

# DATA SHEET

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**HATTELAND®**  
**DISPLAY**

Manufacturer: **Hatteland Display AS**

Product: **23.1 inch Maritime Multi Display (MMD)**

Type: **JH 23T14 MMD-xxx-Axxx**

Last Revised: **23 Sep 2016**  
Revision#: **26**

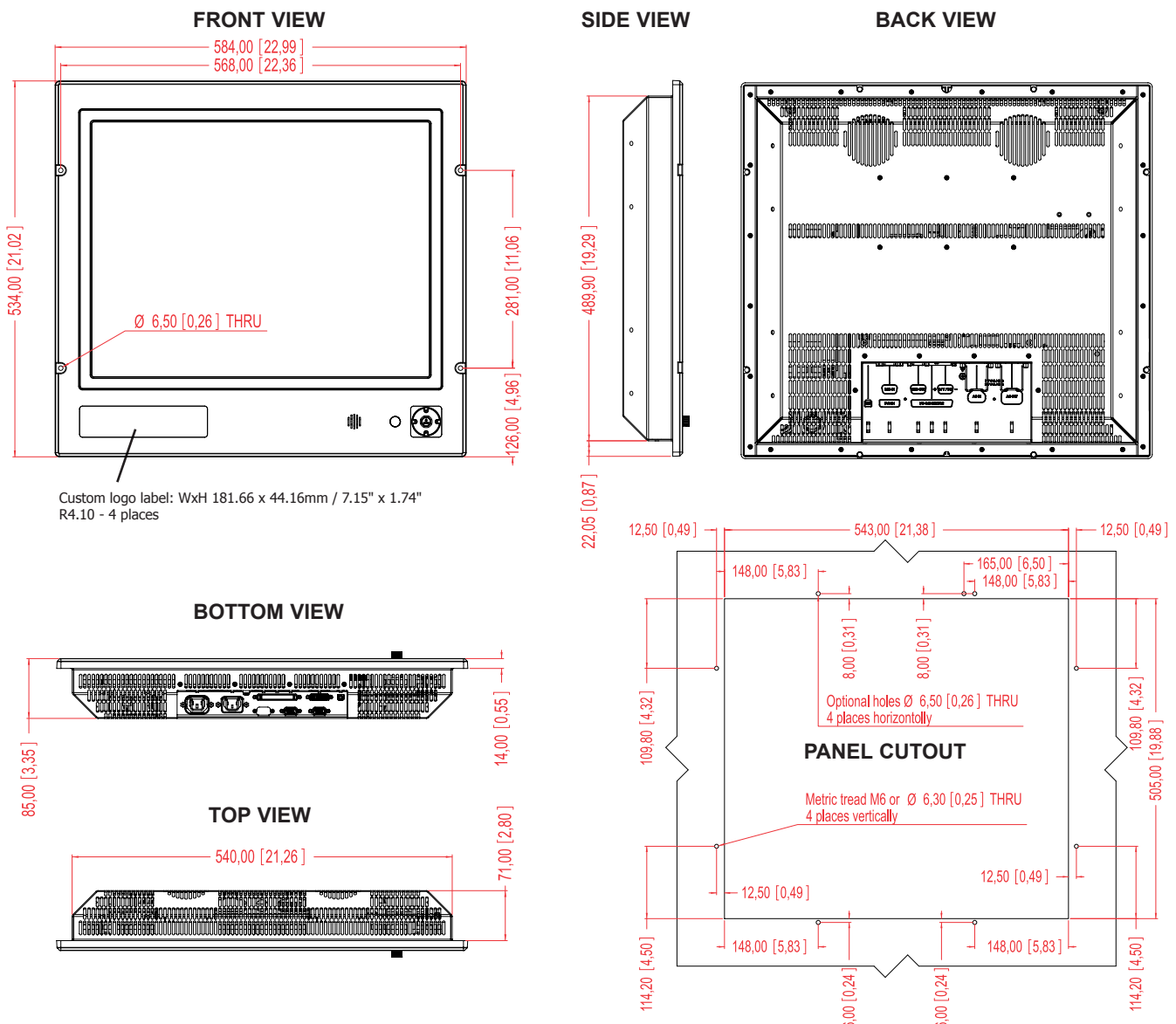
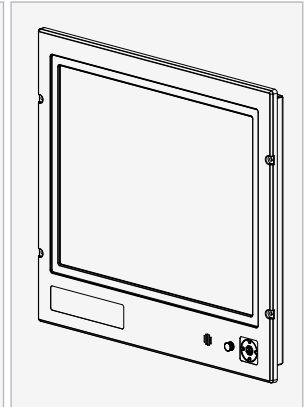
## 23.1 inch Maritime Multi Display (MMD) - Series 1

