



# PRODUCT OVERVIEW

Displays, Panel Computers and Computers 2011/2012



# INTRODUCTION



Hatteland Display is the leading technology provider of maritime display and computer products. We deliver high quality, unique and customized solutions to the international maritime market. The company represents innovation and quality to system integrators, ship yards and boat builders worldwide. Effective quality assurance and investment in sophisticated in-house manufacturing methods and facilities enable us to deliver type approved and Mil tested products.

Hatteland Display has successfully delivered nearly 150,000 products to the maritime industry since 1989. Our customer oriented approach, technical knowledge and dedication to R&D, make us a trusted and preferred supplier of approved solutions, which are backed up by a strong service network.

As the market leader in the commercial marine segment, Hatteland Display is setting the standard in the industry. As technology evolves, we take pride in providing long term support for our products, while at the same time developing new cutting edge solutions for the future. Two of our customers had this to say:

*“Dealing with ever-changing technology is always a challenge; but when you have a trusted partner with a knowledgeable and responsible team like Hatteland Display, you don’t need to worry about getting into trouble”*

*“Hatteland Display provides high quality and innovative products supported by a very capable organization”.*

We take pride in being flexible and always putting our customers first. Our dedication to our customers has been recognized by the market. Another one of our customers commented on their experience:

*“You can get in touch with Hatteland Display’s sales managers anytime, anywhere. Whether on the road, at the office, or in an airport, your call is answered, your SMS is taken, your email is replied, and your concern is attended”.*

Hatteland Display’s products and organization can be described through our core values: **QUALITY – KNOWLEDGE – VALUE**. We live in these values every day and aim to be a provider of Trusted Solutions to the marine market well into the future.

We hope you find the products and solutions that are illustrated in this catalogue of interest and suited for your needs. We are ready to support you if you have any questions.

Kind regards, The Hatteland Display Team

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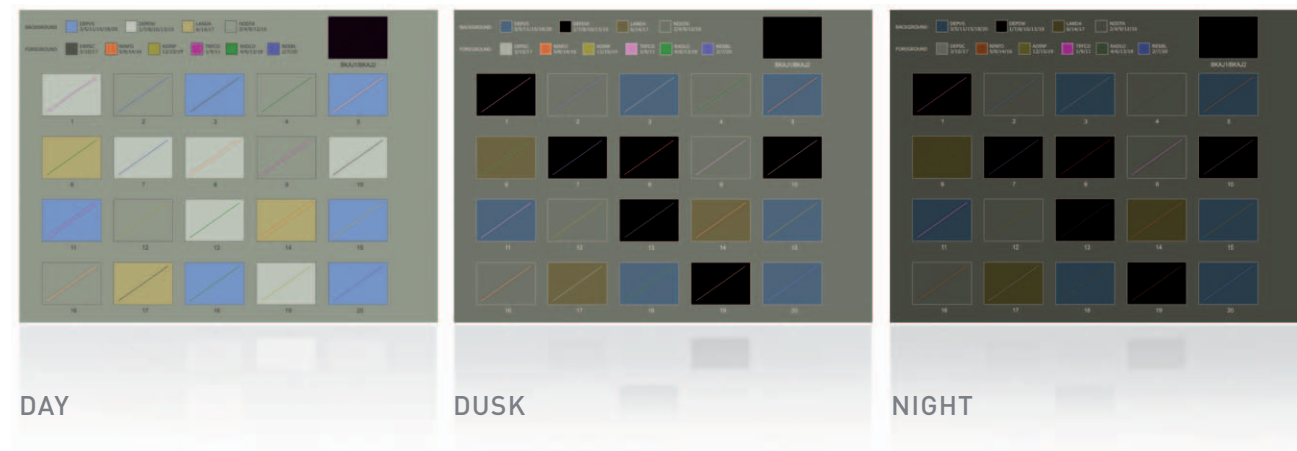
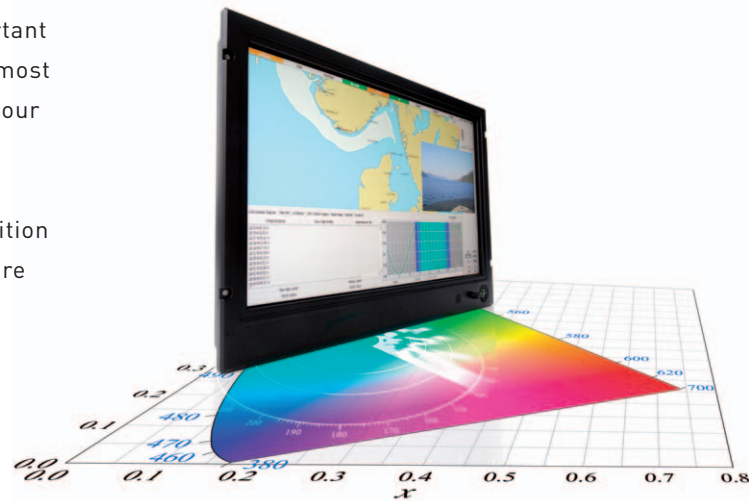
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# HATTELAND DISPLAY ECDIS CALIBRATION

Color calibration of the display is a very important aspect of ECDIS. ECDIS represents one of the most rigorous applications in display technology for our industry.

The consequence of making an error in recognition on the display is potentially very costly, therefore it is important that ECDIS monitors match the colour characteristics specified in the relevant standards. Hatteland Display provides both computers and displays to facilitate an overall ECDIS approved installation.



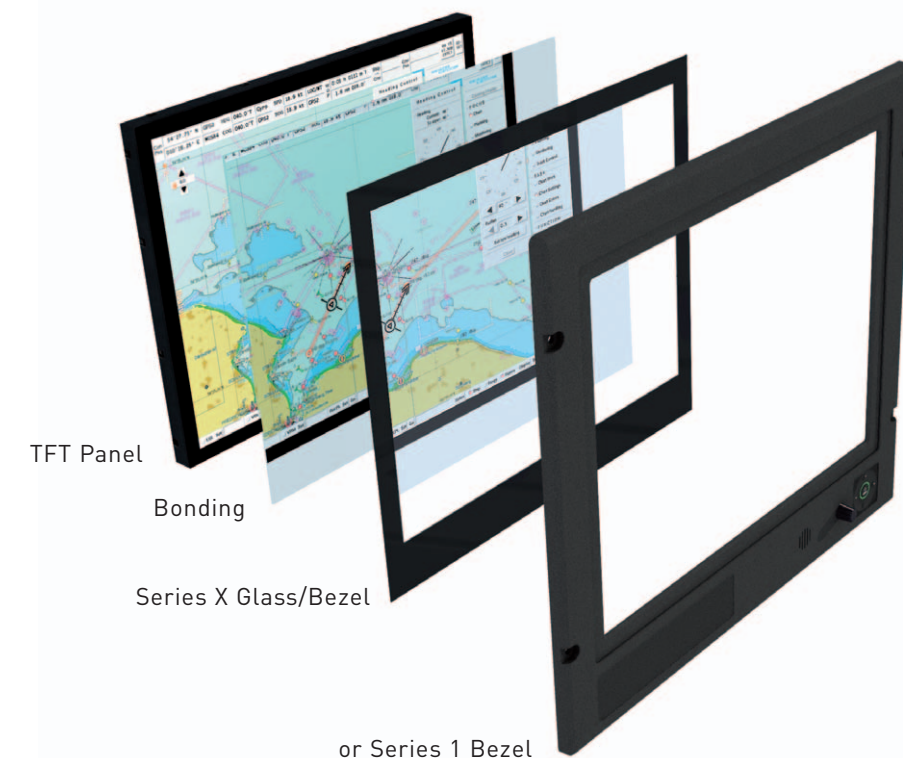
## WHY CHOOSE COLOR CALIBRATION BY HATTELAND DISPLAY?

- With our extensive technical knowledge and experience, we can deliver the best quality type-approved ECDIS displays fulfilling IMO requirements;
- All configurations meet the requirements set in IEC 62288, IEC 62388, IEC 61174 and IEC 60945.
- Hatteland Display ECDIS calibration overcomes all problems associated with different display properties, to ensure correct matching between the standards and the actual products.
- Calibration service is supplied with detailed implementation instructions and extensive support.
- Hatteland Display calibration is the most flexible system, and that can even be used with several types of graphic adapters at a time.

# ENHANCED SUNLIGHT READABILITY THROUGH IN-HOUSE OPTICAL BONDING

Optical bonding greatly enhance the viewing performance, reliability and lifespan of marine displays. It is a process whereby the air gap between the front glass panel and LCD module is filled with a special proprietary compound to negate all of the problems related with marine use such as condensation, sunlight reflection, dust and overheating.

Hatteland Display is dedicated to the art of LCD optical bonding. It is the only such in-house facility of its kind at a marine display manufacturer, and it allows us to provide proprietary added value whilst ensuring the quality and integrity of our display products and technology.



# INNOVATIVE HMI

Within a system, the display provides the primary Human Machine Interface (HMI). Innovative HMI solutions open up new possibilities for the system integrator. Our products can be supplied with touch screens as an option. There are many touch screen technologies available, and we have implemented several of them in our solutions.

## Main usability, performance and integration characteristics are:

Technology	Optical Performance	Stable Calibration	Gloves	Water	Durability	Price	Multitouch	Frameless Design
Analog Resistive	--	+	++	++	-	++	-	-
Surface Capacitive	++	-	--	-	+	-	-	-
Projected Capacitive	++	++	+	+	++	-	++	++

Series 1 can be offered with either resistive or surface capacitive touch screen in most cases, Series X is designed with projected capacitive providing multitouch support.

## MULTITOUCH

Multitouch is defined as the ability to recognize two or more simultaneous touch points. Using projected capacitive technology lets us create a more intuitive form of human-device interaction. Touch-interface gestures, supported by projected capacitive sensors, can simplify the interface and provide an intuitive user experience that goes beyond the typical "button replacement" found in most simple touch interfaces.



Moving the active sensor area on the backside of the protection glass makes the system very durable and not sensitive to surface damages like dirt, scratches etc.

## HATTELAND® Glass Display Control™ (GDC):

A well implemented touch interface can be much simpler to use than a conventional mechanical button-based interface because it can show the user only those controls that are relevant to a particular operation, while all the controls in a conventional interface are always present. Our new display control solution, which we refer to as Glass Display Control, or GDC, is based on projected switches, and have these benefits, and more;

- **Solid state** - reliable.
- **Behind the glass sensors** - don't wear out.
- **No moving parts** - nothing to break, everlasting.



# GUARANTEED RELIABILITY THROUGH TESTING & TYPE APPROVALS

All Hatteland Display products are normally tested and type approved to the required standards by the major classification societies, ensuring our displays, computers and panel computers are fit for the harsh environments encountered at sea.

We also provide dedicated ECDIS calibration which enables us to deliver type approved ECDIS displays straight from the factory to you. Products are normally type approved or in application for Type Approval by the following major classification societies:

## Standard:

<b>ABS</b>	American Bureau of Shipping
<b>BV</b>	Bureau Veritas
<b>ClassNK</b>	Nippon Kaiji Kyokai
<b>DNV</b>	Det Norske Veritas
<b>GL</b>	Germanischer Lloyd
<b>LRS</b>	Lloyd's Register of Shipping

## Optional:

<b>CCS</b>	China Classification Society
<b>KR</b>	Korean Shipping
<b>RS</b>	Russian Maritime Register of Shipping

To ensure the above mentioned type approvals, the products are tested by independent institutions according to the following standards, **where applicable**:

**EN61174** - (IEC1174) Bundesamt für Seeschifffahrt und Hydrographie (BSH)

**EN60529** - IP protection classes.

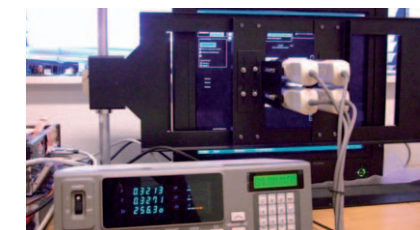
**EN61162** - (IEC1174) Maritime navigation and radio communication equipment and systems.

**EN60945 4th**

**IACS E10**

For MIL Qualified products:

- MIL-STD-461E**
- MIL-STD-810F**
- MIL-STD-167-1**
- MIL-S-901D, Grade A, Class 1**
- Extended IEC 60945**
- TEMPEST SDIP-27**





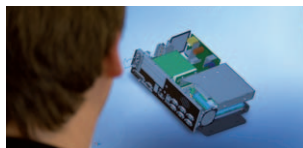
# TECHNICAL DEVELOPMENT

Hatteland Display works closely with systems integrators to ensure our products meet the most demanding requirements for maritime and naval applications. In addition to providing high quality standard technical solutions our company continues to set new standards through the introduction of new technologies and capabilities.



## Optical Bonding

Developed in-house, our unique, proprietary bonding technology prevents fogging and produces the best optical quality. Read more on page 5.



## 3-D Modeling and Simulation

Our engineers use state-of-the-art design tools to minimize design cycle times and integration risks.



## Video System Design and Integration

Our engineering staff is experienced in electronic design of critical analog and digital video circuitry.



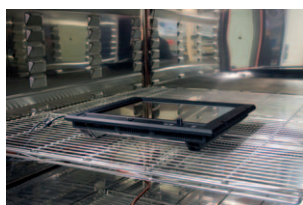
## ECDIS Solutions

Hatteland Display sets the standard for type-approved ECDIS solutions, including automated generation of color calibration tables. We are also the premier supplier of MIL-S-901D qualified ECDIS certified displays. Read more on page 4



## Environmental Qualification Testing and Type Approval

Hatteland Display's knowledge of international shipbuilding standards and military specifications, coupled with our experience in qualification and certification of products to these standards is unsurpassed.



## Test Facilities

Hatteland Displays test laboratory performs in-house IEC60945 (partial) testing and Highly Accelerated Life Testing (HALT) to constantly improve the product quality. Some of the selected test equipment: Climatic Chamber, Vibrator, Heat Chamber and Thermo Graphic Camera.



## ISO-9001:2008 Approved Processes

Hatteland Display's quality system covers all functional areas and facilities to ensure the quality of our work products.





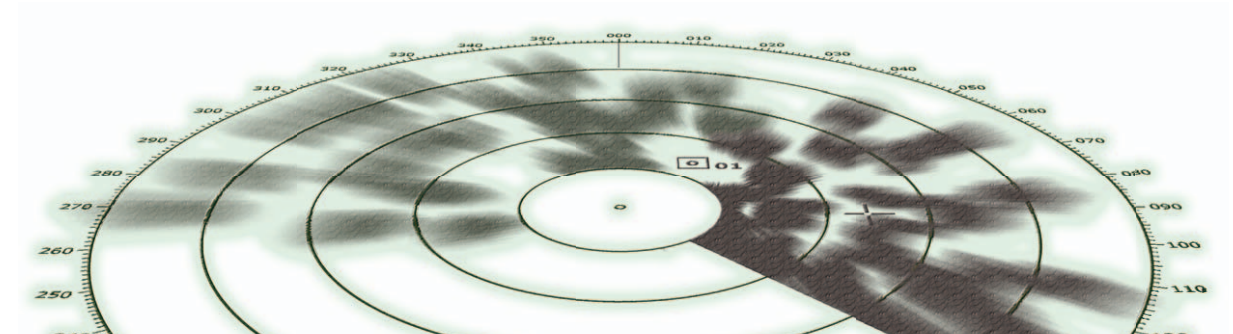
## WORLDWIDE PRESENCE

As part of our lifecycle management we place a huge amount of emphasis on support and have built up a strong network to ensure that we can act fast when you most need us. We provide depot-level repair at all of our global service partner locations.

We use an automated customer service application to facilitate returns. Access to stock spare parts locally and the provision of training completes the basis of our commitment to extending the lifecycle of all Hatteland Display products, making sure that your critical systems are always operational.

## AGENTS AND OFFICES

Wherever you, or your vessel, may be in the world, you can rest assured that you can always reach Hatteland Display's many offices and agents located near you and in your timezone to ensure the best possible support.



For up-to-date service partner locations and specific contact information, please visit our dedicated link:  
[www.hatteland-display.com/service](http://www.hatteland-display.com/service)

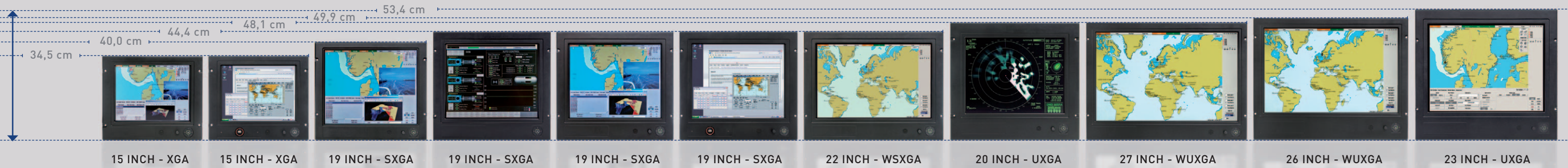
For up-to-date locations and specific contact information, please visit our dedicated link:  
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# PRODUCT SIZE COMPARISON

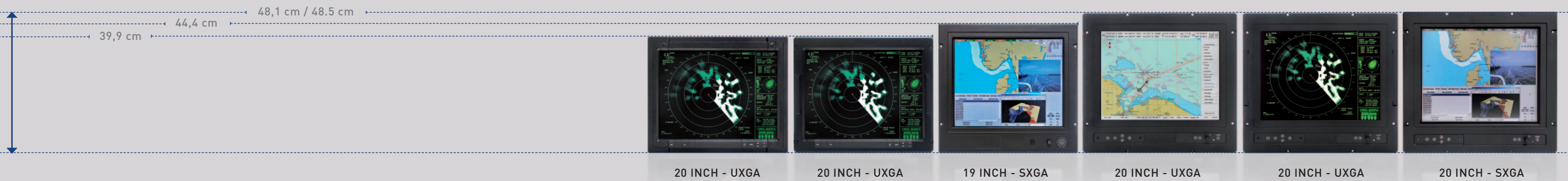
## SERIES 1 - Displays and Panel Computers



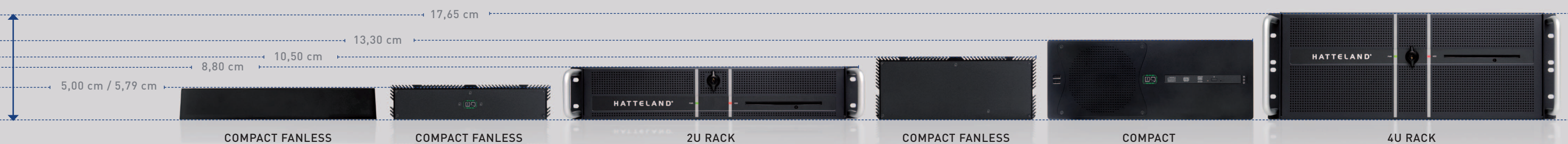
## SERIES X - Displays and Panel Computers



## MIL Qualified Displays



## Rack, Compact and Compact Fanless Computers





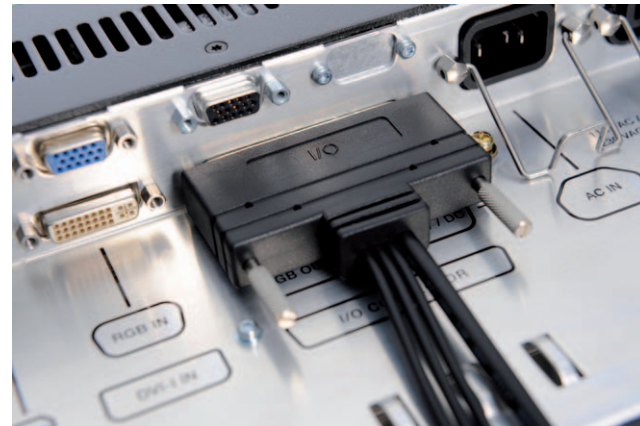
# DISPLAYS SERIES 1

With our dedication to innovation, we took our de facto industry standard Series 1 displays and set about improving them. The result is the Series 1 redesign, a new generation of innovative, rugged marine displays designed for any navigation and automation application, including ECDIS.

Although the new Series 1 offers a clear improvement on performance, functionality and value, we have ensured that it adheres to the Hatteland Display ethos of Form, Fit, Function, so you can harness the many innovative features, without making changes to your existing solutions.

Series 1 displays feature 0-100% dimming, and provide unmatched sun and night vision. All sizes can benefit from Hatteland Display's sophisticated Optical Bonding, which eliminates condensation and dust, and reduces reflection by over 90%. Together with advanced anti-reflective coatings, bonding enables you to see your display in bright sunlight without the need for extensive backlighting, which can cause overheating and a shorter product life cycle.

- TYPE APPROVED
- ECDIS COMPLIANT
- SUPERIOR BONDING TECHNOLOGY
- FORM, FIT AND FUNCTION - LONG-TERM COMMITMENT



Series 1 introduces a number of signal input/output options, which can be increased by using the HATTELAND® Multifunction Cable. Further customized cables are available to ensure that you can interface everything you need to with the greatest of ease.

All Series 1 models are built to last and designed to be reliable in harsh environments, while providing the performance and flexibility you expect. They are perfectly suited to use aboard a wide range of vessels including commercial ships, workboats, coast guard boats and navy ships.





# SPECIFICATIONS - DISPLAYS SERIES 1

The maritime standard...



15 INCH



19 INCH



TECHNICAL DATA	JH 15T17 MMD	JH 19T14 MMD-S (Slim Frame)
<b>TFT Technology</b>	Color Active Matrix TFT/LCD, a-Si TFT Active Matrix	Active Matrix, Thin Film Transistor (TFT), MVA Premium™ Technology
<b>Viewable Image Size &amp; Active Area</b>	15.0 inch - 304.1 [11.97"] (H) x 228.1 [8.98"] (V) mm [inch]	19.0 inch - 376.32 [14.82"] (H) x 301.056 [11.85"] (V) mm [inch]
<b>Native Resolution &amp; Pixel Pitch</b>	1024 x 768 - 0.297 (H) x 0.297 (V) mm	1280 x 1024 - 0.294 (H) x 0.294 (V) mm
<b>Response Time</b>	25 ms (typ)	12 ms (typ)
<b>Light Intensity &amp; Contrast Ratio</b>	250 cd/m <sup>2</sup> (typ) - 400:1 (typ)	300 cd/m <sup>2</sup> (typ) - 900:1 (typ)
<b>View Angle</b>	+/- 85 deg. (up/down/left/right)	+/- 85 deg. (up/down/left/right)
<b>Max Color Output</b>	16.7 million	16.7 million
<b>Sync. Signal Auto-detect</b>	Digital Separate Sync., Composite Sync., Sync. On Green	Digital Separate Sync., Composite Sync., Sync. On Green
<b>Synchronisation Range</b>	15.0 kHz to 91.1 kHz (H) - 60 Hz to 85 Hz (V)	15.0 kHz to 91.1 kHz (H) - 60 Hz to 85 Hz (V)
<b>Optimal Resolution and Hz</b>	1024 x 768 (XGA 4:3) @ 60 Hz	1280 x 1024 (SXGA 5:4) @ 60 Hz
<b>Detectable Resolutions</b>	640 x 350 / 640 x 480 / 720 x 400 / 800 x 600 1024 x 768 / 1280 x 1024 / 1600 x 1200 / 1920 x 1200	640 x 350 / 640 x 480 / 720 x 400 / 800 x 600 1024 x 768 / 1280 x 1024 / 1600 x 1200 / 1920 x 1200
<b>Video Input Option</b>	YES via <b>HATTELAND® Multifunction Cable</b>	YES via <b>HATTELAND® Multifunction Cable</b>
<b>Supported Video Signals</b>	SVHS & COMPOSITE Compatible	SVHS & COMPOSITE Compatible
<b>Product Features</b>	PBP (Picture By Picture), PIP (Picture In Picture), HATTELAND® Multifunction Connector, Hotkey Functionality, Dimmable 0-100%	Multi-power AC & DC, PBP (Picture By Picture), PIP (Picture In Picture), HATTELAND® Multifunction Connector, Hotkey Functionality, Dimmable 0-100%
<b>Power Input &amp; Power Consumption</b>	115/230VAC - 50/60Hz or 24 VDC - 100W (max)	Multi-power 115/230VAC - 50/60Hz + 24 VDC - 50W (typ) - 60W (max)
MECHANICAL DATA	JH 15T17 MMD	JH 19T14 MMD-S (Slim Frame)
<b>User Controls &amp; Activity</b>	Power On/Off + On Screen Display Menu (push button) Brightness Control Hotkeys (left/right - push buttons) Mode Status Illuminated LED-Ring Indicator	Power On/Off + On Screen Display Menu (push button) Brightness Control Hotkeys (left/right - push buttons) Mode Status Illuminated LED-Ring Indicator
<b>Connectors</b>	<b>DVI IN:</b> 1 x DVI-I 29P (female) <b>RGB IN:</b> 1 x HD D-SUB 15P (female) <b>RGB OUT:</b> 1 x HD D-SUB 15P (female) <b>Multifunction:</b> 1 x D-SUB 160p (female) <b>USB:</b> 1 x Type B (female) <b>AC Power IN:</b> 1 x Std IEC inlet <b>AC Power OUT:</b> 1 x Std IEC outlet (5A max) <b>If DC Power IN:</b> 1 x 2p D-SUB (male) Amphenol FCC17	<b>DVI IN:</b> 1 x DVI-I 29P (female) <b>RGB IN:</b> 1 x HD D-SUB 15P (female) <b>RGB OUT:</b> 1 x HD D-SUB 15P (female) <b>Multifunction:</b> 1 x D-SUB 160p (female) <b>USB:</b> 1 x Type B (female) <b>AC Power IN:</b> 1 x Std IEC inlet <b>AC Power OUT:</b> 1 x Std IEC outlet (5A max) <b>DC Power IN:</b> 1 x 2p D-SUB (male) Amphenol FCC17
<b>Models Dimensions &amp; Weight</b>	412.00 (W) x 345.00 (H) x 73.28 (D) mm 16.22" (W) x 13.58" (H) x 2.89" (D) inch Approx 7 kg / 15 lbs	460.00 (W) x 400.00 (H) x 82.00 (D) mm 18.11" (W) x 15.75" (H) x 3.23" (D) inch Approx 10 kg / 22 lbs
<b>Factory Options</b>	1: 24 VDC Power Solution 2: Resistive or Capacitive Touchscreen 3: Keypad only or Keypad+Potmeter+Buzzer controls 4: Optical Bonding Technology 5: Speaker / Buzzer	1: Resistive or Capacitive Touchscreen 2: Keypad only or Keypad+Potmeter+Buzzer controls 3: Optical Bonding Technology 4: Speaker / Buzzer 5: Color Calibrated models (ECDIS)
<b>Available Accessories</b>	Bracket (tilt up/down), Rotary Bracket (left/right), VESA Bracket, Sun Visor, Water Cover, 19" Rack Adapter Frame, 17" CRT Adapter Frame <b>Multifunction Cable Options:</b> 1 x RS-232 COM + 3 x BNC Video In or 1 x RS-232 COM + 3 x BNC Video In + 1 x COM Touch	Bracket (tilt up/down), EN60945 Tested Bracket (tilt up/down), Rotary Bracket (left/right), Sun Visor, VESA Bracket, 19" Rack Adapter Frame, Water Cover <b>Multifunction Cable Options:</b> 1 x RS-232 COM + 3 x BNC Video In or 1 x RS-232 COM + 3 x BNC Video In + 1 x COM Touch
ENVIRONMENTAL DATA	JH 15T17 MMD	JH 19T14 MMD-S (Slim Frame)
<b>Operating Temperature</b>	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%
<b>Storage Temperature</b>	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%
<b>IP Rating</b>	Protection: IP66 front - IP20 rear [EN60529]	Protection: IP66 front - IP20 rear [EN60529]
<b>Compass Safe Distance</b>	Standard: 130 [51.18"] - Steering: 100 [39.37"] cm [inch]	Standard: 65 [25.59"] - Steering: 35 [13.78"] cm [inch]
TYPE APPROVAL & TESTING	JH 15T17 MMD	JH 19T14 MMD-S (Slim Frame)
<b>Note: Some of the Type Approvals could be pending.</b>	IEC 60945 4 <sup>th</sup> [EN 60945:2002] ClassNK - Nippon Kaiji Kyokai GL - Germanischer Lloyd DNV - Det Norske Veritas ABS - American Bureau of Shipping BV - Bureau Veritas CCS - China Classification Society LRS - Lloyd's Register of Shipping	IEC 60945 4 <sup>th</sup> [EN 60945:2002] ClassNK - Nippon Kaiji Kyokai GL - Germanischer Lloyd DNV - Det Norske Veritas ABS - American Bureau of Shipping BV - Bureau Veritas CCS - China Classification Society LRS - Lloyd's Register of Shipping

