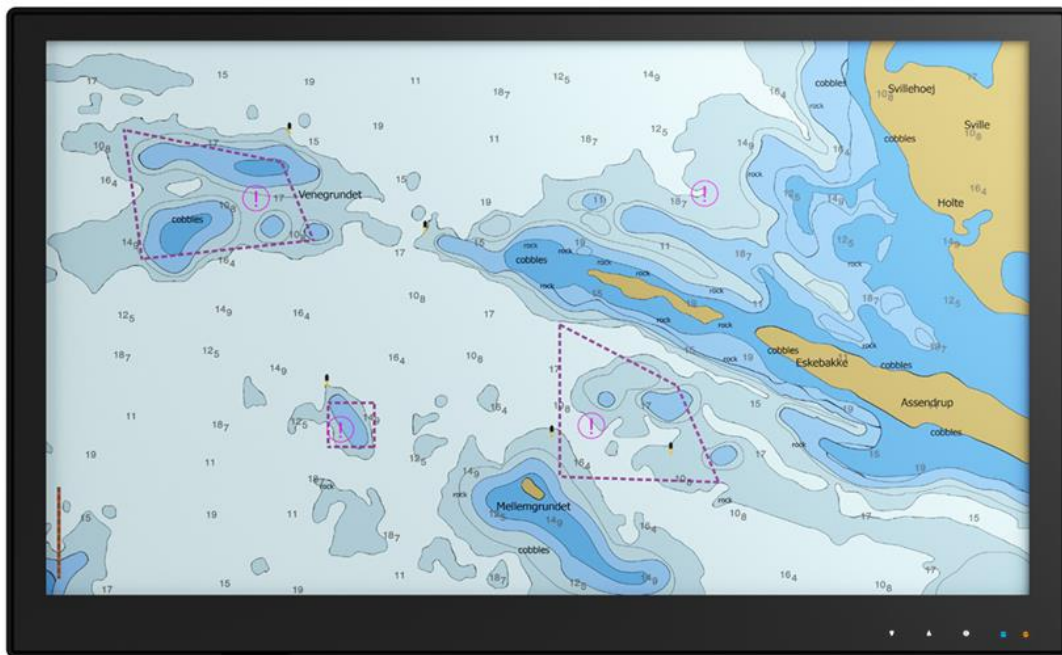


User Reference Manual

DuraPANEL S-Line

DuraPANEL 24 S-Line
DuraPANEL 27 S-Line



Disclaimer

ISIC A/S makes no representation or warranties with respect to the contents or use of this manual and specifically disclaims any express or implied warranties of merchantability or fitness for any particular purpose. Further, ISIC A/S reserves the right to revise this publication and to make changes to its content at any time, without obligation to notify any person or entity of such revisions or changes.

Image sticking: If the Panel PC 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 Panel PC with moving pictures that are 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 Panel PC 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 DuraPANEL 24 & 27 S-Line, manufactured by ISIC A/S, is designed to comply with the emerging generic EEC standards that cover applications in maritime environments.

Classification

The Panel PC is classified as "protected from the weather" according to IEC 60945 (former class b).

Approvals

Approval according to IEC 60945 and IACS E10, 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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1. Features

Congratulations on your product purchase of DuraPANEL S-Line.

This short form manual is designed to get you started working with your new DuraPANEL S-Line.

DuraPANEL S-Line of Panel PCs are all made as rugged Panel PCs especially designed for the demanding operating conditions at sea.

The DuraPANEL S-Line are tested for full compliance to marine-standards IACS E10 and IEC 60945.

The Panel PC 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 Panel PC.

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

DuraPANEL S-Line 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.

