# DuraMON10-24 S Series

## DuraMON10 S
## DuraMON15 S
## DuraMON22 S
## DuraMON24 S

# User Reference Manual

# 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. Image sticking can be reduced by regular operating the monitor with moving pictures that is designed for the purpose.
**Front panel control touch buttons** should not be considered operational controls for radar, navigational systems, and equipment. Front panel controls are for operation of the monitor only.

# 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 DuraMON10-24 S series, manufactured by ISIC A/S, is designed to comply with the emerging generic EEC standards that cover applications in maritime environments.

# Classification

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

# Approvals

Approval according to IEC 60945: Ed. 4 2002/COR1:2008 and IACS E10 Rev. 7 Oct. 2018, 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.



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# Table of Contents

# 1 Features

Congratulations on your product purchase of DuraMON10-24 S series.
This short form manual is designed to get you started working with your new DuraMON10-24 S.

DuraMON10-24 S series of monitors are all made as rugged monitors especially designed for the demanding operating conditions at sea.

The DuraMON10-24 S series are tested for full compliance to marine-standards IACS E10 and IEC 60945.
The monitor comes with excellent brightness and contrast levels that, together with wide viewing angles, ensure high readability, making it very eye-friendly. For the best picture quality, always use a double shielded cable with ferrites, like the one supplied with the monitor.

2 x DisplayPort
Feature control support for DDC/CI VCP commands via DisplayPort interface and USB interface
Dimming control (1cd to 100%)
Anti-Reflective coated cover glass
IP56 protected front, mounted in sealed console.
USB Touch (Optional)

# 2 General considerations at Installation and Operation

DuraMON10-24 S series are designed to work at conditions according to IEC 60945. However, keeping the temperature and vibration level at a minimum will extend the lifetime of the product. ISIC recommend operating this product at normal room temperature (20-25°C), with the lowest level of vibration and humidity.

## 2.1 Installation

To obtain the best possible operating conditions, please note the following precautions.

- Cooling.

  When mounting DuraMON10-24 S series in cabinet/console, please ensure that air can flow freely around the product cabinet, to avoid any unnecessary rise in temperature. If it is not possible to have an adequate natural airflow, please ensure forced airflow inside the console.

- 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.

Please refer to Mechanical Outline for installation

### 2.1.1 Mechanical Outline

| | |
|---|---|
| DuraMON 10 S: | 09311-000 |
| DuraMON 15 S: | 09316-000 |
| DuraMON 22 S: | 11003-000 |
| DuraMON 24 S: | 11004-000 |

### 2.1.2 Desktop/Ceiling mounting kit with tilt

| | |
|---|---|
| DuraMON 10 S: | 09313-000 |
| DuraMON 15 S: | 09314-000 |
| DuraMON 22 S: | 10123-000 |
| DuraMON 24 S: | 10123-000 |

### 2.1.3 Console mounting kit (Sealing IP44):

| | |
|---|---|
| DuraMON 10 S: | 09353-000 |
| DuraMON 15 S: | 09354-000 |
| DuraMON 22 S: | 10064-000 |
| DuraMON 24 S: | 10065-000 |

### 2.1.4 Compass safe distance

| Test object / condition | Minimum Compass safe distance [cm]<br><br>(5.4°/H deviation or a horizontal magnetic flux of 0.094μT) | Minimum Compass safe distance [cm]<br><br>(18°/H deviation or a horizontal magnetic flux of 0.313μT) |
|---|---|---|
| **DuraMON 10 S** | 95 | 60 |
| **DuraMON 15 S** | 110 | 70 |
| **DuraMON 22 S** | 185 | 120 |
| **DuraMON 24 S** | 205 | 140 |

### 2.1.5 Power Consumption

| Test object / condition | Pmax [W]<br>DC | Pmax [VA]<br>AC |
|---|---|---|
| **DuraMON 10 S** | **12** | **-** |
| **DuraMON 15 S** | **21.4** | **-** |
| **DuraMON 22 S** | 44 | 44 |
| **DuraMON 24 S** | 46 | 46 |

In standby mode, the product will still consume power.
To cut off all power consumption, it is necessary to disconnect its supply power.

### 2.1.6 Inrush current

| Test object / condition | Current[A] @ 24VDC |
|---|---|
| **DuraMON 10 S** | 4 |
| **DuraMON 15 S** | 5 |
| **DuraMON 22 S** | 10 |
| **DuraMON 24 S** | 10 |

| Test object / condition | Current[A] @ 115VAC | Current[A] @ 230VAC |
|---|---|---|
| **DuraMON 10 S** | N/A | N/A |
| **DuraMON 15 S** | N/A | N/A |
| **DuraMON 22 S** | 55A | 100A |
| **DuraMON 24 S** | 55A | 100A |

