Marine Bridge System Displays

USERS MANUAL

Version: 1.2

WPM-MAR0840	8.4 inch Marine Bridge Display
WPM-MAR1040	10.4 inch Marine Bridge Display
WPM-MAR1210	12.1 inch Marine Bridge Display
WPM-MAR1500	15.0 inch Marine Bridge Display
WPM-MAR1700	17.0 inch Marine Bridge Display
WPM-MAR1900	19.0 inch Marine Bridge Display
WPM-MAR2000	20.0 inch Marine Bridge Display
WPM-MAR2310	23.1 inch Marine Bridge Display

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REVISION HISTORY

REVISION	AUTHOR	DATE	DESCRIPTION
1.00	Wayne Lin	April 27, 2007	First version release
1.10	Wayne Lin	Sep. 10, 2007	Add certificate serial number label.
1.20	Ethan Wang	May 13, 2010	Add simply trouble shooting guide and point out DNV approved mounting method.

IMPORTANT SAFETY INSTRUCTIONS

Please read these instructions carefully before using the product and save for later reference.

Follow all warnings and instructions marked on the product.

Unplug this product from the wall outlet before cleaning. Clean the product with a damp soft cloth. Do not use liquid or aerosol cleaners as it may cause permanent damage to the screen.

Do not use this product near water.

Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.

This product should be operated from the type of power indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.

This product is equipped with a 3-wire grounding type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. (For AC version only) Do not defeat the purpose of the grounding-type plug.

Do not allow anything to rest on the power cord. Do not locate this product where persons will walk on the cord.

Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock. Never spill liquid of any kind on the product.

Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous voltage points or other risks and will void the warranty. Refer all servicing to qualified service personnel.

Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:

When the power cord or plug is damaged or frayed.

If liquid has been spilled into the product.

If the product has been exposed to rain or water.

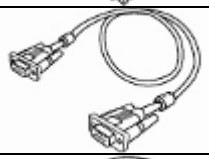
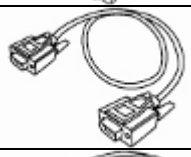
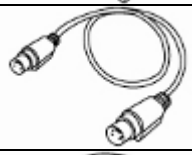
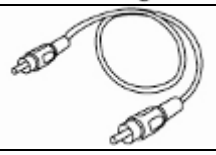
If the product does not operate normally when the operating instructions are followed. Adjust only those controls that are covered by the operating instructions since improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal operation.

If the product has been dropped or the cabinet has been damaged.

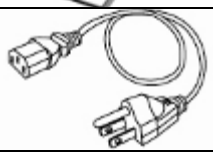
If the product exhibits a distinct change in performance, indicating a need for service.

Packaging List

This product is shipped with the items list below. Please make sure that all are in your package.

Item	Description	Note
	1 pcs of Users Manual.	
	1 pcs of CD for Touchscreen Driver Tools.	
	1 pcs of DVI Cable. DVI-D 24pin Male to 24pin Male: 1.5m.	10.4 inch above
	1 pcs of Std VGA Cable. D-SUB 15pin Male to 15pin Male: 1.8m	
	2 pcs of RS232 Std Serial Cable. D-SUB 9pin Male to 9pin Female: 2m	1pcs for Touch use 1pcs for 10.4 inch above display remote control use.
	1 pcs of S-Video Cable. MD 4pin Male to 4pin Male: 1.8m	
	1 pcs of Composite Cable. Std RCA 3.2mm connector: 1.8m	
	4 pcs of M6 x 30 black screw bolt with M6 nut. **Notice: Only be used to screw the display into a console.** If you prefer your own bolts, please make sure to use M6 and 30mm in length.	10.4 inch above display use.
	4 pcs of M4 x 30 black screw bolt with M6 nut. **Notice: Only be used to screw the display into a console.** If you prefer your own bolts, please make sure to use M4 and 30mm in length.	8.4 inch display use
	M4 x 15 black screw bolt. **Notice: Only be used to screw the display into a console from the rear side.** If you prefer your own bolts, please make sure to use M4 and 30mm in length.	10 pcs for 8.4”,10.4” 12.1”; 12 pcs for 15”; 16 pcs for 17”, 19”, 20.1”, and 18 pcs 23.1” display use.

Optional Accessories

Item	Description	Note
	1 pcs of Transflective LCD User Guide.	Optional with Transflective LCD panel.
	1 pcs of Standard Power Cord. Euro / U.S. Std type, 1.8m	Optional AC version of display use default.

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CHAPTER 1
General Information

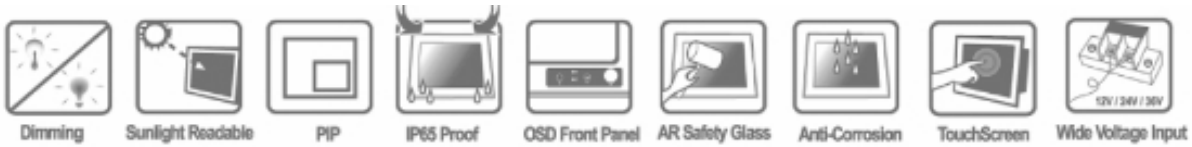
Chapter 1 General Information

The Marine Bridge System Displays are an extraordinary display design with sunlight readable high quality panel, dimming brightness, ease of use OSD front panel control, IP65 proof, multi-scan video function, high quality touchscreen, wide voltage range power input acceptable, and anti-corrosion protection. Born to the demands of maritime applications such as navigation, ship automation and surveillance.

All product designs follow IEC-60945 Maritime Navigation and Radio-communication Equipment and Systems requirements.

1.1 Features about the Marine Bridge System Display

Here are features of Marine Bridge System Displays:



Full-range durable displays

The Marine Bridge System Displays use high quality branding TFT LCD displays with high resolution and wide temperature range panels. From 8.4 inch to 23.1 inch, we offer a wide range choice fulfilling any demand in Marine market.

Hyper Dimming

Our displays use hyper dimming technology that can control backlight brightness linearly from nearly 0% to 100% by a dimming knob. In the night vision it's very suitable for marine applications.

Sunlight Readable (Optional)

Our extraordinary transflective film technology enhances visibility for Marine outdoor or bright ambience environment. (Outdoor readability please take reference to **Appendix E**)

Anti-corrosion IP Proof (Optional)

The Marine displays design with panel (flush) mount IP65 aluminum housing with powder coating design (IP54 rear) achieve the anti-corrosion proof in harsh conditions.

Wide Voltage Input Range Power Input

For marine and transportation power source characteristic, our displays use wide voltage range from 8 to 36V input acceptable. AC power input is also optional for several models from 12 inch to 23.1 inch.

For 12.1 inch to 23.1 inch display, the AC power source is also available for option.

Touchscreen / Anti-reflection Protection Glass

We develop highly compatible mechanical design for each type. Customers can choose high quality SAW touchscreen, 5 wire resistive touchscreen, or even anti-reflection protection glass for option.

Multi-scan Function

The display can accept multi-video inputs as DVI, VGA, S-Video or Composite for example. From 10.4 inch to 23.1 inch displays, our outstanding scaling board design also support PIP (picture in picture) function for special marine applications.

IP65 OSD Front Panel Design

With IP65 water-dust front bezel proof, the Marine Bridge System Displays use easy to use front panel OSD control. It's very convenience and intelligent design for all maritime users.

Anti-Shock and Vibration

Enhanced shock and vibration resistance.

Customize your marine products

Base on our well-experience modulized competence, we can do very flexible and tailor-made design fulfilling any of customer's solution. For different panel characteristics, mechanical design, and electronic component, we can make it for you.

Approved Marine Displays

ITechLCD Marine Bridge System Display design are all followed **IEC-60945 Maritime Navigation and Radio-communication Equipment and Systems requirements.**

The Marine Bridge System Display series consists wide range sizes from 8.4 inches to 23.1 inches. By testing for usability in a ship's wheelhouse during different ambient light conditions. All these models can fulfill most of the demands in maritime applications especially for navigation, ship automation and maritime surveillance.

About this Manual

The users' manual introduce basic information about the product, electrical, mechanical and input / output signal specifications. All specification are subject to change without prior notice due to manufacturing reasons. Check in the "Revision History" in front page of this manual for any update reference.-

1.2 Basic Construction of Marine Bridge System Display

The state of the art modulized technology can integrate all marine display components flexibly.

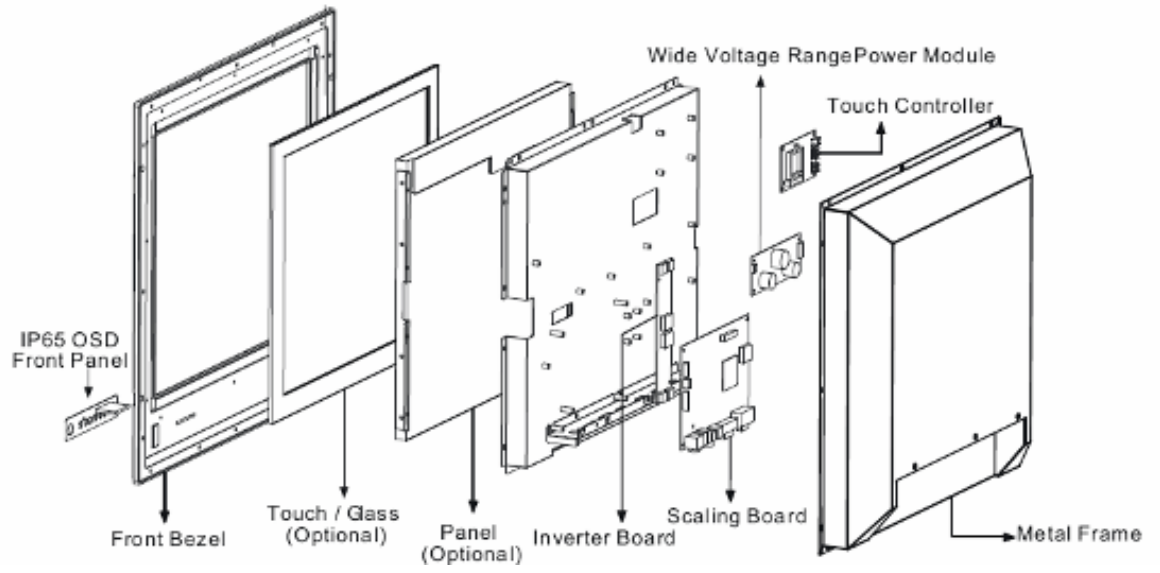


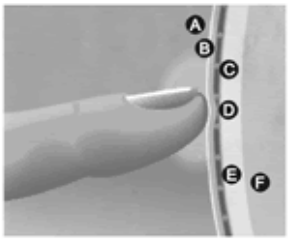
Figure 1.1 Basic Construction

1.3 Touch Screen Solution (Optional)

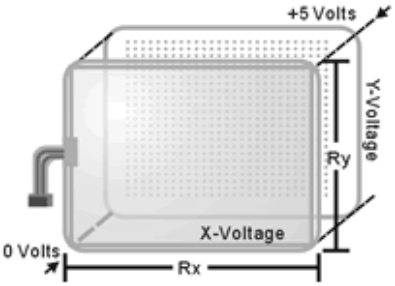
1.3.1 Five-Wire Resistive Touch screen (Optional 1)

Introduction to Five-Wire Resistive Touch screen

The five-wire resistive touchscreens use a glass panel with a uniform resistive coating. A thick polyester coversheet is tightly suspended over the top of the glass, separated by small, transparent insulating dots. The coversheet has a hard, durable coating on the outer side and a conductive coating on the inner side.