COMMERCIAL



# SPECIFICATIONS - DISPLAYS SERIES 1

19 INCH



19 INCH



19 INCH for automation applications

TECHNICAL DATA	JH 19T14 MMD	JH 19T14 STD
<b>TFT Technology</b>	Active Matrix, Thin Film Transistor (TFT), MVA Premium™ Technology	Active Matrix, Thin Film Transistor (TFT), MVA Premium™ Technology
<b>Viewable Image Size &amp; Active Area</b>	19.0 inch - 376.32 [14.82"] [H] x 301.056 [11.85"] [V] mm [inch]	19.0 inch - 376.32 [14.82"] [H] x 301.056 [11.85"] [V] mm [inch]
<b>Native Resolution &amp; Pixel Pitch</b>	1280 x 1024 - 0.294 [H] x 0.294 [V] mm	1280 x 1024 - 0.294 [H] x 0.294 [V] mm
<b>Response Time</b>	12 ms [typ]	12 ms [typ]
<b>Light Intensity &amp; Contrast Ratio</b>	300 cd/m <sup>2</sup> [typ] - 900:1 [typ]	300 cd/m <sup>2</sup> [typ] - 900:1 [typ]
<b>View Angle</b>	+/- 85 deg. [up/down/left/right]	+/- 85 deg. [up/down/left/right]
<b>Max Color Output</b>	16.7 million	16.7 million
<b>Sync. Signal Auto-detect</b>	Digital Separate Sync., Composite Sync., Sync. On Green	Digital Separate Sync., Composite Sync., Sync. On Green
<b>Synchronisation Range</b>	15.0 kHz to 91.1 kHz [H] - 60 Hz to 85 Hz [V]	15.0 kHz to 91.1 kHz [H] - 60 Hz to 85 Hz [V]
<b>Optimal Resolution and Hz</b>	1280 x 1024 [SXGA 5:4] @ 60 Hz	1280 x 1024 [SXGA 5:4] @ 60 Hz
<b>Detectable Resolutions</b>	640 x 350 / 640 x 480 / 720 x 400 / 800 x 600 1024 x 768 / 1280 x 1024 / 1600 x 1200 / 1920 x 1200	640 x 350 / 640 x 480 / 720 x 400 / 800 x 600 1024 x 768 / 1280 x 1024
<b>Video Input Option</b>	YES via <b>HATTELAND® Multifunction Cable</b>	None
<b>Supported Video Signals</b>	SVHS & COMPOSITE Compatible	None
<b>Product Features</b>	PBP (Picture By Picture), PIP (Picture In Picture), HATTELAND® Multifunction Connector, Hotkey Functionality, Dimmable 0-100%	Keypad button control, Hotkey Functionality, Dimmable 20-100%
<b>Power Input &amp; Power Consumption</b>	115/230VAC - 50/60Hz or 24 VDC - 100W [max]	115/230VAC - 50/60Hz - 100W [max]
MECHANICAL DATA	JH 19T14 MMD	JH 19T14 STD
<b>User Controls &amp; Activity</b>	Power On/Off + On Screen Display Menu (push button) Brightness Control Hotkeys (left/right - push buttons) Mode Status Illuminated LED-Ring Indicator	Power On/Off + On Screen Display Menu (push button) Brightness Control Hotkeys (left/right - push buttons) Mode Status Illuminated LED-Ring Indicator
<b>Connectors</b>	<b>DVI IN:</b> 1 x DVI-I 29P (female) <b>RGB IN:</b> 1 x HD D-SUB 15P (female) <b>RGB OUT:</b> 1 x HD D-SUB 15P (female) <b>Multifunction:</b> 1 x D-SUB 160p (female) <b>USB:</b> 1 x Type B (female) <b>AC Power IN:</b> 1 x Std IEC inlet <b>AC Power OUT:</b> 1 x Std IEC outlet (5A max) <b>If DC Power IN:</b> 1 x 2p D-SUB (male) Amphenol FCC17	<b>DVI IN:</b> 1 x DVI-I 29P (female) <b>RGB IN:</b> 1 x HD D-SUB 15P (female)
<b>Models Dimensions &amp; Weight</b>	483.00 [W] x 444.00 [H] x 82.00 [D] mm 19.02" [W] x 17.48" [H] x 3.23" [D] inch Approx 12 kg / 26 lbs	483.00 [W] x 444.00 [H] x 82.00 [D] mm 19.02" [W] x 17.48" [H] x 3.23" [D] inch Approx 12 kg / 26 lbs
<b>Factory Options</b>	1: 24 VDC Power Solution 2: Resistive or Capacitive Touchscreen 3: Keypad only or Keypad+Potmeter+Buzzer controls 4: Optical Bonding Technology 5: Speaker / Buzzer 6: Color Calibrated models [ECDIS]	None
<b>Available Accessories</b>	Bracket (tilt up/down), EN60945 Tested Bracket (tilt up/down), Rotary Bracket (left/right), Sun Visor, VESA Bracket, 21 CRT Adapter Frame, 21 CRT Customized Adapter Frame, Water Cover <b>Multifunction Cable Options:</b> 1 x RS-232 COM + 3 x BNC Video In or 1 x RS-232 COM + 3 x BNC Video In + 1 x COM Touch	Bracket (tilt up/down), EN60945 Tested Bracket (tilt up/down), Rotary Bracket (left/right), Sun Visor, VESA Bracket, 21 CRT Adapter Frame, 21 CRT Customized Adapter Frame, Water Cover
ENVIRONMENTAL DATA	JH 19T14 MMD	JH 19T14 STD
<b>Operating Temperature</b>	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%
<b>Storage Temperature</b>	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%
<b>IP Rating</b>	Protection: IP66 front - IP20 rear [EN60529]	Protection: IP66 front - IP20 rear [EN60529]
<b>Compass Safe Distance</b>	Standard: 160 [62.99"] - Steering: 105 [41.34"] cm [inch]	N/A
TYPE APPROVAL & TESTING	JH 19T14 MMD	JH 19T14 STD
	IEC 60945 4 <sup>th</sup> [EN 60945:2002] ClassNK - Nippon Kaiji Kyokai GL - Germanischer Lloyd DNV - Det Norske Veritas ABS - American Bureau of Shipping LRS - Lloyd's Register of Shipping BV - Bureau Veritas CCS - China Classification Society	IEC 60945 4 <sup>th</sup> [EN 60945:2002] ClassNK - Nippon Kaiji Kyokai GL - Germanischer Lloyd DNV - Det Norske Veritas ABS - American Bureau of Shipping LRS - Lloyd's Register of Shipping BV - Bureau Veritas CCS - China Classification Society

# SPECIFICATIONS - DISPLAYS SERIES 1

20 INCH



22 INCH WIDESCREEN



TECHNICAL DATA	JH 20T17 MMD	JH 22T11 MMD
<b>TFT Technology</b>	Color Active Matrix TFT/LCD, a-Si TFT Active Matrix	Active Matrix, Thin Film Transistor (TFT), RGB Vertical Stripe
<b>Viewable Image Size &amp; Active Area</b>	20.1 inch - 408.0 [16.06"] [H] x 306.0 [12.05"] [V] mm [inch]	22.0 inch - 473.76 [18.65"] [H] x 296.1 [11.66"] [V] mm [inch]
<b>Native Resolution &amp; Pixel Pitch</b>	1600 x 1200 - 0.255 [H] x 0.255 [V] mm	1680 x 1050 - 0.282 [H] x 0.282 [V] mm
<b>Response Time</b>	20 ms [typ]	20 ms [typ]
<b>Light Intensity &amp; Contrast Ratio</b>	250 cd/m <sup>2</sup> [typ] - 500:1 [typ]	300 cd/m <sup>2</sup> [typ] - 1000:1 [typ]
<b>View Angle</b>	+/- 85 deg. [up/down/left/right]	+/- 89 deg. [up/down/left/right]
<b>Max Color Output</b>	16.7 million	16.7 million
<b>Sync. Signal Auto-detect</b>	Digital Separate Sync., Composite Sync., Sync. On Green	Digital Separate Sync., Composite Sync., Sync. On Green
<b>Synchronisation Range</b>	15.0 kHz to 91.1 kHz [H] - 60 Hz to 85 Hz [V]	15.0 kHz to 91.1 kHz [H] - 60 Hz to 85 Hz [V]
<b>Optimal Resolution and Hz</b>	1600 x 1200 [UXGA 4:3] @ 60 Hz	1680 x 1050 [WSXGA 16:10] @ 60 Hz
<b>Detectable Resolutions</b>	640 x 350 / 640 x 480 / 720 x 400 / 800 x 600 1024 x 768 / 1280 x 1024 / 1600 x 1200 / 1920 x 1200	640 x 350 / 640 x 480 / 720 x 400 / 800 x 600 1024 x 768 / 1280 x 1024 / 1600 x 1200 / 1680 x 1050
<b>Video Input Option</b>	YES via <b>HATTELAND® Multifunction Cable</b>	YES via <b>HATTELAND® Multifunction Cable</b>
<b>Supported Video Signals</b>	SVHS & COMPOSITE Compatible	SVHS & COMPOSITE Compatible
<b>Product Features</b>	PBP (Picture By Picture), PIP (Picture In Picture), HATTELAND® Multifunction Connector, Hotkey Functionality, Dimmable 0-100%	PBP (Picture By Picture), PIP (Picture In Picture), HATTELAND® Multifunction Connector, Hotkey Functionality, Dimmable 0-100%
<b>Power Input &amp; Power Consumption</b>	115/230VAC - 50/60Hz or 24 VDC - 100W [max]	115/230VAC - 50/60Hz or 24 VDC - 85W [typ] - 100W [max]
MECHANICAL DATA	JH 20T17 MMD	JH 22T11 MMD
<b>User Controls &amp; Activity</b>	Power On/Off + On Screen Display Menu (push button) Brightness Control Hotkeys (left/right - push buttons) Mode Status Illuminated LED-Ring Indicator	Power On/Off + On Screen Display Menu (push button) Brightness Control Hotkeys (left/right - push buttons) Mode Status Illuminated LED-Ring Indicator
<b>Connectors</b>	<b>DVI IN:</b> 1 x DVI-I 29P (female) <b>RGB IN:</b> 1 x HD D-SUB 15P (female) <b>RGB OUT:</b> 1 x HD D-SUB 15P (female) <b>Multifunction:</b> 1 x D-SUB 160p (female) <b>USB:</b> 1 x Type B (female) <b>AC Power IN:</b> 1 x Std IEC inlet <b>AC Power OUT:</b> 1 x Std IEC outlet (5A max) <b>If DC Power IN:</b> 1 x 2p D-SUB (male) Amphenol FCC17	<b>DVI IN:</b> 1 x DVI-I 29P (female) <b>RGB IN:</b> 1 x HD D-SUB 15P (female) <b>RGB OUT:</b> 1 x HD D-SUB 15P (female) <b>Multifunction:</b> 1 x D-SUB 160p (female) <b>USB:</b> 1 x Type B (female) <b>AC Power IN:</b> 1 x Std IEC inlet <b>AC Power OUT:</b> 1 x Std IEC outlet (5A max) <b>If DC Power IN:</b> 1 x 2p D-SUB (male) Amphenol FCC17
<b>Models Dimensions &amp; Weight</b>	534.00 [W] x 481.00 [H] x 87.00 [D] mm 21.02" [W] x 18.94" [H] x 3.43" [D] inch Approx 15 kg / 33 lbs	527.50 [W] x 444.00 [H] x 82.00 [D] mm 20.77" [W] x 17.48" [H] x 3.23" [D] inch Approx 15 kg / 33 lbs
<b>Factory Options</b>	1: 24 VDC Power Solution 2: Resistive or Capacitive Touchscreen 3: Keypad only or Keypad+Potmeter+Buzzer controls 4: Optical Bonding Technology 5: Speaker / Buzzer 6: Color Calibrated models [ECDIS]	1: 24 VDC Power Solution 2: Capacitive Touchscreen 3: Keypad only or Keypad+Potmeter+Buzzer controls 4: Optical Bonding Technology 5: Speaker / Buzzer 6: Color Calibrated models [ECDIS]
<b>Available Accessories</b>	Bracket (tilt up/down), Rotary Bracket (left/right), Sun Visor, VESA Bracket, Water Cover <b>Multifunction Cable Options:</b> 1 x RS-232 COM + 3 x BNC Video IN or 1 x RS-232 COM + 3 x BNC Video IN + 1 x COM Touch	Bracket (tilt up/down), EN60945 Tested Bracket (tilt up/down), Sun Visor, VESA Bracket, Water Cover <b>Multifunction Cable Options:</b> 1 x RS-232 COM + 3 x BNC Video IN or 1 x RS-232 COM + 3 x BNC Video IN + 1 x COM Touch
ENVIRONMENTAL DATA	JH 20T17 MMD	JH 22T11 MMD
<b>Operating Temperature</b>	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%
<b>Storage Temperature</b>	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%
<b>IP Rating</b>	Protection: IP66 front - IP20 rear [EN60529]	Protection: IP66 front - IP20 rear [EN60529]
<b>Compass Safe Distance</b>	Standard: 75 [29.53"] - Steering: 35 [13.78"] cm [inch]	Standard: 160 [62.99"] - Steering: 90 [35.43"] cm [inch]
TYPE APPROVAL & TESTING	JH 20T17 MMD	JH 22T11 MMD
	IEC 60945 4 <sup>th</sup> [EN 60945:2002] ClassNK - Nippon Kaiji Kyokai GL - Germanischer Lloyd DNV - Det Norske Veritas ABS - American Bureau of Shipping LRS - Lloyd's Register of Shipping BV - Bureau Veritas CCS - China Classification Society	IEC 60945 4 <sup>th</sup> [EN 60945:2002] ClassNK - Nippon Kaiji Kyokai GL - Germanischer Lloyd DNV - Det Norske Veritas ABS - American Bureau of Shipping LRS - Lloyd's Register of Shipping BV - Bureau Veritas CCS - China Classification Society

COMMERCIAL



# SPECIFICATIONS - DISPLAYS SERIES 1

## 23 INCH

With LED BACKLIGHT

THE  
WORLD'S  
FIRST



## 26 INCH WIDESCREEN



## 27 INCH WIDESCREEN



TECHNICAL DATA	JH 23T14 MMD	JH 26T11 MMD
<b>TFT Technology</b>	LED Backlight Technology, Thin Film Transistor (TFT) Active Matrix, MVA (Multi-domain Vertical Alignment) LCD Technology	S-MVA, Active Matrix, Thin Film Transistor (TFT), RGB Vertical Stripe
<b>Viewable Image Size &amp; Active Area</b>	23.1 inch - 470.4 [18.52"] (H) x 352.8 [13.89"] (V) mm [inch]	25.54 inch - 550.08 [21.66"] (H) x 343.8 [13.54"] (V) mm [inch]
<b>Native Resolution &amp; Pixel Pitch</b>	1600 x 1200 - 0.294 (H) x 0.294 (V) mm	1920 x 1200 - 0.2865 (H) x 0.2865 (V) mm
<b>Response Time</b>	12 ms (typ)	8 ms (typ)
<b>Light Intensity &amp; Contrast Ratio</b>	400 cd/m <sup>2</sup> (typ) - 600:1 (typ)	350 cd/m <sup>2</sup> (typ) - 1500:1 (typ)
<b>View Angle</b>	+/- 85 deg. (up/down/left/right)	+/- 88 deg. (up/down/left/right)
<b>Max Color Output</b>	16.7 million	16.7 million
<b>Sync. Signal Auto-detect</b>	Digital Separate Sync., Composite Sync., Sync. On Green	Digital Separate Sync., Composite Sync., Sync. On Green
<b>Synchronisation Range</b>	15.0 kHz to 91.1 kHz (H) - 60 Hz to 85 Hz (V)	15.0 kHz to 91.1 kHz (H) - 60 Hz to 85 Hz (V)
<b>Optimal Resolution and Hz</b>	1600 x 1200 (UXGA 4:3) @ 60 Hz	1920 x 1200 (WUXGA 16:10) @ 60 Hz
<b>Detectable Resolutions</b>	640 x 350 / 640 x 480 / 720 x 400 / 800 x 600 1024 x 768 / 1280 x 1024 / 1600 x 1200 / 1920 x 1200	640 x 350 / 640 x 480 / 720 x 400 / 800 x 600 1024 x 768 / 1280 x 1024 / 1600 x 1200 / 1920 x 1200
<b>Video Input Option</b>	YES via <b>HATTELAND® Multifunction Cable</b>	YES via <b>HATTELAND® Multifunction Cable</b>
<b>Supported Video Signals</b>	SVHS & COMPOSITE Compatible	SVHS & COMPOSITE Compatible
<b>Product Features</b>	LED Backlight Technology, Multi-power AC & DC, PBP (Picture By Picture), PIP (Picture In Picture), HATTELAND® Multifunction Connector, Hotkey Functionality, Dimmable 0-100%	Multi-power AC & DC, PBP (Picture By Picture), PIP (Picture In Picture), HATTELAND® Multifunction Connector, Hotkey Functionality, Dimmable 0-100%
<b>Power Input &amp; Power Consumption</b>	Multi-power 115/230VAC - 50/60Hz + 24 VDC - 95W (typ) - 125W (max)	Multi-power 115/230VAC - 50/60Hz + 24 VDC - 122W (typ) - 185W (max)
MECHANICAL DATA	JH 23T14 MMD	JH 26T11 MMD
<b>User Controls &amp; Activity</b>	Power On/Off + On Screen Display Menu (push button) Brightness Control Hotkeys (left/right - push buttons) Mode Status Illuminated LED-Ring Indicator	Power On/Off + On Screen Display Menu (push button) Brightness Control Hotkeys (left/right - push buttons) Mode Status Illuminated LED-Ring Indicator
<b>Connectors</b>	<b>DVI IN:</b> 1 x DVI-I 29P (female) <b>RGB IN:</b> 1 x HD D-SUB 15P (female) <b>RGB OUT:</b> 1 x HD D-SUB 15P (female) <b>Multifunction:</b> 1 x D-SUB 160p (female) <b>USB:</b> 1 x Type B (female) <b>AC Power IN:</b> 1 x Std IEC inlet <b>AC Power OUT:</b> 1 x Std IEC outlet (5A max) <b>DC Power IN:</b> 1 x 2p DSUB (male) Amphenol FCC17	<b>DVI IN:</b> 1 x DVI-I 29P (female) <b>RGB IN:</b> 1 x HD D-SUB 15P (female) <b>RGB OUT:</b> 1 x HD D-SUB 15P (female) <b>Multifunction:</b> 1 x D-SUB 160p (female) <b>USB:</b> 1 x Type B (female) <b>AC Power IN:</b> 1 x Std IEC inlet <b>AC Power OUT:</b> 1 x Std IEC outlet (5A max) <b>DC Power IN:</b> 1 x 2p DSUB (male) Amphenol FCC17
<b>Models Dimensions &amp; Weight</b>	584.00 (W) x 534.00 (H) x 85.00 (D) mm 22.99" (W) x 21.02" (H) x 3.35" (D) inch Approx 18 kg / 40 lbs	635.00 (W) x 499.00 (H) x 101.50 (D) mm 25.00" (W) x 19.65" (H) x 4.00" (D) inch Approx 15 kg / 33 lbs
<b>Factory Options</b>	1: Capacitive Touchscreen 2: Keypad only or Keypad+Potmeter+Buzzer controls 3: Optical Bonding Technology 4: Speaker / Buzzer 5: Color Calibrated models (ECDIS)	1: AC Power Input model Only 2: Keypad only or Keypad+Potmeter+Buzzer controls 3: Optical Bonding Technology 4: Speaker / Buzzer 5: Color Calibrated models (ECDIS)
<b>Available Accessories</b>	EN60945 Tested Bracket (tilt up/down), Bracket (tilt up/down), Rotary Bracket (left/right), Sun Visor, VESA Bracket, Water Cover <b>Multifunction Cable Options:</b> 1 x RS-232 COM + 3 x BNC Video In or 1 x RS-232 COM + 3 x BNC Video In + 1 x COM Touch	EN60945 Tested Bracket (tilt up/down), Bracket (tilt up/down), Sun Visor, VESA Bracket, Water Cover <b>Multifunction Cable Options:</b> 1 x RS-232 COM + 3 x BNC Video In or 1 x RS-232 COM + 3 x BNC Video In + 1 x COM Touch
<b>Capabilities / Prepared for</b>	N/A	Capacitive Touchscreen
ENVIRONMENTAL DATA	JH 23T14 MMD	JH 26T11 MMD
<b>Operating Temperature</b>	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%
<b>Storage Temperature</b>	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%
<b>IP Rating</b>	Protection: IP66 front - IP20 rear [EN60529]	Protection: IP66 front - IP20 rear [EN60529]
<b>Compass Safe Distance</b>	Standard: 160 [62.99"] - Steering: 105 [41.34"] cm [inch]	Standard: TBD - Steering: TBD
TYPE APPROVAL & TESTING	JH 23T14 MMD	JH 26T11 MMD
<b>Note:</b> Some of the Type Approvals could be pending. <b>Please check our website for the latest status.</b>	IEC 60945 4 <sup>th</sup> [EN 60945:2002] ClassNK - Nippon Kaiji Kyokai GL - Germanischer Lloyd DNV - Det Norske Veritas ABS - American Bureau of Shipping BV - Bureau Veritas LRS - Lloyd's Register of Shipping	IEC 60945 4 <sup>th</sup> [EN 60945:2002] ClassNK - Nippon Kaiji Kyokai GL - Germanischer Lloyd DNV - Det Norske Veritas ABS - American Bureau of Shipping BV - Bureau Veritas LRS - Lloyd's Register of Shipping

# SPECIFICATIONS - DISPLAYS SERIES 1

TECHNICAL DATA	JH 27T11 MMD
<b>TFT Technology</b>	a-Si TFT (Thin Film Transistor) Active Matrix, SPVA (Super Patterned Vertical Alignment) mode
<b>Viewable Image Size &amp; Active Area</b>	27.0 inch - 581.76 [22.90"] (H) x 363.6 [14.31"] (V) mm [inch]
<b>Native Resolution &amp; Pixel Pitch</b>	1920 x 1200 - 0.303 (H) x 0.303 (V) mm
<b>Response Time</b>	6 ms (typ)
<b>Light Intensity &amp; Contrast Ratio</b>	500 cd/m <sup>2</sup> (typ) - 1000:1 (typ)
<b>View Angle</b>	+/- 89 deg. (up/down/left/right)
<b>Max Color Output</b>	16.7 million
<b>Sync. Signal Auto-detect</b>	Digital Separate Sync., Composite Sync., Sync. On Green
<b>Synchronisation Range</b>	15.0 kHz to 91.1 kHz (H) - 60 Hz to 85 Hz (V)
<b>Optimal Resolution and Hz</b>	1920 x 1200 (WUXGA 16:10) @ 60 Hz
<b>Detectable Resolutions</b>	640 x 350 / 640 x 480 / 720 x 400 / 800 x 600 1024 x 768 / 1280 x 1024 / 1600 x 1200 / 1920 x 1200
<b>Video Input Option</b>	YES via <b>HATTELAND® Multifunction Cable</b>
<b>Supported Video Signals</b>	SVHS & COMPOSITE Compatible
<b>Product Features</b>	PBP (Picture By Picture), PIP (Picture In Picture), HATTELAND® Multifunction Connector, Hotkey Functionality, Dimmable 0-100%
<b>Power Input &amp; Power Consumption</b>	115/230VAC - 50/60Hz - 200W (max)
MECHANICAL DATA	JH 27T11 MMD
<b>User Controls &amp; Activity</b>	Power On/Off + On Screen Display Menu (push button) Brightness Control Hotkeys (left/right - push buttons) Mode Status Illuminated LED-Ring Indicator
<b>Connectors</b>	<b>DVI IN:</b> 1 x DVI-I 29P (female) <b>RGB IN:</b> 1 x HD D-SUB 15P (female) <b>RGB OUT:</b> 1 x HD D-SUB 15P (female) <b>Multifunction:</b> 1 x D-SUB 160p (female) <b>USB:</b> 1 x Type B (female) <b>AC Power IN:</b> 1 x Std IEC inlet <b>AC Power OUT:</b> 1 x Std IEC outlet (5A max)
<b>Models Dimensions &amp; Weight</b>	660.00 (W) x 481.00 (H) x 101.50 (D) mm 25.98" (W) x 18.94" (H) x 4.00" (D) inch Approx 16 kg / 35 lbs
<b>Factory Options</b>	1: Keypad only or Keypad+Potmeter+Buzzer controls 2: Optical Bonding Technology 3: Speaker / Buzzer 4: Color Calibrated models (ECDIS)
<b>Available Accessories</b>	EN60945 Tested Table/Foot Bracket, Wall/VESA Bracket, Water Cover <b>Multifunction Cable Options:</b> 1 x RS-232 COM + 3 x BNC Video In or 1 x RS-232 COM + 3 x BNC Video In + 1 x COM Touch
<b>Capabilities / Prepared for</b>	N/A
ENVIRONMENTAL DATA	JH 27T11 MMD
<b>Operating Temperature</b>	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%
<b>Storage Temperature</b>	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%
<b>IP Rating</b>	Protection: IP66 front - IP20 rear [EN60529]
<b>Compass Safe Distance</b>	Standard: 50 [19.69"] - Steering: 30 [11.81"] cm [inch]
TYPE APPROVAL & TESTING	JH 27T11 MMD
	IEC 60945 4 <sup>th</sup> [EN 60945:2002] ClassNK - Nippon Kaiji Kyokai GL - Germanischer Lloyd DNV - Det Norske Veritas ABS - American Bureau of Shipping LRS - Lloyd's Register of Shipping BV - Bureau Veritas CCS - China Classification Society

COMMERCIAL



NEW

## DISPLAYS SERIES X

As a leading manufacturer of display and computer hardware for the maritime segment, Hatteland Display continuously gauges and responds to market needs. Our commitment to develop specialized products for a multitude of onboard ship systems continues, and with that the introduction now of a brand new product range called, Series X.

With cast aluminium, compact (IP22) and sleek by design chassis, the units from this new range can be desk mount or console integrated. The design is modular, allowing for common modules to be used in various models and combinations. Together these design features bring about a range perfectly in synch to market cost expectations – along with that, the performance and type approval always expected in all Hatteland Display products.

All sizes are available in display or panel computer formats, as well as various performance specifications to choose from. There are standard base models available which are listed in the following pages.

The modules used in Series X, are all qualified having undergone and passed our extensive test program, which includes HALT testing. This means that the products are tested well outside the requirements in EN60945 and E10.

The result is a more reliable product.



**HATTELAND®**  
GLASS DISPLAY CONTROL™

COMMERCIAL

- IP22 / IP66
- MULTITOUCH
- TYPE APPROVED
- ECDIS COMPLIANT
- SUPERIOR BONDING TECHNOLOGY
- MODULE BASED, TAILOR-MADE SYSTEMS MADE EASY!
- FORM, FIT AND FUNCTION - LONG-TERM COMMITMENT
- SUNLIGHT READABLE / HIGH BRIGHT VERSIONS AVAILABLE
- GLASS DISPLAY CONTROL™ (GDC), SOLID STATE MENU SYSTEM





# SPECIFICATIONS - DISPLAYS SERIES X

## 8 INCH WIDESCREEN



## 12 INCH



Note:  
Some specifications are pending.

Please visit our website:  
[www.hatteland-display.com](http://www.hatteland-display.com)  
for up-to-date datasheets.

