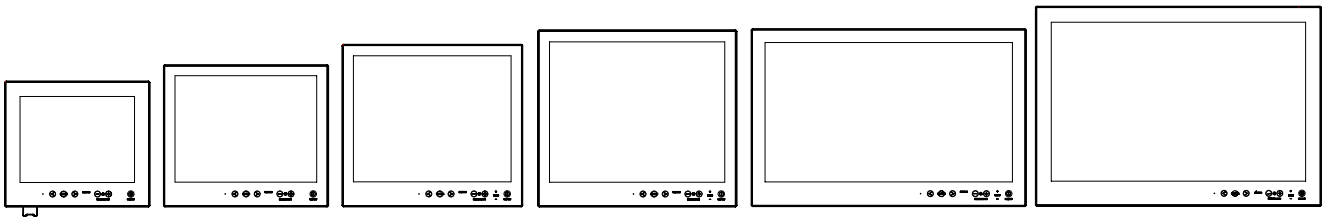
HATTELAND®
DISPLAY

USER MANUAL



Series X - Standard Display (STD) Models

HD 12T21 STD-xxx-Fxxx - 12.1 inch Standard Display
HD 15T21 STD-xxx-Fxxx - 15.0 inch Standard Display
HD 17T21 STD-xxx-Fxxx - 17.0 inch Standard Display
HD 19T21 STD-xxx-Fxxx - 19.0 inch Standard Display
HD 24T21 STD-xxx-Fxxx - 24.0 inch Standard Display
HD 26T21 STD-xxx-Fxxx - 25.54 inch Standard Display

User Manual STD Series X	
Updated: 17 Aug 2017	Doc Id: INB100535-1 (Rev 26)
Created: 363 Approved: 6542	

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

Hatteland Display AS, Stokkastrandvegen 87B, N-5578 Nedre Vats, Norway
Tel: (+47) 4814 2200 - mail@hatteland-display.com - www.hatteland-display.com

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

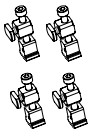
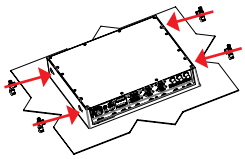
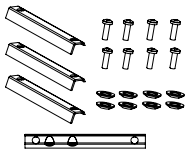
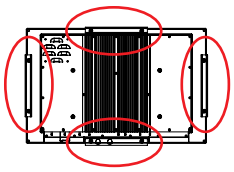
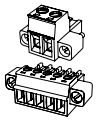
Contents

Contents

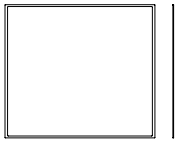
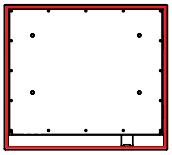
Contents

Contents of package

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

Item	Description	Illustration
 HA-SDM-2M	1 pcs of Standard DVI Signal Cable. DVI-D 18+1P Male to DVI-D 18+1P Male Single Link - Length 2.0m	
 HA-VGA-2M-32	1 pcs of Standard VGA Signal Cable. DSUB 15P Male to DSUB 15P Male - Length 2.0m	
 FS-CABLE EU	1 pcs of power cable European Type F “Schuko” to IEC. Length 1.8m *Note: Included in package for models with AC input.*	EUR TYPE F IEC 
 80099	1 pcs of power cable US Type B plug to IEC. Length 1.8m *Note: Included in package for models with AC input.*	US TYPE B IEC 
 MEDIA STD01	Documentation and Driver DVD/CD containing the user manual, including the Touch Screen driver for units delivered with a factory mounted touch screen. For most recent drivers, please visit “www.hatteland-display.com/archive” 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
	Test Report	
 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 for DC Power In 2 x 5-pin Terminal Block 3.81 for RS-422 / RS-485 / SCOM / Buzzer Module Refer to “Configuring Housing / Terminal Block Connector” section for usage.	 Note: Location of module(s) may differ between unit sizes

Package may also include:

Item	Description	Illustration
 USB-218	1 pcs of Touch Screen Cable USB Type A to Type B. Length Approx 1.8m. *Only included in package if model is equipped with factory mounted Touch Screen*	
	For High Bright / Sunlight Readable models (12-24 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. P006998-1 (12), P006997-1 (15), P007130-1 (17), P007131-1 (19), P007032-1 (24)	

General

About this manual

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

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

About Hatteland Display

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

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

www.hatteland-display.com

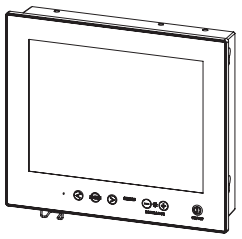
You will find our website full of useful information to help you make an informed choice as to the right product for your needs. You will find detailed product descriptions and specifications for the entire range on Displays, Computers and Panel Computers, Military solutions as well as the range of supporting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

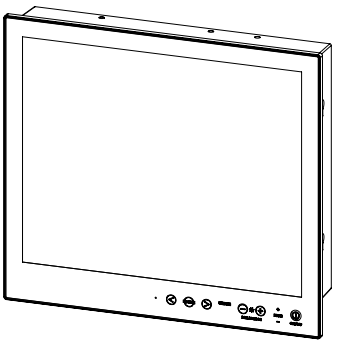
Contact Information

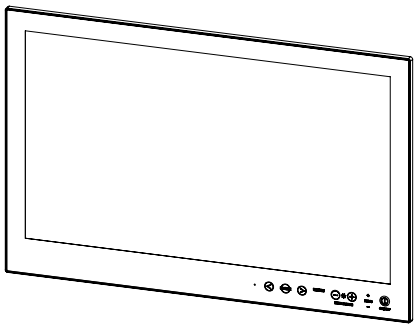
Head office, Vats / Norway: Hatteland Display AS Stokkastrandvegen 87B N-5578 Nedre Vats, Norway Tel: +47 4814 2200 mail@hatteland-display.com	**Sales office, Frankfurt / Germany:** Hatteland Display GmbH Werner Heisenberg Strasse 12, D-63263 Neu-Isenburg, Germany Tel: +49 6102 370 954 Fax: +49 6102 370 968
Sales office, Oslo / Norway: Strandveien 35 N-1366 Lysaker Norway Tel: +47 4814 2200	**Sales office, Aix-en-Provence / France:** Hatteland Display SAS ACTIMART, 1140 RUE AMPERE, BP 50 196 13795 AIX-EN-PROVENCE, CEDEX 3 France Tel: +33 (0) 4 42 16 47 57 Fax: +33 (0) 4 42 16 47 00
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

Standard Display (STD) - Introduction







Series X Displays and Panel Computers offer the ultimate in performance, convenience, state of the art design and enduring quality for system integrators and boat builders. Series X products offer a range of feature sets optimized for varying requirements and applications.

The Series X display range is a flexible monitor solution designed and type approved for the professional maritime segment, where reliability and long life time are key pre-requisites for the industry. The product range combines stunning design and technology with innovative features and options, making it all that the integrator needs for top class type-approved marine systems.

The entry level STD models provide a wide choice of display size and format for shipboard applications where simple data input (RGB & DVI) is required. Be it for ship navigation or automation, this range with all it's possible options provides a robust and cost effective platform from which to display and manage data.

Series X displays feature HATTELAND® Glass Display Control™, LED backlight technology, full dimming and multipower* as standard, and can also accomodate and combine a number of options such as multitouch screen, optical bonding and ECDIS calibration.

* Multipower not available for 12 inch due to space restrictions.

- MULTITOUCH
- TYPE APPROVED
- ECDIS COMPLIANT
- IP22 REAR / IP66 FRONT
- SUPERIOR BONDING TECHNOLOGY
- MODULE BASED, TAILOR-MADE SYSTEMS MADE EASY!
- GLASS DISPLAY CONTROL™ (GDC), SOLID STATE MENU SYSTEM

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 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® 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).

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.

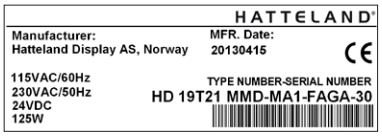
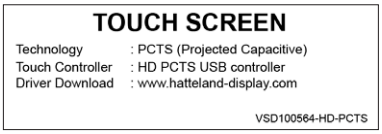
*32bit only available for HD 07T22 / HD 13T22 units. Other units, 32/64 bit supported.

Product Labeling

Introduction

This section details the locations, content details and specifications for factory mounted labels for all currently available standard Hatteland Display Standard Industrial Display (STD) 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).

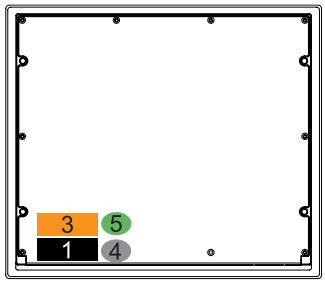
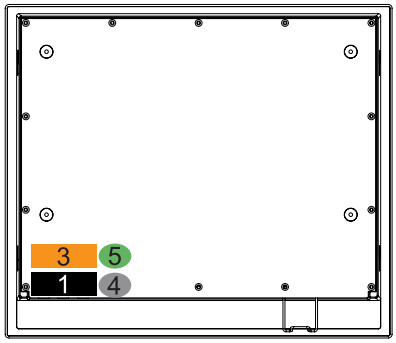
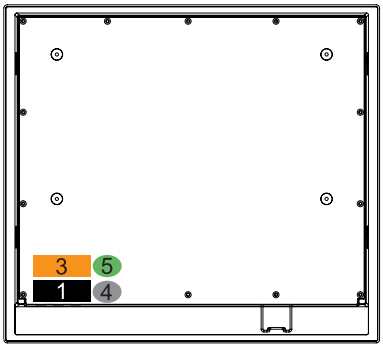
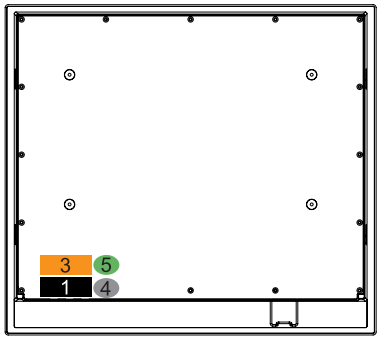
Label Size and Types

ID	Label Layout	Description	Specification
1		**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.	Silver with glue on back, non-tearable and made for thermal transfer printing.
		Barcode type: CODE128 (used extensively world wide in shipping and packaging industries. The symbology was formerly defined as ISO/IEC 15417:2007.)	
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.	Silver with glue on back, non-tearable and made for thermal transfer printing.
		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!	
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.

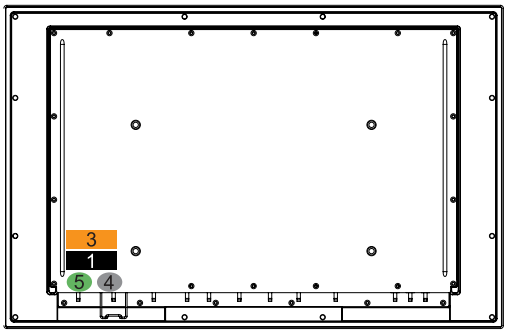
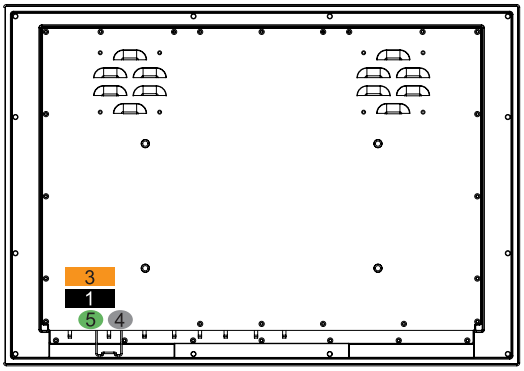
Product Labeling

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, 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 STD-xxx-Fxxx**
	Warranty label covers screw. Labels placed on rear.	**HD 15T21 STD-xxx-Fxxx**
	Warranty label covers screw. Labels placed on rear.	**HD 17T21 STD-xxx-Fxxx**
	Warranty label covers screw. Labels placed on rear.	**HD 19T21 STD-xxx-Fxxx**

Product Labeling

	Warranty label covers screw. Labels placed on rear.	**HD 24T21 STD-xxx-Fxxx**
	Warranty label covers screw. Labels placed on rear.	**HD 26T21 STD-xxx-Fxxx**

Product Labeling

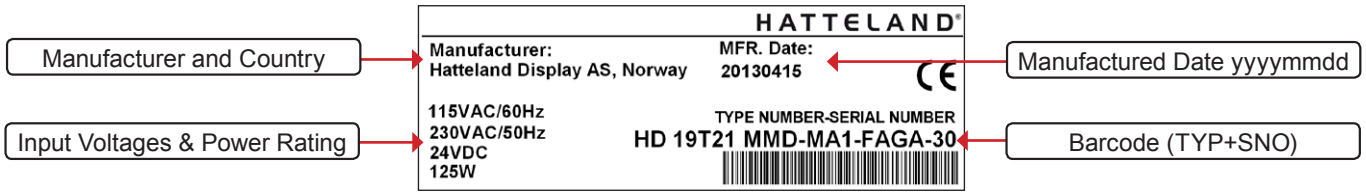
Warranty Label

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)

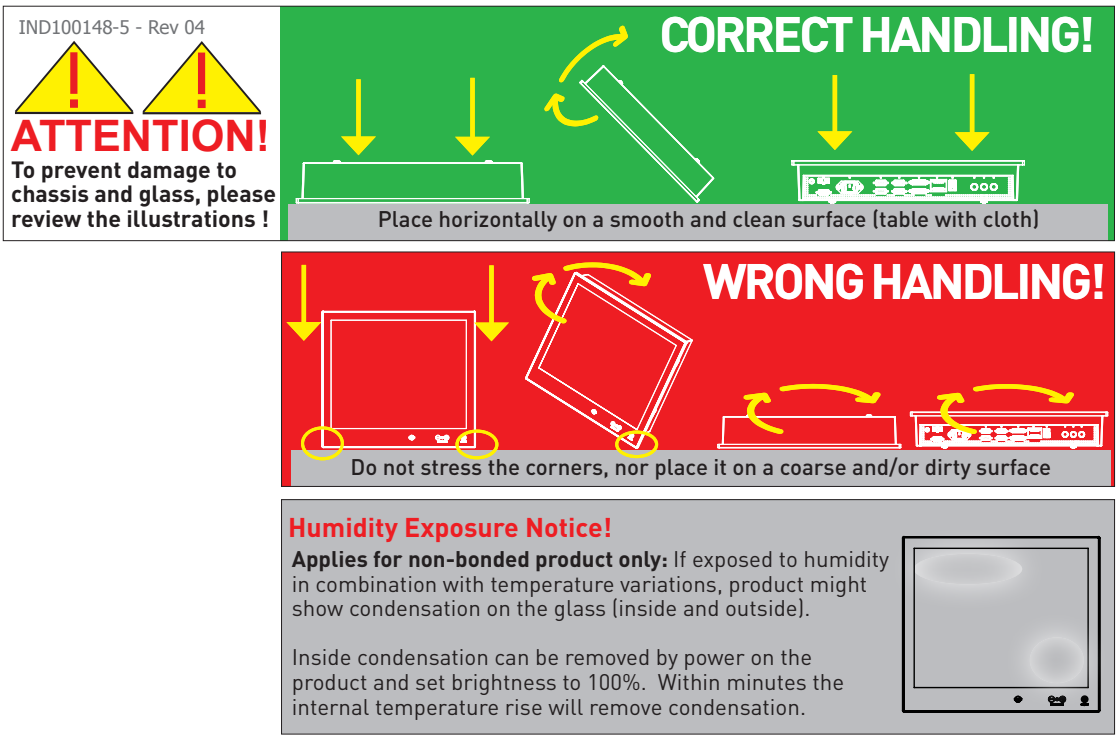


This page left intentionally blank

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.

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		

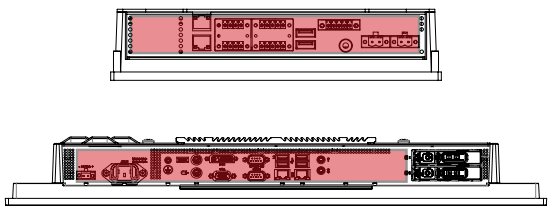
Cables

Use only high quality shielded signal cables.

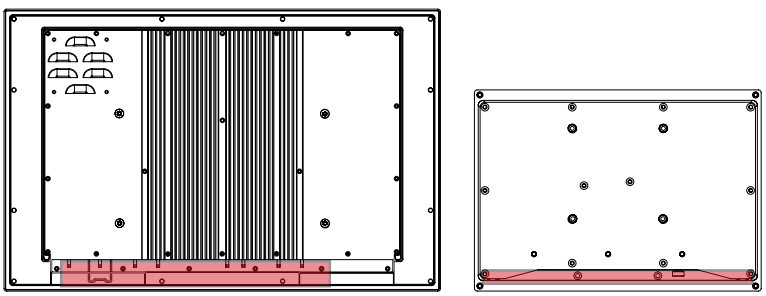
Cable Entries & Connectors (Marked area)

Illustration below for smallest/largest sizes only.

Bottom View



Back View



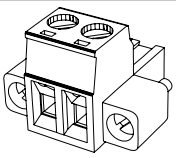
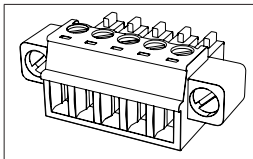
General Installation Recommendations

Maximum Cable Length

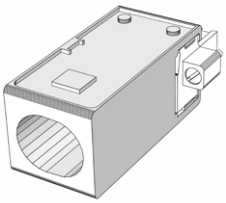
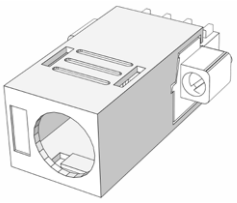
Any cable should generally be kept as short as possible to provide a high quality input/output. The maximum signal cable length will depend on the signal resolution and frequency, but also on the quality of the signal output from the computer/radar.

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			
	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 / SCOM (Serial Remote Control) / Buzzer Identified on Hatteland Display product data sheet as: "Terminal Block 3.81"
└ Reference: http://catalog.phoenixcontact.net/phoenix/treeViewClick.do?reloadFrame=true&UID=1827732			

If your installation require additional cable fasteners support, please visit and purchase directly from manufacturer: Illustrations below are approximate, actual Housing 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 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 5-pin: 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.

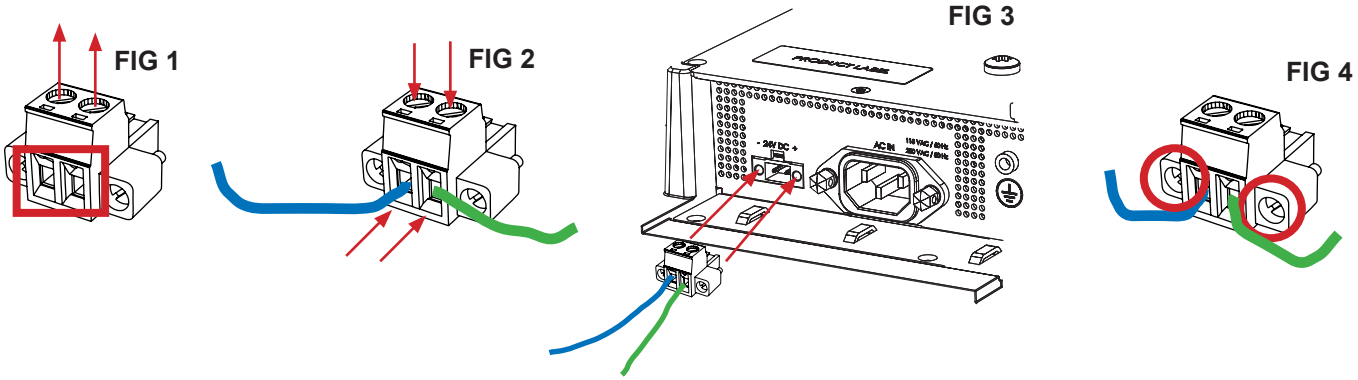


FIG 1: Unscrew (from top) or make sure that the screw terminal (square area) are fully open, so you can secure the inserted cables correctly to the loose housing connector (it may already be plugged into the unit as per factory installation).

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.*

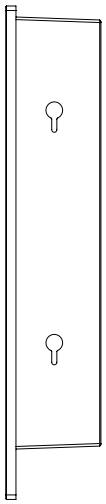
FIG 3: Plug the housing into the appropriate connector area of the unit (glass should be facing down) and check again that the cables secured conforms with the markings on the connector area of the unit. Finalize the installation by fasten the screws located in front on each side of the housing connector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

Panel / Console Mounting Bracket Kit for 12”,15”,17”,19” - Single Key Hole

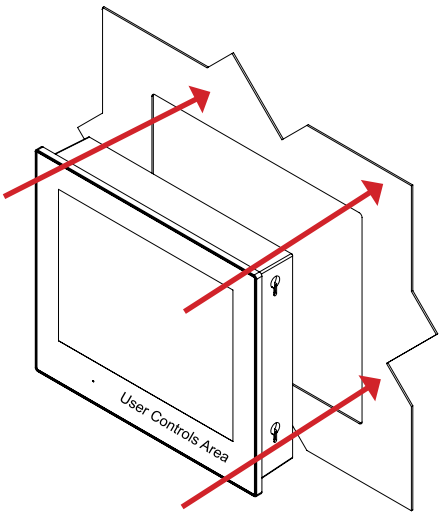
You need: Allen Wrench tool (3mm), 4 pcs of HD CMB SX1-A1 / -A2 or -A3 Kit (-A1 or -A2 included in delivery).
Procedure suitable for: Display and Panel Computers with Single Key Hole. Brackets are EN60945 Tested.

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.

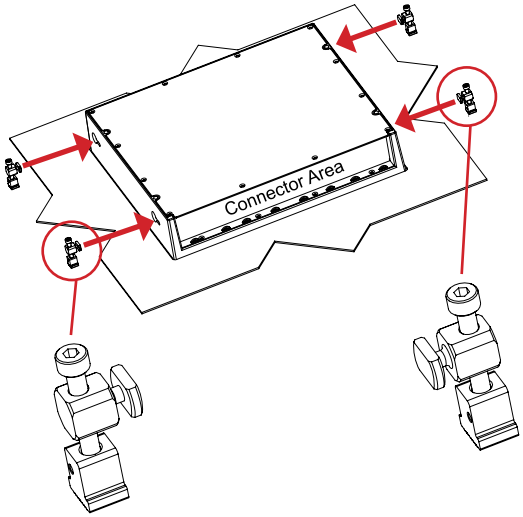
Confirm you have the Single Key Hole model before proceeding!



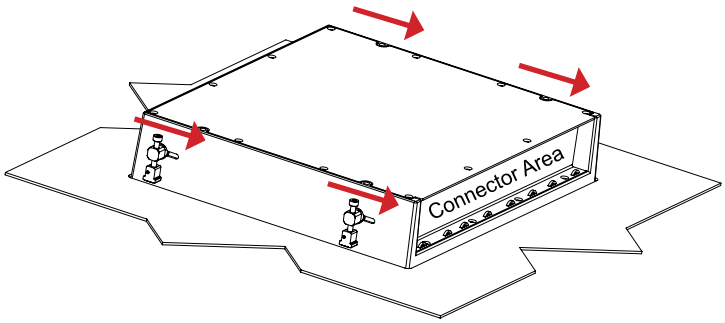
1: Slide the unit into the cutout carefully. User Controls and Connector Area should be facing downwards.



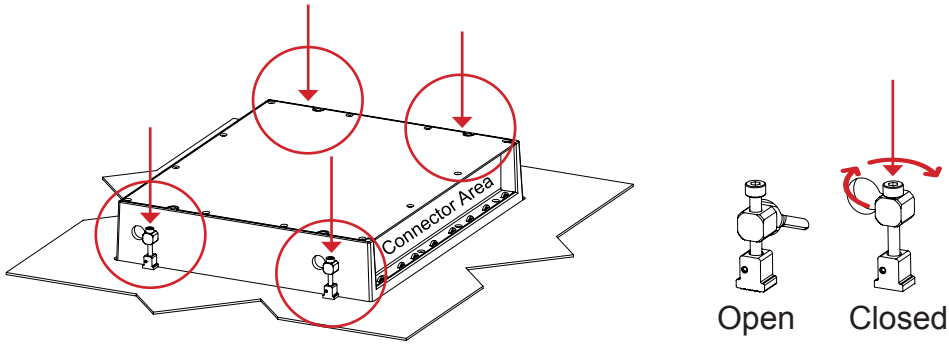
2: Prepare and position the brackets into each of the four key holes. The key part goes into the unit’s largest area of the keyhole, while the Allen screw is visible at the top. See closeup.



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



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

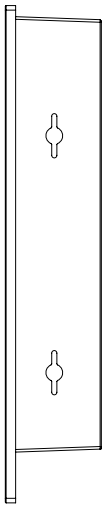


Panel / Console Mounting Bracket Kit for 12”,15”,17”,19” - Double Key Hole

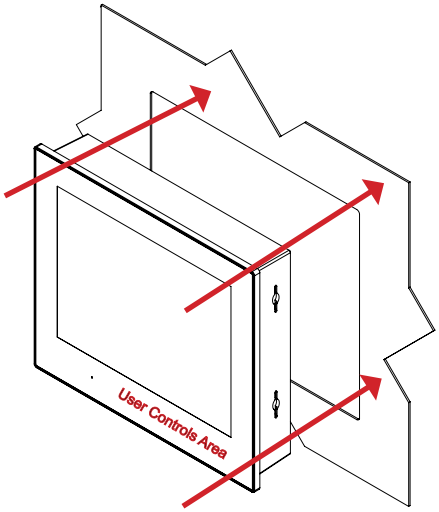
You need: Allen Wrench tool (3mm), 4 pcs of HD CMB SX1-A1 / -A2 or -A3 Kit (-A1 or -A2 included in delivery).
Procedure suitable for: Display and Panel Computers with Double Key Hole. Brackets are EN60945 Tested.

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.

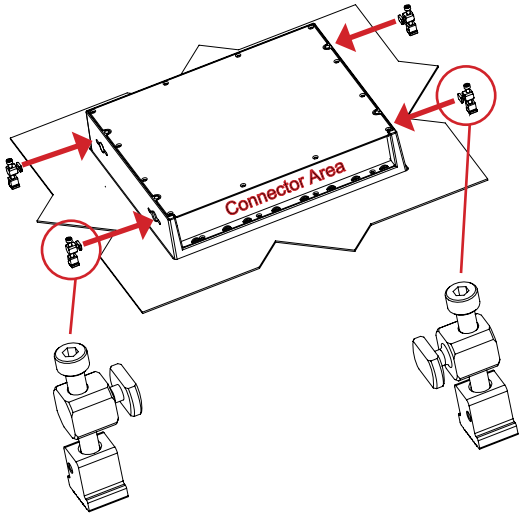
Confirm you have the Double Key Hole model before proceeding!



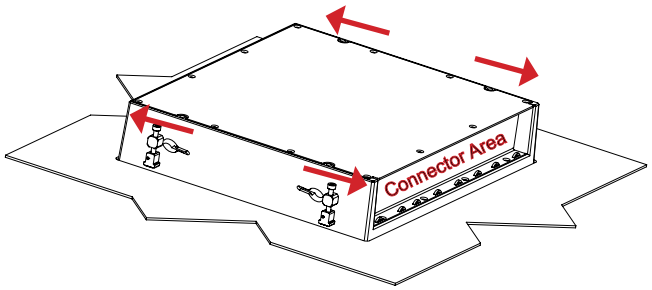
1: Slide the unit into the cutout carefully. User Controls and Connector Area should be facing downwards.



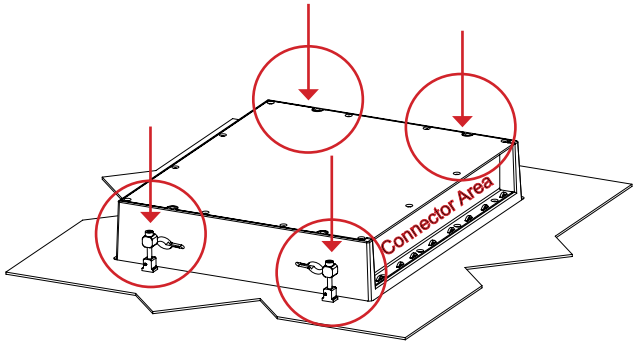
2: Prepare and position the brackets into each of the four key holes. The key part goes into the unit’s largest area of the keyhole, while the Allen screw is visible at the top. See closeup.

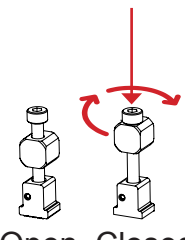


3: When all brackets fits inside the keyhole, slide them to opposite positions from eachother (upper to up, and lower to down) into the narrow gaps, If you are unable to slide them up/down, simply adjust/loosen the top Allen Screw slightly and try again.



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.



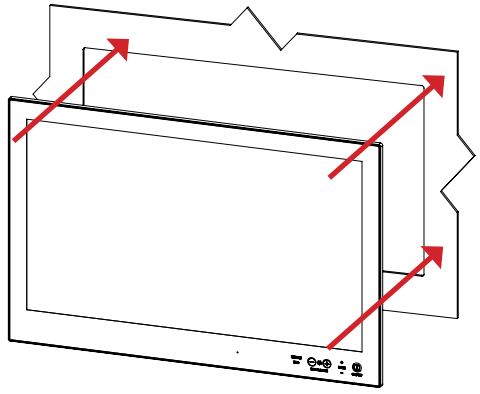


Panel Cutout / Console Mounting Bracket Kit for 24”

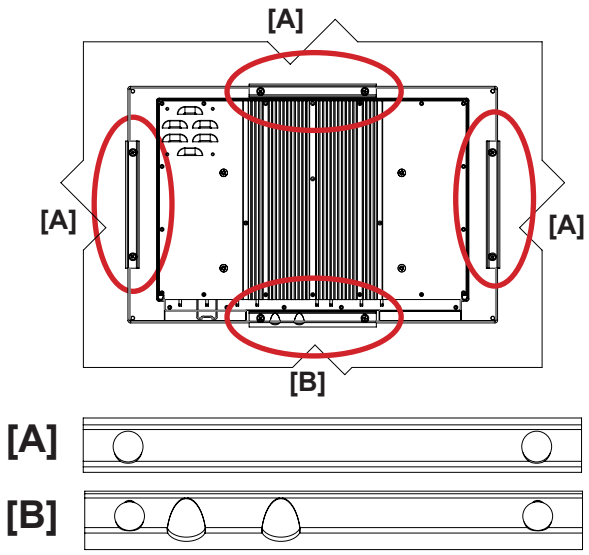
You need: Torx T25 tool, 1 pcs of HD CMB SX1-B1 kit (included in delivery).
Procedure suitable for: Display and Panel Computers Series X range. Brackets are EN60945 Tested.

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.

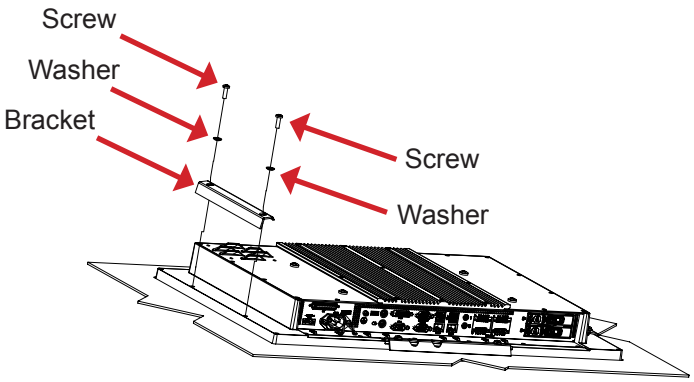
1: Slide the unit into the cutout carefully. User Controls and Connector Area should be facing downwards.



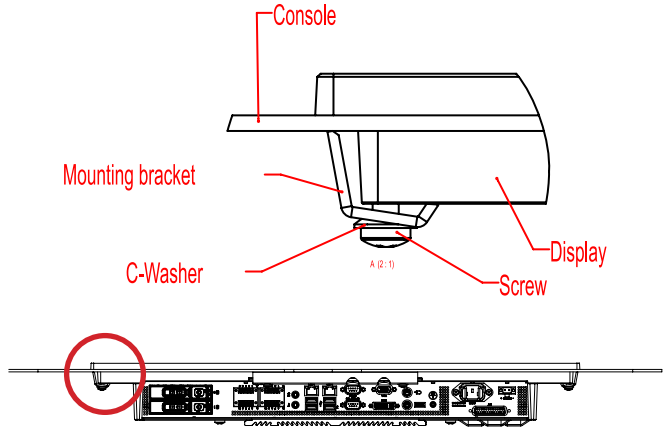
2: Make sure you are aware that brackets should be mounted on TOP, LEFT, RIGHT and BOTTOM sides. Note that the [B] bracket is different than the [A] brackets and mounted near the connectors. See closeup of details.