A Durable hard coat
B Cover sheet
C Separator dot
D Resistive coating
E Glass panel
F CRT



When the screen is touched, the conductive coating makes electrical contact with the coating on the glass. The voltages produced are the analog representation of the position touched. The controller digitizes these voltages and transmits them to the computer for processing. The five-wire technology utilizes the bottom substrate for both X and Y-axis measurements. The flexible coversheet acts only as a voltage-measuring probe. This means the touchscreen will continue working properly even with non-uniformity in the cover sheet's conductive coating. The result is an accurate, durable and reliable touchscreen that offers drift free operation. The touchscreens are sealed against contamination and moisture. The coversheet is sealed to the glass substrate with an industrial grade caulk. This prevents wicking of fluid between the coversheet and glass. Also, the touchscreens are not air vented, thereby preventing fluid ingress through an air vent.

Brief Specifications

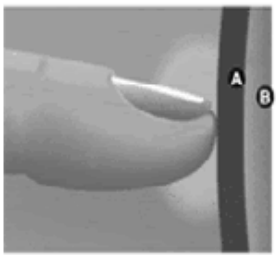
Subject	Details
Input Method	Finger, gloved hand, or stylus activation
Positional Accuracy	Standard deviation error is less than 0.080 (2 mm)
Resolution	Touchpoint density is based on controller resolution of 4096 x 4096
Touch Activation Force	Typically less than 4 ounces (113 grams)
Light Transmission	HL products: 80% +/–5% at 550 nm wavelength Enhanced products: 60% +/–5% at 550 nm wavelength

Update touchscreen driver or new information. Go to www.elotouch.com

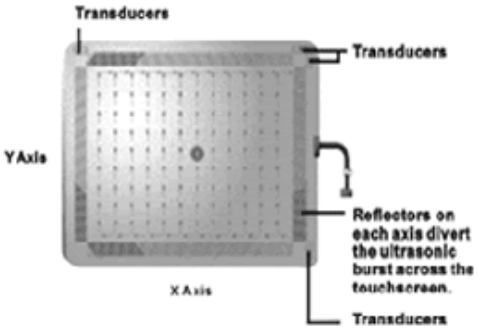
1.3.2 SecureTouch Surface Wave Touch screen (Optional 2)

Introduction to SAW Touch screen

The surface wave is the optical standard of touch. Its pure glass construction provides superior optical performance and makes it the most scratch-resistant technology available. It's nearly impossible to physically "wear out" this touchscreen.



A Glass touchscreen
B CRT



The touch have a glass overlay with transmitting and receiving piezoelectric transducers for both the X and Y axes. The touchscreen controller sends a five-megahertz electrical signal to the transmitting transducer, which converts the signal into ultrasonic waves within the glass. These waves are directed across the front surface of the touchscreen by an array of reflectors. Reflectors on the opposite side gather and direct the waves to the receiving transducer, which reconverts them into an electrical signal—a digital map of the touchscreen surface.

When you touch the screen, you absorb a portion of the wave traveling across it. The received signal is then compared to the stored digital map, the change recognized, and a coordinate calculated. This process happens independently for both the X and Y axes. By measuring the amount of the signal that is absorbed, a Z-axis is also determined. The digitized coordinates are transmitted to the computer for processing.

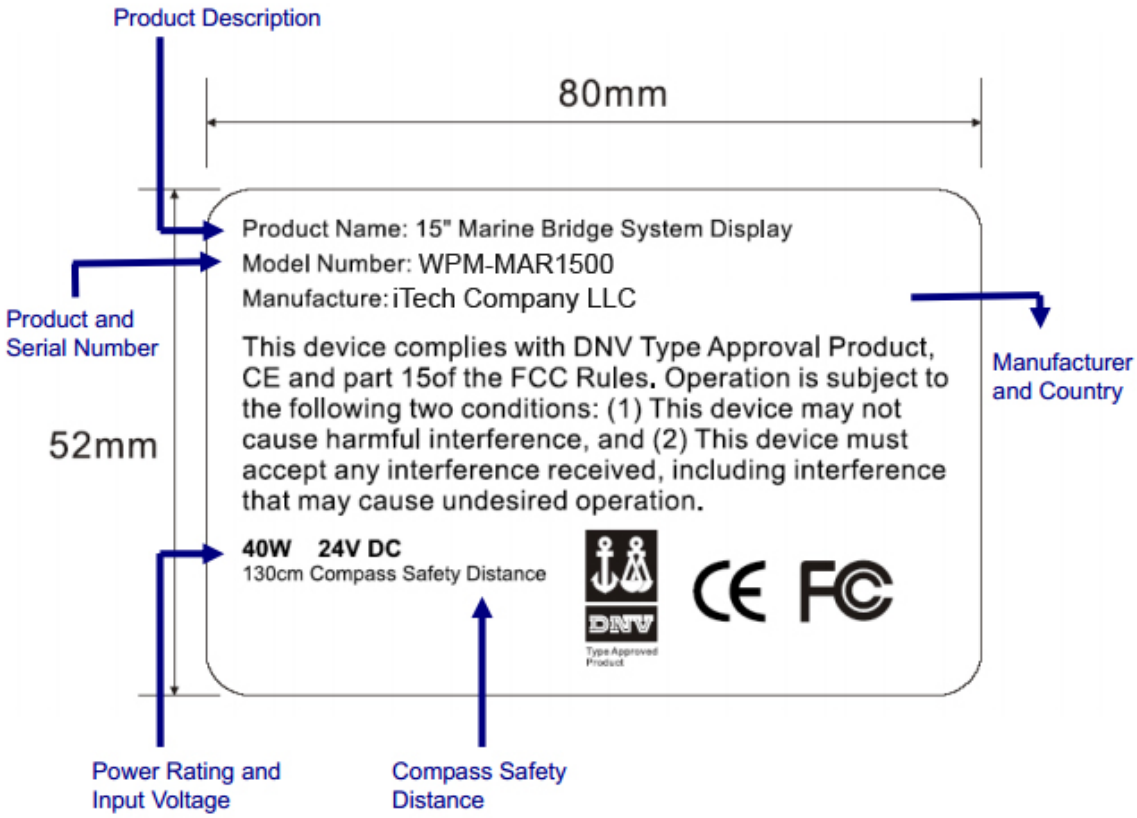
Brief Specifications

Subject	Details
Input Method	Finger or gloved hand (cloth, leather, or rubber) activation
Positional Accuracy	Standard deviation of error is less than 0.080 in. (2 mm)
Resolution	Touchpoint density is based on controller resolution of 4096 x 4096, plus 255 levels corresponding to touch pressure
Touch Activation Force	Typically 2 to 3 ounces (55 to 85 grams)
Light Transmission	Up to 90% per ASTM D1003-92

Update touchscreen driver or new information. Go to www.elotouch.com

1.4 Certificate Serial Number Label

The certificate label and serial number for Marine products are described as below.



