

Dual 10.1" Rack Mount Monitor with Modular Input / Output



User Manual

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IMPORTANT SAFETY INSTRUCTIONS:



The **V-MD1012 Dual Monitor with HDMI I/O and MD Slots** has been tested for conformance to safety regulations and requirements, and has been certified for international use. However, like all electronic equipment, this unit should be used with care. Please read and follow the safety instructions to protect yourself from possible injury and to minimize the risk of damage to the unit.

- Follow all instructions and warnings marked on this unit.
- Do not attempt to service this unit yourself, except where explained in this manual.
- Provide proper ventilation and air circulation and do not use near water.
- Keep objects that might damage the device and assure that the placement of this unit is on a stable surface.
- Use only the power adapter and power cords and connection cables designed for this unit.
- Do not use liquid or aerosol cleaners to clean this unit. Always unplug the power to the device before cleaning.

1. Introduction, Installation and Setup

Introduction

The V-MD1012 is a dual 10.1" rack mount monitor with modular slots and HDMI I/O. This monitor offers a high resolution 1920 x 1200 LED backlit panel. Standard features include markers, 4 user-configurable front panel function buttons, RGB gain and bias control.

Installation

This monitor can be mounted with any standard 19" equipment rack. The attached rack ears can be angled to provide the user control over the viewing angle. Adequate ventilation is required when installed to prevent possible damage to the monitor's internal components.

Package Contents

Carefully unpack the V-MD1012 monitor and verify that the following items are included:

- 1x - V-MD1012 Dual 10.1" Monitor
- 1x – 12V Power Supply

Connections, Power-On and Initial Setup

Plug the power supply into an AC power source (100-240 V @ 50/60 Hz). Attach the power connector to the back of the monitor. Connect the required cables for video signal input and output. (Power must be applied to the V-MD1012 to activate the loop-through output.) The monitor defaults to 'ON' when power is supplied. Video is automatically detected and displayed on the screen.

2. Product Overview & Features

Top and Front Panel Features



1. Power Button

The Power Button will turn the Display ON and OFF. The LED button will dim when the power is ON. The LED is at full power in the OFF state.

2. Input Select Button

Use the Input Select Button to select between the On-Board HDMI Input or the Module Input (when available).

3. User-Definable Function Buttons

Four user-definable function buttons can be used for direct access to various settings. Functions are assigned using the onscreen menu or by highlighting a function and selecting that function button.

4. Menu Navigation Buttons

Use the Menu, ↑, ↓, and Select buttons to display and navigate the on-screen menu. See MAIN MENU AND NAVIGATION for details on using the Menu.

5. Image Adjustment Knobs

Use the Image Adjustment Knobs to adjust image color saturation, brightness and contrast. The status of each adjustment is shown on the bottom left screen, with values ranging from 0 to 100. Pressing a knob once displays the current value. Pressing a knob twice resets the value to the default settings.

6. User Control Knob

The User Control Knob can be customized to control multiple functions. Functions can be changed in the main menu.

7. Stereo Headphone Jack

The 1/8" Headphone Jack can receive two channels of embedded HDMI or SDI Audio and will provide an Audio Signal.

Rear Panel Features



1. Power Connector

Insert the included Power Supply Coax Cable. Optional DC sources supplying the appropriate voltage can be used as well.

2. HDMI Input and Output

The V-MD1012 has 2 HDMI Inputs and 2 Active Loop-Through Outputs. The HDMI Output is HDCP Compliant and will NOT pass through HDCP protected content.

3. Module Slot

Use the Module Slot to install any of the compatible MD Series Modules. This functions as a second video input or output.

4. Upgrade Port

Use for upgrade / debugging purposes ONLY. Please contact Marshall Electronics before attempting to use this port.

