



PRODUCT OVERVIEW

Displays, Panel Computers and Computers 2011



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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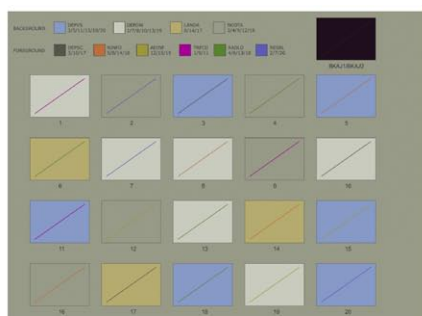
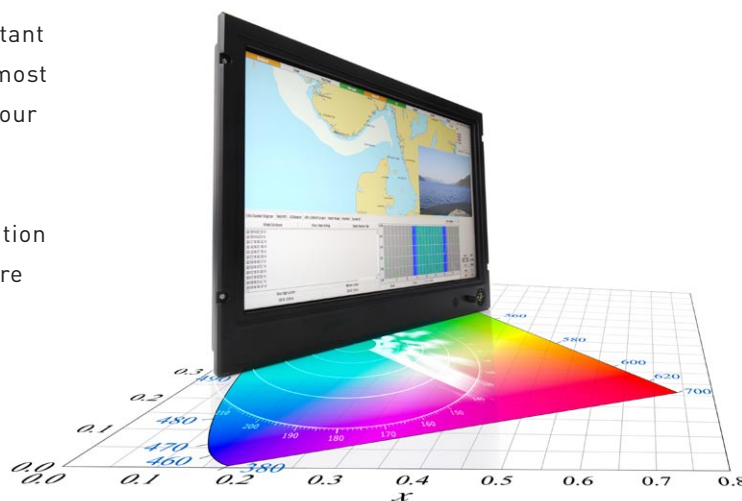
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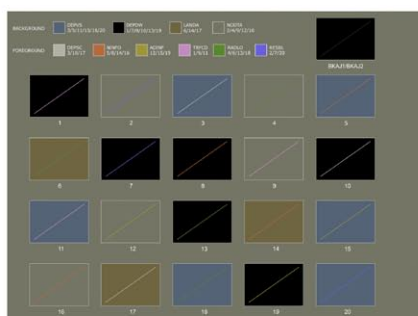
HATTELAND DISPLAY ECDIS CALIBRATION

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.

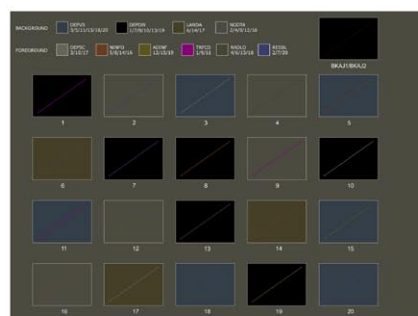
The consequence of making an error in recognition on the display is potentially very costly, therefore it is important that ECDIS monitors match the colour characteristics specified in the relevant standards. Hatteland Display provides both computers and displays to facilitate an overall ECDIS approved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



DAY



DUSK



NIGHT

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:

ABS	American Bureau of Shipping
BV	Bureau Veritas
ClassNK	Nippon Kaiji Kyokai
DNV	Det Norske Veritas
GL	Germanischer Lloyd
KR	Korean Shipping
LRS	Lloyd's Register of Shipping
RS	Russian Maritime Register of Shipping
CCS	China Classification Society

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

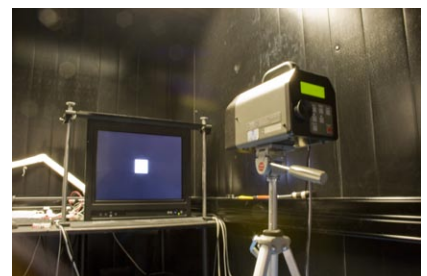
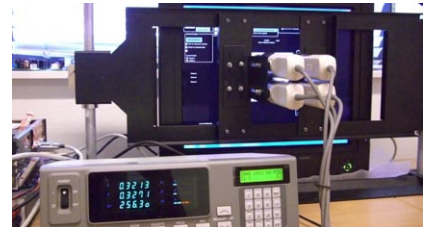
MIL-STD-810F

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.



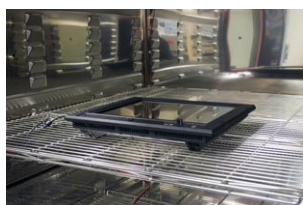
ECDIS Solutions

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.



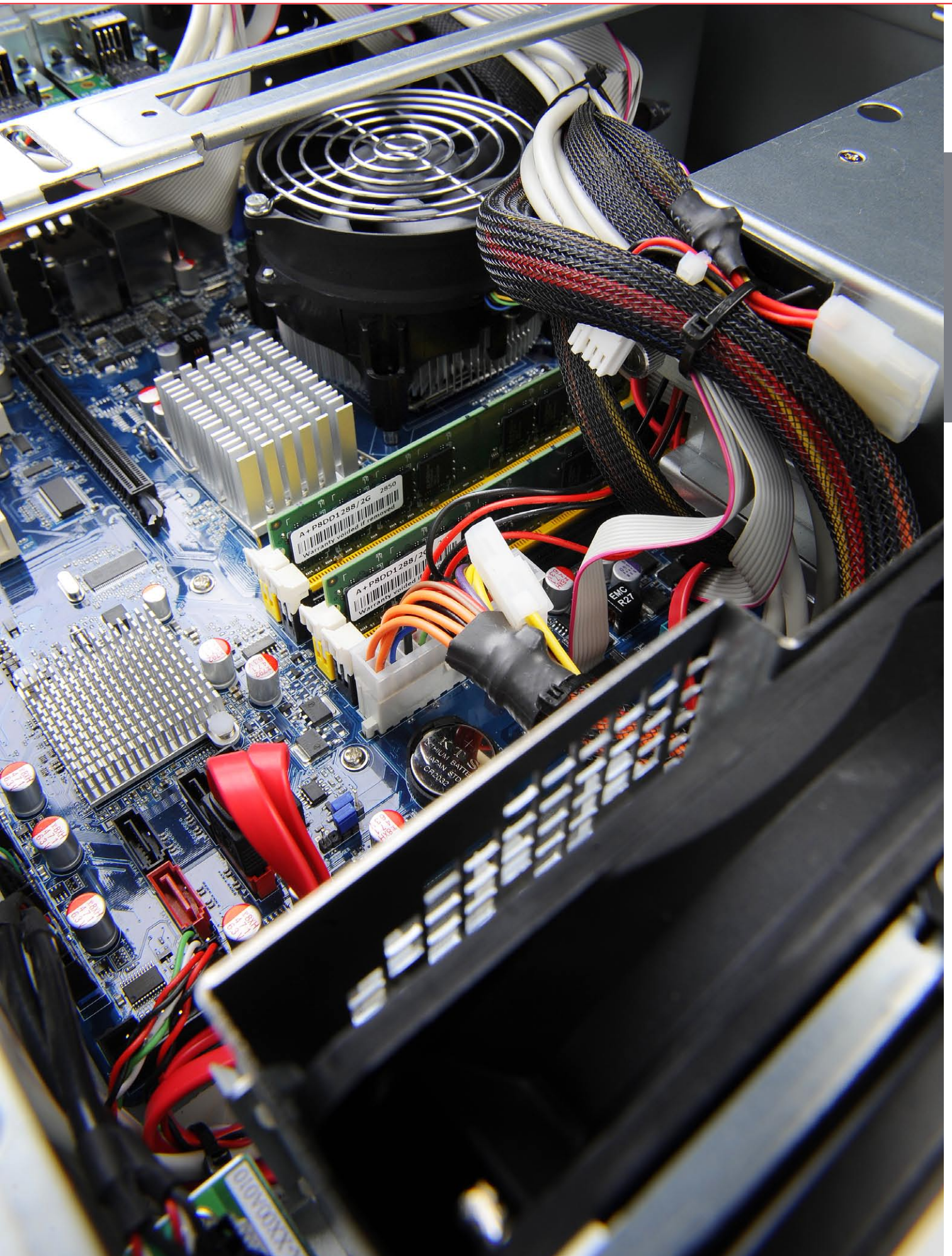
Test Facilities

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.

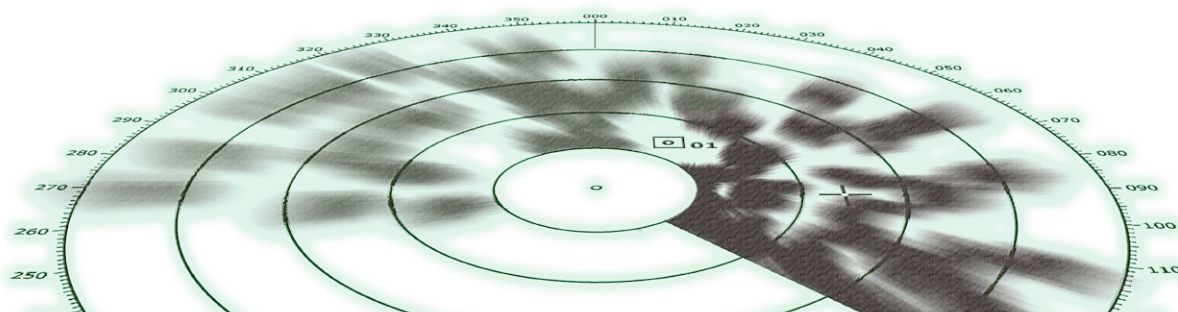
We use an automated customer service application to facilitate returns. Access to stock spare parts locally and the provision of training completes the basis of our commitment to extending the lifecycle of all Hatteland Display products, making sure that your critical systems are always operational.

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

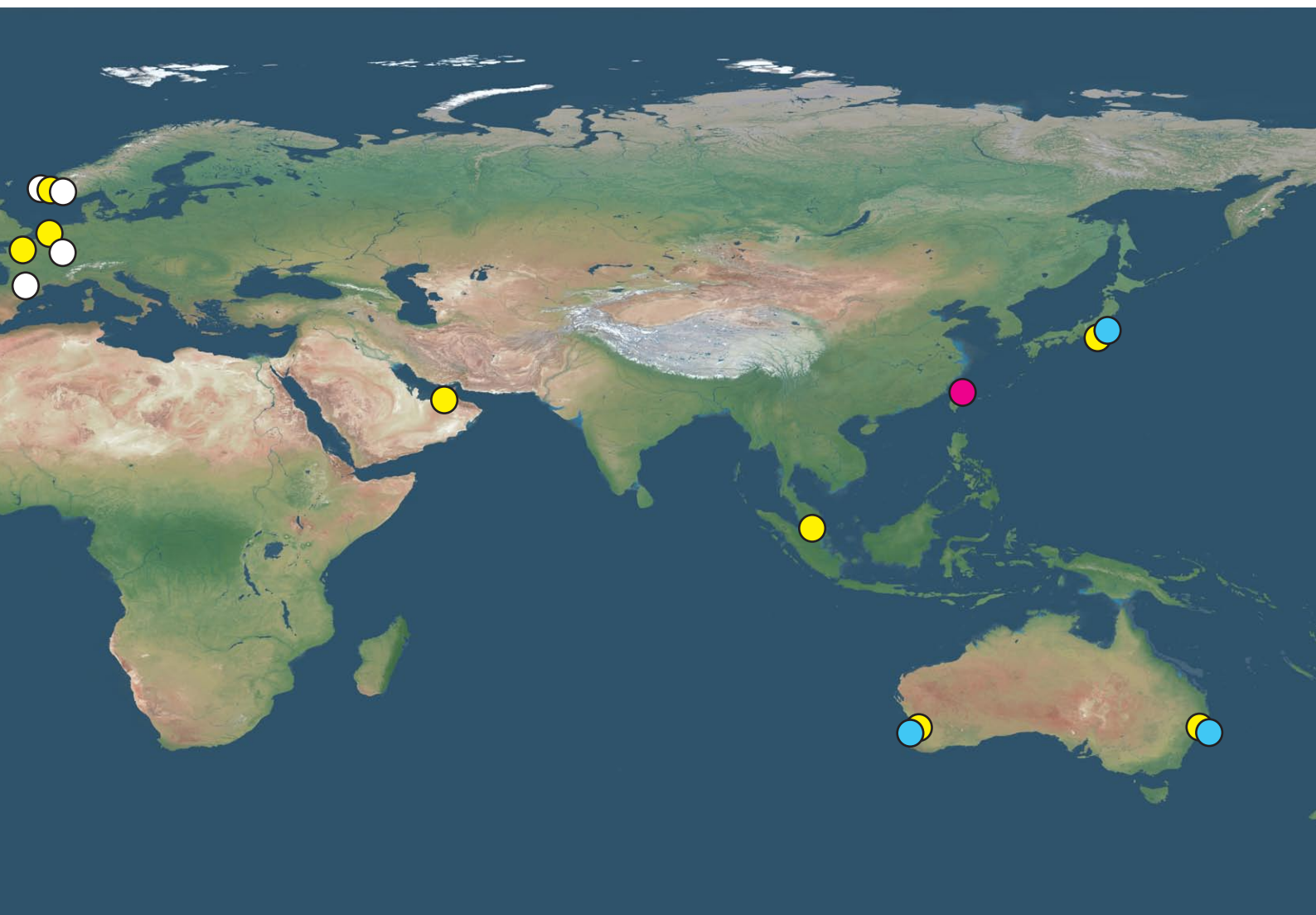


AGENTS AND OFFICES

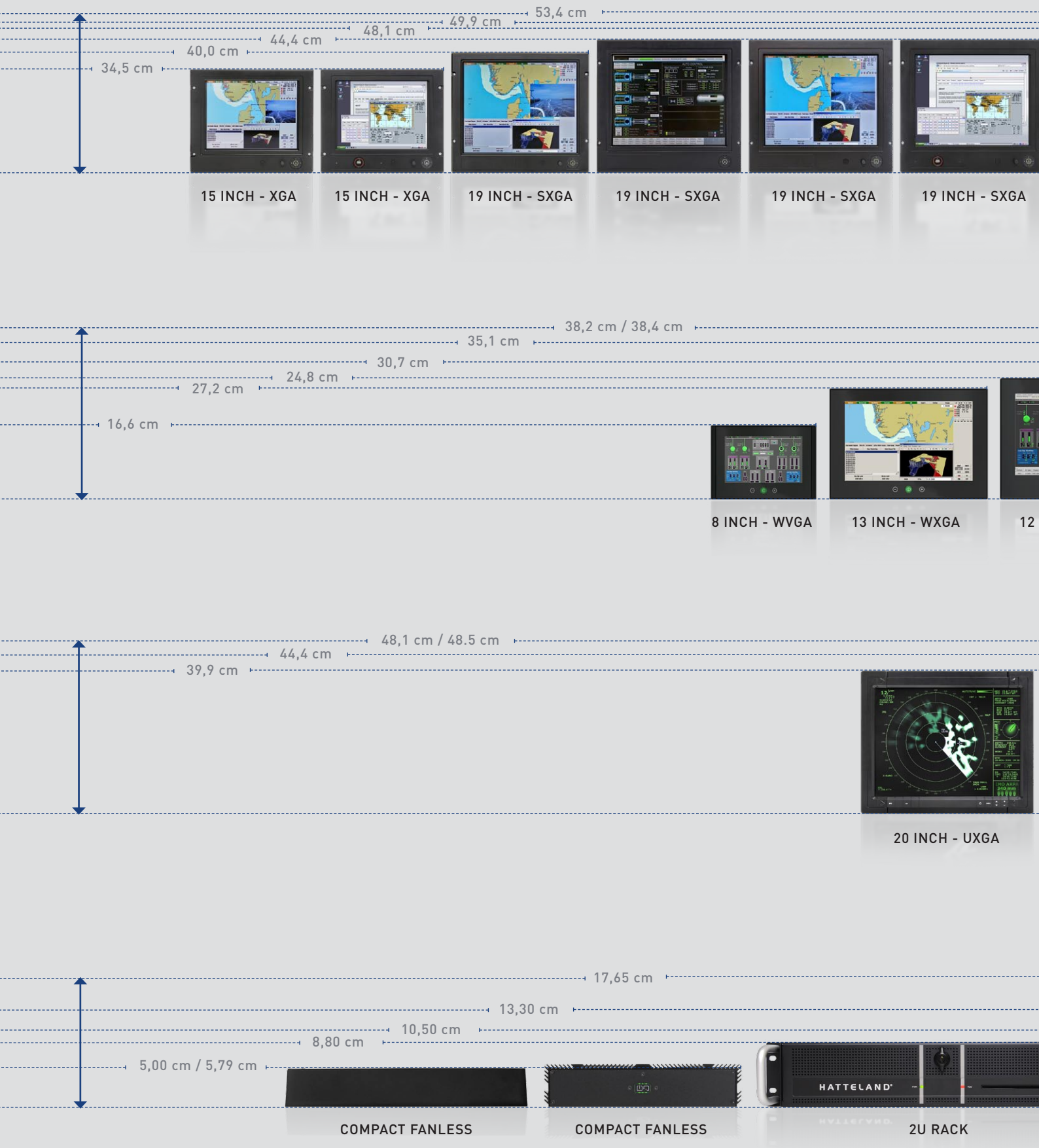
Wherever you, or your vessel, may be in the world, you can rest assure that you can always reach Hatteland Display's many offices and agents located near you and in your timezone to ensure the best possible support.



For up-to-date locations and specific contact information, please visit our dedicated link:
www.hatteland-display.com/locations



PRODUCT SIZE COMPARISON



SERIES 1 - Displays and Panel Computers



22 INCH - WSXGA

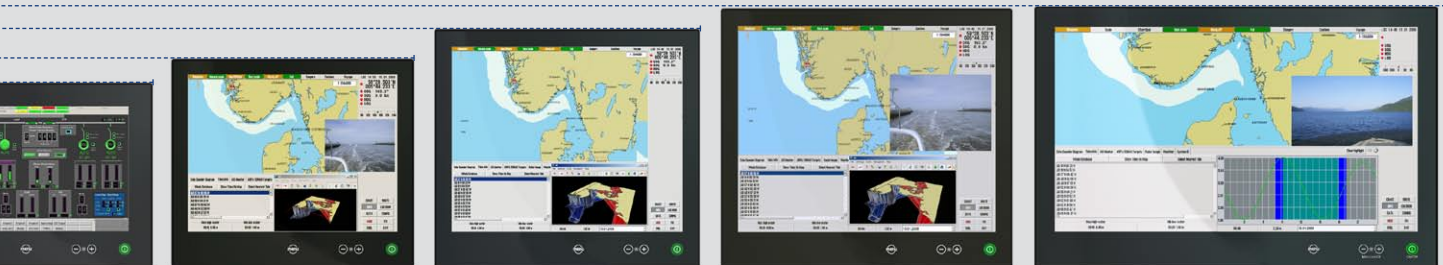
20 INCH - UXGA

27 INCH - WUXGA

26 INCH - WUXGA

23 INCH - UXGA

SERIES X - Displays and Panel Computers



12 INCH - XGA

15 INCH - XGA

17 INCH - SXGA

19 INCH - SXGA

24 INCH - HD 1080

MIL Qualified Displays



20 INCH - UXGA

19 INCH - SXGA

20 INCH - UXGA

20 INCH - UXGA

20 INCH - SXGA

Rack, Compact and Compact Fanless Computers



COMPACT FANLESS

COMPACT

4U RACK

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.