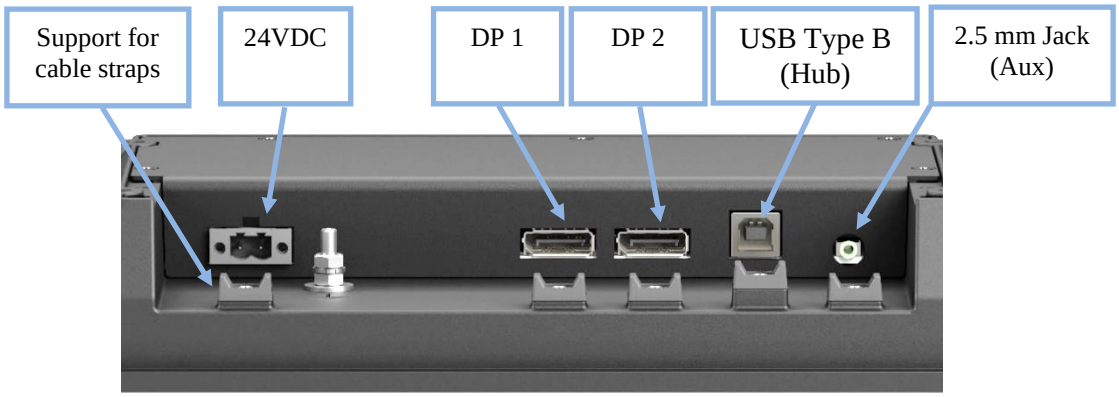
## 2.2 Operation

### 2.2.1 Warm up

To obtain correct display colors and luminance, a warm-up period of minimum 30 minutes is required.

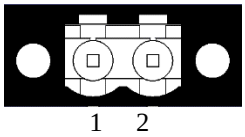
# 3 DuraMON10-24 S connections

## 3.1 24VDC supply



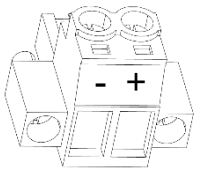

### 3.1.1 Models with 24VDC (18-36VDC) supply voltage

24 VDC: Nominal input voltage. Galvanic marine isolated with reverse polarity protection.
18-36VDC: Operating voltage range.



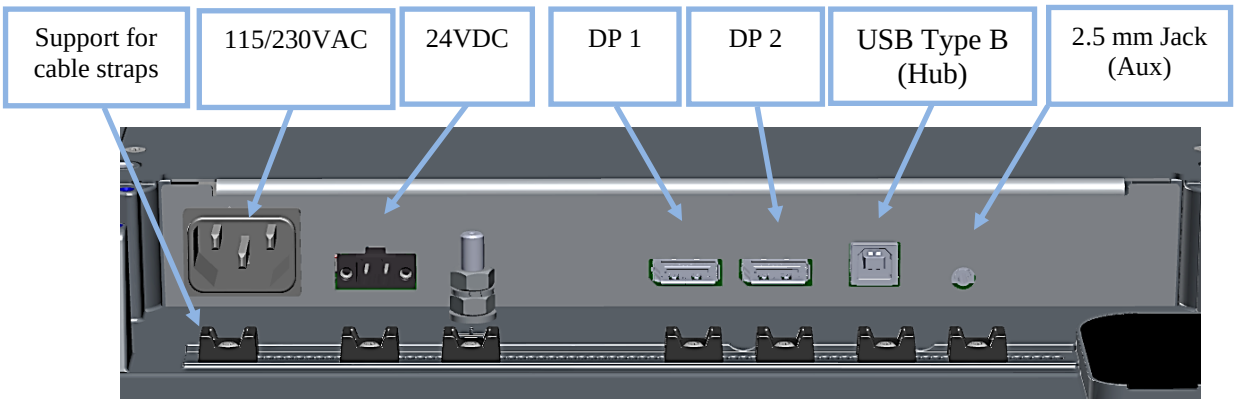

| Terminal | Connection | Wire compliance |
|---|---|---|
| **1** | 0VDC | Multicore AWG16-12 (1-4 mm²) |
| **2** | +24VDC | Multicore AWG16-12 (1-4 mm²) |

Mating part: Weidmüller BLZP5.08HC/02/180F



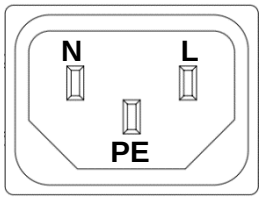

Tool: 0.6x3.5mm slotted (flat headed) screwdriver

## 3.2 110/230VAC supply




### 3.2.1 Models with 110/230VAC supply voltage

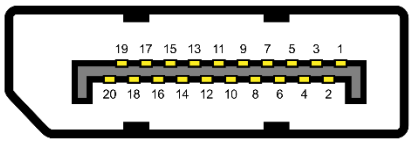
115 / 230 VAC: Nominal input AC voltage.
90 - 264 VAC: Operating AC voltage range.
47 - 63 Hz: Operating frequency range




IEC plug type C14

Mating connector: IEC type C13

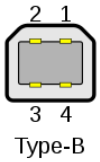
## 3.3 DisplayPort 1.2 (DP) receptacle




Mating part: Male full size DisplayPort connector
with mechanical latch.
Note! Only use DisplayPort cables with pin 20 unconnected

| Pin | Description |
|---|---|
| **1** | ML_Lane 0 (p) |
| **2** | GND |
| **3** | ML_Lane 0 (n) |
| **4** | ML_Lane 1 (p) |
| **5** | GND |
| **6** | ML_Lane 1 (n) |
| **7** | ML_Lane 2 (p) |
| **8** | GND |
| **9** | ML_Lane 2 (n) |
| **10** | ML_Lane 3 (p) |
| **11** | GND |
| **12** | ML_Lane 3 (n) |
| **13** | CONFIG1 |
| **14** | CONFIG 2 |
| **15** | AUX CH (p) |
| **16** | GND |
| **17** | AUX CH (n) |
| **18** | Hot plug |
| **19** | Return |
| **20** | DP_PWR |

