

Solutions for Demanding Applications



VARTECH
SYSTEMS INC.



XHBV Series

8.4" – 10.4" – 12.1" – 15.1"

User's Guide

Read instructions completely before attempting to operate your Display

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Table of Contents



Safety	4
Product Care and Maintenance.....	6
System Set-up	7
Cable Connections	10
Optional AC Power Adapter.....	11
Operator Controls.....	12
On-Screen Display (OSD)	13
Optional Internal Heater	16
Optional NVIS Filter	16
Appendix A - Mechanical Drawings	18
Appendix B - Troubleshooting	18
Appendix C - NEMA and IP Industry Standards	19
Appendix D -Technical/Environmental Specifications.....	20

SAFETY

General Safety Instructions


- Before operating the XHBV Monitor, read this User Manual thoroughly
- Retain this User Manual for future use
- For expeditious installation, follow these User Manual instructions in sequence
- Adhere to all Caution and Warnings on system and as stated in this User Manual
- All User Manual instructions for installation and operation must be followed precisely
- Adjust only those controls covered by the User Manual's operating instructions; improper adjustment of other controls voids the unit's warranty and may result in unit damage, and adhere to local installation codes.

Safety Icons

	Warning! Shock Hazards This icon is intended to tell you of a potential risk of electrical shock.
	Caution! Instructional This icon is intended to tell you of important operating and/or maintenance instructions.

General Unit Safety

- Always disconnect the unit from the power source before cleaning
- Do not operate the unit with a damaged cord
- Do not operate if the unit has been dropped or damaged. The unit needs inspected by qualified VARTECH SYSTEMS Service Personnel
- Position the power cord so it will not be in contact with hot surfaces
- Do not allow anything to rest on the power cord, and
- Do not place the power cord where there will be foot traffic.

	General Safety Precautions
	<ul style="list-style-type: none">• Power cord must be connected to a properly wired and grounded power source• Any equipment to which the unit will be attached must also be connected to properly wired and grounded power sources• Do not connect or disconnect the unit during an electrical storm• Do not remove the unit covers – there are no user serviceable parts in the unit• Do not disassemble or modify the unit to avoid the possibility of electrical shock, damage to electrical components or scratching the Display surface, and• Disassembly of the unit voids the warranty.



fluids from LCD Display

caution!

- If the Monitor should ever become shattered, do not touch fluids from an LCD Display
- If fluid should get on hands or clothing, immediately wipe off with liquid soap or rubbing alcohol on a clean towel; wash with water; immediately consult with a doctor, and
- If fluid gets in the eyes, flush eyes immediately with water for a minimum of 15 minutes; consult with a doctor.

Electrical

Connecting Cables

- Disconnect the power when the Monitor is being installed, and
- Upon installation, verify the power connector is securely seated on the unit.

Power Source

This unit may be operated from an AC or DC power source.

- Use the supplied power cable, and
- Always connect to a properly grounded power source.



EMI/RfI

caution!

This product has been engineered to meet or exceed international industry standards addressing product design and enclosure protection against EMI/RFI when installed with the factory provided cables.

Protection on Servicing

Servicing - User

- User product servicing is limited to cleaning the unit
- Do not disassemble or modify the unit to avoid the possibility of an electrical shock, damage to electrical components or scratching the Display surface, and
- Disassembly voids the warranty.

Servicing - VARTECH SYSTEMS

VARTECH SYSTEMS Qualified Service Personnel may be required if the unit:

- Does not operate normally when installation instructions are followed
- Does not operate normally when operating instructions are followed
- Has been dropped or damaged, or
- Exhibits a distinct change in performance, indicating a need for service.

Shipping

If the unit should need to be shipped to the VARTECH SYSTEMS Service Center, the original packing material should be used to insure safety of the unit in shipping. Repack the unit as it would have originally been received from VARTECH SYSTEMS.