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.

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



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The maritime standard...



SPECIFICATIONS - DISPLAYS SERIES 1

15 INCH



JH 15T17 MMD

19 INCH



JH 19T14 MMD-S

19 INCH



JH 19T14 MMD

TECHNICAL DATA	JH 15T17 MMD	JH 19T14 MMD-SLIM	JH 19T14 MMD
TFT Technology	Color Active Matrix TFT/LCD a-Si TFT Active Matrix	Active Matrix, Thin Film Transistor (TFT) MVA Premium™ Technology	Active Matrix, Thin Film Transistor (TFT) MVA Premium™ Technology
Viewable Image Size & Active Area	15.0 inch - 304.1 [H] x 228.1 [V] mm	19.0 inch - 376.32 [H] x 301.056 [V] mm	19.0 inch - 376.32 [H] x 301.056 [V] mm
Native Resolution & Pixel Pitch	1024 x 768 - 0.297 [H] x 0.297 [V] mm	1280 x 1024 - 0.294 [H] x 0.294 [V] mm	1280 x 1024 - 0.294 [H] x 0.294 [V] mm
Response Time	25 ms [typ]	12 ms [typ]	12 ms [typ]
Light Intensity & Contrast Ratio	250 cd/m ² [typ] - 400:1 [typ]	300 cd/m ² [typ] - 900:1 [typ]	300 cd/m ² [typ] - 900:1 [typ]
View Angle	+/- 85 deg. [up/down/left/right] @ CR >10	+/- 85 deg. [up/down/left/right] @ CR >10	+/- 85 deg. [up/down/left/right] @ CR >10
Max Color Output	16.7 million	16.7 million	16.7 million
Sync. Signal Auto-detect	Digital Separate Sync. Composite Sync. Sync. On Green	Digital Separate Sync. Composite Sync. Sync. On Green	Digital Separate Sync. Composite Sync. Sync. On Green
Synchronisation Range	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]	15,0 kHz to 91,1 kHz [H] 60 Hz to 85 Hz [V]
Optimal Resolution and Hz	1024 x 768 [XGA 4:3] @ 60 Hz	1280 x 1024 [SXGA 5:4] @ 60 Hz	1280 x 1024 [SXGA 5:4] @ 60 Hz
Detectable Resolutions	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	640 x 350 / 640 x 480 / 720 x 400 / 800 x 600 1024 x 768 / 1280 x 1024 / 1600 x 1200 / 1920 x 1200
Video Input Option	YES via HATTELAND® Multifunction Cable	YES via HATTELAND® Multifunction Cable	YES via HATTELAND® Multifunction Cable
Supported Video Signals	SVHS & COMPOSITE Compatible	SVHS & COMPOSITE Compatible	SVHS & COMPOSITE Compatible
Product Features	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%	PBP (Picture By Picture) PIP (Picture In Picture) HATTELAND® Multifunction Connector Hotkey Functionality Dimmable 0-100%
Power Input & Power Consumption	115/230VAC - 50/60Hz or 24 VDC 100W [max]	Multi-power 115/230VAC - 50/60Hz + 24 VDC 50W [typ] - 60W [max]	115/230VAC - 50/60Hz or 24 VDC 100W [max]
MECHANICAL DATA	JH 15T17 MMD	JH 19T14 MMD-SLIM	JH 19T14 MMD
User Controls & Activity	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	Power On/Off + On Screen Display Menu (push button) Brightness Control Hotkeys (left/right - push buttons) Mode Status Illuminated LED-Ring Indicator
Connectors	DVI IN: 1 x DVI-I 29P (female) RGB IN: 1 x HD D-SUB 15P (female) RGB OUT: 1 x HD D-SUB 15P (female) Multifunction: 1 x D-SUB 160p (female) USB I/O: 1 x Type B (female) AC Power IN: 1 x Std IEC inlet AC Power OUT: 1 x Std IEC outlet (5A max) IF DC Power IN: 1 x 2p D-SUB (male) Amphenol FCC17	DVI IN: 1 x DVI-I 29P (female) RGB IN: 1 x HD D-SUB 15P (female) RGB OUT: 1 x HD D-SUB 15P (female) Multifunction: 1 x D-SUB 160p (female) USB I/O: 1 x Type B (female) AC Power IN: 1 x Std IEC inlet AC Power OUT: 1 x Std IEC outlet (5A max) DC Power IN: 1 x 2p D-SUB (male) Amphenol FCC17	DVI IN: 1 x DVI-I 29P (female) RGB IN: 1 x HD D-SUB 15P (female) RGB OUT: 1 x HD D-SUB 15P (female) Multifunction: 1 x D-SUB 160p (female) USB I/O: 1 x Type B (female) AC Power IN: 1 x Std IEC inlet AC Power OUT: 1 x Std IEC outlet (5A max) IF DC Power IN: 1 x 2p D-SUB (male) Amphenol FCC17
Models Dimensions & Weight	412.00 [W] x 345.00 [H] x 73.28 [D] mm Approx 7 kg	460.00 [W] x 400.00 [H] x 82.00 [D] mm Approx 10 kg	483.00 [W] x 444.00 [H] x 82.00 [D] mm Approx 11,5 kg
Factory Options	24 VDC Power Solution Resistive or Capacitive Touchscreen Keypad only or Keypad+Potmeter+Buzzer controls Optical Bonding Technology Speaker / Buzzer	Resistive or Capacitive Touchscreen Keypad only or Keypad+Potmeter+Buzzer controls Optical Bonding Technology Speaker / Buzzer Color Calibrated models [ECDIS]	24 VDC Power Solution Resistive or Capacitive Touchscreen Keypad only or Keypad+Potmeter+Buzzer controls Optical Bonding Technology Speaker / Buzzer Color Calibrated models [ECDIS]
Available Accessories	Bracket (tilt up/down) Rotary Bracket (left/right) VESA Bracket Sun Visor Water Cover 19" Rack Adapter Frame 17" CRT Adapter Frame Multifunction Cable Options: 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 Multifunction Cable Options: 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 Multifunction Cable Options: 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-SLIM	JH 19T14 MMD
Operating Temperature	-15 deg. C to +55 deg. C Humidity up to 95%	-15 deg. C to +55 deg. C Humidity up to 95%	-15 deg. C to +55 deg. C Humidity up to 95%
Storage Temperature	-20 deg. C to +60 deg. C Humidity up to 95%	-20 deg. C to +60 deg. C Humidity up to 95%	-20 deg. C to +60 deg. C Humidity up to 95%
IP Rating	Protection: IP66 front - IP20 rear [EN60529]	Protection: IP66 front - IP20 rear [EN60529]	Protection: IP66 front - IP20 rear [EN60529]
Compass Safe Distance	Standard: 130cm - Steering: 100cm	Standard: TBD - Steering: TBD	Standard: 160cm - Steering: 105cm
TYPE APPROVAL & TESTING	JH 15T17 MMD	JH 19T14 MMD-SLIM	JH 19T14 MMD
Note: Some of the Type Approvals could be pending. Please check our website for the latest status.	IEC 60945 4 th [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 th [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 th [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

SPECIFICATIONS - DISPLAYS SERIES 1

19 INCH

19 INCH for
automation
applications



JH 19T14 STD

20 INCH



JH 20T17 MMD

22 INCH WIDESCREEN



JH 22T11 MMD

TECHNICAL DATA	JH 19T14 STD	JH 20T17 MMD	JH 22T11 MMD
TFT Technology	Active Matrix, Thin Film Transistor (TFT), MVA Premium™ Technology	Color Active Matrix TFT/LCD, a-Si TFT Active Matrix	Active Matrix, Thin Film Transistor (TFT), RGB Vertical Stripe
Viewable Image Size & Active Area	19.0 inch - 376.32 [H] x 301.056 [V] mm	20.1 inch - 408.0 [H] x 306.0 [V] mm	22.0 inch - 473.76 [H] x 296.1 [V] mm
Native Resolution & Pixel Pitch	1280 x 1024 - 0.294 [H] x 0.294 [V] mm	1600 x 1200 - 0.255 [H] x 0.255 [V] mm	1680 x 1050 - 0.282 [H] x 0.282 [V] mm
Response Time	12 ms (typ)	20 ms (typ)	20 ms (typ)
Light Intensity & Contrast Ratio	300 cd/m² (typ) - 900:1 (typ)	250 cd/m² (typ) - 500:1 (typ)	300 cd/m² (typ) - 1000:1 (typ)
View Angle	+/- 85 deg. (up/down/left/right) @ CR >10	+/- 85 deg. (up/down/left/right) @ CR >10	+/- 89 deg. (up/down/left/right) @ CR >10
Max Color Output	16.7 million	16.7 million	16.7 million
Sync. Signal Auto-detect	Digital Separate Sync. Composite Sync. Sync. On Green	Digital Separate Sync. Composite Sync. Sync. On Green	Digital Separate Sync. Composite Sync. Sync. On Green
Synchronisation Range	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]	15.0 kHz to 91.1 kHz [H] 60 Hz to 85 Hz [V]
Optimal Resolution and Hz	1280 x 1024 [SXGA 5:4] @ 60 Hz	1600 x 1200 [UXGA 4:3] @ 60 Hz	1680 x 1050 [WSXGA 16:10] @ 60 Hz
Detectable Resolutions	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 / 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
Video Input Option	None	YES via HATTELAND® Multifunction Cable	YES via HATTELAND® Multifunction Cable
Supported Video Signals	None	SVHS & COMPOSITE Compatible	SVHS & COMPOSITE Compatible
Product Features	Keypad button control Hotkey Functionality Dimmable 20-100%	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%
Power Input & Power Consumption	115/230VAC - 50/60Hz 100W (max)	115/230VAC - 50/60Hz or 24 VDC 100W (max)	115/230VAC - 50/60Hz or 24 VDC 85W (typ) - 100W (max)
MECHANICAL DATA	JH 19T14 STD	JH 20T17 MMD	JH 22T11 MMD
User Controls & Activity	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	Power On/Off + On Screen Display Menu (push button) Brightness Control Hotkeys (left/right - push buttons) Mode Status Illuminated LED-Ring Indicator
Connectors	DVI IN: 1 x DVI-I 29P (female) RGB IN: 1 x HD D-SUB 15P (female)	DVI IN: 1 x DVI-I 29P (female) RGB IN: 1 x HD D-SUB 15P (female) RGB OUT: 1 x HD D-SUB 15P (female) Multifunction: 1 x D-SUB 160p (female) USB I/O: 1 x Type B (female) AC Power IN: 1 x Std IEC inlet AC Power OUT: 1 x Std IEC outlet (5A max) IF DC Power IN: 1 x 2p D-SUB (male) Amphenol FCC17	DVI IN: 1 x DVI-I 29P (female) RGB IN: 1 x HD D-SUB 15P (female) RGB OUT: 1 x HD D-SUB 15P (female) Multifunction: 1 x D-SUB 160p (female) USB I/O: 1 x Type B (female) AC Power IN: 1 x Std IEC inlet AC Power OUT: 1 x Std IEC outlet (5A max) IF DC Power IN: 1 x 2p D-SUB (male) Amphenol FCC17
Models Dimensions & Weight	483.00 [W] x 444.00 [H] x 82.00 [D] mm Approx 11,5 kg	534.00 [W] x 481.00 [H] x 87.00 [D] mm Approx 15 kg	527.50 [W] x 444.00 [H] x 82.00 [D] mm Approx 14,5 kg
Factory Options	None	24 VDC Power Solution Resistive or Capacitive Touchscreen Keypad only or Keypad+Potmeter+Buzzer controls Optical Bonding Technology Speaker / Buzzer Color Calibrated models [ECDIS]	24 VDC Power Solution Capacitive Touchscreen Keypad only or Keypad+Potmeter+Buzzer controls Optical Bonding Technology Speaker / Buzzer Color Calibrated models [ECDIS]
Available Accessories	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	Bracket (tilt up/down) Rotary Bracket (left/right) Sun Visor VESA Bracket Water Cover Multifunction Cable Options: 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 Multifunction Cable Options: 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 19T14 STD	JH 20T17 MMD	JH 22T11 MMD
Operating Temperature	-15 deg. C to +55 deg. C Humidity up to 95%	-15 deg. C to +55 deg. C Humidity up to 95%	-15 deg. C to +55 deg. C Humidity up to 95%
Storage Temperature	-20 deg. C to +60 deg. C Humidity up to 95%	-20 deg. C to +60 deg. C Humidity up to 95%	-20 deg. C to +60 deg. C Humidity up to 95%
IP Rating	Protection: IP66 front - IP20 rear [EN60529]	Protection: IP66 front - IP20 rear [EN60529]	Protection: IP66 front - IP20 rear [EN60529]
Compass Safe Distance	N/A	Standard: 75cm - Steering: 35cm	Standard: 160cm - Steering: 90cm
TYPE APPROVAL & TESTING	JH 19T14 STD	JH 20T17 MMD	JH 22T11 MMD
Note: Some of the Type Approvals could be pending. Please check our website for the latest status.	IEC 60945 4 th [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 CCS - China Classification Society BV - Bureau Veritas	IEC 60945 4 th [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 th [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

SPECIFICATIONS - DISPLAYS SERIES 1

23 INCH

With LED BACKLIGHT

THE
WORLD'S
FIRST



JH 23T14 MMD

26 INCH WIDESCREEN



JH 26T11 MMD

27 INCH WIDESCREEN



JH 27T11 MMD

TECHNICAL DATA	JH 23T14 MMD	JH 26T11 MMD	JH 27T11 MMD
TFT Technology	LED Backlight Technology Thin Film Transistor (TFT) Active Matrix MVA (Multi-domain Vertical Alignment) LCD Tech.	S-MVA, Active Matrix, Thin Film Transistor (TFT) RGB Vertical Stripe	a-Si TFT (Thin Film Transistor) Active Matrix SPVA (Super Patterned Vertical Alignment) mode
Viewable Image Size & Active Area	23.1 inch - 470.4 [H] x 352.8 [V] mm	25.54 inch - 550.08 [H] x 343.8 [V] mm	27.0 inch - 581.76 [H] x 363.6 [V] mm
Native Resolution & Pixel Pitch	1600 x 1200 - 0.294 [H] x 0.294 [V] mm	1920 x 1200 - 0.2865 [H] x 0.2865 [V] mm	1920 x 1200 - 0.303 [H] x 0.303 [V] mm
Response Time	12 ms (typ)	8 ms (typ)	6 ms (typ)
Light Intensity & Contrast Ratio	400 cd/m ² (typ) - 600:1 (typ)	350 cd/m ² (typ) - 1500:1 (typ)	500 cd/m ² (typ) - 1000:1 (typ)
View Angle	+/- 85 deg. (up/down/left/right) @ CR >10	+/- 88 deg. (up/down/left/right) @ CR >10	+/- 89 deg. (up/down/left/right) @ CR >10
Max Color Output	16.7 million	16.7 million	16.7 million
Sync. Signal Auto-detect	Digital Separate Sync. Composite Sync. Sync. On Green	Digital Separate Sync. Composite Sync. Sync. On Green	Digital Separate Sync. Composite Sync. Sync. On Green
Synchronisation Range	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]	15.0 kHz to 91.1 kHz [H] 60 Hz to 85 Hz [V]
Optimal Resolution and Hz	1600 x 1200 [UXGA 4:3] @ 60 Hz	1920 x 1200 [WUXGA 16:10] @ 60 Hz	1920 x 1200 [WUXGA 16:10] @ 60 Hz
Detectable Resolutions	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	640 x 350 / 640 x 480 / 720 x 400 / 800 x 600 1024 x 768 / 1280 x 1024 / 1600 x 1200 / 1920 x 1200
Video Input Option	YES via HATTELAND® Multifunction Cable	YES via HATTELAND® Multifunction Cable	YES via HATTELAND® Multifunction Cable
Supported Video Signals	SVHS & COMPOSITE Compatible	SVHS & COMPOSITE Compatible	SVHS & COMPOSITE Compatible
Product Features	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%	PBP (Picture By Picture) PIP (Picture In Picture) HATTELAND® Multifunction Connector Hotkey Functionality Dimmable 0-100%
Power Input & Power Consumption	Multi-power 115/230VAC - 50/60Hz + 24 VDC 95W (typ) - 125W (max)	Multi-power 115/230VAC - 50/60Hz + 24 VDC TBD (typ) - 185W (max)	115/230VAC - 50/60Hz 200W (max)
MECHANICAL DATA	JH 23T14 MMD	JH 26T11 MMD	JH 27T11 MMD
User Controls & Activity	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	Power On/Off + On Screen Display Menu (push button) Brightness Control Hotkeys (left/right - push buttons) Mode Status Illuminated LED-Ring Indicator
Connectors	DVI IN: 1 x DVI-I 29P (female) RGB IN: 1 x HD D-SUB 15P (female) RGB OUT: 1 x HD D-SUB 15P (female) Multifunction: 1 x D-SUB 160p (female) USB I/O: 1 x Type B (female) AC Power IN: 1 x Std IEC inlet AC Power OUT: 1 x Std IEC outlet (5A max) DC Power IN: 1 x 2p DSUB (male) Amphenol FCC17	DVI IN: 1 x DVI-I 29P (female) RGB IN: 1 x HD D-SUB 15P (female) RGB OUT: 1 x HD D-SUB 15P (female) Multifunction: 1 x D-SUB 160p (female) USB I/O: 1 x Type B (female) AC Power IN: 1 x Std IEC inlet AC Power OUT: 1 x Std IEC outlet (5A max) DC Power IN: 1 x 2p DSUB (male) Amphenol FCC17	DVI IN: 1 x DVI-I 29P (female) RGB IN: 1 x HD D-SUB 15P (female) RGB OUT: 1 x HD D-SUB 15P (female) Multifunction: 1 x D-SUB 160p (female) USB I/O: 1 x Type B (female) AC Power IN: 1 x Std IEC inlet AC Power OUT: 1 x Std IEC outlet (5A max)
Models Dimensions & Weight	584.00 [W] x 534.00 [H] x 85.00 [D] mm Approx 18 kg	635.00 [W] x 499.00 [H] x 101.50 [D] mm Approx 18 kg	660.00 [W] x 481.00 [H] x 101.50 [D] mm Approx 18,0 kg
Factory Options	Capacitive Touchscreen Keypad only or Keypad+Potmeter+Buzzer controls Optical Bonding Technology Speaker / Buzzer Color Calibrated models [ECDIS]	AC Power Input model Only Keypad only or Keypad+Potmeter+Buzzer controls Optical Bonding Technology Speaker / Buzzer Color Calibrated models [ECDIS]	Keypad only or Keypad+Potmeter+Buzzer controls Optical Bonding Technology Speaker / Buzzer Color Calibrated models [ECDIS]
Available Accessories	EN60945 Tested Bracket (tilt up/down) Bracket (tilt up/down) Rotary Bracket (left/right) Sun Visor VESA Bracket Water Cover Multifunction Cable Options: 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 Multifunction Cable Options: 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 Table/Foot Bracket Wall/VESA Bracket Multifunction Cable Options: 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 23T14 MMD	JH 26T11 MMD	JH 27T11 MMD
	-15 deg. C to +55 deg. C Humidity up to 95%	-15 deg. C to +55 deg. C Humidity up to 95%	-15 deg. C to +55 deg. C Humidity up to 95%
	-20 deg. C to +60 deg. C Humidity up to 95%	-20 deg. C to +60 deg. C Humidity up to 95%	-20 deg. C to +60 deg. C Humidity up to 95%
	Protection: IP66 front - IP20 rear [EN60529]	Protection: IP66 front - IP20 rear [EN60529]	Protection: IP66 front - IP20 rear [EN60529]
	Standard: 160cm - Steering: 105cm	Standard: TBD - Steering: TBD	Standard: 50cm - Steering: 30cm
TYPE APPROVAL & TESTING	JH 23T14 MMD	JH 26T11 MMD	JH 27T11 MMD
Note: Some of the Type Approvals could be pending. Please check our website for the latest status.	IEC 60945 4 th [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 th [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 th [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

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.