Specifications

Model Name	V-MD1012
Description	Dual 10.1” Rack Monitor
Panel	
<ul style="list-style-type: none"> • Screen Size: Dual 10.1” Diagonal • Backlight Feature: WLED • Resolution: 1920x1200 • Contrast Ratio: 800:1 • Luminance: 800 cd/m2 • Contrast Ratio: 800:1 • Display Colors: 16.7M (8-Bit) • Signal Interface: 8-Bit • Viewing Angle: 85/85/85/85 (R/L/U/D) 	
Power Consumption	
<ul style="list-style-type: none"> • Power Input: 12VDC • Wattage: 30W • No Over Voltage Protection • No Reverse Polarity Protection 	
Loop-Through	
<ul style="list-style-type: none"> • Yes 	
Cable Lengths	
<ul style="list-style-type: none"> • SDI 300m/ HD 200m/ 3G 100m 	
Thermal Operating and Storage Temperature	
<ul style="list-style-type: none"> • Operating Temp: 10C – 40C • Storage Temp: 0C – 40C 	
Dimensions	
<ul style="list-style-type: none"> • Vertical Hole Spacing: Pass (3RU) • Horizontal Spacing: Pass (18.31”) • Rack Opening: Pass (17.7”) 	
Tally Pinout	
<p>1 Screen</p> <ul style="list-style-type: none"> • Pin 1 – Green • Pin 2 – Red • Pin 3 – Yellow • Pin 4 – Ground • Pin 5 – No Contact <p>Screen 2</p> <ul style="list-style-type: none"> • Pin 11 – Green • Pin 12 – Red • Pin 13 – Yellow • Pin 14 – Ground 	
Module and Format Compatibility	
<p>MD-3GE (Modular)</p> <ul style="list-style-type: none"> • 480i 59.94Hz • 576i 50Hz • 720p 25Hz • 720p 29.97Hz • 720p 30Hz • 720p 50Hz • 720p 59.94Hz • 720p 60Hz • 1080psf 23.98Hz • 1080psf 24Hz • 1080p 23.98Hz • 1080p 24z • 1080p 29.97Hz • 1080i 50Hz • 1080i 60Hz • 3G – Level A 1080p 50Hz • 3G – Level A 1080p 59.94Hz • 3G – Level A 1080p 60Hz 	

MDO-3G (Modular)

- 720p 50Hz
- 720p 59.94Hz
- 720p 60Hz
- 1080p 23.98Hz
- 1080p 24Hz
- 1080p 25Hz
- 1080p 29.97Hz
- 1080p 30Hz
- 1080i 50Hz
- 1080i 59.94Hz
- 1080i 60Hz
- 3G – Level A 1080p 50Hz
- 3G – Level A 1080p 59.94Hz
- 3G – Level A 1080p 60Hz

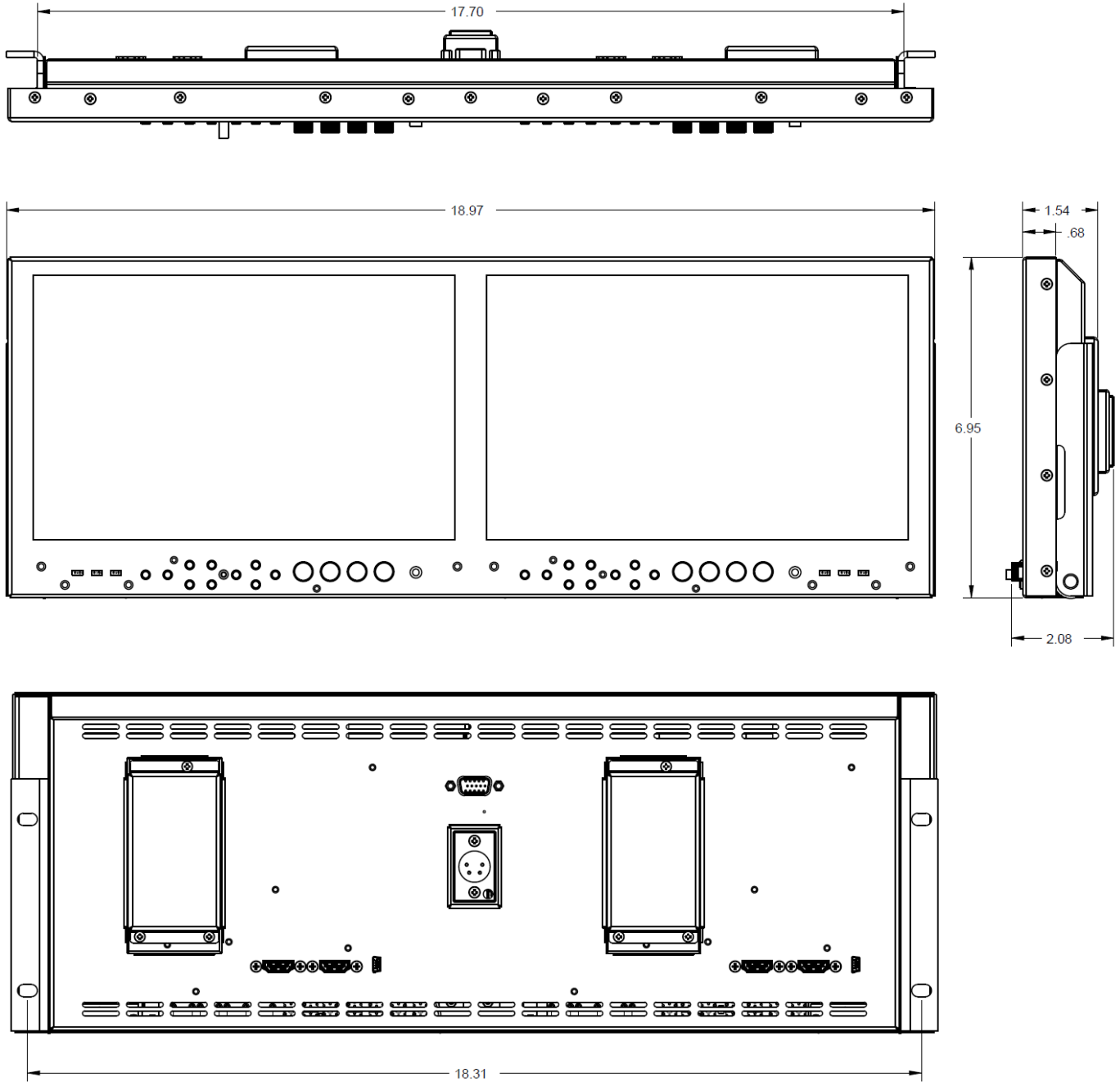
*MDO-3G module output is converted from HDMI input. HDCP protected will not be looped through.