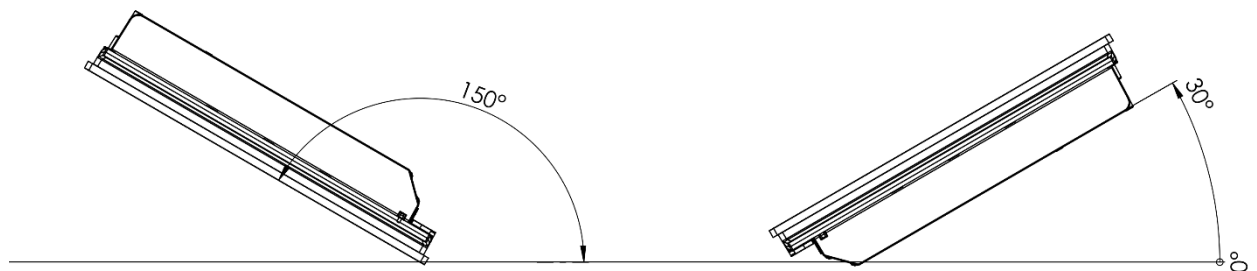
2.1. Installation

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

- Cooling.

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

If possible ensure that the product is installed at an angle between 30 and 150 degrees as shown in the picture.



- 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

DuraPANEL 24 S-Line:	11005-000
DuraPANEL 27 S-Line:	11007-000

2.1.3. Compass safe distance

Test object / condition	Minimum Compass safe distance [cm] Standard (5.4°/H deviation or a horizontal magnetic flux of 0.094μT)	Minimum Compass safe distance [cm] Steering (18°/H deviation or a horizontal magnetic flux of 0.313μT)
DuraPANEL 24 S-Line	145	90
DuraPANEL 27 S-Line	180	115

2.1.4. Power Consumption

Test object / condition	Pmax [W] DC	Pmax [VA] AC
DuraPANEL 24 S-Line	65	75
DuraPANEL 27 S-Line	160	175

In standby mode, the product will still consume power.

To cut off all power consumption, it is necessary to disconnect its supply power.

2.1.5. Inrush current

Test object / condition	Current [A] @ 24VDC
DuraPANEL 24 S-Line	100
DuraPANEL 27 S-Line	100

Test object / condition	Current [A] @ 115VAC	Current [A] @ 230VAC
DuraPANEL 24 S-Line	40	80
DuraPANEL 27 S-Line	40	80