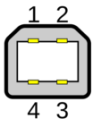
## 3.4 USB Type B receptacle



Type-B

| Pin | Description |
|---|---|
| **1** | VBUS (+5V) |
| **2** | Data- |
| **3** | Data+ |
| **4** | GND |

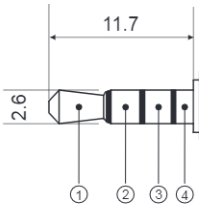
Mating part: Plug USB type B



Type B

## 3.5 2.5 mm jack (reserved for future use)

Mating part: 2.5 mm Jack for half duplex RS-485




| Pin | Description |
|---|---|
| **1** | 5VDC (Only for ISIC applications) |
| **2** | RS-485 A |
| **3** | RS-485 B |
| **4** | GND |

# 4 Technical specifications DuraMON10-24 S

Please refer to datasheet for the purchased variant
DuraMON 10 S: 09328-000
DuraMON 15 S: 09329-000
DuraMON 22 S: 10066-000
DuraMON 24 S: 10067-000

# 5 DuraMON S Series Communication Interface

DuraMON S series supports 2 types of communication protocols
DDC/CI VCP command via DisplayPort
Virtual Serial Communication via USB interface.

## 5.1 Virtual COM Port

Please refer to Serial Communication Protocol 04924-00**2**

The type of the product can be queried by sending the 'TYP' command to the Virtual COM Port.

| Monitor | Response from monitor |
|---|---|
| DuraMON 10 S | DM101 |
| DuraMON 15 S | DM156 |
| DuraMON 22 S | DM215S |
| DuraMON 24 S | DM238S |

## 5.2 DDC/CI VCP Command

Please refer to DDC/CI VCP Command protocol 09370-00**2**.

# 6 USB Touch

**For models ordered with multitouch only:**
Monitors with optional multi-PCAP touch sensor comply with Windows 8 (or newer) standard USB HID drivers. Linux operating systems might come with the HID driver as part of the Linux kernel, compatibility is not guaranteed.

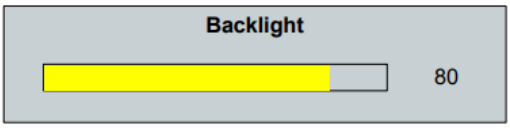
# 7 Buzzer

**For models ordered with Buzzer only:**
Buzzer can be activated by serial command, please refer to Serial Communication Protocol 04924-002

# 8 Display backlight luminance (Dimming)

## 8.1 Backlight Luminance control

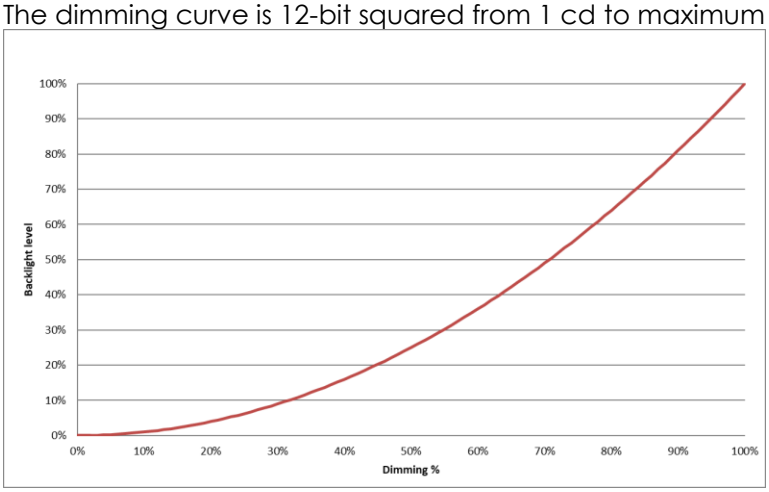
Display luminance can be controlled by Communication interfaces.




**For models with front panel controls:** please refer to section 11.4 UP and DOWN buttons

## 8.2 Dimming curve

The dimming curve is 12-bit squared from 1 cd to maximum brightness for display.




# 9 ECDIS mode

**For ECDIS models only**

To obtain correct display colors and luminance, a warm-up period of minimum 30 minutes is required.

Be aware that use of the backlight, brightness, or contrast controls in ECDIS mode may inhibit visibility of information particularly at night!

## 9.1 ECDIS operational controls

All operational controls for radar, navigational systems and equipment must be operated from such systems and equipment controls.