TECHNICAL DATA	HD 08T21 STD	HD 12T21 MMD
<b>TFT Technology</b>	LED Backlight, TTL Interface, a-si TFT Active Matrix, Widescreen	LED Backlight, TFT Active-matrix
<b>Viewable Image Size &amp; Active Area</b>	8.0 inch - 173.4 [6.83"] (H) x 104.4 [4.11"] (V) mm [inch]	12.1 inch - 245.76 [9.68"] (H) x 184.32 [7.26"] (V) mm [inch]
<b>Native Resolution &amp; Pixel Pitch</b>	800 x 480 - 0.2168 (H) x 0.2168 (V) mm	1024 x 768 - 0.24 (H) x 0.24 (V) mm
<b>Response Time</b>	5/11ms (typ) (Tr/Tf)	35ms (typ)
<b>Light Intensity &amp; Contrast Ratio</b>	600 cd/m <sup>2</sup> (typ) - 600:1 (typ) / High Bright versions TBD	500 cd/m <sup>2</sup> (typ) - 700:1 (typ) / High Bright versions TBD
<b>View Angle</b>	70 deg. (up/down) / 60 deg. (left/right)	80 deg. (up/down/left/right)
<b>Max Color Output</b>	16.7 million	16.7 million
<b>Sync. Signal Auto-detect</b>	Digital Separate Sync., Composite Sync., Sync. On Green	Digital Separate Sync., Composite Sync., Sync. On Green
<b>Synchronisation Range</b>	24 kHz to 81 kHz (H) - 50 Hz to 75 Hz (V)	31.5 kHz to 91.1 kHz (H) - 60 Hz to 85 Hz (V)
<b>Optimal Resolution and Hz</b>	800 x 480 WVGA (5:3) @ 60 Hz	1024 x 768 XGA (4:3) @ 60 Hz
<b>Detectable Resolutions</b>	800 x 480	640 x 350, 640 x 480, 720 x 400, 800 x 600, 1024 x 768
<b>Video Inputs</b>	None	Composite Video
<b>Supported Video Signals</b>	None	Interlaced HDTV, NTSC, PAL and SECAM video, Composite Video
<b>Product Features</b>	Projected Capacitive Technology (PCTouch) MULTITOUCH, LED Backlight Technology, Dimmable 0-100%, Buzzer	LED Backlight Technology, Dimmable 0-100%, PBP (Picture By Picture), PIP (Picture In Picture)
<b>Power Input &amp; Power Consumption</b>	Dual 24VDC, Galvanic Isolated, Automatic Switch <-> sources 20W (typ) - 30W (max)	12-24 VDC TBD W (typ) - 60W (max)
MECHANICAL DATA	HD 08T21 STD	HD 12T21 MMD
<b>User Controls &amp; Activity</b>	Glass Display Control™ (GDC) IP66 with: Power On/Off, On Screen Display Menu, Mode Status Indicator, Brightness Control (-/+) and Buzzer	Glass Display Control™ (GDC) IP66 with: Power On/Off, On Screen Display Menu, Brightness Control (-/+), Hotkeys (left/right), Mode Status Indicator, Buzzer, Light Sensor
<b>Connectors</b>	<b>DVI IN:</b> 1 x DVI-I 29P (female) or configurable as <b>RGB IN:</b> 1 x HD D-SUB 15P (female) via Adapter <b>USB:</b> 1 x Type B (female) <b>DC Power IN:</b> 1 x SL-SMT 90F (1 x 2 pole)	<b>DVI IN:</b> 2 x DVI-D 24P (female) <b>RGB IN:</b> 2 x HD D-SUB 15P (female) <b>Composite Video IN:</b> 3 x BNC <b>SCOM RS-422/485:</b> 1 x TBD connector, non-isolated + Buzzer <b>RGB OUT:</b> 1 x HD D-SUB 15P (female) <b>USB:</b> 1 x Type B (female) Reserved for touch screen <b>Ethernet:</b> 1 x RJ45 (female) for Remote Control <b>SCOM RS-232:</b> 1 x D-SUB 9P (female) non-isolated <b>Potmeter:</b> 1 x D-SUB 9P (male) [Potentiometer IN, +5VDC OUT, BRT +/- IN] <b>DC Power IN:</b> 1 x 2p TBD
<b>Models Dimensions &amp; Weight</b>	236.00 (W) x 166.00 (H) x 51.00 (D) mm 9.29" (W) x 6.54" (H) x 1.97" (D) inch Compatible VESA mounting 75mm Approx TBD kg / TBD lbs	314.00 (W) x 272.00 (H) x 64.50 (D) mm 12.36" (W) x 10.71" (H) x 2.52" (D) inch Approx TBD kg / TBD lbs
<b>Factory Options</b>	1: Optical Bonding Technology 2: Sunlight Readable / High Bright (includes Optical Bonding)	1: Projected Capacitive Technology (PCTouch) MULTITOUCH 2: Optical Bonding Technology 3: Sunlight Readable / High Bright (includes Optical Bonding)
<b>Available Accessories</b>	TBD	TBD
ENVIRONMENTAL DATA	HD 08T21 STD	HD 12T21 MMD
<b>Operating Temperature</b>	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%
<b>Storage Temperature</b>	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%
<b>IP Rating</b>	Protection: IP66 front - IP20 rear [EN60529]	Protection: IP66 front - IP22 rear [EN60529]
<b>Compass Safe Distance</b>	Standard: 45 [17.72"] - Steering: 25 [9.84"] cm [inch]	Standard: TBD - Steering: TBD cm [inch]
<b>Mean Time Between Failures</b>	MTBF TBD hours (MIL-HDBK-217 GB 25.0°C / 77.0°F)	MTBF TBD hours (MIL-HDBK-217 GB 25.0°C / 77.0°F)
TYPE APPROVAL & TESTING	HD 08T21 STD	HD 12T21 MMD
<b>Note:</b> Some of the Type Approvals could be pending.  Please check our website for the latest status.	IEC 60945 4 <sup>th</sup> [EN 60945:2002], IACS E10 ClassNK - Nippon Kaiji Kyokai GL - Germanischer Lloyd DNV - Det Norske Veritas ABS - American Bureau of Shipping BV - Bureau Veritas LRS - Lloyd's Register of Shipping	IEC 60945 4 <sup>th</sup> [EN 60945:2002], IACS E10 ClassNK - Nippon Kaiji Kyokai GL - Germanischer Lloyd DNV - Det Norske Veritas ABS - American Bureau of Shipping BV - Bureau Veritas CCS - China Classification Society LRS - Lloyd's Register of Shipping

# SPECIFICATIONS - DISPLAYS SERIES X

## 12 INCH



## 13 INCH WIDESCREEN



Note:  
Some specifications are pending.

Please visit our website:  
[www.hatteland-display.com](http://www.hatteland-display.com)  
for up-to-date datasheets.

TECHNICAL DATA	HD 12T21 STD	HD 13T21 STD
<b>TFT Technology</b>	LED Backlight, TFT Active-matrix	CCFL Backlight, a-si TFT Active Matrix, Widescreen
<b>Viewable Image Size &amp; Active Area</b>	12.1 inch - 245.76 [9.68"] (H) x 184.32 [7.26"] (V) mm [inch]	13.3 inch - 286.08 [11.26"] (H) x 178.80 [7.04"] (V) mm [inch]
<b>Native Resolution &amp; Pixel Pitch</b>	1024 x 768 - 0.24 (H) x 0.24 (V) mm	1280 x 800 - 0.2235 (H) x 0.2235 (V) mm
<b>Response Time</b>	35ms (typ)	6/10ms (typ) (Tr/Tf)
<b>Light Intensity &amp; Contrast Ratio</b>	500 cd/m <sup>2</sup> (typ) - 700:1 (typ) / High Bright versions TBD	400 cd/m <sup>2</sup> (typ) - 800:1 (typ) / High Bright versions TBD
<b>View Angle</b>	80 deg. (up/down/left/right)	70 deg. (up/down) / 60 deg. (left/right)
<b>Max Color Output</b>	16.7 million	16.7 million
<b>Sync. Signal Auto-detect</b>	Digital Separate Sync., Composite Sync., Sync. On Green	Digital Separate Sync., Composite Sync., Sync. On Green
<b>Synchronisation Range</b>	31.5 kHz to 91.1 kHz (H) - 60 Hz to 85 Hz (V)	24 kHz to 81 kHz (H) - 50 Hz to 75 Hz (V)
<b>Optimal Resolution and Hz</b>	1024 x 768 XGA (4:3) @ 60 Hz	1280 x 800 WXGA (16:10) @ 60 Hz
<b>Detectable Resolutions</b>	640 x 350, 640 x 480, 720 x 400, 800 x 600, 1024 x 768	1280 x 800
<b>Video Input Option</b>	None	None
<b>Supported Video Signals</b>	None	None
<b>Product Features</b>	LED Backlight Technology, Dimmable 0-100%	Projected Capacitive Technology (PCTouch) MULTITOUCH, Dimmable 0-100%, Buzzer
<b>Power Input &amp; Power Consumption</b>	12-24 VDC TBD W (typ) - 60W (max)	Dual 24VDC, Galvanic Isolated, Automatic Switch <-> sources 20W (typ) - 30W (max)
MECHANICAL DATA	HD 12T21 STD	HD 13T21 STD
<b>User Controls &amp; Activity</b>	Glass Display Control™ (GDC) IP66 with: Power On/Off, On Screen Display Menu, Brightness Control (-/+), Mode Status Indicator (Service), Hotkeys (left/right), Buzzer, Light Sensor	Glass Display Control™ (GDC) IP66 with: Power On/Off, Brightness Control (-/+), Mode Status Indicator, Buzzer
<b>Connectors</b>	<b>DVI IN:</b> 1 x DVI-D 24P (female) <b>RGB IN:</b> 1 x HD D-SUB 15P (female) <b>SCOM RS-422/485:</b> 1 x TBD connector, non-isolated + Buzzer <b>SCOM RS-232:</b> 1 x D-SUB 9P (female) non-isolated <b>DC Power IN:</b> 1 x 2p TBD	<b>DVI IN:</b> 1 x DVI-I 29P (female) or configurable as <b>RGB IN:</b> 1 x HD D-SUB 15P (female) via Adapter <b>USB:</b> 1 x Type B (female) <b>DC Power IN:</b> 1 x SL-SMT 90F (1 x 2 pole)
<b>Models Dimensions &amp; Weight</b>	314.00 (W) x 272.00 (H) x 64.50 (D) mm 12.36" (W) x 10.71" (H) x 2.52" (D) inch Approx TBD kg / TBD lbs	355.00 (W) x 248.50 (H) x 58.00 (D) mm 13.98" (W) x 9.78" (H) x 2.28" (D) inch Approx TBD kg / TBD lbs
<b>Factory Options</b>	1: Projected Capacitive Technology (PCTouch) MULTITOUCH 2: Optical Bonding Technology 3: Sunlight Readable / High Bright (includes Optical Bonding) 4: Multi-power supply 115/230VAC - 50/60Hz + 24 VDC inputs	1: Optical Bonding Technology 2: Sunlight Readable / High Bright (includes Optical Bonding)
<b>Available Accessories</b>	TBD	TBD
ENVIRONMENTAL DATA	HD 12T21 STD	HD 13T21 STD
<b>Operating Temperature</b>	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%
<b>Storage Temperature</b>	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%
<b>IP Rating</b>	Protection: IP66 front - IP22 rear [EN60529]	Protection: IP66 front - IP22 rear [EN60529]
<b>Compass Safe Distance</b>	Standard: TBD - Steering: TBD cm [inch]	Standard: 80 [31.50"] - Steering: 45 [17.72"] cm [inch]
<b>Mean Time Between Failures</b>	MTBF TBD hours (MIL-HDBK-217 GB 25.0°C / 77.0°F)	MTBF TBD hours (MIL-HDBK-217 GB 25.0°C / 77.0°F)
TYPE APPROVAL & TESTING	HD 12T21 STD	HD 13T21 STD
<b>Note:</b> Some of the Type Approvals could be pending.  Please check our website for the latest status.	IEC 60945 4 <sup>th</sup> [EN 60945:2002], IACS E10 ClassNK - Nippon Kaiji Kyokai GL - Germanischer Lloyd DNV - Det Norske Veritas ABS - American Bureau of Shipping BV - Bureau Veritas CCS - China Classification Society LRS - Lloyd's Register of Shipping	IEC 60945 4 <sup>th</sup> [EN 60945:2002], IACS E10 ClassNK - Nippon Kaiji Kyokai GL - Germanischer Lloyd DNV - Det Norske Veritas ABS - American Bureau of Shipping BV - Bureau Veritas LRS - Lloyd's Register of Shipping

# SPECIFICATIONS - DISPLAYS SERIES X

15 INCH



15 INCH



Note:  
Some specifications are pending.

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for up-to-date datasheets.

TECHNICAL DATA	HD 15T21 MMD	HD 15T21 STD
<b>TFT Technology</b>	LED Backlight, TFT Active-matrix	LED Backlight, TFT Active-matrix
<b>Viewable Image Size &amp; Active Area</b>	15.0 inch - 304.10 [11.97"] (H) x 228.10 [8.98"] (V) mm [inch]	15.0 inch - 304.1 [11.97"] (H) x 228.1 [8.98"] (V) mm [inch]
<b>Native Resolution &amp; Pixel Pitch</b>	1024 x 768 - 0.297 (H) x 0.297 (V) mm	1024 x 768 - 0.297 (H) x 0.297 (V) mm
<b>Response Time</b>	8ms (typ)	8ms (typ)
<b>Light Intensity &amp; Contrast Ratio</b>	400 cd/m <sup>2</sup> (typ) - 700:1 (typ) / High Bright versions TBD	400 cd/m <sup>2</sup> (typ) - 700:1 (typ) / High Bright versions TBD
<b>View Angle</b>	80 deg. (up/down/left/right)	80 deg. (up/down/left/right)
<b>Max Color Output</b>	16.7 million	16.7 million
<b>Sync. Signal Auto-detect</b>	Digital Separate Sync., Composite Sync., Sync. On Green	Digital Separate Sync., Composite Sync., Sync. On Green
<b>Synchronisation Range</b>	31.5 kHz to 91.1 kHz (H) - 60 Hz to 85 Hz (V)	31.5 kHz to 91.1 kHz (H) - 60 Hz to 85 Hz (V)
<b>Optimal Resolution and Hz</b>	1024 x 768 XGA (4:3) @ 60 Hz	1024 x 768 XGA (4:3) @ 60 Hz
<b>Detectable Resolutions</b>	640 x 350, 640 x 480, 720 x 400, 800 x 600, 1024 x 768	640 x 350, 640 x 480, 720 x 400, 800 x 600, 1024 x 768
<b>Video Input Option</b>	Composite Video	None
<b>Supported Video Signals</b>	Interlaced HDTV, NTSC, PAL and SECAM video Composite Video	None
<b>Product Features</b>	LED Backlight Technology, Dimmable 0-100%, Multi-power AC & DC, PBP (Picture By Picture), PIP (Picture In Picture)	LED Backlight Technology, Dimmable 0-100%, Multi-power AC & DC
<b>Power Input &amp; Power Consumption</b>	Multi-power 115/230VAC - 50/60Hz + 24 VDC TBD W (typ) - 60W (max)	Multi-power 115/230VAC - 50/60Hz + 24 VDC TBD W (typ) - 60W (max)
MECHANICAL DATA	HD 15T21 MMD	HD 15T21 STD
<b>User Controls &amp; Activity</b>	Glass Display Control™ (GDC) IP66 with: Power On/Off, On Screen Display Menu, Brightness Control (-/+), Mode Status Indicator (Service), Hotkeys (left/right), Buzzer, Light Sensor	Glass Display Control™ (GDC) IP66 with: Power On/Off, On Screen Display Menu, Brightness Control (-/+), Mode Status Indicator (Service), Hotkeys (left/right), Buzzer, Light Sensor
<b>Connectors</b>	<b>DVI IN:</b> 2 x DVI-D 24P (female) <b>RGB IN:</b> 2 x HD D-SUB 15P (female) <b>Composite Video IN:</b> 3 x BNC <b>SCOM RS-422/485:</b> 1 x TBD conn. non-isolated + Buzzer <b>RGB OUT:</b> 1 x HD D-SUB 15P (female) <b>USB:</b> 1 x Type B (female) Reserved for touch screen <b>Ethernet:</b> 1 x RJ45 (female) for Remote Control <b>SCOM RS-232:</b> 1 x D-SUB 9P (female) non-isolated <b>Potmeter:</b> 1 x D-SUB 9P (male) (Potentiometer IN, +5VDC OUT, BRT +/- IN) <b>AC Power IN:</b> 1 x Std IEC inlet <b>DC Power IN:</b> 1 x 2p TBD	<b>DVI IN:</b> 1 x DVI-D 24P (female) <b>RGB IN:</b> 1 x HD D-SUB 15P (female) <b>SCOM RS-422/485:</b> 1 x TBD conn. non-isolated + Buzzer <b>SCOM RS-232:</b> 1 x D-SUB 9P (female) non-isolated <b>AC Power IN:</b> 1 x Std IEC inlet <b>DC Power IN:</b> 1 x 2p TBD
<b>Models Dimensions &amp; Weight</b>	356.00 (W) x 307.00 (H) x 71.50 (D) mm 14.02" (W) x 12.09" (H) x 2.81" (D) inch Approx TBD kg / TBD lbs	356.00 (W) x 307.00 (H) x 71.50 (D) mm 14.02" (W) x 12.09" (H) x 2.81" (D) inch Approx TBD kg / TBD lbs
<b>Factory Options</b>	1: Projected Capacitive Technology (PCTouch) MULTITOUCH 2: Optical Bonding Technology 3: Sunlight Readable / High Bright (includes Optical Bonding) 4: 12-24VDC Power Input	1: Projected Capacitive Technology (PCTouch) MULTITOUCH 2: Optical Bonding Technology 3: Sunlight Readable / High Bright (includes Optical Bonding) 4: 12-24VDC Power Input
<b>Available Accessories</b>	TBD	TBD
ENVIRONMENTAL DATA	HD 15T21 MMD	HD 15T21 STD
<b>Operating Temperature</b>	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%
<b>Storage Temperature</b>	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%
<b>IP Rating</b>	Protection: IP66 front - IP22 rear [EN60529]	Protection: IP66 front - IP22 rear [EN60529]
<b>Compass Safe Distance</b>	Standard: TBD - Steering: TBD cm [inch]	Standard: TBD - Steering: TBD cm [inch]
<b>Mean Time Between Failures</b>	MTBF TBD hours (MIL-HDBK-217 GB 25.0°C / 77.0°F)	MTBF TBD hours (MIL-HDBK-217 GB 25.0°C / 77.0°F)
TYPE APPROVAL & TESTING	HD 15T21 MMD	HD 15T21 STD
<b>Note: Some of the Type Approvals could be pending.</b>  <b>Please check our website for the latest status.</b>	IEC 60945 4 <sup>th</sup> [EN 60945:2002], IACS E10 ClassNK - Nippon Kaiji Kyokai GL - Germanischer Lloyd DNV - Det Norske Veritas ABS - American Bureau of Shipping BV - Bureau Veritas CCS - China Classification Society LRS - Lloyd's Register of Shipping	IEC 60945 4 <sup>th</sup> [EN 60945:2002], IACS E10 ClassNK - Nippon Kaiji Kyokai GL - Germanischer Lloyd DNV - Det Norske Veritas ABS - American Bureau of Shipping BV - Bureau Veritas CCS - China Classification Society LRS - Lloyd's Register of Shipping

# SPECIFICATIONS - DISPLAYS SERIES X

17 INCH



17 INCH



Note:  
Some specifications are pending.

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for up-to-date datasheets.

TECHNICAL DATA	HD 17T21 MMD	HD 17T21 STD
<b>TFT Technology</b>	LED Backlight, TFT Active-matrix	LED Backlight, TFT Active-matrix
<b>Viewable Image Size &amp; Active Area</b>	17.0 inch - 337.92 [13.30"] (H) x 270.34 [10.64"] (V) mm [inch]	17.0 inch - 337.92 [13.30"] (H) x 270.34 [10.64"] (V) mm [inch]
<b>Native Resolution &amp; Pixel Pitch</b>	1280 x 1024 - 0.264 (H) x 0.264 (V) mm	1280 x 1024 - 0.264 (H) x 0.264 (V) mm
<b>Response Time</b>	5ms (typ)	5ms (typ)
<b>Light Intensity &amp; Contrast Ratio</b>	350 cd/m <sup>2</sup> (typ) - 1000:1 (typ) / High Bright versions TBD	350 cd/m <sup>2</sup> (typ) - 1000:1 (typ) / High Bright versions TBD
<b>View Angle</b>	80 deg. (up/down/left/right)	80 deg. (up/down/left/right)
<b>Max Color Output</b>	16.7 million	16.7 million
<b>Sync. Signal Auto-detect</b>	Digital Separate Sync., Composite Sync., Sync. On Green	Digital Separate Sync., Composite Sync., Sync. On Green
<b>Synchronisation Range</b>	31.5 kHz to 91.1 kHz (H) - 60 Hz to 85 Hz (V)	31.5 kHz to 91.1 kHz (H) - 60 Hz to 85 Hz (V)
<b>Optimal Resolution and Hz</b>	1280 x 1024 SXGA (5:4) @ 60 Hz	1280 x 1024 SXGA (5:4) @ 60 Hz
<b>Detectable Resolutions</b>	640 x 350, 640 x 480, 720 x 400, 800 x 600, 1024 x 768, 1280 x 1024	640 x 350, 640 x 480, 720 x 400, 800 x 600, 1024 x 768, 1280 x 1024
<b>Video Input Option</b>	Composite Video	None
<b>Supported Video Signals</b>	Interlaced HDTV, NTSC, PAL and SECAM video, Composite Video	None
<b>Product Features</b>	LED Backlight Technology, Dimmable 0-100%, Multi-power AC & DC, PBP (Picture By Picture), PIP (Picture In Picture)	LED Backlight Technology, Dimmable 0-100%, Multi-power AC & DC
<b>Power Input &amp; Power Consumption</b>	Multi-power 115/230VAC - 50/60Hz + 24 VDC TBD W (typ) - 60W (max)	Multi-power 115/230VAC - 50/60Hz + 24 VDC TBD W (typ) - 60W (max)
MECHANICAL DATA	HD 17T21 MMD	HD 17T21 STD
<b>User Controls &amp; Activity</b>	Glass Display Control™ (GDC) IP66 with: Power On/Off, On Screen Display Menu, Brightness Control (-/+), Mode Status Indicators (ECDIS, Service), Hotkeys (left/right), Buzzer, Light Sensor	Glass Display Control™ (GDC) IP66 with: Power On/Off, On Screen Display Menu, Brightness Control (-/+), Mode Status Indicators (ECDIS, Service), Hotkeys (left/right), Buzzer, Light Sensor
<b>Connectors</b>	<b>DVI IN:</b> 2 x DVI-D 24P (female) <b>RGB IN:</b> 2 x HD D-SUB 15P (female) <b>Composite Video IN:</b> 3 x BNC <b>SCOM RS-422/485:</b> 1 x TBD conn. non-isolated + Buzzer <b>RGB OUT:</b> 1 x HD D-SUB 15P (female) <b>USB:</b> 1 x Type B (female) Reserved for touch screen <b>Ethernet:</b> 1 x RJ45 (female) for Remote Control <b>SCOM RS-232:</b> 1 x D-SUB 9P (female) non-isolated <b>Potmeter:</b> 1 x D-SUB 9P (male) (Potentiometer IN, +5VDC OUT, BRT +/- IN) <b>AC Power IN:</b> 1 x Std IEC inlet <b>DC Power IN:</b> 1 x 2p TBD	<b>DVI IN:</b> 1 x DVI-D 24P (female) <b>RGB IN:</b> 1 x HD D-SUB 15P (female) <b>SCOM RS-422/485:</b> 1 x TBD conn. non-isolated + Buzzer <b>SCOM RS-232:</b> 1 x D-SUB 9P (female) non-isolated <b>AC Power IN:</b> 1 x Std IEC inlet <b>DC Power IN:</b> 1 x 2p TBD
<b>Models Dimensions &amp; Weight</b>	390.00 (W) x 351.00 (H) x 73.50 (D) mm 15.35" (W) x 13.82" (H) x 2.89" (D) inch Approx TBD kg / TBD lbs	390.00 (W) x 351.00 (H) x 73.50 (D) mm 15.35" (W) x 13.82" (H) x 2.89" (D) inch Approx TBD kg / TBD lbs
<b>Factory Options</b>	1: Projected Capacitive Technology (PCTouch) MULTITOUCH 2: Optical Bonding Technology 3: Sunlight Readable / High Bright (includes Optical Bonding) 4: Color Calibrated models (ECDIS) 5: 12-24 Power Input	1: Projected Capacitive Technology (PCTouch) MULTITOUCH 2: Optical Bonding Technology 3: Sunlight Readable / High Bright (includes Optical Bonding) 4: Color Calibrated models (ECDIS) 5: 12-24 Power Input
<b>Available Accessories</b>	TBD	TBD
ENVIRONMENTAL DATA	HD 17T21 MMD	HD 17T21 STD
<b>Operating Temperature</b>	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%
<b>Storage Temperature</b>	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%
<b>IP Rating</b>	Protection: IP66 front - IP22 rear [EN60529]	Protection: IP66 front - IP22 rear [EN60529]
<b>Compass Safe Distance</b>	Standard: TBD - Steering: TBD cm [inch]	Standard: TBD - Steering: TBD cm [inch]
<b>Mean Time Between Failures</b>	MTBF TBD hours (MIL-HDBK-217 GB 25.0°C / 77.0°F)	MTBF TBD hours (MIL-HDBK-217 GB 25.0°C / 77.0°F)
TYPE APPROVAL & TESTING	HD 17T21 MMD	HD 17T21 STD
<b>Note: Some of the Type Approvals could be pending.</b>  <b>Please check our website for the latest status.</b>	IEC 60945 4 <sup>th</sup> [EN 60945:2002], IACS E10 ClassNK - Nippon Kaiji Kyokai GL - Germanischer Lloyd DNV - Det Norske Veritas ABS - American Bureau of Shipping BV - Bureau Veritas CCS - China Classification Society LRS - Lloyd's Register of Shipping	IEC 60945 4 <sup>th</sup> [EN 60945:2002], IACS E10 ClassNK - Nippon Kaiji Kyokai GL - Germanischer Lloyd DNV - Det Norske Veritas ABS - American Bureau of Shipping BV - Bureau Veritas CCS - China Classification Society LRS - Lloyd's Register of Shipping



# SPECIFICATIONS - DISPLAYS SERIES X

# SPECIFICATIONS - DISPLAYS SERIES X

Note:  
Some specifications are pending.

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for up-to-date datasheets.

19 INCH



19 INCH



TECHNICAL DATA	HD 19T21 MMD	HD 19T21 STD
<b>TFT Technology</b>	LED Backlight, TFT Active-matrix, MVA (Multi-domain Vertical Alignment) LCD Technology	LED Backlight, TFT Active-matrix, MVA (Multi-domain Vertical Alignment) LCD Technology
<b>Viewable Image Size &amp; Active Area</b>	19.0 inch - 376.32 [14.82"] (H) x 301.06 [11.85"] (V) mm [inch]	19.0 inch - 376.32 [14.82"] (H) x 301.06 [11.85"] (V) mm [inch]
<b>Native Resolution &amp; Pixel Pitch</b>	1280 x 1024 - 0.294 (H) x 0.294 (V) mm	1280 x 1024 - 0.294 (H) x 0.294 (V) mm
<b>Response Time</b>	20ms (typ)	20ms (typ)
<b>Light Intensity &amp; Contrast Ratio</b>	300 cd/m <sup>2</sup> (typ) - 1000:1 (typ) / High Bright versions TBD	300 cd/m <sup>2</sup> (typ) - 1000:1 (typ) / High Bright versions TBD
<b>View Angle</b>	89 deg. (up/down/left/right)	89 deg. (up/down/left/right)
<b>Max Color Output</b>	16.7 million	16.7 million
<b>Sync. Signal Auto-detect</b>	Digital Separate Sync., Composite Sync., Sync. On Green	Digital Separate Sync., Composite Sync., Sync. On Green
<b>Synchronisation Range</b>	31.5 kHz to 91.1 kHz (H) - 60 Hz to 85 Hz (V)	31.5 kHz to 91.1 kHz (H) - 60 Hz to 85 Hz (V)
<b>Optimal Resolution and Hz</b>	1280 x 1024 SXGA [5:4] @ 60 Hz	1280 x 1024 SXGA [5:4] @ 60 Hz
<b>Detectable Resolutions</b>	640 x 350, 640 x 480, 720 x 400, 800 x 600, 1024 x 768, 1280 x 1024	640 x 350, 640 x 480, 720 x 400, 800 x 600, 1024 x 768, 1280 x 1024
<b>Video Input Option</b>	Composite Video	None
<b>Supported Video Signals</b>	Interlaced HDTV, NTSC, PAL and SECAM video, Composite Video	None
<b>Product Features</b>	LED Backlight Technology, Dimmable 0-100%, Multi-power AC & DC, PBP (Picture By Picture), PIP (Picture In Picture)	LED Backlight Technology, Dimmable 0-100%, Multi-power AC & DC
<b>Power Input &amp; Power Consumption</b>	Multi-power 115/230VAC - 50/60Hz + 24 VDC TBD W (typ) - 125W (max)	Multi-power 115/230VAC - 50/60Hz + 24 VDC TBD W (typ) - 125W (max)
MECHANICAL DATA	HD 19T21 MMD	HD 19T21 STD
<b>User Controls &amp; Activity</b>	Glass Display Control™ (GDC) IP66 with: Power On/Off, On Screen Display Menu, Brightness Control (-/+), Mode Status Indicators (ECDIS, Service), Hotkeys (left/right), Buzzer, Light Sensor	Glass Display Control™ (GDC) IP66 with: Power On/Off, On Screen Display Menu, Brightness Control (-/+), Mode Status Indicators (ECDIS, Service), Hotkeys (left/right), Buzzer, Light Sensor
<b>Connectors</b>	<b>DVI IN:</b> 2 x DVI-D 24P (female) <b>RGB IN:</b> 2 x HD D-SUB 15P (female) <b>Composite Video IN:</b> 3 x BNC <b>SCOM RS-422/485:</b> 1 x TBD conn. non-isolated + Buzzer <b>RGB OUT:</b> 1 x HD D-SUB 15P (female) <b>USB:</b> 1 x Type B (female) Reserved for touch screen <b>Ethernet:</b> 1 x RJ45 (female) for Remote Control <b>SCOM RS-232:</b> 1 x D-SUB 9P (female) non-isolated <b>Potmeter:</b> 1 x D-SUB 9P (male) (Potentiometer IN, +5VDC OUT, BRT +/- IN) <b>AC Power IN:</b> 1 x Std IEC inlet <b>DC Power IN:</b> 1 x 2p TBD	<b>DVI IN:</b> 1 x DVI-D 24P (female) <b>RGB IN:</b> 1 x HD D-SUB 15P (female) <b>SCOM RS-422/485:</b> 1 x TBD conn. non-isolated + Buzzer <b>SCOM RS-232:</b> 1 x D-SUB 9P (female) non-isolated <b>AC Power IN:</b> 1 x Std IEC inlet <b>DC Power IN:</b> 1 x 2p TBD
<b>Models Dimensions &amp; Weight</b>	429.00 (W) x 382.00 (H) x 74.50 (D) mm 16.89" (W) x 15.04" (H) x 2.93" (D) inch Approx TBD kg / TBD lbs	429.00 (W) x 382.00 (H) x 74.50 (D) mm 16.89" (W) x 15.04" (H) x 2.93" (D) inch Approx TBD kg / TBD lbs
<b>Factory Options</b>	1: Projected Capacitive Technology (PCTouch) MULTITOUCH 2: Optical Bonding Technology 3: Sunlight Readable / High Bright (includes Optical Bonding) 4: Color Calibrated models (ECDIS) 5: 12-24VDC Power Input	1: Projected Capacitive Technology (PCTouch) MULTITOUCH 2: Optical Bonding Technology 3: Sunlight Readable / High Bright (includes Optical Bonding) 4: Color Calibrated models (ECDIS) 5: 12-24VDC Power Input
<b>Available Accessories</b>	TBD	TBD
ENVIRONMENTAL DATA	HD 19T21 MMD	HD 19T21 STD
<b>Operating Temperature</b>	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%
<b>Storage Temperature</b>	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%
<b>IP Rating</b>	Protection: IP66 front - IP22 rear (EN60529)	Protection: IP66 front - IP22 rear (EN60529)
<b>Compass Safe Distance</b>	Standard: TBD - Steering: TBD cm [inch]	Standard: TBD - Steering: TBD cm [inch]
<b>Mean Time Between Failures</b>	MTBF TBD hours (MIL-HDBK-217 GB 25.0°C / 77.0°F)	MTBF TBD hours (MIL-HDBK-217 GB 25.0°C / 77.0°F)
TYPE APPROVAL & TESTING	HD 19T21 MMD	HD 19T21 STD
<b>Note:</b> Some of the Type Approvals could be pending.  Please check our website for the latest status.	IEC 60945 4 <sup>th</sup> [EN 60945:2002], IACS E10 ClassNK - Nippon Kaiji Kyokai GL - Germanischer Lloyd DNV - Det Norske Veritas ABS - American Bureau of Shipping BV - Bureau Veritas CCS - China Classification Society LRS - Lloyd's Register of Shipping	IEC 60945 4 <sup>th</sup> [EN 60945:2002], IACS E10 ClassNK - Nippon Kaiji Kyokai GL - Germanischer Lloyd DNV - Det Norske Veritas ABS - American Bureau of Shipping BV - Bureau Veritas CCS - China Classification Society LRS - Lloyd's Register of Shipping

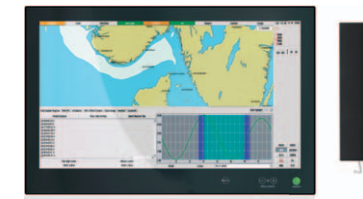
Note:  
Some specifications are pending.