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.

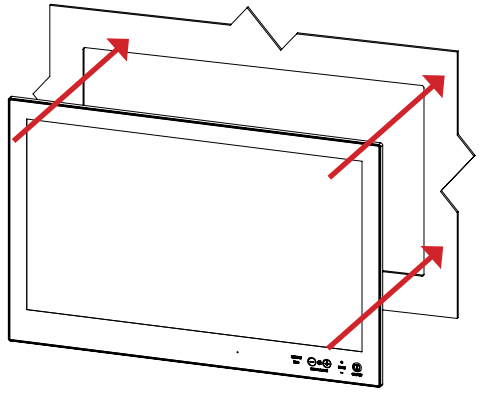


Panel Cutout / Console Mounting Bracket Kit for 26”

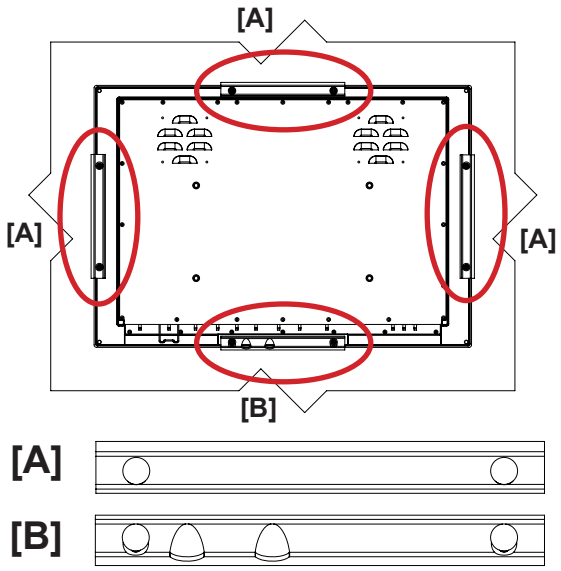
You need: Torx T25 tool, 1 pcs of HD CMB SX1-C1 kit (included in delivery).
Procedure suitable for: Display and Panel Computers Series X. Brackets are EN60945 Tested.

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.

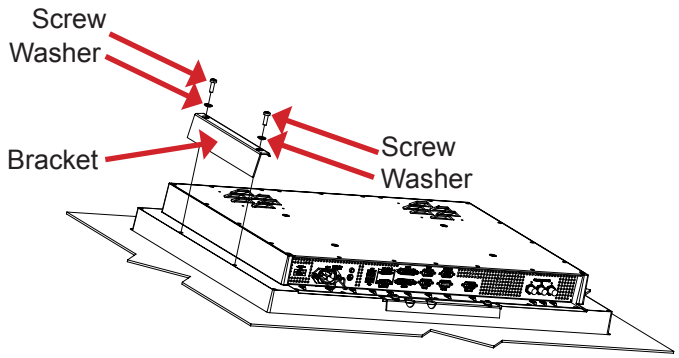
1: Slide the unit into the cutout carefully. User Controls and Connector Area should be facing downwards.



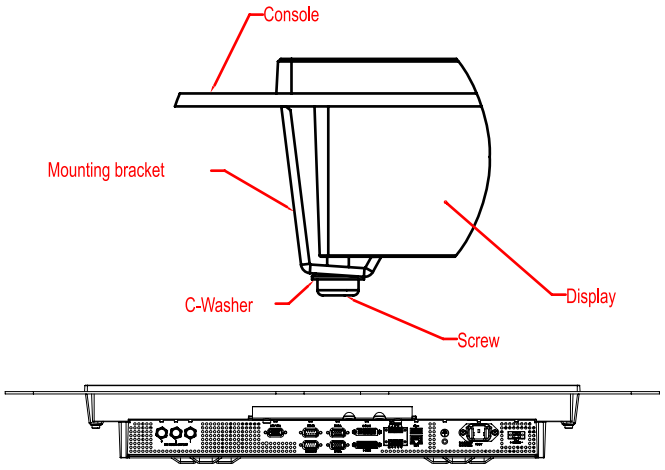
2: Make sure you are aware that brackets should be mounted on TOP, LEFT, RIGHT and BOTTOM sides. Note that the [B] bracket is different than the [A] brackets and mounted near the connectors. See closeup of details.



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.

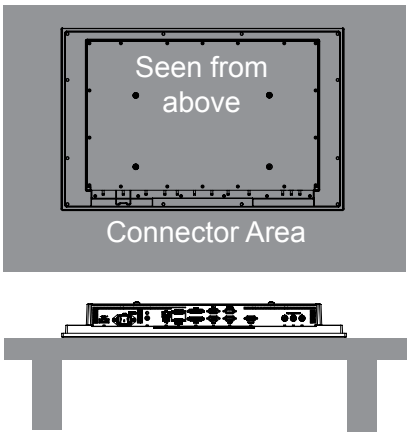


Mounting Bracket for Table / Desktop installation - 24",26"

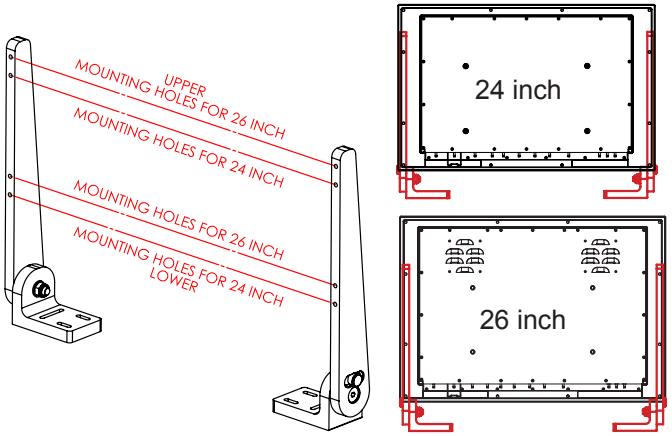
You need: M5 Unbrako® Hex Key tool and 1 pcs of HD TMB SX1-C1 Mounting Bracket Kit.
Fasteners (6 pcs M6) for Table / Desktop location not included. Procedure suitable for: Display and Panel Computers.

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.

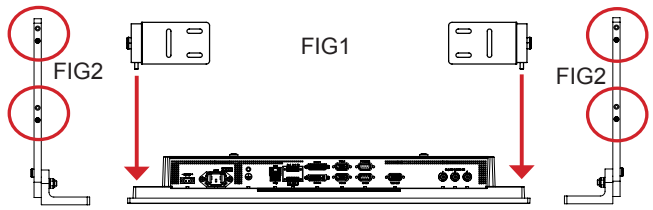
1: Place the unit on a dry, flat, clean, soft surface (i.e. table) with the glass front facing down as illustrated. Connector area should be facing downwards from you.



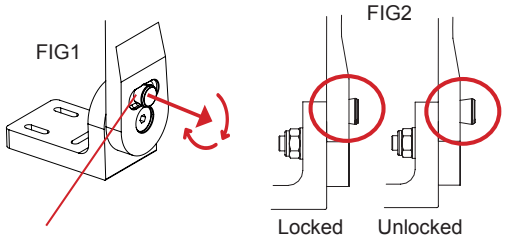
2: Inspect the mounting holes of brackets. For mounting to a 24 inch unit, please use the **lower holes** as indicated. For mounting to a 26 inch unit, please use the **upper holes** as indicated.



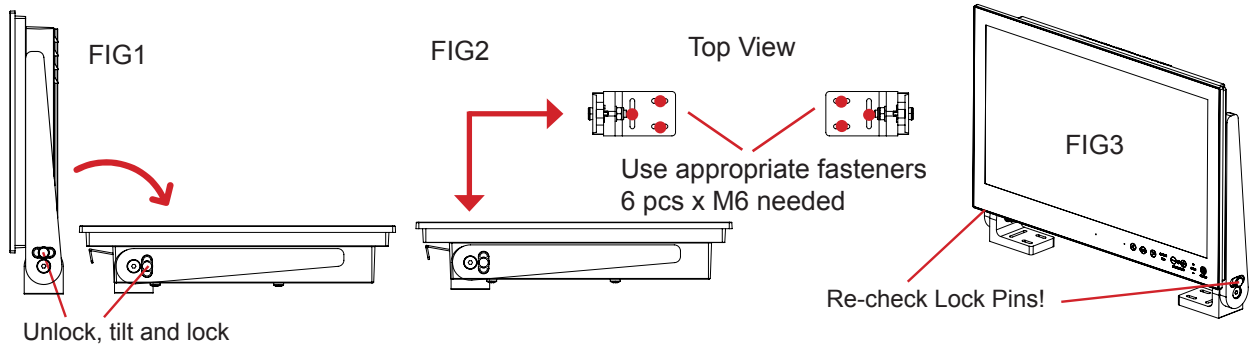
3: Place one bracket at the time with the mounting holes facing down into the suitable mounting position and fasten with 2 x M5 screws on each bracket. Torque Force 3.5Nm.



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).



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).



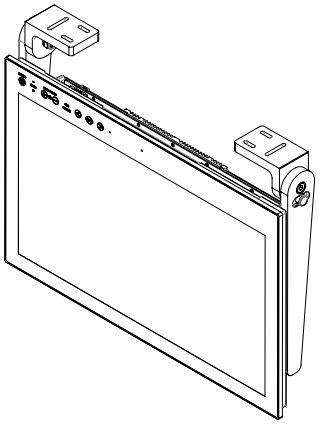
Installation Procedures

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

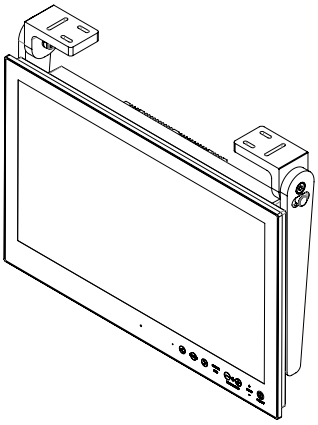
Upside Down Position: User Controls will be upside down, cables go straight up. You may configure Glass Display Control™ (GDC) LED symbols to show or not, since symbols will be seen upside down. Displayed image needs to be flipped vertically. Review http://www.hatteland-display.com/inb100018-4.php (“Glass 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.

Upside Down



Normal Position



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

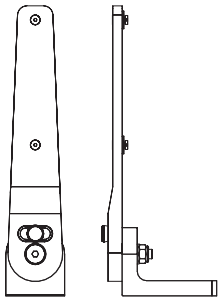
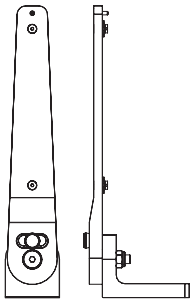
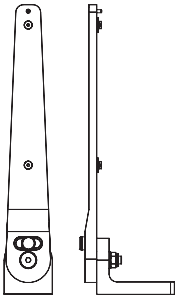
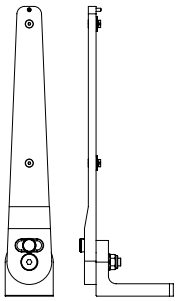
Procedure suitable for: Display (MMD/STD) and Panel Computer (MMC) Series X product ranges.

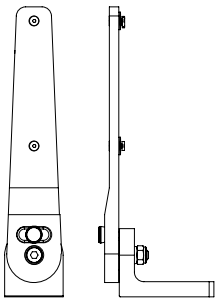
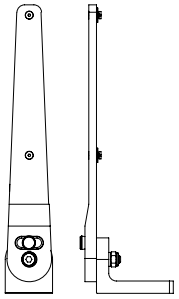
Two versions of bracket exists, please review the table below to identify your unit model and bracket type. Brackets that are currently sold/delivered are marked with **green** color. Those which are obsolete (and replaced by newer type of bracket) are shown in **red** color. The two bracket types exists due to slight variation in manufacturing regarding the unit’s mounting holes (key hole) that exist with either “single key hole” or “double key hole”.

Bracket Arms are clearly marked with Typenumber label so you can identify which version you have (BRD or TMB).

Note: If you ordered a unit with mounting bracket from factory, the corresponding matching bracket has been already been chosen to ensure correct fitting. If you order brackets separately at a later date, you should study the table below carefully as well as review the type of key hole your Display or Panel Computer units has. If unsure, please contact Hatteland Display for support in choosing the correct bracket version (BRD or TMB).

Table last updated 09 Feb 2015. Throughout 2015 the BRD (HW00) versions will be phased out of production and only TMB (HW01) versions will remain available for manufactured units.

Typenumber	Illustration	Fits unit model	Notes	Status
HD 12BRD SX1-A1		HD 12T21 MMD-xxx-Fxxx HD 12T21 STD-xxx-Fxxx HD 12T21 MMC-xxx-xxxx	“HW blank” and “HW00”: Sold since 2014. Fits Single Key Hole Chassis only. Will be replaced by “HW01”, when HW00 is out of stock. “HW01”: For Double Key Hole Chassis, use HD TMB SX1-A1 (see next page).	
HD 15BRD SX1-A1		HD 15T21 MMD-xxx-Fxxx HD 15T21 STD-xxx-Fxxx HD 15T21 MMC-xxx-xxxx	“HW blank” and “HW00”: Sold since January 2013, fits only Single Key Hole Chassis. Will be replaced by “HW01”, when HW00 is out of stock. “HW01”: For Double Key Hole Chassis, use HD TMB SX1-A1 (see next page).	
HD 17BRD SX1-A1		HD 17T21 MMD-xxx-Fxxx HD 17T21 STD-xxx-Fxxx HD 17T21 MxC-xxx-xxxx	“HW blank” and “HW00”: Sold since June 2012, fits only Single Key Hole Chassis. Obsolete, replaced by “HW01”. “HW01”: For Double Key Hole Chassis, use HD TMB SX1-B1 (see next page).	
HD 19BRD SX1-A1		HD 19T21 MMD-xxx-Fxxx HD 19T21 STD-xxx-Fxxx HD 19T21 MxC-xxx-xxxx	“HW blank” and “HW00”: Sold since March 2012, fits only Single Key Hole Chassis. Obsolete, replaced by “HW01”. “HW01”: For Double Key Hole Chassis, use HD TMB SX1-B1 (see next page).	

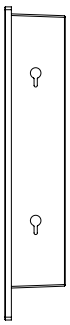
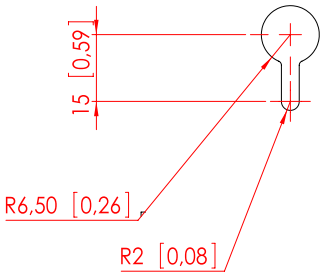
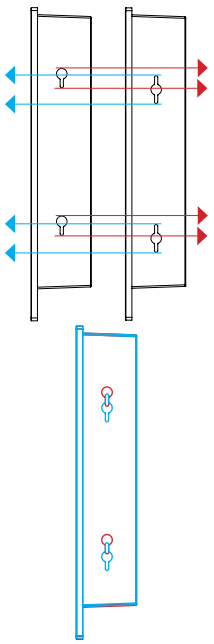
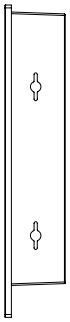
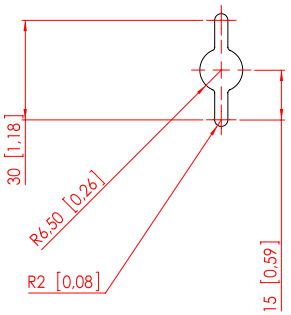
HD TMB-SX1-A1		HD 12T21 MMD-xxx-Fxxx HD 12T21 STD-xxx-Fxxx HD 12T21 MMC-xxx-xxxx HD 15T21 MMD-xxx-Fxxx HD 15T21 STD-xxx-Fxxx HD 15T21 MMC-xxx-xxxx	"HW01": Sold since April 2012. Fits Double Key Hole Chassis only.	
HD TMB-SX1-B1		HD 17T21 MMD-xxx-Fxxx HD 17T21 STD-xxx-Fxxx HD 17T21 MxC-xxx-xxxx HD 19T21 MMD-xxx-Fxxx HD 19T21 STD-xxx-Fxxx HD 19T21 MxC-xxx-xxxx	"HW01": Sold since May 2012. Fits Double Key Hole Chassis only.	

* Note: Reference to HWxx (Hardware Code) can be identified by number of digits in a Display or Panel Computer serial number. Each HWcode upgrade will add 10000 in value to exisiting Serial Number counting.

Single Key Hole vs Double Key Hole

Our Display or Panel Computer units may have Single Key Hole, whilst others have Double Key Hole present in the chassis sides. This is due to slight variation in initial production vs Mass Production throughout 2012-2015. It should be noted that Single Key hole units does not support ceiling mount. Double Key Hole supports ceiling mount of unit.

Single or Double Key Hole can be identified as follows:

Key Hole Type	Key Hole Location (seen from both sides)	Key Hole Dimensions	Key Hole Difference
Single			
Double			

Important to know about LEFT and RIGHT brackets

Throughout the following installation procedure for both BRD and TMB brackets, 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

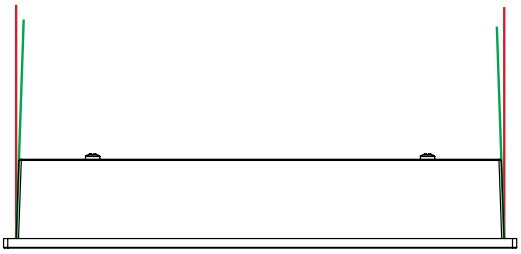


FIG 2
Location of angled block,
and seen straight from top showing slight angle

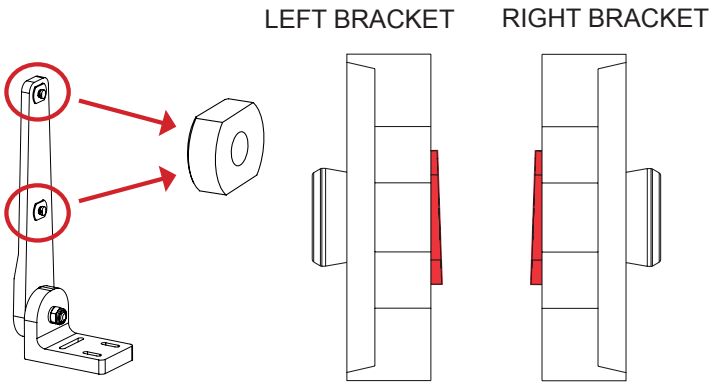


FIG 3 - Seen from under bracket base
Wrong mounting of LEFT / RIGHT Brackets
Indicating footprint is incorrect

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

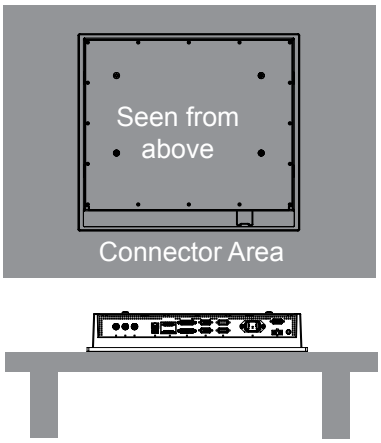
Installation Procedure - BRD Versions

Procedure suitable for: Display (MMD/STD) and Panel Computer (MMC) Series X product ranges.

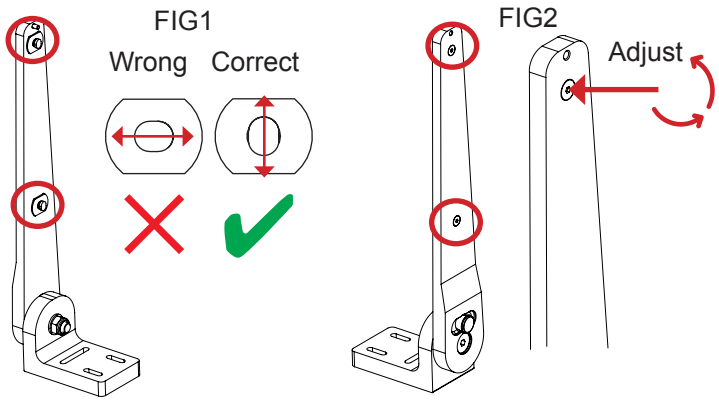
You need:
- M4, M5 Unbrako® Hex Key tool (not included with delivery).
- Fasteners (6 pcs M6) for mounting complete unit onto table or desktop location (not included with delivery).
- 1 pcs of HD xxBRD SX1-A1 Mounting Bracket Kit, where xx=15, 17 or 19 inch.

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.

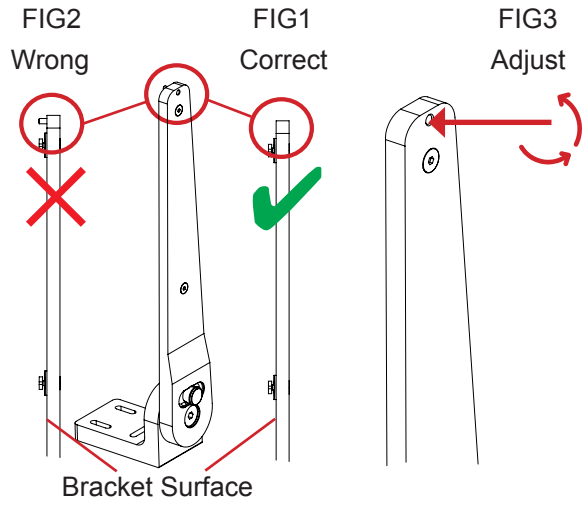
▼ 1: Place the unit on a dry, flat, clean, soft surface (i.e. table) with the glass front facing down as illustrated. Connector area should be facing downwards from you.



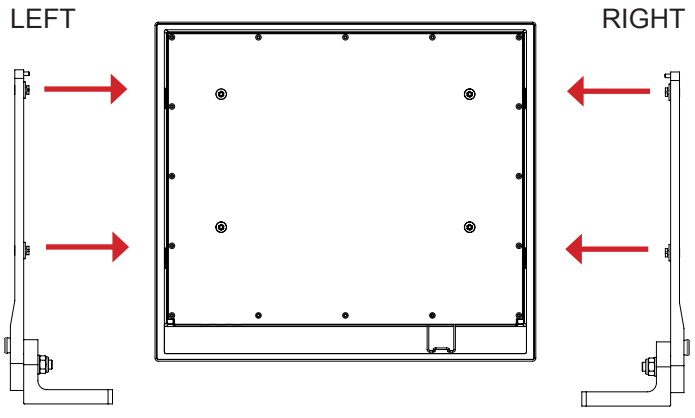
▼ 2: Inspect the inner side of both brackets and especially the orientation of the Key Hole Plug (4 pcs). They should be shaped as an standing “egg” to ensure proper fitting in the Key Hole of unit (FIG1). Note: You may have to loose the fastening screw (M5) (FIG2) if the Key Hole Plug can not be turned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



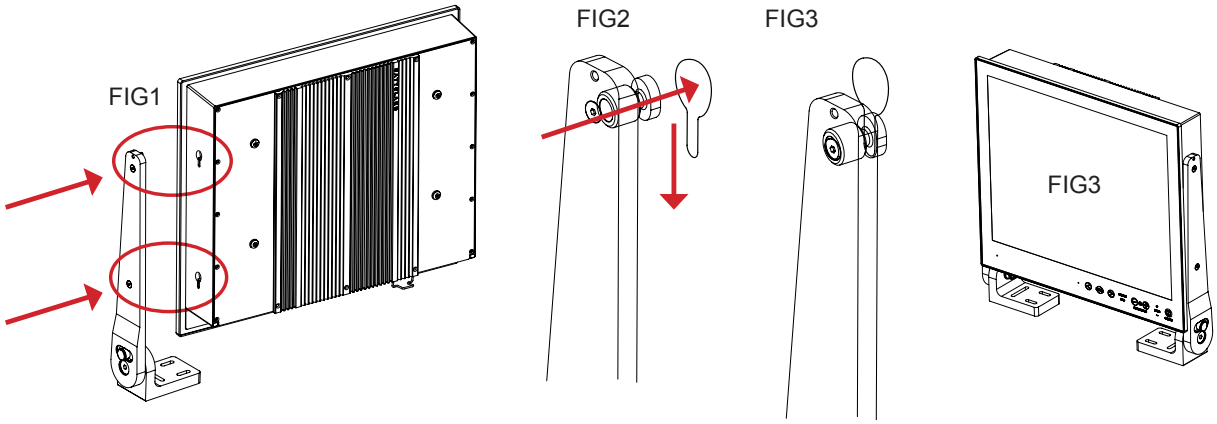
▼ 3: Verify that the Key Hole Set Screw (M4) is aligned with the bracket surface (FIG1). If this screw appear too far out (FIG2), proper fitting into the Key Hole can not be completed. Turn screw clockwise or anti-clockwise (FIG3) to adjust the position.



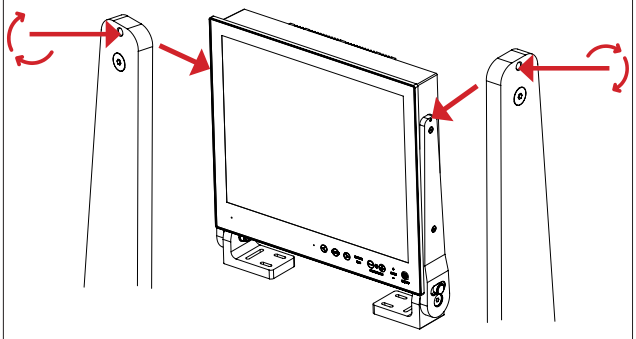
▼ 4: Notice the indication of LEFT and RIGHT. The mounting bracket (2 pcs) is marked with respective stickers “L” and “R” from factory. Please make sure that LEFT bracket is positioned on LEFT side and RIGHT bracket is positioned on the RIGHT side as shown below.



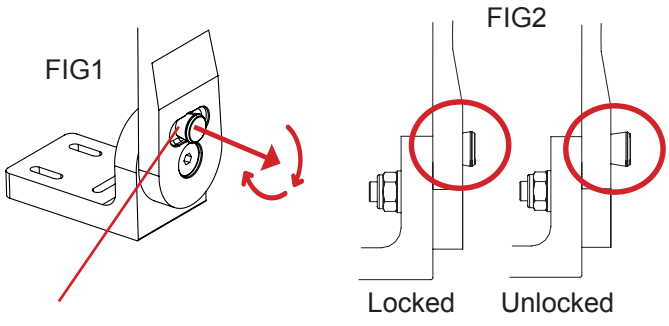
▼ 5: Ensure that both Key Hole Plugs slide into the Key Holes and goes to the bottom position (FIG1 and FIG2). If they appear too tight, you may loose the Key Hole Plug screw a few turns and re-try (see previous step 2). FIG3 shows Key Hole Plug correctly into Key Hole and both brackets in place.



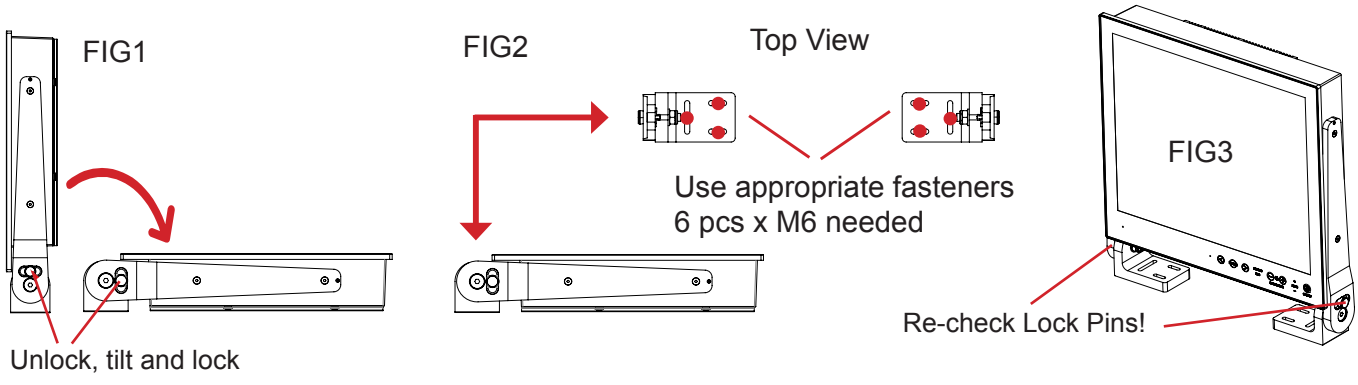
▼ 6: Tighten Key Hole Screw firmly on each side and make sure the brackets are properly mounted and aligned to the main chassis of unit. Verify with your hands that both brackets are firmly attached.



▼ 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).



▼ 8: You may now mount the unit onto your desired location. It is advised that you unlock the Lock Pin (as shown in step 7), 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!** Then repeat step 7 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).



Single Key hole units does not support ceiling mount.

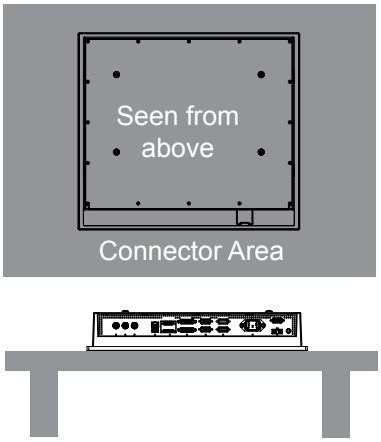
Installation Procedure - TMB Versions

Procedure suitable for: Display (MMD/STD) and Panel Computer (MMC) Series X product ranges.

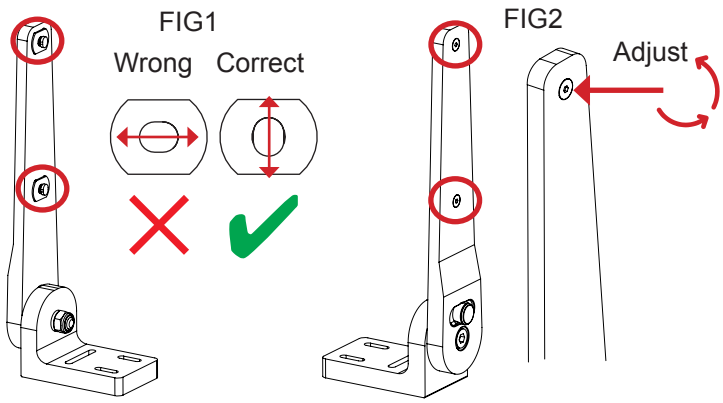
You need:
- M4 Unbrako® Hex Key tool (not included with delivery).
- Fasteners (6 pcs M6) for mounting complete unit onto table or desktop location (not included with delivery).
- 1 pcs of HD TMB SX1-A1 Mounting Bracket Kit (for 12 and 15 inch)
- or 1 pcs of HD TMB SX1-B1 Mounting Bracket Kit (for 17 and 19 inch)

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.

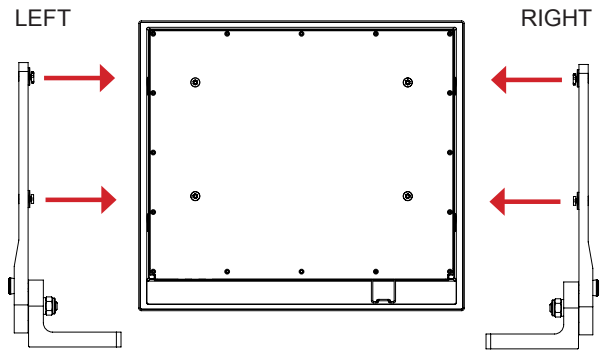
▼ 1: Place the unit on a dry, flat, clean, soft surface (i.e. table) with the glass front facing down as illustrated. Connector area should be facing downwards from you.



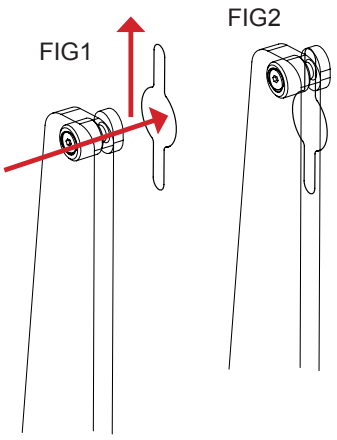
▼ 2: Inspect the inner side of both brackets and especially the orientation of the Key Hole Plug (4 pcs). They should be shaped as an standing “egg” to ensure proper fitting in the Key Hole of unit (FIG1). Note: You may have to loose the fastening screw (M5) (FIG2) if the Key Hole Plug can not be turned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



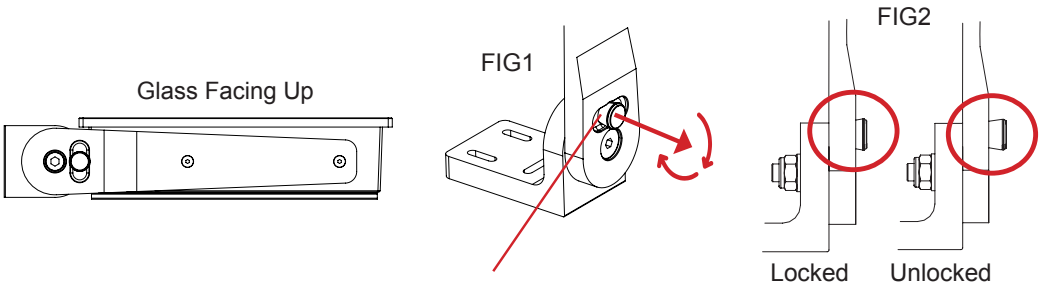
▼ 3: Notice the indication of LEFT and RIGHT. The mounting bracket (2 pcs) is marked with respective stickers “L” and “R” from factory. Please make sure that LEFT bracket is positioned on LEFT side and RIGHT bracket is positioned on the RIGHT side as shown below.