**Warning:** Operating the front panel control up or down touch button in will cause incorrect ECDIS backlight setting, and the orange status indicator will illuminate as a warning. Pressing UP and DOWN together at the same time will restore preset ECDIS backlight luminance

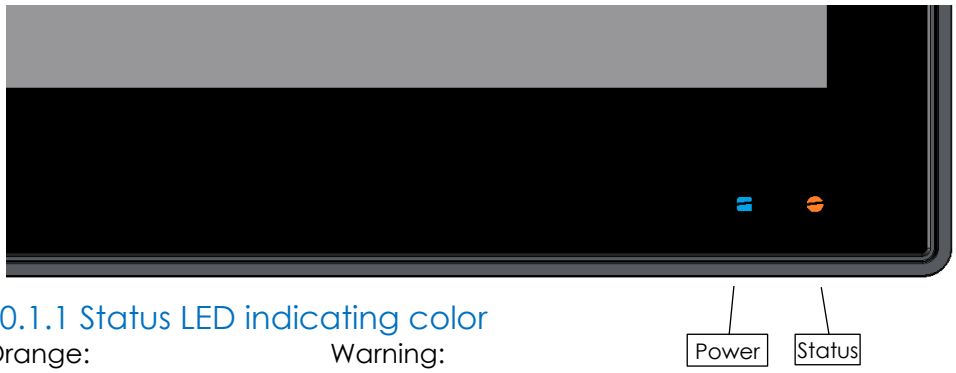
## 9.2 ECDIS setup

To setup ECDIS on the system a color token table must be downloaded from the monitor to the ECDIS application.
USB interface: Please refer to Serial Communication Protocol 04924-002 for details.
DDC interface: Please refer to DDC/CI VCP Command protocol 09370-002 for details.

# 10 DuraMON10-24 S LED indicators

The LEDs are not marked on the front and are only visible when activated.
LED brightness follows the LCD backlight setting.

## 10.1 LED indicator behavior




### 10.1.1 Status LED indicating color

| | |
|---|---|
| Orange: | Warning:<br>- Standby<br>- No signal<br>- Out of ECDIS mode (DAY/DUSK/NIGHT) (for ECDIS models only) |
| Green: | In ECDIS mode DAY/DUSK/NIGHT (for ECDIS models only) |
| No light: | OK - Normal operation |

### 10.1.2 Power LED indicating color

| | |
|---|---|
| Blue: | Power is connected to the product. |
| No blue light: | No power |

## 10.2 Optional (Custom) LED indicator behavior

### 10.2.1 Optional Status LED indicating color

| | |
|---|---|
| Orange: | "Warning"<br>- Standby<br>- No signal<br>- Out of ECDIS range (DAY/DUSK/NIGHT) (for ECDIS models only) |
| Green: | N/A |
| LCD image + No light: | OK - Normal operation |
| no LCD image + No light: | No power |

### 10.2.2 Optional Power LED indicating color

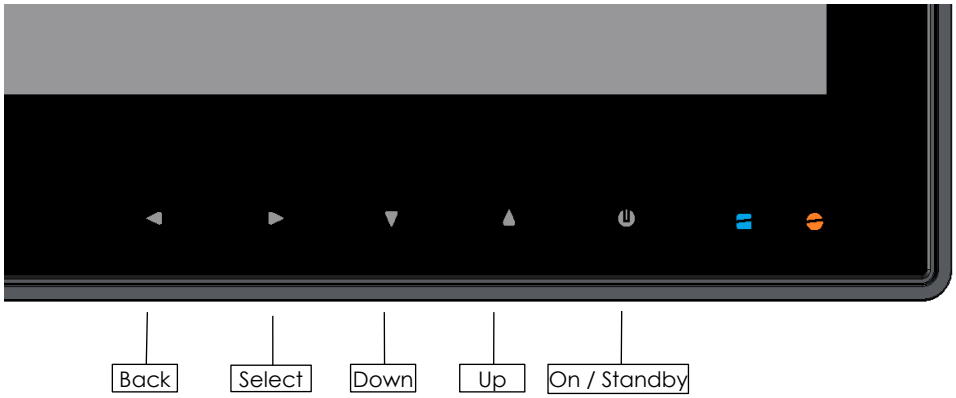
| | |
|---|---|
| Blue: | N/A |

# 11 Front panel controls

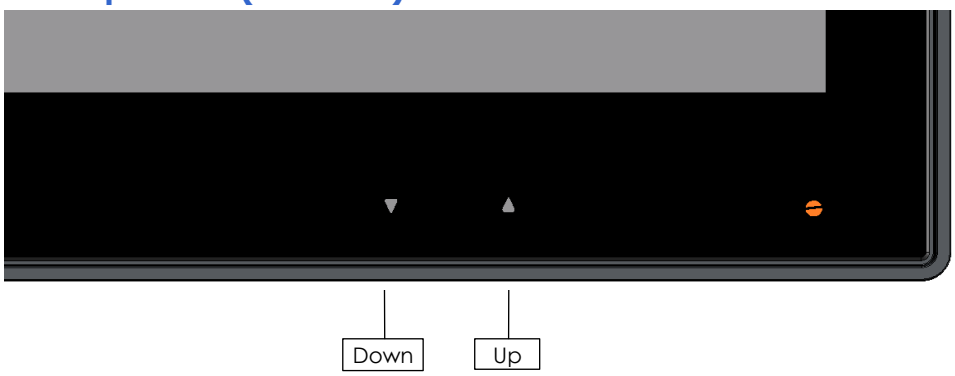
**For models with front panel touch button interface only.**
**Please refer to disclaimer on page 2.**

## 11.1 touch button interface

The front panel control icons are illuminated and will follow the brightness level of the monitor backlight luminance.