Please visit our website:  
[www.hatteland-display.com](http://www.hatteland-display.com)  
for up-to-date datasheets.

24 INCH WIDESCREEN



24 INCH WIDESCREEN



TECHNICAL DATA	HD 24T21 MMD	HD 24T21 STD
<b>TFT Technology</b>	LED Backlight, TFT Active-matrix, Widescreen MVA (Multi-domain Vertical Alignment) LCD Technology	LED Backlight, TFT Active-matrix, Widescreen MVA (Multi-domain Vertical Alignment) LCD Technology
<b>Viewable Image Size &amp; Active Area</b>	24.0 inch - 531.36 [20.92"] (H) x 298.89 [11.77"] (V) mm [inch]	24.0 inch - 531.36 [20.92"] (H) x 298.89 [11.77"] (V) mm [inch]
<b>Native Resolution &amp; Pixel Pitch</b>	1920 x 1080 - 0.276 (H) x 0.276 (V) mm	1920 x 1080 - 0.276 (H) x 0.276 (V) mm
<b>Response Time</b>	25ms (typ)	25ms (typ)
<b>Light Intensity &amp; Contrast Ratio</b>	250 cd/m <sup>2</sup> (typ) - 3000:1 (typ) / High Bright versions TBD	250 cd/m <sup>2</sup> (typ) - 3000:1 (typ) / High Bright versions TBD
<b>View Angle</b>	89 deg. (up/down/left/right)	89 deg. (up/down/left/right)
<b>Max Color Output</b>	16.7 million	16.7 million
<b>Sync. Signal Auto-detect</b>	Digital Separate Sync., Composite Sync., Sync. On Green	Digital Separate Sync., Composite Sync., Sync. On Green
<b>Synchronisation Range</b>	31.5 kHz to 91.1 kHz (H) - 60 Hz to 85 Hz (V)	31.5 kHz to 91.1 kHz (H) - 60 Hz to 85 Hz (V)
<b>Optimal Resolution and Hz</b>	1920 x 1080 FHD [16:9] @ 60 Hz	1920 x 1080 FHD [16:9] @ 60 Hz
<b>Detectable Resolutions</b>	640 x 350, 640 x 480, 720 x 400, 800 x 600, 1024 x 768, 1280 x 1024, 1600 x 1200, 1920 x 1080, 1920 x 1200	640 x 350, 640 x 480, 720 x 400, 800 x 600, 1024 x 768, 1280 x 1024, 1600 x 1200, 1920 x 1080, 1920 x 1200
<b>Video Input Option</b>	Composite Video	None
<b>Supported Video Signals</b>	Interlaced HDTV, NTSC, PAL and SECAM video, Composite Video	None
<b>Product Features</b>	LED Backlight Technology, Dimmable 0-100%, Multi-power AC & DC, PBP (Picture By Picture), PIP (Picture In Picture)	LED Backlight Technology, Dimmable 0-100%, Multi-power AC & DC
<b>Power Input &amp; Power Consumption</b>	Multi-power 115/230VAC - 50/60Hz + 24 VDC TBD W (typ) - 125W (max)	Multi-power 115/230VAC - 50/60Hz + 24 VDC TBD W (typ) - 125W (max)
MECHANICAL DATA	HD 24T21 MMD	HD 24T21 STD
<b>User Controls &amp; Activity</b>	Glass Display Control™ (GDC) IP66 with: Power On/Off, On Screen Display Menu, Brightness Control (-/+), Mode Status Indicators (ECDIS, Service), Hotkeys (left/right), Buzzer, Light Sensor	Glass Display Control™ (GDC) IP66 with: Power On/Off, On Screen Display Menu, Brightness Control (-/+), Mode Status Indicators (ECDIS, Service), Hotkeys (left/right), Buzzer, Light Sensor
<b>Connectors</b>	<b>DVI IN:</b> 2 x DVI-D 24P (female) <b>RGB IN:</b> 2 x HD D-SUB 15P (female) <b>Composite Video IN:</b> 3 x BNC <b>SCOM RS-422/485:</b> 1 x TBD conn. non-isolated + Buzzer <b>RGB OUT:</b> 1 x HD D-SUB 15P (female) <b>USB:</b> 1 x Type B (female) Reserved for touch screen <b>Ethernet:</b> 1 x RJ45 (female) for Remote Control <b>SCOM RS-232:</b> 1 x D-SUB 9P (female) non-isolated <b>Potmeter:</b> 1 x D-SUB 9P (male) (Potentiometer IN, +5VDC OUT, BRT +/- IN) <b>AC Power IN:</b> 1 x Std IEC inlet <b>DC Power IN:</b> 1 x 2p TBD	<b>DVI IN:</b> 1 x DVI-D 24P (female) <b>RGB IN:</b> 1 x HD D-SUB 15P (female) <b>SCOM RS-422/485:</b> 1 x TBD conn. non-isolated + Buzzer <b>SCOM RS-232:</b> 1 x D-SUB 9P (female) non-isolated <b>AC Power IN:</b> 1 x Std IEC inlet <b>DC Power IN:</b> 1 x 2p TBD
<b>Models Dimensions &amp; Weight</b>	593.00 (W) x 384.00 (H) x 70.00 (D) mm 23.35" (W) x 13.70" (H) x 2.76" (D) inch Approx 14 kg / 31 lbs	593.00 (W) x 384.00 (H) x 70.00 (D) mm 23.35" (W) x 13.70" (H) x 2.76" (D) inch Approx 14 kg / 31 lbs
<b>Factory Options</b>	1: Projected Capacitive Technology (PCTouch) MULTITOUCH 2: Optical Bonding Technology 3: Sunlight Readable / High Bright (includes Optical Bonding) 4: Color Calibrated models (ECDIS)	1: Projected Capacitive Technology (PCTouch) MULTITOUCH 2: Optical Bonding Technology 3: Sunlight Readable / High Bright (includes Optical Bonding) 4: Color Calibrated models (ECDIS)
<b>Available Accessories</b>	TBD	TBD
ENVIRONMENTAL DATA	HD 24T21 MMD	HD 24T21 STD
<b>Operating Temperature</b>	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%
<b>Storage Temperature</b>	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%
<b>IP Rating</b>	Protection: IP66 front - IP22 rear (EN60529)	Protection: IP66 front - IP22 rear (EN60529)
<b>Compass Safe Distance</b>	Standard: TBD - Steering: TBD cm [inch]	Standard: TBD - Steering: TBD cm [inch]
<b>Mean Time Between Failures</b>	MTBF TBD hours (MIL-HDBK-217 GB 25.0°C / 77.0°F)	MTBF TBD hours (MIL-HDBK-217 GB 25.0°C / 77.0°F)
TYPE APPROVAL & TESTING	HD 24T21 MMD	HD 24T21 STD
<b>Note:</b> Some of the Type Approvals could be pending.  Please check our website for the latest status.	IEC 60945 4 <sup>th</sup> [EN 60945:2002], IACS E10 ClassNK - Nippon Kaiji Kyokai GL - Germanischer Lloyd DNV - Det Norske Veritas ABS - American Bureau of Shipping BV - Bureau Veritas CCS - China Classification Society LRS - Lloyd's Register of Shipping	IEC 60945 4 <sup>th</sup> [EN 60945:2002], IACS E10 ClassNK - Nippon Kaiji Kyokai GL - Germanischer Lloyd DNV - Det Norske Veritas ABS - American Bureau of Shipping BV - Bureau Veritas CCS - China Classification Society LRS - Lloyd's Register of Shipping



# PANEL COMPUTERS SERIES 1

All Series 1 panel computers are based around the high quality, rugged Series 1 displays. With a panel computer though, the displays come with a built-in computer, instantly transforming them into navigation and automation power-houses, ideal for a whole range of different systems and solutions.

Of course, with Series 1 panel computers you immediately get the benefits from the Series 1 displays, such as unmatched viewing clarity and long life, but with the additional flexibility of a computer. They follow the same form and fit as Series 1 displays too, making them an ideal match for common system design requirements or as a replacement computer.

The computer itself is specified to ensure that it is capable of running all marine applications, from ECDIS software through to engine monitoring and automation applications.

- TYPE APPROVED
- COST EFFECTIVE
- ECDIS COMPLIANT
- SUPERIOR BONDING TECHNOLOGY
- FORM, FIT AND FUNCTION - LONG-TERM COMMITMENT

It has power to spare too, so software developers can be sure that Hatteland Display Series 1 panel computers can handle the latest applications being designed for bridge and engine room systems in addition to other, more custom uses.

Series 1 panel computers offer the ultimate in convenience for systems integrators and boat builders. This is backed up by the inherent qualities of Series 1 displays and the flexibility of the powerful integrated computer. Series 1 panel computers are a single flexible solution, designed only for the marine environment and built to last.



A computer and display,  
all in one...





**NEW**

15 INCH



19 INCH



15 INCH



Slim Model...  
suitable for IP66 installations

TECHNICAL DATA - DISPLAY	JH 15T17 MMC	JH 19T14 MMC
<b>TFT Technology</b>	Color Active Matrix TFT/LCD, a-Si TFT Active Matrix	Active Matrix TFT/LCD, MVA Premium™ Technology
<b>Viewable Image Size &amp; Active Area</b>	15.0 inch - 304.10 [11.97"] [H] x 228.10 [8.98"] [V] mm [inch]	19.0 inch - 376.32 [14.82"] [H] x 301.06 [11.85"] [V] mm [inch]
<b>Native Resolution &amp; Pixel Pitch</b>	1024 x 768 - 0.297 [H] x 0.297 [V] mm	1280 x 1024 - 0.294 [H] x 0.294 [V] mm
<b>Response Time</b>	25 ms (typ)	12 ms (typ)
<b>Light Intensity &amp; Contrast Ratio</b>	250 cd/m² (typ) - 400:1 (typ)	300 cd/m² (typ) - 900:1 (typ)
<b>View Angle</b>	+/- 85 deg. (Up/Down/Left/Right)	+/- 85 deg. (Up/Down/Left/Right)
<b>Max Color Output</b>	16.7 million	16.7 million
<b>Optimal Resolution and Hz</b>	1024 x 768 [XGA 4:3] @ 60 Hz* (If resolution is above/below 1:1, desktop scrolling mode will be used)	1280 x 1024 [SXGA 5:4] @ 60 Hz (If resolution is above/below 1:1, desktop scrolling mode will be used)
<b>Power Input</b>	115/230VAC - 50/60Hz or 24VDC	115/230VAC - 50/60Hz or 24VDC
<b>Power Consumption</b>	Core™2 60W (typ) or Celeron® 50W (typ) - 100W Max	Core™2 60W (typ) or Celeron® 50W (typ) - 100W Max
TECHNICAL DATA - COMPUTER	JH 15T17 MMC	JH 19T14 MMC
<b>Installed Operating System (OS)</b>	None or Microsoft® Windows® Embedded Enterprise (XP Professional ENG w/SP2c, 32bit)	None or Microsoft® Windows® Embedded Enterprise (XP Professional ENG w/SP2c, 32bit)
<b>Storage</b>	30GB SSD [SATA 2.5"]	30GB SSD [SATA 2.5"]
<b>Available Processors Options</b>	Intel® Core™2 Duo L7400 - 1.5GHz, 4MB Cache, 667MHz FSB Intel® Celeron® M ULV 423 - 1.06GHz, 1MB Cache, 533MHz FSB (Core™2 needs additional internal fan)	Intel® Core™2 Duo L7400 - 1.5GHz, 4MB Cache, 667MHz FSB Intel® Celeron® M ULV 423 - 1.06GHz, 1MB Cache, 533MHz FSB (Core™2 needs additional internal fan)
<b>Memory</b>	2 x 1 GB 667MHz DDR2 Non-ECC CL5 DIMM	2 x 1 GB 667MHz DDR2 Non-ECC CL5 DIMM
<b>System Chipset / Graphics Chipset</b>	Intel® 82945GME / Intel® 945GME Integrated	Intel® 82945GME / Intel® 945GME Integrated
<b>Max Resolution / Max Hz</b>	2048 x 1536 / 85Hz	2048 x 1536 / 85Hz
<b>BIOS</b>	Award BIOS, supports ACPI	Award BIOS, supports ACPI
<b>Speaker / Buzzer</b>	None / Buzzer: 3500Hz	None / Buzzer: 3500Hz
<b>Power Manager and Monitoring</b>	ACPI - Temperature, voltage and fan monitoring	ACPI - Temperature, voltage and fan monitoring
MECHANICAL DATA	JH 15T17 MMC	JH 19T14 MMC
<b>User Controls &amp; Activity</b>	Power On/Off (push button), Brightness Control (rotary control), Mode Status Illuminated LED-Ring Indicator, Buzzer, USB 2.0 Connector (behind hatch)	Power On/Off (push button), Brightness Control (rotary control), Mode Status Illuminated LED-Ring Indicator, Buzzer, USB 2.0 Connector (behind hatch)
<b>Visible I/O Connectors</b>	<b>10/100/1000 Ethernet:</b> 2 x RJ-45 <b>Keyboard:</b> 1 x PS/2 <b>Mouse:</b> 1 x PS/2 <b>COM:</b> 2 x DB9 [RS-232/422/485, opto-isolated] <b>LPT/Parallel:</b> 1 x DB25 Bi-Directional/ECP/EPP <b>USB 2.0:</b> 5 x Std. USB Type A (1 in front IP66, 4 in rear) <b>DVI/RGB OUT:</b> 1 x 29P DVI-I or as RGB with adapter <b>Compact Flash:</b> 1 x Type 1 & II Compatible <b>AC Power IN:</b> 1 x Std IEC inlet <b>If DC Power IN:</b> 1 x 2p DSUB (male) Amphenol FCC17	<b>10/100/1000 Ethernet:</b> 2 x RJ-45 <b>Keyboard:</b> 1 x PS/2 <b>Mouse:</b> 1 x PS/2 <b>COM:</b> 2 x DB9 [RS-232/422/485, opto-isolated] <b>LPT/Parallel:</b> 1 x DB25 Bi-Directional/ECP/EPP <b>USB 2.0:</b> 5 x Std. USB Type A (1 in front IP66, 4 in rear) <b>DVI/RGB OUT:</b> 1 x 29P DVI-I or as RGB with adapter <b>Compact Flash:</b> 1 x Type 1 & II Compatible <b>AC Power IN:</b> 1 x Std IEC inlet <b>If DC Power IN:</b> 1 x 2p DSUB (male) Amphenol FCC17
<b>Dimensions &amp; Weight</b>	412.00 [W] x 345.00 [H] x 73.28 [D] mm 16.22" [W] x 13.58" [H] x 2.89" [D] inch Approx 8 kg / 18 lbs	483.00 [W] x 444.00 [H] x 82.00 [D] mm 19.02" [W] x 17.48" [H] x 3.23" [D] inch Approx 11 kg / 24 lbs
<b>Factory Options</b>	1: Resistive or Capacitive Touchscreen 2: Optical Bonding Technology 3: Up to 4GB of memory	1: Resistive or Capacitive Touchscreen 2: Optical Bonding Technology 3: Up to 4GB of memory
<b>Available Accessories</b>	Bracket (tilt up/down), Rotary Bracket (left/right), Sun Visor, Water Cover, VESA Bracket, 19" Rack Adapter Frame, 17" CRT Adapter Frame	Bracket (tilt up/down), EN60945 Tested Bracket (tilt up/down), Rotary Bracket (left/right), Sun Visor, Water Cover, VESA, Bracket, 21 CRT Adapter Frame, 21 CRT Customized Adapter Frame
<b>Capabilities / Prepared for</b>	1 x miniPCI (requires terminal plate modification)	1 x miniPCI (requires terminal plate modification)
ENVIRONMENTAL DATA	JH 15T17 MMC	JH 19T14 MMC
<b>Operating Temperature</b>	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%
<b>Storage Temperature</b>	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%
<b>IP Rating</b>	Protection: IP66 front - IP20 rear [EN60529]	Protection: IP66 front - IP20 rear [EN60529]
<b>Compass Safe Distance</b>	AC Standard: 55 [21.65"] - Steering: 35 [13.78"] cm [inch] DC Standard: 115 [45.28"] - Steering: 75 [29.53"] cm [inch]	AC Standard: 75 [29.53"] - Steering: 45 [17.72"] cm [inch] DC Standard: 115 [45.28"] - Steering: 75 [29.53"] cm [inch]
TYPE APPROVAL & TESTING	JH 15T17 MMC	JH 19T14 MMC
<b>Note: Some of the Type Approvals could be pending. Please check our website for the latest status.</b>	IEC 60945 4 <sup>th</sup> [EN 60945:2002], IACS E10 ClassNK - Nippon Kaiji Kyokai, GL - Germanischer Lloyd, DNV - Det Norske Veritas, ABS - American Bureau of Shipping, LRS - Lloyd's Register of Shipping, BV - Bureau Veritas	IEC 60945 4 <sup>th</sup> [EN 60945:2002], IACS E10 ClassNK - Nippon Kaiji Kyokai, GL - Germanischer Lloyd, DNV - Det Norske Veritas, ABS - American Bureau of Shipping, LRS - Lloyd's Register of Shipping, BV - Bureau Veritas

TECHNICAL DATA - DISPLAY	JH 15T17 MMC-SLIM
<b>TFT Technology</b>	Color Active Matrix TFT/LCD, a-Si TFT Active Matrix, Optical Bonding Technology
<b>Viewable Image Size &amp; Active Area</b>	15.0 inch - 304.1 [11.97"] [H] x 228.1 [8.98"] [V] mm [inch]
<b>Native Resolution &amp; Pixel Pitch</b>	1024 x 768 - 0.297 [H] x 0.297 [V] mm
<b>Response Time</b>	25 ms (typ)
<b>Light Intensity &amp; Contrast Ratio</b>	250 cd/m² (typ) - 400:1 (typ)
<b>View Angle</b>	+/- 85 deg. (Up/Down/Left/Right)
<b>Max Color Output</b>	16.7 million
<b>Optimal Resolution and Hz</b>	1024 x 768 [XGA 4:3] @ 60 Hz* (If resolution is above/below 1:1, desktop scrolling mode will be used)
<b>Power Input</b>	Multi-power 115/230VAC - 50/60Hz + 24VDC
<b>Power Consumption</b>	Core™2 50W (typ) - 100W Max
TECHNICAL DATA - COMPUTER	JH 15T17 MMC-SLIM
<b>Installed Operating System (OS)</b>	None or Microsoft® Windows® Embedded Enterprise (XP Professional ENG w/SP2c, 32bit)
<b>Storage</b>	30GB SSD [SATA 2.5"]
<b>Available Processors Options</b>	Intel® Core™2 Duo L7400 - 1.5GHz, 4MB Cache, 667MHz FSB Intel® Celeron® M ULV 423 - 1.06GHz, 1MB Cache, 533MHz FSB (Core™2 needs additional internal fan)
<b>Memory</b>	2 x 1 GB 667MHz DDR2 Non-ECC CL5 DIMM
<b>System Chipset / Graphics Chipset</b>	Intel® 82945GME / Intel® 945GME Integrated
<b>Max Resolution / Max Hz</b>	2048 x 1536 / 85Hz
<b>BIOS</b>	Award BIOS, supports ACPI
<b>Speaker / Buzzer</b>	None / Buzzer: 3500Hz
<b>Power Manager and Monitoring</b>	ACPI - Temperature, voltage and fan monitoring
MECHANICAL DATA	JH 15T17 MMC-SLIM
<b>User Controls &amp; Activity</b>	Power ON/OFF function via BIOS / power cable connected
<b>Visible I/O Connectors</b>	<b>10/100/1000 Ethernet:</b> 2 x RJ-45 <b>Keyboard:</b> 1 x PS/2 <b>Mouse:</b> 1 x PS/2 <b>COM:</b> 2 x DB9 [RS-232/422/485, opto-isolated] <b>LPT/Parallel:</b> 1 x DB25 Bi-Directional/ECP/EPP <b>USB 2.0:</b> 4 x Std. USB Type A <b>DVI/RGB OUT:</b> 1 x 29P DVI-I or as RGB with adapter <b>Compact Flash:</b> 1 x Type 1 & II Compatible <b>AC Power IN:</b> 1 x Std IEC inlet <b>DC Power IN:</b> 1 x 2p DSUB (male) Amphenol FCC17
<b>Dimensions &amp; Weight</b>	361.00 [W] x 289.00 [H] x 87.00 [D] mm 14.21" [W] x 11.38" [H] x 3.43" [D] inch Approx 8 kg / 18 lbs
<b>Factory Options</b>	1: Capacitive Touchscreen 2: Up to 4GB of memory
<b>Available Accessories</b>	None
<b>Capabilities / Prepared for</b>	None
ENVIRONMENTAL DATA	JH 15T17 MMC-SLIM
<b>Operating Temperature</b>	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%
<b>Storage Temperature</b>	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%
<b>IP Rating</b>	Protection: IP66 front - IP66 rear [EN60529]
<b>Compass Safe Distance</b>	Standard: TBD - Steering: TBD
<b>MTBF (Mean Time Between Failures)</b>	27239 hours [MIL-HDBK-217 GB 25.0°C / 77.0°F]
TYPE APPROVAL & TESTING	JH 15T17 MMC-SLIM
<b>Note: Some of the Type Approvals could be pending. Please check our website for the latest status.</b>	IEC 60945 4 <sup>th</sup> [EN 60945:2002], IACS E10 ClassNK - Nippon Kaiji Kyokai, GL - Germanischer Lloyd, DNV - Det Norske Veritas, ABS - American Bureau of Shipping, LRS - Lloyd's Register of Shipping, BV - Bureau Veritas



COMMERCIAL

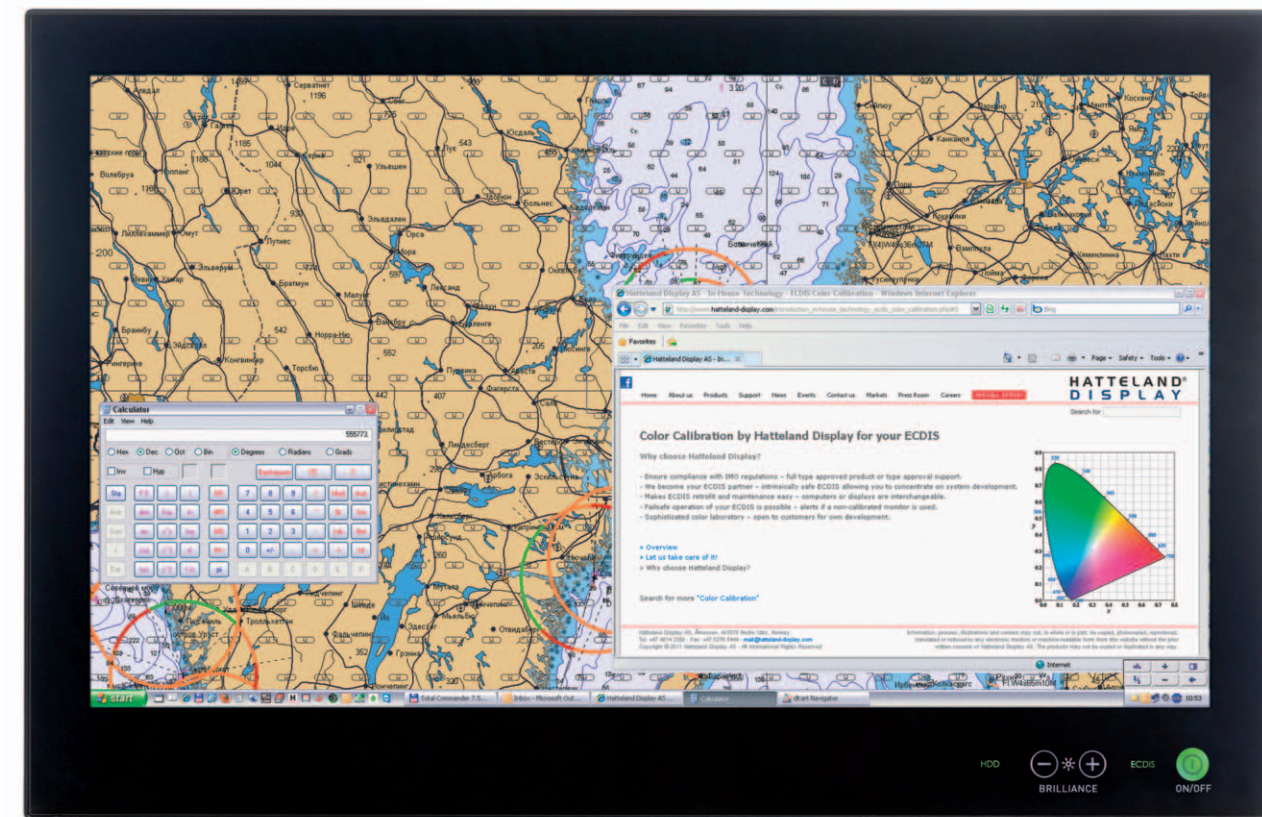


# PANEL COMPUTERS SERIES X

The Series X MMC range of products has been developed alongside the display versions, thus expanding the impressive footprint and impact of this Series X on the maritime market.

The considerable advances made by Hatteland Display over recent years in PC platform development is now enhancing further the panel PC offering. All Series X display sizes are available with state of the art PC technology integrated, designed and built for type approved maritime systems.

- IP22 / IP66
- MULTITOUCH
- TYPE APPROVED
- ECDIS COMPLIANT
- SUPERIOR BONDING TECHNOLOGY
- MODULE BASED, TAILOR-MADE SYSTEMS MADE EASY!
- FORM, FIT AND FUNCTION - LONG-TERM COMMITMENT
- SUNLIGHT READABLE / HIGH BRIGHT VERSIONS AVAILABLE
- GLASS DISPLAY CONTROL™ (GDC), SOLID STATE MENU SYSTEM



**HATTELAND®**  
GLASS DISPLAY CONTROL™

COMMERCIAL





NEW

Note:  
Some specifications are pending.

Please visit our website:  
[www.hatteland-display.com](http://www.hatteland-display.com)  
for up-to-date datasheets.

