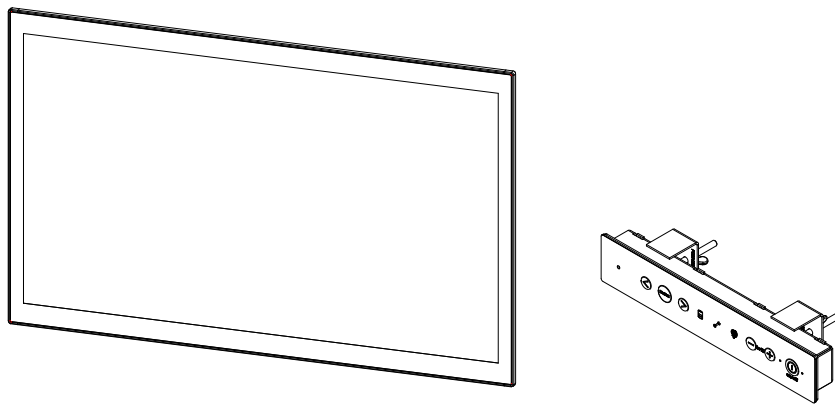# USER MANUAL

Series X - 42.5 inch Multi Vision Display (MVD)

HD 43T22 MVD-MAx-CyTz
Console Mount Model + External Tactile Display Controls (TDC)

where x=ECDIS Factory Calibrated, y=Optical Bonding Technology,
z=Projected Capacitive Touch Screen (Multitouch)

Please visit www.hattelandtechnology.com for the latest electronic version of this manual.

Contents

Contents

Contents

Contents of package

Item	Description	Illustration
TP52/TC01-1,8M	1 x Power Cable European Type F "Schuko" to IEC. Length 1.8m	EUR TYPE F IEC
TP11/TC01-1,8M	1 x Power Cable US Type B plug to IEC. Length 1.8m	US TYPE B IEC
VSD101004-1	1 x DP to DP (DisplayPort 1.2) Signal Cable. DP 20P Male. Length 2.0m	
FCE17-E2W2SS-2N0	1 x 2-pin DSUB Female DC Power Input internal cable screw terminal	
L17DPPK09JSU	1 x DSUB Cover for FCE17-E2W2SS-2N0	
Test Report Papers	1 x Product Declaration, 1 x Display/MMC Checklist	
742 711 31	1 x Ferrite Würth, Ø Cable: 6.0 - 7.5 mm. This ferrite is required when connecting a RS-232 cable to the SCOM on the unit (1 x 9p D-SUB, female, non-isolated) connector to be fully compliant with type approvals. Review installation chapter for more information.	
1827732	2 x 5-pin Terminal Block 3.81 for RS-422 / RS-485 / SCOM / Buzzer Module, MC 1,5/ 5-STF-3,81 Refer to "Configuring Housing / Terminal Block Connector" section for usage.	
P022999	2 x 43" IP66 Console Gasket EPDM Cellular Rubber S-4215, L-Shaped IP66 Mount Gasket (EPDM), for Flush/Console mount (L-shaped). Both L-shaped gaskets are mounted on rear of unit as indicated.	
HD TDCMVD KIT-A1	1 x Complete Tactile Display Control (TDC) kit Includes cable VSD203146-1 shown below for connectivity	
VSD203146-1	1 x TDC BOX Extension 15-pin DSUB cable Male to Female for External Tactile Display Controls (TDC). Length 1.5m. Part of "HD TDCMVD KIT-A1" above.	
HD CMB SX2-G1	1 x 43" EN60945 Console Mounting Bracket Kit Console Thickness Min: 7.50 [0.30"] - Max: 15.00 [0.59"] mm [inch] 10 x Bracket HD 24T21 SH-A (P025485) 20 x M5x16 Pan Head screw ISO 14583 Torx, A4 (145 050x016 A4T) 20 x M6 C-washers DIN6319 Steel (144 064x120x22)	

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Contents of package

2X-EA12	2 x ATEN LockPro HDMI/DP Cablelock + 2 x M3x6 Panhead Screw Torx w/sems spring plain 7mm Zc1 Both not factory mounted, delivered loose in package.	

Package may also include: (model dependent)

Item	Description	Illustration
VSD100913-1	1 pcs USB Male Cable Type A to Type A. Length 2.0m If unit was delivered with Factory Mounted Touch Screen option.	

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General

About this manual

The manual contains electrical, mechanical and input/output signal specifications. All specifications in this manual, due to manufacturing, new revisions and approvals, are subject to change without notice. However, the last updated and revision date of this manual are shown both on the frontpage and also in the "Revision History" chapter. This user manual is a standard/general manual that applies to all variations of its product family, i.e. deviation from actual configuration may exist.

About Hatteland Technology

Hatteland Technology 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 worldwide. 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.hattelandtechnology.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 locations 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, Aksdal / Norway: Hatteland Technology AS Eikeskogvegen 52 N-5570 Aksdal, Norway Switchboard: Tel: +47 4814 2200 mail@hattelandtechnology.com	**Sales office, Frankfurt / Germany:** Hatteland Technology GmbH Werner Heisenberg Strasse 12, D-63263 Neu-Isenburg, Germany Uwe Scheumann: Tel: +45 2463 9565 Elke Freisens: Tel: +49 173 6174753 Goetz Vogelmann: (Sales Director ASIA) Tel: +49 (0) 6102 37 09 54
Sales office, Oslo / Norway: Hatteland Technology AS Strandveien 35 N-1366 Lysaker Norway Switchboard: Tel: +47 4814 2200 mail@hattelandtechnology.com	**Sales office, Aix-en-Provence / France:** Hatteland Technology SAS Actimart- 1140, rue Ampère, CS 80544 13594 Aix-en-Provence, Cedex 3 France Mehdi Bounoua (Sales Director Europe, Middle East & Africa): Tel : +33 6 88 33 64 93
Sales office, Vista / USA: Hatteland Display Inc 450 South Melrose Drive, Suite #107 Vista, CA 92081 USA Donna Pallonetti: Tel: +1 858-282-0659 Fax: +1 858-408-1834	

For an up-2-date list, please visit https://www.hattelandtechnology.com/contact

Multi Vision Display (MVD) - Introduction

The Series X Multi Vision Display (MVD) range of products provides large 4K resolution display solutions to maritime IBS, Automation and Command Control system integrators. The cutting-edge high definition LED display technology used, with its high quality brightness and contrast, enables the presentation of large amounts of data onto one screen instead of multiple displays.

The 43 inch Series X MVD features 4K screen resolution and high-end panel technology, it provides unmatched viewing clarity in all light conditions. Its ultramodern approach represents the pinnacle of maritime display technology, making it the most advanced platform for the development of a new generation of sophisticated, function rich and user-friendly bridge technologies that demand only the best display solutions to ensure increased navigational safety and efficiency on the bridge.

Approved for harsh maritime environments where reliability and long life time are key factors, the new 43 inch Series X MVD display is a robust, flexible and ergonomic solution, suitable for a wide range of bridge applications including ECDIS, radar, voyage planning, safety systems and tactical command & control platforms. Standard features include console, optical bonding, multi-data input, full dimming, built in On-Screen Display (OSD) and uniquely for a console mounted solution, an external Tactile button-control panel which can be mounted separately for operation of the OSD and other parameters. Factory options include Multi-touch interface and ECDIS Calibrated models.
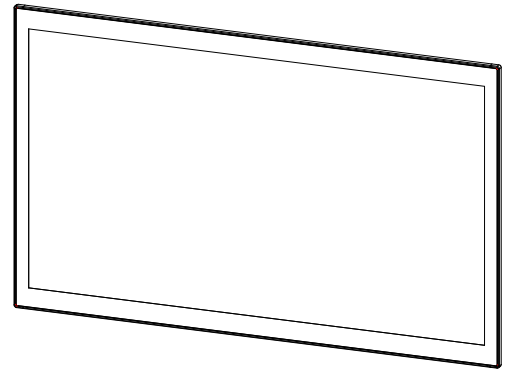
• **4K UHD - DisplayPort (DP) & HDMI inputs**

• **LED Backlight Technology**

• **Full Dimming 100%**

• **Multi-Touch Option**

• **Superior Optical Bonding Option**

• **Resolution at 3840 x 2160 (4K)**

• **Console mount model**

• **ECDIS & Radar Compliant**

• **EN60945 Tested and Type Approved**

• **Supports Tactor and Active Stylus Pen**

Product Labeling

Introduction

This section details the locations, content details and specifications for factory mounted labels for all currently available standard Hatteland Technology Maritime Multi Vision (MVD) 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.

Label Size and Types

ID	Label Layout	Description	Specification
1	**HATTELAND**® Manufacturer: Hatteland Display AS, Norway MFR. Date: 20190227 CE 100-240V AC 50/60Hz 24VDC TYPE NUMBER-SERIAL NUMBER 130W (max) **HD 43T22 MVD-MA1-COTP-123456**	**Type** : **Serial Number Label** **Name** : Label B **Size** : 60mm wide x 20mm 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	**TOUCH SCREEN** This product is equipped with a PCTS (Projected Capacitive) Touch Screen Touch Controller: HD PCTS USB controller Driver Download: www.hatteland-display.com VSD100564-HD-PCTS	**Type** : **Touch Screen Label** **Name** : Label B **Size** : 60mm wide x 20mm 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	**WARRANTY VOID IF REMOVED**	**Type** : **Warranty Label** **Size** : 30mm wide x 23mm high (oval size)	Tamper-proof sticker with glue on back.
5	**QUALITY CONTROL** OK☑ QC PID SIGN	**Type** : **Quality Control (QC) Label** **Size** : 30mm wide x 23mm high (oval size)	Ordinary sticker with glue on back.

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 or damaged by screw driver. This label is located on the back of the product and covers a key screw. This is to aid service departments in determining if there has been any unauthorized service on a unit still under warranty.
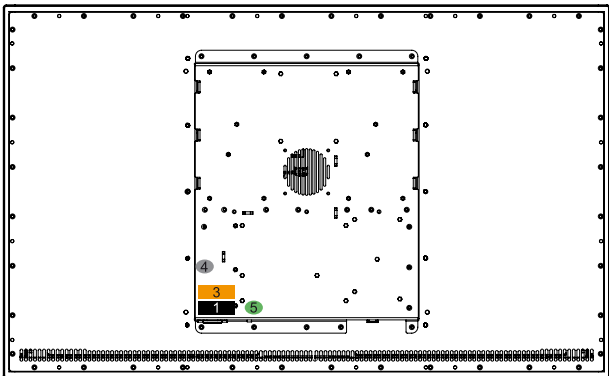
Quality Control (QC) Label
This label indicates that the unit is produced, tested and packed according to the manufacture's QA specifications. It will include a Personal ID and signature by the personnel responsible for approving the unit in production, testing and warehouse departments.

Product Labeling

Label Locations

Number ID and coloring based on "Label Size and Types" table from previous page. All illustrations below are 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
	Warranty label covers screw. Labels placed on rear. - Serial Number Label - Touch Screen Label (if applicable) - QC Label - Warranty Label	**HD 43T22 MVD-MAx-CxTx** Console Models

Introduction to products with touch screen

Nearly all of our products with touch screen use 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 allows us to 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 Datasheet (in this manual) to determine if PCTS are supported and/or its advanced features of additional touch methods (example Tactor and Active Stylus Pen) are available.

The technical benefits of PCTS 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 Technology:

Technology	Optical Performance	Gloves	Water	Durability	Multitouch	Stylus	Objects (Tactor)
Analog Resistive	- -	+ +	+ +	-	-	-	- -
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 units are exposed to these factors while powered. Hatteland Technology recommends protecting the unit from direct rain or drips if critical touch operations are to be performed. Take necessary 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

All units with Touch Screens are automatically detected by the Operating System via HID. There is no need to install additional Third-Party touch screen drivers.

Note: By factory default the Default Touch Enabled Source is set to DisplayPort (DP). Touchscreen is not active if using HDMI. You may change this behaviour in the OSD menu: "Miscellaneous/Touch PWR" as described in the OSD Menu chapter in this manual.

Microsoft® Windows® 7 / Microsoft® Windows® 10 IoT
- Please use Windows® Generic HID driver, no specific driver needed to use multi-touch.

Microsoft® Windows® XP - For 32, 43 and 55 inch units:
- Multi-Touch Screen is not supported for this Operating System.
- Alternative Single Touch / Mouse Mode not supported.
Ref: OS End-of-Life: https://www.hatteland-display.com/mails/09_2016_eol.html

If you experience any deviation in the touch input accuracy, consider re-calibrating the touch screen for your system. Please use the standard Operating System functionality to calibrate.

Example for Microsoft® Windows® 10 IoT:
1.Open Control Panel.
2.Click on Hardware and Sound.
3.Under "Tablet PC Settings," click the Calibrate the screen for pen or touch input link.
4.Under "Display options," select the display (if applicable).
5.Click the Calibrate button.
6.Select the Touch input option

Example for Microsoft® Windows® 7:
1: Open Control Panel
2: Open "Tablet PC Settings"
3: Under "Display options," select your display.
4: Click the Calibrate button and follow instructions
5: To save settings, click "Apply" or "OK" on the "Table PC Settings" window.

Linux
- Please use Linux Generic Touch driver. Use kernel 4.10 or later.

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Installation

General Installation Recommendations
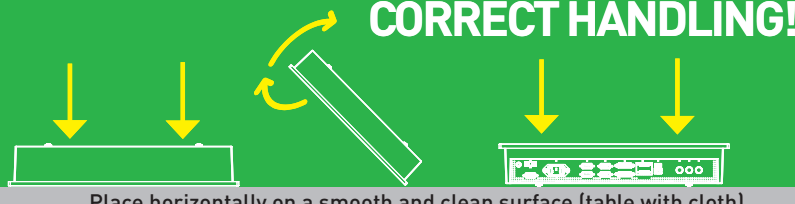
First Things First!

IND100148-5 - Rev 05

ATTENTION!
To prevent damage to chassis and glass, please review the illustrations !
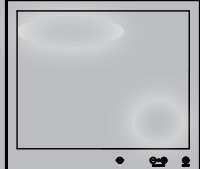
CORRECT HANDLING!
Place horizontally on a smooth and clean surface (table with cloth)

WRONG HANDLING!
Do not stress the corners, nor place it on a coarse and/or dirty surface

Humidity Exposure Notice!
Applies for non-bonded product only: If exposed to humidity in combination with temperature variations, product might show condensation on the glass (inside and outside).

Inside condensation can be removed by power on the product and set brightness to 100%. During minutes the internal temperature rise will remove condensation.

Installation and mounting

Note: Each installation case is different, and Hatteland Technology can only offer general tips as each individual case must be reviewed at local site thoroughly by users themselves and then take necessary steps in basis of the following points below. It is expected that user has adequate installation knowledge regarding protecting the units in terms of preventing overheat, provide good air ventilation and be aware of general precautions to ensure long life time of units and internal electronic components. The points below serve only as a guide and may not all be applicable for the users installation in every situation.

1. Most of our units 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 unit. The air inlet and outlet openings must definitely be kept clear; coverings which restrict ventilation are not permissible.

General Installation Recommendations

3. The 43 inch units in particular are tested and approved for horizontal mount and vertical mount.
   Please consider the thermal situation when mounting the unit, in particular when mounted flat (horizontally).
   "Air traps" must be avoided, active ventilation might be required, depending on the actual installation.

Console Flat Mount - Thermal Solution

Table/Panel

LCD Panel
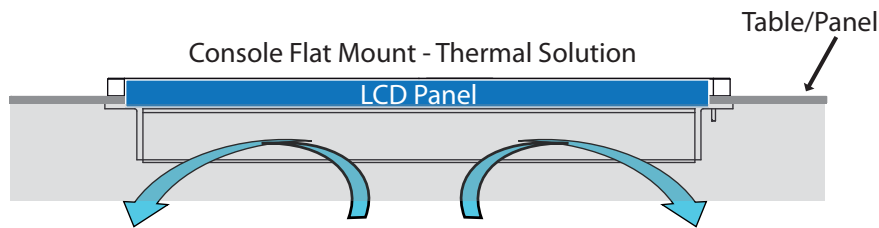
Hot air needs to escape/circulate the console casing.
Thermally controlled fans are suggested as the optimal solution.

**Please note recommended mounting for Non-Bonded units vs Bonded units and requirements.
Based on a permanent mounting. Take notice of orientation of Front Glass below:**

With or without Bonding OK

0°

45°

Bonding Required!

