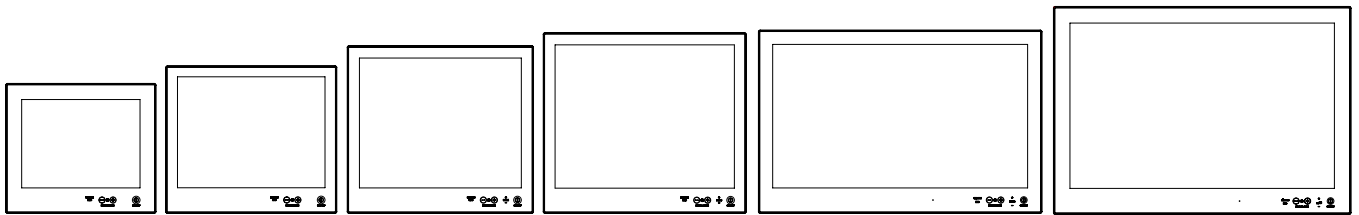


USER MANUAL



Series X - Maritime Multi Computer (MMC) Models

HD 12T21 MMC-xxx-xxxx - 12.1 inch Maritime Multi Computer
 HD 15T21 MMC-xxx-xxxx - 15.0 inch Maritime Multi Computer
 HD 17T21 MxC-xxx-xxxx - 17.0 inch Maritime Multi Computer
 HD 19T21 MxC-xxx-xxxx - 19.0 inch Maritime Multi Computer
 HD 24T21 MxC-xxx-xxxx - 24.0 inch Maritime Multi Computer
 HD 26T21 MxC-xxx-xxxx - 25.54 inch Maritime Multi Computer

(MxC, where x is either; M=Standard (MMC), E=ECDIS Calibrated (MEC))

User Manual MMC Series X

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Created: 363

Approved: 6542

Please visit www.hatteland-display.com for the latest electronic version of this manual.

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Aamsosen, N-5578 Nedre Vats, Norway

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All other product names or trademarks are properties of their respective owners !

WARNING: This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

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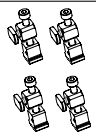
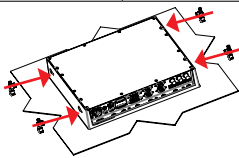
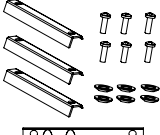
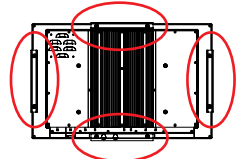
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Contents of package

Note: Entries listed below are for Standard factory shipments. Customized factory shipments may deviate from this list.

Item	Description	Illustration
 FS-CABLE EU	1 pcs of power cable European Type F "Schuko" to IEC. Length 1.8m	EUR TYPE F ↔ IEC 
 80099	1 pcs of power cable US Type B plug to IEC. Length 1.8m	US TYPE B ↔ IEC 
 MEDIA STD01	Documentation and Driver DVD for factory installed components like mainboard, IDE, network etc. It also includes the Touch Screen driver for units delivered with a factory mounted touch screen. Note: To use this DVD disc you will need an external USB CD/DVD drive or provide means of getting contents copied over via USB memory stick/network to MMC unit. (The package may contain a Provisional CD during introduction of newer products).	 <p>Menu and Driver browser for Microsoft® Windows®</p>
	Recovery Image (located on hidden partition on SSD) Note: Only applicable for factory delivered units with SSD hardware.	
	Test Report	

Package may also include:

Item	Description	Illustration
 HD XXTBR CMB-A1	4 pcs of Key Hole Mounting Brackets for Console/Panel Mounting, Anodized Aluminium/Stainless Steel. Suitable for panel thickness 3.0mm to 10.0mm. This bracket kit is suitable for 12, 15, 17 and 19 inch units.	
 HD 24TBR CMB-A1	Bracket Kit suitable for console/panel mounting which contains: 3 x Mounting Bracket for top, left and right side 1 x Mounting Bracket for bottom side (terminal/connector plate area) 8 x M5x16 screws 8 x C-Washers This bracket kit is suitable for 24 inch units.	

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General

About this manual

The manual contains electrical, mechanical and input/output signal specifications. All specifications in this manual, due to manufacturing, new revisions and approvals, are subject to change without notice. However, the last update and revision of this manual are shown both on the frontpage and also in the "Revision History" chapter at the end of the manual.

Furthermore, for third party datasheet and user manuals, please see dedicated Documentation and Driver DVD delivered with the product or contact our sales/technical/helpdesk personnel for support.

About Hatteland Display

Hatteland Display is the leading technology provider of specialized display and computer products, delivering high quality, unique and customized solutions to the international maritime, naval and industrial markets.

The company represents innovation and quality to the system integrators world wide. Effective quality assurance and investment in sophisticated in-house manufacturing methods and facilities enable us to deliver Type Approved and Mil tested products. Our customer oriented approach, technical knowledge and dedication to R&D, makes us a trusted and preferred supplier of approved solutions, which are backed up by a strong service network.

www.hatteland-display.com

You will find our website full of useful information to help you make an informed choice as to the right product for your needs. You will find detailed product descriptions and specifications for the entire range on Displays, Computers and Panel Computers, Military solutions as well as the range of supporting accessories. The site carries a wealth of information regarding our product testing and approvals in addition to company contact information for our various offices around the world, the global service centers and the technical help desk, all ensuring the best possible support wherever you, or your vessel, may be in the world.

Contact Information

<p>Head office, Vats / Norway: Hatteland Display AS Åmsosen N-5578 Nedre Vats, Norway</p> <p>Tel: +47 4814 2200 Fax: +47 5276 5444</p> <p>mail@hatteland-display.com</p>	<p>Sales office, Frankfurt / Germany: Hatteland Display GmbH Werner Heisenberg Strasse 12, D-63263 Neu-Isenburg, Germany</p> <p>Tel: +49 6102 370 954 Fax: +49 6102 370 968</p>
<p>Sales office, Oslo / Norway: Solbråveien 20 N-1383 Asker Norway</p> <p>Tel: +47 4814 2200 Fax: +47 5276 5444</p>	<p>Sales office, Aix-en-Provence / France: Hatteland Display SAS ACTIMART, 1140 RUE AMPERE, BP 50 196 13795 AIX-EN-PROVENCE, CEDEX 3 France</p> <p>Tel: +33 (0) 4 42 16 47 57 Fax: +33 (0) 4 42 16 47 00</p>
<p>Sales office, San Diego / USA: Hatteland Display Inc. 11440 W. Bernardo Court, Suite 300 San Diego, CA 92127, USA</p> <p>Tel: +1 858 753 1959 Fax: +1 858 430 2461</p>	

For an up-2-date list, please visit www.hatteland-display.com/locations

Panel Computers Series X

Maritime Multi Computer (MMC) - Introduction

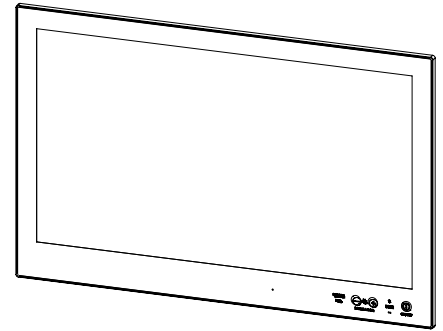
As a leading manufacturer of display and computer hardware for the maritime segment, Hatteland Display continuously gauges and responds to market needs. Our commitment to develop specialized products for a multitude of onboard ship systems continues, and with that the introduction now of a brand new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

With cast aluminium, compact 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.

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.

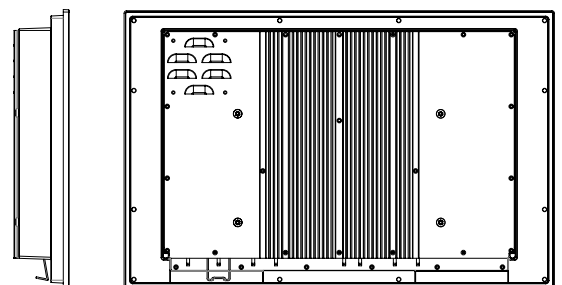
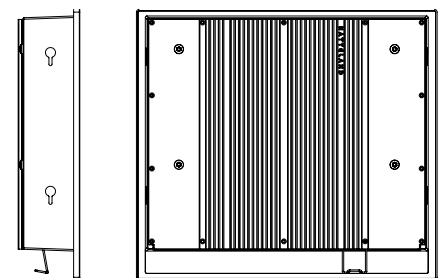
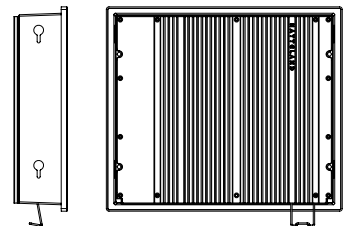
The Series X MMC range of products has been developed alongside the display versions, thus expanding the impressive footprint and impact of this Series X on the maritime market.

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.



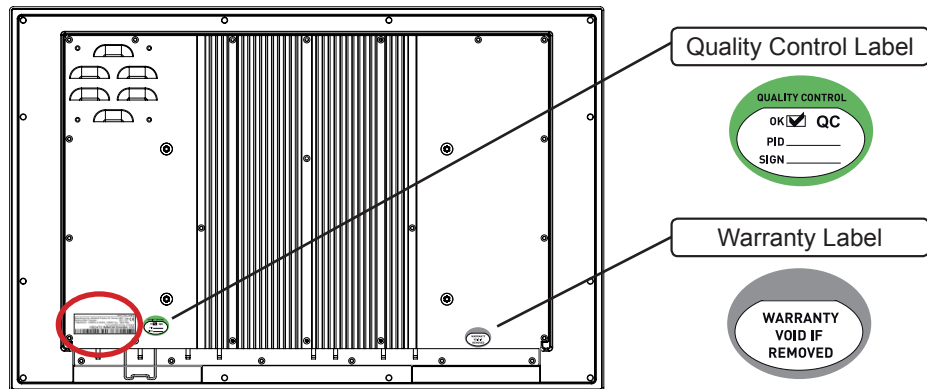
A computer and display, all in one...

- MULTITOUCH
- Type Approved
- ECDIS Compliant
- IP22 rear / IP66 front
- Superior Bonding Technology
- Module based, tailor-made systems made easy!
- Sunlight Readable / High Bright versions available
- GLASS DISPLAY CONTROL™ (GDC), Solid State Menu System

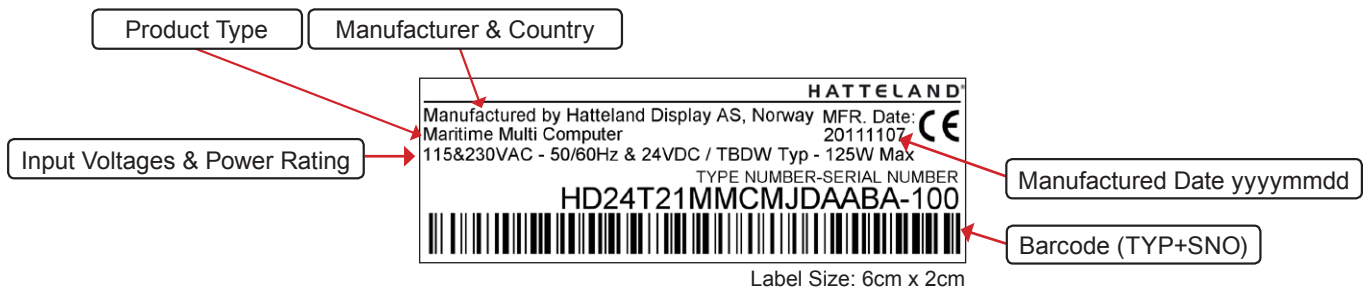


Product Labeling

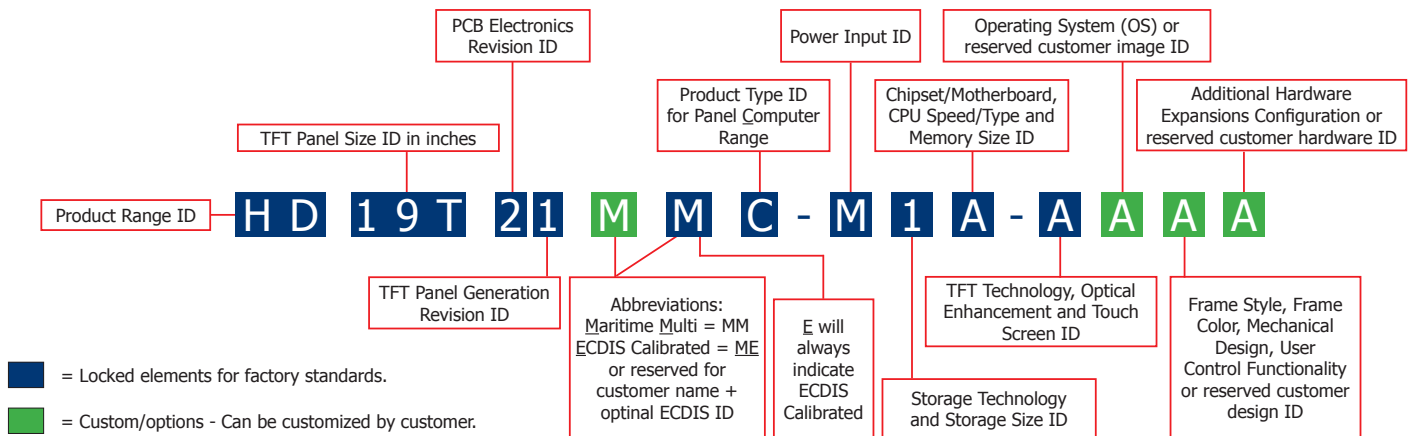
Labels and Locations



Serial Number Label Layout (example)



Typenumber Structure (example)



Warranty Label

If you are to perform service on a unit still under warranty, any warranty will be void if this label shows signs of removal attempts (re-gluing) or removed completely. This label is located on the back of the product and covers a key screw. This is to aid service departments to determine if there has been any unauthorized service on a unit still under warranty.

Quality Control (QC) Label

This label indicates that the unit is produced, tested and packed according to manufacturer's QA specifications. It will include a Personal ID and signature by the person responsible for approving the unit in production, test and warehouse departments.



Installation

General Installation Recommendations

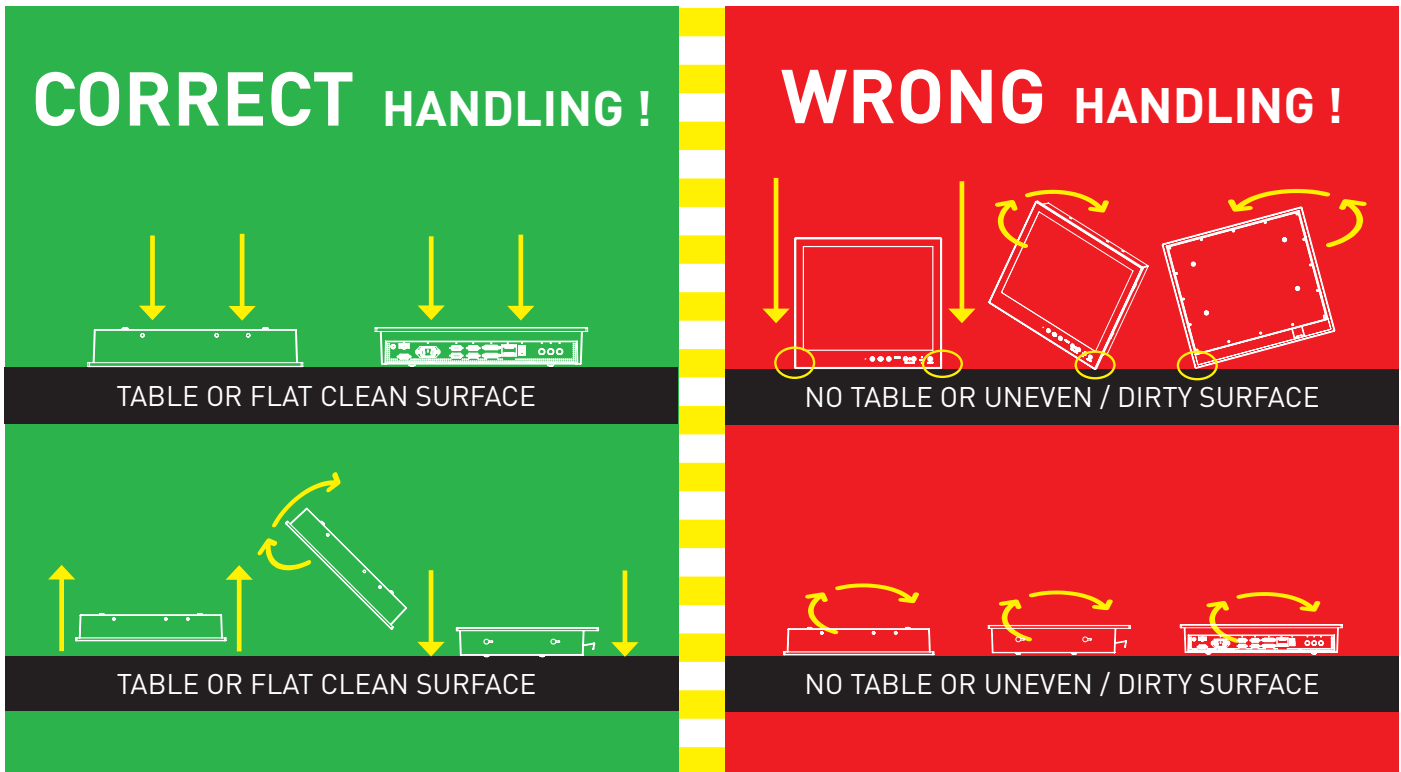
First Things First!



ATTENTION!

To prevent damage to chassis corners and / or breaking front glass, please review the illustrations below before handling the units!

IND100148-5 - Rev 01



Installation and mounting

1. Most of our products are intended for various methods of installation or mounting (panel mounting, bracket mounting, ceiling/wall, console mounting etc.); for details, please see the relevant mechanical drawings.
2. Adequate ventilation is a necessary prerequisite for the life of the product. The air inlet and outlet openings must definitely be kept clear; coverings which restrict ventilation are not permissible.
3. Generally, do not install the unit in a horizontal position (laying down), as this will cause heat to build up inside the unit which will damage the LCD Panel. To prevent this problem we recommend installing the unit in a vertical position (± 30 degrees) to improve the airflow through the unit.
4. To further improve the cooling of the unit we recommend installing Cooling Fans underneath blowing upwards into the unit air inlet. This may be required in high temperature applications and also when there is reason to expect temperature problems due to non-optimal way of mounting.
5. Exposure to extreme direct sunlight can cause a considerable increase in the temperature of the unit, and might under certain circumstances lead to overtemperature. This point should already be taken into consideration when the bridge equipment is being planned (sun shades, distance from the windows, ventilation, etc.)
6. Space necessary for ventilation, for cable inlets, for the operating procedures and for maintenance, must be provided.

General Installation Recommendations

7. If the push buttons of the product are not illuminated, an external, dimmable illumination (IEC 60945 Ed. 4, 4.2.2.3, e.g. Goose neck light) is required for navigational use. The illumination shall be dazzle-free and adjustable to extinction.
8. Information about necessary pull-relievers for cables is indicated in the Physical Connection section of this manual. Attention must be paid to this information so that cable breaks will not occur, e.g. during service work.
9. Do not paint the product. The surface treatment influences on the excess heat transfer. Painting, labels or other surface treatments that differ from the factory default, might cause overheating.
10. Exposure to heavy vibration and acoustic noise might under certain circumstances affect functionality and expected lifetime. This must be considered during system assembly and installation. Mounting position must carefully be selected to avoid any exposure of amplified vibration.

General mounting instructions

1. The useful life of the components of all Electronics Units generally decreases with increasing ambient temperature; it is therefore advisable to install such units in air-conditioned rooms. If there are no such facilities these rooms must at least be dry, adequately ventilated and kept at a suitable temperature in order to prevent the formation of condensation inside the display unit.
2. With most Electronic Units, cooling takes place via the surface of the casing. The cooling must not be impaired by partial covering of the unit or by installation of the unit in a confined cabinet.
3. In the area of the wheel house, the distance of each electronics unit from the magnetic standard compass or the magnetic steering compass must not be less than the permitted magnetic protection distance. This distance is measured from the centre of the magnetic system of the compass to the nearest point on the corresponding unit concerned.
4. Units which are to be used on the bridge wing must be installed inside the "wing control console" protected against the weather. In order to avoid misting of the viewing screen, a 25 ... 50 W console-heating (power depending on the volume) is recommended.
5. When selecting the site of a display unit, the maximum cable lengths have to be considered.
6. When a product is being installed, the surface base or bulkhead must be checked to ensure that it is flat in order to avoid twisting of the unit when the fixing screws are tightened, because such twisting would impair mechanical functions. Any unevenness should be compensated for by means of spacing-washers.
7. The grounding screws of the units must be connected to the body of the ship (ground); the wire used should have a cross sectional area of at least 6 mm².
8. Transportation damage, even if apparently insignificant at first glance, must immediately be examined and be reported to the freight carrier. The moment of setting-to-work of the equipment is too late, not only for reporting the damage but also for the supply of replacements.
9. The classification is only valid for approved mounting brackets provided by Hatteland Display. The unit shall be mounted stand-alone without any devices or loose parts placed at or nearby the unit. Any other type of mounting might require test and re-classification.