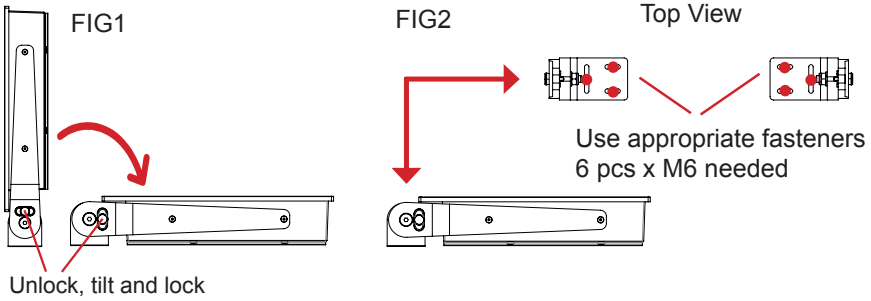
▼ 4: Ensure that both Key Hole Plugs slide into the Key Holes and goes to the upper position (FIG1 and FIG2). If they appear too tight, you may loose the Key Hole Plug screw a few turns and re-try (see previous step 2).



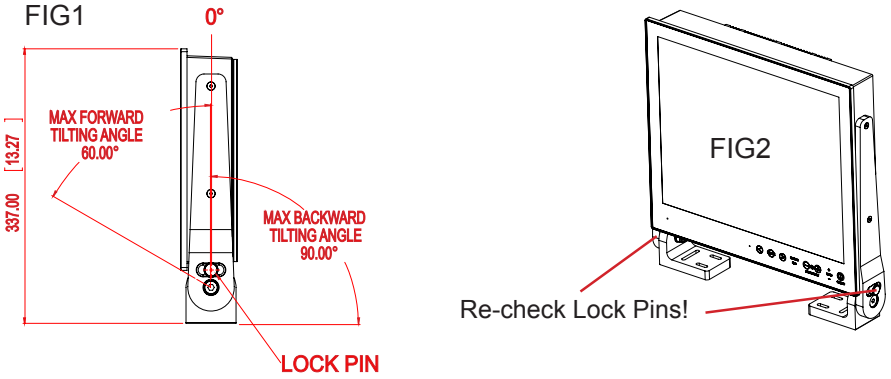
▼ 5: While unit is lying flat on table, check the Tilting Lock Pin position. These can be pulled out by hand, turned 90° (FIG1) and turned back 90° until the Lock Pin automatically clicks into place by a spring (FIG2).



▼ 6: 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!**

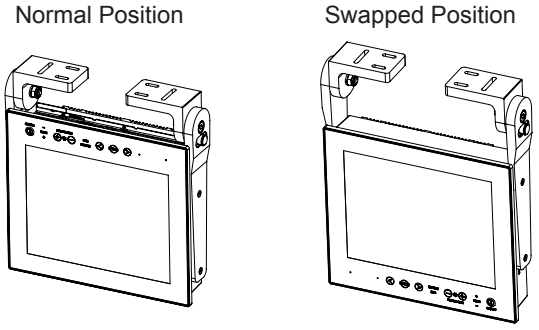


▼ 7: Max Forward and Backward angle shown below (FIG1). When your desired tilting position has been achieved, you need to verify that the Lock Pin are in locking position and the unit is firmly attached and does not appear loose (FIG2).

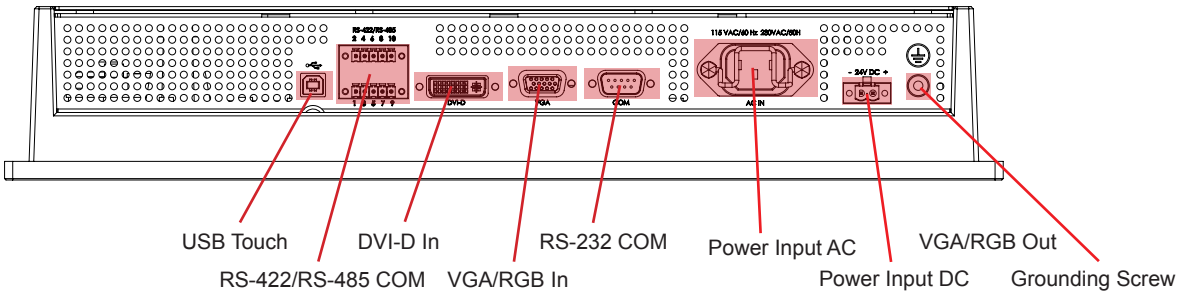


▼ 8: Depending on installation needs, you may mount the complete unit in ceiling in two different ways.
Normal Position: User Controls will be upside down, cables go straight up. You may configure Glass Display Control™ (GDC) LED symbols to show or not, since symbols will be seen upside down.
Review 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”).



Connection area of unit (illustration)

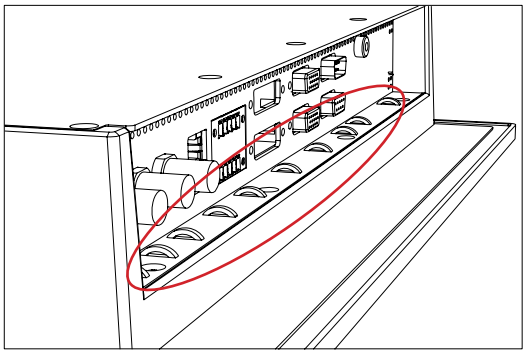


Note: 19 inch unit used as example above, please review specifications for your actual model.

Reduce Cable Tension

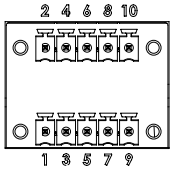
To reduce tension of the cables you connect, secure them with a cable tie to the available chassis hinges located near the connectors.

Note: Amount of chassis hinges can vary depending on model.



USB TOUCH:

Connect a TYPE B USB Cable between this connector and your PC. Suitable drivers to install and calibrate the touchscreen are available on the separate installation media delivered with the unit. Port is USB2.0 (<5m).



RS-422 / RS-485 COM I/O:

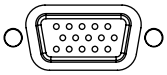
The COM (non-isolated RS-422/485) allows functionality to communicate with serial based equipment including external buzzer functionality. Connect and fasten your cables from your compatible external equipment to the 5-pin Terminal Block 3.81 connector. Please review the “Pinout Assignments” chapter as well as “Housing / Terminal Block Connector Overview” in this manual for more information

DVI-D IN:

Connect your DVI cable to the DVI-D 18+1P, Single Link Connector (female). Secure your DVI cable to the hex spacers provided on the unit and make sure you do not bend any of the pins inside the connector. Connect the other end of the cable to the DVI connector on your equipment and secure it.

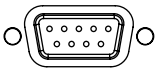
Important note for DVI signal detection:

Please note that for the operating system to detect DVI signals correctly, the DVI cable MUST be connected physically to the unit during boot up otherwise you may experience a black image. Furthermore certain graphics drivers may need to refresh their device list (often done manually by user - detect devices), while in some cases the Plug-n-Play will automatically detect the DVI signal correctly. Please consult your local technician if you have this behaviour of detection problems when using DVI. In all cases the problem can be solved in the operating system, and this is not a malfunction in the graphic controller for display units.



VGA/RGB IN:

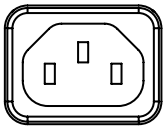
Connect your VGA cable to the D-SUB 15P Connectors (female). Secure the VGA cable to the hex spacers provided on the unit and make sure you do not bend any of the pins inside the connector when connecting. Connect the other end of the cable to the VGA connector on your equipment and secure it.



RS-232 COM I/O:

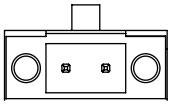
This 9P COM connector provides additional functionality for the unit. The Serial Remote Control features a RS-232 (non-isolated) interface for controlling internal parameters like brightness. You can access most of the parameters available in the OSD menu and with special commands control the unit externally. This COM can also be used to upgrade the firmware for the graphic controller inside the unit which is available on request and through service channels (for qualified personnell only). Fasten your external cable to the D-SUB 9P Female connector using the provided screws on the cable housing.

Please review “Management Settings/Communication” in the “OSD Menu Functions” chapter for more information.



POWER INPUT:

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



POWER INPUT:

Connect your DC power cable to the 2-pin Terminal Block 5.08 connector. The internal DC power module supports 24VDC. For more information, please review “Housing Connector Overview” earlier in this manual.

GROUNDING SCREW:

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

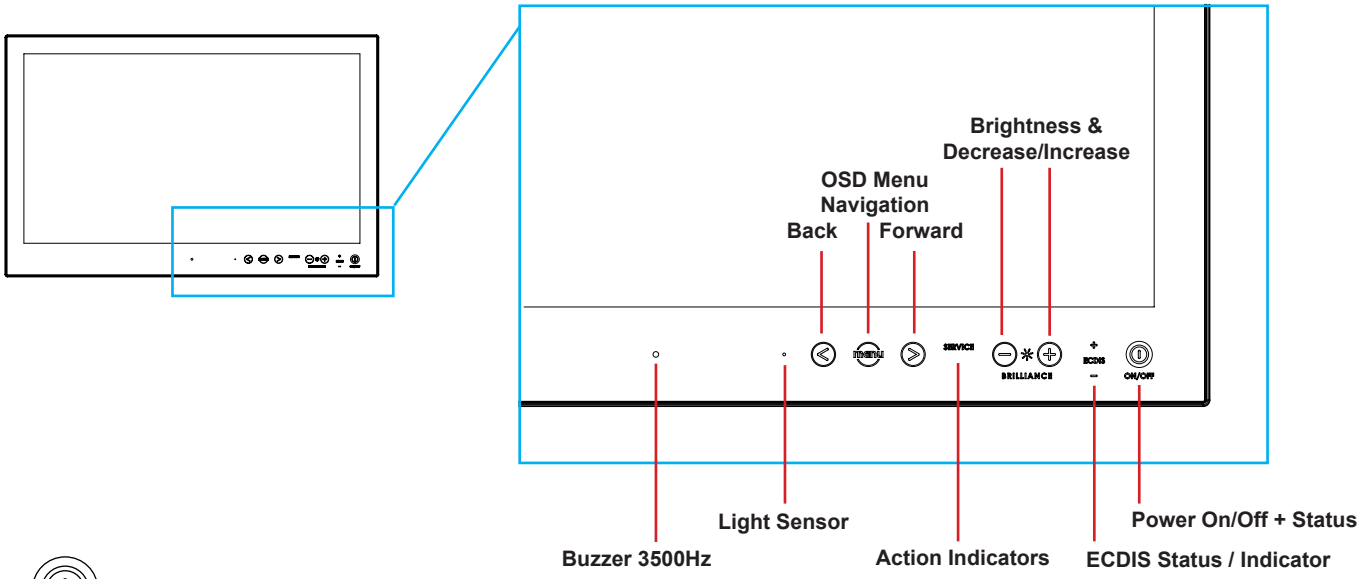
Multi-power note: (For units supporting AC & DC input simultaneously)

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.

Operation

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, except power symbol which has a white silk print to indicate its position on the front glass. Further, not all symbols are available depending on factory options and product sizes (where applicable). 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.



ON/OFF **Power ON/OFF:**

This symbol and all text will illuminate in red when suitable power is connected and the unit is turned off. When the unit is on and operating, this symbol will illuminate constantly either in yellow color (signal not recognized/not present and no image on screen) or green color (signal detected and image on screen).

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/yellow 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/yellow to red or the image on screen disappears.

menu **OSD Menu, Navigation:**

If the OSD (On Screen Display) menu was activated (and is cleary visible on screen), both the “<” and “>” are used to navigate and set options within the OSD menu

To access the main OSD menu, touch anywhere on the “MENU” circle symbol and the OSD menu will clearly be seen as an overlay over the existing displayed image. The complete definition of all the menus and functions are available in the “OSD MENU FUNCTIONS” chapter in this manual.

User Controls

SERVICE **Action Indicators:**

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.

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. The symbols (-) and (+) are also used to change values in the OSD menu when its activated / function selected for adjusting.

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 in red color and that "ECDIS" text remains illuminated in green during operation. Note that by touching these symbols no action will be performed or has been assigned.

Note: ECDIS functionality is mostly only suitable for model sizes above 15 inch units.

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!

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!
Please review the "Pinout Assignments" chapter in this manual for controlling the Buzzer functionality.

Note:
In the following "On Screen Display (OSD)" menu chapter, these buttons are referenced as:

menu	"MENU"
	"(-) Brilliance (+)"
	"(<) Navigation (>)"

OSD Menu Overview

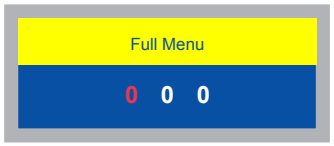
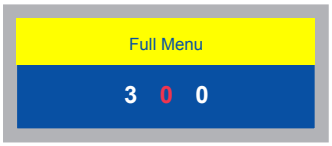
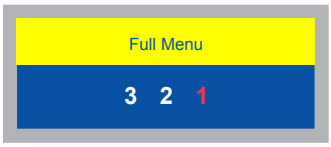
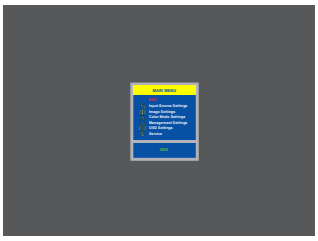
On Screen Display (OSD) Menu Introduction

The OSD menu consists of main menus and submenus which is very easy to navigate through. All functions are explained in-depth later in this user manual. You should prior to using the OSD menu and functions, be sure to familiarize yourself with how to physically access the menu, how to navigate up/down/left/right, how to modify values, exiting menus and more.

Please note: Factory default illustrations only! Available functions, icons and text may deviate slightly from actual OSD menu on your product due to different OSD software configurations and customized solutions.

OSD Keycode / OSD Lock Mode

During use, a small requester may pop-up on screen asking you for a 3 digit “Key Code”. This is a safety feature (due to ECDIS Compliance) that might be predefined in your setup. To quickly understand how to enter a code, navigate and finally access the underlying main menu, simply follow the illustration below. The “Key Code” is by factory default **“321”**. If the “Key Code” requester do not appear on screen, you can skip reading this section for now and proceed to the next page.

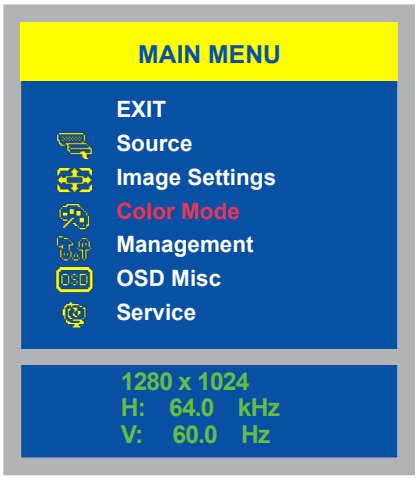
 Active Display Area + Requester	 Close-up of Requester	 Close-up of Requester
1: Typical position of requester on screen. Red number indicate number position, default loaction is always on first number.	2: Enter first number (from 0 to 9). Use “(-) Brilliance (+)” touch buttons to increase/decrease. Number change in real time.	3: Now touch “(<) Navigation (>)” right button to store first number and proceed to second number. You may use left button to go back editing the previous number if you like.
 Close-up of Requester	 Active Display Area + OSD Menu	
4: Repeat step 2 and 3, until “Key Code” reads “3 2 1” and finally touch menu button to continue.	5: The OSD menu appear in “Simplified” or “Full Menu” mode (if confgured to do so)	

After the code was successfully entered you will gain access to the OSD Menu and a multitude of functions will be available for adjusting or reviewing. Please proceed to the next page, where you will learn the differences between “Simplified” and “Full” menu modes and a complete map of all the underlying functions available within.

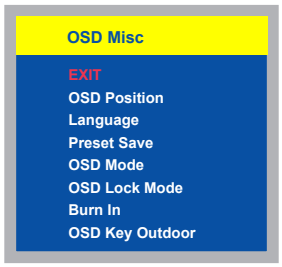
OSD Menu Overview

OSD Simplified and Full Menu modes (examples)

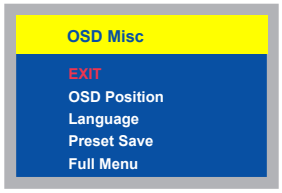
You may encounter two different menu setups based on factory default or by customized preset configuration. By first apperance they look the same at the main level, but the underlying sub-menus are slightly different. The Simplified Menu mode offers easy and clear access to most commonly used functions. The Full Menu mode offers a more advanced menu with technical information and is suited for more technical minded users.



OSD Menu showing for example “Color Mode” chosen in the menu. Each of these lines might have additional submenus where other lists of choices will be seen. Notice the green text information. This may change depending on the selected function.



Full Menu Illustration



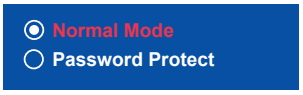
Simplified Menu Illustration

Submenu where the difference between “Full” menu (top) and “Simplified” menu (bottom) is illustrated with less functions available. Notice that the height of menus will adjust based on content.

OSD Visual Feedback (examples)

Throughout all OSD menus there are certain symbols you need to familiarize yourself with. These are to visually indicate that a value can be increased/decreased, option by “radio” button style, display a Slide Bar Meter or just for information purposes only. A Slider Bar with number beside it will indicate the value has a minimum, current and max limit. All changes in values and lists happen in real time as you touch the menu button and/or touch navigation buttons.

Whenever a function is selected, the item will be visually indicated by text changes from white to red. The icon will remain in yellow color always.



“Radio Button” indicates the current state of this function, while the red text indicates the position of the cursor. To set a new assignment to the function, simply touch the “MENU” button for the red text function and the “radio button” will be moved to the selected red text function. Radio buttons only allows for 1 choice out of several choices shown.

Slider Bar meter indicates the “filling” up based on a minimum and maximum value. The current value is written to the left. These Slider Bar meters useally appear at the bottom of menus.

Text displayed in Green Color indicates to draw user’s attention towards information about an selected function or its current state. This information box useally appear the the bottom of menus.

Note: The examples above are the most common ones displayed. Your menu may have slight different style and colors, depending on firmware, variations and customized solutions, but the logic of operation is the same.

OSD Menu Overview

OSD Menu Structure

In this table all functions within menus and their submenus are shown. Functions that begins with an asterix (*) and in **bold/red font color** style indicates this function/menu is only available during “Full” menu mode. Some functions are not available for all signal sources due to industry standards and signal properties. Functions with a “>” in the end, indicates a submenu or list of options will be displayed. Depth of the sub-menus (levels) are identified from 1 to 5.

Source (page 48)

Level 1 (Main Menu)	Level 2	Level 3	Level 4	Level 5
Exit				
Source >	< Exit			
	VGA >	(Automatic Action)		
	DVI >	(Automatic Action)		
	Auto Source >	< Exit		
		Yes, No	(Radio Button)	

Image Settings (page 49-50)

Level 1 (Main Menu)	Level 2	Level 3	Level 4	Level 5
Image Settings >	< Exit			
	Auto Setup >	(Automatic Action)		
	***Black Level >**	(Slider Bar)		
	***Contrast >**	(Slider Bar)		
	Display >	< Exit		
		H.Position >	(Slider Bar)	
		V.Position >	(Slider Bar)	
		Clock >	(Slider Bar)	
		Phase >	(Slider Bar)	

Color Mode (page 51)

Level 1 (Main Menu)	Level 2	Level 3	Level 4	Level 5
Color Mode >	< Exit			
	Color Temperature >	< Exit		
		9300K >	(Radio Button)	
		8000K >	(Radio Button)	
		6500K >	(Radio Button)	
		***User >**	< Exit	
			Red >	(Slider Bar)
			Green >	(Slider Bar)
			Blue >	(Slider Bar)
	Calibration Mode >	(Automatic Action)		

OSD Menu Overview

Management (page 52)

Level 1 (Main Menu)	Level 2	Level 3	Level 4	Level 5
Management >	< Exit			
	LED Drive >	(Slider Bar)		
	*Communication >	< Exit		
		RS232 >	(Radio Button)	
		2-wire RS485 >	(Radio Button)	
		4-wire RS485/422 >	(Radio Button)	
		Address RS >	(Slider Bar)	

OSD Misc (page 53-56)

Level 1 (Main Menu)	Level 2	Level 3	Level 4	Level 5
OSD Misc >	< Exit			
	OSD Position >	< Exit		
		OSD H Position >	(Slider Bar)	
		OSD V Position >	(Slider Bar)	
	Language >	< Exit		
		Norsk >	(Radio Button)	
		English >	(Radio Button)	
		Français >	(Radio Button)	
		Deutsch >	(Radio Button)	
		Italiano >	(Radio Button)	
		Español >	(Radio Button)	
		日本語 >	(Radio Button)	
		簡體中文 >	(Radio Button)	
	Preset Save >	< Exit		
		Recall >	(Automatic Action)	
		*Save >	< Exit	
			User 1 >	(Automatic Action)
		Load >	< Exit	
			User 1>	(Automatic Action)
	*OSD Mode >	< Exit		
		Simplified >	(Radio Button)	
		Full >	(Radio Button) and Enter Key Code “362”	
	*OSD Lock Mode >	Normal Mode >	(Radio Button)	
		Password Protect >	(Radio Button) and Enter Key Code “321”	
	Full Menu >	(Select and Enter Key Code “362”)		
	Burn In >	Factory / Internal use only.		
	*OSD Key Outdoor >	< Exit		
		On >	(Select)	
		Off >	(Select)	

Service (page 57-58)

Level 1 (Main Menu)	Level 2	Level 3	Level 4	Level 5
Service >	< Exit			
	RAP Firmware >	(Text Displayed)		
	CYP Firmware >	(Text Displayed)		
	Operation Hours >	(Text Displayed)		
	Current Temp >	(Text Displayed)		
	Fault Status >	< Exit		
		NVRAM >	(Text Displayed)	
		DDC >	(Text Displayed)	
		TMP Sensor >	(Text Displayed)	
	Test Pattern >	(Automatic Action)		

OSD Menu Functions

The following section covers all possible settings that the user can (in a certain mode) encounter or needs to adjust via easy understandable menus, text and navigation. For simpler reading the menu choice **“Exit”** has been left out of description in this chapter intentionally. Whenever **“Exit”** is available, you can exit current menu and go back to the previous one visited. When there is no more previous menus available, the OSD menu overlay will be shut off and hidden. All settings are saved real-time or when you exit a menu (including timeout of menu visibility).

The number shown in the “|------x------” line gives the indication of the submenu level where the function is located (also reference to the table in the previous chapter). It requires the user to touch the “MENU” symbol to enter that submenu.

Please note: Available functions described may deviate slightly from actual OSD menu on your unit. This is due to different OSD software configurations and customized solutions. Shown here are factory standards.

Source

Lets you configure signal source input (DVI or VGA) as well as activate or disable the Auto Source functionality. The contents of these submenus are listed below.

|---2--- **Source - VGA**

Sets the signal source detection to “VGA” (Analog RGB/VGA).

|---2--- **Source - DVI**

Sets the signal source detection to “DVI” (Digital).

|---2--- **Source - Auto Source**

Set to either ‘Yes’ or ‘No’. Signal is automatically searched for and selected. If any signal is disconnected physically, the video controller will automatically search and select from the next item available in the list, such as; “DVI” (Digital) or “VGA” (Analog RGB/VGA).

- Note: If all signals was physically disconnected from the unit, the Auto Source function will loop endlessly until it detects a valid signal to display.

Image Settings

Lets you configure various visual preferences for any signal. The contents of these submenu are listed below.

|---2--- Image Settings - Auto Setup

Will automatically fit / reset the current displayed full screen signal and center it based on the active area of the TFT display. This function rely on properties of the incoming signal.

- Note: Only applicable for “VGA” (Analog RGB/VGA) signals. Will override any manual adjustments done previously.

|---2--- Image Settings - Black Level *Available in “Full Mode” only

Increase/decrease the black level saturation (brightness) in real-time of the current displayed full screen signal. A visual slider in the OSD menu will show the current value. This value adjusts the TFT panel’s brightness by controlling the voltage feed.

- Note: Value adjustable from 0 to 100. 50 is factory default.

|---2--- Image Settings - Contrast *Available in “Full Mode” only

Increase/decrease the contrast in real-time of the current displayed full screen signal.

- Note: Value adjustable from 0 to 100. 50 is factory default.

|---2--- Image Settings - Display

Allows to adjust “VGA” (Analog RGB/VGA) signals Horizontally (left/right) and Vertically (up/down) and Clock and Phase within the TFT panel Active Area. Clock and Phase is suitable when the image seems to have a “waterfall / rolling bars” effect.

- Note: This function can move information in the image outside the visible TFT Active Area, so use caution when modifying this parameter. Try to determine the max end of borders (look at each corner) of the image before you proceed using this function.

|--------3-------- Image Settings - Display - H.Position

Settings as follows:

“H.Position” = Move image within the TFT panel active area Horizontally (left/right), values from 0 to 100.

- Note: Default value is centered inside the active TFT panel area.

|--------3-------- **Image Settings - Display - V.Position**

Settings as follows:

"V.Position" = Move image within the TFT panel active area Vertically (up/down), values from 0 to 100.

- Note: Default value is centered inside the active TFT panel area.

|--------3-------- **Image Settings - Display - Clock**

Adjust the horizontal frequency (clock) of the analog signal to improve visibility of the entire image. When it is adjusted, you will notice that the image will appear to be stretched and might in some situations start to flicker/scroll, at which point you must reverse the last adjustment to stop it from flickering/scrolling anymore. This function can be used for older signals that is not automatically detected by the internal display controller.

To adjust the Clock and Phase to a optimal setting it is recommended to display a image with alternating white and black lines by stepped by 1 pixels either vertically or horizontally. It is suggested to use a dedicated and external test pattern while adjusting.

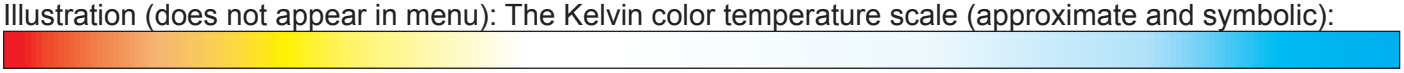
|--------3-------- **Image Settings - Display - Phase**

Fine tune the data sampling position of the signal (impacts on image quality). This function will remove small transparent defects in typical characters where a portion seems to be more faint then the nearby black pixels. The faint pixels are always visible as a line from top to bottom (vertically). Note that this function is automatic and does not allow for manual values. It is suggested to use a dedicated and external test pattern while adjusting.

Color Mode

Lets you adjust the color temperature (Kelvin degrees) of the image. This applies to the Source signal only. OSD Menu overlay will be unaffected. Lower values make the image appear warmer, while higher values will make it appear cooler. The contents of these submenus are listed below.

Illustration (does not appear in menu): The Kelvin color temperature scale (approximate and symbolic):



1800K 4000K 5500K 8000K 12000K 16000K

|---2--- Color Mode - Color Temperature

Settings as follows:

"9300K" = Cool, a blueish white.
"8000K" = Neutral, a white close to natural light.
"6500K" = Warm, a reddish white.

|--------3-------- Color Mode - Color Temperature - User *Available in "Full Mode" only

Allows individual adjustment of Red, Green and Blue color gains. The selected setting will be preserved for each signal input (DVI/VGA)

Settings as follows:

"Red" = Adjust the Red Gain.
"Blue" = Adjust the Green Gain.
"Green" = Adjust the Blue Gain.

- Note: Value adjustable from 0 to 100. 50 is factory default.

|---2--- Color Mode - Calibration Mode

Will automatically adjust the color balance of the current displayed full screen signal. This function will analyse the incoming signal strength for RGB values and adjust it for "best eye visuality". Colors are automatically calculated based on a overall coloring model to attempt a more true, relevant and correct look. In general, you should display a image on screen while performing this action that contains variations of Red, Green, Blue, Black, White, Gray colors to get the best optimal balance of the current signal. An example is a test pattern image, similar to the picture illustrated later in the manual (see "Service - Test Pattern")

Management

Allows you to adjust voltages for LED (which illuminate the front glass symbols) and setup Serial Communication mode. The contents of these submenus are listed below.

|---2--- Management - LED Drive

The touch enabled symbols available on the front glass of the unit is backlight illuminated by LED technology. If you have the need to adjust the brightness strength of these LED (to conform with Night Vision situations), you may do so by adjusting this value in real time.

Settings as follows:

“LED Drive”	= Adjust values from 0 to 100.

- Note: Default is TBD

|---2--- Management - Communication *Available in “Full Mode” only

The unit allows for remote control (adjust brightness for example) and/or accessing internal information about the unit such as typenumber, serial number and more. To setup this feature, you first need to configure the Serial properly to match your external equipment specifications. The contents of the submenus is listed below.

Settings as follows:

“RS232”	= Sets the internal communication to standard RS-232 protocol.
“2-wire RS485”	= Sets the internal communication to RS-485 protocol (Half duplex).
“4-wire RS485/422”	= Sets the internal communication to RS-485/422 protocol (Full duplex).
“Address RS”	= Set the global unique channel/port ID for the unit (0-15 available).

- Note: Default mode is “RS232” protocol.

A more detailed description of the SCOM (Serial 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.

OSD Misc

Allows you to customize the visual appearance of the On Screen Display (OSD) menu, such as; position, language, save, load and recall favourite settings and more. The contents of these submenus are listed below.

|---2--- OSD Misc - OSD Position

Settings as follows:

"OSD H.Position" = Place the OSD menu overlay Horizontally (left/right), values from 0 to 100.

"OSD V.Position" = Place the OSD menu overlay Vertically (up/down), values from 0 to 100.

● Note: Default position of the OSD menu overlay is in the lower left corner of the of the Active Display area. Default value for both functions is 100.

|---2--- OSD Misc - Language

Available OSD language to be used for all text and warnings that may appear.

Settings as follows:

"Norsk" = Display OSD in Norwegian.
"English" = Display OSD in English.
"Français" = Display OSD in French.
"Deutsch" = Display OSD in German.
"Italiano" = Display OSD in Italian.
"Español" = Display OSD in Spanish.
"日本語" = Display OSD in Japanese.
"簡體中文" = Display OSD in Simplified Chinese.

● Note: Default language is English.

|---2--- OSD Misc - Preset Save

Allow to work with Memory Presets (Recall/Save/Load) for OSD menu settings and overlays. The contents of the submenu is listed below.

Settings as follows:

"Recall" = Reset back to factory defaults. Will override and restore all previous modified settings.

|--------3--------

OSD Misc - Presets - Save *Available in “Full Mode” only

Allows to save current state of all function and values to user defined presets. The contents of the submenu is listed below.

Settings as follows:

“User 1” = Save all OSD settings to User 1 slot.

|--------3--------

OSD Misc - Presets - Load

Allows to save current state of all function and values to user defined presets. The contents of the submenu is listed below.

Settings as follows:

“User 1” = Load all OSD settings from User 1 slot.

|---2---

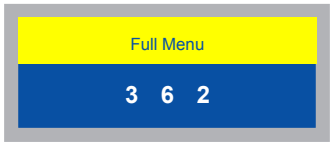
OSD Misc - OSD Mode *Available in “Full Mode” only

Configuring the OSD Mode to show as simplified/most common functions or advanced (full) setup. The change you do here will be stored in memory and stays as such even after powering off the unit.

Settings as follows:

“Simplified” = A few functions is not visible/available in this state. For most uses this is the preferred setting and are safe for the display functionality and continuous trusted operation on the unit.

“Full” = All functions and parameters is visible/available in this state. Some of the settings adjusted could impact on display functionality and image quality. Only experienced and qualified personnel should access and change parameters when in this mode. Also, more technical details about signals, frequency will be available. The layout of the OSD menu will also change to a slightly bigger window with more menus and functions available.



