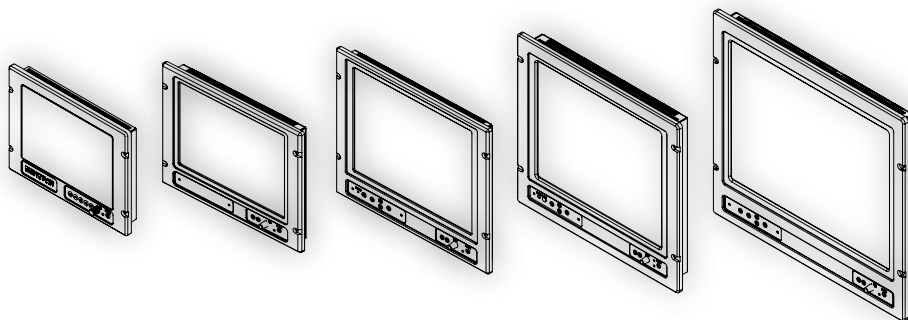


User Manual



Maritime Multi Display Models

- JH 10T06 MMD - 10.4 inch Maritime Multi Display
- JH 15T03 MMD - 15.0 inch Maritime Multi Display
- JH 17T01 MMD - 17.4 inch Maritime Multi Display
- JH 18T04 MMD - 18.1 inch Maritime Multi Display
- JH 19T01 MMD - 19.0 inch Maritime Multi Display
- JH 20T03 MMD - 20.1 inch Maritime Multi Display
- JH 20T04 MMD - 20.1 inch Maritime Multi Display
- JH 23T02 MMD - 23.1 inch Maritime Multi Display

Industrial TFT Display Models

- JH 10T05 VGA - 10.4 inch Industrial TFT Display
- JH 10T06 STD - 10.4 inch Industrial TFT Display
- JH 15T03 STD - 15.0 inch Industrial TFT Display

Jakob Hatteland Display AS
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www.hatteland.com

User Manual MMD/TFT Series

Updated: 02 Jun 2003

Doc Id: INB100005-1

For models: (and some variations)
-A1, -A2, -C1, -C2, -C3, -C4

Rev.
1

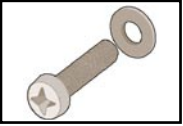

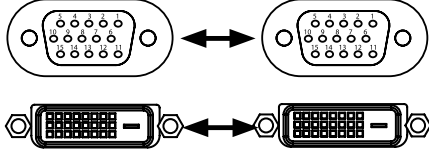


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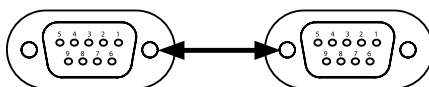
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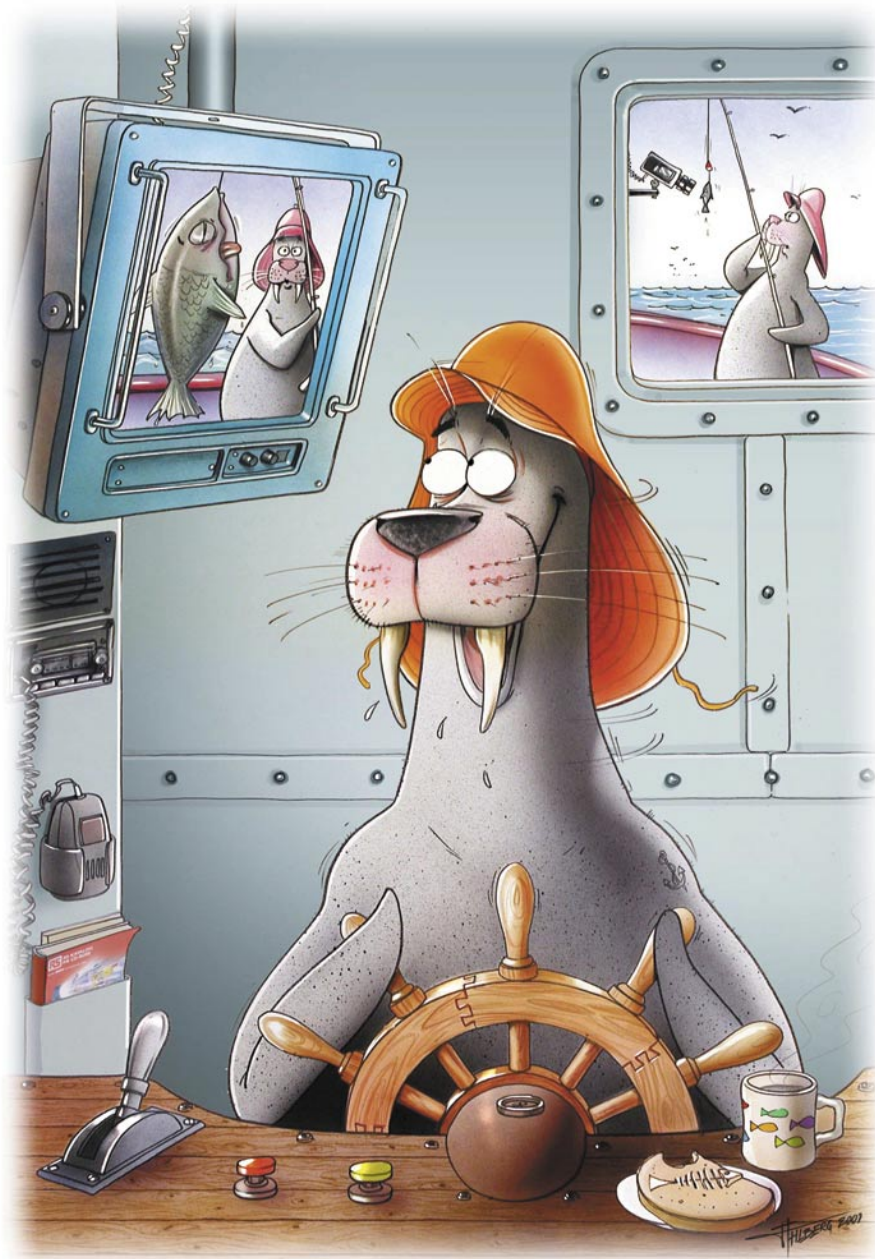
Contents of package

This product is shipped with:

Item	Description	Illustration
	4 pcs of PAN M6X25 black bolts with M6 plastic washer. These should only be used to secure the display into a console. <i>Note: If you prefer your own bolts, make sure they are minimum M6 and 25mm in length for security reasons.</i>	
	1 pcs of Standard Signal Cable and/or DVI cable. DSUB 15P Male to DSUB 15P Male - Length approx: 1.8m DVI-D 24P Male to DVI-D 24P Male - Length approx: 1.8m <i>Note: DVI cable only included on products that supports DVI.</i>	
	1 pcs of Standard Power Cable. (European or US standard) - Length approx: 1.9m <i>Note: Power cable not included in the DC version.</i>	
	1 pcs of User Manual	

Optional Accessories:

Item	Description	Illustration
	4 pcs of M6X12 Unbraco bolts (Included with bracket) These should only be used to secure the bracket on the display. <i>If you prefer your own bolts, make sure they do not exceed 12mm in length. Use any longer will do serious damage to components inside the product!</i>	
	1 pcs of Standard Serial Cable DSUB 9p Male to DSUB 9p Male - Length approx: 1.5m This cable is only included if you purchased a touchscreen product.	



Introduction to Jakob Hatteland Display

Jakob Hatteland Display AS is a fully owned Norwegian company. Since the start in 1987, the company have been involved in the maritime market. Today the company develops and manufactures a complete range of high quality and type approved products. The company is a major and leading supplier to the different maritime, naval and industrial markets.

The concept

All products are designed to meet the requirements for different applications in many environments. The products offered are based on high quality and state-of-the-art modules with the highest specifications. The concept enables to display professional applications with clarity and enhanced color and image quality. Integration in systems are made easy due to standardized products and features. All products are fully dimmable for night vision on bridge installations.

The product range

Jakob Hatteland Display AS has introduced the **MMD - Maritime Multi Display** and the **MMC - Maritime Multi Computer** to the market. All products are part of the wide range of sizes and options, which are suitable for a vast array of different applications. Within the **MMD** range the products are complying with ECDIS & ARPA standards. The products can be delivered with standard accessories such as remote control, external power relay, video buffer, bracket, sun visor and touch screen. In addition to our standard products, custom adaptations can be arranged for colour, logo, mechanical design and electrical interfaces. Within the range of products, **MIL** tested units are available for naval applications.

About this manual

This manual contains information needed for service of the Hatteland displays. The manual contains also electrical, mechanical and input signal specifications. All specifications in this manual, due to manufacturing, new revisions and approvals, are subject to change without notice. **It is recommended that a service engineer read this manual before servicing the monitor.**

The Hatteland Monitor

The products undergo thoroughly testing in accordance with maritime regulations. Standards such as the IEC945 (EN60945) are mandatory for the products. ECDIS products are also tested and approved by the BSH in accordance to the IEC61174 standard. The products are type approved by the worlds leading classification societies.

Furthermore, all monitors and displays undergo thorough quality control before delivery, and are reinforced where necessary to withstand harsh working environments. Changes in the monitors, such as the removal of casings or the closing of existing ventilation openings, or improper mounting of the monitors, will lead to loss of approval; furthermore, our warranty for any resulting damage or malfunctions will become null and void.

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

Safety Warnings



CAUTION

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

The discharge of electrostatic energy into a semiconductor can destroy the semiconductor or change its properties. Before opening a display's housing to remove or touch a board, proper ESD measurements must be taken.

1. Before repair work, operator should ground himself by putting on a wrist band.
2. The wrist band should be connected to ground via a ground cord.
3. A one megaohm resistor, installed in the wrist connection end of the ground cord, is a safety requirement.
4. Work table and floor of work area should be covered with electrostatic shielding in order to discharge static electricity via an earth wire.
5. Alternatively an Static-dissipative ESD work mat must be positioned at the workplace.
The 3M™ 8501 Portable Field Service Kit is a good choice for this purpose.
6. Thoroughly grounded soldering, measurement and test tools must be used.
7. Do not disassemble the LCD panel under low humidity (50% RH or less).

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



DANGER

Even when the display is switched off, there will be a dangerous voltage present on exposed contacts inside. Therefore, before a unit is opened, it must be ensured that the power cord is removed from the power inlet.

Capacitors in the AC powersupply can store dangerous voltages for several hours, even when they have been disconnected from the supply voltage.



WARNING

1. Pay attention to the regulations for the prevention of accidents.
2. When parts replacement is required for servicing, always use the manufacturer's specified replacement.
3. When replacing the component, always be certain that all the components are put back in place.
4. Make sure all connectors are properly connected before reassembling and switching on power.
5. Use a proper Screwdriver. If you use a screwdriver that does not fit, you may damage the screws.

Handling LCD panel



(when replacing panel or backlight lamp)

1. Do not apply any strong mechanical shock to the LCD panel
Since this LCD panel is made of glass, excessive shock may damage the panel or cause a malfunction.
2. Do not press hard on the LCD panel surface.
In the LCD panel, the gap between two glass plates is kept perfectly even to maintain display properties and reliability. Any hard pressure on the LCD panel may cause the following problems:
 - Ununiformity of color
 - Disorder of orientation of liquid crystalProblem returns to normal condition after a while or by turning power off and on again.
However these operations should be avoided to insure reliability.
3. Do not scratch the polarizing film on the LCD panel surface.
 - Do not press or rub the display surface with a hard tool, tweezers, etc.
 - For handling, use cotton or conductive gloves so that the display surface is not soiled.

Cleaning LCD panel



If dust or dirt soils the display surface, clean it as follows with a soft dry cloth without chemicals.

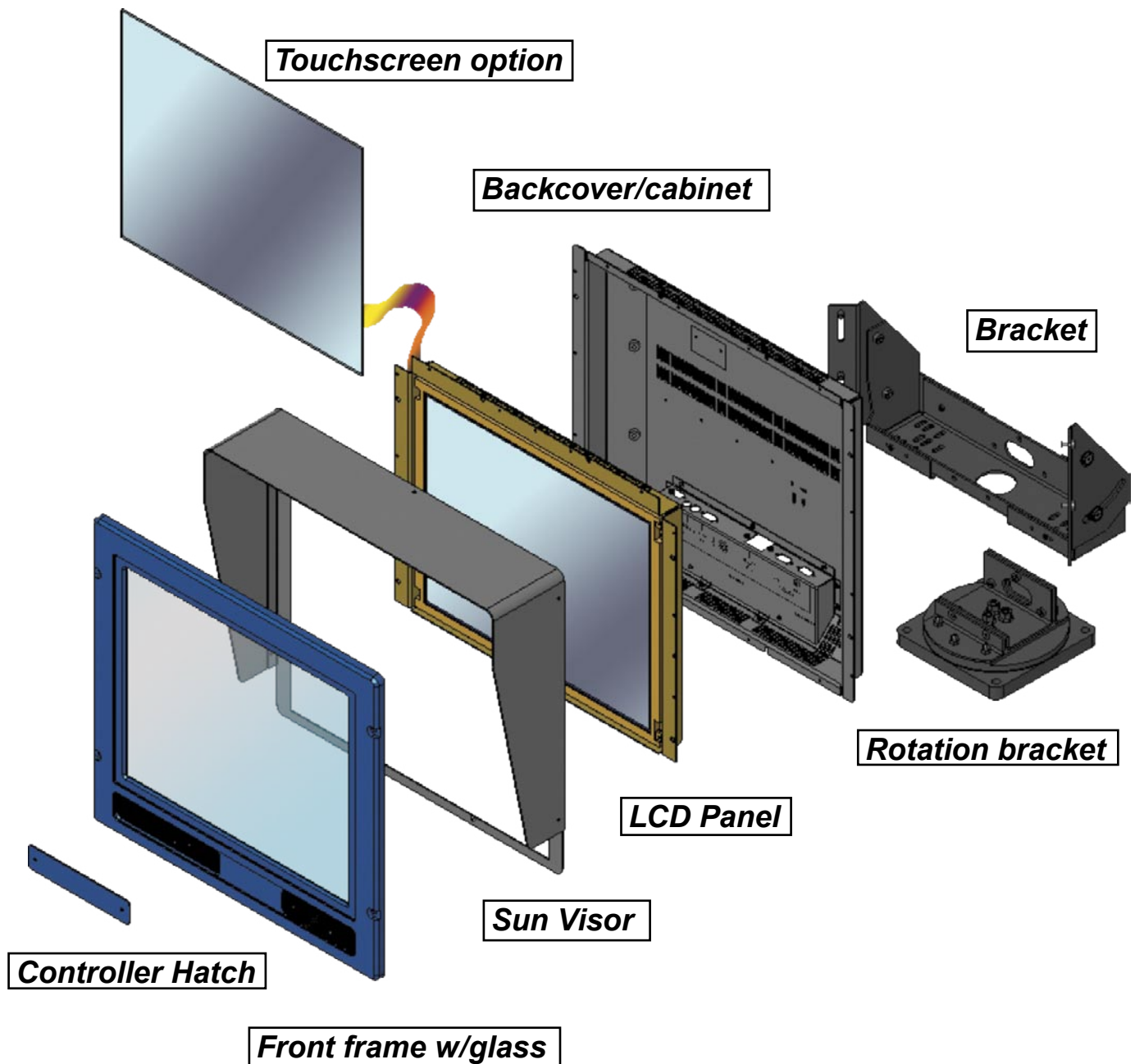
Dust - Wipe off with a soft cloth. (do not rub.)

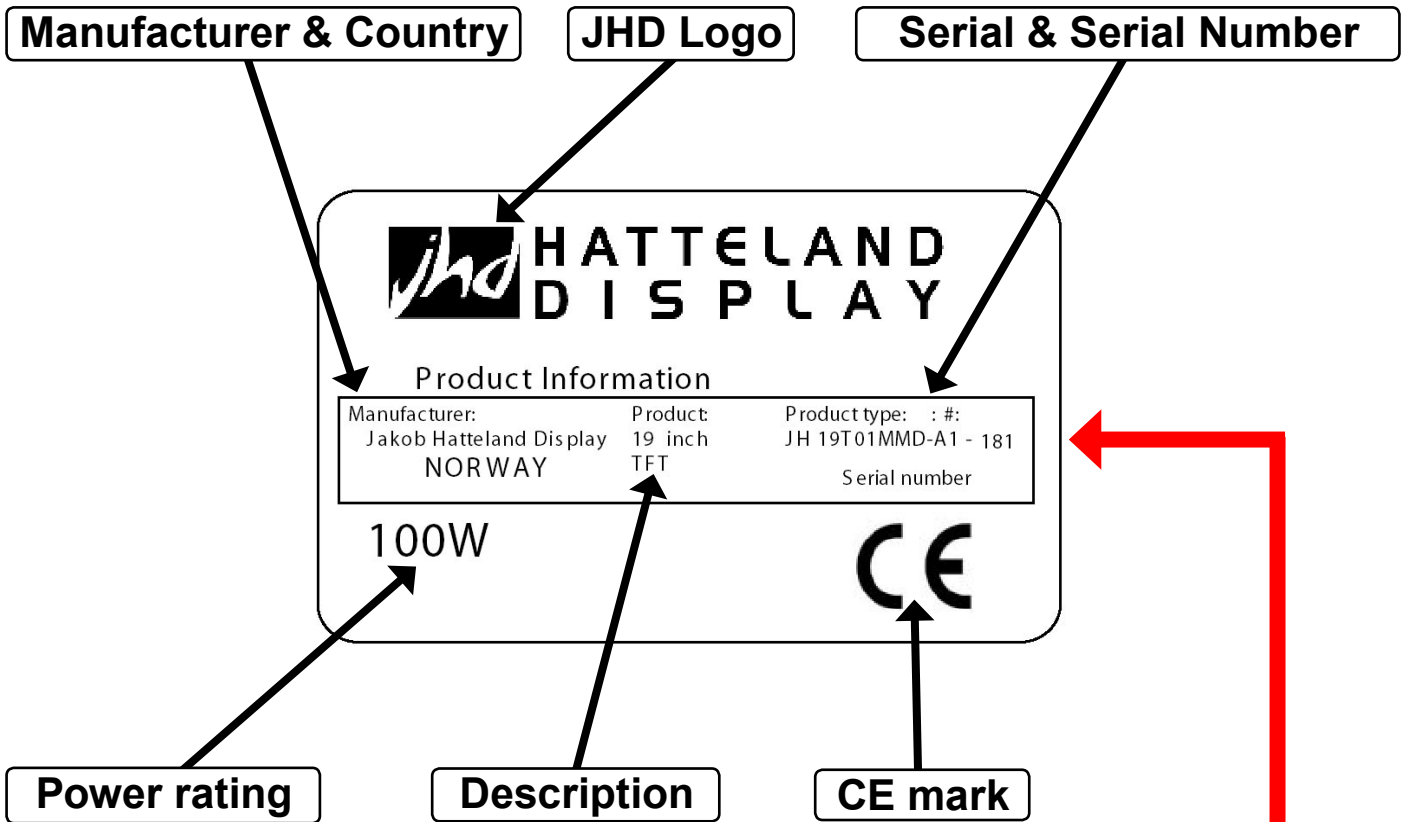
Dirt - Apply clear water to a soft cloth and squeeze hard out of water drops, then lightly wipe off the specified parts. Only if the dirt is hardly wiped off, use isopropyl alcohol or ethanol. Be careful not to splash the water or the solvents on the edge of polarizer and in the LCD unit. The polarizer possibly exfoliates due to the solvent and water penetrated between the polarizer and the LCD panel.

Caution !

- * Do not use unspecified solvent such as ketone (acetone, etc.) and aromatics (xylene, toluene, etc)
- * Be careful not to allow the water of solvent to enter the module.
- * If solvent or water drops are left for a long period of time, the part may become deformed or discolored.
- * Wipe off immediately in the same way as for dirt.
- * Do not allow oil to adhere to the module since excessive oil is hard to clean.

Basic Construction of the Hatteland Display Monitor

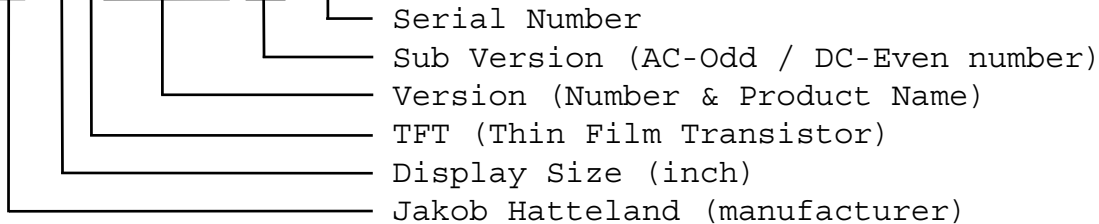




Product Type and Serial Number

JH XXAXX AAA-AX-XXX NOMENCLATURE

JH 19T01 MMD-A1-181 Example



Sub Versions covered by this manual:

AC	DC	Powersupply input
A1	A2	Standard version
C1	C2	with Touchscreen
C3	C4	variation of touchscreen type

- The monitor is type approved according EN60945 (1997), 4.4, equipment category b) protected from the weather.
- Use of brightness and push buttons may inhibit visibility of information at night.

VGA BIOS Firmware: (On MMD and similar products only)

On older products you will ONLY have the advanced version of the OSD menu. (V0.x / 1.0 / 1.10)
On newer products you will ONLY have the simplified version of the OSD menu. (V1.2 and up)

To verify your BIOS Firmware version, the version number is displayed in the UTILITIES menu in the right top corner. If no version number shows, you may have a BIOS Firmware below V1.00

This manual matches the BIOS Firmware V1.00 / V1.10 / V1.2 / V1.2F1 / V1.2F2 and V1.3F

As the available functions are nearly identical between older products and V1.3F, there should be no critical need to update the BIOS Firmware. In any case, consult your local technician or sales/technical personnel at Hatteland Display if problems arise during the installation or within usage of the product or lack of support for your signal refresh rate etc.

See also the "Revision Record xxx Controller" section in this manual for more detailed information about VGA BIOS firmware revisions.

DVI-D Support:

During May 2003, new factory produced MMD and similar models will be upgraded with support for DVI-D. This will include a new DVI-D 24pin connector in addition to the already installed connections, like S-VHS, Composite and RGB connectors. DVI-D transmits the RGB signals digitally, which gives sharper quality images and correct color presentation. Just connect the cable between your computer system and our display. The VGA controller will automatically use the DVI-D as output if configured to do so.

The Hatteland Group - Terms Of Sale And Delivery:

1) APPLICATION

The terms of sale and delivery include the following companies: Autostore AS, Jakob Hatteland Assembly AS, Jakob Hatteland Computer AS, Jakob Hatteland Display AS, Jakob Hatteland Logistics, Jakob Hatteland Supply AS and Jakob Hatteland Technology AS.

2) PRICE

a) The price is per each, if nothing else has been stated, VAT not included. Price is based on the prices from our suppliers, current custom rates, taxes, rate of exchange and international raw material prices. We reserve ourselves the rights to adjustments in case of alternation on the above mentioned.

b) Included in the price is the supplier's standard packing. In case of re-packing/smaller quantities we reserve ourselves the right to add an additional sum for warrantable packing according to CECC 0015 (Basic inspection for protection of electrostatic sensitive devices)

3) VALIDITY

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

4) PACKAGE QUOTATION

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

5) TERMS OF PAYMENT

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

6) TIME OF DELIVERY

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

7) DELIVERY POINT OF TIME

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

8) FREIGHT / PACKING / FORWARDING FEE

Jakob Hatteland Display AS charge NOK 50 in forwarding fee for orders below NOK 1.000. For orders below NOK 1.000 Jakob Hatteland Supply AS charge freight according to expenses, and NOK 25 for packing. For handling requested beyond ordinary hours NOK 250 is charged. Express service is charged with NOK 100 + freight charges. All the companies charge freight according to expenses for orders above NOK 1.000. VAT not included.

9) COMPLAINT

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

10) GUARANTEE / SERVICES

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

I) there has been encroached upon the goods without seller's consent

II) terms of payment is not fulfilled

III) the goods have been damaged due to unskilled treatment

IV) components which are sensitive for static electricity have not been unpacked and treated in a secure way.

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

11) RESPONSIBILITY

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

12) CANCELLATION / RETURN

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

13) LOAN, RENT and DEMO

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

14) LIMITATIONS

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

15) SOFTWARE

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

16) RE-EXPORT

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

17) QUESTION IN DISPUTE

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

INSTRUCTIONS FOR THE CONSIGNEE

1) CONTROL

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

2) SECURING EVIDENCE

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

3) RESCUE

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

4) COMPLAINT

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

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

5) DOCUMENTATION

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

Return Of Goods Information



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

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

This is needed to credit the invoice 100%. Missing parts will not be subject for credit, and you will not get total credit for returned product. You will either be charged separately or the amount is withdrawn from the credit. If you noticed that our product missed accessories upon receipt, we are of course open for further investigation and positive solutions. If you decide to ship the missing items on the after hand, you will get 100% credit for that particular invoice or items received at JHD incoming goods control. Please contact our sales personnel if additional questions.

Current prices apply as per Desember 2002:

Signal Cable DSUB 15P Male or Female - Approx 1,8meters	Price: 170,- NOK each
Signal Cable BNC 5P - Approx 1,8meters	Price: 350,- NOK each
RS-232 serial cable DSUB 9P - Approx 1,8meters	Price: 80,- NOK each
Powercable 110 / 220 VAC (European or US standard) - Approx 1,8meters	Price: 50,- NOK each
(Minor) + Medium or severe scratches / chemical spill on backcover or front frame	Price: 1300,- NOK
Any scratch, chemical spill or similar on front glass	Price: 1000,- NOK

Approved packaging methods/materials: (Applies to all shipments to JHD)

When returning goods, please make sure you surround the product with the following material, whenever possible: Original packaging from JHD, firm foam material, bubble wrap or lots of PadPack paper or Foam chips/polyester wrapped in sealed plastic bags. In any case, always use a solid cardboard box to surround everything.

Not approved packaging methods/materials are: Foam chips, expanded polyester, clothes, nothing, or too little, or anything that will crumble and get into the ventilation holes of products and cardboard boxes that are not suitable to secure the product during shipment.

COMMON ERRORS:

If for some reason there should be something wrong with the picture quality or no picture present, check the symptoms carefully and try to cure it with the hints below:

NO PICTURE / LED BEHAVIOUR:

Power Switch and computer power switch should be in the ON position. The signal cable should be completely connected to the video card/computer. Check the connector for bent or pushed-in pins. If the LED in front is red, no external VGA signal is present. If there is no light at all in the LED, try to turn the brightness knob. If it's still black, no power is present to the unit. Check your external power source. A lack of image is most likely to be caused by incorrect connection, lack of power, failure to provide a signal or incorrect graphic card 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, ie 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 can 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).