General Installation Recommendations

Ergonomics

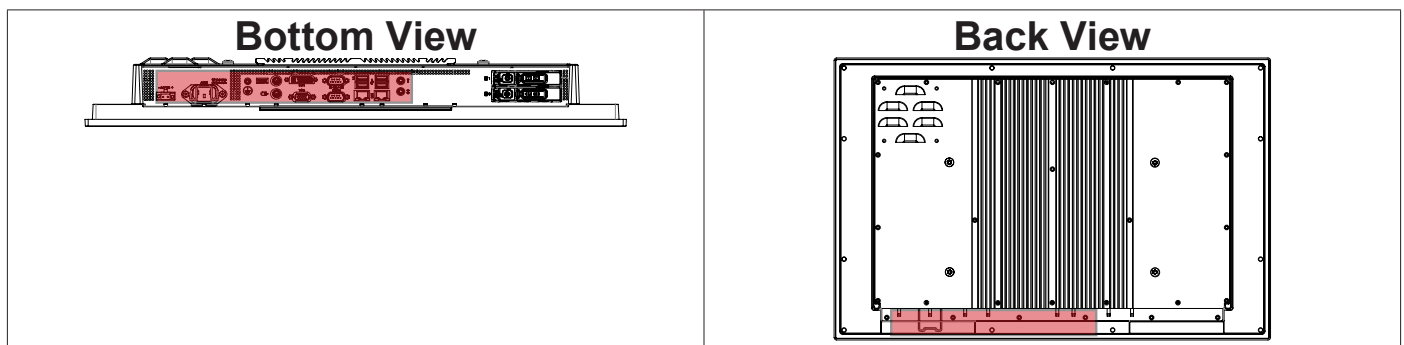
1. Adjust the unit height so that the top of the screen is at or below eye level. Your eyes should look slightly downwards when viewing the middle of the screen.
2. Adjust screen inclination to remain gaze angle to the centre of the screen approximately perpendicular to the line of gaze.
3. When products are to be operated both from a sitting position and from a standing position, a screen inclination of about 30° to 40° (from a vertical plane) has turned out to be favourable.
4. The brightness of displays is limited. Sunlight passing directly through the bridge windows - or its reflection - which falls upon the screen workplaces must be reduced by suitable means (negatively inclined window surfaces, venetian blinds, distance from the windows, dark colouring of the deckhead). However, units can be offered with optical enhanced technology to reduce reflections and are viewable in direct sun light, but as a general rule the units at the bridge wing area is recommended to be installed or mounted by suitable alignment or bulkhead / deckhead mounting in such a way that reflections of light from the front pane of the display are not directed into the observer's viewing direction.
5. The use of ordinary commercial filter plates or filter films is not permitted for items of equipment that require approval (by optical effects, "aids" of that kind can suppress small radar targets, for example).
6. For ECDIS applications, the minimum recommended viewing distance are as follows:
(IEC62288, Part 7.5 Screen resolution)

17 inch = 908mm	19 inch = 1011mm	20 inch = 878mm	23 inch = 1011mm	27 inch = 1000mm	
-----------------	------------------	-----------------	------------------	------------------	--

Cables

Use only high quality shielded signal cables.

Cable Entries & Connectors (Marked area) - Illustration only



Maximum Cable Length

Any cable should generally be kept as short as possible to provide a high quality input/output. The maximum signal cable length will depend on the signal resolution and frequency, but also on the quality of the signal output from the computer/radar.

General Installation Recommendations

Configuring housing connectors

Housing connectors are available in different sizes (2-pin, 4-pin, 5-pin) which plugs into the connector area of the unit. These housing connectors are by factory default mounted on the unit. Below is a brief illustration that might be useful during configuration and installation of such connectors. You will need suitable pre-configured cable(s) and tools to configure the connector(s) and cable(s) that are present in your installation environment. Below is a sample for a 2-pin DC power connector. The procedure is the same for other connectors of this type.

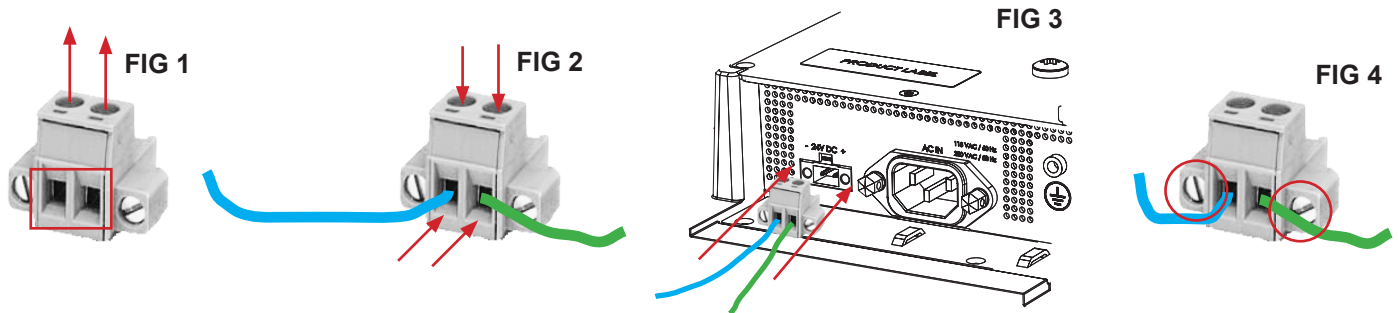


FIG 1: Unscrew (from top) or make sure that the screw terminal (square area) are fully open, so you can secure the inserted cables correctly to the loose housing connector (it may already be plugged into the unit as per factory installation).

FIG 2: Insert cables* (from front) and screw / secure the cables by turning the screw on top of the housing to secure the cables properly. Check that the cables is firmly in place and do not appear loose or falls out when pulling gently.

**Note: Required polarization verification (for instance -/+ for DC power input) should conform with the markings on the connector area of the unit. Ignoring the markings on the unit or its add-on modules might damage the unit and/or external equipment in which end, warranty will be void.*

FIG 3: Plug the housing into the appropriate connector area of the unit and check again that the cables secured conforms with the markings on the connector area of the unit. Finalize the installation by fasten the screws located in front on each side of the housing connector (**FIG 4**).

Installation Procedures

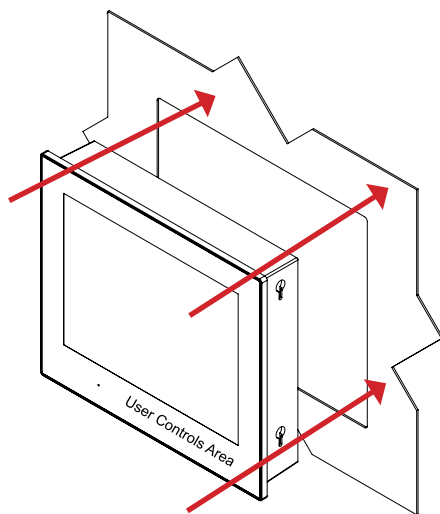
Panel / Console Mounting Key Hole Bracket Kit for 12",15",17",19"

You need: Allen Wrench tool (3mm), 4 pcs of HD XXTBR CMB-A1 kit (available separately).
Procedure suitable for: Display and Panel Computers Series X range.

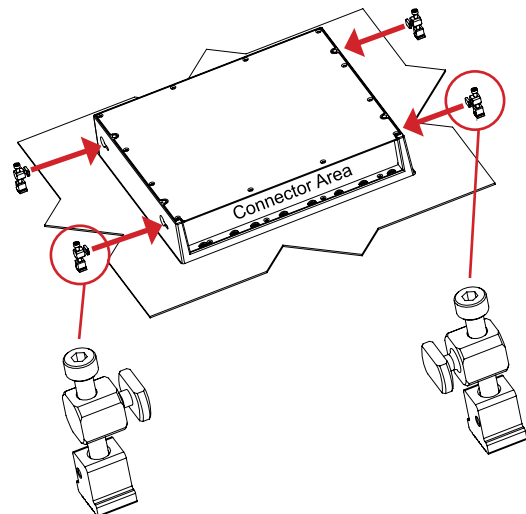


Attention: A suitable pre-cut panel cutout should be made prior to mounting. Do not force the unit into the panel cutout as it might break the outer glass or scratch the chassis on the unit. Make sure that the panel cutout is not too tight for the unit. Please disconnect ALL cables before proceeding. Please re-check the relevant and required panel cutout measurements if unsure.

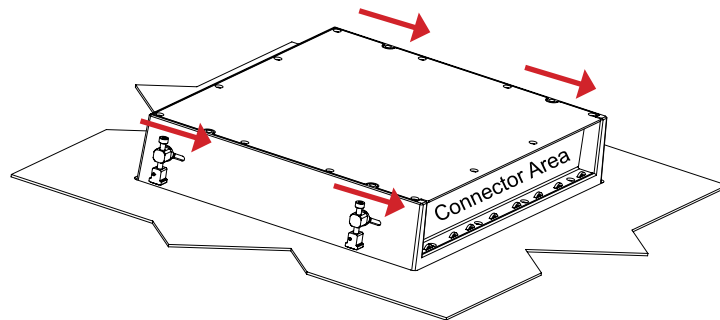
1: Slide the unit into the cutout carefully. User Controls and Connector Area should be facing downwards.



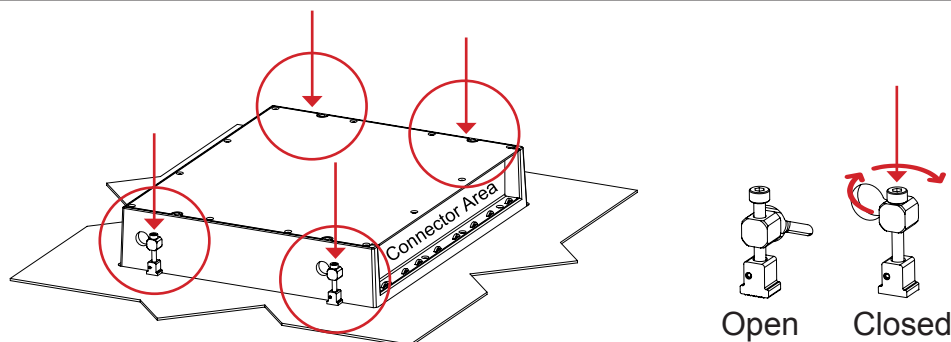
2: Prepare and position the brackets into each of the four key holes. The key part goes into the unit's largest area of the keyhole, while the Allen screw is visible at the top. See closeup.



3: When all brackets fits inside the keyhole, slide them down into the narrow gap. If you are unable to slide them down, simply adjust/loosen the top Allen Screw slightly and try again.



4: Secure the unit by fastening the top Allen screws fairly. Make sure you do it equally and even for all 4 sides. Do not use excessive force. See closeup of a open and closed position to the right.



Installation Procedures

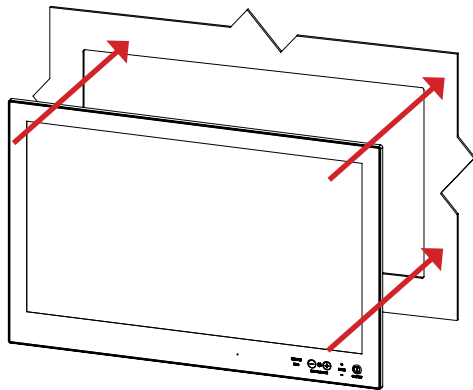
Panel Cutout / Console Mounting Bracket Kit for 24 inch

You need: Pozidriv tool, 1 pcs of HD 24TBR CMB-A1 kit (available separately).
Procedure suitable for: Display and Panel Computers Series X range.

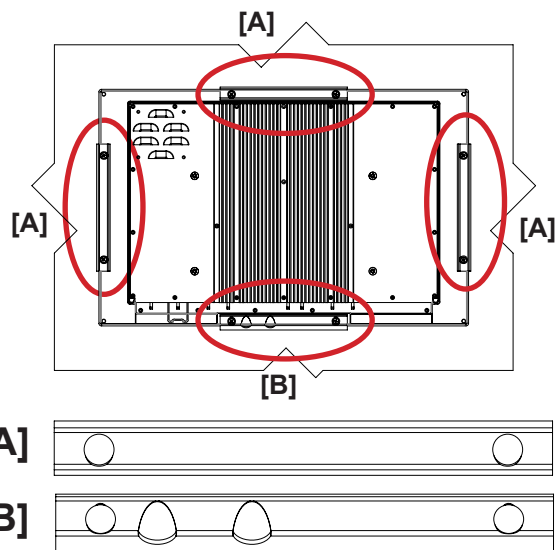


Attention: A suitable pre-cut panel cutout should be made prior to mounting. Do not force the unit into the panel cutout as it might break the outer glass or scratch the chassis on the unit. Make sure that the panel cutout is not too tight for the unit. Please disconnect ALL cables before proceeding. Please re-check the relevant and required panel cutout measurements if unsure.

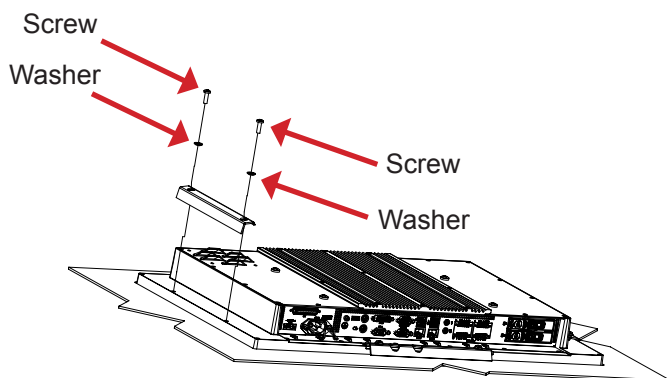
1: Slide the unit into the cutout carefully. User Controls and Connector Area should be facing downwards.



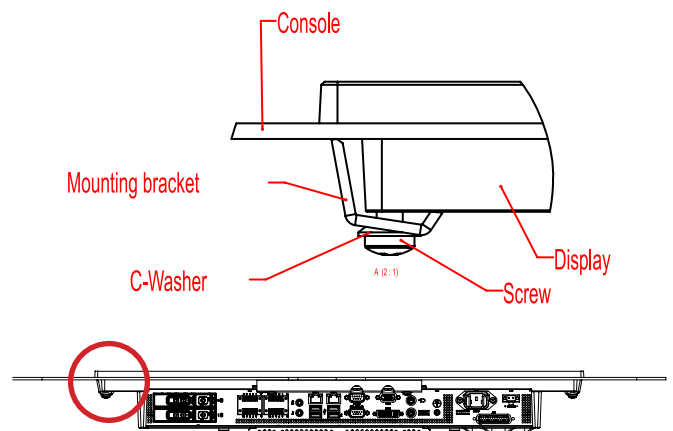
2: Make sure you are aware that brackets should be mounted on TOP, LEFT, RIGHT and BOTTOM sides. Note that the [B] bracket is different than the [A] brackets and mounted near the connectors. See closeup of details.



3: Secure each bracket with the provided M5x16 screws and C-Washers as illustrated below. Make sure you do it equally and even for all 4 sides. Do not use excessive force. 2 screws and 2 washers pr. bracket. Note the orientation of brackets before you begin.

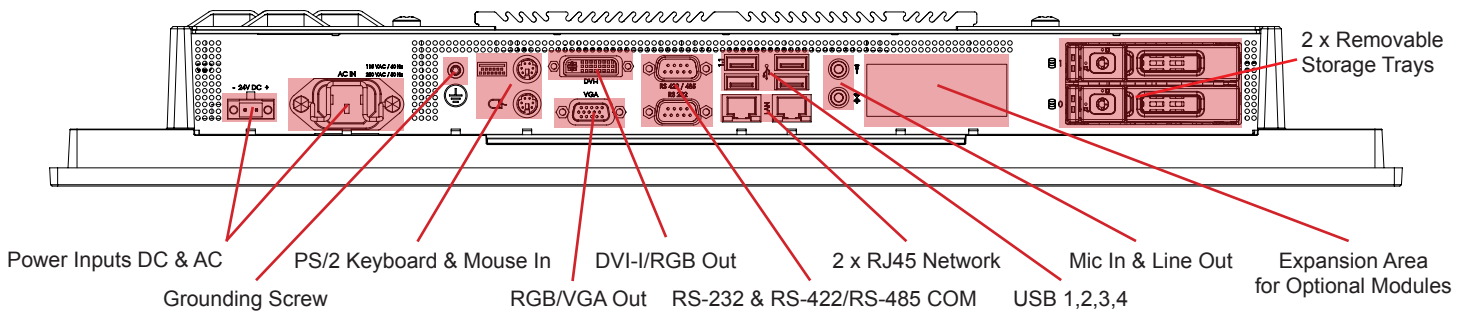


4: Review closeup of the mounting of brackets with screws and C-Washers in place. Seen from bottom side.



Physical Connections

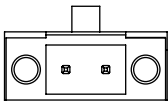
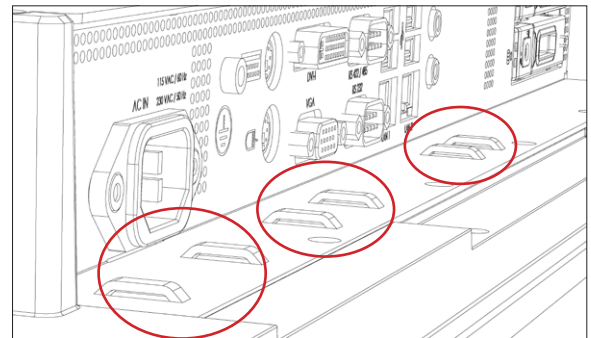
Connection area of unit (illustration)



Note: 24 inch unit used as example above, please review specifications for your actual model.

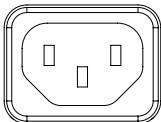
Reduce Cable Tension

To reduce tension of the cables you connect, secure them with a cable tie to the available chassis hinges located near the connectors. Note that the actual position of these hinges may vary depending on the specific unit.



POWER INPUT:

Connect your DC power cable to the Phoenix 2pin 1927564 MSTB 2,5/2-GF-5,08 THT connector. The internal DC power module supports 24VDC. Please check specifications for your unit.



POWER INPUT:

The internal AC power module supports both 115VAC/60Hz and 230VAC/50Hz power input. Please check specifications for your unit.



GROUNDING SCREW:

Note: DC models are required / recommended to be properly grounded via the  screw located on the unit. Please review "General Installation Chapter", pt. 6 for more information.



Multi-power note: (For units supporting AC & DC input simultaneously)

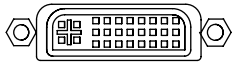
The unit has a dual input power supply which will accept both AC and DC input. If both inputs are connected, the unit will be powered by AC. If AC is disconnected it will automatically switch over to DC without affecting the operation of the unit. This makes it possible to use AC power as primary power and a 24V battery as secondary power, eliminating the need for expensive UPS systems.

Physical Connections



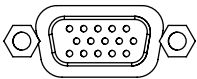
PS/2 Keyboard and PS/2 Mouse INPUTS:

Connect the PS/2 keyboard cable to the PS/2 5P Connector (female) marked with  Icon.
Connect the PS/2 mouse cable to the PS/2 5P Connector (female) marked with an  Icon.



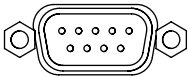
DVI-I or RGB / VGA OUT:

Enables a direct clone signal output from the computer. You may choose to use a DVI-I 29P cable directly or use a DVI-I -> RGB adapter to use a RGB/VGA HD D-SUB 15P instead for this purpose. Connect the cable to the Connector (female) and secure it to the hex spacers provided on the unit. Connect the other end to your equipment and secure it.



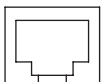
VGA / RGB OUT:

Will output a clone signal from the computer for use with external display or monitor. Connects via a High Density D-SUB 15P Female connector. Fasten the cable to the connector using the provided screws on the cable housing itself.



COM1, 2 Serial Port INPUT / OUTPUT:

Supports RS-232/422/485 using D-SUB 9P Male connectors. Fasten the cable to the connector using the provided screws on the cable housing itself.



Network 1, 2 INPUT / OUTPUT:

Supports 10/100/1000Mbps Ethernet (LAN). Suitable for twisted pair cables CAT.5E. Make sure the network cable connector "clicks" into the RJ-45 connector.

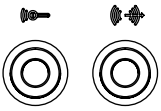


USB 1, 2, 3, 4 INPUT / OUTPUT:

Supports any USB1.1 (12Mbps) and USB2.0 (480Mbps) compliant peripherals. Drivers for most USB devices are usually included in operating system or on separate installation DVD's delivered with Third Party products. USB 1.1 devices will operate in USB 1.1 mode (12 Mbps).


Note: 1 x USB port is 1.1 compliant and marked with a  symbol next to connector.

Physical Connections



Audio INPUT / OUTPUT:

Both connectors are 3.5mm mini jack stereo.

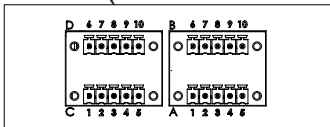
Light Pink / Mic In	
Microphone symbol	
Light Green / Line Out	
Audio signal symbol	



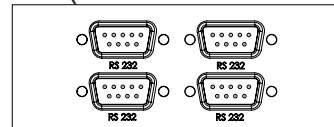
EXPANSION AREA for Optional modules:

In this expansion area of the unit, optional modules such as; 4 x RS-422/RS-485 ECDIS/NMEA COM Module or 4 x RS-232 COM Module can be factory installed (see illustration below or dedicated Data Sheets in this manual for detailed information). Both modules are suitable for communication with serial protocol based equipment. Connect and secure your cables to the Phoenix Terminal Block 3.81 or D-SUB 9P connectors, depending on module installed.