PRODUCT CARE & MAINTENANCE

Product Care

This XHBV Monitor has been designed to provide optimum performance and service without any required scheduled maintenance other than occasional cleaning.



Disconnect the Monitor from the power source before cleaning the Monitor, optional Touch Screen or unit's enclosure.



- Do not use abrasive cleaners or solvent-based (flammable) cleaners on the Flat Panel, enclosure or any other electrical device (cables, power cord, etc.)
- Do not use paper products as they may scratch the Display screen, and
- Do not directly apply cleaning solutions to the Display screen.

Display Screen Cleaning

- A vinegar-based cleaner is preferred: prevents streaking, degradation of coatings
- A non-abrasive glass cleaner may be used, as in a professional foam glass cleaner
- Apply the cleaning solution to a soft clean cloth, dampening slightly
- Keep a fresh side of the cleaning cloth towards the screen surface to avoid scratching it with accumulated grit, and
- To minimize the risk of abrasion to the screen, air drying is recommended.



In marine or similar environments, an added benefit of a vinegar-based cleaner is its effectiveness in dissolving mineral and salt deposits.

Monitor Enclosure

- Clean the unit enclosure with a soft clean cloth lightly dampened with a general purpose mild detergent solution
- Wipe down with clean water; dry with a soft clean cloth.



To avoid risk of electrical shock, do not disassemble the unit's enclosure. Users cannot service the Monitor. User maintenance is restricted to cleaning or power cord replacement, as explained. Disassembling the unit voids the warranty.

Long-term Storage

- For long-term storage, it is suggested the unit be stored in a normal indoor environment and the Display glass be protected from accidental damage
- For pedestal mount units, disconnect the cable(s) and loosen the arm adjustment to a point where the ball can be removed from the arm, or For Flush or Panel Mount units, cover the product with a protective covering that will not scratch or transfer any dyes to the Display screen.

Maintenance

Other Maintenance

Only VARTECH SYSTEMS Qualified Service Personnel should perform all other maintenance except for cleaning and the power cord replacement described below.



Power Cord

To avoid shock and fire hazards, replaced the unit's power cord if:

- Insulation becomes damaged, or
- A loose connection is suspected.

SYSTEM SET-UP

System Requirements

The XHBV accepts a standard NTSC composite video signal from any device – a camera, VCR or DVD.

Shipping Box Contents

The XHBV is shipped in a custom box with custom foam packaging. It is recommended the installer save the box and all packaging materials in case the unit would need to be returned to the VARTECH SYSTEMS Service Center.

The shipping box contents are:

- XHBV unit
- Power Cable
- Mounting System and Hardware
- User CD

The XHBV is designed to be mounted with a universal ball-and-socket mounting kit, in a Flat Panel position or optional Flush Mount configuration.

Pedestal Mount

The XHBV is shipped with a RAM® universal ball-and-socket system mounting kit (Figure 1). By installing the Monitor with this kit, the User can quickly adjust the viewing angle to improve viewability in changing environments. This ball-and-socket system has proven to be successful in supporting an extreme amount of weight in high vibration and difficult-mount applications.

Locate the ball-and-socket system in the shipping box. The kit consists of two RAM balls on mounting plates and a RAM arm, with an adjustable T-knob and a packet of three (3) M4 x 10 counter-sunk stainless screws for mounting to the XHBV. (Figures 1 - 3)