90°

With or without Bonding OK

0°

45°

90°
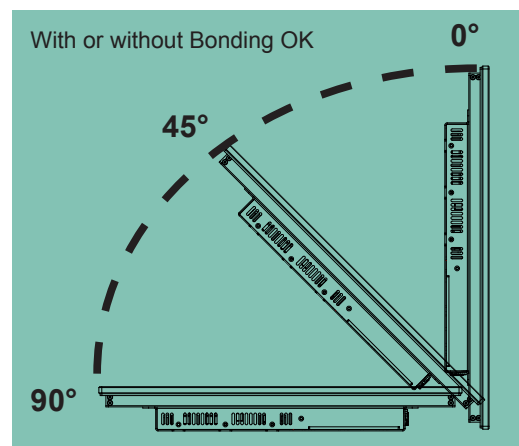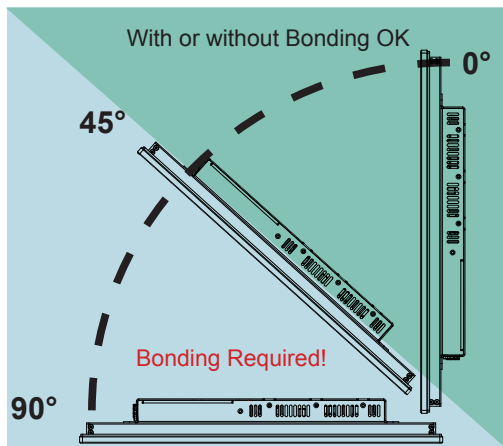
4. To further improve the thermal situation, we recommend using forced air passing by the product. In some cases, convection based cooling can create "heat zones" around the product. This may be required in high temperature applications and also when there is reason to expect temperature problems due 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 excessive temperature. 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 should be free from glare 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 the excess heat transfer. Painting, labels or other surface treatments that differ from the factory default, might cause overheating.

10. Exposure to heavy vibration and acoustic noise might under certain circumstances affect functionality and expected lifetime. This must be considered during system assembly and installation. Mounting position must be carefully selected to avoid any exposure of amplified vibration.

Installation   **19**

General Installation Recommendations

Installation limitations

Due to environmental factors, please review the section below.

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

    For all units with a factory mounted touch screen (and for outdoor use) the touch controller can react and is sensitive to raindrops. The only solution to this situation is not to mount the unit in a vertical angle lower than ±30 degrees, i.e. flat mounting. This is to ensure that the touch screen is not activated by staying/running raindrops and accidentally automatically chooses functions in your running chart, radar or other software installed.

Installation   20

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 center 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 must 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. Products with AC input must be grounded to protective Earth (Safety Ground) when necessary via the bolt (usually on terminal plate) available on the product.
   Products with DC input must be grounded to protective Earth (Safety Ground) via the bolt (usually on terminal plate) available on the product.
   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 Technology. The unit should 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.

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 using 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 & soda) 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 allow the angle of gaze to remain at the center 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 favorable.

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 coloring of the deckhead).

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)

43 inch = 842mm				

General Installation Recommendations

Cables
Use only high quality shielded signal cables.

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 not only on the signal resolution and frequency, but also on the quality of the signal output from the computer/radar. For optimal signal quality, use HDMI 1.4/2.0 compliant cables.

Cable Entries & Connectors (Marked area)
Illustration below for smallest/largest sizes only.

Back View - Console Models
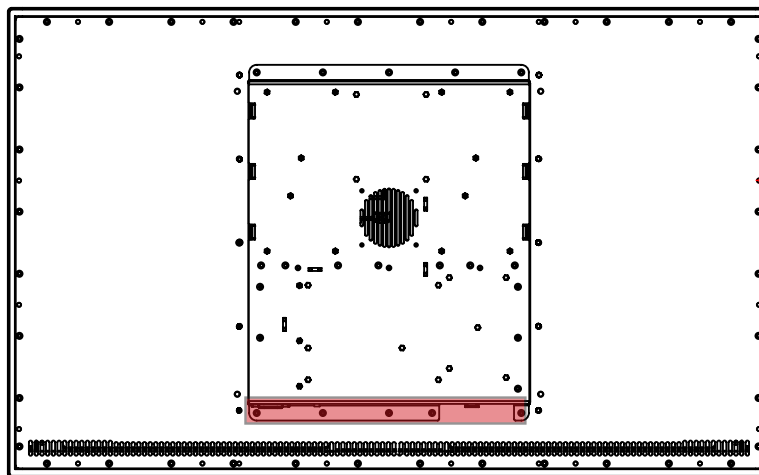
General Installation Recommendations

Configuring DC power input housing connector

Note: Only applicable for DC models!
For installations that require DC power input, use the provided
2-pin DC Power Input housing with internal cable screw terminal.

It is recommended that thickness of cables are
Minimum 20 AWG and Maximum 18 AWG. Length should be
determined by qualified personnel.

1: Open the housing
2: Unmount the fasteners. (FIG 1)
3: Mount power cables to screw terminal (FIG 2). **Note polarity!**
4: Secure the cable tightly with fasteners (FIG 3, FIG 1)
5: Close the housing
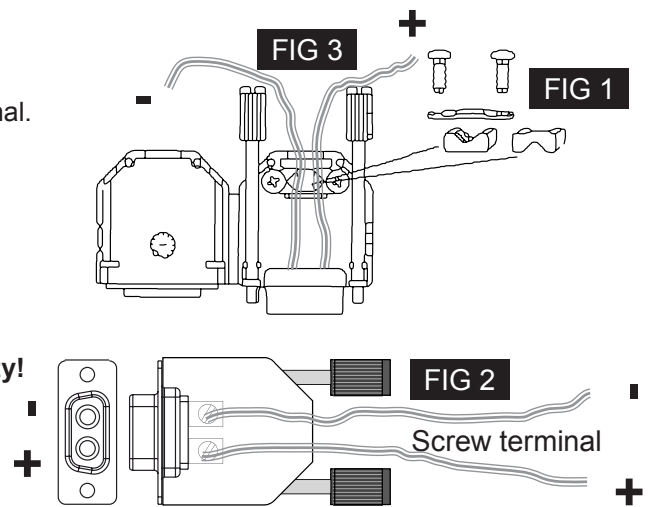
DC shall be grounded to protective Earth / Safety Ground!
Review "General Mounting Instructions" in the "Installation" chapter earlier in this manual.

FIG 3
FIG 1
FIG 2
Screw terminal

General Installation Recommendations

Ferrite

The ferrite prevents high frequency electrical noise (radio frequency interference) from exiting or entering the equipment. **This ferrite is required when connecting a RS-232 cable to the SCOM on the unit (1 x 9p D-SUB, female, non-isolated) connector to be fully compliant with type approvals.**

The ferrite should be mounted (clipped in place on the cable) and located as close as possible to the connector piece that connects to the rear of computer.

When ready: Open the ferrite, place the cable inside as shown in FIG1, and then gently close it until a click can be heard (FIG2). You may close and re-open them as many times as required during the installation.

FIG1

FIG2

To computer

To computer
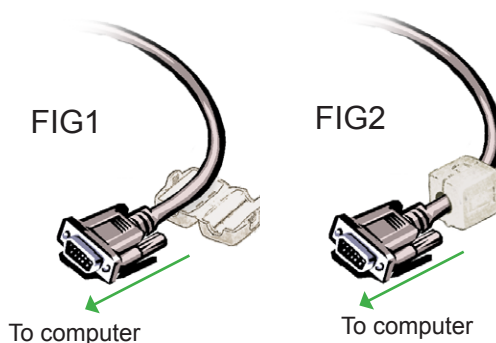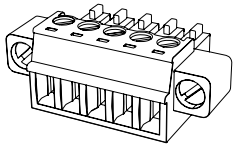
Red Line indicate where Ferrite should be mounted (as close as possible to the connector).
Do not mount ferrite (Orange square) below the red line!

Typenumber	Ferrite Type	Dimetric View	Preferred distance of ferrite. Side view.
HD 43T22 MVD-MAx-CxTx Console Models	1 x 742 711 31 Würth type		
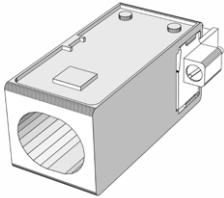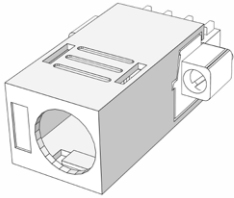
General Installation Recommendations

Housing / Terminal Block Connector Overview

Housing / Terminal Block connectors are available which plug 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 cannot 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 the the 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.).

Illustration	Pins	Manufacturer Details	Connector used for module
	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 Technology product datasheet as: "Terminal Block 3.81"

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

Cable Housing - Illustration	Cover Hood - Illustration
KGG-MC 1,5/ 5 (5-pin)	BCZ 3.81 AH05 BK BX (5-pin)

For 5-pin:
https://www.phoenixcontact.com/online/portal/us?uri=pxc-oc-itemdetail:pid=1834372&library=usen&pcck=P-11-02-01&tab=1

For 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 an example procedure for a 2-pin DC power connector. The procedure is the same for other connectors of this type as listed in table on previous page. Unit and connector used as illustration below is for reference only.
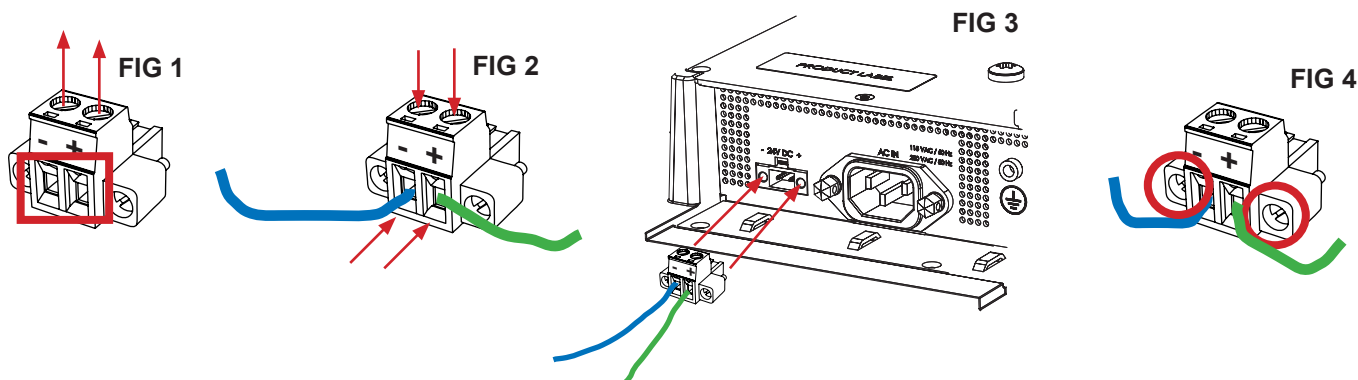
FIG 1: Unscrew (from top) or make sure that the screw terminal (square area) is fully open, so you can secure the inserted cables correctly to the loose housing connector (it may already be plugged into the unit as per factory installation).

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 are firmly in place and do not appear loose or fall 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 conform with the markings on the connector area of the unit. Finalize the installation by fastening the screws located in front on each side of the housing connector **(FIG 4).**

Connector / Function	Recommended Cable Thickness
2-pin DC Power Input (Terminal Block 5.08)	Minimum 20 AWG - Maximum 18 AWG
4-pin CAN (Terminal Block 3.81)	Minimum 22 AWG - Maximum 20 AWG
5-pin NMEA COM (Terminal Block 3.81)	Minimum 22 AWG - Maximum 18 AWG
5-pin DIO (Terminal Block 3.81)	Minimum 22 AWG - Maximum 18 AWG

Installation Procedures
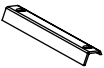
Console Mounting

The Console Mount Display model comes with a complete mounting bracket system and the External Remote Control (Tactile Display Controls (TDC)) as standard (HD TDCMVD KIT-A1). You need: Torx T25 tool,
1 pcs of HD CMB SX2-G1 kit (included in delivery).
Console Thickness Min: 7.50 [0.30"] - Max: 15.00 [0.59"] mm [inch]

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.

Item	Amount	Art	Description	Notes
	10	P006858-1	Console Mounting Bracket for Slim Units	
	20	145 050x016 A4T	M5x16 Pan Head screw ISO 14583 Torx, A4	For P006858-1
	20	144 064x120x22	M6 C-washers DIN6319 Steel	For P006858-1

▼ 1: Slide the unit into the panel cutout carefully. User Controls and Connector Area should be facing downwards.
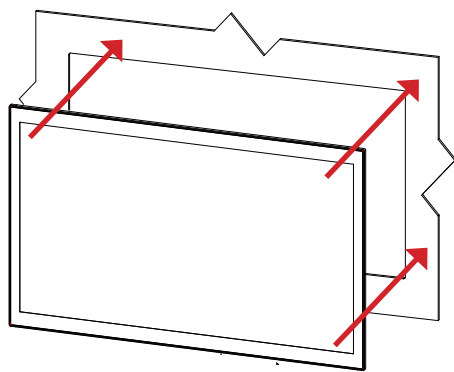
▼ 2: Mount all 10 brackets in rear as indicated.
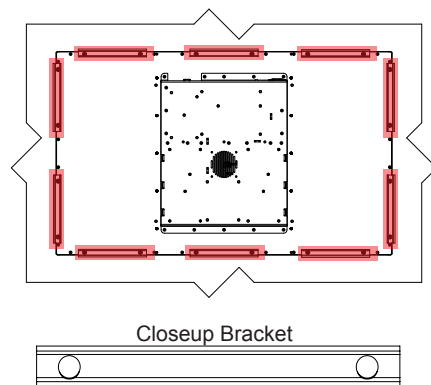
Closeup Bracket

▼ 3: Secure each bracket with the provided screws as illustrated below. Make sure you do it equally and even for all 4 sides. Use Torque Force 3.75Nm. Note the orientation of brackets before you begin.

Bracket
Washer
Screw
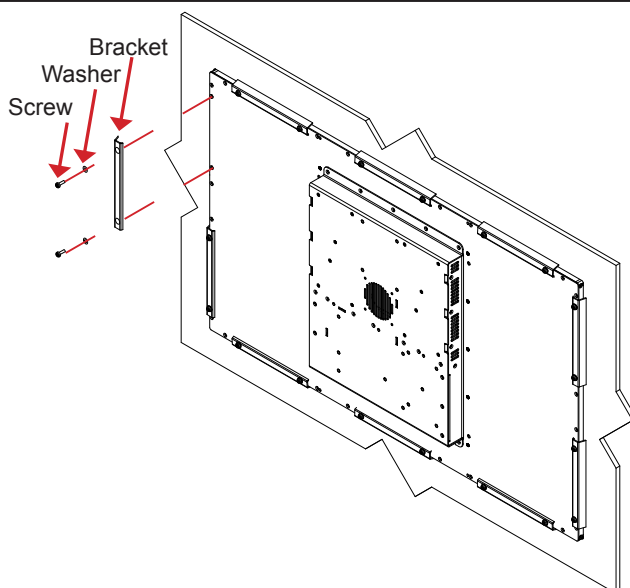
▼ 4: Review closeup of the mounting of brackets with screws. Seen from bottom side.