HDMI Input (Board)

- 480p 59.94Hz
- 576p 50Hz
- 720p 25Hz
- 720p 29.97Hz
- 720p 30Hz
- 720p 50Hz
- 720p 59.94Hz
- 720p 60Hz
- 1080psf 23.98Hz
- 1080psf 24Hz
- 1080p 23.98Hz
- 1080p 24Hz
- 1080p 25Hz
- 1080p 29.97Hz
- 1080p 30Hz
- 1080i 50Hz
- 3G – Level A 1080p 50Hz
- 3G – Level A 1080p 59.94Hz
- 3G – Level A 1080p 60Hz

3. Dimensions

Dimensions

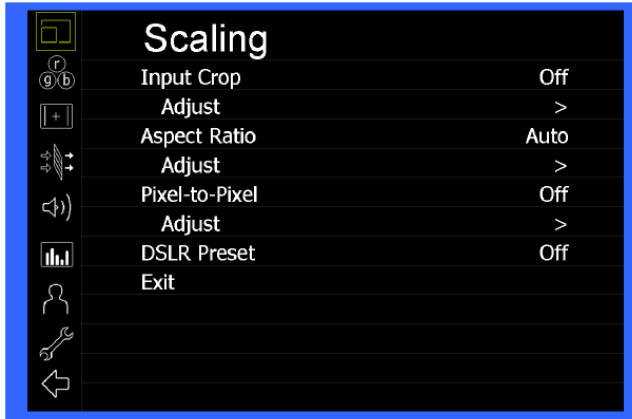


4. Navigation Menu

Main Menu:

Push the 4 Menu Buttons or the Marshall Electronics RotoMenu™ Knob (integrated into the BRIGHT knob) to adjust the function configurations. To change configurations, select a configuration from the main menu by turning the knob and pressing the menu button once to select. Edit configuration by turning knob to change levels, then press menu button again to confirm the changes. Repeat with each selection as needed. By default, the menu automatically times out after 15 seconds of being idle.

4.1 Scaling Configuration Submenu



ITEMS	OPTIONS
Scaling Configuration	
Input Crop	Off, On
Aspect Ratio	Auto, Full Screen, 4:3, 16:9, Custom
Pixel-to-Pixel	Off, On
DSLR Preset	Off, NK 16:9, NK 3:2, CN 16:9

Use the Scaling Submenu to adjust how the video signal is displayed on each screen.

Input Crop

Enable the Input Crop function to select the area of active video that you would like shown on the image display. Select the area by accessing the Adjust Function.

Input Crop Adjust

Use the BRIGHT knob to move the selection box LEFT and RIGHT.
 Use the COLOR knob to move the selection box UP and DOWN.
 Use the CONTRAST knob to move the right border LEFT and RIGHT.
 Use the USER knob to move the bottom border UP and DOWN.