2.2. Operation

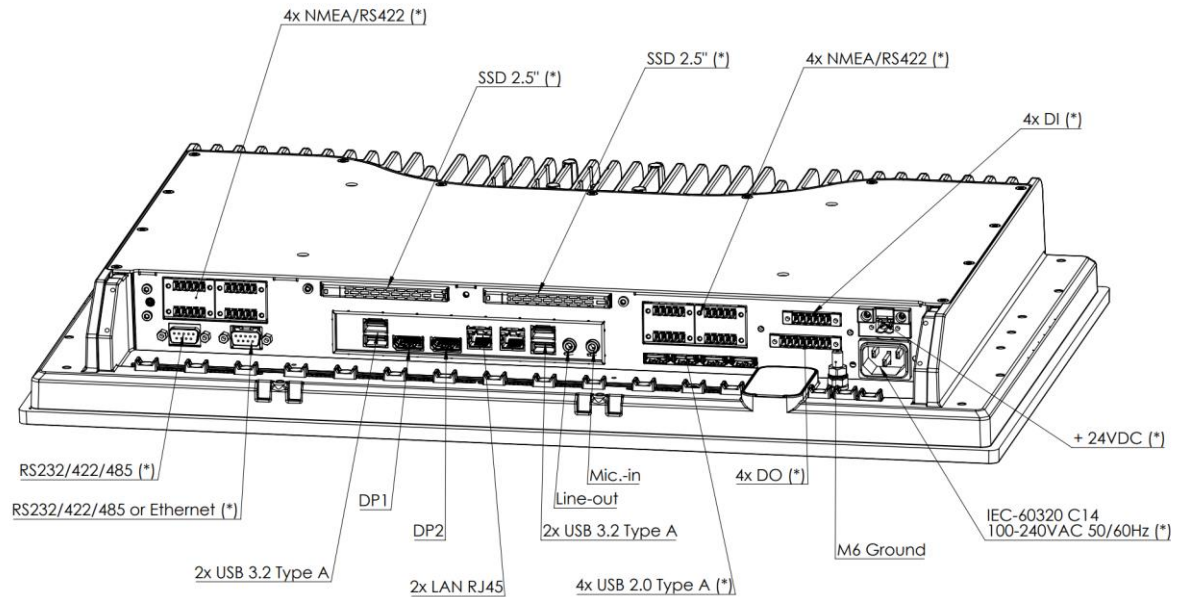
2.2.1. Warm up

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

3. Connections

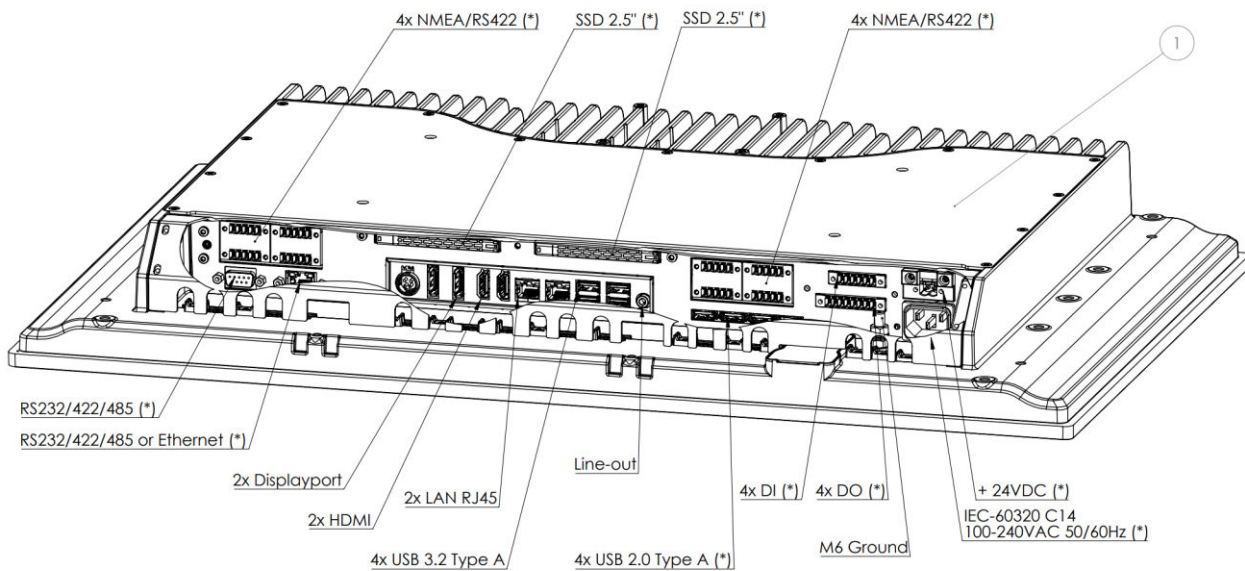
3.1. Overview

3.1.1. Intel® Q370 Platform (DuraPANEL 24 S-Line Example)



(*) Optional

3.1.2. Intel® Q670 Platform (DuraPANEL 27 S-Line Example)



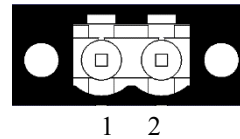
(*) Optional

3.2. Connectors

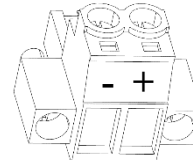
3.2.1. Models with 24VDC (18-36VDC) supply voltage

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

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



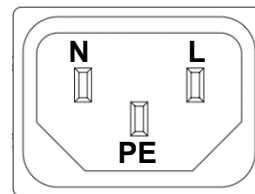
Mating part: Weidmüller BLZP5.08HC/02/180F



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

3.2.2. Models with 115/230VAC supply voltage

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

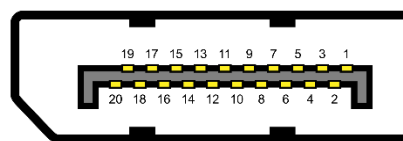


IEC plug type C14

Mating connector: IEC type C13

3.2.3. DisplayPort

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

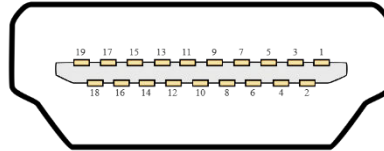


Mating part: Male full size DisplayPort connector with mechanical latch.

