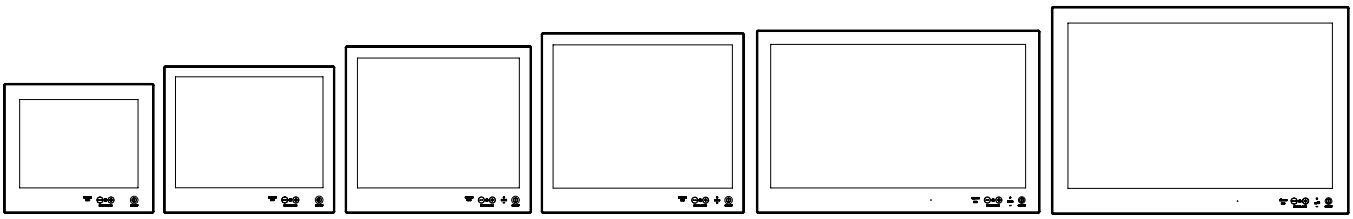
HATTELAND®
DISPLAY

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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The products described, or referenced, herein are copyrighted to the respective owners. The products may not be copied or duplicated in any way. This documentation contains proprietary information that is not to be disclosed to persons outside the user's company without prior written consent of Hatteland Display AS.

The copyright notice appearing above is included to provide statutory protection in the event of unauthorized or unintentional public disclosure.

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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.

Last revised 6 Jan 2015

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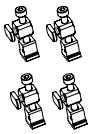
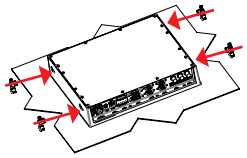
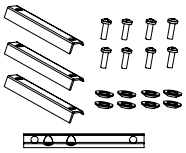
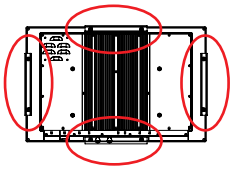
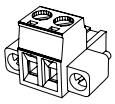
Contents

Contents

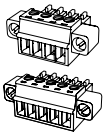
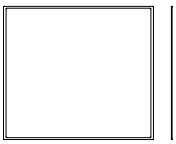
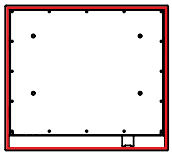
Contents

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. For most recent drivers, please visit “www.hatteland-display.com/archive”. 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. In some cases (due to revisions) a provisonal CD (PRO02-xxx) may be delivered with the unit instead.	 Menu browser for Microsoft® Windows® Operating Systems
	Recovery Image (located on hidden partition on SSD) Note: Only applicable for factory delivered units with SSD hardware.	
	Test Reports (3 x A4 papers): 1 x Display/MMC Checklist 1 x Product Declaration 1 x BurnInTest Certificate (signed)	
 HD CMB SX1-A1 or HD CMB SX1-A2	Model Dependent: 4 pcs of Key Hole Mounting Brackets for Console/Panel Mounting, Anodized Aluminium/Stainless Steel. The bracket kit is suitable for 12, 15, 17 and 19 inch units and is EN60945 Tested. Note: Either -A1 or -A2 version may be delivered during Q4-2014 to Q3-2015 Reference: http://www.hatteland-display.com/mails/02_2015_ecn.html A1: Suitable for panel thickness 3.0 [0.12] to max: 12.00 [0.47] mm [inch] A2: Suitable for panel thickness 1.0 [0.04] to max: 12.75 [0.50] mm [inch]	
 HD CMB SX1-B1 or HD CMB SX1-C1	Model dependent: 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 HD CMB SX1-B1 = Suitable only for 24 inch units and is EN60945 Tested. HD CMB SX1-C1 = Suitable only for 26 inch units and is EN60945 Tested.	
 Terminal Block Connector Kit	Terminal Block Connector Kit as follows (may in some cases be already factory mounted): 1 x 2-pin Terminal Block 5.08 (Phoenix 1961986) for DC Power In Refer to “Configuring Housing / Terminal Block Connector” section for usage.	

Package may also include: (based on accessories/options ordered)

Item	Description	Illustration
 Terminal Block Connector Kit	Depending on factory mounted options, Terminal Bracket Connector kit as follows: 4 x 5-pin Terminal Block 3.81 for RS-422 / RS-485 NMEA COM (PCA100293-1) 4 x 4-pin Terminal Block 3.81 for CAN Interface (ZIA0001310-B) 4 x 4-pin Terminal Block 3.81 Digital Input/Output (PCA100297-1)	 Note: Location of module(s) may differ between unit sizes
	For High Bright / Sunlight Readable models (17-24 inch) an EPDM sealing gasket for IP66 console mount is factory pre-mounted / included with delivery. Details / Type number reference: Surface: RAL9011, Glue: 3M9471LE, Thickness 2mm. P007130-1 (17), P007131-1 (19), P007032-1 (24)	

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General

Hatteland Display AS

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.

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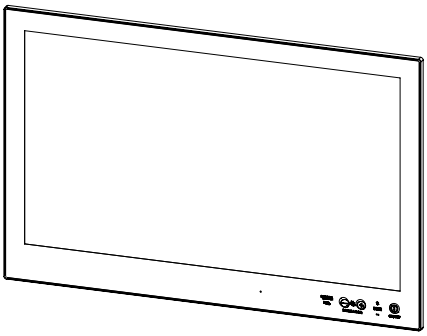
Sales office, Vista / USA: Hatteland Display Inc 380 South Melrose Drive, Suite 349 Vista, CA 92081 USA Tel: +1 760-643-4061 Fax: +1 858-408-1834	

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.

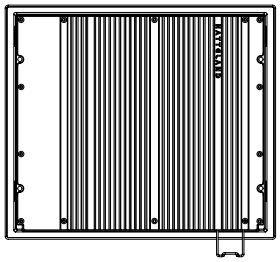
With cast aluminium, compact and sleek by design chassis, the units from this new range can be desk mount or console integrated. The design is modular, allowing for common modules to be used in various models and combinations. Together these design features bring about a range perfectly in synch to market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

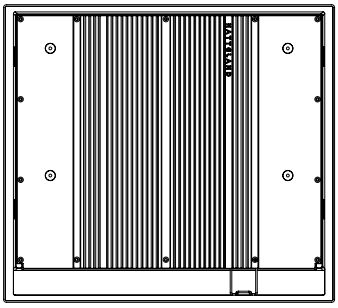
The modules used in Series X, are all qualified having undergone and passed our extensive test program, which includes HALT testing. This means that the products are tested well outside the requirements in EN60945 and E10. The result is a more reliable product.

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.

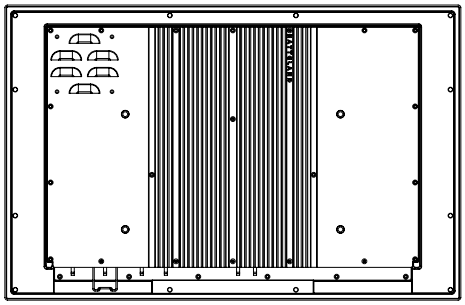
The considerable advances made by Hatteland Display over recent years in PC platform development is now enhancing further the panel PC offering. All Series X display sizes are available with state of the art PC technology integrated, designed and built for type approved maritime systems.

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



Touch screen products

Introduction to products with touch screen

Nearly all of our Series X products with touch screen uses Projected Capacitive Touch screen (PCTS), widely used with great success on mobile phones and typical pad devices. PCTS can be equally effective also for marine applications. One of the advantages of PCTS is that it has features seen in both resistive and surface capacitive touch screen technologies.

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

Please review the appropriate Product Data Sheet (in this manual) to determine if PCTS are supported.

The technical benefits of PCT are:
- Very good optical performance (same as surface capacitive)

- Environmentally strong, the touch sensor is inside the product (better than both surface capacitive and resistive)

- Supports Multitouch (Newer Operating System (OS) required in most cases.

- Excellent readability - light transmission of up to 91% through a standard sensor

- Stability - no drift, therefore no recalibration is required

- Pointing device - works with gloved and ungloved finger

- Resistance to contamination - by harsh cleaning fluids and other noxious substances

- Communicates via USB to external computer or internally

Comparisons between general Touch Technologies used by Hatteland Display:

Technology	Optical Performance	Stable Calibration	Gloves	Water	Durability	Price	Multitouch
Analog Resisitive	- -	+	+ +	+ +	-	+ +	-
Surface Capacitive	+ +	-	- -	-	+	-	-
Projected Capacitive	+ +	+ +	+	+ *	+ +	+	+ +

*Projected Capacitive (PCTS) / Water: Touch Screen Glass Surface can withstand drip and direct rain, but expect reduced capability, detection and performance if unit are exposed to these factors while powered. Hatteland Display recommends to protect the unit from direct rain or drips if critical touch operations are to be performed. Take nessessary steps (if detected or suspected) within the installation environment to prevent accidental touch gestures or presses not performed intentionally by a human operator.

Touch screen products

Touch Screen Drivers and Documentation

All units are shipped with a Documentation and Drivers DVD or CD which contains suitable drivers* for touch screens. (Named MEDIA STD01).

You can also visit our website www.hatteland-display.com/archive to view the same list (or even recently new added products) for our models with touch screen.

Before using the touch screen, it should be calibrated for your system.
Please install the 3rd party software* and use the Calibrate function.

For additional touch controller/screen documentation and updated drivers*, please visit the 3rd party manufacturer website as found in the Touch Screen Wizard menu.

***General Note:**
Newer Operating Systems (OS), from year 2011 and above, does not specifically require additional 3rd party drivers in order to operate the touch screen and support “Multitouch”. For example; Microsoft® Windows® 7 and above comes with default factory installed Windows HID drivers fully supporting “Multitouch”. You may choose to install 3rd party drivers for example during trouble-shooting situations or to review features of the 3rd party software. Hatteland Display suggests that you should use factory default Microsoft® Windows® 7 HID touch drivers in any case possible.

For older Operating Systems (like Microsoft® Windows® XP and older), before year 2011, the OS does not not support “Multitouch” technology and the touch screen will just operate as a ordinary single-point touch screen. Additionally to get touch screen working at all in older OS, you need to install 3rd party drivers.

Note that the lack of “Multitouch” support is not dependent on hardware or software/firmware for the controller specifically, but rather dependent on important core functions in the Operating System which are outside control of the 3rd party software.

Summary

Microsoft® Windows® 7 / Microsoft® Windows® 8 / Microsoft® Windows® 8.1 / Microsoft® Windows® 10 IoT
- All HD xxT21 / T22 / MVD units:
- Please use Windows® Generic HID driver, no specific driver needed to use multi-touch.

Microsoft® Windows® 7 32 bit only
- HD 07T22 / HD 13T22 units:
- Please use Windows® Generic HID driver, no specific driver needed to use multi-touch.

Linux (openSUSE® 11.4, Fedora™ 15, Ubuntu® 10.04 LTS, Ubuntu® 12.04 LTS)
- All units:
- Please use Linux Generic Touch driver.
  Note: Kernel before 2.6.38: Single touch support.
  Note: Kernel above 2.6.38: Multi touch support.
*32bit only available for HD 07T22 / HD 13T22 units. Other units, 32/64 bit supported.

---------- Note: Windows® XP is End Of Life ----------
Reference: http://www.hatteland-display.com/mails/09_2016_eol.html

Microsoft® Windows® XP
- 24 and 26 inch HD xx21 units:
- Please use Touch Screen Driver Wizard and install PCT Touch Utility, example PtouchUtility-1.0.0.4-150326.exe.
  Reference August 2015: http://www.hatteland-display.com/mails/21_2015_ecn.html

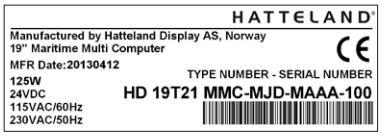
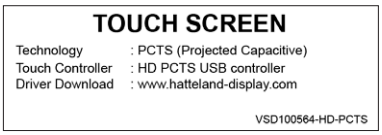
Microsoft® Windows® XP
- 8, 12, 13, 15, 17 and 19 inch HD xxT21 units:
- Please use Touch Screen Driver Wizard and install eGalaxTouch Drivers (XPE_5.11.0.9223).
---------- Note: Windows® XP is End Of Life ----------

Product Labeling

Introduction

This section details the locations, content details and specifications for factory mounted labels for all currently available standard Hatteland Display Panel Computer (MMC) models. This information will in most cases also apply for most Customized Models as well, but may differ based on customer requirements, in that case, please refer to the customized User Manual (paper or electronic version, dependent on customer requirements).

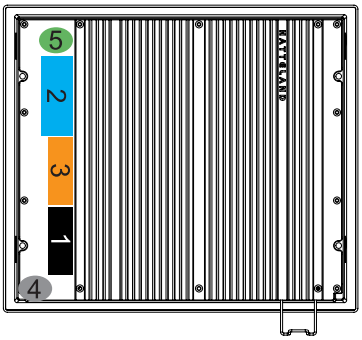
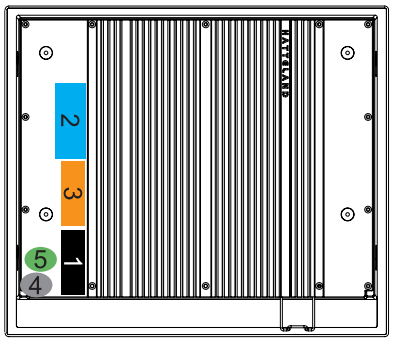
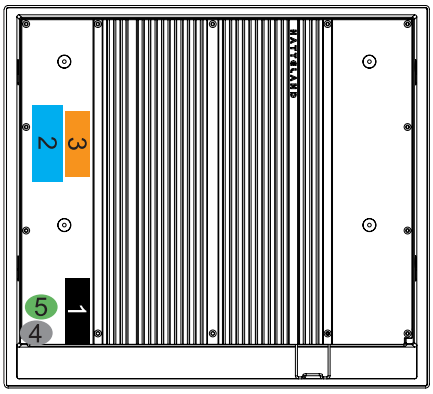
Label Size and Types

ID	Label Layout	Description	Specification
1	 Please note that typenumber shown above is a generic sample only. May not reflect products mentioned in this manual. Please review actual product S/N label.	**Type : Serial Number Label** **Name** : Label B **Size** : 60mm wide x 22mm high (rectangle size) Note: Text content of label will match specifications derived from Data Sheet. **Barcode type:** CODE128 (used extensively world wide in shipping and packaging industries. The symbology was formerly defined as ISO/IEC 15417:2007.)	Silver with glue on back, non-tearable and made for thermal transfer printing.
2		**Type : Operating System (OS) label.** Microsoft® Windows® Embedded Enterprise only. **Size** : 70mm wide x 28mm high (rectangle size) Note: Label only present if OS was part of factory option order. Linux OS does not have any label.	As per delivered from supplier.
3		**Type : Touch Screen Label** **Name** : Label B **Size** : 60mm wide x 22mm high (rectangle size) Note: Only present if Touch Screen was part of factory option order. **Note:** Content on label will vary based on Touch Screen type and/or Touch Screen Controller. Label shown to the right is for illustration purposes only!	Silver with glue on back, non-tearable and made for thermal transfer printing.
4		**Type : Warranty Label** **Size** : 30mm wide x 23mm high (oval size)	Tampering proof sticker with glue on back.
5		**Type : Quality Control (QC) Label** **Size** : 30mm wide x 23mm high (oval size)	Ordinary sticker with glue on back.

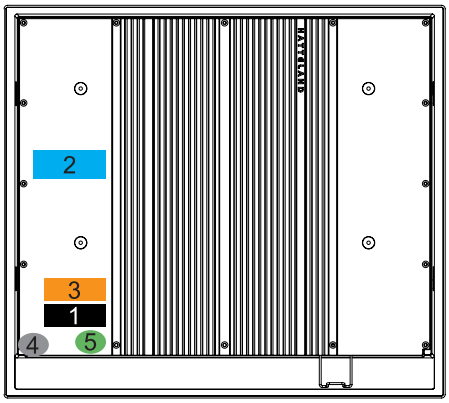
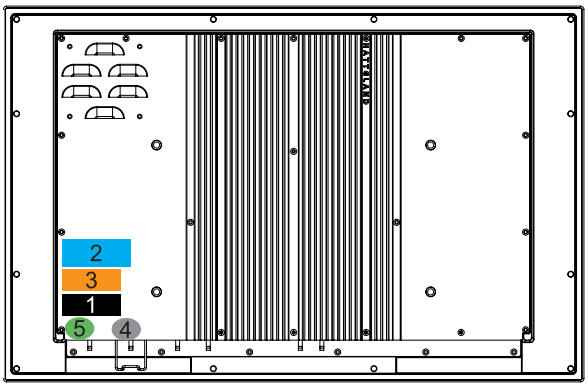
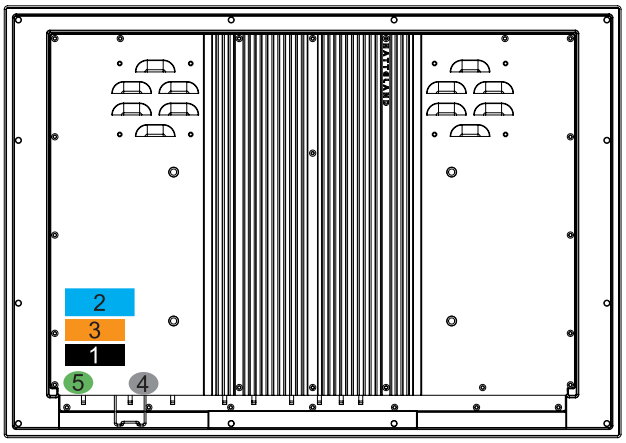
Product Labeling

Label Locations

Number ID and coloring based on “Label Size and Types“ table from previous page. All illustrations below is seen from rear (and side where needed) with connectors facing down. Actual labels regarding its size and text orientation vs product size is drawn in. Due to space restrictions on selected units, some labels will be rotated 90 degrees to fit properly. The arrangement of labels may be shifted/stacked differently as it is based on factory options, such as; Touch Screen and Operating System (OS), but they will be grouped together where possible.

Label Positions	Notes	Applies for Product Range
	Warranty label covers screw. Labels placed on rear.	**HD 12T21 MMC-xxx-xxxx**
	Warranty label covers screw. Labels placed on rear.	**HD 15T21 MMC-xxx-xxxx**
	Warranty label covers screw. Labels placed on rear.	**HD 17T21 MxC-xxx-xxxx**

Product Labeling

	Warranty label covers screw. Labels placed on rear.	**HD 19T21 MxC-xxx-xxxx**
	Warranty label covers screw. Labels placed on rear.	**HD 24T21 MxC-xxx-xxxx**
	Warranty label covers screw. Labels placed on rear.	**HD 26T21 MxC-xxx-xxxx**

Product Labeling

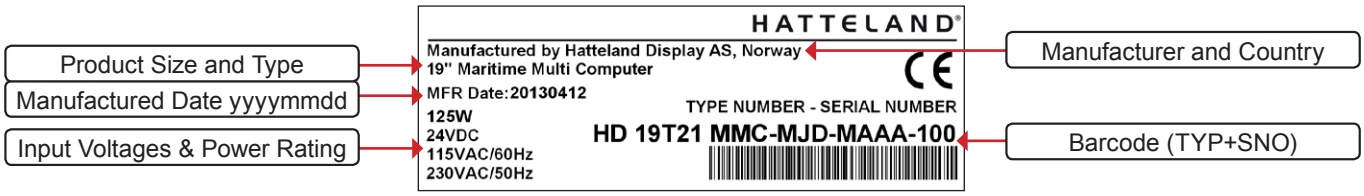
Warranty Label

If you are to perform service on a unit still under warranty, any warranty will be void if this label show 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 personnell responsible for approving the unit in production, test and warehouse departments.

Serial Number Label Layout (example)



Please note that typenumber shown above is a generic sample only. May not reflect products mentioned in this manual. Please review actual product S/N label.

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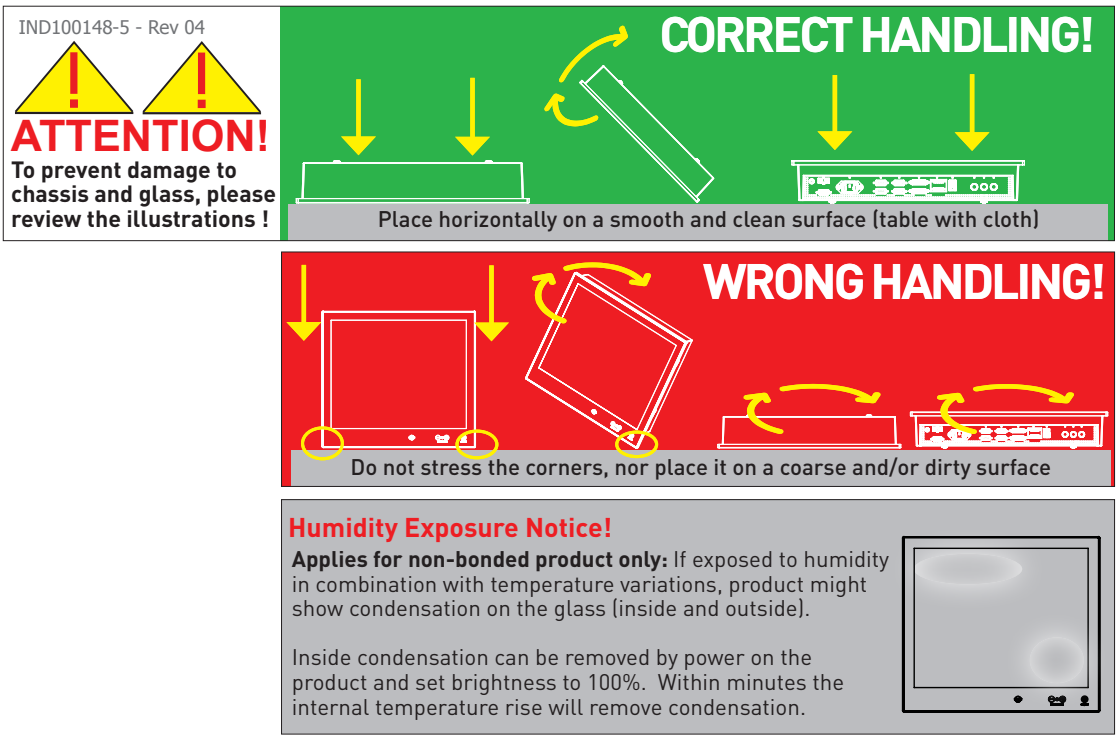
Installation

General Installation Recommendations

First Things First!



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 thermal situation we recommend to use forced air passing by the product. In some cases, convection based cooling can create “heat zones” around the product. 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.

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.

General Installation Recommendations

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. Expose 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.

Installation limitations

Due to environmental factors, please review the points noted below.

A: Overheat prevention:

For Maritime Multi Computer (MMC, Panel Computers) it is advised that you do not mount the unit in a vertical angle lower than ±30 degrees, as noted in point 3 (previous section), i.e. flat mounting of the unit. This is to prevent both overheating the unit as well as ensure proper cooling airflow to sustain long-life and stable operation. Panel Computer units generate more heat than regular Display units naturally because of CPU and mainboard chips.

It should be noted that 24” and 26” MMC units have internal fans providing additional cooling airflow of their own, whilst smaller units (typically 8” to 19”) has no internal fans. In such cases, the ±30 vertical angle may in certain situations allow for lower angle mounting provided that the console casing has adequate cooling (see point D), however this is suggested as a trouble-shooting tip during installation or during short-term observer use if found suitable. It should not be considered as a defintive trusted solution.

B: Glass Display Control™ (GDC) front glass touch buttons:

As this uses Projected Capacitive technology (instead of conventional hard physical buttons and knobs), the touch controller can react and are sensitive to raindrops (for outdoor installations). To ensure that raindrops do not stay on the unit’s flat glass surface, please do not mount the unit in a vertical angle lower than ±30 degrees, i.e. flat mounting of the unit. This is to prevent accidental touches that are similar to a human finger (cover area for a x period of seconds) as well as make sure the raindrops are “moving” and slides down off the glass surface.

For Maritime Multi Display (MMD) and Industrial Standard Display (STD) units (not available for Panel Computers (MMC) units), the angle could potentionally be lower as the On Screen Display (OSD) menu offers a "OSD Key utdoor" function with 5 seconds delay before activation on front glass functions. Please review the "OSD Menu Functions" to learn more. In certain situations this might help, but is only suggested as a trouble-shooting tip during installation or during short-term observer use if found suitable. It should not be considered as a defintive trusted solution.

C: Projected Capacitive Technology (PCTouch) MULTITOUCH and in general Touch Screen glass:

For all units with a factory mounted touch screen and for outdoor use especially, please review point B above regarding staying raindrops. Only solution to this situation is not to mount the unit in a vertical angle lower than ±30 degrees, i.e. flat mounting of the unit to ensure touch screen is not activated and accidentally automatically chooses functions in your running chart, radar or other software installed.

D: General rule for console mounted units:

To ensure proper cooling airflow, long-life and stable operation for all units, please make sure that the console casing have either fans or decent ventilation holes to prevent overheating inside the console due to the combined temperature of both Display or Panel Computer units together with other electronic instruments. A general rule is to make sure the console casing is capable of expelling “worst case scenario” in respect of the “Max Power Consumption” of all devices installed. Please review also point 2, 5, 6 and 9 (previous section) for additional information and installation tips.

Note that 24” and 26” Panel Computer units have their own internal fans. See point A for more information.

General Installation Recommendations

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. This Product shall be grounded to protective Earth. For AC Power cables this is done through the ground wire in the connector, for DC input the ground bolt shall be used. A shorter and thicker cable gives better grounding. A 6mm² is recommended, but a 4mm² or even 2.5mm² can be used for this purpose

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. The front surface of the display glass has an anti-reflective (AR) coating which can be scratched and damaged with improper cleaning. It is recommended to use only 90+% pure Isopropyl alcohol (Isopropanol) and a soft fabric cloth for this first cleaning. Fold a cloth into a small pad, dampen the cloth with alcohol, and wipe the glass from one edge to the other in one direction with one continuous motion. The product glass will require cleaning as needed. The soft cloth & alcohol wipe is recommended to clean fingerprints and oils off the glass. Water stains (including coffee, tea & coke) should be first cleaned off the glass with a soft fabric cloth wet with water, immediately followed with wiping using an alcohol wetted cloth.

2. 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.

3. Adjust screen inclination to remain gaze angle to the centre of the screen approximately perpendicular to the line of gaze.

4. 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.

5. 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 and/or High Bright panels 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.

6. 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).

7. For ECDIS applications, the minimum recommended viewing distance are as follows:
   (IEC62288, Part 7.5 Screen resolution)

17 inch = 907mm	19 inch = 1010mm	24 inch = 951mm	26 inch = 985mm		

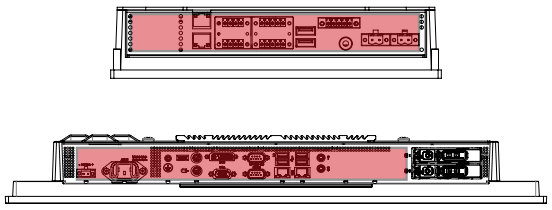
Cables

Use only high quality shielded signal cables.

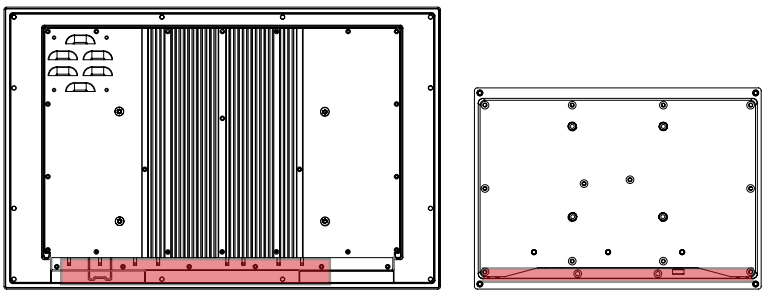
Cable Entries & Connectors (Marked area)

Illustration below for smallest/largest sizes only.

Bottom View



Back View



General Installation Recommendations

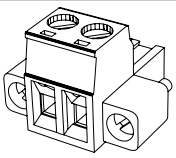
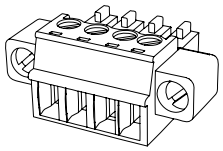
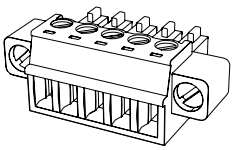
Maximum Cable Length

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

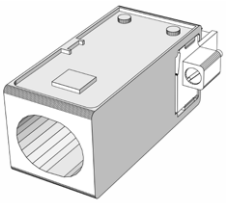
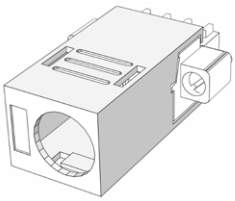
Housing / Terminal Block Connector Overview

Housing / Terminal Block connectors are available in different sizes (example 2-pin, 4-pin, 5-pin) which plugs into the connector area of the unit. They are mounted by factory default and delivered with the unit. The housing / terminal block connectors have steering rails, which ensures that it can not be mounted wrong. The color of these connectors may vary between black, green and orange depending on manufacturer. You may use approved equivalents of these connectors, but note that warranty will be void if any damage would occur to either the unit's original PCB terminal socket connector or inside the unit (electronic components, boards etc.). The table below is applicable for any Series X products, such as Display and Panel Computers, including newer type of Stand-Alone Computers.

Illustration	Pins	Manufacturer Details	Connector used for module
	2-pin	MSTB 2,5/ 2-STF-5,08 BK Screwdriver: SZS 0,6x3,5, slot-headed. Tightening torque min. 0.5 Nm. Tightening torque max 0.6 Nm.	• DC Power IN (24VDC) - Single Input Identified on Hatteland Display product data sheet as: "Terminal Block 5.08"
└ Reference: http://catalog.phoenixcontact.net/phoenix/treeViewClick.do?reloadFrame=true&UID=1961986			
	4-pin	BCZ 3.81/04/180F SN BK BX Screwdriver: 0.4x2.5mm DIN 5264. Tightening torque min.. 0.2 Nm. Tightening torque max. 0.25 Nm.	• CAN Interface (ZIA0001310-B) Identified on Hatteland Display product data sheet as: "Terminal Block 3.81"
└ Reference: http://catalog.weidmueller.com/catalog/Start.do?localeId=en&ObjectID=1792970000			
	5-pin	MC 1,5/ 5-STF-3,81 Screwdriver: SZS 0,4X2,5mm VDE, slot-headed. Tightening torque min. 0.22 Nm. Tightening torque max 0.25 Nm.	• RS-422 / RS-485 NMEA (PCA100293-1 / Q170 IO) • Digital Input/Output (PCA100297-1 / Q170 IO) Identified on Hatteland Display product data sheet as: "Terminal Block 3.81"
└ Reference: http://catalog.phoenixcontact.net/phoenix/treeViewClick.do?reloadFrame=true&UID=1827732			

General Installation Recommendations

If your installation require additional cable fasteners support, please visit and purchase directly from manufacturer: Illustrations below are approximate, actual Housing and Hood may deviate slightly, but function remains the same.

Cable Housing - Illustration	Cover Hood - Illustration
 KGG-MSTB 2,5/ 2 (2-pin) KGG-MC 1,5/ 5 (5-pin)	 BCZ 3.81 AH04 BK BX (4-pin) BCZ 3.81 AH05 BK BX (5-pin)
For 2-pin and 5-pin: https://www.phoenixcontact.com/online/portal/us?uri=pxc-oc-itemdetail:pid=1803934&library=usen&pcck=P-11-02-01&tab=1 https://www.phoenixcontact.com/online/portal/us?uri=pxc-oc-itemdetail:pid=1834372&library=usen&pcck=P-11-02-01&tab=1 For 4-pin and 5-pin http://catalog.weidmueller.com/procat/Product.jsp;jsessionid=B040D5EB6832629E567C884809FDF6C1?productId=(%5b1005290000%5d) http://catalog.weidmueller.com/procat/Product.jsp;jsessionid=D399022A1B3211C0146BCBE716D93211?productId=(%5b1005300000%5d)	

Configuring Housing / Terminal Block connectors

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 procedure for a 2-pin DC power connector. The procedure is the same for other connectors of this type as listed in table above. Unit used as illustration below is for reference only.

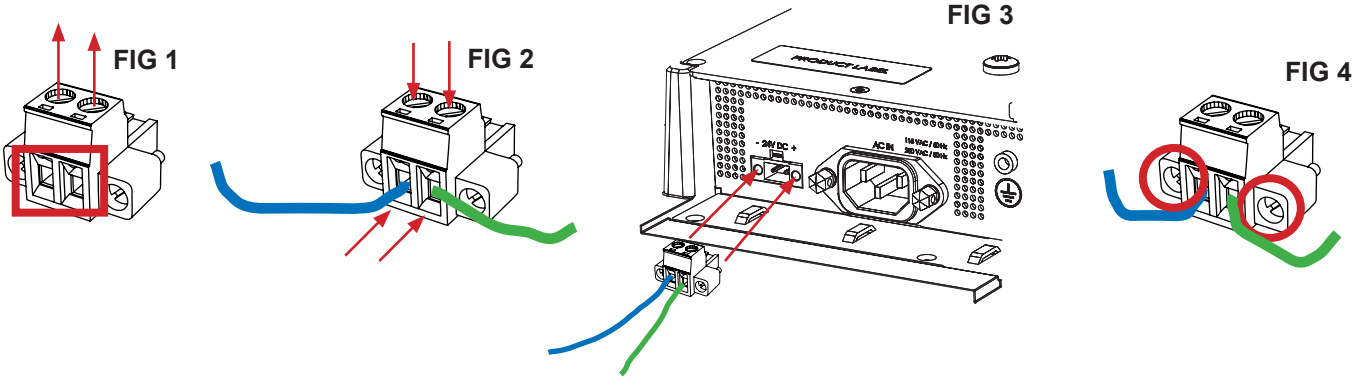


FIG 1: Unscrew (from top) or make sure that the screw terminal (square area) are fully open, so you can secure the inserted cables correctly to the loose housing connector (it may already be plugged into the unit as per factory installation).

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 (glass should be facing down) 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).**

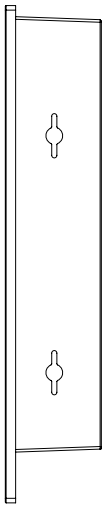
Installation Procedures

Panel / Console Mounting Bracket Kit for 12”, 15”, 17” and 19”

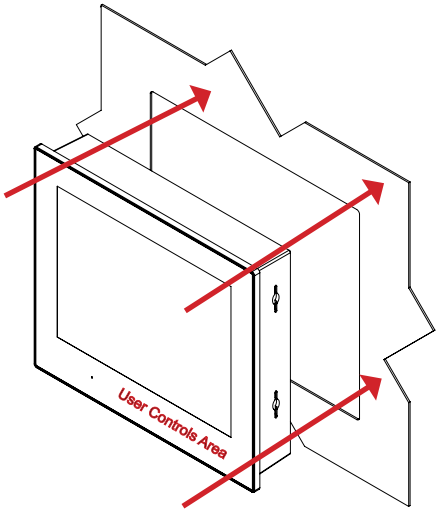
You need: Allen Wrench tool (3mm), 4 pcs of HD CMB SX1-A2 or -A3 Kit (-A2 included in delivery).
Procedure suitable for: Display and Panel Computers. Brackets are EN60945 Tested.

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.

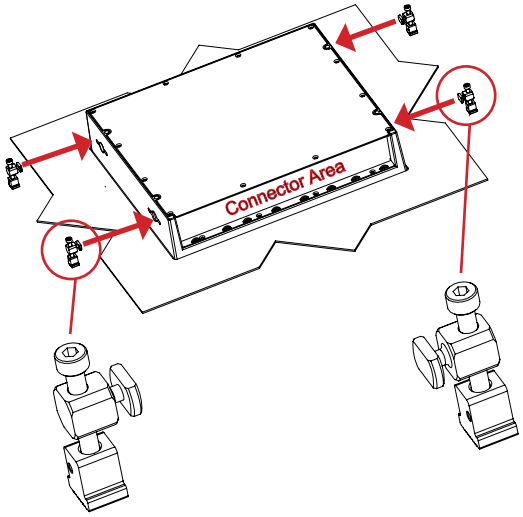
Confirm you have the Double Key Hole model before proceeding!



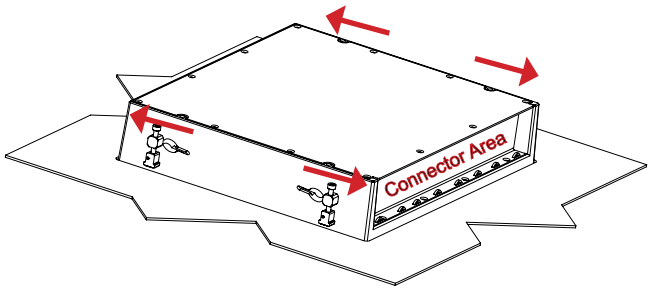
1: Slide the unit into the cutout carefully. User Controls and Connector Area should be facing downwards.