Display
Console
Bracket+Washer+Screw
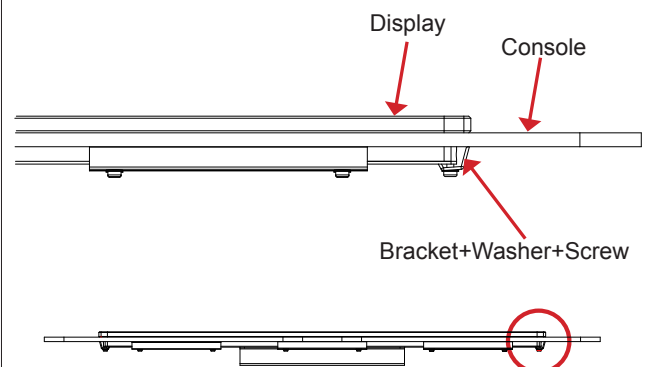
Installation 28

Installation Procedures

▼ 5: Mount the External Tactile Display Controls (TDC) unit as desired elsewhere in the console (Note: Cable length from factory is 1.5m). Review Technical Drawings in this user manual for more details or see Panel Cutout reference below. Connection between TDC and Display must occur inside console.
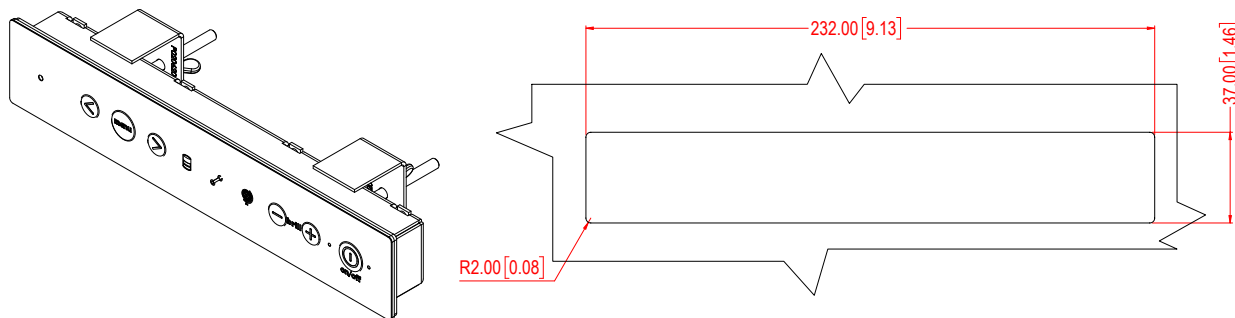
Note: Cable that connects the TDC unit to the Display unit must under no circumstances be connected or disconnected while the Display unit is powered on. Failure to do so may result in a damaged TDC or Display Unit

Physical Connections

Connection area

Power Input AC   Firmware Update   DisplayPort (DP) In   2 x HDMI1.4 In   USB Touch+SCOM   User Port   SCOM RS-422/RS-485

Power Input DC   Grounding Screw   1 x HDMI2.0 In   TDC Interface   SCOM RJ45 Network   SCOM RS-232
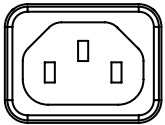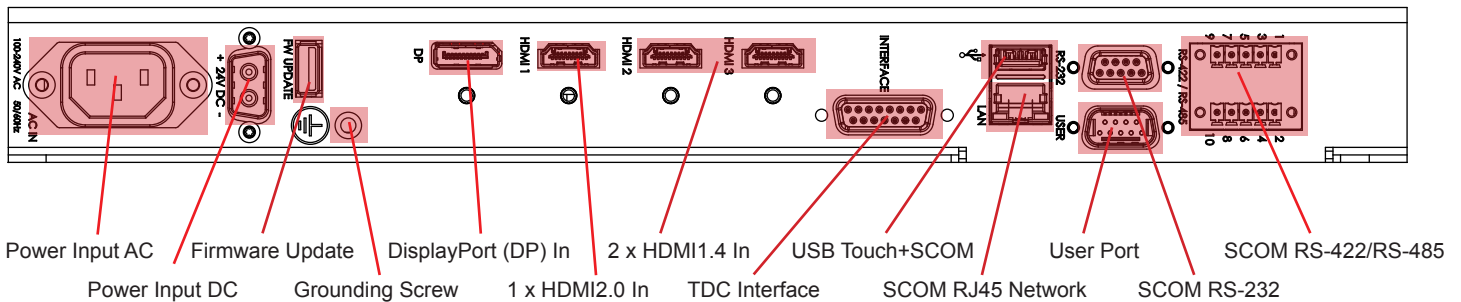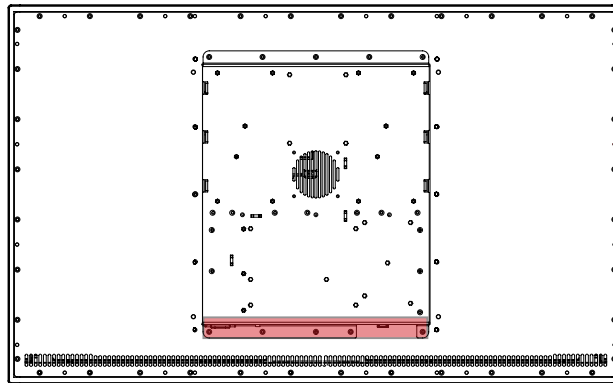
POWER INPUT AC:

The internal AC power module supports 100-240V AC 50/60Hz power input.
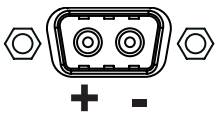
POWER INPUT DC:

Connect your DC power cable to the 2P Amphenol FCC17 D-SUB Connector (male). Secure the cable to the hex spacers provided on the unit, and secure the other end to your power supply. The internal DC power module supports 24VDC. Please check specifications for your unit.

Multi-power note:

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.

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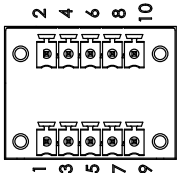
RS-422 / RS-485 COM I/O:

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. One example of peripherals from Hatteland Technology is the External Remote Controller (HD REM SX1-A1). This connector will allow remote control of the display unit to control common functions like brightness, input source and more via the Serial Remote Control (SCOM) as provided by Hatteland Technology.

Hatteland Technology's Serial Remote Control Interface (SCOM) protocol document can be downloaded from:
https://www.hattelandtechnology.com/hubfs/pdfget/inb100018-6.htm
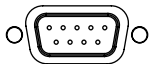
USER PORT (Potentiometer I/O):

Allows for controlling Brightness of the displayed image on screen by connecting an external remote control to the D-SUB 9P connector (male) which has Potentiometer Analog Input, User Brightness (BRT), I2C and +5VDC & 12VDC OUT functionality built in. Review the "Pin Assignments" chapter in this manual for more information on how to activate this functionality. Note: Do not connect/disconnect cables to this connector while product is powered on.
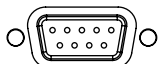
RS-232 SCOM I/O:

This D-SUB 9P connector (female) provides additional functionality for the unit. The Serial Remote Control (SCOM) 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 personnel only). Fasten your external cable to the connector using the provided screws on the cable housing.

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

Hatteland Technology's Serial Remote Control Interface (SCOM) protocol document can be downloaded from:
https://www.hattelandtechnology.com/hubfs/pdfget/inb100018-6.htm
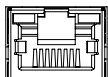
SCOM Network/LAN I/O:

Supports 10/100/1000Mbps Ethernet (LAN). Suitable for twisted pair cables CAT.5E. Make sure the network cable connector "clicks" into the RJ-45 connector. This connector will allow remote control of the display unit to control common functions like brightness, input source and more via the Serial Remote Control (SCOM) as provided by Hatteland Technology.

Hatteland Technology's Serial Remote Control Interface (SCOM) protocol document can be downloaded from:
https://www.hattelandtechnology.com/hubfs/pdfget/inb100018-6.htm

Physical Connections
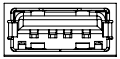
USB TOUCH SCREEN + SCOM:

Connect a TYPE A USB Cable between this connector and your PC. Port is USB2.0 (<5m). This connector will allow Touchscreen connectivity and/or remote control of the display unit to control common functions like brightness, input source and more via the Serial Remote Control (SCOM) as provided by Hatteland Technology.

Hatteland Technology's Serial Remote Control Interface (SCOM) protocol document can be downloaded from: https://www.hattelandtechnology.com/hubfs/pdfget/inb100018-6.htm

GROUNDING SCREW:

Please review "General mounting instructions" in the "Installation" chapter, pt. 7 for more information.
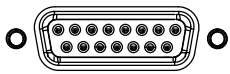
Interface Connector (External Tactile Display Controls - TDC):

This 15P DSUB (male) connector provides an interface for User Controls in order to Power On/OFF the unit as well as full access to the OSD Menu, Brightness, Contrast functions and more. On certain models this connector is already by factory default occupied and connected.

Secure the Interface 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.

> Note: Cable that connects the TDC unit to the Display unit must under no circumstances be connected or disconnected while the Display unit is powered on. Failure to do so may result in a damaged TDC or Display Unit
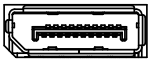
DisplayPort (DP) IN:

Connect your DP (male) cable firmly into to the DisplayPort (v1.2) 20P connector (female) of the unit. For additional secure mounting, consider using the provided "ATEN LockPro HDMI/DP Cablelock". For optimal signal quality and stability, use HDMI 1.4/2.0 compliant cable.

HDMI IN #1, #2, #3:

Connect your HDMI (male) cable firmly into to the HDMI 19P connector (female) of the unit. HDMI1 = 2.0, HDMI2 and HDMI3 = 1.4. For additional secure mounting, consider using the provided "ATEN LockPro HDMI/DP Cablelock". For optimal signal quality and stability, use HDMI 1.4/2.0 compliant cable.
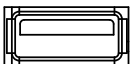
FW (Firmware) Update:

Intended for on-site possibility to upgrade/service the internal Firmware inside the unit that could fix issues or to improve functions for either Video Controller or Glass Display Control™ (GDC). Upgrading should only be performed by a skilled technician familiar with typical Firmware/Bios upgrading. Insert a TYPE A USB Memory Stick into this connector. Port is USB2.0 (<5m).

Firmware Upgrade Procedure available on request, reference: **DOC206316-1**.

In case of problems during Firmware update, please visit our support webpage: https://www.hattelandtechnology.com/support/contact

Operation

USER CONTROLS OVERVIEW

The Tactile Display Controls (TDC) External Remote allows interactivity and feedback. In addition, all buttons and symbols are backlight illuminated. Note that these symbols are only illuminated when suitable power is connected.
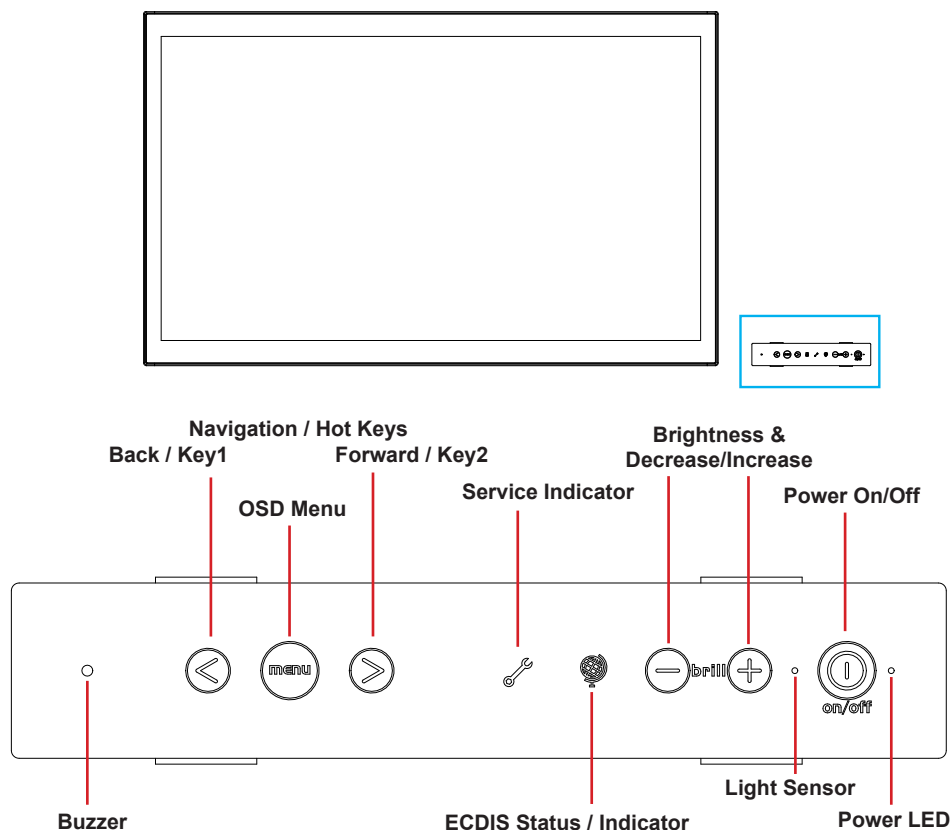
Power ON:
To turn the unit on, verify that the "Power LED" symbol is illuminated in orange (indicates suitable power is connected) and press the button and hold until the symbol changes to green light or an image appears on the screen.

Power OFF:
To turn the unit off, press the power button and hold until the "Power LED" either illuminates/changes from green to orange or the image on screen disappears.

OSD Menu, Navigation:

MENU: To access the main OSD menu, press the "MENU" button 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.

Navigation: If the OSD (On Screen Display) menu was activated (and is clearly visible on screen), both the "<" and ">" buttons are used to navigate and set options within the OSD menu. If OSD menu is not active on screen (and not assigned to any Hot Key functions) these buttons are not illuminated or active.

Hot Keys (Key1 / Key2): Additionally you can assign the (<) and (>) to behave like "Hot Keys". Please note that only assigned functions to the Hot Keys will make them illuminate and become active even if the OSD Menu was not shown on screen. If Hot Keys were defined and by pressing MENU, the (<) and (>) will revert back to Navigation logic, and any Hot Keys functions will have to be disabled in order to navigate the menu properly at this point.

Review "Miscellaneous > Key1/Key2" in OSD Menu for more information

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User Controls

Service Indicator:
Reserved for future use, no built-in function defined.

Brightness Adjust:
Brilliance / Brightness adjustment of the displayed image is adjusted by pressing the (-) or (+) buttons.

ECDIS Status / Indicator: (optional factory standard)
For units that have been factory ECDIS calibrated this symbol will illuminate in green constantly as long as the unit is powered. The symbol will illuminate in orange when the Brightness/Brilliance is adjusted either above or below ECDIS factory calibration point.

To be able to stay within ECDIS calibrated range, please assure that this symbol are not illuminated in orange color during operation. Note that by touching this symbol no action will be performed or has been assigned.

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 Technology SCOM functionality of the unit and thus can be used to control brightness remotely. Note: This sensor is barely visible to the eye and lies under the glass. It has no illumination behind to indicate its position. Touching or covering this area will naturally make the sensor data inaccurate and should be avoided!

By standard Hatteland Technology factory defaults this function has not been pre-defined.

Please review "SCOM Section: Glass Display Control™ (GDC)" section and the ""LIS" - Read Ambient Light Sensor" command for more information in the Serial Remote Control Interface (SCOM) protocol document, located at:
http://www.hattelandtechnology.com/hubfs/pdfget/inb100018-6.htm

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

menu	"MENU"
(-) (+)	"(-) Brilliance/Brill (+)"
(<) (>)	"(<) Navigation (>)" These can also be defined as "Hot Keys". Review "Miscellaneous > Key1/Key2" in OSD Menu

Buzzer:
Only functional for units ordered with Buzzer functionality. Frequency range is 1500-2500Hz. The location of the buzzer hole (physical hole in glass) is barely visible to 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 and review the Serial Remote Control Interface (SCOM) protocol document, located at:
http://www.hattelandtechnology.com/hubfs/pdfget/inb100018-6.htm

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OSD Menu Overview

On Screen Display (OSD) Menu Introduction

The OSD menu consists of single menu overlay with two columns which are Sub-Menu and Adjust Value / Choices Menu which are easy to navigate through. All functions are explained in-depth later in this user manual. Prior to using the OSD menu, you should 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. The OSD Menu overlay will appear over any signal input and based on OSD settings either be position in center, become transparent depending on factory default setting or by user's own preference.

⚠️ **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 Key Code (password) overview
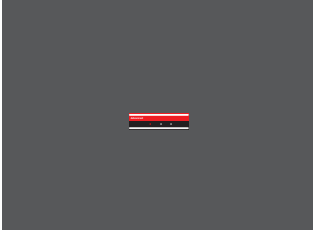
During use/accessing the OSD menu, based on factory default or customized configuration, there might be a pop-up requester asking for a Key Code (password) to gain further access to requested menu. These are 3 digits long.

Keycode	Description
321	Applies for "ECDIS Compliance" products. Code must be entered to get access to OSD MENU. Configured in OSD parameter: "OSD Menu > OSD Lock Mode > Menu Protect"
362	If OSD are in Basic Mode, entering code gets access to Advanced Mode. Configured in OSD parameter: "OSD Menu > OSD Mode > Advanced"
---	Service Mode - Only applicable for authorized service personnel. Configured in OSD parameter: "OSD Menu > OSD Mode > Service"

OSD Menu Overview

OSD Keycode / OSD Lock Mode

During use, a small requester may pop-up on screen asking you for a "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	**Advanced** 0 0 0 Close-up of Requester	**Advanced** 3 2 0 Close-up of Requester
1: Typical position of requester on screen.	2: Enter first number (from 0 to 9). Use "Navigation/Hot Keys" touch buttons to increase/decrease. Number change in real time.	3: Now touch menu button to store first number and proceed to second number. Current number will appear in red color
Advanced 3 2 1 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	

After the code is 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 "Basic" and "Advanced" menu modes and a complete map of all the underlying functions available within.

OSD Menu Overview

OSD "Basic" and "Advanced" Menu modes (examples)

You may encounter two different menu size setups based on factory default or by customized preset configuration. The "Basic" Menu mode offers easy and clear access to most commonly used functions. The "Advanced" Menu mode offers more choices with technical information and is suited for technical minded users or specific configuration needs.