- Note: When requesting a “Full” mode from a Simplified mode, the user are required to enter a key code. This code is factory preset to “362”. You can enter the code by using navigation, (-) Brilliance (+) and “MENU” to confirm. After a successful entering of the key code, the OSD menu will always be in this state (even after power off). To revert back to “Simplified” mode, simply change it back and exit the OSD menu.

|---2--- **OSD Misc - OSD Lock Mode** ***Available in "Full Mode" only**

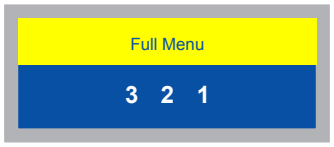
To prevent accidental or unwanted user intervention, you can set the behaviour of how the OSD menu is accessible by the user. Normally it is by factory default accessible by touching the MENU" symbol on the front glass of the unit.

Settings as follows:

"Normal Mode" = Default accessible pop-up by touching the "MENU" symbol. For Non-ECDIS Compliant usage.

"Password Protect" = Ask for key code first (321). Required for ECDIS Compliance.

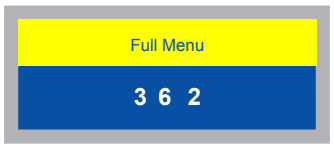
Example illustration of key code requester:



|---2--- **OSD Misc - Full Menu** ***Available in "Simplified Mode" only**

Configuring the OSD Mode to show as advanced (full) setup. All commands available for user during a one-time session. After the OSD disappeared (due to inactivity/timeout) the OSD menu will be reverted back to its initial state prior to the change.

Example illustration of key code requester:



- Note: When requesting a "Full" mode from a Simplified mode, the user are required to enter a key code. This code is factory preset to "362". You can enter the code by using navigation, (-) Brilliance (+) and "MENU" to confirm.

|---2--- **OSD Misc - Burn In** ***Factory / Internal Use only**

Sets the unit into "Burn In" mode and enables to write EDID data.
Only suitable for factory / Internal Use

|---2--- **OSD Settings - OSD Key Outdoor**

To prevent accidental activation of Glass Display Control™ (GDC) touch functions, you can add an extra layer of security on how “sensitve” the touch detection operates. This applies for “MENU”, “(-) Brilliance (+)” and “Power Off” functions. The OSD Key Outdoor function is especially effective if the unit is located in a outside environment where rain drops could potentionally trigger touch button functions. Note that this setting does not apply for fullscreen sized touch screen glasses.

Settings as follows:

“Off”	= All touch symbols operates normally.
“On”	= Touch symbols responds when you press and hold it for 5 seconds.

Service

Will show various technical and unit related information, such as; Firmware versions, Elapsed Time, Internal Temperature, Fault Status and activation for the internal Test Pattern image useful for trouble-shooting. Whenever you are in contact with helpdesk or service personnel, they might require you to read back some of these values in order to precisely pinpoint any problem/question you should have with the unit or its functionality.

Information blocks as follows:

“RAP Firmware Rev”	= Displays the firmware version of the RAP videocontroller. Example: “RAP120106R0V01”
“CYP Firmware Rev”	= Displays the firmware version of the touch enabled buttons. Example: “TBC120105R0V01”
“Operation Hours”	= Shows the time elapsed in hours since first-time power on. Example: “180 Hrs”
“Current Temperature”	= Shows the internal temperature measured by onchip sensor. Example: “+27 C”, in Celcius Degrees.

|---2---

Service - Fault Status

Will show detected Fault Staus by measuring various internal values during unit operation. Status is stated as either “OK” or “FAULT”.

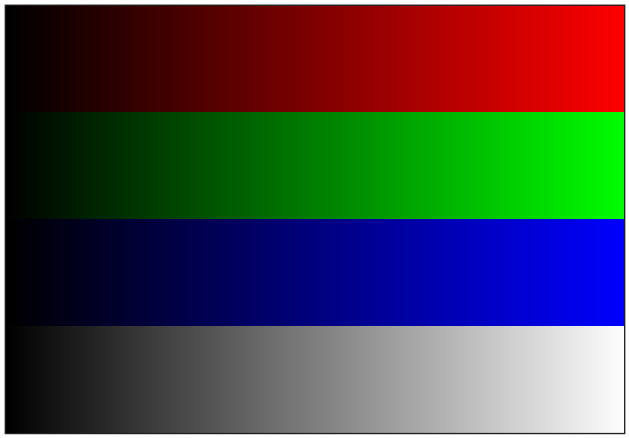
Fault Status as follows:

“NVRAM”	= Status for Non-volatile random-access memory, used to store parameters and settings.
“DDC”	= Status for TFT panel specifications (EDID data) and DDC (Display Data Channel). It is to make sure the TFT panel’s specifications can be detected succesfully by the display controller software. This can be used in trouble-shooting situations to determine that the display are not or are the reason for a faulty or undesirable operation. The problem may be from external equipment.
“TMP Sensor”	= Status for internal temperature measured by onchip sensor.

|---2--- Service - Test Pattern

Will show the internal test pattern with shading color boxes for Red, Green, Blue and Black/White (Grayscale) to check for deviations in the TFT panel/display controller behaviour. It is independent of any current resolution or specifications found in the signal inputs. The test pattern is generated internally in the display controller and is sent 1:1 directly to the TFT panel. It can be useful during trouble-shooting situations to determine the source of a display or connectivity problem regarding external equipment.

To active this function simply touch the “MENU” button.



- Note: This function will not inform/report any deviations directly, you need to have the required technical expertise to interpret the test pattern displayed.

Operation Advanced (DDC/CI)

Operation Advanced (DDC/CI) Control Overview

Introduction

DDC/CI (Display Data Channel/Command Interface) specifies a means for a computer to send commands to the unit's Display Video Controller to programatically adjust parameters of the display instead of pressing physical buttons or navigate through an OSD menu. Specific commands to control units are defined in a separate official Monitor Control Command Set (MCCS) industry standard. The signal inputs supported are VGA and DVI.

Hatteland Display's Series X - Industrial Standard Displays (STD) from 12 to 26 inch now support some of these commands (units with RAP Firmware RAP160205R0V01) and is gradually implemented in production from 13th of February 2017 and fully implemented for units delivered after 31st of March 2017.
Reference: http://www.hatteland-display.com/mails/02_2017_ecn.html

To determine if your unit has the DDC/CI commands supported as described in this chapter, please review the "On Screen Display (OSD) Menu" chapter (Service section) in this manual.

It is expected that the user have previous experience of the DDC/CI protocol and how to implement the commands in their own control applications. A suitable starting point for sending commands, are the GUI operated (or command line version) of softMCCS software, reference: http://www.entechtaiwan.com/lib/softmccs.shtm

The listed DDC/CI commands below are equivalent to the same functions available in the well implemented Hatteland Display Serial/Ethernet Communication Control Interface (SCOM) protocol, where specified, reference: "http://www.hatteland-display.com/pdf/manual/inb100018-4_technical_manual_serial_and_ethernet_communication_control_interface(scom)_seriesx.pdf"

The column "SCOM" is a reference and not part of the DDC/CI commands explained in the table below.

Syntax: [S] = Start Condition & [P] = Stop Condition (marked with gray color). Numbers in black/green/red colors are Byte Value in Hexadecimal.

Description	Syntax and Functionality	Details and Values	SCOM Equivalent
User Brightness Control (backlight) (0x10)	Set/Write Brightness value: [S] <6E:w> 51 84 03 10 00 xx FD [P] Reply of successfull request: [S] <6F:r> FD 80 BE*[P] Read Brightness value: [S] <6E:w> 51 82 01 10 AC [P] Reply of successfull request: [S] <6F:r> 6E 88 02 00 10 00 00 64 00 xx 95*[P]	10 = Command ID Where **xx** = 0 to 64 **Min-Max Range:** 0-100 (0x00-0x64) During Read reply, these values will be present. Read/Write support.	BRT
Glass Display Control™ (GDC) Brilliance Button (0xE2)	Set/Write Brilliance Value: [S] <6E:w> 51 84 03 E2 00 xx 68 [P] Reply of successfull request: [S] <6F:r> 68 80 BE*[P] Read Brilliance Value: [S] <6E:w> 51 82 01 E2 5E [P] Reply of successfull request: [S] <6F:r> 6E 88 02 00 E2 00 00 64 00 xx 00*[P]	E2 = Command ID Where **xx** = 0 to 64 **Min-Max Range:** 0-100 (0x00-0x64) During Read reply, these values will be present. Read/Write support.	BRU
Buzzer Control (0xE5)	Write/Turn ON: [S] <6E:w> 51 84 03 E5 00 01 5C [P] Reply of successfull request: [S] <6F:r> 5C 80 BE*[P] Write/Turn OFF: [S] <6E:w> 51 84 03 E5 00 00 5D [P] Reply of successfull Turn OFF request: [S] <6F:r> 5D 80 BE*[P]	E5 = Command ID Where **01** = Turn On Where **00** = Turn Off Write Support only.	BZZ

Color Mode: Kelvin Color Tempearture (0x14)	Set/Write Color Temperature: [S] <6E:w> 51 84 03 14 00 ww xx [P] Reply of successfull request: [S] <6F:r> xx 80 BE*[P] Read Color Temperature Value: [S] <6E:w> 51 82 01 14 A8 [P] Reply of successfull request: [S] <6F:r> 6E 88 02 00 14 00 00 0E 00 yy zz*[P]	14 = Command ID Where Write **ww xx** **05 A9** = 6500 **07 AB** = 8000 **08 A4** = 9300 Where Read **yy zz** **05 AB** = 6500 **07 A9** = 8000 **08 A6** = 9300 Read/Write support.	MCC: (Color Temperature Select)
Gamma Calibration (0x14)	Set/Write Calibration: [S] <6E:w> 51 84 03 14 00 ww xx [P] Reply of successfull request: [S] <6F:r> xx 80 BE*[P] Read Calibration: [S] <6E:w> 51 82 01 14 A8 [P] Reply of successfull request: [S] <6F:r> 6E 88 02 00 14 00 00 0E 00 yy zz*[P]	14 = Command ID Where Write **ww xx** **0C A0** = VGA **0D A1** = DVI Where Read **yy zz** **0C A2** = VGA **0D A3** = DVI Read/Write support.	MCC: (Gamma (Calibration))

This page left intentionally blank

Specifications

Specifications - HD 12T21 STD-xxx-Fxxx

TFT Technology:

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

TFT Characteristics:

- Native Resolution : 1024 x 768
- Pixel Pitch (RGB) : 0.24 (H) x 0.24 (V) mm
- Response Time : 35ms (typical), black to white
- Contrast Ratio : 700:1 (typical)
- Light Intensity : 600 cd/m² (typical)
- Viewable Angle : +/- 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

Synchronization:

- Digital separate synchronization
- Composite synchronization
- Synchronization on green
- Auto detects VGA -> XGA, interlaced and non interlaced
- Video Signal : Analog RGB 0,7Vp-p
  : Input Impedance 75 Ohm

Synchronization Range:

- Horizontal : 31,5 kHz to 91,1 kHz
- Vertical : 60 Hz* to 85 Hz

** Recommended for optimal picture quality*

Supported Signals:

Resolutions:

- VGA : 640 x 480 (including 640 x 350)
- SVGA : 800 x 600 (including 720 x 400)
- XGA : 1024 x 768*

** Recommended for optimal picture quality*

Power Specifications:

Multi-power Supply:

- 115&230VAC - 50/60Hz + 24 VDC - HD 12T21 STD-Mxx-Fxxx

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 : 60W (max) - 15W (typ)

Physical Considerations:

- W:314.00 [12.36"] x H:272.00 [10.71"] x D:64.50 [2.54"] mm [inch]
- 4 x M6 VESA mounting 280x150mm, Max 12mm deep
- Weight: 3.8kg / 8.4lbs

Signal Terminals:

- DVI-D Signal IN : 1 x 24p DVI (female)
- RGB Signal IN : 1 x 15p HD D-SUB (female)
- SCOM RS-422/485 : 1 x 5-pin Terminal Block 3.81, non-isolated+Buzzer
- SCOM RS-232 : 1 x 9p D-SUB (female) non-isolated+Buzzer
- If Touchscreen : 1 x USB TYPE B Connector (female)
- AC Power IN : 1 x Std IEC Inlet
- DC Power IN : 1 x 2-pin Terminal Block 5.08

User Controls:

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

- Power On/Off, On Screen Display Menu, Brightness Control (-/+)
- Mode/Status Indicator (Service)
- Buzzer (not visible), Light Sensor (not visible)

Environmental Considerations:

- Operating : Temperature -15 deg. C to +55 deg. C
  - Humidity up to 95%
- Storage : Temperature -20 deg. C to +60 deg. C
  - Humidity up to 95%
- IP Rating : Protection: IP66 front - IP22 rear (EN60529)

Lifetime Considerations:

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

Available Accessories:

- 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
- HD VED SX1-A1 : 1 x VESA Bracket, not EN60945 Tested
- HD REM SX1-A1 : 1 x External Remote Control, EN60945 Tested

Please see user manual/datasheet for more information

Factory Options:

- Projected Capacitive Touch Screen (Multitouch, USB interface)
- Optical Bonding Technology

Compass Safe Distance: HD 12T21 STD-xxx-Fxxx Standard: 125cm Steering: 75cm

APPROVALS & CERTIFICATES

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

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

Specifications - HD 15T21 STD-xxx-Fxxx

TFT Technology:

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

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

Synchronization:

- Digital separate synchronization
- Composite synchronization
- Synchronization on green
- Auto detects VGA -> XGA, interlaced and non interlaced
- Video Signal : Analog RGB 0,7Vp-p
  : Input Impedance 75 Ohm

Synchronization Range:

- Horizontal : 31.5 kHz to 91.1 kHz
- Vertical : 60 Hz* to 85 Hz

** Recommended for optimal picture quality*

Supported Signals:

Resolutions:

- VGA : 640 x 480 (including 640 x 350)
- SVGA : 800 x 600 (including 720 x 400)
- XGA : 1024 x 768*

** Recommended for optimal picture quality*

Power Specifications:

Multi-power Supply:

- 115&230VAC - 50/60Hz + 24 VDC - HD 15T21 STD-Mxx-Fxxx

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

Power Consumption:

- Operating AC/DC : 60 W (max) TBC

Physical Considerations:

- W:356.00 [14.02"] x H:307.00 [12.09"] x D:71.50 [2.81"] mm [inch]
- 4 x M6 VESA mounting 280x150mm, Max 12mm deep
- Weight: 4.8kg / 10.6lbs

Signal Terminals:

- DVI-D Signal IN : 1 x 24p DVI (female)
- RGB Signal IN : 1 x 15p HD D-SUB (female)
- SCOM RS-422/485 : 1 x 5-pin Terminal Block 3.81, non-isolated+Buzzer
- SCOM RS-232 : 1 x 9p D-SUB (female) non-isolated+Buzzer
- If Touchscreen : 1 x USB TYPE B Connector (female)
- AC Power IN : 1 x Std IEC Inlet
- DC Power IN : 1 x 2-pin Terminal Block 5.08

User Controls:

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

- Power On/Off, On Screen Display Menu, Brightness Control (-/+)
- Mode/Status Indicator (Service)
- Buzzer (not visible), Light Sensor (not visible)

Environmental Considerations:

- Operating : Temperature -15 deg. C to +55 deg. C
  - Humidity up to 95%
- Storage : Temperature -20 deg. C to +60 deg. C
  - Humidity up to 95%
- IP Rating : Protection: IP66 front - IP22 rear (EN60529)

Lifetime Considerations:

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

Available Accessories:

- 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
- 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 REM SX1-A1 : 1 x External Remote Control, EN60945 Tested
- HD 15COV SX1-A1 : 1 x UV Sun Cover

Please see user manual/datasheet for more information

Factory Options:

- Projected Capacitive Touch Screen (Multitouch, USB interface)
- Optical Bonding Technology

Compass Safe Distance: HD 15T21 STD-xxx-Fxxx Standard: 55cm Steering: 40cm

APPROVALS & CERTIFICATES

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

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

Specifications - HD 17T21 STD-xxx-Fxxx

TFT Technology:

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

TFT Characteristics:

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

Synchronization:

- Digital separate synchronization
- Composite synchronization
- Synchronization on green
- Auto detects VGA -> SXGA, interlaced and non interlaced
- Video Signal : Analog RGB 0,7Vp-p
  : Input Impedance 75 Ohm

Synchronization Range:

- Horizontal : 31.5 kHz to 91.1 kHz
- Vertical : 60 Hz* to 85 Hz

** Recommended for optimal picture quality*

Supported Signals:

Resolutions:

- VGA : 640 x 480 (including 640 x 350)
- SVGA : 800 x 600 (including 720 x 400)
- XGA : 1024 x 768
- SXGA : 1280 x 1024*

** Recommended for optimal picture quality*

Power Specifications:

Multi-power Supply:

- 115&230VAC - 50/60Hz + 24 VDC - HD 17T21 STD-Mxx-Fxxx

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 : 22W (typ) - 60W (max)

Physical Considerations:

- W:390.00 [15.35"] x H:351.00 [13.82"] x D:73.50 [2.89"] mm [inch]
- 4 x M6 VESA mounting 280x150mm, Max 12mm deep
- Weight: 5.8kg / 12.8lbs

Signal Terminals:

- DVI-D Signal IN : 1 x 24p DVI (female)
- RGB Signal IN : 1 x 15p HD D-SUB (female)
- SCOM RS-422/485 : 1 x 5-pin Terminal Block 3.81, non-isolated+Buzzer
- SCOM RS-232 : 1 x 9p D-SUB (female) non-isolated+Buzzer
- If Touchscreen : 1 x USB TYPE B Connector (female)
- AC Power IN : 1 x Std IEC Inlet
- DC Power IN : 1 x 2-pin Terminal Block 5.08

User Controls:

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

- Power On/Off, On Screen Display Menu, Brightness Control (-/+)
- Mode Status Indicators (ECDIS, Service)
- Buzzer (not visible), Light Sensor (not visible)

Environmental Considerations:

- Operating : Temperature -15 deg. C to +55 deg. C
  - Humidity up to 95%
- Storage : Temperature -20 deg. C to +60 deg. C
  - Humidity up to 95%
- IP Rating : Protection: IP66 front - IP22 rear (EN60529)

Lifetime Considerations:

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

Available Accessories:

- 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
- HD VED SX1-A1 : 1 x VESA Bracket, not EN60945 Tested
- HD REM SX1-A1 : 1 x External Remote Control, EN60945 Tested
- HD 17COV SX1-A1 : 1 x UV Sun Cover

Please see user manual/datasheet for more information

Factory Options:

- Projected Capacitive Touch Screen (Multitouch, USB interface)
- Optical Bonding Technology
- Color Calibrated models (ECDIS)

Compass Safe Distance: HD 17T21 STD-xxx-Fxxx Standard: 80cm Steering: 50cm

APPROVALS & CERTIFICATES

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

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

Specifications - HD 19T21 STD-xxx-Fxxx

TFT Technology:

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

Synchronization:

- Digital separate synchronization
- Composite synchronization
- Synchronization on green
- Auto detects VGA -> SXGA, interlaced and non interlaced
- Video Signal : Analog RGB 0,7Vp-p
  : Input Impedance 75 Ohm

Synchronization Range:

- Horizontal : 31.5 kHz to 91.1 kHz
- Vertical : 60 Hz* to 85 Hz

** Recommended for optimal picture quality*

Supported Signals:

Resolutions:

- VGA : 640 x 480 (including 640 x 350)
- SVGA : 800 x 600 (including 720 x 400)
- XGA : 1024 x 768
- SXGA : 1280 x 1024*

** Recommended for optimal picture quality*

Power Specifications:

Multi-power Supply:

- 100&230VAC - 50/60Hz + 24 VDC - HD 19T21 STD-Mxx-Fxxx

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 Standard : 33W (typ) - 125W (max)

Physical Considerations:

- W:429.00 [16.89"] x H:382.00 [15.04"] x D:74.50 [2.93"] mm [inch]
- 4 x M6 VESA mounting 280x150mm, Max 12mm deep
- Weight: 7.8kg / 17.2lbs

Signal Terminals:

- DVI-D Signal IN : 1 x 24p DVI (female)
- RGB Signal IN : 1 x 15p HD D-SUB (female)
- SCOM RS-422/485 : 1 x 5-pin Terminal Block 3.81, non-isolated+Buzzer
- SCOM RS-232 : 1 x 9p D-SUB (female) non-isolated+Buzzer
- If Touchscreen : 1 x USB TYPE B Connector (female)
- AC Power IN : 1 x Std IEC Inlet
- DC Power IN : 1 x 2-pin Terminal Block 5.08

User Controls:

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

- Power On/Off, On Screen Display Menu, Brightness Control (-/+)
- Mode Status Indicators (ECDIS, Service)
- Buzzer (not visible), Light Sensor (not visible)

Environmental Considerations:

- Operating : Temperature -15 deg. C to +55 deg. C
  - Humidity up to 95%
- Storage : Temperature -20 deg. C to +60 deg. C
  - Humidity up to 95%
- IP Rating : Protection: IP66 front - IP22 rear (EN60529)

Lifetime Considerations:

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

Available Accessories:

- 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
- 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 REM SX1-A1 : 1 x External Remote Control, EN60945 Tested
- HD 19COV SX1-A1 : 1 x UV Sun Cover

Please see user manual/datasheet for more information

Factory Options:

- Projected Capacitive Touch Screen (Multitouch, USB interface)
- Optical Bonding Technology
- Color Calibrated models (ECDIS)

Compass Safe Distance: HD 19T21 STD-xxx-Fxxx Standard: 125cm Steering: 75cm

APPROVALS & CERTIFICATES

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

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

Specifications - HD 24T21 STD-xxx-Fxxx

TFT Technology:

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

TFT Characteristics:

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

Synchronization:

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

Synchronization Range:

- Horizontal : 31.5 kHz to 91.1 kHz
- Vertical : 60 Hz* to 85 Hz

** Recommended for optimal picture quality*

Supported Signals:

Resolutions:

- VGA : 640 x 480 (including 640 x 350)
- SVGA : 800 x 600 (including 720 x 400)
- XGA : 1024 x 768
- SXGA : 1280 x 1024
- UXGA : 1600 x 1200
- FHD : 1920 x 1080*
- WUXGA : 1920 x 1200

** Recommended for optimal picture quality*

Power Specifications:

Multi-power Supply:

- 115&230VAC - 50/60Hz + 24 VDC - HD 24T21 STD-Mxx-Fxxx

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: 40W (typ) - 125W (max)

Physical Considerations:

- W:593.00 [23.35"] x H:384.00 [15.12"] x D:70.00 [2.76"] mm [inch]
- 4 x M6 VESA mounting 280x150mm, Max 12mm deep
- Weight: 10.1kg / 22.2lbs

Signal Terminals:

- DVI-D Signal IN : 1 x 24p DVI (female)
- RGB Signal IN : 1 x 15p HD D-SUB (female)
- SCOM RS-422/485 : 1 x 5-pin Terminal Block 3.81, non-isolated+Buzzer
- SCOM RS-232 : 1 x 9p D-SUB (female) non-isolated+Buzzer
- If Touchscreen : 1 x USB TYPE B Connector (female)
- AC Power IN : 1 x Std IEC Inlet
- DC Power IN : 1 x 2-pin Terminal Block 5.08

User Controls:

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

- Power On/Off, On Screen Display Menu, Brightness Control (-/+)
- Mode Status Indicators (ECDIS, Service)
- Buzzer (not visible), Light Sensor (not visible)

Environmental Considerations:

- Operating : Temperature -15 deg. C to +55 deg. C
  Humidity up to 95%
- Storage : Temperature -20 deg. C to +60 deg. C
  Humidity up to 95%
- IP Rating : Protection: IP66 front – IP22 rear (EN60529)

Lifetime Considerations:

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

Available Accessories:

- HD CMB SX1-B1 : 1 x Console Mount Kit. EN60945 Tested
- HD TMB SX1-C1 : 1 x Table Mount Bracket. EN60945 Tested
- HD VED SX1-A1 : 1 x VESA Bracket, not EN60945 Tested
- HD REM SX1-A1 : 1 x External Remote Control, EN60945 Tested
- HD 24COV SX1-A1 : 1 x UV Sun Cover

Please see user manual/datasheet for more information

Factory Options:

- Projected Capacitive Touch Screen (Multitouch, USB interface)
- Optical Bonding Technology
- Color Calibrated models (ECDIS)

Compass Safe Distance: HD 24T21 STD-xxx-Fxxx Standard: 125cm Steering: 75cm

APPROVALS & CERTIFICATES

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

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

Specifications - HD 26T21 STD-xxx-Fxxx (LED/CCFL version)

TFT Technology:

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

TFT Characteristics:

- Native Resolution : 1920 x 1200
- Pixel Pitch (RGB) : 0.2865 (H) x 0.2865 (V) mm
- Response Time : 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

Synchronization:

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

Synchronization Range:

- Horizontal : 31.5 kHz to 91.1 kHz
- Vertical : 60 Hz* to 85 Hz

** Recommended for optimal picture quality*

Supported Signals:

Resolutions:

- VGA : 640 x 480 (including 640 x 350)
- SVGA : 800 x 600 (including 720 x 400)
- XGA : 1024 x 768
- SXGA : 1280 x 1024
- UXGA : 1600 x 1200
- FHD : 1920 x 1080
- WUXGA : 1920 x 1200*

** Recommended for optimal picture quality*

Power Specifications:

Multi-power Supply:

- 115&230VAC - 50/60Hz + 24 VDC - HD 26T21 STD-Mxx-Fxxx

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: 51W (max)

Physical Considerations:

- W:621.00 [24.45"] x H:435.00 [17.13"] x D:98.20 [3.86"] mm [inch]
- 4 x M6 VESA mounting 280x150mm, Max 12mm deep
- Weight: 15.9kg / 35.0lbs

Signal Terminals:

- DVI-D Signal IN : 1 x 24p DVI (female)
- RGB Signal IN : 1 x 15p HD D-SUB (female)
- SCOM RS-422/485 : 1 x 5-pin Terminal Block 3.81, non-isolated+Buzzer
- SCOM RS-232 : 1 x 9p D-SUB (female) non-isolated+Buzzer
- If Touchscreen : 1 x USB TYPE B Connector (female)
- AC Power IN : 1 x Std IEC Inlet
- DC Power IN : 1 x 2-pin Terminal Block 5.08

User Controls:

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

- Power On/Off, On Screen Display Menu, Brightness Control (-/+)
- Mode Status Indicators (ECDIS, Service)
- Buzzer (not visible), Light Sensor (not visible)

Environmental Considerations:

- Operating : Temperature -15 deg. C to +55 deg. C
  - Humidity up to 95%
- Storage : Temperature -20 deg. C to +60 deg. C
  - Humidity up to 95%
- IP Rating : Protection: IP66 front – IP22 rear (EN60529)

Lifetime Considerations:

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

Available Accessories:

- HD CMB SX1-C1 : 1 x Console Mount Kit. EN60945 Tested
- HD TMB SX1-C1 : 1 x Table Mount Bracket. EN60945 Tested
- HD VED SX1-A1 : 1 x VESA Bracket, not EN60945 Tested
- HD REM SX1-A1 : 1 x External Remote Control, EN60945 Tested

Please see user manual/datasheet for more information

Factory Options:

- Projected Capacitive Touch Screen (Multitouch, USB interface)
- Optical Bonding Technology
- Color Calibrated models (ECDIS)
- Single AC Power 115&230VAC - 50/60Hz Input

Compass Safe Distance: HD 26T21 STD-xxx-Fxxx Standard: 125cm Steering: 80cm

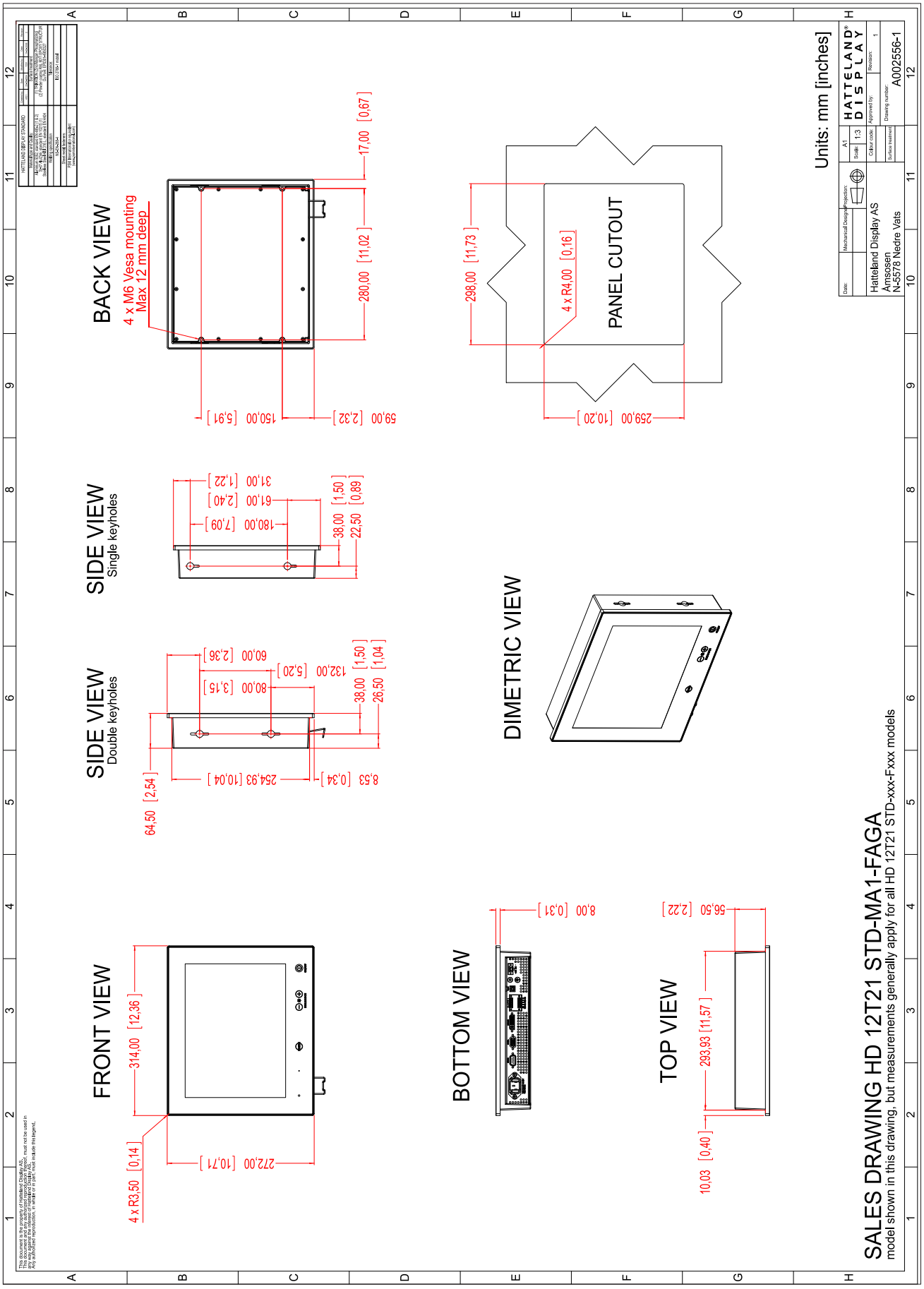
APPROVALS & CERTIFICATES

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

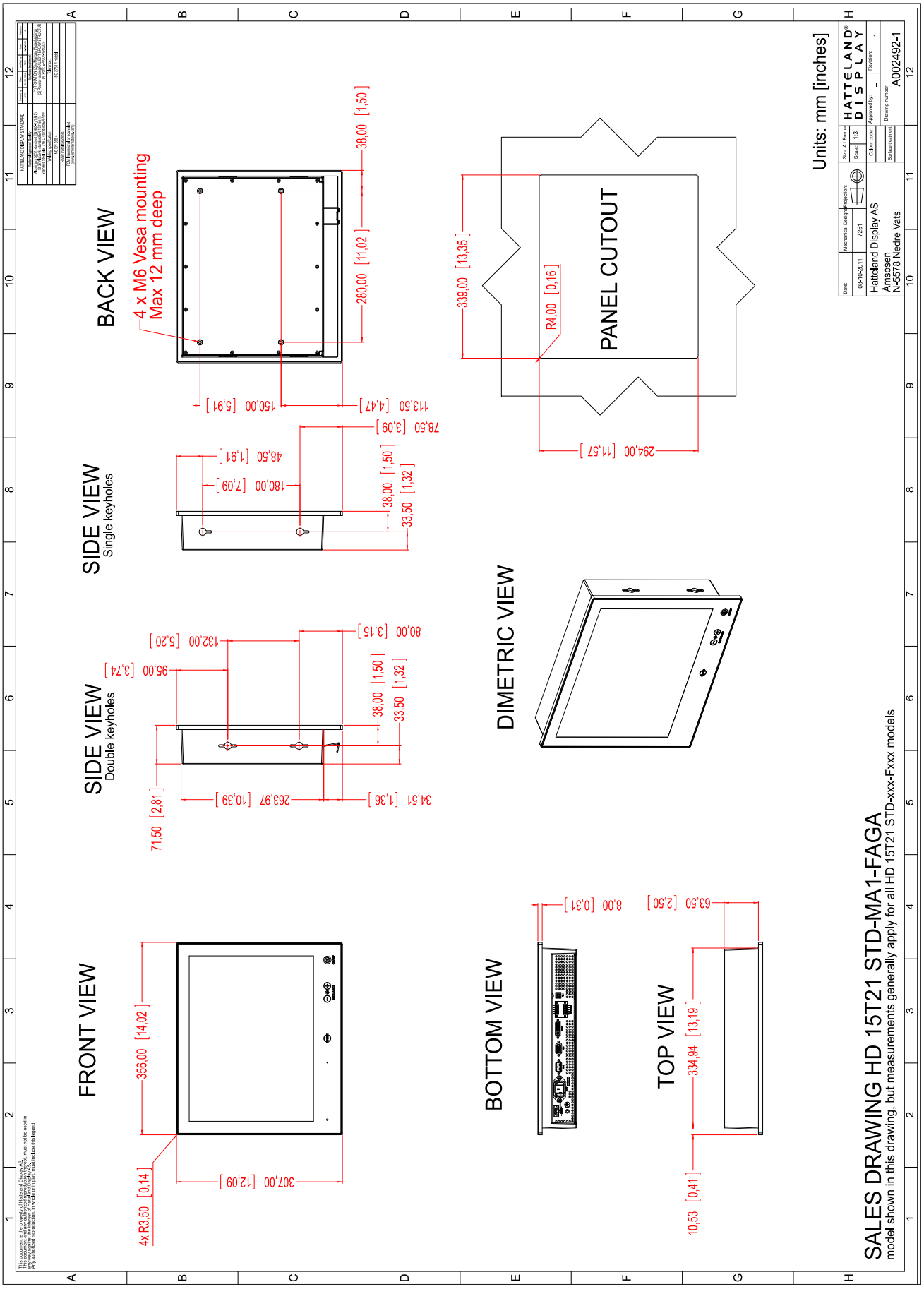
IEC 60945 4th (EN 60945:2002)
GL - Germanischer Lloyd
CCS - China Classification Societ
EU RO MR - Mutual Recognition
IACS E10
DNV - Det Norske Veritas
BV - Bureau Veritas
ClassNK - Nippon Kaiji Kyokai
ABS - American Bureau of Shipping
LRS - Lloyd's Register of Shipping