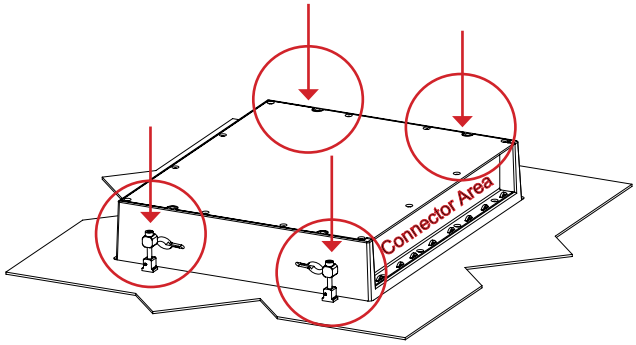
2: Prepare and position the brackets into each of the four key holes. The key part goes into the unit’s largest area of the keyhole, while the Allen screw is visible at the top. See closeup.

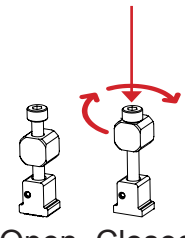


3: When all brackets fits inside the keyhole, slide them to opposite positions from eachother (upper to up, and lower to down) into the narrow gaps, If you are unable to slide them up/down, simply adjust/loosen the top Allen Screw slightly and try again.



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.





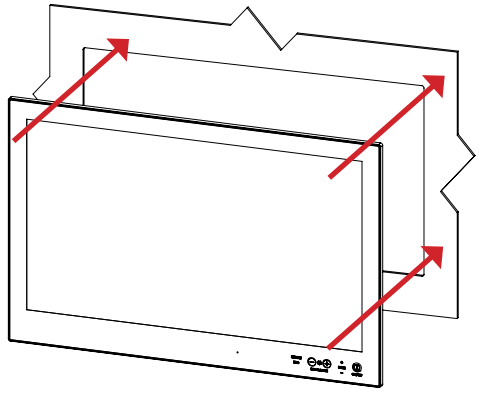
Installation Procedures

Panel Cutout / Console Mounting Bracket Kit for 24”

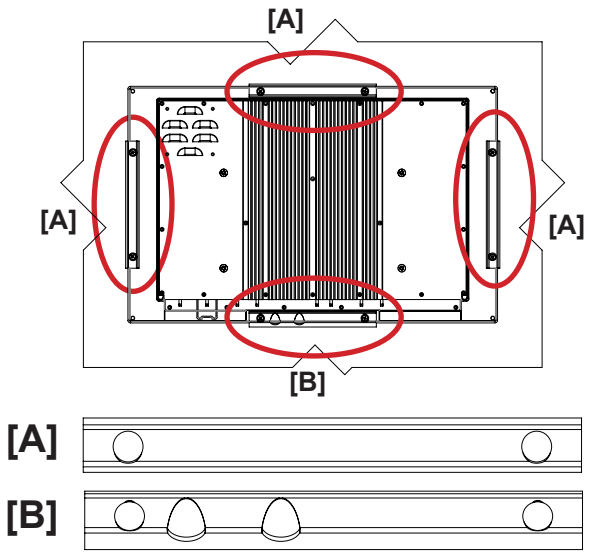
You need: Torx T25 tool, 1 pcs of HD CMB SX1-B1 kit (included in delivery).
Procedure suitable for: Display and Panel Computers Series X range. Brackets are EN60945 Tested.

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.

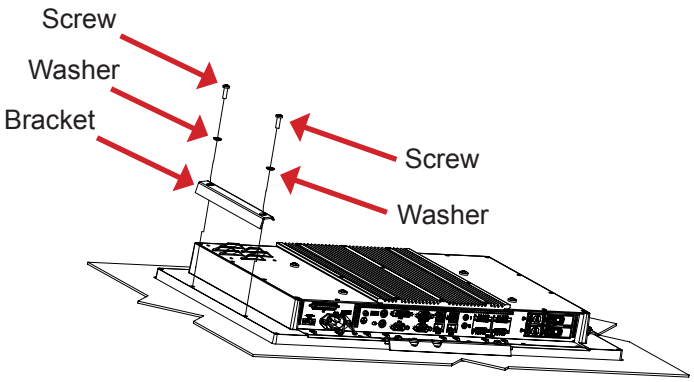
1: Slide the unit into the cutout carefully. User Controls and Connector Area should be facing downwards.



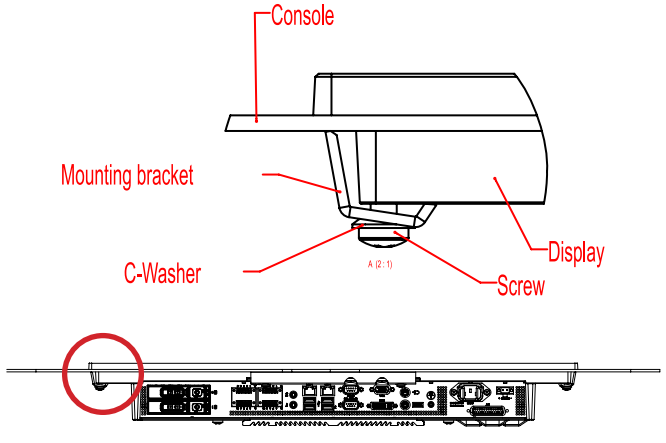
2: Make sure you are aware that brackets should be mounted on TOP, LEFT, RIGHT and BOTTOM sides. Note that the [B] bracket is different than the [A] brackets and mounted near the connectors. See closeup of details.



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. Use Torque Force 3.0Nm, 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.



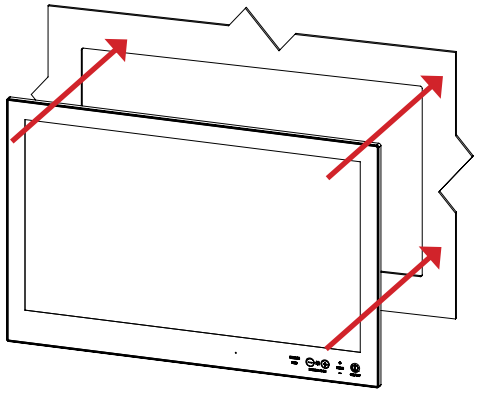
Installation Procedures

Panel Cutout / Console Mounting Bracket Kit for 26 inch

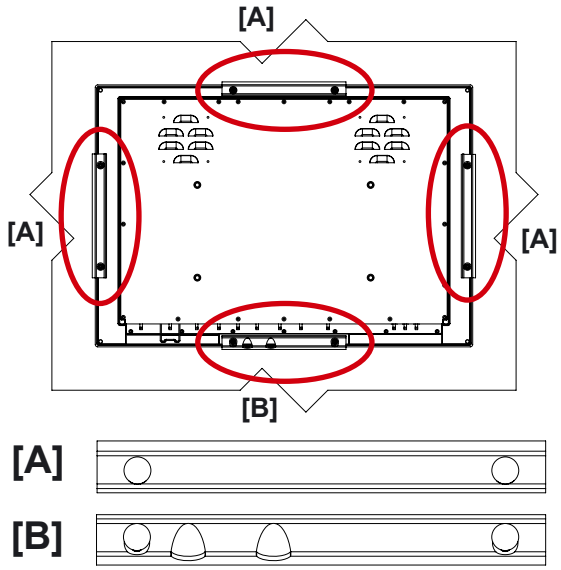
You need: Torx T25 tool, 1 pcs of HD CMB SX1-C1 kit (included in delivery).
Procedure suitable for: Display and Panel Computers Series X. Brackets are EN60945 Tested.

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.

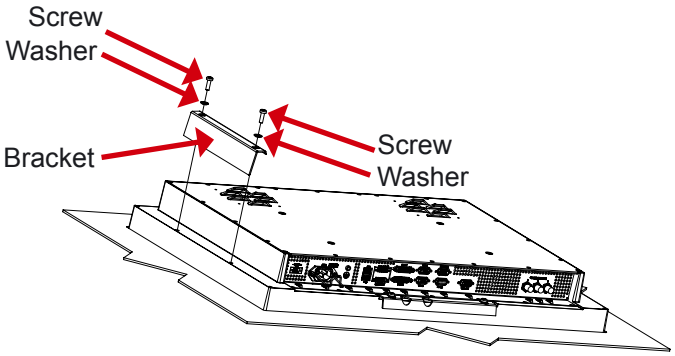
▼ 1: Slide the unit into the cutout carefully. User Controls and Connector Area should be facing downwards.



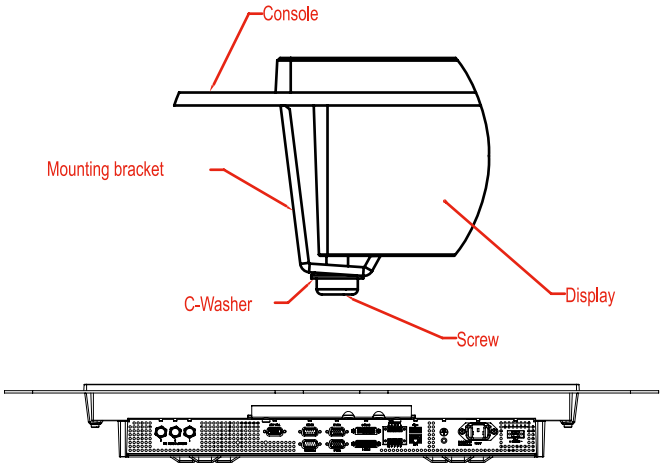
▼ 2: Make sure you are aware that brackets should be mounted on TOP, LEFT, RIGHT and BOTTOM sides. Note that the [B] bracket is different than the [A] brackets and mounted near the connectors. See closeup of details.



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. Use Torque Force 3.0Nm, 2 screws and 2 washers pr. bracket. Note the orientation of brackets before you begin.

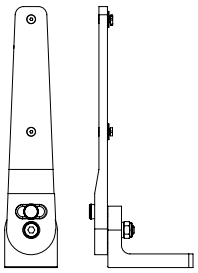
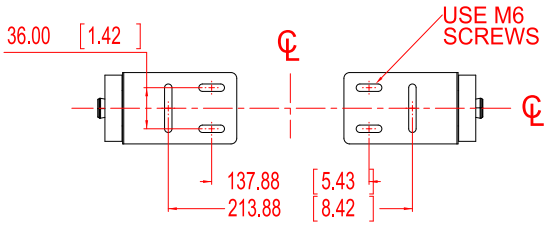
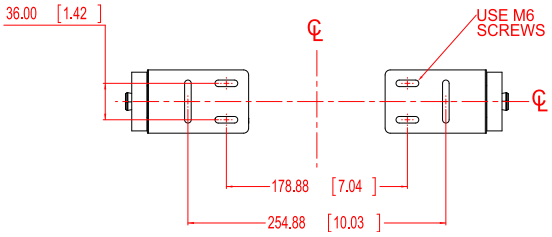
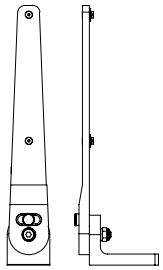
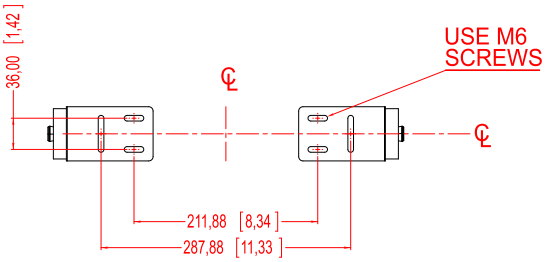
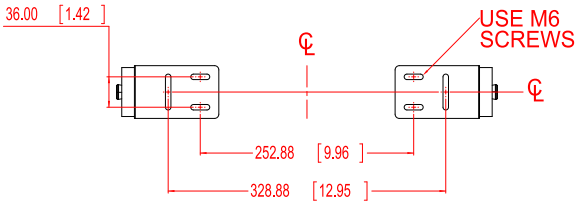


▼ 4: Review closeup of the mounting of brackets with screws and C-Washers in place. Seen from bottom side.



Installation Procedures

Mounting Bracket, Table / Desktop / Ceiling - 12”,15”,17”,19”

Typenumber	Illustration	Fits unit model	“Footprint” indicates holes to drill at installation location.
HD TMB-SX1-A1		HD 12T21 MMD-xxx-Fxxx HD 12T21 STD-xxx-Fxxx HD 12T21 MMC-xxx-xxxx	
		HD 15T21 MMD-xxx-Fxxx HD 15T21 STD-xxx-Fxxx HD 15T21 MMC-xxx-xxxx	
HD TMB-SX1-B1		HD 17T21 MMD-xxx-Fxxx HD 17T21 STD-xxx-Fxxx HD 17T21 MxC-xxx-xxxx	
		HD 19T21 MMD-xxx-Fxxx HD 19T21 STD-xxx-Fxxx HD 19T21 MxC-xxx-xxxx	

Installation Procedures

Important to know about LEFT and RIGHT brackets

Throughout the following installation procedure, it is important to understand the difference between LEFT and RIGHT brackets. The Display and Panel Computer chassis are not 100% square boxed, but are slightly designed with a minor narrow angled chassis towards the rear (FIG1) to allow easier “drop-in” of units into consoles. Likewise to get a correct footprint placement of the brackets, both brackets feature a slight angled design on the oval circled cut shaped block to compensate for this (FIG2) making LEFT and RIGHT bracket slightly different and naturally has to be correctly mounted.

Please ensure that LEFT and RIGHT brackets are as indicated in FIG4, and not as shown in FIG3 below.

FIG 1
Red Line straight up
Green Line indicates slight angled design of chassis

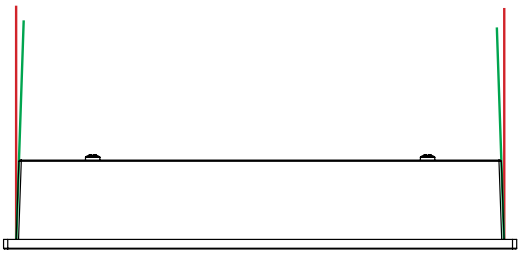


FIG 2
Location of angled block,
and seen straight from top showing slight angle

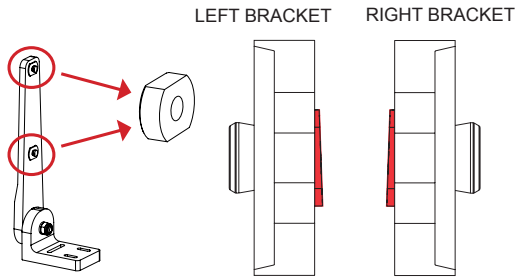


FIG 3 - Seen from under bracket base
Wrong mounting of LEFT / RIGHT Brackets
Indicating footprint is incorrect

FIG 4- Seen from under bracket base
Correct mounting of LEFT / RIGHT Brackets
Indicating footprint is correct

Installation Procedures

Installation Procedure - TMB Versions

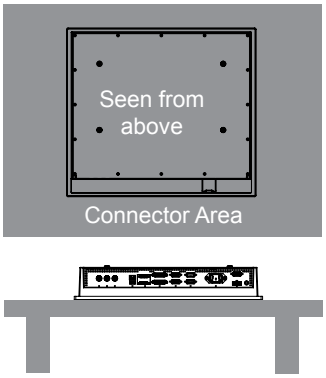
Procedure suitable for: Display (MMD/STD) and Panel Computer (MMC) Series X Generation (G1) product ranges. 19 inch model used as example in this procedure.

You need:
- M4 Unbrako® Hex Key tool (not included with delivery).
- M7 Unbrako® Hex Key tool (not included with delivery) - Needed only for alternative procedure in Step 2,3.
- M17 Open End Wrench tool (not included with delivery) - Needed only for alternative procedure in Step 2,3.
- Fasteners (6 pcs M6) for mounting complete unit onto table or desktop location (not included with delivery).
- 1 pcs of HD TMB SX1-A1 Mounting Bracket Kit (for 12 and 15 inch)
- or 1 pcs of HD TMB SX1-B1 Mounting Bracket Kit (for 17 and 19 inch)

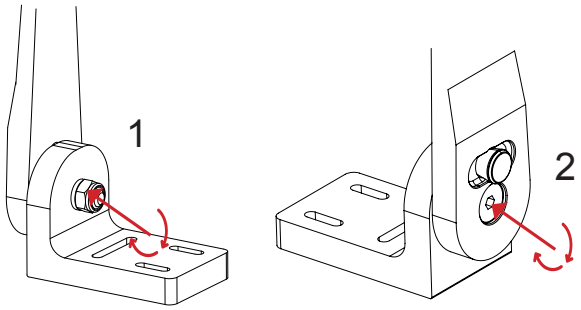
Boxed marked with GREY color below are considered alternative procedures. In most cases, these procedures can be ignored as suggested by factory.

Attention: A suitable pre-drilled location and knowledge of measurements for both main unit and brackets/tilting functionality should be prepared and checked prior to mounting. Please disconnect ALL cables before proceeding. Please review User Manual or visit www.hatteland-display.com for Technical Drawings regarding measurements for both main unit and Mounting Brackets.

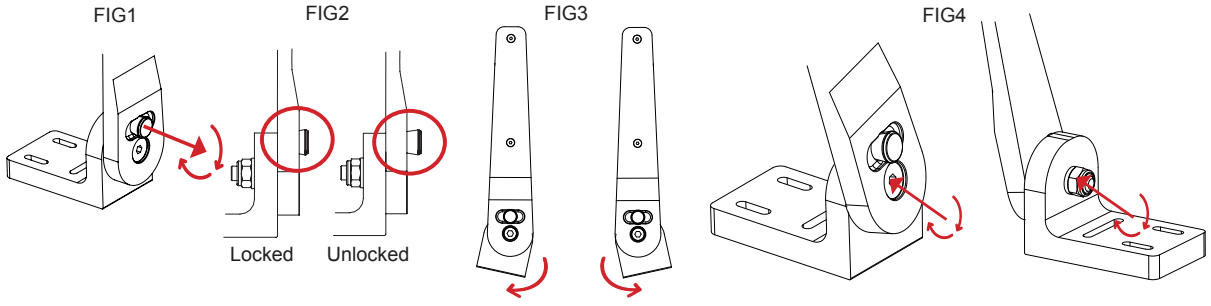
▼ 1: Place the unit on a dry, flat, clean, soft surface (i.e. table) with the glass front facing down as illustrated. Connector area should be facing downwards from you.



▼ 2: By factory default the lower part of the bracket (Feet Base) are tightly fastened by the center Hex Socket Bolt and Locking Nut. Tilting can not be performed by hand. If you need to pre-configure the tilt angle of the final assembled unit with brackets BEFORE you secure it into the installation location, simply unscrew and loosen the Locking Nut (M17) first and the Hex Socket Screw (M7) as indicated below. If there is no need to adjust the Feet Base (use recommended factory default position of 0 degree), skip to step 4 now.

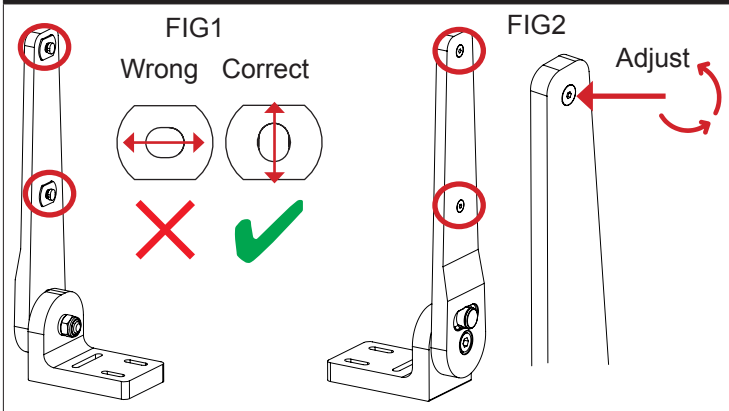


▼ 3: Once loosened a bit, pull out the Tilting Lock Pin, rotate it 90° (FIG1 / FIG2) and you are now able to tilt/rotate the Feet Base by hand (FIG3). Once the desired angle has been reached, rotate the Tilting Lock Pin 90° and lock the angle into the nearest “click” the Locking Pin matches (FIG 1 / FIG2). Make sure both Feet Base are tilted/rotated to EXACTLY the same angle! Secure both Hex Socket Bolts and Locking Bolt (FIG4) so they cannot move by themselves when proceeding to next step. Use Torque Force 25Nm.

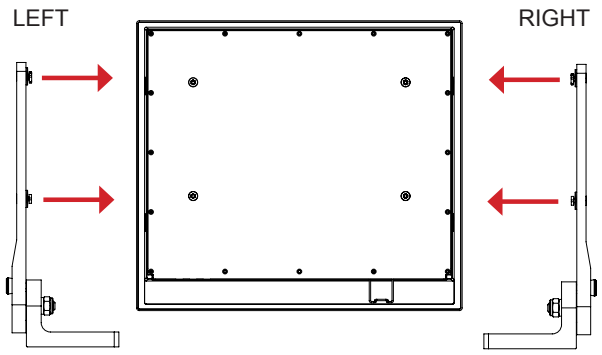


Installation Procedures

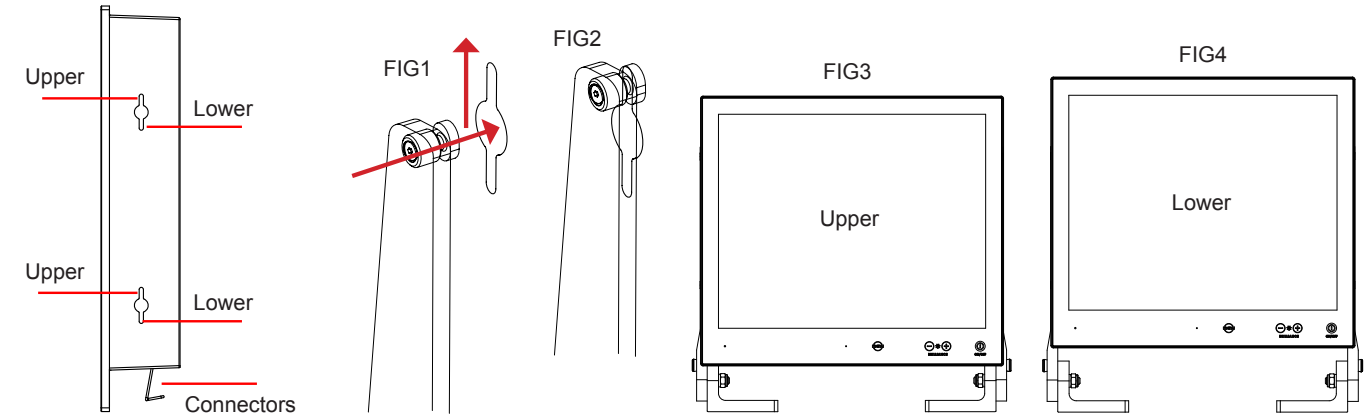
▼ 4: Inspect the inner side of both brackets and especially the orientation of the Key Hole Plug (4 pcs). They should be shaped as an standing “egg” to ensure proper fitting in the Key Hole of unit (FIG1). Note: You may have to loose the fastening screw (M5) (FIG2) if the Key Hole Plug can not be turned by hand.



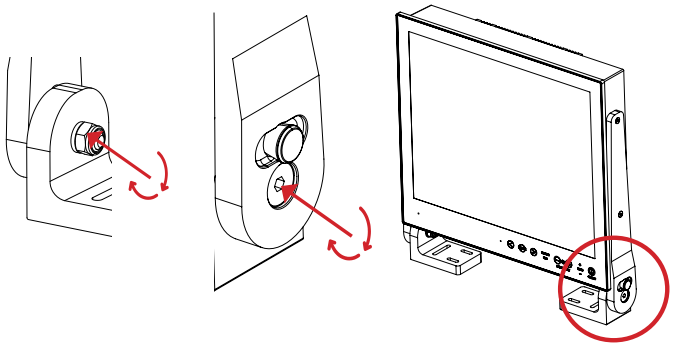
▼ 5: Notice the indication of LEFT and RIGHT. The mounting bracket (2 pcs) is marked with respective stickers “L” and “R” from factory. Please make sure that LEFT bracket is positioned on LEFT side and RIGHT bracket is positioned on the RIGHT side as shown below.



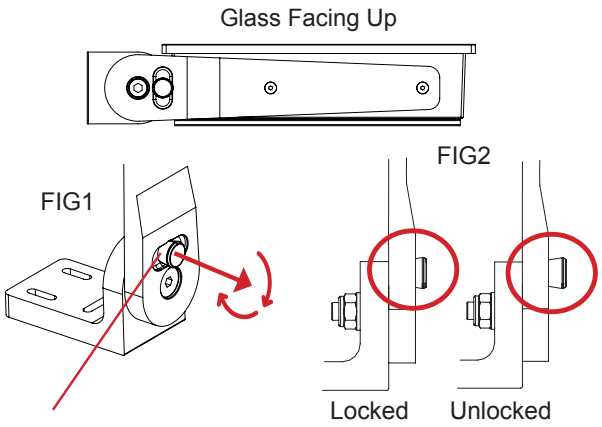
▼ 6: Ensure that both Key Hole Plugs slide into the Key Holes and goes to the upper position (factory recommended) (FIG1 and FIG2). If they appear too tight, you may loose the Key Hole Plug screw a few turns and re-try (see previous step 4).
You can also alternatively use the lower position of Key Hole to add extra height under unit to allow cables and/or additional installed connectors to fit in tight installations (FIG 3 and FIG 4 shows difference gained).



Note: If you had previously loosened the Hex Socket Bolt and Locking Nut in Step 2-3, secure both the Hex Socket Bolt and Locking Nut using Torque Force 25Nm. If you didn’t loose them, proceeed to Step 8.

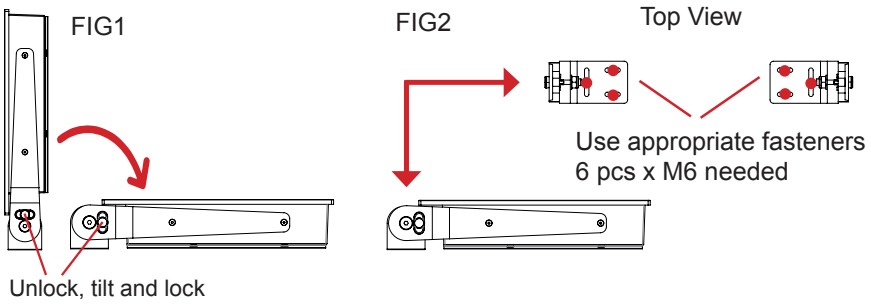


▼ 7: While unit is lying flat on table, check the Tilting Lock Pin position. These can be pulled out by hand, turned 90° (FIG1) and turned back 90° until the Lock Pin automatically clicks into place by a spring (FIG2).

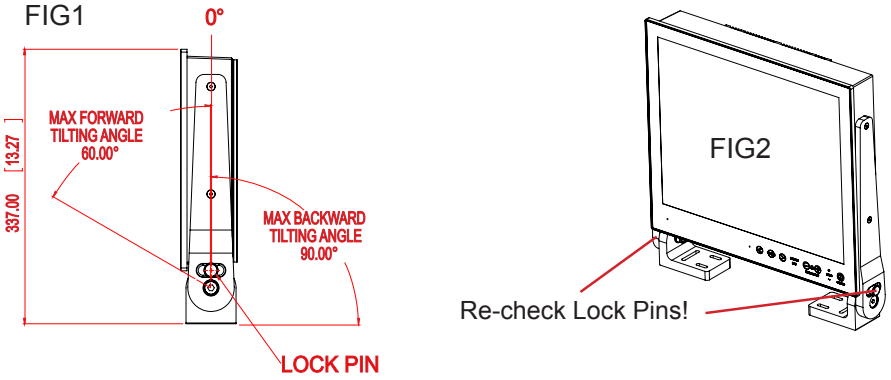


Installation Procedures

▼ 8: You may now mount the unit onto your desired location. It is advised that you unlock the Lock Pin (as shown in step 5), tilt the unit 90 degrees backwards (FIG1) and properly fasten the bracket base into location (FIG2). **NB! Be careful not to break or scratch the edge of the front glass!** *You may notice that it is now possible to tilt the unit while Base Feets are fasten as the added weight of unit will help the momentum (see Step 2, "Tilting can not be performed by hand").*

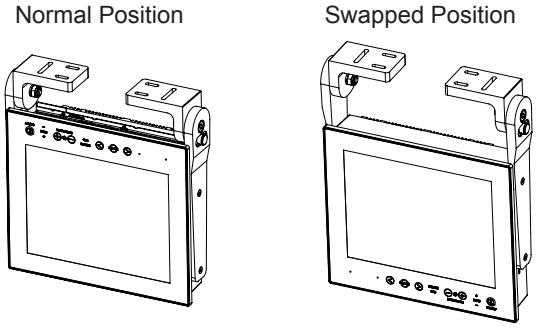


▼ 9: Max Forward and Backward angle shown below (FIG1). When your desired tilting position has been achieved, you need to verify that the Tilting Lock Pin are in locking position and the unit is firmly attached and does not appear loose (FIG2).



▼ Alternative Mounting: Depending on installation needs, you may mount the complete unit in ceiling in two different ways.
Normal Position: User Controls will be upside down, cables go straight up. You may configure Glass Display Control™ (GDC) LED symbols to show or not, since symbols will be seen upside down.
Review http://www.hatteland-display.com/inb100018-4.php ("Glass Display Control™ (GDC) LED & Button operations" section).

Swapped Position: User Controls readable, cables has to bend up or go straight down, Left and Right Bracket needs to be swapped, indicating Left Bracket on Right Side, and RIght Bracket on Left Side to ensure proper fitting and to avoid wrong footprint of the mounting holes of the bracket base (reference to "Important to know about LEFT and RIGHT brackets").



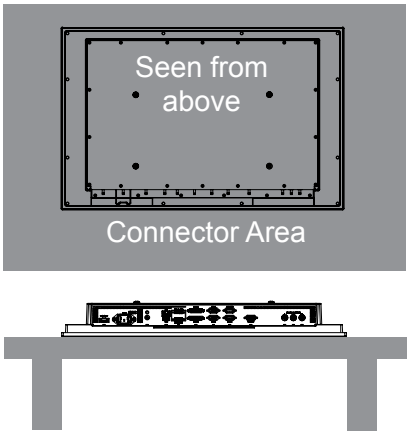
Installation Procedures

Mounting Bracket for Table / Desktop installation - 24”, 26” and 27”

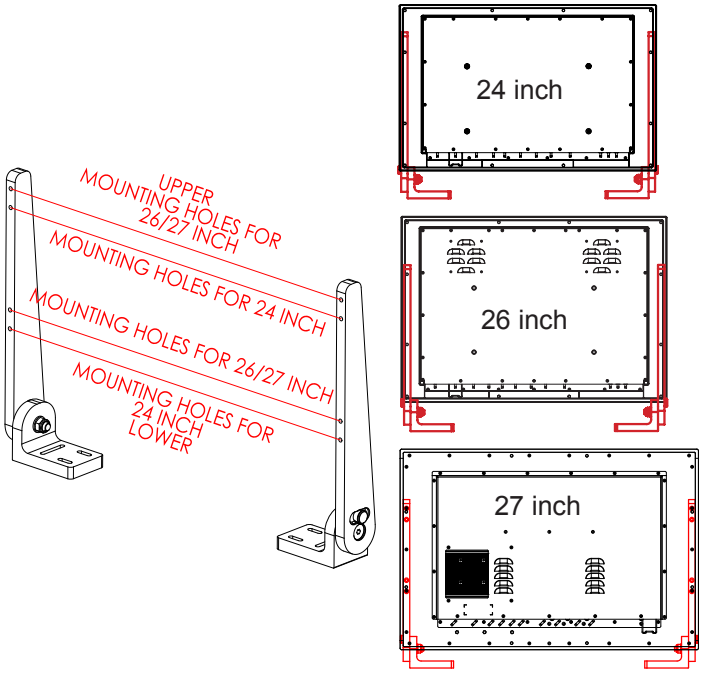
You need: M5 Unbrako® Hex Key tool and 1 pcs of HD TMB SX1-C1 Mounting Bracket Kit. Fasteners (6 pcs M6) for Table / Desktop location not included. Procedure suitable for: Display and Panel Computers. 24 inch unit used as illustration below, but same procedure apply for 26 and 27 inch units as well.

Attention: A suitable pre-drilled location should be prepared and checked prior to mounting. Please disconnect ALL cables before proceeding. Please review User Manual or visit www.hatteland-display.com for Technical Drawings regarding measurements for both main unit and Mounting Brackets.

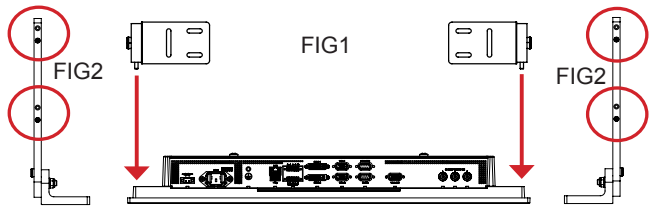
▼ 1: Place the unit on a dry, flat, clean, soft surface (i.e. table) with the glass front facing down as illustrated. Connector area should be facing downwards from you.



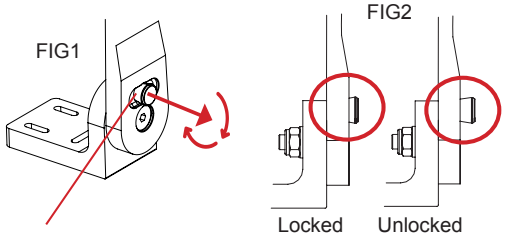
▼ 2: Inspect the mounting holes of brackets. For mounting to a 24 inch unit, please use the **lower holes** as indicated. For mounting to a 26 / 27 inch unit, please use the **upper holes** as indicated.



▼ 3: Place one bracket at the time with the mounting holes facing down into the suitable mounting position and fasten with 2 x M5 screws on each bracket. Torque Force 3.5Nm.

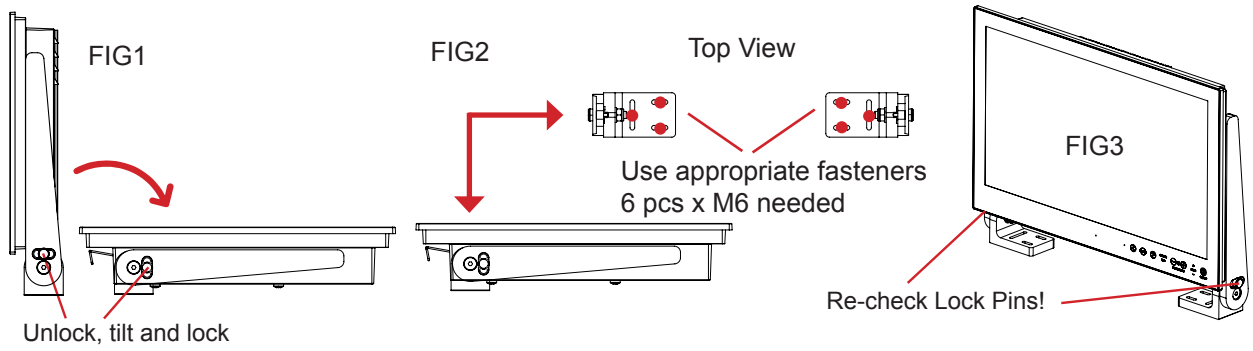


▼ 4: While unit is lying flat on table, check the Tilting Lock Pin position. These can be pulled out by hand, turned 90° (FIG1) and turned back 90° until the Lock Pin automatically clicks into place by a spring (FIG2).



Installation Procedures

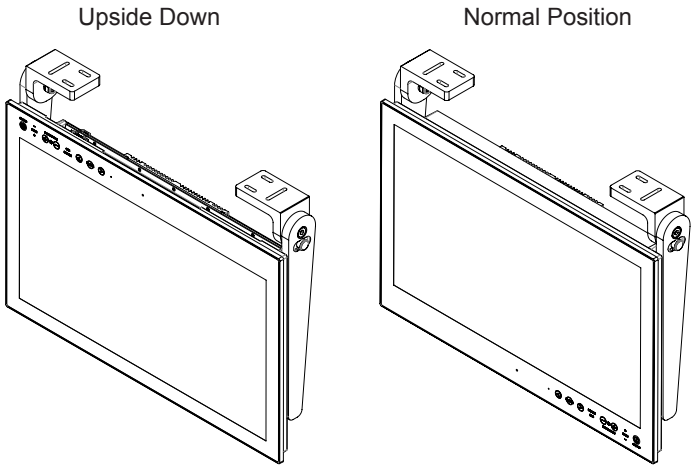
▼ 5: You may now mount the unit onto your desired location. It is advised that you unlock the Lock Pin (as shown in step 4), tilt the unit 90° backwards (FIG1) and properly fasten the bracket base into location (FIG2).
NB! Be careful not to break or scratch the edge of the front glass! Then repeat step 4 again until your desired tilting position has been achieved and you have verified that the Lock Pin are in locking position and the unit is firmly attached and does not appear loose (FIG3).