Example of BASIC MENU

DisplayPort		Resolution: 3840x2160@60Hz
Image Settings	Select source to Adjust	Main Input
Color Mode Settings	Brightness	128
PIP Menu	Contrast	128
OSD Menu	Saturation	128
Miscellaneous	Hue	128
Input Source Settings	Sharpness	128
Communication	Analog VGA Adjustment	
Service Settings	Auto Adjustment	On
Presets	Exit	
Fault Status		
Exit		
	Main Input:	Second Input:
	Third Input:	Fourth Input:

Basic OSD Menu showing for example "Image Settings" chosen in the menu. The first column is visible at all times, while the two next columns will change based on contents of that submenu and adjustable values. The design and size of OSD menu area does not change in any setting. In Basic Mode, certain settings have been locked (gray text) to allow only the most common basic functions available for user only.

Example of ADVANCED MENU

DisplayPort		Resolution: 3840x2160@60Hz
Image Settings	Select source to Adjust	Main Input
Color Mode Settings	Brightness	128
PIP Menu	Contrast	128
OSD Menu	Saturation	128
Miscellaneous	Hue	128
Input Source Settings	Sharpness	128
Communication	Analog VGA Adjustment	
Service Settings	Auto Adjustment	On
Presets	Exit	
Fault Status		
Exit		
	Main Input:	Second Input:
	Third Input:	Fourth Input:

Advanced OSD Menu showing for example "Image Settings" chosen in the menu. The first column is visible at all times, while the two next columns will change based on contents of that submenu and adjustable values. The design and size of OSD menu area does not change in any setting. In Advanced Mode, all settings are available (except those which are dependent on signal inputs or by product design).

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OSD Visual User Feedback (examples)

Throughout all OSD menus there are certain graphic elements you need to familiarize yourself with. These are to visually indicate that a value can be increased/decreased, accessed, display a Slide Bar Meter or just for information purposes only. All functions have text based, human readable text for clarity and uses no graphical icons. 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.

Image Settings	**PIP H. Position**
A round frame with text marked in red, means this is the currently selected item in the menu with additional settings that can be adjusted	Text marked in gray color means that the current function in menu is either not enabled or is not available to adjust.
RS232 ●	**128**
A dot next to an item in the menu, means that this function is currently active and set by user previously (stored setting).	A Slider Bar meter indicates the minimum and maximum value for the current function selected. The current value is written to the left.

Note: The examples above are the most common ones displayed.

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OSD Menu Overview

OSD Menu Structure

In this table all functions within menus and their submenus with choices are shown. Functions with a ">" in the end, indicates a submenu or list of options will be displayed.

Image Settings

Main Menu	Sub Menu	Adjust / Choices Menu
Image Settings >	Select Source to Adjust >	- Main Input - Second Input - Third Input - Fourth Input
	Brightness >	(Slider Bar)
	Contrast >	(Slider Bar)
	Saturation >	(Slider Bar)
	Hue >	(Slider Bar)
	Sharpness >	(Slider Bar)
	Analog VGA Adjustment >	**Command not in use/No Function**
	Auto Adjustment >	**Command not in use/No Function**
	< Exit	

Color Mode Settings

Main Menu	Sub Menu	Adjust / Choices Menu
Color Mode Settings >	Color Temperature >	- 9300K - 8000K - 6500K - User
	Gamma >	- No Calibration - Calibration DisplayPort - Calibration HDMI
	Red Gain >	(Slider Bar)
	Green Gain >	(Slider Bar)
	Blue Gain >	(Slider Bar)
	Gamma Reset >	- On - Off
	< Exit	

OSD Menu Overview

PIP Menu

Main Menu	Sub Menu	Adjust / Choices Menu
PIP Menu >	PIP Mode >	- PIP Off - PIP Child - PIP Split - PIP Wide - Triple PIP - Quad PIP
	PIP Child Size >	(Slider Bar)
	PIP H. Position	(Slider Bar)
	PIP V. Position	(Slider Bar)
	Swap Source	(Automatic Action)
	< Exit	

OSD Menu

Main Menu	Sub Menu	Adjust / Choices Menu
OSD Menu >	OSD Language >	- English - Français > (French) - Deutsch > (German) - Italiano > (Italian) - Norsk > (Norwegian) - 日本語 > (Japanese) - 簡體中文 > (Simplified Chinese)
	OSD H. Position >	(Slider Bar)
	OSD V. Position >	(Slider Bar)
	OSD Timeout (sec) >	(Slider Bar)
	OSD Transparent >	(Slider Bar)
	OSD Mode >	- Basic - Advanced - Service
	OSD Lock Mode >	- Normal - Menu Protect - Full Protect
	OSD Key Outdoor >	- On - Off
	< Exit	

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OSD Menu Overview

Miscellaneous

Main Menu	Sub Menu	Adjust / Choices Menu
Miscellaneous >	Aspect Ratio >	- Full - 16:9 - 4:3 - 1:1 - Native
	GDC Sensitivity >	(Slider Bar)
	Power Plan >	- Enable - Disable
	LAN/Sleep-Mode >	- Enable - Disable
	Touch PWR >	- DP - HDMI1 - HDMI2 - HDMI3 - Signal - Active - Off
	Power Button >	- Enable - Disable
	DDC/CI >	- DP - HDMI1 - HDMI2 - HDMI3 - Disable - Signal - Active
	Key 1 >	- Black Level - Touch PWR - Main Input - Second Input - PIP Mode - Aspect Ratio - Swap Source - Test Pattern - Language - No Function
	Key 2 >	- Black Level - Touch PWR - Main Input - Second Input - PIP Mode - Aspect Ratio - Swap Source - Test Pattern - Language - No Function
	< Exit	

Input Source Settings

Main Menu	Sub Menu	Adjust / Choices Menu
Input Source Settings >	Main Input >	- Display Port - HDMI1 - HDMI2 - HDMI3
	Second Input >	- Display Port - HDMI1 - HDMI2 - HDMI3
	Third Input >	- Display Port - HDMI1 - HDMI2 - HDMI3
	Fourth Input >	- Display Port - HDMI1 - HDMI2 - HDMI3
	Auto Source >	- On - Off
	< Exit	

Communication

Main Menu	Sub Menu	Adjust / Choices Menu
Communication >	RS232 >	(Automatic Action)
	2-wire RS485 >	(Automatic Action)
	4-wire RS485/422 >	(Automatic Action)
	USB >	(Automatic Action)
	Address RS >	(Slider Bar)
	Auto IP Address >	- Enable - Disable
	Fixed IP Address >	(Number Input, xxx.xxx.xxx.xxx)
	< Exit	

Service Settings

Main Menu	Sub Menu	Adjust / Choices Menu
Service Settings >	Video Scaler Firmware:	(Text only)
	uC Firmware:	(Text only)
	Current Temperature:	(Text only)
	Test Pattern >	- Enable - Disable
	Burn In >	- Enable - Disable
	< Exit	

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OSD Menu Overview

Presets

Main Menu	Sub Menu	Adjust / Choices Menu
Presets >	Save >	- User1 - User2 - User3 - User4 - User5
	Load >	- Default - User1 - User2 - User3 - User4 - User5
	Recall >	(Automatic Action)
	< Exit	

Fault Status

Main Menu	Sub Menu	Adjust / Choices Menu
Fault Status >	NVRAM	(Text only)
	Ethernet	(Text only)
	GDC	(Text only)
	TMP Sensor	(Text only)
	LED Driver	(Text only)
	Video Scaler	(Text only)
	MAC Eeprom	(Text only)
	< Exit	

OSD Menu Functions

On Screen Display (OSD) Menu Functions

The following section covers all possible settings that are user adjustable via easy understandable menus, text and navigation. To simplify reading the menu choices, **"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 are 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 any menu (including time out 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.**

Image Settings

Lets you configure various visual preferences for any signal input, including activated Picture-in-Picture (PIP) sources available and if configured by user. The contents of this submenu and choices are listed below.

|---2---   **Image Settings > Select Source to Adjust**

The possible signal source inputs are; "Main Input", "Second Input", "Third Input" and "Fourth Input". Note: Any of the inputs may have been configured as either; DisplayPort (DP), HDMI1, HDMI2 or HDMI3 depending on factory defaults and user preferences. To set the category for a chosen input, review the "Input Source Settings" later in this manual.

|---2---   **Image Settings > Brightness**

Increase/decrease the black level saturation of the TFT panel electronically by controlling the voltage level in real-time of the current selected source signal. Window overlays (PIP/PBP) and the OSD Menu overlay will be unaffected. This will be independent of the actual adjustment done by the front user controls like potmeters or buttons. A visual slider in the OSD menu will show the current value.

● Note: Value adjustable from 0 to 255. 128 is factory default.

|---2---   **Image Settings > Contrast**

Increase/decrease the contrast of the panel electronically by controlling the voltage level in real-time of the current selected source signal. Window overlays (PIP/PBP) and the OSD Menu overlay will be unaffected. A visual slider in the OSD menu will show the current value.

● Note: Value adjustable from 0 to 255. 128 is factory default.

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OSD Menu Functions

|---2--- **Image Settings > Saturation**

Increase/decrease the overall video color saturation/color amount of the current selected source signal. Note that this function can also make noisy color signals appear crisper/clearer if adjusted to gray scales.

● Note: Value adjustable from 0 to 255. 128 is factory default.

|---2--- **Image Settings > Hue**

Allows you to adjust/shift the main color properties of all Red, Green, Blue and Yellow (unique hues) values. This can be useful in certain cases whose output may have shifted or seems to be "out of phase", where for instance blue seems more dominant than green, red and yellow-ish colors. By using HUE one can shift the entire color range of all components left or right in the spectrum.

● Note: Value adjustable from 0 to 255. 128 is factory default.

|---2--- **Image Settings > Sharpness**

Increase/decrease the overall image sharpness. This affects the active display area, and applies to all signal inputs and window overlays (PIP/PBP). Use it to increase the visual quality of signals from older equipment or improve electronically weak signals.

● Note: Value adjustable from 0 to 255. 128 is factory default.

|---2--- **Image Settings > Analog VGA Adjustment**

NOTE: This function is not supported or active for this product type.

|---2--- **Image Settings > Auto Adjustment**

NOTE: This function is not supported or active for this product type.

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OSD Menu Functions

Color Mode Settings

Lets you adjust the color temperature (Kelvin degrees) of the image. This applies to the Main Source signal. Window overlays (PIP/PBP) and OSD Menu overlay will be unaffected. Lower values make the image appear warmer, while higher values will make it appear cooler. The contents of this submenu and choices 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 Settings > Color Temperature

Set to either "9300K" (Cool, a blueish white), "8000K" (Neutral, a white close to natural light), "6500K" (Warn, a reddish white) or "User", (only available when Advanced Menu Mode is active).

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

Color Mode Settings > Color Temperature > User

Allows individual adjustment of Red, Green and Blue color gains. The selected setting will be saved for each signal input.

● Note: Value adjustable from 0 to 255. 128 is factory default.

|---2---

Color Mode Settings > Gamma

This will activate the stored gamma curve color compensation as well as the LED indicators or backlight brilliance used with ECDIS. Set to either "No Calibration", "Calibration DisplayPort" or "Calibration HDMI", where these represents the two storage locations for compensation data. When either of them are active, they will override the color temperature setting for the signal channel. Different signal channels can be set to different settings that will be saved.

This function is suitable for use with external equipment. Color temperature will be disabled.

● Note: Default is No Calibration with Gamma 2.2 and 140nits.

|---2---

Color Mode Settings > Red Gain

Increase or Decrease the overall gain for the displayed image on screen affecting values RGB, where R=RED intensity in specific is adjusted (GB values are not affected).

● Note: Value adjustable from 0 to 255. 128 is factory default.

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OSD Menu Functions

|---2---
Color Mode Settings > Green Gain

Increase or Decrease the overall gain for the displayed image on screen affecting values RGB, where G=GREEN intensity in specific is adjusted (RB values are not affected).

● Note: Value adjustable from 0 to 255. 128 is factory default.

|---2---
Color Mode Settings > Blue Gain

Increase or Decrease the overall gain for the displayed image on screen affecting values RGB, where B=BLUE intensity in specific is adjusted (RG values are not affected).

● Note: Value adjustable from 0 to 255. 128 is factory default.

|---2---
Color Mode Settings > Gamma Reset

This will restore the original factory default setting, where "No Calibration" profile is automatically chosen and Gamma=2.2 with 140nits.

Settings as follows:

"On"   = Executes Gamma Reset and sets to "No Calibration"
"Off"   = No function executed

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OSD Menu Functions

PIP Menu
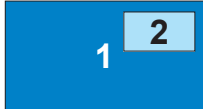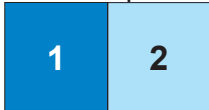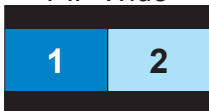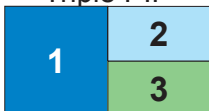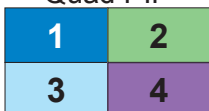
Lets you adjust how the Picture-in-Picture (PIP) display mode is set up. The default position of the rectangle is set to the upper left corner of the Active Display area. Note that this requires a valid incoming signal to be present in either signal inputs. The contents of this submenu and choices are listed below.

Since several sources can be used as PIP overlay, each available PIP overlay can be configured. To choose the specific PIP overlay to be adjusted, see earlier reference in the manual under "Image Settings > Select Source to Adjust" function.

|---2---   ### PIP Menu > PIP Mode

Settings as follows:

"PIP Off"   = Picture in Picture is inactive and the other PIP settings can not be accessed.

"PIP Child" **1** **2**	The Second Signal Source will be displayed in a small frame as an overlay over the Main Source signal. Other PIP settings can now be adjusted.
"PIP Split" **1** **2**	The Main Source and Second signal sources are shown side-by-side with the Main Source to the left and the Second Source to the right. Other PIP settings can now be adjusted. Note: Both sources will be stretched to fill screen. If aspect ratio is needed, consider PIP Wide function below, or set the sources to match 50% resolution of the native display. Example: If native TFT panel has 3840 x 2160 resolution, sources must be set to 1920 (wide) x 2160 (height) to appear correctly (aspect ratio).
"PIP Wide" **1** **2**	The Main Source and Second signal sources are shown side-by-side in widescreen mode with the Main Source to the left and the Second to the right. Other PIP settings can now be adjusted.
"Triple PIP" **1** **2** **3**	The Main Source, Second and Third signal sources are shown as row/column style. Other PIP settings can now be adjusted. Note: Only 1920x1080 signals are accepted. Main source will be stretched to fill screen. If aspect ratio is needed set the Main Source to 1920 (wide) x 2160 (height) to appear correctly (aspect ratio).
"Quad PIP" **1** **2** **3** **4**	The Main Source, Second, Third and Fourth signal sources are shown row/ column style. Other PIP settings can now be adjusted. Since there are no Main Source under these overlays in this setting, the Main Source is now part of a 2-by-2 visible setup (usually located in the top left corner) displaying 4 x true 1920x1080 (Full HD) signals at the same time.

If Touch Screen is present on unit and operational during any PIP modes:
Touch always on   = in this all touch signal is broadcasted to connected computer unit independently of active graphical inputs.
Touch active   = broadcast touch signal when main source is active.

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OSD Menu Functions

PIP Menu > PIP Child Size

Adjust the size (H and V proportionally) for the currently selected PIP Source, values from 1 to 7.

Note: Example shows calculation and approximate size in mm and precise pixels assuming a FHD 1920x1080 was used as PIP Source. PIP size is dependent on incoming PIP source signal, such as its resolution and aspect ratio will both affect sizes in mm and pixels in comparsion to illustration below. However, the visual appearance between each step is relative to example below. All mm values are rounded up to nearest. Deviation is +/- 1mm. PIP Position in H. and V. are 0 in this example.

43 inch panel:
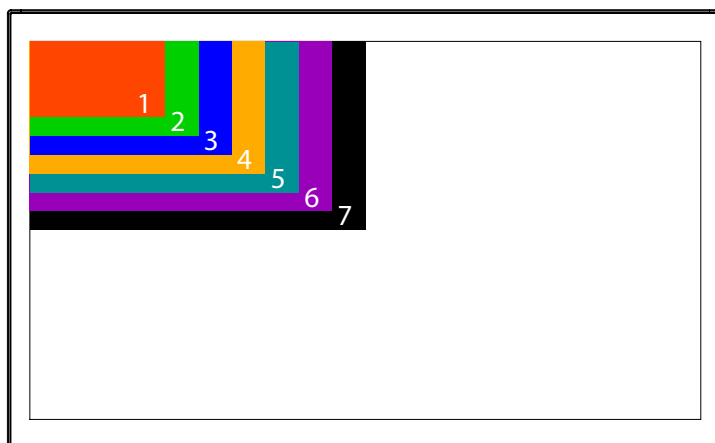
STEP VALUE	in MM	in Pixels
1 (Min Size)	188 x 106	770 x 434
2	236 x 132	964 x 542
3	282 x 159	1154 x 648
4	330 x 185	1346 x 756
5	376 x 212	1536 x 864
6	424 x 238	1730 x 972
7 (max size) 1/4 of Native TFT	470 x 264	1920 x 1080

PIP Menu > PIP H. Position

Adjust the Horizontal (left/right) position for the currently selected PIP Source, values from 0 to 255.