figure 1



figure 2

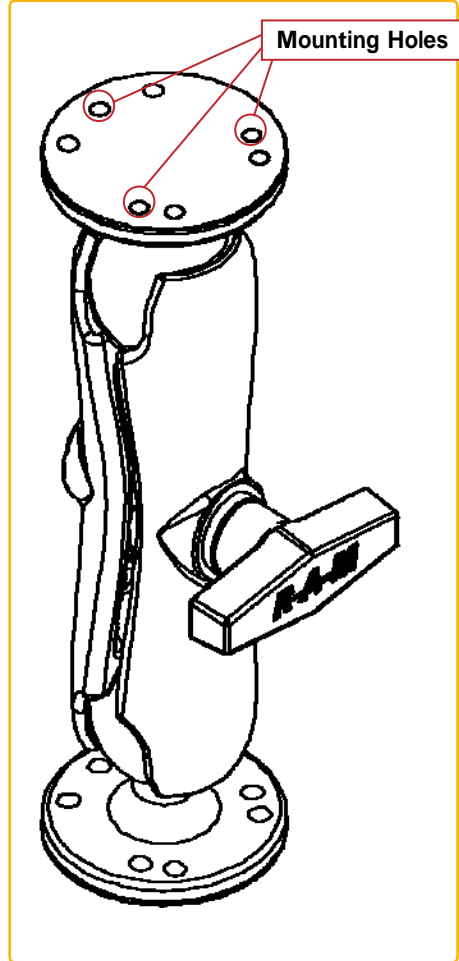


figure 3

There are three mounting holes in the back of the Monitor for the ball mounting plate. Take care not to strip the screw holes or over tighten. (Figure 3)

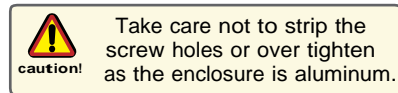
- Note the location of the three mounting holes on a ball mounting plate (Figure 3)
- With three (3) M4 x 10 counter-sunk stainless screws attach this mounting plate to the back of the XHBV
- Mount the second ball mounting plate where the Monitor will be installed
- Insert each ball into the RAM arm
- Lightly tighten the arm around the balls using the T-knob on the arm (Figure 1, 3)
- Adjust the Monitor to the viewing preference, and
- Tighten the T-knob to hold the Monitor in position.

It is recommended the remaining ball be mounted on a flat surface. Because of the various surface substrates the Monitor will be mounted on, the installer will provide the screws to mount the other ball.

Panel Mount

The Panel Mount installation should be specified at the time of order; the ball-and-socket mount system will not be included in the shipping box.

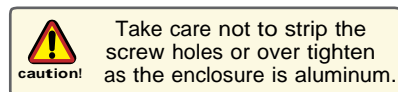
The mounting hardware packet is included with the unit accessories in the shipping box. This packet includes four (4) threaded screws (approximately 7.6 cm [3"] long), four (4) Nylock nuts and four (4) flat washers. For installation, there are four tapped mounting holes on the four corners of the unit's rear panel.



Flush Mount with Optional Bezel

With the Flush Mount Bezel, the XHBV Flat Panel Display may be mounted flush with the mounting surface; the ball-and-socket mount system or any mounting hardware will not be included in the shipping box. The installer needs to supply screws for this type of installation.


Note the locations of the milled holes in the Flush Mount Bezel. Drill corresponding holes into the substrate where the Monitor is to be mounted.



CABLE CONNECT

Cables

- The XHBV is packaged with one cable:
DC Power, #1 in Figure 4
- The BNC cable and S-Video cable, #2 and 3 in Figure 4, are provided by the end-user, and
- The AC Power Adapter is optional. (Figure 5)

 Use care when inserting or removing connectors.

- 1 DC Power Input
- 2 BNC Input
- 3 S-Video Input

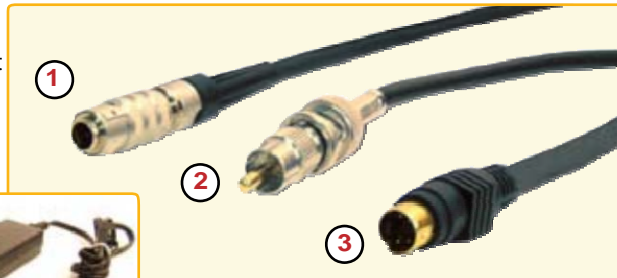


figure 4



figure 5

Connectors

Connectors are located on the bottom of the unit housing, from left to right: BNC, S-Video and Power. (Figure 6)

Connectors are physically unique to insure the installer makes the proper connections.



