.isic-systems.com under aftersales
By mail to service@isic-systems.com
During office-hours (Mo-Fr: CET 0800 - 1600) at +45 70 20 70 77

Service: Before shipment for service Request Return Material Authorisation number
at homepage www.isic-systems.com under RMA
By mail to service@isic-systems.com

17 Revision history

Rev A	Dec 2012	Release

18 Appendix A: Pixel policy

ISO 9241-307:2008 guidelines for LCD pixel defects

Introduction

TFT displays consist of a set number of pixels. Each pixel consists of 3 sub-pixels also called dots (one red, one blue and one green). Every sub-pixel is addressed by its own transistor. As a result, the manufacturing of glass substrate is very complex.

Due to the nature of this manufacturing process, occasional defects can occur. Pixel defects or failures cannot be fixed or repaired and may occur at any stage during the service life of the TFT display.

To regulate the acceptability of defects and protect the end user, ISIC A/S complies with the ISO 9241-307:2008 standard. This standard recommends how many defects are considered acceptable in a display, before it should be replaced within the terms of the warranty.

Monitor classification

ISO 9241-307:2008

Allowed defects per type per million pixels						
	Pixel defects			Cluster defect		
Defect classes	**Type 1**	**Type 2**	**Type 3 total** $(2 \times N_{3a} + N_{3b})$	**Type 1**	**Type 2**	**Type 3**
Class: 0	0	0	0	0	0	0
Class: I	1	1	5	0	0	0
Class: II	2	2	10	0	0	1
Class: III	5	15	100	0	0	5

ISIC TFT monitors comply with ISO 9241-307:2008 Class II.
Special agreements about other classifications can be made between ISIC A/S and the customer.

Measurement method/monitoring conditions for pixel defects

In compliance with the ISO-9241-307:2008 standard, the following conditions are observed:

- Final check for pixel fault undertaken right after burn-in, i.e. with pre-heating of the display.
- Surrounding temperature 25ºC ± 5ºC
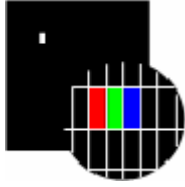- Relative air humidity 40–70%

Pixel definition

Every pixel consists of three sub-pixels/dots (red, blue, green).
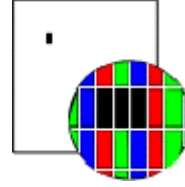Every sub-pixel has its own transistor.
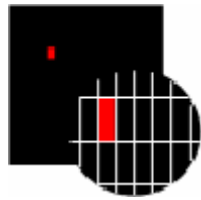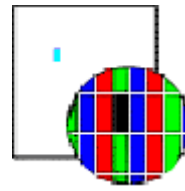The three sub-pixels/dots must be considered as one unit.

Pixel

Pixel defect type 1   Pixel constantly lit

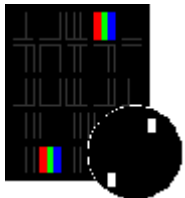**Pixel defect type 2**   Pixel constantly dark

Pixel defect type 3a

Sub-pixel/dot (red, blue, green) constantly lit

Pixel defect type 3b

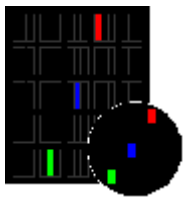Sub-pixel/dot (red, blue, green) constantly dark

Cluster

A cluster consists of 5 x 5 pixels.

Cluster pixel defect type 1

Pixels in a cluster area constantly lit

Cluster pixel defect type 2

Pixels in a cluster area constantly dark

Cluster pixel defect type 3a

Sub-pixels/dots in a cluster area constantly lit

Cluster pixel defect type 3b

Sub-pixels/dots in a cluster area constantly dark

Pixel faults accepted by ISIC A/S

The maximum number of pixel faults that is considered acceptable at different screen resolutions is shown in the table below.

This is the native resolution and not the resolution as adjusted by user.

Class II

Allowable number of pixel faults in monitor applications							
Screen type	Native resolution	Number of pixels	Pixel defect type 1	Pixel defect type 2	Pixel defect Type 3 total $(2 \times N_{3a} + N_{3b})$	Cluster defect type 1 and 2	Cluster defect type 3
XGA	1024x768	768,432	1	1	7	0	0
SXGA	1280x1024	1,310,720	2	2	13	0	1
UXGA	1600x1200	1,920,000	3	3	19	0	1
FHD	1920x1080	2,073,600	4	4	20	0	2
WUXGA	1920x1200	2,304,000	4	4	23	0	2

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