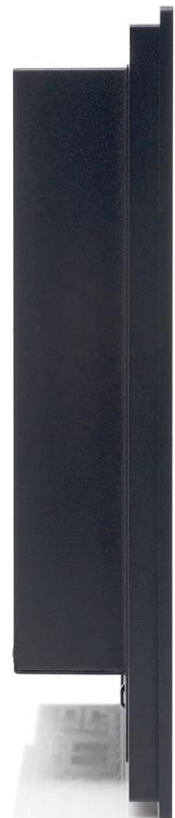
- IP22 / IP66
- MULTITOUCH
- TYPE APPROVED
- ECDIS COMPLIANT
- SUPERIOR BONDING TECHNOLOGY
- MODULE BASED, TAILOR-MADE SYSTEMS MADE EASY!
- FORM, FIT AND FUNCTION - LONG-TERM COMMITMENT
- GLASS DISPLAY CONTROL™ , SOLID STATE MENU SYSTEM
- SUNLIGHT READABLE / HIGH BRIGHT VERSIONS AVAILABLE



NEW

HATTELAND®
GLASS DISPLAY CONTROL™

COMMERCIAL



SPECIFICATIONS - DISPLAYS SERIES X

Note: Please visit our website www.hatteland-display.com for up-to-date datasheets and specifications during 2011.

8 INCH WIDESCREEN



HD 08T21 STD

12 INCH



HD 12T21 MMD

12 INCH



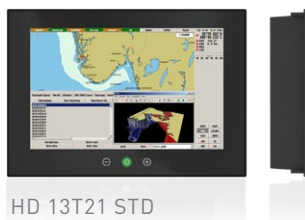
HD 12T21 STD

TECHNICAL DATA	HD 08T21 STD	HD 12T21 MMD	HD 12T21 STD
TFT Technology	LED Backlight, TTL Interface, a-si TFT Active Matrix	LED Backlight, TFT Active-matrix	LED Backlight, TFT Active-matrix
Viewable Image Size & Active Area	8.0 inch - 173.4 [H] x 104.4 [V] mm	12.1 inch - 245.76 [H] x 184.32 [V] mm	12.1 inch - 245.76 [H] x 184.32 [V] mm
Native Resolution & Pixel Pitch	800 x 480 - 0.2168 [H] x 0.2168 [V] mm	1024 x 768 - 0.24 [H] x 0.24 [V] mm	1024 x 768 - 0.24 [H] x 0.24 [V] mm
Response Time	5/11ms [typ] [Tr/Tf]	35ms [typ]	35ms [typ]
Light Intensity & Contrast Ratio	600 cd/m ² [typ] - 600:1 [typ] High Bright versions available	500 cd/m ² [typ] - 700:1 [typ] High Bright versions available	500 cd/m ² [typ] - 700:1 [typ] High Bright versions available
View Angle	70 deg. [up/down] / 60 deg. [left/right] @ CR >10	80 deg. [up/down/left/right] @ CR >10	80 deg. [up/down/left/right] @ CR >10
Max Color Output	16.7 million	16.7 million	16.7 million
Sync. Signal Auto-detect	Digital Separate Sync. Composite Sync. Sync. On Green	Digital Separate Sync. Composite Sync. Sync. On Green	Digital Separate Sync. Composite Sync. Sync. On Green
Synchronisation Range	TBD [H] TBD [V]	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]
Optimal Resolution and Hz	800 x 480 WVGA [4:3] @ 60 Hz	1024 x 768 XGA [4:3] @ 60 Hz	1024 x 768 XGA [4:3] @ 60 Hz
Detectable Resolutions	800 x 480	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
Video Input Option	None	Yes, via Optional Composite Video Input [3 x BNC]	None
Supported Video Signals	None	Interlaced HDTV, NTSC, PAL and SECAM video Composite Video	None
Product Features	LED Backlight Technology Dimmable 0-100% Dual DC Power Input with Automatic Switch <-> sources	LED Backlight Technology Dimmable 0-100% Multi-power AC & DC Optional PBP (Picture By Picture) Optional PIP (Picture In Picture)	LED Backlight Technology Dimmable 0-100% Multi-power AC & DC
Power Input & Power Consumption	Dual 24VDC, Galvanic Isolated 20W [typ] - 30W [max]	Multi-power 115/230VAC - 50/60Hz + 24 VDC TBD W [typ] - TBD W [max]	Multi-power 115/230VAC - 50/60Hz + 24 VDC TBD W [typ] - TBD W [max]
MECHANICAL DATA	HD 08T21 STD	HD 12T21 MMD	HD 12T21 STD
User Controls & Activity	Glass Display Control™ with: Power On/Off + On Screen Display Menu + Mode Status Brightness Control [-/+]	Glass Display Control™ with: Power On/Off + On Screen Display Menu + Mode Status Brightness Control [-/+] Hotkey Functionality (left/right)	Glass Display Control™ with: Power On/Off + On Screen Display Menu + Mode Status Brightness Control [-/+] Hotkey Functionality (left/right)
Connectors	DVI IN: 1 x DVI-I 29P (female) or configurable as RGB IN: 1 x HD D-SUB 15P (female) via Adapter USB I/O: 1 x Type B (female) DC Power IN: 1 x SL SMT 90F [1 x 4 pole]	DVI IN: 2 x DVI-I 29P (female) RGB IN: 2 x HD D-SUB 15P (female) Function I/O: 1 x RS 422/485 RGB OUT: 1 x HD D-SUB 15P (female) USB I/O: 1 x Type B (female) Ethernet I/O: 1 x RJ45 (female) - Serial Remote Control Serial Control I/O: 1 x D-SUB 9P RS232 (female) Remote CTRL: 1 x D-SUB 9P (male) I2C, +5V, +12V, Potmeter AC Power IN: 1 x Std IEC inlet DC Power IN: 1 x 2p D-SUB (male) Amphenol FCC17	DVI IN: 1 x DVI-I 29P (female) RGB IN: 1 x HD D-SUB 15P (female) Function I/O: 1 x RS 422/485 Serial Control I/O: 1 x D-SUB 9P RS232 (female) AC Power IN: 1 x Std IEC inlet DC Power IN: 1 x 2p D-SUB (male) Amphenol FCC17
Models Dimensions & Weight	236.00 [W] x 166.00 [H] x 50.00 [D] mm Approx TBD kg	314.00 [W] x 272.00 [H] x 55.50 [D] mm Approx TBD kg	314.00 [W] x 272.00 [H] x 55.50 [D] mm Approx TBD kg
Factory Options	Projected Capacitive Technology (PCTouch) MULTITOUCH Optical Bonding Technology	Projected Capacitive Technology (PCTouch) MULTITOUCH Optical Bonding Technology Composite Video Input [3 x BNC]	None
Available Accessories	TBD	TBD	TBD
ENVIRONMENTAL DATA	HD 08T21 STD	HD 12T21 MMD	HD 12T21 STD
Operating Temperature	-15 deg. C to +55 deg. C Humidity up to 95%	-15 deg. C to +55 deg. C Humidity up to 95%	-15 deg. C to +55 deg. C Humidity up to 95%
Storage Temperature	-20 deg. C to +60 deg. C Humidity up to 95%	-20 deg. C to +60 deg. C Humidity up to 95%	-20 deg. C to +60 deg. C Humidity up to 95%
IP Rating	Protection: IP66 front - IP20 rear [EN60529]	Protection: IP66 front - IP22 rear [EN60529]	Protection: IP66 front - IP22 rear [EN60529]
Compass Safe Distance	Standard: TBDcm - Steering: TBDcm	Standard: TBDcm - Steering: TBDcm	Standard: TBDcm - Steering: TBDcm
TYPE APPROVAL & TESTING	HD 08T21 STD	HD 12T21 MMD	HD 12T21 STD
Note: Some of the Type Approvals could be pending. Please check our website for the latest status.	IEC 60945 4 th [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 th [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 th [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

Note: Please visit our website www.hatteland-display.com for up-to-date datasheets and specifications during 2011.

13 INCH WIDESCREEN



HD 13T21 STD

15 INCH



HD 15T21 MMD

15 INCH



HD 15T21 STD

TECHNICAL DATA	HD 13T21 STD	HD 15T21 MMD	HD 15T21 STD
TFT Technology	CCFL Backlight, a-si TFT Active Matrix	LED Backlight, TFT Active-matrix	LED Backlight, TFT Active-matrix
Viewable Image Size & Active Area	13.3 inch - 286.08 [H] x 178.8 [V] mm	15.0 inch - 304.1 [H] x 228.1 [V] mm	15.0 inch - 304.1 [H] x 228.1 [V] mm
Native Resolution & Pixel Pitch	1280 x 800 - 0.2235 [H] x 0.2235 [V] mm	1024 x 768 - 0.297 [H] x 0.297 [V] mm	1024 x 768 - 0.297 [H] x 0.297 [V] mm
Response Time	6/10ms [typ] (Tr/Tf)	8ms [typ]	8ms [typ]
Light Intensity & Contrast Ratio	400 cd/m ² [typ] - 800:1 [typ] High Bright versions available	400 cd/m ² [typ] - 700:1 [typ] High Bright versions available	400 cd/m ² [typ] - 700:1 [typ] High Bright versions available
View Angle	70 deg. [up/down] / 60 deg. [left/right] @ CR >10	80 deg. [up/down/left/right] @ CR >10	80 deg. [up/down/left/right] @ CR >10
Max Color Output	16.7 million	16.7 million	16.7 million
Sync. Signal Auto-detect	Digital Separate Sync. Composite Sync. Sync. On Green	Digital Separate Sync. Composite Sync. Sync. On Green	Digital Separate Sync. Composite Sync. Sync. On Green
Synchronisation Range	TBD [H] TBD [V]	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]
Optimal Resolution and Hz	1280 x 800 WXGA [4:3] @ 60 Hz	1024 x 768 XGA [4:3] @ 60 Hz	1024 x 768 XGA [4:3] @ 60 Hz
Detectable Resolutions	1280 x 800	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
Video Input Option	None	Yes, via Optional Composite Video Input [3 x BNC]	None
Supported Video Signals	None	Interlaced HDTV, NTSC, PAL and SECAM video Composite Video	None
Product Features	Dimmable 0-100% Dual DC Power Input with Automatic Switch <-> sources	LED Backlight Technology Dimmable 0-100% Multi-power AC & DC Optional PBP (Picture By Picture) Optional PIP (Picture In Picture)	LED Backlight Technology Dimmable 0-100% Multi-power AC & DC
Power Input & Power Consumption	Dual 24VDC, Galvanic Isolated 20W [typ] - 30W [max]	Multi-power 115/230VAC - 50/60Hz + 24 VDC TBD W [typ] - TBD W [max]	Multi-power 115/230VAC - 50/60Hz + 24 VDC TBD W [typ] - TBD W [max]
MECHANICAL DATA	HD 13T21 STD	HD 15T21 MMD	HD 15T21 STD
User Controls & Activity	Glass Display Control™ with: Power On/Off + On Screen Display Menu + Mode Status Brightness Control [-/+]	Glass Display Control™ with: Power On/Off + On Screen Display Menu + Mode Status Brightness Control [-/+] Hotkey Functionality [left/right]	Glass Display Control™ with: Power On/Off + On Screen Display Menu + Mode Status Brightness Control [-/+] Hotkey Functionality [left/right]
Connectors	DVI IN: 1 x DVI-I 29P [female] or configurable as RGB IN: 1 x HD D-SUB 15P [female] via Adapter USB I/O: 1 x Type B [female] DC Power IN: 1 x SL SMT 90F [1 x 4 pole]	DVI IN: 2 x DVI-I 29P [female] RGB IN: 2 x HD D-SUB 15P [female] Function I/O: 1 x RS 422/485 RGB OUT: 1 x HD D-SUB 15P [female] USB I/O: 1 x Type B [female] Ethernet I/O: 1 x RJ45 [female] - Serial Remote Control Serial Control I/O: 1 x D-SUB 9P RS232 [female] Remote CTRL: 1 x D-SUB 9P [male] I2C, +5V, +12V, Potmeter AC Power IN: 1 x Std IEC inlet DC Power IN: 1 x 2p D-SUB [male] Amphenol FCC17	DVI IN: 1 x DVI-I 29P [female] RGB IN: 1 x HD D-SUB 15P [female] Function I/O: 1 x RS 422/485 Serial Control I/O: 1 x D-SUB 9P RS232 [female] AC Power IN: 1 x Std IEC inlet DC Power IN: 1 x 2p D-SUB [male] Amphenol FCC17
Models Dimensions & Weight	355.00 [W] x 248.50 [H] x 57.00 [D] mm Approx TBD kg	356.00 [W] x 307.00 [H] x 58.00 [D] mm Approx TBD kg	356.00 [W] x 307.00 [H] x 58.00 [D] mm Approx TBD kg
Factory Options	Projected Capacitive Technology (PCTouch) MULTITOUCH Optical Bonding Technology	Projected Capacitive Technology (PCTouch) MULTITOUCH Optical Bonding Technology Composite Video Input [3 x BNC]	None
Available Accessories	TBD	TBD	TBD
ENVIRONMENTAL DATA	HD 13T21 STD	HD 15T21 MMD	HD 15T21 STD
Operating Temperature	-15 deg. C to +55 deg. C Humidity up to 95%	-15 deg. C to +55 deg. C Humidity up to 95%	-15 deg. C to +55 deg. C Humidity up to 95%
Storage Temperature	-20 deg. C to +60 deg. C Humidity up to 95%	-20 deg. C to +60 deg. C Humidity up to 95%	-20 deg. C to +60 deg. C Humidity up to 95%
IP Rating	Protection: IP66 front - IP22 rear [EN60529]	Protection: IP66 front - IP22 rear [EN60529]	Protection: IP66 front - IP22 rear [EN60529]
Compass Safe Distance	Standard: TBDcm - Steering: TBDcm	Standard: TBDcm - Steering: TBDcm	Standard: TBDcm - Steering: TBDcm
TYPE APPROVAL & TESTING	HD 13T21 STD	HD 15T21 MMD	HD 15T21 STD
Note: Some of the Type Approvals could be pending. Please check our website for the latest status.	IEC 60945 4 th [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 th [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 th [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

Note: Please visit our website www.hatteland-display.com for up-to-date datasheets and specifications during 2011.