- 1 BNC Input
- 2 S-Video Input
- 3 Power Input

figure 6

Composite BNC Connector

The XHBV accepts a standard NTSC composite video signal from any device – a camera, VCR or DVD. This signal is carried to the Monitor via a coaxial video terminated with a BNC connector.

- The end-user supplies the BNC coaxial video cable
- The BNC receptacle on the Monitor is sealed
- Line up with first connector, #1 in Figure 6, and
- Plug together, adding a ¼ twist to lock the two pieces.

S-Video Connector

- A standard S-Video component cable is required for installation
- The IP68 sealed S-Video connector is #2 in Figure 6
- The flat side of the connector lines up with the connector's rectangular bar, and
- Plug the connectors together.

DC Power Connector

- The IP68 sealed DC Power Cable, 3 m (10 ft), is in the accessory box
- Line up the red dots to #3 in Figure 6
- Plug in the quick-connect 3-pin connector
- To disconnect, pull the outside ring on the connector away from the unit until the cable is free
- The positive flying lead is marked with a "+" label. The negative lead is not marked (Figure 7).
- Connect the flying leads to the corresponding polarity on the DC voltage source, primary terminal.

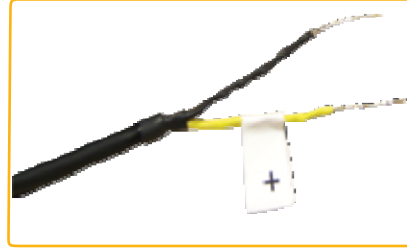


figure 7



Verify the polarity of the power source posts prior to attaching the power cable's flying leads.

OPTIONAL AC POWER ADAPTER

Optional AC Power Adapter

- The optional AC Power Adapter Cable Set consists of a 3 m (10 ft) cable with an IP68 sealed connector, the power adapter and a 1.8 m (6 ft) common AC power cord (Figure 6)
- The adapter accepts voltage from 110 to 250 VAC and frequency from 47 to 63Hz
- The AC power cord plug is a North American standard for 120 VAC/60Hz, and
- Line up the red dots to #3 in Figure 7
- Plug in the quick-connect 3-pin connector, and
- To disconnect, pull the outside ring on the connector away from the unit until free.

Note: The optional AC Power Adapter is not an off-the-shelf item. It is equipped with a specific connector for integration with the XHBV monitor.

Operator Controls

On the right hand side of the Monitor bezel are six Operator Control buttons (Figure 8).

Power Button

Note: Monitor defaults to an AUTO-OFF state when power is applied.

- The Power On/Off button is marked with the I/O (Input/Output) symbol
- Momentarily pressing this button will turn ON or turn OFF the unit, and
- A Red LED located under the I/O button glows when the unit is powered on.

Optional feature: Monitor defaults to an AUTO-ON state when power is applied. This feature must be ordered when the Monitor order is placed. It is not available after the unit is built.

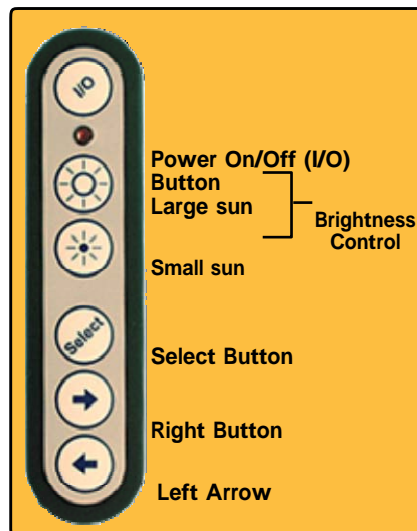


figure 8

Brightness Buttons

These buttons control the brightness of the LCD Panel Display.