4 x RS-422/RS-485 (Phoenix Terminal Block 3.81)



4 x RS-232 (DSUB 9P Male connectors)

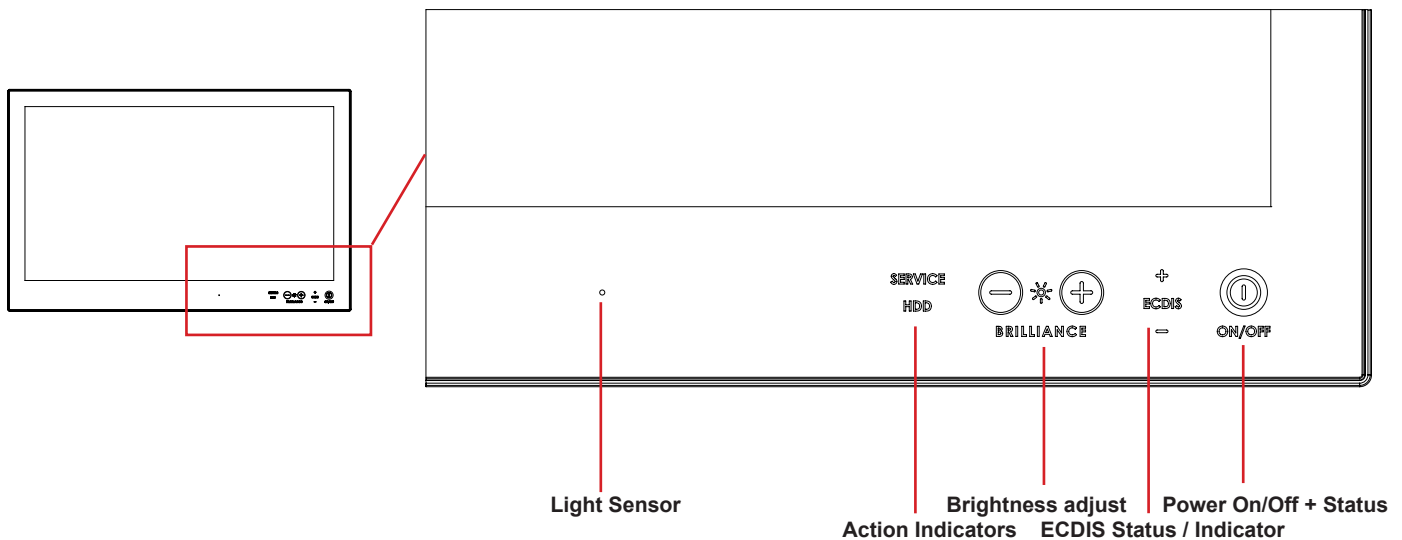




Operation MMC Products

USER CONTROLS OVERVIEW

The units are designed by using HATTELAND® Glass Display Control™ (GDC) touch technology to allow interactivity adjusting brilliance (brightness) and control power on / off with the use of illuminated symbols. Note that these symbols are only visible (backlight illuminated) when suitable power is connected. There is no physical moving knobs, potmeters, wheels or push buttons available as everything is touch surface controlled by Projected Capacitive technology, that allows a human finger (including several types of gloves) to control the unit.



○ Light Sensor:

Used to sense level of ambient light in the surrounding environment. The sensor data can be read by suitable software through the Hatteland Display SCOM functionality of the unit and thus can be used to control brightness remotely. Note: This sensor is not visible for the eye or has any illumination behind to indicate it's position. Further, by touching or covering this area will naturally make the sensor data inaccurate.

SERVICE HDD Action Indicators:

- HDD = Whenever there is a storage device activity (HDD/SSD read or write operations) this area will illuminate and blink accordingly in sync. with the read/write operations while the unit is powered. Note that by touching this symbol no action will be performed or has been assigned.
- SERVICE = Built in functionality to determine when the unit requires service in order to perform within preset factory standards. This area will illuminate constantly until the unit is powered off. Note that by touching this symbol no action will be performed or has been assigned.



BRILLIANCE Brightness Adjust:

Brilliance / Brightness adjustment of the displayed image is adjusted by touching the (-) or (+) illuminated symbols. The entire area of text and symbols are visible as long as the unit is powered. Note that only the (-) and (+) are touch sensitive while the "*" and "BRILLIANCE" symbols are not.

+ ECDIS - ECDIS Status / Indicator: (optional factory standard)

For units that has been factory ECDIS calibrated the text "ECDIS" will illuminate in green constantly as long as the unit is powered. The "+" and "-" symbols will illuminate in red when the Brightness/Brilliance is adjusted either above or below ECDIS factory calibration point.

To be able to stay within ECDIS calibrated range, please assure that both the "+" and "-" are not illuminated and that "ECDIS" text remains illuminated during operation. Note that by touching these symbols no action will be performed or has been assigned.

User Controls



ON/OFF

Power ON/OFF:

This symbol and all text will illuminate in red when suitable power is connected and the unit is turned off. When the unit is on and operating, this symbol will change into green color and illuminate constantly.

Power ON:

To turn the unit on, verify that the symbol is illuminated in red (indicates suitable power is connected) and touch the power symbol and hold until the the symbol changes to green light or a image appears on the screen.

Power OFF:

To turn the unit off, touch the power symbol and hold until it either illuminate/change from green to red or the image on screen disappears.

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Specifications

Specifications - HD 12T21 MMC-xxx-xxxx

Note: All specifications are subject to change without prior notice!

TFT Technology:

- High Quality TFT active-matrix liquid crystal panel with LED Backlight
- 12.1 inch viewable image size, Aspect Ratio 4:3

TFT Characteristics:

- Native Resolution : 1024 x 768
- Pixel Pitch (RGB) : 0.24 (H) x 0.24 (V) mm
- Response Time Standard : 35ms (typical), black to white
- Response Time High Bright : 19ms (typical), black to white
- Contrast Ratio Standard : 700:1 (typical)
- Contrast Ratio High Bright : 600:1 (typical)
- Light Intensity Standard : 500 cd/m² (typical)
- Light Intensity High Bright : 1000 cd/m² (typical)
- Viewable Angle Standard : +/- 80 deg. (Up/Down/Left/Right) (typical)
- Viewable Angle High Bright : +/- 80 deg. (U/D), +/- 60 deg. (L/R) (typ)
- Active Display Area : 245.76 (H) x 184.32 (V) mm
- Max Colors : 16.7 million

Computer Specifications:

- Installed OS : None or see table below
- Installed Storage : 1 x 250GB 2.5" HDD. Option for 1 x 2.5" removable HDD(SATA), RAID 0,1 or see table below
- CPU/Processor : See table below
- Installed Memory : 1 x 2GB DDR3 1066/800MHz or see table below
- System Chipset : Intel® BD82QM57
- Graphics Chipset : Intel® Arrandale IGD supports DVM 5.0
- Ethernet LAN #1 : Intel® 82577LM Gigabit LAN 10/100/1000Mbps
- Ethernet LAN #2 : Realtek RTL8111C Gigabit LAN 10/100/1000Mbps
- Audio Chipset : Realtek ALC888-GR (+2W Amplifier)
- BIOS : UEFI AMIBIOS
- Speaker / Buzzer : No Speaker / 3500Hz Buzzer
- Watchdog Timer : 256 Segments, 0, 1, 2...255 sec/min
- Power Manager : ACPI S3/S4
- Monitoring : Temperature and voltages status
- Other Features : GPIO, LAN Wakeup, USB Boot and Wakeup
- DVI-I OUT Resolution : From 640 x 480 to 1920 x 1200 @ 60 Hz
- RGB OUT Resolution : From 640 x 480 to 2048 x 1536 @ 75 Hz
- Sync. Range : Hor: 31.5 kHz to 91.1 kHz, Ver: 60 Hz* to 85 Hz

Available Computer Configurations:

Type	Description	Size/Specification
CPU	1 x Intel® Celeron® P4505, 1.86GHz, 2MB Cache, FSB 800MHz or 1 x Intel® Core™ i7-620LE, 2.0GHz, 4MB Cache, FSB 1066MHz	
Memory	1 x Single Channel, 200-pin DDR3	- 1GB, 2GB, 4GB
Storage	1 x 2.5" SSD SATA (Half Slim) Single or Multi Level	- 8GB
Storage	1 x 2.5" SSD SATA, Single or Multi Level	- 40GB, 80GB, 120GB, 300GB
Storage	1 x 2.5" HDD SATA	- 40GB, 80GB, 120GB, 300GB - 500GB/1TB (Coming Q3 2012)
OS	Microsoft® Windows® Embedded Enterprise or customized image	- Win XP Pro Eng w/SP3 or SP2c - Win Server 2K3/2K8 Eng, 64bit - Win 7 Pro Eng, 32bit/64bit
Notes	For OS Win7, >1GB RAM and >40GB SSD/HDD is recommended.	

Power Specifications:

Multi-power Supply:

- 115&230VAC - 50/60Hz + 24 VDC - HD 12T21 MMC-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 : 60 W (max) - TBD W (typ)

For a full overview of typenumbers, please review the following link:
www.hatteland-display.com/pdflink/ind100780-4.php

Compass Safe Distance: HD 12T21 MMC-xxx-xxxx - Standard: TBD - Steering: TBD. MTBF (Mean Time Between Failures - MIL-HDBK-217 GB 25°C) = TBD

APPROVALS & CERTIFICATES

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

IEC 60945 4th (EN 60945:2002) (Pending)
GL - Germanischer Lloyd (Pending)
CCS - China Classification Society (Pending)

IACS E10 (Pending)
DNV - Det Norske Veritas (Pending)
BV - Bureau Veritas (Pending)

ClassNK - Nippon Kaiji Kyokai (Pending)
ABS - American Bureau of Shipping (Pending)
LRS - Lloyd's Register of Shipping (Pending)

Physical Considerations:

- 314.00 (W) x 272.00 (H) x 70.90 (D) mm
- 12.36" (W) x 10.71" (H) x 2.79" (D)
- 4 x M6 VESA mounting 280x150mm, Max 12mm deep
- Weight: TBD kg (approx)

User Controls:

Behind front bezel - Glass Display Control™ (GDC) IP66:

- Power On/Off, Brightness Control (-/+), Hotkeys (left/right)
- Power LED, HDD/SSD LED, Mode Status Indicator (Service)
- Buzzer (not visible), Light Sensor (not visible)

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: IP66 front - IP22 rear (EN60529)

Safety 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.

Input/Output Connectors:

Connector	Rear	Internal
• Ethernet GBLan	2 x RJ-45	
• Keyboard	1 x PS/2 (purple)	
• Mouse	1 x PS/2 (green)	
• COM RS-232	1 x DB9M non-isolated	
• COM RS-422/485	1 x DB9M non-isolated	
• LPT/Parallel		1 x Pin Header
• USB1.1 (>10m)	1 x USB Type A	
• USB2.0 (<10m)	3 x USB Type A	2 x Pin Header (=4 USB)
• 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	
• Line Out	1 x 3.5mm mini jack (Lime)	
• Speaker L/F	1 x mini-DIN 5pin (TBD)	
• Mic In	1 x 3.5mm mini jack (Pink)	

Available Accessories:

- HD XXTBR CMB-A1 = 1 x Panel Mount Kit
 - HD 12BRD SX1-A1 = 1 x Table Mount Bracket. EN60945 Tested*
 - JH C01MF A-A = 1 x USB Cable 1m, TypeA to Chassis mount receptacle
- Please see user manual/datasheet for more information

Factory Options:

- Projected Capacitive Touch Screen (Multitouch, USB interface)*
- Optical Bonding Technology
- Sunlight Readable / High Bright (includes Optical Bonding) model*
- Variations of SSD/HDD Storage, RAM Memory, Operating System

Capabilities / Prepared for:

- 4 x COM RS-422/485 isolated ECDIS/NMEA (Phoenix T. Block 3.81)
- 2 x CAN isolated module (Phoenix Terminal Block 3.81)
- 4 x COM RS-232 non-isolated module (9P D-SUB connectors)

* Release date to be confirmed. Please contact us for more information.

Specifications - HD 15T21 MMC-xxx-xxxx

Note: All specifications are subject to change without prior notice!

TFT Technology:

- High Quality TFT active-matrix liquid crystal panel with LED Backlight
- 15.0 inch viewable image size, Aspect Ratio 4:3

TFT Characteristics:

- Native Resolution : 1024 x 768
- Pixel Pitch (RGB) : 0.297 (H) x 0.297 (V) mm
- Response Time Standard : 8ms (typical), black to white
- Response Time High Bright : 19ms (typical), black to white
- Contrast Ratio Standard : 700:1 (typical)
- Contrast Ratio High Bright : 800:1 (typical)
- Light Intensity Standard : 400 cd/m² (typical)
- Light Intensity High Bright : 800 cd/m² (typical)
- Viewable Angle Standard : +/- 80 deg. (Up/Down/Left/Right) (typical)
- Viewable Angle High Bright : +/- 80 deg. (U/D), +/- 60 deg. (L/R) (typ)
- Active Display Area : 304.1 (H) x 228.1 (V) mm
- Max Colors : 16.7 million

Computer Specifications:

- Installed OS : None or see table below
- Installed Storage : 1 x 250GB 2.5" HDD. Option for 2 x 2.5" removable HDD(SATA), Raid 0,1 or see table below
- CPU/Processor : See table below
- Installed Memory : 1 x 2GB DDR3 1066/800MHz or see table below
- System Chipset : Intel® BD82QM57
- Graphics Chipset : Intel® Arrandale IGD supports DVM 5.0
- Ethernet LAN #1 : Intel® 82577LM Gigabit LAN 10/100/1000Mbps
- Ethernet LAN #2 : Realtek RTL8111C Gigabit LAN 10/100/1000Mbps
- Audio Chipset : Realtek ALC888-GR (+2W Amplifier)
- BIOS : UEFI AMIBIOS
- Speaker / Buzzer : No Speaker / 3500Hz Buzzer
- Watchdog Timer : 256 Segments, 0, 1, 2...255 sec/min
- Power Manager : ACPI S3/S4
- Monitoring : Temperature and voltages status
- Other Features : GPIO, LAN Wakeup, USB Boot and Wakeup
- DVI-I OUT Resolution : From 640 x 480 to 1920 x 1200 @ 60 Hz
- RGB OUT Resolution : From 640 x 480 to 2048 x 1536 @ 75 Hz
- Sync. Range : Hor: 31.5 kHz to 91.1 kHz, Ver: 60 Hz* to 85 Hz

Available Computer Configurations:

Type	Description	Size/Specification
CPU	1 x Intel® Celeron® P4505, 1.86GHz, 2MB Cache, FSB 800MHz or 1 x Intel® Core™ i7-620LE, 2.0GHz, 4MB Cache, FSB 1066MHz	
Memory	1 x Single Channel, 200-pin DDR3	- 1GB, 2GB, 4GB
Storage	2 x 2.5" SSD SATA, Single or Multi Level	- 40GB, 80GB, 120GB, 300GB
Storage	2 x 2.5" HDD SATA	- 40GB, 80GB, 120GB, 300GB - 500GB/1TB (Coming Q3 2012)
OS	Microsoft® Windows® Embedded Enterprise or customized image	- Win XP Pro Eng w/SP3 or SP2c - Win Server 2K3/2K8 Eng, 64bit - Win 7 Pro Eng, 32bit/64bit
Notes	For OS Win7, >1GB RAM and >40GB SSD/HDD is recommended.	

Power Specifications:

Multi-power Supply:

- 115&230VAC - 50/60Hz + 24 VDC - HD 15T21 MMC-Mxx-xxxx
- 12-24VDC - HD 15T21 MMC-Fxx-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 AC/DC : 60 W (max) TBC

For a full overview of typenumbers, please review the following link:

www.hatteland-display.com/pdflink/ind100780-4.php

Compass Safe Distance: HD 15T21 MMC-xxx-xxxx - Standard: TBD - Steering: TBD. MTBF (Mean Time Between Failures - MIL-HDBK-217 GB 25°C) = TBD

APPROVALS & CERTIFICATES

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

IEC 60945 4th (EN 60945:2002)

GL - Germanischer Lloyd (Pending)

CCS - China Classification Society (Pending)

IACS E10

DNV - Det Norske Veritas (Pending)

BV - Bureau Veritas (Pending)

ClassNK - Nippon Kaiji Kyokai (Pending)

ABS - American Bureau of Shipping (Pending)

LRS - Lloyd's Register of Shipping (Pending)

Physical Considerations:

- 356.00 (W) x 307.00 (H) x 77.90 (D) mm
- 14.02" (W) x 12.09" (H) x 3.07" (D)
- 4 x M6 VESA mounting 280x150mm, Max 12mm deep
- Weight: TBD kg (approx)

User Controls:

Behind front bezel - Glass Display Control™ (GDC) IP66:

- Power On/Off, Brightness Control (-/+), Hotkeys (left/right)
- Power LED, HDD/SSD LED, Mode Status Indicator (Service)
- Buzzer (not visible), Light Sensor (not visible)

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: IP66 front - IP22 rear (EN60529)

Safety 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.

Input/Output Connectors:

Connector	Rear	Internal
• Ethernet GBLan	2 x RJ-45	
• Keyboard	1 x PS/2 (purple)	
• Mouse	1 x PS/2 (green)	
• COM RS-232	1 x DB9M non-isolated	
• COM RS-422/485	1 x DB9M non-isolated	
• LPT / Parallel		1 x Pin Header
• USB1.1 (>10m)	1 x USB Type A	
• USB2.0 (<10m)	3 x USB Type A	2 x Pin Header (=4 USB)
• 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	
• Line Out	1 x 3.5mm mini jack (Lime)	
• Speaker L/F	1 x mini-DIN 5pin (TBD)	
• Mic In	1 x 3.5mm mini jack (Pink)	

Available Accessories:

- HD XXTBR CMB-A1 = 1 x Panel Mount Kit
- HD 15BRD SX1-A1 = 1 x Table Mount Bracket. EN60945 Tested*
- JH C01MF A-A = 1 x USB Cable 1m, TypeA to Chassis mount receptacle

Please see user manual/datasheet for more information

Factory Options:

- Projected Capacitive Touch Screen (Multitouch, USB interface)*
- Optical Bonding Technology
- Sunlight Readable / High Bright (includes Optical Bonding) model*
- Variations of SSD/HDD Storage, RAM Memory, Operating System

Capabilities / Prepared for:

- 4 x COM RS-422/485 isolated ECDIS/NMEA (Phoenix T. Block 3.81)
- 2 x CAN isolated module (Phoenix Terminal Block 3.81)
- 4 x COM RS-232 non-isolated module (9P D-SUB connectors)

* Release date to be confirmed. Please contact us for more information.

Specifications - HD 17T21 MxC-xxx-xxxx

Note: All specifications are subject to change without prior notice!

TFT Technology:

- High Quality TFT active-matrix liquid crystal panel with LED Backlight
- 17.0 inch viewable image size, Aspect Ratio 5:4

TFT Characteristics:

- Native Resolution : 1280 x 1024
- Pixel Pitch (RGB) : 0.264 (H) x 0.264 (V) mm
- Response Time : 5ms (typical), "black" to "white"
- Contrast Ratio : 1000:1 (typical)
- Light Intensity : 350 cd/m² (typical)
- Viewable Angle : +/- 80 deg. (typical) (Up/Down/Left/Right)
- Active Display Area : 337.92 (H) x 270.336 (V) mm
- Max Colors : 16.7 million

Computer Specifications:

- Installed OS : None or see table below
- Installed Storage : 1 x 250GB 2.5" HDD. Option for 2 x 2.5" removable HDD(SATA),Raid 0,1 or see table below
- CPU/Processor : See table below
- Installed Memory : 1 x 2GB DDR3 1066/800MHz or see table below
- System Chipset : Intel® BD82QM57
- Graphics Chipset : Intel® Arrandale IGD supports DVM 5.0
- Ethernet LAN #1 : Intel® 82577LM Gigabit LAN 10/100/1000Mbps
- Ethernet LAN #2 : Realtek RTL8111C Gigabit LAN 10/100/1000Mbps
- Audio Chipset : Realtek ALC888-GR (+2W Amplifier)
- BIOS : UEFI AMIBIOS
- Speaker / Buzzer : No Speaker / 3500Hz Buzzer
- Watchdog Timer : 256 Segments, 0, 1, 2...255 sec/min
- Power Manager : ACPI S3/S4
- Monitoring : Temperature and voltages status
- Other Features : GPIO, LAN Wakeup, USB Boot and Wakeup
- DVI-I OUT Res. : From 640 x 480 to 1920 x 1200 @ 60 Hz
- RGB OUT Resolution : From 640 x 480 to 2048 x 1536 @ 75 Hz
- Sync. Range : Hor: 31.5 kHz to 91.1 kHz, Ver: 60 Hz* to 85 Hz

Available Computer Configurations:

Type	Description	Size/Specification
CPU	1 x Intel® Celeron® P4505, 1.86GHz, 2MB Cache, FSB 800MHz or 1 x Intel® Core™ i7-620LE, 2.0GHz, 4MB Cache, FSB 1066MHz	
Memory	1 x Single Channel, 200-pin DDR3	- 1GB, 2GB, 4GB
Storage	2 x 2.5" SSD SATA, Single or Multi Level	- 40GB, 80GB, 120GB, 300GB
Storage	2 x 2.5" HDD SATA	- 40GB, 80GB, 120GB, 300GB - 500GB/1TB (Coming Q3 2012)
OS	Microsoft® Windows® Embedded Enterprise or customized image	- Win XP Pro Eng w/SP3 or SP2c - Win Server 2K3/2K8 Eng, 64bit - Win 7 Pro Eng, 32bit/64bit
Notes	For OS Win7, >1GB RAM and >40GB SSD/HDD is recommended.	