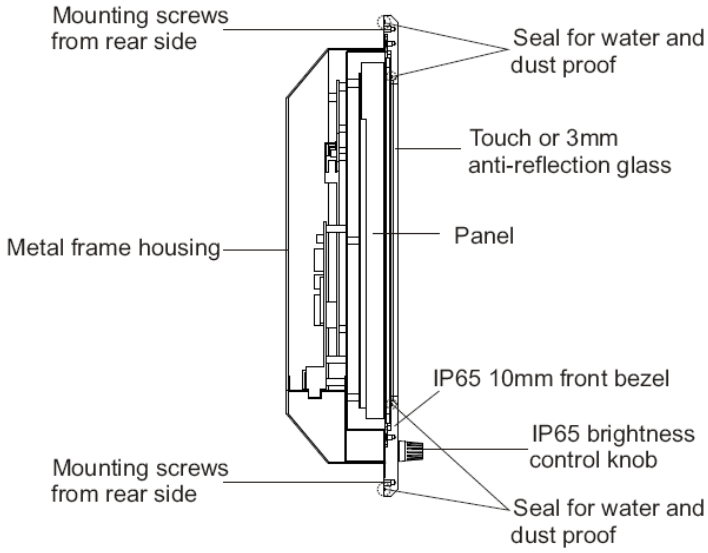
CHAPTER 2
Installation

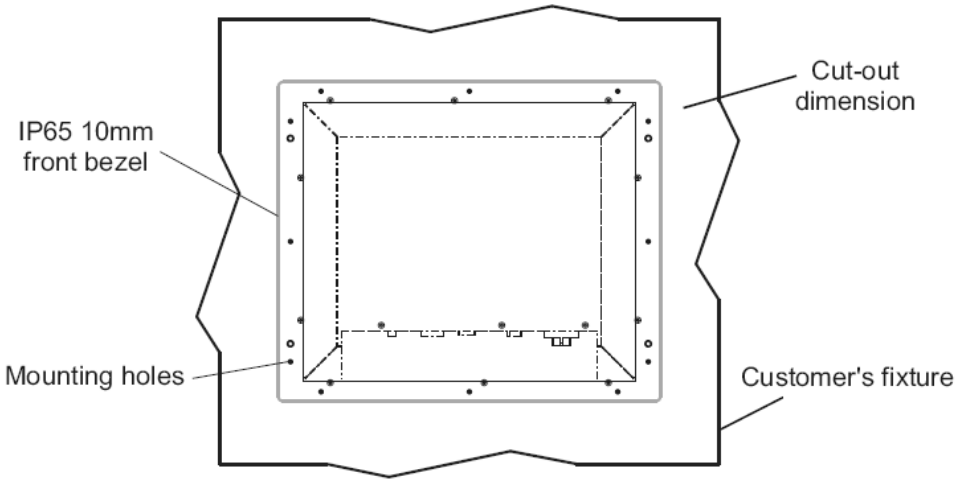
Chapter 2 Installation

2.1 General installation

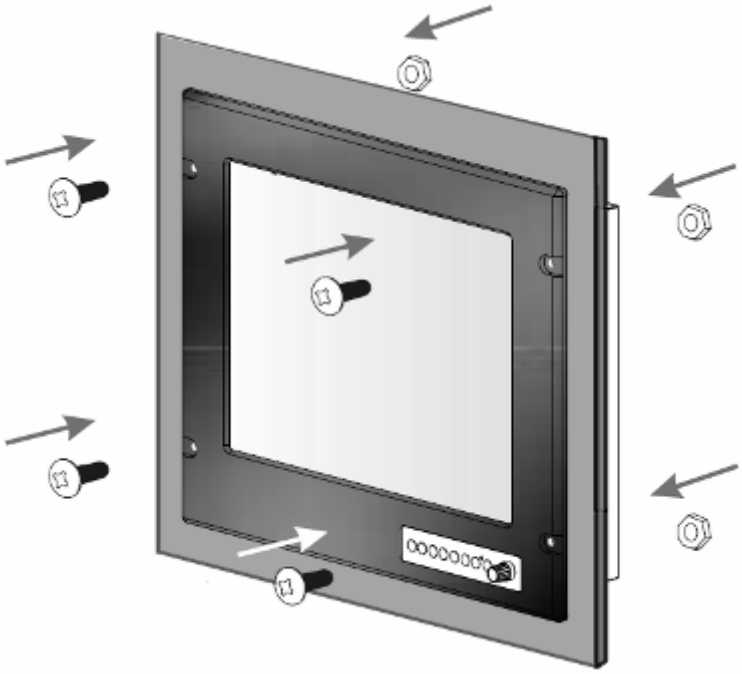
The Marine Bridge System Display can be applied for several different installation methods. Including panel (flush) mounting, bracket mounting, ceiling / wall mounting…etc. For panel (flush) mounting is normally for a ship's wheelhouse use, it's easy to follow few steps to fix the display product in customer's fixture.

Check the mechanical and mounting concept as below first. The fixture cut-out dimension and mounting holes based on drawing.

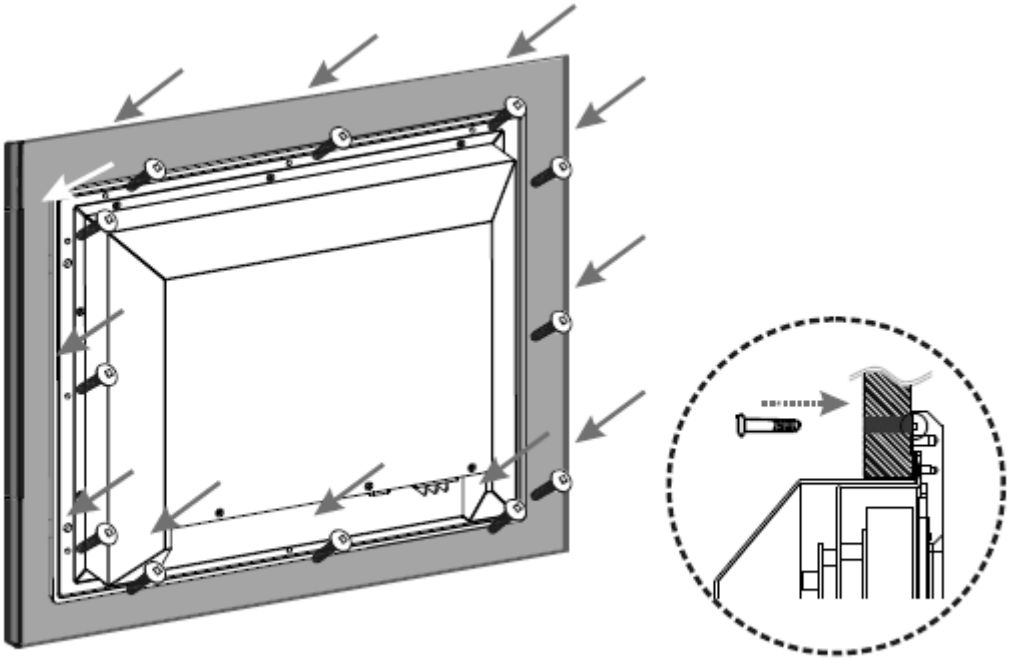




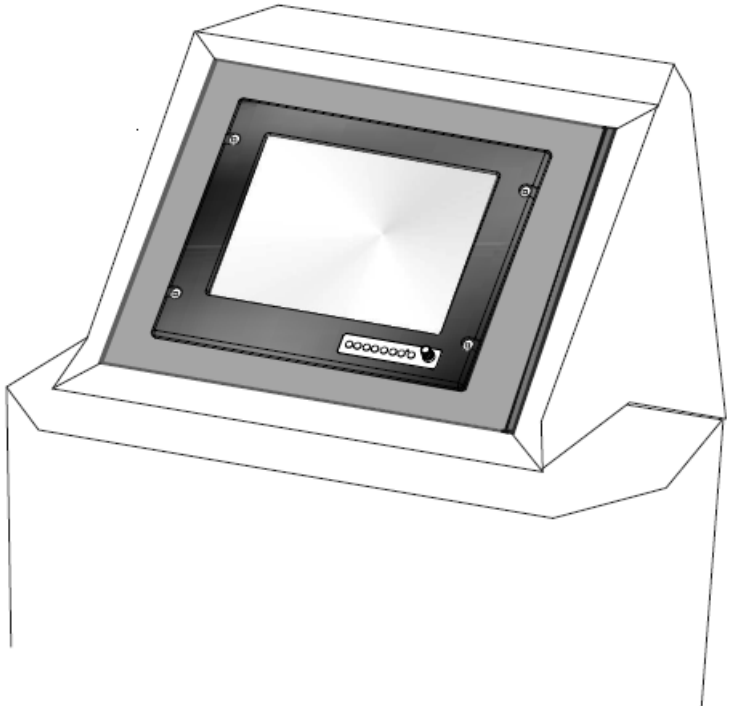
Step1. Put the marine product on the fixture (console) from the front, and screw by four M6 x 30 mm black bolts with nuts.



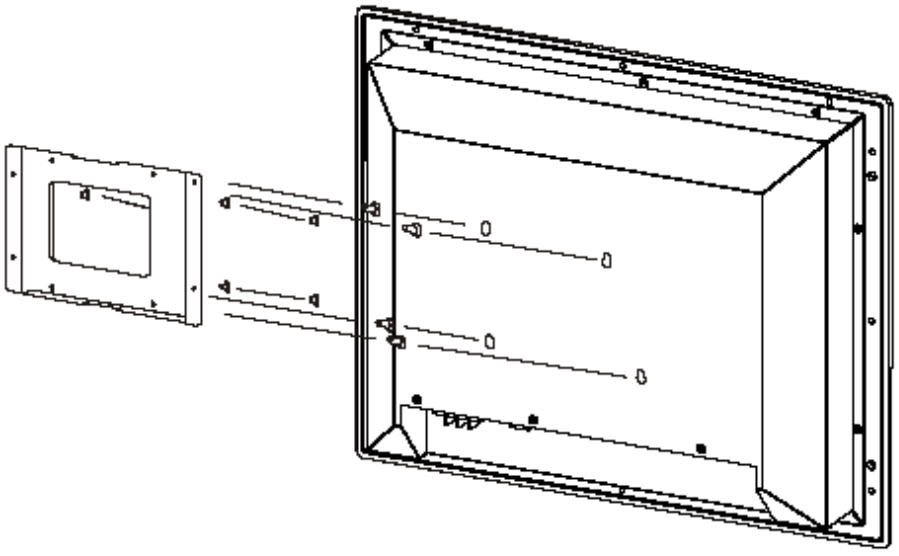
Step2. Use M4x 15mm bolts to drill through the fixture into the mounting holes on the rear side of IP65 front bezel.(The quantity of mounting screws based on drawing)



Step3. Check the finished mounting concept. (DNV certification approved)



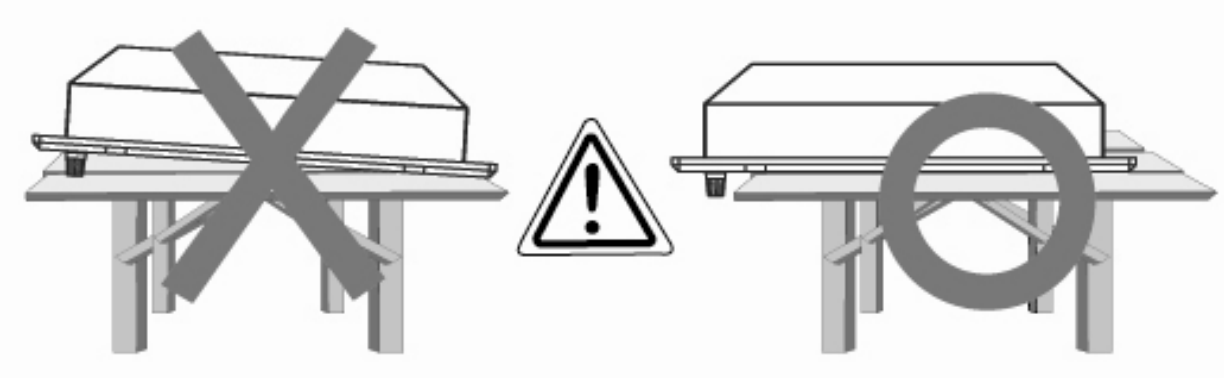
** Please Note: VESA and wall mount with mounting kit by special request.