17 INCH



HD 17T21 MMD

17 INCH



HD 17T21 STD

19 INCH



HD 19T21 MMD

TECHNICAL DATA	HD 17T21 MMD	HD 17T21 STD	HD 19T21 MMD
TFT Technology	LED Backlight, TFT Active-matrix	LED Backlight, TFT Active-matrix	LED Backlight, TFT Active-matrix, MVA (Multi-domain Vertical Alignment) LCD Technology
Viewable Image Size & Active Area	17.0 inch - 337.92 [H] x 270.336 [V] mm	17.0 inch - 337.92 [H] x 270.336 [V] mm	19.0 inch - 376.32 [H] x 301.056 [V] mm
Native Resolution & Pixel Pitch	1280 x 1024 - 0.264 [H] x 0.264 [V] mm	1280 x 1024 - 0.264 [H] x 0.264 [V] mm	1280 x 1024 - 0.294 [H] x 0.294 [V] mm
Response Time	5ms (typ)	5ms (typ)	20ms (typ)
Light Intensity & Contrast Ratio	350 cd/m ² (typ) - 1000:1 (typ) High Bright versions available	350 cd/m ² (typ) - 1000:1 (typ) High Bright versions available	300 cd/m ² (typ) - 1000:1 (typ) High Bright versions available
View Angle	80 deg. [up/down/left/right] @ CR >10	80 deg. [up/down/left/right] @ CR >10	89 deg. [up/down/left/right] @ CR >10
Max Color Output	16.7 million	16.7 million	16.7 million
Sync. Signal Auto-detect	Digital Separate Sync. Composite Sync. Sync. On Green	Digital Separate Sync. Composite Sync. Sync. On Green	Digital Separate Sync. Composite Sync. Sync. On Green
Synchronisation Range	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]	31.5 kHz to 91,1 kHz [H] 60 Hz to 85 Hz [V]
Optimal Resolution and Hz	1280 x 1024 SXGA [5:4] @ 60 Hz	1280 x 1024 SXGA [5:4] @ 60 Hz	1280 x 1024 SXGA [5:4] @ 60 Hz
Detectable Resolutions	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	640 x 350, 640 x 480, 720 x 400, 800 x 600, 1024 x 768, 1280 x 1024
Video Input Option	Yes, via Optional Composite Video Input (3 x BNC)	None	Yes, via Optional Composite Video Input (3 x BNC)
Supported Video Signals	Interlaced HDTV, NTSC, PAL and SECAM video Composite Video	None	Interlaced HDTV, NTSC, PAL and SECAM video Composite Video
Product Features	LED Backlight Technology Dimmable 0-100% Multi-power AC & DC Optional PBP (Picture By Picture) Optional PIP (Picture In Picture)	LED Backlight Technology Dimmable 0-100% Multi-power AC & DC	LED Backlight Technology Dimmable 0-100% Multi-power AC & DC Optional PBP (Picture By Picture) Optional PIP (Picture In Picture)
Power Input & Power Consumption	Multi-power 115/230VAC - 50/60Hz + 24 VDC TBD W (typ) - TBD W (max)	Multi-power 115/230VAC - 50/60Hz + 24 VDC TBD W (typ) - TBD W (max)	Multi-power 115/230VAC - 50/60Hz + 24 VDC TBD W (typ) - TBD W (max)
MECHANICAL DATA	HD 17T21 MMD	HD 17T21 STD	HD 19T21 MMD
User Controls & Activity	Glass Display Control™ with: Power On/Off + On Screen Display Menu + Mode Status Brightness Control (-/+) Hotkey Functionality (left/right)	Glass Display Control™ with: Power On/Off + On Screen Display Menu + Mode Status Brightness Control (-/+) Hotkey Functionality (left/right)	Glass Display Control™ with: Power On/Off + On Screen Display Menu + Mode Status Brightness Control (-/+) Hotkey Functionality (left/right)
Connectors	DVI IN: 2 x DVI-I 29P (female) RGB IN: 2 x HD D-SUB 15P (female) Function I/O: 1 x RS 422/485 RGB OUT: 1 x HD D-SUB 15P (female) USB I/O: 1 x Type B (female) Ethernet I/O: 1 x RJ45 (female) - Serial Remote Control Serial Control I/O: 1 x D-SUB 9P RS232 (female) Remote CTRL: 1 x D-SUB 9P (male) I2C, +5V, +12V, Potmeter AC Power IN: 1 x Std IEC inlet DC Power IN: 1 x 2p D-SUB (male) Amphenol FCC17	DVI IN: 1 x DVI-I 29P (female) RGB IN: 1 x HD D-SUB 15P (female) Function I/O: 1 x RS 422/485 Serial Control I/O: 1 x D-SUB 9P RS232 (female) AC Power IN: 1 x Std IEC inlet DC Power IN: 1 x 2p D-SUB (male) Amphenol FCC17	DVI IN: 2 x DVI-I 29P (female) RGB IN: 2 x HD D-SUB 15P (female) Function I/O: 1 x RS 422/485 RGB OUT: 1 x HD D-SUB 15P (female) USB I/O: 1 x Type B (female) Ethernet I/O: 1 x RJ45 (female) - Serial Remote Control Serial Control I/O: 1 x D-SUB 9P RS232 (female) Remote CTRL: 1 x D-SUB 9P (male) I2C, +5V, +12V, Potmeter AC Power IN: 1 x Std IEC inlet DC Power IN: 1 x 2p D-SUB (male) Amphenol FCC17
Models Dimensions & Weight	390.00 [W] x 351.00 [H] x 63.50 [D] mm Approx TBD kg	390.00 [W] x 351.00 [H] x 63.50 [D] mm Approx TBD kg	429.00 [W] x 382.00 [H] x 65.00 [D] mm Approx TBD kg
Factory Options	Projected Capacitive Technology (PCTouch) MULTITOUCH Optical Bonding Technology Composite Video Input (3 x BNC)	None	Projected Capacitive Technology (PCTouch) MULTITOUCH Optical Bonding Technology Composite Video Input (3 x BNC) Color Calibrated models (ECDIS)
Available Accessories	TBD	TBD	TBD
ENVIRONMENTAL DATA	HD 17T21 MMD	HD 17T21 STD	HD 19T21 MMD
Operating Temperature	-15 deg. C to +55 deg. C Humidity up to 95%	-15 deg. C to +55 deg. C Humidity up to 95%	-15 deg. C to +55 deg. C Humidity up to 95%
Storage Temperature	-20 deg. C to +60 deg. C Humidity up to 95%	-20 deg. C to +60 deg. C Humidity up to 95%	-20 deg. C to +60 deg. C Humidity up to 95%
IP Rating	Protection: IP66 front - IP22 rear [EN60529]	Protection: IP66 front - IP22 rear [EN60529]	Protection: IP66 front - IP22 rear [EN60529]
Compass Safe Distance	Standard: TBDcm - Steering: TBDcm	Standard: TBDcm - Steering: TBDcm	Standard: TBDcm - Steering: TBDcm
TYPE APPROVAL & TESTING	HD 17T21 MMD	HD 17T21 STD	HD 19T21 MMD
Note: Some of the Type Approvals could be pending. Please check our website for the latest status.	IEC 60945 4 th [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 th [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 th [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

Note: Please visit our website www.hatteland-display.com for up-to-date datasheets and specifications during 2011.

19 INCH



HD 19T21 STD

24 INCH WIDESCREEN



HD 24T21 MMD

24 INCH WIDESCREEN



HD 24T21 STD

TECHNICAL DATA	HD 19T21 STD	HD 24T21 MMD	HD 24T21 STD
TFT Technology	LED Backlight, TFT Active-matrix, MVA (Multi-domain Vertical Alignment) LCD Technology	LED Backlight, TFT Active-matrix, MVA (Multi-domain Vertical Alignment) LCD Technology	LED Backlight, TFT Active-matrix, MVA (Multi-domain Vertical Alignment) LCD Technology
Viewable Image Size & Active Area	19.0 inch - 376.32 (H) x 301.056 (V) mm	24.0 inch - 531.36 (H) x 298.89 (V) mm	24.0 inch - 531.36 (H) x 298.89 (V) mm
Native Resolution & Pixel Pitch	1280 x 1024 - 0.294 (H) x 0.294 (V) mm	1920 x 1080 - 0.276 (H) x 0.276 (V) mm	1920 x 1080 - 0.276 (H) x 0.276 (V) mm
Response Time	20ms [typ]	25ms [typ]	25ms [typ]
Light Intensity & Contrast Ratio	300 cd/m ² [typ] - 1000:1 [typ] High Bright versions available	250 cd/m ² [typ] - 3000:1 [typ] High Bright versions available	250 cd/m ² [typ] - 3000:1 [typ] High Bright versions available
View Angle	89 deg. (up/down/left/right) @ CR >10	89 deg. (up/down/left/right) @ CR >10	89 deg. (up/down/left/right) @ CR >10
Max Color Output	16.7 million	16.7 million	16.7 million
Sync. Signal Auto-detect	Digital Separate Sync. Composite Sync. Sync. On Green	Digital Separate Sync. Composite Sync. Sync. On Green	Digital Separate Sync. Composite Sync. Sync. On Green
Synchronisation Range	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)	31.5 kHz to 91,1 kHz (H) 60 Hz to 85 Hz (V)
Optimal Resolution and Hz	1280 x 1024 SXGA (5:4) @ 60 Hz	1920 x 1080 FHD (4:3) @ 60 Hz	1920 x 1080 FHD (4:3) @ 60 Hz
Detectable Resolutions	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, 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
Video Input Option	None	Yes, via Optional Composite Video Input (3 x BNC)	None
Supported Video Signals	None	Interlaced HDTV, NTSC, PAL and SECAM video Composite Video	None
Product Features	LED Backlight Technology Dimmable 0-100% Multi-power AC & DC	LED Backlight Technology Dimmable 0-100% Multi-power AC & DC Optional PBP (Picture By Picture) Optional PIP (Picture In Picture)	LED Backlight Technology Dimmable 0-100% Multi-power AC & DC
Power Input & Power Consumption	Multi-power 115/230VAC - 50/60Hz + 24 VDC TBD W [typ] - TBD W (max)	Multi-power 115/230VAC - 50/60Hz + 24 VDC TBD W [typ] - TBD W (max)	Multi-power 115/230VAC - 50/60Hz + 24 VDC TBD W [typ] - TBD W (max)
MECHANICAL DATA	HD 19T21 STD	HD 24T21 MMD	HD 24T21 STD
User Controls & Activity	Glass Display Control™ with: Power On/Off + On Screen Display Menu + Mode Status Brightness Control (-/+) Hotkey Functionality (left/right)	Glass Display Control™ with: Power On/Off + On Screen Display Menu + Mode Status Brightness Control (-/+) Hotkey Functionality (left/right)	Glass Display Control™ with: Power On/Off + On Screen Display Menu + Mode Status Brightness Control (-/+) Hotkey Functionality (left/right)
Connectors	DVI IN: 1 x DVI-I 29P (female) RGB IN: 1 x HD D-SUB 15P (female) Function I/O: 1 x RS 422/485 Serial Control I/O: 1 x D-SUB 9P RS232 (female) AC Power IN: 1 x Std IEC inlet DC Power IN: 1 x 2p D-SUB (male) Amphenol FCC17	DVI IN: 2 x DVI-I 29P (female) RGB IN: 2 x HD D-SUB 15P (female) Function I/O: 1 x RS 422/485 RGB OUT: 1 x HD D-SUB 15P (female) USB I/O: 1 x Type B (female) Ethernet I/O: 1 x RJ45 (female) - Serial Remote Control Serial Control I/O: 1 x D-SUB 9P RS232 (female) Remote CTRL: 1 x D-SUB 9P (male) I2C, +5V, +12V, Potmeter AC Power IN: 1 x Std IEC inlet DC Power IN: 1 x 2p D-SUB (male) Amphenol FCC17	DVI IN: 1 x DVI-I 29P (female) RGB IN: 1 x HD D-SUB 15P (female) Function I/O: 1 x RS 422/485 Serial Control I/O: 1 x D-SUB 9P RS232 (female) AC Power IN: 1 x Std IEC inlet DC Power IN: 1 x 2p D-SUB (male) Amphenol FCC17
Models Dimensions & Weight	429.00 (W) x 382.00 (H) x 65.00 (D) mm Approx TBD kg	593.00 (W) x 348.00 (H) x 71.00 (D) mm Approx 14 kg	593.00 (W) x 348.00 (H) x 71.00 (D) mm Approx 14 kg
Factory Options	None	Projected Capacitive Technology (PCTouch) MULTITOUCH Optical Bonding Technology Composite Video Input (3 x BNC) Color Calibrated models (ECDIS)	None
Available Accessories	TBD	TBD	TBD
ENVIRONMENTAL DATA	HD 19T21 STD	HD 24T21 MMD	HD 24T21 STD
Operating Temperature	-15 deg. C to +55 deg. C Humidity up to 95%	-15 deg. C to +55 deg. C Humidity up to 95%	-15 deg. C to +55 deg. C Humidity up to 95%
Storage Temperature	-20 deg. C to +60 deg. C Humidity up to 95%	-20 deg. C to +60 deg. C Humidity up to 95%	-20 deg. C to +60 deg. C Humidity up to 95%
IP Rating	Protection: IP66 front - IP22 rear (EN60529)	Protection: IP66 front - IP22 rear (EN60529)	Protection: IP66 front - IP22 rear (EN60529)
Compass Safe Distance	Standard: TBDcm - Steering: TBDcm	Standard: TBDcm - Steering: TBDcm	Standard: TBDcm - Steering: TBDcm
TYPE APPROVAL & TESTING	HD 19T21 STD	HD 24T21 MMD	HD 24T21 STD
Note: Some of the Type Approvals could be pending. Please check our website for the latest status.	IEC 60945 4 th (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 th (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 th (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.

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.

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



A computer and display,
all in one...



COM
MER
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Slim Model...
suitable for IP66 installations

SPECIFICATIONS - PANEL COMPUTERS SERIES 1

15 INCH



JH 15T17 MMC-S

15 INCH



JH 15T17 MMC

19 INCH



JH 19T14 MMC

TECHNICAL - DISPLAY	JH 15T17 MMC-SLIM	JH 15T17 MMC	JH 19T14 MMC
TFT Technology	Color Active Matrix TFT/LCD, a-Si TFT Active Matrix, Optical Bonding	Color Active Matrix TFT/LCD, a-Si TFT Active Matrix	Active Matrix, Thin Film Transistor (TFT) MVA Premium™ Technology
Viewable Image Size & Active Area	15.0 inch - 304.1 [H] x 228.1 [V] mm	15.0 inch - 304.1 [H] x 228.1 [V] mm	19.0 inch - 376.32 [H] x 301.056 [V] mm
Native Resolution & Pixel Pitch	1024 x 768 - 0.297 [H] x 0.297 [V] mm	1024 x 768 - 0.297 [H] x 0.297 [V] mm	1280 x 1024 - 0.294 [H] x 0.294 [V] mm
Response Time	25 ms (typ)	25 ms (typ)	12 ms (typ)
Light Intensity & Contrast Ratio	250 cd/m² (typ) - 400:1 (typ)	250 cd/m² (typ) - 400:1 (typ)	300 cd/m² (typ) - 900:1 (typ)
View Angle	+/- 85 deg. [Up/Down/Left/Right] @ CR >10	+/- 85 deg. [Up/Down/Left/Right] @ CR >10	+/- 85 deg. [Up/Down/Left/Right] @ CR >10
Max Color Output	16.7 million	16.7 million	16.7 million
Optimal Resolution and Hz	1024 x 768 [XGA 4:3] @ 60 Hz*	1024 x 768 [XGA 4:3] @ 60 Hz*	1280 x 1024 [SXGA 5:4] @ 60 Hz
Detectable Resolutions	If resolution is above/below 1:1 resolution, desktop scrolling mode will be used	If resolution is above/below 1:1 resolution, desktop scrolling mode will be used	If resolution is above/below 1:1 resolution, desktop scrolling mode will be used
Power Input	Multi-power 115/230VAC - 50/60Hz + 24VDC	115/230VAC - 50/60Hz or 24VDC	115/230VAC - 50/60Hz or 24VDC
Power Consumption	Core™2 50W (typ) - 100W Max	Core™2 60W (typ) / Celeron® 50W (typ) - 100W Max	Core™2 60W (typ) / Celeron® 50W (typ) - 100W Max
TECHNICAL - COMPUTER	JH 15T17 MMC-SLIM	JH 15T17 MMC	JH 19T14 MMC
Installed Operating System (OS)	None or Microsoft® Windows® Embedded Enterprise (XP Professional ENG w/SP2c, 32bit)	None or Microsoft® Windows® Embedded Enterprise (XP Professional ENG w/SP2c, 32bit)	None or Microsoft® Windows® Embedded Enterprise (XP Professional ENG w/SP2c, 32bit)
Storage	30GB SSD (SATA 2.5")	30GB SSD (SATA 2.5")	30GB SSD (SATA 2.5")
Available Processors Options	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 fan inside unit)	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 fan inside unit)	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 fan inside unit)
Memory	2 x 1 GB 667MHz DDR2 Non-ECC CL5 DIMM	2 x 1 GB 667MHz DDR2 Non-ECC CL5 DIMM	2 x 1 GB 667MHz DDR2 Non-ECC CL5 DIMM
System Chipset	Intel® 82945GME	Intel® 82945GME	Intel® 82945GME
On-board Graphics Chipset	Intel® 945GME Integrated	Intel® 945GME Integrated	Intel® 945GME Integrated
Max Resolution / Max Hz	2048 x 1536 / 85Hz	2048 x 1536 / 85Hz	2048 x 1536 / 85Hz
BIOS	Award BIOS, supports ACPI	Award BIOS, supports ACPI	Award BIOS, supports ACPI
Speaker	None	None	None
Power Manager	ACPI	ACPI	ACPI
Monitoring	Temperature, voltage and fan monitoring	Temperature, voltage and fan monitoring	Temperature, voltage and fan monitoring
MECHANICAL DATA	JH 15T17 MMC-SLIM	JH 15T17 MMC	JH 19T14 MMC
User Controls & Activity	Power ON/OFF function via BIOS / power cable connected	Power On/Off [push button] Brightness Control [rotary control] Mode Status Illuminated LED-Ring Indicator USB 2.0 Connector (behind hatch)	Power On/Off [push button] Brightness Control [rotary control] Mode Status Illuminated LED-Ring Indicator USB 2.0 Connector (behind hatch)
Visible I/O Connectors	10/100/1000 Ethernet I/O: 2 x RJ-45 COM1 I/O: 2 x DB9 [RS-232/422/485, opto-isolated] USB 2.0 I/O: 4 x Std. USB Keyboard I/O: 1 x PS/2 Mouse I/O: 1 x PS/2 LPT I/O: 1 x DB25 Compact Flash I/O: 1 x Type I & II Compatible DVI/RGB OUT: 1 x 29P DVI-I or as RGB with adapter AC Power IN: 1 x Std IEC inlet DC Power IN: 1 x 2p DSUB (male) Amphenol FCC17	10/100/1000 Ethernet I/O: 2 x RJ-45 COM1 I/O: 2 x DB9 [RS-232/422/485, opto-isolated] USB 2.0 I/O: 5 x Std. USB [1 in front IP66, 4 in rear] Keyboard I/O: 1 x PS/2 Mouse I/O: 1 x PS/2 LPT I/O: 1 x DB25 Compact Flash I/O: 1 x Type I & II Compatible DVI/RGB OUT: 1 x 29P DVI-I or as RGB with adapter AC Power IN: 1 x Std IEC inlet DC Power IN: 1 x 2p DSUB (male) Amphenol FCC17	10/100/1000 Ethernet I/O: 2 x RJ-45 COM1 I/O: 2 x DB9 [RS-232/422/485, opto-isolated] USB 2.0 I/O: 5 x Std. USB [1 in front IP66, 4 in rear] Keyboard I/O: 1 x PS/2 Mouse I/O: 1 x PS/2 LPT I/O: 1 x DB25 Compact Flash I/O: 1 x Type I & II Compatible DVI/RGB OUT: 1 x 29P DVI-I or as RGB with adapter AC Power IN: 1 x Std IEC inlet DC Power IN: 1 x 2p DSUB (male) Amphenol FCC17
Dimensions & Weight	361.00 [W] x 289.00 [H] x 87.00 [D] mm 7.8 kg	412.00 [W] x 345.00 [H] x 73.28 [D] mm Approx 8 kg	483.00 [W] x 444.00 [H] x 82.00 [D] mm Approx 11 kg
Factory Options	Capacitive Touchscreen Buzzer 3500Hz Up to 4GB of memory	Resistive Touchscreen Button Controls or Potmeter Controls Optical Bonding Technology Buzzer 3500Hz Up to 4GB of memory	Resistive Touchscreen Button Controls or Potmeter Controls Optical Bonding Technology Buzzer 3500Hz Up to 4GB of memory
Available Accessories	None	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
Capabilities / Prepared for	None	1 x Mini PCI [requires terminal plate modification]	1 x Mini PCI [requires terminal plate modification]
ENVIRONMENTAL DATA	JH 15T17 MMC-SLIM	JH 15T17 MMC	JH 19T14 MMC
Operating Temperature	-15 deg. C to +55 deg. C Humidity up to 95%	-15 deg. C to +55 deg. C Humidity up to 95%	-15 deg. C to +55 deg. C Humidity up to 95%
Storage Temperature	-20 deg. C to +60 deg. C Humidity up to 95%	-20 deg. C to +60 deg. C Humidity up to 95%	-20 deg. C to +60 deg. C Humidity up to 95%
IP Rating	Protection: IP66 front - IP66 rear [EN60529]	Protection: IP66 front - IP20 rear [EN60529]	Protection: IP66 front - IP20 rear [EN60529]
Compass Safe Distance	Standard: TBD - Steering: TBD	AC/DC Standard: 55/115cm - Steering: 35/75cm	AC/DC Standard: 75/115cm - Steering: 45/75cm
TYPE APPROVAL & TESTING	JH 15T17 MMC-SLIM	JH 15T17 MMC	JH 19T14 MMC
Note: Some of the Type Approvals could be pending. Please check our website for the latest status.	IEC 60945 4 th [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 th [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 th [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