Power Specifications:

Multi-power Supply:

- 115&230VAC - 50/60Hz + 24 VDC - HD 17T21 MxC-Mxx-xxxx
 - 12-24VDC - HD 17T21 MxC-Fxx-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 AC/DC : 60 W (max) TBC

Physical Considerations:

- 390.00 (W) x 351.00 (H) x 79.90 (D) mm
- 15.35" (W) x 13.82" (H) x 3.15" (D)
- 4 x M6 VESA mounting 280x150mm, Max 12mm deep
- Weight: TBD kg (approx)

User Controls:

Behind front bezel - Glass Display Control™ (GDC) IP66:

- Power On/Off, Brightness Control (-/+), Hotkeys (left/right)
- Power LED, HDD/SSD LED, Mode Status Indicators (ECDIS, Service)
- Buzzer (not visible), Light Sensor (not visible)

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: IP66 front - IP22 rear (EN60529)

Safety 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.

Input/Output Connectors:

Connector	Rear	Internal
• Ethernet GB LAN	2 x RJ-45	
• Keyboard	1 x PS/2 (purple)	
• Mouse	1 x PS/2 (green)	
• COM RS-232	1 x DB9M non-isolated	
• COM RS-422/485	1 x DB9M non-isolated	
• LPT / Parallel		1 x Pin Header
• USB1.1 (>10m)	1 x USB Type A	
• USB2.0 (<10m)	3 x USB Type A	2 x Pin Header (=4 USB)
• 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	
• Line Out	1 x 3.5mm mini jack (Lime)	
• Speaker L/F	1 x mini-DIN 5pin (TBD)	
• Mic In	1 x 3.5mm mini jack (Pink)	

Available Accessories:

- HD XXTBR CMB-A1 = 1 x Panel Mount Kit
 - HD 17BRD SX1-A1 = 1 x Table Mount Bracket. EN60945 Tested*
 - JH C01MF A-A = 1 x USB Cable 1m, Type A to Chassis mount receptacle
- Please see user manual/datasheet for more information

Factory Options:

- Projected Capacitive Touch Screen (Multitouch, USB interface)*
- Optical Bonding Technology
- Sunlight Readable / High Bright (includes Optical Bonding) model*
- Color Calibrated models (ECDIS)
- Variations of SSD/HDD Storage, RAM Memory, Operating System

Capabilities / Prepared for:

- 4 x COM RS-422/485 isolated ECDIS/NMEA (Phoenix T. Block 3.81)
- 2 x CAN isolated module (Phoenix Terminal Block 3.81)
- 4 x COM RS-232 non-isolated module (9P D-SUB connectors)

* Release date to be confirmed. Please contact us for more information.

For a full overview of typenumbers, please review the following link:
www.hatteland-display.com/pdflink/ind100780-4.php

Compass Safe Distance: HD 17T21 MxC-xxx-xxxx - Standard: TBD - Steering: TBD. MTBF (Mean Time Between Failures - MIL-HDBK-217 GB 25°C) = TBD

APPROVALS & CERTIFICATES

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

IEC 60945 4th (EN 60945:2002)

GL - Germanischer Lloyd (Pending)

CCS - China Classification Society (Pending)

IACS E10

DNV - Det Norske Veritas (Pending)

BV - Bureau Veritas (Pending)

ClassNK - Nippon Kaiji Kyokai (Pending)

ABS - American Bureau of Shipping (Pending)

LRS - Lloyd's Register of Shipping (Pending)

Specifications - HD 19T21 MxC-xxx-xxxx

Note: All specifications are subject to change without prior notice!

TFT Technology:

- High Quality TFT active-matrix liquid crystal panel with LED Backlight
- 19.0 inch viewable image size, Aspect Ratio 5:4
- MVA (Multi-domain Vertical Alignment) LCD Technology

TFT Characteristics:

- Native Resolution : 1280 x 1024
- Pixel Pitch (RGB) : 0.294 (H) x 0.294 (V) mm
- Response Time : 20ms (typical), "black" to "white"
- Contrast Ratio : 1000:1 (typical)
- Light Intensity : 300 cd/m² (typical)
- Viewable Angle : +/- 89 deg. (typical) (Up/Down/Left/Right)
- Active Display Area : 376.32 (H) x 301.056 (V) mm
- Max Colors : 16.7 million

Computer Specifications:

- Installed OS : None or see table below
- Installed Storage : 1 x 250GB 2.5" HDD. Option for 2 x 2.5" removable HDD(SATA), RAID 0,1 or see table below
- CPU/Processor : See table below
- Installed Memory : 1 x 2GB DDR3 1066/800MHz or see table below
- System Chipset : Intel® BD82QM57
- Graphics Chipset : Intel® Arrandale IGD supports DVMT 5.0
- Ethernet LAN #1 : Intel® 82577LM Gigabit LAN 10/100/1000Mbps
- Ethernet LAN #2 : Realtek RTL8111C Gigabit LAN 10/100/1000Mbps
- Audio Chipset : Realtek ALC888-GR (+2W Amplifier)
- BIOS : UEFI AMIBIOS
- Speaker / Buzzer : No Speaker / 3500Hz Buzzer
- Watchdog Timer : 256 Segments, 0, 1, 2...255 sec/min
- Power Manager : ACPI S3/S4
- Monitoring : Temperature and voltages status
- Other Features : GPIO, LAN Wakeup, USB Boot and Wakeup
- DVI-I OUT Res. : From 640 x 480 to 1920 x 1200 @ 60 Hz
- RGB OUT Resolution : From 640 x 480 to 2048 x 1536 @ 75 Hz
- Sync. Range : Hor: 31.5 kHz to 91.1 kHz, Ver: 60 Hz* to 85 Hz

Available Computer Configurations:

Type	Description	Size/Specification
CPU	1 x Intel® Celeron® P4505, 1.86GHz, 2MB Cache, FSB 800MHz or 1 x Intel® Core™ i7-620LE, 2.0GHz, 4MB Cache, FSB 1066MHz	
Memory	1 x Single Channel, 200-pin DDR3	- 1GB, 2GB, 4GB
Storage	2 x 2.5" SSD SATA, Single or Multi Level	- 40GB, 80GB, 120GB, 300GB
Storage	2 x 2.5" HDD SATA	- 40GB, 80GB, 120GB, 300GB - 500GB/1TB (Coming Q3 2012)
OS	Microsoft® Windows® Embedded Enterprise or customized image	- Win XP Pro Eng w/SP3 or SP2c - Win Server 2K3/2K8 Eng, 64bit - Win 7 Pro Eng, 32bit/64bit
Notes	For OS Win7, >1GB RAM and >40GB SSD/HDD is recommended.	

Power Specifications:

Multi-power Supply:

- 115&230VAC - 50/60Hz + 24 VDC - HD 19T21 MxC-Mxx-xxxx
- 12-24VDC - HD 19T21 MxC-Fxx-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 AC/DC : 125 W (max) TBC

Physical Considerations:

- 429.00 (W) x 382.00 (H) x 80.90 (D) mm
- 16.89" (W) x 15.04" (H) x 3.19" (D)
- 4 x M6 VESA mounting 280x150mm, Max 12mm deep
- Weight: 8.6 kg / 18.9 lbs

User Controls:

Behind front bezel - Glass Display Control™ (GDC) IP66:

- Power On/Off, Brightness Control (-/+), Hotkeys (left/right)
- Power LED, HDD/SSD LED, Mode Status Indicators (ECDIS, Service)
- Buzzer (not visible), Light Sensor (not visible)

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: IP66 front - IP22 rear (EN60529)

Safety 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.

Input/Output Connectors:

Connector	Rear	Internal
• Ethernet GB LAN	2 x RJ-45	
• Keyboard	1 x PS/2 (purple)	
• Mouse	1 x PS/2 (green)	
• COM RS-232	1 x DB9M non-isolated	
• COM RS-422/485	1 x DB9M non-isolated	
• LPT / Parallel		1 x Pin Header
• USB1.1 (>10m)	1 x USB Type A	
• USB2.0 (<10m)	3 x USB Type A	2 x Pin Header (=4 USB)
• 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	
• Line Out	1 x 3.5mm mini jack (Lime)	
• Speaker L/F	1 x mini-DIN 5pin (TBD)	
• Mic In	1 x 3.5mm mini jack (Pink)	

Available Accessories:

- HD XXTBR CMB-A1 = 1 x Panel Mount Kit
 - HD 19BRD SX1-A1 = 1 x Table Mount Bracket. EN60945 Tested*
 - JH C01MF A-A = 1 x USB Cable 1m, Type A to Chassis mount receptacle
- Please see user manual/datasheet for more information

Factory Options:

- Projected Capacitive Touch Screen (Multitouch, USB interface)*
- Optical Bonding Technology
- Sunlight Readable / High Bright (includes Optical Bonding) model*
- Color Calibrated models (ECDIS)
- Variations of SSD/HDD Storage, RAM Memory, Operating System

Capabilities / Prepared for:

- 4 x COM RS-422/485 isolated ECDIS/NMEA (Phoenix T. Block 3.81)
- 2 x CAN isolated module (Phoenix Terminal Block 3.81)
- 4 x COM RS-232 non-isolated module (9P D-SUB connectors)

* Release date to be confirmed. Please contact us for more information.

For a full overview of typenumbers, please review the following link:
www.hatteland-display.com/pdflink/nd100780-4.php

Compass Safe Distance: HD 19T21 MxC-xxx-xxxx - Standard: TBD - Steering: TBD. MTBF (Mean Time Between Failures - MIL-HDBK-217 GB 25°C) = TBD

APPROVALS & CERTIFICATES

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

IEC 60945 4th (EN 60945:2002)

GL - Germanischer Lloyd (Pending)

CCS - China Classification Society (Pending)

IACS E10

DNV - Det Norske Veritas (Pending)

BV - Bureau Veritas (Pending)

ClassNK - Nippon Kaiji Kyokai (Pending)

ABS - American Bureau of Shipping (Pending)

LRS - Lloyd's Register of Shipping (Pending)

Specifications - HD 24T21 MxC-xxx-xxxx

Note: All specifications are subject to change without prior notice!

TFT Technology:

- High Quality TFT active-matrix liquid crystal panel with LED Backlight
- 24.0 inch viewable image size, Widescreen, Aspect Ratio 16:9
- MVA (Multi-domain Vertical Alignment) LCD Technology, RGB vertical stripe

TFT Characteristics:

- Native Resolution : 1920 x 1080 (FHD)
- Pixel Pitch (RGB) : 0.276 (H) x 0.276 (V) mm
- Response Time : 25 ms (typical), "black" to "white"
- Contrast Ratio : 3000:1 (typical)
- Light Intensity : 300 cd/m² (typical)
- Viewable Angle : +/- 89 deg. (typical) (Up/Down/Left/Right)
- Active Display Area : 531.36 (H) x 298.89 (V) mm
- Max Colors : 16.7 millions (RGB 8-bit)

Computer Specifications:

- Installed OS : None or see table below
- Installed Storage : 1 x 250GB 2.5" HDD. Option for 2 x 2.5" removable HDD(SATA), RAID 0,1 or see table below
- CPU/Processor : See table below
- Installed Memory : 1 x 2GB DDR3 1066/800MHz or see table below
- System Chipset : Intel® BD82QM57
- Graphics Chipset : Intel® Arrandale IGD supports DVM 5.0
- Ethernet LAN #1 : Intel® 82577LM Gigabit LAN 10/100/1000Mbps
- Ethernet LAN #2 : Realtek RTL8111C Gigabit LAN 10/100/1000Mbps
- Audio Chipset : Realtek ALC888-GR (+2W Amplifier)
- BIOS : UEFI AMIBIOS
- Speaker / Buzzer : No Speaker / 3500Hz Buzzer
- Watchdog Timer : 256 Segments, 0, 1, 2...255 sec/min
- Power Manager : ACPI S3/S4
- Monitoring : Temperature and voltages status
- Other Features : GPIO, LAN Wakeup, USB Boot and Wakeup
- DVI-I OUT Resolution : From 640 x 480 to 1920 x 1200 @ 60 Hz
- RGB OUT Resolution : From 640 x 480 to 2048 x 1536 @ 75 Hz
- Sync. Range : Hor: 31.5 kHz to 91.1 kHz, Ver: 60 Hz* to 85 Hz

Available Computer Configurations:

Type	Description	Size/Specification
CPU	1 x Intel® Celeron® P4505, 1.86GHz, 2MB Cache, FSB 800MHz or 1 x Intel® Core™ i7-620LE, 2.0GHz, 4MB Cache, FSB 1066MHz	
Memory	1 x Single Channel, 200-pin DDR3	- 1GB, 2GB, 4GB
Storage	2 x 2.5" SSD SATA, Single or Multi Level	- 40GB, 80GB, 120GB, 300GB
Storage	2 x 2.5" HDD SATA	- 40GB, 80GB, 120GB, 300GB - 500GB/1TB (Coming Q3 2012)
OS	Microsoft® Windows® Embedded Enterprise or customized image	- Win XP Pro Eng w/SP3 or SP2c - Win Server 2K3/2K8 Eng, 64bit - Win 7 Pro Eng, 32bit/64bit
Notes	For OS Win7, >1GB RAM and >40GB SSD/HDD is recommended.	

Power Specifications:

Multi-power Supply:

- 115&230VAC - 50/60Hz + 24 VDC - HD 24T21 MxC-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 AC/DC : 125 W (max) TBC
: TBD (typ) at max backlight+high CPU load

Physical Considerations:

- 593.00 (W) x 384.00 (H) x 76.40 (D) mm
- 23.35" (W) x 15.12" (H) x 3.01" (D)
- 4 x M6 VESA mounting 280x150mm, Max 12mm deep
- Weight: 11.2 kg / 24.6 lbs

User Controls:

Behind front bezel - Glass Display Control™ (GDC) IP66:

- Power On/Off, Brightness Control (-/+), Hotkeys (left/right)
- Power LED, HDD/SSD LED, Mode Status Indicators (ECDIS, Service)
- Buzzer (not visible), Light Sensor (not visible)

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: IP66 front - IP22 rear (EN60529)

Safety 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.

Input/Output Connectors:

Connector	Rear	Internal
• Ethernet GBLan	2 x RJ-45	
• Keyboard	1 x PS/2 (purple)	
• Mouse	1 x PS/2 (green)	
• COM RS-232	1 x DB9M non-isolated	
• COM RS-422/485	1 x DB9M non-isolated	
• LPT / Parallel		1 x Pin Header
• USB1.1 (>10m)	1 x USB Type A	
• USB2.0 (<10m)	3 x USB Type A	2 x Pin Header (=4 USB)
• 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	
• Line Out	1 x 3.5mm mini jack (Lime)	
• Speaker L/F	1 x mini-DIN 5pin (TBD)	
• Mic In	1 x 3.5mm mini jack (Pink)	

Available Accessories:

- HD 24TBR CMB-A1 = 1 x Panel Mount Kit (included with delivery)
 - HD 24BRD SX1-A1 = 1 x Table Mount Bracket. EN60945 Tested*
 - JH C01MF A-A = 1 x USB Cable 1m, Type A to Chassis mount receptacle
- Please see user manual/datasheet for more information

Factory Options:

- Projected Capacitive Touch Screen (Multitouch, USB interface)*
- Optical Bonding Technology
- Sunlight Readable / High Bright (includes Optical Bonding) model*
- Color Calibrated models (ECDIS)
- Variations of SSD/HDD Storage, RAM Memory, Operating System

Capabilities / Prepared for:

- 4 x COM RS-422/485 isolated ECDIS/NMEA (Phoenix T. Block 3.81)
- 2 x CAN isolated module (Phoenix Terminal Block 3.81)
- 4 x COM RS-232 non-isolated module (9P D-SUB connectors)

* Release date to be confirmed. Please contact us for more information.

For a full overview of typenumbers, please review the following link:
www.hatteland-display.com/pdflink/ind100780-4.php

Compass Safe Distance: HD 24T21 MxC-xxx-xxxx - Standard: TBD - Steering: TBD. MTBF (Mean Time Between Failures - MIL-HDBK-217 GB 25°C) = TBD

APPROVALS & CERTIFICATES

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

IEC 60945 4th (EN 60945:2002)

GL - Germanischer Lloyd (Pending)

CCS - China Classification Society (Pending)

IACS E10

DNV - Det Norske Veritas (Pending)

BV - Bureau Veritas (Pending)

ClassNK - Nippon Kaiji Kyokai (Pending)

ABS - American Bureau of Shipping (Pending)

LRS - Lloyd's Register of Shipping (Pending)

Specifications - HD 26T21 MxC-xxx-xxxx

Note: All specifications are subject to change without prior notice!

TFT Technology:

- High Quality TFT with LED Backlight
- 25.54 inch viewable image size, Widescreen, Aspect Ratio 16:10
- S-MVA, Active Matrix, Thin Film Transistor (TFT)
- RGB Vertical Stripe

TFT Characteristics:

- Native Resolution : 1920 x 1200
- Pixel Pitch (RGB) : 0.2865 (H) x 0.2865 (V) mm
- Response Time : 8 ms (typical), "gray" to "gray"
- Contrast Ratio : 1500:1 (typical)
- Light Intensity : 350 cd/m² (typical)
- Viewable Angle : +/- 88 deg. (typical) (Up/Down/Left/Right)
- Active Display Area : 550.08 (H) x 343.8 (V) mm
- Max Colors : 16.7 million

Computer Specifications:

- Installed OS : None or see table below
- Installed Storage : 1 x 250GB 2.5" HDD. Option for 2 x 2.5" removable HDD(SATA), RAID 0,1 or see table below
- CPU/Processor : See table below
- Installed Memory : 1 x 2GB DDR3 1066/800MHz or see table below
- System Chipset : Intel® BD82QM57
- Graphics Chipset : Intel® Arrandale IGD supports DVMT 5.0
- Ethernet LAN #1 : Intel® 82577LM Gigabit LAN 10/100/1000Mbps
- Ethernet LAN #2 : Realtek RTL8111C Gigabit LAN 10/100/1000Mbps
- Audio Chipset : Realtek ALC888-GR (+2W Amplifier)
- BIOS : UEFI AMIBIOS
- Speaker / Buzzer : No Speaker / 3500Hz Buzzer
- Watchdog Timer : 256 Segments, 0, 1, 2...255 sec/min
- Power Manager : ACPI S3/S4
- Monitoring : Temperature and voltages status
- Other Features : GPIO, LAN Wakeup, USB Boot and Wakeup
- DVI-I OUT Resolution : From 640 x 480 to 1920 x 1200 @ 60 Hz
- RGB OUT Resolution : From 640 x 480 to 2048 x 1536 @ 75 Hz
- Sync. Range : Hor: 31.5 kHz to 91.1 kHz, Ver: 60 Hz* to 85 Hz

Available Computer Configurations:

Type	Description	Size/Specification
CPU	1 x Intel® Celeron® P4505, 1.86GHz, 2MB Cache, FSB 800MHz or 1 x Intel® Core™ i7-620LE, 2.0GHz, 4MB Cache, FSB 1066MHz	
Memory	1 x Single Channel, 200-pin DDR3	- 1GB, 2GB, 4GB
Storage	2 x 2.5" SSD SATA, Single or Multi Level	- 40GB, 80GB, 120GB, 300GB
Storage	2 x 2.5" HDD SATA	- 40GB, 80GB, 120GB, 300GB - 500GB/1TB (Coming Q3 2012)
OS	Microsoft® Windows® Embedded Enterprise or customized image	- Win XP Pro Eng w/SP3 or SP2c - Win Server 2K3/2K8 Eng. 64bit - Win 7 Pro Eng, 32bit/64bit
Notes	For OS Win7, >1GB RAM and >40GB SSD/HDD is recommended.	

Power Specifications:

Multi-power Supply:

- 115&230VAC - 50/60Hz + 24 VDC - HD 26T21 MxC-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 AC/DC : 125 W (max) TBC
- : TBD (typ) at max backlight+high CPU load

Physical Considerations:

- 621.00 (W) x 435.00 (H) x 97.70 (D) mm
- 24.45" (W) x 17.13" (H) x 3.85" (D) inch
- 4 x M6 VESA mounting 280x150mm, Max 12mm deep
- Weight: TBD kg (approx)

User Controls:

Behind front bezel - Glass Display Control™ (GDC) IP66:

- Power On/Off, Brightness Control (-/+), Hotkeys (left/right)
- Power LED, HDD/SSD LED, Mode Status Indicators (ECDIS, Service)
- Buzzer (not visible), Light Sensor (not visible)

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: IP66 front - IP22 rear (EN60529)

Safety 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.