2.2 Installation Notice

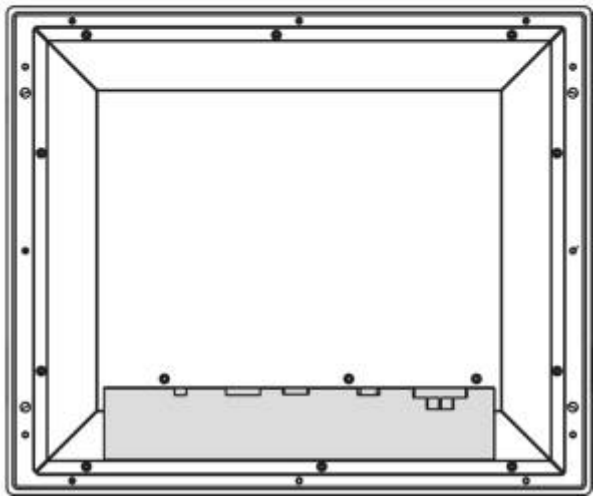
2.2.1 Brightness Control Knob Precaution

The dimming brightness control knob may be damaged by wrong placement. Please make sure the right way to protect the knob.



2.2.2 Cable Connection Precaution

Make sure to use qualified shielded signal cable to connect to Marine products. These cables including RGB, DVI, RS232, LAN, and USB cable should be connected inside the area as marked below. For DC power connection, please make sure the power cable is tightly connected by two screws of the terminal block.



CHAPTER 3
Operation the LCD Display

Chapter 3 Operation of the LCD Display

3.1 Input / Output Signals Overview

The Marine Bridge System Display design with versatile video input / output functions. The default signal for 10.4 inch to 23.1 inch displays can use VGA, DVI, S-Video and Composite. These displays can also support PIP (picture in picture) multi-scan function fulfilling the maritime multi-function demand. (For 8.4 inch, the default signal functions are VGA, S-Video and Composite)

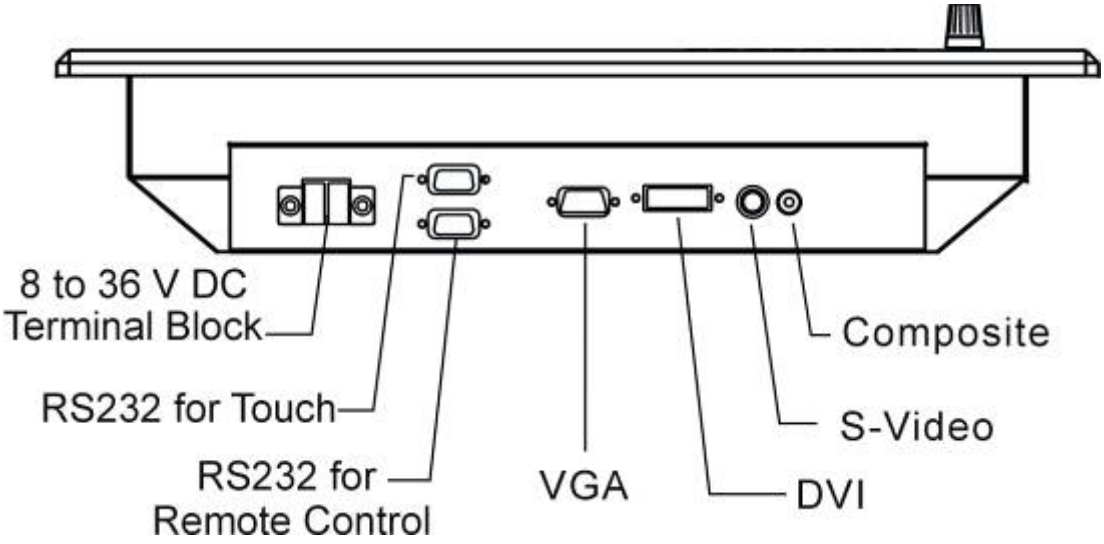


Figure 3.1 Input / Output Signals

**Please Note: Some connectors are optional depends on the product model.

Power input (DC Version / AC Version)
Default DC terminal block power source input compact design meets the maritime application. The terminal block is to be secured that the cable to screw terminal.

AC Std 90V to 265V power input is also available for AC version option, use standard power cord to connect to the AC power inlet.

RS232 serial port for touch and remote control connection
Connect Standard D-SUB 9pin connector from your system to connect to the monitor to control the touchscreen. Be make sure the appropriate touch driver is installed.

The other function for remote control should be depends on your own application software to build-in RS232 command code. The function makes it easy to control the LCD monitor in your own PC via RS232 port connection.

VGA port connection
Use D-SUB 15-pin (Male) VGA signal cable to the VGA connector in the rear of PC system, and plug the other end to the TFT LCD display. Fasten cable connectors with screws.

DVI port connection
Plug the 24pin (Male) DVI signal cable to the DVI connector in the rear of the PC system, and plug the other end to the TFT LCD display. Fasten cable connectors with screws.

S-Video connection
Plug standard S-Video(SVHS) cable into the mini 4 way din plug. Use PIP (picture in picture) function to switch source when multi video signals are activated and choose from OSD menu.

* Note: The S-Video function must be activate by OSD menu selection.

Composite connection
Connect composite video signal cable into the RCA jack input. Use PIP (picture in picture) function to switch source when multi video signals are activated and choose from OSD menu.

* Note: The Composite function must be activate by OSD menu selection.

3.2 OSD User Controls

The compact OSD in front control is a user-friendly interface both to remote the display function and dimming VR knob. The on screen display (OSD) contains several functions that will let the user to adjust or set up the display to their preferred setting. It also supplies special Hot Keys of clicking two keys together for easy flipping image and auto adjusting color balance

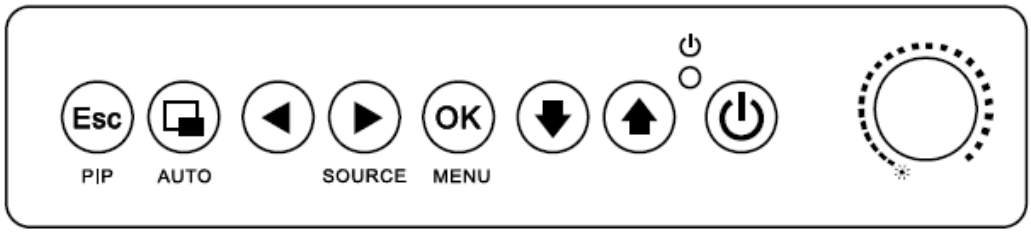


Figure 3.2 OSD User Controls

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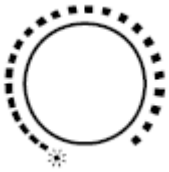
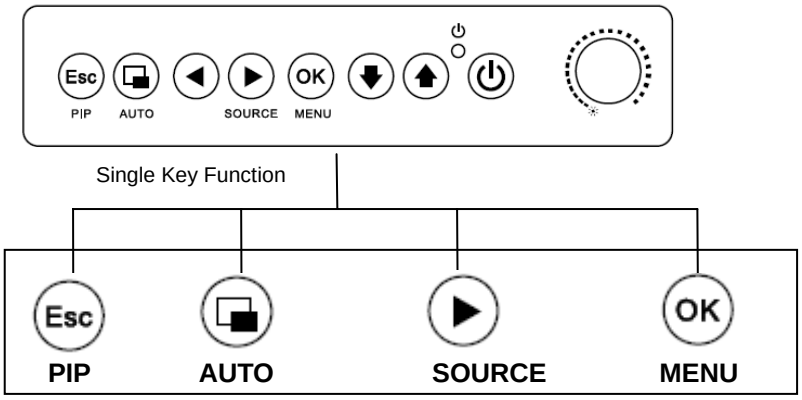


The Dimming Knob
The TFT LCD display support hyper dimming function to adjust brightness from nearly 0% to 100% via a easy to use VR knob.

Power On/ Off
Press the Power On/Off button to switch the TFT LCD display power.

Display Status LED indicator
When the TFT LCD display are normally operated, the LED indicator turns to green light. And the LED turns to red light when the TFT LCD display going to sleep.

Refer to the OSD Single Key Function as below and understand how to use the display functions step by step.



3.3 PIP (Picture in Picture) Function

When OSD **Menu** is disabled, it cycles through the available PIP display modes. Repeated keystrokes will change the size of the PIP display to side-by-side (PAP) display, and then back to normal display.

When OSD Menu is enabled, press“

” returns to the previous menu level or closes the OSD if pressed at the **Menu** level.

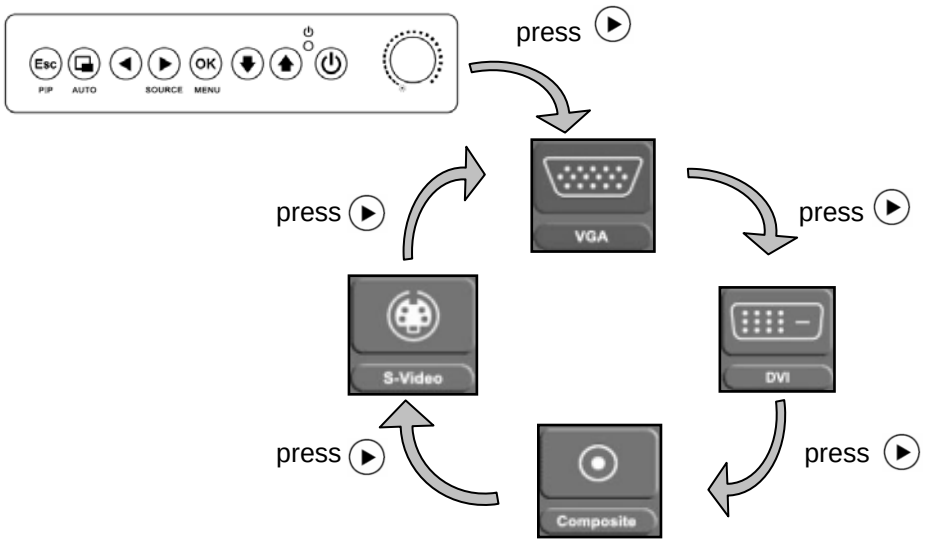
3.4 Auto Adjustment Function

When OSD **Menu** and **PIP** is disabled, press“ ” will perform the screen **Auto Adjustment.**

When **PIP** is enabled, it **switches the image** in the Main Display to the PIP Display and vice versa by pressing again. When image side-by-side (PAP mode) is active, the SWAP key ( ) exchanges the left and right displays.