When satisfied with the position, press the SELECT button or press the BRIGHT knob to confirm selection.



The new cropped selection will be displayed on the screen. If Aspect Ratio is set to AUTO, the monitor will select the closest aspect ratio to the dimensions of the customized Input.

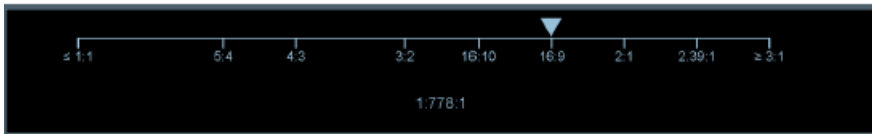
Aspect Ratio

Use this menu option to switch between several aspect ratio settings.

- In 4:3 Mode, images are scaled up or down to fill the maximum 4:3 portion of the screen.
- In 16:9 Mode, images are scaled to fill the entire 16:9 screen.
- In Full Screen, images are scaled to fill the entire screen.
- In Custom Mode, use the adjust function to customize the image scaling.

Aspect Ratio Adjust

Use any of the rotary knobs to select your desired aspect ratio. Standard aspect ratio settings are shown on the Aspect Ratio selection widget. Move along the scale and the current aspect ratio will be displayed below the widget.



Aspect Ratio selection widget



Custom Aspect Ratio selection

Pixel-to-Pixel

Use this setting to enable the Pixel-to-Pixel Mode.

This mode bypasses the monitor's internal scaling function and displays images in their native resolution and aspect ratio, with a one-to-one mapping of incoming image pixels to screen pixels:

- For incoming formats smaller than the native resolution of the screen (or selected aspect ratio), the image will be displayed in the center of the screen using only the necessary LCD pixels. For example, 720p images will display exactly 1280x720 pixels in the center of the screen. The surrounding screen area will be black.

Use the Adjust Function to customize the Pixel to Pixel zone.

Pixel-to-Pixel Adjust



The outer square represents the entire image and the inner grey box represents the current Pixel to Pixel selection. Use the COLOR knob to move selection LEFT and RIGHT. Use the CONTRAST knob to move selection UP or DOWN. Press the SELECT button or the ROTOMENU knob to lock selection.

DSLR Preset

Use the DSLR Preset option to reduce the visibility of on screen indicators shown with popular DSLR cameras. Available options are as follows:

- NK 16:9
- NK 3:2
- CN 16:9
- CN 3:2

4.2 Color Configuration Submenu



ITEMS	OPTIONS
Color Configuration	
Temperature	D55, D65, D93, Custom, Linear
Bias & Gain	Bias: Red 0-100, Green 0-100, Blue 0-100 Gain: Red 0-100, Green 0-100, Blue 0-100
Gamma	1.6, 1.8, 2.0, 2.2, 2.4
Color Space	Auto, YCbCr, RGB

Temperature

Use this setting to choose one of three color temperature presets:

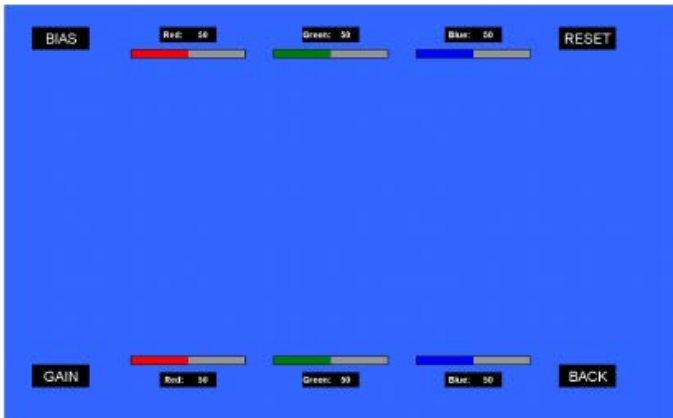
- D55 (5500K)
- D65 (6500K)
- D93 (9300K)
- Custom (Adjustable Color Bias and Gain)
- Linear (No processing is applied to the panel)

Bias & Gain

Select this submenu to fine-tune the monitor's color balance (R,G,B). Only experienced video engineers should modify because this will alter the overall color shading of the screen. Main function is for color matching to other monitors.

Note: The Color Temperature preset will automatically switch to Custom when Color Bias settings are adjusted. It is normal for color bias adjustments to be very subtle.