PANEL COMPUTERS SERIES X

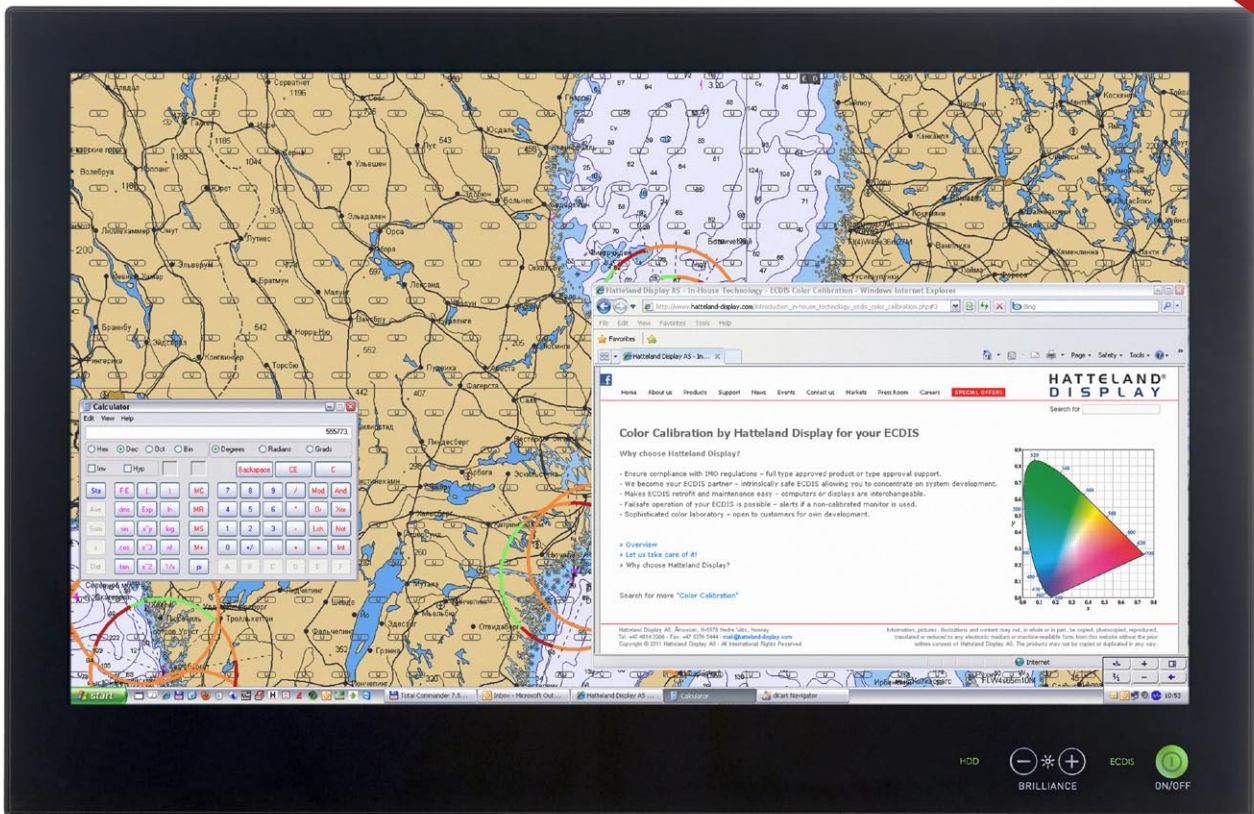
The Series X MMC range of products has been developed alongside the display versions, thus expanding the impressive footprint and impact of this Series X on the maritime market.

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
- SUNLIGHT READABLE
- SUPERIOR BONDING TECHNOLOGY
- MODULE BASED, TAILOR-MADE SYSTEMS MADE EASY!
- FORM, FIT AND FUNCTION - LONG-TERM COMMITMENT
- GLASS DISPLAY CONTROL™, SOLID STATE MENU SYSTEM



NEW



HATTELAND®
GLASS DISPLAY CONTROL™

COM
MER
CIA
L



SPECIFICATIONS - PANEL COMPUTERS SERIES X

Note: Please visit our website www.hatteland-display.com for up-to-date datasheets and specifications during 2011.

8 INCH



HD 08T21 MMC

13 INCH



HD 13T21 MMC

13 INCH



HD 13T21 MMC

TECHNICAL DATA - DISPLAY	HD 08T21 MMC	HD 13T21 MMC with Intel® Atom™	HD 13T21 MMC with Intel® Core™2 Duo
TFT Technology	LED Backlight, TTL Interface, a-si TFT Active Matrix	CCFL Backlight, a-si TFT Active Matrix	CCFL Backlight, a-si TFT Active Matrix
Viewable Image Size & Active Area	8.0 inch - 173.4 [H] x 104.4 [V] mm	13.3 inch - 286.08 [H] x 178.8 [V] mm	13.3 inch - 286.08 [H] x 178.8 [V] mm
Native Resolution & Pixel Pitch	800 x 480 - 0.2168 [H] x 0.2168 [V] mm	1280 x 800 - 0.2235 [H] x 0.2235 [V] mm	1280 x 800 - 0.2235 [H] x 0.2235 [V] mm
Response Time	5/11ms [typ] [Tr/Tf]	6/10ms [typ] [Tr/Tf]	6/10ms [typ] [Tr/Tf]
Light Intensity & Contrast Ratio	600 cd/m² [typ] - 600:1 [typ]	400 cd/m² [typ] - 800:1 [typ]	400 cd/m² [typ] - 800:1 [typ]
View Angle	70 deg. [up/down] / 60 deg. [left/right] @ CR >10	70 deg. [up/down] / 60 deg. [left/right] @ CR >10	70 deg. [up/down] / 60 deg. [left/right] @ CR >10
Max Color Output	262000	262000	262000
Optimal Resolution and Hz	800 x 480 WVGA [4:3] @ 60 Hz	1280 x 800 WXGA [4:3] @ 60 Hz	1280 x 800 WXGA [4:3] @ 60 Hz
Detectable Resolutions	800 x 480	1280 x 800	1280 x 800
Power Input	Dual 24VDC, Galvanic Isolated	Dual 24VDC, Galvanic Isolated	Dual 24VDC, Galvanic Isolated
Power Consumption	20W [typ] - 30W [max]	20W [typ] - 30W [max]	35W [typ] - 60W [max]
TECHNICAL DATA - COMPUTER	HD 08T21 MMC	HD 13T21 MMC with Intel® Atom™	HD 13T21 MMC with Intel® Core™2 Duo
Installed Operating System (OS)	None or Custom Build Image	None or Custom Build Image	None, or custom build image or Windows Embedded Enterprise (XP/Win7)
Storage	1 x 8 GB SSD	1 x 8 GB SSD	1 x 60 GB SSD
Processor/CPU	1 x Intel® Atom™ N450	1 x Intel® Atom™ N450	1 x Intel® Core™2 Duo Desktop Processor P8400 2.26GHz, Bus Speed 1066MHz, 3 MB L2 Cache
Memory	1 x 512 MB	1 x 512 MB	2 x 1 GB Installed Dual Channel 200-pin DDR2 800MHz SO-DIMM
System Chipset	NM10	NM10	Intel® GM45 / ICH9 Support Intel® Active Management Technology
On-board Graphics Chipset	GMA 3150 [onboard CPU, Direct X9, Open GL1.5 Win/Open GL2.0 Linux]	GMA 3150 [onboard CPU, Direct X9, Open GL1.5 Win/Open GL2.0 Linux]	Intel® Graphics Media Accelerator GMA 4500MHD Integrated/Daughter Board (CH7307C)
Max Resolution / Max Hz Out	1400 x 1050 @ 85Hz	1400 x 1050 @ 85Hz	DVI-D: Max 1600 x 1200 @ 60Hz *Higher resolution available via Blanking, RGB: 1920x1200
BIOS	TBD	TBD	TBD
Speaker	None	None	None
Buzzer	Yes [according to EN60945]	Yes [according to EN60945]	Yes [according to EN60945]
Power Manager	ACPI	ACPI	ACPI
Monitoring	Temperature, voltages and cooling fan status	Temperature, voltages and cooling fan status	Temperatures, voltages & cooling fan status. Auto throttling control if CPU overheats
MECHANICAL DATA	HD 08T21 MMC	HD 13T21 MMC with Intel® Atom™	HD 13T21 MMC with Intel® Core™2 Duo
User Controls & Activity	Glass Display Control™ with: Power On/Off + Mode Status Brightness Control (-/+) 3 x Touch button (user defined) Buzzer	Glass Display Control™ with: Power On/Off + Mode Status Brightness Control (-/+) 3 x Touch button (user defined) Buzzer	Glass Display Control™ with: Power On/Off + Mode Status Brightness Control (-/+) 3 x Touch button (user defined) Buzzer
Visible I/O Connectors	Primary Power: 1 x SL SMT 90F [1 x 4 pole] Secondary Power: 1 x SL SMT 90F [1 x 4 pole] LAN: 2 x RJ45 USB: 2 x Type A 1 x Pin header Mechanical Relay (NO/NC): 1 x SC 90F [1 x 3 pole] Solid State Relay (NO): 2 x SCD 90F [2 x 2 pole] Digital Input (isolated/protected): 2 x SCD 90F [2 x 2 pole] COM (isolated RS422/RS485): 1 x SC 90F [1 x 5 pole] Safety Signal Relay (NO/NC): 1 x SC 90F [1 x 3 pole]	Primary Power: 1 x SL SMT 90F [1 x 4 pole] Secondary Power: 1 x SL SMT 90F [1 x 4 pole] LAN: 2 x RJ45 USB: 2 x Type A 1 x Pin header Mechanical Relay (NO/NC): 1 x SC 90F [1 x 3 pole] Solid State Relay (NO): 2 x SCD 90F [2 x 2 pole] Digital Input (isolated/protected): 2 x SCD 90F [2 x 2 pole] COM (isolated RS422/RS485): 1 x SC 90F [1 x 5 pole] Safety Signal Relay (NO/NC): 1 x SC 90F [1 x 3 pole]	Primary Power: 1 x SL SMT 90F [1 x 4 pole] Secondary Power: 1 x SL SMT 90F [1 x 4 pole] LAN: 2 x RJ45 USB: 2 x Type A 1 x Pin header Mechanical Relay (NO/NC): 1 x SC 90F [1 x 3 pole] Solid State Relay (NO): 2 x SCD 90F [2 x 2 pole] Digital Input (isolated/protected): 2 x SCD 90F [2 x 2 pole] COM (isolated RS422/RS485): 1 x SC 90F [1 x 5 pole] Safety Signal Relay (NO/NC): 1 x SC 90F [1 x 3 pole] DVI-I: 1 x DVI-I 29pin
Dimensions & Weight	236.00 [W] x 166.00 [H] x 50.00 [D] mm Approx TBD kg	355.00 [W] x 248.50 [H] x 64.36 [D] mm Approx TBD kg	355.00 [W] x 248.50 [H] x 64.36 [D] mm Approx TBD kg
Factory Options	Projected Capacitive Technology (PCTouch) MULTITOUCH Optical Bonding Technology	Projected Capacitive Technology (PCTouch) MULTITOUCH Optical Bonding Technology Larger SSD Storage Sizes	Projected Capacitive Technology (PCTouch) MULTITOUCH Optical Bonding Technology
Available Accessories	Larger SSD Storage Sizes	TBD	TBD
Capabilities / Prepared For	1 x USB in front 1 x COM - Un-isolated COM (RS232 / RS422 / RS485) 1 x DVI-I - DVI-I output, for additional / external display 1 x DIO [4/4] - Digital Input / Output [4/4] 2 x CAN (isolated) - SL SMT 90F Connectors	1 x USB in front 1 x COM - Un-isolated COM (RS232 / RS422 / RS485) 1 x DVI-I - DVI-I output, 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 RS422/RS485 isolated, NMEA compliant	1 x USB in front 1 x COM - Un-isolated COM (RS232 / RS422 / RS485) 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 RS422/RS485 isolated, NMEA compliant
ENVIRONMENTAL DATA	HD 08T21 MMC	HD 13T21 MMC with Intel® Atom™	HD 13T21 MMC with Intel® Core™2 Duo
Operating Temperature	-15 deg. C to +55 deg. C Humidity up to 95%	-15 deg. C to +55 deg. C Humidity up to 95%	-15 deg. C to +55 deg. C Humidity up to 95%
Storage Temperature	-20 deg. C to +60 deg. C Humidity up to 95%	-20 deg. C to +60 deg. C Humidity up to 95%	-20 deg. C to +60 deg. C Humidity up to 95%
IP Rating	Protection: IP66 front - IP22 rear [EN60529]	Protection: IP66 front - IP22 rear [EN60529]	Protection: IP66 front - IP22 rear [EN60529]
Compass Safe Distance	Standard: TBDcm - Steering: TBDcm	Standard: TBDcm - Steering: TBDcm	Standard: TBDcm - Steering: TBDcm
TYPE APPROVAL & TESTING	HD 08T21 MMC	HD 13T21 MMC with Intel® Atom™	HD 13T21 MMC with Intel® Core™2 Duo
Note: Some of the Type Approvals could be pending.	IEC 60945 4 th [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 th [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 th [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

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SPECIFICATIONS - PANEL COMPUTERS SERIES X

Note: Please visit our website www.hatteland-display.com for up-to-date datasheets and specifications during 2011.