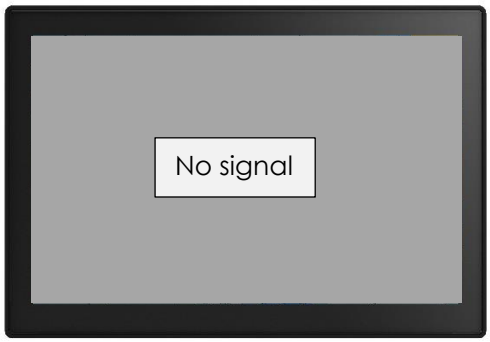



## 11.2 Optional (Custom) touch button interface




## 11.3 On / Standby

When no input signals are detected, the screen will display "No signal" for 15 sec and enter standby mode.




When the input signal is detected, the screen will turn on again.

**For models with front panel controls only:**

**Warning: (For ECDIS models only)** the Standby button ⏻ should not be operated in ECDIS mode. All controls should be handled from the radar, navigational systems, and equipment.

On, press the standby button ⏻ to activate the monitor and backlight.

Standby can be activated by pressing the ⏻ button for 5 seconds.

## 11.4 UP and DOWN buttons:

**Warning:** (For ECDIS models only) Operating the front panel control up or down touch button in will cause incorrect ECDIS backlight setting, and the orange status indicator will illuminate as a warning. Pressing UP and DOWN together at the same time will restore preset ECDIS backlight luminance

UP and DOWN buttons will adjust the monitor backlight luminance.

## 11.5 Advanced OSD

With the Advanced OSD (On Screen Display) you can modify the settings and control the special features of the DuraMON as described in **Appendix A**.

Advanced OSD can be operated by Communication Interfaces.

**For models with front panel controls "Back" and "Select" interfaces only:**
To enter the Advanced OSD, press both the "Back" and "Select" buttonss at the same time.
To navigate the Advanced OSD use the "Up" and "Down" buttons and press "Select" to select a specific setting. To get back to the previous menu point, press the "Back" button.

# 12 Troubleshooting

| Problem | Cause | Solutions |
|---|---|---|
| No picture on display | Backlight luminance set to minimum | Increase backlight |
| No picture on display | Monitor turned off | Turn on the monitor |
| No picture on display | No input signal present | Apply signal |
| No picture on display | No power cord connected | Apply power |
| The unit will not turn on. | Unknown | Please do not try to open the unit. Send it to ISIC A/S for repair. |

# 13 Servicing the unit

In case the unit still fails after following the troubleshooting send the unit to ISIC for repair. There are no user serviceable parts inside and to ensure ECDIS compliance the monitor must be recalibrated at ISIC.

# 14 Terms, Acronyms and abbreviations

OSD: On Screen Display

# 15 ISIC info / Support

In case you have inquiries or problems with your DuraMON10-24 S, you have a number of possibilities to get support.

| | |
|---|---|
| Company name: | ISIC A/S |
| Head office: | Edwin Rahrs Vej 54<br>DK – 8220 Brabrand<br>Denmark |
| Shipping address: | Holmstrupgaardvej 5<br>DK-8220 Brabrand<br>Denmark |
| Telephone: | +45 70 20 70 77 |
| Email: | isic@isic-systems.com |
| www: | www.isic-systems.com |
| VAT number: | DK 16 70 45 39 |
| Bank Address: | Handelsbanken A/S<br>Havneholmen 29<br>DK-1561 København V<br>Denmark |
| Bank Code: | 0892 |
| IBAN DKK: | DK53 0892 0001 0159 69 |
| IBAN EUR: | DK48 0892 0003 0026 19 |
| IBAN USD: | DK26 0892 0003 0026 27 |
| SWIFT: | HANDDKKK |
| Contacts: | |
| RFQ's: | By mail to sales@isic-systems.com |
| Orders: | By mail to orders@isic-systems.com |
| Support: | Via homepage www.isic-systems.com under aftersales<br>By mail to service@isic-systems.com<br>During office-hours (Mo-Fr: CET 0800 - 1500) at +45 70 20 70 77 |
| Service: | Before shipment for service Request Return Material Authorization number at homepage https://isic-systems.com/after-sales/tech-support-rma/<br>By mail to service@isic-systems.com |

# 16 Revision history

| | | |
|---|---|---|
| Rev 0 | April 2021 | Preliminary |
| Rev A | June 2021 | First release |
| Rev B | September 2023 | adding DuraMON 22 S + DuraMON 24 S (with front panel controls and ECDIS) and VA data |
| | | |

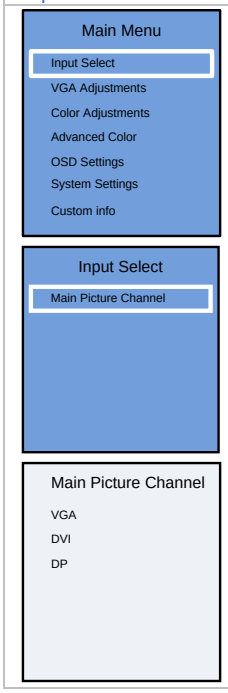
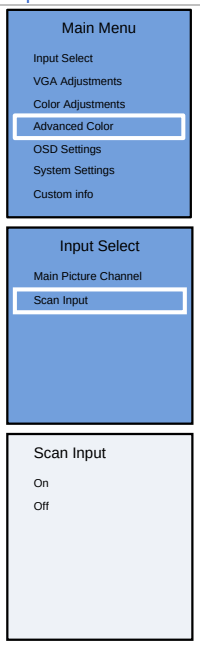
# 17 Appendix A: Advanced OSD Menu