Note! Only use DisplayPort cables with pin 20 unconnected

3.2.4. HDMI

Pin	Description
1	TMDS Data 2+
2	TMDS Data 2 Shield
3	TMDS Data 2-
4	TMDS Data 1+
5	TMDS Data Shield
6	TMDS Data 1-
7	TMDS Data 0+
8	TMDS Data 0 Shield
9	TMDS Data 0-
10	TMDS Clock+
11	TMDS Clock Shield
12	TMDS Clock-
13	CEC
14	HEC Data-
15	SCL (Serial Clock for DDC)
16	SDA (Serial Data Line for DDC)
17	DDC / CEC / HEC Ground
18	+5 V Power (50mA max)
19	Hot Plug Detect (1.3) / HEC Data+ (1.4)

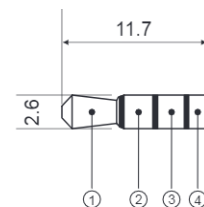


Mating part: Male full size HDMI plug type-A with mechanical latch.

3.2.5. 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



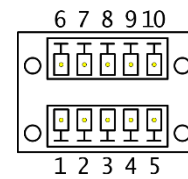
Mating part: 2.5 mm Jack

3.2.6. NMEA

Phoenix connector 1842940

Mating connector Phoenix connector 1827732 Terminal Block 5-pin rows (MC 1,5/ 5-STF-3,81)

1	TxD- Transmit Data Negative
2	TxD+ Transmit Data Positive
3	GND Isolated Ground
4	RxD- Receive Data Negative
5	RxD+ Receive Data Positive
6	TxD- Transmit Data Negative
7	TxD+ Transmit Data Positive
8	GND Isolated Ground
9	RxD- Receive Data Negative
10	RxD+ Receive Data Positive



Mating connector:

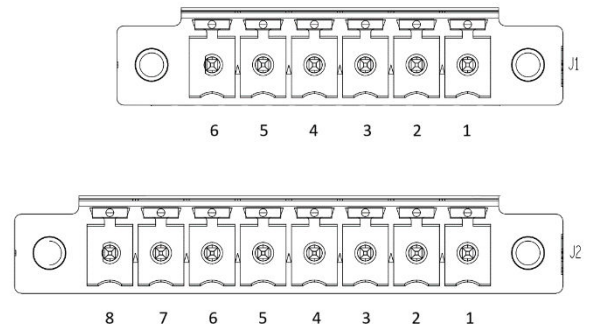
Phoenix 1827745 Terminal Block 6-pin rows (MC 1,5/ 6-STF-3,81)

Phoenix 1827761 Terminal Block 8-pin rows (MC 1,5/ 8-STF-3,81)

3.2.7. IO Module

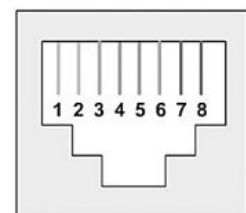
Phoenix connector 1830635(J1), 1830651(J2)

	J1	J2
1	DI_1	K1_1
2	GND	K1_2
3	DI_2	K1_3
4	DI_3	K1_4
5	GND	K1_5
6	DI_6	K1_6
7		K1_7
8		K1_8



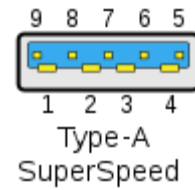
3.2.8. Ethernet

Pin Out	10 base-T	100 base-T	1000 base-T
1	TX+	TX+	BI_DA+
2	TX-	TX-	BI_DA-
3	RX+	RX+	BI_DB+
4	n/c	n/c	BI_DC+
5	n/c	n/c	BI_DC-
6	RX-	RX-	BI_DB-
7	n/c	n/c	BI_DD+
8	n/c	n/c	BI_DD-