This page left intentionally blank

Technical Drawings

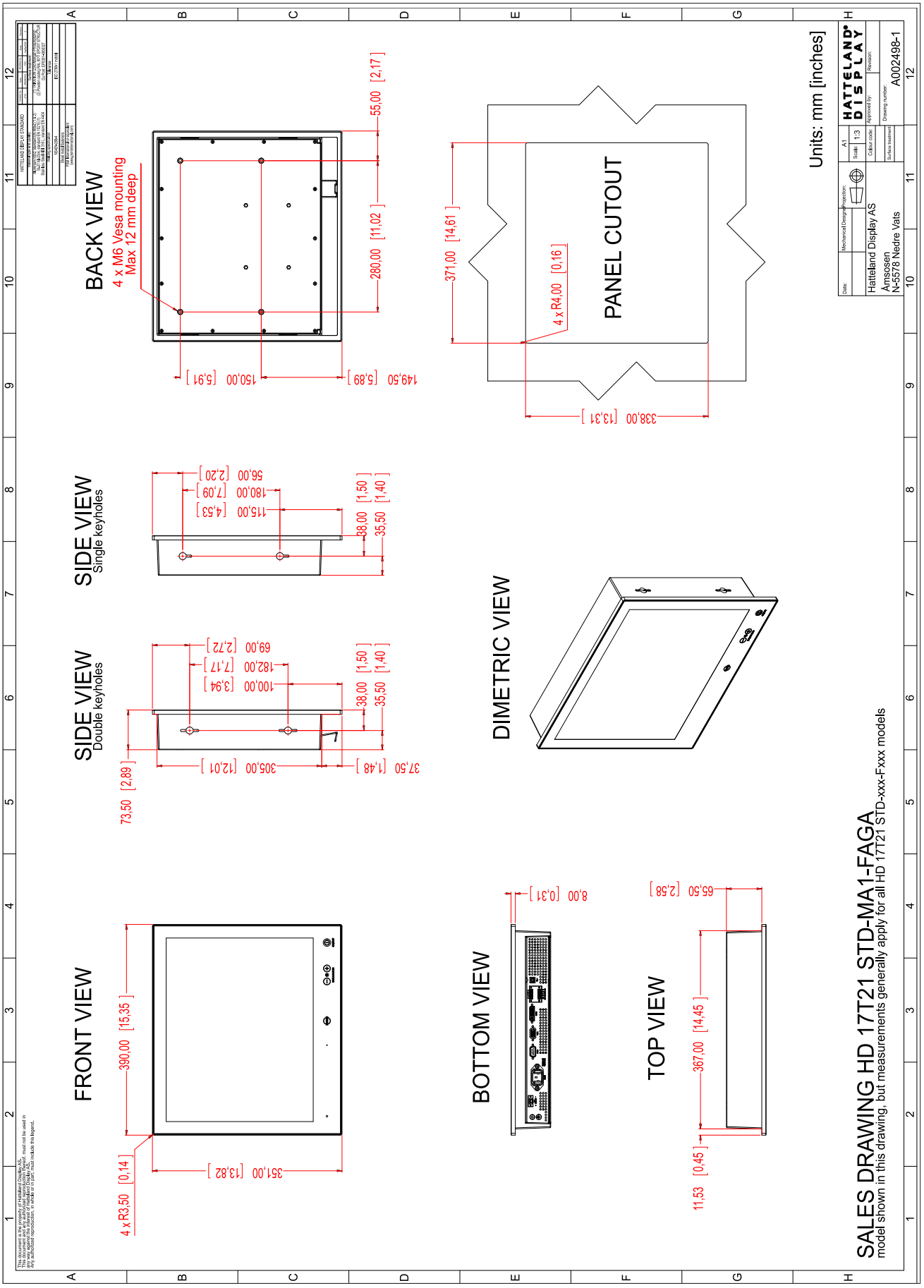


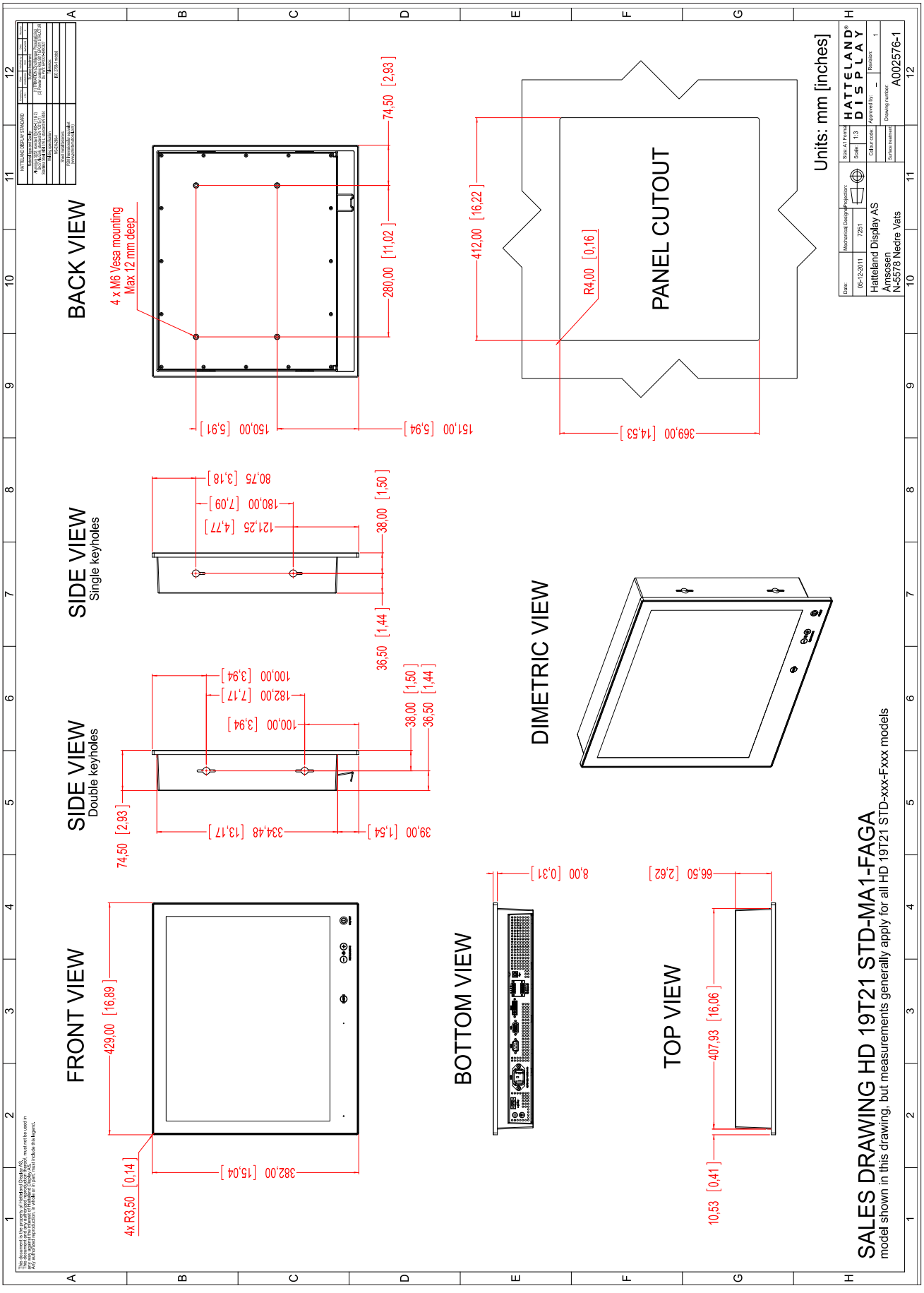
Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.



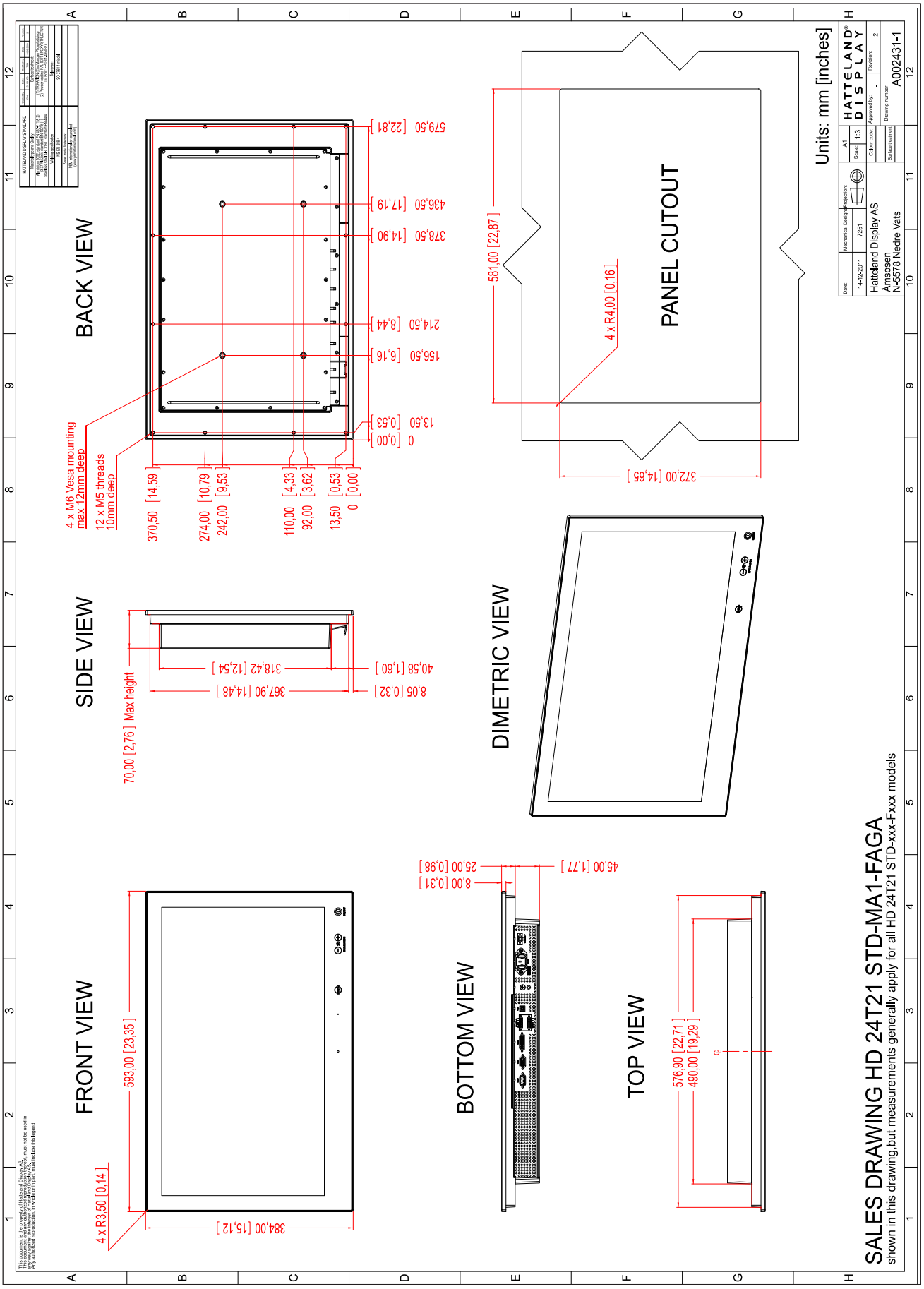
Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.

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.



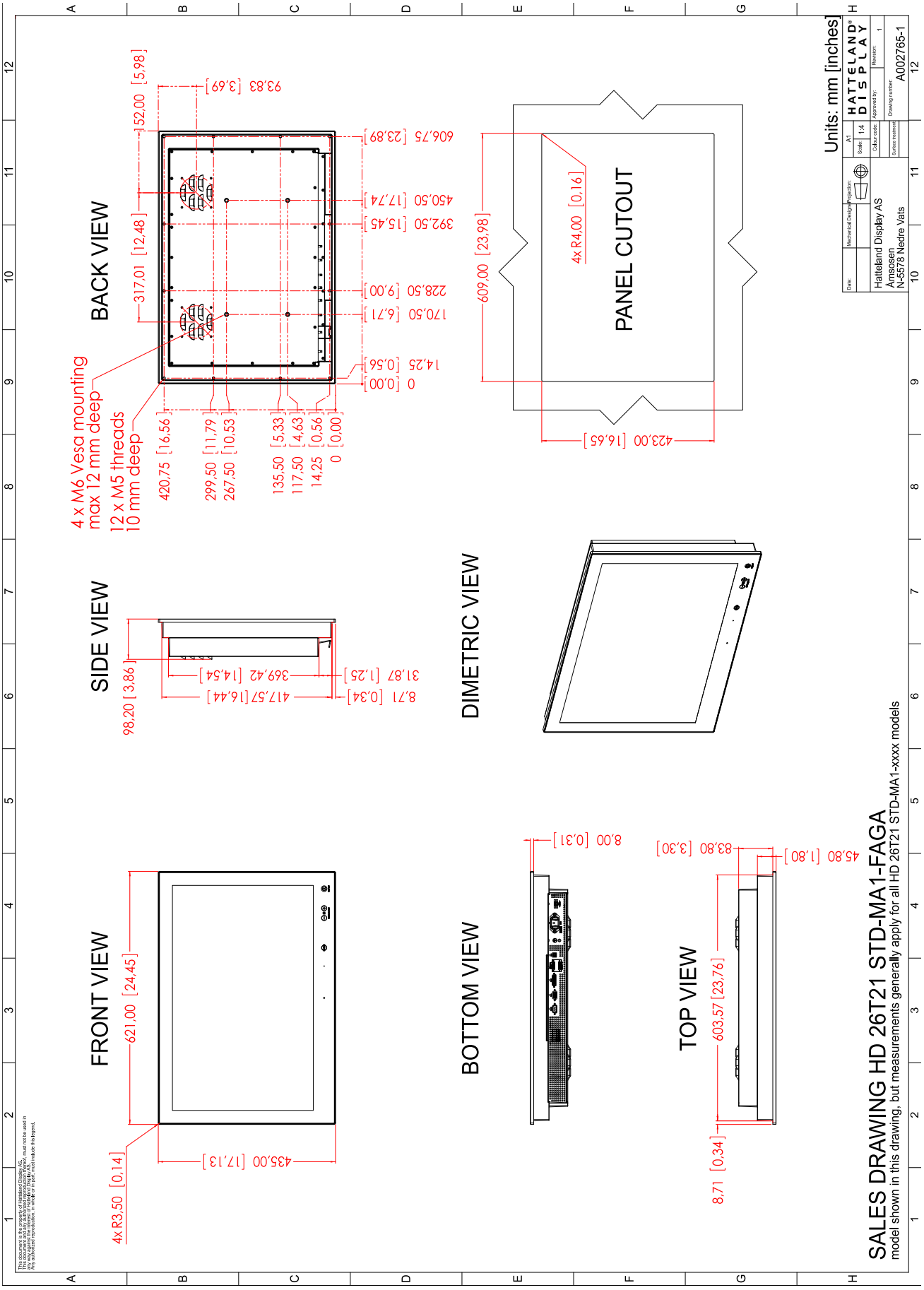


Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.



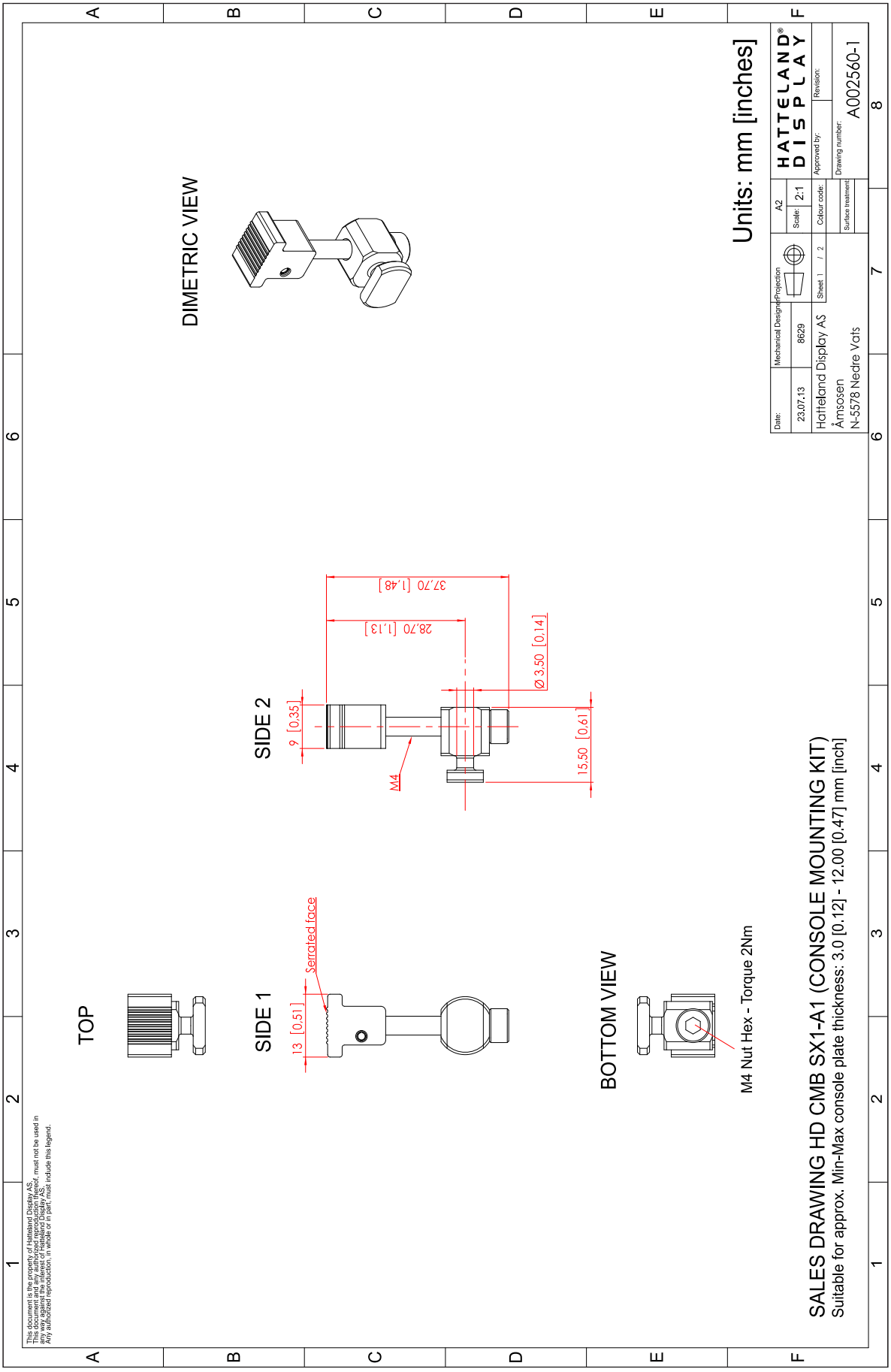
Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.

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.



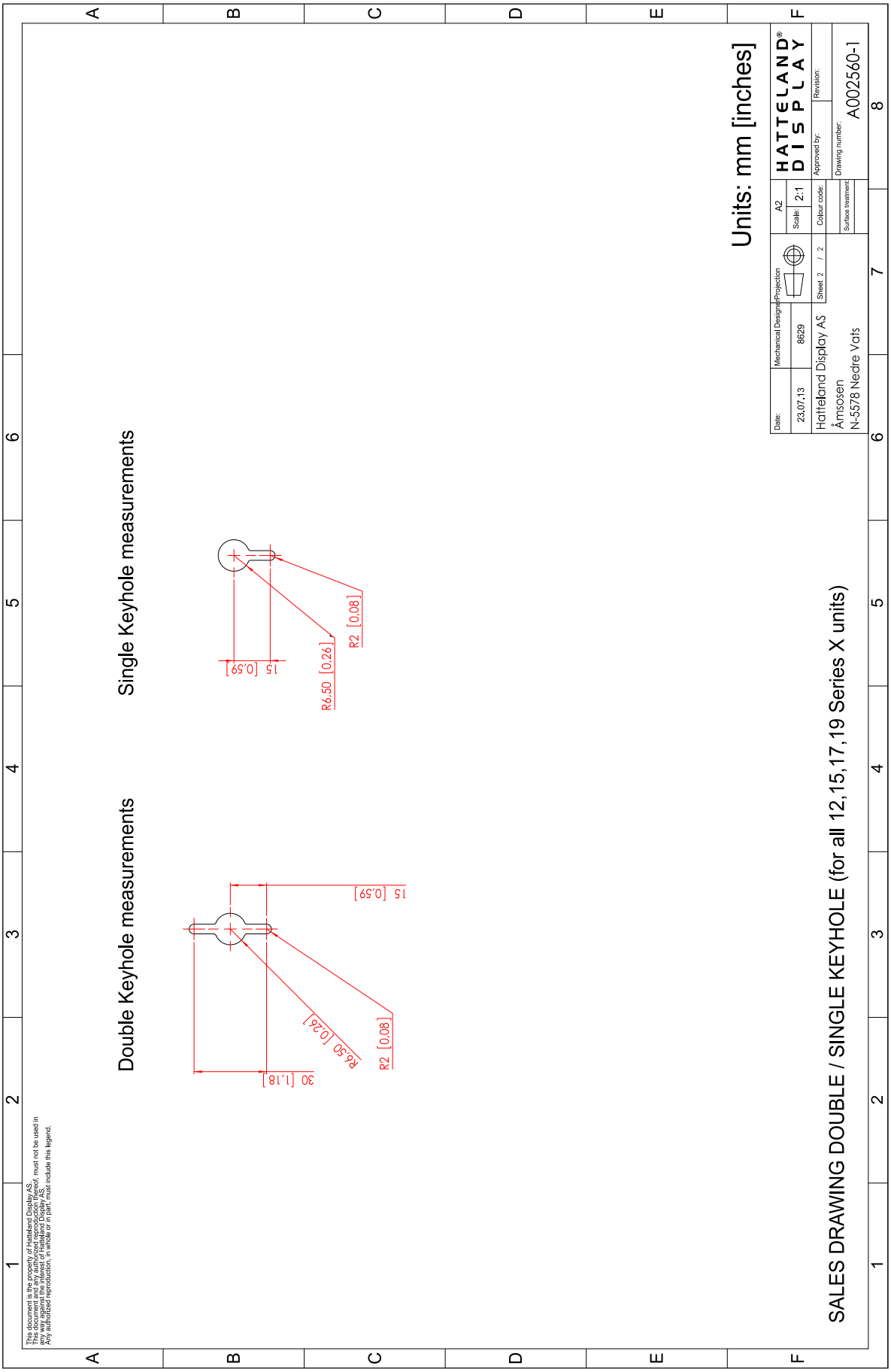
This page left intentionally blank

Technical Drawings - Accessories



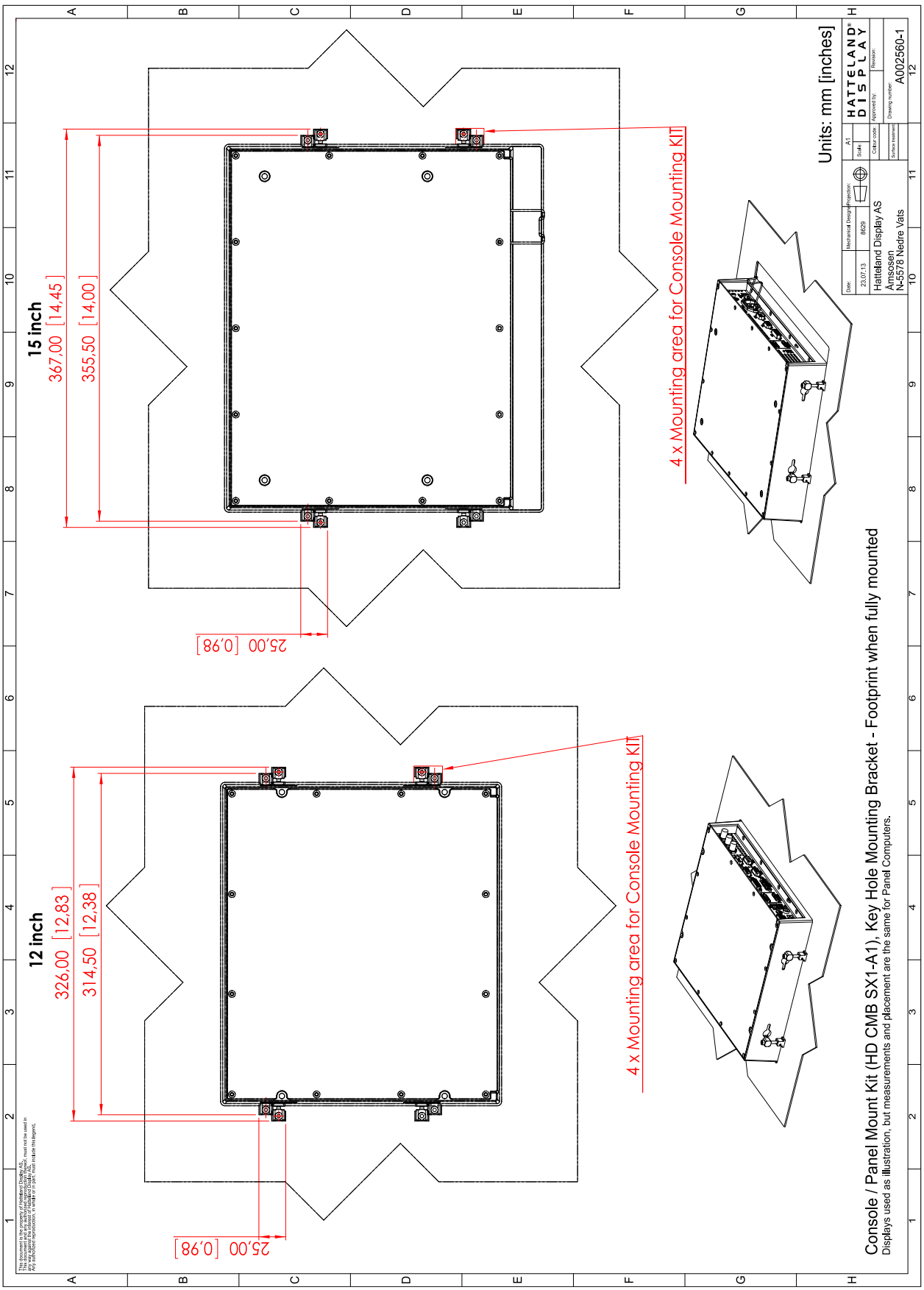
Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.

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.



Technical Drawings - HD CMB SX1-A1 (for Double Key Hole)

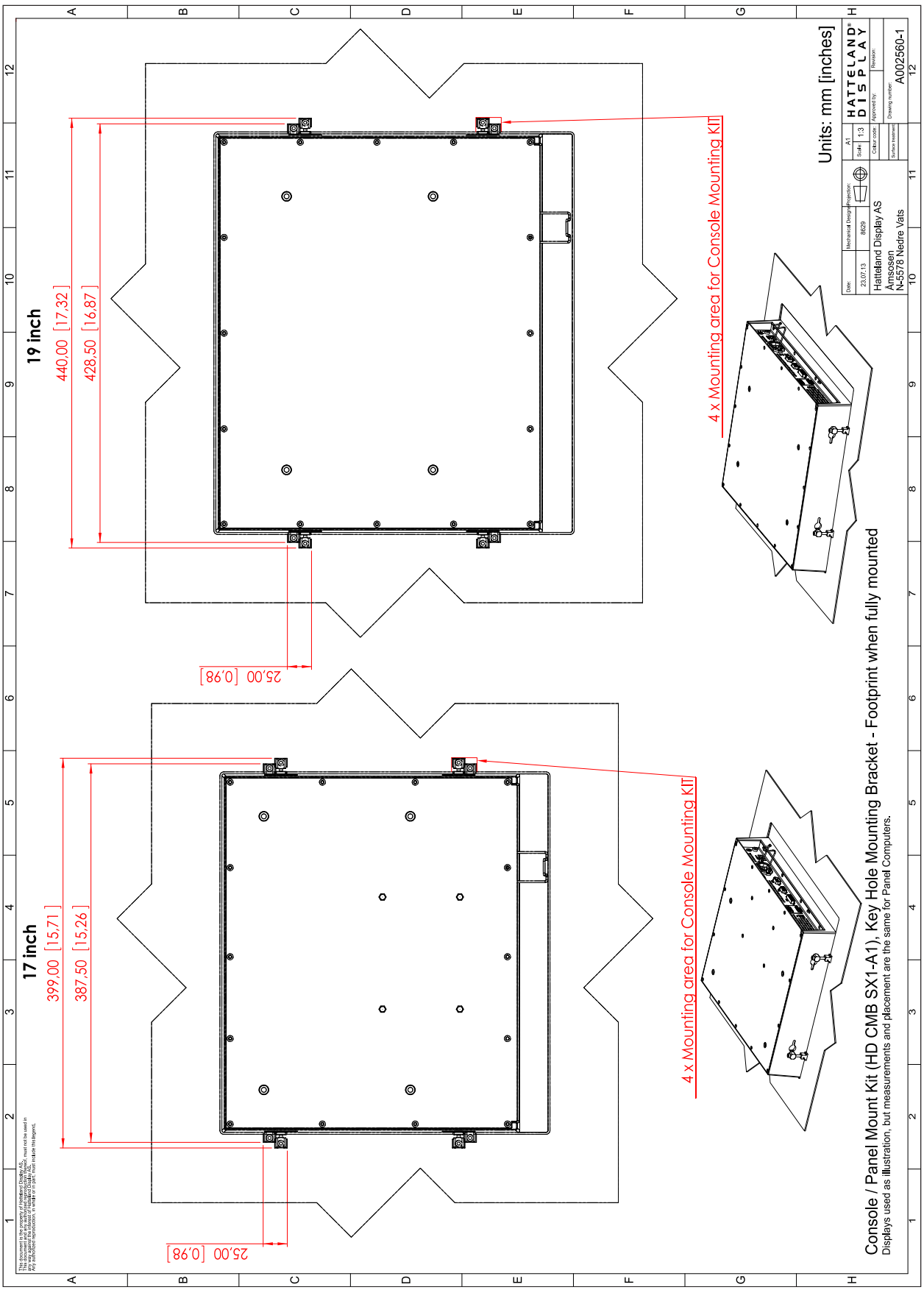
Drawing shows the occupied measurements when brackets are fully mounted.