With the Advanced OSD (On Screen Display) you can modify the settings and control the special features of the DuraMON

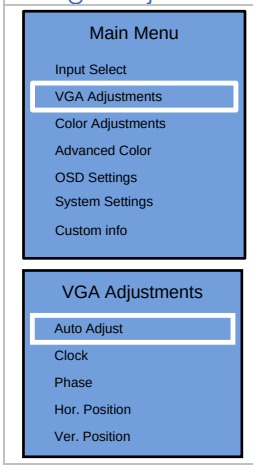
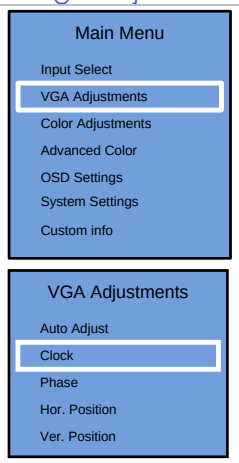
Advanced OSD can also be operated by Communication Interfaces.

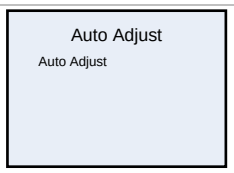
**For models with front panel controls "Back" and "Select" interfaces only:**
To enter the Advanced OSD, press both the "Back" and "Select" buttons at the same time.
To navigate the Advanced OSD use the "Up" and "Down" buttons and press "Select" to select a specific setting. To get back to the previous menu point, press the "Back" button.

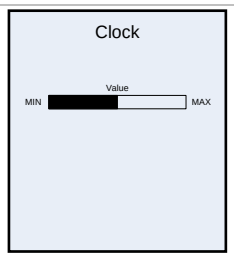
## 17.1 Input select

| Input Select – Main Picture Channel | | Input Select – Scan Input | |
|---|---|---|---|
|  | The Main Picture Channel can be selected between all available inputs (VGA, Display Port and DVI. |  | Scans Inputs for active source.<br><br>Default is On. |

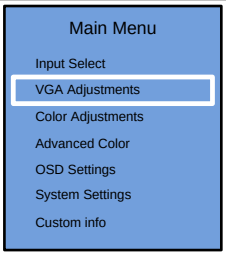
## 17.2 VGA Adjustments

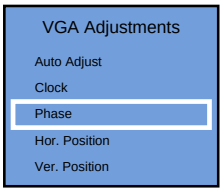
| Image Adjustments – Auto Adjust | | Image Adjustments – Clock | |
|---|---|---|---|
|  | Selecting auto adjust will force the system to adjust the image (clock, phase, bandwith and position) |  | The pixel clock for VGA can be selected here. |

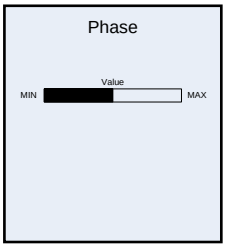



## Image Adjustments – Phase

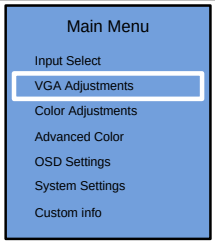


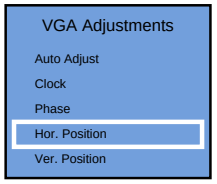



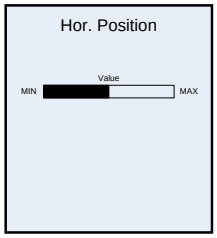




The phase of the display can be set for VGA.

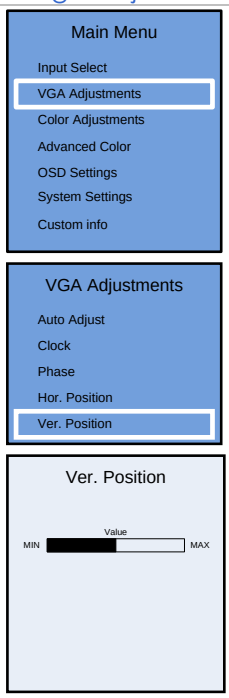
## Image Adjustments – Hor. Position



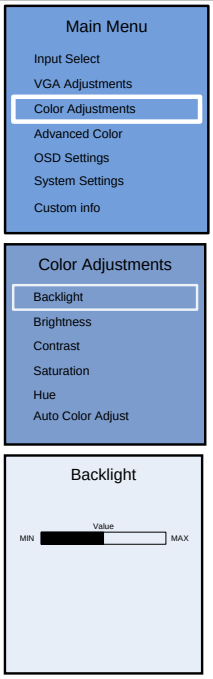



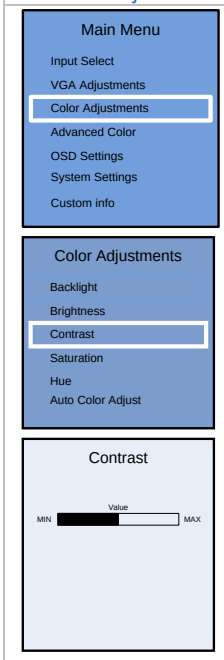

The horizontal position of the picture can be set here.

| Image Adjustments – Vert. Position | |
|---|---|
|  | The vertical position of the picture can be set here. |

## 17.3 Color adjustments (not available in ECDIS mode)

| Color Adjustment – Backlight | | Color Adjustment – Brightness | |
|---|---|---|---|
|  | It is possible to set the backlight level.<br><br>Default is 50%.<br><br>*Unless popups or OSD is present it is possible to press the "UP" or "DOWN" button to adjust the backlight level and then press "ENTER" afterwards.* |  | It is possible to set the brightness level.<br><br>Default is 50%. |

## Color Adjustment – Contrast




It is possible to set the Contrast level.