3.5 Source Function

When OSD **Menu** is disabled, press “ ” will cycle through the available input sources for the Main Display.



When OSD **Menu** is enabled, it moves right when navigating the **Menu** and **Sub Menu** and increments a slider bar.

3.6 OSD Menu Function

After the power on, press" OK " to enter OSD **Menu**.

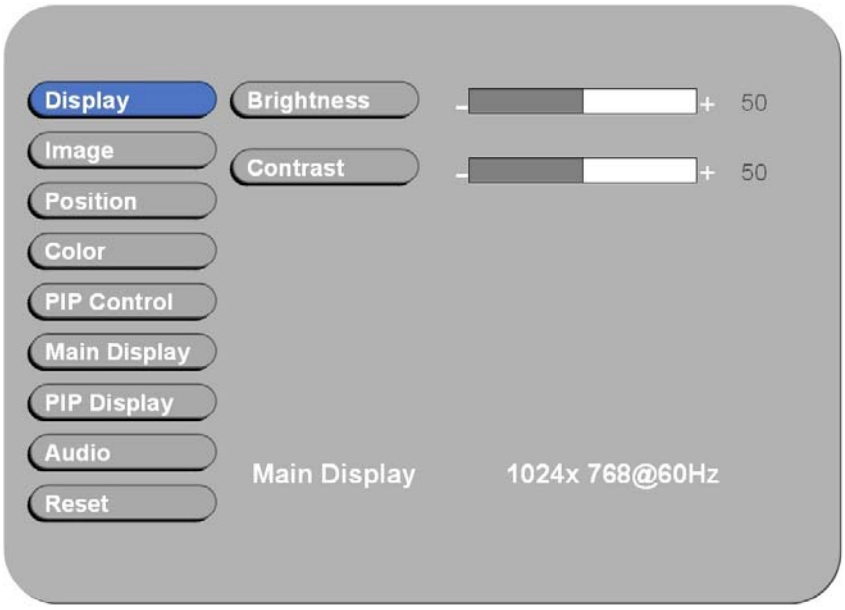


Figure 3.3 OSD Menu

There are 9 functions for in the OSD **Menu** for selection. For each function, it is very easy to select by the other navigation keys to adjust. Following the direction as below:

1. Press " " (Up) and " " (Down) to select each **function.**
2. Press " OK " to enter the sub menu, and press " Esc " to exit.
3. Press " " (Up) and " " (Down) to select the **sub-function.**
4. When enter to each **sub-function**, press " " (Left) and " " (Right) to decrease / increase the bar value.

3.6.1 Display Item Menu

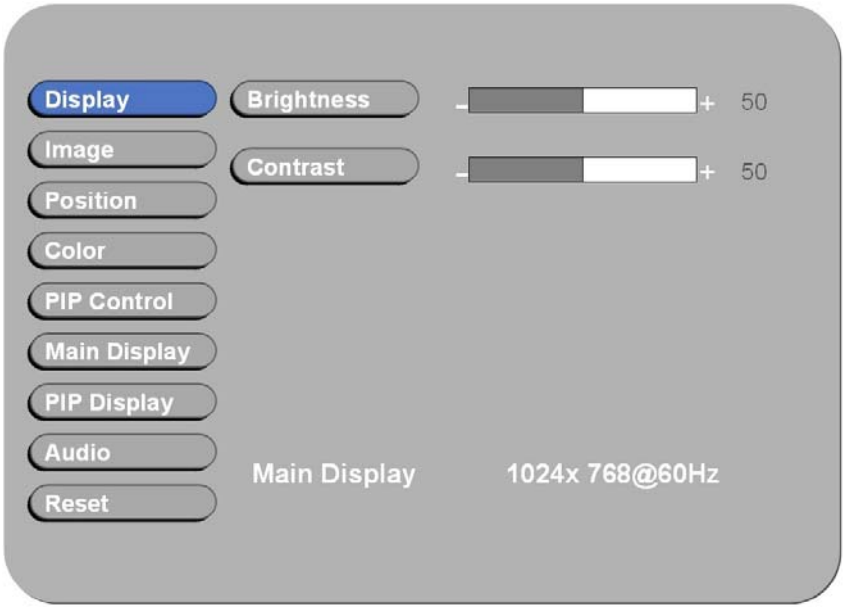


Figure 3.4 Display Item Menu

Display Item Menu		
Menu	**Input Source**	**Description and Usage**
Brightness	VGA DVI Composite S-Video	Adjust brightness only used in brightness knob. Adjustment is no response here.
Contrast		Press "◄" / "►" to adjust contrast.

3.6.2 Image Item Menu

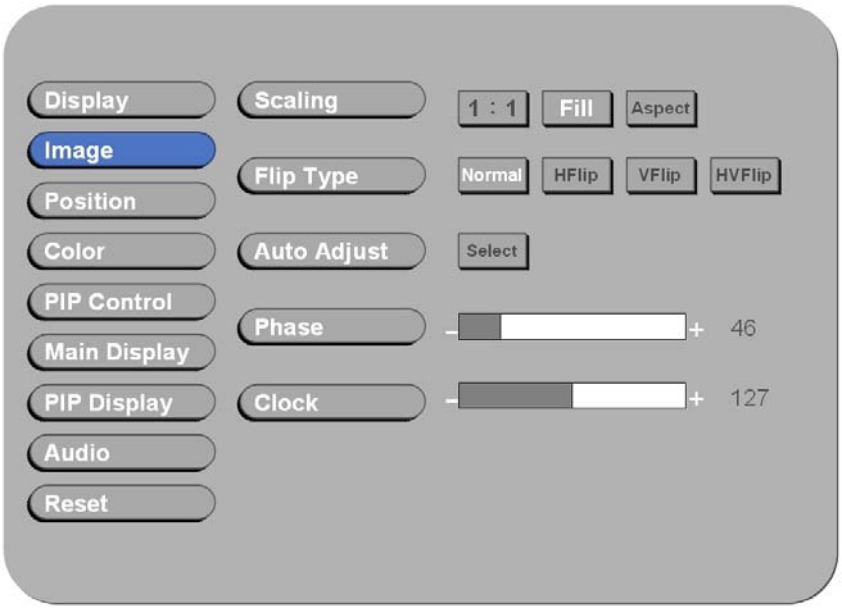


Figure 3.5 Image Item Menu (VGA)

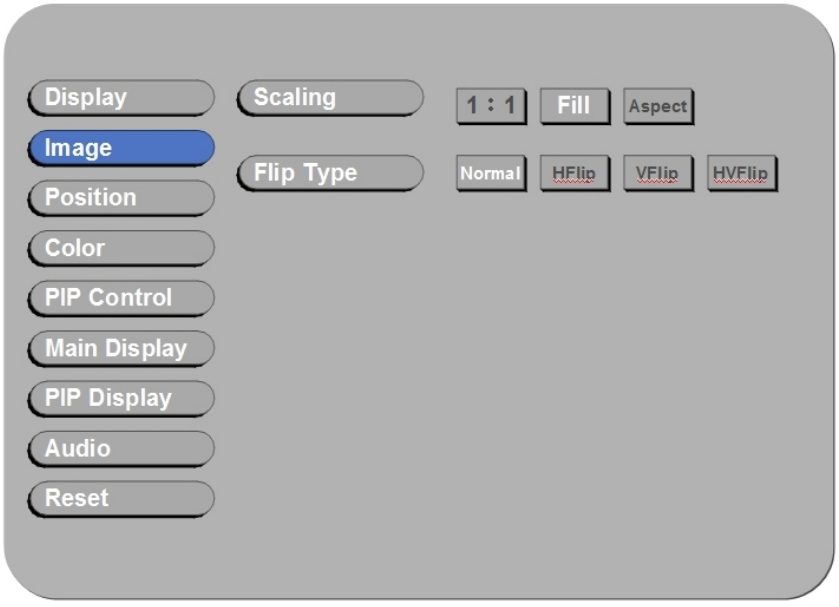


Figure 3.6 Image Item Menu (DVI)

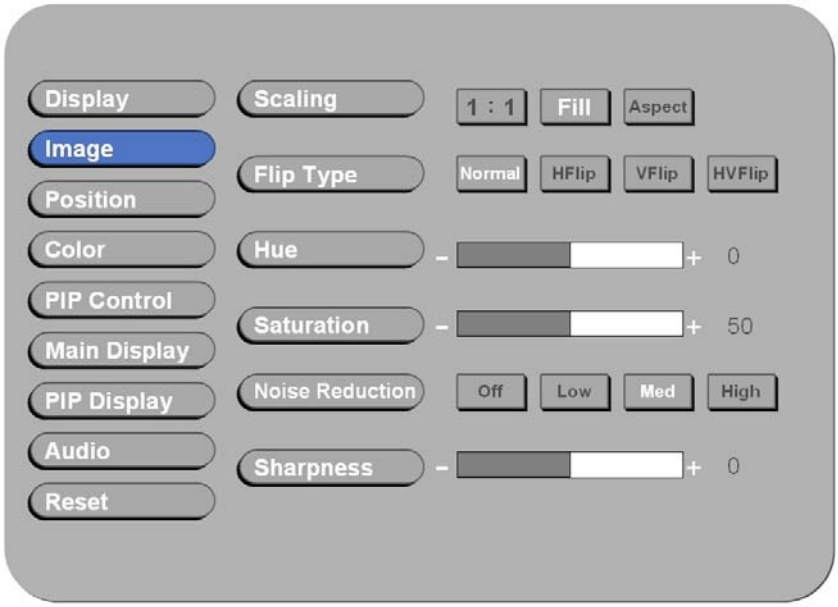


Figure 3.7 Image Item Menu (Composite, S-Video)

Image Item Menu		
Menu	**Input Source**	**Description and Usage**
Scaling**	VGA DVI Composite S-Video	Change the scaling mode by using the"◄" / "►" buttons to select **1:1, Fill or aspect**. Press "OK" to activate the selected Scaling mode.
Flip Type		Using "◄" / "►" and "OK" to select the display flip for **Normal, HFlip, VFlip, or HVFlip** mode.
Auto-Adjust**	VGA Only	Initiate this to have the monitor logic to choose the best settings for the current input signal.
Phase		Adjust **Phase** to optimize the display quality by using "◄" / "►" to change the value.
Clock		Select **Clock** to adjust the horizontal screen size by using "◄" / "►" to change the value.
Hue	Composite and S-Video Only	Press "◄" / "►" to select **Hue** to obtain the desired color settings.
Saturation		Press "◄" / ► "" to select **Saturation** to adjust the optimal color degree level.
Noise Reduction		Using "◄" / "►" and "OK" to select the **Noise Reduction** for **Off, Low, Mid,** and **High** mode.
Sharpness		The **Sharpness** of the image may be optimized by using "◄" / "►" to change the value of the slider bar.