IMAGE APPERANCE:

A faulty TFT panel can have black lines, pixel errors, failed sections, flickering or flashing image. Incorrect graphics 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.

CONTINUED FAILURE:

If unit after unit keeps failing, consider and investigate whether you are short circuiting the equipment or doing something else seriously wrong.

Installation and mounting of Display Monitors

1. Most of our displays monitors are intended for various methods of installation or mounting (panel mounting, bracket mounting, ceiling/wall mounting etc.); for details, please see the relevant mechanical drawings.
2. Adequate ventilation is a necessary prerequisite for the life of the display. The air inlet and outlet openings must definitely be kept clear; coverings which restrict ventilation are not permissible.
3. Do not install the monitor in a horizontal position (laying down), as this will cause heat to build up inside the display which will damage the LCD Panel. To prevent this problem we recommend installing the monitor in a vertical position (± 30 degrees) to improve the airflow through the monitor.
4. Exposure to direct sunlight can cause a considerable increase in the temperature of the unit, and might under certain circumstances lead to overtemperature. This point should already be taken into consideration when the bridge equipment is being planned (sun shades, distance from the windows, ventilation, etc.)
5. Space necessary for ventilation, for cable inlets, for the operating procedures and for maintenance, must be provided.
6. To further improve the cooling of the monitor we recommend installing Cooling Fans underneath the monitor blowing upwards into the monitor air inlet. This may be required in high temperature applications and also when there is reason to expect temperature problems due to non-optimal way of mounting(Ref.2-5).
7. If the push buttons of the display are not illuminated, an external, dimmable illumination (IEC 60945, 6.5.c, e.g. Goose neck light is required for navigational use.
8. Information about necessary pull-relievers for cables is given in the installation drawings. Attention must be paid to this information so that cable breaks will not occur, e.g. during service work.

Ergonomics

1. Adjust the monitor height so that the top of the screen is at or below eye level. Your eyes should look slightly downwards when viewing the middle of the screen.
2. Adjust screen inclination to remain gaze angle to the centre of the screen approximately perpendicular to the line of gaze.
3. When screen are to be operated both from a sitting position and from a standing position, a screen inclination of about 30° to 40° (from a vertical plane) has turned out to be favourable.
4. The brightness of monitors is limited. Sunlight passing directly through the bridge windows - or its reflection - which falls upon the screen workplaces must be reduced by suitable means (negatively inclined window surfaces, Venetian blinds, distance from the windows, dark colouring of the deckhead)

5. Monitors in the bridge wing area must be installed or mounted by suitable alignment or bulkhead/ deckhead mounting in such a way that reflections of light from the front pane of the monitor are not directed into the observer's viewing direction.
6. The use of ordinary commercial filter plates or filter films is not permitted for items of equipment that require approval (by optical effects, "aids" of that kind can suppress small radar targets, for example).

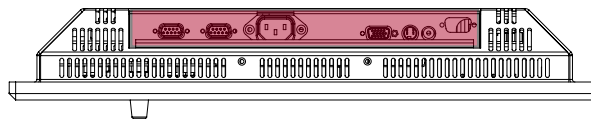
Cables

Use only high quality shielded VGA cable with separate coax for Red, Green and Blue video signal. Or if your product have an DVI-D connector, use only high quality DVI cables.

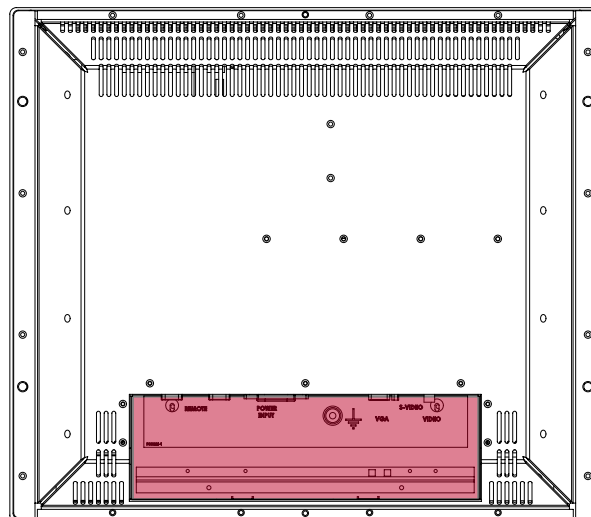
Jakob Hatteland Display AS supply a variety of high quality VGA or DVI cables intended for this use.

Cable Entries & Connectors (Marked area) - Illustration only

Bottom View



Back View



Maximum Cable Length

The VGA/DVI cable should generally be kept as short as possible to provide a high quality output on the display. The maximum cable length will depend on the signal resolution and frequency but also on the quality of the signal output from the computer. We recommend using 60Hz vertical frequency for our display monitors.

Cables up to 10 meters generally provides good picture quality even with a 1600x1200 (UXGA) 60Hz signal. In most cases (especially with lower resolutions) even longer cables will provide a satisfactory result. This should however be tested in advance before making the decision on how far the monitor can be placed from the signal source.

General mounting instructions

- 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.
- 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.
- In the area of the wheel house, the distance of each electronics unit from the magnetic standard compass or the magnetic steering compass must not be less than the permitted magnetic protection distance.

This distance is measured from the centre of the magnetic system of the compass to the nearest point on the corresponding unit concerned.

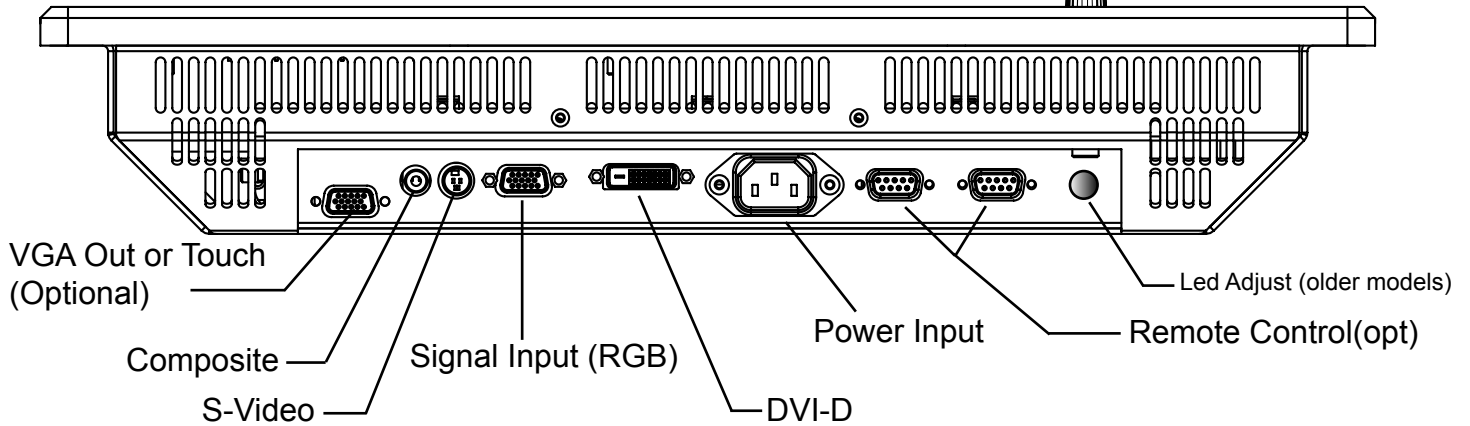
- Units which are to be used on the bridge wing must be installed inside the “wing control console” protected against the weather. In order to avoid misting of the viewing screen, a 25 ... 50 W console-heating (power depending on the volume) is recommended.
- When selecting the site of a display unit, the maximum cable lengths have to be considered.
- The impairment of read-out from a display screen by direct light from lamps or the sun must be avoided. Rear windows must be blacked out by means of roller blinds or Venetian blinds.
- Disturbing reflections on the screen of a display caused by pilot lamps and illuminated signs must be prevented by suitable measures (screening or relocating).
- When a display 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.
- The grounding screws of the units must be connected to the body of the ship (ground); the wire used should have a cross sectional area of at least 6 mm².
- 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.

Rotary Bracket

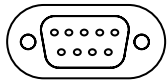
This can only be mounted if your product is equipped with a **Standard Bracket**.

Use the provided bolts to secure it. You may choose your own bolts to secure it to a table or desktop, recommended size are: M10 and minimum 30mm in length.

Connection area of display (illustration)



NOTE: Available connectors/locations may vary depending on model !



TOUCHSCREEN / VGA OUT: (optional)

Connect the RS-232 cable to the D-SUB 9P Connector (female) on the rear side of the TFT display. Connect the other end to your COM port of your computer. Install the necessary software needed to operate it.

- Note that the connector is only installed upon customer request. VGA OUT connector is then removed.
- By factory standards the product have been mounted with a VGA OUT 15PIN DSUB connector, this signal is a clone of the incoming signal.



COMPOSITE (PAL VIDEO):

Connect your composite video signal cable into the RCA jack plug. To activate the Picture In Picture function, the TFT display must be configured via the OSD menus.

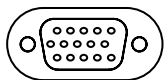
- Note that *Composite Video* must be selected as the incoming video source.



S-VIDEO:

Connect your S-Video (SVHS) video signal cable into the mini 4-way din plug. It can only be inserted one way and make sure you don't bend any of the pins inside your cable. To activate the Picture In Picture function, the TFT display must be configured via the OSD menus.

- Note that *S-Video* must be selected as the incoming video source.



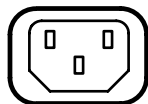
SIGNAL INPUT (RGB):

Connect the VGA cable to the D-SUB 15P Connector (female) on the rear side of the TFT display. If possible, screw the VGA cable to the D-SUB connector and make sure you don't bend any of the pins inside the VGA cable connector. To reduce tension of the VGA cable, secure it to the base mounted cable tie clamp. Connect the other end of the cable to the VGA output of your computer, and fasten it there also.

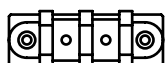
continues....

**DVI-D INPUT:** (Only on models produced after/during May 2003)

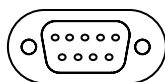
Connect the DVI cable to the DVI-D 24P Connector (female) on the rear side of the TFT display. If possible, screw the DVI cable to the DVI-D connector and make sure you don't bend any of the pins inside the DVI cable connector. To reduce tension of the DVI cable, secure it to the base mounted cable tie clamp. Connect the other end of the cable to the DVI-D output of your computer, and fasten it there also.

**POWER INPUT:** (AC Version)

The internal AC power module supports both 115VAC/60Hz and 230/50Hz power input. You may secure the cable further by mounting it to the base mounted cable tie clamp.

**POWER INPUT:** (DC Version)

Secure the cables (check polarity!) to the screw terminal, you may secure the cable further by mounting it to the base mounted cable tie clamp. The internal DC power module supports voltage from 12 to 24 VDC.

**REMOTE CONTROL:** (optional)

The two serial remote control connectors are used for displays with the JHSCOM-A1 or JHSCOM-B1. It features a RS232/RS422/RS485 interface for controlling all parameters, including brightness, for the display. For further information, see the "Remote Control Specification" at www.hatteland.com

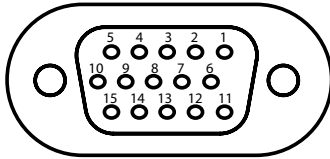
**LED ADJUST:** (Only on older versions)

The led adjust is only present in displays described in the chapter *automatic power light dimming*. With the led adjust knob, you can manually adjust the intensity of the power light indicator which is located in the front of the display. The power light indicator is controlled by the Auto Power LED Dimming function which automatically adjusts the intensity of the power light based on your environment lightning. You could also turn it off if that is necessary.

Note:

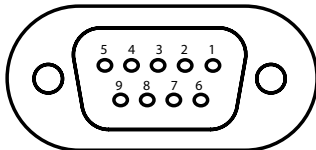
If you have optional accessories beyond these standard connectors described here, you are welcome to visit our website at www.hatteland.com for separate documentation/specifications regarding accessories (when made available).

VGA D-SUB 15P CONNECTOR FEMALE:



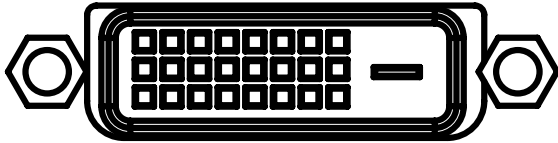
Pin Number:	Description:
1	Red, analog
2	Green, analog
3	Blue, analog
4	Reserved for monitor ID bit 2 (grounded)
5	Digital ground
6	Analog ground red
7	Analog ground green
8	Analog ground blue
9	+5V power supply for DDC (optional)
10	Digital ground
11	Reserved for monitor ID bit 0 (grounded)
12	DDC serial data
13	Horizontal sync or composite sync, input
14	Vertical sync, input
15	DDC serial clock

TOUCHSCREEN D-SUB 9P CONNECTOR FEMALE: (optional)



Pin Number:	Description:
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI

DVI-D 24P CONNECTOR FEMALE:



Pin Number:	Description:
1 (Upper left)	T.M.D.S. Data2 -
2	T.M.D.S. Data2 +
3	T.M.D.S. Data2/4 Shield
4	T.M.D.S. Data4 -
5	T.M.D.S. Data4 +
6	DDC Clock
7	DDC Data
8 (Upper right)	Not connected
9	T.M.D.S. Data1 -
10	T.M.D.S. Data1 +
11	T.M.D.S. Data1/3 Shield
12	T.M.D.S. Data3 -
13	T.M.D.S. Data3 +
14	+5V Power
15	Ground (for +5V)
16	Hot Plug Detect
17 (Lower right)	T.M.D.S. Data0 -
18	T.M.D.S. Data0 +
19	T.M.D.S. Data0/5 Shield
20	T.M.D.S. Data5 -
21	T.M.D.S. Data5 +
22	T.M.D.S. Clock Shield
23	T.M.D.S. Clock +
24 (Lower right)	T.M.D.S. Clock -

DDC = Display Data Channel

T.M.D.S = Transition Minimized Differential Signal

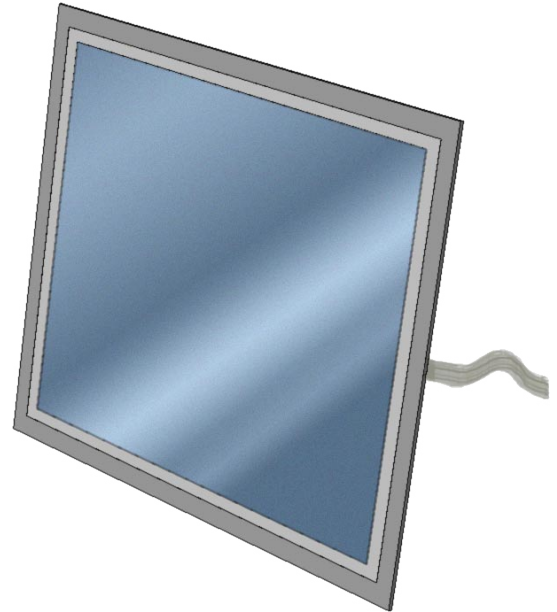


Introduction to Jakob Hatteland Display products with touchscreen

JHD uses both Resistive and Capacitive touchscreen solutions for their products. Please visit our website to verify what product and touchscreen solution your product have.

Capacitive Touchscreen

Capacitive touchscreens operate using oscillator circuits that are located in each corner of the glass overlay and measure the capacitance of the area to be “touched”. Depending on where the user touches the overlay, the oscillators will vary in frequency. A touchscreen controller then measures the frequency variations to ascertain the coordinates of the person’s touch. This glass overlay has a coating that stores the charge deposited over its surface electrically. It will not operate with either a gloved hand or with a mechanical stylus.



Brief Specifications

Subject	Details
Construction	Top: ClearTek protective overcoat protects the sensors and increase durability. Inside: Electrode X/Y grid pattern and conductive coating. Bottom: Glass and conductive coating. Small amount of voltage is applied to the four corners for measuring X and Y coordinates of the touch point.
Positional Accuracy	Reported touch coordinates are within 1.0% of true position. (Based on viewing area dimensions)
Touch Contact Requirements	3 ms for finger input.
Endurance Tested	More than 225 million touches in one location without noticeable degradation to the surface.
Cleaning	Water, isopropyl, alcohol, and similar non-abrasive cleaners.
Liquid Resistance	Liquids on screen does not impede touchscreen performance.
Light Transmission	Up to 88% at 550 nm; dependant on specific surface finish chosen.

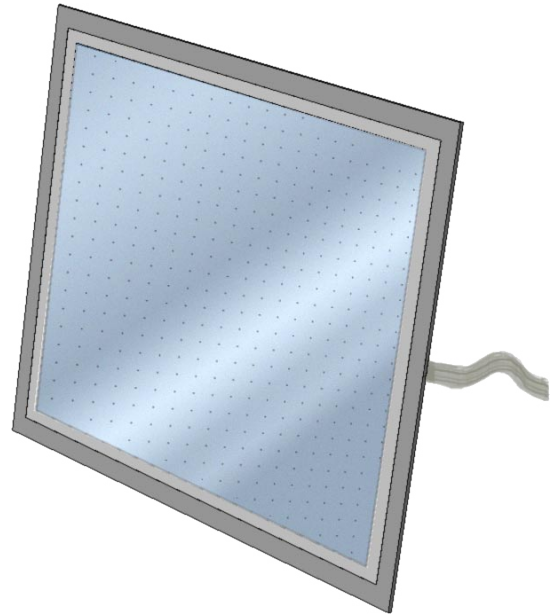
Updated touchscreen drivers and documentation for your operating system:

Please visit our website www.hatteland.com (click on support, and then touchdrivers) for 3rd party software, drivers and complete documentation for touchscreens.

Resistive Touchscreen

It generally uses a display overlay composed of layers, each with a conductive coating on the interior surface. Special separator “dots” are distributed evenly across the active area and separate the conductive interior layers.

The pressure from using either a mechanical stylus or finger produces an internal electrical contact at the “action point” which supplies the controller with vertical and horizontal analog voltages for data input. The resistive touchscreens are anti-glare to reduce reflective shine intensity, which will slightly diffuse the light output throughout the screen. Resistive technology activation can be initiated by; a gloved hand, fingernail, mechanical stylus or an ungloved finger.



Brief Specifications

Subject	Details
Construction	Top: Polyester with outside hard-surface coating with clear or anti-glare finish. Inside: Transparent conductive coating. Bottom: Glass substrate with uniform conductive coating. Top and bottom layers separated by separator dots.
Positional Accuracy	Standard deviation of error is less than +/- 0.080-inch (2mm).
Touch Activation Force	Typically 57 to 133 g
Expected Life Performance	More than 35 million touches in one location without failure, using a stylus similar to a finger.
Chemical Resistance (Exposed for one hour)	Acetone, Ammonia-based glass cleaners, Common food and beverages, Hexane, Isopropyl alcohol, Methylene chloride, Methyl ethyl ketone, Mineral spirits, Turpentine
Light Transmission	Typically 75% over visible light spectrum.

Updated touchscreen drivers and documentation for your operating system:

Please visit our website www.hatteland.com (click on support, and then touchdrivers) for 3rd party software, drivers and complete documentation for touchscreens.



Specifications - JH 10T06 MMD



TFT Display:

10.4" viewable image size
Active Matrix, Thin Film Transistor (TFT)
RGB vertical stripe

Characteristics:

Pixel number : 640 x 480
Pixel pitch (RGB) : 0,33 (H) x 0,33 (V) mm
Response Time : 20 ms (typ), "black" to "white"
Contrast Ratio : 300:1 (typ)
Light Intensity : 350 cd/m² (typical)
Viewable Angle : +/- 70 deg. (H)
 : +/- 40 deg. (V)

Display Colors Analog Input:

262,144 colors (6-bit color max)

RGB Input Signal:

Analog RGB 0,7Vp-p
Input impedance 75 Ohm

Sync Signal:

Digital separate sync., Composite sync., sync. on green
Auto detects VGA

Synchronisation Range:

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

Resolutions:

640 x 350 / 640 x 480 *

Video Input Signal:

Interlaced NTSC, PAL/SECAM video with input
format of composite video, S-Video & component video
(YCrCb)

* Recommended for optimum picture quality

Active Display Area:

211,2 (H) x 158,4 (V) mm

Power Supply:

JH 10T06 MMD A1 : 115VAC/60Hz or 230VAC/50Hz
JH 10T06 MMD A2 : 24 VDC

Power Consumption:

Operating: Max 60 W

Environmental Considerations:

Operating: Temperature -15 deg. C to +55 deg. C
Humidity 30% to 90% (non condensing)
Storage: Temperature -20 deg. C to +60 deg. C
Humidity 10% to 90% (non condensing)

Dimensions:

339 (W) x 256 (H) x 54 (D) mm
Weight: 3.5 kg (Approx)

Input Signal Terminal:

RGB (PC) signal:
15pin mini D-SUB (Female)

Video Signal:

Composite video : Phono plug
S-Video : S-Video plug

Power:

JH 10T06 MMD A1 : Std IEC inlet (AC input)
JH 10T06 MMD A2 : Screw terminal (DC input)

Touch Screen: (optional)

1 x D-SUB 9P Connector (female)

User Controls:

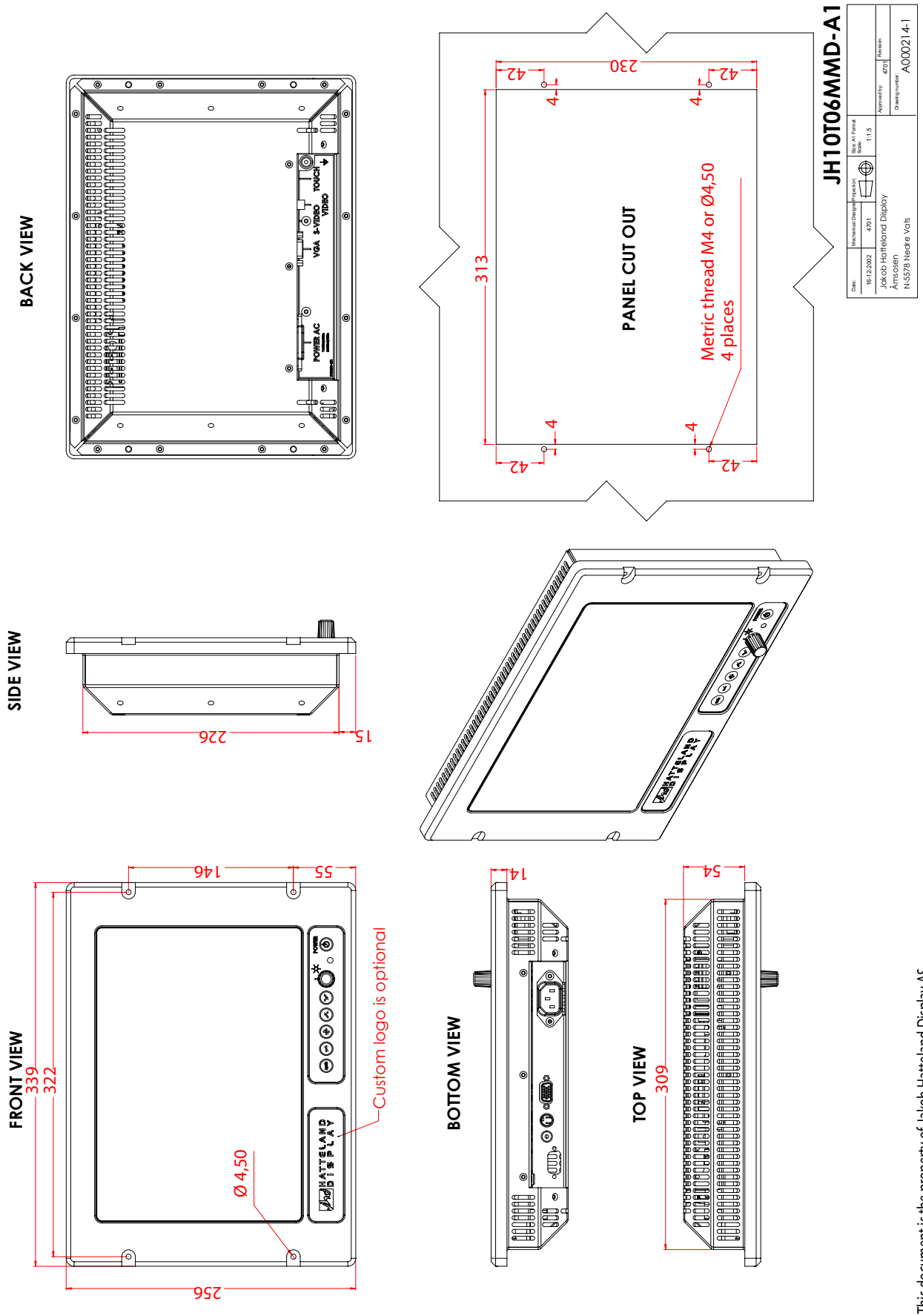
Power On/Off button, Brightness Control, Mode Status LED
On Screen Display Control.

Specification and design are subject to change without notice.

For additional information, datasheets and support for this product, please visit our website:



www.hatteland.com



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At the time of printing this manual, this technical drawing was not available. Please check our internet pages (under support) for updates and datasheets on this issue.

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Specifications - JH 15T03 MMD



TFT Display:

15.0" viewable image size
Thin Film Transistor (TFT)
MVA technology

Characteristics:

Pixel number : 1024 x 768
Pixel pitch (RGB) : (0,297) (H) x 0,297 (V) mm
Response Time : 25 ms (typ)
Contrast Ratio : 400:1 (typ)
Light Intensity : 250 cd/m² (typical)
Viewable Angle : +/- 80 deg.(typical)(Up/Down/Left/Right)
(@ CR > 10)

Display Colors Analog Input:

262,144 colors (6-bit color)

RGB Input Signal:

Analog RGB 0,7Vp-p
Input impedance 75 Ohm

Sync Signal:

Digital separate sync., Composite sync., sync. on green
Auto detects VGA -> SXGA, interlaced and non interlaced

Synchronisation Range:

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

Resolutions:

640 x 350 / 640 x 480 / 720 x 400
800 x 600 / 1024 x 768 *

Video Input Signal:

Interlaced NTSC, PAL/SECAM video with input
format of composite video, S-Video & component video
(YCrCb)

Active Display Area:

304,1 (H) x 228,1 (V) mm

Power Supply:

JH 15T03 MMD A1 : 115VAC/60Hz or 230VAC/50Hz
JH 15T03 MMD A2 : 12-24 VDC

Power Consumption:

Operating: Max 40 W

Environmental Considerations:

Operating: Temperature -15 deg. C to +50 deg. C
Humidity 20% to 85% (non condensing)
Storage: Temperature -20 deg. C to +60 deg. C
Humidity 5% to 85% (non condensing)

Dimensions:

412 (W) x 345 (H) x 58 (D) mm
Weight: 7 kg (approx w/bracket)

Input Signal Terminal:

RGB (PC) signal:
15pin mini D-SUB (Female)

Video Signal:

Composite video : Phono plug
S-Video : S-Video plug

Power:

JH 15T03 MMD A1 : Std IEC inlet (AC input)
JH 15T03 MMD A2 : Screw terminal (DC input)

Touch Screen: (optional)

1 x D-SUB 9P Connector (female)

User Controls:

Power On/Off button, Brightness Control, Mode Status LED
On Screen Display Control, Auto LED intensity adjust.