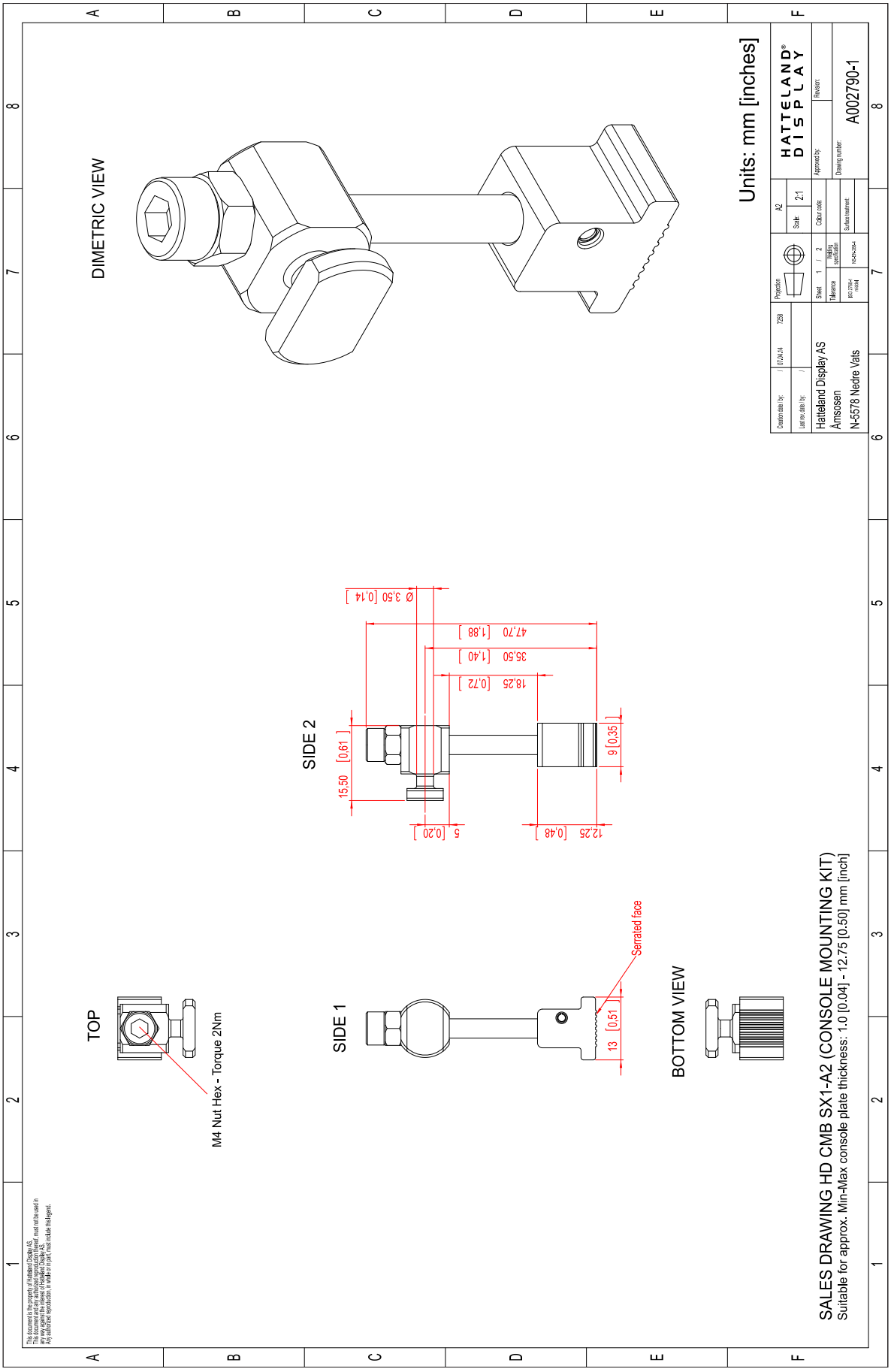
Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.

Technical Drawings - HD CMB SX1-A1 (for Double Key Hole)

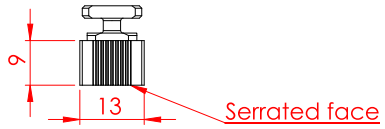
Drawing shows the occupied measurements when brackets are fully mounted.

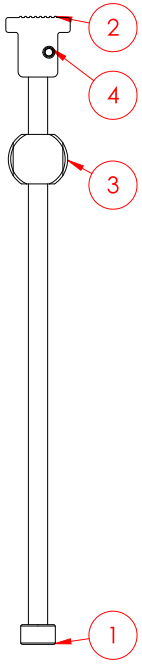


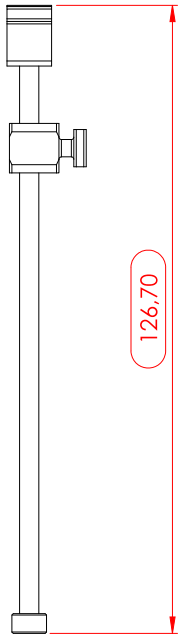
Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.



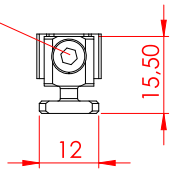
Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.







M4 Nut Hex - Torque 2Nm



Units: mm

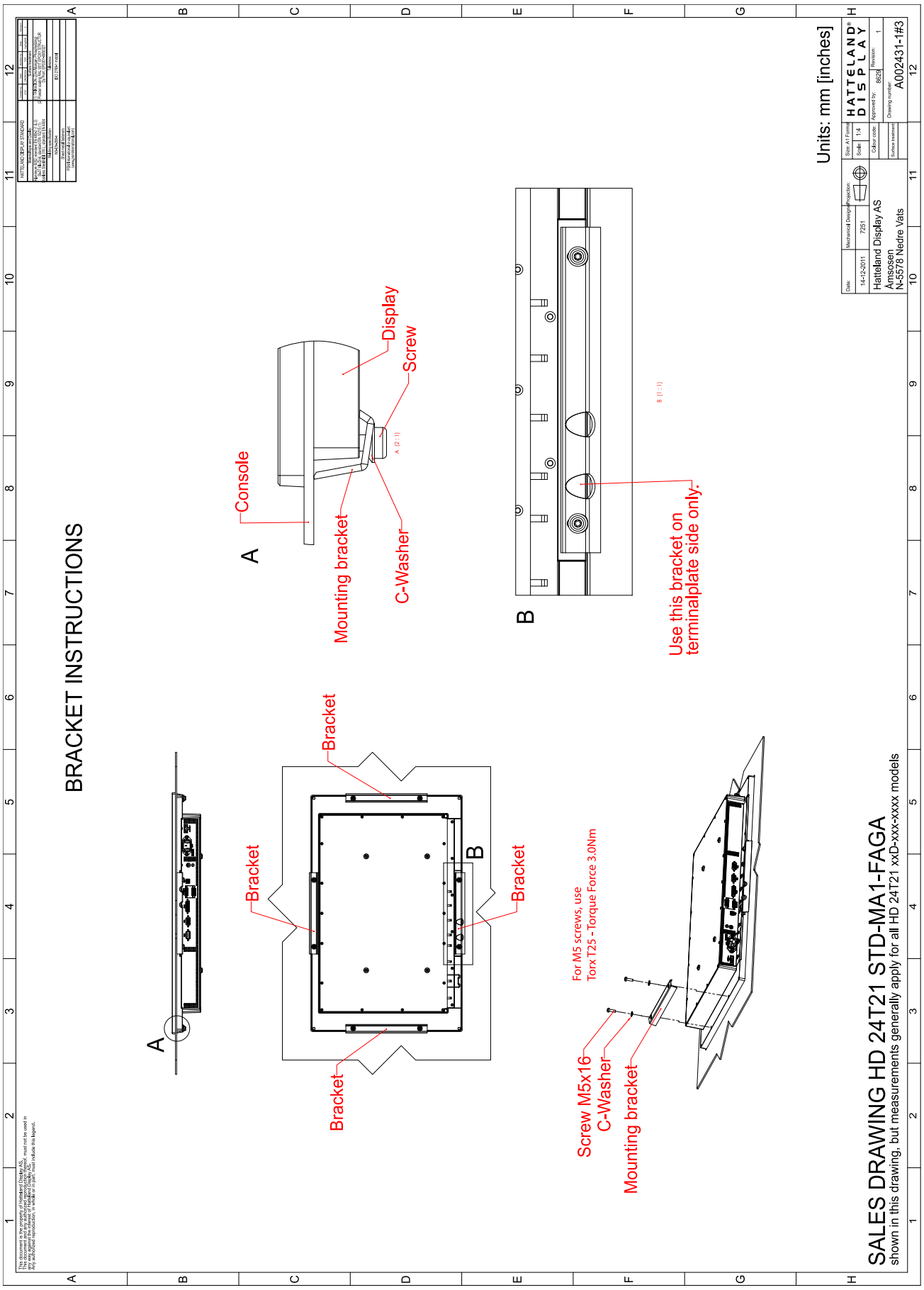
ItemNo	Quantity	Description	ID	Revision	Material
1	1	M4x120 Unbrako	P016129	01	
2	1	Bracket	P006569-1	03	
3	1	PRT0004	P006875-1	02	
4	1	SPLIT_PIN_2_8	P006883-1	01	

SALES DRAWING HD CMB SX1-A3 (CONSOLE MOUNTING KIT)

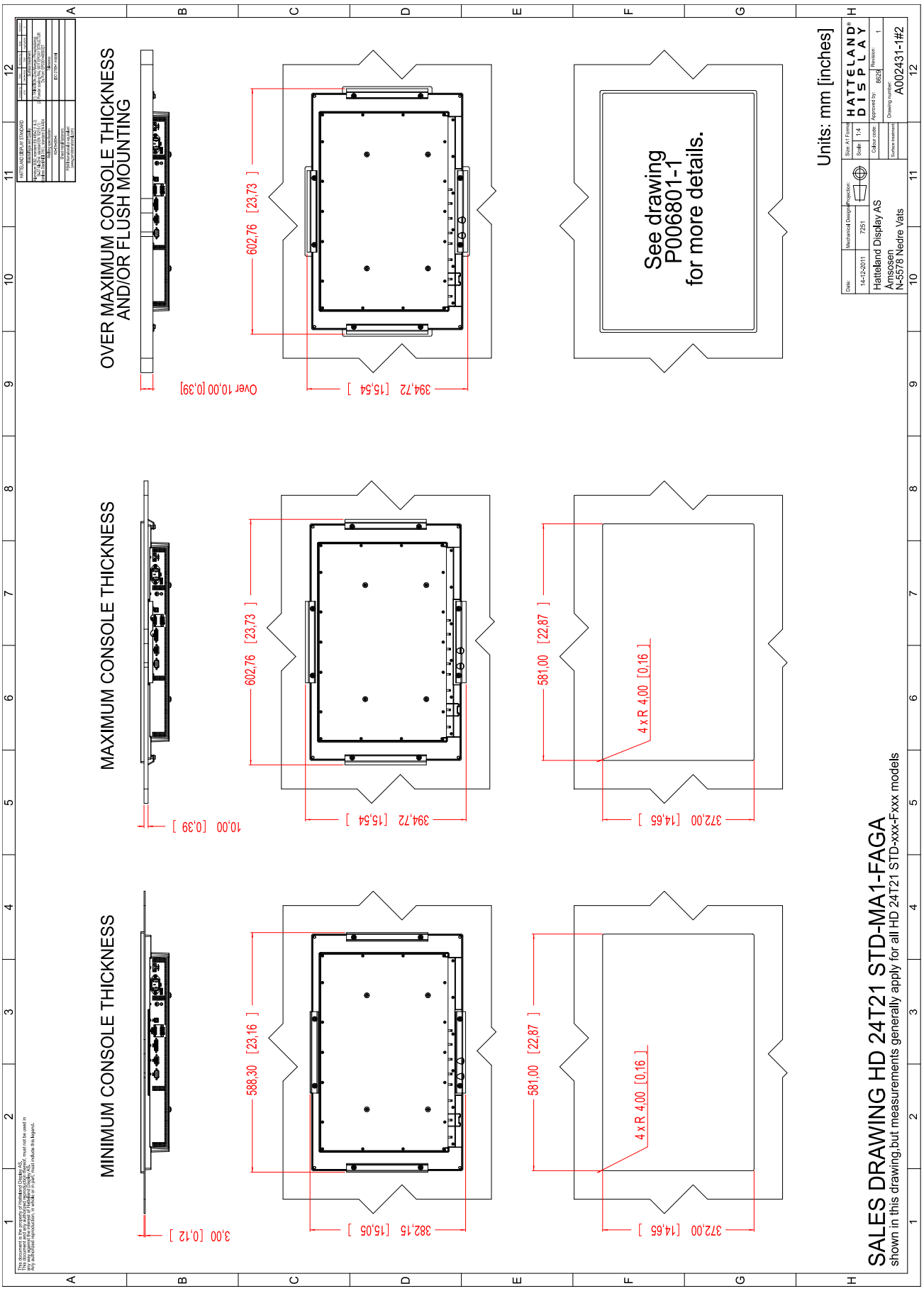
Suitable for approx. Min-Max console plate thickness: 1.0 [0.04] - 12.75 [0.50] mm [inch]
Features long screws for easier installation in tight spaces.

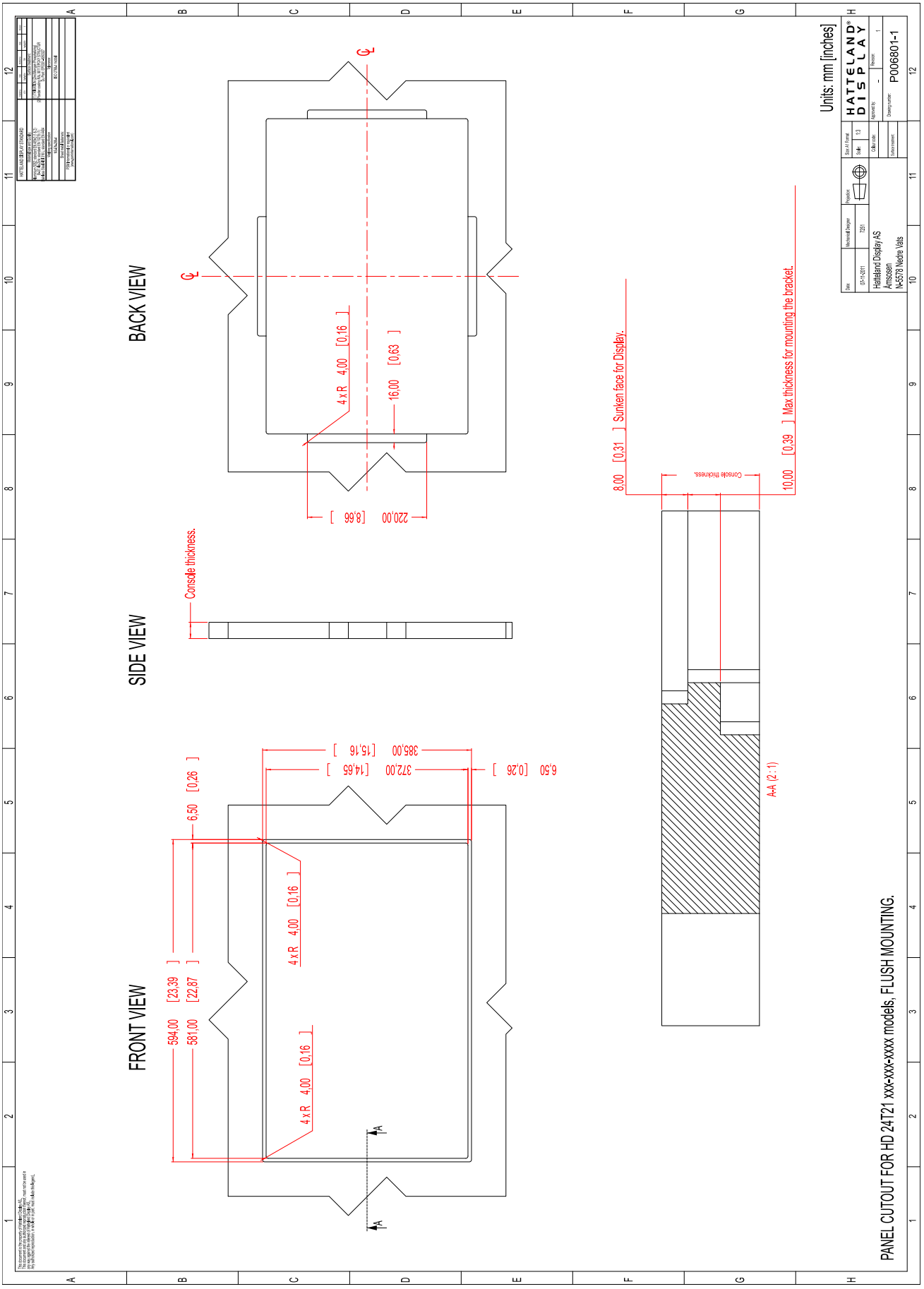
Creation date / by:	14.10.14 7258	Projection:	Drawing size: A3	HATTELAND® DISPLAY	
Last rev. date / by:	/		Scale: 1:1		
Hatteland Display AS Åmsosen N-5578 Nedre Vats		Sheet 1 of 1 Tolerance / Welding specification ISO 2768-1 middel / NS-EN-288-4	Colour code: Surface treatment:	Approved by:	Revision: 01
				Drawing number: A008649	

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.

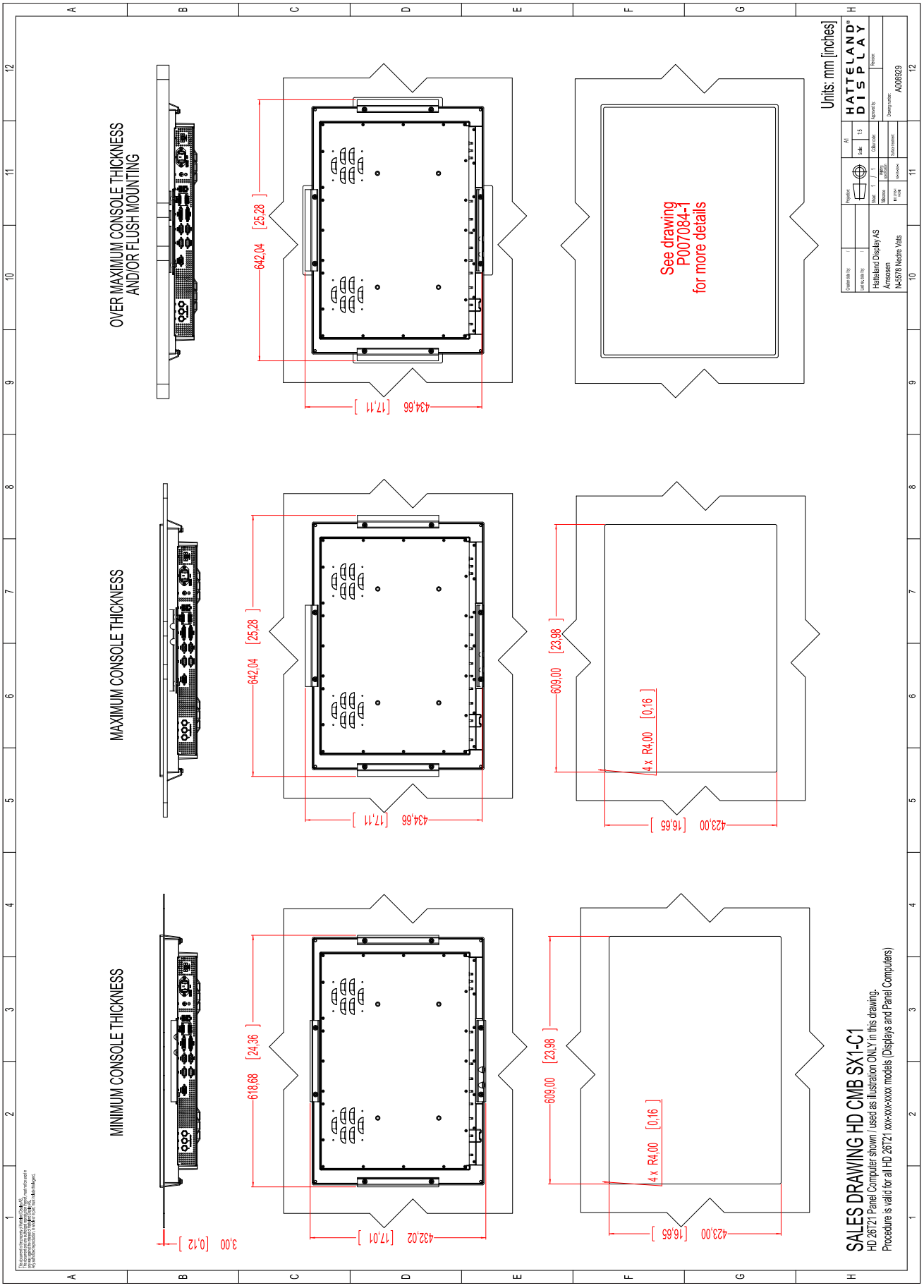


Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.



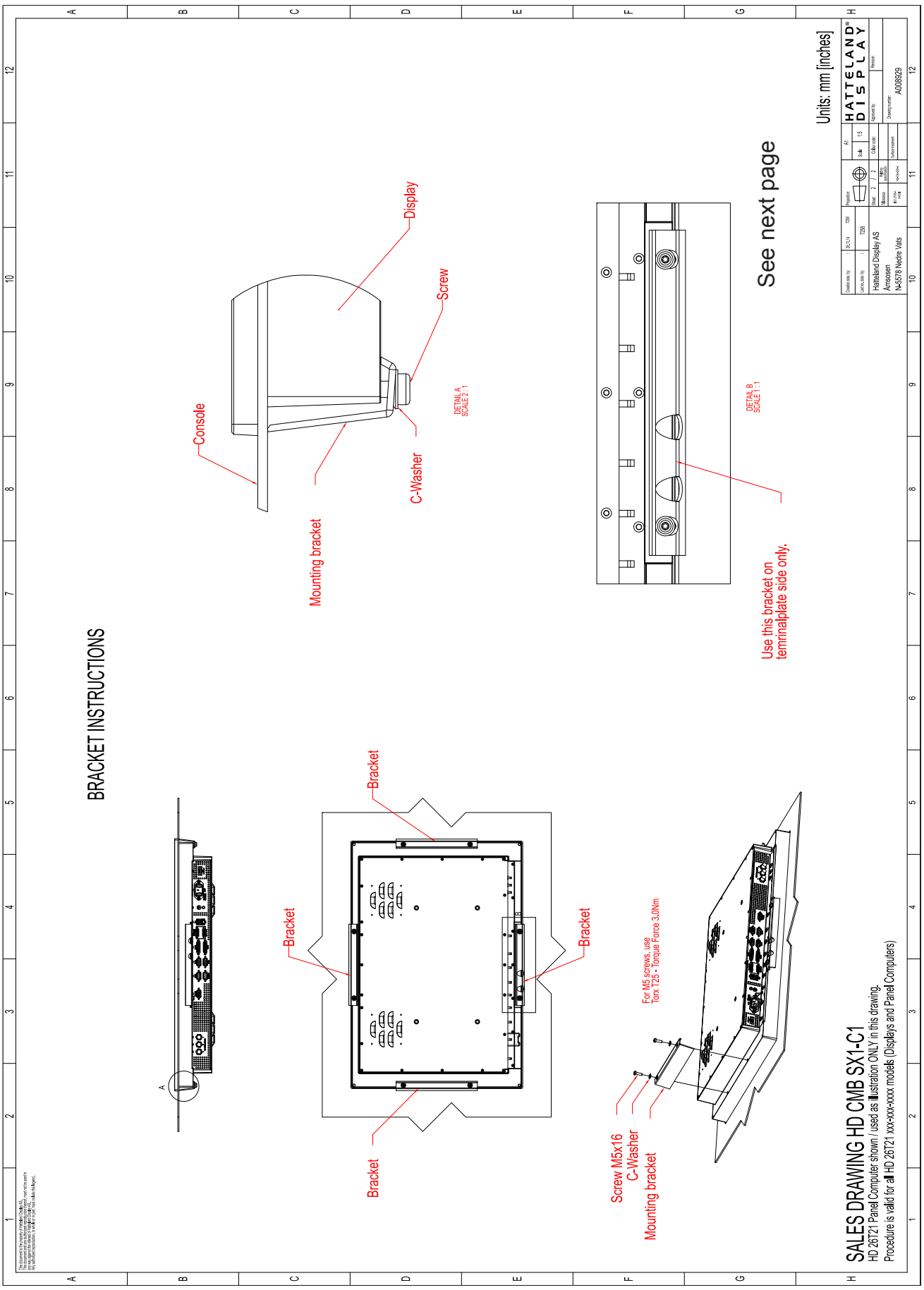


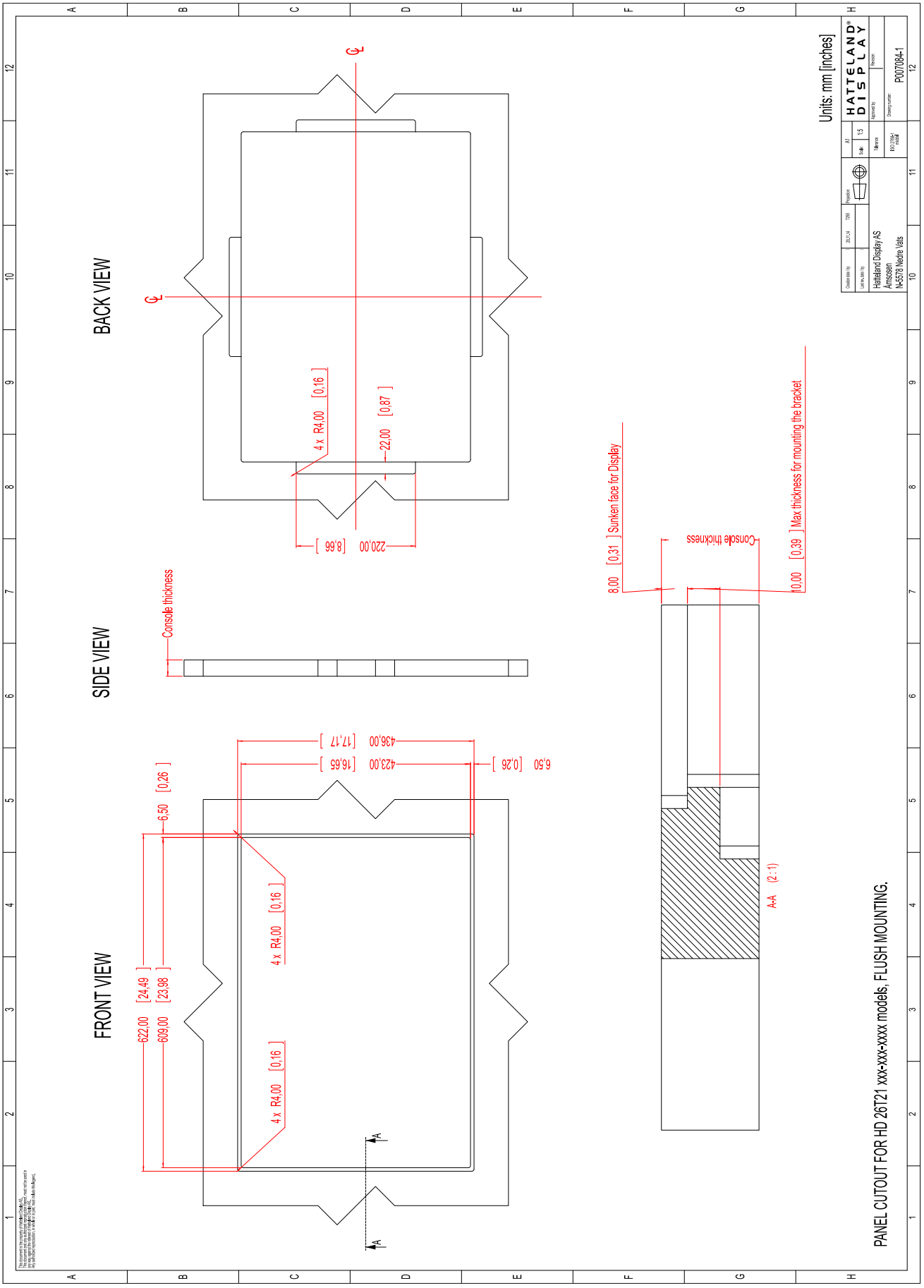
Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.



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.

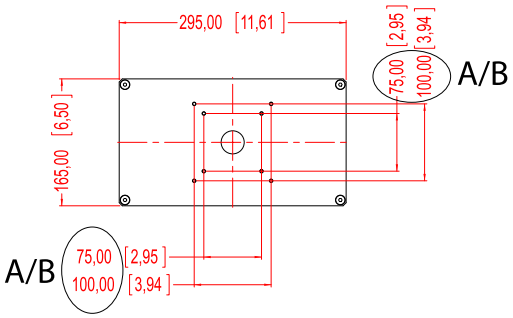
Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.



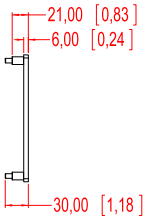


Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.