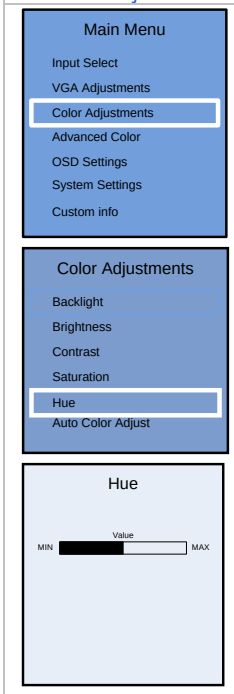
Default is 50%.

## Color Adjustment – Saturation


It is possible to set the color saturation level.

Default is 50%.

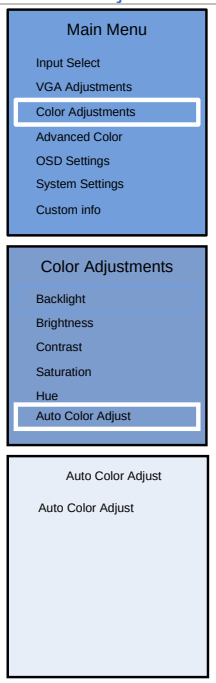
## Color Adjustment – Hue




It is possible to set the Hue level.

Default is 50%.

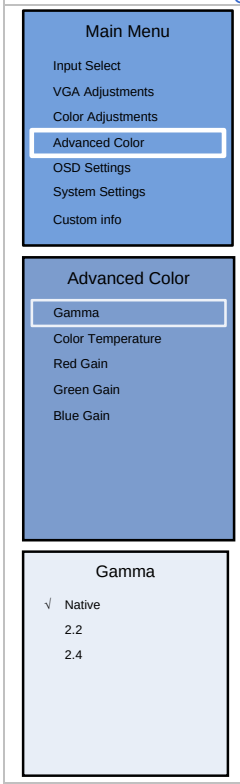
## Color Adjustment – Auto Color Adjust




It is possible to set use the command Auto Color Adjust.

## 17.4 Advanced Color (not available in ECDIS mode)

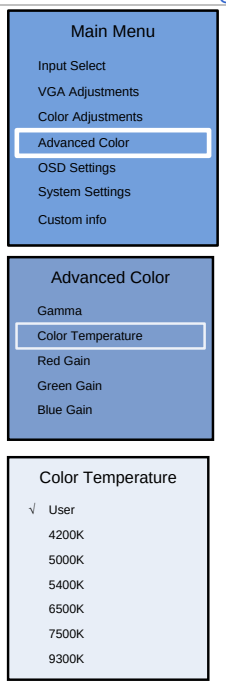
### Adv. Color Settings – Gamma




It is possible to set the Gamma

Default is Native.

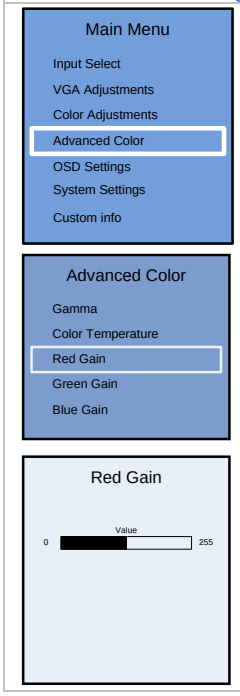
### Adv. Color Settings – Color Temp




It is possible to set the Color Temperature.

Default is User.

### Adv. Color Settings – Red/Green/Blue



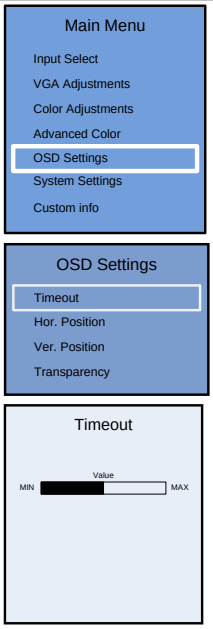

The rate for Red/Green/Blue can be set here from 0 – 255.

Default is 255/255/255

Note: These values are only adjustable when Color Temperature is set to 'User'

## 17.5 OSD settings

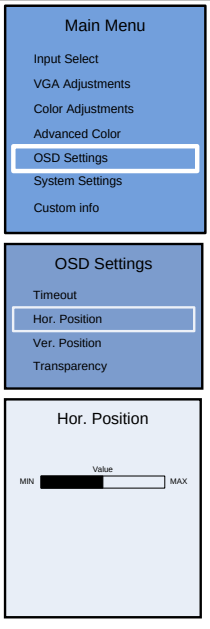
### OSD Settings – Menu Timeout




The Menu Timeout period can be set between 0 and 60 seconds in steps of 5 seconds.