* Recommended for optimum picture quality

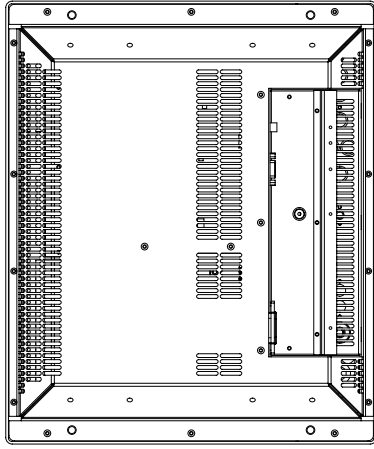
Specification and design are subject to change without notice.

For additional information, datasheets and support for this product, please visit our website:

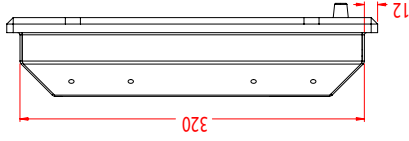


www.hatteland.com

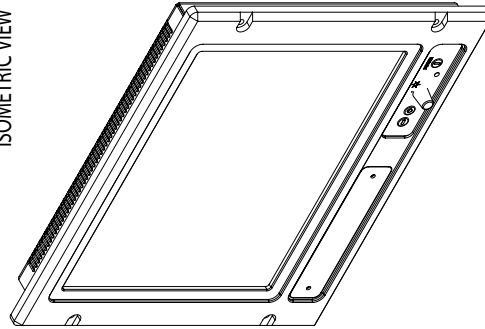
BACK VIEW



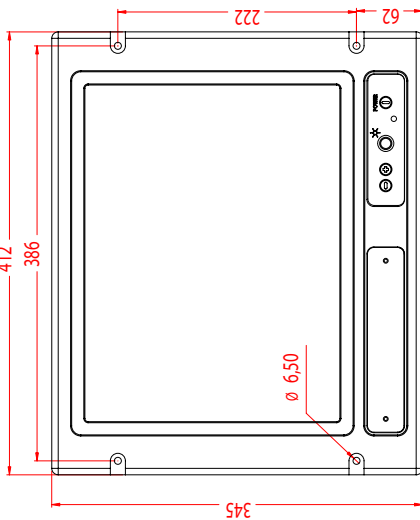
SIDE VIEW



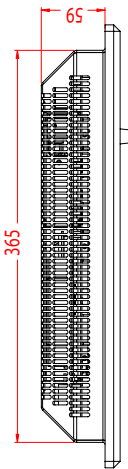
ISOMETRIC VIEW



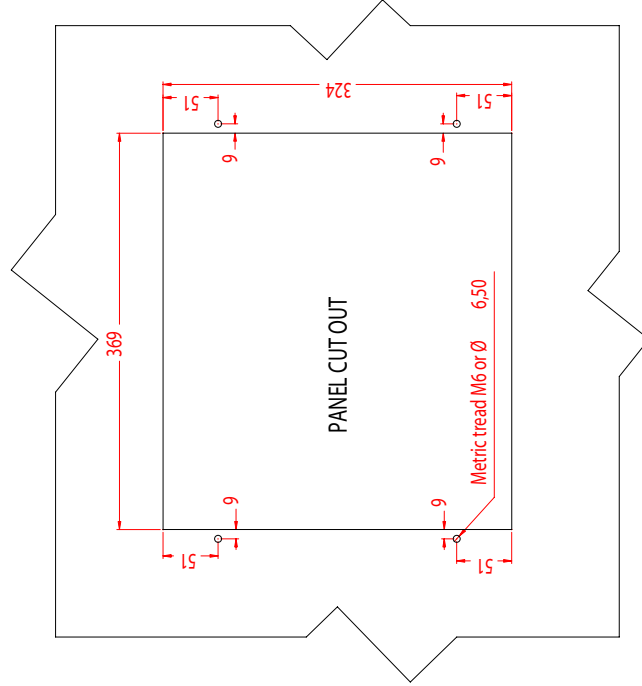
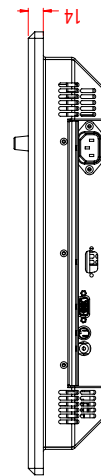
FRONT VIEW



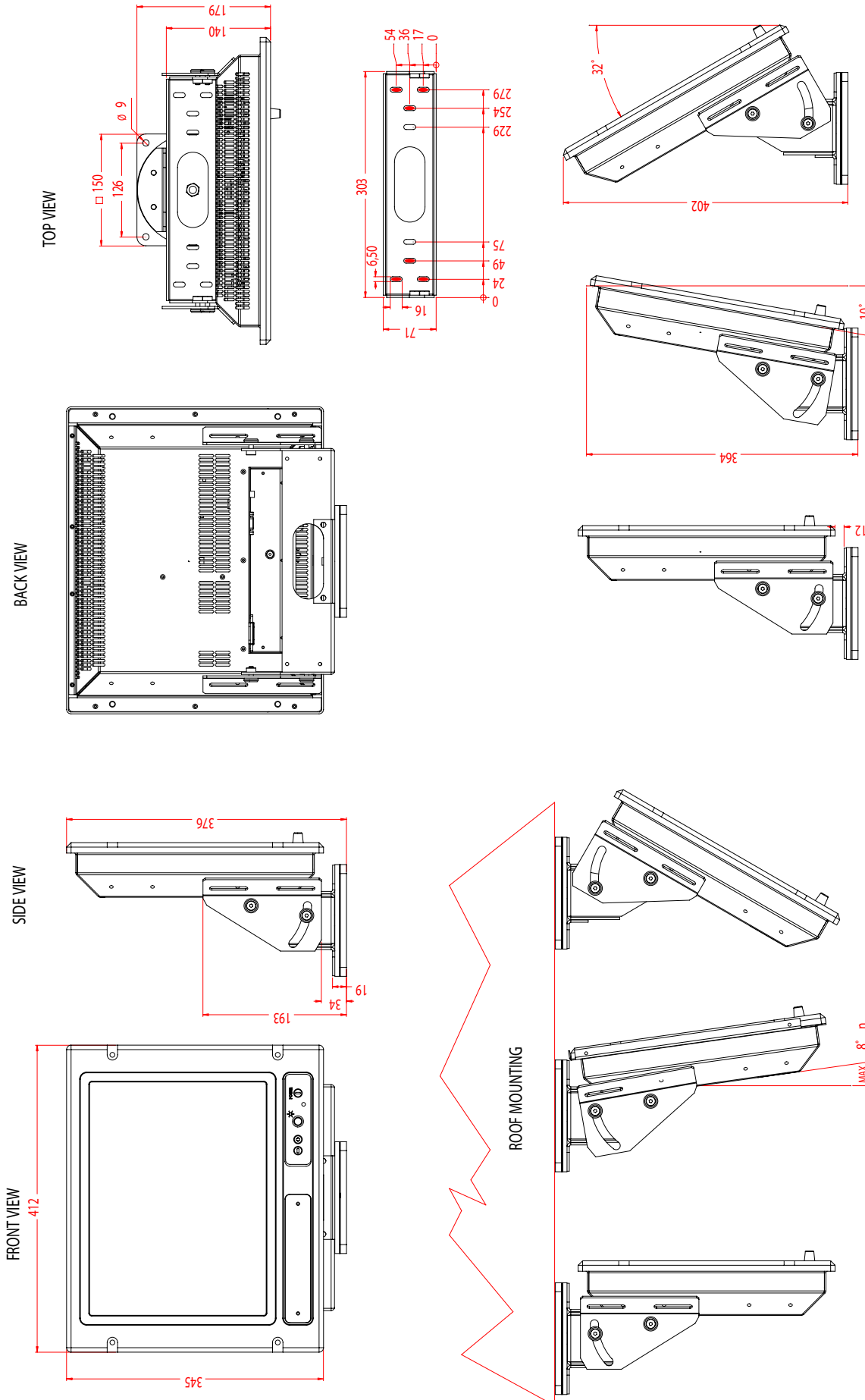
TOP VIEW



BOTTOM VIEW



Date	09-04-2022	Author/Type	4700	Revision		Material/Stock	12.5	Customer	
Jakob Hatteland Display Amosmen N-5578 Nerde Vals				A000104-1					



Date: 09-06-2022	Author/Type: 4701	Part No.:	Material/Finish: 12.5	Quantity:
Jakob Hatteland Display Amossem N-5578 Nedre Vats		A000104-1		

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Specifications - JH 17T01 MMD



TFT Display:

17.4" viewable image size
Thin Film Transistor (TFT)
MVA technology

Characteristics:

Pixel number : 1280 x 1024
Pixel pitch (RGB) : (0,27) (H) x 0,27 (V) mm
Response Time : 25 ms (typ)
Contrast Ratio : 400:1 (typ)
Light Intensity : 220 cd/m² (typical)
Viewable Angle : +/- 80 deg.(typical)(Up/Down/Left/Right)
(@ CR > 10)

Display Colors Analog Input:

16.777.216 colors (8-bit color)

RGB Input Signal:

Analog RGB 0,7Vp-p
Input impedance 75 Ohm

Sync Signal:

Digital separate sync., Composite sync., sync. on green
Auto detects VGA -> SXGA, interlaced and non interlaced

Synchronisation Range:

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

Resolutions:

640 x 350 / 640 x 480 / 720 x 400
800 x 600 / 1024 x 768 / 1280 x 1024 *

Video Input Signal:

Interlaced NTSC, PAL/SECAM video with input
format of composite video, S-Video & component video
(YCrCb)

Active Display Area:

345,6 (H) x 276,48 (V) mm

Power Supply:

JH 17T01 MMD A1 : 115VAC/60Hz or 230VAC/50Hz
JH 17T01 MMD A2 : 24 VDC

Power Consumption:

Operating: Max 60 W

Environmental Considerations:

Operating: Temperature -15 deg. C to +55 deg. C
Humidity 30% to 90% (non condensing)
Storage: Temperature -20 deg. C to +60 deg. C
Humidity 10% to 90% (non condensing)

Dimensions:

460 (W) x 400 (H) x 60.10 (D) mm
Weight: 9.2 kg (approx w/bracket)

Input Signal Terminal:

RGB (PC) signal:
15pin mini D-SUB (Female)

Video Signal:

Composite video : Phono plug
S-Video : S-Video plug

Power:

JH 17T01 MMD A1 : Std IEC inlet (AC input)
JH 17T01 MMD A2 : Screw terminal (DC input)

Touch Screen: (optional)

1 x D-SUB 9P Connector (female)

User Controls:

Power On/Off button, Brightness Control, Mode Status LED
On Screen Display Control, Auto LED intensity adjust.

* Recommended for optimum picture quality

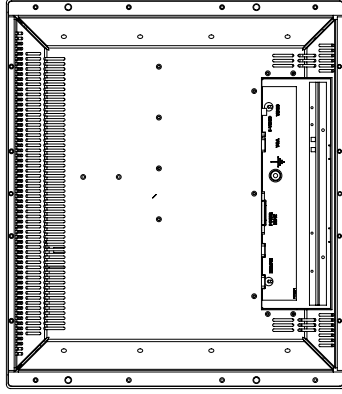
Specification and design are subject to change without notice.

For additional information, datasheets and support for this product, please visit our website:

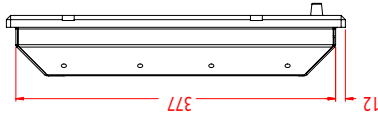


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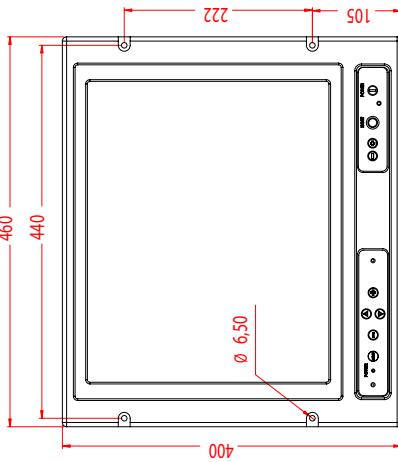
BACK VIEW



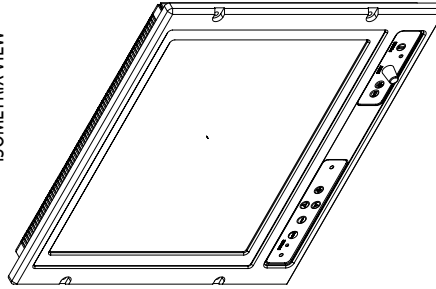
SIDE VIEW



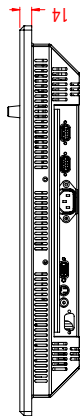
FRONT VIEW



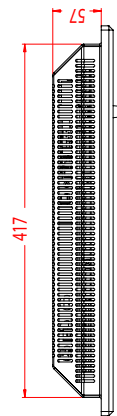
ISOMETRIX VIEW



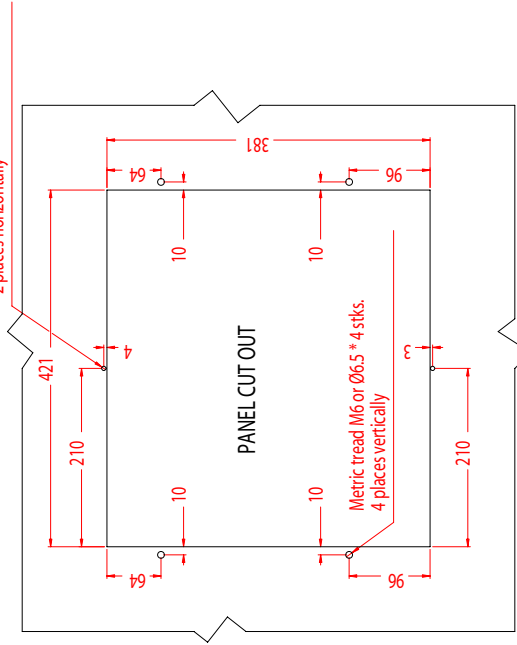
BOTTOM VIEW



TOP VIEW

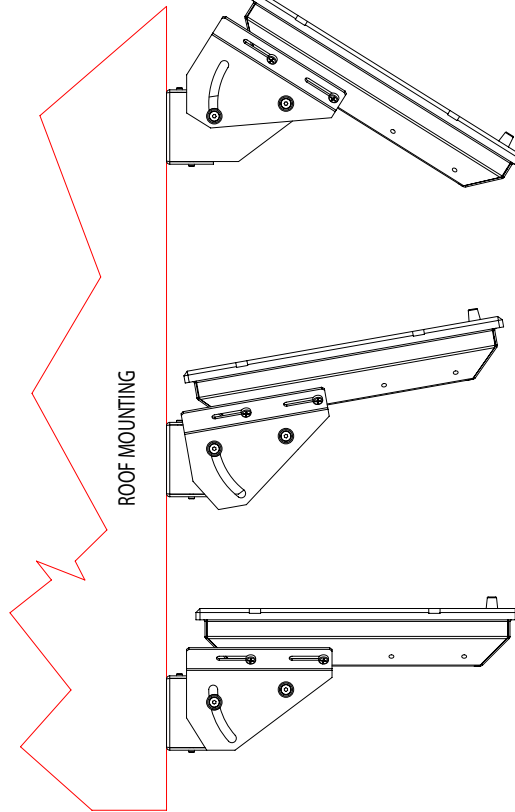
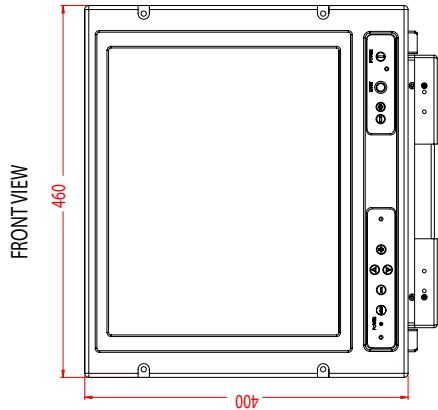
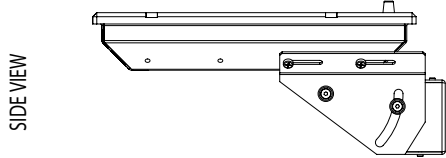
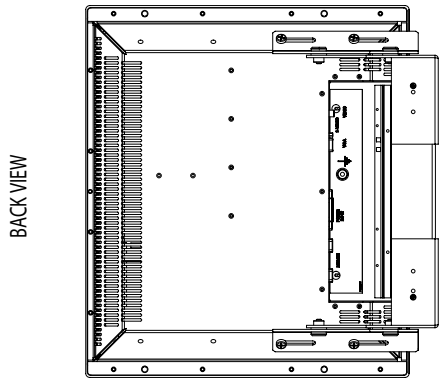
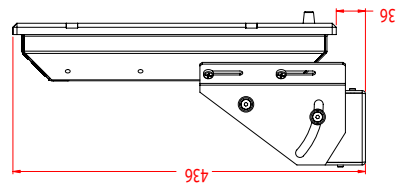
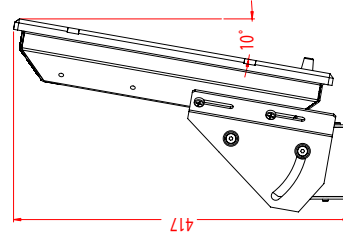
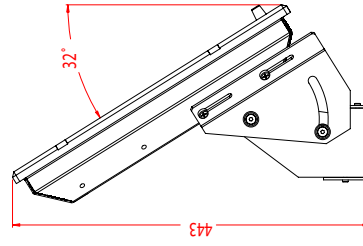
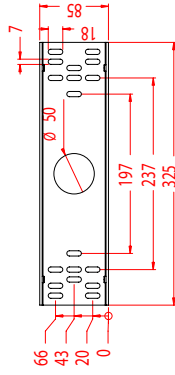
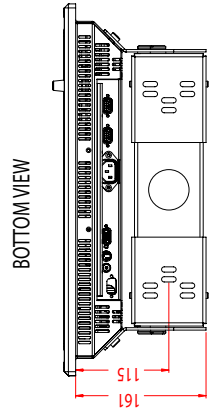
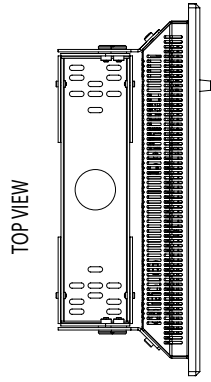


Optional holes Ø6.5 * 2 stks
Screwed from back side of panel
2 places horizontally



Part No.	JH17T01 MMD-A1
Rev.	13
Manufacturer	Jakob Hatteland Display Arnsen N-5578 Nægle Vals

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Part No.	JH17T01 MMD-A1
Rev.	1.0
Material	Aluminum
Color	Black
Weight	1.5
Volume	
Manufacturer	Jakob Hatteland Display Amoson N-5528 Wade Vals

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Specifications - JH 18T04 MMD



TFT Display:

18.1" viewable image size
Thin Film Transistor (TFT)
a-Si TFT Active Matrix

Characteristics:

Pixel number : 1280 x 1024
Pixel pitch (RGB) : (0,0935) (H) x 0,2805 (V) mm
Response Time : 40 ms (typ)
Contrast Ratio : 300:1 (typ)
Light Intensity : 200 cd/m² (typical)
Viewable Angle : +/- 85 deg.(typical)(Up/Down/Left/Right)
(@ CR > 10)

Display Colors Analog Input:

16.777.26 colors (8-bit color)

RGB Input Signal:

Analog RGB 0,7Vp-p
Input impedance 75 Ohm

Sync Signal:

Digital separate sync., Composite sync., sync. on green
Auto detects VGA -> SXGA, interlaced and non interlaced

Synchronisation Range:

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

Resolutions:

640 x 350 / 640 x 480 / 720 x 400
800 x 600 / 1024 x 768 / 1280 x 1024 *

Video Input Signal:

Interlaced NTSC, PAL/SECAM video with input
format of composite video, S-Video & component video
(YCrCb)

Active Display Area:

359,04 (H) x 287,232 (V) mm

Power Supply:

JH 18T04 MMD A1 : 115VAC/60Hz or 230VAC/50Hz
JH 18T04 MMD A2 : 24 VDC

Power Consumption:

Operating: 75 W (typ)

Environmental Considerations:

Operating: Temperature -15 deg. C to +55 deg. C
Humidity 30% to 93% (non condensing)
Storage: Temperature -20 deg. C to +60 deg. C
Humidity 10% to 90% (non condensing)

Dimensions:

483 (W) x 444 (H) x 75.57 (D) mm
Weight: 11.50 kg (Approx w/bracket)

Input Signal Terminal:

RGB (PC) signal:
15pin mini D-SUB (Female)

Video Signal:

Composite video : Phono plug
S-Video : S-Video plug

Power:

JH 18T04 MMD A1 : Std IEC inlet (AC input)
JH 18T04 MMD A2 : Screw terminal (DC input)

Touch Screen: (optional)

1 x D-SUB 9P Connector (female)

User Controls:

Power On/Off button, Brightness Control, Mode Status LED
On Screen Display Control, Auto LED intensity adjust.

* Recommended for optimum picture quality

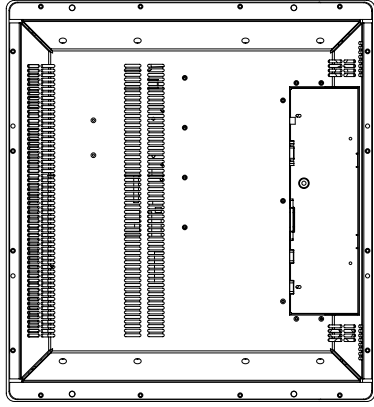
Specification and design are subject to change without notice.

For additional information, datasheets and support for this product, please visit our website:

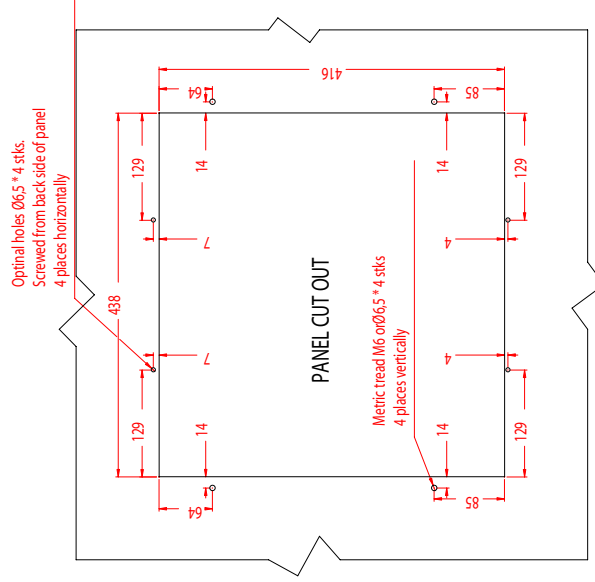


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BACK VIEW

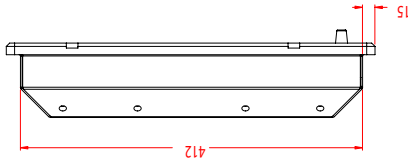


Optimal holes $\varnothing 6,5 * 4$ stks.
Screwed from back side of panel
4 places horizontally

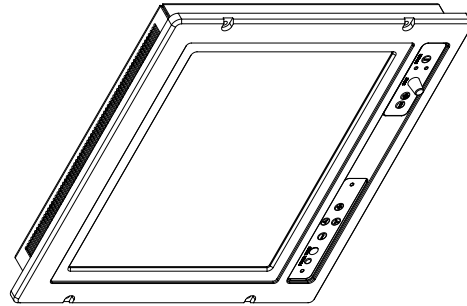


Part No.	JH18T04MMD	Rev.	1.0
Part Name	32711	Material	13
Manufacturer	Jacob Hatteland Display Amoszen N-5578 Neire Wts	Part No.	JH18T04-MMD-A1