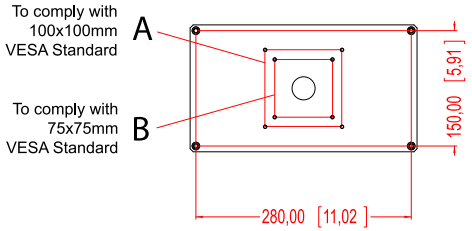
FRONT VIEW



SIDE VIEW



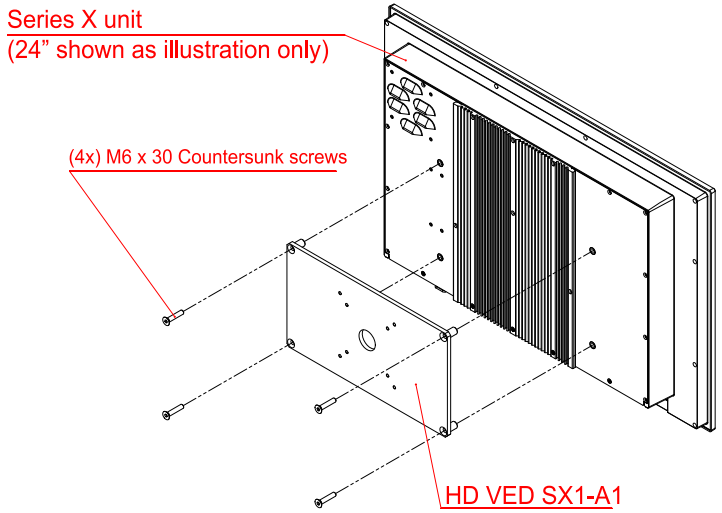
BACK VIEW



BOTTOM VIEW

TOP VIEW

MOUNTING OF VESA BRACKET

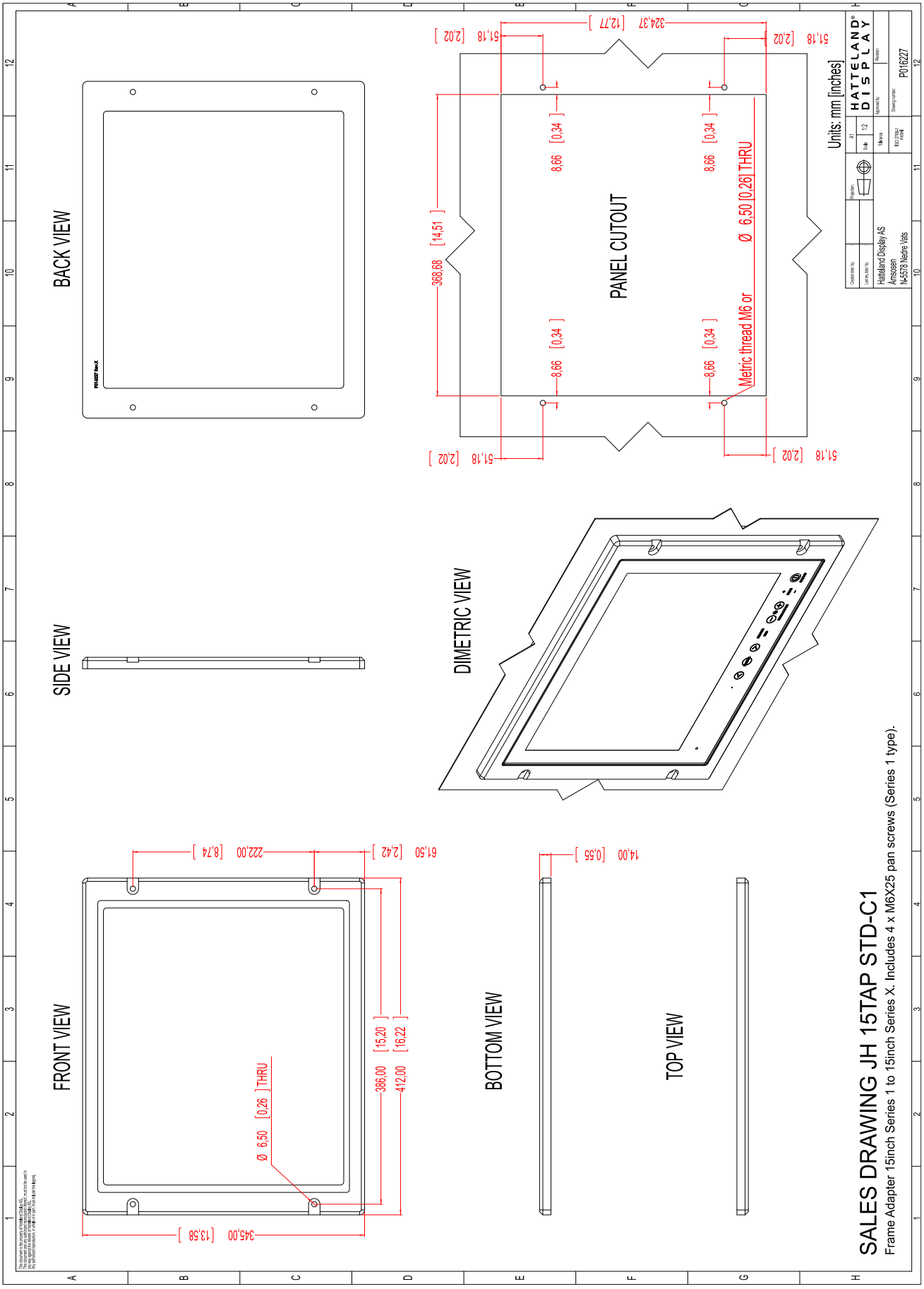


Units: mm [inches]

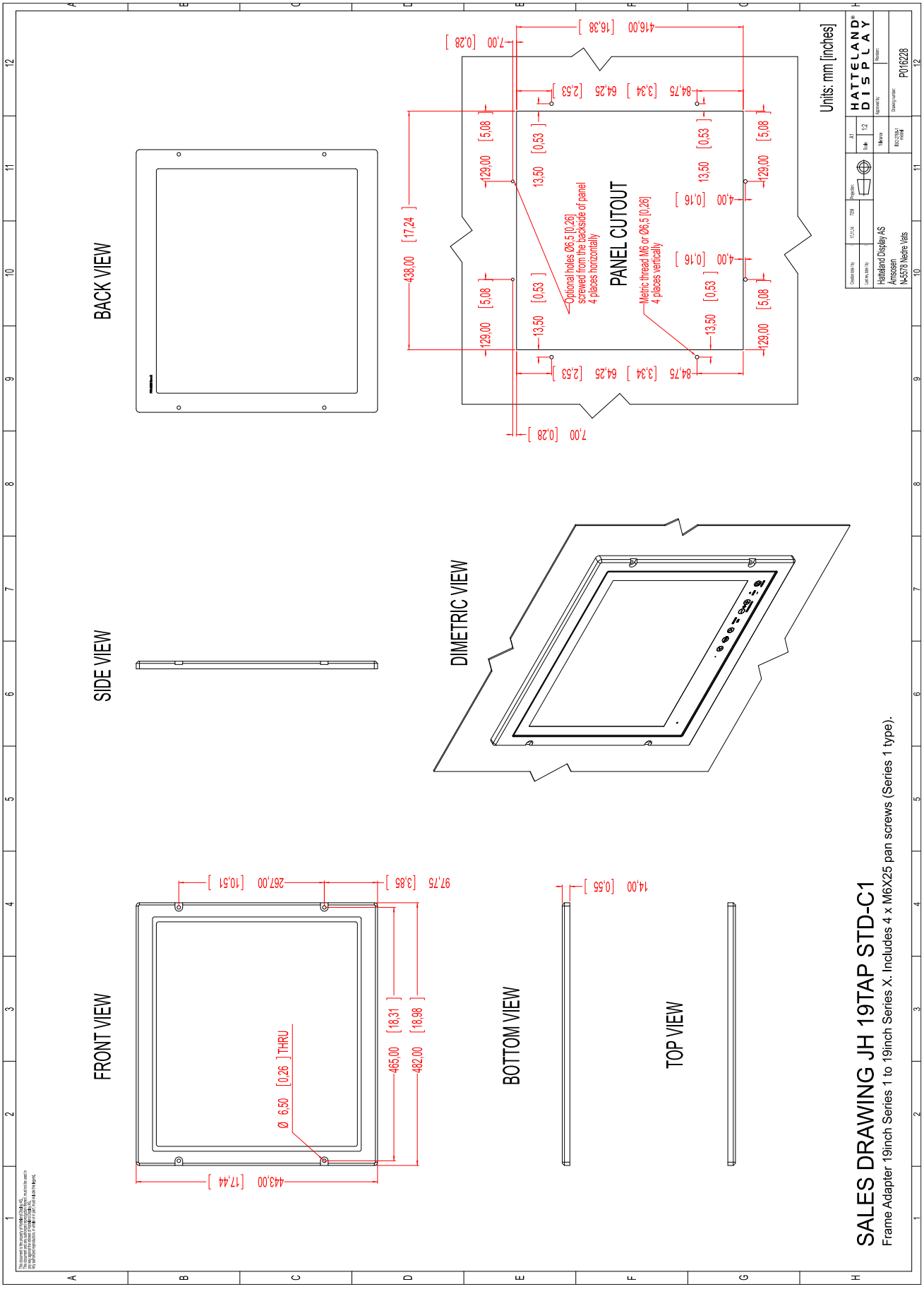
Date: 17.09.12	Mechanical Design: 7251	Projection:	A1 Scale: 1:3	HATTELAND® DISPLAY
Hatteland Display AS Åmsosen N-5578 Nedre Vats			Colour code:	Approved by: 7251 Revision: 02
			Surface treatment:	Drawing number: A006282

SALES DRAWING HD VED SX1-A1

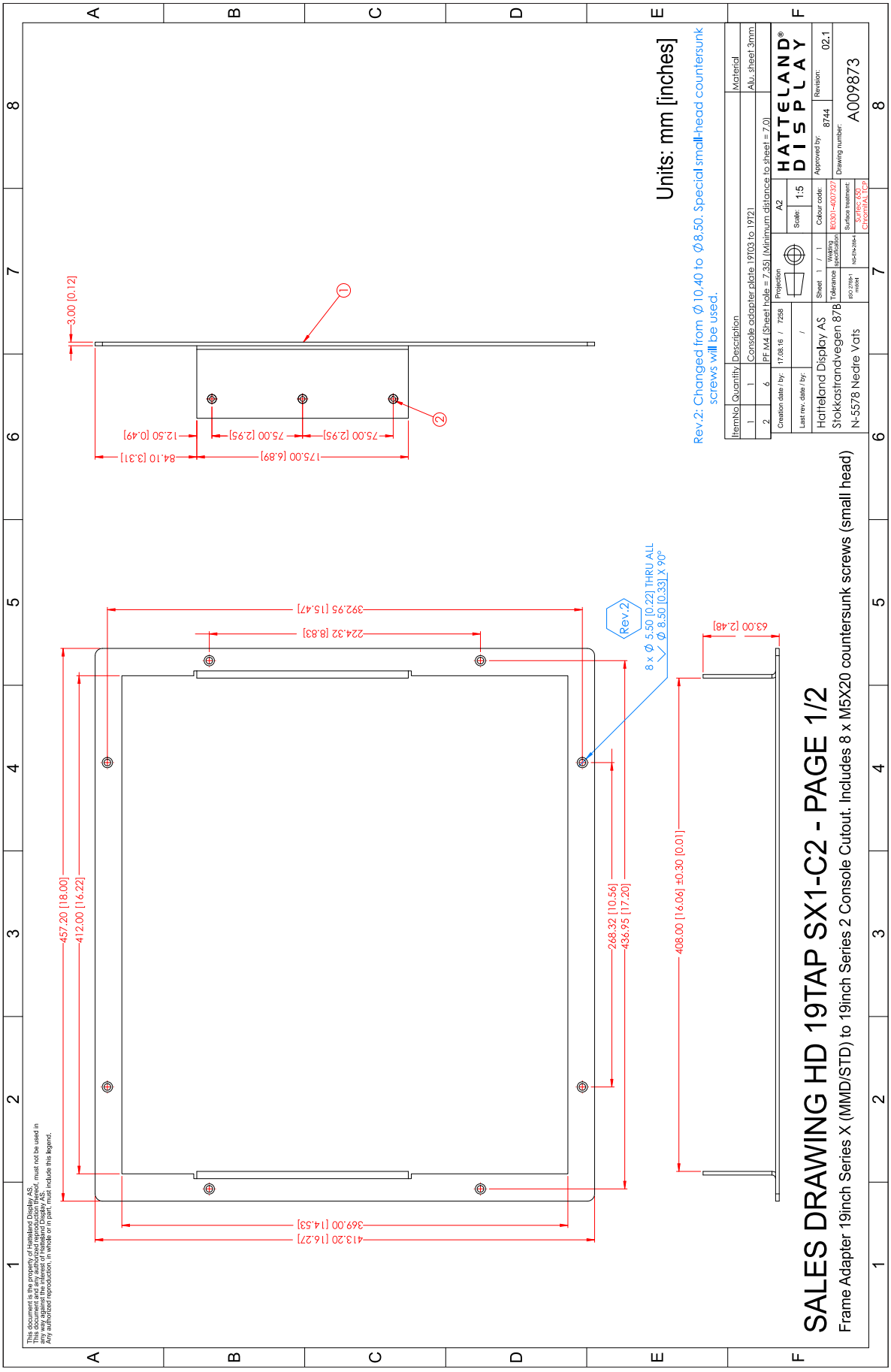
This Vesa bracket applies for 12", 15", 17", 19", 24" and 26" Series X units.



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.

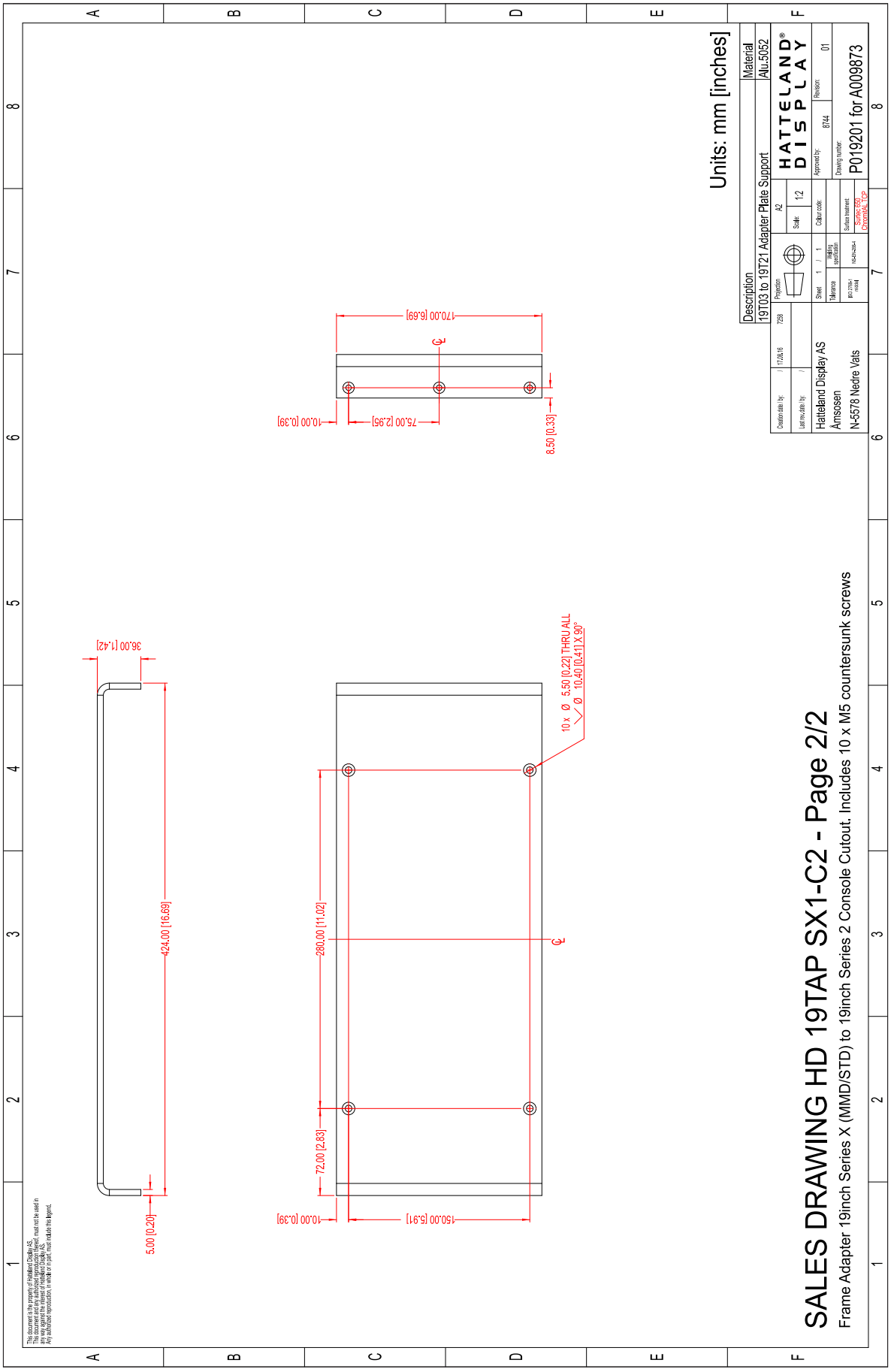


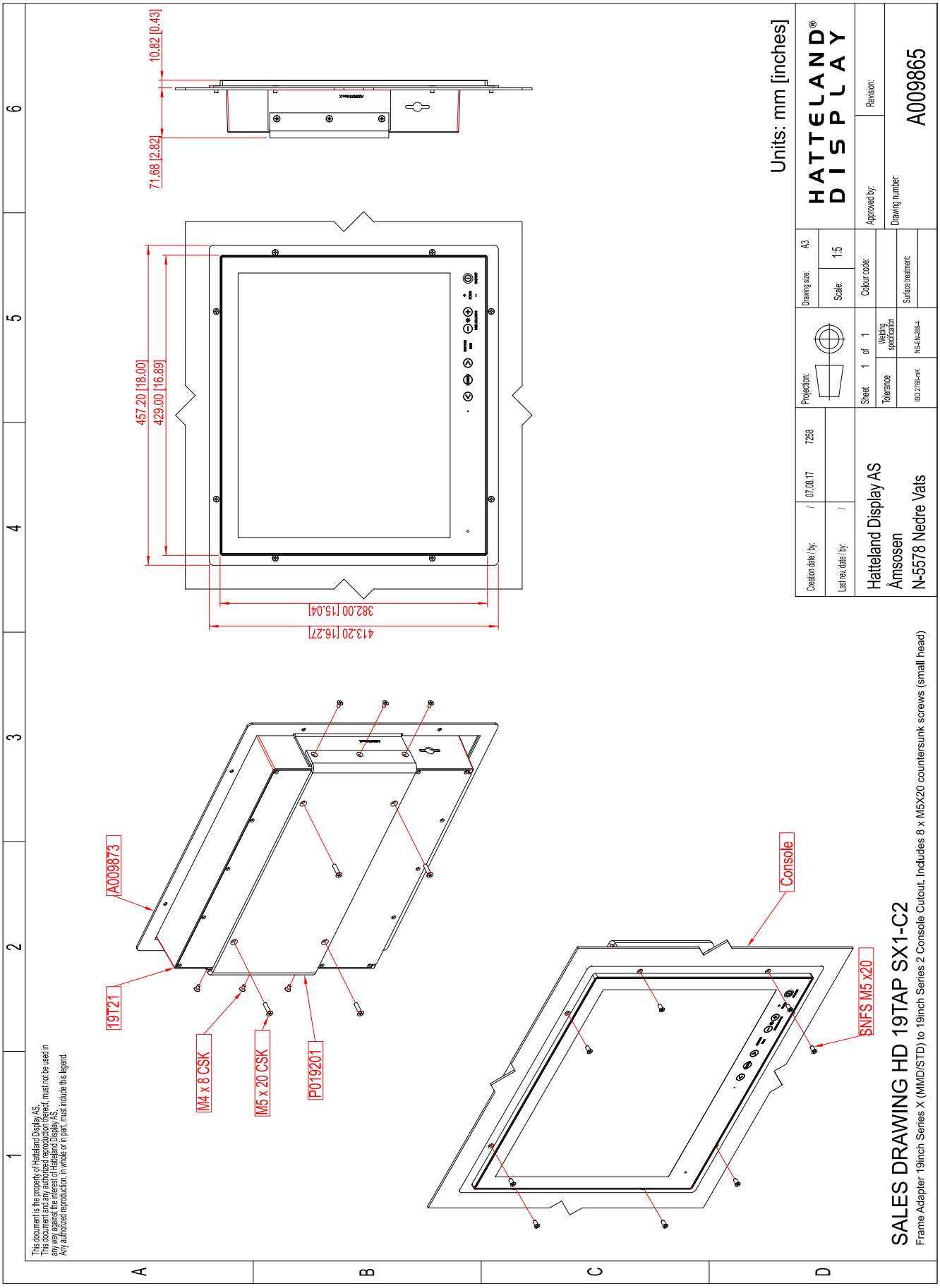
Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.



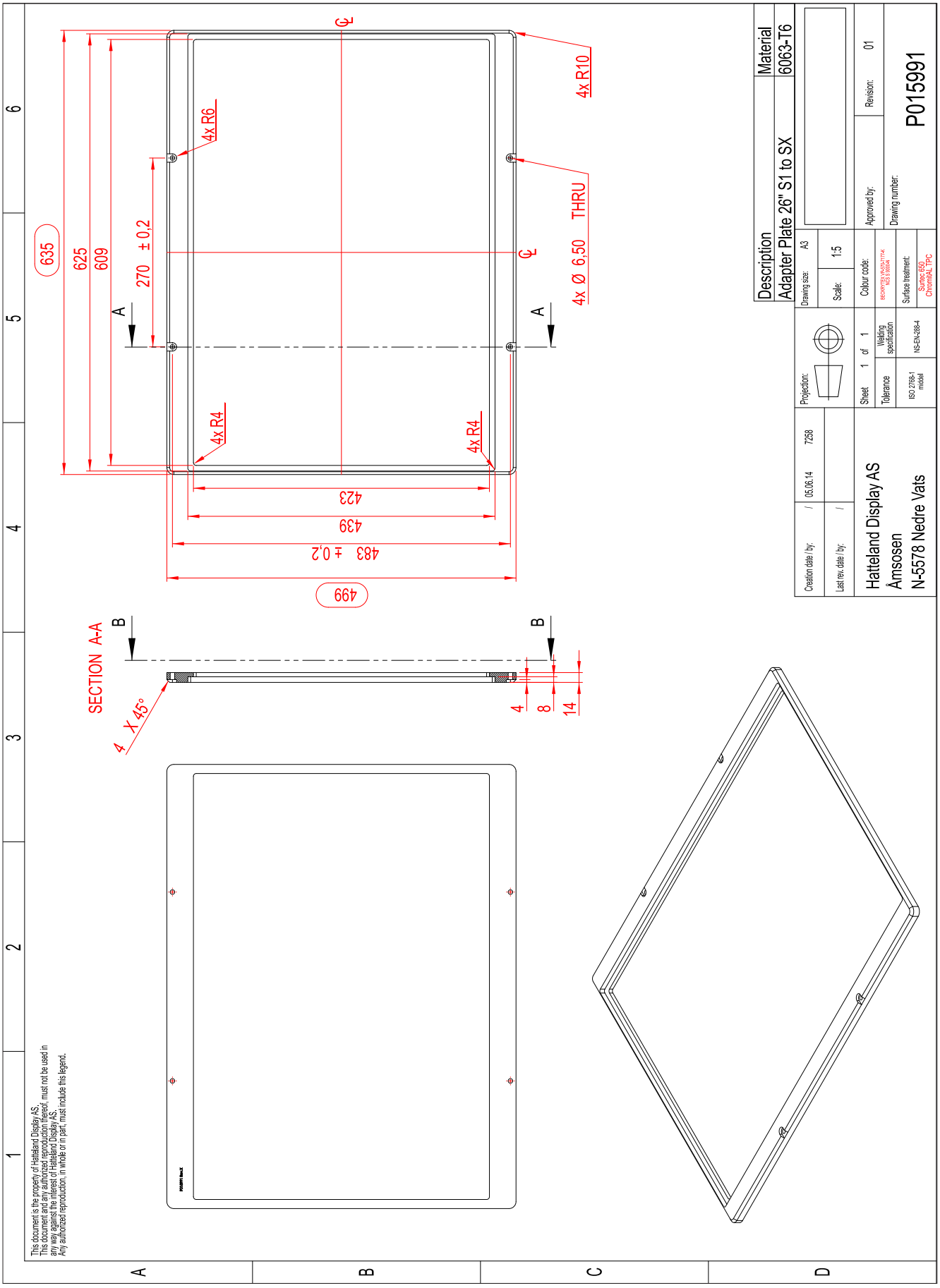
Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.

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.

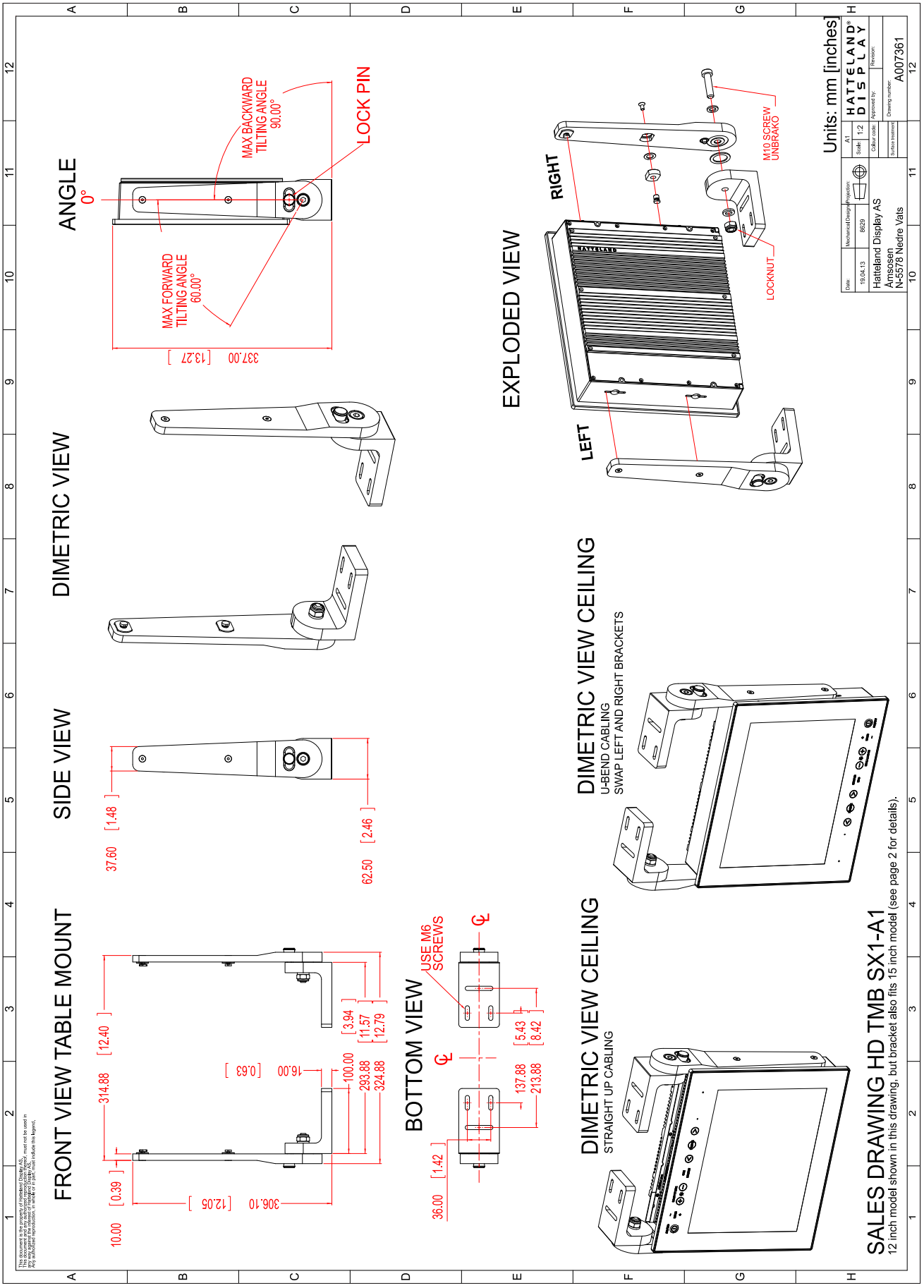




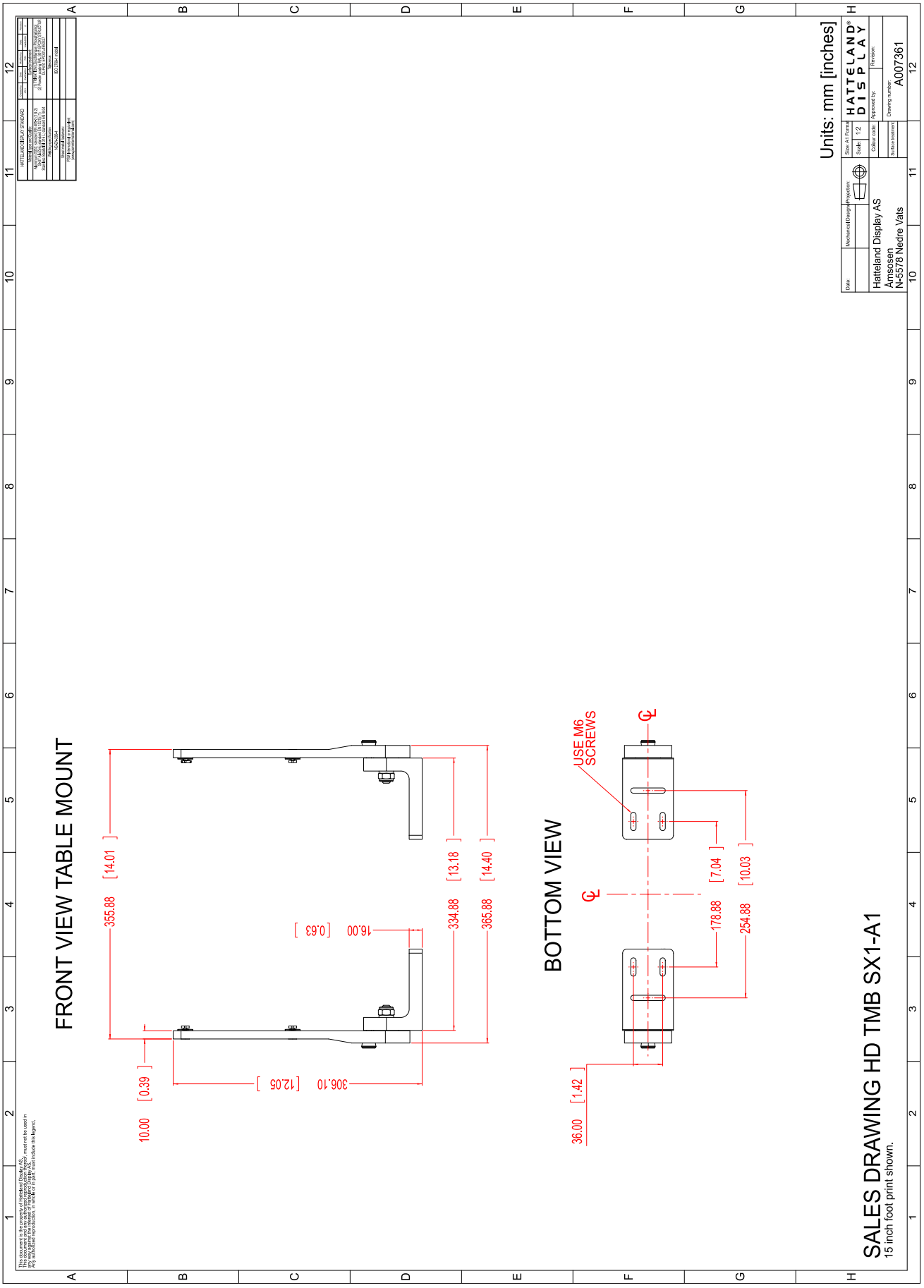
Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.



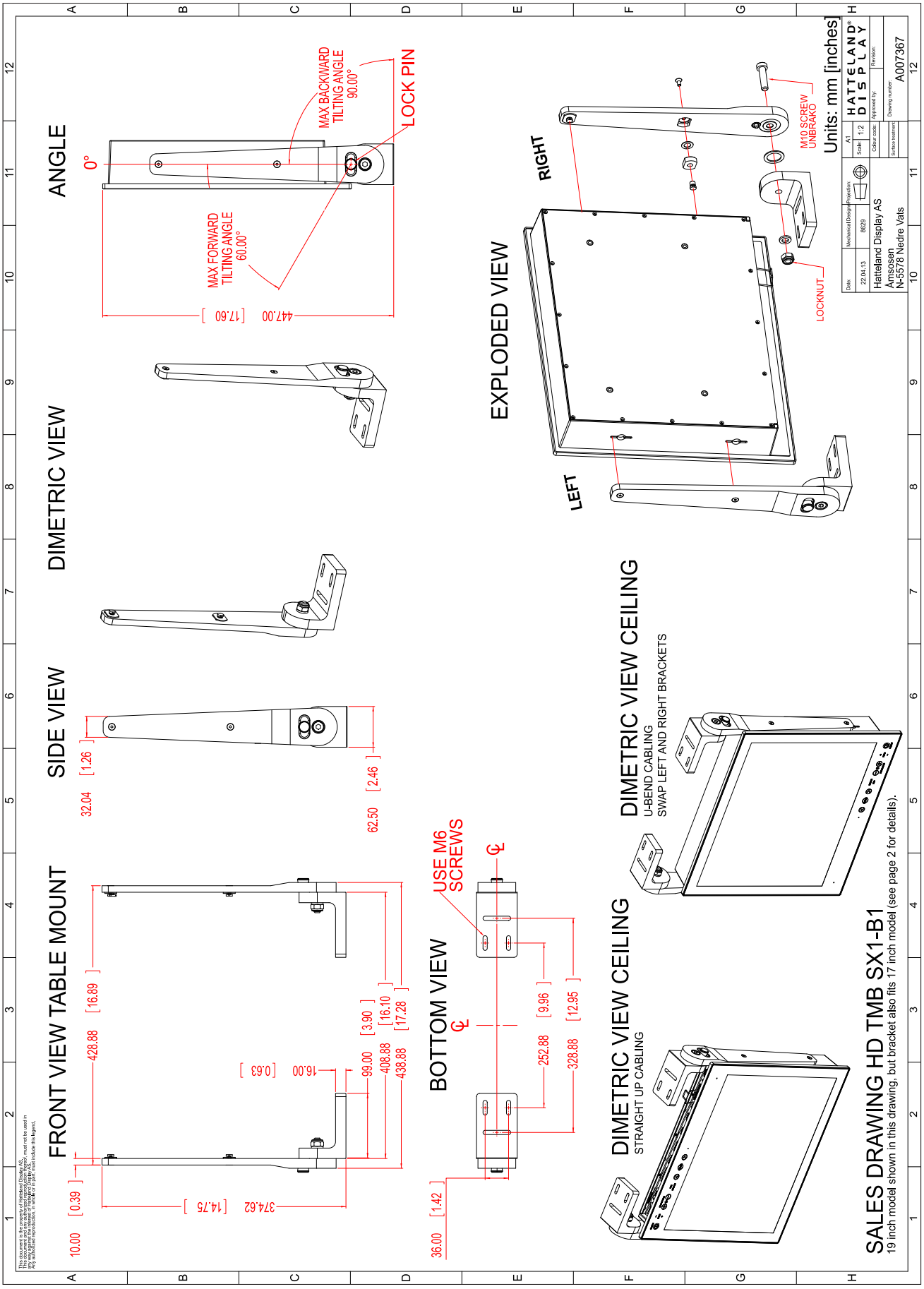
Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.



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.