▼ Alternative Mounting: Depending on installation needs, you may mount the complete unit in ceiling in two different ways.

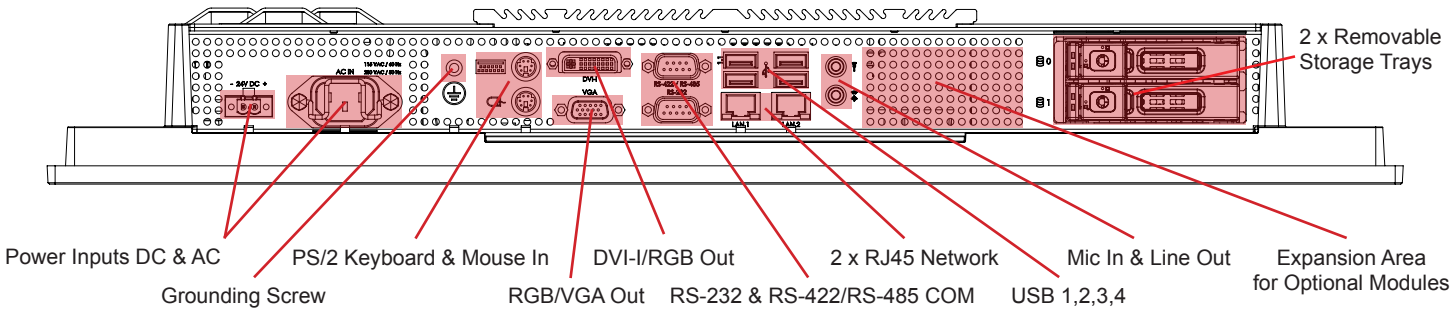
Upside Down Position: User Controls will be upside down, cables go straight up. You may configure Glass Display Control™ (GDC) LED symbols to show or not, since symbols will be seen upside down. Displayed image needs to be flipped vertically. Review the appropriate SCOM manuals (“Glass Display Control™ (GDC) LED & Button operations” section).

Normal Position: User Controls readable, no image flip needed, cables has to bend up or go straight down.



Physical Connections

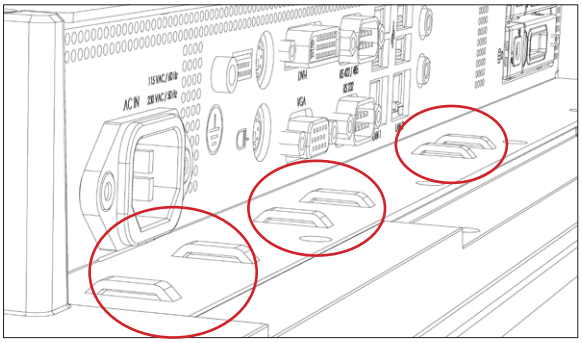
Connection area of unit (illustration)

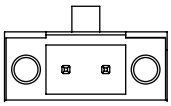


Note: 24 inch unit used as example above, please review specifications for your actual model.

Reduce Cable Tension

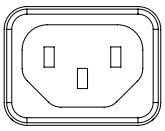
To reduce tension of the cables you connect, secure them with a cable tie to the available chassis hinges located near the connectors. Note that the actual position of these hinges may vary depending on the specific unit.





POWER INPUT:

Connect your DC power cable to the 2-pin Terminal Block 5.08 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:

Please review “General Installation Chapter”, pt. 7 for more information.

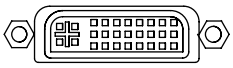
Multi-power note: (For units supporting AC & DC input simultaneously)

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

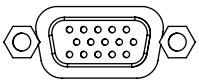
PS/2 Keyboard and PS/2 Mouse INPUTS:

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.



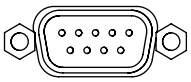
DVI-I or RGB / VGA OUT:

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.



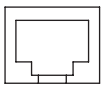
VGA / RGB OUT:

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.



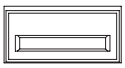
COM1, 2 Serial Port INPUT / OUTPUT:

Supports RS-232 (COM1) and RS-422/485 (COM2) 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.



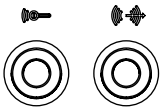
USB 1, 2, 3, 4 INPUT / OUTPUT:

Supports USB compliant peripherals. Drivers for most USB devices are usually included in operating system or on separate installation DVD’s delivered with Third Party products.

- Port 1 is by factory default locked to USB1.1 (<10m, 12Mbps) and the 1.1 symbol is indicated next to the connector. Peripherals that require more or less than 12Mbps should not be connected to this port, as both driver and device will fail to install and initalize correctly. Please re-connect your device into port 2,3,4 instead in these situations.

- Port 2,3,4 is USB2.0 (<5m, 480Mbps) compliant, including support for USB1.1 (<10m, 12Mbps) peripherals.

Physical Connections



Audio INPUT / OUTPUT:

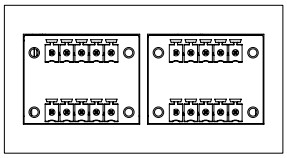
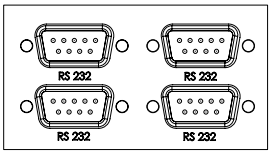
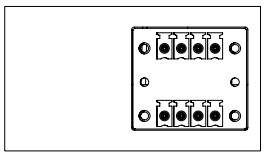
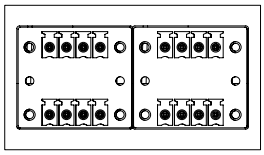
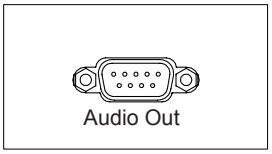
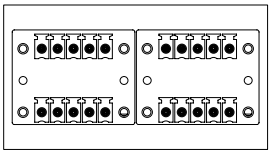
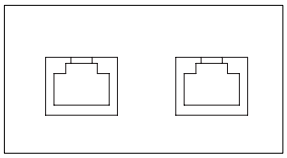
Both connectors are 3.5mm mini jack stereo.

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

Physical Connections

EXPANSION AREA for Optional modules:

In this expansion area of the unit, optional factory mounted modules may be available (see illustrations below or dedicated Data Sheets as well as “Housing / Terminal Block Connector Overview” in this manual for more information). Connect and secure your cables to the Terminal Blocks or connectors, depending on module installed. The table below lists all modules currently available for factory mounting.

Illustration	Description
	4 x RS-422/RS-485 NMEA (PCA100293-1), Terminal Block 3.81 connection module. Applies for 12,15,17,19,24 and 26 units
	4 x RS-232 (PCA100294-1), DSUB 9P Male connectors module. Applies for 12, 15,17,19,24 and 26 units
 	1 or 2 x CAN isolated (ZIA0001310-B), Terminal Block 3.81, 2 channel module(s). Applies for 12, 15,17,19,24 and 26 units
	1 x 2W Amplified Audio Mono/Stereo Out (HT 00235 OPT-A1). D-SUB 9P Female connector. Applies for 12, 15,17,19 units
	2 x Isolated Digital IO (4 Output + 4 Input) (PCA100297-1), Terminal Block 3.81 connection module. Applies for 12, 15,17,19,24 and 26 units
	2 x LAN 10/100Mbps (PCA100298-1), RJ-45 connection module. Applies for 15,17,19,24 and 26 units

Internal support for remote controlling MMC units:

A detailed description of the SCOM (Serial/Ethernet Communication) can be found here: http://www.hatteland-display.com/pdflink/inb100018-4.php - Review also the “Pinout Assignments” chapter in this manual for additional help during preperation and/or installation of external equipment intended to communicate with.

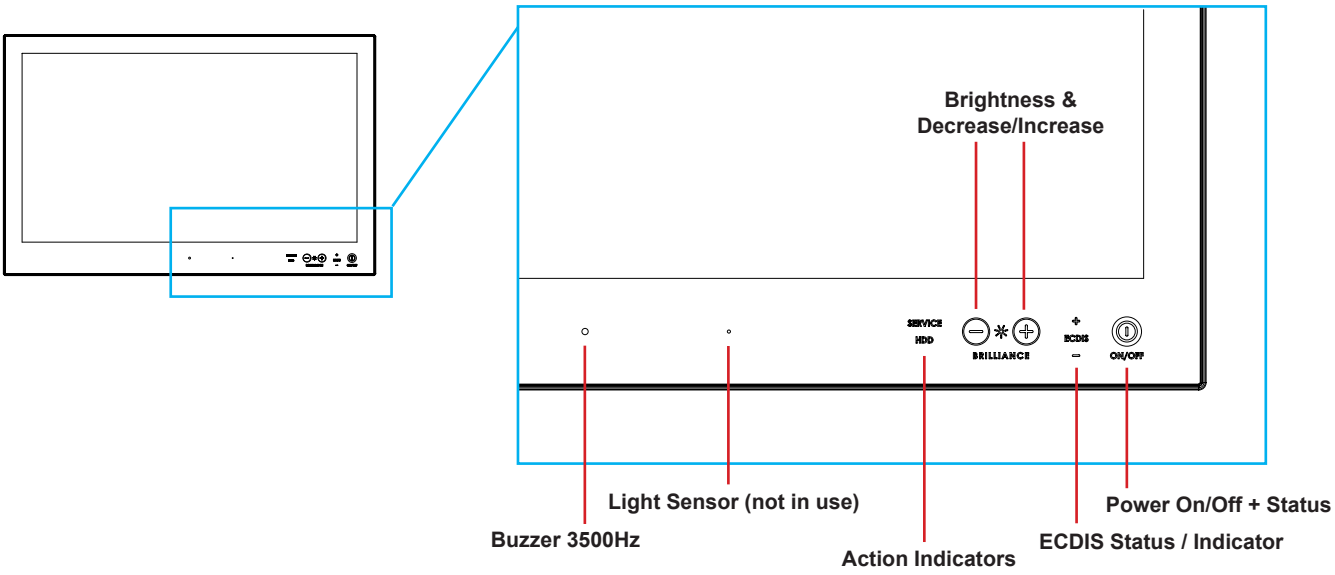
Released

Operation
MMC Products

User Controls

USER CONTROLS OVERVIEW

The units are designed by using 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.



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.

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.

User Controls

+ 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/Brillance 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.

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.

○ **Buzzer:**

Only functional for units ordered with Buzzer functionality. The location of the buzzer hole (physical hole in glass) is barely visible for the eye. Touching this area will naturally mute buzzer sound or in some cases make it lower or change audible frequency. In no circumstances should this area be blocked by either stickers or objects!

To take advantage of the buzzer, please review the SCOM (Serial/Ethernet Communication) manual located here: http://www.hatteland-display.com/pdflink/inb100018-4.php (reference: “BZZ” - Buzzer Control command, through the Internal Virtual COM (VCOM) interface).

○ **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 barly visible for the eye and lies under the glass. It has no illumination behind to indicate it’s position. Touching or covering this area will naturally make the sensor data inaccurate and should be avoided!

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Specifications

Specifications - HD 12T21 MMC-xxx-xxxx

All specifications are subject to change without prior notice!

TFT Technology:

- LED Backlight Technology, TFT Active-matrix
- 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
• Contrast Ratio Standard	: 700:1 (typical)
• Light Intensity Standard	: 600 cd/m² (typical)
• Viewable Angle Standard	: +/- 80 deg. (L/R), +/- 70 deg. (U/D) (typ)
• Active Display Area	: 245.76 (H) x 184.32 (V) mm
• Max Colors	: 16.7 million

Computer Specifications:

• OS Options	: None or see table below
• Storage Options	: None or see table below
• CPU/Processor	: See table below
• Memory Options	: None 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 ALC892
• 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® Core™ i7-620LE, 2.0GHz, 4MB Cache, FSB 1066MHz or 1 x Intel® Celeron® P4505*, 1.86GHz, 2MB Cache, FSB 800MHz *Single Core only	
Memory	1 x Single Channel, 204-pin DDR3 1066/800Mhz	- 2GB, 4GB (max)
Storage	1 x 2.5" SSD SATA, Multi Level (MLC)	- 80GB, 120GB, 300GB
Storage	1 x 2.5" HDD* SATA *Combination buzzer and spinning hard disk (HDD) is not possible.	- 1TB
Storage	1 x 2.5" HDD SATA Ruggedized/Automotive	- 320GB
OS Option	Embedded Enterprise (WEE): - Microsoft® Windows® Server 2003/2008/2008R2 (Eng) - Microsoft® Windows® 7 Professional/Ultimate (Eng, SP1) openSUSE® 11.4 (Linux) Fedora™ 15 (Linux) Ubuntu® 10.04 LTS Ubuntu® 12.04 LTS See also Accessories (HT 00300 MSOS) options.	
Notes	- For Win7 OS, >1GB RAM + Review "SSD Selection Guide" in manual. - 32bit or 64bit versions available where applicable.	

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 AC/DC: 60W (max) - 26W (typ)*

*Max backlight, Idle CPU load, Microsoft® Windows® 7)

Physical Considerations:

- W:314.00 [12.36"] x H:272.00 [10.71"] x D:70.90 [2.79"] mm [inch]
- 4 x M6 VESA mounting 280x150mm, Max 12mm deep
- Weight: 4.9kg / 10.8lbs

User Controls:

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

- Power On/Off, Brightness Control (-/+)
- Power LED, HDD/SSD LED, Mode Status Indicator (Service)
- Buzzer (through glass), Light Sensor (behind glass)

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)
• Compass Safe Distance	: Standard: 40cm - Steering: 20cm

Lifetime Considerations:

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

Input/Output Connectors:

Connector	Rear
• 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
• USB1.1 (<10m)	1 x USB Type A
• USB2.0 (<5m)	3 x USB Type A
• DVI or RGB OUT	1 x 29P DVI-I or as RGB with adapter
• RGB OUT	1 x 15p HD D-SUB
• AC Power IN	1 x Std IEC inlet
• DC Power IN	1 x 2-pin Terminal Block 5.08
• Line OUT	1 x 3.5mm mini jack (Lime)
• Mic IN	1 x 3.5mm mini jack (Pink)

Available Accessories:

• HD CMB SX1-A2	: 1 x Console Mount Kit (1-12.75mm). EN60945 Tested
• HD CMB SX1-A3	: 1 x Console Mount Kit (1-12.75mm). EN60945 Tested Long screws for easier installation in tight spaces.
• HD TMB SX1-A1	: 1 x Table Mount Bracket. EN60945 Tested Note: Can not be combined with HDD, use SSD only.
• HD VED SX1-A1	: 1 x VESA Bracket, not EN60945 Tested
• JH C01MF A-A	: 1 x USB Cable 1m, TypeA-Chassis mount receptacle
• HT 00262 OPT-A1	: 4 x RS-422/RS-485 isolated, USB ext. module
• HT 00263 OPT-A1	: 4 x RS-232 COM non-isolated, USB ext. module
• HT 00264 OPT-A1	: 1 x CAN isolated, 2 channel, USB ext. module
• HT 00273 OPT-A1	: 4 x Digital IN/OUT isolated, USB ext. module
• HT 00300 MSOS	: OS options -> http://www.hatteland-display.com/os

Please see user manual/datasheet for more information

Factory Options:

- Optical Bonding Technology
- Projected Capacitive Touch Screen (Multitouch, USB interface)
- 1 x HT 00235 OPT-A1 (2W Amplified Audio out via DB9F)*
- 1 x PCA100293-1 (4xCOM RS-422/485 isolated NMEA 4 channel)*
- 1 x ZIA0001310-B (1 x CAN isolated, 2 channel)*
- 1 x PCA100297-1 (Isolated Digital IO module, 4xOutput/4xInput)*
- 1 x PCA100294-1 (4xCOM RS-232 unisolated DB9M)*
- Variations of SSD/HDD Storage, RAM Memory, Operating System

*Only 1 module can be installed

APPROVALS & CERTIFICATES

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

IEC 60945 4th (EN 60945:2002) **IACS E10** **IP66** **ClassNK** - Nippon Kaiji Kyokai **GL** - Germanischer Lloyd
DNV - Det Norske Veritas **ABS** - American Bureau of Shipping **CCS** - China Classification Society **BV** - Bureau Veritas
LRS - Lloyd's Register of Shipping **EU RO MR** - Mutual Recognition

Specifications - HD 15T21 MMC-xxx-xxxx

All specifications are subject to change without prior notice!

TFT Technology:

- LED Backlight Technology, TFT Active-matrix
- 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 : 8ms (typical), black to white
- Contrast Ratio : 1500:1 (typical)
- Light Intensity : 400 cd/m² (typical)
- Viewable Angle : +/- 85 deg. (Up/Down/Left/Right) (typical)
- Active Display Area : 304.1 (H) x 228.1 (V) mm
- Max Colors : 16.7 million

Computer Specifications:

• OS Options	: None or see table below
• Storage Options	: None or see table below
• CPU/Processor	: See table below
• Memory Options	: None 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 ALC892
• 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® Core™ i7-620LE, 2.0GHz, 4MB Cache, FSB 1066MHz or 1 x Intel® Celeron® P4505*, 1.86GHz, 2MB Cache, FSB 800MHz *Single Core only	
Memory	1 x Single Channel, 204-pin DDR3 1066/800Mhz	- 2GB, 4GB (Max)
Storage	1 x 2.5" SSD SATA, Multi Level (MLC)	- 80GB, 120GB, 300GB
Storage	1 x 2.5" HDD* SATA *Combination buzzer and spinning hard disk (HDD) is not possible.	- 1TB
Storage	1 x 2.5" HDD SATA Ruggedized/Automotive	- 320GB
OS Option	Embedded Enterprise (WEE): - Microsoft® Windows® Server 2003/2008/2008R2 (Eng) - Microsoft® Windows® 7 Professional/Ultimate (Eng, SP1) openSUSE® 11.4 (Linux) Fedora™ 15 (Linux) Ubuntu® 10.04 LTS Ubuntu® 12.04 LTS See also Accessories (HT 00300 MSOS) options.	
Notes	- For Win7 OS, >1GB RAM + Review "SSD Selection Guide" in manual. - 32bit or 64bit versions available where applicable.	

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: 52W (typ) - 59W (max)

Physical Considerations:

- W:356.00 [14.02"] x H:307.00 [12.09"] x D:77.90 [3.07"] mm [inch]
- 4 x M6 VESA mounting 280x150mm, Max 12mm deep
- Weight: 6.0kg / 13.2lbs

User Controls:

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

- Power On/Off, Brightness Control (-/+)
- Power LED, HDD/SSD LED, Mode Status Indicator (Service)
- Buzzer (through glass), Light Sensor (behind glass)

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)
- Compass Safe Distance : Standard: 55cm - Steering: 40cm

Lifetime Considerations:

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

Input/Output Connectors:

Connector	Rear
• 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
• USB1.1 (<10m)	1 x USB Type A
• USB2.0 (<5m)	3 x USB Type A
• DVI or RGB OUT	1 x 29P DVI-I or as RGB with adapter
• RGB OUT	1 x 15p HD D-SUB
• AC Power IN	1 x Std IEC inlet
• DC Power IN	1 x 2-pin Terminal Block 5.08
• Line OUT	1 x 3.5mm mini jack (Lime)
• Mic IN	1 x 3.5mm mini jack (Pink)

Available Accessories:

- HD CMB SX1-A2 : 1 x Console Mount Kit (1-12.75mm). EN60945 Tested
- HD CMB SX1-A3 : 1 x Console Mount Kit (1-12.75mm). EN60945 Tested
Long screws for easier installation in tight spaces.
- HD TMB SX1-A1 : 1 x Table Mount Bracket. EN60945 Tested
Note: Can not be combined with HDD, use SSD only.
- HD VED SX1-A1 : 1 x VESA Bracket, not EN60945 Tested
- JH 15TAP STD-C1 : 1 x Frame Adapter (15" Series 1 to Series X) retrofit
- HD 15COV SX1-A1 : 1 x UV Sun Cover
- JH C01MF A-A : 1 x USB Cable 1m, TypeA-Chassis mount receptacle
- HT 00262 OPT-A1 : 4 x RS-422/RS-485 isolated, USB ext. module
- HT 00263 OPT-A1 : 4 x RS-232 COM non-isolated, USB ext. module
- HT 00264 OPT-A1 : 1 x CAN isolated, 2 channel, USB ext. module
- HT 00273 OPT-A1 : 4 x Digital IN/OUT isolated, USB ext. module
- HT 00274 OPT-A1 : 2 x LAN 10/100Mbps, RJ45, USB ext. module
- HT 00300 MSOS : OS options -> http://www.hatteland-display.com/os

Please see user manual/datasheet for more information

Factory Options:

- Projected Capacitive Touch Screen (Multitouch, USB interface)
- Optical Bonding Technology
- Variations of SSD/HDD Storage, RAM Memory, Operating System
- 1 x PCA100293-1 (4xCOM RS-422/485 isolated NMEA 2 channel)*
- 1 x ZIA0001310-B (1 x CAN isolated, 2 channel)*
- 1 x HT 00235 OPT-A1 (2W Amplified Audio out via DB9F)
- 1 x PCA100297-1 (Isolated Digital IO module,4 x Output/4 x Input)*
- 1 x PCA100294-1 (4xCOM RS-232 unisolated DB9M)*
- 1 x PCA100298-1 (LAN 10/100Mbps, 2 ports (RJ45)*

*Only 1 module can be installed

APPROVALS & CERTIFICATES

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

IEC 60945 4th (EN 60945:2002)
DNV - Det Norske Veritas
LRS - Lloyd's Register of Shipping
IACS E10
IP66
ABS - American Bureau of Shipping
EU RO MR - Mutual Recognition
ClassNK - Nippon Kaiji Kyokai
CCS - China Classification Society
GL - Germanischer Lloyd
BV - Bureau Veritas

Specifications - HD 17T21 MxC-xxx-xxxx

All specifications are subject to change without prior notice!

TFT Technology:

- LED Backlight Technology, TFT Active-matrix
- 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 Standard : 350 cd/m² (typical)
- Viewable Angle @ CR>10 : +/- 80° (Down/Left/Right), 60° (Up) (typ)
- Active Display Area : 337.92 (H) x 270.336 (V) mm
- Max Colors : 16.7 million

Computer Specifications:

• OS Options	: None or see table below
• Storage Options	: None or see table below
• CPU/Processor	: See table below
• Memory Options	: None 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 ALC892
• 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 or 1 x Intel® Core™ i5-520E, 2.40GHz, FSB 800/1066MHz, 3MB Cache	
Memory	1 x Single Channel, 204-pin DDR3 1066/800Mhz	- 2GB, 4GB (Max)
Storage	2 x 2.5" SSD SATA, Multi Level (MLC)	- 80GB, 120GB, 300GB
Storage	2 x 2.5" HDD* SATA *Combination buzzer and spinning hard disk (HDD) is not possible.	- 1TB
Storage	2 x 2.5" HDD SATA Ruggedized/Automotive	- 320GB
OS Option	Embedded Enterprise (WEE): - Microsoft® Windows® Server 2003/2008/2008R2 (Eng) - Microsoft® Windows® 7 Professional/Ultimate (Eng, SP1) openSUSE® 11.4 (Linux) Fedora™ 15 (Linux) Ubuntu® 10.04 LTS Ubuntu® 12.04 LTS See also Accessories (HT 00300 MSOS) options.	
Notes	- For Win7 OS, >1GB RAM + Review "SSD Selection Guide" in manual. - 32bit or 64bit versions available where applicable.	

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: 60W (max) - 43W (typ)*

*Max backlight, Idle CPU load, Microsoft® Windows® 7)

Physical Considerations:

- W:390.00 [15.35"] x H:351.00 [13.82"] x D:79.90 [3.15"] mm [inch]
- 4 x M6 VESA mounting 280x150mm, Max 12mm deep
- Weight: 7.5kg / 16.5lbs

User Controls:

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

- Power On/Off, Brightness Control (-/+)
- Power LED, HDD/SSD LED, Mode Status Indicator (ECDIS, Service)
- Buzzer (through glass), Light Sensor (behind glass)

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)
- Compass Safe Distance : Standard: 115cm - Steering: 70cm

Lifetime Considerations:

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

Input/Output Connectors:

Connector	Rear
• 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
• USB1.1 (<10m)	1 x USB Type A
• USB2.0 (<5m)	3 x USB Type A
• DVI or RGB OUT	1 x 29P DVI-I or as RGB with adapter
• RGB OUT	1 x 15p HD D-SUB
• AC Power IN	1 x Std IEC inlet
• DC Power IN	1 x 2-pin Terminal Block 5.08
• Line OUT	1 x 3.5mm mini jack (Lime)
• Mic IN	1 x 3.5mm mini jack (Pink)

Available Accessories:

- HD CMB SX1-A2 : 1 x Console Mount Kit (1-12.75mm). EN60945 Tested
- HD CMB SX1-A3 : 1 x Console Mount Kit (1-12.75mm). EN60945 Tested
Long screws for easier installation in tight spaces.
- HD TMB SX1-B1 : 1 x Table Mount Bracket. EN60945 Tested
Note: Can not be combined with HDD, use SSD only.
- HD VED SX1-A1 : 1 x VESA Bracket, not EN60945 Tested
- HD 17COV SX1-A1 : 1 x UV Sun Cover
- JH C01MF A-A : 1 x USB Cable 1m, TypeA-Chassis mount receptacle
- HT 00262 OPT-A1 : 4 x RS-422/RS-485 isolated, USB ext. module
- HT 00263 OPT-A1 : 4 x RS-232 COM non-isolated, USB ext. module
- HT 00264 OPT-A1 : 1 x CAN isolated, 2 channel, USB ext. module
- HT 00273 OPT-A1 : 4 x Digital IN/OUT isolated, USB ext. module
- HT 00274 OPT-A1 : 2 x LAN 10/100Mbps, RJ45, USB ext. module
- HT 00300 MSOS : OS options -> http://www.hatteland-display.com/os

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
- 1 x PCA100293-1 (4xCOM RS-422/485 isolated NMEA 2 channel)*
- 1 x ZIA0001310-B (1 x CAN isolated, 2 channel)*
- 1 x HT 00235 OPT-A1 (2W Amplified Audio out via DB9F)
- 1 x PCA100297-1 (Isolated Digital IO module,4 x Output/4 x Input)*
- 1 x PCA100294-1 (4xCOM RS-232 unisolated DB9M)*
- 1 x PCA100298-1 (LAN 10/100Mbps, 2 ports (RJ45)*

*Only 1 module can be installed

APPROVALS & CERTIFICATES

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

IEC 60945 4th (EN 60945:2002)
DNV - Det Norske Veritas
LRS - Lloyd's Register of Shipping
IACS E10 IP66
ABS - American Bureau of Shipping
EU RO MR - Mutual Recognition
ClassNK - Nippon Kaiji Kyokai
CCS - China Classification Society
GL - Germanischer Lloyd
BV - Bureau Veritas

Specifications - HD 19T21 MxC-xxx-xxxx

All specifications are subject to change without prior notice!

TFT Technology:

- LED Backlight Technology, TFT Active-matrix
- 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 : 1500:1 (typical)
- Light Intensity : 350 cd/m² (typical)
- Viewable Angle : +/- 85 deg. (typical) (Up/Down/Left/Right)
- Active Display Area : 376.32 (H) x 301.056 (V) mm
- Max Colors : 16.7 million

Computer Specifications:

• OS Options	: None or see table below
• Storage Options	: None or see table below
• CPU/Processor	: See table below
• Memory Options	: None 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 ALC892
• 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 or 1 x Intel® Core™ i5-520E, 2.40GHz, FSB 800/1066MHz, 3MB Cache	
Memory	1 x Single Channel, 204-pin DDR3 1066/800Mhz	- 2GB, 4GB (Max)
Storage	2 x 2.5" SSD SATA, Multi Level (MLC)	- 80GB, 120GB, 300GB
Storage	2 x 2.5" HDD* SATA *Combination buzzer and spinning hard disk (HDD) is not possible.	- 1TB
Storage	2 x 2.5" HDD SATA Ruggedized/Automotive	- 320GB
OS Option	Embedded Enterprise (WEE): - Microsoft® Windows® Server 2003/2008/2008R2 (Eng) - Microsoft® Windows® 7 Professional/Ultimate (Eng, SP1) openSUSE® 11.4 (Linux) Fedora™ 15 (Linux) Ubuntu® 10.04 LTS Ubuntu® 12.04 LTS See also Accessories (HT 00300 MSOS) options.	
Notes	- For Win7 OS, >1GB RAM + Review "SSD Selection Guide" in manual. - 32bit or 64bit versions available where applicable.	

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: 125W (max) - 49W (typ)*

*Max backlight, Idle CPU load, Microsoft® Windows® 7)

Physical Considerations:

- W:429.00 [16.89"] x H:382.00 [15.04"] x D:80.90 [3.19"] mm [inch]
- 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 (-/+)
- Power LED, HDD/SSD LED, Mode Status Indicator (ECDIS, Service)
- Buzzer (through glass), Light Sensor (behind glass)

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)
- Compass Safe Distance : Standard: 70cm - Steering: 45cm

Lifetime Considerations:

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

Input/Output Connectors:

Connector	Rear
• 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
• USB1.1 (<10m)	1 x USB Type A
• USB2.0 (<5m)	3 x USB Type A
• DVI or RGB OUT	1 x 29P DVI-I or as RGB with adapter
• RGB OUT	1 x 15p HD D-SUB
• AC Power IN	1 x Std IEC inlet
• DC Power IN	1 x 2-pin Terminal Block 5.08
• Line OUT	1 x 3.5mm mini jack (Lime)
• Mic IN	1 x 3.5mm mini jack (Pink)

Available Accessories:

- HD CMB SX1-A2 : 1 x Console Mount Kit (1-12.75mm). EN60945 Tested
- HD CMB SX1-A3 : 1 x Console Mount Kit (1-12.75mm). EN60945 Tested
Long screws for easier installation in tight spaces.
- HD TMB SX1-B1 : 1 x Table Mount Bracket. EN60945 Tested
Note: Can not be combined with HDD, use SSD only.
- HD VED SX1-A1 : 1 x VESA Bracket, not EN60945 Tested
- JH 19TAP STD-C1 : 1 x Frame Adapter (19" Series 1 to Series X) retrofit
- HD 19TAP SX1-C2 : 1 x Frame Adapter (19" Series X to Series 2) retrofit
- HD 19COV SX1-A1 : 1 x UV Sun Cover
- JH C01MF A-A : 1 x USB Cable 1m, TypeA-Chassis mount receptacle
- HT 00262 OPT-A1 : 4 x RS-422/RS-485 isolated, USB ext. module)
- HT 00263 OPT-A1 : 4 x RS-232 COM non-isolated, USB ext. module
- HT 00264 OPT-A1 : 1 x CAN isolated, 2 channel, USB ext. module
- HT 00273 OPT-A1 : 4 x Digital IN/OUT isolated, USB ext. module
- HT 00274 OPT-A1 : 2 x LAN 10/100Mbps, RJ45, USB ext. module
- HT 00300 MSOS : OS options -> http://www.hatteland-display.com/os

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
- 1 x PCA100293-1 (4xCOM RS-422/485 isolated NMEA 2 channel)*
- 1 x ZIA0001310-B (1 x CAN isolated, 2 channel)*
- 1 x HT 00235 OPT-A1 (2W Amplified Audio out via DB9F)
- 1 x PCA100297-1 (Isolated Digital IO module,4 x Output/4 x Input)*
- 1 x PCA100294-1 (4xCOM RS-232 unisolated DB9M)*
- 1 x PCA100298-1 (LAN 10/100Mbps, 2 ports (RJ45)*

*Only 1 module can be installed

APPROVALS & CERTIFICATES

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

IEC 60945 4th (EN 60945:2002)
DNV - Det Norske Veritas
LRS - Lloyd's Register of Shipping
IACS E10 IP66
ABS - American Bureau of Shipping
EU RO MR - Mutual Recognition
ClassNK - Nippon Kaiji Kyokai
CCS - China Classification Society
GL - Germanischer Lloyd
BV - Bureau Veritas

Specifications - HD 24T21 MxC-xxx-xxxx

All specifications are subject to change without prior notice!

TFT Technology:

- LED Backlight Technology, TFT Active-matrix
- 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 Standard : 300 cd/m² (typical)
- Light Intensity High Bright : 1000 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:

• OS Options	: None or see table below
• Storage Options	: None or see table below
• CPU/Processor	: See table below
• Memory Options	: None 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 ALC892
• 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 or 1 x Intel® Core™ i5-520E, 2.40GHz, FSB 800/1066MHz, 3MB Cache	
Memory	1 x Single Channel, 204-pin DDR3 1066/800Mhz	- 2GB, 4GB (Max)
Storage	2 x 2.5" SSD SATA, Multi Level (MLC)	- 80GB, 120GB, 300GB
Storage	2 x 2.5" HDD* SATA *Combination buzzer and spinning hard disk (HDD) is not possible.	- 1TB
Storage	2 x 2.5" HDD SATA Ruggedized/Automotive	- 320GB
OS Option	Embedded Enterprise (WEE): - Microsoft® Windows® Server 2003/2008/2008R2 (Eng) - Microsoft® Windows® 7 Professional/Ultimate (Eng, SP1) openSUSE® 11.4 (Linux) Fedora™ 15 (Linux) Ubuntu® 10.04 LTS Ubuntu® 12.04 LTS See also Accessories (HT 00300 MSOS) options.	
Notes	- For Win7 OS, >1GB RAM + Review "SSD Selection Guide" in manual. - 32bit or 64bit versions available where applicable.	

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: 125W (max) - 50W (typ)*

*Max backlight, Idle CPU load, Microsoft® Windows® 7)

Physical Considerations:

- W:593.00 [23.35"] x H:384.00 [15.12"] x D:76.40 [3.01"] mm [inch]
- 4 x M6 VESA mounting 280x150mm, Max 12mm deep
- Weight: 11.2 kg / 24.6 lbs
- High Bright only: Includes an EPDM sealing gasket (IP66 console mount).

User Controls:

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

- Power On/Off, Brightness Control (-/+)
- Power LED, HDD/SSD LED, Mode Status Indicator (ECDIS, Service)
- Buzzer (through glass), Light Sensor (behind glass)

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)
- Compass Safe Distance : Standard: 115cm - Steering: 70cm

Lifetime Considerations:

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

Input/Output Connectors:

Connector	Rear
• 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
• USB1.1 (<10m)	1 x USB Type A
• USB2.0 (<5m)	3 x USB Type A
• DVI or RGB OUT	1 x 29P DVI-I or as RGB with adapter
• RGB OUT	1 x 15p HD D-SUB
• AC Power IN	1 x Std IEC inlet
• DC Power IN	1 x 2-pin Terminal Block 5.08
• Line OUT	1 x 3.5mm mini jack (Lime)
• Mic IN	1 x 3.5mm mini jack (Pink)
• HDD/SSD Tray	2 x 2.5" Sized Tray/Bay (1 x factory default occupied)

Available Accessories:

- HD CMB SX1-B1 : 1 x Console Mount Kit. EN60945 Tested
- HD TMB SX1-C1 : 1 x Table Mount Bracket. EN60945 Tested
  Note: Can not be combined with HDD, use SSD only.
- HD VED SX1-A1 : 1 x VESA Bracket, not EN60945 Tested
- HD 24COV SX1-A1 : 1 x UV Sun Cover
- JH C01MF A-A : 1 x USB Cable 1m, TypeA-Chassis mount receptacle
- HT 00262 OPT-A1 : 4 x RS-422/RS-485 isolated, USB ext. module
- HT 00263 OPT-A1 : 4 x RS-232 COM non-isolated, USB ext. module
- HT 00264 OPT-A1 : 1 x CAN isolated, 2 channel, USB ext. module
- HT 00273 OPT-A1 : 4 x Digital IN/OUT isolated, USB ext. module
- HT 00274 OPT-A1 : 2 x LAN 10/100Mbps, RJ45, USB ext. module
- HD 000TR SX1-A1 : 1 x Removable Front Tray 2.5" Empty
- HD xxxyy SX1-z1 : 1 x Removable Front Tray 2.5" w/Storage Device*
- HT 00300 MSOS : OS options -> http://www.hatteland-display.com/os

*Where xxx=080,120,300,320,001. yy=GB,TB. z=S (SSD), z=H (HDD).
Example: HD 120GB SX1-S1 (120GB SSD SATA 2,5"). Choose Device from table.