- The LARGE SUN button, when repeatedly pressed or held down causes the display's LCD panel backlight brightness to be stepped up in increments to its brightest setting
- The SMALL SUN button, when repeatedly pressed or held down causes the display's LCD panel backlight brightness to be stepped down in increments to its lowest setting, which is just above total black, suitable in very subdued light, as in night time operations, and
- Adjusted settings are maintained when the unit is powered off, then powered on.



USER TIP

Adjust the brightness of the Display to the lowest possible setting for a given set of conditions and display characteristics. Doing so will provide the best viewing of the image, extend the lamp life of the backlight and reduce the internal heat of the Display.

Select Button

The SELECT Button is the access point to the On-Screen Display (OSD) Source Screen Function Menu. (See On-Screen Display.)

Press the SELECT button *twice* to access the Video Source Menu, to move between video inputs, Composite and S-Video.

Right Arrow Button

The RIGHT Arrow Button is an adjustment tool in the On-Screen Display (OSD) Source Screen Controls Menu. (See OSD Screen Control Menu Categories.)

Left Arrow Button

The LEFT Arrow Button is an adjustment tool in the On-Screen Display (OSD) Source Screen Controls Menu. (See OSD Screen Controls Menu Categories.)

ON-SCREEN DISPLAY

The On-Screen Display (OSD) User Interface is where display signal source adjustments are made. The Source Screen Controls Menu provides access to fine-tuning the display.

OSD Source Screen Controls Menu Activation

To activate the OSD Source Screen Controls Menu in the active video source, press and release the SELECT button.

Note: OSD Source Screen Controls Menu will close after 15 seconds of inactivity.

OSD Source Screen Controls Menu

The Controls Menu is comprised of seven source screen control categories with adjustable settings.

Display Category Adjustments

- Press the SELECT button to access the Controls Menu
- In the Controls Menu, to choose a Display Category, use the RIGHT or LEFT Arrow button to move UP or DOWN the Controls Menu
- The Controls Menu item changes color, from black to red, when it is active
- When a Controls Menu item is in red, press the SELECT button to open
- The adjustment controls are the RIGHT and LEFT Arrow buttons, which increase or decrease the value of the menu item's parameter as noted in the indicator screen
- Create the new parameter value
- Press the SELECT button to save the new value; this returns the User to the Controls Menu
- Move the RIGHT or LEFT Arrow button to move to another Controls Menu item, or
- Move the RIGHT or LEFT Arrow button to Exit.

OSD Source Screen Controls Menu Categories



- New settings will be stored in memory upon pressing the SELECT button to exit the OSD Source Screen Controls Menu item.
- If SELECT is not pressed, or inactivity is detected within the 15 second factory default OSD menu duration, any screen function adjustments made will be saved.

Controls Menu Parameters

Video Horizontal

Video Horizontal adjusts the picture screen, left to right.

- Open the "Video Horizontal" function, and
- Press the RIGHT or LEFT Arrow button to adjust the display's horizontal position.

Video Vertical

Video Vertical adjusts the picture screen, top to bottom.

- Open the "Video Vertical" function, and
- Press the RIGHT or LEFT Arrow button to adjust the display's vertical position.



It is recommended to adjust the LED back light brightness to maximum before fine-tuning the OSD Source Screen Controls Menu Parameter: Brightness.

Video Brightness

Before adjusting the Video Brightness parameters, set the LCD panel back light brightness using the LARGE SUN button; set to its brightest in the ambient light source.

- Open the “Video Brightness” function, and
- Press the RIGHT or LEFT Arrow button to set the Display’s desired brightness.

Video Blacklevel

Video Blacklevel adjustment intensifies or decreases the saturation of black.

- Open the “Video Blacklevel” function, and
- Press the RIGHT or LEFT Arrow button to set the Display’s desired black level.

Video Contrast

Video Contrast is the difference in brightness between the light and dark areas of the pixels of the picture.

- Open the “Video Contrast” function, and
- Press the RIGHT or LEFT Arrow button to set the Display’s desired contrast.