8 INCH WIDESCREEN



13 INCH WIDESCREEN



TECHNICAL DATA - DISPLAY	HD 08T21 MMC	HD 13T21 MMC with Intel® Atom™
<b>TFT Technology</b>	LED Backlight, a-si TFT Active Matrix, Widescreen	CCFL Backlight, a-si TFT Active Matrix, Widescreen
<b>Viewable Image Size &amp; Active Area</b>	8.0 inch - 173.4 [6.83"] [H] x 104.4 [4.11"] [V] mm [inch]	13.3 inch - 286.08 [11.26"] [H] x 178.80 [7.04"] [V] mm [inch]
<b>Native Resolution &amp; Pixel Pitch</b>	800 x 480 - 0.2168 (H) x 0.2168 (V) mm	1280 x 800 - 0.2235 (H) x 0.2235 (V) mm
<b>Response Time</b>	5/11ms (typ) (Tr/Tf)	6/10ms (typ) (Tr/Tf)
<b>Light Intensity &amp; Contrast Ratio</b>	600 cd/m <sup>2</sup> (typ) - 600:1 (typ) / Hight Bright versions TBD	400 cd/m <sup>2</sup> (typ) - 800:1 (typ) / Hight Bright versions TBD
<b>View Angle / Max Color Output</b>	70 deg. (up/down), 60 deg. (left/right) / 262000	70 deg. (up/down), 60 deg. (left/right) / 262000
<b>Synchronisation Range</b>	24 kHz to 81 kHz (H) - 50 Hz to 75 Hz (V)	24 kHz to 81 kHz (H) - 50 Hz to 75 Hz (V)
<b>Optimal Resolution and Hz</b>	800 x 480 WVGA (5:3) @ 60 Hz (If resolution is above/below 1:1, desktop scrolling mode will be used)	1280 x 800 WXGA (16:10) @ 60 Hz (If resolution is above/below 1:1, desktop scrolling mode will be used)
<b>Detectable Resolutions</b>	From 640 x 480 to 800 x 480	From 640 x 480 to 1280 x 800
<b>Power Input / Power Consumption</b>	Dual 24VDC, Galvanic Isolated, Automatic Switch <-> sources 20W (typ) - 30W (max)	Dual 24VDC, Galvanic Isolated, Automatic Switch <-> source 20W (typ) - 30W (max)
<b>Product Features</b>	Projected Capacitive Technology (PCTouch) MULTITOUCH, LED Backlight Technology, Dimmable 0-100%, Buzzer	Projected Capacitive Technology (PCTouch) MULTITOUCH, Dimmable 0-100%, Buzzer
TECHNICAL DATA - COMPUTER	HD 08T21 MMC	HD 13T21 MMC with Intel® Atom™
<b>Installed Operating System (OS) Options</b>	None or Microsoft® Windows® Embedded Enterprise (32bit: XP Pro / Win Server 2003 / Win 7 Pro / Win Server 2008)	None or Microsoft® Windows® Embedded Enterprise (32bit: XP Pro / Win Server 2003 / Win 7 Pro / Win Server 2008)
<b>Storage Options</b>	2.5" SSD SATA (Single or Multi Level) 30 GB, 60 GB, 120 GB, 250 GB or Half Slim: 8 GB, 30 GB, 60 GB	2.5" SSD SATA (Single or Multi Level) 30 GB, 60 GB, 120 GB, 250 GB or Half Slim: 8 GB, 30 GB, 60 GB
<b>Processor/CPU</b>	1 x Intel® Atom™ N450, 1.66GHz, 512KB L2 Cache	1 x Intel® Atom™ N450, 1.66GHz, 512KB L2 Cache
<b>Memory Options</b>	0.5 GB, 1 GB or 2 GB (DDR2 667MHz SO-DIMM)	0.5 GB, 1 GB or 2 GB (DDR2 667MHz SO-DIMM)
<b>System Chipset / Graphics Chipset</b>	Intel® NM10, ICH8M / Intel® GMA 3150	Intel® NM10, ICH8M / Intel® GMA 3150
<b>BIOS / Speaker / Buzzer</b>	AMIBIOS / None / Buzzer according to EN60945	AMIBIOS / None / Buzzer according to EN60945
<b>Power Manager and Monitoring</b>	ACPI - Temperature, voltages and cooling fan status	ACPI - Temperature, voltages and cooling fan status
MECHANICAL DATA	HD 08T21 MMC	HD 13T21 MMC with Intel® Atom™
<b>User Controls &amp; Activity</b>	Glass Display Control™ (GDC) IP66 with: Power On/Off, Brightness Control (-/+), Mode Status Indicator, Buzzer	Glass Display Control™ (GDC) IP66 with: Power On/Off, Brightness Control (-/+), Mode Status Indicator, Buzzer
<b>Visible I/O Connectors</b>	<b>Primary Power:</b> 1 x SL-SMT 90F (1 x 2 pole) <b>Secondary Power:</b> 1 x SL-SMT 90F (1 x 2 pole) <b>LAN:</b> 2 x RJ45 <b>USB2.0:</b> 2 x Type A + 1 x Internal Pin Header <b>Mechanical Relay (NO/NC):</b> 1 x SC 90F (1 x 3 pole)* <b>Solid State Relay (NO):</b> 2 x SCD 90F (2 x 2 pole)* <b>Digital Input (isolated/protected):</b> 2 x SCD 90F (2 x 2 pole) <b>COM (isolated RS-422/485):</b> 1 x SC 90F (1 x 5 pole) <b>Safety Signal Relay (NO/NC):</b> 1 x SC 90F (1 x 3 pole) *IEC 60950 Compliant, 48VDC	<b>Primary Power:</b> 1 x SL-SMT 90F (1 x 2 pole) <b>Secondary Power:</b> 1 x SL-SMT 90F (1 x 2 pole) <b>LAN:</b> 2 x RJ45 <b>USB2.0:</b> 2 x Type A + 1 x Internal Pin Header <b>Mechanical Relay (NO/NC):</b> 1 x SC 90F (1 x 3 pole)* <b>Solid State Relay (NO):</b> 2 x SCD 90F (2 x 2 pole)* <b>Digital Input (isolated/protected):</b> 2 x SCD 90F (2 x 2 pole) <b>COM (isolated RS-422/485):</b> 1 x SC 90F (1 x 5 pole) <b>Safety Signal Relay (NO/NC):</b> 1 x SC 90F (1 x 3 pole) *IEC 60950 Compliant, 48VDC
<b>Dimensions &amp; Weight</b>	236.00 (W) x 166.00 (H) x 51.00 (D) mm 9.29" (W) x 6.54" (H) x 2.01" (D) inch Compatible VESA mounting 75mm - Approx TBD kg / TBD lbs	355.00 (W) x 248.50 (H) x 58.00 (D) mm 13.97" (W) x 9.78" (H) x 2.28" (D) inch Compatible VESA mounting 75mm - Approx TBD kg / TBD lbs
<b>Factory Options</b>	1: Optical Bonding Technology 2: Sunlight Readable / High Bright (includes Optical Bonding)	1: Optical Bonding Technology 2: Sunlight Readable / High Bright (includes Optical Bonding)
<b>Available Accessories</b>	TBD	TBD
<b>Capabilities / Prepared For</b>	1 x COM - Un-isolated COM (RS-232/422/485) 1 x DVI-I - DVI-I ouput, for additional / external display 1 x DIO (4/4) - Digital Input / Output (4/4) 2 x CAN (isolated) (SL-SMT 90F Connectors)	1 x COM - Un-isolated COM (RS-232/422/485) 1 x DVI-I - DVI-I ouput, for additional / external display 1 x DIO (4/4) - Digital Input / Output (4/4) 2 x CAN (isolated) (SL-SMT 90F connectors) 4 x COM RS-422/485 isolated, NMEA compliant
ENVIRONMENTAL DATA	HD 08T21 MMC	HD 13T21 MMC with Intel® Atom™
<b>Operating Temperature</b>	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%
<b>Storage Temperature</b>	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%
<b>IP Rating</b>	Protection: IP66 front - IP22 rear (EN60529)	Protection: IP66 front - IP22 rear (EN60529)
<b>Compass Safe Distance</b>	Standard: 45 [17.72"] - Steering: 25 [9.84"] cm [inch]	Standard: 80 [31.50"] - Steering: 45 [17.72"] cm [inch]
<b>Mean Time Between Failures</b>	MTBF TBD hours (MIL-HDBK-217 GB 25.0°C / 77.0°F)	MTBF TBD hours (MIL-HDBK-217 GB 25.0°C / 77.0°F)
TYPE APPROVAL & TESTING	HD 08T21 MMC	HD 13T21 MMC with Intel® Atom™
<b>Note: Some of the Type Approvals could be pending.</b>	IEC 60945 4 <sup>th</sup> (EN 60945:2002), IACS E10 ClassNK - Nippon Kaiji Kyokai, GL - Germanischer Lloyd DNV - Det Norske Veritas, BV - Bureau Veritas ABS - American Bureau of Shipping, LRS - Lloyd's Register of Shipping	IEC 60945 4 <sup>th</sup> (EN 60945:2002), IACS E10 ClassNK - Nippon Kaiji Kyokai, GL - Germanischer Lloyd DNV - Det Norske Veritas, BV - Bureau Veritas ABS - American Bureau of Shipping, LRS - Lloyd's Register of Shipping

Note:  
Some specifications are pending.

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13 INCH WIDESCREEN



TECHNICAL DATA - DISPLAY	HD 13T21 MMC with Intel® Core™2 Duo
<b>TFT Technology</b>	CCFL Backlight, a-si TFT Active Matrix, Widescreen
<b>Viewable Image Size &amp; Active Area</b>	13.3 inch - 286.08 [11.26"] [H] x 178.80 [7.04"] [V] mm [inch]
<b>Native Resolution &amp; Pixel Pitch</b>	1280 x 800 - 0.2235 (H) x 0.2235 (V) mm
<b>Response Time</b>	6/10ms (typ) (Tr/Tf)
<b>Light Intensity &amp; Contrast Ratio</b>	400 cd/m <sup>2</sup> (typ) - 800:1 (typ) / Hight Bright versions TBD
<b>View Angle / Max Color Output</b>	70 deg. (up/down), 60 deg. (left/right) / 262000
<b>Synchronisation Range</b>	24 kHz to 81 kHz (H) - 50 Hz to 75 Hz (V)
<b>Optimal Resolution and Hz</b>	1280 x 800 WXGA (16:10) @ 60 Hz (If resolution is above/below 1:1, desktop scrolling mode will be used)
<b>Detectable Resolutions</b>	From 640 x 480 to 1280 x 800
<b>Power Input / Power Consumption</b>	Dual 24VDC, Galvanic Isolated, Automatic Switch <-> source 35W (typ) - 60W (max)
<b>Product Features</b>	Projected Capacitive Technology (PCTouch) MULTITOUCH, Dimmable 0-100%, Buzzer
TECHNICAL DATA - COMPUTER	HD 13T21 MMC with Intel® Core™2 Duo
<b>Installed Operating System (OS) Options</b>	None or Microsoft® Windows® Embedded Enterprise (32bit: XP Pro / Win Server 2003 / Win 7 Pro / Win Server 2008)
<b>Storage Options</b>	2.5" SSD SATA (Single or Multi Level) 30 GB, 60 GB, 120 GB, 250 GB or Half Slim: 8 GB, 30 GB, 60 GB
<b>Processor/CPU</b>	1 x Intel® Core™2 Duo P8400 2.26GHz, 3MB L2 Cache, 1066MHz
<b>Memory Options</b>	1 GB, 2 GB or 4 GB (Dual Ch. DDR2 800MHz SO-DIMM)
<b>System Chipset / Graphics Chipset</b>	Intel® GM45, ICH9 / Intel® GMA 4500MHD (CH7307C)
<b>BIOS / Speaker / Buzzer</b>	AWARD / None / Buzzer according to EN60945
<b>Power Manager and Monitoring</b>	ACPI - Temperature, voltages and cooling fan status
MECHANICAL DATA	HD 13T21 MMC with Intel® Core™2 Duo
<b>User Controls &amp; Activity</b>	Glass Display Control™ (GDC) IP66 with: Power On/Off, Brightness Control (-/+), Mode Status Indicator, Buzzer
<b>Visible I/O Connectors</b>	<b>Primary Power:</b> 1 x SL-SMT 90F (1 x 2 pole) <b>Secondary Power:</b> 1 x SL-SMT 90F (1 x 2 pole) <b>LAN:</b> 2 x RJ45 <b>USB2.0:</b> 2 x Type A + 1 x Internal Pin Header <b>Mechanical Relay (NO/NC):</b> 1 x SC 90F (1 x 3 pole)* <b>Solid State Relay (NO):</b> 2 x SCD 90F (2 x 2 pole)* <b>Digital Input (isolated/protected):</b> 2 x SCD 90F (2 x 2 pole) <b>COM (isolated RS-422/485):</b> 1 x SC 90F (1 x 5 pole) <b>Safety Signal Relay (NO/NC):</b> 1 x SC 90F (1 x 3 pole) *IEC 60950 Compliant, 48VDC
<b>Dimensions &amp; Weight</b>	355.00 (W) x 248.50 (H) x 65.40 (D) mm 13.97" (W) x 9.78" (H) x 2.57" (D) inch Compatible VESA mounting 75mm - Approx TBD kg / TBD lbs
<b>Factory Options</b>	1: Optical Bonding Technology 2: Sunlight Readable / High Bright (includes Optical Bonding)
<b>Available Accessories</b>	TBD
<b>Capabilities / Prepared For</b>	1 x COM - Un-isolated COM (RS-232/422/485) 1 x miniPCIe - Require modification of chassis 1 x DIO (4/4) - Digital Input / Output (4/4) 2 x CAN (isolated) (SL-SMT 90F connectors) 1 x DVI-D 24pin 4 x COM RS-422/485 isolated, NMEA compliant
ENVIRONMENTAL DATA	HD 13T21 MMC with Intel® Core™2 Duo
<b>Operating Temperature</b>	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%
<b>Storage Temperature</b>	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%
<b>IP Rating</b>	Protection: IP66 front - IP22 rear (EN60529)
<b>Compass Safe Distance</b>	Standard: 80 [31.50"] - Steering: 45 [17.72"] cm [inch]
<b>Mean Time Between Failures</b>	MTBF TBD hours (MIL-HDBK-217 GB 25.0°C / 77.0°F)
TYPE APPROVAL & TESTING	HD 13T21 MMC with Intel® Core™2 Duo
<b>Note: Some of the Type Approvals could be pending.</b>	IEC 60945 4 <sup>th</sup> (EN 60945:2002), IACS E10 ClassNK - Nippon Kaiji Kyokai, GL - Germanischer Lloyd DNV - Det Norske Veritas, BV - Bureau Veritas ABS - American Bureau of Shipping, LRS - Lloyd's Register of Shipping



COMMERCIAL



# SPECIFICATIONS - PANEL COMPUTERS SERIES X

Note:  
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12 INCH



15 INCH



TECHNICAL DATA - DISPLAY	HD 12T21 MMC	HD 15T21 MMC
<b>TFT Technology</b>	LED Backlight, TFT Active-matrix	LED Backlight, TFT Active-matrix
<b>Viewable Image Size &amp; Active Area</b>	12.1 inch - 245.76 [9.68"] (H) x 184.32 [7.26"] (V) mm [inch]	15.0 inch - 304.1 [11.97"] (H) x 228.1 [8.98"] (V) mm [inch]
<b>Native Resolution &amp; Pixel Pitch</b>	1024 x 768 - 0.24 (H) x 0.24 (V) mm	1024 x 768 - 0.297 (H) x 0.297 (V) mm
<b>Response Time</b>	35ms (typ)	8ms (typ)
<b>Light Intensity &amp; Contrast Ratio</b>	500 cd/m <sup>2</sup> (typ) - 700:1 (typ) / High Bright versions TBD	400 cd/m <sup>2</sup> (typ) - 700:1 (typ) / High Bright versions TBD
<b>View Angle / Max Color Output</b>	80 deg. (up/down/left/right) / 16.7 million	80 deg. (up/down/left/right) / 16.7 million
<b>Synchronisation Range</b>	31.5 kHz to 91.1 kHz (H) - 60 Hz to 85 Hz (V)	31.5 kHz to 91.1 kHz (H) - 60 Hz to 85 Hz (V)
<b>Optimal Resolution and Hz</b>	1024 x 768 XGA [4:3] @ 60 Hz [If resolution is above/below 1:1, desktop scrolling mode will be used]	1024 x 768 XGA [4:3] @ 60 Hz [If resolution is above/below 1:1, desktop scrolling mode will be used]
<b>Detectable Resolutions</b>	DVI: From 640 x 480 to 1920 x 1200 @ 60 Hz RGB: From 640 x 480 to 2048 x 1536 @ 75 Hz	DVI: From 640 x 480 to 1920 x 1200 @ 60 Hz RGB: From 640 x 480 to 2048 x 1536 @ 75 Hz
<b>Power Input / Power Consumption</b>	12-24 VDC - TBD (typ) - 60W (max)	Multi-power 115/230VAC - 50/60Hz + 24 VDC - TBD (typ) - 60W (max)
<b>Product Features</b>	Dimmable 0-100%, Buzzer, GPIO, LAN Wakeup, USB Boot & Wakeup	Dimmable 0-100%, Buzzer, GPIO, LAN Wakeup, USB Boot & Wakeup
TECHNICAL DATA - COMPUTER	HD 12T21 MMC	HD 15T21 MMC
<b>Installed Operating System (OS) Options</b>	None or Microsoft® Windows® Embedded Enterprise (32bit: XP Pro / Win Server 2003 / Win 7 Pro / Win Server 2008)	None or Microsoft® Windows® Embedded Enterprise (32bit: XP Pro / Win Server 2003 / Win 7 Pro / Win Server 2008)
<b>Storage Options</b>	2x2.5" SSD SATA (Single or Multi Level) - 30GB, 60GB, 120GB, 250GB or 2x2.5" HDD SATA - 30GB, 60GB, 120GB, 250GB	2x2.5" SSD SATA (Single or Multi Level) - 30GB, 60GB, 120GB, 250GB or 2x2.5" HDD SATA - 30GB, 60GB, 120GB, 250GB
<b>Processor/CPU</b>	1 x Intel® Celeron® P4505 (2MB Cache, 1.86 GHz), FSB: 800MHz	1 x Intel® Celeron® P4505 (2MB Cache, 1.86 GHz), FSB: 800MHz
<b>Memory Options</b>	1 GB, 2 GB or 4 GB [Dual Channel DDR3 1066/800MHz SO-DIMM]	1 GB, 2 GB or 4 GB [Dual Channel DDR3 1066/800MHz SO-DIMM]
<b>System Chipset / Graphics Chipset</b>	Intel® BD82QM57 / Intel® Arrandale IGD supports DVMT 5.0	Intel® BD82QM57 / Intel® Arrandale IGD supports DVMT 5.0
<b>BIOS / Speaker / Buzzer</b>	UEFI AMIBIOS / No Speaker / Buzzer: 3500Hz	UEFI AMIBIOS / No Speaker / Buzzer: 3500Hz
<b>Power Manager, Monitoring and Watchdog Timer</b>	ACPI S3/S4 - Temperature and voltages status 256 Segments, 0, 1, 2...255 sec/min	ACPI S3/S4 - Temperature and voltages status 256 Segments, 0, 1, 2...255 sec/min
MECHANICAL DATA	HD 12T21 MMC	HD 15T21 MMC
<b>User Controls &amp; Activity</b>	Glass Display Control™ (GDC) IP66 with: Power On/Off, Brightness Control (-/+), Hotkeys (left/right), Power LED, HDD/SSD LED, Buzzer, Mode Status Indicator (Service), Buzzer, Light Sensor	Glass Display Control™ (GDC) IP66 with: Power On/Off, Brightness Control (-/+), Hotkeys (left/right), Power LED, HDD/SSD LED, Buzzer, Mode Status Indicator (Service), Buzzer, Light Sensor
<b>Visible I/O Connectors</b>	<b>Ethernet GBLan:</b> 2 x RJ-45 <b>Keyboard and Mouse:</b> 1 x PS/2 (purple) + 1 x PS/2 (green) <b>COM RS-232:</b> 1 x DB9M non-isolated <b>COM RS-422/485:</b> 1 x DB9M non-isolated <b>LPT / Parallel:</b> 1 x Internal Pin Header <b>USB1.1 (&gt;10m):</b> 1 x USB Type A <b>USB2.0 (&lt;10m):</b> 3 x USB Type A + 2 x Internal Pin header (=4 USB) <b>DVI / RGB OUT:</b> 1 x 29P DVI-I or as RGB with adapter <b>RGB OUT:</b> 1 x 15p HD D-SUB <b>DC Power:</b> 1 x Phoenix 2pin 1927564 MSTB 2,5/ 2-GF-5,08 THT <b>Line Out+Mic In:</b> 1x3.5mm mini jack + 1 x 3.5mm mini jack <b>Speaker L/F:</b> 1 x TBD	<b>Ethernet GBLan:</b> 2 x RJ-45 <b>Keyboard and Mouse:</b> 1 x PS/2 (purple) + 1 x PS/2 (green) <b>COM RS-232:</b> 1 x DB9M non-isolated <b>COM RS-422/485:</b> 1 x DB9M non-isolated <b>LPT / Parallel:</b> 1 x Internal Pin Header <b>USB1.1 (&gt;10m):</b> 1 x USB Type A <b>USB2.0 (&lt;10m):</b> 3 x USB Type A + 2 x Internal Pin header (=4 USB) <b>DVI / RGB OUT:</b> 1 x 29P DVI-I or as RGB with adapter <b>RGB OUT:</b> 1 x 15p HD D-SUB <b>AC Power:</b> 1 x Std IEC inlet <b>DC Power:</b> 1 x Phoenix 2pin 1927564 MSTB 2,5/ 2-GF-5,08 THT <b>Line Out+Mic In:</b> 1x3.5mm mini jack + 1 x 3.5mm mini jack <b>Speaker L/F:</b> 1 x TBD
<b>Dimensions &amp; Weight</b>	314.00 [12.36"] (W) x 272.00 [10.70"] (H) x 70.90 [2.79"] (D) mm [inch] Approx TBD kg / TBD lbs	356.00 [14.01"] (W) x 307.00 [12.08"] (H) x 77.90 [3.07"] (D) mm [inch] Approx TBD kg / TBD lbs
<b>Factory Options</b>	1: Projected Capacitive Touch Screen (Multitouch, USB interface) 2: Optical Bonding Technology 3: Sunlight Readable / High Bright (includes Optical Bonding) 4: Variations of SSD/HDD Storage, RAM Memory, Operating System	1: Projected Capacitive Touch Screen (Multitouch, USB interface) 2: Optical Bonding Technology 3: Sunlight Readable / High Bright (includes Optical Bonding) 4: Variations of SSD/HDD Storage, RAM Memory, Operating System 5: 12-24VDC Power Input
<b>Available Accessories</b>	TBD	TBD
<b>Capabilities / Prepared For</b>	4 x COM isolated RS-422/485, ECDIS/NMEA Compliant CAN module, 2 x CAN isolated	4 x COM isolated RS-422/485, ECDIS/NMEA Compliant CAN module, 2 x CAN isolated
ENVIRONMENTAL DATA	HD 12T21 MMC	HD 15T21 MMC
<b>Operating Temperature</b>	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%
<b>Storage Temperature</b>	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%
<b>IP Rating</b>	Protection: IP66 front - IP22 rear [EN60529]	Protection: IP66 front - IP22 rear [EN60529]
<b>Compass Safe Distance</b>	Standard: TBD - Steering: TBD cm [inch]	Standard: TBD - Steering: TBD cm [inch]
<b>Mean Time Between Failures</b>	MTBF TBD hours [MIL-HDBK-217 GB 25.0°C / 77.0°F]	MTBF TBD hours [MIL-HDBK-217 GB 25.0°C / 77.0°F]
TYPE APPROVAL & TESTING	HD 12T21 MMC	HD 15T21 MMC
<b>Note: Some of the Type Approvals could be pending.</b>	IEC 60945 4 <sup>th</sup> [EN 60945:2002], IACS E10 ClassNK - Nippon Kaiji Kyokai, DNV - Det Norske Veritas, ABS - American Bureau of Shipping, GL - Germanischer Lloyd, BV - Bureau Veritas, LRS - Lloyd's Register of Shipping, CCS - China Classification Society	IEC 60945 4 <sup>th</sup> [EN 60945:2002], IACS E10 ClassNK - Nippon Kaiji Kyokai, DNV - Det Norske Veritas, ABS - American Bureau of Shipping, GL - Germanischer Lloyd, BV - Bureau Veritas, LRS - Lloyd's Register of Shipping, CCS - China Classification Society

Note: Some of the Type Approvals could be pending.

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# SPECIFICATIONS - PANEL COMPUTERS SERIES X

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17 INCH



19 INCH



TECHNICAL DATA - DISPLAY	HD 17T21 MMC	HD 19T21 MMC
<b>TFT Technology</b>	LED Backlight, TFT Active-matrix	LED Backlight, TFT Active-matrix, MVA LCD Technology
<b>Viewable Image Size &amp; Active Area</b>	17.0 inch - 337.92 [13.30"] (H) x 270.34 [10.64"] (V) mm [inch]	19.0 inch - 376.32 [14.82"] (H) x 301.06 [11.85"] (V) mm [inch]
<b>Native Resolution &amp; Pixel Pitch</b>	1280 x 1024 - 0.264 (H) x 0.264 (V) mm	1280 x 1024 - 0.294 (H) x 0.294 (V) mm
<b>Response Time</b>	5ms (typ)	20ms (typ)
<b>Light Intensity &amp; Contrast Ratio</b>	350 cd/m <sup>2</sup> (typ) - 1000:1 (typ) / High Bright versions TBD	300 cd/m <sup>2</sup> (typ) - 1000:1 (typ) / High Bright versions TBD
<b>View Angle / Max Color Output</b>	80 deg. (up/down/left/right) / 16.7 million	89 deg. (up/down/left/right) / 16.7 million
<b>Synchronisation Range</b>	31.5 kHz to 91.1 kHz (H) - 60 Hz to 85 Hz (V)	31.5 kHz to 91.1 kHz (H) - 60 Hz to 85 Hz (V)
<b>Optimal Resolution and Hz</b>	1280 x 1024 SXGA [5:4] @ 60 Hz [If resolution is above/below 1:1, desktop scrolling mode will be used]	1280 x 1024 SXGA [5:4] @ 60 Hz [If resolution is above/below 1:1, desktop scrolling mode will be used]
<b>Detectable Resolutions</b>	DVI: From 640 x 480 to 1920 x 1200 @ 60 Hz RGB: From 640 x 480 to 2048 x 1536 @ 75 Hz	DVI: From 640 x 480 to 1920 x 1200 @ 60 Hz RGB: From 640 x 480 to 2048 x 1536 @ 75 Hz
<b>Power Input / Power Consumption</b>	Multi-power 115/230VAC - 50/60Hz + 24 VDC - TBD (typ) - 60W (max)	Multi-power 115/230VAC - 50/60Hz + 24 VDC - TBD (typ) - 125W (max)
<b>Product Features</b>	Dimmable 0-100%, Buzzer, GPIO, LAN Wakeup, USB Boot & Wakeup	Dimmable 0-100%, Buzzer, GPIO, LAN Wakeup, USB Boot & Wakeup
TECHNICAL DATA - COMPUTER	HD 17T21 MMC	HD 19T21 MMC
<b>Installed Operating System (OS) Options</b>	None or Microsoft® Windows® Embedded Enterprise (32bit: XP Pro / Win Server 2003 / Win 7 Pro / Win Server 2008)	None or Microsoft® Windows® Embedded Enterprise (32bit: XP Pro / Win Server 2003 / Win 7 Pro / Win Server 2008)
<b>Storage Options</b>	2x2.5" SSD SATA (Single or Multi Level) - 30GB, 60GB, 120GB, 250GB or 2x2.5" HDD SATA - 30GB, 60GB, 120GB, 250GB	2x2.5" SSD SATA (Single or Multi Level) - 30GB, 60GB, 120GB, 250GB or 2x2.5" HDD SATA - 30GB, 60GB, 120GB, 250GB
<b>Processor/CPU</b>	1 x Intel® Celeron® P4505 (2MB Cache, 1.86 GHz), FSB: 800MHz	1 x Intel® Celeron® P4505 (2MB Cache, 1.86 GHz), FSB: 800MHz
<b>Memory Options</b>	1 GB, 2 GB or 4 GB [Dual Channel DDR3 1066/800MHz SO-DIMM]	1 GB, 2 GB or 4 GB [Dual Channel DDR3 1066/800MHz SO-DIMM]
<b>System Chipset / Graphics Chipset</b>	Intel® BD82QM57 / Intel® Arrandale IGD supports DVMT 5.0	Intel® BD82QM57 / Intel® Arrandale IGD supports DVMT 5.0
<b>BIOS / Speaker / Buzzer</b>	UEFI AMIBIOS / No Speaker / Buzzer: 3500Hz	UEFI AMIBIOS / No Speaker / Buzzer: 3500Hz
<b>Power Manager, Monitoring and Watchdog Timer</b>	ACPI S3/S4 - Temperature and voltages status 256 Segments, 0, 1, 2...255 sec/min	ACPI S3/S4 - Temperature and voltages status 256 Segments, 0, 1, 2...255 sec/min
MECHANICAL DATA	HD 17T21 MMC	HD 19T21 MMC
<b>User Controls &amp; Activity</b>	Glass Display Control™ (GDC) IP66 with: Power On/Off, Brightness Control (-/+), Hotkeys (left/right), Power LED, HDD/SSD LED, Buzzer, Mode Status Indicators (ECDIS, Service), Buzzer, Light Sensor	Glass Display Control™ (GDC) IP66 with: Power On/Off, Brightness Control (-/+), Hotkeys (left/right), Power LED, HDD/SSD LED, Buzzer, Mode Status Indicators (ECDIS, Service), Buzzer, Light Sensor
<b>Visible I/O Connectors</b>	<b>Ethernet GBLan:</b> 2 x RJ-45 <b>Keyboard and Mouse:</b> 1 x PS/2 (purple) + 1 x PS/2 (green) <b>COM RS-232:</b> 1 x DB9M non-isolated <b>COM RS-422/485:</b> 1 x DB9M non-isolated <b>LPT / Parallel:</b> 1 x Internal Pin Header <b>USB1.1 (&gt;10m):</b> 1 x USB Type A <b>USB2.0 (&lt;10m):</b> 3 x USB Type A + 2 x Internal Pin header (=4 USB) <b>DVI / RGB OUT:</b> 1 x 29P DVI-I or as RGB with adapter <b>RGB OUT:</b> 1 x 15p HD D-SUB <b>AC Power:</b> 1 x Std IEC inlet <b>DC Power:</b> 1 x Phoenix 2pin 1927564 MSTB 2,5/ 2-GF-5,08 THT <b>Line Out+Mic In:</b> 1x3.5mm mini jack + 1 x 3.5mm mini jack <b>Speaker L/F:</b> 1 x TBD	<b>Ethernet GBLan:</b> 2 x RJ-45 <b>Keyboard and Mouse:</b> 1 x PS/2 (purple) + 1 x PS/2 (green) <b>COM RS-232:</b> 1 x DB9M non-isolated <b>COM RS-422/485:</b> 1 x DB9M non-isolated <b>LPT / Parallel:</b> 1 x Internal Pin Header <b>USB1.1 (&gt;10m):</b> 1 x USB Type A <b>USB2.0 (&lt;10m):</b> 3 x USB Type A + 2 x Internal Pin header (=4 USB) <b>DVI / RGB OUT:</b> 1 x 29P DVI-I or as RGB with adapter <b>RGB OUT:</b> 1 x 15p HD D-SUB <b>AC Power:</b> 1 x Std IEC inlet <b>DC Power:</b> 1 x Phoenix 2pin 1927564 MSTB 2,5/ 2-GF-5,08 THT <b>Line Out+Mic In:</b> 1x3.5mm mini jack + 1 x 3.5mm mini jack <b>Speaker L/F:</b> 1 x TBD
<b>Dimensions &amp; Weight</b>	390.00 [15.35"] (W) x 351.00 [13.82"] (H) x 79.90 [3.15"] (D) mm [inch] Approx TBD kg / TBD lbs	429.00 [16.89"] (W) x 382.00 [15.09"] (H) x 80.90 [3.19"] (D) mm [inch] Approx TBD kg / TBD lbs
<b>Factory Options</b>	1: Projected Capacitive Touch Screen (Multitouch, USB interface) 2: Optical Bonding Technology 3: Sunlight Readable / High Bright (includes Optical Bonding) 4: Variations of SSD/HDD Storage, RAM Memory, Operating System 5: Color Calibrated Models (ECDIS) 6: 12-24VDC Power Input	1: Projected Capacitive Touch Screen (Multitouch, USB interface) 2: Optical Bonding Technology 3: Sunlight Readable / High Bright (includes Optical Bonding) 4: Variations of SSD/HDD Storage, RAM Memory, Operating System 5: Color Calibrated Models (ECDIS) 6: 12-24VDC Power Input
<b>Available Accessories</b>	TBD	TBD
<b>Capabilities / Prepared For</b>	4 x COM isolated RS-422/485, ECDIS/NMEA Compliant CAN module, 2 x CAN isolated	4 x COM isolated RS-422/485, ECDIS/NMEA Compliant CAN module, 2 x CAN isolated
ENVIRONMENTAL DATA	HD 17T21 MMC	HD 19T21 MMC
<b>Operating Temperature</b>	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%
<b>Storage Temperature</b>	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%
<b>IP Rating</b>	Protection: IP66 front - IP22 rear [EN60529]	Protection: IP66 front - IP22 rear [EN60529]
<b>Compass Safe Distance</b>	Standard: TBD - Steering: TBD cm [inch]	Standard: TBD - Steering: TBD cm [inch]
<b>Mean Time Between Failures</b>	MTBF TBD hours [MIL-HDBK-217 GB 25.0°C / 77.0°F]	MTBF TBD hours [MIL-HDBK-217 GB 25.0°C / 77.0°F]
TYPE APPROVAL & TESTING	HD 17T21 MMC	HD 19T21 MMC
<b>Note: Some of the Type Approvals could be pending.</b>	IEC 60945 4 <sup>th</sup> [EN 60945:2002], IACS E10 ClassNK - Nippon Kaiji Kyokai, DNV - Det Norske Veritas, ABS - American Bureau of Shipping, GL - Germanischer Lloyd, BV - Bureau Veritas, LRS - Lloyd's Register of Shipping, CCS - China Classification Society	IEC 60945 4 <sup>th</sup> [EN 60945:2002], IACS E10 ClassNK - Nippon Kaiji Kyokai, DNV - Det Norske Veritas, ABS - American Bureau of Shipping, GL - Germanischer Lloyd, BV - Bureau Veritas, LRS - Lloyd's Register of Shipping, CCS - China Classification Society

Note: Some of the Type Approvals could be pending.