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
- 1 x PCA100293-1 (4xCOM RS-422/485 isolated NMEA 2 channel)*
- 1 x PCA100294-1 (4xCOM RS-232 unisolated DB9M)*
- 1 x ZIA0001310-B (1 x CAN isolated 2ch. or 2 x CAN isolated 4ch.)*
- 1 x HT 00235 OPT-A1 (2W Amplified Audio out via DB9F)
- 1 x PCA100297-1 (Isolated Digital IO module,4 x Output/4 x Input)*
- 1 x PCA100298-1 (LAN 10/100Mbps, 2 ports RJ45)*
- 1 x VSD100832-1 (LPT1 Parallel (Bi-Directional/EPP/ECP). DB25F

*Only 1 module can be installed

APPROVALS & CERTIFICATES

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

IEC 60945 4th (EN 60945:2002)
DNV - Det Norske Veritas
LRS - Lloyd's Register of Shipping
IACS E10
IP66
ABS - American Bureau of Shipping
EU RO MR - Mutual Recognition
ClassNK - Nippon Kaiji Kyokai
CCS - China Classification Society
GL - Germanischer Lloyd
BV - Bureau Veritas

Specifications - HD 26T21 MxC-xxx-xxxx

All specifications are subject to change without prior notice!

TFT Technology:

- LED Backlight Technology, TFT Active-matrix
- 25.54 inch viewable image size, Widescreen, Aspect Ratio 16:10
- S-MVA (Multi-domain Vertical Alignment) Technoogy, RGB Vertical Stripe

TFT Characteristics:

- Native Resolution : 1920 x 1200
- Pixel Pitch (RGB) : 0.2865 (H) x 0.2865 (V) mm
- Response Time : 20ms (Tr+Tf)
- Contrast Ratio : 1500:1 (typical)
- Light Intensity : 350 cd/m^2 (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:

• OS Options	: None or see table below
• Storage Options	: None or see table below
• CPU/Processor	: See table below
• Memory Options	: None 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 ALC892
• 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 or 1 x Intel® Core™ i5-520E, 2.40GHz, FSB 800/1066MHz, 3MB Cache	
Memory	1 x Single Channel, 204-pin DDR3 1066/800Mhz	- 2GB, 4GB (Max)
Storage	2 x 2.5" SSD SATA, Multi Level (MLC)	- 80GB, 120GB, 300GB
Storage	2 x 2.5" HDD* SATA *Combination buzzer and spinning hard disk (HDD) is not possible.	- 1TB
Storage	2 x 2.5" HDD SATA Ruggedized/Automotive	- 320GB
OS Option	Embedded Enterprise (WEE): - Microsoft® Windows® Server 2003/2008/2008R2 (Eng) - Microsoft® Windows® 7 Professional/Ultimate (Eng, SP1) openSUSE® 11.4 (Linux) Fedora™ 15 (Linux) Ubuntu® 10.04 LTS Ubuntu® 12.04 LTS See also Accessories (HT 00300 MSOS) options.	
Notes	- For Win7 OS, >1GB RAM + Review "SSD Selection Guide" in manual. - 32bit or 64bit versions available where applicable.	

Power Specifications:

Multi-power Supply:

- 115&230VAC - 50/60Hz + 24 VDC

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: 79W (typ) - 94W (max)

Physical Considerations:

- W:621.00 [24.45"] x H:435.00 [17.13"] x D:97.70 [3.85"] mm [inch]
- 4 x M6 VESA mounting 280x150mm, Max 12mm deep
- Weight: 16.2kg / 35.6lbs

User Controls:

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

- Power On/Off, Brightness Control (-/+)
- Power LED, HDD/SSD LED, Mode Status Indicator (ECDIS, Service)
- Buzzer (through glass), Light Sensor (behind glass)

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)
- Compass Safe Distance : Standard: 125cm - Steering: 80cm

Lifetime Considerations:

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

Input/Output Connectors:

Connector	Rear
• 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
• USB1.1 (<10m)	1 x USB Type A
• USB2.0 (<5m)	3 x USB Type A
• DVI or RGB OUT	1 x 29P DVI-I or as RGB with adapter
• RGB OUT	1 x 15p HD D-SUB
• AC Power IN	1 x Std IEC inlet
• DC Power IN	1 x 2-pin Terminal Block 5.08
• Line OUT	1 x 3.5mm mini jack (Lime)
• Mic IN	1 x 3.5mm mini jack (Pink)
• HDD/SSD Tray	2 x 2.5" Sized Tray/Bay (1 x factory default occupied)

Available Accessories:

- HD CMB SX1-C1 : 1 x Console Mount Kit. EN60945 Tested
- HD TMB SX1-C1 : 1 x Table Mount Bracket. EN60945 Tested
  Note: Can not be combined with HDD, use SSD only.
- HD VED SX1-A1 : 1 x VESA Bracket, not EN60945 Tested
- JH C01MF A-A : 1 x USB Cable 1m, TypeA-Chassis mount receptacle
- HT 00262 OPT-A1 : 4 x RS-422/RS-485 isolated, USB ext. module
- HT 00263 OPT-A1 : 4 x RS-232 COM non-isolated, USB ext. module
- HT 00264 OPT-A1 : 1 x CAN isolated, 2 channel, USB ext. module
- HT 00273 OPT-A1 : 4 x Digital IN/OUT isolated, USB ext. module
- HT 00274 OPT-A1 : 2 x LAN 10/100Mbps, RJ45, USB ext. module
- HT 00300 MSOS : OS options -> http://www.hatteland-display.com/os
- HD 000TR SX1-A1 : 1 x Removable Front Tray 2.5" Empty
- HD xxxyy SX1-z1 : 1 x Removable Front Tray 2.5" w/Storage Device*

*Where xxx=080,120,300,320,001. yy=GB,TB. z=S (SSD), z=H (HDD).
Example: HD 120GB SX1-S1 (120GB SSD SATA 2,5"). Choose Device from table.

Factory Options:

- Projected Capacitive Touch Screen (Multitouch, USB interface)
- Capacitive Touch Screen w/Cosmetic alu front frame (USB, -FxxC model)
- Optical Bonding Technology
- Color Calibrated models (ECDIS)
- Variations of SSD/HDD Storage, RAM Memory, Operating System
- 1 x PCA100293-1 (4xCOM RS-422/485 isolated NMEA 2 channel)*
- 1 x PCA100294-1 (4xCOM RS-232 unisolated DB9M)*
- 1 x ZIA0001310-B (1 x CAN isolated 2ch. or 2 x CAN isolated 4ch.)*
- 1 x HT 00235 OPT-A1 (2W Amplified Audio out via DB9F)
- 1 x PCA100297-1 (Isolated Digital IO module,4 x Output/4 x Input)*
- 1 x PCA100298-1 (LAN 10/100Mbps, 2 ports RJ45)*
- 1 x VSD100832-1 (LPT1 Parallel (Bi-Directional/EPP/ECP). DB25F

*Only 1 module can be installed

APPROVALS & CERTIFICATES

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

IEC 60945 4th (EN 60945:2002) **IACS E10** **IP66** **ClassNK** - Nippon Kaiji Kyokai **GL** - Germanischer Lloyd
DNV - Det Norske Veritas **ABS** - American Bureau of Shipping **CCS** - China Classification Society **BV** - Bureau Veritas

Specifications - CAN Module with CO-Processor

All specifications are subject to change without prior notice!

DATA SHEET

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HATTELAND® DISPLAY

Manufacturer:	**Hatteland Display AS**
Product:	**CAN Module with CO-Processor**
Typenumber:	**ZIA0001310-B**

Last Revised:	**31 Jul 2017**
Revision#:	**17**

1 x CAN, 2 channels, 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 by factory default for Series X / Series X G2 8, 12, 13, 15, 17, 19, 24, 26 inch Panel Computers and selected 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.

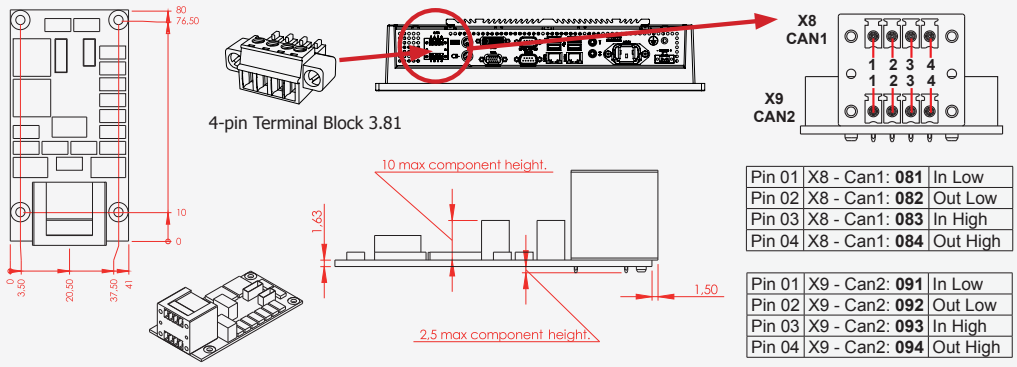
Cost effective CAN solution, Withstand marine requirements, General and open architecture that will allow the end customer to modify and handle the source code, General CAN interface support, NMEA2000, J1939, CANOpen.

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 ±27V
• ESD rating on CAN bus	ESD rating of ±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	(SCD 3.81/08/90F 3.2SN BK BX) (Do not connect to this, use Terminal Block)
• Cable connector	2 x (BCZ 3.81/04/180F SN BK BX) Terminal Block Connector (see illustration below)
• Cable	Twisted pair, no ground
• Supported protocols	SAE J2934 Standard Data Bus Interface
• Power Consumption	Max 204mA.
• Supported OS	**Embedded Enterprise (WEE):** Microsoft® Windows® XP Professional (Eng, SP3, SP2c), Microsoft® Windows® Server 2003/2008/2008R2 (Eng), Microsoft® Windows® 2003/2008/2008R2 (Eng), Microsoft® Windows® 7 Professional/Ultimate (Eng, SP1). **Linux:** openSUSE® 11.4, Fedora™ 15, Ubuntu® 10.04 LTS, Ubuntu® 12.04 LTS.
Note: Listed Operating Systems above are hardware/platform dependent. Please check datasheet for specific unit if OS is supported.	
• Test and certificate	Hatteland Display standard (tested / type approved by the following classification societies): **IEC 60945 4th** (EN 60945:2002), **IACS E10**, **ClassNK** - Nippon Kaiji Kyokai, **GL** - Germanischer Lloyd, **DNV** - Det Norske Veritas, **ABS** - American Bureau of Shipping, **CCS** - China Classification Society (Pending), **BV** - Bureau Veritas, **LRS** - Lloyd's Register of Shipping (Pending), **EU RO MR** - Mutual Recognition
• Relevant Documentation	http://www.hatteland-display.com/pdf/misc/doc101357-1_hd_can_module_programmer_guide_windows.pdf http://www.hatteland-display.com/pdf/misc/doc101356-1_hd_can_module_programmer_guide_linux.pdf http://www.hatteland-display.com/drivers/can_gw_application_note_package.zip

Illustration and Pinning:

Note: Product below for illustration only. Location of module and product size/design may differ. Connector/pinning remain the same.



Pin 01	X8 - Can1: **081**	In Low
Pin 02	X8 - Can1: **082**	Out Low
Pin 03	X8 - Can1: **083**	In High
Pin 04	X8 - Can1: **084**	Out High

Pin 01	X9 - Can2: **091**	In Low
Pin 02	X9 - Can2: **092**	Out Low
Pin 03	X9 - Can2: **093**	In High
Pin 04	X9 - Can2: **094**	Out High

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.

Hatteland Display AS, Stokkastrandvegen 87B, N-5578 Nedre Vats, Norway
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Specifications - NMEA / IEC COM Module RS-422 / RS-485

DATA SHEET

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HATTELAND® DISPLAY

Manufacturer:	**Hatteland Display AS**
Product:	**4 channel RS-422 / RS-485 COM module**
Typenumber:	**PCA100293-1**

Last Revised:	**31 Jul 2017**
Revision#:	**20**

4 channel RS-422 / RS-485, NMEA / IEC COM Module

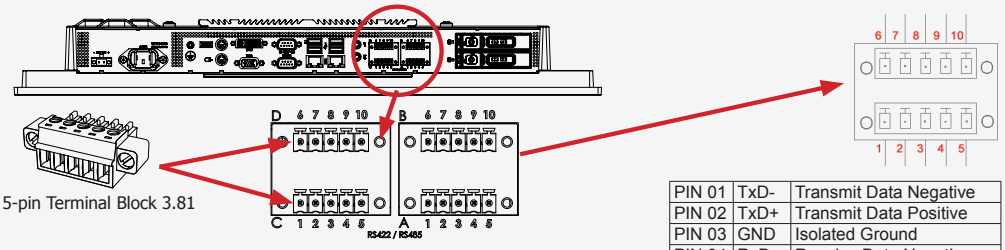
Description:

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 products, such as; Series X / Series X G2 12, 13, 15, 17, 19, 24, 26 inch Panel Computers and selected Stand-alone Computers.

Internal USB to RS-485 / RS-422 isolated	
• Features	- Independent channels (If card is replaced most OS will not change COM port number). - Outputs are short circuits protected. Inputs are protected. - Driver strength are approved. - All channels is fully isolated, channel to channel and channel to chassis. - Classified towards IEC61162-1 and IEC61162-2. - Tested according to EN61162. - NMEA-183 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 ESD protection 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 overide jumper* which can be used to force the transmitter to always be active. See below and page 2 for details.
• Connector	Terminal Block 5-pin rows (MC 1,5/ 5-STF-3,81) (see illustration below)
• Power Consumption	Max 347mA.
• Supported Operating Systems (OS)	**Embedded Enterprise (WEE):** Microsoft® Windows® XP Professional (Eng, SP3, SP2c), Microsoft® Windows® Server 2003/2008/2008R2 (Eng), Microsoft® Windows® 2003/2008/2008R2 (Eng), Microsoft® Windows® 7 Professional/Ultimate (Eng, SP1). **Linux:** openSUSE® 11.4, Fedora™ 15, Ubuntu® 10.04 LTS, Ubuntu® 12.04 LTS.
• Drivers	"www.hatteland-display.com/pdf/misc/doc102080-1_usb-com_module_configuration.pdf" www.hatteland-display.com/drivers/ht00262opt-a1_drivers.zip http://www.hatteland-display.com/support_hardware_drivers_peripherals.php Linux, please visit: http://www.ftdichip.com/Drivers/D2XX.htm
Note: Listed Operating Systems above are hardware/platform dependent. Please check datasheet for specific unit if OS is supported.	
• Test and certificate	Hatteland Display standard, (tested / type approved by the following classification societies): **IEC 60945 4th** (EN 60945:2002), **IACS E10**, **ClassNK** - Nippon Kaiji Kyokai, **GL** - Germanischer Lloyd, **DNV** - Det Norske Veritas, **ABS** - American Bureau of Shipping, **CCS** - China Classification Society (Pending), **BV** - Bureau Veritas, **LRS** - Lloyd's Register of Shipping (Pending), **EU RO MR** - Mutual Recognition

Illustration and Pinning:

Note: Product below for illustration only. Location of module and product size/design may differ. Connector/pinning remain the same.



5-pin Terminal Block 3.81

PIN 01	TxD-	Transmit Data Negative
PIN 02	TxD+	Transmit Data Positive
PIN 03	GND	Isolated Ground
PIN 04	RxD-	Receive Data Negative
PIN 05	RxD+	Receive Data Positive
PIN 06	TxD-	Transmit Data Negative
PIN 07	TxD+	Transmit Data Positive
PIN 08	GND	Isolated Ground
PIN 09	RxD-	Receive Data Negative
PIN 10	RxD+	Receive Data Positive

4 Ports (Virtual COM) identified in the Operating System (OS):
COMx (A), COMx (B), COMx (C), COMx (D)*
*Configuration dependent, x = next available port number(s) OS.

RS-485 Half Duplex (2-wire, supports ECHO) Configuration:
Connect TX and RX pair-wise: TX- to RX-, TX+ to RX+.

*Note: The jumper for "force of transmitter" is open by factory default. For some custom models this jumper is preset to closed (active), in that case unit has to be opened and jumper set to open to allow Half Duplex mode.

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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Specifications - NMEA / IEC COM Module RS-422 / RS-485

Note: All specifications are subject to change without prior notice!
Please visit www.hatteland-display.com for the latest electronic version.

HATTELAND® DISPLAY

CAUTION
This unit contains electrostatic sensitive devices.
Observe precautions for handling.

Users who needs to open the unit set jumper settings will VOID THE WARRANTY!
Before opening, proper ESD measurements must be taken!

1. Operator should ground himself by using a wrist band.

2. The wrist band should be connected to ground via a ground cord.

3. A one megaohm resistor, installed in the wrist connection end of the ground cord, is a safety requirement.

4. Hatteland Display recommend to use an Static-dissipative ESD work mat positioned at the workplace. The 3M™ 8501 Portable Field Service Kit is a good choice for this purpose. Make sure that the mat, operator and product is wired/grounded together.

All assisting persons who might come into contact with the endangered boards must also use the ESD equipment.

Jumper Configuration:

Please note:
- By standard factory default, all of the jumpers on all channels are set to open (no jumper), except some customized models as per request.
- It is expected that the user has the required knowledge for working with PCB Cards, electronics and setting jumpers.
- To avoid voiding warranty, please contact us prior to ordering to ensure safe and correct configuration regarding ECHO in factory.
- Incorrect setting of these jumpers can cause strange data losses/corruption which are hard to debug in software.

There are 2 jumpers for each channel (physically they are located as **A,B,D,C** as indicated below). You will have to provide suitable 2mm jumpers (not part of any delivery) See illustration below showing internal PCB card.

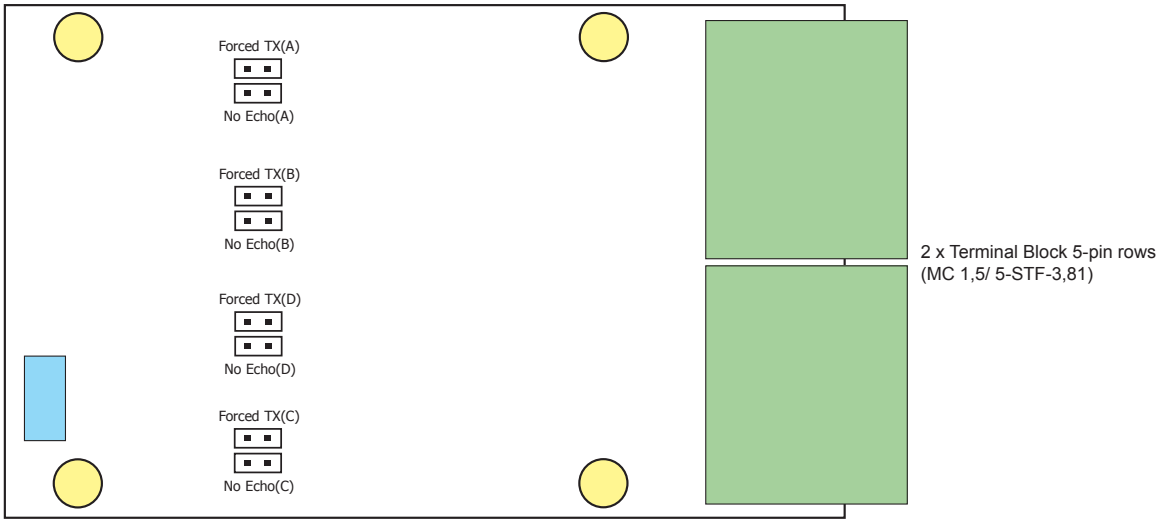
Forced TX(x):
If this jumper is set it will enable the RS485 transmitter for channel X at all times. It can be useful when the end user need the transmitter to remain on at all times. Note that it is only possible to use one transmitter on the bus when this jumper is set. It will force the bus to a logic high state when there is no traffic. Power consumption is increased if this jumper is set since the termination resistor always see the full output voltage.

No ECHO(x) - NOTE: Required for some MODBUS Compability.
Jumper mounted: This setting is only to be used during half duplex communication. When this jumper is set it will disable ability to receive data (Echo of transmitted data) while transmitting is active. Some software libraries are not able to use echo and therefore need this jumper set. Typically example is a very common MODBUS library.

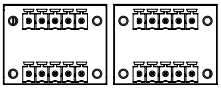
Jumper open (no jumper): Recommended setting. All data sent on the bus is read back and the application/driver on the computer can check that we was able to send the data onto the bus.

Isolation:
This only apply to the module in itself, the internally mounted units are most likely less isolated due to cable/connectors used.

Jumper Locations (top view) - General illustration:



Specifications - NMEA / IEC COM Module RS-422 / RS-485

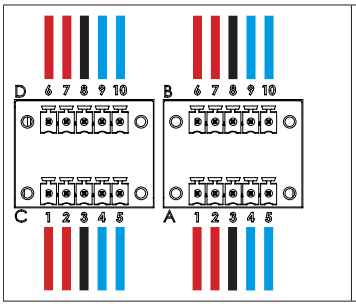


NMEA RS-422 / RS-485 (ECDIS) module (PCA100293-1):

Suitable for communication with serial protocol based equipment. Connect and secure your cables to the Terminal Block 3.81 connector. For more information please review the Data Sheet in the Appendix chapter as well as the "Housing Connector Overview" in this manual.

Note: Our units is based on an isolated RS-485 interface with enhancements to meet NMEA standard. Our unit is designed to be used with the isolated ground wire connected as shown below. If this wire is not connected, our units is more sensitive to fast transient voltage at the connectors. (The "isolated Ground" wire will help absorb this energy).

For slow changing or DC offset our system will most likely work without the ground wire. Hatteland Display recommends connecting the ground wire since it will help protect the system in event of fast transient and most likely also help improve signal integrity in the system. Please note that if no ground wire is used and the transient dump too much energy for the ESD logic to handle you will need to replace the NMEA card (If the NMEA card fails due to this it will not be a warranty repair).



- **Black** is always connected
- **Blue** is connected when the device act as a receiver
- **Red** is connected when the device is acting as a transmitter

PIN 01 & 06	**TxD-**	**Transmit Data Negative**
PIN 02 & 07	**TxD+**	**Transmit Data Positive**
PIN 03 & 08	**GND**	**Isolated Ground**
PIN 04 & 09	**RxD-**	**Receive Data Negative**
PIN 05 & 10	**RxD+**	**Receive Data Positive**

- **Black** is always connected
- **Blue** is connected when the device act as a receiver
- **Red** is connected when the device is acting as a transmitter

NMEA Standards:

IEC61162-1 chapter 3.5.5 state that the input shall withstand 15V between ground and input. The reference speed specified is set at 4800 bit/s.

IEC61162-2 chapter 3.1 state that there are 3 wires to be used. (A, B and C). The reference speed for this interface is set as 38400 bit/s.

Please visit **http://www.iec.ch** (International Electrotechnical Commission) for the complete standard description.

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HATTELAND® DISPLAY

Manufacturer:	**Hatteland Display AS**
Product:	**COM Module RS-232**
Typenumber:	**PCA100294-1**

Last Revised:	**25 Feb 2016**
Revision#:	**10**

4 channel COM RS-232, DB9M 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, 24 and 26 inch Panel Computers and selected Stand-alone Computers.

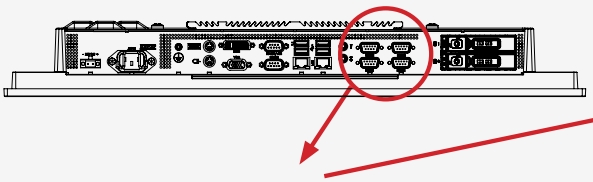
Features:

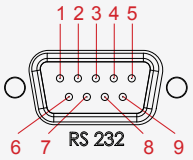
- 4 independent channels (If a card is replaced most operating system will not change COM port number)
- Outputs are short circuits protected

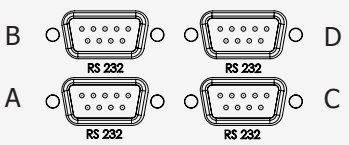
Internal USB to 4 channel x RS-232 non isolated	
• Features	All channels have support for all RS-232 DB-9 signals
• Connector	Standard RS-232 DB-9 male housing and pinning
• Data Rate	230kbps
• ESD Rating (IEC 1000-4-2 Air) (RS-232 I/Os)	±15 kV
• ESD Rating (IEC 1000-4-2 Contact) (RS-232 I/Os)	±8 kV
• Test and certificate	Hatteland Display standard, (tested / type approved by the following classification societies): **IEC 60945 4th** (EN 60945:2002), **IACS E10**, **ClassNK** - Nippon Kaiji Kyokai (Pending), **GL** - Germanischer Lloyd, **DNV** - Det Norske Veritas, **ABS** - American Bureau of Shipping, **CCS** - China Classification Society (Pending), **BV** - Bureau Veritas, **LRS** - Lloyd's Register of Shipping (Pending), **EU RO MR** - Mutual Recognition
• Supported Operating Systems (OS)	**Embedded Enterprise (WEE):** Microsoft® Windows® XP Professional (Eng, SP3, SP2c), Microsoft® Windows® Server 2003/2008/2008R2 (Eng), Microsoft® Windows® 2003/2008/2008R2 (Eng), Microsoft® Windows® 7 Professional/Ultimate (Eng, SP1). **Linux:** openSUSE® 11.4, Fedora™ 15, Ubuntu® 10.04 LTS, Ubuntu® 12.04 LTS.
• Drivers	"www.hatteland-display.com/pdf/misc/doc102080-1_usb-com_module_configuration.pdf" www.hatteland-display.com/drivers/ht00263opt-a1_drivers.zip http://www.hatteland-display.com/support_hardware_drivers_peripherals.php Linux, please visit: http://www.ftdichip.com/Drivers/D2XX.htm
Note: Listed Operating Systems above are hardware/platform dependent. Please check datasheet for specific unit if OS is supported.	

Illustration and Pinning:

Note: Product below for illustration only. Location of module and product size/design may differ. Connector/pinning remain the same.







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	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

*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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Specifications - Isolated Digital Input/Output Module

All specifications are subject to change without prior notice!

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HATTELAND® DISPLAY

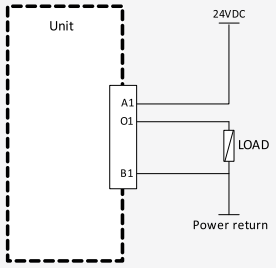
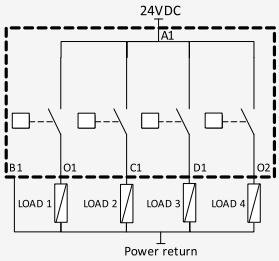
Manufacturer:	**Hatteland Display AS**
Product:	**Isolated Digital IO module (4 x Output + 4 x Input)**
Typenumber:	**PCA100297-1**

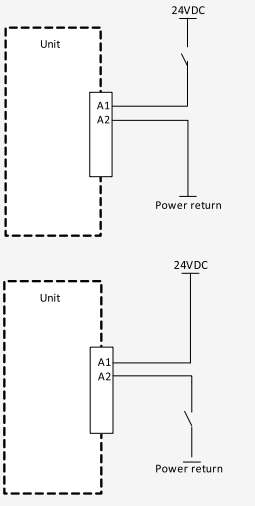
Last Revised:	**30 May 2016**
Revision#:	**10**

4 x Isolated Input + 4 x Output, Digital IO Module

Description:

The Hatteland Display DIO modules provide the system with 4 isolated digital output and 4 isolated digital input. The module is attached to the motherboard via USB interface. Application software access the DIO channels via D2XX interface provided by the chip manufacturer, i.e. in the normal case is there no requirements for low level software development. This module will mainly be integrated, electrical and mechanical, in the final products, such as; Series X 12, 13, 15, 17, 19, 24, 26 inch Panel Computers and selected Stand-alone Computers.

Digital Output		**Application Circuit**
• Features	- Independent output channels, High side switch. - Outputs are short circuits and overload protected. - Thermal shutdown. - Isolated towards chassis. - Output status/diagnostic feedback available for each output channel. - Outputs is rated for inductive and resistive loads. - Outputs is rated for driving small motors. - Classified towards IEC60945 and IEC60950.	
• Maximum Ratings	- Voltage: 9-36V continuously. - Load Current: 150mA. - Response time hardware for change of output state <20ms. - Response time hardware for diagnostic feedback <30ms.* - Worst case short circuit current (each channel) < 1.5A. *Typical response time at system level: 200ms.	
• Typical Application	- Low Power control / relay control. - Medium power buzzer. - Indicator/signal lamps.	**Above: High side switch concept**

Digital Input		**Application Circuits**
• Features	- Independent input channels. - Fully isolated towards chassis and channel to channel. - Short circuit and reverse voltage protected. - Classified towards IEC60945 and IEC60950.	
• Maximum Ratings	- Input voltage 8-36V. - Response time hardware <10ms. - Input current < 20mA.	

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.

Hatteland Display AS, Stokkastrandvegen 87B, N-5578 Nedre Vats, Norway
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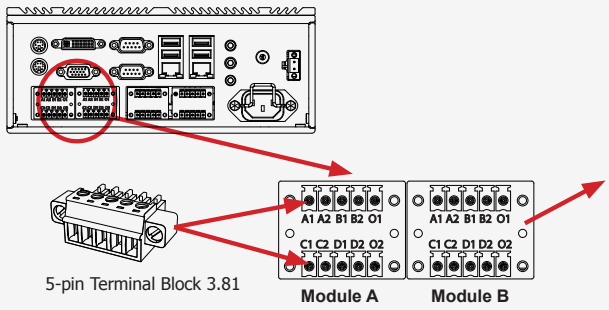
Specifications - Isolated Digital Input/Output Module

All specifications are subject to change without prior notice!

Additional	
• Cable connector	(MC 1,5/ 5-STF-3,81) Terminal Block 3.81 (see illustration below)
• Test and certificate	Hatteland Display standard, (tested / type approved by the following classification societies): **IEC 60945 4th** (EN 60945:2002), **IACS E10**, **ClassNK** - Nippon Kaiji Kyokai, **GL** - Germanischer Lloyd, **DNV** - Det Norske Veritas, **ABS** - American Bureau of Shipping, **CCS** - China Classification Society (pending), **BV** - Bureau Veritas, **LRS** - Lloyd's Register of Shipping, **EU RO MR** - Mutual Recognition
• Safety IEC60950	The DIO module is intended to be used in control circuits and this module does therefore need external fuse to meet safety agency approvals.

Illustration and Pinning

Note: Product below for illustration only. Location of module and product size/design may differ. Connector/pinning/specifications remain the same.



Module A		Module B	
A1	External Power +	A1	IN+[0]
A2	N/C (Not Connected)	A2	IN-[0]
B1	External Power - (GND1)	B1	IN+[1]
B2	N/C (Not Connected)	B2	IN-[1]
O1	HS[0]	O1	N/C
C1	HS[1]	C1	IN+[2]
C2	N/C (Not Connected)	C2	IN-[2]
D1	HS[2]	D1	IN+[3]
D2	N/C (Not Connected)	D2	IN-[3]
O2	HS[3]	O2	N/C

Supported Operating Systems (OS)

Embedded Enterprise (WEE):	**Linux:**
- Microsoft® Windows® XP Professional (Eng, SP3, SP2c)	- openSUSE® 11.4
- Microsoft® Windows® Server 2003/2008/2008R2 (Eng)	- Fedora™ 15
- Microsoft® Windows® 2003/2008/2008R2 (Eng)	- Ubuntu® 10.04 LTS
- Microsoft® Windows® 7 Professional/Ultimate (Eng, SP1).	- Ubuntu® 12.04 LTS

Note: Listed Operating Systems above are hardware/platform dependent. Please check datasheet for specific unit if OS is supported.

Currently supported D2XX Drivers

		Processor Architecture		
Operating System (OS)	**Release Date** (yyyy-mm-dd)	**x86 (32-bit)**	**x64 (64-bit)**	**Comments [Footnote]**
Microsoft® Windows®*	2013-02-20	2.08.28	2.08.28	2.08.28 WHQL Certified [*1] Release Notes [*2]
Linux	2012-06-29	1.1.12	1.1.12	[*3]

*includes the following versions of the Microsoft® Windows® operating systems:
Windows® XP, Windows® Server 2003, Windows® Vista, Windows® Server 2008, Windows® 7, Windows® Server 2008 R2 and Windows® 8.

For updates, please visit: http://www.ftdichip.com/Drivers/D2XX.htm

Footnotes:
[*1] = http://www.ftdichip.com/Drivers/CDM/CDM20828_Setup.exe
[*2] = http://www.ftdichip.com/Drivers/CDM/CDM%202%2008%2030%20Release%20Info%20for%208.1.rtf
[*3] = http://www.ftdichip.com/Drivers/D2XX/Linux/ReadMe-linux.txt

Getting started, documentation and specific Hatteland Display Library links:
http://www.ftdichip.com/Support/Documents/ProgramGuides/D2XX_Programmer%27s_Guide(FT_000071).pdf
http://www.hatteland-display.com/pdf/misc/doc101781-1_programmer_guide_ht00273opt-a1.pdf
http://www.hatteland-display.com/drivers/dio_pca100297-1_ht00273opt-a1_package.zip

DATA SHEET

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HATTELAND® DISPLAY

Manufacturer:	**Hatteland Display AS**
Product:	**Internal LAN Module RJ-45**
Typenumber:	**PCA100298-1**

Last Revised:	**31 Jul 2017**
Revision#:	**04**

2 x LAN RJ-45 - Internal Module

Description:

The Hatteland Display USB->Ethernet module provide the system with dual independent Ethernet ports. The module is connected internally to the motherboard via standard USB interfaces. Application software access the ethernet channels as standard ethernet devices, i.e. in the normal case is there no requirements for additional software development. This module can be integrated, electrical and mechanical, for the product such as Series X / Series X G2 13, 15, 17, 19, 24 and 26 inch Panel Computers and selected Stand-alone Computers (Please check datasheet for your unit if PCA100298-1 is listed as part of Factory Options).

Features:

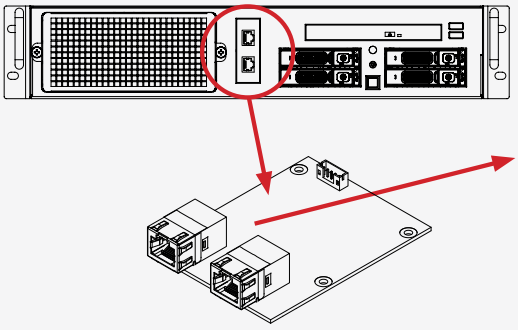
- USB 2.0 and 1.1 Standard Compliant.
- Two internal USB ports are required.
- IEEE 802.3 10Base-T/100 Base-T compatible.

Note: Wake-on-lan is not supported.

Internal 2 x USB to 2 x RJ-45	
• Connector	1kV Isolated RJ-45, 8-pin connector and pinning. Each port as two LED reporting status of transmit/receive
• Power Consumption	Max 326mA.
• Test and certificate	Hatteland Display standard, (tested / type approved by the following classification societies): **IEC 60945 4th (EN 60945:2002), IACS E10,** **EU RO MR -** Mutual Recognition (covers DNV, BV, ABS, GL, NK and LRS certificates)
• Supported Operating Systems (OS)	**Embedded Enterprise (WEE):** Microsoft® Windows® 7 Professional SP1 32/64bit, Microsoft® Windows® 7 Ultimate SP1 32/64bit, Microsoft® Windows® Embedded 8.0 Industry Pro MultiLang 32/64bit, Microsoft® Windows® Embedded 8.1 Industry Pro MultiLang 32/64bit, **Linux:** openSUSE® 11.4, Fedora™ 15, Ubuntu® 10.04 LTS, Ubuntu® 12.04 LTS.
• Drivers	http://www.asix.com.tw/products.php?op=pItemdetail&PItemID=105;71;101&PLine=71
Note: Listed Operating Systems above are hardware/platform dependent. Please check datasheet for specific unit if OS is supported.	

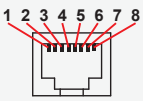
Illustration and Pinning:

Note: Product below for illustration only. Location of module and product size/design may differ. Connector/pinning remain the same.