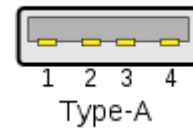
3.2.9. USB 3.0

Pin	Color	Signal name	Description
Shell	N/A	Shield	Metal housing
1	Red	VBUS	Power
2	White	Data-	USB 2.0 differential pair
3	Green	Data+	
4	Black	GND	Ground for power return
5	Blue	StdA_SSRX-	SuperSpeed transmitter differential pair
6	Yellow	StdA_SSRX+	
7	N/A	GND_DRAIN	Ground for signal return
8	Purple	StdA_SSTX-	SuperSpeed receiver differential pair
9	Orange	StdA_SSTX+	



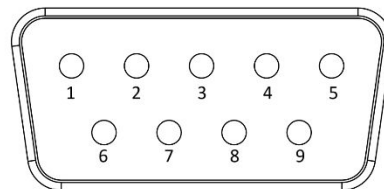
3.2.10. USB 2.0

Pin	Color	Signal name	Description
1	Red	VBUS	Power
2	White	Data-	USB 2.0 differential pair
3	Green	Data+	
4	Black	GND	Ground for power return



3.2.11. RS232

9- pin D-SUB	
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	+12V/+5V



4. Technical specifications

4.1. Intel® Q370 Platform

CPU:	Intel® Core® i3-9100TE 2.20 GHz <i>Optional Intel® Core i-9500TE 2.20 GHz</i> <i>Optional Intel® Core i7-9700TE 1.80 GHz</i> <i>Optional Intel® Celeron G1820TE 2.20 GHz</i> <i>Optional Intel® Pentium G4400TE 2.40 GHz</i>
Chipset:	Intel® Q370 Express Chipset
Memory:	4GB DDR3 2666 MHz SODIMM <i>Up to 32GB DDR4 SODIMM</i>
Hard Disk Drive:	256/512GB M.2 PCIE SSD or SATA <i>Optional 256 / 512 / 1TB... 2TB SSD SATA (option)</i>
Video:	Intel® UHD Graphics <i>3 Independent display capable</i> 2x DP 1.2 video output connectors
Audio:	Mic-in x 1, Line out x 1
Ethernet:	2 x 10/100/1000 Gbits/s Ethernet LAN on-board, (RJ45)
USB:	4 x USB 3.0 ports, 4 x USB 2.0
COM:	1x RS232

4.2. Intel® Q670 Platform

CPU:	Intel® Core® i3-12100TE 2.1 GHz <i>Optional Intel® Core i5-12500TE 1.90 GHz</i> <i>Optional Intel® Core i7-12700TE 1.40 GHz</i> <i>Optional Intel® Core i3-13100TE 2.40 GHz</i> <i>Optional Intel® Core i5-13500TE 1.30 GHz</i> <i>Optional Intel® Core i7-13700TE 1.10 GHz</i> <i>Optional Intel® Core i7-13900TE 1.00 GHz</i>
Chipset:	Intel® Q670 Express Chipset
Memory:	4GB DDR3 2666 MHz SODIMM <i>Up to 64GB DDR4 / 5 SODIMM</i>
Hard Disk Drive:	256/512GB M.2 PCIE SSD or SATA <i>Optional 256 / 512 / 1TB... 2TB SSD SATA (option)</i>
Video:	Intel® UHD Graphics <i>3 Independent display capable</i> 2x DP 1.2 video output connectors 2x HDMI 2.0
Audio:	Mic-in x 1, Line out x 1
Ethernet:	2 x 10/100/1000 Gbits/s Ethernet LAN on-board, (RJ45)
USB:	4 x USB 3.0 ports, 4 x USB 2.0
COM:	1x RS232

4.3. Environmental

Operating Temperature:	-15 to 55 °C
Storage Temperature:	-25 to 70 °C
Relative Humidity:	8 to 95 %

4.4. Approvals

CE Mark:	EN61000
Marine:	IACS E10 & IEC 60945
Radar / Navigation:	IEC 61174, IEC 62288, IEC 62388
Certificates:	MR Certificate

4.5. Power

Alternating Current:	115 / 230VAC 50-60Hz (90-264VAC 47-63Hz abs. min/max)
Direct Current:	24VDC (18-36VDC abs. min/max) <i>Optional Dual power, combined AC and DC input</i>