12 INCH



HD 12T21 MMC

15 INCH



HD 15T21 MMC

17 INCH



HD 17T21 MMC

TECHNICAL DATA - DISPLAY	HD 12T21 MMC	HD 15T21 MMC	HD 17T21 MMC
TFT Technology	LED Backlight, TFT Active-matrix	LED Backlight, TFT Active-matrix	LED Backlight, TFT Active-matrix
Viewable Image Size & Active Area	12.1 inch - 245.76 [H] x 184.32 [V] mm	15.0 inch - 304.1 [H] x 228.1 [V] mm	17.0 inch - 337.92 [H] x 270.336 [V] mm
Native Resolution & Pixel Pitch	1024 x 768 - 0.24 [H] x 0.24 [V] mm	1024 x 768 - 0.297 [H] x 0.297 [V] mm	1280 x 1024 - 0.264 [H] x 0.264 [V] mm
Response Time	35ms [typ]	8ms [typ]	5ms [typ]
Light Intensity & Contrast Ratio	500 cd/m ² [typ] - 700:1 [typ] High Bright versions available	400 cd/m ² [typ] - 700:1 [typ] High Bright versions available	350 cd/m ² [typ] - 1000:1 [typ] High Bright versions available
View Angle	80 deg. [up/down/left/right] @ CR >10	80 deg. [up/down/left/right] @ CR >10	80 deg. [up/down/left/right] @ CR >10
Max Color Output	16.7 million	16.7 million	16.7 million
Optimal Resolution and Hz	1024 x 768 XGA [4:3] @ 60 Hz	1024 x 768 XGA [4:3] @ 60 Hz	1280 x 1024 SXGA [5:4] @ 60 Hz
Detectable Resolutions	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	640 x 350, 640 x 480, 720 x 400, 800 x 600, 1024 x 768, 1280 x 1024
Power Input	Multi-power 115/230VAC - 50/60Hz + 24 VDC	Multi-power 115/230VAC - 50/60Hz + 24 VDC	Multi-power 115/230VAC - 50/60Hz + 24 VDC
Power Consumption	TBD W [typ] - TBD W [max]	TBD W [typ] - TBD W [max]	TBD W [typ] - TBD W [max]
TECHNICAL DATA - COMPUTER	HD 12T21 MMC	HD 15T21 MMC	HD 17T21 MMC
Installed Operating System [OS]	None, or Windows Embedded Enterprise [XP/Win7]	None, or Windows Embedded Enterprise [XP/Win7]	None, or Windows Embedded Enterprise [XP/Win7]
Storage	2 x 2.5" removable HDD [SATA] Default configuration: 1 x 250GB HDD. Raid: 0,1	2 x 2.5" removable HDD [SATA] Default configuration: 1 x 250GB HDD. Raid: 0,1	2 x 2.5" removable HDD [SATA] Default configuration: 1 x 250GB HDD. Raid: 0,1
Processor/CPU	1 x Intel® Celeron® P4505 [2M Cache, 1.86 GHz] Front Side Bus [FSB] 800MHz	1 x Intel® Celeron® P4505 [2M Cache, 1.86 GHz] Front Side Bus [FSB] 800MHz	1 x Intel® Celeron® P4505 [2M Cache, 1.86 GHz] Front Side Bus [FSB] 800MHz
Memory	1 x 2GB DDR3 1066/800MHz non-ECC SO-DIMM	1 x 2GB DDR3 1066/800MHz non-ECC SO-DIMM	1 x 2GB DDR3 1066/800MHz non-ECC SO-DIMM
System Chipset	Intel® BD82QM57	Intel® BD82QM57	Intel® BD82QM57
On-board Graphics Chipset	Intel® Arrandale IGD supports DVM T 5.0	Intel® Arrandale IGD supports DVM T 5.0	Intel® Arrandale IGD supports DVM T 5.0
Max Resolution / Max Hz Out	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	DVI: From 640 x 480 to 1920 x 1200 @ 60 Hz RGB: From 640 x 480 to 2048 x 1536 @ 75 Hz
BIOS	AMI BIOS	AMI BIOS	AMI BIOS
Speaker	None	None	None
Buzzer	3500Hz	3500Hz	3500Hz
Power Manager	ACPI S3/S4	ACPI S3/S4	ACPI S3/S4
Monitoring	Temperature and voltages status	Temperature and voltages status	Temperature and voltages status
Watchdog Timer	256 Segments, 0, 1, 2...255 sec/min	256 Segments, 0, 1, 2...255 sec/min	256 Segments, 0, 1, 2...255 sec/min
Other Features	GPIO, LAN Wakeup, USB Boot and Wakeup	GPIO, LAN Wakeup, USB Boot and Wakeup	GPIO, LAN Wakeup, USB Boot and Wakeup
MECHANICAL DATA	HD 12T21 MMC	HD 15T21 MMC	HD 17T21 MMC
User Controls & Activity	Glass Display Control™ with: Power On/Off, Brightness Control [-/+], HDD LED, Buzzer Mode Status Indications [ECDIS, Service]	Glass Display Control™ with: Power On/Off, Brightness Control [-/+], HDD LED, Buzzer Mode Status Indications [ECDIS, Service]	Glass Display Control™ with: Power On/Off, Brightness Control [-/+], HDD LED, Buzzer Mode Status Indications [ECDIS, Service]
Visible I/O Connectors	Ethernet GBLan: 2 x RJ-45 Keyboard: 1 x PS/2 (purple) Mouse: 1 x PS/2 (green) COM1: 1 x DB9M RS-232 non-isolated COM2: 1 x DB9M RS-422/485 non-isolated LPT1: 1 x Pin Header USB 1.1: 1 x USB Type A 2 x Pin Header (=4 USB) USB 2.0: 3 x USB Type A DVI or RGB OUT: 1 x 29P DVI-I or as RGB with adapter RGB OUT: 1 x 15p HD D-SUB AC Power: 1 x Std IEC inlet DC Power: 1 x Phoenix 2pin 1927564 MSTB 2,5/ 2-GF-5,08 THT Speaker: L/F 2 x 3.5mm mini jack (Lime+Light Blue) Mic In: 1 x 3.5mm mini jack (Pink)	Ethernet GBLan: 2 x RJ-45 Keyboard: 1 x PS/2 (purple) Mouse: 1 x PS/2 (green) COM1: 1 x DB9M RS-232 non-isolated COM2: 1 x DB9M RS-422/485 non-isolated LPT1: 1 x Pin Header USB 1.1: 1 x USB Type A 2 x Pin Header (=4 USB) USB 2.0: 3 x USB Type A DVI or RGB OUT: 1 x 29P DVI-I or as RGB with adapter RGB OUT: 1 x 15p HD D-SUB AC Power: 1 x Std IEC inlet DC Power: 1 x Phoenix 2pin 1927564 MSTB 2,5/ 2-GF-5,08 THT Speaker: L/F 2 x 3.5mm mini jack (Lime+Light Blue) Mic In: 1 x 3.5mm mini jack (Pink)	Ethernet GBLan: 2 x RJ-45 Keyboard: 1 x PS/2 (purple) Mouse: 1 x PS/2 (green) COM1: 1 x DB9M RS-232 non-isolated COM2: 1 x DB9M RS-422/485 non-isolated LPT1: 1 x Pin Header USB 1.1: 1 x USB Type A 2 x Pin Header (=4 USB) USB 2.0: 3 x USB Type A DVI or RGB OUT: 1 x 29P DVI-I or as RGB with adapter RGB OUT: 1 x 15p HD D-SUB AC Power: 1 x Std IEC inlet DC Power: 1 x Phoenix 2pin 1927564 MSTB 2,5/ 2-GF-5,08 THT Speaker: L/F 2 x 3.5mm mini jack (Lime+Light Blue) Mic In: 1 x 3.5mm mini jack (Pink)
Dimensions & Weight	314.00 [W] x 272.00 [H] x 64.90 [D] mm Approx TBD kg	356.00 [W] x 307.00 [H] x 67.40 [D] mm Approx TBD kg	390.00 [W] x 351.00 [H] x 72.90 [D] mm Approx TBD kg
Factory Options	Projected Capacitive Technology [PCTouch] MULTITOUCH Optical Bonding Technology	Projected Capacitive Technology [PCTouch] MULTITOUCH Optical Bonding Technology	Projected Capacitive Technology [PCTouch] MULTITOUCH Optical Bonding Technology
Available Accessories	TBD	TBD	TBD
Capabilities / Prepared For	4 x COM isolated RS422/RS485, ECDIS/NMEA Compliant CAN module, 2 x CAN isolated	4 x COM isolated RS422/RS485, ECDIS/NMEA Compliant CAN module, 2 x CAN isolated	4 x COM isolated RS422/RS485, ECDIS/NMEA Compliant CAN module, 2 x CAN isolated
ENVIRONMENTAL DATA	HD 12T21 MMC	HD 15T21 MMC	HD 17T21 MMC
Operating Temperature	-15 deg. C to +55 deg. C Humidity up to 95%	-15 deg. C to +55 deg. C Humidity up to 95%	-15 deg. C to +55 deg. C Humidity up to 95%
Storage Temperature	-20 deg. C to +60 deg. C Humidity up to 95%	-20 deg. C to +60 deg. C Humidity up to 95%	-20 deg. C to +60 deg. C Humidity up to 95%
IP Rating	Protection: IP66 front - IP22 rear [EN60529]	Protection: IP66 front - IP22 rear [EN60529]	Protection: IP66 front - IP22 rear [EN60529]
Compass Safe Distance	Standard: TBDcm - Steering: TBDcm	Standard: TBDcm - Steering: TBDcm	Standard: TBDcm - Steering: TBDcm
TYPE APPROVAL & TESTING	HD 12T21 MMC	HD 15T21 MMC	HD 17T21 MMC
Note: Some of the Type Approvals could be pending. Please check our website for the latest status.	IEC 60945 4 th [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 th [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 th [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 - PANEL COMPUTERS SERIES X

19 INCH



HD 19T21 MMC

24 INCH WIDESCREEN



HD 24T21 MMC

Note: Please visit our website www.hatteland-display.com for up-to-date datasheets and specifications during 2011.

TECHNICAL DATA - DISPLAY	HD 19T21 MMC	HD 24T21 MMC
TFT Technology	LED Backlight, TFT Active-matrix, MVA (Multi-domain Vertical Alignment) LCD Technology	LED Backlight, TFT Active-matrix, MVA (Multi-domain Vertical Alignment) LCD Technology
Viewable Image Size & Active Area	19.0 inch - 376.32 [H] x 301.056 [V] mm	24.0 inch - 531.36 [H] x 298.89 [V] mm
Native Resolution & Pixel Pitch	1280 x 1024 - 0.294 [H] x 0.294 [V] mm	1920 x 1080 - 0.276 [H] x 0.276 [V] mm
Response Time	20ms (typ)	25ms (typ)
Light Intensity & Contrast Ratio	300 cd/m ² (typ) - 1000:1 (typ) High Bright versions available	250 cd/m ² (typ) - 3000:1 (typ) High Bright versions available
View Angle	89 deg. (up/down/left/right) @ CR >10	89 deg. (up/down/left/right) @ CR >10
Max Color Output	16.7 million	16.7 million
Optimal Resolution and Hz	1280 x 1024 SXGA (5:4) @ 60 Hz	1920 x 1080 FHD (4:3) @ 60 Hz
Detectable Resolutions	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, 1600 x 1200, 1920 x 1080, 1920 x 1200
Power Input	Multi-power 115/230VAC - 50/60Hz + 24 VDC	Multi-power 115/230VAC - 50/60Hz + 24 VDC
Power Consumption	TBD W (typ) - TBD W (max)	TBD W (typ) - TBD W (max)
TECHNICAL DATA - COMPUTER	HD 19T21 MMC	HD 24T21 MMC
Installed Operating System (OS)	None, or Windows Embedded Enterprise (XP/Win7)	None, or Windows Embedded Enterprise (XP/Win7)
Storage	2 x 2.5" removable HDD (SATA) Default configuration: 1 x 250GB HDD. Raid: 0,1	2 x 2.5" removable HDD (SATA) Default configuration: 1 x 250GB HDD. Raid: 0,1
Processor/CPU	1 x Intel® Celeron® P4505 (2M Cache, 1.86 GHz) Front Side Bus (FSB) 800MHz	1 x Intel® Celeron® P4505 (2M Cache, 1.86 GHz) Front Side Bus (FSB) 800MHz
Memory	1 x 2GB DDR3 1066/800MHz non-ECC SO-DIMM	1 x 2GB DDR3 1066/800MHz non-ECC SO-DIMM
System Chipset	Intel® BD82QM57	Intel® BD82QM57
On-board Graphics Chipset	Intel® Arrandale IGD supports DVM 5.0	Intel® Arrandale IGD supports DVM 5.0
Max Resolution / Max Hz Out	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
BIOS	AMI BIOS	AMI BIOS
Speaker	None	None
Buzzer	3500Hz	3500Hz
Power Manager	ACPI S3/S4	ACPI S3/S4
Monitoring	Temperature and voltages status	Temperature and voltages status
Watchdog Timer	256 Segments, 0, 1, 2...255 sec/min	256 Segments, 0, 1, 2...255 sec/min
Other Features	GPIO, LAN Wakeup, USB Boot and Wakeup	GPIO, LAN Wakeup, USB Boot and Wakeup
MECHANICAL DATA	HD 19T21 MMC	HD 24T21 MMC
User Controls & Activity	Glass Display Control™ with: Power On/Off, Brightness Control (-/+), HDD LED, Buzzer Mode Status Indications (ECDIS, Service)	Glass Display Control™ with: Power On/Off, Brightness Control (-/+), HDD LED, Buzzer Mode Status Indications (ECDIS, Service)
Visible I/O Connectors	Ethernet GB LAN: 2 x RJ-45 Keyboard: 1 x PS/2 (purple) Mouse: 1 x PS/2 (green) COM1: 1 x DB9M RS-232 non-isolated COM2: 1 x DB9M RS-422/485 non-isolated LPT1: 1 x Pin Header USB 1.1: 1 x USB Type A 2 x Pin Header (=4 USB) USB 2.0: 3 x USB Type A DVI or RGB OUT: 1 x 29P DVI-I or as RGB with adapter RGB OUT: 1 x 15p HD D-SUB AC Power: 1 x Std IEC inlet DC Power: 1 x Phoenix 2pin 1927564 MSTB 2,5/ 2-GF-5,08 THT Speaker: L/F 2 x 3.5mm mini jack (Lime+Light Blue) Mic In: 1 x 3.5mm mini jack (Pink)	Ethernet GB LAN: 2 x RJ-45 Keyboard: 1 x PS/2 (purple) Mouse: 1 x PS/2 (green) COM1: 1 x DB9M RS-232 non-isolated COM2: 1 x DB9M RS-422/485 non-isolated LPT1: 1 x Pin Header USB 1.1: 1 x USB Type A 2 x Pin Header (=4 USB) USB 2.0: 3 x USB Type A DVI or RGB OUT: 1 x 29P DVI-I or as RGB with adapter RGB OUT: 1 x 15p HD D-SUB AC Power: 1 x Std IEC inlet DC Power: 1 x Phoenix 2pin 1927564 MSTB 2,5/ 2-GF-5,08 THT Speaker: L/F 2 x 3.5mm mini jack (Lime+Light Blue) Mic In: 1 x 3.5mm mini jack (Pink)
Dimensions & Weight	429.00 [W] x 382.00 [H] x 74.40 [D] mm Approx TBD kg	593.00 [W] x 348.00 [H] x 80.40 [D] mm Approx 14 kg
Factory Options	Projected Capacitive Technology (PCTouch) MULTITOUCH Optical Bonding Technology	Projected Capacitive Technology (PCTouch) MULTITOUCH Optical Bonding Technology
Available Accessories	TBD	TBD
Capabilities / Prepared For	4 x COM isolated RS422/RS485, ECDIS/NMEA Compliant CAN module, 2 x CAN isolated	4 x COM isolated RS422/RS485, ECDIS/NMEA Compliant CAN module, 2 x CAN isolated
ENVIRONMENTAL DATA	HD 19T21 MMC	HD 24T21 MMC
Operating Temperature	-15 deg. C to +55 deg. C Humidity up to 95%	-15 deg. C to +55 deg. C Humidity up to 95%
Storage Temperature	-20 deg. C to +60 deg. C Humidity up to 95%	-20 deg. C to +60 deg. C Humidity up to 95%
IP Rating	Protection: IP66 front - IP22 rear (EN60529)	Protection: IP66 front - IP22 rear (EN60529)
Compass Safe Distance	Standard: TBDcm - Steering: TBDcm	Standard: TBDcm - Steering: TBDcm
TYPE APPROVAL & TESTING	HD 19T21 MMC	HD 24T21 MMC
Note: Some of the Type Approvals could be pending. Please check our website for the latest status.	IEC 60945 4 th [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 th [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

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.



*Factory installed Operating Systems delivered from Hatteland Display, example: HT C01 **STD**-xxxx:

ST0 = No OS

STD = Microsoft® Windows® Embedded Enterprise (Win XP Pro Eng w/SP2c, 32bit)

ST3 = Microsoft® Windows® Embedded Enterprise (Win Server 2003 Eng, 32bit)

ST7 = Microsoft® Windows® Embedded Enterprise (Win 7 Pro Eng, 32bit)

ST8 = Microsoft® Windows® Embedded Enterprise (Win Server 2008 Eng, 32bit)



COMMERCIAL



HT C01
Compact



HT 216
2U Standard



HT 416
4U Standard



NEW

HT B21E AND HT B21F
Compact Fanless



**Designed
to perform in
harsh environments...**

HT B17
Compact Fanless



HT B18
Compact Fanless



**C
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SPECIFICATIONS - COMPUTERS

COMPACT



HT C01

2U STANDARD



HT 216

4U STANDARD



HT 416

TECHNICAL DATA	HT C01	HT 216	HT 416
Installed Operating System (OS)	None or Option Dependent	None or Option Dependent	None or Option Dependent
Storage	Option Dependent	1 x 250GB 3.5" SATA 7200 RPM, 8MB Cache or Option Dependent	1 x 250GB 3.5" SATA 7200 RPM, 8MB Cache or Option Dependent
CPU / Processor & FSB Speed	1 x Intel® Core™2 Duo Desktop Processor E6400 3.0GHz, 1333MHz FSB, 6MB L2 Cache	1 x Intel® Core™2 Duo Desktop Processor E6400 2.13GHz, 1066MHz FSB, 2MB L2 Cache	1 x Intel® Core™2 Duo Desktop Processor E6400 2.13GHz, 1066MHz FSB, 2MB L2 Cache
Memory	2 x 1 GB Dual Channel DDR2 800/667MHz SDRAM, 240-pin DIMM or Option Dependent	2 x 1GB Dual Channel DDR2 800/667MHz SDRAM DIMM or Option Dependent	2 x 1GB Dual Channel DDR2 800/667MHz SDRAM DIMM or Option Dependent
System Chipset	Intel® Q35 ICH9DO	Intel® Q965 ICH8DO	Intel® Q965 ICH8DO
On-board Graphics Chipset / Card	Intel® GMA 3100 with 1 x HD DB15F (female) RGB/VGA OUT 1 x 29P (female) DVI-I	Integrated VGA, supports CRT with 1 x HD DB15F (female) RGB/VGA OUT or Option Dependent	Integrated VGA, supports CRT with 1 x HD DB15F (female) RGB/VGA OUT or Option Dependent
Max Resolution / Max Hz	2048 x 1536 / 75Hz	2048 x 1536 / 85Hz	2048 x 1536 / 85Hz
BIOS	Award	AMI 8MB Flash	AMI 8MB Flash
PCI Slots / PCIe Slots	All slots are Full Height & Full Length profile: 2 x PCI2.3 Slots, 3V and 5V Interface 1 x PCIe X16 (add2) + 1 x PCIe X1	All slots are Half Length and Low Profile: 2 x PCI Slots 32bit, 3V and 5V Interface 1 x PCIe 4X 1 PCIe 16X (add2) (Graphic Mode)	All slots are Full Height & Full Length profile: 5 x PCI Slots 32bit, 3V and 5V Interface 1 x PCIe 4X 1 PCIe 16X (add2) (Graphic Mode)
Media Drive(s)	1 x DVD-RW/CD-RW Dual Recorder/Player Drive	1 x Slim DVD/CD-RW Recorder/Player Drive or Option Dependent	1 x Slim DVD/CD-RW Recorder/Player Drive or Option Dependent
Parallel Port (LPT female)	1 x DB25F Bi-Directional Centronics with ECP/EPP	1 x DB25F Bi-Directional Centronics with SPP/EPP/ECP	1 x DB25F Bi-Directional Centronics with SPP/EPP/ECP
Serial Port(s)	2 x DB9M RS-232 or Option Dependent	1 x DB9M RS-232 1 x DB9M RS-232/RS-422/RS-485 (elec. isolated)	1 x DB9M RS-232 1 x DB9M RS-232/RS-422/RS-485 (elec. isolated)
Ethernet Port(s)	2 x RJ45 10/100/1000Mbps - Intel® 82566DM 2 x RJ45 10/100/1000Mbps - Realtek RTL 8168C	2 x RJ45 10/100/1000Mbps - Realtek RTL8111B or Option Dependent	2 x RJ45 10/100/1000Mbps - Realtek RTL8111B or Option Dependent
USB Port(s)	8 x USB2.0 Type A (rear) 2 x USB2.0 Type A (front)	8 x USB2.0 Type A (rear) 2 x USB2.0 (Internal)	8 x USB2.0 Type A (rear) 2 x USB2.0 (Internal)
Keyboard & Mouse Ports	1 x PS/2 Keyboard 1 x PS/2 Mouse	1 x PS/2 Keyboard 1 x PS/2 Mouse	1 x PS/2 Keyboard 1 x PS/2 Mouse
Audio Port(s)	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	6 x 3.5mm Jacks (LINE IN/LINE OUT/MIC IN) AC97 Codec, 7.1 channel, HD Audio
Speaker	None	On-board	On-board
Power Manager	ACPI	None	ACPI
Monitoring / Watchdog	Temperature, voltage, fans with auto throttle WatchDog Reset: 1 sec-255 min & 1 sec. or 1 min/step	None	None
Power Input	115/230VAC - 50/60Hz (300W) or 24VDC If AC Power IN: 1 x Std IEC inlet If DC Power IN: 1 x 2p DSUB (male) Amphenol FCC17	115/230VAC - 50/60Hz (400W Autorange) AC Power IN: 1 x Std IEC inlet	115/230VAC - 50/60Hz (400W Autorange) AC Power IN: 1 x Std IEC inlet
Power Consumption	Operating 70W (typ)	Operating 100W (typ)	Operating 100W (typ)
MECHANICAL DATA	HT C01	HT 216	HT 416
Key Features	High Performance Replaceable Air Filter in front Service friendly Includes mounting brackets	Heavy-duty steel 2U Rackmount chassis Removable air filter / Lockable front hatch door Supports 2 x 5 1/4" disk bays (one slim) Supports 4 x 3 1/2" disk bays Rear cable strain reliefs with grounding thread Rear PCI card support holder, fixed to chassis Cooling fans (High/Low Pressure, PSU, CPU & PCI)	Heavy-duty steel 4U Rackmount chassis Removable air filter / Lockable front hatch door Supports 6 x 5 1/4" disk bays 4 x 5 1/4" + 2 x slim, one used for air Supports 4 x 3 1/2" disk bays Rear cable strain reliefs with grounding thread Rear PCI card support holder, fixed to chassis Cooling fans (High/Low Pressure, PSU, CPU & PCI)
Dimensions & Weight	345.00 (W) x 133.00 (H) x 390.00 (D) mm - 3U Approx 10kg	430.00 (W) x 80.00 (H) x 460.80 (D) mm - 2U Approx 10kg	431.00 (W) x 176.50 (H) x 443.00 (D) mm - 4U Approx 25kg
User Controls / Activity	On/Off Push Button, Reset Button Power LED / HDD LED	On/Off Push Button Power LED / HDD LED	On/Off Push Button Power LED / HDD LED
Factory Options	1 x 250 GB 2.5" SATA, 5400 RPM, 8MB Buffer 4 or 8 x COM Ports - Supports RS-232/422/485 1 x 30 GB SSD 2.5" SATA 1 x Matrox P690, PCIe x 16 / PCIe x 1 / PCI Low Profile Up to 8 GB memory	1 x 16-128GB SDD 3.5" SATA 1 x Matrox P690, PCIe x 16 / PCIe x 1 / PCI Low Profile 2 x Intel® 10/100/1000Mbps (Teaming, Low Profile) 1 x Bluestorm Card - COM (Low Profile) Custom Specified Front as label 2 x USB2.0 Connectors in front Future support for larger HDD sizes possible	2-4 x 250GB HDD 3.5" SATA 1 x 16-128GB SDD 3.5" SATA Storage RAID Option with 0,1,5,10 Mode 1 x Matrox P690, PCIe x 16 / PCIe x 1 / PCI Low Profile 2 x Intel® 10/100/1000Mbps (Teaming, Low Profile) Custom Specified Front as label Up to 8GB Memory
Available Accessories	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	Mounting Rails Kit 20 inch for 19 inch rack Recovery Kit (USB Flash)	Mounting Rails Kit 20 inch for 19 inch rack Recovery Kit (USB Flash)
Capabilities / Prepared for	Up to 8GB DDR2 800/667MHz SDRAM, 240-pin DIMM	Up to 8GB DDR2 800/667MHz SDRAM DIMM 2 x USB2.0 Connectors in front 4 x 250GB HDD 3.5" SATA Supports 4 x 3 1/2" disk bays Supports 2 x 5 1/4" disk bays (one slim)	2-4 x 250GB HDD 3.5" SATA 1 x 16-128GB SDD 3.5" SATA Storage RAID Option with 0,1,5,10 Mode 1 x Matrox P690, PCIe x 16 / PCIe x 1 / PCI Low Profile 2 x Intel® 10/100/1000Mbps (Teaming, Low Profile) 1 x Bluestorm Card - COM (Low Profile) Custom Specified Front as label Future support for larger HDD sizes possible
ENVIRONMENTAL DATA	HT C01	HT 216	HT 416
Operating Temperature	-15 deg. C to +55 deg. C, Humidity up to 95% DNV Temperature Class B +70 deg. C for 2 hours	-15 deg. C to +55 deg. C, Humidity up to 95%	-15 deg. C to +55 deg. C, Humidity up to 95%
Storage Temperature	-20 deg. C to +60 deg. C, Humidity up to 95%	-20 deg. C to +60 deg. C, Humidity up to 95%	-20 deg. C to +60 deg. C, Humidity up to 95%
Compass Safe Distance	Standard: 150cm - Steering: 95cm	Standard: 140cm - Steering: 80cm	Standard: 135cm - Steering: 90cm
MTBF (Mean Time Between Failures)	22581 hours	24790 hours	24790 hours
TYPE APPROVAL & TESTING	HT C01	HT 216	HT 416
Note: Some of the Type Approvals could be pending. Please check our website for the latest status.	IEC 60945 4 th [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	IEC 60945 4 th [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 th [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