Input/Output Connectors:

Connector	Rear	Internal
• Ethernet GBLan	2 x RJ-45	
• Keyboard	1 x PS/2 (purple)	
• Mouse	1 x PS/2 (green)	
• COM RS-232	1 x DB9M non-isolated	
• COM RS-422/485	1 x DB9M non-isolated	
• LPT / Parallel		1 x Pin Header
• USB1.1 (>10m)	1 x USB Type A	
• USB2.0 (<10m)	3 x USB Type A	2 x Pin Header (=4 USB)
• 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	
• Line Out	1 x 3.5mm mini jack (Lime)	
• Speaker L/F	1 x mini-DIN 5pin (TBD)	
• Mic In	1 x 3.5mm mini jack (Pink)	

Available Accessories:

TBD

Factory Options:

- Projected Capacitive Touch Screen (Multitouch, USB interface)*
- Optical Bonding Technology
- Sunlight Readable / High Bright (includes Optical Bonding) model*
- Color Calibrated models (ECDIS)
- Variations of SSD/HDD Storage, RAM Memory, Operating System

Capabilities / Prepared for:

- 4 x COM RS-422/485 isolated ECDIS/NMEA (Phoenix T. Block 3.81)
- 2 x CAN isolated module (Phoenix Terminal Block 3.81)
- 4 x COM RS-232 non-isolated module (9P D-SUB connectors)

* Release date to be confirmed. Please contact us for more information.

For a full overview of typenumbers, please review the following link:
www.hatteland-display.com/pdflink/ind100780-4.php

Compass Safe Distance: HD 26T21 MxC-xxx-xxxx - Standard: TBD - Steering: TBD. MTBF (Mean Time Between Failures - MIL-HDBK-217 GB 25°C) = TBD

APPROVALS & CERTIFICATES

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

IEC 60945 4th (EN 60945:2002) (Pending)
GL - Germanischer Lloyd (Pending)
CCS - China Classification Society (Pending)

IACS E10 (Pending)
DNV - Det Norske Veritas (Pending)
BV - Bureau Veritas (Pending)

ClassNK - Nippon Kaiji Kyokai (Pending)
ABS - American Bureau of Shipping (Pending)
LRS - Lloyd's Register of Shipping (Pending)

Specifications - CAN Module with CO-Processor

DATA SHEET

**HATTELAND®
DISPLAY**

Manufacturer: **Hatteland Display AS**
Product: **CAN Module with CO-Processor**

Last Revised: **23 May 2011**
Revision#: **02**

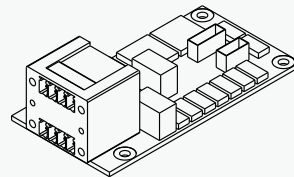
CAN MODULE with CO-Processor

Description:

CAN Module with CO-Processor (NXP LPC1756) is a USB to dual isolated CAN interface board. This card will mainly be integrated, electrical and mechanical, in the final product such as Series X 8, 12, 13, 15, 17, 19 and 24 inch Panel Computers and Stand-alone Computers.

The Hatteland Display CAN Module is delivered with software download functions and standard API, SAE J2534, which allow the user to add their own functions, such as real time critical functions, and high level CAN protocol.

The CAN Module can operate as a standalone unit, which can be configured to operate independent of application software and hardware. This allow the user to use the CAN Module for time and safe critical operations.

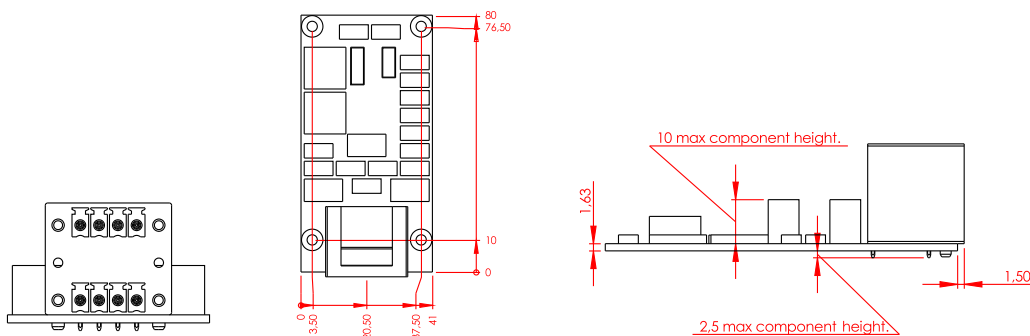


Features:

- Cost effective CAN solution
- Withstand marine requirements
- General and open architecture that will allow the end customer to modify and handle the source code
- General CAN interface support, NMEA2000, J1939, CANOpen

Specifications

• Number of CAN interfaces	: 2 independent channels isolated from each other
• Version	: CAN 2.0B
• Isolation	: Galvanic isolation 2kV, CAN1 to CAN2 and port to chassis
• Protection	: Continuous short circuit signal to signal : Continuous short circuit to isolated GND : Continuous shorts to $\pm 27V$
• ESD rating on CAN bus	: ESD rating of $\pm 12kV$ Human body model
• Min Baud rate	: 64kbit
• Max baud rate	: 500kbit
• Address mode	: 11/29bit
• Terminating	: No termination on PCB, user will put them in connector
• PCB Connector	: Weidmuller 1973600000 (SCD 3.81/08/90F 3.25N BK BX)
• Cable connector	: 2 x Weidmuller 1077880000 (BCZ 3.81/04/180 SN BK BX PRT)
• Cable	: Twisted pair, no ground
• Supported protocols	: SAE J1939 Standard Data Bus Interface : NMEA 2000 Standard Data Bus Interface : CANopen 4.0 (CIA DS 301 ver. 4.x)
• Supported OS	: WEE (Windows XP Pro, Win CE 6.0) : WEE (Windows 7 Pro) and Linux on request
• Test and certificate	: Hatteland Display standard



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.

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Tel: (+47) 4814 2200 - mail@hatteland-display.com - www.hatteland-display.com

DATA SHEET

**HATTELAND®
DISPLAY**

Manufacturer: **Hatteland Display AS**
 Product: **COM Module RS-422 / RS-485**
 Typenumber: **PCA100293-1**

Last Revised: **14 Mar 2012**
 Revision#: **04**

COM MODULE

Description:

The Hatteland Display COM modules provide the system with quad independent COM channels. The module is attached to the motherboard via standard USB interface. Application software access the COM channels as standard COM devices, i.e. in the normal case is there no requirements for additional software development. This module will mainly be integrated, electrical and mechanical, in the final product such as Series X 12, 13, 15, 17, 19 and 24 inch Panel Computers and HT B21 Stand-alone Computers.

Features:

- 4 independent channels (If a card is replaced most operating system will not change COM port number).
- Outputs are short circuits protected. Inputs are protected for NMEA use.
- Driver strength are approved for NMEA use.
- Connect your external equipment via the Phoenix Terminal Block 3.81.

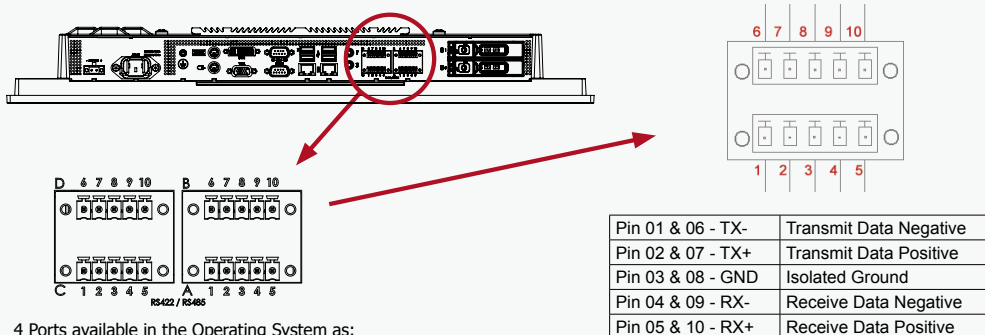
Specifications PCA100293-1

Internal USB to 4 channel x RS-422 / RS-485 isolated

• Features	: All channels is fully isolated, channel to channel and channel to chassis. : The module is classified towards IEC61162-1 and is NMEA-0183 compliant. : All requirement for usage in ECDIS applications/systems is fulfilled.
• Absolute Max voltage applied to outputs	: -8V to +13V
• Data Rate / Technical Data Output	: Outputs 230kbps (Theoretically 400kbps) : ±15kV using the Human Body Model on all RS-485 signals : Isolation rating = 2000VRMS, not intended for connection to live power nets.
• Transmitter enable mode	: Standard mode is automatic. : Standard Mode will accept send by RTS, but will in fact ignore RTS. : Each channel have a override jumper which can be used to force the transmitter to always be active.
• Test and certificate	: Hatteland Display standard
• Supported Operating Systems (OS)	Windows Server 2008 R2, Windows 7 (32 & 64 bit), Windows Server 2008 (32 & 64 bit), Windows Vista (32 & 64 bit), Windows Server 2003 (32 & 64 bit), Windows XP (32 & 64 bit), Windows ME, Windows 98, Linux, Mac OS X, Mac OS 9, Mac OS 8, Windows CE.NET (Version 4.2 and greater) and Android

Illustration and Pinning:

Note: Product below for illustration only. Location of module and product size/design may differ.



4 Ports available in the Operating System as:
COMx (A), COMx (B), COMx (C), COMx (D)*

Pinning is identical for upper and lower row

*Configuration dependent, x = next available port number(s) in operating system.

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.

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 Tel: (+47) 4814 2200 - mail@hatteland-display.com - www.hatteland-display.com

DATA SHEET

**HATTELAND®
DISPLAY**

Manufacturer: **Hatteland Display AS**

Product: **COM Module RS-232**

Typenumber: **PCA100294-1**

Last Revised: **14 Mar 2012**

Revision#: **03**

COM MODULE

Description:

The Hatteland Display COM modules provide the system with quad independent COM channels. The module is attached to the motherboard via standard USB interface. Application software access the COM channels as standard COM devices, i.e. in the normal case is there no requirements for additional software development. This module will mainly be integrated, electrical and mechanical, in the final product such as Series X 12, 13, 15, 17, 19 and 24 inch Panel Computers and HT B21 Stand-alone Computers.

Features:

- 4 independent channels (If a card is replaced most operating system will not change COM port number)
- Outputs are short circuits protected

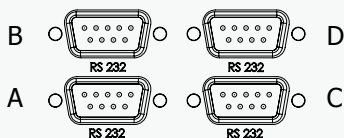
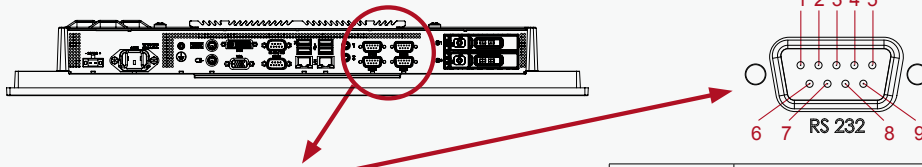
Specifications PCA100294-1

Internal USB to 4 channel x RS-232 non isolated

• Features	: All channels have support for all RS-232 DB-9 signals
• Connector	: Standard RS-232 DB-9 male housing and pinning
• Data Rate	: 230kbps
• ESD Rating (IEC 1000-4-2 Air) (RS-232 I/Os)	: ±15 kV
• ESD Rating (IEC 1000-4-2 Contact) (RS-232 I/Os)	: ±8 kV
• Test and certificate	: Hatteland Display standard
• Supported Operating Systems (OS)	Windows Server 2008 R2, Windows 7 (32 & 64 bit), Windows Server 2008 (32 & 64 bit), Windows Vista (32 & 64 bit), Windows Server 2003 (32 & 64 bit), Windows XP (32 & 64 bit), Windows ME, Windows 98, Linux, Mac OS X, Mac OS 9, Mac OS 8, Windows CE.NET (Version 4.2 and greater) and Android

Illustration and Pinning:

Note: Product below for illustration only. Location of module and product size/design may differ.



4 Ports available in Operating System as:
COMx (A), COMx (B), COMx (C), COMx (D)*

Pin 01 - DCD	Data Carrier Detect
Pin 02 - RXD	Receive Data
Pin 03 - TXD	Transmit Data
Pin 04 - DTR	Data Terminal Ready
Pin 05 - GND	Ground
Pin 06 - DSR	Data Set Ready
Pin 07 - RTS	Request To Send
Pin 08 - CTS	Clear To Send
Pin 09 - RI	Ring Indicator

*Configuration dependent, x = next available port number(s) in operating system.

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.

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Tel: (+47) 4814 2200 - mail@hatteland-display.com - www.hatteland-display.com



Specifications Accessories

Specifications - JH C01MF A-A

DATA SHEET

**HATTELAND®
DISPLAY**

Manufacturer: **Hatteland Display AS**

ACCESSORY

Product: **USB Cable 1m**

Type: **JH C01MF A-A**

Last Revised: **30 Nov 2011**
Revision#: **01**

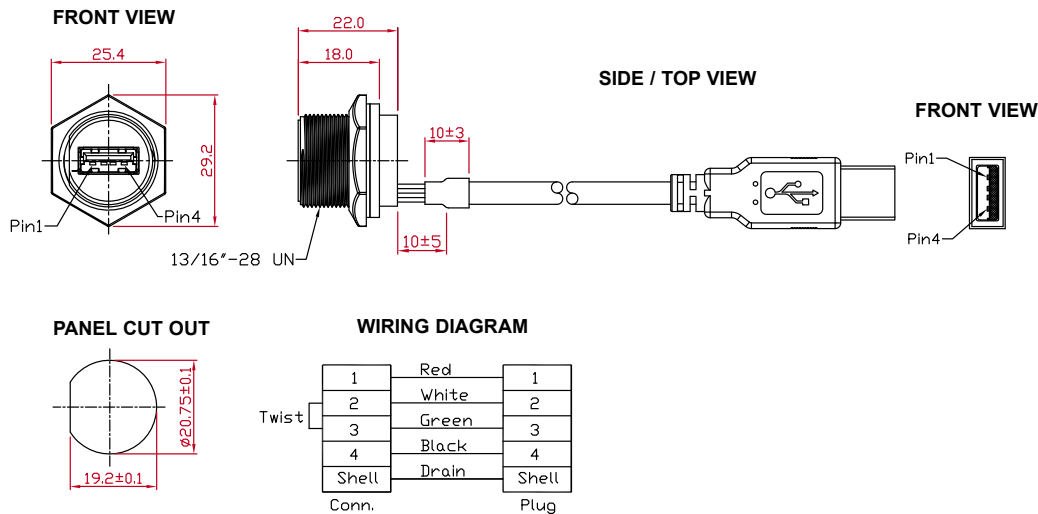
USB Cable

Description:

USB Cable (Type A plug to Chassis mount Type A receptacle) suitable for installations that feature a secure fastening connection from external equipment with standard Type A ports to all Hatteland Display computers and panel computers with standard USB Type A ports. RoHS Compliance.

Specifications

• Waterproof Rate	: IP67
• Recommended Panel Thickness	: 0.8 to 6.0 mm
• Recommended Torque	: 6~7 Kgf-cm
• Mating Cap P/N	: GT1C533122
• Over Mold	: Black color PVC
• USB Type A Plug	: Thermal plastic, black color housing : Copper Alloy contacts with AU Plated finish : Cold Roll Steel shell with NI Plated finish
• Cable	: 1m, UL2725 1P x 28AWG + 2C x 24AWG+Al/My+D+B, 5.0mm thickness, black color
• Shrink Tube	: L=10mm, Black color
• Receptacle Connector	: USB-A Plastic C3 Panel Jack screw with pig tail
• Type Approval / Testing	: Not tested, IEC60945 and IACS E10 pending



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.

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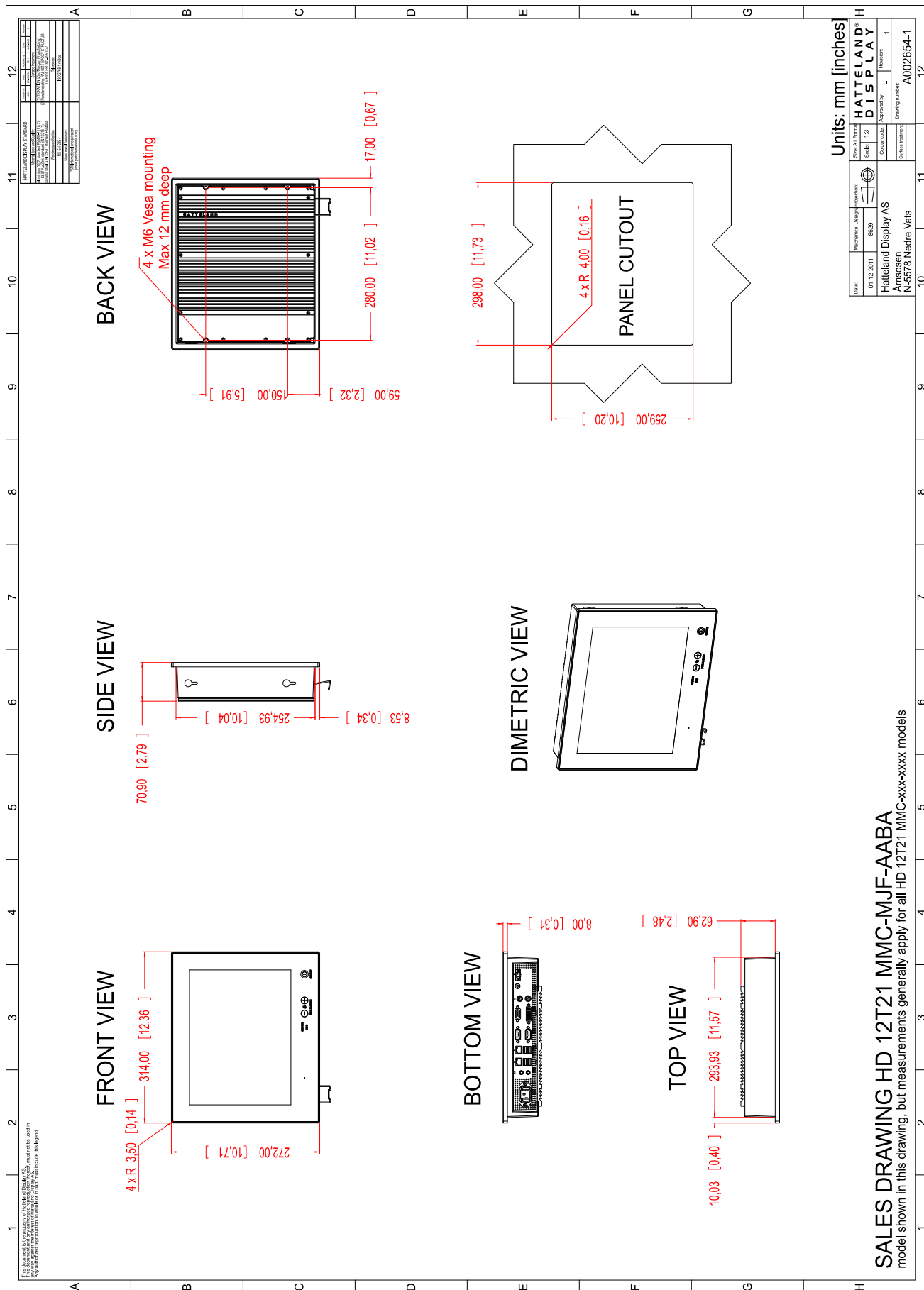
Hatteland Display AS, Åmsosen, N-5578 Nedre Vats, Norway
Tel: (+47) 4814 2200 - mail@hatteland-display.com - www.hatteland-display.com



Technical Drawings

Technical Drawings - HD 12T21 MMC-xxx-xxxx

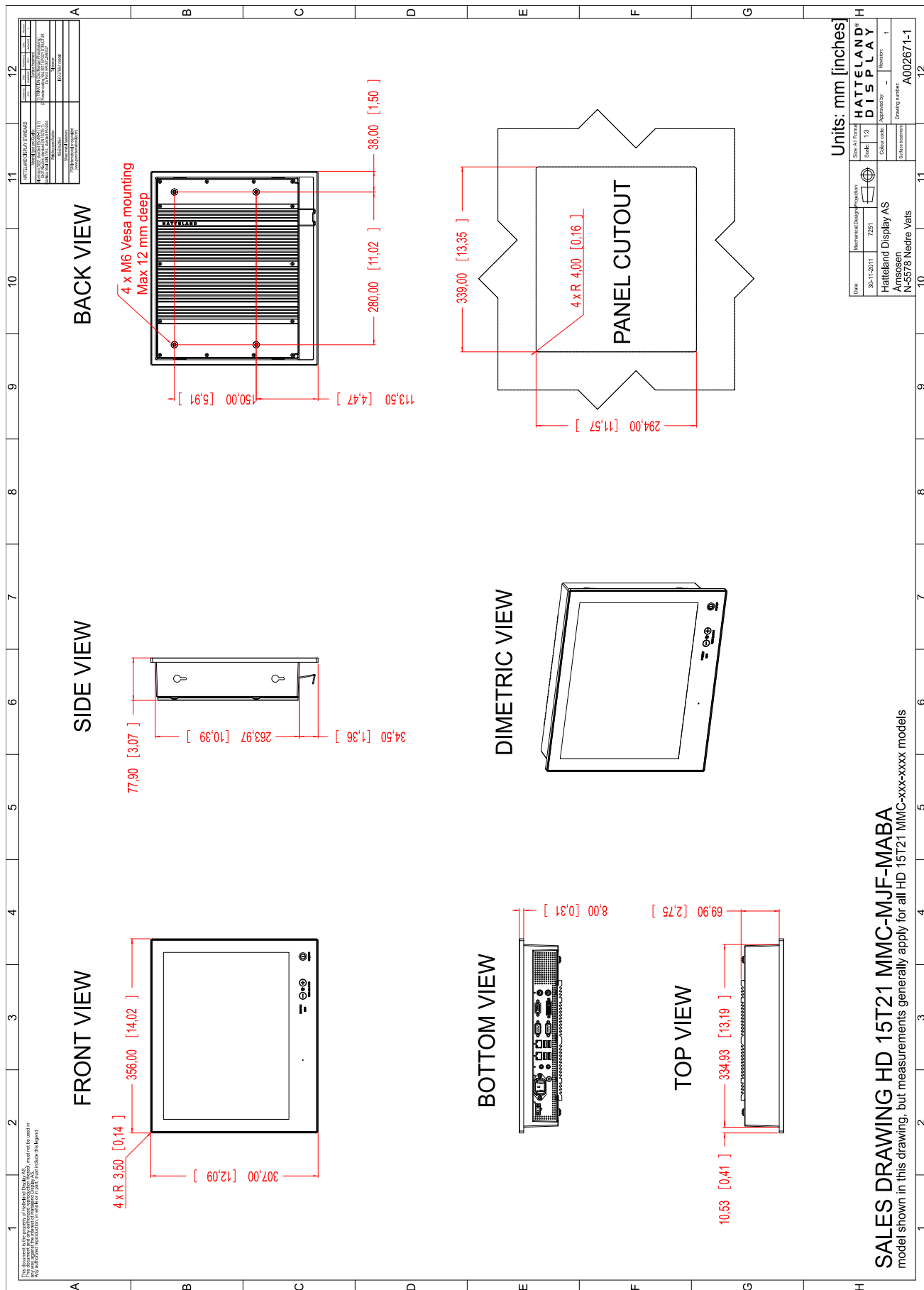
Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.