Please check our website for the latest status.



# SPECIFICATIONS - PANEL COMPUTERS SERIES X

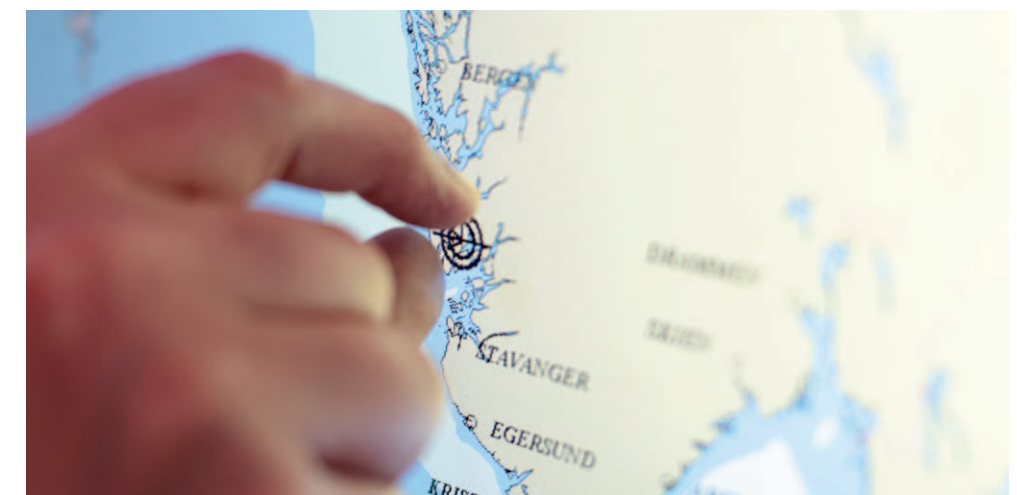
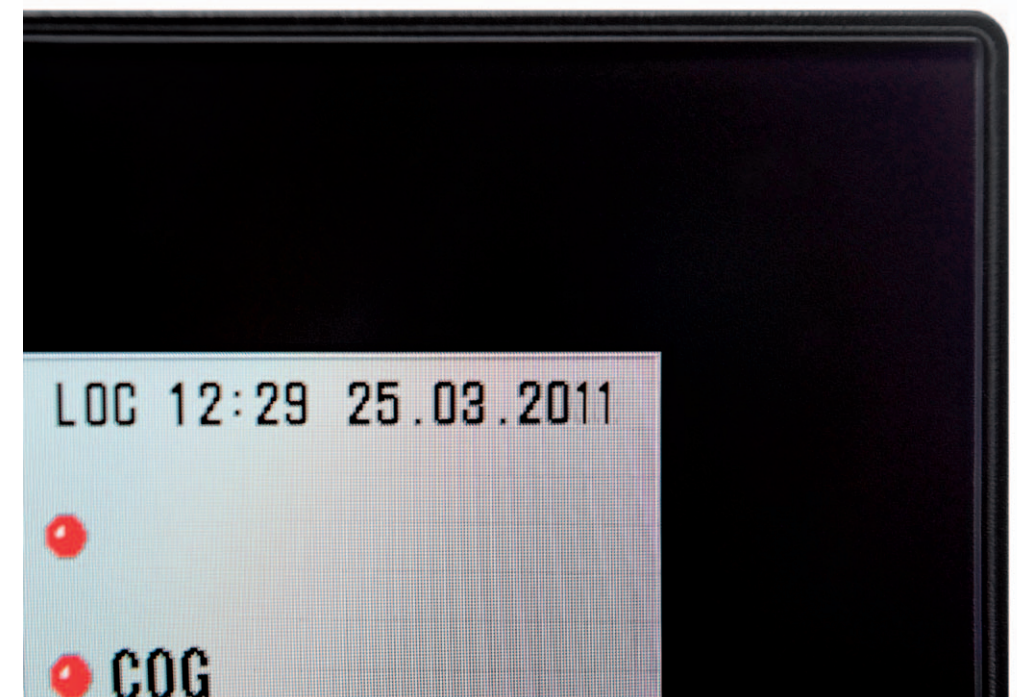
## 24 INCH WIDESCREEN



Note:  
Some specifications are pending.

Please visit our website:  
[www.hatteland-display.com](http://www.hatteland-display.com)  
for up-to-date datasheets.

TECHNICAL DATA - DISPLAY	HD 24T21 MMC
<b>TFT Technology</b>	LED Backlight, TFT Active-matrix, Widescreen MVA [Multi-domain Vertical Alignment] LCD Technology
<b>Viewable Image Size &amp; Active Area</b>	24.0 inch - 531.36 [20.92"] [H] x 298.89 [11.77"] [V] mm [inch]
<b>Native Resolution &amp; Pixel Pitch</b>	1920 x 1080 - 0.276 [H] x 0.276 [V] mm
<b>Response Time</b>	25ms (typ)
<b>Light Intensity &amp; Contrast Ratio</b>	250 cd/m <sup>2</sup> (typ) - 3000:1 (typ) / High Bright versions TBD
<b>View Angle / Max Color Output</b>	89 deg. (up/down/left/right) / 16.7 million
<b>Synchronisation Range</b>	31.5 kHz to 91.1 kHz [H] - 60 Hz to 85 Hz [V]
<b>Optimal Resolution and Hz</b>	1920 x 1080 FHD [16:9] @ 60 Hz (If resolution is above/below 1:1, desktop scrolling mode will be used)
<b>Detectable Resolutions</b>	DVI: From 640 x 480 to 1920 x 1200 @ 60 Hz RGB: From 640 x 480 to 2048 x 1536 @ 75 Hz
<b>Power Input &amp; Power Consumption</b>	Multi-power 115/230VAC - 50/60Hz + 24 VDC - TBD (typ) - 125W (max)
<b>Power Consumption</b>	TBD W (typ) - TBD W (max)
TECHNICAL DATA - COMPUTER	HD 24T21 MMC
<b>Installed Operating System (OS) Options</b>	None or Microsoft® Windows® Embedded Enterprise (32bit: XP Pro / Win Server 2003 / Win 7 Pro / Win Server 2008)
<b>Storage Options</b>	2x2.5" SSD SATA (Single or Multi Level) - 30GB, 60GB, 120GB, 250GB or 2x2.5" HDD SATA - 30GB, 60GB, 120GB, 250GB
<b>Processor/CPU</b>	1 x Intel® Celeron® P4505 (2MB Cache, 1.86 GHz), FSB: 800MHz
<b>Memory Options</b>	1 GB, 2 GB or 4 GB (Dual Channel DDR3 1066/800MHz SO-DIMM)
<b>System Chipset / Graphics Chipset</b>	Intel® BD82QM57 / Intel® Arrandale IGD supports DVM 5.0
<b>BIOS / Speaker / Buzzer</b>	UEFI AMIBIOS / No Speaker / Buzzer: 3500Hz
<b>Power Manager, Monitoring and Watchdog Timer</b>	ACPI S3/S4 - Temperature and voltages status 256 Segments, 0, 1, 2...255 sec/min
MECHANICAL DATA	HD 24T21 MMC
<b>User Controls &amp; Activity</b>	Glass Display Control™ (GDC) IP66 with: Power On/Off, Brightness Control (-/+), Hotkeys (left/right), Power LED, HDD/SSD LED, Buzzer, Mode Status Indicators (ECDIS, Service), Buzzer, Light Sensor
<b>Visible I/O Connectors</b>	<b>Ethernet GBLan:</b> 2 x RJ-45 <b>Keyboard and Mouse:</b> 1 x PS/2 (purple) + 1 x PS/2 (green) <b>COM RS-232:</b> 1 x DB9M non-isolated <b>COM RS-422/485:</b> 1 x DB9M non-isolated <b>LPT / Parallel:</b> 1 x Internal Pin Header <b>USB1.1 (&gt;10m):</b> 1 x USB Type A <b>USB2.0 (&lt;10m):</b> 3 x USB Type A + 2 x Internal Pin header (=4 USB) <b>DVI / RGB OUT:</b> 1 x 29P DVI-I or as RGB with adapter <b>RGB OUT:</b> 1 x 15p HD D-SUB <b>AC Power:</b> 1 x Std IEC inlet <b>DC Power:</b> 1 x Phoenix 2pin 1927564 MSTB 2,5/ 2-GF-5,08 THT <b>Line Out+Mic In:</b> 1x3.5mm mini jack + 1 x 3.5mm mini jack <b>Speaker L/F:</b> 1 x TBD
<b>Dimensions &amp; Weight</b>	593.00 [23.35"] [W] x 348.00 [13.70"] [H] x 76.40 [3.01"] [D] mm [inch] Approx 14 kg / 31 lbs
<b>Factory Options</b>	1: Projected Capacitive Touch Screen (Multitouch, USB interface) 2: Optical Bonding Technology 3: Sunlight Readable / High Bright (includes Optical Bonding) 4: Variations of SSD/HDD Storage, RAM Memory, Operating System 5: Color Calibrated Models (ECDIS)
<b>Available Accessories</b>	TBD
<b>Capabilities / Prepared For</b>	4 x COM isolated RS-422/485, ECDIS/NMEA Compliant CAN module, 2 x CAN isolated
ENVIRONMENTAL DATA	HD 24T21 MMC
<b>Operating Temperature</b>	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%
<b>Storage Temperature</b>	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%
<b>IP Rating</b>	Protection: IP66 front - IP22 rear [EN60529]
<b>Compass Safe Distance</b>	Standard: TBD - Steering: TBD cm [inch]
<b>Mean Time Between Failures</b>	MTBF TBD hours (MIL-HDBK-217 GB 25.0°C / 77.0°F)
TYPE APPROVAL & TESTING	HD 24T21 MMC
<b>Note: Some of the Type Approvals could be pending.</b>	IEC 60945 4 <sup>th</sup> [EN 60945:2002], IACS E10 ClassNK - Nippon Kaiji Kyokai, DNV - Det Norske Veritas, ABS - American Bureau of Shipping, GL - Germanischer Lloyd, BV - Bureau Veritas, LRS - Lloyd's Register of Shipping, CCS - China Classification Society



COMMERCIAL



## COMPUTERS

Hatteland Display's range of type-approved marine computers is designed to perform in harsh environments while providing the performance and flexibility you expect.

We offer rack mount and black box / standalone computer solutions for every need. Our computers are used by system integrators, boat builders and end-users and can be found on all vessel types, all over the world.

If you are looking for a high quality marine computer for navigation, monitoring or entertainment solutions, Hatteland Display can fulfil your high expectations at a reasonable cost.

Our computer range covers all eventualities and requirements. We offer a wide range of processor choices, HDD and power options, and solid state technology, neatly engineered within industry standard form factors such as 19 inch rack mount, 2U, 3U and 4U.

We continually develop our marine computers portfolio to make the best use of emerging computer technology so you can be sure that your Hatteland Display computer offers the power needed to run modern applications\*, with the flexibility to be installed wherever you want, for any marine use.



COMMERCIAL



**\*Typical factory installed Operating Systems delivered with Hatteland Display Panel Computers and Computers:**

- Microsoft® Windows® Embedded Enterprise (Win XP Pro Eng w/SP2c, 32bit)
- Microsoft® Windows® Embedded Enterprise (Win Server 2003 Eng, 32bit)
- Microsoft® Windows® Embedded Enterprise (Win 7 Pro Eng, 32bit)
- Microsoft® Windows® Embedded Enterprise (Win Server 2008 Eng, 32bit)



**NEW**



Designed to perform in harsh environments...

**HT B21E AND HT B21F**  
Compact Fanless



All our computers are delivered with mounting brackets as standard...

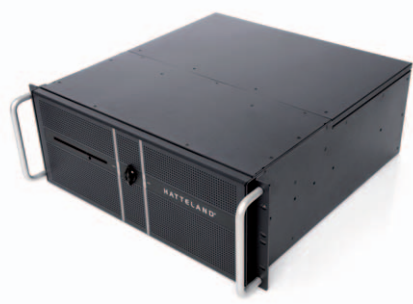
**HT C01**  
Compact



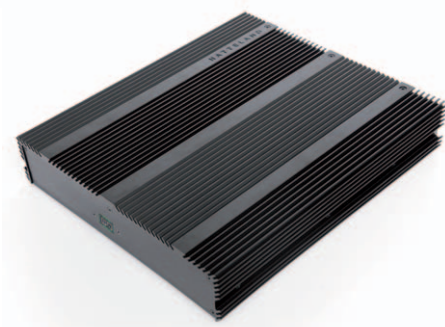
**HT 216**  
2U Standard



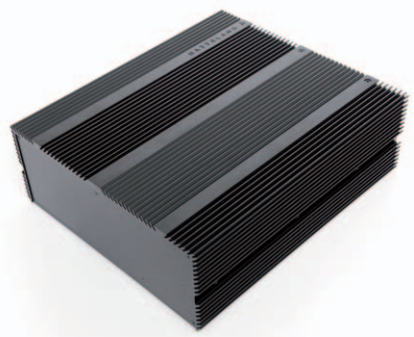
**HT 416**  
4U Standard



**HT B17 AND HT B17GE**  
Compact Fanless



**HT B18**  
Compact Fanless



COMMERCIAL



# SPECIFICATIONS - COMPUTERS

## COMPACT



## 2U STANDARD



TECHNICAL DATA	HT C01	HT 216
<b>Installed Operating System (OS) Options</b>	None or Microsoft® Windows® Embedded Enterprise (32bit: XP Pro / Win Server 2003 / Win 7 Pro / Win Server 2008)	None or Microsoft® Windows® Embedded Enterprise (32bit: XP Pro / Win Server 2003 / Win 7 Pro / Win Server 2008)
<b>Storage Options</b>	1 x 250GB HDD 2.5" SATA, 5400 RPM, Automotive or 1 x 30GB SSD 2.5" SATA	1 to 4 x 250GB HDD 3.5" SATA, 7200 RPM, 8MB Cache (Front-mounted removable disks)
<b>Processor/CPU</b>	1 x Intel® Core™2 Duo E8400, 3.0GHz, 1333MHz FSB, 6MB L2	1 x Intel® Core™2 Duo E6400, 2.13GHz, 1066MHz FSB, 2MB L2 Cache
<b>Memory</b>	2 x 1 GB Dual Ch. DDR2 800/667MHz, SDRAM, 240-pin DIMM	2 x 1GB Dual Channel DDR2 800/667MHz, SDRAM DIMM
<b>System Chipset / Graphics Chipset and Connectors</b>	Intel® Q35, ICH9DO / Intel® GMA 3100 integrated with 1 x HD DB15F (female) RGB/VGA OUT and 1 x 29P (female) DVI-I	Intel® Q965, ICH8DO / Integrated VGA, supports CRT with 1 x HD DB15F (female) RGB/VGA OUT
<b>Max Resolution / Max Hz</b>	2048 x 1536 @ 75Hz	2048 x 1536 @ 85Hz
<b>BIOS</b>	AWARD BIOS	AMIBIOS 8MB Flash
<b>PCI Slots / PCIe Slots</b>	2xPCI2.3, 3V/5V Interface + 1xPCIe X16 (add2) + 1xPCIe X1 All slots are Full Height & Full Length profile	2xPCI 32bit, 3V/5V Interface + 1xPCIe X4 + 1xPCIe X16 (add2/Graphic Mode) All slots are Half Length and Low Profile
<b>Media Drive(s)</b>	1 x DVD-RW/CD-RW Dual Recorder/Player	1 x Slim DVD/CD-RW Recorder/Player Drive
<b>LPT / Parallel Port</b>	1 x DB25F Bi-Directional Centronics with ECP/EPP mode	1 x DB25F Bi-Directional Centronics with SPP/EPP/ECP mode
<b>Serial Port(s)</b>	2 x DB9M RS-232	1 x DB9M RS-232 + 1 x DB9M RS-232/422/485 (electrical isolated)
<b>Ethernet Port(s)</b>	2 x RJ45 10/100/1000Mbps - Intel® 82566DM, Intel® AMT 2 x RJ45 10/100/1000Mbps - Realtek RTL 8168C(P)8111C	2 x RJ45 10/100/1000Mbps - Realtek RTL8111B
<b>USB Port(s)</b>	8 x USB2.0/1.1 Type A (rear) + 2 x USB2.0/1.1 Type A (front)	8 x USB2.0 Type A (rear) + 2 x USB2.0 (Internal Pin Header)
<b>Keyboard &amp; Mouse Ports</b>	1 x PS/2 Keyboard + 1 x PS/2 Mouse	1 x PS/2 Keyboard + 1 x PS/2 Mouse
<b>Audio Ports</b>	3 x 3.5mm Jacks (LINE IN/LINE OUT/MIC IN) Realtek ALC888 7.1 channel, HD Audio	6 x 3.5mm Jacks (LINE IN/LINE OUT/MIC IN) AC97 Codec, 7.1 channel, HD Audio
<b>Speaker</b>	None	On-board
<b>Power Manager / Monitoring and Watchdog</b>	ACPI - Temperature, voltage, cooling fans with auto throttle. Watchdog Timer, reset: 1 sec ~255 min & 1 sec. or 1 min/step	ACPI
<b>Power Input and Consumption</b>	115/230VAC - 50/60Hz (300W) or 24VDC (220W) <b>If AC Power IN:</b> 1 x Std IEC inlet <b>If DC Power IN:</b> 1 x 2p DSUB (male) Amphenol FCC17 Operating 70W (typ)	115/230VAC - 50/60Hz (400W Autorange) - Operating 100W (typ) <b>AC Power IN:</b> 1 x Std IEC inlet
MECHANICAL DATA	HT C01	HT 216
<b>Key Features</b>	High Performance, Replaceable Air Filter in front, Service friendly, Includes mounting brackets, reddot design award honourable mention 2009	Heavy-duty steel 2U Rackmount chassis with handles, Removable air filter and lockable front hatch door, Supports 2 x 5 1/4" disk bays (one slim, one full size), Supports 4 x 3 1/2" disk bays, Rear cable strain reliefs with grounding thread, Rear PCI card support holder, fixed to chassis, 5 x Cooling fans (High/Low Pressure, PSU, CPU & PCI)
<b>Dimensions &amp; Weight</b>	345.00 (W) x 133.00 (H) x 390.00 (D) mm (3U) 13.58" (W) x 5.24" (H) x 15.35" (D) inch (3U) Approx 10 kg / 22 lbs	430.00 (W) x 80.00 (H) x 460.80 (D) mm (2u) 16.93" (W) x 3.15" (H) x 18.14" (D) inch (2U) Approx 10 kg / 22 lbs
<b>User Controls / Activity</b>	Power On/Off Push Button, Reset Button, Power LED, HDD/SSD LED	Power On/Off Push Button, Power LED, HDD LED
<b>Factory Options</b>	1: 1 x Matrox DualHead® P690, PCIe X16 / X1 / PCI Low Profile 2: Bluestorm Serial I/O Card (4 x COM ports, RS-232/422/485) 3: Future support for larger HDD sizes possible	1: 1 x Matrox DualHead® P690, PCIe X16 / PCIe X1 / PCI Low Profile 2: 2 x Intel® 10/100/1000Mbps (Teaming, Low Profile) 3: Future support for larger HDD sizes possible
<b>Available Accessories</b>	19 inch Rack Case Kit (4U), Mounting Rails Kit 20 or 26 inch for 19 inch rack, Recovery Kit(USB Flash), Mounting Bracket PCI Kit	Mounting Rails Kit 20 inch for 19 inch rack, Recovery Kit (USB Flash)
<b>Capabilities / Prepared for</b>	1: 4 x COM Ports - Supports RS-232/422/485 2: 8 x COM Ports - Supports RS-232/422/485 3: Up to 8GB DDR2 800/667MHz SDRAM, 240-pin DIMM	N/A
ENVIRONMENTAL DATA	HT C01	HT 216
<b>Operating Temperature</b>	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95% DNV Temperature Class B 70.0°C / 158.0°F for 2 hours	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%
<b>Storage Temperature</b>	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%
<b>Compass Safe Distance</b>	Standard: 150 [59.06"] - Steering: 95 [35.63"] cm [inch]	Standard: 140 [55.12"] - Steering: 80 [31.50"] cm [inch]
<b>Mean Time Between Failures</b>	MTBF 22581 hours (MIL-HDBK-217 GB 25.0°C / 77.0°F)	MTBF 24790 hours (MIL-HDBK-217 GB 25.0°C / 77.0°F)
TYPE APPROVAL & TESTING	HT C01	HT 216
	IEC 60945 4 <sup>th</sup> [EN 60945:2002], EN61162, IACS E10 ClassNK - Nippon Kaiji Kyokai GL - Germanischer Lloyd DNV - Det Norske Veritas ABS - American Bureau of Shipping BV - Bureau Veritas LRS - Lloyd's Register of Shipping	IEC 60945 4 <sup>th</sup> [EN 60945:2002], EN61162, IACS E10 ClassNK - Nippon Kaiji Kyokai GL - Germanischer Lloyd DNV - Det Norske Veritas ABS - American Bureau of Shipping BV - Bureau Veritas LRS - Lloyd's Register of Shipping

# SPECIFICATIONS - COMPUTERS

## 4U STANDARD



## COMPACT FANLESS



TECHNICAL DATA	HT 416	HT B17
<b>Installed Operating System (OS) Options</b>	None or Microsoft® Windows® Embedded Enterprise (32bit: XP Pro / Win Server 2003 / Win 7 Pro / Win Server 2008)	None or Microsoft® Windows® Embedded Enterprise (32bit: XP Pro / Win Server 2003 / Win 7 Pro / Win Server 2008)
<b>Storage Options</b>	1 to 4 x 250GB HDD 3.5" SATA, 7200 RPM, 8MB Cache (Front-mounted removable disks)	1 x internal 2.5" 30GB SSD SATA
<b>Processor/CPU</b>	1 x Intel® Core™2 Duo E6400, 2.13GHz, 1066MHz FSB, 2MB L2 Cache	1 x Intel® Core™2 Duo P8400, 2.26GHz, 1066MHz FSB, 3MB L2
<b>Memory</b>	2 x 1GB Dual Channel DDR2 800/667MHz, SDRAM DIMM	2 x 1GB Dual Channel DDR2 800/667MHz, SO-DIMM 200-pin
<b>System Chipset / Graphics Chipset and Connectors</b>	Intel® Q965, ICH8DO / Integrated VGA, supports CRT with 1 x HD DB15F (female) RGB/VGA OUT	Intel® GM45, ICH9 / Intel® GMA 4500MHD with 2 x DVI-D 24P (female) or 1 x HD DB15F (female) + 1 x DVI-D 24P
<b>Max Resolution / Max Hz</b>	2048 x 1536 @ 85Hz	1600 x 1200 @ 60Hz
<b>BIOS</b>	AMIBIOS 8MB Flash	AWARD BIOS
<b>PCI Slots / PCIe Slots</b>	5xPCI 32bit, 3V/5V Interface + 1xPCIe X4 + 1xPCIe X16 (add2/Graphic Mode) All slots are Full Height and Full Length	None
<b>Media Drive(s)</b>	1 x Slim DVD/CD-RW Recorder/Player Drive	None
<b>LPT / Parallel Port</b>	1 x DB25F Bi-Directional Centronics with SPP/EPP/ECP mode	None
<b>Serial Port(s)</b>	1 x DB9M RS-232 + 1 x DB9M RS-232/422/485 (electrical isolated)	1 x DB9M RS-232 (COM1)
<b>Ethernet Port(s)</b>	2 x RJ45 10/100/1000Mbps - Realtek RTL8111B	2 x RJ45 10/100/1000Mbps, Intel® 82567L and Intel® 82574L PCI-E
<b>USB Port(s)</b>	8 x USB2.0 Type A (rear) + 2 x USB2.0 (Internal Pin Header)	4 x USB2.0/1.1 Type A
<b>Keyboard &amp; Mouse Ports</b>	1 x PS/2 Keyboard + 1 x PS/2 Mouse	1 x PS/2 Keyboard + 1 x PS/2 Mouse
<b>Audio Ports</b>	6 x 3.5mm Jacks (LINE IN/LINE OUT/MIC IN) AC97 Codec, 7.1 channel, HD Audio	ICH9M+AC97, Codec ALC888, 7.1 Channels, 6 x 3.5mm Jacks (Front Out, Line In, Mic, Center/LFE, Surround, Surround Back)
<b>Speaker</b>	On-board	None
<b>Power Manager / Monitoring and Watchdog</b>	ACPI	ACPI / Monitoring CPU temperature, voltage, cooling fan status. Auto throttling control. Watchdog timer: Reset 1 sec. ~255 min and 1 sec. or 1 min./step
<b>Power Input and Consumption</b>	115/230VAC - 50/60Hz (400W Autorange) - Operating 100W (typ) <b>AC Power IN:</b> 1 x Std IEC inlet	Multi-power 115/230VAC - 50/60Hz + 24 VDC <b>AC Power IN:</b> 1 x Std IEC inlet <b>DC Power IN:</b> 1 x 2p DSUB (male) Amphenol FCC17 Operating: 30W (typ) - 60w (max)
MECHANICAL DATA	HT 416	HT B17
<b>Key Features</b>	Heavy-duty steel 2U Rackmount chassis with handles, Removable air filter and lockable front hatch door, Supports 6 x 5 1/4" disk bays (4 x 5 1/4", 2 x slim, one used for air flow), Supports 4 x 3 1/2" disk bays, Rear cable strain reliefs with grounding thread, Rear PCI card support holder, fixed to chassis, 5 x Cooling fans (High/Low Pressure, PSU, CPU & PCI)	Multi-power AC & DC, Heat Pipe Cooling Technology, HDD-Free Solution possible with SSD, Fanless and no moving parts inside, Aluminium Chassis w/no apertures, Compact Form Factor, Includes Mounting Bracket Kit
<b>Dimensions &amp; Weight</b>	431.00 (W) x 176.50 (H) x 443.00 (D) mm (4U) 16.97" (W) x 6.95" (H) x 17.44" (D) inch Approx 25 kg / 55 lbs	270.00 (W) x 57.95 (H) x 310.00 (D) mm 10.63" (W) x 2.28" (H) x 12.20" inch Approx 5 kg / 11 lbs
<b>User Controls / Activity</b>	Power On/Off Push Button, Power LED, HDD LED	Power On/Off Push Button, Reset Button, Power LED, SSD LED
<b>Factory Options</b>	1: 1 x Matrox DualHead® P690, PCIe X16 / PCIe X1 / PCI Low Profile 2: 2 x Intel® 10/100/1000Mbps (Teaming, Low Profile) 3: Future support for larger HDD sizes possible	1: Future support for larger HDD sizes possible
<b>Available Accessories</b>	Mounting Rails Kit 20 inch for 19 inch rack, Recovery Kit (USB Flash)	Mounting Plate, Mounting Plate with cable relief, Recovery Kit (USB Flash)
<b>Capabilities / Prepared for</b>	N/A	Up to 4GB DDR2 800/667MHz SO-DIMM 200-pin
ENVIRONMENTAL DATA	HT 416	HT B17
<b>Operating Temperature</b>	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%
<b>Storage Temperature</b>	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%
<b>Compass Safe Distance</b>	Standard: 135 [53.15"] - Steering: 90 [35.43"] cm [inch]	Standard: 75 [29.53"] - Steering: 45 [17.72"] cm [inch]
<b>Mean Time Between Failures</b>	MTBF 24790 hours (MIL-HDBK-217 GB 25.0°C / 77.0°F)	MTBF 44622 hours (MIL-HDBK-217 GB 25.0°C / 77.0°F)
TYPE APPROVAL & TESTING	HT 416	HT B17
	IEC 60945 4 <sup>th</sup> [EN 60945:2002], EN61162, IACS E10 ClassNK - Nippon Kaiji Kyokai GL - Germanischer Lloyd DNV - Det Norske Veritas ABS - American Bureau of Shipping BV - Bureau Veritas LRS - Lloyd's Register of Shipping	IEC 60945 4 <sup>th</sup> [EN 60945:2002], IACS E10 ClassNK - Nippon Kaiji Kyokai GL - Germanischer Lloyd DNV - Det Norske Veritas ABS - American Bureau of Shipping BV - Bureau Veritas LRS - Lloyd's Register of Shipping



# SPECIFICATIONS - COMPUTERS

Note:  
Some specifications are pending.