8-pin RJ-45 10/100Mbps LAN/Ethernet

PCA100298-1 / HT 00274 OPT-A1



Pin 01 - TDP	Transmit Differential Pair (Positive)
Pin 02 - TDN	Transmit Differential Pair (Negative)
Pin 03 - RDP	Receive Differential Pair (Positive)
Pin 04 - NC	Not Connected
Pin 05 - NC	Not Connected
Pin 06 - RDN	Receive Differential Pair (Negative)
Pin 07 - NC	Not Connected
Pin 08 - NC	Not Connected

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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Specifications
Accessories

DATA SHEET

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HATTELAND® DISPLAY

ACCESSORY

Manufacturer:	**Hatteland Display AS**
Product:	**USB Cable 1m**
Type:	**JH C01MF A-A**

Last Revised:	**17 Jul 2014**
Revision#:	**04**

USB Cable

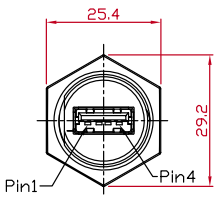
Description:

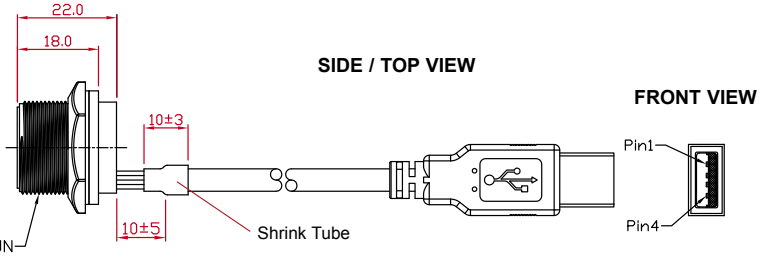
USB Cable (Type A plug to Chassis mount Type A receptacle) suitable for installations that feature a secure fastening connection from external equipment with standard Type A ports to all Hatteland Display computers and panel computers with standard USB Type A ports. RoHS Compliance.

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	: Hatteland Display standard, (tested / type approved by the following classification societies): **IEC 60945 4th** (EN 60945:2002), **IACS E10**, **EU RO MR** - Mutual Recognition
• Included with delivery	: 1 x 218-N28 Strip Pad (Adhesive Panduit 30) : 1 x B2-100 Black Cable tie 2,5x100mm

FRONT VIEW

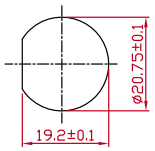




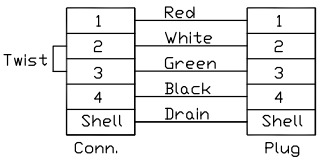
SIDE / TOP VIEW

FRONT VIEW

PANEL CUT OUT



WIRING DIAGRAM



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

Manufacturer:	**Hatteland Display AS**
Product:	**External Modules - USB Connectivity**
Typenumber:	**Based on internal modules, see table on page 2**

Last Revised:	**30 May 2016**
Revision#:	**14**

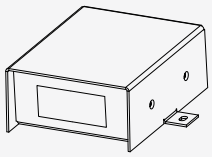
External Modules - USB Connectivity

Description:

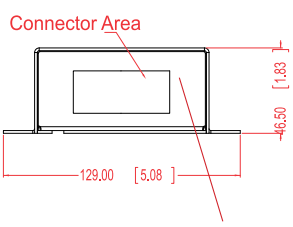
Hatteland Displays IO module series concept for marine applications adds more functionality to your Maritime Multi Computers and Maritime Stand-Alone computers. They are available as regular factory options for the entire range of Series X Maritime Multi Displays, Maritime Multi Computers and as well as the latest Maritime Stand-Alone computers.

In addition, the module concept has been taken further to a self contained and encased external USB module version. This provides flexibility for new installations and easy upgrade of already installed systems. In fact, any Hatteland Display product that has a USB2.0 port can take advantage of these External Modules for both legacy, obsoleted, current and future products as long as the software and firmware supports the Operating System. (note: CAN module is only supported for Series X and newer computers).

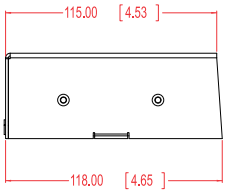
Fully compatible with all Hatteland Display latest generation products, external cased modules enable system integrators to benefit from the features of these internal options as an external and easy to connect solution. They interface via a standard USB Type A Cable(s) and the chassis comes with its own mounting hinges.



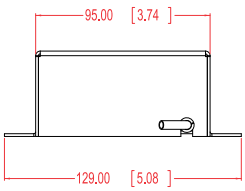
FRONT VIEW



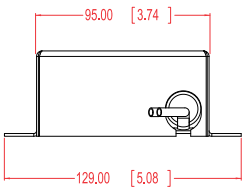
SIDE VIEW



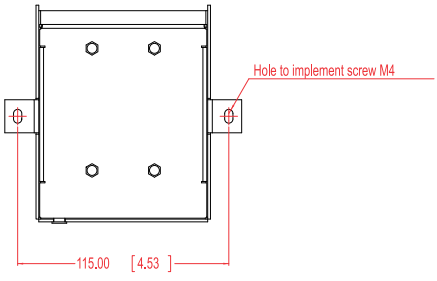
BACK VIEW Single Cable



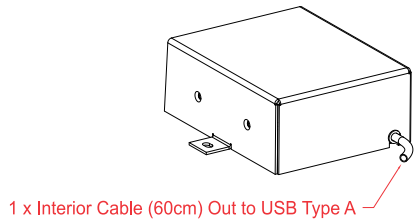
BACK VIEW Double Cable



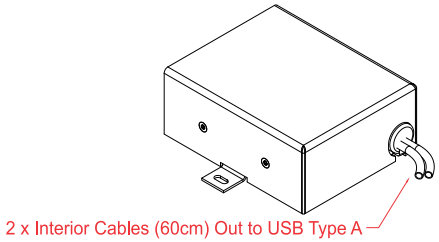
BOTTOM VIEW



DIMETRIC VIEW BACK Single Cable



DIMETRIC VIEW BACK Double Cable



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Specifications - External Modules (USB)

All specifications are subject to change without prior notice!

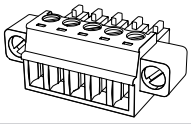
Note: All specifications are subject to change without prior notice!
Please visit www.hatteland-display.com for the latest electronic version.

HATTELAND® DISPLAY

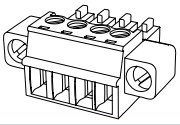
Ordering Details:

TypeNumber	Description	Internal Specifications (link to separate datasheets)
HT 00262 OPT-A1	**NMEA COM** 4 x NMEA RS-422/RS-485 isolated Via 5-pin Terminal Block 3.81 Connector Connects through 1 x USB Cable	**(Based on PCA100293-1)** www.hatteland-display.com/pdf/ind_ds/ds_pca100293-1_com_module_rs-422_rs-485.pdf "www.hatteland-display.com/pdf/misc/doc102080-1_usb-com_module_configuration.pdf" www.hatteland-display.com/drivers/ht00262opt-a1_drivers.zip
HT 00263 OPT-A1	**COM** 4 x RS-232 COM Via 4 x DB-9 Male Connector Connects through 1 x USB Cable	**(Based on PCA100294-1)** www.hatteland-display.com/pdf/ind_ds/ds_pca100294-1_com_module_rs-232.pdf "www.hatteland-display.com/pdf/misc/doc102080-1_usb-com_module_configuration.pdf" www.hatteland-display.com/drivers/ht00263opt-a1_drivers.zip
HT 00264 OPT-A1	**CAN** 1 x CAN isolated Via 4-pin Terminal Block 3.81 Connector Connects through 1 x USB Cable	**(Based on ZIA0001310-B)** www.hatteland-display.com/pdf/ind_ds/ds_zia0001310-b_can_module.pdf www.hatteland-display.com/pdf/misc/doc101357-1_hd_can_module_programmer_guide_windows.pdf www.hatteland-display.com/pdf/misc/doc101356-1_hd_can_module_programmer_guide_linux.pdf www.hatteland-display.com/drivers/can_gw_application_note_package.zip
HT 00273 OPT-A1	**DIO** 4 x Digital Input isolated 4 x Digital Output Via 5-pin Terminal Block 3.81 Connector Connects through 1 x USB Cable	**(Based on PCA100297-1)** www.hatteland-display.com/pdf/ind_ds/ds_pca100297-1_4x_digital_module.pdf www.hatteland-display.com/pdf/misc/doc101781-1_programmer_guide_ht00273opt-a1.pdf www.hatteland-display.com/drivers/dio_pca100297-1_ht00273opt-a1_package.zip
HT 00274 OPT-A1	**LAN** 2 x Ethernet Ports, 10/100Mbps Via 2 x RJ-45 Connectors Connects through 2 x USB Cables	**(Based on PCA100298-1 - Requires two USB TYPE A ports)** www.hatteland-display.com/pdf/ind_ds/ds_pca100298-1_lan_module_rj-45.pdf

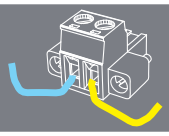
Most modules interfaces by using Terminal Block type connectors (where applicable), as listed below:



For NMEA COM & DIO Module Connection:
5-pin
MC 1,5/ 5-STF-3,81



For CAN Module Connection:
4-pin
BCZ 3.81/04/180F SN BK BX



Secure cables with Screw Terminals

Suitable cable housing references:
For 5-pin:
https://www.phoenixcontact.com/online/portal/us?uri=pxc-oc-itemdetail:pid=1834372&library=usen&pcck=P-11-02-01&tab=1
For 4-pin
http://catalog.weidmueller.com/procat/Product.jsp;jsessionid=B040D5EB6832629E567C884809FDF6C1?productId=(%5b1005290000%5d)

Compass Safe Distance - Standard: 15cm - Steering: 10cm

APPROVALS & CERTIFICATES

These products have been tested / type approved by the following classification societies:
IEC 60945 4th (EN 60945:2002) **IACS E10** **EU RO MR** - Mutual Recognition (covers DNV, BV, ABS, GL, NK and LRS certificates)*
* Pending for HT 00274 OPT-A1 / PCA100298-1

2/2

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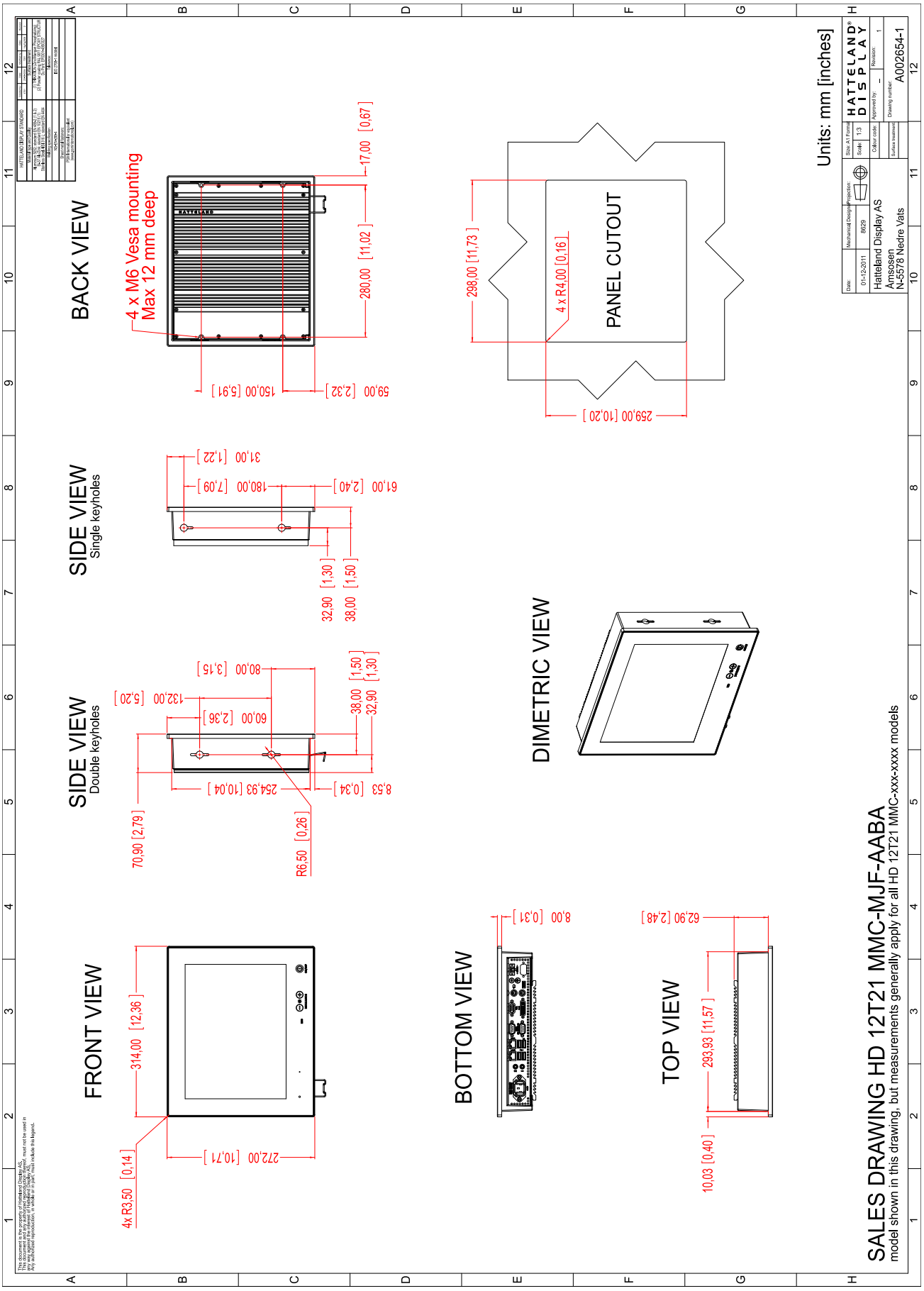
Technical Drawings

Technical Drawings - HD 12T21 MMC-xxx-xxxx



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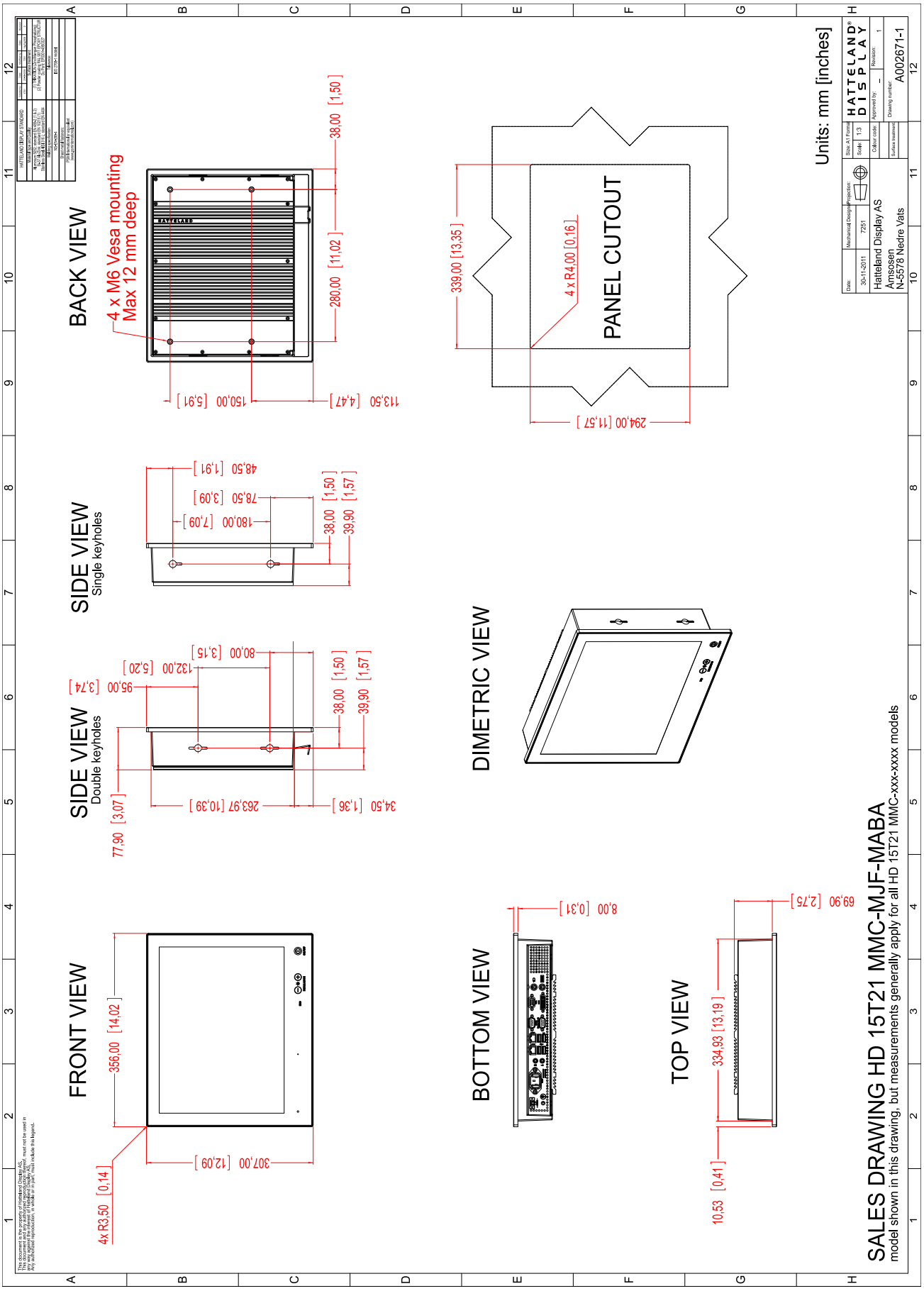
Technical Drawings - HD 15T21 MMC-xxx-xxxx



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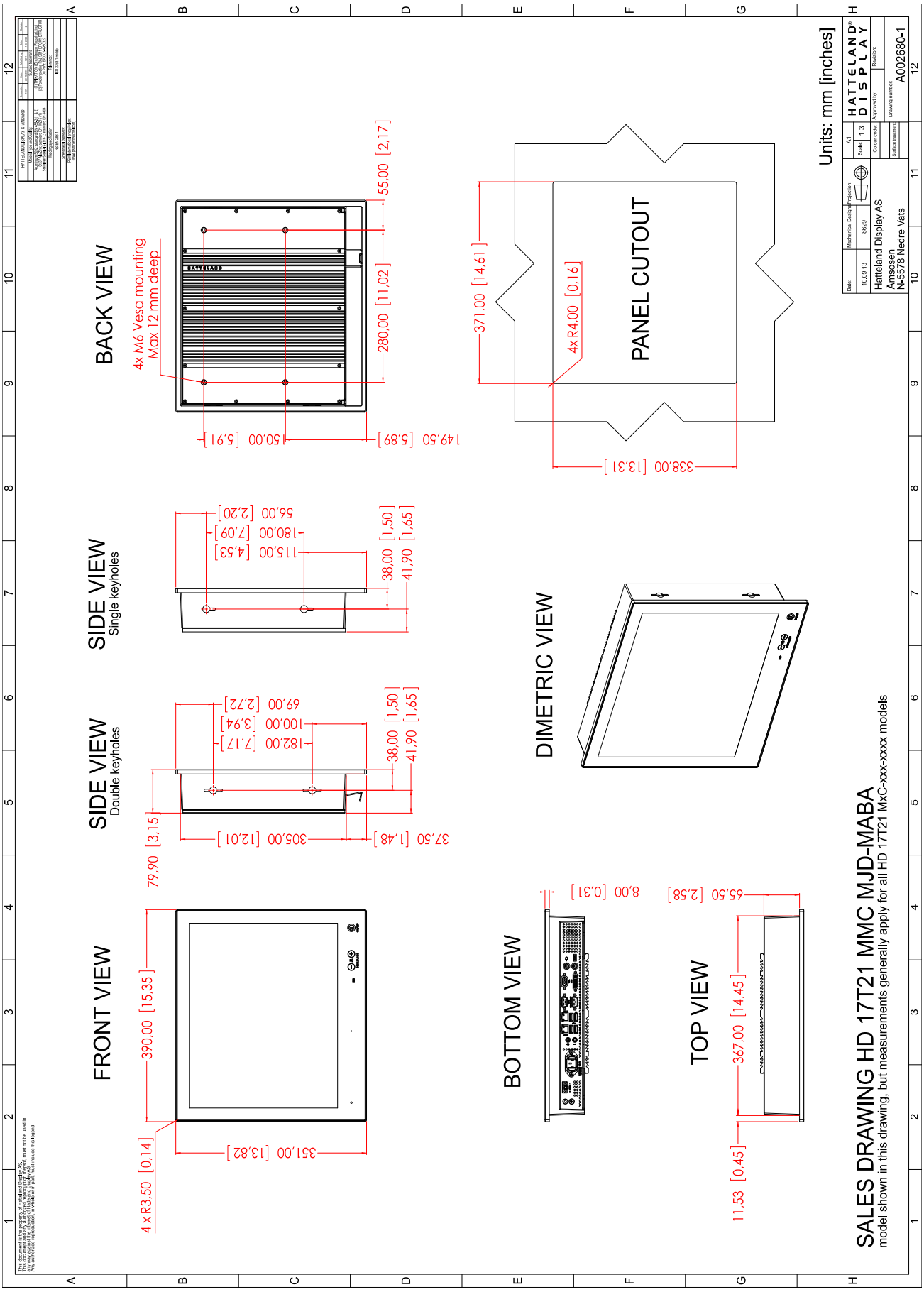
Technical Drawings - HD 17T21 MxC-xxx-xxxx



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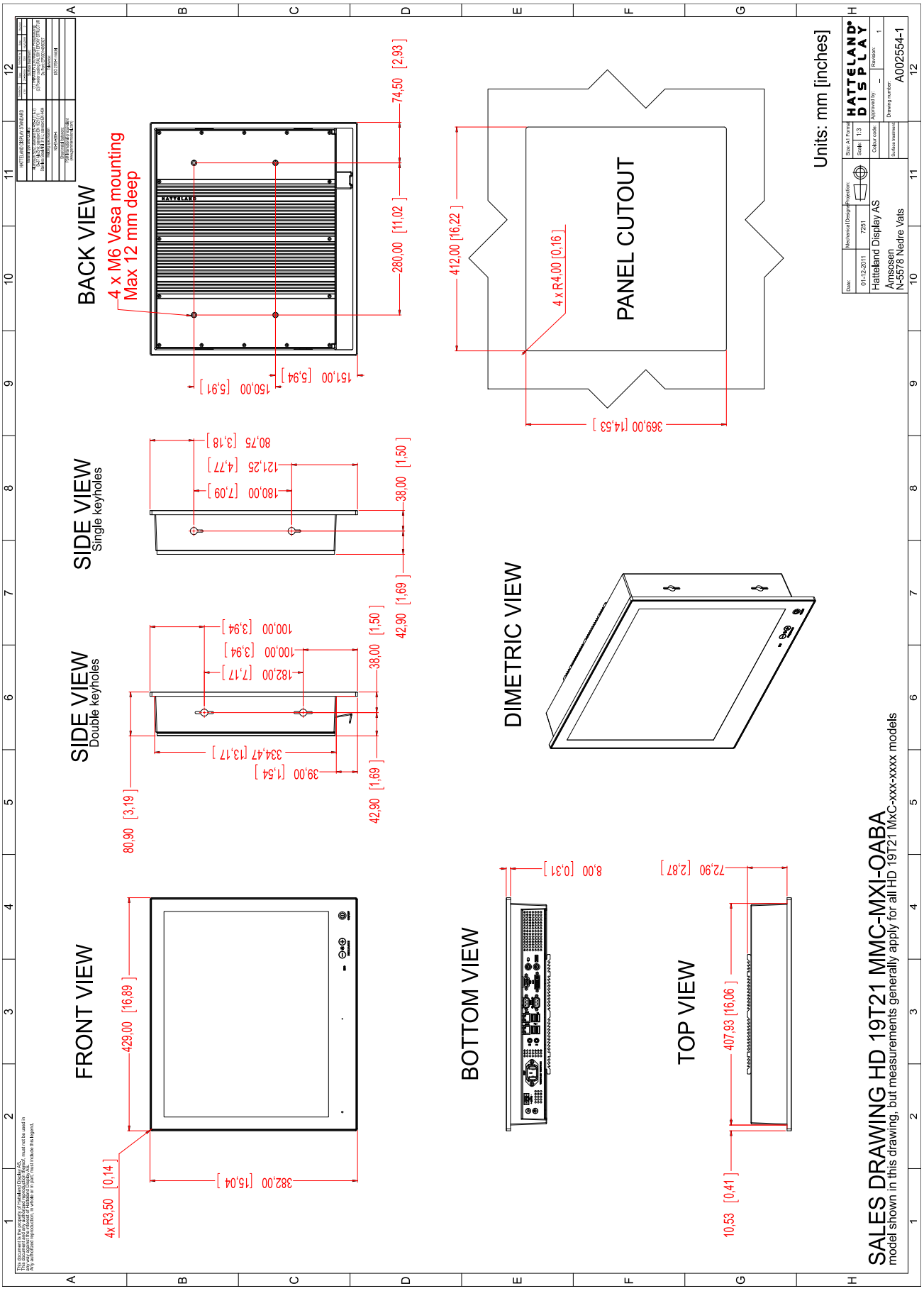
Technical Drawings - HD 19T21 MxC-xxx-xxxx



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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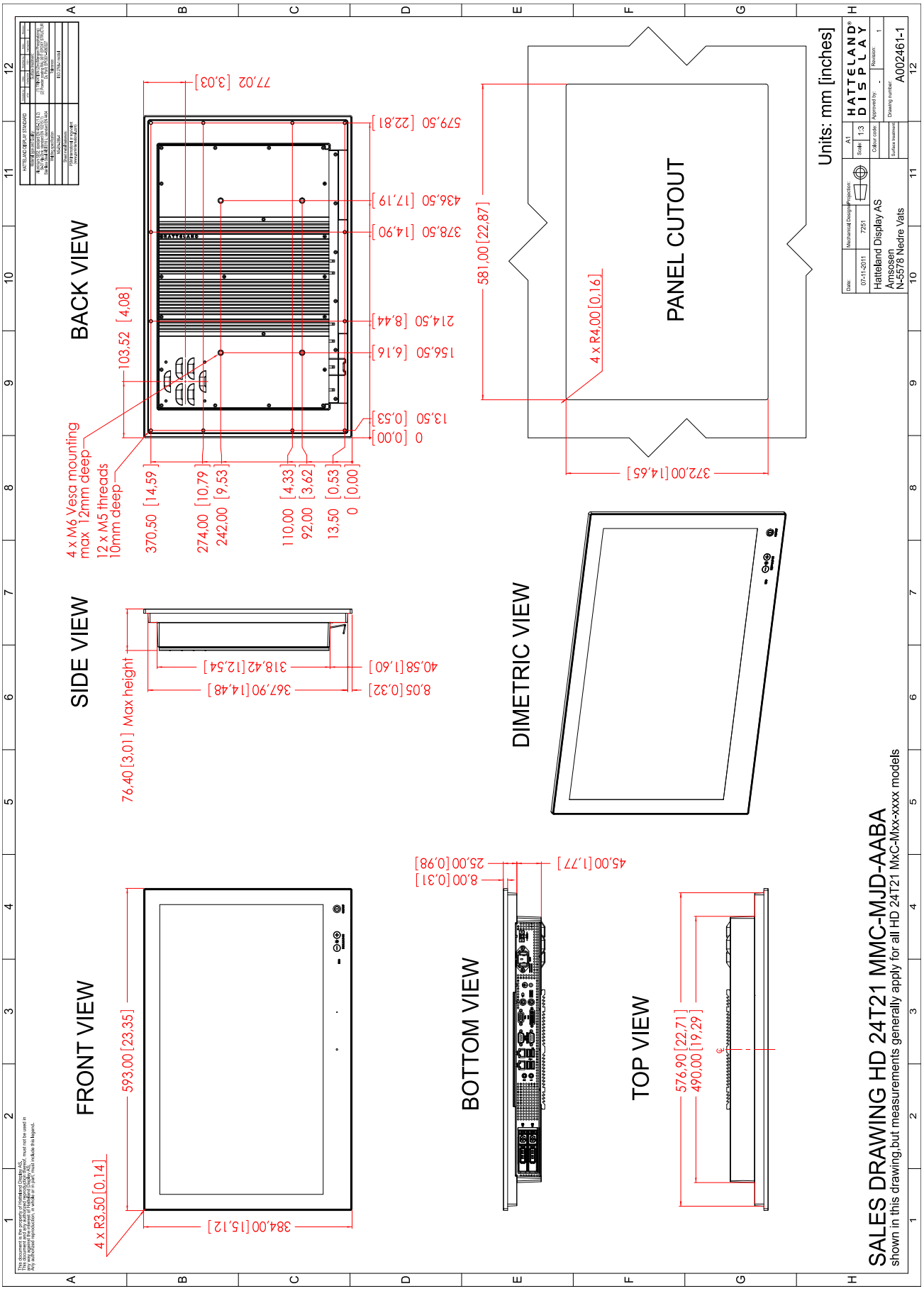
Technical Drawings - HD 24T21 MxC-xxx-xxxx



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.

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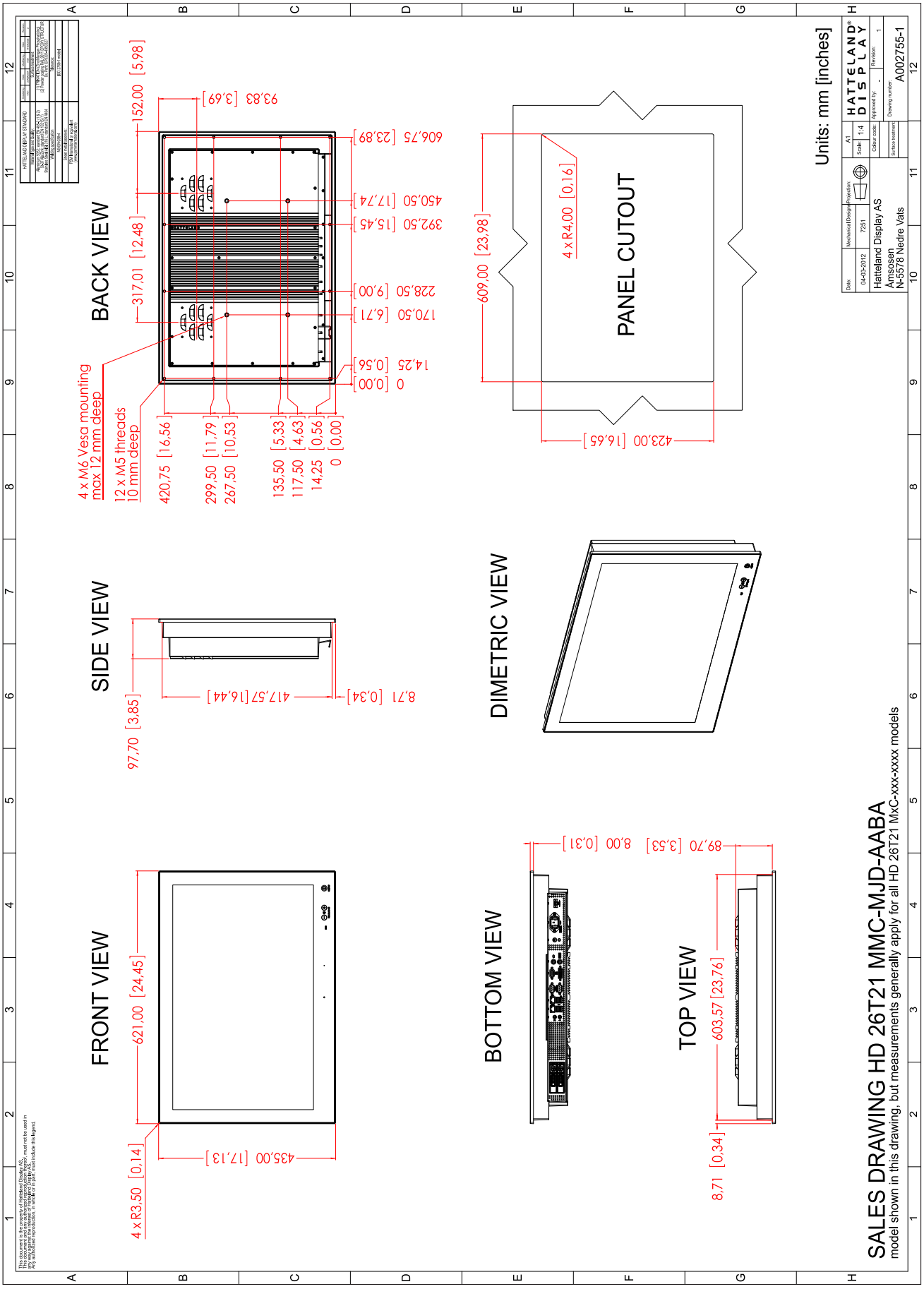
Technical Drawings - HD 26T21 MxC-xxx-xxxx



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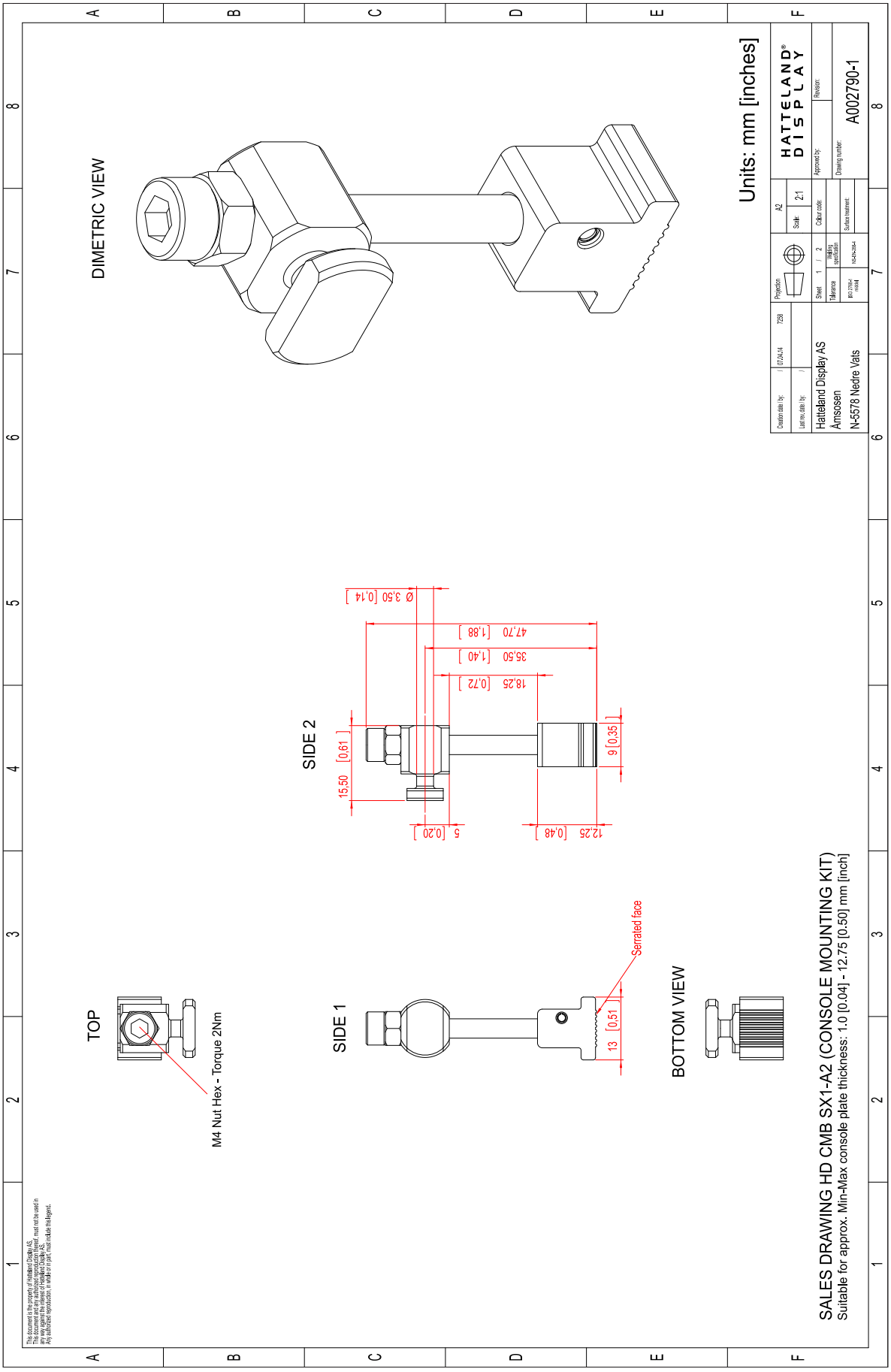
Technical Drawings - Accessories