Default is 30 seconds

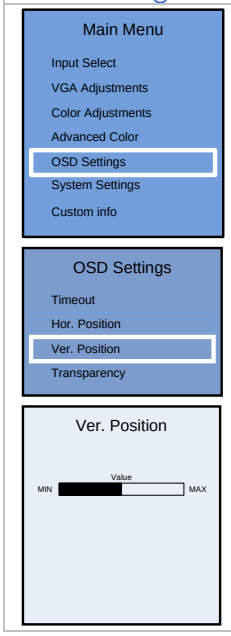
### OSD Settings – Menu Hor. Pos.




The Horizontal Position of the OSD can be set from 0 (left margin) to 100 (right margin).

Default is 0 (left margin).

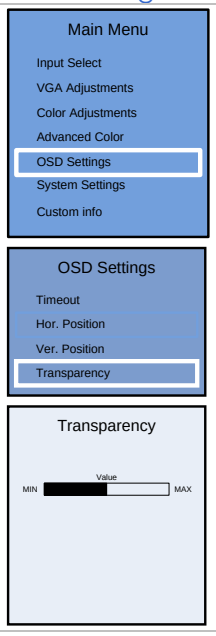
### OSD Settings – Menu Vert. Pos.




The Vertical Position of the OSD can be set from 0 (upper margin) to 100 (bottom margin).

Default is 50 (center of the display)

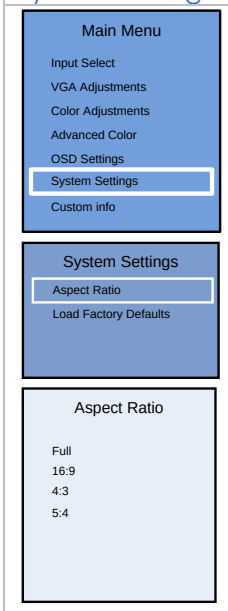
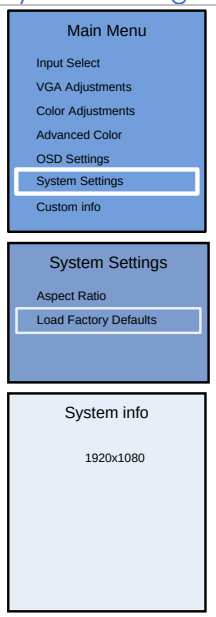
### OSD Settings – Transparency




The transparency of both the OSD and the Popup can be selected from 0 (solid) to 15 (clear)

Default is 2

## 17.6 System settings

| System Settings – Aspect Ratio | | System Settings – Load Factory Defaults | |
|---|---|---|---|
|  | Change Aspect Ratio.<br><br>Default is Full. |  | Reset the monitor to factory settings. |

# 18 Appendix B: 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 | | | | | | |
|---|---|---|---|---|---|---|
| **Defect classes** | **Pixel defects** | | | **Cluster defect** | | |
| | **Type 1** | **Type 2** | **Type 3 total** ($2xN_{3a} + N_{3b}$) | **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.

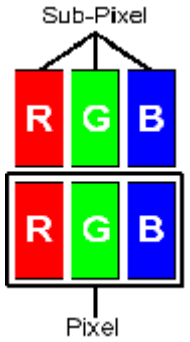
### Measurement method/monitoring conditions for pixel defects

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 25°C ± 5°C
- Relative air humidity 40–70%

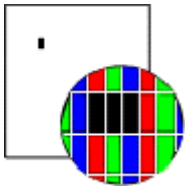
### Pixel definition

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.



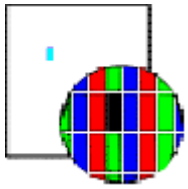
## Pixel

**Pixel defect type 1** Pixel constantly lit



**Pixel defect type 2** Pixel constantly dark

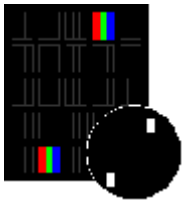
**Pixel defect type 3a**
Sub-pixel/dot (red, blue, green) constantly lit



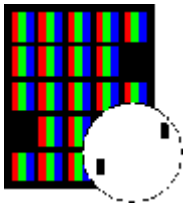
**Pixel defect type 3b**
Sub-pixel/dot (red, blue, green) constantly dark

## Cluster

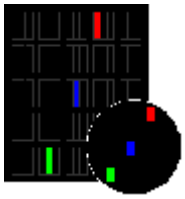
A cluster consists of 5 x 5 pixels.



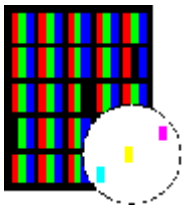
**Cluster pixel defect type 1**
Pixels in a cluster area constantly lit



**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** ($2xN_{3a} + N_{3b}$) | **Cluster defect type 1 and 2** | **Cluster defect type 3** |
| **WVGA** | **800x480** | **384,000** | **0** | **0** | **3** | **0** | **0** |
| **XGA** | **1024x768** | **768,432** | **1** | **1** | **7** | **0** | **0** |
| **WXGA** | **1280x800** | **1,024,000** | **2** | **2** | **10** | **0** | **1** |
| **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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