** Please Note in **Scaling**:

1. In **1:1** mode, the input image is centered on the screen. In **Fill** mode, the input image is stretched / compressed to fill the available display area.

2. In **Aspect** mode, the input image is stretched / compressed by the same horizontal and vertical factor.

** Please Note in **Auto-Adjust**:
The only button available is "**SELECT**". Note this may change the values of Phase and Clock, and there is no 'undo' feature.

3.6.3 Position Item Menu

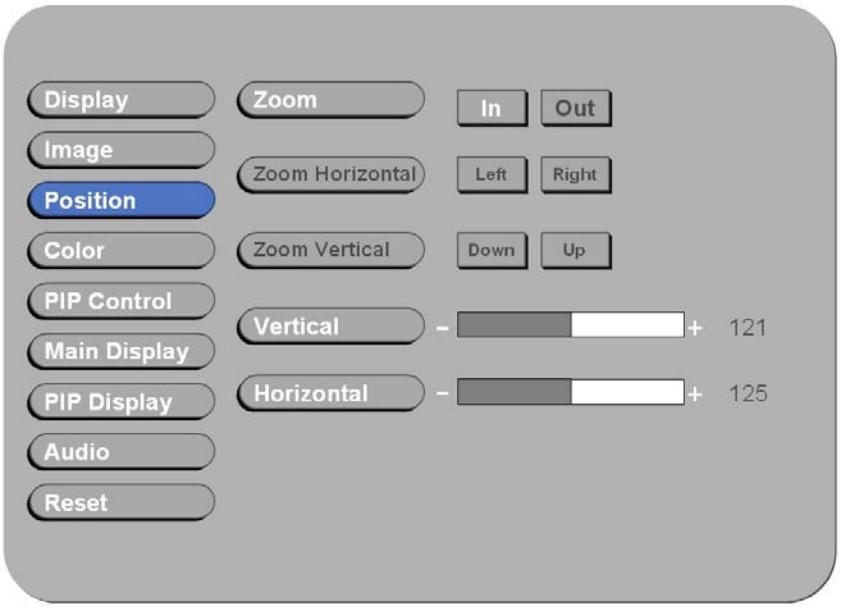


Figure 3.8 Position Item Menu (VGA)

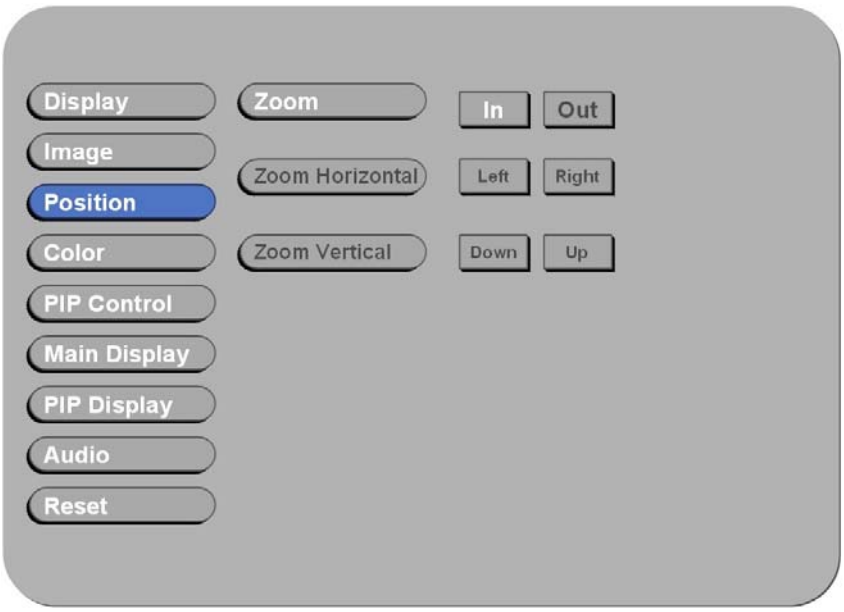


Figure 3.9 Position Item Menu (DVI, Composite, S-Video)

Position Item Menu		
Menu	**Input Source**	**Description and Usage**
Zoom	VGA DVI Composite S-Video	Change the current Zoom setting only to the Main Display, using "◄" / "►" to select either **In** or **Out**. Zoom is at a temporary setting and will be lost at power down.
Zoom Horizontal		**Zoom Horizontal** is unavailable until the user performs a **Zoom In** action. Using "◄" / "►" to select either Left or Right to change the current Horizontal Pan setting. Pan settings will be lost at power down.
Zoom Vertical		**Zoom Vertical** is unavailable until the user performs a Zoom In action. Using "◄" / "►" to select either Up or Down to change the current Vertical Pan setting and. Pan settings will be lost at power down.
Vertical	VGA	Move the screen up or down by using "◄" / "►" to change the vertical position value.
Horizontal		Move the screen left or right by using "◄" / "►" to change the horizontal position value.

3.6.4 Color Item Menu

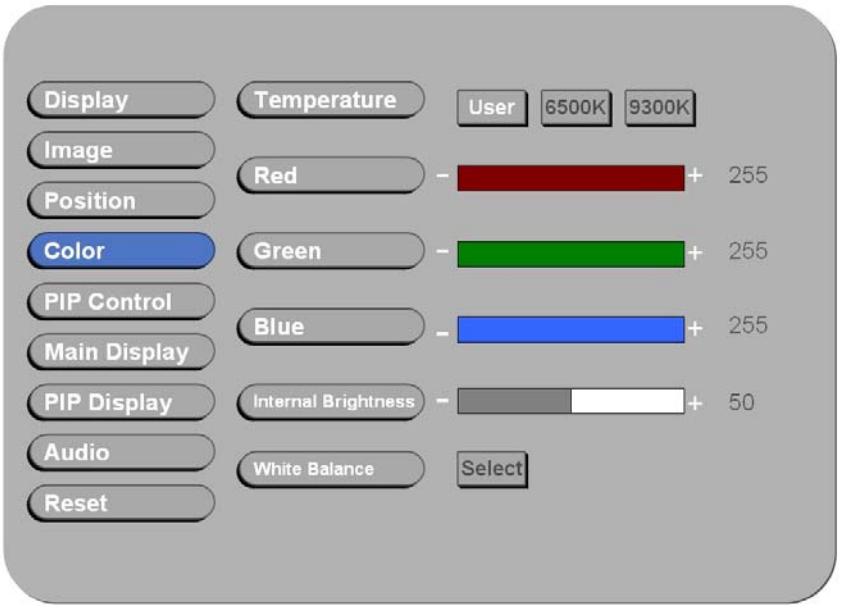


Figure 3.10 Color Item Menu (VGA)

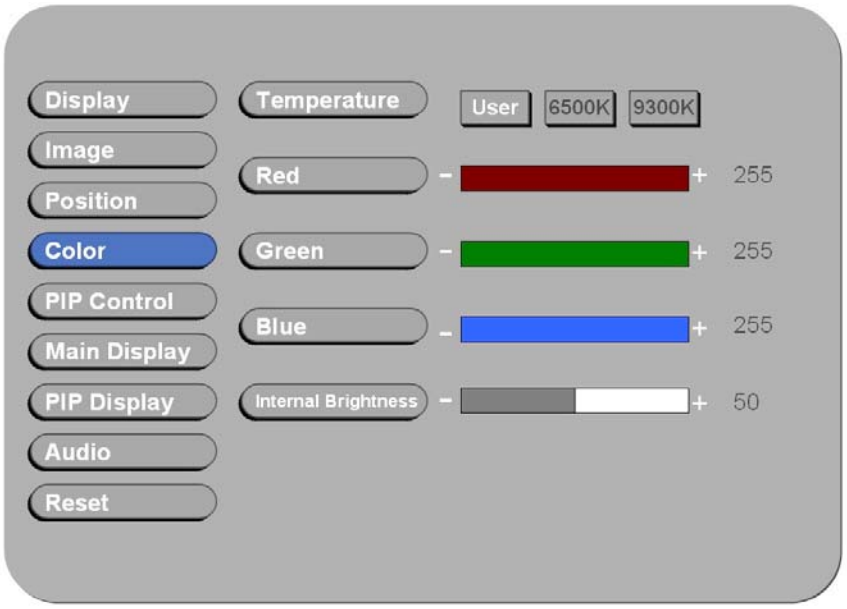


Figure 3.11 Color Item Menu (DVI, Composite, S-Video)

Color Item Menu		
Menu	**Input Source**	**Description and Usage**
Temperature	VGA DVI Composite S-Video	To configure color temperature, use "◄" / "►" to change the value to **User Preset, 6500K,** or **9300 K** to set a color temperature to suit your own preference. When User Preset is selected, the values of the Red, Green, and Blue sliders below are used to determine color settings.
R		Press "◄" / "►" to adjust the **Red** color to obtain the desired color settings.
G		Press "◄" / "►" to adjust the **Green** color to obtain the desired color settings.
B		Press "◄" / "►" to adjust the **Blue** color to obtain the desired color settings.
Internal Brightness		Press "◄" / "►" to adjust the **Red** color to obtain the desired color settings.
White Balance	VGA Only	When in "VGA" mode, press "Select" to adjust **White Balance** for the display setting.