Technical Drawings - HD CMB SX1-A2



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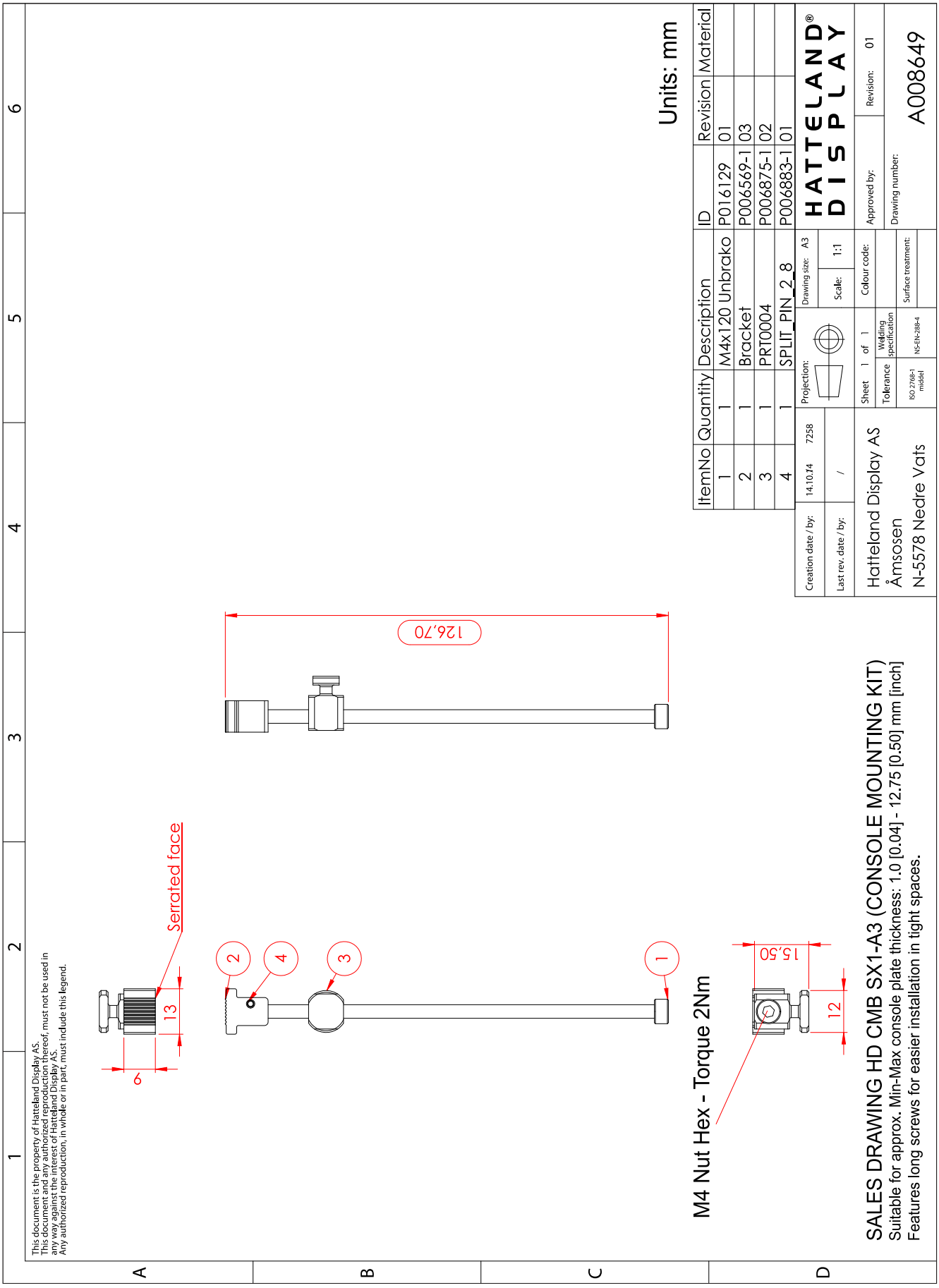
Technical Drawings - HD CMB SX1-A3



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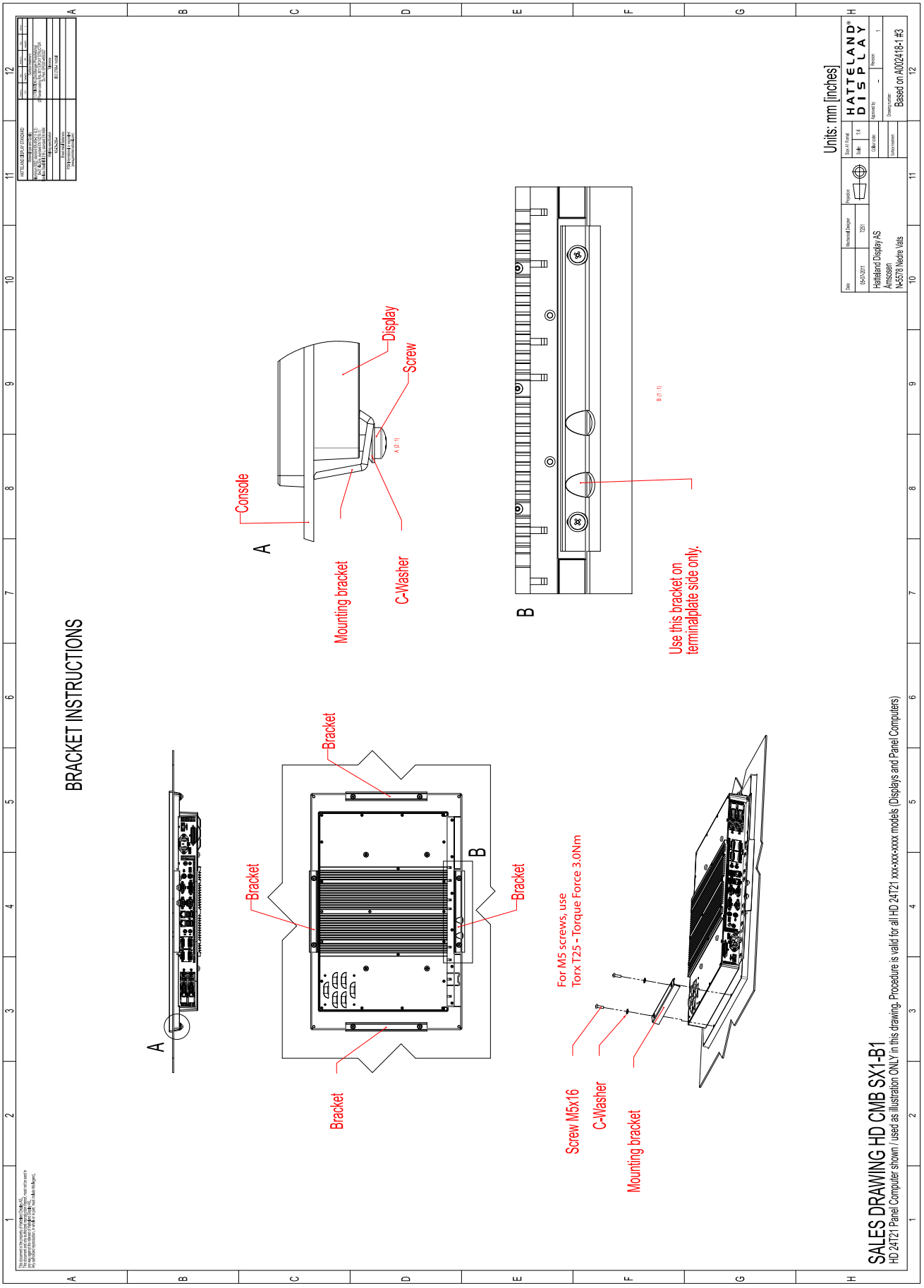
Technical Drawings - HD CMB SX1-B1



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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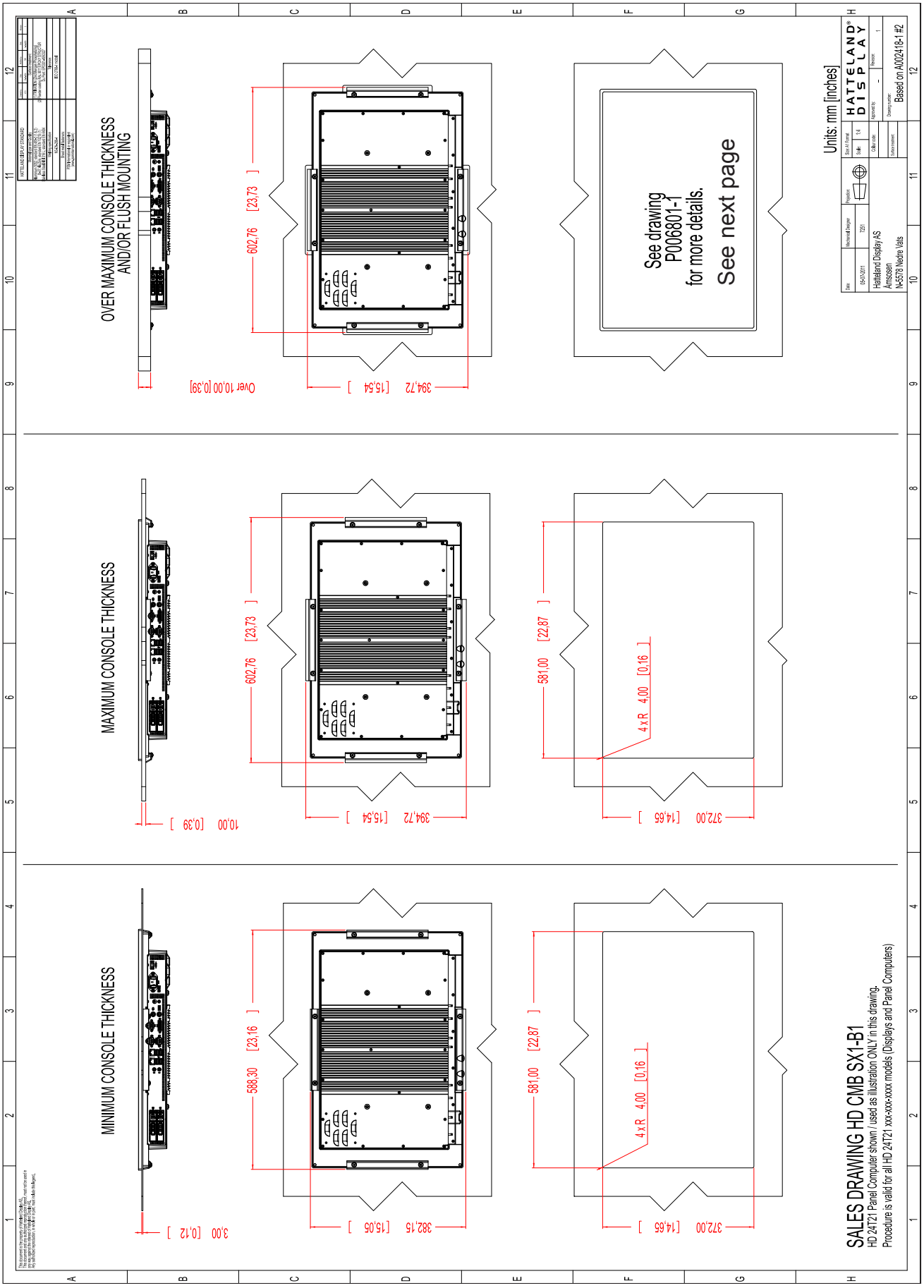
Technical Drawings - HD CMB SX1-B1



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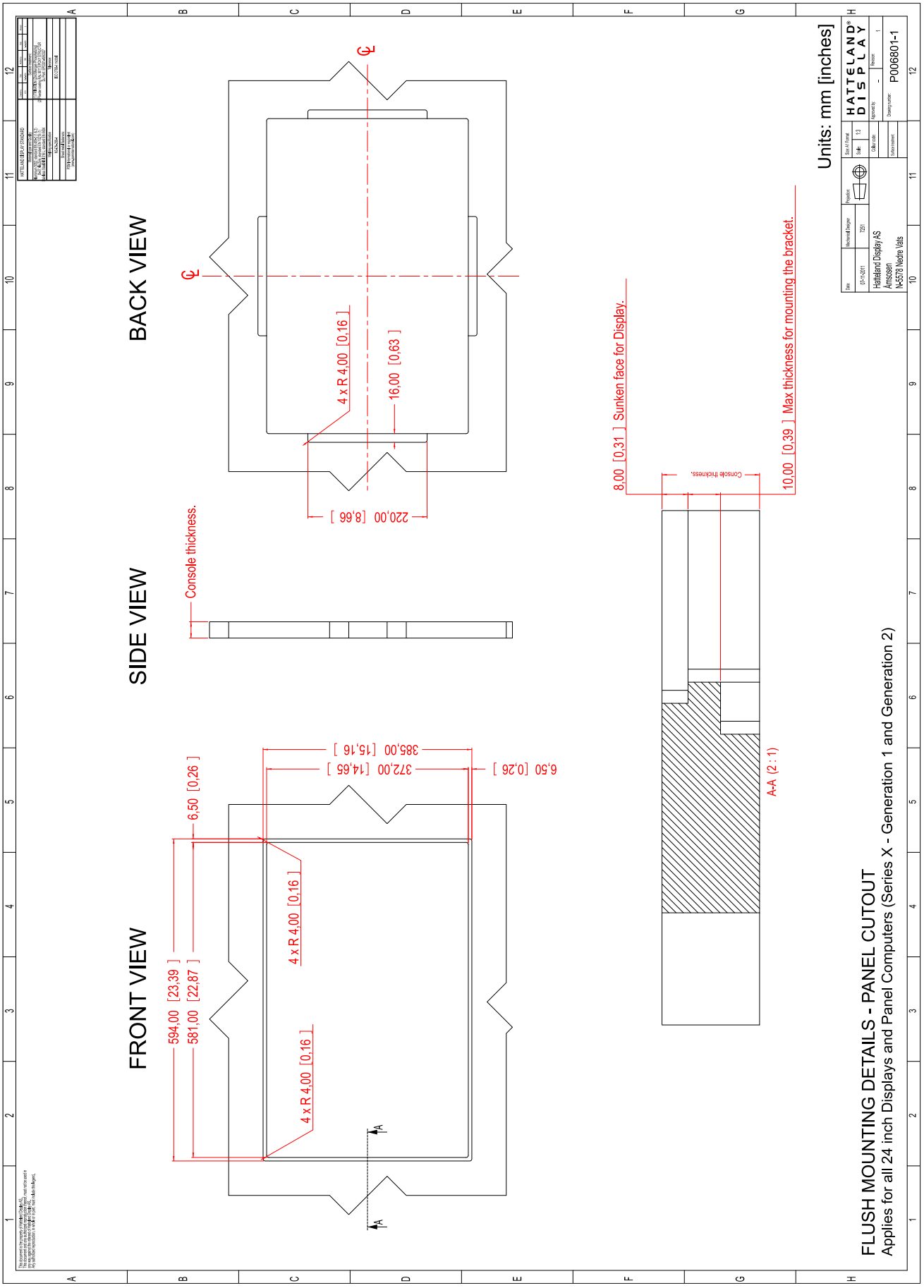
Technical Drawings - HD CMB SX1-B1



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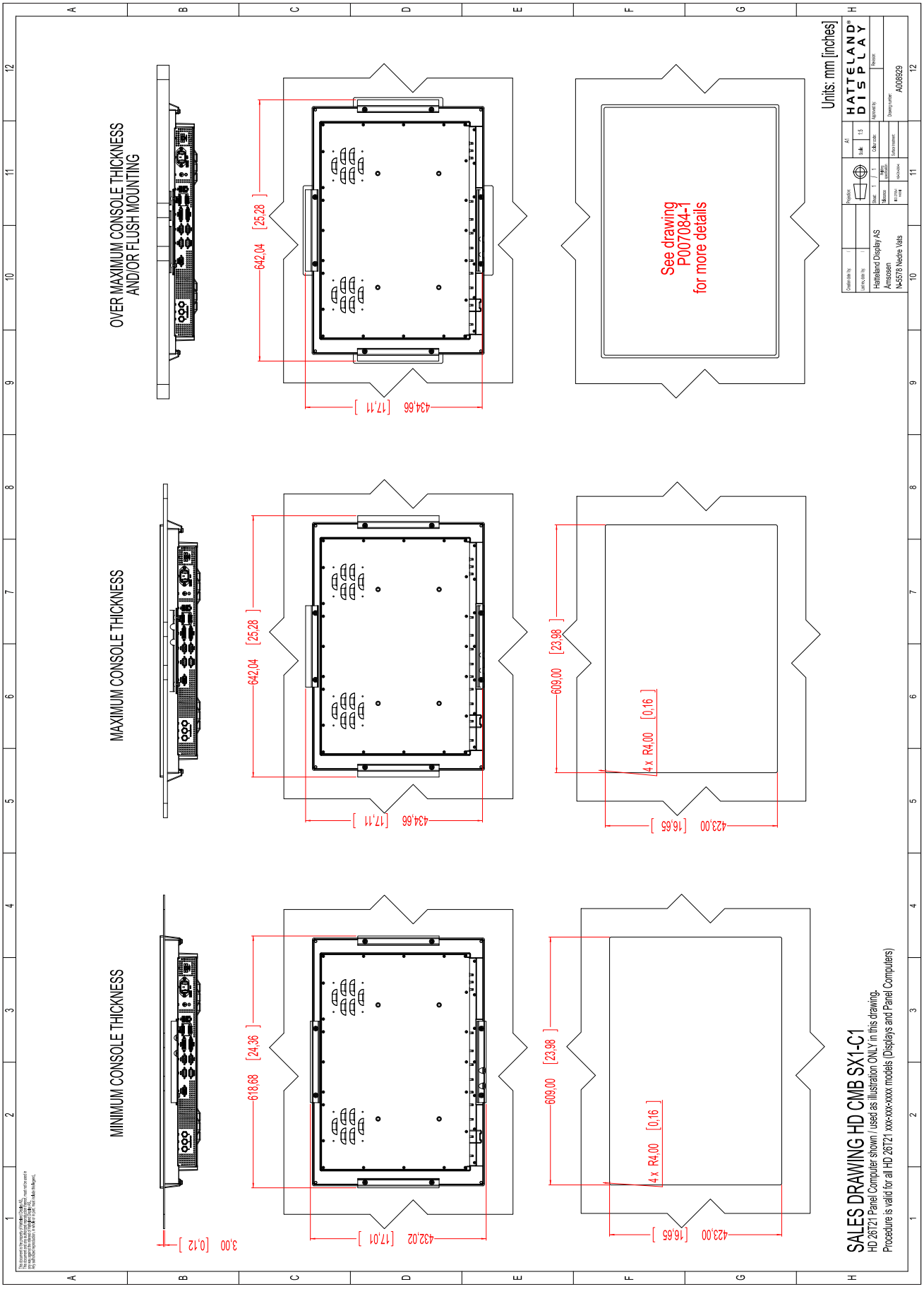
Technical Drawings - HD CMB SX1-C1



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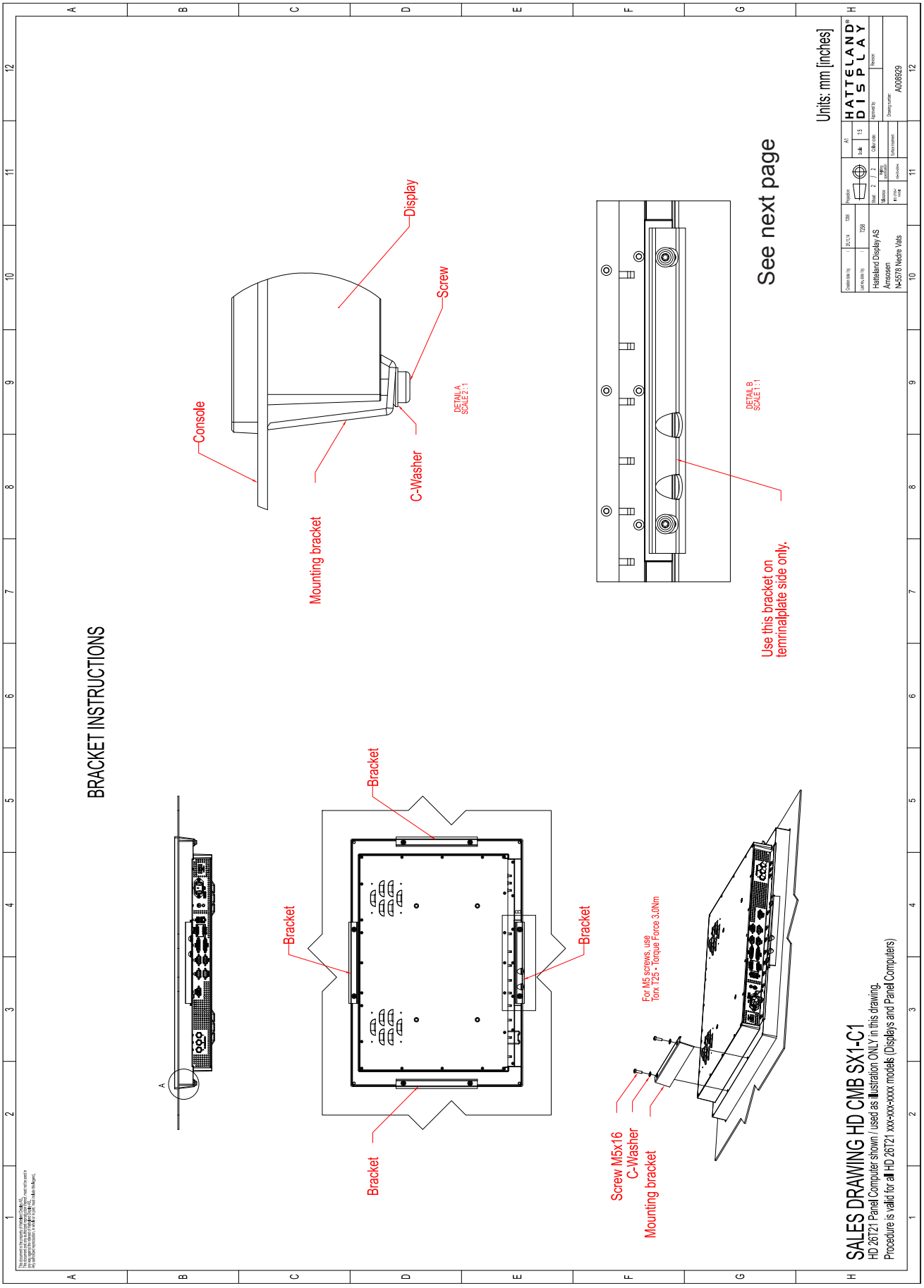
Technical Drawings - HD CMB SX1-C1



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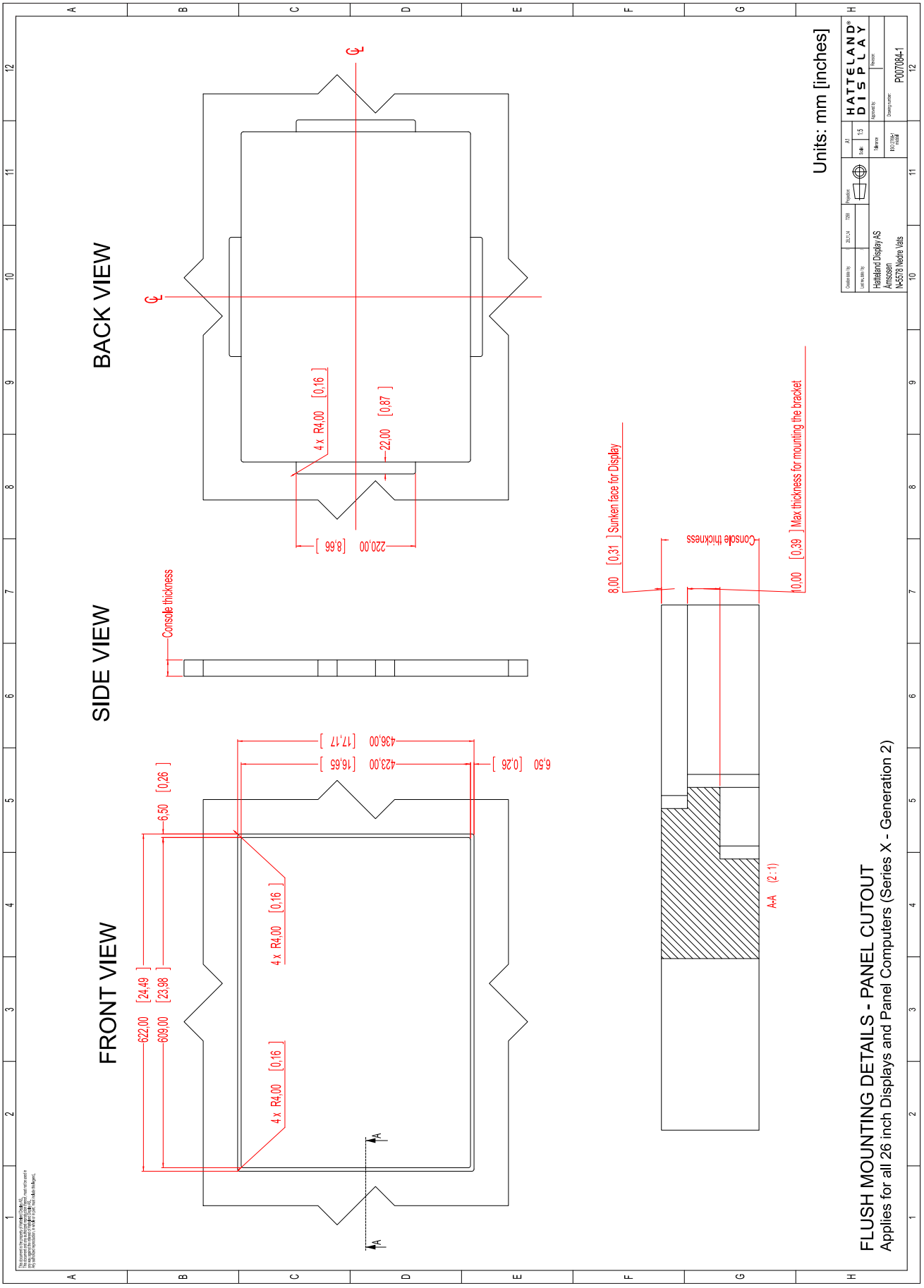
Technical Drawings - HD CMB SX1-C1



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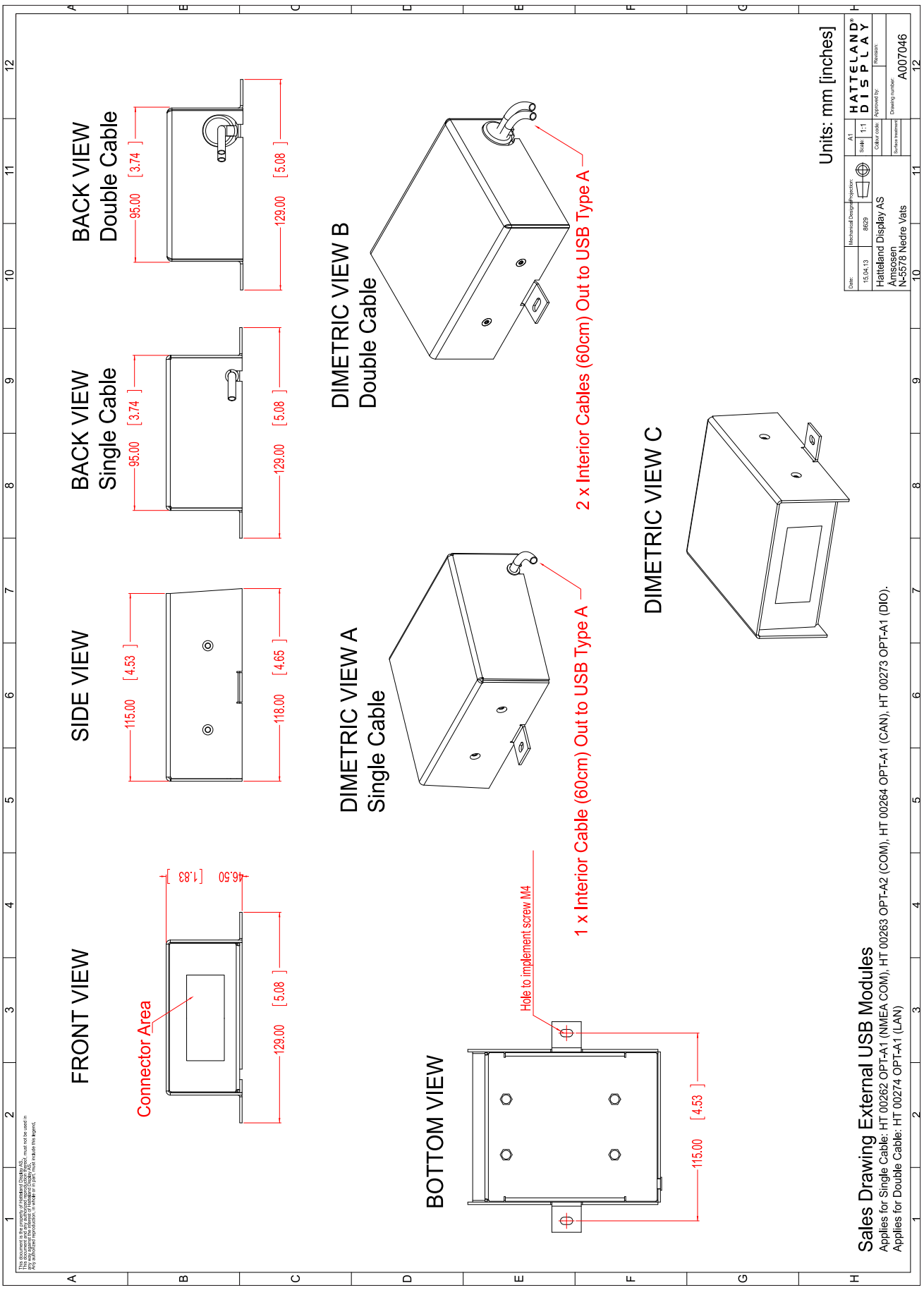
Technical Drawings - External Modules (USB)



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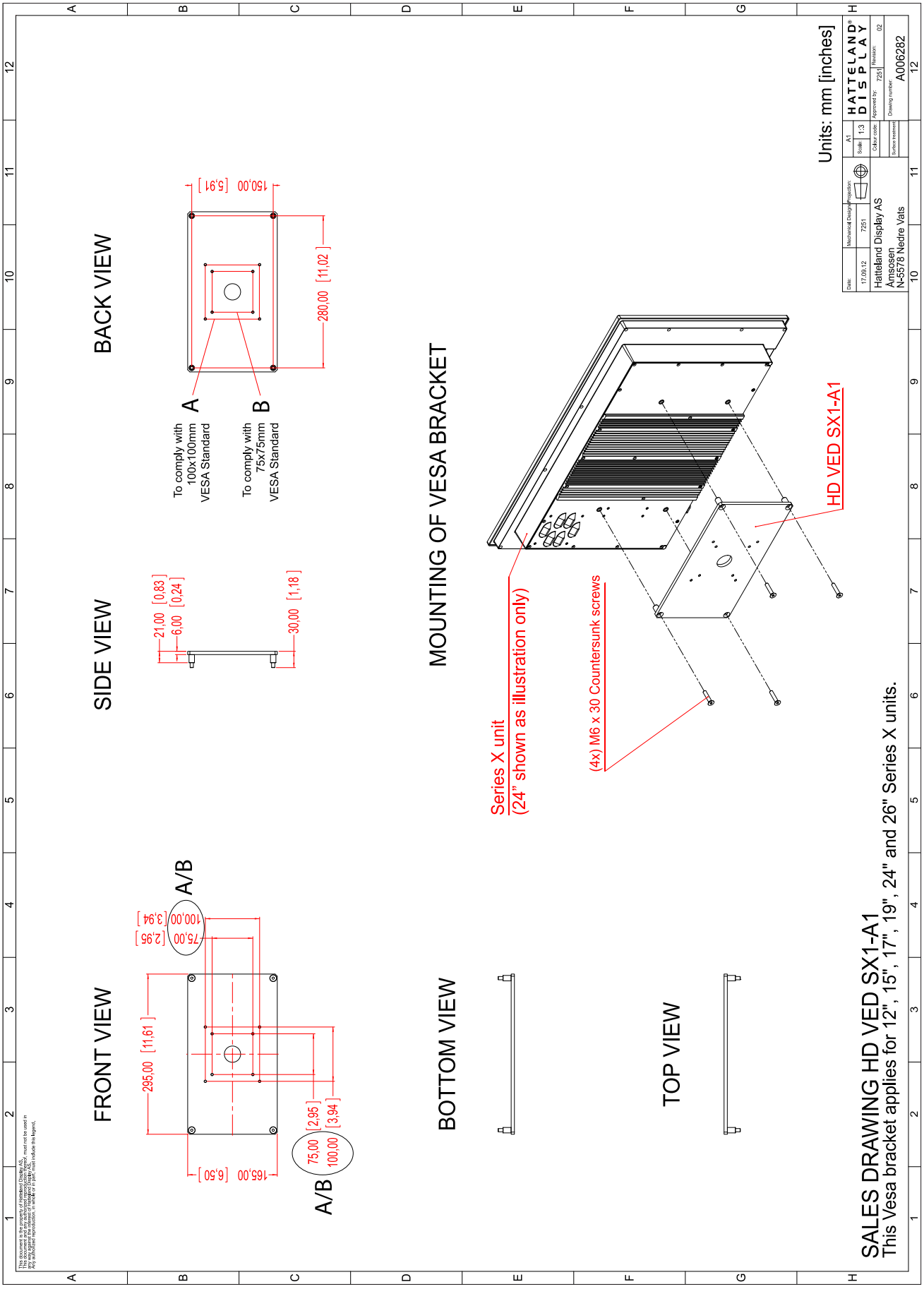
Technical Drawings - HD VED SX1-A1



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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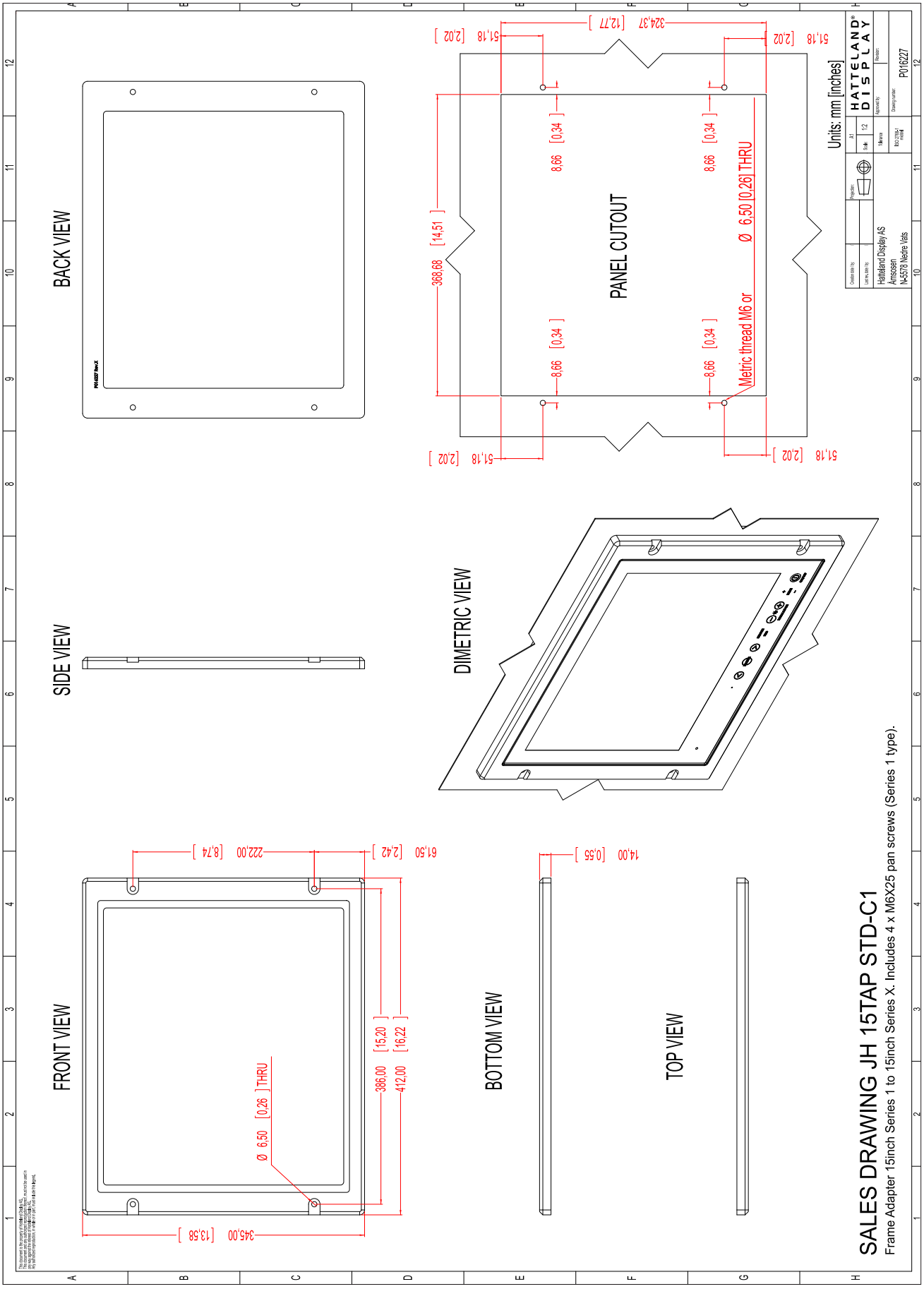
Technical Drawings - JH 15TAP STD-C1