### Features:

The Series 1 Maritime Multi Display (MMD) models are delivered with Multi-power (AC and DC power input built in) ensuring that they are compatible with all power systems on all vessels. It will automatically switch to whatever power is connected, making it highly flexible for shipbuilders and system integrators alike. Connections in addition include DVI-I in, VGA out, VGA in, IEC outlet and USB I/O.

Signal input/output options can be increased by using the Multifunction Connector, which allows the connection of many common signal types through a single cable connection, for common signals such as; Composite Video Input, Touch Screen and Serial Communication. The Series 1 provide Picture-By-Picture (PBP) and Picture-In-Picture (PIP) functionality.

The unit features LED Backlight Technology instead of traditional CCFL Backlighting which increases the light intensity life time. Further, with Optical Bonding Technology the viewing performance, reliability and lifespan increases dramatically. Bonding will also help with problems related to condensation, sunlight reflection, night vision and overheating. By factory standards the unit is ECDIS Compliant.



Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.

## TFT Technology:

- High Quality TFT with LED Backlight Technology
- 23.1 inch viewable image size
- TFT active-matrix liquid crystal panel
- MVA (Multi-domain Vertical Alignment) LCD Technology

## TFT Characteristics:

- Pixel Number : 1600 x 1200
- Pixel Pitch (RGB) : 0.294 (H) x 0.294 (V) mm
- Response Time : 12ms (typ) black-white-black or 8ms gray to gray
- Contrast Ratio : 600:1 (typical)
- Light Intensity : 400 cd/m2 (typical)
- Viewable Angle : +/- 85 deg. (typical) (Up/Down/Left/Right)
- Active Display Area : 470.4 (H) x 352.8 (V) mm
- Max Colors : 16.7 millions

## Synchronisation:

### Sync Signal:

- Digital separate synchronisation
- Composite synchronisation
- Synchronisation on green.
- Auto detects VGA -> WUXGA, interlaced and non interlaced
- Video Signal : Analog RGB 0,7Vp-p
- : Input Impedance 75 Ohm

### Synchronisation Range:

- Horizontal : 15,0 kHz to 91,1 kHz
- Vertical : 60 Hz\* to 85 Hz

\* Recommended for optimum picture quality

## Supported Signals:

### Resolutions:

- VGA : 640 x 480 (including 640 x 350)
- SVGA : 800 x 600 (including 720 x 400)
- XGA : 1024 x 768
- SXGA : 1280 x 1024
- UXGA : 1600 x 1200\*
- WUXGA : 1920 x 1200

\* Recommended for optimum picture quality. (60 Hz only)

### Video Signals (with Multifunction Cable):

- Interlaced NTSC and PAL/SECAM video
- Composite video

## Power Specifications:

### Multi-power Supply:

- 115&230VAC - 50/60Hz + 24 VDC - JH 23T14 MMD-Mxx-xxxx

Note: You may connect either AC power or DC power or both. In case both sources are connected, power will be sourced from the AC input. If AC input is lost, there will be a uninterrupted switch-over to DC input.