PIP Menu > PIP V. Position

Adjust the Vertical (up/down) position for the currently selected PIP Source, values from 0 to 255.

PIP Menu > Swap Source

Swaps the Primary source signal with Secondary source signal including adjustments you may have made, meaning that whatever is in Main Source will become the contents of the defined PIP rectangle, and contents of the PIP rectangle to become full screen.

OSD Menu Functions

OSD Menu

Allows you to customize the visual appearance of the On Screen Display (OSD) menu and its behavior. The contents of this submenu and choices are listed below.

|---2---
OSD Menu > OSD Language

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

Settings as follows:

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

● Note: Current selected language is shown in green color. Default language is English.

|---2---
OSD Menu > OSD H. Position

Place the OSD menu overlay Horizontally (left/right), values from 0 to 255.

● Note: Default value is 128 (50% half of current resolution)

|---2---
OSD Menu > OSD V. Position

Place the OSD menu overlay Vertically (up/down), values from 0 to 255.

● Note: Default value is 128 (50% half of current resolution)

|---2---
OSD Menu > OSD Timeout (sec)

Adjust the timeout in seconds that the OSD menu overlay is automatically exited and hidden from view. This timeout is counted from last activity (navigation or adjusting parameters). The value is adjustable from 5 to 30 seconds.

● Note: Default timeout value is 10 seconds.

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OSD Menu Functions

|---2--- **OSD Menu > OSD Transparent**

Adjust the alpha blend also known as transparency of the OSD Menu overlay. It means that all signal inputs and PIP/PBP images show through the OSD Menu. It is used when important information on the display is necessary to be visible at all times.

● Note: Level adjustable from 0 to 7. 0 is factory default (no transparency/solid background color).

|---2--- **OSD Menu > OSD Mode**

Configuring the OSD Menu access based on most common functions to service/trouble-shooting.

Settings as follows:

"Basic" = A few functions are 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.

"Advanced" = All functions and parameters are 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.

"Service" = Only applicable for authorized service personnel.

● Note: Learn how to navigate and enter the correct code, by reading the "OSD Keycode / OSD Lock Mode" introduction section in the previous chapter.

● Note: When requesting "Advanced" mode from "Basic" mode, the user is required to enter a key code. This code is factory preset to "362". You can enter the code by using navigation and "MENU" to confirm. After a successful entering of the key code, the OSD menu will always be in this state during powered on. After a power off and on to the unit, the OSD Mode will be reverted back to "Basic" mode.

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OSD Menu Functions

|---2--- **OSD Menu > OSD Lock Mode**

To prevent accidental or unwanted user intervention, you can set the behavior of how the OSD menu is accessible by the user including adjusting brightness via the "(-) Brilliance (+)" symbols. Normally by factory default accessible by touching the "MENU" symbol.

Settings as follows:

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

"Menu Protect" = Ask for key code first (321) when the "MENU" symbol is touched on the front glass and before the OSD menu will appear.
Required for ECDIS Compliance usage.

"Full Protect" = When activated: You will have to touch the "MENU" symbol for 5 seconds after which the key code requester will appear. Note that only the "MENU" symbol will activate the password request, all other touches on other symbols are ignored. After key code was entered and accepted, the OSD menu will appear in which case you have **"x"** seconds to use brilliance and power functions before all functions are deactivated again and returns to "Advanced Mode".

"x" value is defined as OSD Timeout (sec) value.

● Note: Learn how to navigate and enter the correct code, by reading the "OSD Keycode / OSD Lock Mode" introduction section earlier in this chapter.

|---2--- **OSD Menu > OSD Key Outdoor**

NOTE: This function is primarily suitable for units with "Glass Display Control™ (GDC) which feature touch technology. This function does not add any suitable support for units with "Tactile Display Controls (TDC) that feature conventional button technology. To determine which model you have, please review "User Cntrols" chapter in this manual.

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 potentially trigger touch button functions.

Settings as follows:

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

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OSD Menu Functions

Miscellaneous

Allows you to adjust various settings for interaction/communication and behavior. The contents of this submenu and choices are listed below.

|---2---

Miscellaneous > Aspect Ratio

Allows you to scale the currently displayed full screen signal in various ways.

Settings as follows:

"Full" = Zoom current full screen signal to fill the entire active display area. Aspect ratio is ignored, which means that picture may appear distorted or stretched.

"16:9" = Default setting. Ensures a widescreen aspect ratio true to the actual properties of the screen.

"4:3" = Shows the incoming signal as 4:3 scaling. Note: On a widescreen physical size, the image on screen will have black borders on each side and the image on screen may appear distorted or compressed in height.

"1:1" = Zoom current screen signal to fill the entire active display area as 1:1 native pixel resolution. Example; if the incoming signal is a 1920x1080, on a 3840x2160 unit, the incoming signal will be shown 50% less in size and centered on screen. Aspect ratio is kept unchanged.

"Native" = Size in respect of native TFT LCD resolution.

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OSD Menu Functions

|---2---
Miscellaneous > GDC Sensitivity

NOTE: This function is primarily suitable for units with "Glass Display Control™" (GDC) which feature touch technology. This function does not add any suitable support for units with "Tactile Display Controls (TDC) that feature conventional button technology. To determine which model you have, please review "User Cntrols" chapter in this manual.

The touch enabled symbols known as GDC (Glass Display Control™) can be adjusted in sensitivity. It basically means that a small value requires a larger area to be covered longer over time, while a large value will require less smaller area to be covered in less time. If you set the value too low or too high, you may feel a difference in either increased responsiveness or the lack of such. By factory default, the most optimal value has been preset.

Values from 0 to 255.

- Note: Default is model dependent and set by factory. Note that the difference between 0 and 255 is minimal, as it is not suitable to go beyond a fair responsiveness that could cause accidental triggering of functions to occur by nearby objects touching the glass (i.e. rain drops for instance, washing glass with cloth).

- Caution: If the sensitivity value was set very low, you may experience an increased occurrence of non-responsiveness which also affects accessing the correct menu function in order to re-adjust this value. It is therefore suggested as a last resort solution to reset this value via SCOM (Serial/Ethernet Communication) functionality instead by sending a "Reset Factory Default" (or "Load User Default"+Slot Number, if available and previously stored by using "Save User Default"+Slot Number) commands if you are unable to navigate the OSD menu.

|---2---
Miscellaneous > Power Plan

This setting will allow users to configure the overall power mode of USB port in Power off mode. When set to "Enable" users can remotely send SCOM commands through USB port even if unit has entered into Power off (sleep mode / no image on screen). When set to "Disable" the USB port is not active and cannot receive SCOM commands.

Settings as follows:

"Enable"   = Enabled power off mode.
"Disable"   = Disabled power off mode.

- Note: Factory Default set to "Disable"

|---2---
Miscellaneous > Lan/Sleep Mode

This setting will allow users to configure the power mode of Ethernet port in Power off mode. When set to "Enable" users can remotely send SCOM commands through Ethernet port even if unit has entered into Power off (sleep mode / no image on screen). When set to "Disable" the Ethernet port is not active and cannot receive SCOM commands.

Settings as follows:

"Enable"   = Enabled in power off mode.
"Disable"   = Disabled in power off mode.

- Note: Factory Default set to "Enable"

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OSD Menu Functions

|---2--- **Miscellaneous > Touch PWR**

This setting will allow you to filter the signal processing from touch screen to reach the computer. For instance, if user only want touch screen to be active when DisplayPort signal is defined as Main Input, but disallows touch screen processing on other signal inputs, the non-touch screen enabled signal inputs would require the user to operate elements on screen either with keyboard, mouse or just for information purposes only with no user interaction possible via touch screen.

Settings as follows (applies to defined Main Source Input):

"DP"	= Touch is enabled only when DisplayPort is active as Main Input.
"HDMI1"	= Touch is enabled only when HDMI1 is active as Main Input.
"HDMI2"	= Touch is enabled only when HDMI2 is active as Main Input.
"HDMI3"	= Touch is enabled only when HDMI3 is active as Main Input.
"Signal"	= Touch is enabled when any input is active as Main Input.
"Active"	= Touch is always enabled, even if there are no image on screen. Display unit may be powered off, but require power cable connected as well as a powered on computer. Signals from touch screen will still reach the computer.
"Off"	= Touch disabled. No signals sent from touch screen to computer.

● Note: Default Factory Setting is "DP".

|---2--- **Miscellaneous > Power Button**

This setting will allow you to manually enable the use of an external power button to turn off the Display unit. Please review the Pinout Assignments (Potentiometer Control 9-pin DSUB MALE Connector) for connectivity.

Settings as follows:

"Enable"	= Key press from External power button detection enabled.
"Disable"	= Key press from External power button detection disabled.

|---2--- **Miscellaneous > DDC/CI**

This setting will allow user to enable and set which signal input where DDC/CI display control communication will occur. For more information about DDC/CI, please review the "Operation Advanced (DDC/CI) Control Overview" chapter in this manual.

The possible choices are: "DP", "HDMI1", "HDMI2", "HDMI3", "Disable", "Signal" and "Active" (enabled on any input source that appear as Main Input).

|---2--- **Miscellaneous > Key 1 / Key 2**

Assign a commonly used OSD menu function to the available touch enabled "Hot Keys" (<) and (>) which are located on the User Controls. The following functions are available to assign and most of them have a negative and positive counting logic. All of these functions are described before and after this segment in the manual.

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OSD Menu Functions

Settings as follows (for both "Key1" and "Key2"):

"Black Level" = Increase/Decrease Brightness of the TFT panel (not backlight).
Reference in user manual: "Image Settings / Brightness"

"PIP Child Size" = Increase/Decrease the size of the Picture-In-Picture overlay.
Reference in user manual: "PIP Menu / PIP Child Size"

"Main Source" = Flip up/down through the available signal sources (to full screen) defined as Main Input.
Reference in user manual: "PIP Menu / Swap Source"

"Second Source" = Flip up/down through the available signal sources (to PIP/PBP) defined as Second, Third and Fourth Inputs
Reference in user manual: "PIP Menu / Swap Source"

"PIP Mode" = Flip up/down through the PIP/PBP functions.
Reference in user manual: "PIP Menu / PIP Mode"

"Graphic Scaling" = Flip up/down through the scaling methods available.
Reference in user manual: "OSD Miscellaneous / Aspect Ratio"

"Swap Source" = Loops through all the sources available defined as Main, Second, Third and Fourth input. Range is: "DP", "HDMI1", "HDMI2", "HDMI3"
Reference in user manual: "Input Source Settings"

"Test Pattern" = Display the internal test image overriding any signal inputs. Both Hot Keys performs the same action.
Reference in user manual: "Service Settings / Test Pattern"

"OSD Language" = Flip up/down through available languages (real-time changes).
Reference in user manual: "OSD Menu > OSD Language"

"No Function" = Nothing will be activated when user touches Hot Keys on front glass. Both Hot Keys performs the same action.

● Note: Default Hot Keys are assigned to "No Function"

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OSD Menu Functions

Input Source Settings

Allows you to assign the OSD named inputs to a physical reference to the available signal sources connected to the unit. The contents of this submenu and choices are listed below. Note: Switch time between sources is ~5 sec.

|---2--- **Input Source Settings > Main Input**

Whatever chosen as "Main Input" will be used as reference throughout the OSD Menu.
Available sources are; "Display Port","HDMI1","HDMI2" and "HDMI3".

|---2--- **Input Source Settings > Second Input**

Whatever chosen as "Second Input" will be used as reference throughout the OSD Menu.
Available sources are; "Display Port","HDMI1","HDMI2" and "HDMI3".

|---2--- **Input Source Settings > Third Input**

Whatever chosen as "Third Input" will be used as reference throughout the OSD Menu.
Available sources are; "Display Port","HDMI1","HDMI2" and "HDMI3".

|---2--- **Input Source Settings > Fourth Input**

Whatever chosen as "Fourth Input" will be used as reference throughout the OSD Menu.
Available sources are; "Display Port","HDMI1","HDMI2" and "HDMI3".

|---2--- **Input Source Settings > Auto Source**

Turns on or off the internal automatic detection of incoming signals and when found stops and show this signal source on the screen. If no source is connected physically, the function will loop through all inputs forever. Available sources are "DisplayPort", "HDMI1", "HDMI2" and "HDMI3".

Settings as follows:
  "On"   = Loops until a valid signal source is found and stops. "On" is Factory default.
  "Off"   = No automatic detection loop will occur. User has to set manually.
         Unit will enter Sleep mode.

● Switch time for next source is ~5 sec.The longest auto detection time is ~1minute from 1st source to last source.

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OSD Menu Functions

Communication

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

A more detailed description of the SCOM (Serial/Ethernet Communication) can be found here:
https://www.hattelandtechnology.com/hubfs/pdfget/inb100018-6.htm
Review also the "Pinout Assignments" chapter in this manual for additional help during preparation and/or installation of external equipment intended to communicate with.

Settings as follows:

"RS232"   = Sets the SCOM communication to standard RS-232 protocol.

"2-wire RS-485"   = Sets the SCOM communication to RS-485 protocol (Half duplex).

"4-wire RS485/422"   = Sets the SCOM communication to RS-485/422 protocol (Full duplex).

"USB"   = Sets the SCOM communication to standard USB protocol.

"Address RS"   = Set the global unique channel / port ID for the unit (range 0-254).

"Auto IP Address"   = Enable or Disable the discovery to assign IP Adress Automatically.

"Fixed IP Address"   = You can set the IP address manually (xxx.xxx.xxx.xxx).

● Note: Default mode is "RS232" protocol.

OSD Menu Functions

Service Settings

Will show various technical and unit related information, such as; Firmware versions, activation for the internal Test Pattern image useful for trouble-shooting. Some of these functions are static information while others are accessible. Whenever you are in contact with helpdesk or service, 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:

"Video Scaler Firmware" = Displays the firmware version of the video controller.
Example: "FW300001-0A21"

"uC Firmware" = Displays the firmware version of the touch enabled buttons.
Example: "FW100002-TA09"

"Current Temperature" = Shows the internal temperature measured by onchip sensor.
Example: "+042..", in Celsius Degrees.

|---2---
Service Settings > Test Pattern

Will show the internal test pattern with greyscales, colors and raster patterned boxes to check for deviations in the TFT panel/display controller behavior. 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. The unit will show a Test Pattern even if no signal cable is connected or any valid signal source is detected.

To activate this function, touch the "MENU" button.
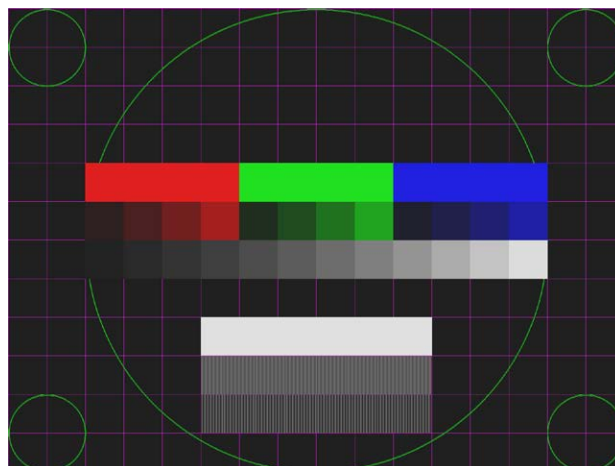
● Note: This function will not inform/report any deviations directly, you need to have the required technical expertise to interpret the test pattern displayed.

User Controls   60

|---2---

Service Settings > Burn In

Used to Warm up the panel with full-screen solid color. For internal testing purposes only. Please contact your nearest Hatteland Technology office, or Service Partner before using this setting.

OSD Menu Functions

Preset

Allows Memory Presets (Recall/Save/Load) for OSD menu settings and overlays user have defined. The contents of this submenu and choices are listed below.

|---2---
Preset > Save

Allows you to save current state of all functions and values to user defined presets.

Choices as follows:

"User 1"	= Save all OSD settings to User 1 slot.
"User 2"	= Save all OSD settings to User 2 slot.
"User 3"	= Save all OSD settings to User 3 slot.
"User 4"	= Save all OSD settings to User 4 slot.
"User 5"	= Save all OSD settings to User 5 slot.

|---2---
Preset > Load

Allows you to load previous states of all functions and values to user defined presets.

Choice as follows:

"Default"	= Reset back to initial values as they appeared when menu was accessed before any user interaction in the menu was noticed.
"User 1"	= Load all OSD settings from User 1 slot.
"User 2"	= Load all OSD settings from User 2 slot.
"User 3"	= Load all OSD settings from User 3 slot.
"User 4"	= Load all OSD settings from User 4 slot.
"User 5"	= Load all OSD settings from User 5 slot.

|---2---
Preset > Recall

Press "MENU" button to reset back to factory defaults. Will override and restore all previous modified settings.