3.6.5 PIP Control Item Menu

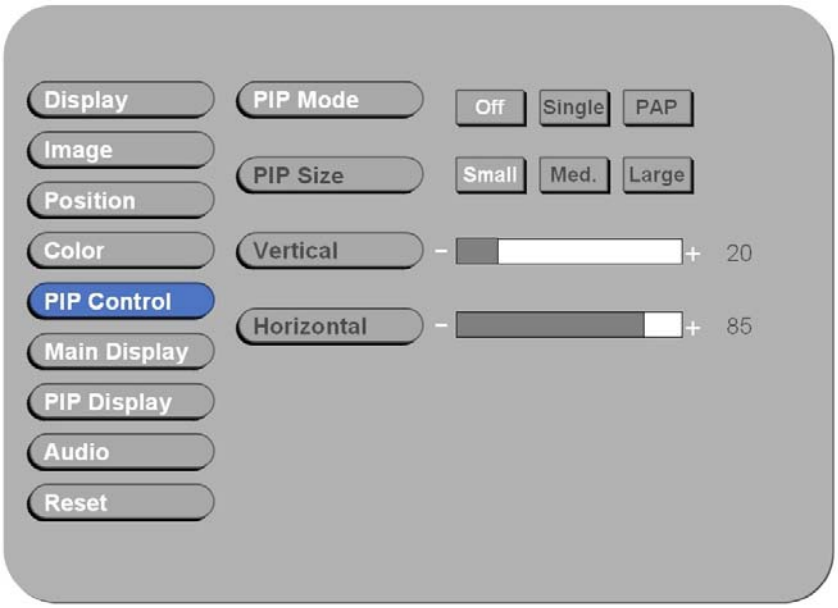


Figure 3.12 PIP Control Item Menu

PIP Control Item Menu		
Menu	**Input Source**	**Description and Usage**
Mode	VGA DVI Composite S-Video	Use "◄" / "►" to change the Mode value to be **Off, Single,** or **PAP****. In **Off** mode, the Main display fills the entire screen. In **Single** mode, a PIP display floats over the screen. In **PAP** mode, the screen is divided into two side-by-side display areas.
Size		PIP Size can be altered only when **Single PIP** mode is selected. To configure the PIP display size, use "◄" / "►" to change the value to **Small, Medium** or **Large**.
Vertical**		Both vertical and horizontal PIP position can be altered only when Single PIP mode is selected. Configure the PIP Vertical and Horizontal Position, by using "◄" / "►" to change the value using the slider bar.
Horizontal		

** Please Note in **PAP** mode:
When selecting "**PAP**" mode, the display area is now divided into two parts. The left window displays the Main output, while the right window displays the PIP output. Each window is half size of the total display area. Each input is scaled down to fit the window.

** Please Note in **PIP** mode:
Note that the PIP screen can have any position on the screen. This can be achieved by adjusting both Horizontal and Vertical positions.

3.6.6 Main Display Item Menu

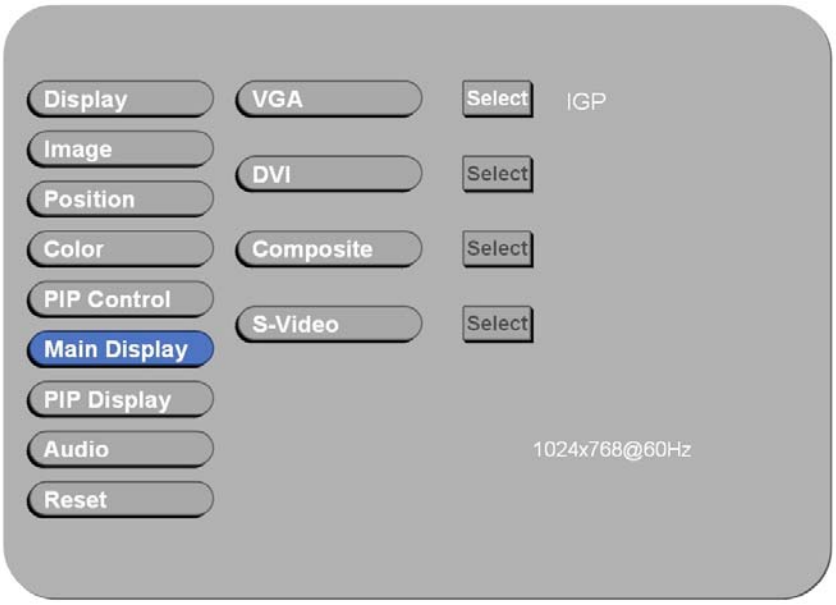


Figure 3.13 Main Display Item Menu

Press “ ” and “ ” to select the **Main Display** main source, including V**GA, DVI, Composite,** and **S-Video** mode.

Press “ ” to choose “**Select**”.

3.6.7 PIP Display Item Menu

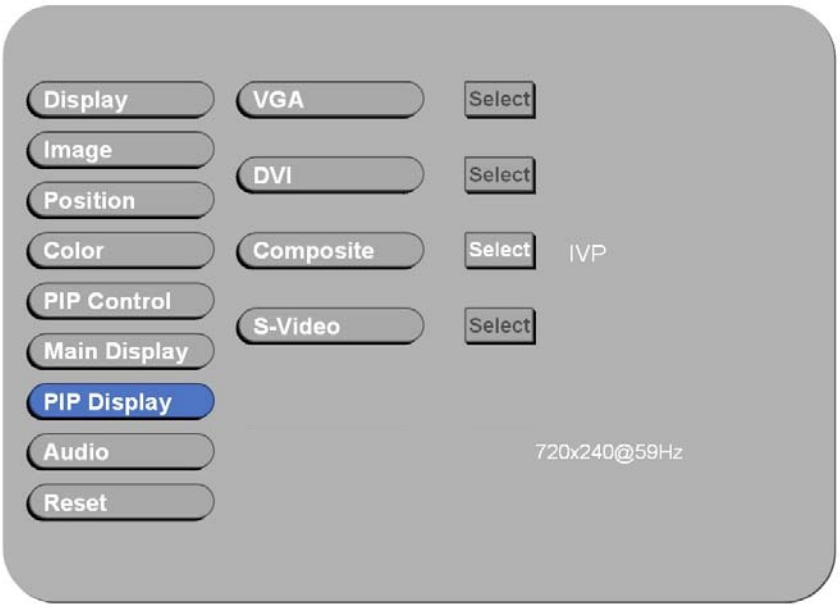


Figure 3.14 PIP Display Item Menu

Press “ ” and “ ” to select the **PIP Display** main source, including V**GA, DVI, Composite,** and **S-Video** mode.

Press “ ” to choose “**Select**”.

3.6.8 Audio Item Menu (Optional)

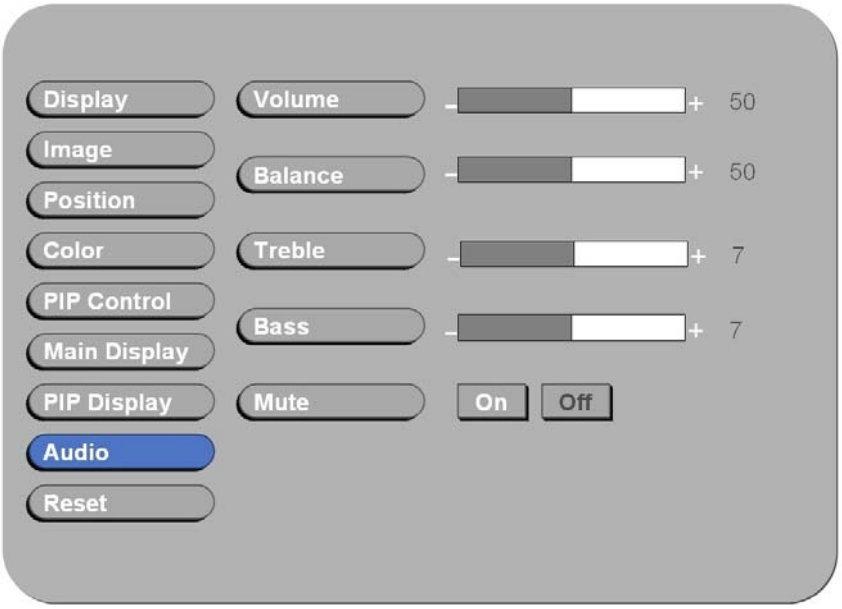


Figure 3.15 Audio Item Menu

Audio Item Menu		
Menu	**Input Source**	**Description and Usage**
Volume	VGA DVI Composite S-Video	To adjust the volume, use "◄" / "►" to change the value of the slider bar to increase or decrease the volume.
Balance		To configure the audio balance, either left or right, use "◄" / "►" to change the value of the slider bar to change the value.
Treble		Increase or decrease the audio treble by using "◄" / "►" to change the value.
Bass		To configure the bass, use "◄" / "►" to change the bass value.
Mute		To turn mute off/on, select either On/Off for Mute. By default, mute is set to No, or turned off.