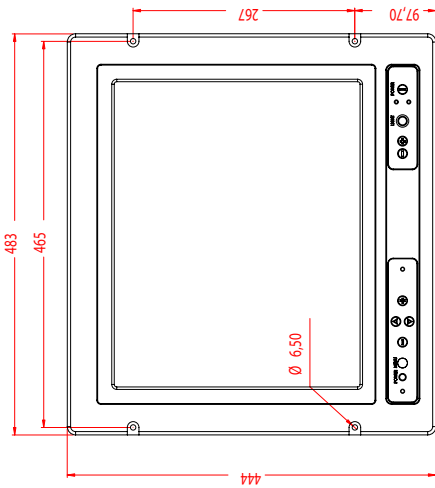
SIDE VIEW



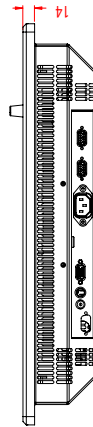
ISOMETRIC VIEW



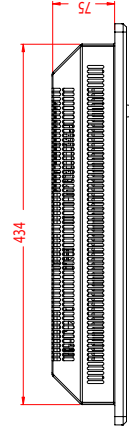
FRONT VIEW



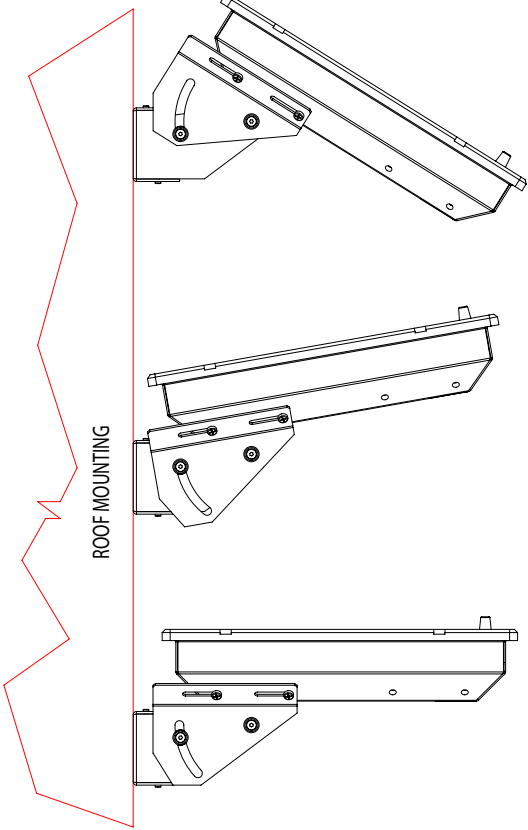
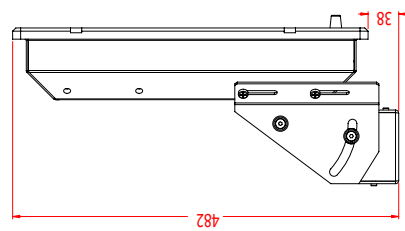
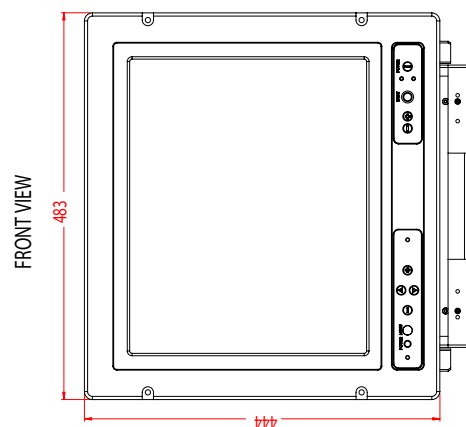
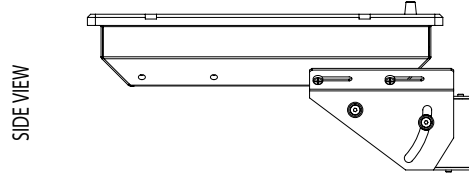
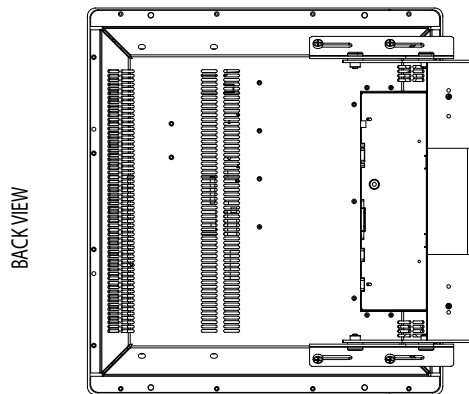
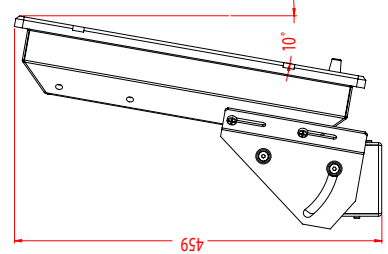
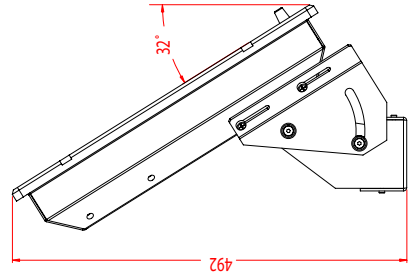
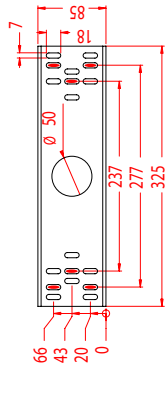
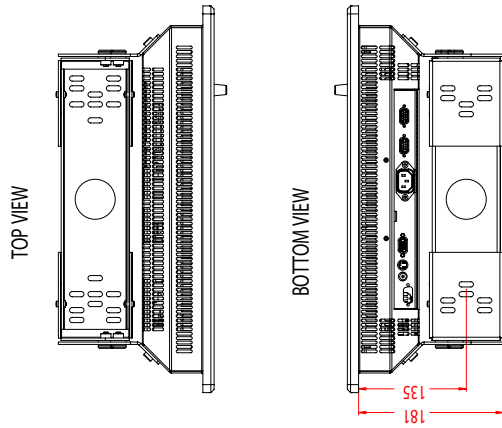
BOTTOM VIEW



TOP VIEW



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Issue No.	13	Part No.	JH18T04 MMD-A1
Rev		Rev	
Issue Date	2021	Issue Date	
Author		Author	
Checked		Checked	
Approved		Approved	
Jakob Hatteland Display		Jakob Hatteland Display	
Amrosim		Amrosim	
N-6578 Hedre Vås		N-6578 Hedre Vås	

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Specifications - JH 19T01 MMD



TFT Display:

19.0" viewable image size
Active Matrix, Thin Film Transistor (TFT)
MVA Premium™ technology

Characteristics:

Pixel number : 1280 x 1024
Pixel pitch (RGB) : 0,294 (H) x 0,294 (V) mm
Response Time : 15 ms (typ)
Contrast Ratio : 600:1 (typ)
Light Intensity : 250 cd/m2 (typical)
Viewable Angle : +/- 85 deg.(typical)(Up/Down/Left/Right)
(@ CR > 10)

Display Colors Analog Input:

16.777.26 colors (8-bit color)

RGB Input Signal:

Analog RGB 0,7Vp-p
Input impedance 75 Ohm

Sync Signal:

Digital separate sync., Composite sync., sync. on green
Auto detects VGA -> SXGA, interlaced and non interlaced

Synchronisation Range:

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

Resolutions:

640 x 350 / 640 x 480 / 720 x 400
800 x 600 / 1024 x 768 / 1280 x 1024 *

Video Input Signal:

Interlaced NTSC, PAL/SECAM video with input
format of composite video, S-Video & component video
(YCrCb)

Active Display Area:

376,32 (H) x 301,056 (V) mm

Power Supply:

JH 19T01 MMD A1 : 115VAC/60Hz or 230VAC/50Hz
JH 19T01 MMD A2 : 24 VDC

Power Consumption:

Operating: Max 100 W

Environmental Considerations:

Operating: Temperature -15 deg. C to +55 deg. C
Humidity 30% to 90% (non condensing)
Storage: Temperature -20 deg. C to +60 deg. C
Humidity 10% to 90% (non condensing)

Dimensions:

483 (W) x 444 (H) x 68 (D) mm
Weight: 12 kg (Approx w/bracket)

Input Signal Terminal:

RGB (PC) signal:
15pin mini D-SUB (Female)

Video Signal:

Composite video : Phono plug
S-Video : S-Video plug

Power:

JH 19T01 MMD A1 : Std IEC inlet (AC input)
JH 19T01 MMD A2 : Screw terminal (DC input)

Touch Screen: (optional)

1 x D-SUB 9P Connector (female)

User Controls:

Power On/Off button, Brightness Control, Mode Status LED
On Screen Display Control, Auto LED intensity adjust.

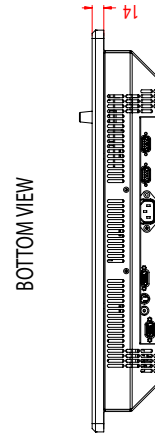
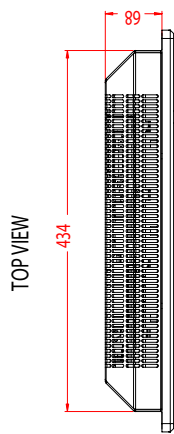
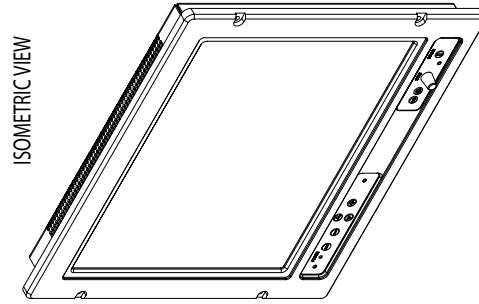
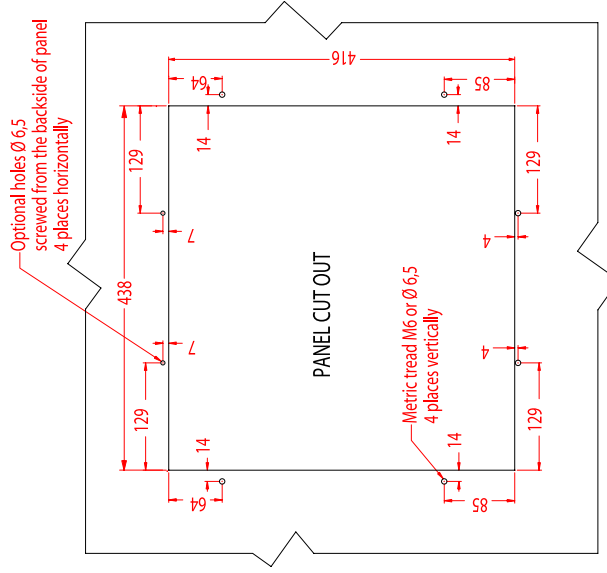
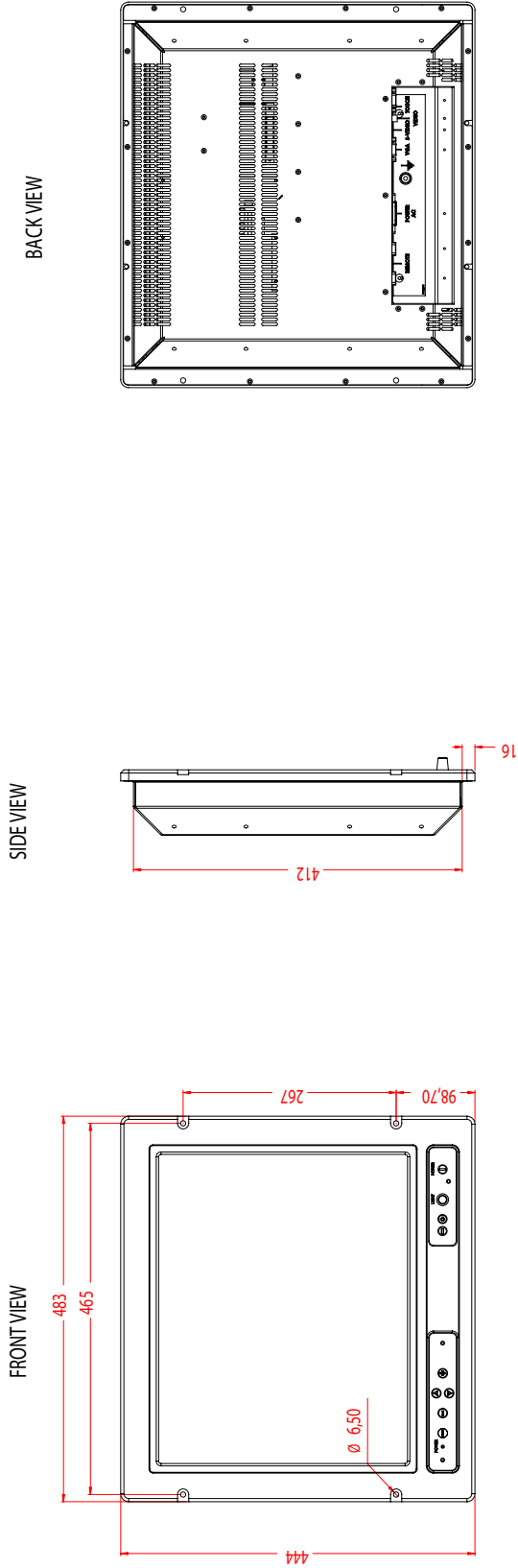
* Recommended for optimum picture quality

Specification and design are subject to change without notice.

For additional information, datasheets and support for this product, please visit our website:



www.hatteland.com



DATE	13	REV	
BY		APP	
DESIGN		DATE	
		A000043-1	
Jakob Hatteland Display Arnesen N-5778 Neire V&S			

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Specifications - JH 20T03 MMD



TFT Display:

20.1" viewable image size
Active Matrix
Thin Film Transistor (Super-TFT)

Characteristics:

Pixel number : 1280 x 1024
Pixel pitch (RGB) : 0,312 (H) x 0,312 (V) mm
Response Time : 25 ms (typ)
Contrast Ratio : 300:1 (typ)
Light Intensity : 250 cd/m² (typical)
Viewable Angle : +/- 85 deg.(typical)(Up/Down/Left/Right)
(@ CR > 10)

Display Colors Analog Input:

16.777.26 colors (8-bit color)

RGB Input Signal:

Analog RGB 0,7Vp-p
Input impedance 75 Ohm

Sync Signal:

Digital separate sync., Composite sync., sync. on green
Auto detects VGA -> SXGA, interlaced and non interlaced

Synchronisation Range:

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

Resolutions:

640 x 350 / 640 x 480 / 720 x 400
800 x 600 / 1024 x 768 / 1280 x 1024 *

Video Input Signal:

Interlaced NTSC, PAL/SECAM video with input
format of composite video, S-Video & component video
(YCrCb)

Active Display Area:

399,36 (H) x 319,49 (V) mm

Power Supply:

JH 20T03 MMD A1 : 115VAC/60Hz or 230VAC/50Hz
JH 20T03 MMD A2 : 24 VDC

Power Consumption:

Operating: Max 100 W

Environmental Considerations:

Operating: Temperature -15 deg. C to +55 deg. C
Humidity 30% to 90% (non condensing)
Storage: Temperature -20 deg. C to +60 deg. C
Humidity 10% to 90% (non condensing)

Dimensions:

534 (W) x 481 (H) x 79.50 (D) mm
Weight: 14 kg (Approx w/bracket)

Input Signal Terminal:

RGB (PC) signal:
15pin mini D-SUB (Female)

Video Signal:

Composite video : Phono plug
S-Video : S-Video plug

Power:

JH 20T03 MMD A1 : Std IEC inlet (AC input)
JH 20T03 MMD A2 : Screw terminal (DC input)

Touch Screen: (optional)

1 x D-SUB 9P Connector (female)

User Controls:

Power On/Off button, Brightness Control, Mode Status LED
On Screen Display Control, Auto LED intensity adjust.

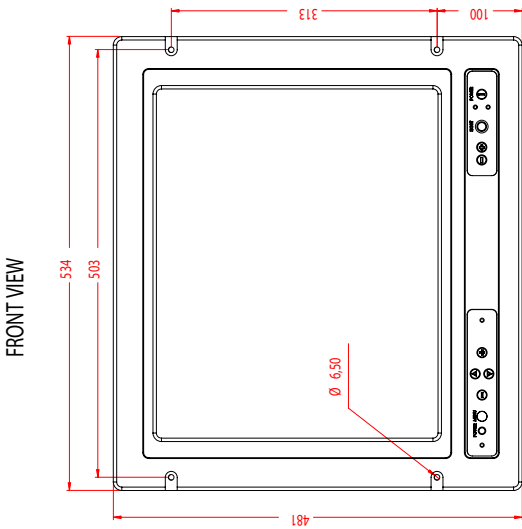
* Recommended for optimum picture quality

Specification and design are subject to change without notice.

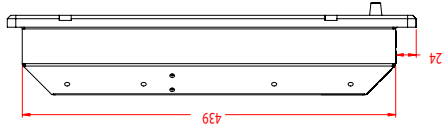
For additional information, datasheets and support for this product, please visit our website:



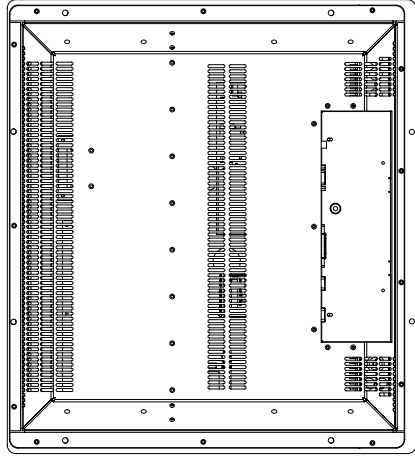
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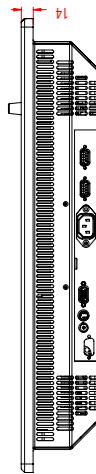
SIDE VIEW



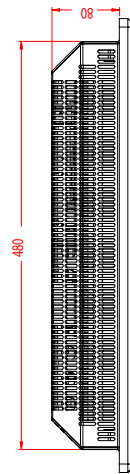
BACK VIEW



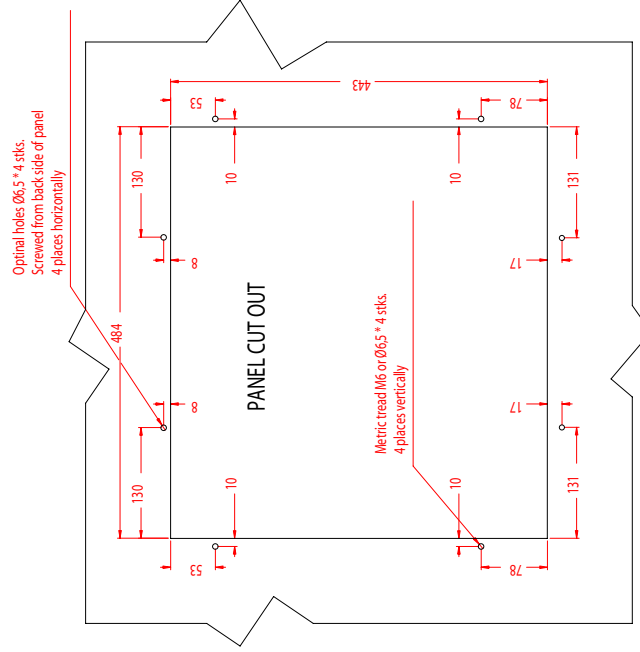
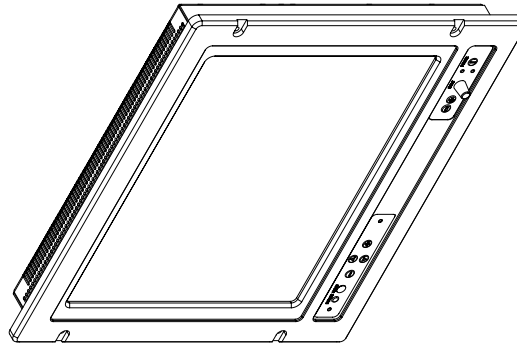
BOTTOM VIEW



TOP VIEW

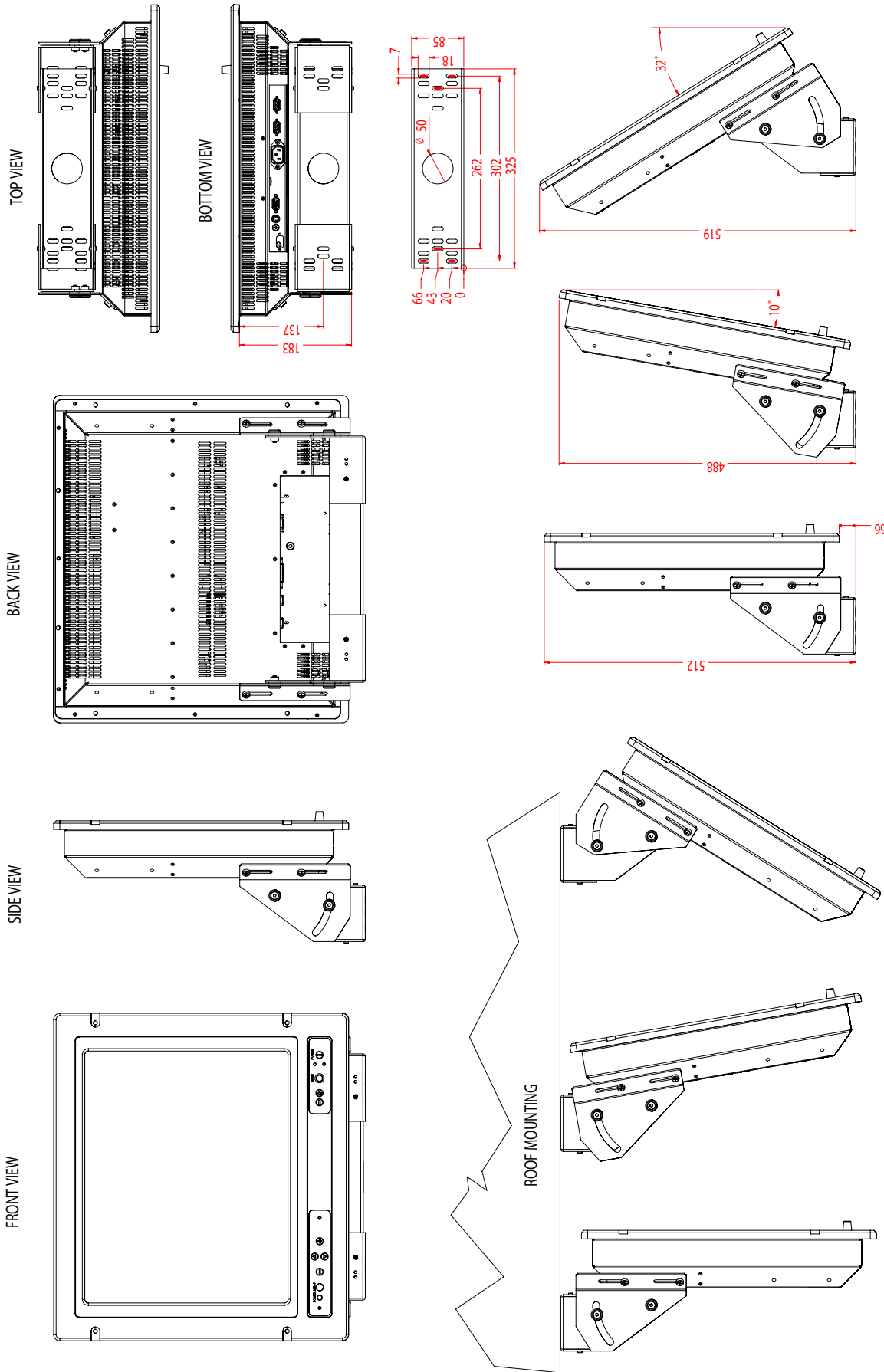


ISOMETRIC VIEW



Rev.	3-10-2022	Drawn By	3371	Checked By		Material Code	113	Part No.	JH20T03MMD-A1
								Manufacturer	Jakob Hatteland Display Armsen N-5578 Neite/bås

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Order No.	JH20T03MMD	Part No.	13211	Revision	1.3	Product No.	JH20T03MMD-A1
Manufacturer				Hatteland Display			
Company Name				Jakob Hatteland Display			
Address				Amrosken			
Country				N-5578 Meire Vlis			

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Specifications - JH 20T04 MMD



TFT Display:

20.1" viewable image size
Active Matrix, Thin Film Transistor (TFT)
MVA Premium™ Technology

Characteristics:

Pixel number : 1600 x 1200
Pixel pitch (RGB) : 0,255 (H) x 0,255 (V) mm
Response Time : 15 ms (typ)
Contrast Ratio : 600:1 (typ)
Light Intensity : 250 cd/m2 (typical)
Viewable Angle : +/- 85 deg.(typical)(Up/Down/Left/Right)
(@ CR > 10)

Display Colors Analog Input:

16.777.26 colors (8-bit color)

RGB Input Signal:

Analog RGB 0,7Vp-p
Input impedance 75 Ohm

Sync Signal:

Digital separate sync., Composite sync., sync. on green
Auto detects VGA -> UXGA, interlaced and non interlaced

Synchronisation Range:

Horizontal : 31,5 kHz to 106,259 kHz
Vertical : 60 Hz * to 85 Hz

Resolutions:

640 x 350 / 640 x 480 / 720 x 400
800 x 600 / 1024 x 768 / 1280 x 1024 / 1600 x 1200*

Video Input Signal:

Interlaced NTSC, PAL/SECAM video with input
format of composite video, S-Video & component video
(YCrCb)

Active Display Area:

408,0 (H) x 306,0 (V) mm

Power Supply:

JH 20T04 MMD A1 : 115VAC/60Hz or 230VAC/50Hz
JH 20T04 MMD A2 : 24 VDC

Power Consumption:

Operating: Max 100 W

Environmental Considerations:

Operating: Temperature -15 deg. C to +55 deg. C
Humidity 30% to 90% (non condensing)
Storage: Temperature -20 deg. C to +60 deg. C
Humidity 10% to 90% (non condensing)

Dimensions:

534 (W) x 481 (H) x 73 (D) mm
Weight: 15 kg (Approx w/bracket)

Input Signal Terminal:

RGB (PC) signal:
15pin mini D-SUB (Female)

Video Signal:

Composite video : Phono plug
S-Video : S-Video plug

Power:

JH 20T04 MMD A1 : Std IEC inlet (AC input)
JH 20T04 MMD A2 : Screw terminal (DC input)

Touch Screen: (optional)

1 x D-SUB 9P Connector (female)

User Controls:

Power On/Off button, Brightness Control, Mode Status LED
On Screen Display Control, Auto LED intensity adjust.

* Recommended for optimum picture quality

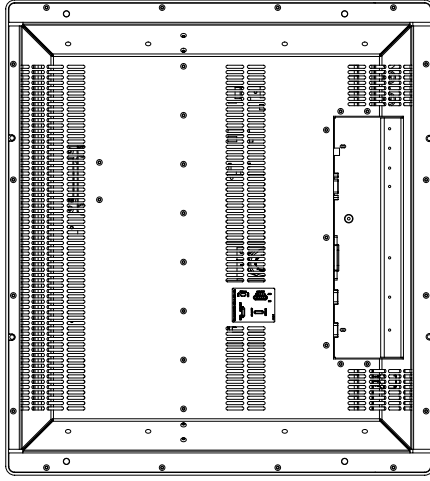
Specification and design are subject to change without notice.