4.6. DuraPANEL 24 S-Line Specific

Display size:	23.8 inch 16:9 LCD (TFT)
Resolution:	1920 x 1080
Active area:	527 x 296 mm
Viewing distance:	944 mm minimum
Pixel pitch:	0.2745 x 0.2745 mm
View angle:	89° (T/B), 89° (L/R) (typical)
Luminance:	450 Cd/m ² (typical)
Contrast ratio:	1000:1 (typical)
Front glass:	Anti-glare
Touch:	Optional PCAP Multitouch (USB)
Size:	571.4mm (W) x 350.5mm (H) x 75.6mm (D)
Weight:	App. 13 kg.
Bracket:	Desk/ceiling-and wall-bracket (optional extra)

4.7. DuraPANEL 27 S-Line Specific

Display size:	27 inch 16:9 LCD (TFT)
Resolution:	1920 x 1080
Active area:	597.6 x 336.15 mm
Viewing distance:	1070 mm minimum
Pixel pitch:	0.31125 x 0.31125 mm
View angle:	89° (T/B), 89° (L/R) (typical)
Luminance:	350 Cd/m ² (typical)
Contrast ratio:	3000:1 (typical)
Front glass:	Anti-glare
Touch:	Optional PCAP Multitouch (USB)
Size:	632.0mm (W) x 398.5mm (H) x 75.6mm (D)
Weight:	App. 15 kg.
Bracket:	Desk/ceiling-and wall-bracket (optional extra)

5. Display backlight luminance (Dimming)

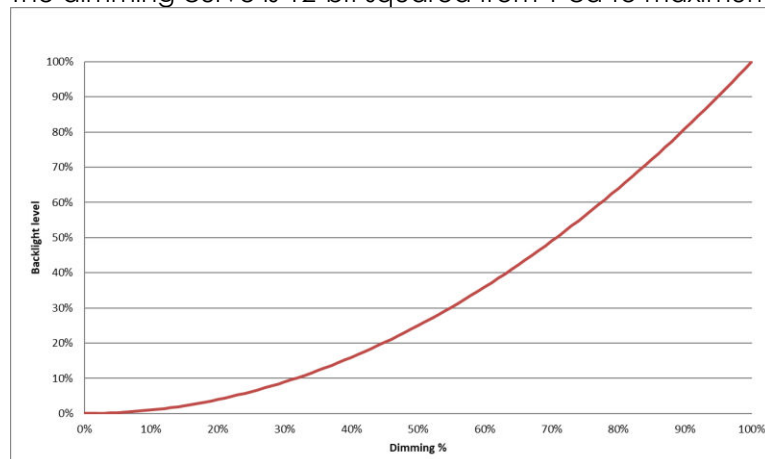
5.1. Backlight Luminance control

Display luminance can be controlled by Communication interfaces.

For models with front panel controls: please refer to section [UP and DOWN buttons](#).

5.2. Dimming curve

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



6. 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!

6.1. 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.

6.2. ECDIS setup

To set up ECDIS on the system a color token table must be downloaded from the Panel PC to the ECDIS application.

USB interface: Please refer to Serial Communication Protocol 04924-002 for details.

7. LED indicators

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

7.1. LED indicator behavior



7.1.1. Status LED indicating color

Orange:	Warning: - Standby - 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

7.1.2. Power LED indicating color

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

7.2. Optional (Custom) LED indicator behavior

7.2.1. Optional Status LED indicating color

Orange:	Warning: - Standby - 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
--------------------------	----------