3.6.9 Reset Menu

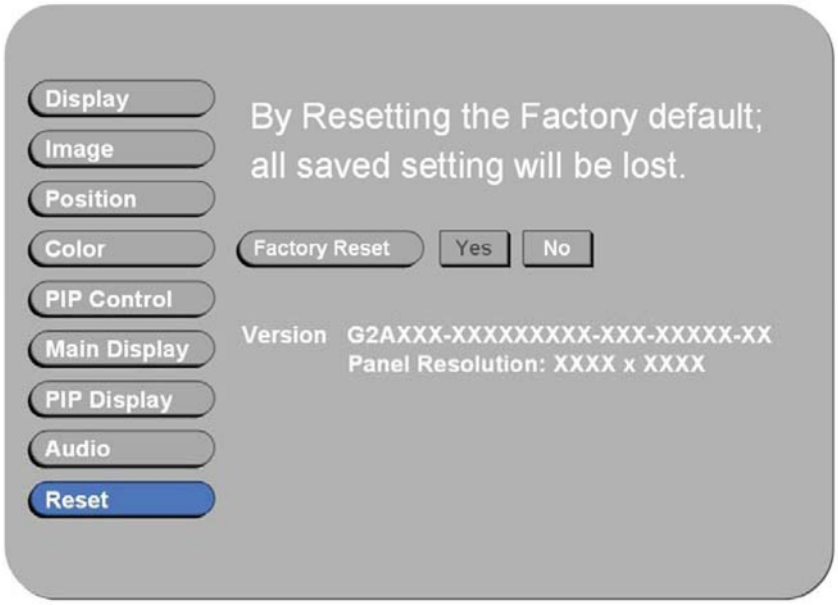


Figure 3.16 Reset Item Menu

Factory Reset Item Menu		
Menu	**Input Source**	**Description and Usage**
Factory Reset	VGA DVI Composite S-Video	To reset all settings to factory defaults, open the **Factory Reset** Item. Use "◄" / "►" to select the "**Yes**" option, and press "OK". WARNING: All user adjustments will be lost. Press "**EXIT**" (Esc) to return to the Main Menu without making changes.

3.7 Simply trouble shooting guide

What if the display has no power after you push the power button?

- First of all, make sure your power resource is work and your power cord is securely connected into the plug-in. Second, if you have the power switch button, please check the switch is "open". After you check all of your power connection and switch, please push the power button again to use your product.

What if the OSD (on screen display) controls is inaccessible?

- To unlock the OSD controls when the OSD is preset to be locked. **What if there are strange lines on my LCD monitor when I shut down the PC?**
- You can use the auto-adjust function to adjust the horizontal or vertical phase and pixel frequency in order to solve this kind of problem.

What if my LCD monitor screen keeps blinking?

- Please check you're VGA or DVI connector to make sure the connector is connecting well. Furthermore, you may also check your pins of the connector to see if there are any bent or missing pins.

For more information, please go on the website of http://www.iTechLCD.com to ask your question. We will be pleasure to answer your questions.

Appendix

Appendix A: Cleaning the Monitor

1. Make sure the monitor is turned off.

2. Never spray or pour any liquid directly on the screen or case.

3. Wipe the screen with a clean, soft, lint-free cloth. This removes dust and other particles.

4. The display area is highly prone to scratching. Do not use ketone type material (ex. Acetone), Ethyl alcohol, toluene, ethyl acid or Methyl chloride to clear the panel. It may permanently damage the panel and void the warranty.

5. If it is still not clean enough, apply a small amount of non-ammonia, non-alcohol based glass cleaner onto a clean, soft, lint-free cloth, and wipe the screen.

6. Don’t use water or oil directly on the monitor. If droplets are allowed to drop on the monitor permanent staining or discoloration may occur.

Appendix B: Disclaimer and Troubleshooting

Disclaimer

We do not recommend using any ammonia or alcohol-based cleaners on the monitor screen or case. Some chemical cleaners have been reported to damage the screen and/or case of the monitor. Seller will not be liable for damage resulting from the use of any ammonia or alcohol-based cleaner.

Troubleshooting

If your monitor fails to operate correctly, consult the following chart for possible solution before calling for repairs:

Condition	Check Point
The picture does not appear	Check if the signal cable is firmly seated in the socket. Check if the Power is ON at the computer Check if the brightness control is at the appropriate position, not at the minimum.
The screen is not synchronized	Check if the signal cable is firmly seated in the socket. Check if the output level matches the input level of your computer. Make sure the signal timings of the computer system are within the specification of the monitor. If your computer was working with a CRT monitor, you should check the current signal timing and turn off your computer before you connect the VGA Cable to this monitor.
The position of the screen is not in the center	Adjust the H-position, and V-position, or Perform the Auto adjustment.
The screen is too bright (too dark).	Check if the brightness or contrast control is at the appropriate position, not at the Maximum (Minimum).
The screen is shaking or waving	Perform the Auto adjustment.. Moving all objects which emit a magnetic field such as motor or transformer, away from the monitor. Check if the specific voltage is applied. Check if the signal timing of the computer system is within the specification of monitor.

If you are unable to correct the fault by using this chart, stop using your monitor and contact your distributor or dealer for further assistance.

Appendix C: Supported Modes

Graphics

No.	Resolution	Frequency (Hz)	Note
1	640x350	70	IBM
2	640x400	70	IBM
3	640x480	60	VESA
4	640x480	72	VESA
5	640x480	75	VESA
6	720x400	70	IBM
7	800x600	56	VESA
8	800x600	60	VESA
9	800x600	72	VESA
10	800x600	75	VESA
11	1024x768	60	VESA
12	1024x768	70	VESA
13	1024x768	75	VESA
14	1280x768	60	
15	1152x864	75	
16	1280x960	60	VESA
17	1280x1024	60	VESA
18	1280x1024	60	HP
19	1280x1024	70	NCD
20	1280x1024	72	HP
21	1280x1024	75	VESA
22	1600x1200	60	VESA
23	1920x1200	60	VESA
24	1360x768	60	

Video

No.		
1	NTSC / 480I / 525I	720 x 240 x 60I
2	PAL / 576I /625I	720 x 288 x 50I
3	480P	720 x 480 x 60P
4	(HDTV) 720P	1280 x 720 x 50P
5	(HDTV) 720P	1280 x 720 x 60P
6	(HDTV) 1080I	1920 x 1080 x 50I
7	(HDTV) 1080P	1920 x 1080 x 60I

Not all modes will be supported, due to different panel brands

Appendix D: RS-232 Command Code(Optional)

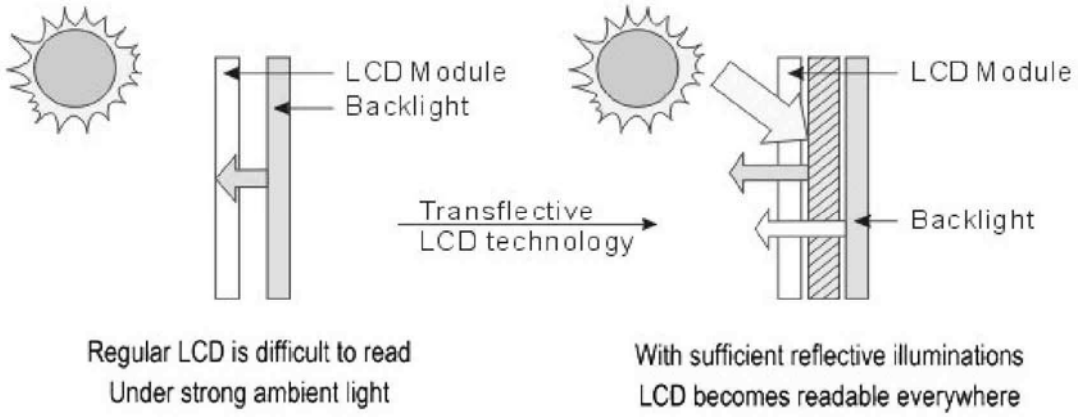
01	DOWN	0x04, 0x12, 0x02, 0xE8, 0x00
02	UP	0x04, 0x12, 0x03, 0xE7, 0x00
03	LEFT	0x04, 0x12, 0x05, 0xE5, 0x00
04	RIGHT	0x04, 0x12, 0x06, 0xE4, 0x00
05	ENTER	0x04, 0x12, 0x07, 0xE3, 0x00
06	EXIT	0x04, 0x12, 0x08, 0xE2, 0x00
07	SWAP	0x04, 0x12, 0x0A, 0xE0, 0x00
08	SOURCE	0x04, 0x12, 0x0E, 0xDC, 0x00
09	POWER	0x04, 0x12, 0x0F, 0xDB, 0x00
10	AUTO ADJUST	0x04, 0x12, 0x11, 0xD9, 0x00
11	ASPECT	0x04, 0x12, 0x14, 0xD6, 0x00
12	MENU	0x04, 0x12, 0x15, 0xD5, 0x00
13	PIP	0x04, 0x12, 0x16, 0xD4, 0x00
14	VolDown	0x04, 0x12, 0x19, 0xD1, 0x00
15	VolUp	0x04, 0x12, 0x1A, 0xD0, 0x00
16	RESET	0x04, 0x12, 0x23, 0xC7, 0x00
17	AUTO COLOR	0x04, 0x12, 0x29, 0xC1, 0x00
18	FLIP	0x04, 0x12, 0x2C, 0xBE, 0x00
19	MUTE	0x04, 0x12, 0x2D, 0xBD, 0x00
20	ACK	0x03, 0x0C, 0xF1

Description: ex. DOWN `0x04, 0x12, 0x02, 0xE8,`
`Function par1, par2, par3, par4`

```
Function: DOWN➔down key
Par1:       0x04➔length (cannot be modified by user)
Par2:       0x12➔inquiry code (cannot be modified by user)
Par3:       0x02➔command code (can be modified by user)
Par4:       0xE8➔check sum (cannot be modified by user)
```

Appendix E: Sunlight Readable (Transflective) Outdoor Readability (Optional)

Transflective LCD technology can be applied to certain selected regular TFT LCD to introduce the LCD with a reflective function. With the imposed reflective function, the modified LCD can reflect the ambient light passing the LCD cell and utilize the reflected light beams as its illumination. The stronger the ambient light is, the brighter the LCD will appear. As a result, the modified LCD is viewable under lighting conditions including direct sunlight.



The following table shows the outdoor readability for the Marine Bridge System Display models.

Outdoor Readability

Model Number	WPM-MAR 0840	WPM-MAR 1040	WPM-MAR 1500	WPM-MAR 1700	WPM-MAR 1900	WPM-MAR 2000
Ambient light(nit)	10,000	10,000	10,000	10,000	10,000	10,000
	30,000	30,000	30,000	30,000	30,000	30,000
	80,000	80,000	80,000	80,000	80,000	80,000
Brightness gain (nit)	432.7	437.5	680	490	500	312.5
	620	670	870	630	630	456
	1,180	1,150	1,320	900	830	680
Reflectance(net)(%)	1.20%	1.20%	1%	0.83%	0.50%	0.70%
	1.15%	1.15%	0.98%	0.70%	0.65%	0.68%
	1.16%	1.10%	0.90%	0.45%	0.40%	0.45%

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