For additional information, datasheets and support for this product, please visit our website:

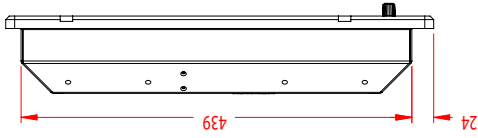


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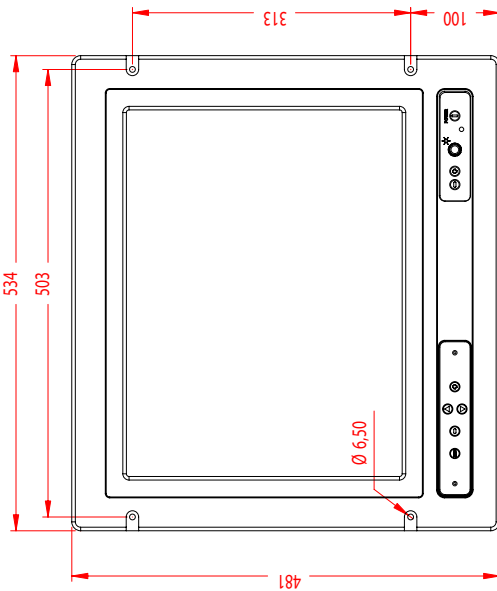
BACK VIEW



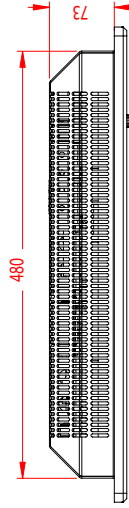
SIDE VIEW



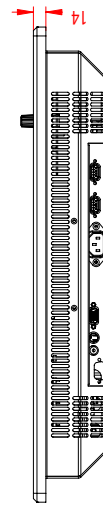
FRONT VIEW



TOP VIEW

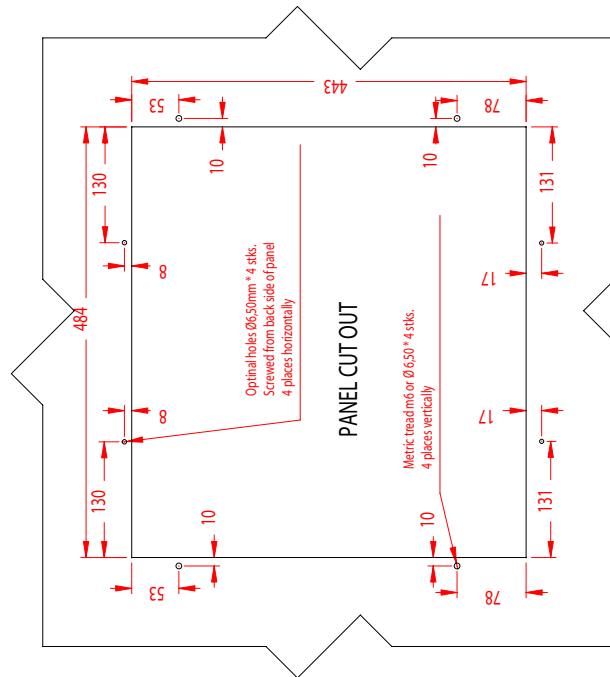


BOTTOM VIEW



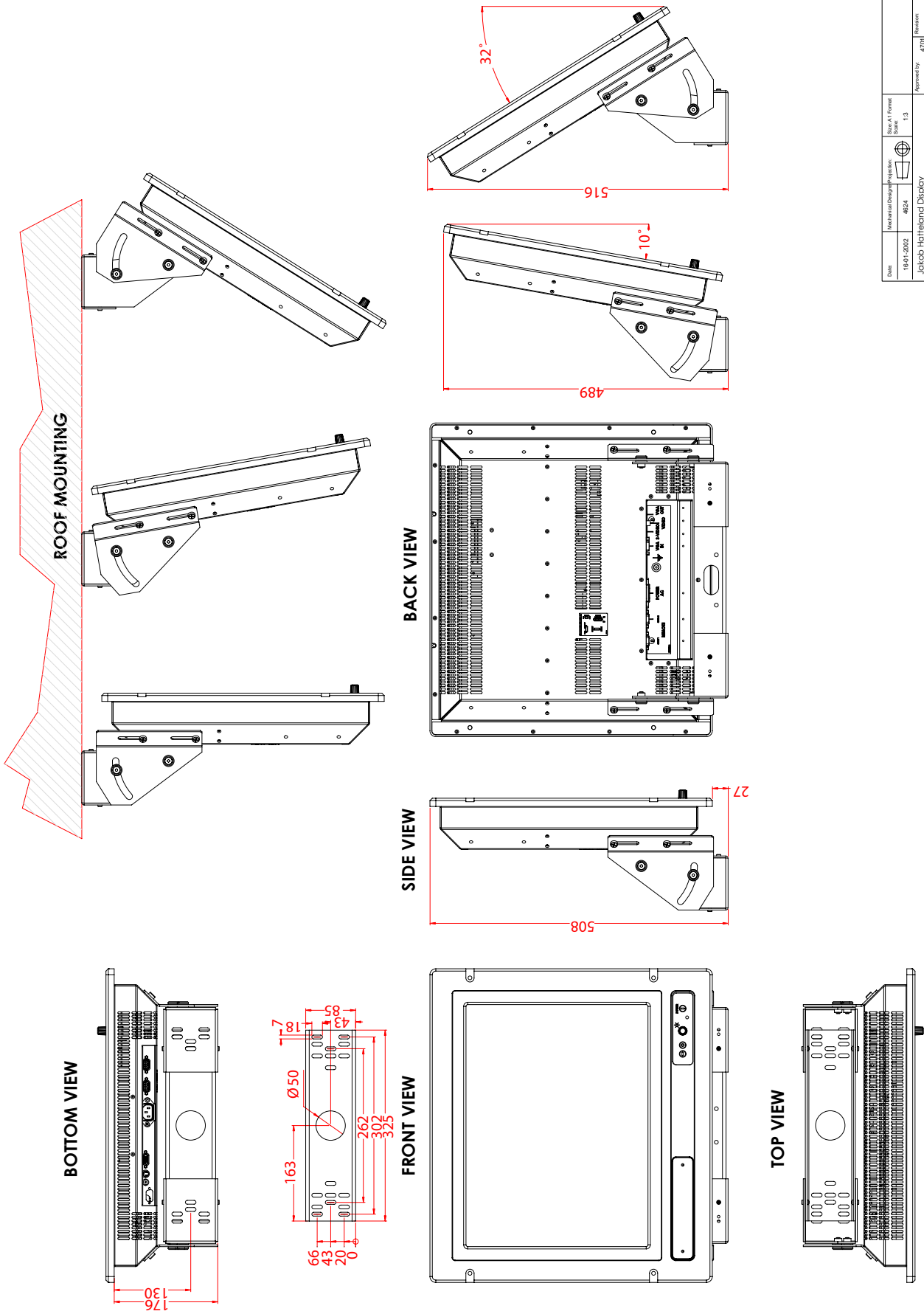
JH20T04 MMD-A1

Dato	23-01-2002	Konstr./reprint	4624	Projeksjon		Målest./A3 Format	1:6	Ersatt av	
Jakob Hatteland Display AS Åmsosen N-5578 Nedre Vats							A000071-1		



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Date	16.01.2002	Manufactured Design/Revision	4824	Scale	A1 Format 1:3
Approved by	Jakob Hatteland Display Amsoen	Revision	4701	Drawing number	A-000071-1
N-5578 Nedde Vats					



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Specifications - JH 23T02 MMD



TFT Display:

23.1" viewable image size
Thin Film Transistor (TFT)
MVA Premium™ Technology

Characteristics:

Pixel number : 1600 x 1200
Pixel pitch (RGB) : 0,294 (H) x 0,294 (V) mm
Response Time : 20 ms (typ)
Contrast Ratio : 600:1 (typ)
Light Intensity : 250 cd/m2 (typical)
Viewable Angle : +/- 85 deg.(typical)(Up/Down/Left/Right)
(@ CR > 10)

Display Colors Analog Input:

16.777.26 colors (8-bit color)

RGB Input Signal:

Analog RGB 0,7Vp-p
Input impedance 75 Ohm

Sync Signal:

Digital separate sync., Composite sync., sync. on green
Auto detects VGA -> UXGA, interlaced and non interlaced

Synchronisation Range:

Horizontal : 31,5 kHz to 106,259 kHz
Vertical : 60 Hz * to 85 Hz

Resolutions:

640 x 350 / 640 x 480 / 720 x 400
800 x 600 / 1024 x 768 / 1280 x 1024 / 1600 x 1200*

Video Input Signal:

Interlaced NTSC, PAL/SECAM video with input
format of composite video, S-Video & component video
(YCrCb)

Active Display Area:

470,4 (H) x 352,8 (V) mm

Power Supply:

JH 23T02 MMD A1 : 115VAC/60Hz or 230VAC/50Hz
JH 23T02 MMD A2 : 24 VDC

Power Consumption:

Operating: Max 100 W

Environmental Considerations:

Operating: Temperature -15 deg. C to +55 deg. C
Humidity 30% to 90% (non condensing)
Storage: Temperature -20 deg. C to +60 deg. C
Humidity 10% to 90% (non condensing)

Dimensions:

584 (W) x 534 (H) x 72 (D) mm
Weight: 17 kg (Approx w/bracket)

Input Signal Terminal:

RGB (PC) signal:
15pin mini D-SUB (Female)

Video Signal:

Composite video : Phono plug
S-Video : S-Video plug

Power:

JH 23T02 MMD A1 : Std IEC inlet (AC input)
JH 23T02 MMD A2 : Screw terminal (DC input)

Touch Screen: (optional)

1 x D-SUB 9P Connector (female)

User Controls:

Power On/Off button, Brightness Control, Mode Status LED
On Screen Display Control, Auto LED intensity adjust.

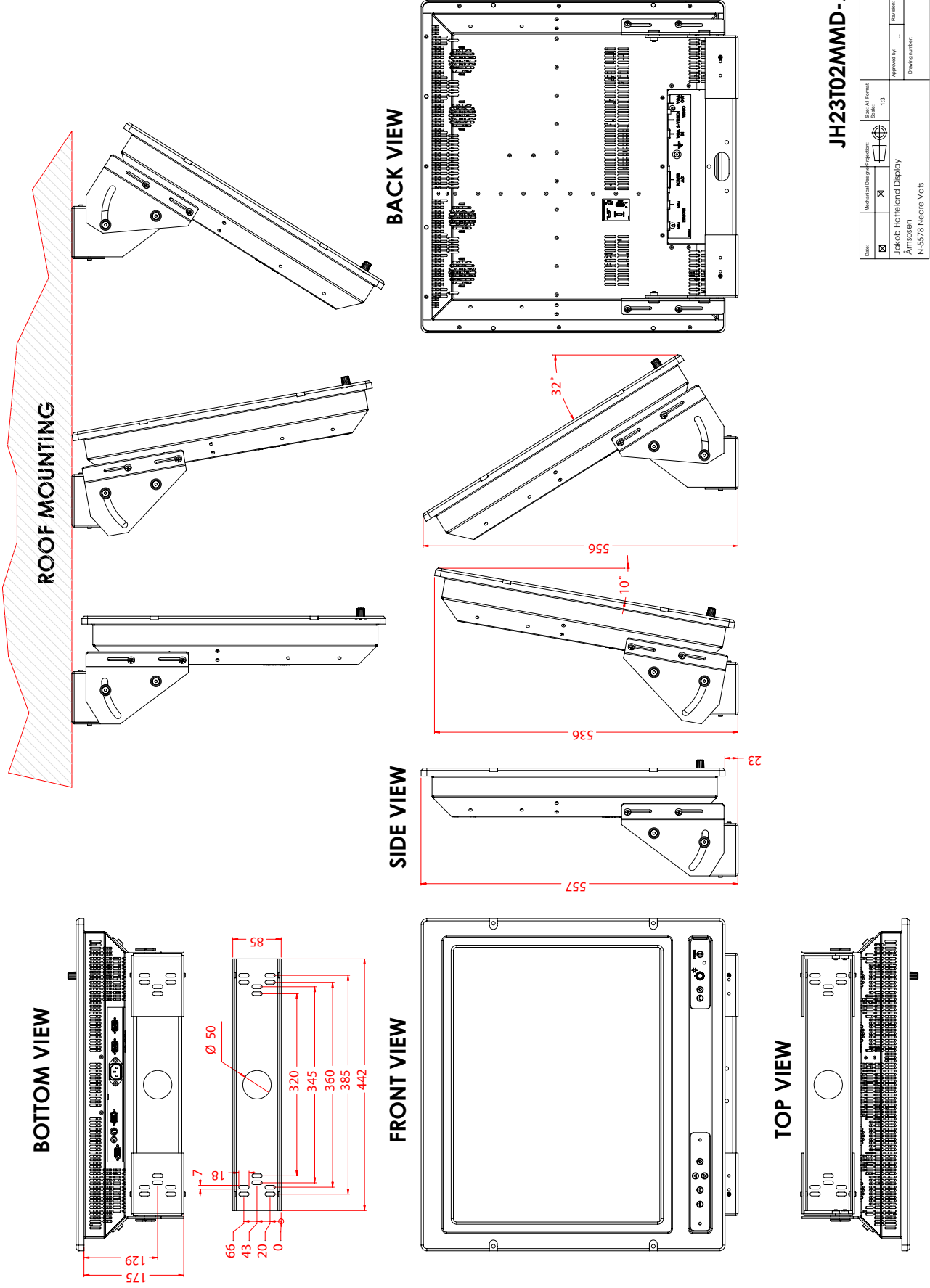
* Recommended for optimum picture quality

Specification and design are subject to change without notice.

For additional information, datasheets and support for this product, please visit our website:



www.hatteland.com



JH23T02MMD-A1

Date:	<input checked="" type="checkbox"/> Mechanical Design/Production:	Size: A1 Format:	Sheet:	1.3	Approval by:	Revision:	2
	<input checked="" type="checkbox"/> Jakob Hatteland Display						
	Ansøeren						
	N-3578 Hiedre Vats						

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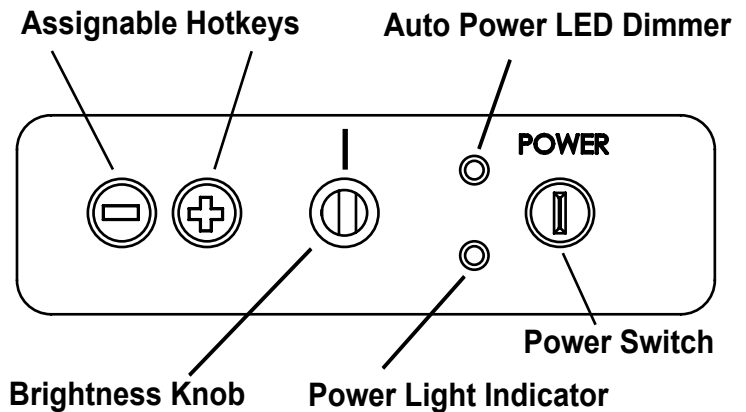
POWER SWITCH:

This TFT display features a Instant-ON/Delay-OFF switch, which ensures that the display is not turned off by user accident.

Power ON: To turn the display on, press down the power switch. The power light indicator will turn green.

(If no VGA signal sync is present, "NO SYNC" message will appear in the display)

Power OFF: To turn the display off, press and hold the power switch down for 3 seconds.



DISPLAY ADJUSTMENT CONTROLS:

This TFT display features a 100% dimmable image, which means it is capable of displaying a completely black image when the brightness knob is turned fully to the left.

BRIGHTNESS - Adjust the image brightness with the brightness knob.

NOTE: The design and placement of the user / osd controls may vary from product to product !

AUTOMATIC POWER LIGHT DIMMING:

This TFT display features a Power LED Dimmer function which control the light intensity of the power light indicator. There are two different solutions for this feature.

- 1- Intelligent Auto Power LED Dimmer which control the light intensity based on your enviroment lightning. This can also be manually adjusted using the Led Adjust knob on the rear side of the display.
- 2- The light intensity is regulated according to the backlight, that is according to the brightness knob. With the exception that when the backlight brightness is zero, the power led is just visible in dark environment. This means that the power led is not visible in daylight when the brightness knob is turned fully to the left.

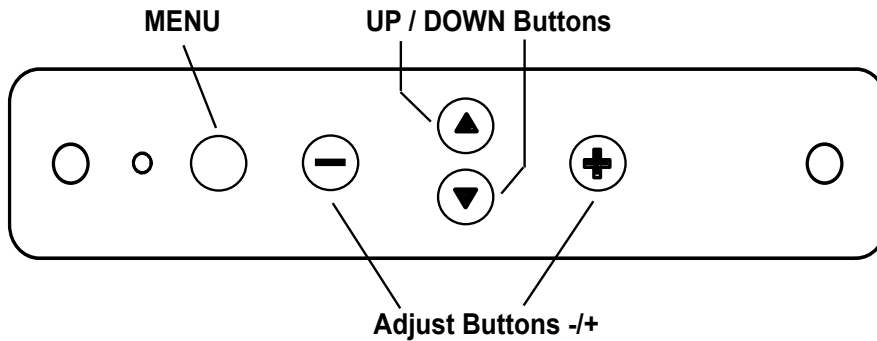
Note:

If there is a led adjustment knob at the connection area of the display as described in "INSTALLATION AND RECOMMANDATIONS" chapter, the manner of operation described in paragraph one applies. For displays produced after the creation date of this manual, paragraph two applies. For displays produced before year 2002, paragraph one applies.

ASSIGNABLE HOTKEYS:

The user can assign various display functions as hotkeys (increase/decrease).

This will enable the user to quickly adjust the brightness, image size, contrast or other functions to control the image. To assign these hotkeys, enter the "UTILITIES MENU/DIRECT ACCESS" menu and change them to the desired hotkey function. Default hotkeys are set to increase/decrease volume.



USER CONTROLS:

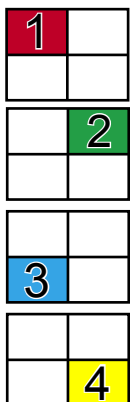
The On Screen Manager (OSD menu) controls are located under the metal hatch on the left side of the display. To begin understanding the menu and its usage, just follow these steps for a quick start.

- 1: Press the "MENU" button. The OSD menu will show all the available functions you can adjust or control.
- 2: You can move to the next icon by pressing "MENU".
- 3: Select options within icon menu by pressing "UP" or "DOWN" buttons. The selected option will turn yellow.
- 4: Use "+" or "-" buttons to increase/decrease values.
- 5: Move the selection left or right by using "+" or "-" buttons. The selected option will turn green.
- 6: To confirm the selection, press "+" button.

OSD MENU:

The On Screen Manager (OSD menu) contains several functions that will let the user to adjust or setup the display to their preferred setting. The functions are shown as easy understandable icons. Some of the menus have sub-menus, use "+" to access and "MENU" to go back to the previous menu.

The OSD menu consists of 4 modes: (Icon beside function indicates if it's available in that mode)



Mode 1 - Available functions in **PC/DVI MODE Simplified OSD Menu - (Logo will appear)**
User can adjust the most common functions needed to operate the display.

Mode 2 - Available functions in **PC/DVI MODE Advanced OSD Menu - (No logo will appear)**
User can access more advanced functions. (Service menu)

Mode 3 - Available functions in **VIDEO MODE Simplified OSD Menu - (Logo will appear)**
User can adjust the most common functions needed to operate the display.

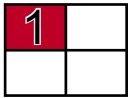
Mode 4 - Available functions in **VIDEO MODE Advanced OSD Menu - (No logo will appear)**
User can access more advanced functions. (Service menu)

PC/DVI MODE = When RGB signal (i.e Windows or other operating system) is displayed full screen.
VIDEO MODE = When video signal (i.e CAMERA / VCR / DVD) is displayed full screen.

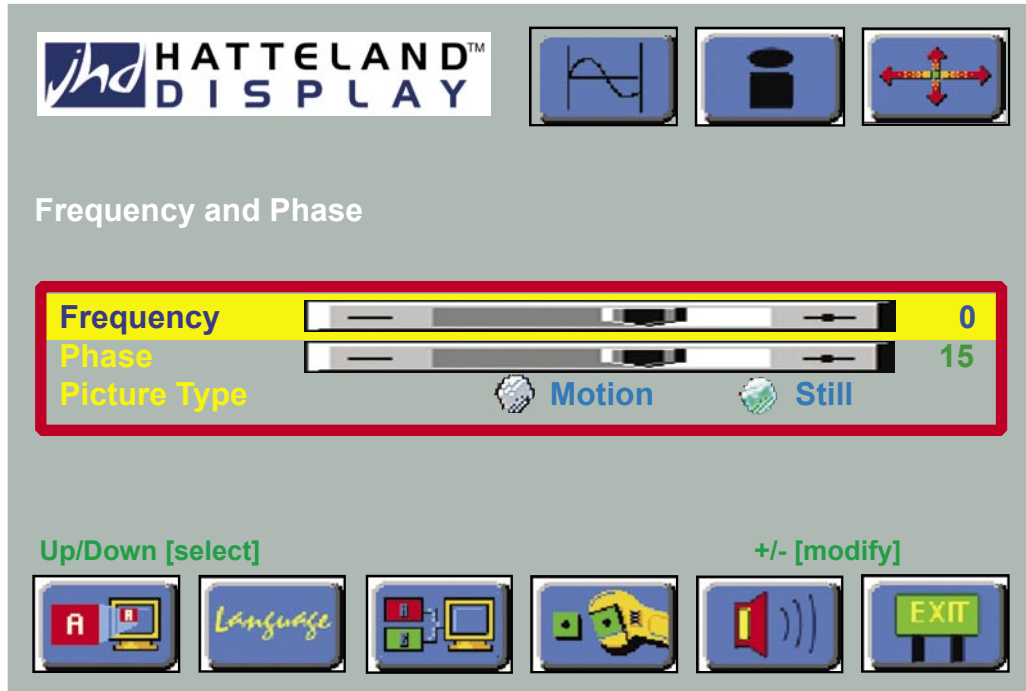
To access the Advanced OSD Menu you must press and hold the "DOWN" button while turning power on. When picture appears, release the "DOWN" button and press "MENU" to access the advanced functions. See the "NOTES" section of this manual on how to determine your BIOS VGA firmware version! See also the "Revision Record xxx Controller" section in this manual for more detailed information.

Osd Menu Overview

Mode 1 - Function layout in PC/DVI MODE Simplified OSD Menu: (User menu)



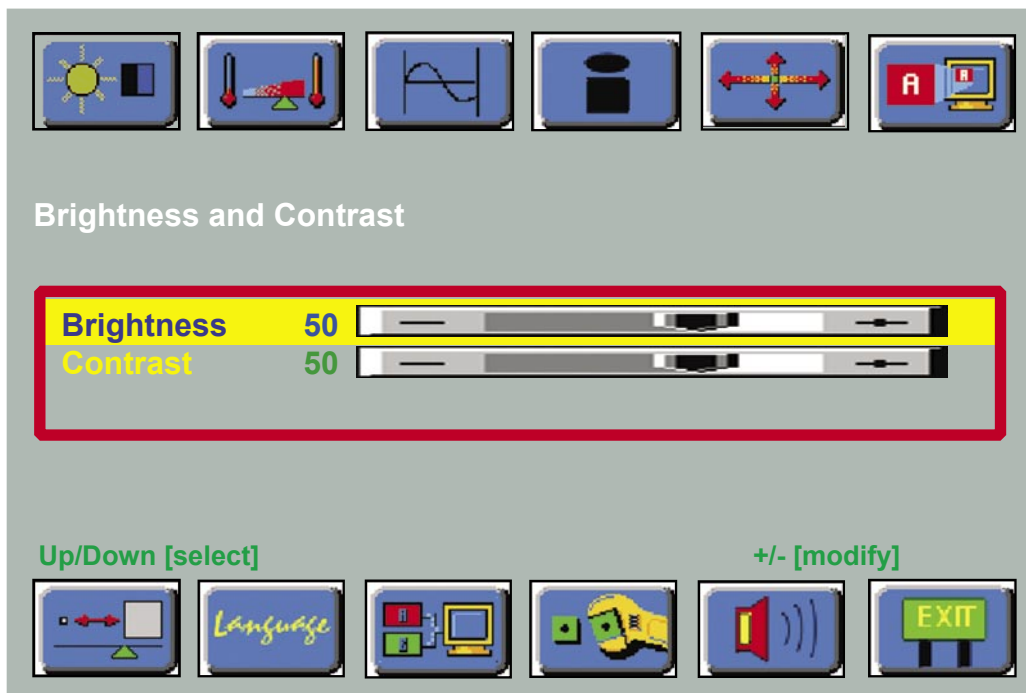
Note that to be in PC/DVI MODE, a computer signal must be present in full screen, i.e Windows or other operating system/radar system. Having a PIP view simultaneously will not interfere or change the menu structure in any way.



Mode 2 - Function layout in PC/DVI MODE Advanced OSD Menu: (Service menu)

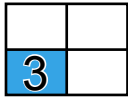


Note that to be in PC/DVI MODE, a computer signal must be present in full screen, i.e Windows or other operating system/radar system. Having a PIP view simultaneously will not interfere or change the menu structure in any way.

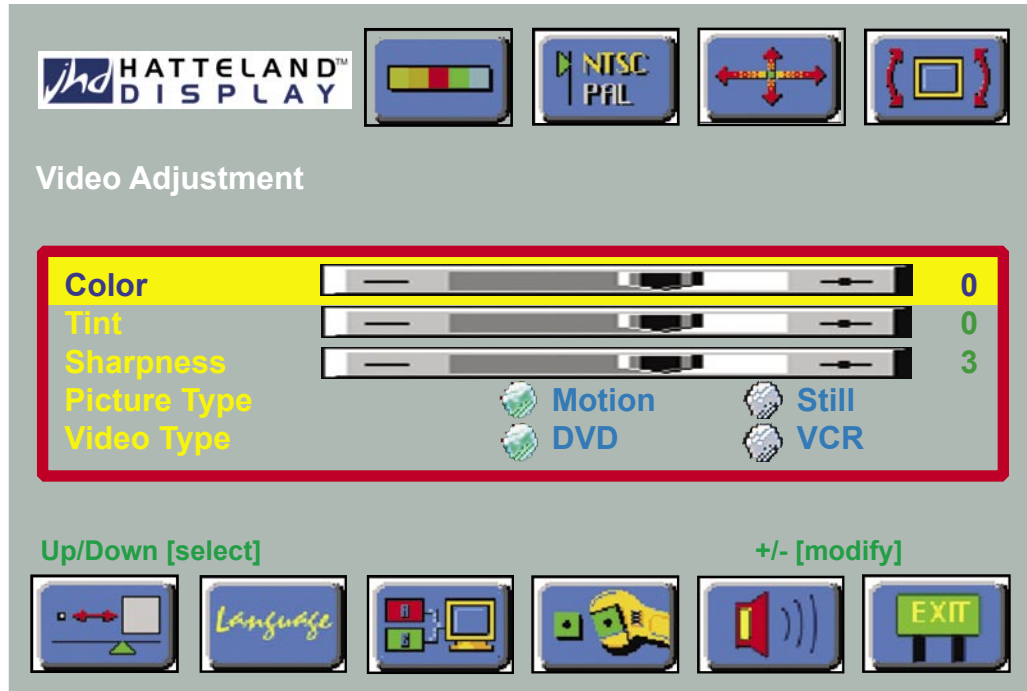


Osd Menu Overview

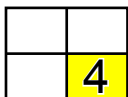
Mode 3 - Function layout in VIDEO MODE Simplified OSD Menu: (User menu)



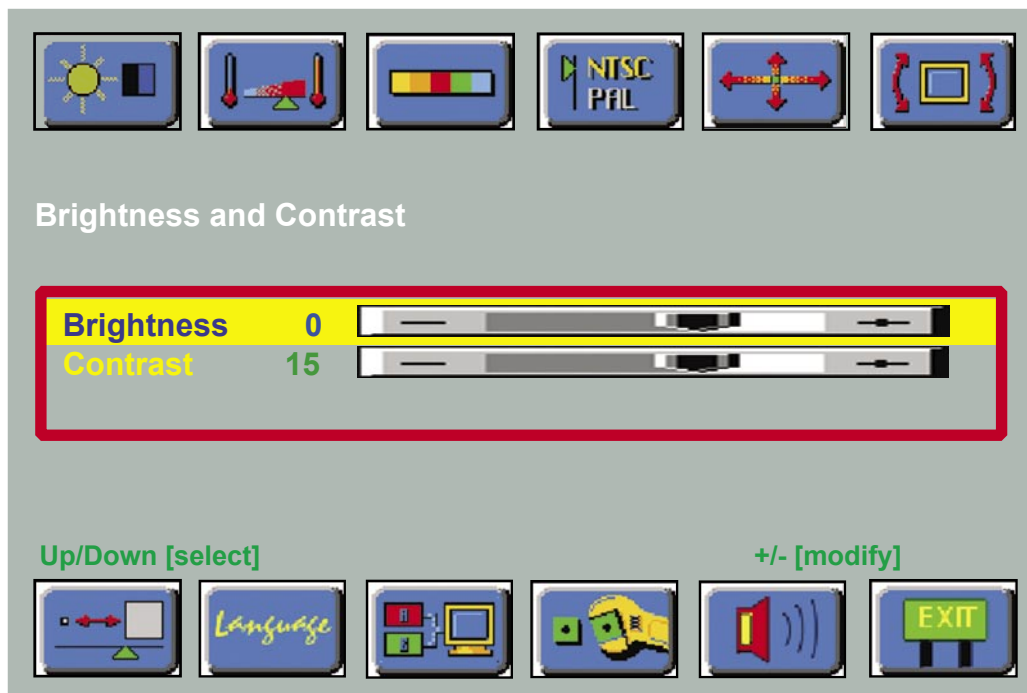
Note that to be in VIDEO MODE, a video signal must be present in full screen, i.e from a camera, VCR or DVD player.