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Technical Drawings - HD 15T21 MMC-xxx-xxxx

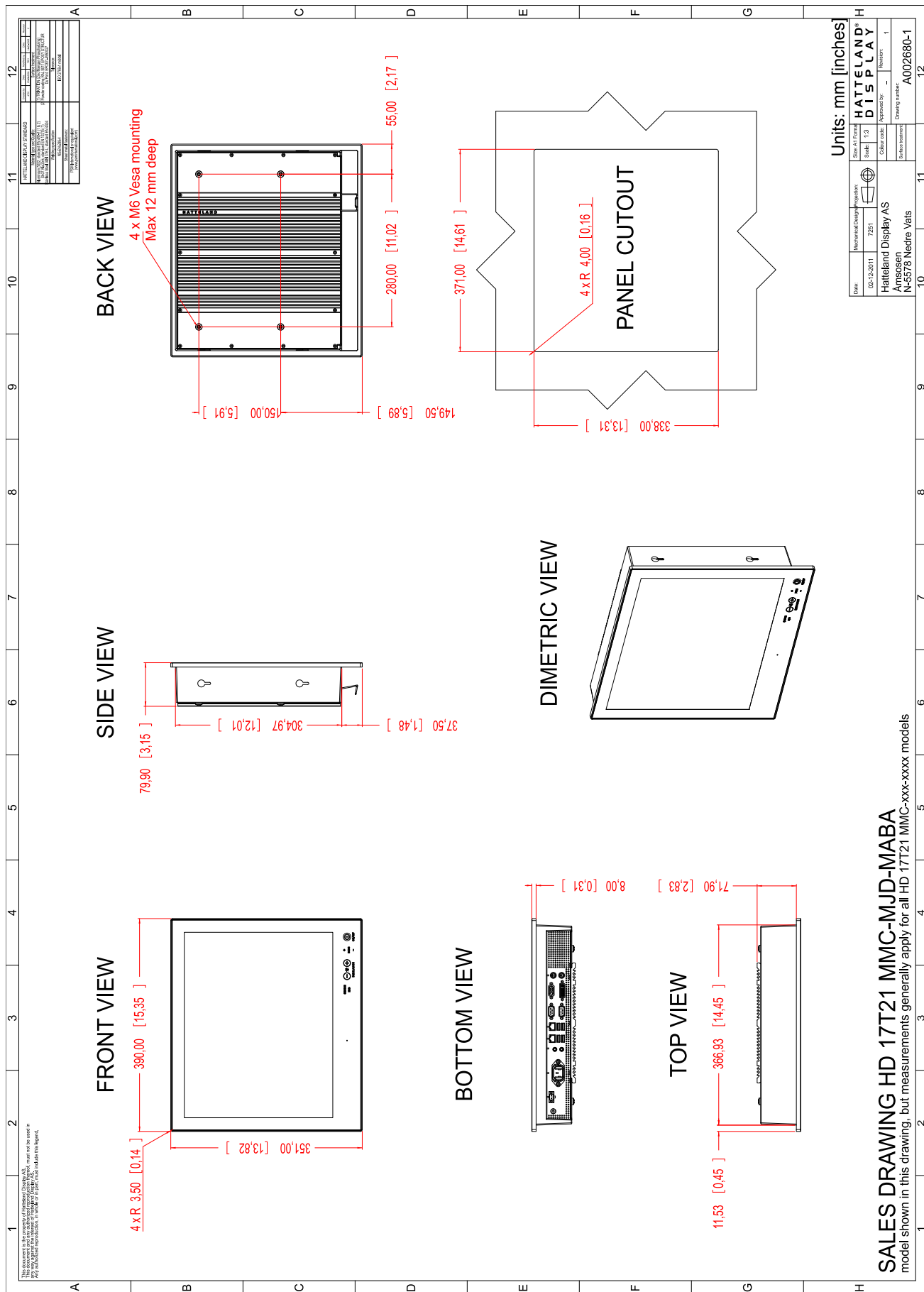
Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.



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Technical Drawings - HD 17T21 MxC-xxx-xxxx

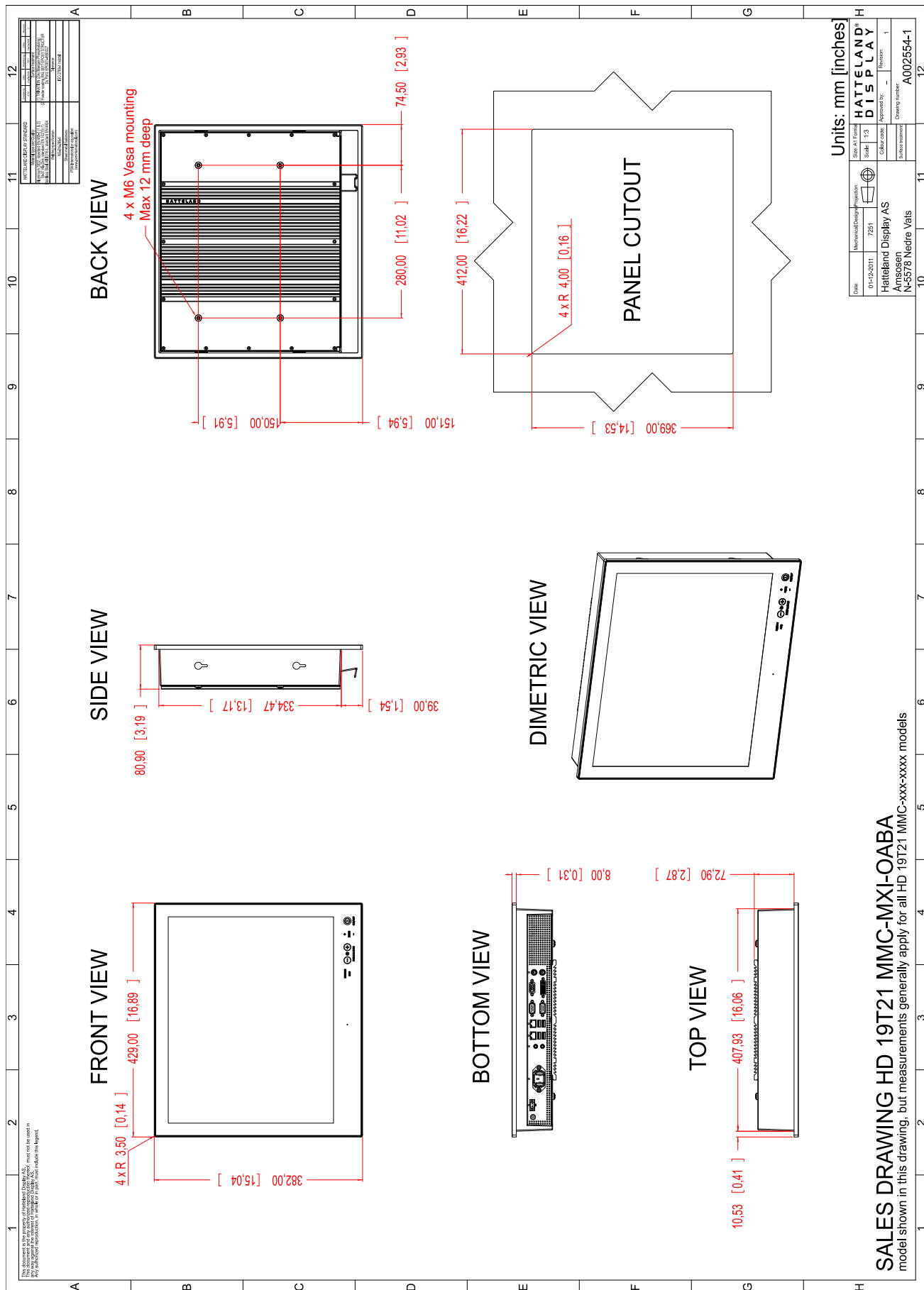
Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.



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Technical Drawings - HD 19T21 MxC-xxx-xxxx

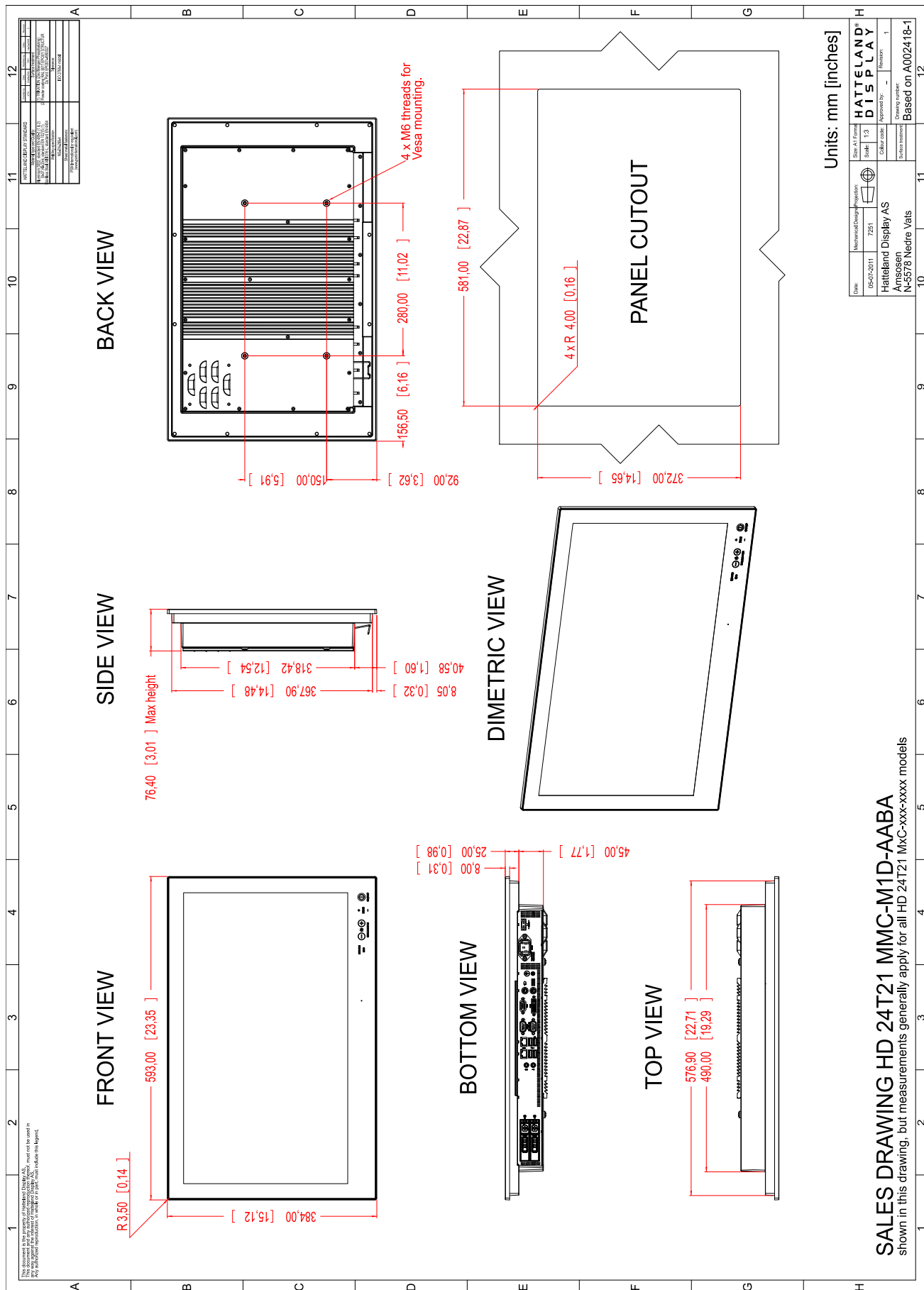
Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.



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Technical Drawings - HD 24T21 MxC-xxx-xxxx

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.

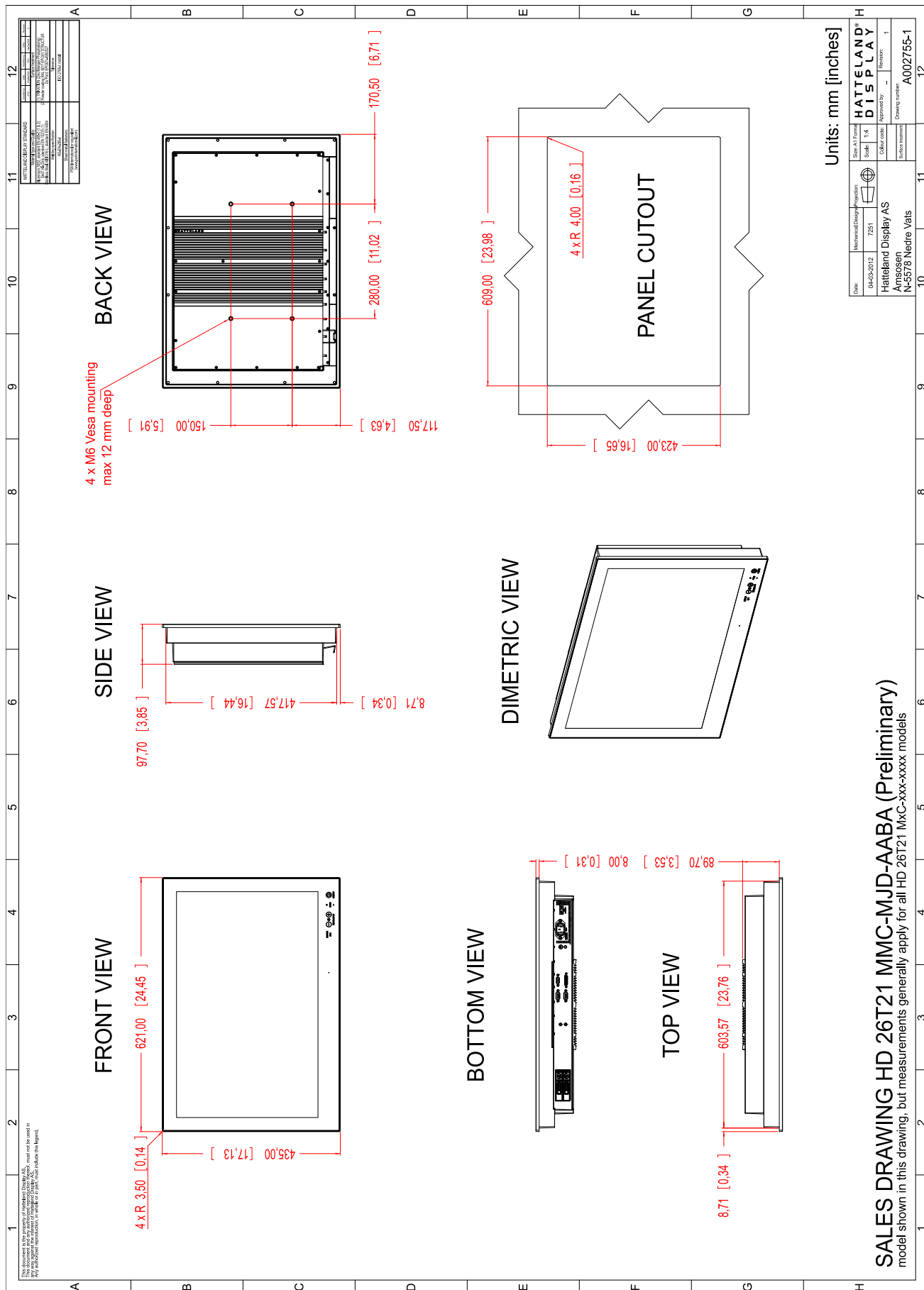


SALES DRAWING HD 24T21 MMC-M1D-AABA
 shown in this drawing, but measurements generally apply for all HD 24T21 MxC-xxx-xxxx models

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Technical Drawings - HD 26T21 MxC-xxx-xxxx

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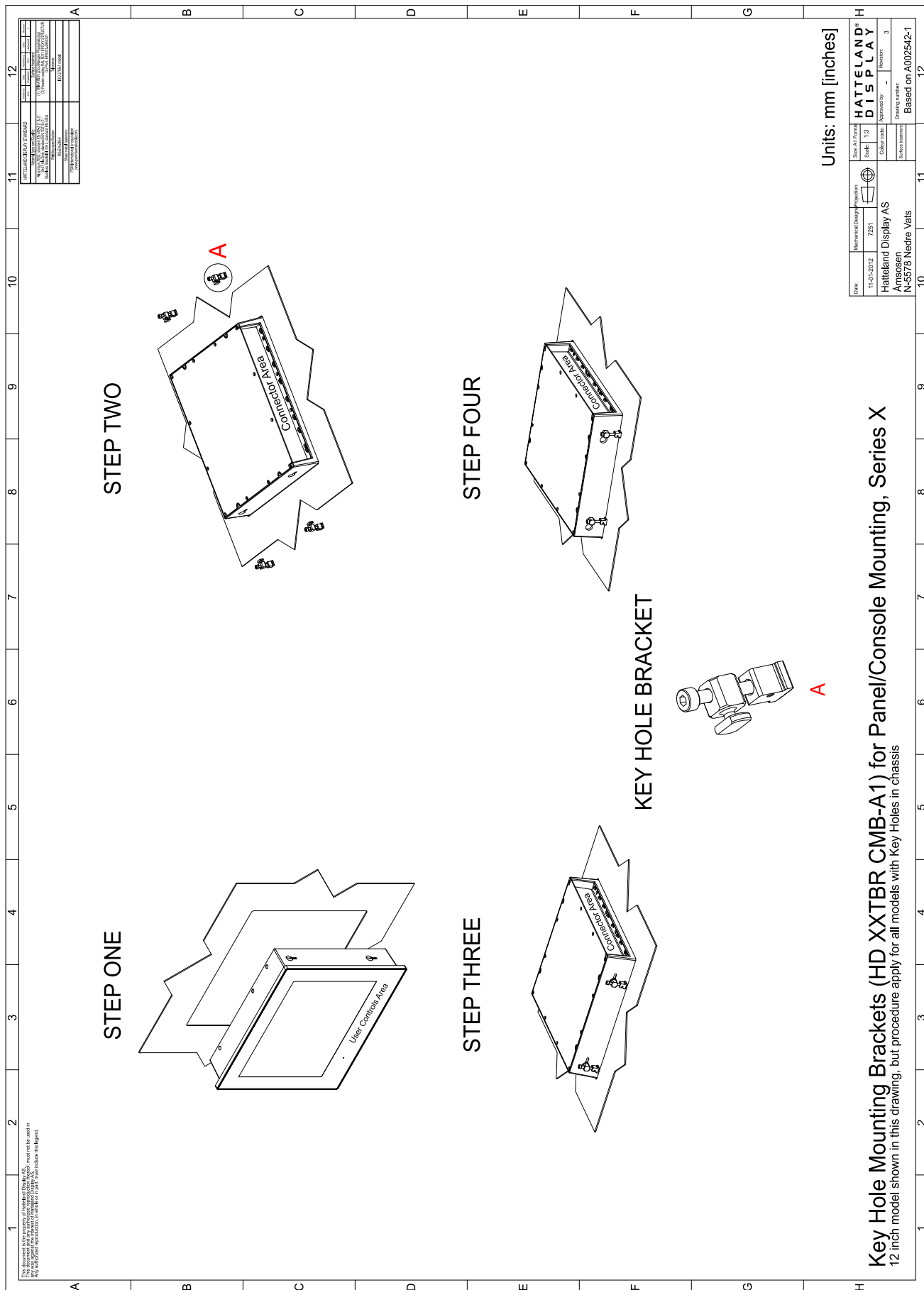
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Technical Drawings - Accessories