COMPACT FANLESS



HT B17

COMPACT FANLESS



HT B18

TECHNICAL DATA	HT B17	HT B18
Installed Operating System (OS)	None or Option Dependent	None or Option Dependent
Storage	1 x internal SSD/HDD [2.5"]	1 x removable SSD/HDD 1 x internal SSD/HDD [2.5"]
CPU / Processor & FSB Speed	1 x Intel® Core™2 Duo Mobile Processor T8400 2.26GHz, 1066MHz FSB, 3MB L2 Cache	1 x Intel® Core™2 Duo Mobile Processor T8400 2.26GHz, 1066MHz FSB, 3MB L2 Cache
Memory	2 x 1GB Dual Channel DDR2 800/667MHz SO-DIMM 200-pin	2 x 1GB Dual Channel DDR2 800/667MHz SO-DIMM 200-pin
System Chipset	Intel® GM45 / ICH9	Intel® GM45 / ICH9
On-board Graphics Chipset / Card	Intel® GMA 4500MHD 2 x 29P (female) DVI-I or 1 x HD DB15F (female) RGB/VGA + 1 x 29P (female) DVI-I	Intel® GMA 4500MHD 2 x 29P (female) DVI-I or 1 x HD DB15F (female) RGB/VGA + 1 x 29P (female) DVI-I
Max Resolution / Max Hz	2048 x 1536 / 85Hz	2048 x 1536 / 85Hz
BIOS	Award 4Mb Flash BIOS	Award 4Mb Flash BIOS
PCI Slots / PCIe Slots	None	2 x PCI (Full height, Half length)
Media Drive(s)	None	None
Parallel Port (LPT female)	None	None
Serial Port(s)	1 x DB9M RS-232	2 x DB9M RS-232
Ethernet Port(s)	2 x RJ45 10/100/1000Mbps - Intel® 82567L and 82574L	2 x RJ45 10/100/1000Mbps - Intel® 82567L and 82574L
USB Port(s)	4 x USB2.0 Type A	4 x USB2.0 Type A
Keyboard & Mouse Ports	1 x PS/2 Keyboard 1 x PS/2 Mouse	1 x PS/2 Keyboard 1 x PS/2 Mouse
Audio Port(s)	ALC888, AC97, 6 x 3.5mm Jacks Front Out, Line In, Mic, Center/LFE, Surround, Surround Back	ALC888, AC97, 6 x 3.5mm Jacks Front Out, Line In, Mic, Center/LFE, Surround, Surround Back
Speaker	None	None
Power Manager	ACPI	ACPI
Monitoring / Watchdog	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	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
Power Input	Multi-power 115/230VAC - 50/60Hz + 24 VDC AC Power IN: 1 x Std IEC inlet DC Power IN: 1 x 2p DSUB (male) Amphenol FCC17	Multi-power 115/230VAC - 50/60Hz + 24 VDC AC Power IN: 1 x Std IEC inlet DC Power IN: 1 x 2p DSUB (male) Amphenol FCC17
Power Consumption	Operating: 30W (typ) - 60w (max)	Operating: 30W (typ) - 60w (max)
MECHANICAL DATA	HT B17	HT B18
Key Features	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 Disk Includes Mounting Bracket Kit
Dimensions & Weight	270.00 [W] x 57.95 [H] x 310.00 [D] mm Approx 5kg	270.00 [W] x 105.95 [H] x 310.00 [D] mm Approx 5kg
User Controls / Activity	On/Off Push Button, Reset Button Power LED / HDD LED	On/Off Push Button, Reset Button Power LED / HDD LED
Factory Options	Future support for larger SSD/HDD sizes possible	Future support for larger SSD/HDD sizes possible
Available Accessories	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
Capabilities / Prepared for	Up to 4GB DDR2 800/667MHz SO-DIMM 200-pin	Serial Card 4 or 8 x COM Ports - Supports RS-232/422/485 1 x PCI + 1 x PCIe1 (Full height, half length) Up to 4GB DDR2 800/667MHz SO-DIMM 200-pin
ENVIRONMENTAL DATA	HT B17	HT B18
Operating Temperature	-15 deg. C to +55 deg. C Humidity up to 95%	-15 deg. C to +55 deg. C Humidity up to 95%
Storage Temperature	-20 deg. C to +60 deg. C Humidity up to 95%	-20 deg. C to +60 deg. C Humidity up to 95%
Compass Safe Distance	Standard: 75cm - Steering: 45cm	Standard: 75cm - Steering: 45cm
MTBF (Mean Time Between Failures)	44622 hours	44622 hours
TYPE APPROVAL & TESTING	HT B17	HT B18
Note: Some of the Type Approvals could be pending. Please check our website for the latest status.	IEC 60945 4 th [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 th [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: Please visit our website www.hatteland-display.com for up-to-date datasheets and specifications during 2011.

COMPACT



HT B21E

COMPACT



HT B21F

TECHNICAL DATA	HT B21E with Intel® Atom™	HT B21F with Intel® Core™2 Duo
Installed Operating System (OS)	None, or Windows Embedded Enterprise (XP/Win7)	None, or Windows Embedded Enterprise (XP/Win7)
Storage	1 x 8GB SSD	1 x 60GB SSD
CPU / Processor & FSB Speed	1 x Intel® Atom™ N450	1 x Intel® Core™2 Duo P8400 2.26GHz, Bus Speed 1066MHz, 3 MB L2 Cache
Memory	2 x 512MB	2 x 1 GB [Dual Channel 200-pin DDR2 800MHz SO-DIMM]
System Chipset	NM10	Intel® GM45 / ICH9, Support Intel® Active Management Technology
On-board Graphics Chipset / Card	GMA 3150 [onboard CPU, DirectX9, OpenGL 1.5 Win/OpenGL 2.0 Linux]	Intel® Graphics Media Accel. GMA4500MHD Integrated/Daughter Board [CH7307C]
Max Resolution / Max Hz	Max 1600 x 1200 @ 60Hz (DVI) Max 1920 x 1200 - Via DVI to RGB adapter	Max 1400 x 1200 @ 60Hz (DVI), Higher resolution available via Blanking. RGB OUT Resolution: Max 1920 x 1200 - Via DVI to RGB adapter
BIOS	TBD	TBD
Ethernet Port(s)	2 x RJ45 10/100/1000Mbps	4 x RJ45 10/100/1000Mbps
Serial Port(s)	1 x COM1 [isolated RS422/RS485] - SC 90F [1 x 5 pole]	1 x COM1 [isolated RS422/RS485] - SC 90F [1 x 5 pole]
USB Port(s)	2 x USB2.0 Type A + 1 x [2 x 5 pole] Internal Pin Header	4 x USB2.0 Type A + 1 x [2 x 5 pole] Internal Pin Header
Speaker	None	None
Buzzer	Yes (according to EN60945)	Yes (according to EN60945)
Power Manager	ACPI	ACPI
Monitoring / Watchdog	Temperatures, voltages & cooling fan status	Temperatures, voltages & cooling fan status. Auto throttling control if CPU overheats
Power Input	Dual 24VDC - 2 x SL SMT 90F [1 x 4 pole]	Dual 24VDC - 2 x SL SMT 90F [1 x 4 pole]
Power Consumption	Operating: TBD W (typ) - TBD W (max)	Operating: TBD W (typ) - TBD W (max)
Other Connectors	Mechanical Relay (NO/NC): TBD - 1 x SC 90F [1 x 3 pole] Solid State Relay (NO): TBD (over current protection) 2 x SCD 90F [2 x 2 pole] Digital Input: TBD (isolated/protected) 2 x SCD 90F [2 x 2 pole] Safety Signal Relay (NO/NC): TBD 1 x SC 90F [1 x 3 pole]	Mechanical Relay (NO/NC): TBD - 1 x SC 90F [1 x 3 pole] Solid State Relay (NO): TBD (over current protection) 2 x SCD 90F [2 x 2 pole] Digital Input: TBD (isolated/protected) 2 x SCD 90F [2 x 2 pole] Safety Signal Relay (NO/NC): TBD 1 x SC 90F [1 x 3 pole]
MECHANICAL DATA	HT B21E with Intel® Atom™	HT B21F with Intel® Core™2 Duo
Key Features	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
Dimensions & Weight	TBD (W) x TBD (H) x TBD (D) mm Approx 5kg	TBD (W) x TBD (H) x TBD (D) mm Approx 5kg
User Controls / Activity	Power Button, Power LED, Reset Button, HDD LED	Power Button, Power LED, Reset Button, HDD LED
Factory Options	Future support for larger SSD/HDD sizes possible	Future support for larger SSD/HDD sizes possible
Available Accessories	TBD	TBD
Capabilities / Prepared for	1 x COM - Un-isolated COM (RS232 / RS422 / RS485) 1 x DVI-I - DVI-I output, for additional / external display DIO [4/4] - Digital Input / Output [4/4] 2 x CAN [isolated] - SL SMT 90F connectors	1 x COM - Un-isolated COM (RS232 / RS422 / RS485) 1 x miniPCIe - Require modification of chassis DIO [4/4] - Digital Input / Output [4/4] 2 x CAN [isolated] - SL SMT 90F connectors 1 x DVI-D 24pin
ENVIRONMENTAL DATA	HT B21E with Intel® Atom™	HT B21F with Intel® Core™2 Duo
Operating Temperature	-15 deg. C to +55 deg. C Humidity up to 95%	-15 deg. C to +55 deg. C Humidity up to 95%
Storage Temperature	-20 deg. C to +60 deg. C Humidity up to 95%	-20 deg. C to +60 deg. C Humidity up to 95%
Compass Safe Distance	Standard: TBDcm - Steering: TBDcm	Standard: TBDcm - Steering: TBDcm
MTBF (Mean Time Between Failures)	TBD	TBD
TYPE APPROVAL & TESTING	HT B21E with Intel® Atom™	HT B21F with Intel® Core™2 Duo
Note: Some of the Type Approvals could be pending. Please check our website for the latest status.	IEC 60945 4 th [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 th [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

NEW



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

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



TEMPEST certified
by the Norwegian
National Security
Authority

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.