Please visit our website:  
[www.hatteland-display.com](http://www.hatteland-display.com)  
for up-to-date datasheets.

## COMPACT FANLESS



## COMPACT FANLESS



TECHNICAL DATA	HT B17GE	HT B18
<b>Installed Operating System (OS) Options</b>	None or Microsoft® Windows® Embedded Enterprise (32bit: XP Pro / Win Server 2003 / Win 7 Pro / Win Server 2008)	None or Microsoft® Windows® Embedded Enterprise (32bit: XP Pro / Win Server 2003 / Win 7 Pro / Win Server 2008)
<b>Storage Options</b>	TBD	1 x replaceable 2.5" 30GB SSD SATA
<b>Processor/CPU</b>	1 x Intel® Celeron® Dual Core P4505, 1.86GHz, 2MB Cache	1 x Intel® Core™2 Duo P8400, 2.26GHz, 1066MHz FSB, 3MB L2
<b>Memory</b>	1 x 2GB DDR3 800MHz SO-DIMM	2 x 1GB Dual Channel DDR2 800/667MHz, SO-DIMM 200-pin
<b>System Chipset / Graphics Chipset and Connectors</b>	Intel® GM57 / Intel® HD Graphics with 1 x HD DB15F (female) RGB/VGA + 1 x DVI-I 29P (female)	Intel® GM45, ICH9 / Intel® GMA 4500MHD with 2 x DVI-D 24P (female) or 1 x HD DB15F (female) + 1 x DVI-D 24P
<b>Max Resolution / Max Hz</b>	RGB/VGA: 2048 x 1536 @ 75Hz - DVI: 1600 x 1200 @ 60Hz	1600 x 1200 @ 60Hz
<b>BIOS</b>	AMIBIOS	AWARD BIOS
<b>PCI Slots / PCIe Slots</b>	None	2 x PCI2.3, 32bit, 3V/5V, Full height, Half length (Max Power Consumption (both slots) shall not exceed 15W)
<b>Media Drive(s)</b>	None	None
<b>LPT / Parallel Port</b>	None	None
<b>Serial Port(s)</b>	1 x DB9M RS-232 + 1 x DB9M RS-422/485	1 x DB9M RS-232 (COM1) + 1 x DB9M RS-232/422/485 (COM2)
<b>Ethernet Port(s)</b>	1 x RJ45 10/100/1000Mbps Intel® 82577LM + 1 x RJ45 10/100/1000Mbps Realtek RTL8111C	1 x RJ45 10/100/1000Mbps Intel® 82567L + 1 x RJ45 10/100/1000Mbps Intel® 82574L
<b>USB Port(s)</b>	2 x USB2.0 Type A + 2 x USB1.1 Type A	4 x USB2.0/1.1 Type A
<b>Keyboard &amp; Mouse Ports</b>	1 x PS/2 Keyboard + 1 x PS/2 Mouse	1 x PS/2 Keyboard + 1 x PS/2 Mouse
<b>Audio Ports</b>	Realtek ALC888-GR, 3 x 3.5mm jacks, supports 5.1 channel, Line-in, Mic-in, Line-out, 6W amplifier	ICH9M+AC97, Codec ALC888, 7.1 Channels, 6 x 3.5mm Jacks (Front Out, Line In, Mic, Center/LFE, Surround, Surround Back)
<b>Speaker</b>	None	None
<b>Power Manager / Monitoring and Watchdog</b>	ACPI S3/S4 - Monitoring CPU temperature, voltage, cooling fan status. Auto throttling control when CPU overheats. Watchdog timer: Reset 1 sec. ~255 min and 1 sec. or 1 min./step	ACPI - Monitoring CPU temperature, voltage, cooling fan status. Auto throttling control when CPU overheats. Watchdog timer: Reset 1 sec. ~255 min and 1 sec. or 1 min./step
<b>Power Input and Consumption</b>	Multi-power 115/230VAC - 50/60Hz + 24 VDC <b>AC Power IN:</b> 1 x Std IEC inlet <b>DC Power IN:</b> 1 x 2p DSUB (male) Amphenol FCC17 Operating: 30W (typ) - 60w (max)	Multi-power 115/230VAC - 50/60Hz + 24 VDC <b>AC Power IN:</b> 1 x Std IEC inlet <b>DC Power IN:</b> 1 x 2p DSUB (male) Amphenol FCC17 Operating: 30W (typ) - 60w (max)
<b>Digital I/O Connectors</b>	None	None
MECHANICAL DATA	HT B17GE	HT B18
<b>Key Features</b>	Multi-power AC & DC, Heat Pipe Cooling Technology, HDD-Free Solution possible with SSD, Fanless and no moving parts inside, Aluminium Chassis w/no apertures, Compact Form Factor, Includes Mounting Bracket Kit	Multi-power AC & DC, Heat Pipe Cooling Technology, HDD-Free Solution possible with SSD, Fanless and no moving parts inside, Aluminium Chassis w/no apertures, Compact Form Factor, Removable SSD Disk, Includes Mounting Bracket Kit
<b>Dimensions &amp; Weight</b>	270.00 (W) x 57.95 (H) x 310.00 (D) mm 10.63" (W) x 2.28" (H) x 12.20" inch Approx 5 kg / 11 lbs	270.00 (W) x 105.95 (H) x 310.00 (D) mm 10.63" (W) x 4.17" (H) x 12.20" inch Approx 5 kg / 11 lbs
<b>User Controls / Activity</b>	Power On/Off Push Button, Reset Button, Power LED, HDD/SSD LED	Power On/Off Push Button, Reset Button, Power LED, SSD LED
<b>Factory Options</b>	TBD	N/A
<b>Available Accessories</b>	Mounting Plate, Mounting Plate with cable relief, Recovery Kit (USB Flash)	Mounting Plate, Mounting Plate with cable relief, Recovery Kit (USB Flash), Mounting Bracket for PCI/PCIe Cards
<b>Capabilities / Prepared for</b>	1: 4GB (DDR3 800MHz SO-DIMM) 2: Dual 2.5" SATA (SSD/HDD) 3: 1 x 2.5" half slim SSD, JEDEC MO-297 4: Hatteland Display COM, 4 x RS-422/485 isolated ECDIS & NMEA compliant 5: 1 x LPT port (25p female)	1: 1 x PCI + 1 x PCIe X1 (Both full height & half length) 2: Serial Card 4 x COM Ports - Supports RS-232/422/485 3: Serial Card 8 x COM Ports - Supports RS-232/422/485 4: Up to 4GB DDR2 800/667MHz SO-DIMM 200-pin
ENVIRONMENTAL DATA	HT B17GE	HT B18
<b>Operating Temperature</b>	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%
<b>Storage Temperature</b>	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%
<b>Compass Safe Distance</b>	Standard: TBD - Steering: TBD cm [inch]	Standard: 75 [29.53"] - Steering: 45 [17.72"] cm [inch]
<b>Mean Time Between Failures</b>	MTBF TBD hours [MIL-HDBK-217 GB 25.0°C / 77.0°F]	MTBF 44622 hours [MIL-HDBK-217 GB 25.0°C / 77.0°F]
TYPE APPROVAL & TESTING	HT B17GE	HT B18
<b>Note: Some of the Type Approvals could be pending.</b>	IEC 60945 4 <sup>th</sup> [EN 60945:2002], IACS E10 ClassNK - Nippon Kaiji Kyokai GL - Germanischer Lloyd DNV - Det Norske Veritas ABS - American Bureau of Shipping BV - Bureau Veritas LRS - Lloyd's Register of Shipping	IEC 60945 4 <sup>th</sup> [EN 60945:2002], EN61162, IACS E10 ClassNK - Nippon Kaiji Kyokai GL - Germanischer Lloyd DNV - Det Norske Veritas ABS - American Bureau of Shipping BV - Bureau Veritas LRS - Lloyd's Register of Shipping

# SPECIFICATIONS - COMPUTERS

Note:  
Some specifications are pending.

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## COMPACT FANLESS



## COMPACT FANLESS



TECHNICAL DATA	HT B21F with Intel® Atom™	HT B21E with Intel® Core™2 Duo
<b>Installed Operating System (OS) Options</b>	None or Microsoft® Windows® Embedded Enterprise (32bit: XP Pro / Win Server 2003 / Win 7 Pro / Win Server 2008)	None or Microsoft® Windows® Embedded Enterprise (32bit: XP Pro / Win Server 2003 / Win 7 Pro / Win Server 2008)
<b>Storage Options</b>	1 x 8GB SSD 2.5" SATA	1 x 60GB SSD (2.5" SATA)
<b>Processor/CPU</b>	1 x Intel® Atom™ N450 1.66GHz, 512KB L2 Cache	1 x Intel® Core™2 Duo P8400 2.26GHz, FSB:1066MHz, 3 MB L2
<b>Memory</b>	2 x 512MB 200-pin DDR2 667MHz SO-DIMM	2 x 1 GB (Dual Channel 200-pin DDR2 800MHz SO-DIMM)
<b>System Chipset / Graphics Chipset and Connectors</b>	Intel® NM10, ICH8M / Intel® GMA 3150 with 1 x DVI-I 29P	Intel® GM45, ICH9 / Intel® HD Graphics GMA4500MHD with 2 x DVI-I 29P
<b>Max Resolution / Max Hz</b>	DVI: Max 1600 x 1200 @ 60Hz VGA/RGB: Max 1920 x 1200 @ 60Hz - Via DVI to RGB adapter	DVI: Max 1600 x 1200 @ 60Hz (Higher via blanking) VGA/RGB: Max 1920 x 1200 @ 60Hz - Via DVI to RGB adapter
<b>BIOS</b>	AMIBIOS	AWARD
<b>PCI Slots / PCIe Slots</b>	None	None
<b>Media Drive(s)</b>	None	None
<b>LPT / Parallel Port</b>	None	None
<b>Serial Port(s)</b>	1 x SC 90F (1 x 5 pole) (COM1) isolated RS-422/485	1 x SC 90F (1 x 5 pole) (COM1) (isolated RS-422/485)
<b>Ethernet Port(s)</b>	2 x RJ-45 10/100/1000Mbps	4 x RJ-45 10/100/1000Mbps
<b>USB Port(s)</b>	2 x USB2.0/1.1 Type A + 1 x Internal Pin Header	2 x USB2.0/1.1 Type A + 1 x Internal Pin Header
<b>Keyboard &amp; Mouse Ports</b>	None	None
<b>Audio Ports</b>	None	None
<b>Speaker / Buzzer</b>	None / Buzzer according to EN60945	None / Buzzer according to EN60945
<b>Power Manager / Monitoring and Watchdog</b>	ACPI - Temperatures, voltages & cooling fan status	ACPI - Temperatures, voltages & cooling fan status. Auto throttling control if CPU overheats
<b>Power Input and Consumption</b>	Dual 24VDC - 2 x SL-SMT 90F (1 x 2 pole) Operating: TBD W (typ) - TBD W (max)	Dual 24VDC - 2 x SL-SMT 90F (1 x 2 pole) Operating: TBD W (typ) - TBD W (max)
<b>Digital I/O Connectors</b>	<b>Mechanical Relay (NO/NC):</b> 1 x SC 90F (1 x 3 pole) <b>Solid State Relay (NO):</b> 2 x SCD 90F (2 x 2 pole) <b>Digital Input:</b> (isolated/protected) 2 x SCD 90F (2 x 2 pole) <b>Safety Signal Relay (NO/NC):</b> 1 x SC 90F (1 x 3 pole)	<b>Mechanical Relay (NO/NC):</b> 1 x SC 90F (1 x 3 pole) <b>Solid State Relay (NO):</b> 2 x SCD 90F (2 x 2 pole) <b>Digital Input:</b> (isolated/protected) 2 x SCD 90F (2 x 2 pole) <b>Safety Signal Relay (NO/NC):</b> 1 x SC 90F (1 x 3 pole)
MECHANICAL DATA	HT B21F with Intel® Atom™	HT B21E with Intel® Core™2 Duo
<b>Key Features</b>	Heat Pipe Cooling Technology, Interchangeable CPU, HDD-Free Solution possible with SSD, Fanless and no moving parts inside, Aluminium Chassis w/no apertures, Dual DC Power Input, Compact Form Factor, Includes Mounting Bracket	Heat Pipe Cooling Technology, Interchangeable CPU, HDD-Free Solution possible with SSD, Fanless and no moving parts inside, Aluminium Chassis w/no apertures, Dual DC Power Input, Compact Form Factor, Includes Mounting Bracket
<b>Dimensions &amp; Weight</b>	331.00 (W) x 59.35 (H) x 235.00 (D) mm 13.03" (W) x 2.34" (H) x 9.25" (D) Approx 5 kg / 11 lbs	331.00 (W) x 59.35 (H) x 235.00 (D) mm 13.03" (W) x 2.34" (H) x 9.25" (D) Approx 5 kg / 11 lbs
<b>User Controls / Activity</b>	Power On/Off Push Button, Reset Button, Power LED, SSD LED	Power On/Off Push Button, Reset Button, Power LED, SSD LED
<b>Factory Options</b>	1: Future support for larger SSD sizes possible TBD	1: Future support for larger SSD sizes possible TBD
<b>Available Accessories</b>	TBD	TBD
<b>Capabilities / Prepared for</b>	1: 1 x COM - Un-isolated COM (RS-232/422/485) 2: 1 x DVI-I - DVI-I output, for additional / external display 3: 1 x DIO (4/4) - Digital Input / Output (4/4) 4: 2 x CAN (isolated) - SL-SMT 90F connectors 5: 4 x COM RS-422/485 isolated, NMEA compliant 6: 4 x COM RS-232 isolated, NMEA compliant	1: 1 x COM - Un-isolated COM (RS-232/422/485) 2: 1 x miniPCIe - Require modification of chassis 3: 1 x DIO (4/4) - Digital Input / Output (4/4) 4: 2 x CAN (isolated) - SL-SMT 90F connectors 5: 1 x DVI-D 24pin 6: 4 x COM RS-422/485 isolated, NMEA compliant 7: 4 x COM RS-232 isolated, NMEA compliant
ENVIRONMENTAL DATA	HT B21F with Intel® Atom™	HT B21E with Intel® Core™2 Duo
<b>Operating Temperature</b>	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%
<b>Storage Temperature</b>	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%
<b>Compass Safe Distance</b>	Standard: TBD - Steering: TBD cm [inch]	Standard: TBD - Steering: TBD cm [inch]
<b>Mean Time Between Failures</b>	MTBF TBD hours [MIL-HDBK-217 GB 25.0°C / 77.0°F]	MTBF TBD hours [MIL-HDBK-217 GB 25.0°C / 77.0°F]
TYPE APPROVAL & TESTING	HT B21F with Intel® Atom™	HT B21E with Intel® Core™2 Duo
<b>Note: Some of the Type Approvals could be pending.</b>	IEC 60945 4 <sup>th</sup> [EN 60945:2002], IACS E10 ClassNK - Nippon Kaiji Kyokai GL - Germanischer Lloyd DNV - Det Norske Veritas ABS - American Bureau of Shipping BV - Bureau Veritas LRS - Lloyd's Register of Shipping	IEC 60945 4 <sup>th</sup> [EN 60945:2002], IACS E10 ClassNK - Nippon Kaiji Kyokai GL - Germanischer Lloyd DNV - Det Norske Veritas ABS - American Bureau of Shipping BV - Bureau Veritas LRS - Lloyd's Register of Shipping



## MIL QUALIFIED PRODUCTS

Displays and computers are the critical link between the combat operator and today's mission-critical systems. As the leading international supplier of rugged marine displays, computers and panel computers, Hatteland Display understands the importance of product quality, reliability and performance. With over twenty years experience, Hatteland Display has established sophisticated design techniques, meticulous manufacturing processes, stringent testing programs and world-class quality control systems that reduce risk and total cost of ownership for our customers.

Whether your need is for COTS or custom product solutions, Hatteland Display is dedicated to becoming a dependable link in your supply chain and logistics support network.

Through continual expansion and improvement of our development and manufacturing facilities as well as our global support network, customers worldwide have gained confidence in the quality and value of our products and solutions, and also in our ability to deliver and support them over the entire product lifecycle. Our knowledge of the unique design, testing and life-cycle management issues of displays and computers for naval vessels has enabled us to develop high quality Naval products, which can be found in navigation, automation and C4i solutions aboard everything from aircraft carriers and destroyers to patrol boats and submarines.

We also provide dedicated ECDIS calibration which enables us to deliver type approved ECDIS displays straight from the factory to you.



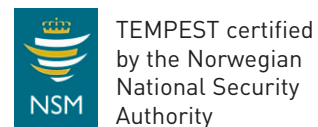
## RAISING THE STANDARDS

Hatteland Display naval products are tested according to MIL-STD-461E, MIL-STD-810F, MIL-STD-167-1 and MIL-S-901D, Grade A, Class 1, in addition to extended IEC 60945. We have Type Approval from all major marine classification societies, ensuring our marine displays, computers and panel computers are fit for the harsh environments encountered on missions at sea.

**MIL-STD-461E**  
**MIL-STD-810F**  
**MIL-STD-167-1**  
**MIL-S-901D, Grade A, Class 1**

**Extended IEC 60945**

**TEMPEST SDIP-27**



## COTS OR CUSTOM SOLUTIONS

Hatteland Display has a proven track record of providing dependable solutions to systems integrators and Navies around the world, which is a reflection of our product quality, value and the trust which our customers put into our solutions.

In addition to our extensive portfolio of standard (COTS) products, Hatteland Display delivers custom and badged product solutions to some of the largest and best-known system providers in the industry. Our ability to provide tailored solutions and support high-volume production runs has led to lasting relationships with our customers.

Product innovation and flexible manufacturing are key to Hatteland Display's leadership strategy. We have made substantial investments in state-of-the-art design tools, environmental test equipment, manufacturing and quality systems and are recognized for providing the highest quality and best value in the Naval and Defense market.



NAVAL



## PAST PERFORMANCE - NAVIES

Our products are in applications for navigation, automation and C4i on a wide range of military vessel types, including Aircraft Carriers, Destroyers, Frigates, Mine Hunters, Patrol Boats and Submarines.

### Navies, among others, currently supplied by Hatteland Display

Belgian, Canadian, Chilean, Danish, Dutch, French, German, Greek, Indian, Italian, Japanese MSDF, Korean, Malaysian, Mexican, Norwegian, Polish, Royal Australian, Royal Navy (UK), Royal Navy of Oman, Singapore, South African, Spanish, Swedish, Turkish, UAE and US.

With this much experience you can be sure that Hatteland Display is a strong link in the naval supply chain.

### Coastguards, among others, currently supplied by Hatteland Display

Germany, Japan, Jamaica, Netherlands, Norway and US.

### Reference programs, among others, currently supplied by Hatteland Display

FREMM, BAM, Barracuda, MIL-GEM, SOGIM, AWD, LCS, DEEPWATER, LHD/LHA, DDG/CG and LSD/LPD.



Meeting the Demand.  
Qualified for shock,  
vibration and EMI...



SPECIFICATIONS - MIL QUALIFIED DISPLAYS

SPECIFICATIONS - MIL QUALIFIED DISPLAYS

19 INCH TEMPEST TESTED



20 INCH



20 INCH W/HANDLES



20 INCH



20 INCH



TECHNICAL DATA	HM 19T14 MMD-AAT-AOBA	HM 20T07 MIL / HM 20T07 MIL-H
<b>TFT Technology</b>	Active Matrix, Thin Film Transistor (TFT), MVA Premium™ Technology, Optical Bonding Technology	a-Si TFT (Thin Film Transistor) Active Matrix, Optical Bonding Technology
<b>Viewable Image Size &amp; Active Area</b>	19.0 inch - 376.32 [14.82"] (H) x 301.056 [11.85"] (V) mm [inch]	20.1 inch - 408.0 [16.06"] (H) x 306.0 [12.05"] (V) mm [inch]
<b>Native Resolution &amp; Pixel Pitch</b>	1280 x 1024 - 0.294 (H) x 0.294 (V) mm	1600 x 1200 - 0.255 (H) x 0.255 (V) mm
<b>Response Time</b>	12 ms (typ)	20 ms (typ)
<b>Light Intensity &amp; Contrast Ratio</b>	300 cd/m <sup>2</sup> (typ) - 900:1 (typ)	250 cd/m <sup>2</sup> (typ) - 500:1 (typ)
<b>View Angle / Max Color</b>	+/- 85 deg. (up/down/left/right) / 16.7 million	+/- 88 deg. (up/down/left/right) / 16.7 million
<b>Sync. Signal Auto-detect</b>	Digital Separate Sync., Composite Sync., Sync. On Green	Digital Separate Sync., Composite Sync., Sync. On Green
<b>Synchronization Range</b>	15.0 kHz to 91.1 kHz (H) - 60 Hz to 85 Hz (V)	15.0 kHz to 91 kHz (H) - 56 Hz to 75 Hz (V)
<b>Optimal Resolution and Hz</b>	1280 x 1024 (SXGA 5:4) @ 60 Hz	1600 x 1200 (UXGA 4:3) @ 60 Hz
<b>Detectable Resolutions</b>	640 x 350 / 640 x 480 / 720 x 400 / 800 x 600 / 1024 x 768 / 1280 x 1024 / 1600 x 1200	640 x 350 / 640 x 480 / 720 x 400 / 800 x 600 / 1024 x 768 / 1280 x 1024 / 1600 x 1200
<b>Video Input Option</b>	YES via <b>HATTELAND® Multifunction Cable</b>	YES
<b>Supported Video Signals</b>	SVHS & COMPOSITE Compatible	COMPOSITE Compatible (NTSC/PAL/SECAM Interlaced)
<b>Product Features</b>	TEMPEST Tested, Front Bonded, PBP (Picture By Picture), PIP (Picture In Picture), HATTELAND® Multifunction Connector, Hotkey Functionality, Dimmable 0-100%, Buzzer	Front Bonded, Qualified for shock, vibration & EMI, Fully adjustable backlight [0-100%], PIP (Picture-In-Picture), Serial Communication (SCOM) <b>Front mounted handles (HM 20T07 MIL-H1 and -H2 model only)</b>
<b>Power Input &amp; Power Consumption</b>	115/230VAC - 50/60Hz - 100W (max)	115/230VAC - 50/60Hz or 24VDC (HM 20T07 MIL-H2 model only) 75W (typ) - 100W (max)
MECHANICAL DATA	HM 19T14 MMD-AAT-AOBA	HM 20T07 MIL / HM 20T07 MIL-H
<b>User Controls</b>	Power On/Off + On Screen Display Menu (push button), Brightness Control (rotary), Hotkeys (left/right - push buttons), Mode Status Illuminated LED-Ring Indicator, Buzzer	Power On/Off (push button), Brightness Control Rotary Knob, 2 x hotkeys, Mode Status LED, On Screen Display control (OSD/OSM) (behind hatch), Serial Remote Control DIP-Switch Settings (rear)
<b>Connectors</b>	<b>DVI IN:</b> 1 x DVI-I 29P (female) <b>RGB IN:</b> 1 x HD D-SUB 15P (female) <b>RGB OUT:</b> 1 x HD D-SUB 15P (female) <b>Multifunction:</b> 1 x D-SUB 160p (female) <b>USB:</b> 1 x Type B (female) - (Not in use/ Not connected) <b>AC Power IN:</b> 1 x Std IEC inlet <b>AC Power OUT:</b> 1 x Std IEC outlet <b>SCOM RS-232:</b> 1 x DB9F <b>Composite Video IN:</b> 3 x BNC	<b>RGB IN:</b> 5 x BNC Connectors (RGBHV) <b>RGB OUT:</b> 1 x HD D-SUB 15P (female) <b>Composite Video IN:</b> 1 x BNC Connector <b>Serial Remote Control:</b> 2 x D-SUB 9P (female) <b>AC Power IN:</b> 1 x Std IEC inlet <b>If Touch Screen:</b> 1 x DB9F RS-232 communication
<b>Models Dimensions &amp; Weight</b>	483.00 (W) x 444.00 (H) x 82.00 (D) mm 19.02" (W) x 17.48" (H) x 3.23" (D) inch Approx 12 kg / 26 lbs	534.00 [21.02"] (W) x 481.00 [18.94"] (H) x 87.00 [3.43"]* (D) mm [inch] Approx 14 kg / 31 lbs <b>*HM 20T07 MIL-H1/H2 model w/handles: 147.00 [4.99"] (D) mm [inch]</b>
<b>Factory Options</b>	1: Color Calibrated models (ECDIS)	1: 24/28 VDC Power Solution (-H1 model only) 2: Resistive Touchscreen 8 wire 3: Color Calibrated models (ECDIS)
<b>Available Accessories</b>	VSD100692-x Multifunction Cable, Bracket (tilt up/down), EN60945 Tested Bracket (tilt up/down), Rotary Bracket (left/right), Sun Visor, VESA Bracket, 19" Rack Adapter Frame for 21" CRT, Water Cover	Bracket (tilt up/down), Rotary Bracket (left/right), VESA Bracket, Sun Visor, Water Cover
ENVIRONMENTAL DATA	HM 19T14 MMD-AAT-AOBA	HM 20T07 MIL / HM 20T07 MIL-H
<b>Dry Heat Storage</b>	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%	70.0°C / 158.0°F (IEC 60068-2-2 [1974], Test Bd)
<b>Cold Storage</b>	N/A	-40.0°C / -40.0°F (IEC 60068-2-1 [1990], Test Ad)
<b>Operating Temperature (typ)</b>	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95%	-15.0°C / 5.0°F to 55.0°C / 131.0°F
<b>Humidity</b>	N/A	Up to 95%
<b>Shock</b>	N/A	50g / 30ms (IEC 60068-2-27 [1987], Test Ea)
<b>Grade A Shock</b>	N/A	Class 1 (hard-mounted) (MIL-S-901D)
<b>Transient Shock</b>	N/A	N/A
<b>Rain (drip proof)</b>	N/A	N/A
<b>Salt Fog</b>	N/A	N/A
<b>Vibration Testing</b>	N/A	MIL-STD-167-1 - Console Mounted
<b>IP Rating</b>	Protection (EN60529): IP66 front - IP20 rear	Protection (EN60529): IP66 front - IP20 rear
<b>Compass Safe Distance</b>	Standard: 160 [62.99"] - Steering: 105 [41.34"] cm [inch]	Standard: 115 [45.28"] - Steering: 70 [27.56"] cm [inch]
TYPE APPROVAL & TESTING	HM 19T14 MMD-AAT-AOBA	HM 20T07 MIL / HM 20T07 MIL-H
<b>Type Approval / Certificates</b>	TEMPEST SDIP-27 Level B, IEC 60945 4 <sup>th</sup> [EN 60945:2002], ClassNK - Nippon Kaiji Kyokai, GL - Germanischer Lloyd, DNV - Det Norske Veritas, ABS - American Bureau of Shipping, BV - Bureau Veritas	IEC 60945 4 <sup>th</sup> [EN 60945:2002], ClassNK - Nippon Kaiji Kyokai, DNV - Det Norske Veritas, GL - Germanischer Lloyd, BV - Bureau Veritas, LRS - Lloyd's Register of Shipping, ABS - American Bureau of Shipping
<b>EMI Testing</b>	N/A	MIL-STD 461E 1999, CE 101, CE 102, CS 101, CS 114, CS 116, RE 101, RE 102, RS 101, RS 103