Technical Drawings - HD XXTBR CMB-A1

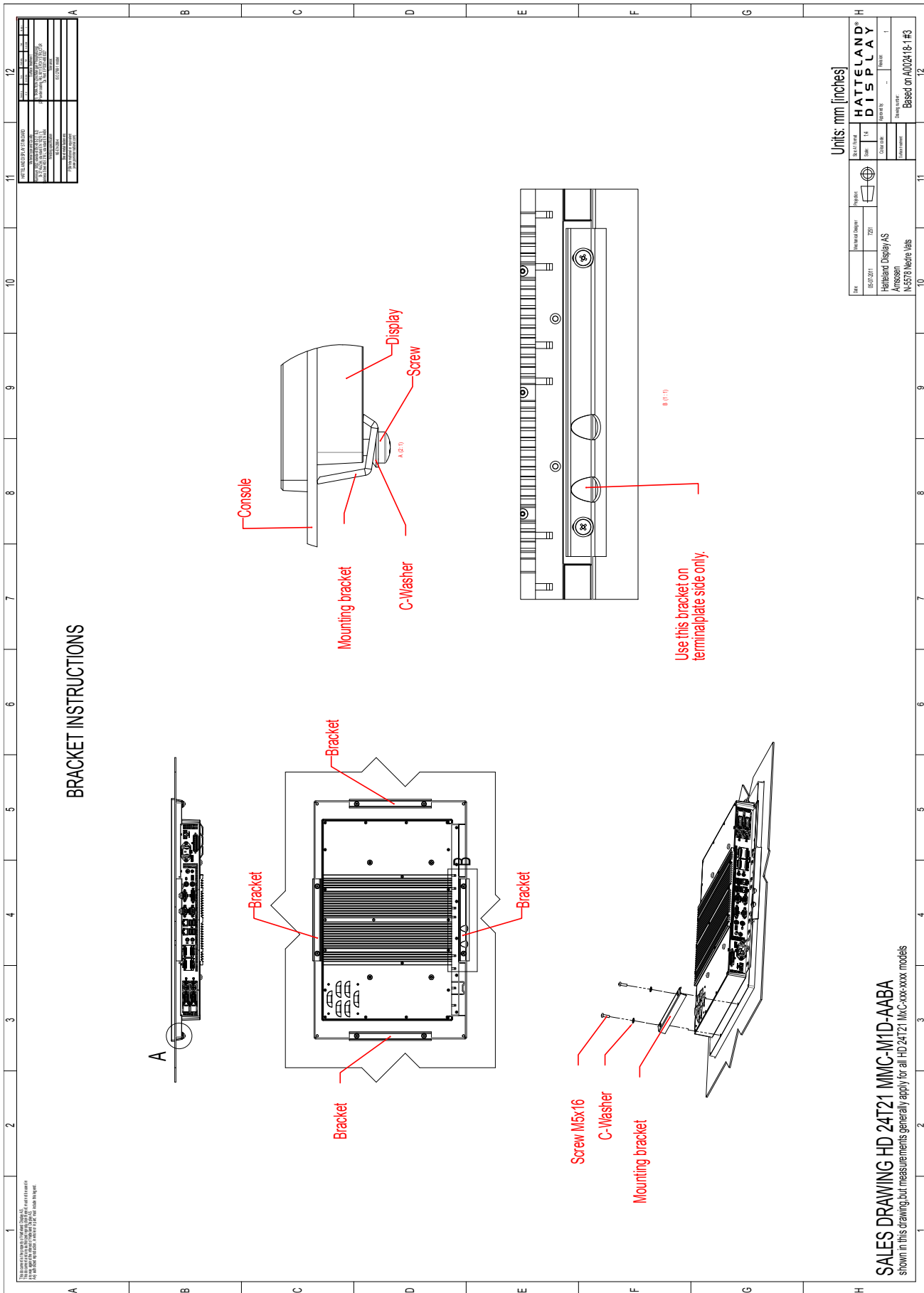
Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- .1mm. For accurate measurements, check relevant DWG file.



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Technical Drawings - HD 24TBR CMB-A1

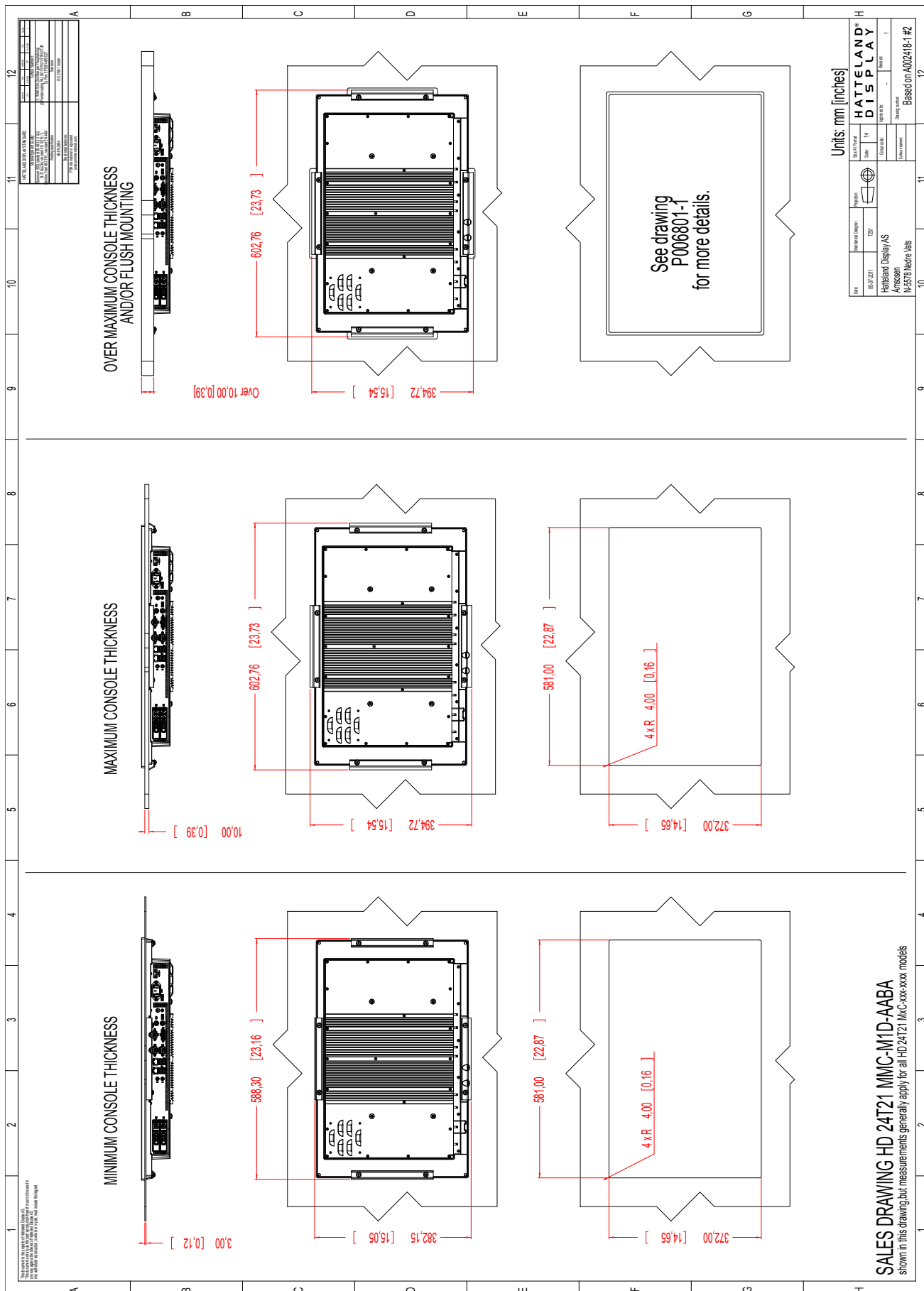
Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- .1mm. For accurate measurements, check relevant DWG file.



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Technical Drawings - HD 24TBR CMB-A1

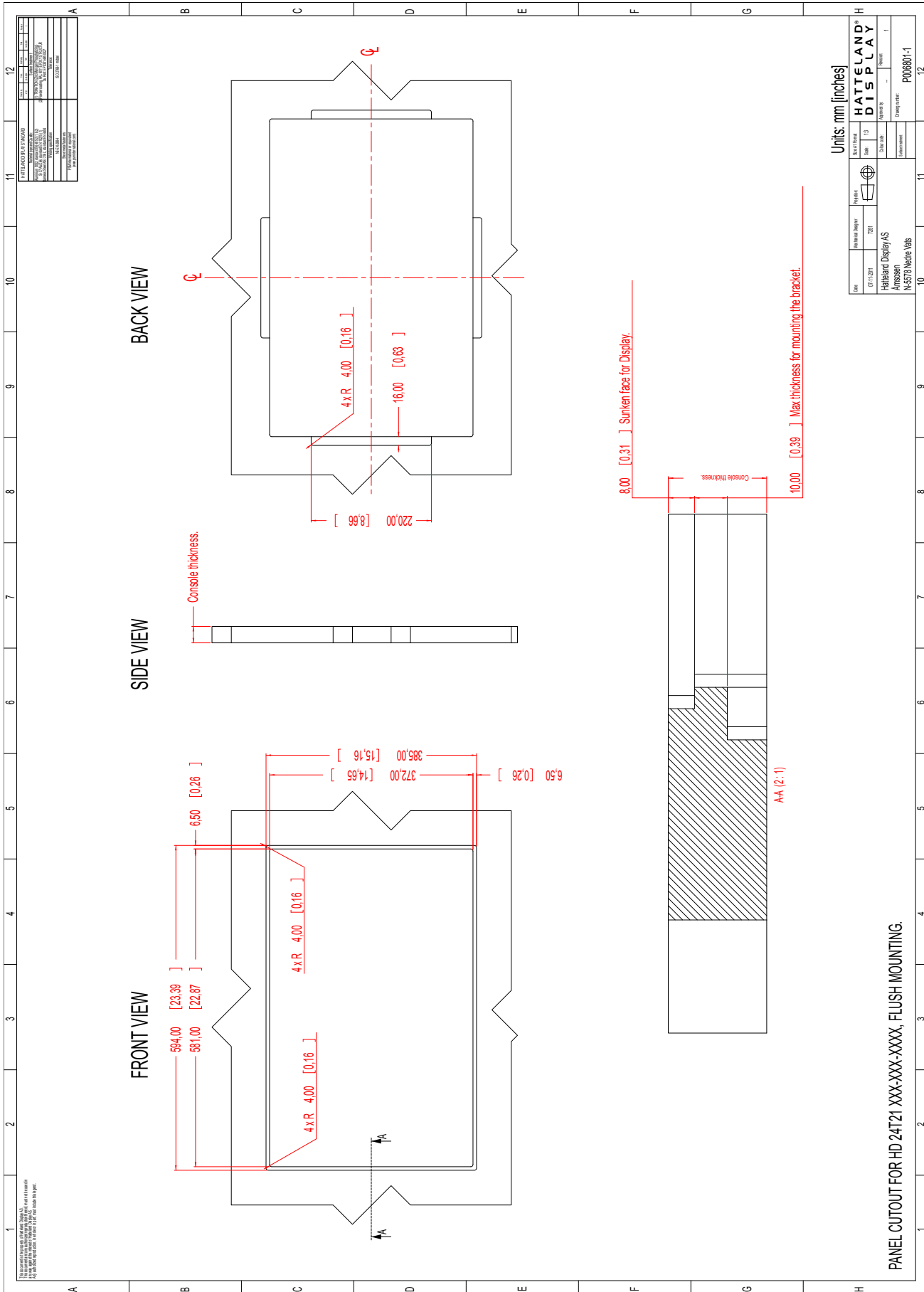
Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- .1mm. For accurate measurements, check relevant DWG file.



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Technical Drawings - HD 24TBR CMB-A1

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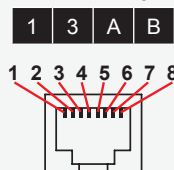
Appendixes

Pinout Assignments

ID's (1,2,3,A,B) denotes where connector is (by factory default) or may be available (through factory customization). Note that some combinations may not be possible due to space restrictions. List also valid for customized models. All pin out assignments are seen from users Point of View (POV) while looking straight at the connector. Some connectors are not available on certain units due to product range specifications. Please review the dedicated datasheet or technical drawings for your actual unit to identify and determine the presence of desired connector.

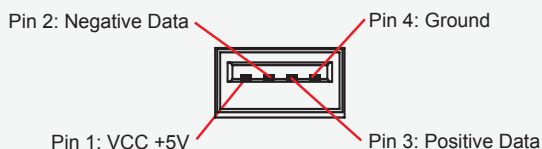
- | | |
|---|---|
| 1 | Available for MMD (Maritime Multi Displays) units. |
| 2 | Available for STD (Industrial Standard Displays) units. |
| 3 | Available for MMC (Maritime Multi Computers / Panel Computers) units. |
| A | For 8/13 inch sizes only |
| B | For 12/15/17/19/24/26 inch sizes only |

8 pin RJ45 10/100/1000mbps LAN/Ethernet

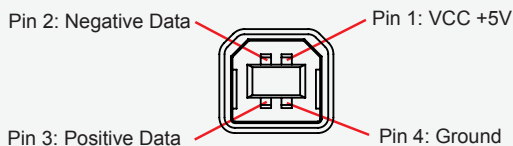
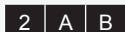


PIN 01	D0P	Differential Pair 0 (Positive)
PIN 02	D0N	Differential Pair 0 (Negative)
PIN 03	D1P	Differential Pair 1 (Positive)
PIN 04	D2P	Differential Pair 2 (Positive)
PIN 05	D2N	Differential Pair 2 (Negative)
PIN 06	D1N	Differential Pair 1 (Negative)
PIN 07	D3N	Differential Pair 3 (Positive)
PIN 08	D3N	Differential Pair 3 (Negative)

4 pin USB TYPE A



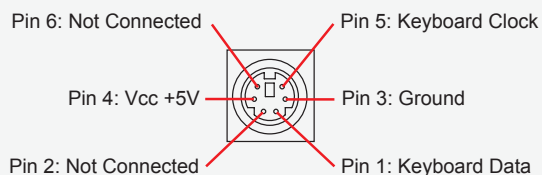
4 pin USB TYPE B



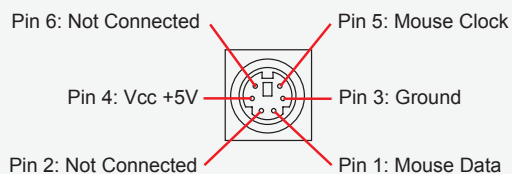
1 pin RCA/BNC COMP. VIDEO



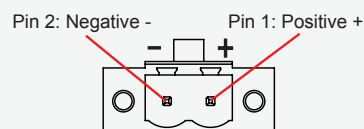
5 pin PS/2 KEYBOARD



5 pin PS/2 MOUSE

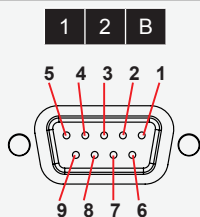


2 pin DC Power Input. Phoenix



Pinout Assignments

9 pin DSUB Serial COM RS-232 non-isolated

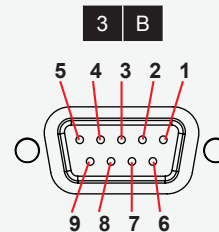


PIN 01	BUZ+	Buzzer Control Positive*
PIN 02	TxD	Transmit Data
PIN 03	RxD	Receive Data
PIN 04	DTR	Data Terminal Ready
PIN 05	GND	Ground
PIN 06	DSR	Data Set Ready
PIN 07	RTS	Request To Send
PIN 08	CTS	Clear To Send
PIN 09	BUZ-	Buzzer Control Negative*

*Wake On Ring is not enabled

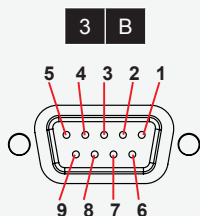
9 pin DSUB Serial COM RS-485/RS-422

Full Duplex Mode



PIN 01	TxD-	Transmit Data Negative
PIN 02	TxD+	Transmit Data Positive
PIN 03	RxD+	Receive Data Positive
PIN 04	RxD-	Receive Data Negative
PIN 05	GND	Ground
PIN 06	N/C	No internal connection
PIN 07	N/C	No internal connection
PIN 08	N/C	No internal connection
PIN 09	N/C	No internal connection

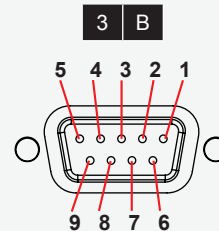
9 pin DSUB Serial COM RS-232 non-isolated



PIN 01	DCD	Data Carrier Detect
PIN 02	RxD	Receive Data
PIN 03	TxD	Transmit Data
PIN 04	DTR	Data Terminal Ready
PIN 05	GND	Signal Ground
PIN 06	DSR	Data Set Ready
PIN 07	RTS	Request To Send
PIN 08	CTS	Clear To Send
PIN 09	RI	Ring Indicator

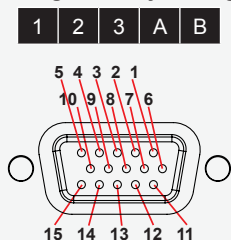
9 pin DSUB Serial COM RS-485/RS-422

Half Duplex Mode



PIN 01	Res.	Reserved, do not connect
PIN 02	Res.	Reserved, do not connect
PIN 03	Data+	Data Positive
PIN 04	Data-	Data Negative
PIN 05	GND	Ground
PIN 06	N/C	No internal connection
PIN 07	N/C	No internal connection
PIN 08	N/C	No internal connection
PIN 09	N/C	No internal connection

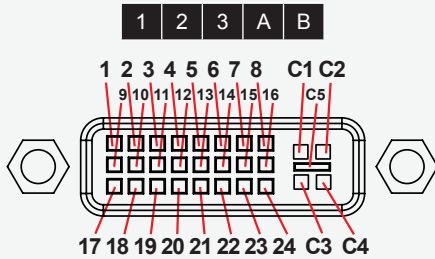
15 pin DSUB High Density Analog RGB/VGA



PIN 01	RED	Red, analog
PIN 02	GREEN	Green, analog
PIN 03	BLUE	Blue, analog
PIN 04	ID2/RES	Reserved for monitor ID bit 2 (grounded)
PIN 05	GND	Digital ground
PIN 06	RED_RTN	Analog ground red
PIN 07	GREEN_RTN	Analog ground green
PIN 08	BLUE_RTN	Analog ground blue
PIN 09	KEY/PWR	+5V power supply for DDC (optional)
PIN 10	GND	Digital ground
PIN 11	ID0/RES	Reserved for monitor ID bit 0 (grounded)
PIN 12	ID1/SDA	DDC serial data
PIN 13	HSYNC.	Horizontal sync or composite sync, input
PIN 14	VSYSN.	Vertical sync, input
PIN 15	ID3/SCL	DDC serial clock

Pinout Assignments

18/24/24+5 pin DVI-D, DVI-I, Single Link, Dual Link Combined



PIN 01	T.M.D.S. Data2 - (Digital - RED link 1)
PIN 02	T.M.D.S. Data2 + (Digital + RED link 1)
PIN 03	T.M.D.S. Data2/4 Shield
PIN 04	T.M.D.S. Data4 - (Digital - GREEN link 2)
PIN 05	T.M.D.S. Data4 + (Digital + GREEN link 2)
PIN 06	DDC Clock
PIN 07	DDC Data
PIN 08	Analog Vertical Sync (DVI-I only)
PIN 09	T.M.D.S. Data1 - (Digital - GREEN link 1)
PIN 10	T.M.D.S. Data1 + (Digital + GREEN link 1)
PIN 11	T.M.D.S. Data1/3 Shield
PIN 12	T.M.D.S. Data3 - (Digital - BLUE link 2)
PIN 13	T.M.D.S. Data3 + (Digital + BLUE link 2)
PIN 14	+5V Power (for standby mode)
PIN 15	Ground (for +5V and analog sync)
PIN 16	Hot Plug Detect
PIN 17	T.M.D.S. Data0 - (Digital - BLUE link 1) and digital sync.
PIN 18	T.M.D.S. Data0 + (Digital + BLUE link 1) and digital sync.
PIN 19	T.M.D.S. Data0/5 Shield
PIN 20	T.M.D.S. Data5 - (Digital - RED link 2)
PIN 21	T.M.D.S. Data5 + (Digital - RED link 2)
PIN 22	T.M.D.S. Clock Shield
PIN 23	T.M.D.S. Clock + (Digital clock + (Links 1 and 2)
PIN 24	T.M.D.S. Clock - (Digital clock - (Links 1 and 2)
PIN C1	Analog RED
PIN C2	Analog GREEN
PIN C3	Analog BLUE
PIN C4	Analog Horizontal Sync.
PIN C5	Analog Ground (return for RGB signals)

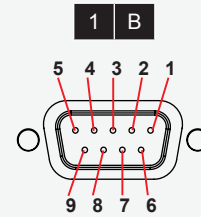
DDC = Display Data Channel.

.M.D.S = Transition Minimized Differential Signal

PIN C1,C2,C3,C4 = Only present on DVI-I connectors.

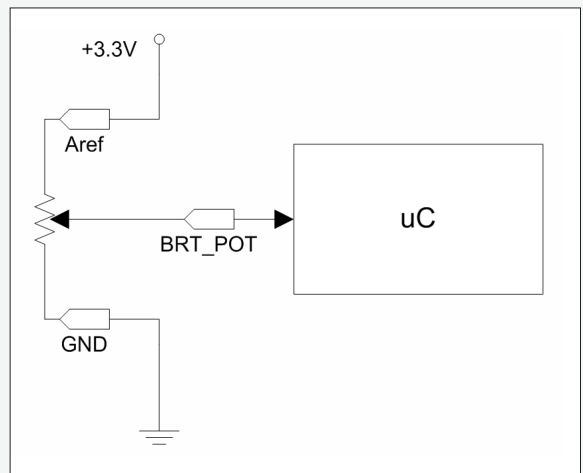
NOTE: Connector shows a DUAL LINK design, but some units may not support it. Only units with 1920x1200 or more in resolution require / support DUAL LINK.