User Controls   62

OSD Menu Functions

Fault Status

Will show detected Fault Status by measuring various internal values for the items monitored.
Status is stated as either "OK" or "FAULT". The contents of this submenu and choices are listed below.

Fault Status as follows:

"NVRAM" = Status on Non-volatile random-access memory which is used to store parameters and settings.

"Ethernet" = Status on Ethernet/LAN communication chip controller.

"GDC" = Status on User Controls button controller.

"TMP Sensor" = Status on internal temperature measured by on-chip sensor.

"LED Driver" = Not in use, default value "OK"

"Video Scaler" = Status on on-board Digital Visual Interface graphics chip processor.

"MAC Eeprom" = Status of the storage of the Ethernet Port MAC Address.

User Controls   63

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Operation Advanced (DDC/CI)

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 programmatically 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 DVI*, HDMI, DisplayPort (DP) and VGA*.

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 has 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 Technology Serial/Ethernet Communication Control Interface (SCOM) protocol, where specified, reference: https://www.hattelandtechnology.com/hubfs/pdfget/inb100018-6.htm

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

> *NOTE: This chapter is an overall description of DDC/CI support for various/selected Hatteland Technology products. References to VGA (RGB), DVI and Composite may not be present on your product, due to hardware changes/Engineering Change Notifications issued for Multi Vision Displays (MVD), please check actual datasheet for your model to verify.
> Reference: https://www.hatteland-display.com/mails/08_2019_ecn.html

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	Via SCOM
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 FF 00 xx 95*[P]	10 = Command ID Where **xx** = 0 to 255 **Min-Max Range:** 0-255 (0x00-0xFF) During Read reply, these values will be present. Read/Write support.	BRT
Power Mode (Power On/Off/Sleep) (0xD6) *Note: Not the same as OSD's "Power Plan" function.	Write Power Mode: [S] <6E:w> 51 84 03 D6 00 xx 5C [P] Reply of successfull request: [S] <6F:r> 5C 80 BE*[P] Read Power Mode: [S] <6E:w> 51 82 01 D6 6A [P] Reply of successfull request: [S] <6F:r> 6E 88 02 00 D6 01 00 05 00 xx 67*[P]	D6 = Command ID Where **xx** is: 0x01 = On 0x02 = Standby 0x03 = Standby 0x04 = Standby 0x05 = OFF 0x3F = Read Command: Modes are described in INB100018-6 (SCOM) document. Read/Write support.	PWR
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 FF 00 xx 00*[P]	E2 = Command ID Where **xx** = 0 to 255 **Min-Max Range:** 0-255 (0x00-0xFF) During Read reply, these values will be present. Read/Write support.	BRU

Operation Advanced (DDC/CI) Control Overview

Description	Syntax and Functionality	Details and Values	Via SCOM
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* **0E A2** = DP **0F A3** = HDMI Where Read **yy zz** **0C A2** = VGA* **0D A3** = DVI* **0E A4** = DP **0F A5** = HDMI Read/Write support.	MCC: (Gamma (Calibration))
Buzzer Control (0xE5)	Write/Turn ON: [S] <6E:w> 51 84 03 E5 00 FF 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 **FF** = Turn On Where **00** = Turn Off Write Support only.	BZZ

Description	Syntax and Functionality	Details and Values	Via SCOM
Touch Power Mode (0xE6)	Write/Set Power Mode: [S] <6E:w> 51 84 03 E6 00 xx A1 [P] Reply of successfull request: [S] <6F:r> 5C 80 BE*[P] Read Power Mode: [S] <6E:w> 51 82 01 E6 5A [P] Reply of successfull request : [S] <6F:r> 6E 88 02 00 E6 01 00 FF 00 FF 53*[P]	E6 = Command ID Where **xx** is: 0xFF = Always Active 0xFE = Only active when display is on and has an active input signal 0x00 = Only active if selected source is active AND Selected Source="DVI-I_1"* 0x01 = Only active if selected source is active AND Selected Source="DVI-I_2"* 0x02 = Only active if selected source is active AND Selected Source="DVI3"* 0x03 = Only active if selected source is active AND Selected Source="DVI4"* 0x10 = Only active if selected source is active AND Selected Source="RGB_1"* 0x11 = Only active if selected source is active AND Selected Source="RGB_2"* 0x12 = Only active if selected source is active AND Selected Source="RGB_3"* 0x13 = Only active if selected source is active AND Selected Source="RGB_4"* 0x20 = Only active if selected source is active AND Selected Source="CVIDEO1" 0x21 = Only active if selected source is active AND Selected Source="CVIDEO2" 0x22 = Only active if selected source is active AND Selected Source="CVIDEO3" 0x23 = Only active if selected source is active AND Selected Source="CVIDEO4" 0x30 = Only active if selected source is active AND Selected Source="DP1" 0x31 = Only active if selected source is active AND Selected Source="DP2" 0x32 = Only active if selected source is active AND Selected Source="DP3" 0x33 = Only active if selected source is active AND Selected Source="DP4" 0x3F = Read Command Read/Write support.	MCC: (Touch Power Mode)
Actual Temperature (0xF0)	Read Temperature: [S] <6E:w> 51 82 01 F0 4C [P] Reply of successfull request: [S] <6F:r> 6E 88 02 00 F0 01 ww xx yy zz 63*[P]	F0 = Command ID Read support. Reply 4 bytes (ww, xx, yy, zz) indicating degree in Celcius. Example: 0038	TMP
Unit Run Time (0xF3)	Read Elapsed Hours: [S] <6E:w> 51 82 01 F3 4F [P] Reply of successfull request: [S] <6F:r> 6E 88 02 00 F3 01 ww xx yy zz 63*[P]	F3 = Command ID Read support. Reply in ASCII 4 bytes (ww, xx, yy, zz) indicating hours. Example: 1038	ETC

Specifications

TFT Technology:
- High Quality TFT with LED Backlight Technology
- 42.5 inch viewable image size, Widescreen, Aspect Ratio 16:9
- a-Si TFT active matrix, RGB vertical stripe

TFT Characteristics:
- Native Resolution   : 3840 x 2160 (UHD, 4K)
- Pixel Pitch (RGB)   : 0.2451 (H) x 0.2451 (V) mm
- Response Time   : 8 ms (typical) (G to G)
- Contrast Ratio   : 3000:1 (typical)
- Light Intensity   : 500 cd/m² (typical)
- Viewable Angle   : +/- 89 deg. (typical) (Up/Down/Left/Right)
- Active Display Area   : 941.184 (H) x 529.416 (V) mm
- Max Colors   : 16.7 million

Supported Signals:
Resolutions:
VGA (640 x 350) to UHD (3840 x 2160*)
 Recommended for optimal picture quality. Review Timing Table in User Manual.

Power Specifications:
Multi-power Supply:
- 100-240V AC 50/60Hz + 24 VDC

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

Power Consumption:
- Operating: 130W (max)

Physical Considerations:
- W:1005.00 [39.57] x H:620 [24.41] x D: 75.50 [2.97] mm [inch]
- Weight: 27.0 kg / 59.4lbs

Signal Terminals:
- HDMI 1.4 Input   : 2 x 19p HDMI (female) - Max 3840x2160@30Hz
- HDMI 2.0 Input   : 1 x 19p HDMI (female) - Max 3840x2160@60Hz
- DP 1.2 Input   : 1 x 20p DisplayPort (female) - Max 3840x2160@60Hz
                      Note: Max Cable length: <3m
- SCOM RS-422/485   : 1 x 5-pin Terminal Block 3.81 non-isolated + Buzzer
- SCOM+Touch   : 1 x USB TYPE A Connector (female)
- SCOM Ethernet   : 1 x RJ45 Connector for Remote Control
- SCOM RS-232   : 1 x 9p D-SUB (female) non-isolated
- User Interface   : 1 x 9p D-SUB (male) - Potentiometer Analog Input,
                      User Brightness (BRT), I2C and +5VDC & 12VDC OUT
- SW Interface   : 1 x USB TYPE A (female) for Firmware Update
- GDCx Interface   : 1 x 15p D-SUB (male) for GDC Hardware Comm.
- AC Power IN   : 1 x Std IEC Inlet
- DC Power IN   : 1 x 2p D-SUB Connector (male) - Amphenol FCC17

User Controls:
External Tactile Display Controls (TDC) - Art: HD TDCMVD KIT-A1
- Power On/Off Button, Power LED, On Screen Display Menu Button,
- Brightness Control (-/+) buttons, Hotkeys (left/right) buttons,
- ECDIS Indicator, Buzzer, Light Sensor

Environmental Considerations:
- Operating   : Temperature -15C° to +55C°
- Storage   : Temperature -30C° to +70C°
- Humidity   : Up to 95% (Operating / Storage)
- IP Rating   : Protection: IP66 front - IP20 rear (EN60529)
- Compass Safe Distance : Standard: 80cm - Steering: 50cm

Lifetime Considerations:
Even though 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 TDCMVD KIT-A1 : 1 x External Tactile Display Controls (TDC)
                     (Included with delivery)
- HD CMB SX2-G1   : 1 x Console Mount Kit. EN60945 Tested
                     (Included with delivery)
- HD REM SX1-A1   : 1 x External Remote Control, EN60945 Tested
- P023259   : 1 x HM 43T22 EMI Shield Gasket Elastofoam

Please see user manual/datasheet for more information

Factory Options:
- Optical Bonding Technology
- Projected Capacitive Touch Screen (Multitouch, USB, Pen/Glove support)
- Color Calibrated models (ECDIS)

Prepared for:
- Tactor (Rotation Angle Value, X/Y Position, 1 x Button) supported Model
- Active Stylus Pen Supported Model

APPROVALS & CERTIFICATES

These products have been tested / type approved by the following classification societies:

IEC 60945 4th (EN 60945:2002)   **IACS E10**   **EU RO MR** - Mutual Recognition   **ClassNK** - Nippon Kaiji Kyokai
CCS - China Classification Society

Console/External Remote Model   **70**

Technical Drawings

Units: mm [inches]

BACK VIEW

583 [22,95]

164 [6,46]
164 [6,46]
164 [6,46]
164 [6,46]
164 [6,46]
164 [6,46]

20 x M5 mounting points
Max depth 12mm

975,50 [38,41]

164 [6,46]
164 [6,46]
164 [6,46]

BOTTOM VIEW

307,25 [12,10]
370 [14,57]
984,50 [38,76]
307,25 [12,10]

TOP VIEW

SIDE VIEW

34,50 [1,36]
12 [0,47]
(without console gasket)

75,50 [2,97]

85 [3,35]
596 [23,46]
426 [16,77]
85 [3,35]

CONNECTORS CLOSE-UP

FRONT VIEW

1005 [39,57]
943,50 [37,15] Viewing area

30,75 [1,21]

620 [24,41]
531,80 [20,94] Viewing area
44,10 [1,74]
44,10 [1,74]
30,75 [1,21]

DIMETRIC VIEW

PANEL CUTOUT

37,00 [1,46]
232,00 [9,13]
R2,00 [0,08]

SIDE VIEW

26,88 [1,06]
1,88 [0,07]
3,88 [0,15]
77,94 [3,07]
35,00 [1,38]

TOP VIEW

Panel thickness - 0 up to 35mm
(optionally - when mounting brackets flipped 35mm to 65mm)

230,00 [9,06]

15 pin connector
not shown

External Tactile Display Controls (TDC)

FRONT VIEW

45,00 [1,77]
240,00 [9,45]
26,00 [1,02]
48,00 [1,89]

SALES DRAWING HD 43T22 MVD-MA1-COTP + HD TDCMVD KIT-A1
model shown in this drawing, but measurements generally apply for all HD 43T22 MVD-MAx-CxTx models

For dimensions not shown, see DWG or 3D model.

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Hatteland Technology AS
Eikeskogvegen 52
N-5570 Aksdal

A010811

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.

DIMETRIC VIEWS

SIDE VIEW

27,92 [1,10]
2,92 [0,11]
78,98 [3,11]
4,92 [0,19]
35,00 [1,38]

FRONT VIEW

45,00 [1,77]
240,00 [9,45]
26,00 [1,02]
48,00 [1,89]

Note: Some symbols may not be available depending on configuration

TOP VIEW

230,00 [9,06]

15 pin connector not shown

Panel thickness - 0 up to 35mm (optionaly - when mounting brackets flipped 35mm to 65mm)

PANEL CUTOUT

37,00 [1,46]
232,00 [9,13]
R2.00 [0,08]

Units: mm [inches]

SALES DRAWING - External Tactile Display Controls (TDC)

For Console Mount models

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Technical Drawings - Accessories

Technical Drawings - IP66 Mount Gasket (EPDM)

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.

SIDE VIEW

2.00 [0.08]

FRONT VIEW

8.00 [0.31]

1001.00 [39.41]

P022999 Rev 01
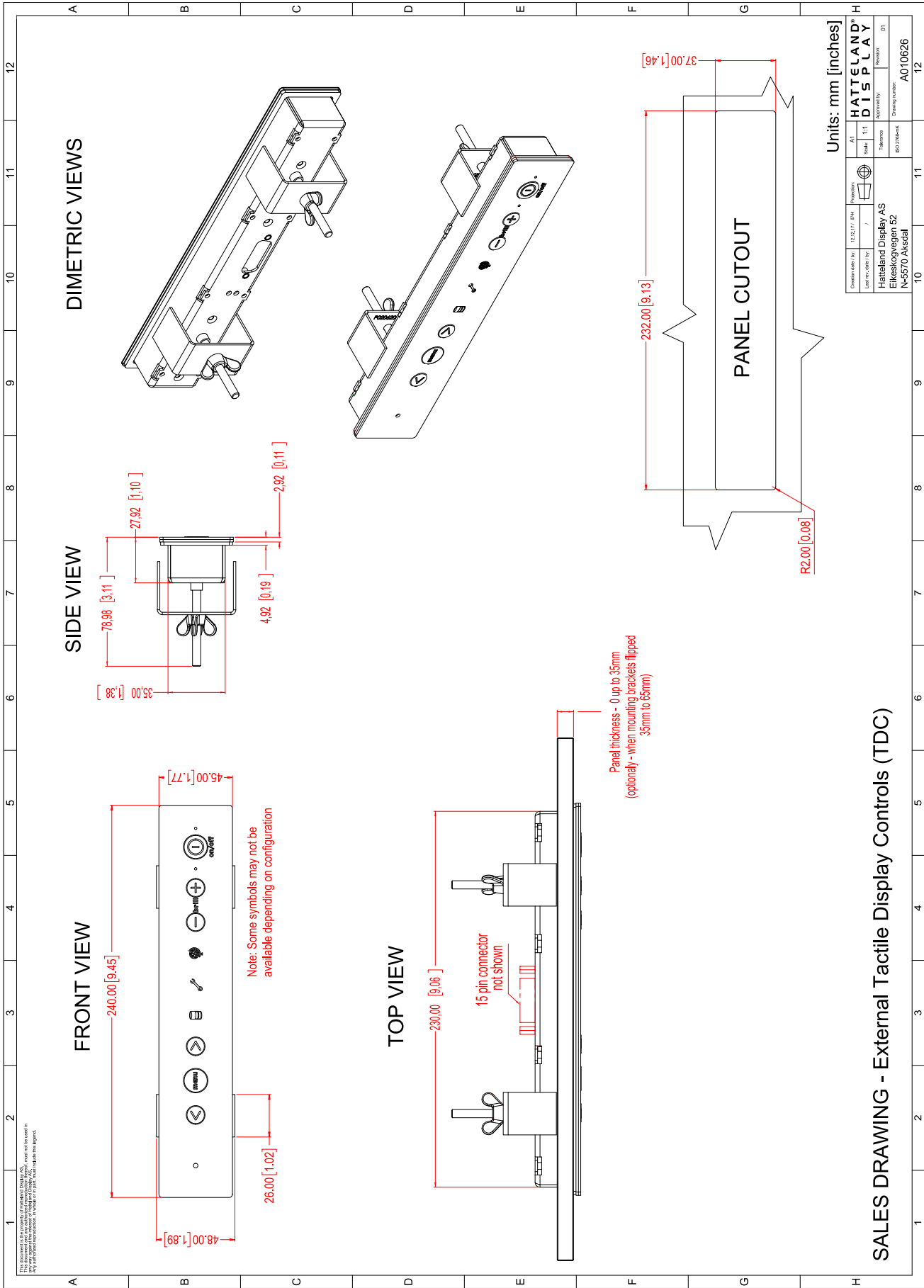
R1.00 [0.04]

2 x R3.50 [0.14]

608.00 [23.94]

6.00 [0.24]

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SALES DRAWING P022999 (IP66 Mount Gasket EPDM)

Units: mm [inches]

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.