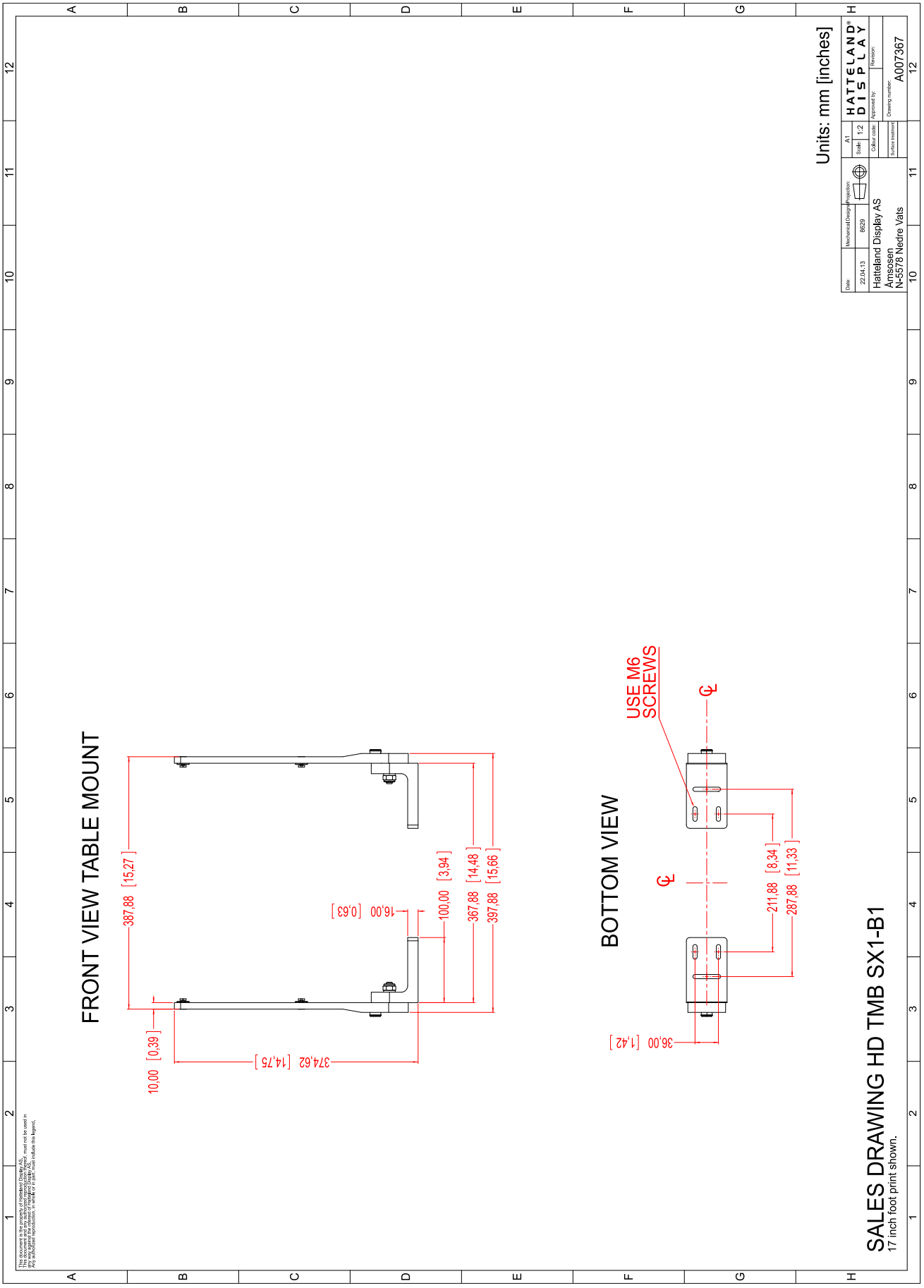


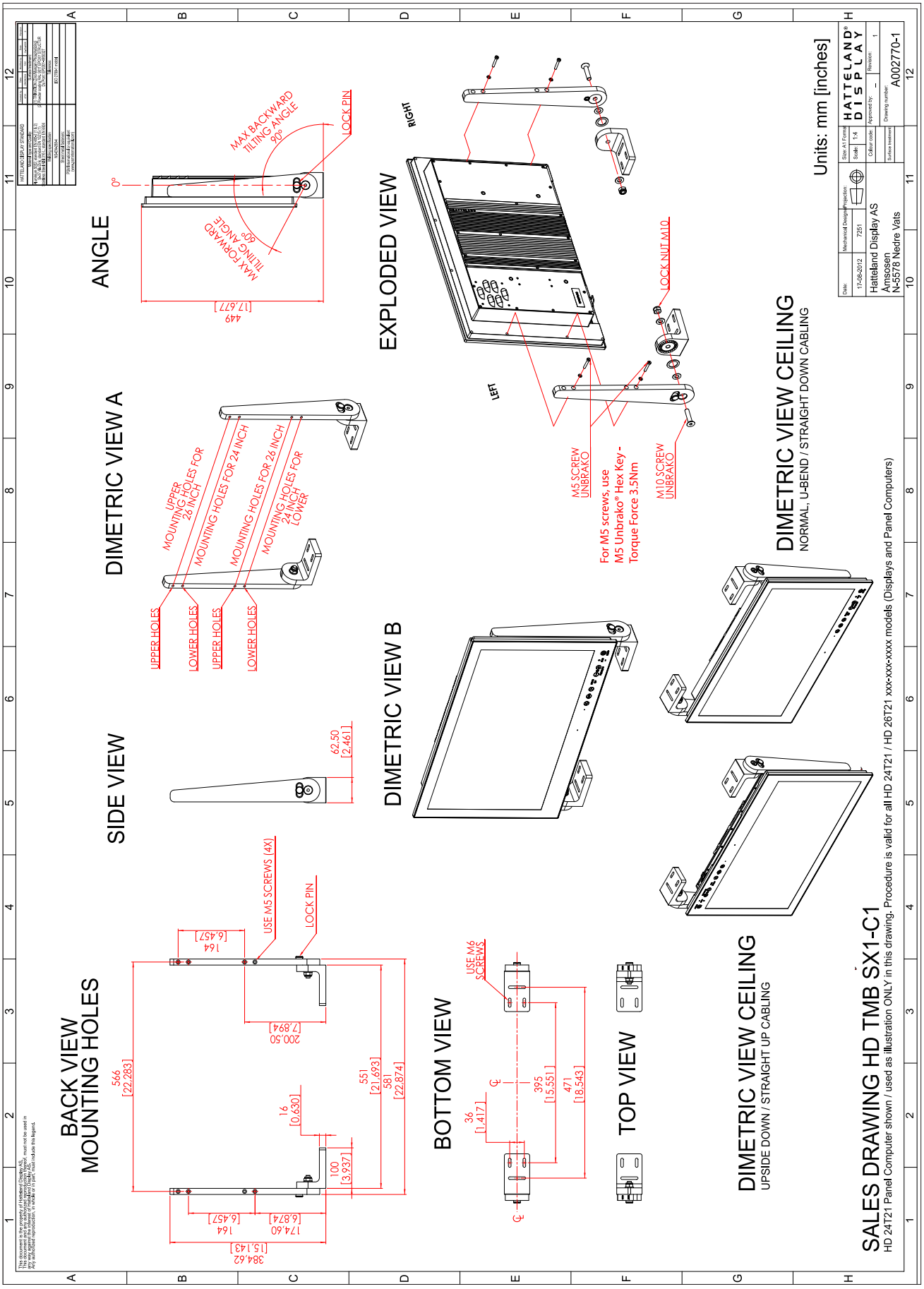
Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.



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.

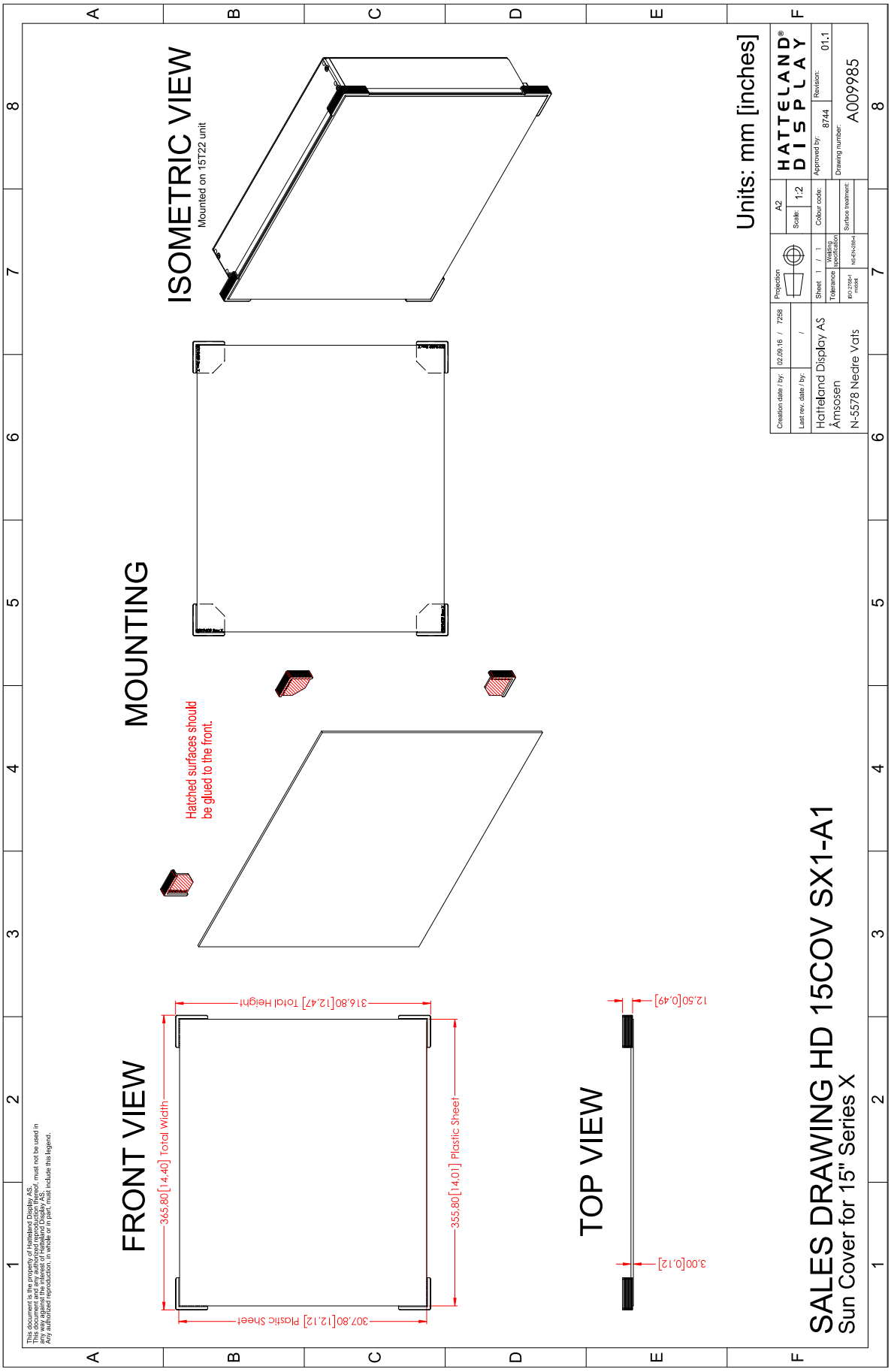
Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.



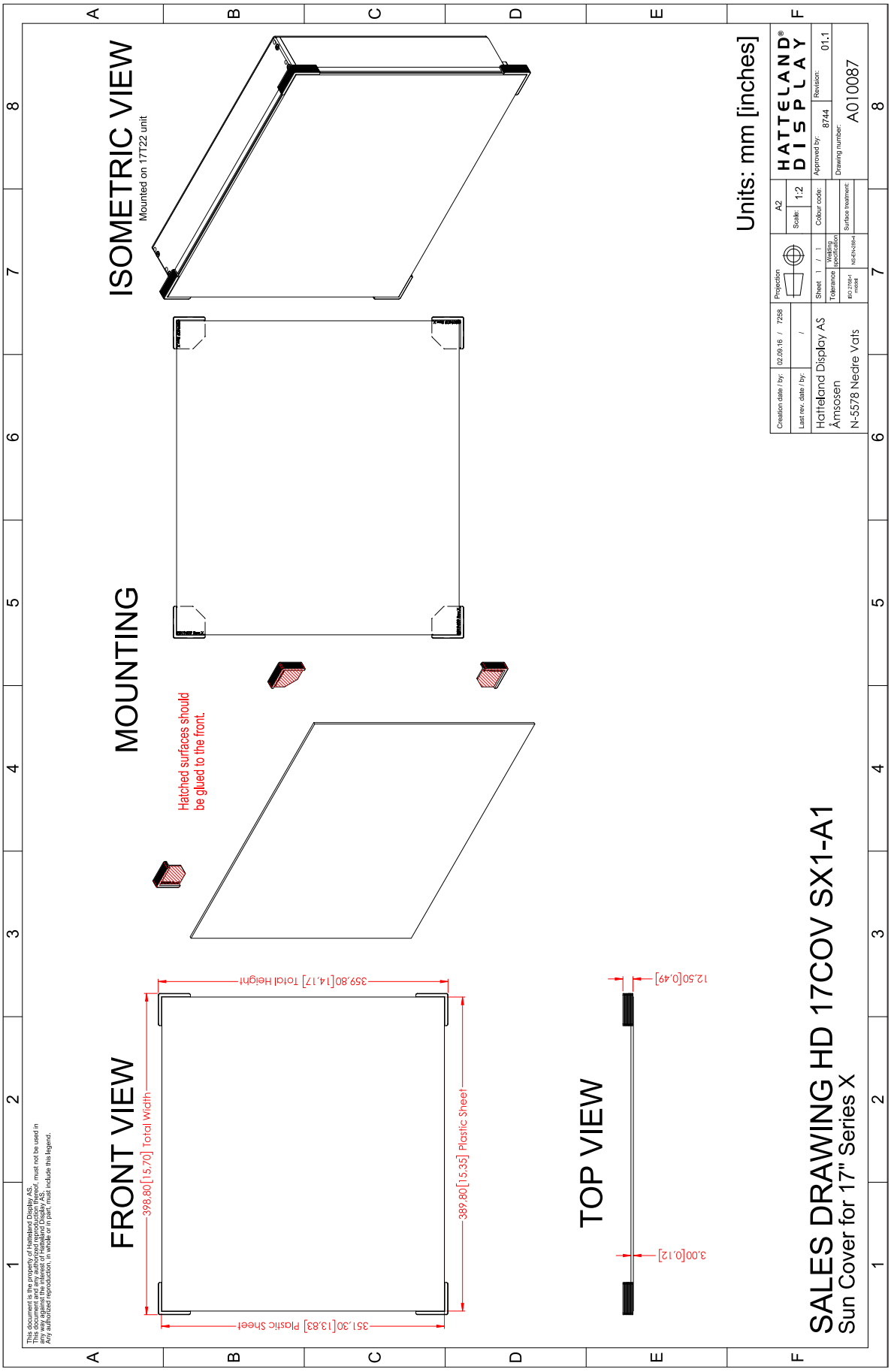


Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.

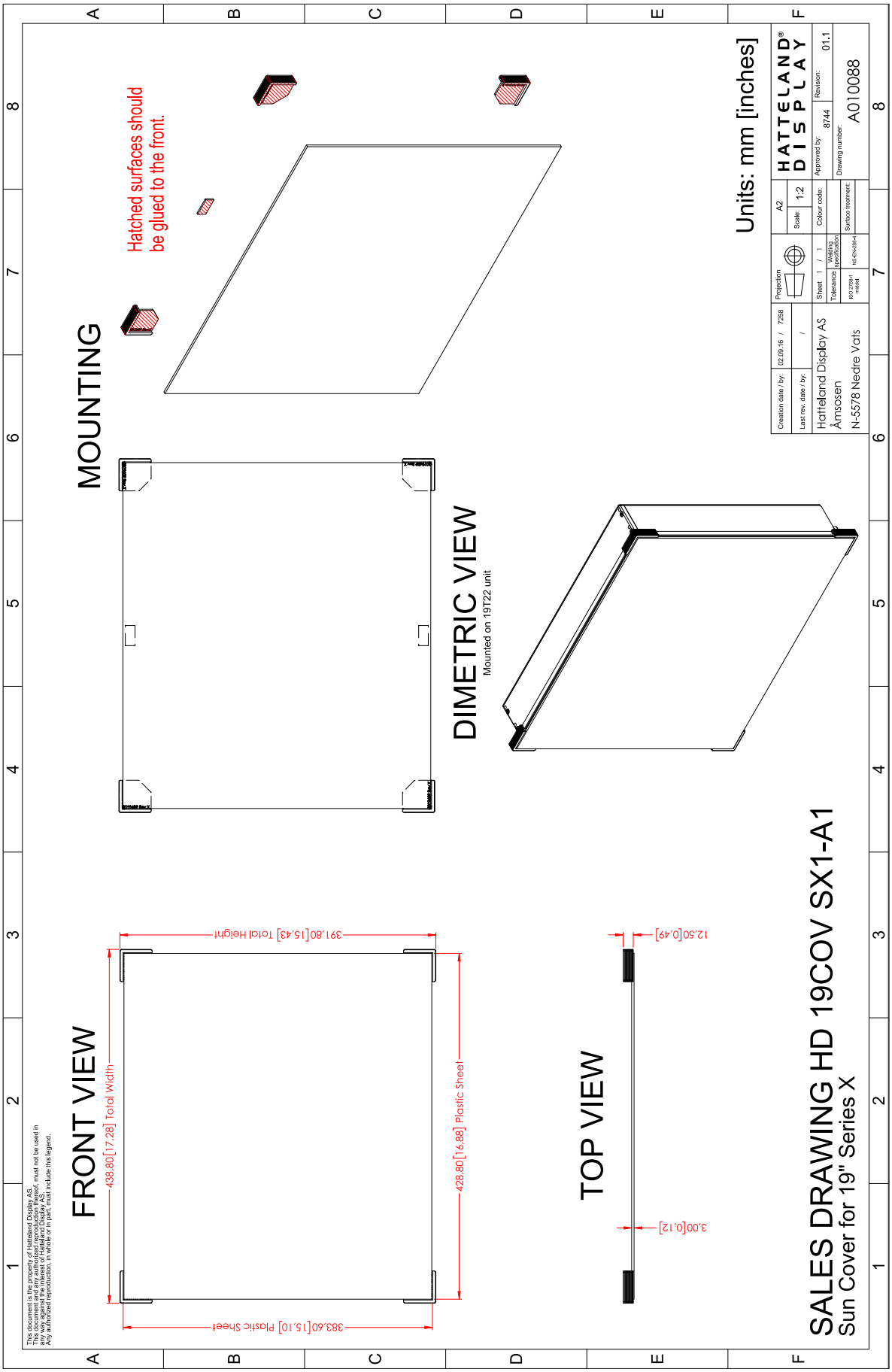
Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.

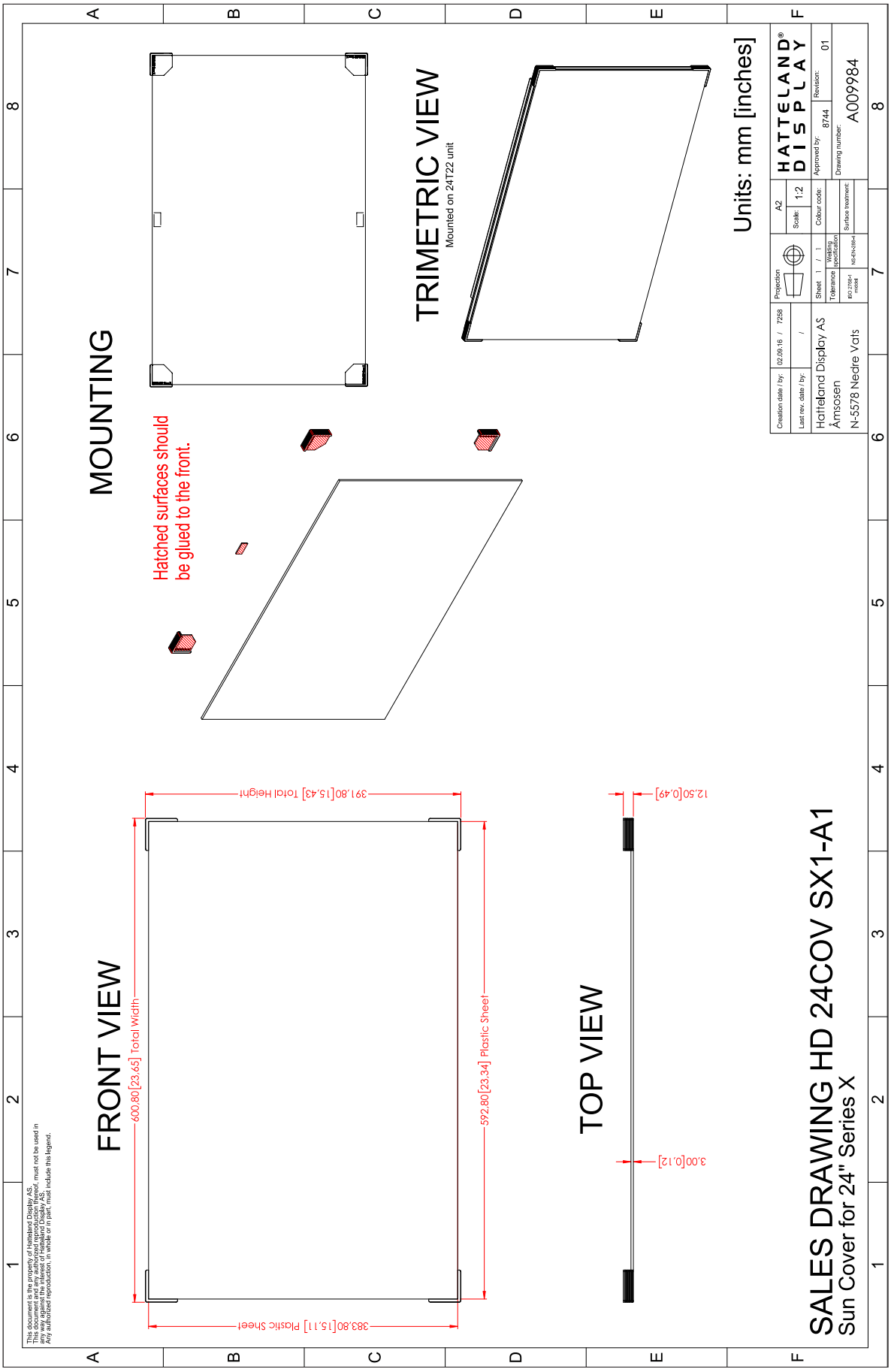


Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.



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.





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.

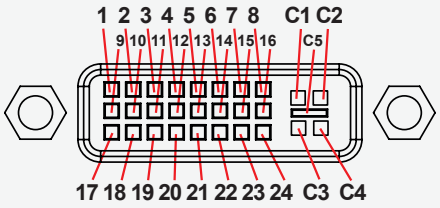
This page left intentionally blank

Appendixes

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.

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

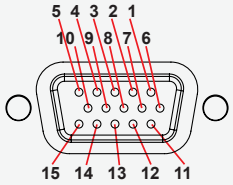


PIN 01	T.M.D.S. Data2 - (Digital - RED link 1)
PIN 02	T.M.D.S. Data2 + (Digital + RED link 1)
PIN 03	T.M.D.S. Data2/4 Shield
PIN 04	T.M.D.S. Data4 - (Digital - GREEN link 2)
PIN 05	T.M.D.S. Data4 + (Digital + GREEN link 2)
PIN 06	DDC Clock
PIN 07	DDC Data
PIN 08	Analog Vertical Sync (DVI-I only)
PIN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

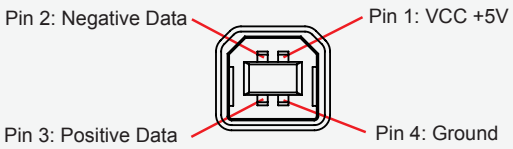
NOTE: Connector shows a DUAL LINK design, but some units may not support it. Only units with 1920x1200 or more in resolution require / support DUAL LINK.

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

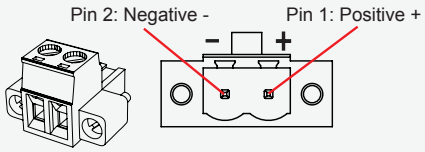


PIN 01	RED	Red, analog
PIN 02	GREEN	Green, analog
PIN 03	BLUE	Blue, analog
PIN 04	ID2/RES	Reserved for monitor ID bit 2 (grounded)
PIN 05	GND	Digital ground
PIN 06	RED_RTN	Analog ground red
PIN 07	GREEN_RTN	Analog ground green
PIN 08	BLUE_RTN	Analog ground blue
PIN 09	KEY/PWR	+5V power supply for DDC (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

4-pin USB TYPE B

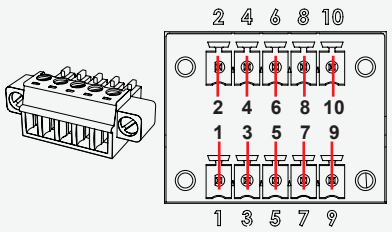


2-pin DC Power Input,



Pinout Assignments

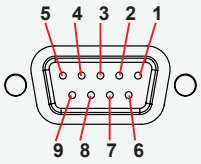
10-pin RS-422 / RS-485 Module
"RS-422/RS-485 SCOM + Ext. Buzzer"



PIN 01*	RxD+	Receive Data Positive
PIN 02	GND	Ground
PIN 03*	RxD-	Receive Data Negative
PIN 04	+5V	+5V Out
PIN 05*	TxD+	Transmit Data Positive
PIN 06**	BUZ-	Buzzer Control Negative
PIN 07*	TxD-	Transmit Data Negative
PIN 08**	BUZ+	Buzzer Control Positive
PIN 09	GNDR	Ground 100Ω
PIN 10	GND	Ground

*Pin 1,3,5,7 = RS-485 Full Duplex (4-wire)
*Pin 5,7 = RS-485 Half Duplex (2-wire)
**See notes in blue.

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



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

*Wake On Ring is not enabled
**See notes in blue.

****Buzzer - External Drive Logic:**

- Able to supply 12VDC+-5%@100mA
- Short circuit protected at <500mA
- <50VDC from ground of Display unit
  (Our input is isolated, this is layout limitation)
- Our input is classified as signal input, not power.

Notes:

Unit may have several physical connectors available for Buzzer control. Please only use RS-232 or RS-485 pins to control Buzzer, not both at the same time.

Series X (G1 - Generation 1):

- External drive logic can drive the buzzer even when the Display Unit is off.

Series X (G2 - Generation 2) / MVD Series:

- Display Unit needs external power connected to turn buzzer on. (Any logic power state).

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.

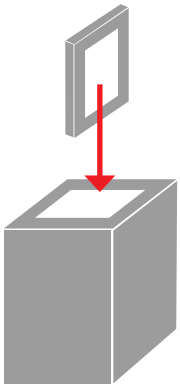
Before returning goods, please contact your system supplier before sending anything directly to manufacturer. When you return products after loan, test, evaulation or products subject for credit, you must ensure that all accessories received from our warehouse is returned. This applies to cables, powermodules 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.

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

Reference to Engineering Change Notification June 2013: http://www.hatteland-display.com/mails/10_2013_ecn.html

Touch Screen Firmware V1001 (12 inch) and V1000 (15,17,19,24):
For Maritime Multi Display (MMD) / Industrial Standard Display (STD) units the touch screen signals are routed through the display unit via the USB port and can not be controlled / detect status by the unit itself in any way. It means that even if the unit was turned off by the front bezel Power ON/OFF function, the touch screen is still active and it will still send touch screen signals through the pipeline.

This can be an issue to consider when you are cleaning the front glass. In order to avoid sending touch screen signals, you have to either physically cut power to the unit, making sure that no lights illuminate, or disconnect the USB cable physically from either computer or display unit. You may also disable the touch screen functionality from within the Operating System (OS) or via customized functions from within applications running on the external computer you have connected.

Touch Screen Firmware V1002 (12 inch) and V1001 (15,17,19,24,26):
Issue described above has been solved. For Maritime Multi Display (MMD) / Industrial Standard Display (STD) units regarding cleaning of front glass, you have to be aware that in order to avoid sending touch screen signals to a connected computer, you have to turn off the Display unit (via its front Power Symbol) and clean the front glass. When done cleaning, simply turn on the Display again and Touch Screen controller is automatically re-activated.

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
00-1	BU SE	23 Feb 2012	Release for internal review.
00-2	ALL SE	16 Mar 2012	Revised after internal review.
01	BU SE	14 May 2012	Release for internet
02	AK SE	17 Aug 2012	Revised type approvals and removed MTBF data, page 40,41,42,43,44,45
03	BU SE	18 Jun 2013	Revised Contents of Package (connectors), page 6 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 Removed High Bright option for all STD models, page 52,53,54,55,56 Revised 26 inch datasheet, no Projected Capacitive possible, only Capacitive Touch Screen, page 57 Revised 26 inch technical drawings from preliminary to rev1, page 65 Added accessory HD VED SX1-A1 VESA Bracket drawing, page 72 Added note for PCTS (Projected Capacitive) Touch Screen, page 85 Added LED Backlight Technology, page 57 - Reference: http://www.hatteland-display.com/mails/06_2013_ecn.html
04	SE	03 Jul 2013	Revised Mounting Brackets, Keyhole, Left/Right, BRD and TMB versions, page 28,29,30,31,32,33,34
05	FG SE	30 Sep 2013	Revised typenumber for DC Power In Connector (1805301 to correct 1961986), page 6,23
06	LS SE	13 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 25,26,29-35 Revised User Controls illustration and descriptions, page 40 Replaced Single Keyhole drawings with updated Double+Single Keyhole (12,15,17,19 inch), page 66,67,68,69 Revised Technical Drawings for 24 and 26 inch, page 70,71
07	LS SE	17 Dec 2013	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 76,77
08	SE	28 May 2014	Revised Mounting Bracket, Table / Desktop / Ceiling - 12”,15”,17”,19” chapter, page 29-35 Revised Sales Drawing HD CMB SX1-A1, page 74-77 Added Sales Drawing HD CMB SX1-A2, page 78 Revised Sales Drawing HD VED SX1-A1, page 82 Added Sales Drawing for HD TMB SX1-A1 (12/15 inch), page 83-84 Added Sales Drawing for HD TMB SX1-B1 (17/19 inch), page 85-86 Added Sales Drawing for HD TMB SX1-C1 (24/26 inch), page 87
09	MH SE	22 Oct 2014	Revised Contents of package (USB A-B for touchscreen), page 6 Revised Pinout Assignments and Connectors (removed not available connectors for STD models), page 90,91
10	BB KK SE	28 Nov 2014	Added HD CMB SX1-A3 accessory, page 79 Added JH 15TAP STD-C1 and JH 19TAP STD-C1 accessories, page 84,85 General update throughout the manual.
11	KK FG SE	09 Dec 2014	Added drawings for HD CMB SX1-C1 accessory, page 28,85,86,87 Added Multitouch option, now available for 26 inch models, page 65
12	PG VM MS SE	09 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 91 Revised ”Return of goods information”, page 102 Revised ”General Terms and Conditions”, page 103
13	MJL SE	31 Mar 2015	Revised Grounding, General Mounting Instructions chapter, point 7, ref: QAR/128155, page 20
14	MJL SE	13 Apr 2015	Revised Grounding Screw text, page 40
15	GM FG SE	26 Aug 2015	Revised ”Touch Screen Drivers” chapter, page 11

Revision History

16	FG AK SE	06 Nov 2015	General update throughout the manual Revised Touch Screen Introduction, text and tables, page 10 Revised HD TMB SX1-C1, Max Forward Tilting angle (from 62° to 60°), page 96
17	VM AK SE	20 Jan 2016	Revised text for ”OSD Key Outdoor” mode, not applicable for STD units. Ref: QAR/131995, page 19
18	VM WJ SE	27 Jan 2016	”OSD Key Outdoor” mode is available for STD units as well on units produced at least after Jan 2015 (please check your unit, if available on older units). Text and function added, ref: QAR/131995, page 19,45,47,56
19	AK DK SE	26 Feb 2016	Added ”Operation Advanced (DDC/CI) control” chapter, effective from models with RAP video controller firmware RAP160205R0V01 (5. Feb.2016) and higher, page 59,60,61
20	VM SE	25 May 2016	Added missing text info for ”Color Mode - Calibration Mode” function. page 51
21	JE SE	01 Jun 2016	General update throughout the manual, ref: http://www.hatteland-display.com/mails/06_2016_ecn.html
22	JE ML SE	21 Dec 2016	Added details for buzzer pins, page 103 General update throughout the manual.
23	KKK SE	01 Feb 2017	Added Accessory, HD 19TAP SX1-C2 (19inch Series X to 19inch Series 2 Console Cutout), page 95,96 Added Accessory, HD 15/17/19/24COV SX1-A1 (UV Sun Covers), page 103,104,105,106
24	JE WJ BB SE	08 Feb 2017	Revised DDC/CI chapter with updated date and reference to ECN, page 60
25	JE SE	11 May 2017	Removed reference to ”Hotkeys”, function only available on Maritime Multi Displays (MMD), page 42,64,65,66,67,68,69
26	KKK AK FG SE	17 Aug 2017	Added Mounting Instructions, JH 19TAP SX1-C2, page 97

Revision History