TECHNICAL DATA	HM 20T07 NMD NSN (NATO Stock Number): 7025-01-576-3091	HM 20T07 CMD NSN (NATO Stock Number): 7025-25-160-4382
<b>TFT Technology</b>	a-Si TFT (Thin Film Transistor) Active Matrix, Optical Bonding	a-Si TFT (Thin Film Transistor) Active Matrix, Optical Bonding
<b>Viewable Image Size &amp; Active Area</b>	20.1 inch - 408.0 [16.06"] (H) x 306.0 [12.05"] (V) mm [inch]	20.1 inch - 408.0 [16.06"] (H) x 306.0 [12.05"] (V) mm [inch]
<b>Native Resolution &amp; Pixel Pitch</b>	1600 x 1200 - 0.255 (H) x 0.255 (V) mm	1600 x 1200 - 0.255 (H) x 0.255 (V) mm
<b>Response Time</b>	20 ms (typ)	20 ms (typ)
<b>Light Intensity &amp; Contrast Ratio</b>	250 cd/m <sup>2</sup> (typ) - 500:1 (typ)	250 cd/m <sup>2</sup> (typ) - 500:1 (typ)
<b>View Angle / Max Color</b>	+/- 88 deg. (up/down/left/right) / 16.7 million	+/- 88 deg. (up/down/left/right) / 16.7 million
<b>Sync. Signal Auto-detect</b>	Digital Separate Sync., Composite Sync., Sync. On Green	Digital Separate Sync., Composite Sync., Sync. On Green
<b>Synchronization Range</b>	15.0 kHz to 91 kHz (H) - 56 Hz to 75 Hz (V)	15.0 kHz to 91 kHz (H) - 56 Hz to 75 Hz (V)
<b>Optimal Resolution and Hz</b>	1600 x 1200 (UXGA 4:3) @ 60 Hz	1600 x 1200 (UXGA 4:3) @ 60 Hz
<b>Detectable Resolutions</b>	640 x 350 / 640 x 480 / 720 x 400 / 800 x 600 / 1024 x 768 / 1280 x 1024 / 1600 x 1200	640 x 350 / 640 x 480 / 720 x 400 / 800 x 600 / 1024 x 768 / 1280 x 1024 / 1600 x 1200
<b>Video Input Option</b>	None	None
<b>Supported Video Signals</b>	None	None
<b>Product Features</b>	Front Bonded, Qualified for shock, vibration & EMI, Adaptable to 19 inch racks or consoles, Fully adjustable backlight [0-100%], Serial Communication (SCOM) Interface, Lockable handles, Suitable for bridge or below decks	Front Bonded, Qualified for shock, vibration & EMI, Adaptable to 19 inch racks or consoles, Fully adjustable backlight [0-100%], Serial Communication (SCOM) Interface, Front mounted handles, Suitable for bridge or below decks
<b>Power Input &amp; Power Consumption</b>	115/230VAC - 50/60/400Hz or 24/28 VDC - 75W (typ) - 100W (max)	115/230VAC - 50/60/400Hz or 24/28 VDC - 75W (typ) - 100W (max)
<b>Inrush Current / Other</b>	10A for 24/28VDC, Max. @ 25.0°C / 77.0°F 10A for 115VAC, Max. @ 25.0°C / 77.0°F	10A for 24/28VDC, Max. @ 25.0°C / 77.0°F 10A for 115VAC, Max. @ 25.0°C / 77.0°F
MECHANICAL DATA	HM 20T07 NMD	HM 20T07 CMD
<b>User Controls</b>	BIT Function Button, INV Alarm Indicator LED, Power On/Off Button, On Screen Display control (OSD/OSM) button, Up/Down OSD Navigation / Hotkey Set #1 Buttons, +/- Brightness Backlight Control, Backlight Illuminated Buttons	BIT Function Button, INV Alarm Indicator LED, Power On/Off Button, On Screen Display control (OSD/OSM) button, Up/Down OSD Navigation / Hotkey Set #1 Buttons, +/- Brightness Backlight Control, Backlight Illuminated Buttons
<b>Connectors</b>	<b>DVI IN:</b> 1 x DVI-I 29P (female) or configurable as <b>RGB IN:</b> 1 x HD D-SUB 15P (female) via Adapter <b>RGB IN:</b> 5 x BNC J01(R)+J03(G)+J05(B)+J07(H)+J08(V) <b>RGB OUT:</b> 3 x BNC J02(R)+J04(G)+J06(B) <b>AC Power IN:</b> 1 x Circular MIL P/N: AMP - MS27468T9F98P <b>DC Power IN:</b> 1 x Circular MIL P/N: AMP - MS27468T15F5P <b>Grounding:</b> 1 x M4 Internal Screw Thread <b>Combined Touch / SCOM+BIT Interface:</b> 1 x D-SUB 9P (female)	<b>DVI IN:</b> 1 x DVI-I 29P (female) or configurable as <b>RGB IN:</b> 1 x HD D-SUB 15P (female) via Adapter <b>RGB IN:</b> 5 x BNC J01(R)+J03(G)+J05(B)+J07(H)+J08(V) <b>RGB OUT:</b> 3 x BNC J02(R)+J04(G)+J06(B) <b>AC Power IN:</b> 1 x Circular MIL P/N: AMP - MS27468T9F98P <b>DC Power IN:</b> 1 x Circular MIL P/N: AMP - MS27468T15F5P <b>Grounding:</b> 1 x M4 Internal Screw Thread <b>Combined Touch / SCOM+BIT Interface:</b> 1 x D-SUB 9P (female)
<b>Models Dimensions &amp; Weight</b>	482.00 (W) x 399.00 (9U) (H) x 95.00 (D) mm 18.98" (W) x 15.71" (9U) (H) x 3.74" (D) inch Approx 12 kg / 26 lbs	482.00 (W) x 399.00 (9U) (H) x 135.00 (D) mm 18.98" (W) x 15.71" (9U) (H) x 5.31" (D) inch Approx 12 kg / 26 lbs
<b>Factory Options</b>	1: 24/28 VDC Power Solution 2: Resistive Touchscreen 8 wire 3: Color Calibrated models (ECDIS)	1: 24/28 VDC Power Solution 2: Resistive Touchscreen 8 wire 3: Color Calibrated models (ECDIS)
<b>Available Accessories</b>	External 10-foot (3.0m) AC power cable NEMA (Halogen Free) External 10 foot (3.0m) AC power cable Europe (Halogen Free) External 10 foot (3.0m) DC power cable (Halogen Free)	External 10-foot (3.0m) AC power cable NEMA (Halogen Free) External 10 foot (3.0m) AC power cable Europe (Halogen Free) External 10 foot (3.0m) DC power cable (Halogen Free)
ENVIRONMENTAL DATA	HM 20T07 NMD	HM 20T07 CMD
<b>Dry Heat Storage</b>	70.0°C / 158.0°F (MIL-STD-810F)	70.0°C / 158.0°F (MIL-STD-810F)
<b>Cold Storage</b>	-40.0°C / -40.0°F (MIL-STD-810F)	-40.0°C / -40.0°F (MIL-STD-810F)
<b>Operating Temperature (typ)</b>	<b>AC:</b> -15.0°C / 5.0°F to 55.0°C / 131.0°F <b>DC:</b> -15.0°C / 5.0°F to +55.0°C / 131.0°F (Mil-Std 810F)	<b>AC:</b> -15.0°C / 5.0°F to 55.0°C / 131.0°F <b>DC:</b> -15.0°C / 5.0°F to 55.0°C / 131.0°F (MIL-STD-810F)
<b>Humidity</b>	95% at 40.0°C / 104.0°F (MIL-STD-810F)	95% at 40.0°C / 104.0°F (Mil-Std 810F)
<b>Shock</b>	60g / 11ms (IEC 60068-2-27 [1987], Test Ea)	60g / 11ms (IEC 60068-2-27 [1987], Test Ea)
<b>Grade A Shock</b>	Class 1 (hard-mounted) (MIL-S-901D)	Class 1 (hard-mounted) (MIL-S-901D)
<b>Transient Shock</b>	2-280 Hz, Designed to envelope a half sine shock pulse of 50g / 35ms (IEC 60068-2-57 [1999-11], Test Ff)	2-280 Hz, Designed to envelope a half sine shock pulse of 50g / 35ms (IEC 60068-2-57 [1999-11], Test Ff)
<b>Rain (drip proof)</b>	MIL-STD-810F - Console mounted	MIL-STD-810F - Console mounted
<b>Salt Fog</b>	MIL-STD-810F	MIL-STD-810F
<b>Vibration Testing</b>	MIL-STD-167-1	MIL-STD-167-1
<b>IP Rating</b>	N/A	N/A
<b>Compass Safe Distance</b>	N/A	N/A
TYPE APPROVAL & TESTING	HM 20T07 NMD	HM 20T07 CMD
<b>Type Approval / Certificates</b>	IEC 60945 4 <sup>th</sup> [EN 60945:2002], IACS E10	IEC 60945 4 <sup>th</sup> [EN 60945:2002]
<b>EMI Testing</b>	MIL-STD 461E 1999, CE 101, CE 102, CS 101, CS 114, CS 116, RE 101, RE 102, RS 101, RS 103	MIL-STD 461E 1999, CE 101, CE 102, CS 101, CS 114, CS 116, RE 101, RE 102, RS 101, RS 103



20 INCH



TECHNICAL DATA	JH 20T03 MIL
<b>TFT Technology</b>	Active Matrix, Thin Film Transistor (TFT)
<b>Viewable Image Size &amp; Active Area</b>	20.1 inch - 399.36 [15.72"] [H] x 319.49 [12.58"] [V] mm [inch]
<b>Native Resolution &amp; Pixel Pitch</b>	1280 x 1024 - 0.312 [H] x 0.312 [V] mm
<b>Response Time</b>	25 ms (typ)
<b>Light Intensity &amp; Contrast Ratio</b>	250 cd/m <sup>2</sup> (typ) - 300:1 (typ)
<b>View Angle</b>	+/- 85 deg. (up/down/left/right) / 16.7 million
<b>Sync. Signal Auto-detect</b>	Digital Separate Sync., Composite Sync., Sync. On Green
<b>Synchronization Range</b>	31.5 kHz to 91.1 kHz [H] - 60 Hz to 85 Hz [V]
<b>Optimal Resolution and Hz</b>	1280 x 1024 [SXGA 5:4] @ 60 Hz
<b>Detectable Resolutions</b>	640 x 350 / 640 x 480 / 720 x 400 / 800 x 600 / 1024 x 768 / 1280 x 1024
<b>Video Input Option</b>	None
<b>Supported Video Signals</b>	None
<b>Product Features</b>	Fully adjustable backlight (0-100%), Serial Communication (SCOM) Interface, Suitable for navigation and automation
<b>Power Input &amp; Power Consumption</b>	115/230VAC - 50/60Hz - 76W [typ] - 100W [max]
<b>Inrush Current / Other</b>	Transient immunity, 100 ns risetime, 10 $\mu$ s duration, 325 VPEAK Supply voltage variation test, 98 -> 138 VAC, 56.4 -> 63.6 Hz Measurements of inrush current = 4 APEAK
MECHANICAL DATA	JH 20T03 MIL
<b>User Controls</b>	Power On/Off (push button), Brightness Control Rotary Knob, 2 x hotkeys, Mode Status LED, On Screen Display control (OSD/OSM)
<b>Connectors</b>	<b>RGB IN:</b> 5 x BNC Connectors (RGBHV) <b>Touch Screen:</b> 1 x D-SUB 9P (female) <b>Serial Remote Control:</b> 2 x D-SUB 9P (female) <b>AC Power IN:</b> 1 x Std IEC inlet
<b>Models Dimensions &amp; Weight</b>	534.00 [W] x 485.00 [H] x 94.00 [D] mm 21.02" [W] x 19.09" [H] x 3.70" [D] inch Approx 14 kg / 31 lbs
<b>Factory Options</b>	1: Capacitive Touchscreen 2: Color Calibrated models (ECDIS) 3: Video Buffer
<b>Available Accessories</b>	Bracket (tilt up/down), Rotary Bracket (left/right), Sun Visor, VESA Bracket, Water Cover, External Power Relay
ENVIRONMENTAL DATA	JH 20T03 MIL
<b>Dry Heat Storage</b>	70.0°C / 158.0°F (IEC 60068-2-2 (1974), Test Bd)
<b>Cold Storage</b>	-40.0°C / -40.0°F (IEC 60068-2-1 (1990), Test Ad)
<b>Operating Temperature (typ)</b>	-15.0°C / 5.0°F to 55.0°C / 131.0°F
<b>Humidity</b>	Up to 95%
<b>Shock</b>	50g / 11ms (IEC 60068-2-27 (1987), Test Ea)
<b>Grade A Shock</b>	N/A
<b>Transient Shock</b>	2-280 Hz, Designed to envelope a half sine shock pulse of 50g / 35ms (IEC 60068-2-57 (1999-11), Test Ff)
<b>Rain (drip proof)</b>	280 l/m <sup>2</sup> /hour - 15min pr. orientation MIL-STD-810F - Console Mounted
<b>Salt Fog</b>	MIL-STD-810F - Console Mounted
<b>Vibration Testing</b>	Endurance Vibration: 4-33 Hz @ +/-5mm, 2g Resonance Search: 4-33 Hz @ 2g No resonance above 2 IEC 60068-2-6 (1995), Test Fc
<b>IP Rating</b>	Protection (EN60529): IP66 front - IP20 rear
<b>Compass Safe Distance</b>	N/A
TYPE APPROVAL & TESTING	JH 20T03 MIL
<b>Type Approval / Certificates</b>	EN60945 3 <sup>rd</sup> (IEC945 3 <sup>rd</sup> ), BV - Bureau Veritas MIL-STD 461E 1999, CE 101, CE 102, CS 101, CS 114, CS 116, RE 101, RE 102, RS 101,RS 103



Rear view of HM 20T07 NMD



# HM C01

Compact  
Rugged  
Naval  
Computer...



4U, 19 INCH  
Rack Adapter accessory



Sliding Rails 20 or 26 inch  
for 4U accessory

## COMPACT



TECHNICAL DATA	HM C01
<b>Installed Operating System (OS) Options</b>	None or Microsoft® Windows® Embedded Enterprise (32bit: XP Pro / Win Server 2003 / Win 7 Pro / Win Server 2008)
<b>Storage</b>	2 x 250GB 2.5" SATA Automotive HDD, 5400RPM, 8MB Buffer
<b>CPU / Processor &amp; FSB Speed</b>	1 x Intel® Core™2 Duo E8400, 3.0GHz, 1333MHz FSB, 6MB L2
<b>Memory</b>	4 x 1GB Dual Channel DDR2 800/667MHz, SDRAM, 240-pin DIMM
<b>System Chipset / Graphics Chipset and Connectors</b>	Intel® Q35, ICH9DO / Intel® GMA 3100 integrated with 1 x HD DB15F (female) RGB/VGA OUT and 1 x 29P (female) DVI-I
<b>Max Resolution / Max Hz</b>	2048 x 1536 / 75Hz
<b>BIOS</b>	Award
<b>PCI Slots / PCIe Slots</b>	2 x PCI2.3, 3V/5V Interface + 1 x PCIe X16 (add2) + 1 x PCIe X1 All slots are Full Height & Full Length profile
<b>Media Drive(s)</b>	1 x DVD-RW/CD-RW Dual Recorder/Player
<b>LPT / Parallel Port</b>	1 x DB25F Bi-Directional Centronics with ECP/EPP mode
<b>Serial Port(s)</b>	2 x DB9M RS-232
<b>Ethernet Port(s)</b>	2 x RJ45 10/100/1000Mbps - Intel® 82566DM, Intel® AMT 2 x RJ45 10/100/1000Mbps - Realtek RTL 8168C(P)8111C
<b>USB Port(s)</b>	8 x USB2.0/1.1 Type A (rear) + 2 x USB2.0/1.1 Type A (front)
<b>Keyboard &amp; Mouse Ports</b>	1 x PS/2 Keyboard + 1 x PS/2 Mouse
<b>Audio Ports</b>	3 x 3.5mm Jacks (LINE IN/LINE OUT/MIC IN) Realtek ALC888 7.1 channel, HD Audio
<b>Speaker</b>	None
<b>Power Manager / Monitoring and Watchdog</b>	ACPI - Temperature, voltage, cooling fans with auto throttle. Watchdog Timer, reset: 1 sec-255 min & 1 sec. or 1 min/step
<b>Power Input and Consumption</b>	24VDC - Operating 70W (typ) <b>DC Power IN:</b> 1 x 2p DSUB (male) Amphenol FCC17
MECHANICAL DATA	HM C01
<b>Key Features</b>	High Performance, Replaceable Air Filter in front, Service friendly, Includes mounting brackets
<b>Dimensions &amp; Weight</b>	345.00 (W) x 133.00 (H) x 390.00 (D) mm (3U) 13.58" (W) x 5.24" (H) x 15.35" (D) inch (3U) Approx 10 kg / 22 lbs
<b>User Controls / Activity</b>	On/Off Push Button, Reset Button, Power LED / HDD LED
<b>Additional Accessories</b>	19 inch Rack Case Kit (4U), Mounting Rails Kit 20 inch for 19 inch rack, Mounting Rails Kit 26 inch for 19 inch rack, Recovery Kit (USB Flash), PCI Kit Mounting Bracket
<b>Capabilities / Prepared for</b>	Up to 8GB DDR2 800/667MHz SDRAM, 240-pin DIMM
ENVIRONMENTAL DATA	HM C01
<b>Operating Temperature</b>	-15.0°C / 5.0°F to 55.0°C / 131.0°F, Humidity up to 95% DNV Temperature Class B 70.0°C / 158.0°F for 2 hours
<b>Storage Temperature</b>	-20.0°C / -4.0°F to 60.0°C / 140.0°F, Humidity up to 95%
<b>Compass Safe Distance</b>	Standard: 150 [59.06"] - Steering: 95 [35.63"] cm [inch]
<b>Mean Time Between Failures</b>	MTBF 22581 hours (MIL-HDBK-217 GB 25.0°C / 77.0°F)
TYPE APPROVAL & TESTING	HM C01
<b>Note: Some of the Type Approvals could be pending. Please check our website for the latest status.</b>	MIL-STD-167-1 Vibration, MIL-STD-810F Shock 50G 30ms, IEC 60945 4 <sup>th</sup> (EN 60945:2002), EN61162, IACS E10 ClassNK - Nippon Kaiji Kyokai GL - Germanischer Lloyd DNV - Det Norske Veritas ABS - American Bureau of Shipping BV - Bureau Veritas LRS - Lloyd's Register of Shipping MIL-STD-461E Naval Limits, CE 101, CE 102, RE 101, RE 102, CS 101, CS 114, CS 116, RS 101, RS 103, IEC 60945 4th (EN 60945:2002)
EMI Testing	



NAVAL



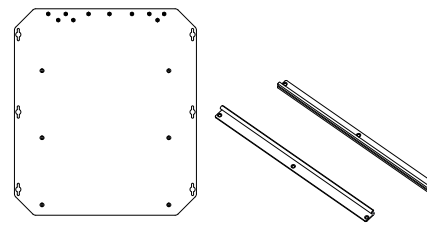
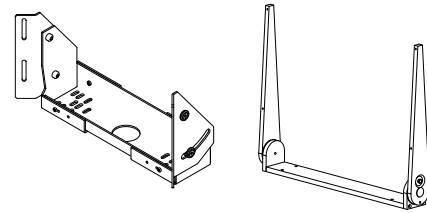
# ACCESSORIES

High quality build accessories suitable for our wide range of Display, Panel Computer and Computer products across all markets. Suitable for Maritime Multi Display (MMD), Maritime Multi Computer (MMC), MIL Qualified (MIL) products and Computers (where applicable).

## Mounting Brackets

Desktop, ceiling, console, wall, rack or cabinet mounting brackets and mounting plates.

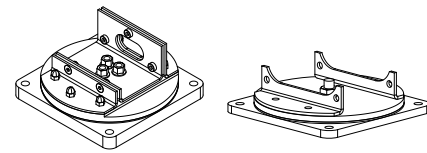
TYPENUMBER	DESCRIPTION	SUITABLE FOR
JH MMDBR STD-A1	Desktop/Ceiling Bracket for Displays and Panel Computers	19, 20 inch
JH 15TBR STD-B1	Desktop/Ceiling Bracket for Displays and Panel Computers	15 inch
JH 19TBR STD-B1	Desktop/Ceiling Bracket for Displays	19 inch Slim
JH 19BRD STD-B1	Desktop/Ceiling Bracket for Displays. EN60945 Tested	19 inch Slim
JH 19BRD STD-A1	Desktop/Ceiling Bracket for Displays and Panel Computers. EN60945 Tested	19 inch
JH 22TBR STD-A1	Desktop/Ceiling Bracket for Displays.	22 inch
JH 22BRD STD-A1	Desktop/Ceiling Bracket for Displays. EN60945 Tested	22 inch
JH 23TBR T01-A1	Desktop/Ceiling Bracket for Displays	23 inch
JH 23BRD STD-A1	Desktop/Ceiling Bracket for Displays. EN60945 Tested	23 inch
JH 26TBR STD-A1	Desktop/Ceiling Bracket for Displays	26 inch
JH 26BRD STD-A1	Desktop/Ceiling Bracket for Displays. EN60945 Tested	26 inch
JH 27BRD STD-A1	Desktop/Ceiling Bracket for Displays. EN60945 Tested	27 inch
HT 00226 OPT-A1	Desktop/Wall/Ceiling/Cabinet for Computers	HT C01, HM C01
HT 00228 OPT-A1	Desktop/Wall/Ceiling/Cabinet for Computers. With Cable Reliefs.	HT B17, HT B18
HT 00244 OPT-A1	Desktop/Wall/Ceiling/Cabinet for Computers.	HT B17, HT B18
HT 00245 OPT-A1	Bracket Kit Desktop/Wall/Ceiling/Cabinet for Computers	HT B17
HT 00246 OPT-A1	Bracket Kit Desktop/Wall/Ceiling/Cabinet for Computers	HT B18



## Rotary Brackets

For use with Mounting Brackets.

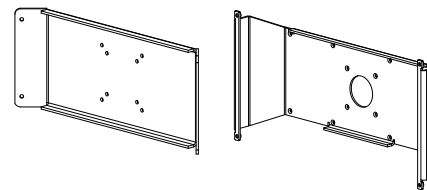
TYPENUMBER	DESCRIPTION	SUITABLE FOR
JH 15TRO STD-A1	For Displays and Panel Computers	15 inch
JH MMDRO STD-A1	For Displays and Panel Computers	19, 20, 23 inch



## VESA Brackets

For Wall or Ceiling mounting, compatible with VESA 75/100mm standards.

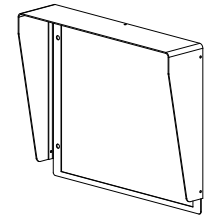
TYPENUMBER	DESCRIPTION	SUITABLE FOR
JH VESA 15T03-A1	For Displays and Panel Computers	15 inch
JH 19VED STD-A1	For Displays and Panel Computers	19 inch
JH 19VED-STD-B1	For Displays	19 inch Slim
JH VESA 20T06-A1	For Displays	20 inch
JH 22VED STD-A1	For Displays	22 inch
JH VESA 23T01-A1	For Displays	23 inch
JH 26VED STD-A1	For Displays	26 inch
JH 27VED STD-B1	For Displays	27 inch



## Sun Visors

For preventing glare and reflections from strong light sources.

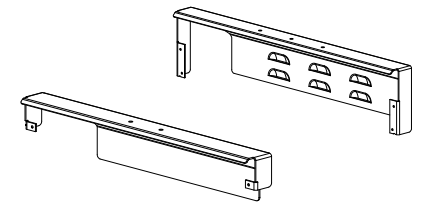
TYPENUMBER	DESCRIPTION	SUITABLE FOR
JH 15TSV STD-A1	For Displays and Panel Computers	15 inch
JH 19TSV STD-A1	For Displays and Panel Computers	19 inch
JH 19TSV STD-B1	For Displays	19 inch Slim
JH 20TSV STD-B1	For Displays	20 inch
JH 22TSV STD-A1	For Displays	22 inch
JH 23TSV STD-A1	For Displays	23 inch
JH 26TSV STD-A1	For Displays	26 inch



## Water Covers

For top of product. IP22 Rated.

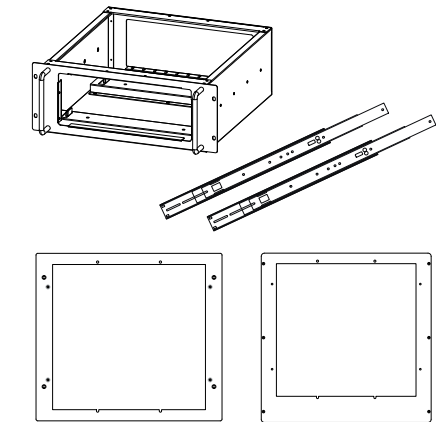
TYPENUMBER	DESCRIPTION	SUITABLE FOR
JH 15TWC STD-A1	For Displays and Panel Computers	15 inch
JH 19TWC STD-B1	For Displays and Panel Computers	19 inch
JH 19TWC STD-C1	For Displays	19 inch Slim
JH 20TWC STD-B1	For Displays	20 inch
JH 22TWC STD-A1	For Displays	22 inch
JH 23TWC STD-A1	For Displays	23 inch
JH 26TWC STD-A1	For Displays	26 inch
JH 27TWC STD-A1	For Displays	27 inch



## Cutout, Frame and Chassis Adapters

19 Inch Rack adapters, Hatteland Display compatible Panel Cut Out adapters, Computer Chassis Rack Adapter, Sliding Rails and CRT adapters suitable for retrofit installations.

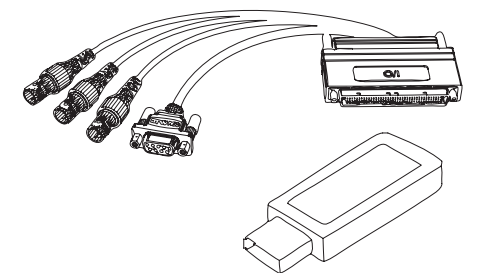
TYPENUMBER	DESCRIPTION	SUITABLE FOR
HT 00223 OPT-A1	Adapt unit to 19 inch Rack 4U size.	HT C01, HM C01
HT 00224 OPT-A1	2 x 20 inch long ball bearing sliding rails for 19 inch Rack	HT C01, HM C01
HT 00225 OPT-A1	2 x 26 inch long ball bearing sliding rails for 19 inch Rack	HT C01, HM C01
HT 00250 OPT-A1	2 x 20 inch long ball bearing sliding rails for 19 inch Rack	HT 216, HT 416
JH 15TAP STD-A1	Frame Adapter, 19 Inch Rack. For Displays and Panel Computers	15 inch
JH 15TAP STD-B1	Frame Adapter, 17 Inch CRT Cut Out Area. or Displays and Panel Computers	15 inch
JH 17TAP STD-A1	Frame Adapter, 19 Inch Rack. For Displays and Panel Computers	19 inch Slim
JH 19TAP STD-A1	Frame Adapter, 21 Inch CRT Cut Out Area. For Displays and Panel Computers	19 inch
JH 19TAP STD-B1	Frame Adapter, 21 Inch CRT Cut Out Area (custom size). For Displays and Panel Computers	19 inch



## Cables and Miscellaneous

These accessories adds even more value to our wide range of display, panel computer and computer products.

TYPENUMBER	DESCRIPTION	SUITABLE FOR
HT 00215 OPT-A1	Recovery Kit (USB Flash). For reverting back to factory/customized installations.	HT B17, HT B17, HT C01, HM C01, HT 216, HT 416
HT 00229 OPT-A1	For secure mounting of PCI/PCIe cards	HT C01, HM C01
HT 00237 OPT-A1	For secure mounting of PCI/PCIe cards	HT B18
JH XPR-A1	115 & 230VAC Power Relay	20 inch
VSD100692-3	Multifunction Cable #1. COM, COM Touch and Composite Video for Displays.	15, 19, 20, 22, 23, 26, 27 inch
VSD100692-4	Multifunction Cable #1. COM and Composite Video for Displays.	15, 19, 20, 22, 23, 26, 27 inch
VSD100694-1	External 10-foot (3.0m) AC power cable NEMA (Halogen Free)	20 inch
VSD100695-1	External 10 foot (3.0m) AC power cable Europe (Halogen Free)	20 inch
VSD100696-1	External 10 foot (3.0m) DC power cable (Halogen Free)	20 inch





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To get an up-to-date list of our locations, please visit:  
[www.hatteland-display.com/locations](http://www.hatteland-display.com/locations)





# Why you should select products from Hatteland Display

## Quality

- Preferred supplier to leading integrators based on rated product quality
- Global service network supported by dedicated in-house service department
- Exclusively use industrial embedded components in our products
- Close partnership with DNV for trusted type approvals
- Take a partnership approach towards our customers and suppliers

## Knowledge

- World's largest supplier of maritime display and computer solutions to the commercial fleet
- Proven reliability with nearly 150,000 maritime products fielded over 20+ years
- Highly skilled R&D organization focused on leading edge technologies
- Significant expertise with ECDIS calibration and approvals
- In-house manufacturing and optical bonding in state of the art facilities
- Training programs for customers and partners

## Value

- Products designed for reduced life cycle cost
- Long term support and life cycle management
- Broad range of type-approved, off-the-shelf products
- Able to cost effectively customize solutions also for low volume products
- Flexible, responsive organization focused on customers needs – Customer first attitude

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Quality - Knowledge - Value