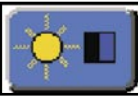
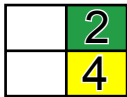


Mode 4 - Function layout in VIDEO MODE Advanced OSD Menu: (Service menu)



Note that to be in VIDEO MODE, a video signal must be present in full screen, i.e from a camera, VCR or DVD player.



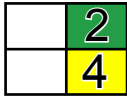


BRIGHTNESS AND CONTRAST:

Selecting this function will enable the user to adjust brightness and contrast for the display.

BRIGHTNESS: Increase/decrease brightness level, total: 100 steps

CONTRAST: Increase/decrease contrast level, total: 100 steps



COLOR TEMPERATURE:

Selecting this function will enable the user to modify the warmth of the picture. Higher temperature = "cooler" picture. Lower temperature = "warmer" picture.

User can select between 9500K, 8000K, 6500K, and 5000K color temperature measured in Kelvin degrees. Press "+" to access the sub-menu, where the RGB values can be adjusted. Use "+" and "-" buttons to adjust these values, and "MENU" to exit. (Saving is done automatically)



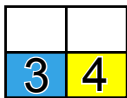
FREQUENCY AND PHASE:

Selecting this function will enable the user to modify the image horizontal size and fine tune the image quality.

FREQUENCY: Increase/decrease the image horizontal size.

PHASE: Fine tune the data sampling position (adjust image quality.)

PICTURE TYPE : Motion / Still (Adjustment for best image quality)
If graphics on screen move a lot, select "Motion"
If graphics on screen are mostly still, select "Still"



VIDEO ADJUSTMENT:

Selecting this function will enable the user to modify the color saturation of the picture, tint and sharpness.

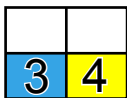
COLOR: Increase/decrease video color level.

TINT: Increase/decrease tint level.

SHARPNESS: Increase/decrease video image sharpness level.

PICTURE TYPE : Motion / Still (Adjustment for best image quality)
If graphics on screen move a lot, select "Motion"
If graphics on screen are mostly still, select "Still"

VIDEO TYPE : Change to best match the source signal. (DVD / VCR)



VIDEO SYSTEM:

Selecting this function will enable the user to select video system and input signals.

AUTO : Automatic detection of NTSC or PAL system. (Not applicable in SECAM)

NTSC / NTSC 4.43 : Manual select NTSC system.

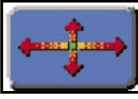
PAL / PAL M : Manual select PAL system.

SECAM : Manual select SECAM system.



STATUS:

Selecting this function will display graphic information such as resolution and frequency.



POSITION:

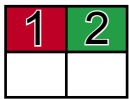
Selecting this function will enable the user to position the image within the display area.

IMAGE UP/DOWN

: Position the image vertically using “UP” or “DOWN” buttons.

IMAGE LEFT/RIGHT

: Position the image horizontally using “+” or “-” buttons.



PICTURE IN PICTURE:

Selecting this function will enable the user to configure PIP window size, input signal source, horizontal and vertical position and more.

PIP SIZE

: Select PIP window size. Choose between OFF, SIZE1, SIZE2 or SIZE3.

PIP SOURCE

: Select video source to be displayed in PIP window.

Choose between AUTO, COMP, SVID or YCbCr/RGB:

AUTO = automatic detection of Composite, S-Video or component.

COMP = manual select composite video signal only.

SVID = manual select S-Video signal only.

YCbCr/RGB = manual select component video or RGB

HORIZONTAL POSITION:



Adjust the position of the PIP window horizontally.

VERTICAL POSITION:



Adjust the position of the PIP window vertically.

ADVANCED PIP SETTINGS: (Press “+” to access the sub-menu)

BRIGHTNESS:



Increase/decrease the image brightness of the PIP window.

CONTRAST:



Increase/decrease the image contrast of the PIP window.

SHARPNESS:



Increase/decrease the image sharpness of the PIP window.

TINT:

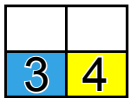


Increase/decrease the tint of the image of the PIP window.

COLOR:

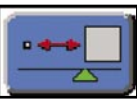
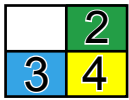


Increase/decrease the color of the image of the PIP window.



ROTATION:

Selecting this function will enable the user to rotate the image to either landscape or portrait format.



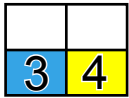
GRAPHIC SCALING MODES:

Selecting this function will enable the user to configure the graphic scaling of the PC or VIDEO image.



Scaling methods in PC/DVI MODE:

ONE TO ONE, FILL SCREEN,
FILL TO ASPECT RATIO,
NOLINEAR SCALING MODES



Scaling methods in VIDEO MODE:

NORMAL, LETTERBOX,
LETTERBOX WITH SUBTITLES,
NOLINEAR SCALING MODES



ONE TO ONE: (Press “+” to access the sub-menu)

HORIZONTAL PAN:

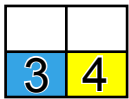


Increase/decrease the horizontal pan.

VERTICAL PAN:



Increase/decrease the vertical pan.



NORMAL: (Press “+” to access the sub-menu)

HORIZONTAL CLIPPING:



Increase/decrease the horizontal clipping.

HORIZONTAL OFFSET:



Increase/decrease the horizontal offset.

HORIZONTAL STRETCH:



Increase/decrease the horizontal stretch.

VERTICAL CLIPPING:



Increase/decrease the vertical clipping.

VERTICAL OFFSET:

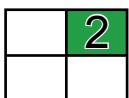


Increase/decrease the vertical offset.

VERTICAL STRETCH:



Increase/decrease the vertical stretch.

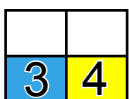


FILL SCREEN

FILL TO ASPECT RATIO

: Enable full screen expansion for lower resolution image.

: Enable full screen expansion for lower resolution image according to aspect ratio.



LETTERBOX

LETTERBOX WITH SUBTITLES

: Stretches a letterboxed picture to full screen.

: Stretches and pans a letterboxed picture to full screen, which enables viewing of subtitles in bottom.



NONLINEAR SCALING MODES: (Press “+” to access the sub-menu)

HORIZONTAL CLIPPING:



Increase/decrease the horizontal clipping.

HORIZONTAL OFFSET:



Increase/decrease the horizontal offset.

HORIZONTAL STRETCH:



Increase/decrease the horizontal stretch.

VERTICAL CLIPPING:



Increase/decrease the vertical clipping.

VERTICAL OFFSET:



Increase/decrease the vertical offset.

VERTICAL STRETCH:



Increase/decrease the vertical stretch.



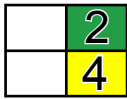
LANGUAGE:

Available languages are: English, Danish and Chinese. This will affect all text and messages in the OSD menus.



UTILITIES:

Selecting this function will enable the user to configure the OSD menu, define hotkeys, verify BIOS Firmware version and miscellaneous operations.



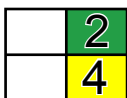
USER SETTING: (Press “+” to access the sub-menu)

DPMS : Disable / Enable the DPMS function.
 DISPLAY INPUT : Disable / Enable input source name upon power up.
 AUTO SOURCE SELECT : Off = Disable auto source select function.
 Low = Auto source select enabled ONLY in power up.
 High = Auto source select ALWAYS enabled.
 GAMMA : 1.0 / 1.6 / 2.2 - Adjusts gamma on TFT display.



OSD SETTING: (Press “+” to access the sub-menu)

OSD H-POSITION: Position the OSD menu horizontally.
 OSD V-POSITION: Position the OSD menu vertically.
 OSD BACKGROUND : Choose between Translucent or Opaque.
 OSD MENU ROTATE : Choose between Normal / Rotate. Will position the menu either horizontally or vertically.
 USER TIMEOUT : Adjust the OSD menu timeout period in a step of 5 seconds.



FREEZE

: Press “+” to freeze the display area, including PIP view.

ZOOM: (Press “+” to access the sub-menu)

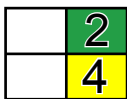
ZOOM LEVEL: Zooms in the display area from center.
 HORIZONTAL PAN: Pan the display area horizontally.
 VERTICAL PAN: Pan the display area vertically.



DIRECT ACCESS 1 & 2: (Press “+” to access the sub-menu)

Define the hotkey function (“+” or “-” front/under hatch buttons) to one of these OSD functions:
 Brightness / Contrast / Volume / Freeze / Zoom / Video Source / PIP * / No Function / Test Pattern
 * By pressing the assigned hot key, the sequence of the selected input video source are:
 Analog RGB / Component / Video / Composite Video / S-Video.

NOTE: Direct Access 1 default setting is VOLUME
NOTE: Direct Access 2 default setting is NO FUNCTION



DISPLAY ORIENTATION: (Press “+” to access the sub-menu)

Will flip/inverse the display area including PIP view. Press “+” to choose between:
 Normal / Horizontal Inverse / Vertical Inverse / Inverse



CALIBRATE RGB GAIN

: Color Calibration. Press “+” to automatically adjust it.



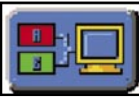
LOAD (FACTORY) DEFAULTS: (Press “+” to access the sub-menu. **NOTE: Only on newer models**)

LOAD USER DEFAULT : Load your own personal custom settings.
 SAVE USER DEFAULT : Save your own personal custom settings.
 LOAD FACTORY DEFAULT : Will reset the VGA controller settings to the factory preset.
 Use caution when using this function, as this will override your current settings. (Does not affect USER DEFAULTS)



TEST PATTERN

: Shows a generic test pattern.



VIDEO SOURCE:

Selecting this function will enable the user to select the type of input signal to show fullscreen. Available inputs are: Analog RGB, Component Video, Composite Video, S-Video and DVI (**DVI: Only on new produced models after or during May 2003**) Pressing “+” will activate the input, and pressing “-” will detect automatically.



VOLUME:

This function is not implented in displays, and have no operational effect.



EXIT MENU:

Selecting this function will exit the OSD menu.
Press “+” to exit and save the current settings.

Note:

The OSD settings will also automatically be stored in memory when the OSD exit on user timeout.

Preset Signal Timings SXGA displays



Mode	Resolution	Clk [MHz]	Horizontal freq [KHz]	Vertical freq [Hz]	Sync Mode
E1_70	640x350	25.175	31.469	70	Digital Separate Sync
E1_70	640x350	25.175	31.469	70	Sync On Green (with or without serrate pulse)
E1_70	640x350	25.175	31.469	70	Composite Sync (with or without serrate pulse)
E1_85	640x350	31.500	37.861	85	Digital Separate Sync
E1_85	640x350	31.500	37.861	85	Sync On Green (with or without serrate pulse)
E1_85	640x350	31.500	37.861	85	Composite Sync (with or without serrate pulse)
E2_70	640x400	25.175	31.469	70	Digital Separate Sync
E2_70	640x400	25.175	31.469	70	Sync On Green (with or without serrate pulse)
E2_70	640x400	25.175	31.469	70	Composite Sync (with or without serrate pulse)
E2_85	640x400	31.500	37.861	85	Digital Separate Sync
E2_85	640x400	31.500	37.861	85	Sync On Green (with or without serrate pulse)
E2_85	640x400	31.500	37.861	85	Composite Sync (with or without serrate pulse)
T_70	720x400	28.322	31.469	70	Digital Separate Sync
T_70	720x400	28.322	31.469	70	Sync On Green (with or without serrate pulse)
T_70	720x400	28.322	31.469	70	Composite Sync (with or without serrate pulse)
T_85	720x400	35.500	37.927	85	Digital Separate Sync
T_85	720x400	35.500	37.927	85	Sync On Green (with or without serrate pulse)
T_85	720x400	35.500	37.927	85	Composite Sync (with or without serrate pulse)
V_62	736x480	28.200	31.403	62	Digital Separate Sync
V_62	736x480	28.200	31.403	62	Sync On Green (with or without serrate pulse)
V_62	736x480	28.200	31.403	62	Composite Sync (with or without serrate pulse)
V_60	640x480	25.175	31.469	60	Digital Separate Sync
V_60	640x480	25.175	31.469	60	Sync On Green (with or without serrate pulse)
V_60	640x480	25.175	31.469	60	Composite Sync (with or without serrate pulse)
V_67	640x480	31.500	37.500	67	Digital Separate Sync
V_67	640x480	31.500	37.500	67	Sync On Green (with or without serrate pulse)
V_67	640x480	31.500	37.500	67	Composite Sync (with or without serrate pulse)
V_72	640x480	31.500	37.861	72	Digital Separate Sync
V_72	640x480	31.500	37.861	72	Sync On Green (with or without serrate pulse)
V_72	640x480	31.500	37.861	72	Composite Sync (with or without serrate pulse)
V_75	640x480	31.500	37.500	75	Digital Separate Sync
V_75	640x480	31.500	37.500	75	Sync On Green (with or without serrate pulse)
V_75	640x480	31.500	37.500	75	Composite Sync (with or without serrate pulse)
V_85	640x480	36.000	43.269	85	Digital Separate Sync
V_85	640x480	36.000	43.269	85	Sync On Green (with or without serrate pulse)
V_85	640x480	36.000	43.269	85	Composite Sync (with or without serrate pulse)
SV_56	800x600	36.000	35.156	56	Digital Separate Sync
SV_56	800x600	36.000	35.156	56	Sync On Green (with or without serrate pulse)
SV_56	800x600	36.000	35.156	56	Composite Sync (with or without serrate pulse)
SV_60	800x600	40.000	37.879	60	Digital Separate Sync
SV_60	800x600	40.000	37.879	60	Sync On Green (with or without serrate pulse)
SV_60	800x600	40.000	37.879	60	Composite Sync (with or without serrate pulse)
SV_72	800x600	50.000	48.077	72	Digital Separate Sync
SV_72	800x600	50.000	48.077	72	Sync On Green (with or without serrate pulse)
SV_72	800x600	50.000	48.077	72	Composite Sync (with or without serrate pulse)
SV_75	800x600	49.500	46.875	75	Digital Separate Sync
SV_75	800x600	49.500	46.875	75	Sync On Green (with or without serrate pulse)
SV_75	800x600	49.500	46.875	75	Composite Sync (with or without serrate pulse)
SV_85	800x600	56.250	53.674	85	Digital Separate Sync
SV_85	800x600	56.250	53.674	85	Sync On Green (with or without serrate pulse)
SV_85	800x600	56.250	53.674	85	Composite Sync (with or without serrate pulse)
X_60	1024x768	65.000	48.363	60	Digital Separate Sync
X_60	1024x768	65.000	48.363	60	Sync On Green (with or without serrate pulse)
X_60	1024x768	65.000	48.363	60	Composite Sync (with or without serrate pulse)

Preset Signal Timings SXGA displays



X_70	1024x768	75.000	56.476	70	Digital Separate Sync
X_70	1024x768	75.000	56.476	70	Sync On Green (with or without serrate pulse)
X_70	1024x768	75.000	56.476	70	Composite Sync (with or without serrate pulse)
X_72	1024x768	75.000	57.515	72	Digital Separate Sync
X_72	1024x768	75.000	57.515	72	Sync On Green (with or without serrate pulse)
X_72	1024x768	75.000	57.515	72	Composite Sync (with or without serrate pulse)
X_75	1024x768	78.750	60.023	75	Digital Separate Sync
X_75	1024x768	78.750	60.023	75	Sync On Green (with or without serrate pulse)
X_75	1024x768	78.750	60.023	75	Composite Sync (with or without serrate pulse)
X_87I	1024x768 43Hz Interaced	44.900	35.522	87	Digital Separate Sync
X_87I	1024x768 43Hz Interaced	44.900	35.522	87	Sync On Green (with or without serrate pulse)
X_87I	1024x768 43Hz Interaced	44.900	35.522	87	Composite Sync (with or without serrate pulse)
X_85	1024x768	94.500	68.677	85	Digital Separate Sync
X_85	1024x768	94.500	68.677	85	Sync On Green (with or without serrate pulse)
X_85	1024x768	94.500	68.677	85	Composite Sync (with or without serrate pulse)
SX_60	1280x1024	108.000	63.981	60	Digital Separate Sync
SX_60	1280x1024	108.000	63.981	60	Sync On Green (with or without serrate pulse)
SX_60	1280x1024	108.000	63.981	60	Composite Sync (with or without serrate pulse)
SX_72	1280x1024	135.000	78.125	72	Digital Separate Sync
SX_72	1280x1024	135.000	78.125	72	Sync On Green (with or without serrate pulse)
SX_72	1280x1024	135.000	78.125	72	Composite Sync (with or without serrate pulse)
SX_75	1280x1024	135.000	79.976	75	Digital Separate Sync
SX_75	1280x1024	135.000	79.976	75	Sync On Green (with or without serrate pulse)
SX_75	1280x1024	135.000	79.976	75	Composite Sync (with or without serrate pulse)
SX_85	1280x1024	149.844	91.146	85	Digital Separate Sync
SX_85	1280x1024	149.844	91.146	85	Sync On Green (with or without serrate pulse)
SX_85	1280x1024	149.844	91.146	85	Composite Sync (with or without serrate pulse)
NTSC S_Video	---	14.318	15.734	60	---
PAL S_Video	---	17.75	15.625	50	---
NTSC Composite Video	---	14.318	15.734	60	---
PAL Composite Video	---	17.75	15.625	50	---

DATE	VERSION	SUMMARY OF CHANGES	NOTE
		With reference to normal SVP-1280 4165100-71 Hardware change: Remove J3, J4 & PP1. Firmware change: Use V1.2x firmware core and support customer's requirement per DV-1167/DL 1. Support 1280x1024/1024x768 interlaced mode from customer's radar system. 2. Customize OSD menu	
28 November, 2001	70	Production release Firmware use V1.2x core, details change from V1.1x to V1.2x please refer to ECD(D0688463.doc) Bare PCB: 0165100-07; P/N 4165115-70 BIOS: U29, V 1.2F (Flash TE28F400B3T)(new) U48, V0.10 (EPM3032ALC44-10) U7, V0.10 (24LC21)	ECN# 870688522
		Remark: -8x can't be upgraded from -7x version	
21 February, 2002	80	New chipset version using PW171-10U & SG9884 Firmware change: 1. Support SG9884 2. Transparent OSD background 3. Add logo on OSD Bare PCB: 0165100-07; P/N 4165115-80 BIOS: U29, V 1.2F1 (Flash TE28F400B3T)(new) U48, V0.20 (EPM3032ALC44-10) U7, V0.10 (24LC21)	ECN# 870688541
22 February, 2002	80 to 81	Firmware change 1. Change OSD logo color to light blue (not transparency) Bare PCB: 0165100-07; P/N 4165115-80 BIOS: U29, V 1.2F2 (Flash TE28F400B3T)(new) U48, V0.20 (EPM3032ALC44-10) U7, V0.10 (24LC21)	ECN# 870688542
27 March, 2002	81 to 82	Change FB2,FB3,FB4 to 0 ohm resistor to solve shadow behind icon up to SXGA 60Hz mode on customer computer system Bare PCB: 0165100-07; P/N 4165115-80 BIOS: U29, V 1.2F2 (Flash TE28F400B3T)(no change) U48, V0.20 (EPM3032ALC44-10)(no change) U7, V0.10 (24LC21)(no change)	ECN# 870688555
27 September, 2002	82 to 83	Release new firmware core v1.3x and new requirement: 1. Added custom timing support (30KHz) as in DV-1254/BL 2. Added Hatteland test picture(Activated by OSD menu or RS-232) 3. "No Function" selection added to direct access. 4. Added direct access 2 5. Support 1280x969 mode for XGA/SXGA panel 6. Direct access 1 defaults to "volume", direct access 2 defaults to "No Function" Bare PCB: 0165100-07; P/N 4165115-83 BIOS: U29, V 1.3F(Flash TE28F400B3T)(changed) U48, V0.20 (EPM3032ALC44-10)(no change) U7, V0.10 (24LC21)(no change)	ECN# 870688596

Mode	Resolution	Clk [MHz]	Horizontal freq [KHz]	Vertical freq [Hz]	Sync Mode
E1_70	640x350	25.175	31.469	70	Digital Separate Sync
E1_70	640x350	25.175	31.469	70	Sync On Green (with or without serrate pulse)
E1_70	640x350	25.175	31.469	70	Composite Sync (with or without serrate pulse)
E1_85	640x350	31.500	37.861	85	Digital Separate Sync
E1_85	640x350	31.500	37.861	85	Sync On Green (with or without serrate pulse)
E1_85	640x350	31.500	37.861	85	Composite Sync (with or without serrate pulse)
E2_70	640x400	25.175	31.469	70	Digital Separate Sync
E2_70	640x400	25.175	31.469	70	Sync On Green (with or without serrate pulse)
E2_70	640x400	25.175	31.469	70	Composite Sync (with or without serrate pulse)
E2_85	640x400	31.500	37.861	85	Digital Separate Sync
E2_85	640x400	31.500	37.861	85	Sync On Green (with or without serrate pulse)
E2_85	640x400	31.500	37.861	85	Composite Sync (with or without serrate pulse)
T_70	720x400	28.322	31.469	70	Digital Separate Sync
T_70	720x400	28.322	31.469	70	Sync On Green (with or without serrate pulse)
T_70	720x400	28.322	31.469	70	Composite Sync (with or without serrate pulse)
T_85	720x400	35.500	37.927	85	Digital Separate Sync
T_85	720x400	35.500	37.927	85	Sync On Green (with or without serrate pulse)
T_85	720x400	35.500	37.927	85	Composite Sync (with or without serrate pulse)
V_62	736x480	28.200	31.403	62	Digital Separate Sync
V_62	736x480	28.200	31.403	62	Sync On Green (with or without serrate pulse)
V_62	736x480	28.200	31.403	62	Composite Sync (with or without serrate pulse)
V_60	640x480	25.175	31.469	60	Digital Separate Sync
V_60	640x480	25.175	31.469	60	Sync On Green (with or without serrate pulse)
V_60	640x480	25.175	31.469	60	Composite Sync (with or without serrate pulse)
V_67	640x480	31.500	37.500	67	Digital Separate Sync
V_67	640x480	31.500	37.500	67	Sync On Green (with or without serrate pulse)
V_67	640x480	31.500	37.500	67	Composite Sync (with or without serrate pulse)
V_72	640x480	31.500	37.861	72	Digital Separate Sync
V_72	640x480	31.500	37.861	72	Sync On Green (with or without serrate pulse)
V_72	640x480	31.500	37.861	72	Composite Sync (with or without serrate pulse)
V_75	640x480	31.500	37.500	75	Digital Separate Sync
V_75	640x480	31.500	37.500	75	Sync On Green (with or without serrate pulse)
V_75	640x480	31.500	37.500	75	Composite Sync (with or without serrate pulse)
V_85	640x480	36.000	43.269	85	Digital Separate Sync
V_85	640x480	36.000	43.269	85	Sync On Green (with or without serrate pulse)
V_85	640x480	36.000	43.269	85	Composite Sync (with or without serrate pulse)
SV_56	800x600	36.000	35.156	56	Digital Separate Sync
SV_56	800x600	36.000	35.156	56	Sync On Green (with or without serrate pulse)
SV_56	800x600	36.000	35.156	56	Composite Sync (with or without serrate pulse)
SV_60	800x600	40.000	37.879	60	Digital Separate Sync
SV_60	800x600	40.000	37.879	60	Sync On Green (with or without serrate pulse)
SV_60	800x600	40.000	37.879	60	Composite Sync (with or without serrate pulse)
SV_72	800x600	50.000	48.077	72	Digital Separate Sync
SV_72	800x600	50.000	48.077	72	Sync On Green (with or without serrate pulse)
SV_72	800x600	50.000	48.077	72	Composite Sync (with or without serrate pulse)
SV_75	800x600	49.500	46.875	75	Digital Separate Sync
SV_75	800x600	49.500	46.875	75	Sync On Green (with or without serrate pulse)
SV_75	800x600	49.500	46.875	75	Composite Sync (with or without serrate pulse)
SV_85	800x600	56.250	53.674	85	Digital Separate Sync
SV_85	800x600	56.250	53.674	85	Sync On Green (with or without serrate pulse)
SV_85	800x600	56.250	53.674	85	Composite Sync (with or without serrate pulse)

Preset Signal Timing UXGA displays



X_60	1024x768	65.000	48.363	60	Digital Separate Sync
X_60	1024x768	65.000	48.363	60	Sync On Green (with or without serrate pulse)
X_60	1024x768	65.000	48.363	60	Composite Sync (with or without serrate pulse)
X_70	1024x768	75.000	56.476	70	Digital Separate Sync
X_70	1024x768	75.000	56.476	70	Sync On Green (with or without serrate pulse)
X_70	1024x768	75.000	56.476	70	Composite Sync (with or without serrate pulse)
X_72	1024x768	75.000	57.515	72	Digital Separate Sync
X_72	1024x768	75.000	57.515	72	Sync On Green (with or without serrate pulse)
X_72	1024x768	75.000	57.515	72	Composite Sync (with or without serrate pulse)
X_75	1024x768	78.750	60.023	75	Digital Separate Sync
X_75	1024x768	78.750	60.023	75	Sync On Green (with or without serrate pulse)
X_75	1024x768	78.750	60.023	75	Composite Sync (with or without serrate pulse)
X_87I	1024x768 43Hz Interaced	44.900	35.522	87	Digital Separate Sync
X_87I	1024x768 43Hz Interaced	44.900	35.522	87	Sync On Green (with or without serrate pulse)
X_87I	1024x768 43Hz Interaced	44.900	35.522	87	Composite Sync (with or without serrate pulse)
X_85	1024x768	94.500	68.677	85	Digital Separate Sync
X_85	1024x768	94.500	68.677	85	Sync On Green (with or without serrate pulse)
X_85	1024x768	94.500	68.677	85	Composite Sync (with or without serrate pulse)
SX_60	1280x1024	108.000	63.981	60	Digital Separate Sync
SX_60	1280x1024	108.000	63.981	60	Sync On Green (with or without serrate pulse)
SX_60	1280x1024	108.000	63.981	60	Composite Sync (with or without serrate pulse)
SX_72	1280x1024	135.000	78.125	72	Digital Separate Sync
SX_72	1280x1024	135.000	78.125	72	Sync On Green (with or without serrate pulse)
SX_72	1280x1024	135.000	78.125	72	Composite Sync (with or without serrate pulse)
SX_75	1280x1024	135.000	79.976	75	Digital Separate Sync
SX_75	1280x1024	135.000	79.976	75	Sync On Green (with or without serrate pulse)
SX_75	1280x1024	135.000	79.976	75	Composite Sync (with or without serrate pulse)
SX_85	1280x1024	149.844	91.146	85	Digital Separate Sync
SX_85	1280x1024	149.844	91.146	85	Sync On Green (with or without serrate pulse)
SX_85	1280x1024	149.844	91.146	85	Composite Sync (with or without serrate pulse)
UX_60	1600x1200	112.288	75.000	60	Digital Separate Sync
UX_60	1600x1200	112.288	75.000	60	Sync On Green (with or without serrate pulse)
UX_60	1600x1200	112.288	75.000	60	Composite Sync (with or without serrate pulse)
UX_70	1600x1200	120.925	87.500	70	Digital Separate Sync
UX_70	1600x1200	120.925	87.500	70	Sync On Green (with or without serrate pulse)
UX_70	1600x1200	120.925	87.500	70	Composite Sync (with or without serrate pulse)
UX_75	1600x1200	129.562	93.75	75	Digital Separate Sync
UX_75	1600x1200	129.562	93.75	75	Sync On Green (with or without serrate pulse)
UX_75	1600x1200	129.562	93.75	75	Composite Sync (with or without serrate pulse)
UX_85	1600x1200	146.625	106.259	85	Digital Separate Sync
UX_85	1600x1200	146.625	106.259	85	Sync On Green (with or without serrate pulse)
UX_85	1600x1200	146.625	106.259	85	Composite Sync (with or without serrate pulse)
NTSC S_Video	---	14.318	15.734	60	---
PAL S_Video	---	17.75	15.625	50	---
NTSC Composite Video	---	14.318	15.734	60	---
PAL Composite Video	---	17.75	15.625	50	---

Revision Record UXGA controller



Revisions made in the internal VGA controller for Hatteland displays are listed below. This revision does not match the model number of the display or are written externally on the product itself. To locate your version internally for your product / controller, please consult the “**NOTES**” section of this manual.