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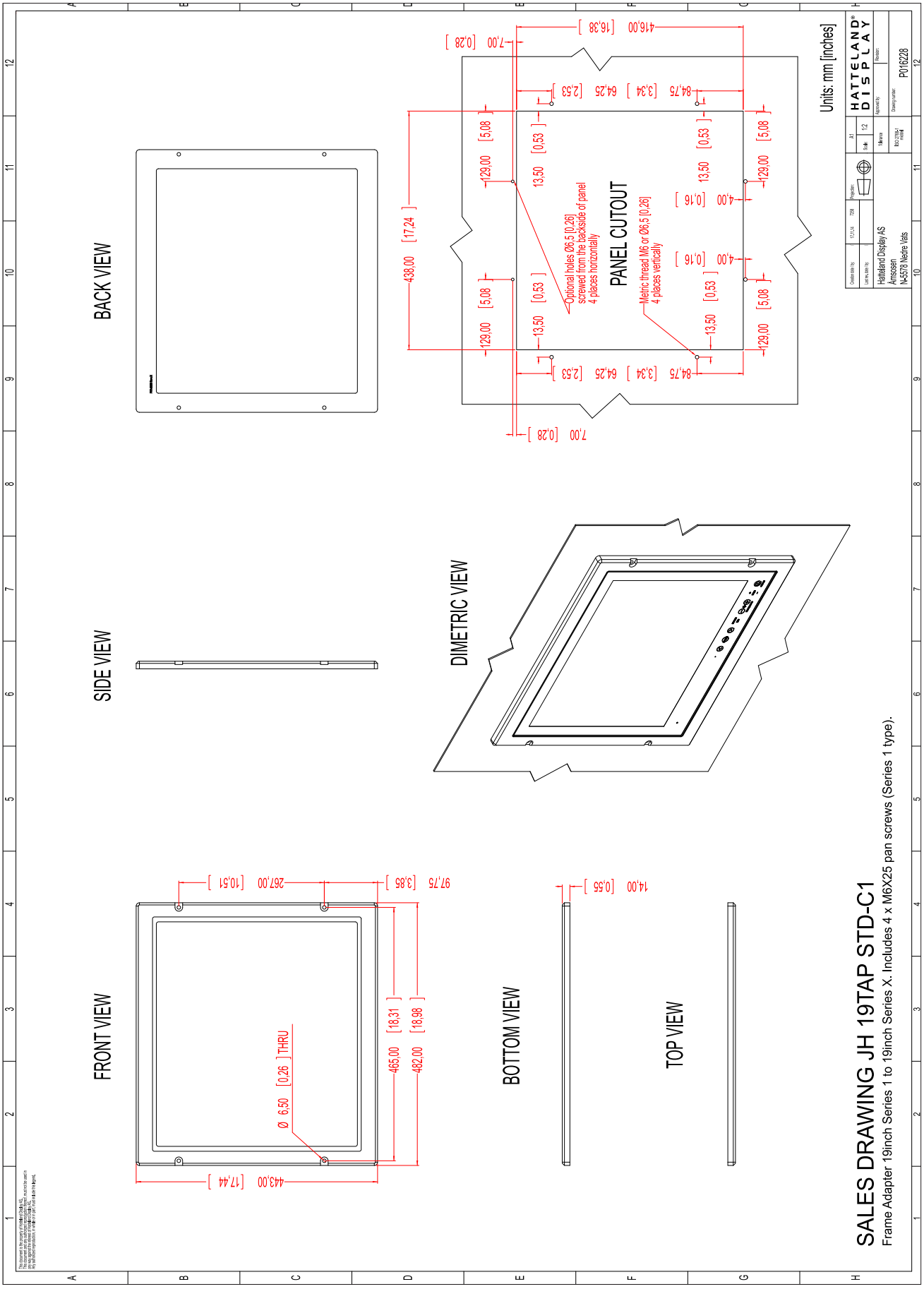
Technical Drawings - JH 19TAP STD-C1



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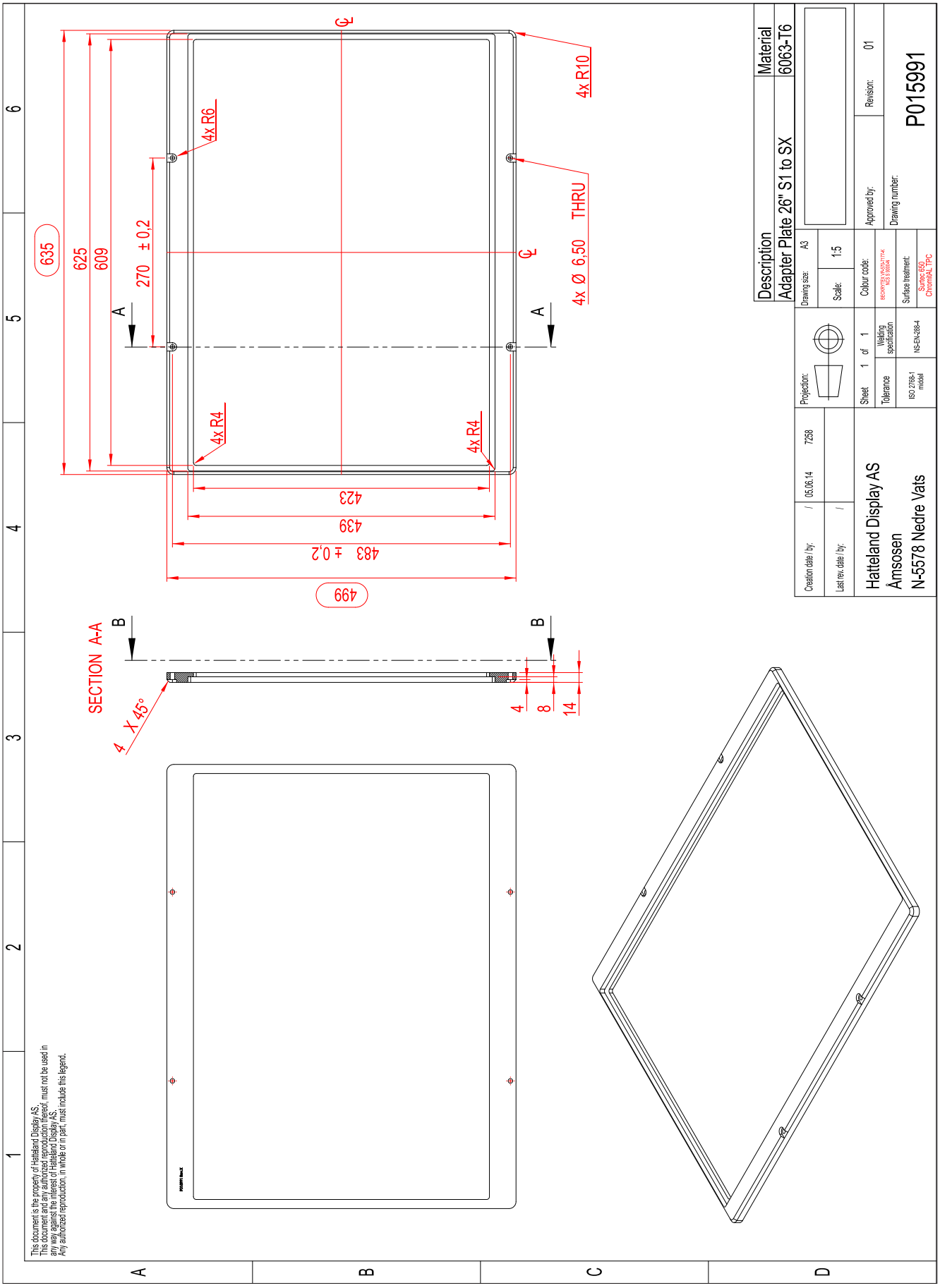
Technical Drawings - JH 26TAP STD-A1



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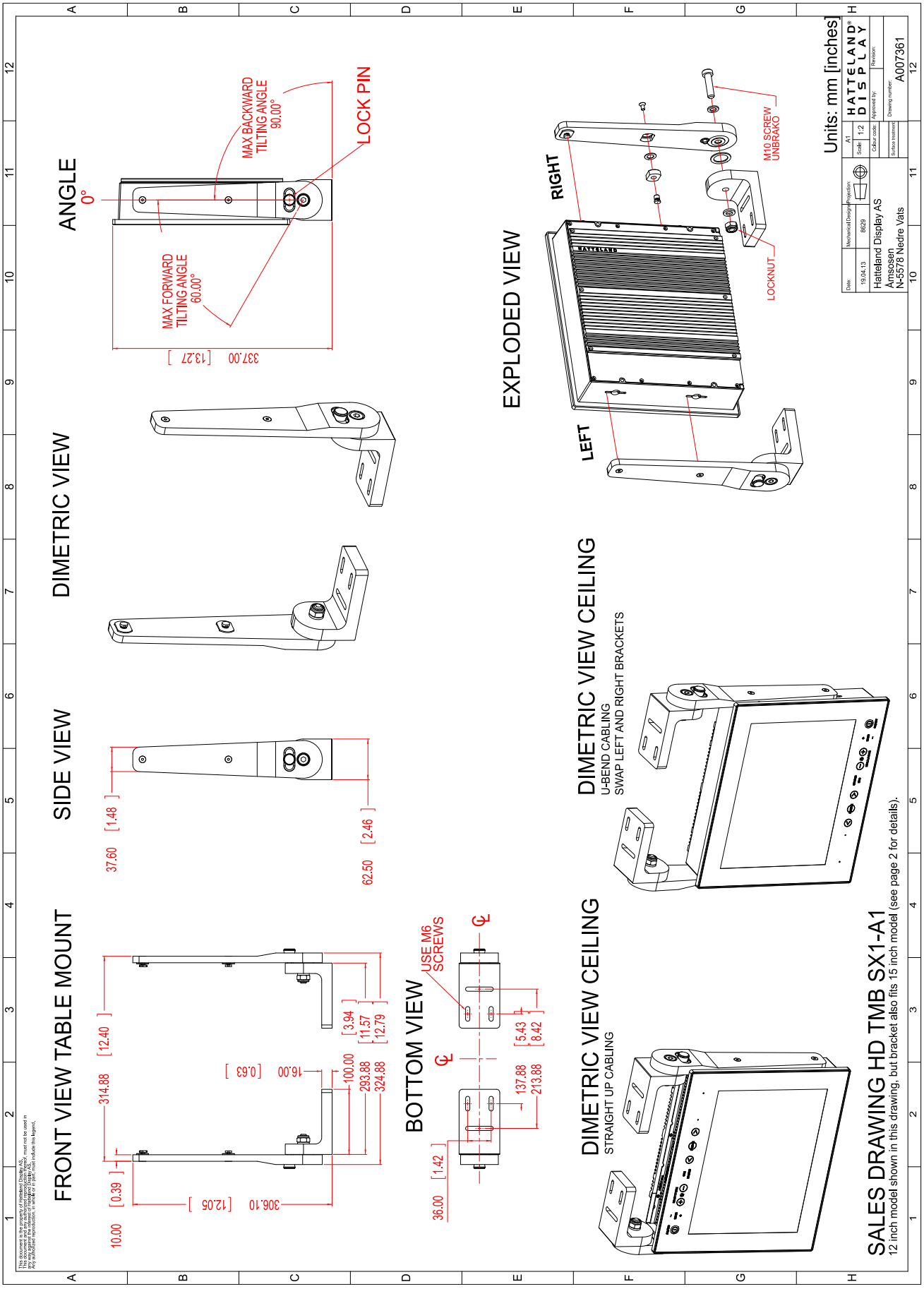
Technical Drawings - HD TMB SX1-A1



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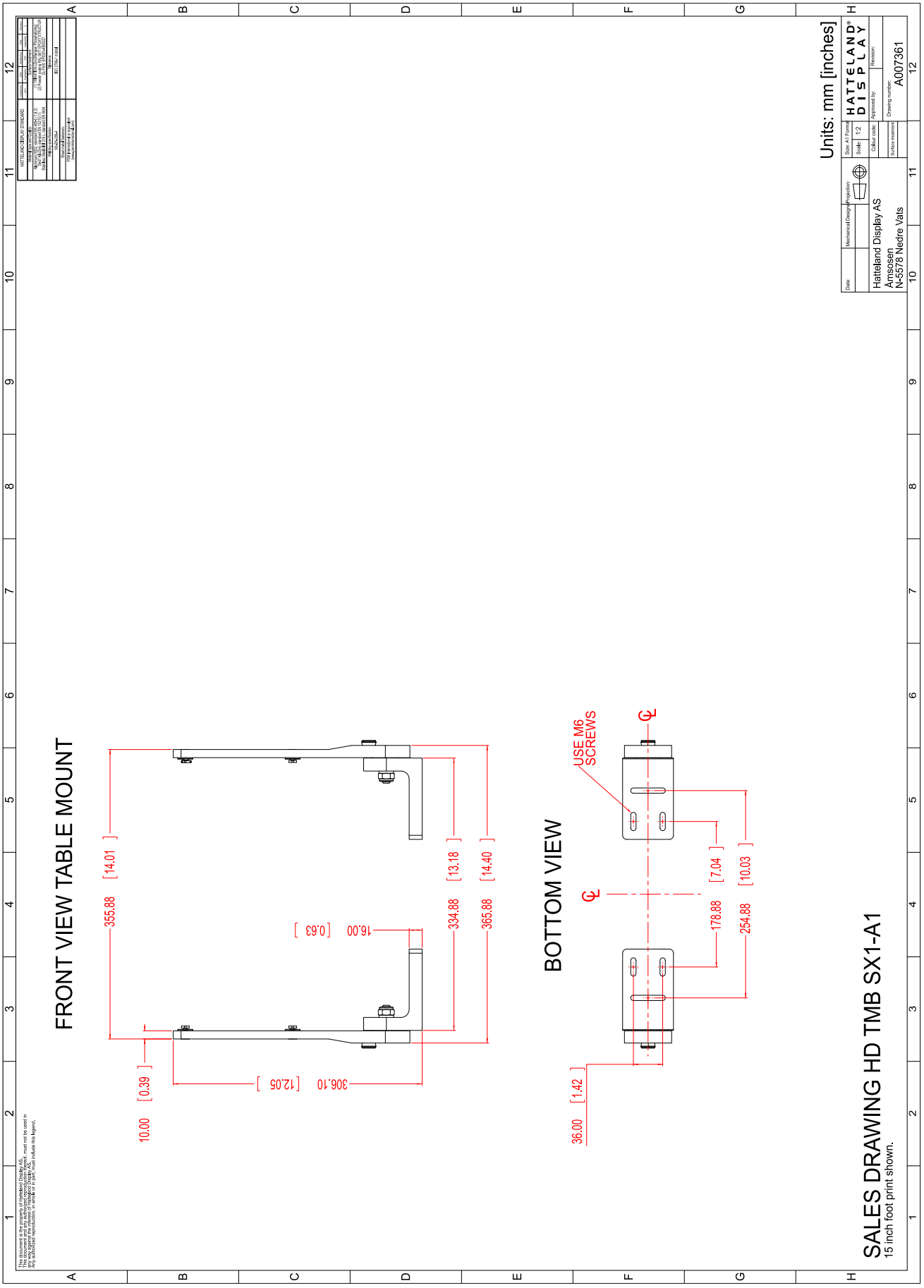
Technical Drawings - HD TMB SX1-A1



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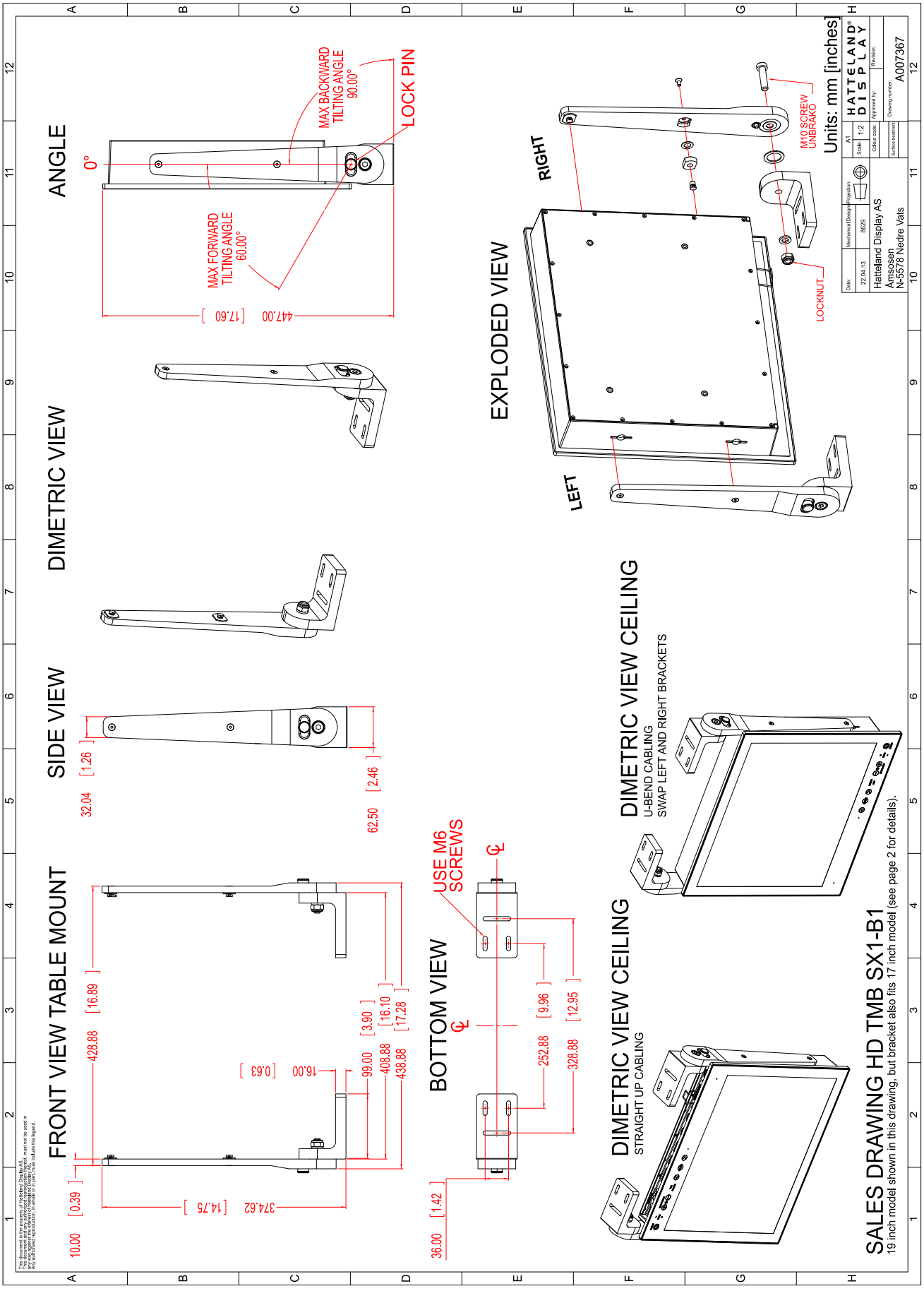
Technical Drawings - HD TMB SX1-B1



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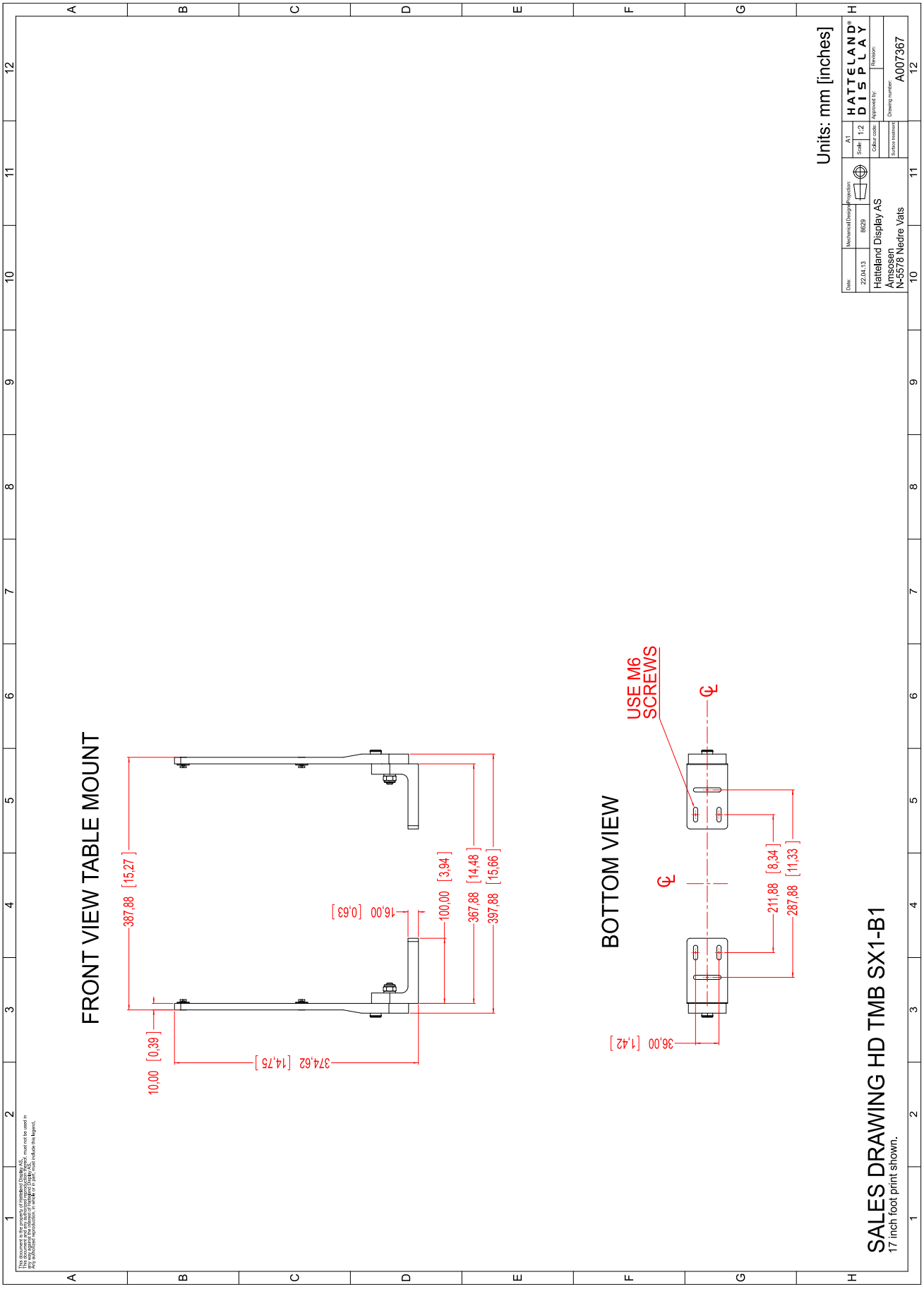
Technical Drawings - HD TMB SX1-B1



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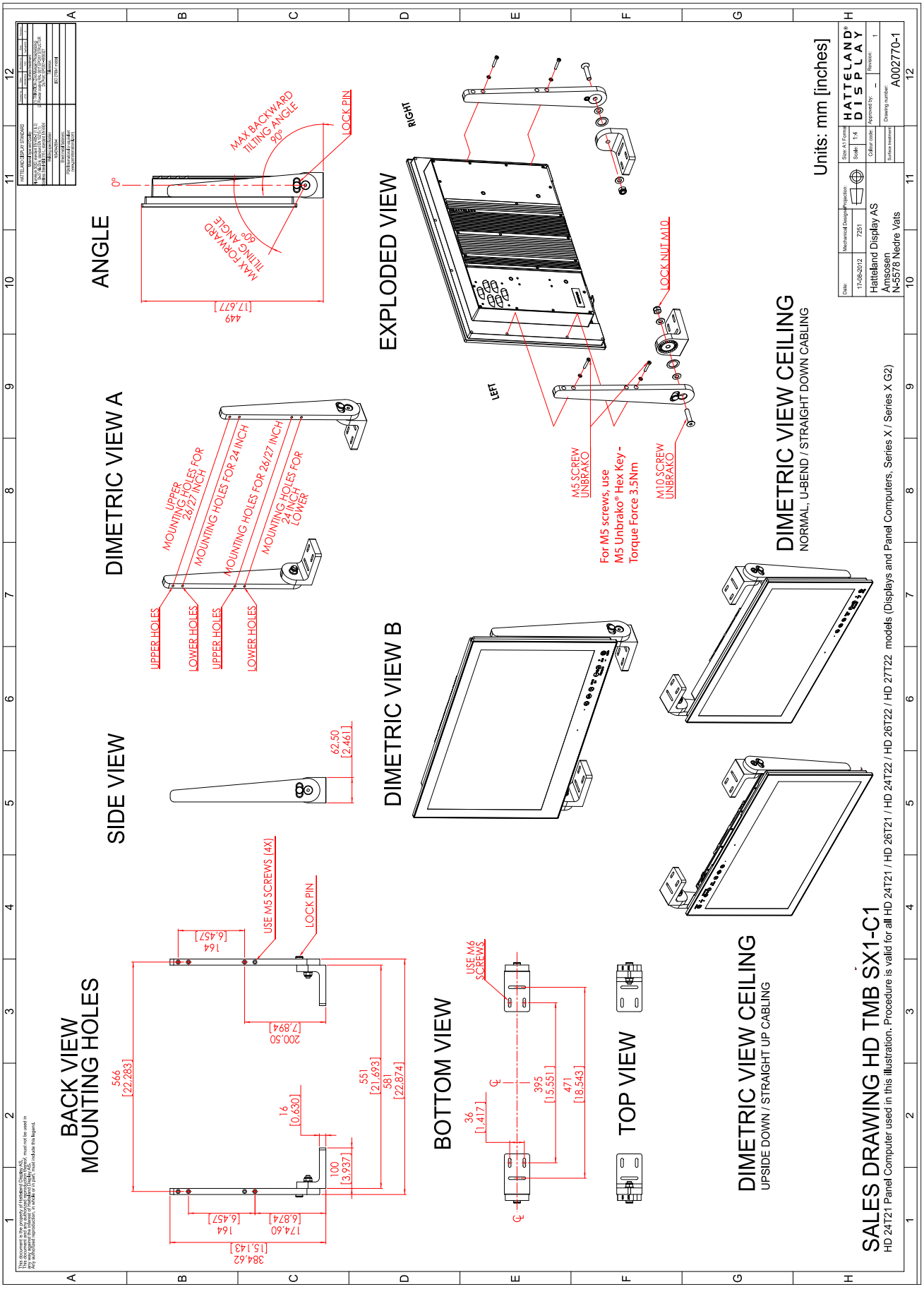
Technical Drawings - HD TMB SX1-C1



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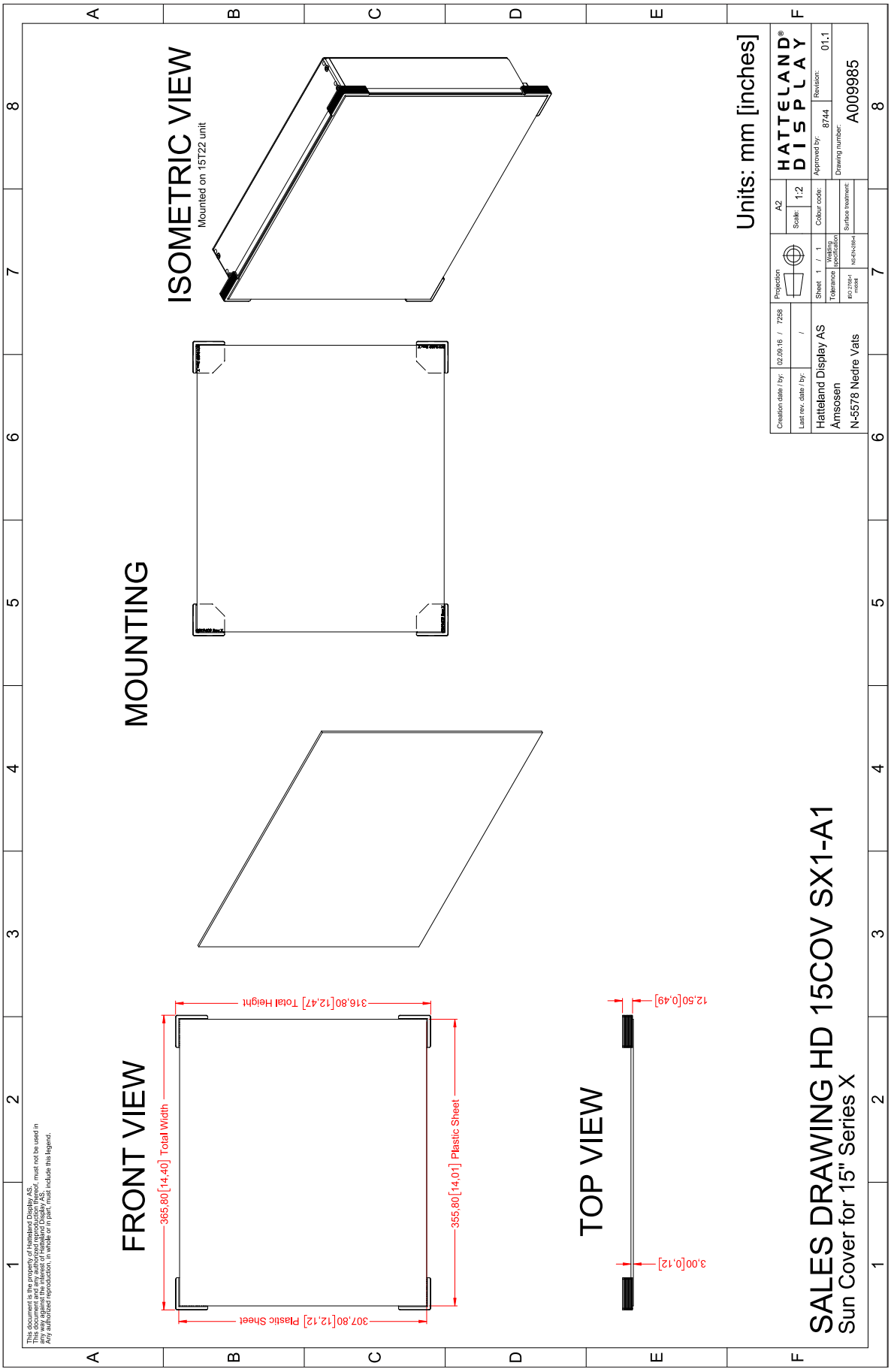
Technical Drawings - HD 15COV SX1-A1



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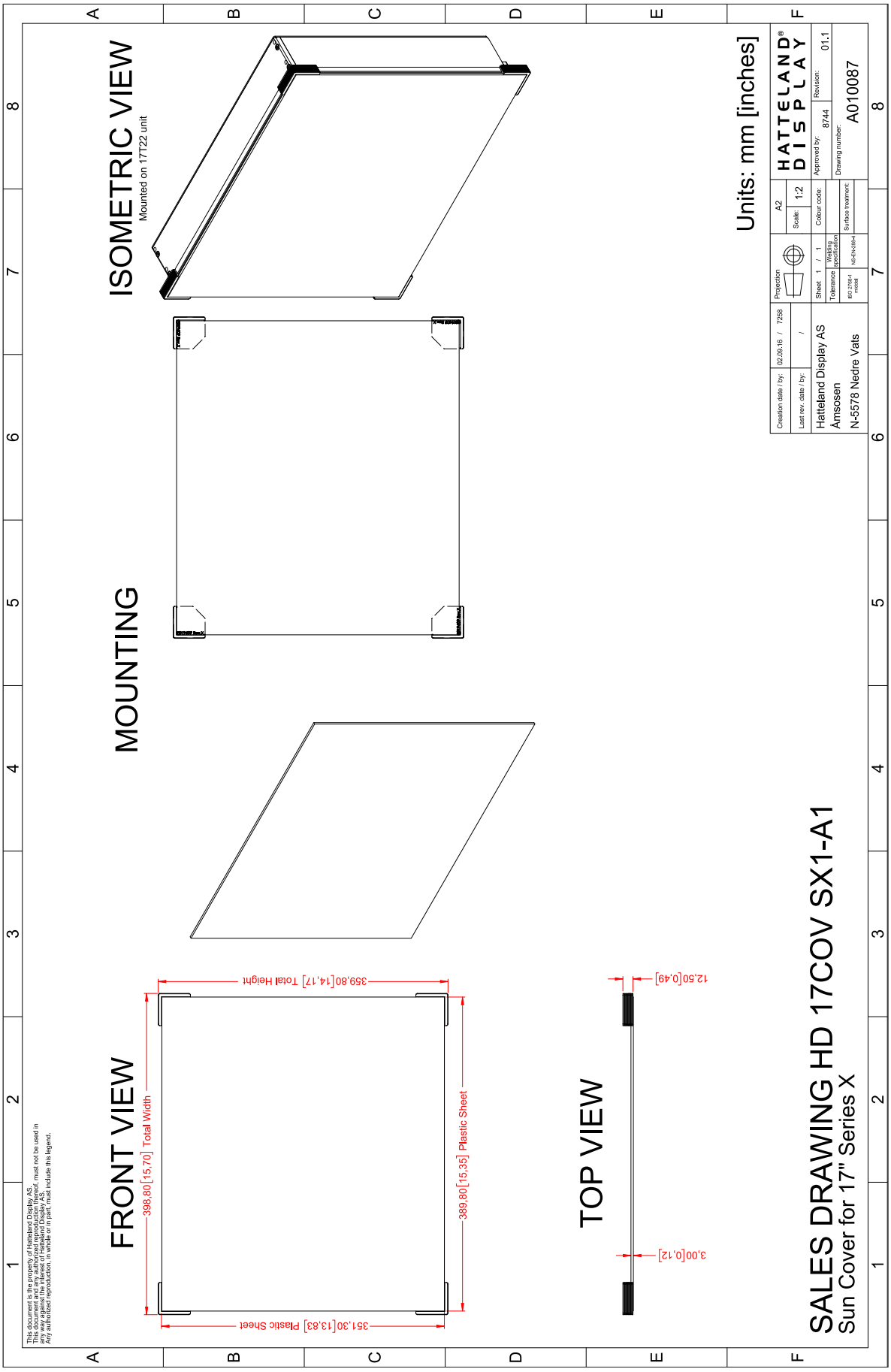
Technical Drawings - HD 17COV SX1-A1



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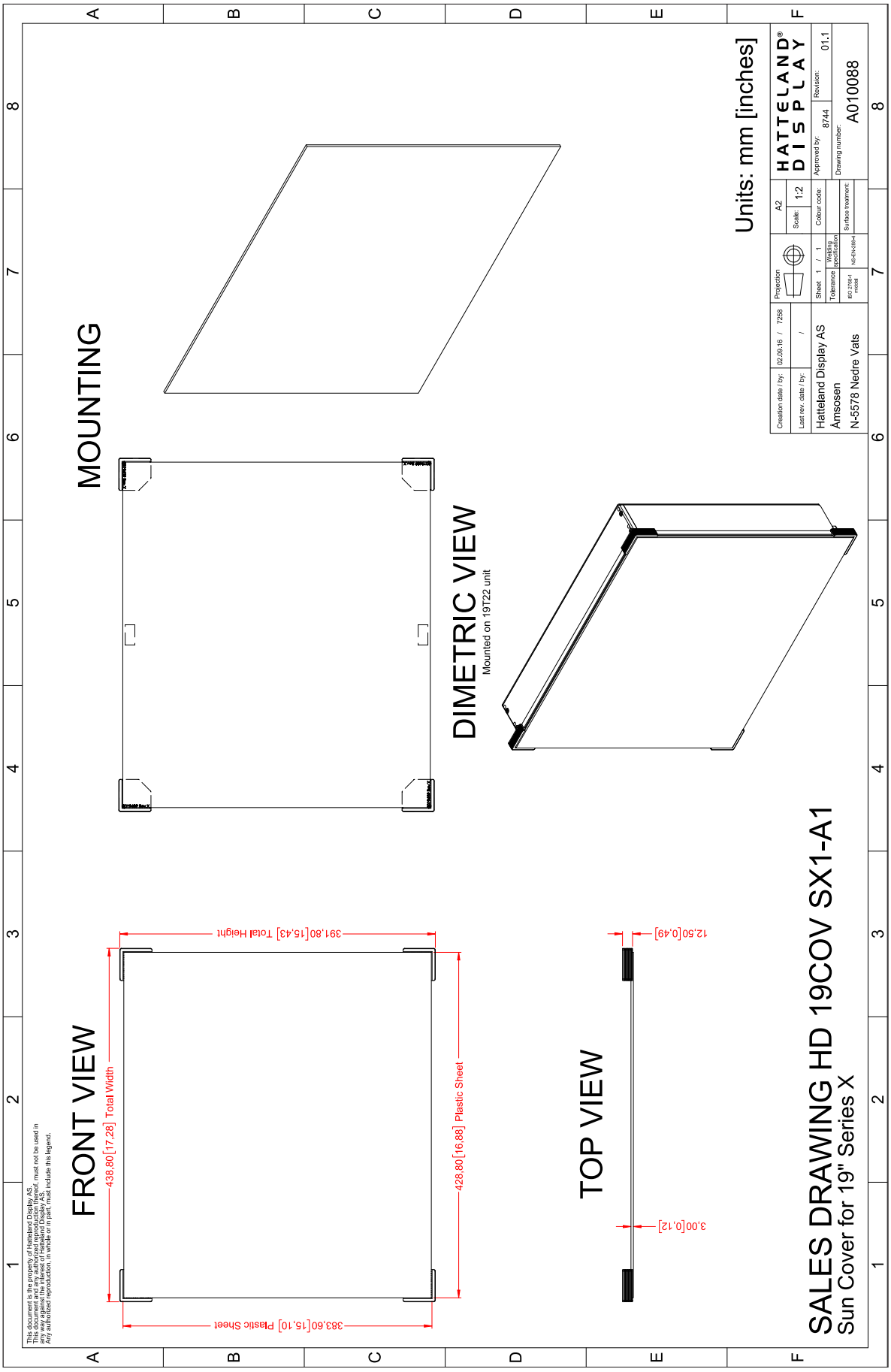
Technical Drawings - HD 19COV SX1-A1