9 pin DSUB Potmeter Control

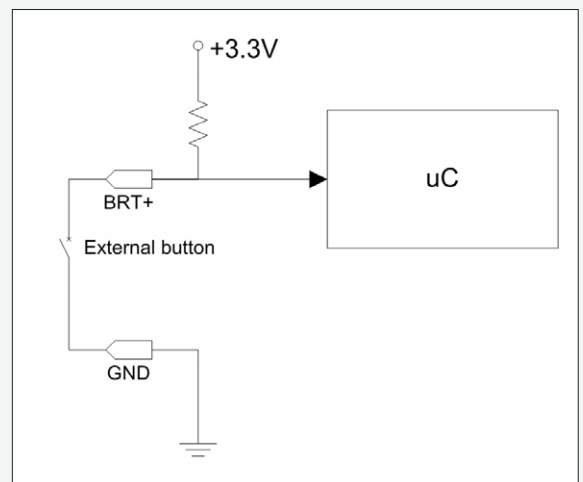


PIN 01	+5V	+5V out
PIN 02	Res.	Reserved, do not connect
PIN 03	Res.	Reserved, do not connect
PIN 04	Aref	For potentiometer
PIN 05	+12V	+12V out
PIN 06	BRT_POT	Potmeter in
PIN 07	BRT -	Button in
PIN 08	BRT+	Button in
PIN 09	GND	Ground

Potentiometer shall be 10kΩ and connected like this illustration below:

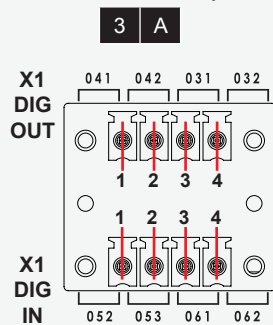


The BRT+ and BRT- can be used for controlling the brilliance by using external buttons. Example for the BRT+ input below:



Pinout Assignments

8 pin Digital Output / Input Module "Solid State Relay"

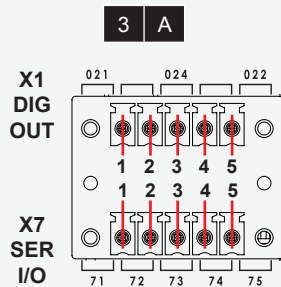


Pin 1	X1 - Out: 41	Out +
Pin 2	X1 - Out: 42	Out -
Pin 3	X1 - Out: 31	COM (Common Center Terminal) *
Pin 4	X1 - Out: 32	NC (Normally Closed)*

* IEC 60950 Compliant, 48VDC

Pin 1	X1 - In: 52	+24VDC
Pin 2	X1 - In: 53	GND (Ground)
Pin 3	X1 - In: 61	+24VDC
Pin 4	X1 - In: 62	+Input

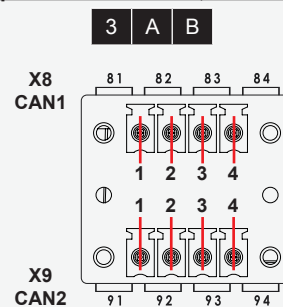
10 pin Digital Output / Input & Serial Module "Mechanical Relay & COM (isolated RS-422/485)"



PIN 1	X1 - Out: 21	COM (Common Center Terminal)
PIN 2	X1 - N/C	Not Connected / Not used
PIN 3	X1 - Out: 24	NO (Normally Open)
PIN 4	X1 - N/C	Not Connected / Not used
PIN 5	X1 - Out: 22	NC (Normally Closed)

PIN 1	X7 - In: 71	Rx+ (Receive Data +)
PIN 2	X7 - In: 72	Rx- (Receive Data -)
PIN 3	X7 - Out: 73	Tx+ (Transmit Data +)
PIN 4	X7 - Out: 74	Tx- (Transmit Data -)
PIN 5	X7 - GND: 75	SGnd (Signal Ground)

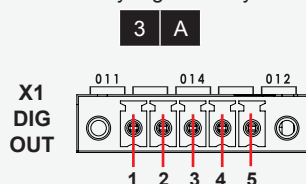
8 pin CAN I/O Module, 2 channels



Pin 1	X8 - Can1: 81	In Low
Pin 2	X8 - Can1: 82	Out Low
Pin 3	X8 - Can1: 83	In High
Pin 4	X8 - Can1: 84	Out High

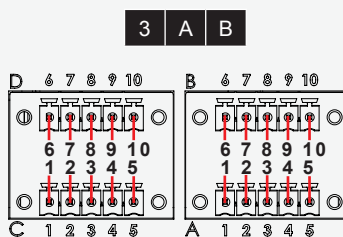
Pin 1	X9 - Can2: 91	In Low
Pin 2	X9 - Can2: 92	Out Low
Pin 3	X9 - Can2: 93	In High
Pin 4	X9 - Can2: 94	Out High

5 pin Digital Output Module "Safety Signal Relay"



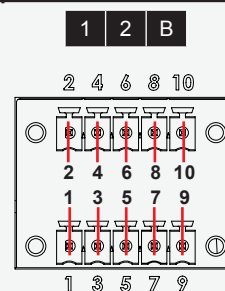
PIN 1	X1 - Out: 11	COM (Common Center Terminal)
PIN 2	X1 - N/C	Not Connected Not in use
PIN 3	X1 - Out: 14	NO (Normally Open)
PIN 4	X1 - N/C	Not Connected Not in use
PIN 5	X1 - Out: 12	NC (Normally Closed)

10 pin RS-422 / RS-485 NMEA Module, 2 ports "PCA100293-1"



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

10 pin RS-422 / RS-485 Module



PIN 1	RxD+	Receive Data Positive
PIN 2	GND	Ground
PIN 3	RxD-	Receive Data Negative
PIN 4	+5V	+5V Out
PIN 5	TxD+	Transmit Data Positive
PIN 6	BUZ-	Buzzer Control Negative
PIN 7	TxD-	Transmit Data Negative
PIN 8	BUZ+	Buzzer Control Positive
PIN 9	GNDR	Ground 100Ω
PIN 10	GND	Ground

Basic Trouble-shooting

GENERAL ISSUES FOR TFT PANEL BASED PRODUCTS

Note: Applies for a range of various products. This is only meant as a general guide.

NO PICTURE / LED BEHAVIOUR:

If there is no light at all in the LED at the FRONT, check power cables. If the LED in front is green then check if the brightness is set/adjusted to max brightness. Lack of image is most likely to be caused by incorrect connection, lack of power or wrong BIOS settings.

SCROLLING / UNSTABLE IMAGE:

Signal cable may not be completely connected to computer or TFT display. Check the pin assignments and signal timings of the display and your video card with respect to recommended timing and pin assignments. Make sure that the video card is compatible and that it is properly seated / installed on the computer.

DISPLAY AREA IS NOT CENTERED / SIZED CORRECTLY

Make sure that a supported video mode has been selected on the display, or on the video card / system. If it is impossible to position the image correctly, i.e. the image adjustment controls will not move the image far enough, then test it again using another graphics card for the PC system. This situation may occur with a custom graphics card that is not close to standard timings or if something is in the graphics line that may be affecting the signal, such as a signal splitter (please note that normally a signal splitter will not have any adverse effect). If it is impossible to change to the correct resolution/color depth, check if you have the right graphics driver installed in your system.

IMAGE APPEARANCE:

A faulty TFT panel can have black lines, pixel errors, failed sections, flickering or flashing image. Incorrect graphic card refresh rate, resolution or interlaced mode will probably cause the image to be the wrong size, it may scroll, flicker badly or possibly even no image is present. Sparkling on the display may be a faulty TFT panel signal cable, and it needs service attention.

RGB Signal Only: Horizontal interference can usually be corrected by adjusting the PHASE (OSD menu).
Vertical interference can usually be corrected by adjusting the FREQUENCY (OSD menu).

DEW CONDENSATION BEHIND GLASS:

Note that this problem will not occur on bonded products. For non-bonded products, do the following:
Power on the TFT product and set brightness to 100%. Turn off any automatic screensavers on PC or similar. During minutes the dew will be gone. To speed up the process, use a fan heater for a reasonable time. Do not overheat the unit.

GENERAL ISSUES FOR COMPUTER BASED PRODUCTS

Note: Applies for a range of various products. This is only meant as a general guide.

CD-ROM FAILURE OR READ/DETECTION PROBLEMS:

If the product are operated/located in a area with extreme condensation, the CD/DVD drive may not work correctly due to condensation on the read head. Keep the product on for a while until it's reached normal operating temperature, and retry accessing discs. Otherwise, consider using USB memory sticks or alternative storage devices.

NO CD-ROM AVAILABLE ON YOUR PRODUCT FOR INSTALLING DRIVERS/SOFTWARE:

Please use USB memory sticks, USB Floppy drive, USB CD-Rom Drive or alternative storage devices to transfer/install software on CD-ROM-less units.

HATTELAND® DISPLAY


Declaration of Conformity

We, manufacturer, **Hatteland Display AS**
Åmsosen, N-5578 Nedre Vats, Norway

declare under our sole responsibility that the
JH MMD, JH MMC, JH STD, JH MIL, HM NMD, HM MIL, HM CMD, HT STD, HD MMD, HM MMD, HT MMC
and HD MMC product ranges is in conformity with the following standards in accordance with the EMC Directive.

Low Voltage Directive 2006/95/EC
EN 60950

EMC Directive 2004/108/EC
EN 55022 Class A
EN 55024

Signature:.....
Frode Grindheim
Vice President Product Management
Nedre Vats, Norway

Signature:.....
Arne Kristiansen
Site Manager - Test & Commission Division
Oslo, Norway



CE MARK FIRST AFFIXED DATE (11 March 2010)

HATTELAND® DISPLAY


Declaration of Conformity

We, manufacturer, **Hatteland Display AS**
Åmsosen, N-5578 Nedre Vats, Norway

declare under our sole responsibility that the products listed below comply with
FCC 47 CFR Part 15, Subpart B, Class A:

JH MMD, JH MMC, JH STD, JH MIL, HM NMD, HM MIL, HM CMD,
HT STD, HD MMD, HM MMD, HT MMC and HD MMC product ranges.

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Signature:.....
Frode Grindheim
Vice President Product Management
Nedre Vats, Norway

Signature:.....
Arne Kristiansen
Site Manager - Test & Commission Division
Oslo, Norway



FCC MARK FIRST AFFIXED DATE (16 February 2012)

Return Of Goods Information

Return of goods:

(Applies not to warranty/normal service/repair of products)

Hatteland Display referenced as “manufacturer” in this document.

Before returning goods, please contact your system supplier before sending anything directly to manufacturer. When you return products after loan, test, evaluation or products subject for credit, you must ensure that all accessories received from our warehouse is returned. This applies to cables, powermodules and additional equipment except screws or similar, user manual, datasheets or other written paper documents. Furthermore, the product must not have any minor / medium or severe scratches, chemical spills or similar on the backcover, front frame or glass.

This is needed to credit the invoice 100%. Missing parts will not be subject for credit, and you will not get total credit for returned product. You will either be charged separately or the amount is withdrawn from the credit. If you decide to ship the missing items on the after hand, you will get 100% credit for that particular invoice or items received at manufacturer incoming goods control. Please contact our service/sales department if additional questions



Handling and packing units for return/credit

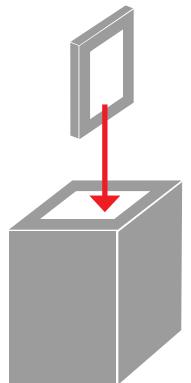
To prevent damage during shipping and transportation, respect the guidelines below.

Make sure you surround the product with the following material (whenever possible):

Use the original packaging from manufacturer, firm foam material, bubble wrap, lots of PadPack paper or foam chips/polyester wrapped in sealed plastic bags. Please make sure that the unit is protected with a surrounding plastic bag to prevent dust accumulation around the unit.

If you do not have the original packaging or are uncertain how to secure the unit properly, please consider seeking advice from nearby shipping or transportation offices, if in doubt!

Do not under any circumstances use loose foam chips, expanded polyester, clothes, cardboard with sharp edges/spikes, too little or nothing to secure the unit inside the box. Do not use cardboard boxes that are clearly too weak or not suitable for securing the unit properly during overseas shipment.



Terms Of Sale And Delivery

1) APPLICATION

The terms of sale and delivery apply for Hatteland Display.

2) PRICE

- a) The price is per each, if nothing else has been stated, VAT not included. Price is based on the prices from our suppliers, current custom rates, taxes, rate of exchange and international raw material prices. We reserve ourselves the rights to adjustments in case of alternation on the above mentioned.
- b) Included in the price is the supplier's standard packing. In case of re-packing/smaller quantities we reserve ourselves the right to add an additional sum for warrantable packing according to CECC 0015 (Basic inspection for protection of electrostatic sensitive devices)

3) VALIDITY

If nothing else has been stated in our quotation, the offer is valid for 30 days from the date of quotation.

4) PACKAGE QUOTATION

A package quotation means that all the components offered, must be ordered by us. If one component or more are removed from the quotation, the prices given in the package quotation are not valid.

5) TERMS OF PAYMENT

Cash on delivery or payment in advance. Net granted for companies, schools and institutions only, according to agreement. In case of too late payment 1.5% interest/month will be charged. Seller has mortgage rights in the goods delivered until the purchase price, additional interests and charges have been paid in full. Accepted bill is not considered as payment until it has been honoured in full.

6) TIME OF DELIVERY

The quoted time of delivery is based on information from our suppliers. We disclaim any responsibility for the consequences of any delay or cancellation from our suppliers. Belated delivery gives not solely the right for cancellation.

7) DELIVERY POINT OF TIME

Goods are considered delivered to customer when handed over to charterer.

8) FREIGHT / PACKING / FORWARDING FEE

Hatteland Display AS charge NOK 50,- in forwarding fee for orders below NOK 1000,-.
Freight charge according to expenses for orders above NOK 1000,-. VAT not included.

9) COMPLAINT

By receipt customer must check goods for obvious defects which have to be claimed within 8 days from receipt. Otherwise acceptance of complaint can not be counted on.

10) GUARANTEE / SERVICES

Time of guarantee is calculated from our date of shipment, and applies to the extent that we are covered by our supplier's guarantee regulations. The guarantee does no longer apply if:

- I) there has been encroached upon the goods without seller's consent
- II) terms of payment is not fulfilled
- III) the goods have been damaged due to unskilled treatment
- IV) components which are sensitive for static electricity have not been unpacked and treated in a secure way.

Minimum requirements: CECC 00015's standards for handling of such components. The guarantee does not include fair wear and tear.

11) RESPONSIBILITY

Seller undertake to deliver faultless and functional capable goods according to existing technical specifications. Seller disclaim responsibility for any damage or loss which directly or indirectly may be caused due to failure or defect with the delivered goods, if carelessness from the seller can be limited up to the cost of the goods. The supplier's responsibility for defects with the supplied goods do not include secondary damage or loss.

Terms

12) CANCELLATION / RETURN

Binding sales contract is concluded when we have confirmed customer's purchase order. Any disagreements in our order confirmation must be reported to seller within 6 days. The agreement can not be altered without our permission, after acceptance from our supplier. If goods are wanted to be returned, a Return No must be assigned from seller. Returned goods without a Return No will not be accepted. By return of stock listed goods, 20% return fee is charged. Returned goods are shipped on customer's account and risk.

13) LOAN, RENT and DEMO

When borrowing of goods for demo/test, the date of return must be added to the document. If no date has been stated, date of return is two weeks from the date of the document. Before return, seller must be contacted for a Return No (RTK). Goods which have been sold with an agreed right of return within stated terms, shall also have a Return No. The Return No must be obtained before the stated date of return. Returned goods without a Return No, or which have not been packed in original packing, will not be accepted.

14) LIMITATIONS

If any of our suppliers claim limited delivery terms towards us, our terms of delivery will be restricted according to those.

15) SOFTWARE

Sold or borrowed software is not allowed to be copied or spread in other ways, without a written permission.

16) RE-EXPORT

Goods delivered from seller may be subject to special rules of exportation in their supplier's native country. Buyer is responsible to obtain necessary permissions for further export/re-sale.

17) QUESTION IN DISPUTE

To settle any dispute the Karmsund Herredsrett is approved the legal venue.

INSTRUCTIONS FOR THE CONSIGNEE

1) CONTROL

Control the goods immediately by receipt. Examine the quantity towards the invoice/packinglist/shipping documents. Look for outward defects on the packing which may indicate damage on or loss of contents. Control the container and the seals for any defects.

2) SECURING EVIDENCE

When defects on the goods have been found, evidence must be secured, and seller must be informed. Call the transporter and point out the defects. Add a description of the defects on the goods receipt, the forwarder's copy of the way-bill or on the driving slip.

3) RESCUE

Bound the damage. Try to restrict the damage and the loss. Seller will compensate expenses incurred due to reasonable security efforts in addition to damage and loss.

4) COMPLAINT

Write immediately a complaint to the transporter or his agent. Forward immediately the complaint to the transporter or his agent, and hold the transporter responsible for the defects. The complaint must be sent at the latest:

- for carriage by sea: within 3 days
- for overland / air transportation within 7 days

5) DOCUMENTATION

For any claims the following documentation is required, and must be forwarded to the company or their agent: invoice, way-bill and/or bill of landing, and/or statement of arrival, inspection document, besides a copy of the letter of complaint to the transporter.

Pixel Defect Policy

PIXEL DEFECT POLICY

Dot-defects (Bright or dark spots on the panel)

Due to the effect that dot failures are part of the TFT technology such failure occurrence cannot be prevented basically. Even though dot defects usually occur during production process, new defects can appear within the lifespan of a TFT display. Neither the production at LCD-supplier nor the use of a LCD-Monitor after shipment can be influenced by Hatteland Display. Hence Hatteland Display cannot be made responsible for such dot failures. However Hatteland Display understand and accepts the responsibility towards the customers for the delivery of new displays, therefore accepts a limitation on dot defect's occurrence on new displays delivered to the customer.

PRINCIPLES

- a. One pixel consists of 3 dots (Red, Green and Blue)
- b. Dot defects are differentiated between:
 - Bright dot defects: Spot on the panel appear as pixels or sub pixels that are always lit. Non-extinguishing dot.
 - Dark dot defects: Spot on the panel appear as pixels or sub pixels that are always dark (off). Non-lightening dot.
- c. Inspector observes the LCD from normal direction at a distance of 50cm above the worktable. Dark dots are counted under entire white screen. Bright dots are counted under entire black screen.
- d. Dot failures within tolerances below do not qualify for warranty claims.

PIXEL DEFECT TOLERANCES

Bright dot	≤ 4 dots
Two adjacent bright dots *	≤ 2
Distance between 2 dot defects *	≥ 15 mm
Dark dots	≤ 8
Total number of bright or dark dot defects. *	≤ 8

* 1 or 2 adjacent dot defects considered as 1 defect.

EXTRAORDINARY CIRCUMSTANCES

Possible cases which cannot be influenced either by customer or Hatteland Display.

Examples for extraordinary circumstances:

- Allocation from LCD-Supplier
- Outstanding high number of LCD-panels with bright dots but within LCD-suppliers Specification.
- Sharply increased demand by customer

In such cases a mutual agreement is inevitable.

Examples:

- Acceptance of bright dots in "non-critical" display areas.
- Acceptance of bright dots with defined color.

Last Revised July 2007

General Notes: (For all products)

- The unit is type approved according to EN60945 4th, 4.4, equipment category b) protected from the weather.
- Other type approvals applies for the different products.
Please see the appropriate "Specifications" page in this manual for more information.
- Use of brilliance and Glass Display Control™ (touch key functions) may inhibit visibility of information at night.

Revision History

Rev.	By	Date	Notes
0	BU SE	08 Nov 2011 23 Nov 2011	Release for internal review. Revised after internal review.
1	BU SE	06 Dec 2011	Released for internet/customers
2	SE	21 Dec 2011	Revise text about other models, page 15 Revised specifications, minor text changes page 22,24,25,26 Added datasheet for JH C01MF A-A, page 28 Added datasheet for CAN MODULE with CO-Processor, page 29
3	GOS BT BU AK SE	07 Mar 2012	Added note on frontpage for MxC models, page 1 Revised Contents of Package, added HD XXTBR STD-A1 mounting brackets and added note, page 5 Added note for handling products correctly (First Things First!), page 12 Added installation procedure for Panel Cutout / Console Mounting Bracket Kit for 24 inch, page 17 Added indication/illustration of optional NMEA COM module, page 18 Revised Specifications where needed (small text changes and cleanup), page 26-30 Added preliminary 26 inch drawings and specifications, page 31, 43 Added datasheet for COM Module PCA100293-1, (RS-422/RS-485, ECDIS/NMEA Compliant), page 33 Added datasheet for COM Module PCA100294-1 (RS-232), page 34 Added installation procedure for Key Hole Mounting Bracket Kit, page 16, page 46 Added Pin Out assignment for DC Power Input, page 52 Added Pin Out assignments for specific Series X connectors, page 52-55 Revised text for "Handling and packing units for return/credit", page 58 Added FCC declaration, page 57
4	BU SE	14 Mar 2012	Removed numbering (COM1-4, COM3-6) and added instead note "configuration dependent", page 33,34 Changed 250 cd/m2 to 300 cd/m2, page 30