PANEL CUTOUT

Units: mm [inches]

HATTELAND TECHNOLOGY

Console Thickness range:
MIN 7.5mm, MAX 150mm
10 [0,39] 10mm Shown.

10x console brackets.
20x M5x16 Pan head torx screws with DIN6319 washers

SALES DRAWING HD 43T22 MVD-MA1-COTP (Console Mounting with HD CMB SX2-G1)
model shown in this drawing, but measurements generally apply for all HD 43T22 MVD-MAx-CxTx models

For dimensions not shown, see DWG or 3D model.

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N-5570 Aksdal

Dimensions might be shown with or without decimals and indicated as mm [inches]. Tolerance on drawings is +/- 1mm. For accurate measurements, check relevant DWG file.
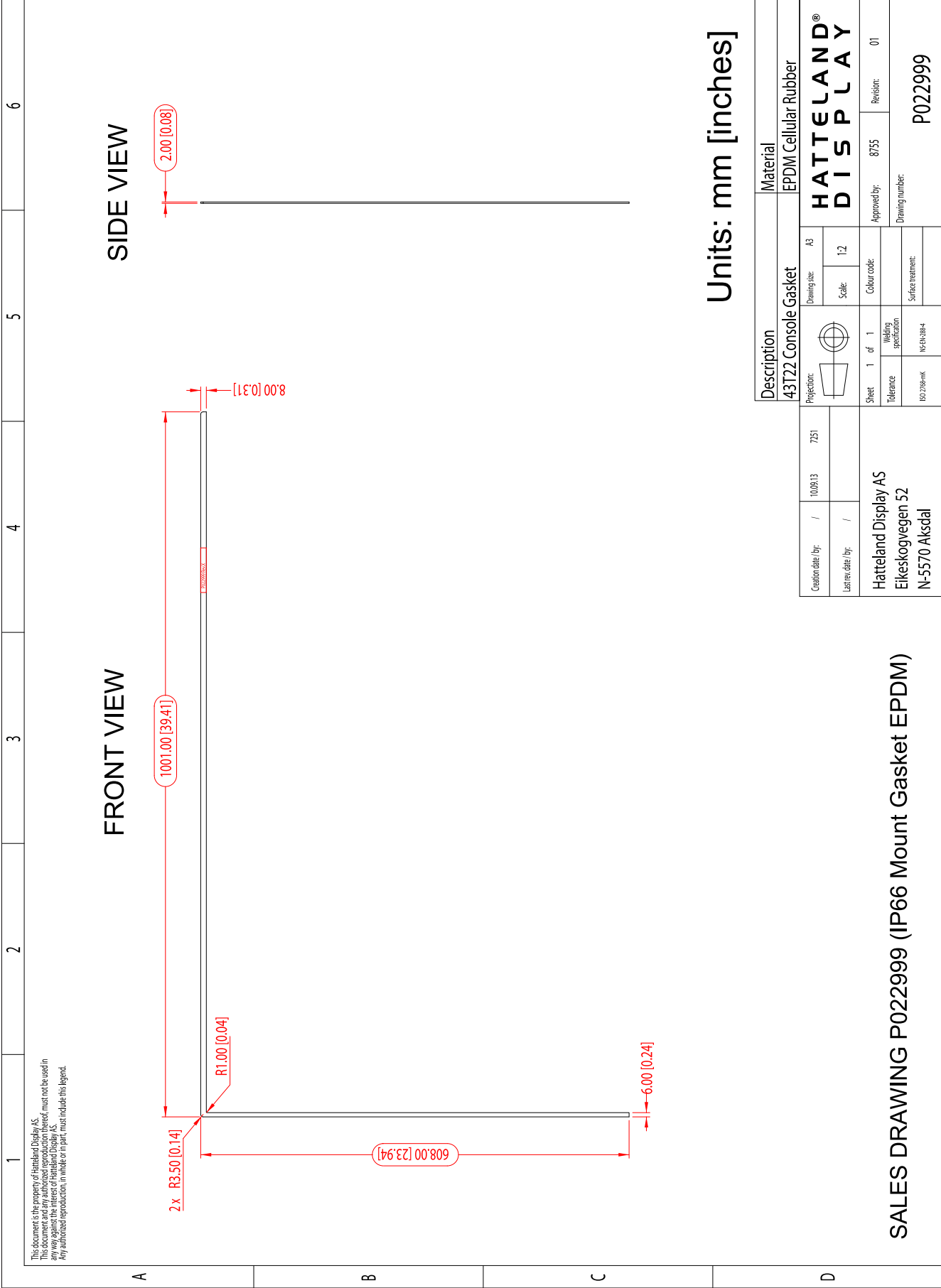
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DETAIL B
SCALE 2 : 1

R2.75
R3.50
R2.75
2.00
2.00

C
C

SECTION C-C
SCALE 2 : 1

R9.00
7.00

200.00
164.00
14.70

B
A

P006858-1 Rev.X

DETAIL A
SCALE 2 : 1

1.0 X 45°
1.0 X 60°
115.00°
109.00°
16.43
5.27
15.51

Creation date / by:	17.10.11	7251
Last rev. date / by:	/	7258

Hatteland Technology AS
Eikeskogvegen 52
N-5570 Aksdal

Projection:

Sheet 1 of 1
Tolerance
ISO 2768-mK

Welding specification
NS-EN-288-4

Drawing size: A3
Scale: 1:2
Colour code:
Surface treatment:
Surtec 650
ChromitAL TPC

Description
Braket HD 24T21 SH-A

Material
Alu.5052

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Approved by: 7258   Revision: 02
Drawing number:

P006858-1

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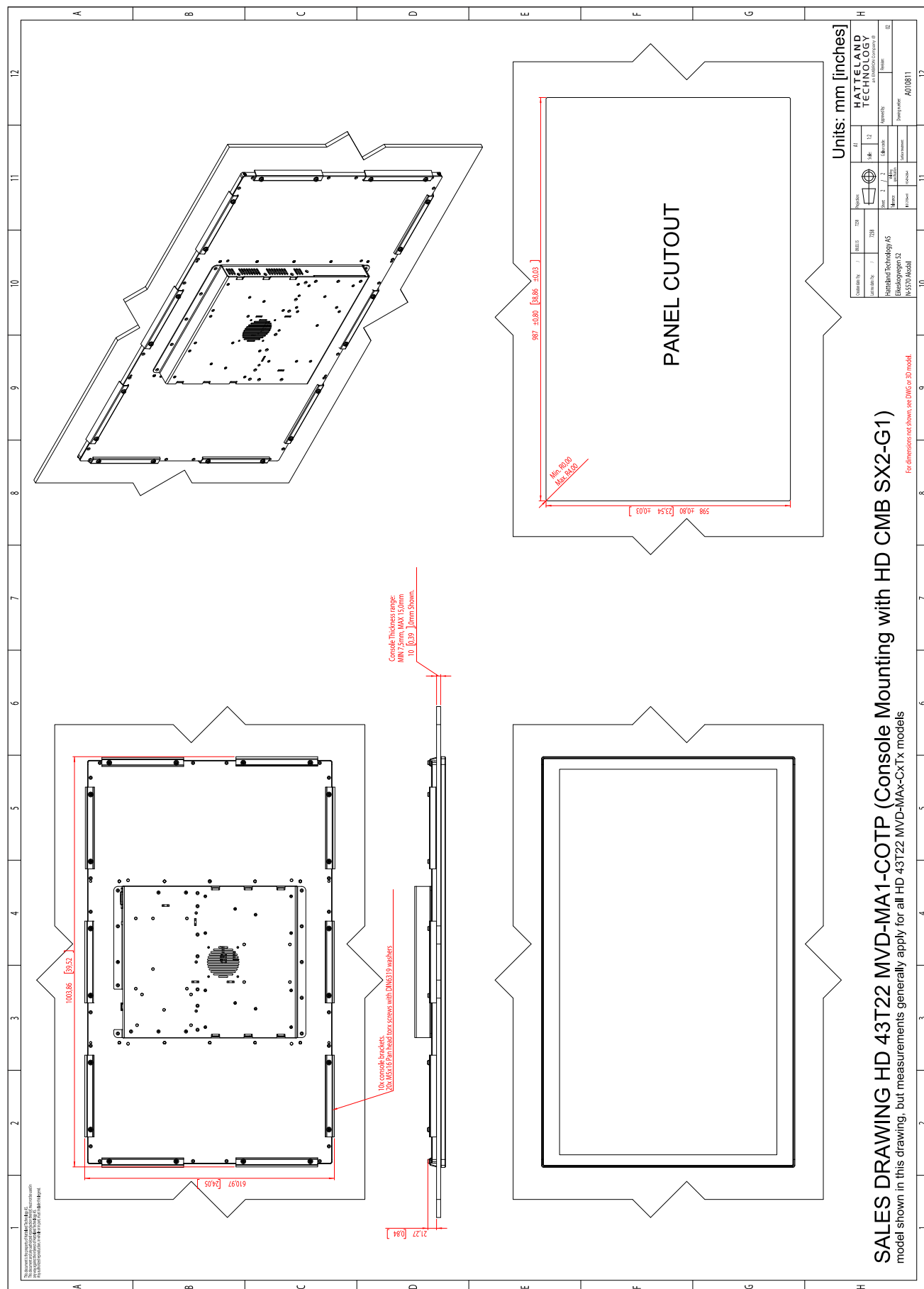
For dimensions not shown, see 3D model.

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.

2 x M3x6mm PanHead screws
Tightening Torque 0.8 Nm

ISOMETRIC VIEW

Console thumb fastening screws

Console with panel cutout

TOP VIEW

127.43 [5.02]

69.50 [2.74]

SIDE VIEW

51.09 [2.01]

2.80 [0.11]

FRONT VIEW

37.50 [1.48]

95.00 [3.74]

BACK VIEW

28 [1.10]

125.00 [4.92]

Do not loosen these screws

PANEL CUTOUT

30.00 [1.18]

R2 [0.08]

85.50 [3.37]

SALES DRAWING HD REM SX1-A1 (RS485 3-Button Remote)

HATTELAND® DISPLAY

Date 17.03.15 Hatteland Display AS
Arnsosen
N-5578 Nedre Vats

A1 Scale 2:1

A008899

12

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Appendixes

Touch Screen Inhibit Functionality

1: Navigate in OSD Menu to "Miscellaneous/Touch PWR" and select the "Off" setting.

2: Configure any of the Hotkeys "<" Left (Key 1) or ">" Right (Key 2) to "Touch PWR" via OSD menu: "Miscellaneous/Key 1/Touch PWR" or "Miscellaneous/Key 2/Touch PWR".
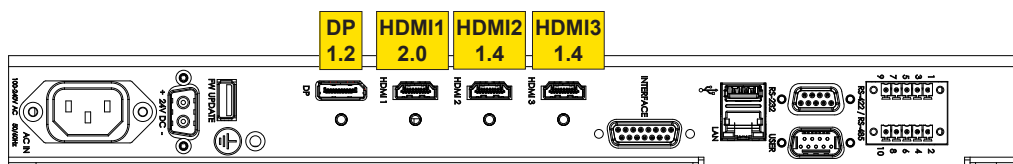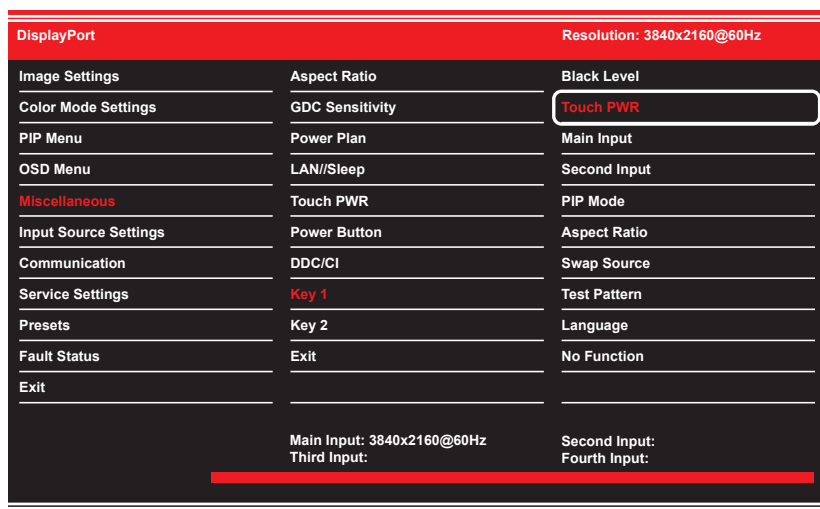
Preset Signal Timings

Resolution	Pixel Freq. MHz	H. Timing Sync Polar	Freq. KHz	Total Pixel	Active Pixel	V. Timing Sync Polar	Freq. Hz	Total Line	Active Line	Notes
640x350 @70Hz	25.151	P	31.44	800	640	N	70.02	449	350	
720x400 @70Hz	28.295	N	31.44	900	720	P	70.02	449	400	
640x480 @60Hz	25.175	-	31.47	800	640	-	59.94	525	480	
800x600 @60Hz	40	-	37.88	1056	800	-	60.32	628	600	
1024x768 @60Hz	65	-	48.36	1344	1024	-	60	806	768	
1152x864 @60Hz	88.566	-	54	1640	1152	-	60	900	864	
1280x1024@60Hz	108	-	63.98	1688	1280	-	60.02	1066	1024	
1600x1200@60Hz	160.875	-	74.48	2160	1600	-	59.96	1242	1200	
1920x1080@60Hz	148.5	-	66.6	2160	1920	-	60	1125	1080	
1920x1200@60Hz	154.11	-	74.1	2080	1920	-	59.99	1235	1200	Analog VGA
2560x1440@60Hz	241	+	88.8	2720	2560	-	60.01	1481	1440	
3840x2160@30Hz	262.75		65.68	4000	3840		29.98	2191	2160	HDMI 1.4
3840x2160@60Hz	533.25		133.31	4000	3840		59.99	2222	2160	HDMI 2.0 & DP 1.2

Appendix   **83**

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.
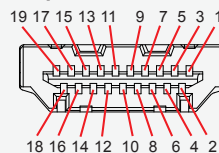
20-pin DisplayPort (DP) Female
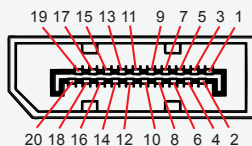
| PIN 01	ML_Lane 0 (p) - Lane 0 (positive)
PIN 02	GND - Ground
PIN 03	ML_Lane 0 (n) - Lane 0 (negative)
PIN 04	ML_Lane 1 (p) - Lane 1 (positive)
PIN 05	GND - Ground
PIN 06	ML_Lane 1 (n) - Lane 1 (negative)
PIN 07	ML_Lane 2 (p) - Lane 2 (positive)
PIN 08	GND - Ground
PIN 09	ML_Lane 2 (n) - Lane 2 (negative)
PIN 10	ML_Lane 3 (p) - Lane 3 (positive)
PIN 11	GND - Ground
PIN 12	ML_Lane 3 (n) - Lane 3 (negative)
PIN 13*	CONFIG1 - connected to Ground*
PIN 14*	CONFIG2 - connected to Ground*
PIN 15	AUX CH (p) - Auxiliary Channel (positive)
PIN 16	GND - Ground
PIN 17	AUX CH (n) - Auxiliary Channel (negative)
PIN 18	Hot Plug - Hot Plug Detect
PIN 19	Return - Return for Power
PIN 20	DP_PWR - Power for connector (3.3 V 500 mA)

*Pins 13 and 14 may either be directly connected to ground or connected to ground through a pulldown device. This is the pinout for source-side connector, the sink-side connector pinout will have lanes 0–3 reversed in order; i.e., lane 3 will be on pin 1(n) and 3(p) while lane 0 will be on pin 10(n) and 12(p).