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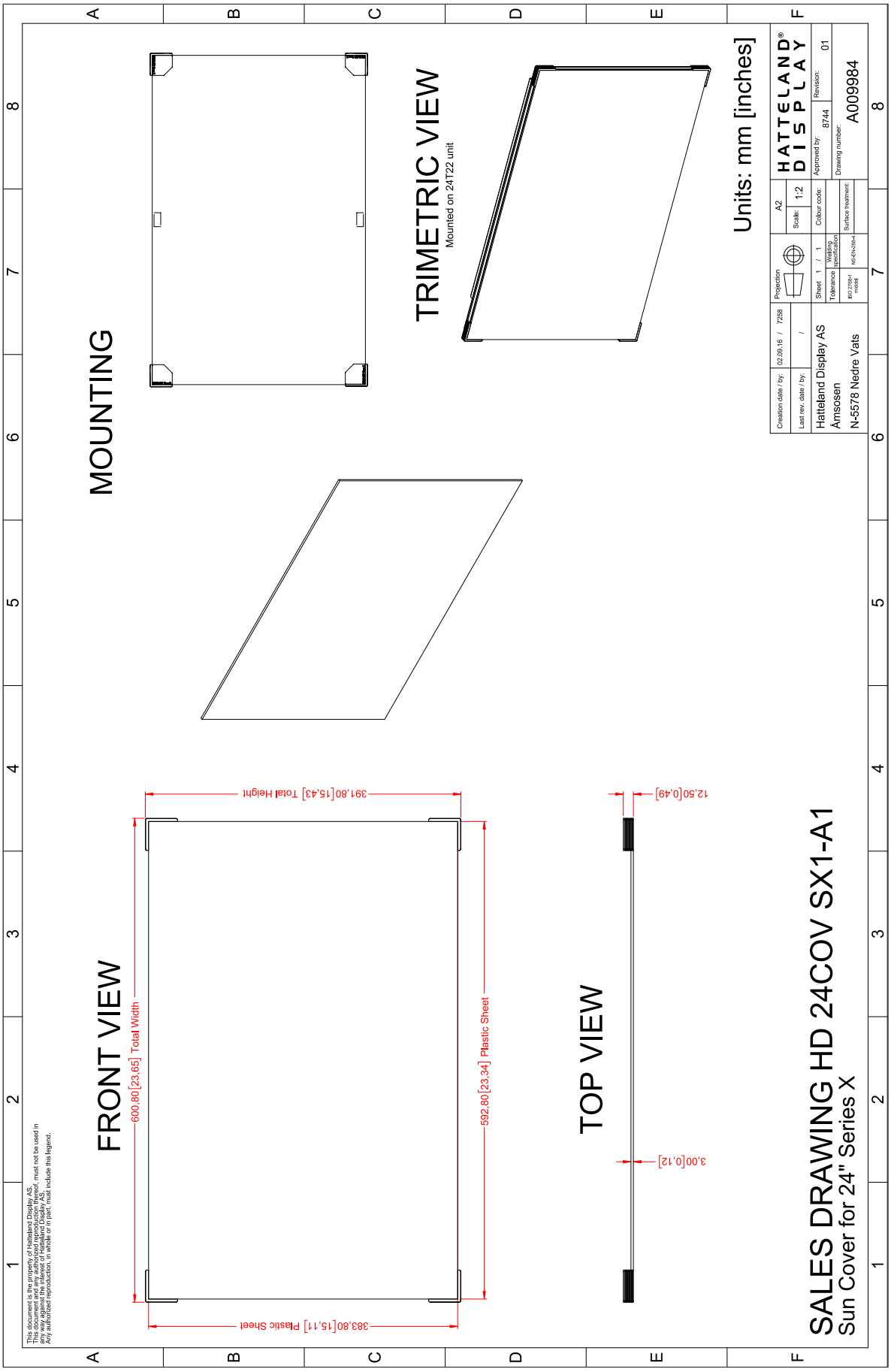
Technical Drawings - HD 24COV SX1-A1



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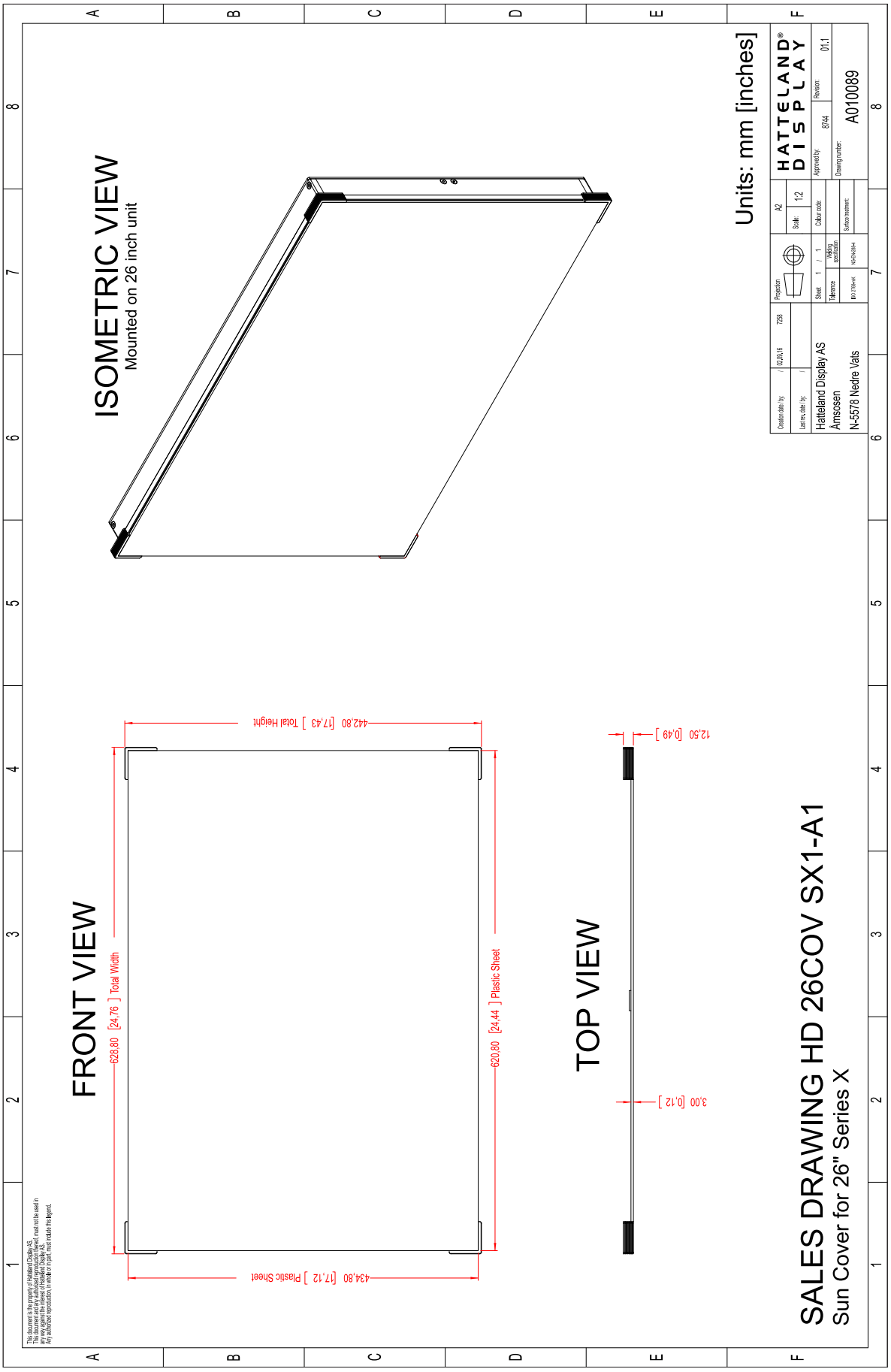
Technical Drawings - HD 26COV SX1-A1



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Released

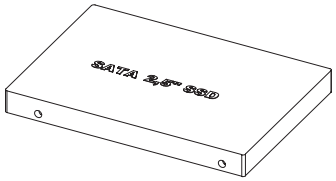
Appendixes

SSD Selection Guide

Solid State Disk (SSD) Devices

Last revised : 4 November 2014

SSD's has many benefits over conventional hard drives, but when it comes to write endurance it is important to choose the technology to be used with care. It is of very high importance to consider several aspects when using an SSD for a particular application, below the most critical ones, such as:



- **Nature of the application, data written to disk during a defined time period (worst case).**
- **Operating System (OS) and applications settings, optimized for SSD.**
- **SSD selection, there are several choices of price and performance.**
- **Expected system life, using worst case calculations.**

SSD devices have limited life time. The life time of the SSD device is direct dependent of the application software.

- **Selection / dimensioning of SSD device is required for each unique application.**
- **Selection / dimensioning of SSD device have to be done of the system house.**
- **Selection / dimensioning of SSD device shall be done towards data rate , size of footprint is secondary and in most cases not the dimensioning factor.**

Hatteland Displays Recommendations, MLC device

Use of OS image adapted for HDD without any modifications for SSD:
> Do not use SSD.

Basic SSD configuration of OS but not considered SSD in application SW and no estimation of amount of written data:
> Do not use SSD.

Basic SSD configuration of OS and basic consideration of SSD in application SW. Estimation based at guess, but actual amount of written data not known:
> Select next larger device, i.e if calculation gives 80GB, select 120GB instead.
> Minimum size 80GB.

Actual data known, based at measurements at actual application, running in worst case scenario:
> Select device according to calculation.

SSD Selection Guide

Calculation of required size of SSD (Multi-Level Cell - MLC) device)

The table below details the write endurance of the an enterprise environment. All values are verified by Hatteland Display during the qualification / selection process.

Write Endurance Specifications Intel® SSD 320 Series	
Device Size	Value in TBW (Terabytes)
40 GB	5
80 GB	10
120 GB	15
160 GB	15
300 GB	30
600 GB	60
Write endurance is measured while running 100% random 4KB (4096 bytes) writes spanning 100% of the drive using Iometer.	

Write Endurance Specifications Current 2.5" SSD (MLC)	
Device Size	Value in TBW (Terabytes)
80 GB	45
120 GB	70
160 GB	100
240 GB	140
300 GB	225
600 GB	330
JESD218 standard1 and based on JESD219 workload.	

Formula for calculating disk size:
z = **y** * **x**

Where **y** = Requested minimum lifetime (with respect to wear out, [year]).
Where **x** = Data rate (GB /per year).
Where **z** = Total amount of data written data to SSD during its whole lifetime.

Step-by-Step Calculation

Step 1: Measure (preferred) or estimate data rate **y**, [GB /per year].
Step 2: Define minimum expected lifetime for SSD device **x** [year].
Step 3: Calculate total amount of data written to the SSD during its whole lifetime, **z** = **y** * **x**.
Step 4: Use table, **column 2**, the **z** value shall be less or equal to the value in the table to achieve requested lifetime.

Write Endurance Specifications Intel® SSD 320 Series	
Device Size	Value in TBW (Terabytes)
40 GB	5
80 GB	**10**
120 GB	15
160 GB	15
300 GB	30
600 GB	60

Write Endurance Specifications Current 2.5" SSD (MLC)	
Device Size	Value in TBW (Terabytes)
80 GB	**45**
120 GB	70
160 GB	100
240 GB	140
300 GB	225
600 GB	330

Step 5: Select the SSD device, **column 1,** which corresponds to the selected value in **column 2**.
Step 6. Check that the size of the selected SSD is greater than required size of the SSD, if not select the size of the SSD that match customer requirements.

SSD Selection Guide

Example (based on Intel® SSD 320 Series)

A general assessment based on requirements to determine the most suitable SSD device. When these factors are known or specified in detail, we can calculate and conclude which SSD device is most suitable (see bottom of page).

Question	Client Answer
We need to know how much data is written to disk (worst case) during a known time period (per second, minute, hour etc.) and the nature of this data?	Chart Data : 2GB /Week Log/User Data: : 10kB /Sec Swap Data : 100kB /Sec
How much space is used on as fixed for your application?	40GB over : Chart Data Area (typical Chart size is 30GB) 1GB : Log Data and User Data area 4GB : Swap Area
How long time shall this disk work with no problems?	5 years

Example Calculation and Conclusion

Calculation / Estimation of data rate:

Step	Factors	Formula	Result
1	Chart Data: 2GB /Week	2GB * 52	= 104 GB /Year
	Log data and User Data: 10kB /Sec	10kB * 60 * 60 * 24 * 365	= 315 GB /Year
	Swap Data: 100kB /Sec	100kB * 60 * 60 * 24 * 365	= 3.15 TB /Year
		Total	= 3.57 TB/Year
2	Required lifetime:	5 years	
3	Calculate total amount of data written to the SSD during its whole lifetime:	3.57TB * 5	= 17.8 TB
4	Select Disk Using Table	Conclusion	= 300GB SSD Device shall be used.

Measure of number of write cycles (Intel® Solid-State Drive Toolbox software)

Download Software from: **https://downloadcenter.intel.com/Detail_Desc.aspx?agr=Y&DwnldID=18455**

SSD Selection Guide

Preparation

1: Install "Intel® Solid-Sate Drive Toolbox" at target system.

2: Install the unit in valid configuration, i.e. the application shall running valid use case, if possible use worst case scenario (with respect to disk activity).

3: Before start of measurement, check and store actual SMART data.
- Start "Intel® Solid-Sate Drive toolbol".
- Refresh (button at home screen).
- Export SMART data, store current data at file (button at home screen).

Measurement

1: Check and save time for start test scenario.

2: Execute the test scenario long enough to cover all valid use cases which may affect disk activity. (Recommended measurement period is at least 1 week without interruption).

3: When the measurement is completed...
- Check and save time for completion of the test scenario.
- Start Intel® Solid-Sate Drive toolbox.
- Refresh (button at home screen).
- Export SMART data, store current data at file (button at home screen).

Calculation

1: Calculate number of written bytes during the measurement period, use E1 or F1 parameter (stored log file). Number of written bytes per second = (**F1**compleation - **F1**start) / (**Time**completion - **Time**start)

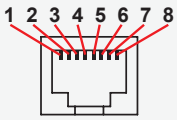
2: Convert to bytes per year.

3: Calculate expected life time (see previous time, section "Step-by-Step Calculation").

Pinout Assignments

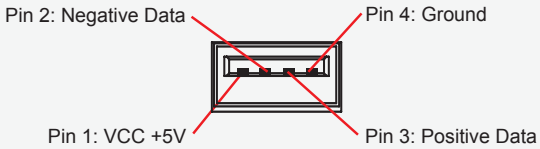
Connectors illustrated here are either standard by factory default or may be available (through factory customization). Note that some combinations may not be possible due to space restrictions. List also valid for customized models. All pin out assignments are seen from users Point of View (POV) while looking straight at the connector. Please review the dedicated datasheet or technical drawings for your actual unit to identify and determine the presence of desired connector. Detailed information about Housing Connectors (terminal blocks) can be found earlier in this manual.

8-pin RJ45 10/100/1000Mbps LAN/Ethernet

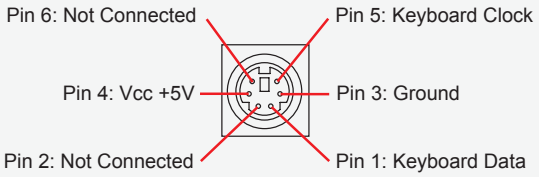


PIN 01	D0P+	Differential Pair 0 (Positive)
PIN 02	D0N-	Differential Pair 0 (Negative)
PIN 03	D1P+	Differential Pair 1 (Positive)
PIN 04	D2P+	Differential Pair 2 (Positive)
PIN 05	D2N-	Differential Pair 2 (Negative)
PIN 06	D1N-	Differential Pair 1 (Negative)
PIN 07	D3P+	Differential Pair 3 (Positive)
PIN 08	D3N-	Differential Pair 3 (Negative)

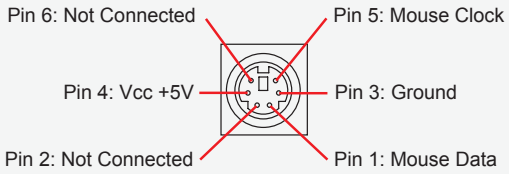
4-pin USB TYPE A



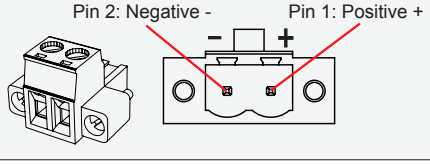
5-pin PS/2 KEYBOARD Female



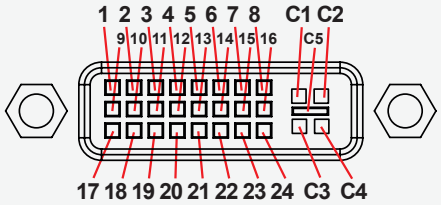
5-pin PS/2 MOUSE Female



2-pin DC Power Input.



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



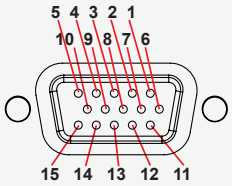
PIN 01	T.M.D.S. Data2 - (Digital - RED link 1)
PIN 02	T.M.D.S. Data2 + (Digital + RED link 1)
PIN 03	T.M.D.S. Data2/4 Shield
PIN 04	T.M.D.S. Data4 - (Digital - GREEN link 2)
PIN 05	T.M.D.S. Data4 + (Digital + GREEN link 2)
PIN 06	DDC Clock
PIN 07	DDC Data
PIN 08	Analog Vertical Sync (DVI-I only)
PIN 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.
T.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.

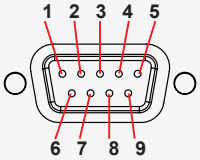
Pinout Assignments

Analog RGB/VGA, 15-pin DSUB High Density Female



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	VSYNC.	Vertical sync, input
PIN 15	ID3/SCL	DDC serial clock

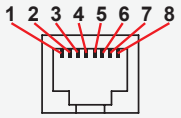
Serial COM RS-232 non-isolated, 9-pin DSUB Male



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

8-pin RJ-45 10/100Mbps LAN/Ethernet

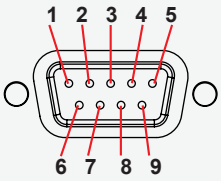
PCA100298-1 / HT 00274 OPT-A1



Pin 01 - TDP	Transmit Differential Pair (Positive)
Pin 02 - TDN	Transmit Differential Pair (Negative)
Pin 03 - RDP	Receive Differential Pair (Positive)
Pin 04 - NC	Not Connected
Pin 05 - NC	Not Connected
Pin 06 - RDN	Receive Differential Pair (Negative)
Pin 07 - NC	Not Connected
Pin 08 - NC	Not Connected

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

"Full Duplex Mode*"

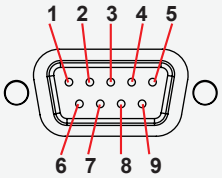


PIN 01	TxD-	Transmit Data Negative
PIN 02	TxD+	Transmit Data Positive
PIN 03	RxD+	Receive Data Positive
PIN 04	RxD-	Receive Data Negative
PIN 05	GND	Signal Ground
PIN 06	N/C	No internal connection
PIN 07	N/C	No internal connection
PIN 08	N/C	No internal connection
PIN 09	N/C	No internal connection

*Master only. ECHO not supported.

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

"Half Duplex Mode*"



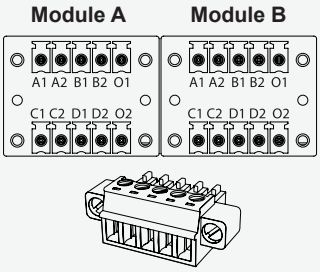
PIN 01	Res.	Reserved, do not connect
PIN 02	Res.	Reserved, do not connect
PIN 03	Data+	Data Positive
PIN 04	Data-	Data Negative
PIN 05	GND	Signal Ground
PIN 06	N/C	No internal connection
PIN 07	N/C	No internal connection
PIN 08	N/C	No internal connection
PIN 09	N/C	No internal connection

*ECHO not supported.
Half Duplex Configuration: Via Hatteland Display API.
Flow control: Via RTS signal (controlled by user application).

Pinout Assignments

10+10 pin Isolated Digital Input/Output Module

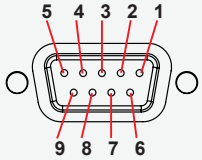
Type Number "PCA100297-1"



Module A			Module B	
A1	External Power +		A1	IN+[0]
A2	N/C (Not Connected)		A2	IN-[0]
B1	External Power - (GND1)		B1	IN+[1]
B2	N/C (Not Connected)		B2	IN-[1]
O1	HS[0]		O1	N/C
C1	HS[1]		C1	IN+[2]
C2	N/C (Not Connected)		C2	IN-[2]
D1	HS[2]		D1	IN+[3]
D2	N/C (Not Connected)		D2	IN-[3]
O2	HS[3]		O2	N/C

9-pin Amplified Mono/Stereo Audio Out, DSUB Female

Type Number "HT 00235 OPT-A1"

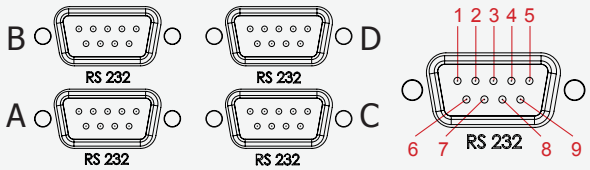


PIN 01	LAUDR	Left Audio Return*
PIN 02	LAUD	Left Audio*
PIN 03	RAUDR	Right Audio Return
PIN 04	RAUD	Right Audio
PIN 05	N/C	No internal connection
PIN 06	N/C	No internal connection
PIN 07	N/C	No internal connection
PIN 08	N/C	No internal connection
PIN 09	N/C	No internal connection

*For Mono: connect pin 01 and 02 only

COM Module RS-232 - 4 x ports, 9-pin DSUB Male

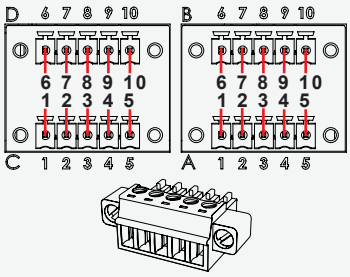
Type Number "PCA100294-1"



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

10+10 pin RS-422 / RS-485 NMEA Module

Type Number "PCA100293-1"



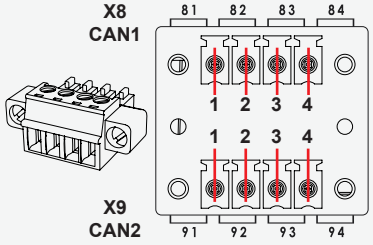
PIN 01	TxD-	Transmit Data Negative
PIN 02	TxD+	Transmit Data Positive
PIN 03	GND	Isolated Ground
PIN 04	RxD-	Receive Data Negative
PIN 05	RxD+	Receive Data Positive
PIN 06	TxD-	Transmit Data Negative
PIN 07	TxD+	Transmit Data Positive
PIN 08	GND	Isolated Ground
PIN 09	RxD-	Receive Data Negative
PIN 10	RxD+	Receive Data Positive

RS-485 Half Duplex (2-wire) Configuration:
Connect TX and RX pair-wise:
TX- to RX-, TX+ to RX+.

*Note: The jumper for "force of transmitter" is open by factory default. For some custom models this jumper is preset to closed (active), in that case unit has to be opened and jumper set to open to allow Half Duplex mode.

4+4 pin CAN I/O Module, 2 channels

Type Number "ZIA0001310-B"



Pin 01	X8 - Can1: **081**	In Low
Pin 02	X8 - Can1: **082**	Out Low
Pin 03	X8 - Can1: **083**	In High
Pin 04	X8 - Can1: **084**	Out High

Pin 01	X9 - Can2: **091**	In Low
Pin 02	X9 - Can2: **092**	Out Low
Pin 03	X9 - Can2: **093**	In High
Pin 04	X9 - Can2: **094**	Out High

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,** Stokkastrandvegen 87B, 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, HD MMC and HT/HM (computers) product ranges is in conformity with the following standards in accordance with the EMC Directive.

Low Voltage Directive 2006/95/EC
EN 60950:2006/A2:2013

EMC Directive 2004/108/EC
EN 55022:2010 / AC:2011 Class A
EN 55024:2010

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

CE

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

CE MARK FIRST AFFIXED DATE (11 March 2010)

Declaration of Conformity

We, manufacturer, **Hatteland Display AS,** Stokkastrandvegen 87B, 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, HD MMC and HT/HM (computers) product ranges is in conformity with IEC 60945 4th (EN 60945:2002) and IACS E10 (where applicable)

HATTELAND®
DISPLAY

Declaration of Conformity

We, manufacturer, **Hatteland Display AS,** Stokkastrandvegen 87B, 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, HD MMC and HT/HM (computers) 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

FC

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

FCC MARK FIRST AFFIXED DATE (16 February 2012)

This document was last approved, reviewed and found valid on **06 Jan 2015** by the signed participants as stated above.

Return Of Goods Information

Return of goods:

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

Hatteland Display referenced as “manufacturer” in this document.

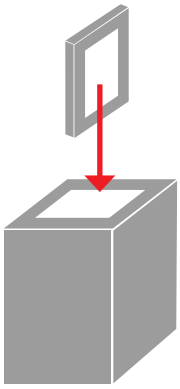
Before returning goods, please contact your system supplier before sending anything directly to manufacturer. When you return products after loan, test, evaulation or products subject for credit, you must ensure that all accessories received from our warehouse is returned. This applies to cables, powermodules 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 or review the following links at bottom of page for more information online.

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.

Reference Links:

http://lcm.hatteland-display.com/CustomerRMA/CustomerRMA.aspx
http://www.hatteland-display.com/rma_procedure.php
http://www.hatteland-display.com/terms

General Terms and Conditions

As of January 2015, Hatteland Display AS' *"Terms of Sales and Delivery"* and *"Warranty Terms"* has been substituted by the updated *"General terms and conditions for sale of goods and performance of additional services"* (the "General Terms and Conditions").

Further, from January 2015 onward, the previous *"Terms of Sales and Delivery"* and *"Warranty Terms"*, as well as other standard terms and conditions, policies and instructions issued by Hatteland Display AS, will be removed from the User Manuals.

Instead, the updated General Terms and Conditions and the other standard terms and conditions, policies and instructions issued by Hatteland Display AS will be available via our website only.

Please visit http://www.hatteland-display.com/terms to review the latest revision of this documentation.

Long Term Storage Recommendations

For Minimum storage life for Hatteland Display products, Storage Conditions, Periodic maintenance - test procedure, please visit: http://www.hatteland-display.com/pdf/misc/ind100350-5_long_term_storage_recommendations.pdf

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 expences 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 forwared 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 *	≥ 15mm
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

Notes

General Notes:

- 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 brillance and Glass Display Control™ (touch key functions) may inhibit visibility of information at night.

- License Terms for the installed OEM Operating System (OS) can be found in the following default factory paths:
  Note: This is a general listing for a varity of OS’s Hatteland Display can factory install depending on unit.
  Please check specification for your unit to verify type of OS installed in order to retrieve the license terms.

  Microsoft® Windows® 7 Professional: C:\Windows\System32\en-US\Licenses_Default\Professional\license.rtf
  Microsoft® Windows® 7 Ultimate: C:\Windows\System32\en-US\Licenses_Default\Ultimate\license.rtf
  Microsoft® Windows® Embedded 8.1 Industry Pro.: C:\Windows\System32\en-US\Licenses_Default\EmbeddedIndustry\license.rtf
  Microsoft® Windows® XP Pro: C:\Microsoft Windows XP Embedded and Windows Embedded Standard 2009 - License Terms.doc
  Note: Does not apply for Microsoft® Windows® XP Professional for Embedded Systems

Note for units equipped with an PCTS (Projected Capacitive) Touch Screen:

Maritime Multi Computer (MMC, Panel Computer) uses internal USB connection and can be controlled by the Operating System (OS). So, in order to clean the glass without any touch screen movement being detected, you either have to shut down the Operating System (either via customized functions from within applications or by touching the Power On/Off symbol) to make sure the unit has been shut down before attempting to clean the glass surface.

To learn more about how to properly clean glass surfaces, review the “Ergonomics” section in the “General Installation Recommendations” chapter earlier in this manual.

User Notes

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
5	AB SE	20 Apr 2012	Revised Console Mount Kit+Table Mount Bracket typenumbers (page 5,16,17,26,27,28,29,30,31,46,47,48)
6	AK SE	16 Aug 2012	Revised type approvals and remove MTBF data, page 26,27,28,29,30,31
7	AB SE	13 Nov 2012	Revised minor text elements throughout manual where needed Revised Contents of Package (Console Mounting kit now part of standard factory delivery), page 5 Added note about Full/Half duplex, page 55
8	BU SE	18 Jun 2013	Revised Contents of Package (connectors), page 5 Added General Touch Screen Info and labels page 10,11,12,13,14,15 Revised Product Labeling chapter, ref: QAR/117540, page 12,13,14,15 Added point 1. to Ergonomics section, cleaning, page 21 Added section “Installation limitations”, page 19,20 Revised point 7 in General mounting instructions, grounding, page 20 Added Housing Connector overview, page 23,24 Added Installation procedures for HD TMB SX1-C1 and HD 19BRD SX1-A1, page 27,28,29 Added note for USB1.1 (12mbps) port, page 31 Revised “Expansion Area for modules” table, page 33 Added Accessory (External Module Box) for: - HT 00262 OPT-A1 (NMEA COM), HT 00263 OPT-A2 (COM), HT 00264 OPT-A1 (CAN) and - HT 00273 OPT-A1 (DIO)), page 40,41,42,43,44,45,68,69 Added High Bright specifications for 17, 19 and 24 inch, page 42,43,44 Added 26” LED Backlight spec, page 45 Added illustration and revised datasheet for HT 00254 OPT-A1, CAN isolated module, page 46 - Reference: http://www.hatteland-display.com/mails/06_2013_ecn.html Added factory option, Digital Input/Output module (HT 00268 OPT-A1), page 49,50,80 Revised datasheet for PCA100293-1, COM Module RS-422 / RS-485, page 47 Added datasheet for External Module USB (CAN/COM/DIO), page 53,54 Added SSD Selection Guide, page 70,71,72 Added pinout assignments for PCA100294-1 (COM Module RS-232), page 77 Added note for PCA100293-1 (RS-485 Half Duplex (2-wire) Configuration), page 79 Added note for PCTS (Projected Capacitive) Touch Screen, page 87 Added note for “License Terms OEM OS”, page 87
9	GOS SE	03 Jul 2013	Revised Mounting Brackets, Keyhole, Left/Right, BRD and TMB versions, page 28,29,30,31,32,33,34
10	FG SE	30 Sep 2013	Revised typenumber for DC Power In Connector (1805301 to correct 1961986), page 6,23

Revision History

11	LS SE	14 Nov 2013	Revised viewing distances (ECDIS), page 21 Revised Housing Connector overview, page 23,24 Revised “Mounting Bracket, Table / Desktop / Ceiling - 12”,15”,17”,19” chapter, page 29,30,31,32,33,34,35 Revised User Controls illustration and descriptions, page 42,43 Replaced Single Keyhole drawings with updated Double+Single Keyhole (15,17,19 inch), page 63,64,65 Revised Technical Drawings for 24 and 26 inch, page 66,67 Revised Technical Drawings for mounting brackets, page 70,71
12	LS JE SE	23 Jan 2014	Revised ”Housing / Terminal Block Connector Overview” chapter, added screwdriver details, page 23 Added drawings for Console Mount Kit 12,15,17,19 footprint indication, page 72,73 Revised “HT 00268 OPT-A1 - Isolated Digital Input/Output Module”, page 55,56
13	JE AK WJ SE	18 Mar 2014	Revised Contents of Package (more details added), page 5 Revised Mounting Bracket, Table / Desktop / Ceiling - 12”,15”,17”,19” (obsoleted brackets) chapter, page 29 Revised datasheet for HT 00254 OPT-A1, CAN isolated module, page 52 Revised “HT 00268 OPT-A1 - Isolated Digital Input/Output Module”, page 55,56 Revised datasheet External Module USB (CAN/COM/DIO), page 59,60
14	AK SE	28 May 2014	Revised Mounting Bracket, Table / Desktop / Ceiling - 12”,15”,17”,19” chapter, page 29-35 Removed reference to A007330 and P012363 (mounting bracket for External Modules USB), page 59-60 Revised Sales Drawing HD CMB SX1-A1, page 70-73 Added Sales Drawing HD CMB SX1-A2, page 74 Revised Sales Drawing HD VED SX1-A1, page 79 Added Sales Drawing for HD TMB SX1-A1 (12/15 inch), page 80-81 Added Sales Drawing for HD TMB SX1-B1 (17/19 inch), page 82-83 Added Sales Drawing for HD TMB SX1-C1 (24/26 inch), page 84
15	FG VM MS SE	05 Aug 2014	General revision throughout the manual regarding minor text changes Revised contents of package and specifications, mention High Bright models includes gasket, page 5 Revised ”Buzzer” functionality (reference to SCOM manual), ref: QAR/124594, page 43
16	JE SE	07 Oct 2014	Removed reference to High Bright option for 12 and 15 models throughout the manual. General update throughout the manual.
17	BB KK SE	28 Nov 2014	Added HD CMB SX1-A3 accessory, page 77 Added JH 15TAP STD-C1 and JH 19TAP STD-C1 accessories, page 83,84 General update throughout the manual, where needed.
18	KK FG SE	09 Dec 2014	Added drawings for HD CMB SX1-C1 accessory, page 28,83,84,85 Added Multitouch option, now available for 26 inch models, page 51 Update PCA100293, NMEA COM with Jumper Settings, page 53,54 Added PCA100298-1, Internal Module LAN RJ-45 factory option, page 40,59,63,64,86
19	PG VM MS SE	10 Feb 2015	General maintenance update regarding minor text changes throughout the manual. Revised note/text for HD CMB SX1-A1 and -A2, page 6 Revised brackets overview, page 29,30 Added drawing for JH 26TAP STD-A1, Series X to Series 1 frame adapter, page 92 Revised ”Return of goods information”, page 109 Revised ”General Terms and Conditions”, page 110
20	MJL SE	03 Jun 2015	Revised all specifications to latest revisions throughout the manual Revised Grounding, General Mounting Instructions chapter, point 7, ref: QAR/128155, page 20 Revised Grounding Screw text, page 38
21	GM FG SE	26 Aug 2015	Revised ”Touch Screen Drivers” chapter, page 11
22	FG AK SE	30 May 2016	Revised HD TMB SX1-C1, Max Forward Tilting angle (from 62° to 60°), page 97 Changed ”HT 00268 OPT-A1” to ”PCA100297-1” and ”HT 00254 OPT-A1” to ”ZIA0001310-B”, throughout the manual (only typenumber change, function remains the same of factory option)
23	BB SE	01 Feb 2017	Revised table ”Expansion area”, added sizes, page 41 Added Accessory, HD 15/17/19/24COV SX1-A1 (UV Sun Covers), page 98,99,100,101
24	KKK SE	06 Oct 2017	Revised Console Mounting Kit procedure, page 25 Revised Table Mounting Bracket procedure, page 28,29,30,31,32 Added Accessory, HD 26COV SX1-A1 (UV Sun Cover), page 94 Removed accessory reference HD CMB SX1-A1 (now obsolete) throughout the manual. General updates throughout the entire user manual