### Power Consumption:

- Operating : 95W (TYP) - 125W (MAX)

## Physical Considerations:

- 584 (W) x 534 (H) x 85 (D) mm - 22.99" (W) x 21.02" (H) x 3.35" (D)
- Weight: 18 kg

## Signal Terminals:

- DVI-I Signal IN : 1 x 29p DVI Female (or as VGA IN with adapter)
- VGA Signal IN : 1 x 15p HD D-SUB (female)
- VGA Signal OUT : 1 x 15p HD D-SUB (female) - Clone of VGA IN\*\*
- Multifunction : 1 x 160p D-SUB (female) - Also see table below
- USB I/O : 1 x TYPE B Conn. (female) Reserved for future use
- AC Power IN : 1 x Std IEC Inlet
- DC Power IN : 1 x 2p D-SUB Connector (male) - Amphenol FCC17
- AC Power OUT : 1 x Std IEC Outlet (5A Max)

\*\*Tested at recommended resolutions. The VGA output signal is at same resolution and sync as the VGA input. The output is working even if the display unit is turned off, but power cable/supply must be connected/provided.

## Multifunction Cable:

Available factory standard cables, 30cm [11.81"] in length.

• VSD100692-1	: 1 x 9P D-SUB (female) - RS-232 (COM1)
• VSD100692-3	: 1 x 9P D-SUB (female) - RS-232 (COM1) : 1 x 9P D-SUB (female) - RS-232 (COM Touch Screen) : 3 x BNC (female) (Composite Video in)
• VSD100692-4	: 1 x 9P D-SUB (female) - RS-232 (COM1) : 3 x BNC (female) (Composite Video in)

Customized cables are possible to support more built-in signals, like: RS-485, RS-422/RS-485, Buzzer, ON/OFF, Touch (PS/2), 1 x S-Video IN, Remote External User Controls, Alternative Keypad interface (i2c) and reserved for other signals. Custom cable lengths can be manufactured.

## User Controls:

### On front bezel - Keypad control (IP66) xxx-xxAx models:

- Power On/Off and On Screen Display Menu (push button)
- Brightness Control (up/down - push buttons)
- Hotkeys (left/right - push buttons)
- Mode Status Red/Green Illuminated LED-Ring Indicator

### On front bezel - Potmeter control (IP66) xxx-xxBx models:

- Power On/Off and On Screen Display Menu (push button)
- Brightness Control (rotary control)
- Hotkeys (left/right - push buttons)
- Mode Status Red/Green Illuminated LED-Ring Indicator
- Speaker / Buzzer

## Environmental Considerations:

- Operating : Temperature -15 deg. C to +55 deg. C  
- Humidity up to 95%
- Storage : Temperature -20 deg. C to +60 deg. C  
- Humidity up to 95%
- IP Rating : Protection (EN60529): IP66 front - IP20 rear
- Compass Safe Dist. : JH23T14MMD-xxx-xxxx - Std: 1.60m Steering: 1.05m

### Lifetime Considerations:

Even although the test conditions for bridge units provide for a maximum operating temperature of 55°C, continuous operation of all electronic components should, if possible, take place at ambient temperatures of only 25°C. This is a necessary prerequisite for long life and low service costs.

## Available Accessories:

- Cables = Custom Multifunction Cable to support more signals
- JH 23TBR T01-A1 = Bracket (See user manual)
- JH 23BRD STD-A1 = Mounting Bracket EN6095 Tested (See manual)
- JH MMDRO STD-A1 = Rotary Bracket (See user manual)
- JH 23TSV STD-A1 = Sun Visor (See user manual)
- JH 23VED STD-A1 = Vesa Bracket (See user manual)
- JH 23TWC STD-A1 = Water Cover (See user manual)

## Factory Options:

- Capacitive Touch Screen / Optical Bonding Technology
- Color Calibrated models (ECDIS)

\*Note that all 23 inch with touch screens are by factory default delivered with bonding.

# TESTING / APPROVALS & CERTIFICATES

This product have been tested / type approved by the following classification societies:

**IEC 60945 4th** (EN 60945:2002)  
**ABS** - American Bureau of Shipping  
**CCS** - China Classification Society

**ClassNK** - Nippon Kaiji Kyokai  
**BV** - Bureau Veritas

**GL** - Germanischer Lloyd  
**LRS** - Lloyd's Register of Shipping

**DNV** - Det Norske Veritas  
**EU RO MR** - Mutual Recognition