Video Hue

Video Hue is the pinks, blues and greens of the Display.

- Open the “Video Hue” function
- Press the RIGHT or LEFT Arrow button to set the Display’s desired tint, and
- Ranges on the Display bar are: low – pinks; mid-range – greens and upper – blues.

Video Color

Video Color adds or subtracts color values from the picture.

- Press the LEFT Arrow button to remove color and go to black and white, and
- Press the RIGHT Arrow button to add color.

Recall

The Recall feature resets the Controls Menu items to factory default.

- Select “Recall” control to reset all the controls to factory default, and
- Press the SELECT button to save changes.

Exit

The Exit menu item takes the User out of the Source Screen Controls Menu.

- Press the RIGHT or LEFT Arrow button to get to Exit, and
- Press the SELECT button to Exit.

----- **Video Source Menu** -----

The Source Screen Video Source Menu gives the menu for the Monitor's video source selections.

Composite Video

- Press the RIGHT or LEFT Arrow button to select "Composite Video" signal, and
- Press the SELECT button to open this source Controls Menu.

S - Video

- Press the RIGHT or LEFT Arrow button to select "S-Video" signal, and
- Press the SELECT button to open this source Controls Menu.

Exit

The Exit menu item takes the User out of the Source Screen Video Source Menu.

- Press the RIGHT or LEFT Arrow button to select Exit, and
- Press the SELECT button to Exit.

OPTIONAL INTERNAL HEATER

Optional Internal Heater

The optional Internal Heater automatically brings the Monitor up to the standard operating temperature if the unit is below that temperature when powered on.

Operations

- The flashing blue LED lights behind the Operator Control Buttons indicate the unit is in the heating mode, bringing the Monitor up to operational temperature
- Once the Monitor is up to operational temperature, the flashing blue LEDs become a constant blue glow and the unit automatically powers on
- Maximum time for the unit to reach operational temperature is approximately 12 minutes, and
- There are no User adjustments for the Internal Heater function.

OPTIONAL NVIS FILTER

Optional NVIS Filter

The optional Night Vision Imaging Systems (NVIS) filter on VARTECH SYSTEMS Monitors is in compliance with the NVIS radiance value requirements of MIL-STD-3009 and MIL-L-85762A for Type 1, Class B, electro-optical displays.

This means the optional NVIS filter is compatible with Night Vision Goggles (NVGs).

APPENDIX A

Mechanical Drawings

Mount diagrams of the XHBV and its dimensions may assist with the installation of the Monitor.

Optional Flush Mount Bezel

Mount diagrams of the Flush Mount Bezel and its dimensions may assist with the installation of the Monitor.

APPENDIX B

Troubleshooting

Symptom: *No light behind button LEDs*

Possible Problem	Solution
No power, loose power connection	Confirm the Monitor is properly connected to a DC or AC power source. Verify the power source is live or try another battery or AC power outlet. Verify the Monitor is powered on.
Reverse polarity	Check polarity of the power connection.

Symptom: *Light behind button LEDs, no display, or “No Signal” error message and/or no image on the display*

Possible Problem	Solution
Power on, no video signal	Verify a video signal is coming out of the signal source (i.e., plug into a known good display source). Verify the incoming signal source selected matches the Monitor signal source (Composite, S-Video). Check the Brightness front panel setting on the Monitor. This may be set too low. Check the Brightness and Contrast controls in the OSD. These may be set too low.

Symptom: Display has rolling “bars” across the screen or vertical shaded bars on the image

Possible Problem	Solution
Defective video cable	On a known good display source, confirm the video cable is not defective.
Interference from adjacent equipment	For proper grounding and shielding, verify use of a proper video cable. Keep the cable away from sources of EMI such as electric motors, or unshielded RFI sources such as radar and microwave.
Horizontal size is not adjusted	In the OSD, adjust the Video Horizontal controls.