DATE	VERSION	SUMMARY OF CHANGES	NOTE
		<p>With reference to normal SV-1600 4167500-30</p> <p>Hardware change:</p> <ol style="list-style-type: none"> 1. Remove J3, J4 & PP1. 2. FB2,FB3,FB4 change to 0 ohm resistor <p>Firmware change: Use V1.2x firmware core and support customer's requirement per DV-1198/DL</p> <ol style="list-style-type: none"> 1. Support 1280x1024/1024x768 interlaced mode from customer's radar system. 2. Customize OSD menu 	
26 April, 2002	30	<p>1st Production release requirement as above</p> <p>Bare PCB: 0167500-02; P/N 4167515-30</p> <p>BIOS: U29, V 1.2F2 (Flash TE28F400B3T)(new) U48, V0.20 (EPM3032ALC44-10) U7, V0.10 (24LC21)</p>	ECN# 870688560
27 September, 2002	30 to 31	<p>Release new firmware core v1.3x and new requirement:</p> <ol style="list-style-type: none"> 1. Added custom timing support (30KHz) as in DV-1254/BL 2. Added Hatteland test picture(Activated by OSD menu or RS-232) 3. “No Function” selection added to direct access. 4. Added direct access 2 5. Support 1280x972 mode 6. Support 1280x969 mode for UXGA panel 7. Direct access1 defaults to “volume”, direct access2 defaults to “No Function” <p>Bare PCB: 0167500-02; P/N 4167515-31</p> <p>BIOS: U29, V 1.3F(Flash TE28F400B3T)(changed) U48, V0.20 (EPM3032ALC44-10)(no change) U7, V0.10 (24LC21)(no change)</p>	ECN# 870688595



Specifications - JH 10T05 VGA



TFT Display:

10.4" viewable image size
Color Active Matrix TFT/LCD
RGB Vertical Stripe

Characteristics:

Pixel number : 640 x 480
Pixel pitch (RGB) : 0,330 (H) x 0,330 (V) mm
Contrast Ratio : 300:1 (typical)
Light Intensity : 350 cd/m²
Viewable Angle : +/- 70 deg. (H)
: +/- 40 deg. (V)

Display Colors Analog Input:

262,144 colors (6-bit color)

RGB Input Signal:

Analog RGB 0,7V_{ss}
Input impedance 75 Ohm

Sync Signal:

Separate H- and V- sync (TTL), Composite Sync,
Composite Sync. On Green

Synchronisation Range:

Horizontal : 31,47 kHz
Vertical : 60 Hz

Resolutions:

640 x 480

Active Display Area:

211,2 (H) x 158,4 (V) mm

Power Supply:

JH 10T05 VGA A0/A2/B1: 12-24 VDC

Power Consumption:

Operating: Max 25 W

Environmental Considerations:

Operating: Temperature 0 deg. C to +50 deg. C
Humidity 10% to 90% (non condensing)
Storage: Temperature -25 deg. C to +60 deg. C
Humidity 10% to 90% (non condensing)

Dimensions:

339 (W) x 256 (H) x 68 (D) mm
Weight: 3.7 kg (Approx)

Input Signal Terminal:

RGB (PC) signal:
15pin mini D-SUB (Female)

Power:

JH 10T05 VGA A2/A0 : Screw terminal (DC input)

Touch Screen: (optional)

1 x D-SUB 9P Connector (female)

User Controls:

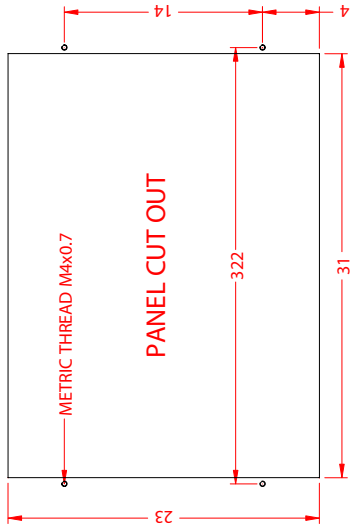
Power On/Off button, Brightness Control, Mode Status LED
On Screen Display Control, Auto LED intensity adjust.

Specification and design are subject to change without notice.

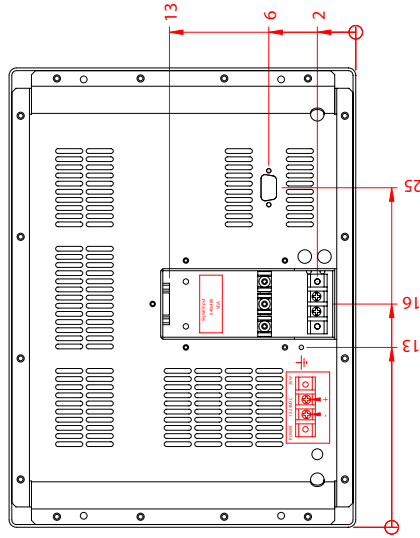
For additional information, datasheets and support for this product, please visit our website:



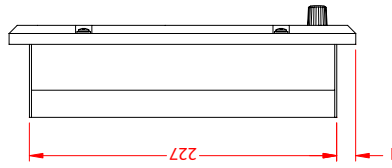
www.hatteland.com



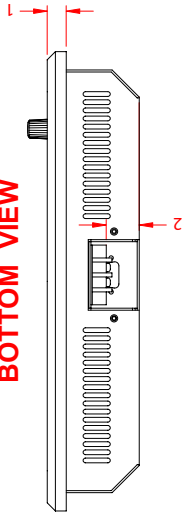
BACK VIEW



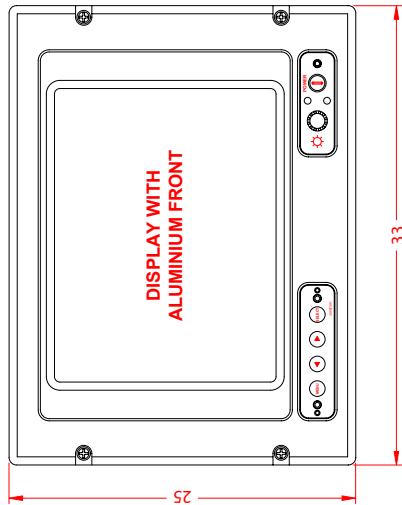
SIDE VIEW



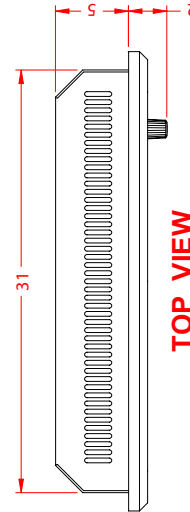
BOTTOM VIEW



FRONT VIEW



TOP VIEW



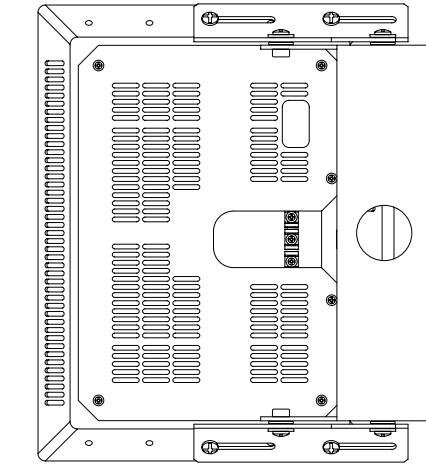
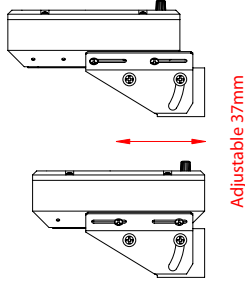
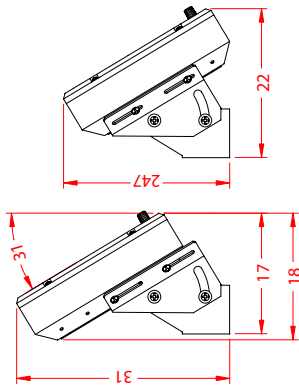
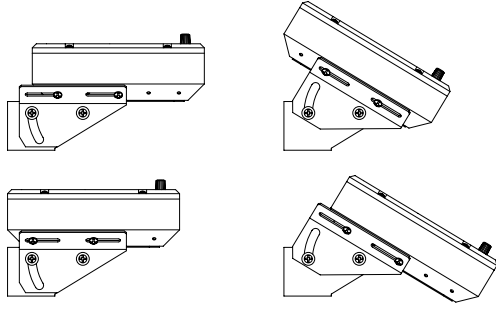
Specifications subject to change without notice
Details can change for custom applications

All dimensions in millimeters

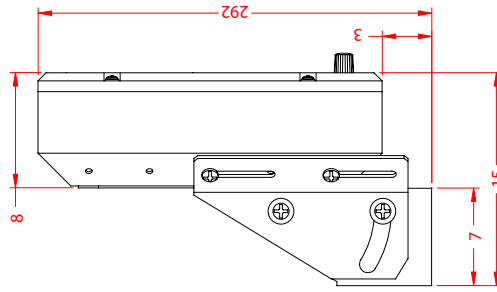
Date 08/03-00 Checked	Dsgn./Drawn RN Stand. chk.	Projection 	Scale (A-3 Format) 1:4	Replacement for	Replacement by
10.4 inch INDUSTRIAL MONITOR TYPE: JH 10T05 VGA				2589S3B1	
Reference	Estimate	Filename Elmagdwwg - Autocad_2501-2750\			

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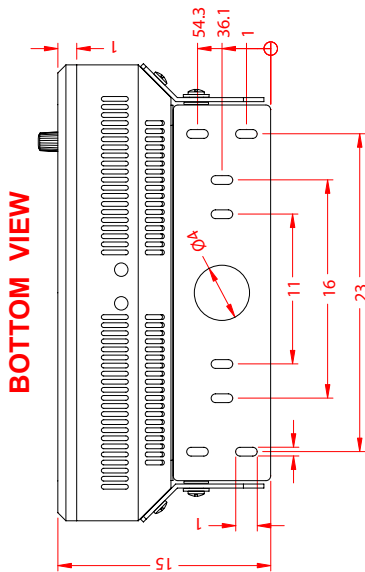
ROOF MOUNTING



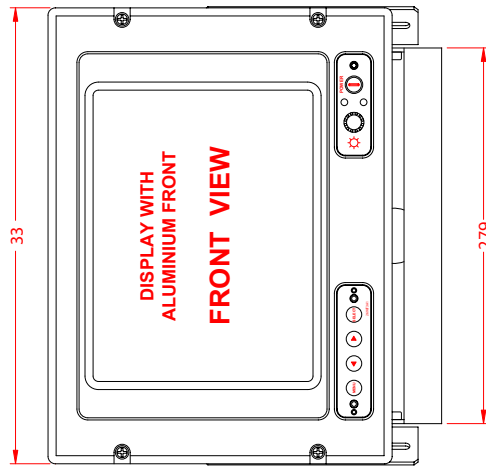
BACK VIEW



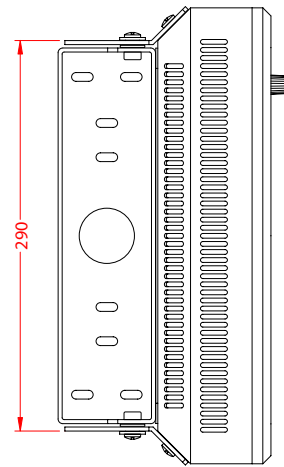
SIDE VIEW



BOTTOM VIEW



FRONT VIEW



TOP VIEW

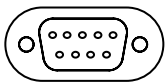
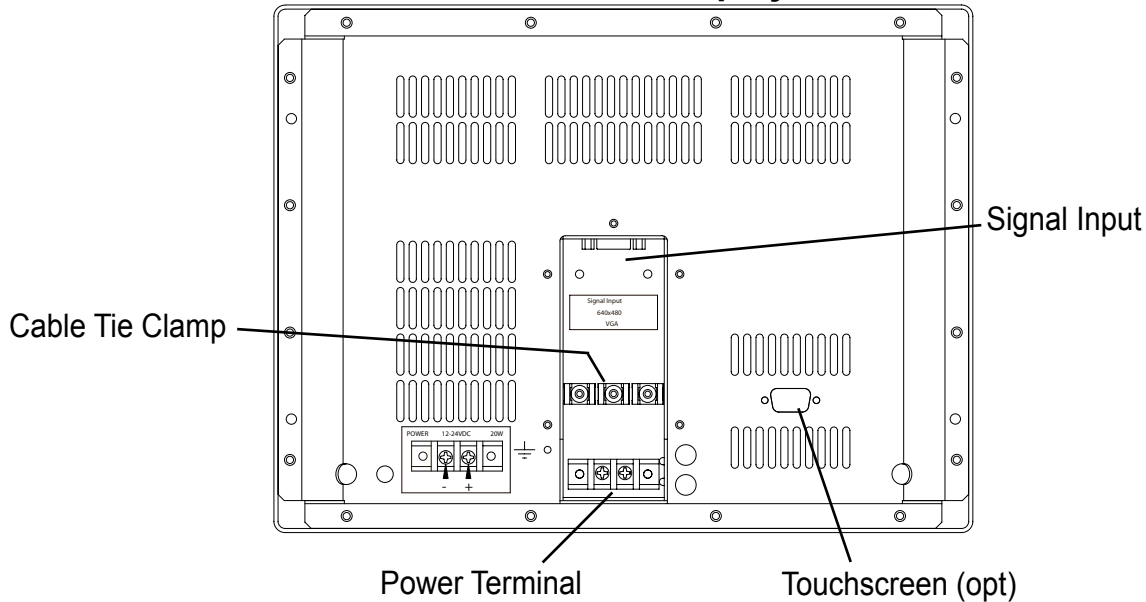
Specifications subject to change without notice
Details can change for custom applications

All dimensions in millimeters

Date 08/03-00 Checked	Dsgn./Drawn RN Stand. chk.	Projection 	Scale (A:3 Format) 1:4
Reference		Estimate	Replacement for
10.4 inch INDUSTRIAL MONITOR TYPE: JH 10T05 VGA CABINET SHOWN WITH ALUMINIUM FRONT		2729S3A1	
Filename Elmagdwg - Autocad_2501-2750\		Replacement by	

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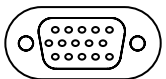
Rear side of display



TOUCHSCREEN: (optional)

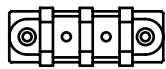
Connect the RS-232 cable to the D-SUB 9P Connector (female) on the rear side of the TFT display. Connect the other end to your COM port of your computer. Install the necessary software needed to operate it.

- Note that the connector is only installed upon customer request.



SIGNAL INPUT (RGB):

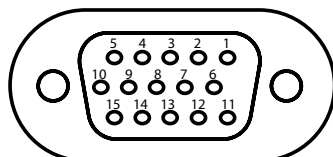
Connect the VGA cable to the D-SUB 15P Connector (female) on the rear side of the TFT display. If possible, screw the VGA cable to the D-SUB connector and make sure you don't bend any of the pins inside the VGA cable connector. To reduce tension of the VGA cable, secure it to the base mounted cable tie clamp. Connect the other end of the cable to the VGA output of your computer, and fasten it there also.



POWER INPUT: (DC Version)

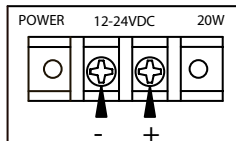
Secure the cables (check polarity!) to the screw terminal, you may secure the cable further by mounting it to the base mounted cable tie clamp. The internal DC power module supports voltage from 12 to 24 VDC.

VGA D-SUB 15P CONNECTOR FEMALE:



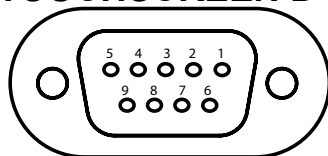
Pin Number:	Description:
1	red, analog
2	green, analog
3	blue, analog
4	no connection
5	digital ground
6	analog ground (red return)
7	analog ground (green return)
8	analog ground (blue return)
9	no connection
10	digital ground
11	no connection
12	no connection
13	horizontal sync, input
14	vertical sync, input
15	no connection

POWER CONNECTOR: (2 x cable eye screws)



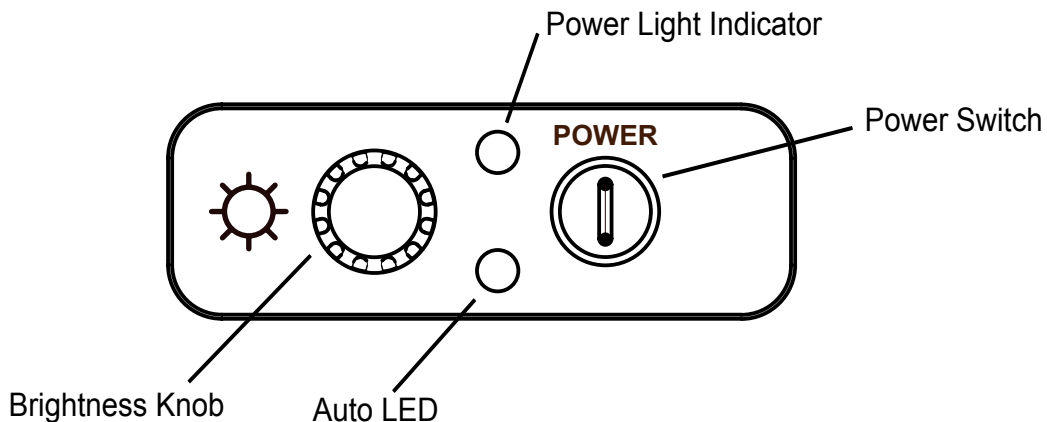
Pin Number:	Description:
-	ground
+	+12 VDC in

TOUCHSCREEN D-SUB 9P CONNECTOR FEMALE: (optional)



Pin Number:	Description:
1	DCD
2	RXD
3	TXD
4	DTR
5	GND
6	DSR
7	RTS
8	CTS
9	RI





POWER SWITCH:

This TFT display features a Instant-ON/Delay-OFF switch, which ensures that the display is not turned off by user accident.

Power ON: To turn the display on, press down the power switch. The power light indicator will turn green.

Note: If no VGA signal sync is present, it will turn red. No error message will be displayed.

Power OFF: To turn the display off, press and hold the power switch down for 3 seconds.

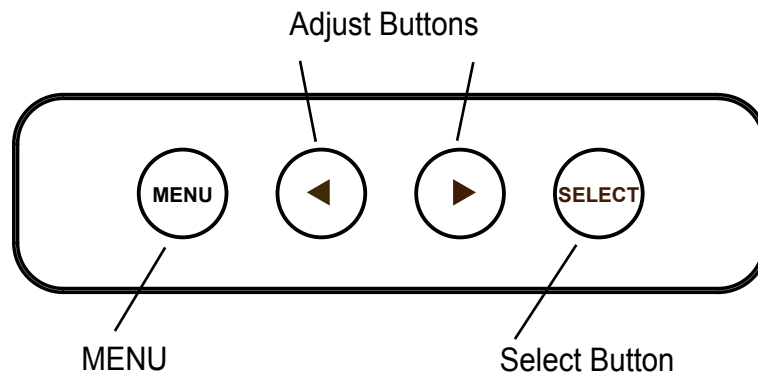
DISPLAY ADJUSTMENT CONTROLS:

This TFT display features a 100% dimmable image, which means it is capable of displaying a completely black image when the brightness knob is turned fully to the left.

BRIGHTNESS - Adjust the image brightness with the knob marked with an sun icon.

AUTOMATIC POWER LIGHT DIMMING:

This TFT display features a intelligent Auto LED (Mode Status LED) which control the light intensity of the power light indicator based on your enviroment lightning. To test it, simply put your thumb over it. The power light indicator will fade down or up.



USER CONTROLS:

- 1: Press the MENU button. The OSD Menu shows the function menu.
- 2: To modify the values, use the “Adjust Buttons” to increase or decrease the values.
- 3: To select another function (in a downwards direction), press the “Select Button”

- Note:**
- You can save the geometry settings automatically by pressing MENU button again. This will also exit the menu.
 - Adjustment may not be perfect depending on the computer or video card you are using.
 - Select a crisp and bright image for display while adjustment takes place.

AVAILABLE FUNCTIONS:

The OSD Menu provides On Screen Display of certain common functions.

Pressing the “MENU” button will bring up the menu with it’s available functions that can be adjusted. The selected function is shown with reversed background. To select another function, press the “SELECT” button to move down on the menu. All modifications will instantly be updated on screen.

CONT	- ----+--- +
PHSE	- ----+--- +
SIZE	- ----+--- +
VERT	- ----+--- +
HORI	- ----+--- +

Above: Sample of OSD Menu

Continues.....

CONT: (Contrast)

Use this function to adjust the image brightness in relation to the background. Pressing the “Adjust Buttons” will increase or decrease the value. The slider on screen will also move from left or right indicating it’s current setting. Marked as “+”.

Note: - To adjust the BRIGHTNESS use the knob marked with a sun icon. (See page 3)

PHSE: (Phase)

Use this function to adjust the data sampling position (image quality). Press the “Adjust Buttons” to increase or decrease the value to meet the user’s desired preference. The slider on screen will also move from left or right indicating it’s current setting. Marked as “+”.

SIZE: (Size)

Use this function to adjust the image size, it may be necessary to adjust the image horizontal position occasionally while using this function. Used together with the “VERT” and “HORI” functions, the user will be able to center the image. Press the “Adjust Buttons” to increase or decrease the value to meet the user’s desired preference. The slider on screen will also move from left or right indicating it’s current setting. Marked as “+”.

VERT: (Vertical Position)

Use this function to adjust the vertical position of the image. Used together with the “HORI” and “SIZE” functions, the user will be able to center the image. Press the “Adjust Buttons” to increase or decrease the value to meet the user’s desired preference. The slider on screen will also move from left or right indicating it’s current setting. Marked as “+”.

HORI: (Horizontal Position)

Use this function to adjust the horizontal position of the image. Used together with the “VERT” and “SIZE” functions, the user will be able to center the image. Press the “Adjust Buttons” to increase or decrease the value to meet the user’s desired preference. The slider on screen will also move from left or right indicating it’s current setting. Marked as “+”.