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

MIL QUALIFIED PRODUCTS

19 INCH



HM 19T14 MMD - TEMPEST TESTED

20 INCH



HM 20T07 MIL

20 INCH



HM 20T07 MIL-H

20 INCH



JH 20T03 MIL

20 INCH



HM 20T07 NMD

20 INCH



HM 20T07 CMD

COMPACT RUGGED NAVAL COMPUTER



HM C01

SPECIFICATIONS - MIL QUALIFIED DISPLAYS

19 INCH TEMPEST

20 INCH

20 INCH

TECHNICAL DATA	HM 19T14 MMD	HM 20T07 MIL / MIL-H	JH 20T03 MIL
TFT Technology	Active Matrix, Thin Film Transistor (TFT) MVA Premium™ Technology	a-Si TFT [Thin Film Transistor] Active Matrix Optical Technology Bonding	Active Matrix, Thin Film Transistor (TFT)
Viewable Image Size & Active Area	19.0 inch - 376.32 [H] x 301.056 [V] mm	20.1 inch - 408.0 [H] x 306.0 [V] mm	20.1 inch - 399.36 [H] x 319.49 [V] mm
Native Resolution & Pixel Pitch	1280 x 1024 - 0.294 [H] x 0.294 [V] mm	1600 x 1200 - 0.255 [H] x 0.255 [V] mm	1280 x 1024 - 0.312 [H] x 0.312 [V] mm
Response Time	12 ms [typ]	20 ms [typ]	25 ms [typ]
Light Intensity & Contrast Ratio	300 cd/m ² [typ] - 900:1 [typ]	250 cd/m ² [typ] - 500:1 [typ]	250 cd/m ² [typ] - 300:1 [typ]
View Angle	+/- 85 deg. [up/down/left/right] @ CR >10	+/- 88 deg. [up/down/left/right] @ CR >10	+/- 85 deg. [up/down/left/right] @ CR >10
Max Color Output	16,777,216 [8-bit color]	16,777,216 [8-bit color]	16,777,216 [8-bit color]
Sync. Signal Auto-detect	Digital Separate Sync. Composite Sync. Sync. On Green	Digital Separate Sync. Composite Sync. Sync. On Green	Digital Separate Sync. Composite Sync. Sync. On Green
Synchronisation Range	15.0 kHz to 91.1 kHz [H] - 60 Hz to 85 Hz [V]	15.0 kHz to 91 kHz [H] - 60 Hz to 85 Hz [V]	31.5 kHz to 91.1 kHz [H] - 60 Hz to 85 Hz [V]
Optimal Resolution and Hz	1280 x 1024 [SXGA 5:4] @ 60 Hz	1600 x 1200 [UXGA 4:3] @ 60 Hz	1280 x 1024 [SXGA 5:4] @ 60 Hz
Detectable Resolutions	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	640 x 350 / 640 x 480 / 720 x 400 / 800 x 600 1024 x 768 / 1280 x 1024 / 1600 x 1200
Video Input Option	YES via HATTELAND® Multifunction Cable	YES	None
Supported Video Signals	SVHS & COMPOSITE Compatible	COMPOSITE Compatible [NTSC/PAL/SECAM]	None
Product Features	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%] Provides PIP [Picture-In-Picture] Serial Communication [SCOM] Interface Suitable for navigation and automation Front mounted handles (HM 20T07 MIL-H1 and -H2 model)	Fully adjustable backlight [0-100%] Serial Communication [SCOM] Interface Suitable for navigation and automation
Power Input & Power Consumption	115/230VAC - 50/60Hz 100W (max)	115/230VAC - 50/60Hz 75W [typ] - 100W (max)	115/230VAC - 50/60Hz 76W [typ] - 100W (max)
Inrush Current / Other	N/A	N/A	Transient immunity, 100 ns risetime, 10 µs duration, 325 VpEAK Supply voltage variation test, 98 -> 138 VAC, 56.4 -> 63.6 Hz Measurements of inrush current = 4 ApeAK
MECHANICAL DATA	HM 19T14 MMD	HM 20T07 MIL / MIL-H	JH 20T03 MIL
User Controls	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 [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]	Power On/Off [push button] Brightness Control Rotary Knob 2 x hotkeys Mode Status LED On Screen Display control [OSD/OSM]
Connectors	DVI IN: 1 x DVI-I 29P [female] RGB IN: 1 x HD D-SUB 15P [female] RGB OUT: 1 x HD D-SUB 15P [female] Multifunction: 1 x D-SUB 160p [female] USB I/O: 1 x Type B [female] - [Not in use/ Not connected] AC Power IN: 1 x Std IEC inlet AC Power OUT: 1 x Std IEC outlet 1 x RS-232 COM + 3 x BNC Video IN	RGB IN: 5 x BNC Connectors [RGBHV] RGB OUT: 1 x HD D-SUB 15P [female] Composite Video IN: 1 x BNC Connector Serial Remote Control: 2 x D-SUB 9P [female] AC Power IN: 1 x Std IEC inlet	RGB IN: 5 x BNC Connectors [RGBHV] Serial Remote Control: 2 x D-SUB 9P [female] AC Power IN: 1 x Std IEC inlet
Models Dimensions & Weight	483.00 [W] x 444.00 [H] x 82.00 [D] mm 483.00 [W] x 509.60 [H] x 228.70 [D] mm [w/brackets] Approx 11,5 kg	534.00 [W] x 481.00 [H] x 87.00 [D] mm 534.00 [W] x 481.00 [H] x 147.00 [D] mm [with handles] Approx 14 kg	534.00 [W] x 485.00 [H] x 94.00 [D] mm Approx 14 kg
Factory Options	Color Calibrated models [ECDIS]	24/28 VDC Power Solution [-H1 model] Resistive Touchscreen 8 wire Color Calibrated models [ECDIS]	Touchscreen Color Calibrated models [ECDIS]
Available Accessories	VSD100692-x Multifunction Cable Bracket [tilt up/down] Rotary Bracket [left/right] Sun Visor VESA Bracket 21 CRT Adapter Frame Water Cover	Bracket [tilt up/down] Rotary Bracket [left/right] VESA Bracket	Bracket [tilt up/down] Rotary Bracket [left/right] Sun Visor VESA Bracket
ENVIRONMENTAL DATA	HM 19T14 MMD	HM 20T07 MIL / MIL-H	JH 20T03 MIL
Dry Heat Storage	-20 deg. C to +60 deg. C - Humidity up to 95%	70 deg. C [IEC 60068-2-2 [1974], Test Bd]	70 deg. C [IEC 60068-2-2 [1974], Test Bd]
Cold Storage	N/A	-40 deg. C [IEC 60068-2-1 [1990], Test Ad]	-40 deg. C [IEC 60068-2-1 [1990], Test Ad]
Operating Temperature [typ]	-15 deg. C to +55 deg. C - Humidity up to 95%	-15 to +55 deg. C	-15 to +55 deg. C
Humidity	N/A	Up to 95%	Up to 95%
Shock	N/A	50g / 30ms [IEC 60068-2-27 [1987], Test Ea]	50g / 11ms [IEC 60068-2-27 [1987], Test Ea]
Grade A Shock	N/A	Class 1 [hard-mounted] [MIL-S-901D]	N/A
Transient Shock	N/A	N/A	2-280 Hz, Designed to envelope a half sine shock pulse of 50g / 35ms [IEC 60068-2-57 [1999-11], Test Ff]
Rain [drip proof]	N/A	N/A	280 l/m ² /hour - 15min pr. orientation MIL-STD-810F - Console Mounted
Salt Fog	N/A	N/A	MIL-STD-810F - Console Mounted
Vibration Testing	N/A	MIL-STD-167-1 - Console Mounted	Endurance Vibration: 4-33 Hz @ +/-5mm, 2g Resonance Search: 4-33 Hz @ 2g No resonance above 2 IEC 60068-2-6 [1995], Test Fc
IP Rating	EN60529 [IP66] [Applies for flush mounting]	EN60529 [IP66 - Applies for flush mount]	N/A
Compass Safe Distance	Standard: 160cm - Steering: 105cm	Standard: 115cm - Steering: 70cm	N/A
TYPE APPROVAL & TESTING	HM 19T14 MMD	HM 20T07 MIL / MIL-H	JH 20T03 MIL
Type Approval / Certificates	TEMPEST SDIP-27 IEC 60945 4 th [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 th [EN 60945:2002] ClassNK - Nippon Kaiji Kyokai DNV - Det Norske Veritas GL - Germanischer Lloyd BV - Bureau Veritas	EN60945 3 rd [IEC945 3 rd] BV - Bureau Veritas
EMI Testing	N/A	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

SPECIFICATIONS - MIL QUALIFIED DISPLAYS

20 INCH

20 INCH

TECHNICAL DATA	HM 20T07 NMD	HM 20T07 CMD
TFT Technology	a-Si TFT (Thin Film Transistor) Active Matrix Optical Technology Bonding	a-Si TFT (Thin Film Transistor) Active Matrix Optical Technology Bonding
Viewable Image Size & Active Area	20.1 inch - 408.0 [H] x 306.0 [V] mm	20.1 inch - 408.0 [H] x 306.0 [V] mm
Native Resolution & Pixel Pitch	1600 x 1200 - 0.255 [H] x 0.255 [V] mm	1600 x 1200 - 0.255 [H] x 0.255 [V] mm
Response Time	20 ms (typ)	20 ms (typ)
Light Intensity & Contrast Ratio	250 cd/m ² (typ) - 500:1 (typ)	250 cd/m ² (typ) - 500:1 (typ)
View Angle	+/- 88 deg. (up/down/left/right) @ CR >10	+/- 88 deg. (up/down/left/right) @ CR >10
Max Color Output	16,777,216 (8-bit color)	16,777,216 (8-bit color)
Sync. Signal Auto-detect	Digital Separate Sync. Composite Sync. Sync. On Green	Digital Separate Sync. Composite Sync. Sync. On Green
Synchronisation Range	15,0 kHz to 91 kHz [H] - 60 Hz to 85 Hz [V]	15,0 kHz to 91 kHz [H] - 60 Hz to 85 Hz [V]
Optimal Resolution and Hz	1600 x 1200 [UXGA 4:3] @ 60 Hz	1600 x 1200 [UXGA 4:3] @ 60 Hz
Detectable Resolutions	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
Video Input Option	None	None
Supported Video Signals	None	None
Product Features	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
Power Input & Power Consumption	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)
Inrush Current / Other	10A for 24/28VDC, Max. @ 25 deg. C 10A for 115VAC, Max. @ 25 deg. C	10A for 24/28VDC, Max. @ 25 deg. C 10A for 115VAC, Max. @ 25 deg. C
MECHANICAL DATA	HM 20T07 NMD	HM 20T07 CMD
User Controls	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
Connectors	DVI IN: 1 x DVI-I 29P (female) RGB IN: 5 x BNC J01 (R)+J03(G)+J05(B)+J07(H)+J08(V) RGB OUT: 3 x BNC J02(R)+J04(G)+J06(B) AC Power IN: 1 x Circular MIL P/N: AMP - MS27468T9F98P DC Power IN: 1 x Circular MIL P/N: AMP - MS27468T15F5P Grounding: 1 x M4 Internal Screw Thread Combi Touch / SCOM+BIT Interface: 1 x D-SUB 9P (female)	DVI IN: 1 x DVI-I 29P (female) RGB IN: 5 x BNC J01 (R)+J03(G)+J05(B)+J07(H)+J08(V) RGB OUT: 3 x BNC J02(R)+J04(G)+J06(B) AC Power IN: 1 x Circular MIL P/N: AMP - MS27468T9F98P DC Power IN: 1 x Circular MIL P/N: AMP - MS27468T15F5P Grounding: 1 x M4 Internal Screw Thread Combi Touch / SCOM+BIT Interface: 1 x D-SUB 9P (female)
Models Dimensions & Weight	482.00 mm [W] x 399.00 mm [9U] [H] x 95.00 mm [D] Approx 11.5 kg	482.00 mm [W] x 399.00 mm [9U] [H] x 135.00 mm [D] Approx 11.5 kg
Factory Options	24/28 VDC Power Solution Resistive Touchscreen 8 wire Color Calibrated models (ECDIS)	24/28 VDC Power Solution Resistive Touchscreen 8 wire Color Calibrated models (ECDIS)
Available Accessories	External 3.0m AC power cable NEMA External 3.0m AC power cable Europe External 3.0m DC power cable	External 3.0m AC power cable NEMA External 3.0m AC power cable Europe External 3.0m DC power cable
ENVIRONMENTAL DATA	HM 20T07 NMD	HM 20T07 CMD
Dry Heat Storage	70 deg. C (MIL-STD-810F)	70 deg. C (MIL-STD-810F)
Cold Storage	-40 deg. C (MIL-STD-810F)	-40 deg. C (MIL-STD-810F)
Operating Temperature (typ)	AC: -15 to +55 deg. C / DC: -15 to +55 deg. C (Mil-Std 810F)	AC: -15 to +55 deg. C / DC: -15 to +55 deg. C (MIL-STD-810F)
Humidity	95% at 40 deg. C (MIL-STD-810F)	95% at 40 deg. C (Mil-Std 810F)
Shock	60g / 11ms (IEC 60068-2-27 (1987), Test Ea)	60g / 11ms (IEC 60068-2-27 (1987), Test Ea)
Grade A Shock	Class 1 (hard-mounted) [MIL-S-901D]	Class 1 (hard-mounted) [MIL-S-901D]
Transient Shock	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)
Rain (drip proof)	MIL-STD-810F - Console mounted	MIL-STD-810F - Console mounted
Salt Fog	MIL-STD-810F	MIL-STD-810F
Vibration Testing	MIL-STD-167-1	MIL-STD-167-1
IP Rating	N/A	N/A
Compass Safe Distance	N/A	N/A
TYPE APPROVAL & TESTING	HM 20T07 NMD	HM 20T07 CMD
Type Approval / Certificates	IEC 60945 4 th [EN 60945:2002] IACS E10	IEC 60945 4 th [EN 60945:2002]
EMI Testing	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



NAVAL

HM C01

Compact Rugged Naval Computer



4U, 19 INCH Rack Adapter and Sliding Rails Accessories Available



TECHNICAL DATA	HM C01
Installed Operating System (OS)	None or Option Dependent
Storage	2 x 250GB 2.5" Automotive HDD, 5400RPM, 8MB Buffer
CPU / Processor & FSB Speed	1 x Intel® Core™2 Duo Desktop Processor E8400 3.0GHz, 1333MHz FSB, 6MB L2 Cache
Memory	4 x 1 GB Dual Channel DDR2 800/667MHz SDRAM, 240-pin DIMM or Option Dependent
System Chipset	Intel® Q35 ICH9DO
On-board Graphics Chipset / Card	Intel® GMA 3100 with 1 x HD DB15F (female) RGB/VGA OUT 1 x 29P (female) DVI-I
Max Resolution / Max Hz	2048 x 1536 / 75Hz
BIOS	Award
PCI Slots / PCIe Slots Full Height & Full Length Profile	2 x PCI2.3 Slots, 3V and 5V Interface 1 x PCIe X16 (add2) + 1 x PCIe X1
Media Drive(s)	1 x DVD-RW/CD-RW Dual Recorder/Player Drive
Parallel Port (LPT female)	1 x DB25F Bi-Directional Centronics with ECP/EPP
Serial Port(s)	2 x DB9M RS-232
Ethernet Port(s)	2 x RJ45 10/100/1000Mbps - Intel® 82566DM 2 x RJ45 10/100/1000Mbps - Realtek RTL 8168C
USB Port(s)	8 x USB2.0 Type A (rear) 2 x USB2.0 Type A (front)
Keyboard & Mouse Ports	1 x PS/2 Keyboard 1 x PS/2 Mouse
Audio Port(s)	3 x 3.5mm Jacks (LINE IN/LINE OUT/MIC IN) Realtek ALC888 7.1 channel, HD Audio
Speaker	None
Power Manager	ACPI
Monitoring / Watchdog	Temperature, voltage, fans with auto throttle WatchDog Reset: 1 sec-255 min & 1 sec. or 1 min/step
Power Input	24VDC DC Power IN: 1 x 2p DSUB (male) Amphenol FCC17
Power Consumption	Operating 70W (typ)
MECHANICAL DATA	HM C01
Key Features	High Performance Replaceable Air Filter in front Service friendly Includes mounting brackets
Dimensions & Weight	345.00 (W) x 133.00 (H) x 390.00 (D) mm - 3U Approx 10kg
User Controls / Activity	On/Off Push Button, Reset Button Power LED / HDD LED
Additional Accessories	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
Capabilities / Prepared for	Up to 8GB DDR2 800/667MHz SDRAM, 240-pin DIMM
ENVIRONMENTAL DATA	HM C01
Operating Temperature	-15 deg. C to +55 deg. C Humidity up to 95% DNV Temperature Class B +70 deg. C for 2 hours
Storage Temperature	-20 deg. C to +60 deg. C Humidity up to 95%
Compass Safe Distance	Standard: 150cm - Steering: 95cm
MTBF (Mean Time Between Failures)	22581 hours
TYPE APPROVAL & TESTING	HM C01
Note: Some of the Type Approvals could be pending. Please check our website for the latest status.	MIL-STD-167-1 Vibration MIL-STD-810F Shock 50G 30ms IEC 60945 4th [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
EMI Testing	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]

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.



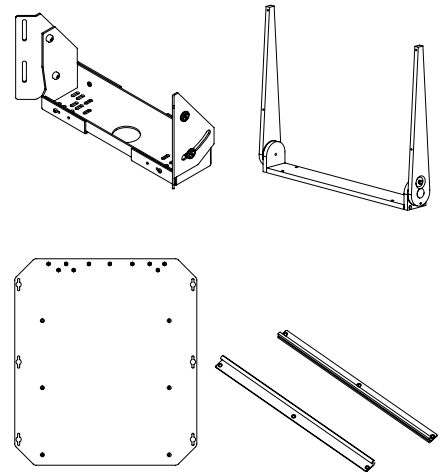
ACCESSORIES

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.

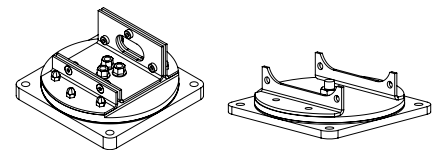
TYPENUMBER	DESCRIPTION	SUITABLE FOR
JH MMDBR STD-A1	Desktop/Ceiling Bracket for Displays and Panel Computers	19, 20 inch
JH 15TBR STD-B1	Desktop/Ceiling Bracket for Displays and Panel Computers	15 inch
JH 19TBR STD-B1	Desktop/Ceiling Bracket for Displays	19 inch Slim
JH 19BRD STD-B1	Desktop/Ceiling Bracket 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 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.

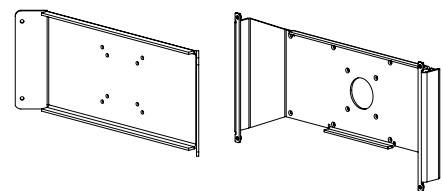
TYPENUMBER	DESCRIPTION	SUITABLE FOR
JH 15TRO STD-A1	For Displays and Panel Computers	15 inch
JH MMDRO STD-A1	For Displays and Panel Computers	19, 20, 23 inch



VESA Brackets

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

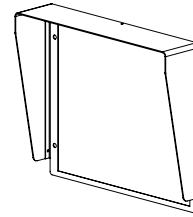
TYPENUMBER	DESCRIPTION	SUITABLE FOR
JH VESA 15T03-A1	For Displays and Panel Computers	15 inch
JH 19VED STD-A1	For Displays and Panel Computers	19 inch
JH 19VED-STD-B1	For Displays	19 inch Slim
JH VESA 20T06-A1	For Displays	20 inch
JH 22VED STD-A1	For Displays	22 inch
JH VESA 23T01-A1	For Displays	23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



Sun Visors

For preventing glare and reflections from strong light sources.

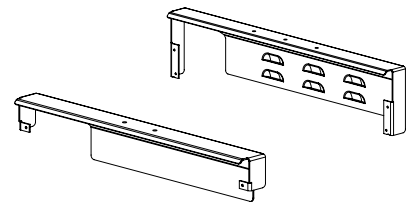
TYPENUMBER	DESCRIPTION	SUITABLE FOR
JH 15TSV STD-A1	For Displays and Panel Computers	15 inch
JH 19TSV STD-A1	For Displays and Panel Computers	19 inch
JH 19TSV STD-B1	For Displays	19 inch Slim
JH 20TSV STD-B1	For Displays	20 inch
JH 22TSV STD-A1	For Displays	22 inch
JH 23TSV STD-A1	For Displays	23 inch



Water Covers

For top of product. IP22 Rated.

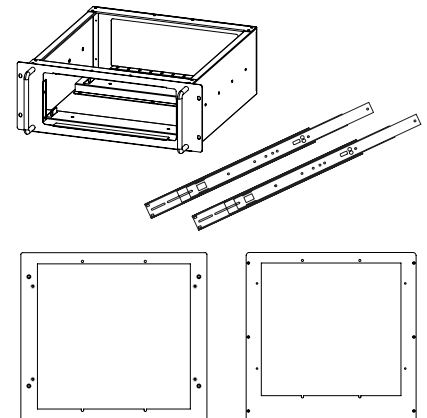
TYPENUMBER	DESCRIPTION	SUITABLE FOR
JH 15TWC STD-A1	For Displays and Panel Computers	15 inch
JH 19TWC STD-B1	For Displays and Panel Computers	19 inch
JH 19TWC STD-C1	For Displays	19 inch Slim
JH 20TWC STD-B1	For Displays	20 inch
JH 22TWC STD-A1	For Displays	22 inch
JH 23TWC STD-A1	For Displays	23 inch



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.

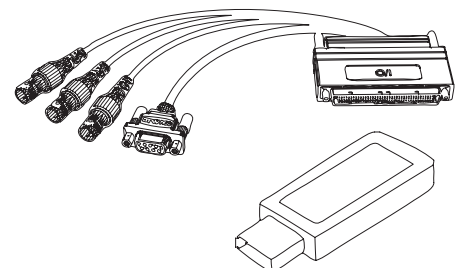
TYPENUMBER	DESCRIPTION	SUITABLE FOR
HT 00223 OPT-A1	Adapt unit to 19 inch Rack 4U size.	HT C01, HM C01
HT 00224 OPT-A1	2 x 20 inch long ball bearing sliding rails for 19 inch Rack	HT C01, HM C01
HT 00225 OPT-A1	2 x 26 inch long ball bearing sliding rails for 19 inch Rack	HT C01, HM C01
HT 00250 OPT-A1	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/PCle cards	HT C01, HM C01
HT 00237 OPT-A1	For secure mounting of PCI/PCle cards	HT B18
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



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