19-pin HDMI Female

PIN 01	TMDS Data2+
PIN 02	TMDS Data2 Shield
PIN 03	TMDS Data2−
PIN 04	TMDS Data1+
PIN 05	TMDS Data1 Shield
PIN 06	TMDS Data1−
PIN 07	TMDS Data0+
PIN 08	TMDS Data0 Shield
PIN 09	TMDS Data0−
PIN 10	TMDS Clock+
PIN 11	TMDS Clock Shield
PIN 12	TMDS Clock−
PIN 13	CEC
PIN 14	Reserved (HDMI 1.0–1.3a) Utility/HEAC+ (HDMI 1.4+, optional, HDMI Ethernet Channel and Audio Return Channel)
PIN 15	SCL (I²C Serial Clock for DDC)
PIN 16	SDA (I²C Serial Data for DDC)
PIN 17	Ground (for DDC, CEC, ARC and HEC)
PIN 18	+5 V (min. 0.055 A)
PIN 19	Hot Plug Detect (all versions) HEAC- (HDMI 1.4+, optional, HDMI Ethernet Channel and Audio Return Channel

4-pin USB TYPE A

Pin 2: Negative Data
Pin 4: Ground
Pin 1: VCC +5V
Pin 3: Positive Data
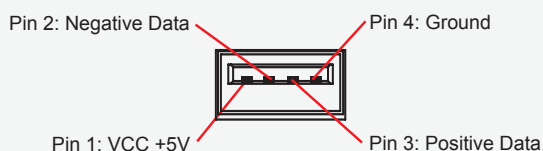
8-pin RJ45 10/100/1000Mbps LAN/Ethernet
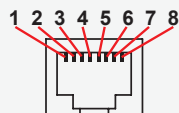
PIN 01	D0P+	Differential Pair 0 (Positive)
PIN 02	D0N-	Differential Pair 0 (Negative)
PIN 03	D1P+	Differential Pair 1 (Positive)
PIN 04	D2P+	Differential Pair 2 (Positive)
PIN 05	D2N-	Differential Pair 2 (Negative)
PIN 06	D1N-	Differential Pair 1 (Negative)
PIN 07	D3P+	Differential Pair 3 (Positive)
PIN 08	D3N-	Differential Pair 3 (Negative)

External User Control Interface, 15-pin DSUB Male
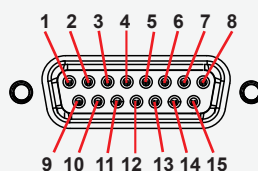
Warning: Do not connect or disconnect cables/connectors to this connector while the Display unit is powered on. Failure to do so may result in damaged electronics inside the Display Unit
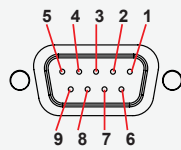
PIN 01	+3V3	+3V DC Out
PIN 02	SCL	Clock
PIN 03	SDA	Data
PIN 04	N/C	Not Connected
PIN 05	N/A	Reserved
PIN 06	N/A	Reserved
PIN 07	N/A	Reserved
PIN 08	Buz+	Buzzer (positive)
PIN 09	GND	Grounding
PIN 10	+5V	+5V DC Out
PIN 11	N/C	Not Connected
PIN 12	N/A	Reserved
PIN 13	N/A	Reserved
PIN 14	N/A	Reserved
PIN 15	Buz-	Buzzer (negative)

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Pinout Assignments

Potentiometer Control, 9-pin DSUB Male

5 4 3 2 1
9 8 7 6

PIN 01	+5V	+5V out
PIN 02	PWR	Power On / Off
PIN 03	Res.	Reserved, do not connect
PIN 04	Aref	For potentiometer
PIN 05	+12V	+12V out
PIN 06	BRT_POT	Potentiometer in
PIN 07	BRT –	Button in
PIN 08	BRT+	Button in
PIN 09	GND	Ground

Potentiometer shall be **10kΩ LINEAR.** Connect like the illustrations shown below:

Fig #1
+3.3V
Aref
Pin 6
BRT_POT
Display
GND

Fig #2
+3.3V
BRT+   Pin 6
External button
Display
GND
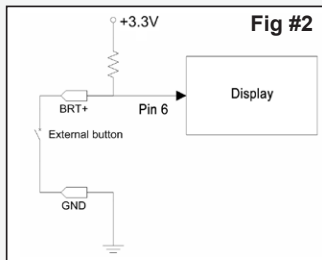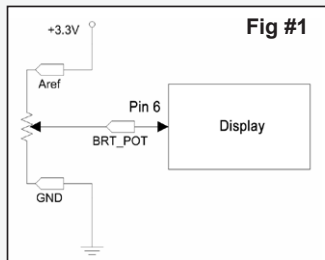
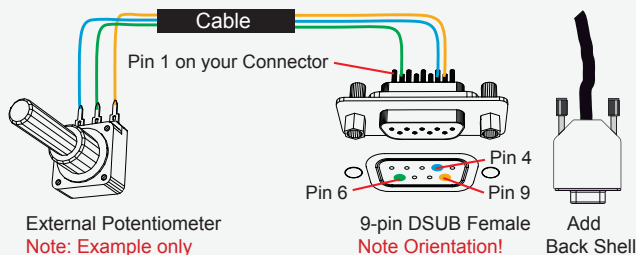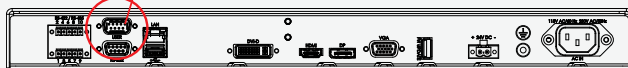The BRT+ and BRT- can be used for controlling the brilliance by using external buttons. Example for the BRT+ input in figure #2:

Building your own cable:
Note: Requires soldering and assembly. It is expected that the technician has experience in electronics, soldering and assembling cables and connectors.

Pin 1 on product

Cable
Pin 1 on your Connector

External Potentiometer
Note: Example only

Pin 6   Pin 4
Pin 9

9-pin DSUB Female
Note Orientation!

Add
Back Shell

Use a cable that contains at least 3 wires (not 3 single wires). Heat Shrink Tubes must be applied to soldered wire/pins. Test connection (beep) with Voltage Meter. Test connection between power pin and other pins to ensure no short circuit is present prior to connecting cable and power on Display unit. Finally, the 9-pin DSUB must be covered by a back shell.

In order to activate the external Potentiometer control, the internal *""POT" - Backlight Control Interface selection"* command has to be set first via our SCOM (Serial Communication Control Interface).

Usage for SCOM: Review the dedicated Technical Manual available from our website: https://www.hattelandtechnology.com/hubfs/pdfget/inb100018-6.htm

External Power ON/OFF Control, 9-pin DSUB Male

5 4 3 2 1
9 8 7 6
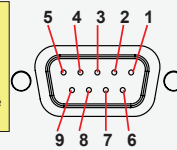
PIN 01	+5V	+5V out
PIN 02	PWR	Power On / Off
PIN 03	Res.	Reserved, do not connect
PIN 04	Aref	For potentiometer
PIN 05	+12V	+12V out
PIN 06	BRT_POT	Potentiometer in
PIN 07	BRT –	Button in
PIN 08	BRT+	Button in
PIN 09	GND	Ground

External Power Button must be of "Push Button" type.
Instant-On. To turn off unit, Press & Hold down for 3 seconds.

Building your own Push Button for External Power Button:
Note: Requires soldering and assembly. It is expected that the technician has experience in electronics, soldering and assembling cables and connectors.

Cable
Pin 1 on your Connector

External Push Button
Note: Example only

Pin 2   Pin 9

9-pin DSUB Female
Note Orientation!

Add
Back Shell
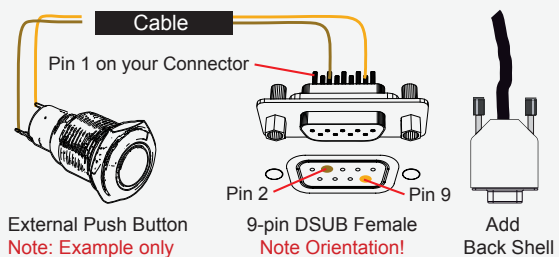
Use a cable that contains at least 2 wires (not 2 single wires). Heat Shrink Tubes must be applied to soldered wire/pins. Test connection (beep) with Voltage Meter.

In order to activate the external Power ON/OFF control it must be enabled:
Via OSD Menu: "OSD Miscellaneous>External Power Button" and set to Enable.
or
Via SCOM (Serial Communication Control Interface):
"MCC" - OSD Control Functionality -> "External Power Button (0x74)".

Usage for SCOM: Review the dedicated Technical Manual available from our website: https://www.hattelandtechnology.com/hubfs/pdfget/inb100018-6.htm

2P DC Power Input Housing
FCE17-E2W2SS-2N0

Pin 2: Ground   Pin 1: +24VDC

-        +

2P DC Power Input on unit
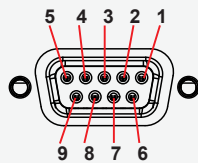Amphenol FCC17 D-SUB MALE

Pin 1: +24VDC   Pin 2: Ground

+   -

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Pinout Assignments

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

PIN 01**	BUZ+	Buzzer Control Positive IN*
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 IN*

RS232-Wake On Ring is not enabled. **See notes in blue.

Suggested "Buzzer" Control Logic inside Computer/System:
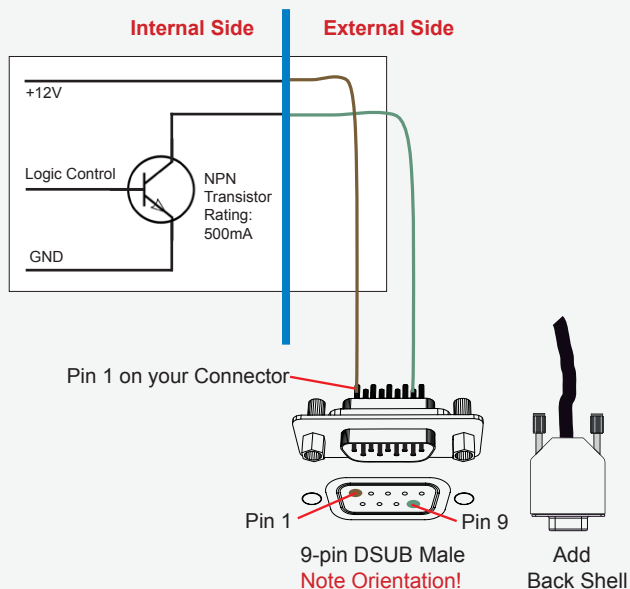
Pin 1 on your Connector

Pin 1   Pin 9

9-pin DSUB Male
Note Orientation!

Add
Back Shell

Note: Requires soldering and assembly. It is expected that the technician has experience in electronics, soldering and assembling cables and connectors. Use a cable that contains at least 2 wires (not 2 single wires). Heat Shrink Tubes must be applied to soldered wire/pins. Test connection (beep) with Voltage Meter. Wires may be combined if using RS-232 COM as well.

10-pin RS-422 / RS-485 Module
"RS-422/RS-485 SCOM + Buzzer"
(Internal Buzzer can be controlled externally)
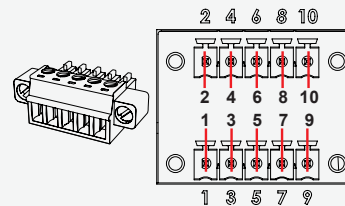
PIN 01*	RxD+	Receive Data Positive
PIN 02	GND	Ground
PIN 03*	RxD-	Receive Data Negative
PIN 04	+5V	+5V Out
PIN 05*	TxD+	Transmit Data Positive
PIN 06**	BUZ-	Buzzer Control Negative
PIN 07*	TxD-	Transmit Data Negative
PIN 08**	BUZ+	Buzzer Control Positive
PIN 09	GNDR	Ground 100Ω
PIN 10	GND	Ground

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

Suggested "Buzzer" Control Logic inside Computer/System:

Connect T.Block
to upper row

Pin "6"   Pin "8"
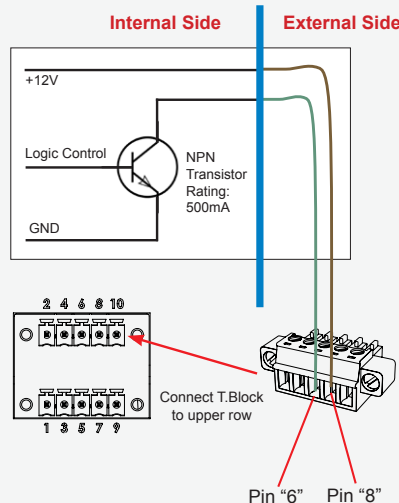
Note:
To ensure that EMC requirements are met, we recommend that the cable is screened and screen is terminated/grounded at both ends with as short as possible pig tail.

For Military/Naval use: +12V line from customer system should be low pass filter or else the power ripple may cause radiated emission to fail.

Use a cable that contains at least 2 wires (not 2 single wires). Test connection (beep) with Voltage Meter. Wires may be combined if using RS-422/485 COM as well.

**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 (G2 - Generation 2) / MVD Series:
• Display Unit needs external power connected
  to turn buzzer on. (Any logic power state).

Basic Trouble-shooting

GENERAL ISSUES FOR TFT PANEL BASED PRODUCTS
Note: Applies for a range of various products. This is only meant as a general guide.

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

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

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

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

VGA 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.

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HATTELAND TECHNOLOGY
an EMBRON Company

Declaration of Conformity

We, manufacturer, **Hatteland Technology AS,** Eikeskogvegen 52, N-5570 Aksdal, 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, HM XRD, HM RMD, 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 2014/35/EU
EN 60950:2006/A2:2013
EMC Directive 2014/30/EU
EN 55032:2012 Class A / AC:2011 Class A
EN 55024:2010

Signature: _____
Frode Grindheim
Vice President Product Management
Aksdal, Norway

CE

CE MARK FIRST AFFIXED DATE (11 March 2010)

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

Declaration of Conformity

We, manufacturer, **Hatteland Technology AS,** Eikeskogvegen 52, N-5570 Aksdal, 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, HM XRD, HM RMD, 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 TECHNOLOGY
an EMBRON Company

Declaration of Conformity

We, manufacturer, **Hatteland Technology AS,** Eikeskogvegen 52, N-5570 Aksdal, 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, HM XRD, HM RMD, 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
Aksdal, Norway

FC

FCC MARK FIRST AFFIXED DATE (16 February 2012)

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

IND100237-1

Return Of Goods Information

Return of goods:

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

Hatteland Technology referenced as "manufacturer" in this document.

Before returning goods, please contact your system supplier before sending anything directly to manufacturer. When you return products after loan, test, evaluation or products subject for credit, you must ensure that all accessories received from our warehouse are 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 required in order 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 later on, 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.

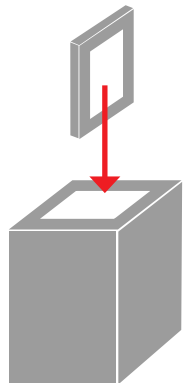## Handling and packing units for return/credit

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 as to 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
https://www.hatteland-display.com/rma_procedure.php
https://www.hattelandtechnology.com/legal-documents

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General Terms and Conditions

As of January 2015, Hatteland Technology AS' *"Terms of Sales and Delivery"* and *"Warranty Terms"* have 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 Technology 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 Technology AS will be available via our website only.

Please visit https://www.hattelandtechnology.com/legal-documents#terms-and-conditions to review the latest revision

Long Term Storage Recommendations

For Minimum storage life for Hatteland Technology products,Storage Conditions,
Periodic maintenance - test procedure, please visit:
https://www.hattelandtechnology.com/hubfs/pdf/misc/ind100350-5_long_term_storage_recommendations.pdf

INSTRUCTIONS FOR THE CONSIGNEE

1) CONTROL
Control the goods immediately by receipt. Examine the quantity against 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
Try to restrict the damage and the loss. Seller will compensate expenses incurred due to reasonable security efforts in addition to damage and loss.

4) COMPLAINT
Immediately write a complaint to the transporter or his agent. Immediately forward 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 forwarded to the company or their agent: invoice, way-bill and/or bill of landing, and/or statement of arrival, inspection document, besides a copy of the letter of complaint to the transporter.

PIXEL DEFECT POLICY

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 an LCD-Monitor after shipment can be influenced by Hatteland Technology. Hence Hatteland Technology cannot be made responsible for such dot failures. However Hatteland Technology understands and accepts the responsibility towards the customers for the delivery of new displays, therefore accepts a limitation on dot defects 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 Technology.

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 April 2019

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 brilliance may inhibit visibility of information at night.

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User Notes

Revision History

Rev.	By	Date	Notes
00_01	SE	28 Feb 2019	Release for internal review.
00_02	HS BB AK SE	12 Mar 2019	Revised after internal reviews
00_03	ALL SE	25 Mar 2019	Revised after internal reivews.
00_04	AK SE	06 Jun 2019	Revised after internal reivews.
00_05	ALL SE	16 Aug 2019	Revised after internal reivews.
00_06	ALL SE	20 Aug 2019	Revised after internal reivews.
01	ALL SE	04 Sep 2019	Final release for Internet
02	VM SE	31 Dec 2019	Revised Contents of Package, remove Drivers and Documentation DVD, page 6 - ref: https://www.hatteland-display.com/mails/20_2019_eol.html Updates performed throughout the user manual, regarding HDMI, DP (OSD/DDC/CI) Various grammar corrected and improved throughout the entire user manual
03	WJ VM SE	19 Feb 2020	Revised "Power Plan" functions text, page 55 Added Console Mounting Kit (HD CMB SX2-G1) drawings, page 6,77,78

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Revision History

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