Specifications - JH 10T06 STD



TFT Display:

10.4" viewable image size
Active Matrix, Thin Film Transistor (TFT)
RGB vertical stripe

Characteristics:

Pixel number : 640 x 480
Pixel pitch (RGB) : 0,33 (H) x 0,33 (V) mm
Response Time : 20 ms (typ), "black" to "white"
Contrast Ratio : 300:1 (typ)
Light Intensity : 350 cd/m2 (typical)
Viewable Angle : +/- 70 deg. (H)
 : +/- 40 deg. (V)

Display Colors Analog Input:

262,144 colors (6-bit color max)

RGB Input Signal:

Analog RGB 0,7Vp-p
Input impedance 75 Ohm

Sync Signal:

Separate Synchronisation only
Auto detects VGA , Non interlaced

Synchronisation Range:

Horizontal : 31,5 kHz to 48,3 kHz
Vertical : 60 Hz *

Resolutions:

640 x 350 / 640 x 480 *

* Recommended for optimum picture quality

Active Display Area:

211,2 (H) x 158,4 (V) mm

Power Supply:

JH 10T06 STD A1 : 115VAC/60Hz or 230VAC/50Hz
JH 10T06 STD A2 : 24 VDC

Power Consumption:

Operating: Max 60 W

Environmental Considerations:

Operating: Temperature -15 deg. C to +55 deg. C
Humidity 30% to 90% (non condensing)
Storage: Temperature -20 deg. C to +60 deg. C
Humidity 10% to 90% (non condensing)

Dimensions:

339 (W) x 256 (H) x 54 (D) mm
Weight: 3.5 kg (Approx)

Input Signal Terminal:

RGB (PC) signal:
15pin mini D-SUB (Female)

Power:

JH 10T06 STD A1 : Std IEC inlet (AC input)
JH 10T06 STD A2 : Screw terminal (DC input)

Touch Screen: (optional)

1 x D-SUB 9P Connector (female)

User Controls:

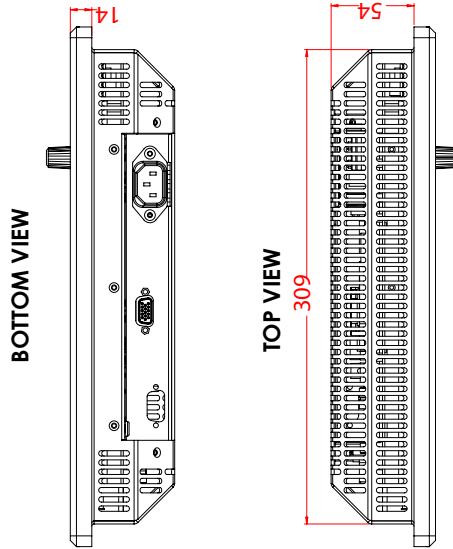
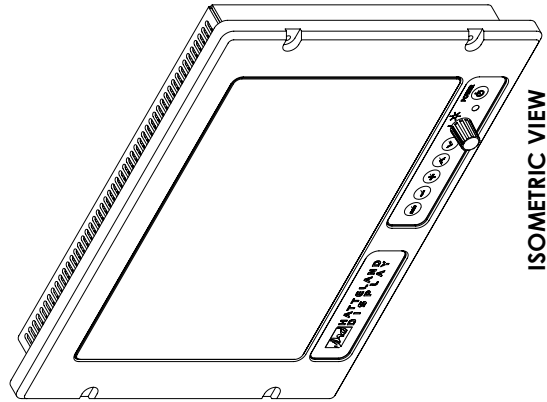
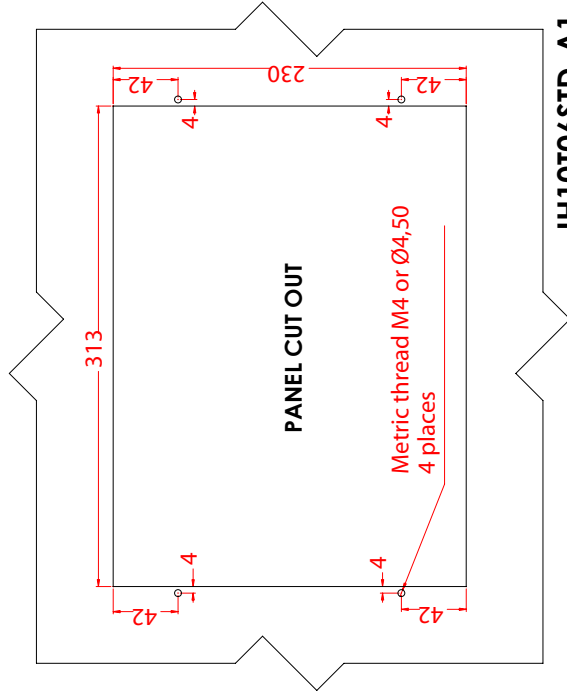
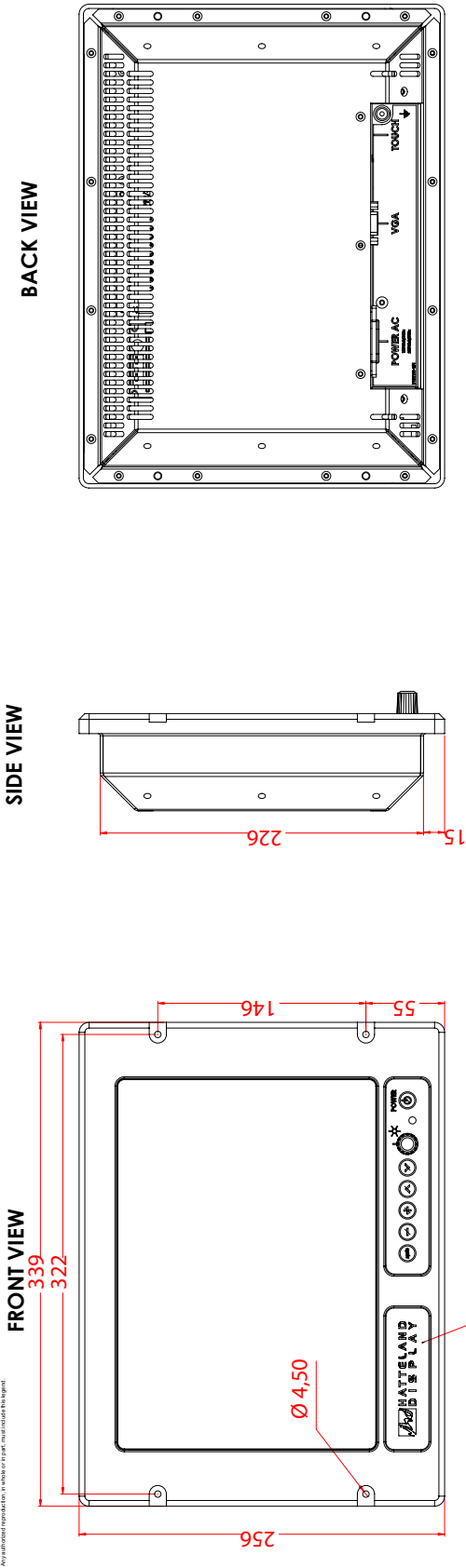
Power On/Off button, Brightness Control, Mode Status LED
On Screen Display Control.

Specification and design are subject to change without notice.

For additional information, datasheets and support for this product, please visit our website:



www.hatteland.com



JH10T06STD-A1

Date	24-03-2003	Part No.	4701	Scale	1:1,5
Manufacturer Display	Jakob Hatteland Display	Approved by	Amosson	Drawn by	4701
Based on A000214-1					

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At the time of printing this manual, this technical drawing was not available. Please check our internet pages (under support) for updates and datasheets on this issue.

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Specifications - JH 15T03 STD



TFT Display:

15.0" viewable image size
Thin Film Transistor (TFT)
MVA technology

Characteristics:

Pixel number : 1024 x 768
Pixel pitch (RGB) : 0,297 (H) x 0,297 (V) mm
Response Time : 25 ms (typ)
Contrast Ratio : 400:1 (typ)
Light Intensity : 250 cd/m2 (typical)
Viewable Angle : +/- 80 deg.(typical)(Up/Down/Left/Right)
(@ CR > 10)

Display Colors Analog Input:

262,144 colors (6-bit color)

RGB Input Signal:

Analog RGB 0,7Vp-p
Input impedance 75 Ohm

Sync Signal:

Separate synchronisation only
Auto detects VGA -> XGA, non interlaced

Synchronisation Range:

Horizontal : 31,5 kHz to 48,3 kHz
Vertical : 60 Hz *

Resolutions:

640 x 480 / 800 x 600 / 1024 x 768 *

* Recommended for optimum picture quality

Active Display Area:

304,1 (H) x 228,1 (V) mm

Power Supply:

JH 15T03 STD A1 : 115VAC/60Hz or 230VAC/50Hz
JH 15T03 STD A2 : 12-24 VDC

Power Consumption:

Operating: Max 40 W

Environmental Considerations:

Operating: Temperature -15 deg. C to +55 deg. C
Humidity 20% to 85% (non condensing)
Storage: Temperature -20 deg. C to +60 deg. C
Humidity 5% to 85% (non condensing)

Dimensions:

412 (W) x 345 (H) x 58 (D) mm
Weight: 7 kg (Approx w/bracket)

Input Signal Terminal:

RGB (PC) signal:
15pin mini Dsub

Power:

JH 15T03 STD A1 : Std IEC inlet (AC input)
JH 15T03 STD A2 : Screw terminal (DC input)

Touch Screen: (optional)

1 x D-SUB 9P Connector (female)

User Controls:

Power On/Off button, Brightness Control, Mode Status LED
On Screen Display Control, Auto LED intensity adjust.

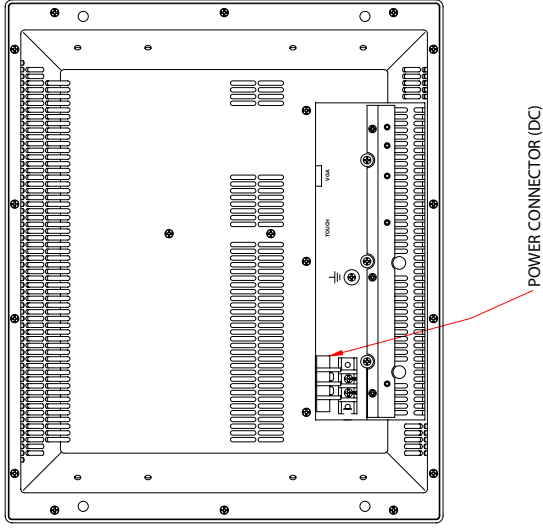
Specification and design are subject to change without notice.

For additional information, datasheets and support for this product, please visit our website:

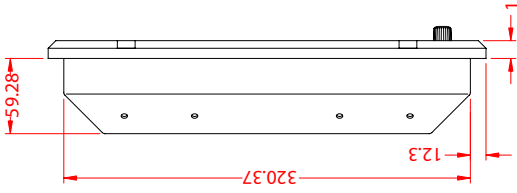


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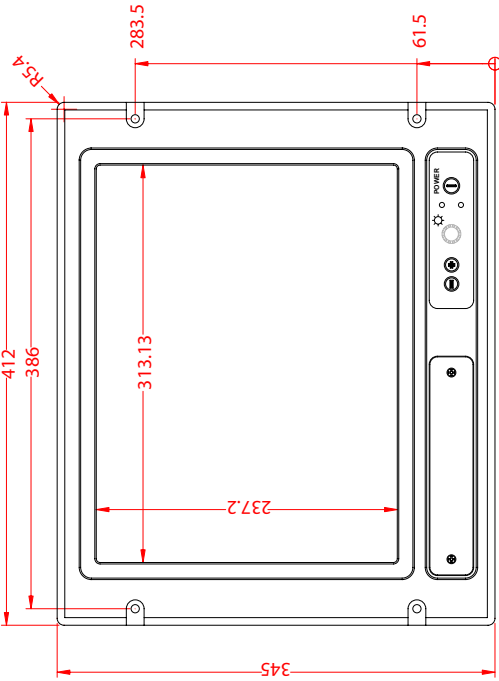
BACK VIEW



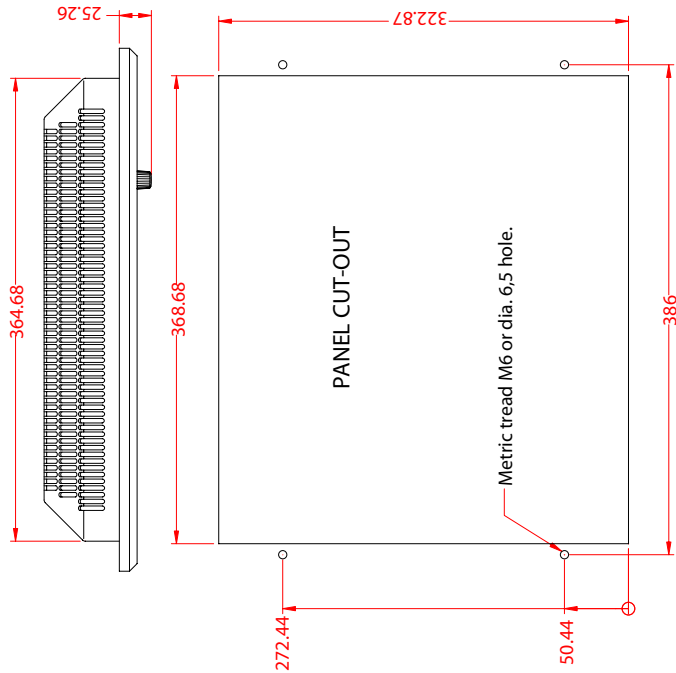
SIDE VIEW



FRONT VIEW



TOP VIEW



Specifications subject to change without notice
Details can change for custom applications

Date	Dgn./Drawn	Projection	Scale (A-3 Format)	All dimensions in millimeters	
10/10-00	RR	1st Angle	1:4	Replacement for	Replacement by
Checked	Stand. chk.				
15,1 inch INDUSTRIAL DISPLAY			Based on 297253C1		
TYPE: JH 15T03 STD			Filename		
Reference	Estimate	Elmagdhwg - Autocad_2751-3000			

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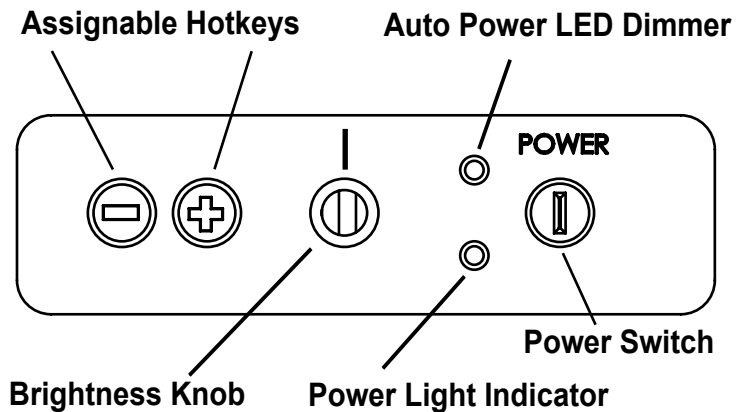
POWER SWITCH:

This TFT display features a Instant-ON/Delay-OFF switch, which ensures that the display is not turned off by user accident.

Power ON: To turn the display on, press down the power switch. The power light indicator will turn green.

(If no VGA signal sync is present, a message will appear in the display)

Power OFF: To turn the display off, press and hold the power switch down for 3 seconds.



DISPLAY ADJUSTMENT CONTROLS:

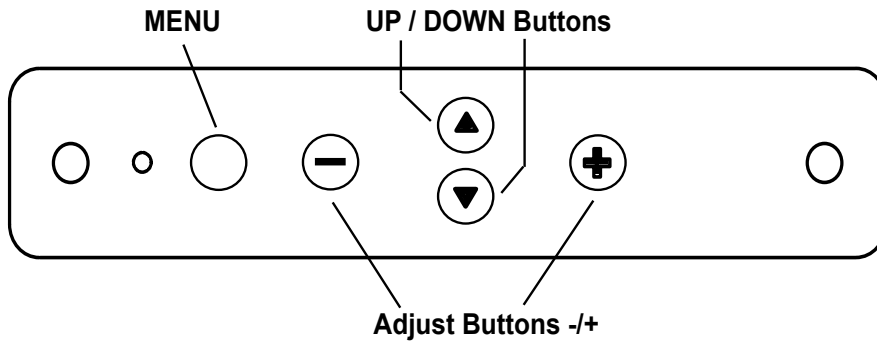
This TFT display features a 100% dimmable image, which means it is capable of displaying a completely black image when the brightness knob is turned fully to the left.

BRIGHTNESS - Adjust the image brightness with the brightness knob.

ASSIGNABLE HOTKEYS:

The user can assign various display functions as hotkeys (increase/decrease).

This will enable the user to quickly adjust the brightness, image size, contrast or other functions to control the image. To assign these hotkeys, enter the “**EXTENDED MENU/DIRECT ACCESS**” menu and change them to the desired hotkey function. Default hotkeys are set to increase/decrease contrast.



USER CONTROLS:

- 1: Press the “MENU” button. The OSD Menu shows the functions menu.
- 2: To modify the values or access to its submenu, use the “Adjust Buttons (-) or (+)”.
- 3: To select another function use the “Select Buttons / Up or Down” to navigate up or down.

Note:

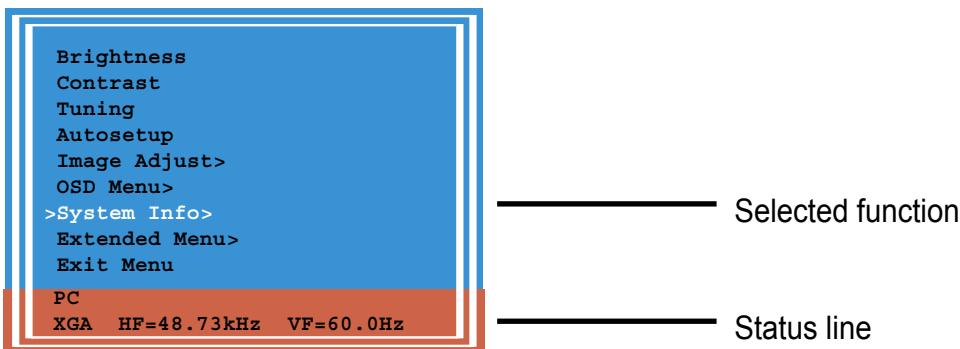
- The image quality depends on the computer or video card you are using.
- Select a crisp and bright image for display while adjustment takes place.
- The modified settings is automatically saved on menu exit. The user can also decide whenever to deactivate this function. This means the user has to save the settings manually by selecting the **Exit Menu** function and choosing save.

AVAILABLE FUNCTIONS:

The OSD Menu provides On Screen Display of certain common functions.

Pressing the “MENU” button will bring up the menu with it’s available functions that can be adjusted. The selected function is highlighted. Often the selected function also have some quick information (status line) which is displayed in the bottom of the menu. The user can also use the “MENU” button to exit any menu or sub-menu.

To select another function, use the “Select Buttons” to navigate down/up on the menu. All modifications will instantly be updated on screen. Some of the menus also have sub-menus where you can modify more parameters, these are marked with an **>** arrow. They can be accessed by pressing the “Adjust Button (+)” button as the OSD Menu describes.



Above: Sample of OSD Menu

Brightness -  +124

Use this function to adjust the image brightness in relation to the background.

Pressing the “**Adjust Buttons (-) or (+)**” will increase or decrease the value. The slider on screen will also move from left or right indicating the current setting and as a numerical value. Range 0 to 236

Contrast -  +114

Use this function to adjust the overall image and background screen brightness.

Pressing the “**Adjust Buttons (-) or (+)**” will increase or decrease the value. The slider on screen will also move from left or right indicating the current setting and as a numerical value. Range 0 to 210

Tuning -  + 17

Use this function to fine tune the data sampling position (adjust display quality).

Pressing the “**Adjust Buttons (-) or (+)**” will increase or decrease the value. The slider on screen will also move from left or right indicating the current setting and as a numerical value. Range 0 to 31

Autosetup

Use this function to automatically set up the display area like positions, image size, tuning etc.

Pressing the “**Adjust Button (+)**” will activate auto setup.

Image Adjustments> (Sub-menu)

In this sub-menu the user can adjust the horizontal position, vertical position, horizontal size, sharpness and the 3 component **RGB (Red, Green, Blue)** color saturations of the display area.

Pressing the “**Adjust Button (+)**” will activate a new sub-menu which contains these functions:

- **Image Horizontal Position** -  + 32

Pressing the “**Adjust Buttons (-) or (+)**” will move the display area horizontally (left or right).

The slider on screen will also move from left or right indicating the current setting and as a numerical value. Range 0 to 58

- **Image Vertical Position** -  + 31

Pressing the “**Adjust Buttons (-) or (+)**” will move the display area vertically (up or down).

The slider on screen will also move from left or right indicating the current setting and as a numerical value. Range 0 to 56

- **Image Horizontal Size** -  + 1340

Pressing the “**Adjust Buttons (-) or (+)**” will expand or shrink the display area from center horizontally.

The slider on screen will also move from left or right indicating the current setting and as a numerical value. Range 1318 to 1358

- **Sharpness** -  +

Pressing the “**Adjust Buttons (-) or (+)**” will adjust the sharpness level of the display area.

The slider on screen will also move from left or right indicating the current setting and as a numerical value. Range 0 to 3

continues on next page.....

....continued from previous page.

- **Red** -  + 18

Pressing the “**Adjust Buttons (-) or (+)**” will increase or decrease the red color level. The slider on screen will also move from left or right indicating the current setting and as a numerical value.
Range 0 to 35

- **Green** -  + 18

Pressing the “**Adjust Buttons (-) or (+)**” will increase or decrease the green color level. The slider on screen will also move from left or right indicating the current setting and as a numerical value.
Range 0 to 35

- **Blue** -  + 18

Pressing the “**Adjust Buttons (-) or (+)**” will increase or decrease the blue color level. The slider on screen will also move from left or right indicating the current setting and as a numerical value.
Range 0 to 35

- **Reset RGB to default**

Pressing the “**Adjust Button (+)**” will reset any modified **RGB** settings back to the previous setting before the user entered this sub-menu.

- **Back>**

Pressing the “**Adjust Button (+)**” or “**MENU**” will exit this sub-menu with the modified settings intact.

OSD Menu> (Sub-menu)

In this sub-menu the user can modify the horizontal position, vertical position, horizontal size, transparency, time out and auto save parameters for the OSD Menu itself.

Pressing the “**Adjust Button (+)**” will activate a new sub-menu which contains these functions:

- **Menu Hori Position** -  + 31

Pressing the “**Adjust Buttons (-) or (+)**” will move the OSD Menu horizontally (left or right).

The slider on screen will also move from left or right indicating the current setting and as a numerical value. Range 0 to 62

- **Menu Vert Position** -  + 30

Pressing the “**Adjust Buttons (-) or (+)**” will move the OSD Menu vertically (up or down).

The slider on screen will also move from left or right indicating the current setting and as a numerical value. Range 0 to 60

- **Transparency** -  +

Pressing the “**Adjust Buttons (-) or (+)**” will adjust the OSD Menu transparent level in a stepwise manner. The slider on screen will also move from left or right indicating the current setting and as a numerical value. Range 0 to 3

- **Time Out**

Pressing the “**Adjust Buttons (-) or (+)**” will modify the timeout of the OSD Menu. The parameter selected will be highlighted. Values are in seconds before the OSD Menu will automatically disappear from the display area. Available parameters are: **10/20/30/45/60/cont**

Choosing **cont** (never auto exit) requires that the user manually exits the menu.

- **Auto Save**

Pressing the “**Adjust Buttons (-) or (+)**” will choose whenever the modified settings will be automatically saved when the OSD Menu exits. The parameter selected will be highlighted.

-When set to **Off** the user will manually have to save the modified settings using the **Exit Menu** function and choosing save.

-When set to **On** all settings modified will automatically be saved when the user exist the menu, or the menu exits itself based on a timeout value.

- **Back>**

Pressing the “**Adjust Button (+)**” or “**MENU**” will exit this sub-menu with the modified settings intact.

System Info> (Sub-menu)

The status line will show some important technical information about the current display mode/controller:

Example:

```
PC
XGA  HF=48.73kHz  VF=60.0Hz
```

On this sub-menu the user can view various technical information for the internal graphics controller and the OSD Menu software. Pressing the “**Adjust Button (+)**” will activate a new sub-menu:

- **Display type**

Shows the suggested display technology the user is running. Also detects what resolution the user is running on the display area. Example: **TFT LCD 1024x768**

- **Model and Serial No**

Shows the internal graphic controller model and its serial number.* Example: **ACL-1024**

* (Note: This is not the same as the display product serial number from Hatteland Display AS)

- **Bios version**

Shows the BIOS version of the OSD Menu software. Example: **00.03-00.03**

- **Run time**

Shows the uptime for the display itself. The user can reset this internal clock by pressing the “**Adjust Button (+)**” and hold it for 5 seconds.

Example: **480h00m** (480 hours and 0 minutes)

- **Back>**

Pressing the “**Adjust Button (+)**” or “**MENU**” will exit this sub-menu with the modified settings intact.

Extended Menu> (Sub-menu)

On this sub-menu the user can modify various OSD Menu parameters such as Direct Access (hot-keys) and language for all the OSD Menu and its submenus including any messages.

Pressing the “**Adjust Button (+)**” will activate a new sub-menu which contains these functions:

- **DOS Text or Graphics**

Pressing the “**Adjust Buttons (-) or (+)**” will select between **Text** or **Graphics**

The parameter selected will be highlighted. Leave this setting to **Graphics** for best results.

- **Direct Access 1>**

Allow the user to define the hot-keys (-) or (+) / **Up** or **Down**) to one of the OSD functions.

When the user presses one of the “**Adjust Buttons (-) or (+)**” or “**Select Buttons / Up or Down**” the assigned hot-key will increase / decrease the value without the user entering the OSD Menu itself.

This can be very time consuming if the user has to modify any of the OSD functions quickly.

Pressing the “**Adjust Button (+)**” will activate a new sub-menu which contains these functions:

- **Brightness**

Selecting this function will assign “**Brightness**” parameter changes to the “**Adjust Buttons (-) or (+)**” buttons.

- **Contrast**

Selecting this function will assign “**Contrast**” parameter changes to the “**Adjust Buttons (-) or (+)**” buttons.

- **Back>**

Pressing the “**Adjust Button (+)**” or “**MENU**” will exit the sub-menu one level with the modified settings intact and saved.

- **Direct Access 2>**

The same procedure applies here as above on: **Direct Access 1>**

The user can now assign the “**Select Buttons / Up or Down**” to the selected OSD function.

- **Language**

Allow the user to configure the OSD Menu language for all the OSD Menu and its submenus including any messages. Pressing the “**Adjust Button (+)**” will activate a new sub-menu which enable the user to select the preferred language. The parameter selected will be highlighted. Available languages are: **English, Italian, Francais, Espanol, Svenska, Nederlands, Deutsche.**

- **Back>**

Pressing the “**Adjust Button (+)**” or “**MENU**” will exit the language sub-menu with the modified settings intact and saved. Pressing it once more will also exit out to the main menu.

Exit Menu

Pressing the “**Adjust Button (+)**” will save the settings and exit the menu.

Pressing the “**Adjust Button (-)**” will exit the menu but does not save the modified settings.

Preset Signal Timing XGA Displays



This TFT display is capable of detecting the following resolutions along with its preset signal timing setting. These settings have been pre-programmed by the RGB controller factory. The following industrial standard settings are supported for this display:

Mode	Resolution	Clk (MHz)	Horiz.Freq(KHz)	Vert.Freq(Hz)	Sync Gate
V_60	640 x 480	25.175	31.469	59.940	Digital Separate Sync.
SV_56	800 x 600	36.000	35.156	56.250	Digital Separate Sync.
SV_60	800 x 600	40.000	37.879	60.317	Digital Separate Sync.
X_60	1024 x 768	65.500	48.363	60.004	Digital Separate Sync.



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