7.2.2. Optional Power LED indicating color

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

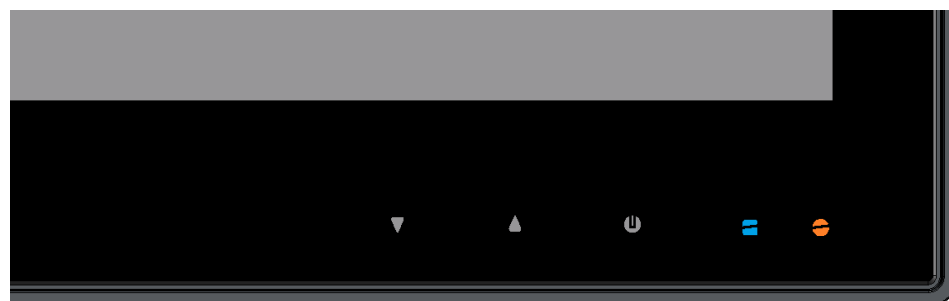
8. Front panel controls

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

8.1. Touch button interface

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

DuraPANEL 24 S-line Layout



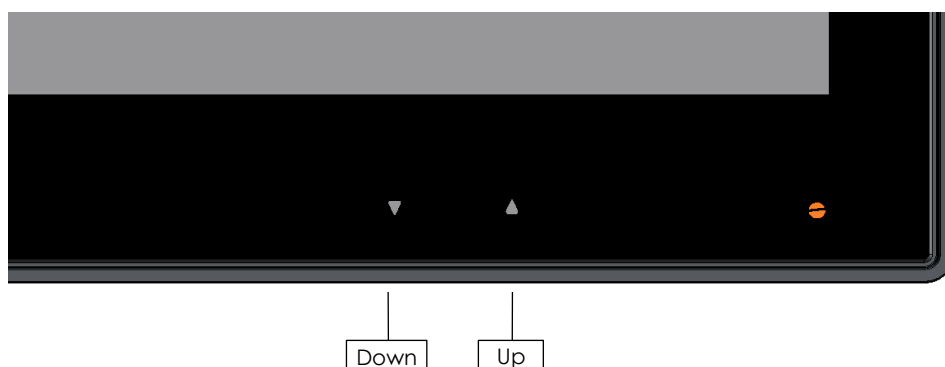
Down Up On / Standby

DuraPANEL 27 S-line Layout



Down Up On / Standby

8.2. Optional (Custom) touch button interface



8.3. On / Standby

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 power on the Panel PC.

Shutdown can be activated by pressing the  /  button for 5 seconds.

Hard-OFF can be activated by pressing the  /  button for 10 seconds.

8.4. 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 Panel PC backlight luminance.

9. Troubleshooting

Problem	Cause	Solutions
No picture on display	Backlight luminance set to minimum	Increase backlight
No picture on display	Panel PC turned off	Turn on the Panel PC
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.

10. 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 Panel PC must be recalibrated at ISIC.

11. Terms, Acronyms and abbreviations

12. ISIC info / Support

In case you have inquiries or problems with your DuraPANEL 24 & 27 S-Line, you have a number of support options.

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

Email: isic@isic-systems.com
www: www.isic-systems.com

VAT number: DK 16 70 45 39

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By mail to service@isic-systems.com

13. Revision history

A	2025-10-07	First Release
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14. Appendix A: Pixel policy

ISO 9241-307:2008 guidelines for LCD pixel defects

14.1. 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.

14.2. Panel PC 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 ($2 \times N_{3a} + N_{3b}$)	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 units comply with ISO 9241-307:2008 Class II.

Special agreements about other classifications can be made between ISIC A/S and the customer.

14.3. 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 $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$
- Relative air humidity 40–70%

14.4. Pixel definition

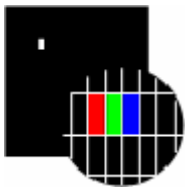
Every pixel consists of three sub-pixels/dots (red, blue, green).

Every sub-pixel has its own transistor.

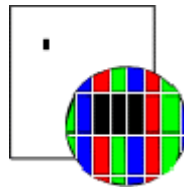
The three sub-pixels/dots must be considered as one unit.



Pixel



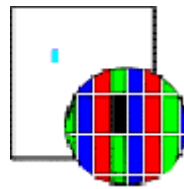
Pixel defect type 1 Pixel constantly lit



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

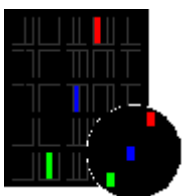
A cluster consists of 5 x 5 pixels.



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

14.5. 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 device 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
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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