Symptom: Picture quality, image stability is distorted

Possible Problem	Solution
Proper cable grounding and shielding	Verify the use of a proper video cable with suitable grounding and shielding. Keep the video cable away from sources of EMI and RFI.
Improper video display settings	Check signal source for proper signal. Check for proper display properties selection.
Display unit is farther than 3 m (10 ft) from signal source	Single cable lengths in excess of the standard 3 m (10 ft) cable should be of high quality shielded cable. Contact VARTECH SYSTEMS for information
Multiple Monitors are driven from the same signal source.	Splitting the video signal divides the strength of the signal. A video signal booster (line driver) is recommended if installation requires more than one Monitor driven from a single video source.
Monitor has incorrect or bad sync signals.	Check for proper video cable installation, or replace suspected faulty cable.

Symptom: Display image is not properly sized

Possible Problem	Solution
OSD adjustments need to be made	Adjust the Video Vertical and Horizontal controls through the OSD.

APPENDIX C

NEMA and IP Industry Standards

There are two major electrical manufacturing organizations monitoring product enclosures and/or their degree of protection; each organization also publishes technical manufacturing standards. The National Electrical Manufacturers Association (NEMA) Standard No. 250 – 2003 addresses non-hazardous locations, enclosure design and its environmental performance requirements. These are referred to as NEMA Types. (www.nema.org)

The International Electrotechnical Commission (IEC) 60529 Standard addresses Ingress Protection (IP); this describes the degree of enclosure protection provided, not the enclosure itself. The first digit of the IP Code designation describes the degree of protection against the ingress of solids; the second digit designates the degree of protection against the ingress of liquids. IP Codes support NEMA Type designations. (www.iec.ch)

VarTech Systems designs the XHBV sealed monitor to exceed the Standards of NEMA 6P and IP68, incorporating a range of environmentally-sealed connectors engineered to provide a safe and secure dust and waterproof environment in rugged conditions.

Summary of NEMA 6P/IP 68: Enclosures constructed for indoor or outdoor use; to provide a degree of protection to personnel against incidental contact with the enclosed equipment; to provide a degree of protection against falling dirt; against hose-directed water and the entry of water during occasional prolonged submersion at a limited depth; and that will be undamaged by external formation of ice on the enclosure.

APPENDIX D

Technical Specifications

	8.4"	10.4"	12.1"
Display	TFT AM, SVGA, LCD, 256K Colors. 800 x 600 pixels	✓	✓
Sunlight Readable	800 nits, Transflective, AR/AG	700 nits, Transflective, AR/AG	✓
Dimming Ratio	100:1	✓	✓
Video Input	NTSC/PAL (B,D, G, I, K)	✓	✓
Connectors	BNC S-Video JAE to Flying leads DC Input	✓	✓
Housing	Milled Aluminum, Black Anodized, UV Clear Coat	✓	✓
Mounting	Panel Mount or RAM Mount (Optional Flush Mount)	✓	✓
Power Consumption	6 Watts Min - 20 Watts Max	✓	✓
Wide Range DC Power Input	8-30 VDC (12, 24, 28 VDC nominal)	✓	✓
Power Conditioning	Internal Short Circuit Protection Load Dump Protection Over Voltage Protection Reverse Polarity Protection	✓	✓

Environmental Specifications

	8.4"	10.4"	12.1"
Operating Temperature	0°C to 60°C (32°F to 140°F)	✓	✓
Operating Temperature w/ Internal Heater Option	-40°C to 60°C (-40°F to 140°F)	✓	✓
Storage Temperature	-40°C to 75°C (-40°F to 167°F)	✓	✓
Shock	50 G	✓	✓
Vibration	5.8 G (5-500 Hz)	✓	✓
IP Rating	IP68 (NEMA 6P Submersible)	✓	✓
Humidity	0-100%	✓	✓
EMI	Designed to meet FCC B, CE	✓	✓
Altitude	45,000 ft.	✓	✓

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