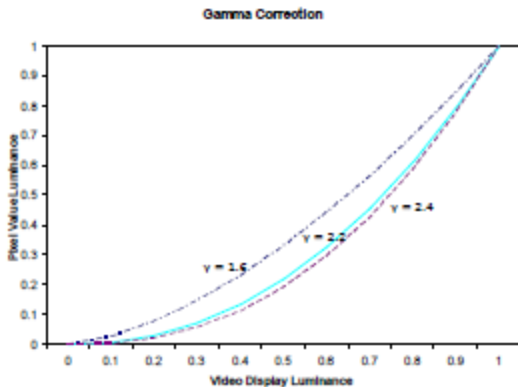
When selecting the RGB Bias and Gain submenu, bias adjustment indicators will appear at the top of the screen, and gain adjustment indicators will appear at the bottom of the screen:



Selecting the BIAS or GAIN icons enables a group change to Red, Green and Blue color components, respectively. Individual colors can be selected for individual color adjustments as well.

Gamma

Use the Gamma setting to adjust the value of the gamma applied to incoming video signals. The default gamma value is 2.2. Gamma correction represents the relationship between the pixel levels from incoming video and the luminance of the monitor. The lowest gamma level available, 1.6, will cause the image to appear brighter. The highest gamma level, 2.4, will cause the image to appear darker. See Gamma Correction Chart below:



Color Space

Use this setting to automatically detect (Auto) or select the color space (RGB or YCrCb) of incoming HDMI video. This should match the color space of the video output settings on the playback device.

4.3 Markers Configuration Submenu



ITEMS	OPTIONS
Markers Configuration	
Enable	Off, On
Center	Off, On
Marker	1, 2
Marker Preset	Off, 4:3, 13:9, 14:9, 16:9, 1.85:1, 2.35:1, 2.39:1, 95% Safe, 93% Safe, 90% Safe, 88% Safe, 85% Safe, 80% Safe, Custom
Marker Customize	Left, Right, Top, Bottom
Marker Line Width	1-10 pixels
Marker Line Color	White (Default), Yellow, Red, Green, Blue
Marker Opacity	0%, 25%, 50%, 75%, 100%

Use the Markers Submenu to select various markers and settings in 4:3, 16:9, or Full Screen mode.

Marker Enable

The Marker Enable displays 16:9 or 4:3 screen markers. By default, this setting is ON.

Center Marker

Use this setting to display a Center Marker on the screen.



Marker Selection

Use this setting to adjust and view the settings of 1 of 2 available markers.

Presets

13 Markers Preset Options have been saved. This setting is disabled when the Pixel-to-Pixel mode is enabled.

- Off (No Marker)
- 4:3 Aspect Ratio
- 13:9 Aspect Ratio
- 14:9 Aspect Ratio
- 16:9 Aspect Ratio
- 1.85:1 Aspect Ratio
- 2.35:1 Aspect Ratio
- 2.39:1 Aspect Ratio
- 95% Safe Area
- 93% Safe Area
- 90% Safe Area
- 88% Safe Area
- 85% Safe Area
- 80% Safe Area
- Custom

Customize

Customize the Screen Markers by using the BRIGHT, COLOR, CONTRAST and USER knobs. These knobs control the LEFT, RIGHT, TOP and BOTTOM edges, respectively.



Both Markers (1 or 2) can be fully customized with this option.

Line Width

Use this setting to choose the Marker Line Width. Options from 1 px (thinnest) to 10 px (widest).

Line Color

Use this setting to select a custom color for the Screen Markers. Options: White (default), Yellow, Red, Green and Blue.

Transparency

Use this setting to select the transparency of the Marker Background. Options: 0% (black), 25%, 50%, 75% and 100% (completely transparent).

4.4 Filter Configuration Submenu



ITEMS	OPTIONS
Filter Configuration	
Check Field	Off, Red, Green, Blue
False Color	Off, On
Peaking	Off, On
Peaking Adjust	Threshold, Color
Clip	Off, On
Clip Adjust	Lower Threshold, Upper Threshold
Clip Invert	Off, On
Clip Monochrome	Off, On

Use the Filters Submenu to enable various Filter modes.

Check Field

Use the Check Field modes for monitor calibration or individual color image analysis. In Monochrome mode, all color is disabled and only a grayscale image is shown. In Blue, Green, and Red check field modes, only the selected color is shown.

Use the following when calibrating to SMPTE color bars:

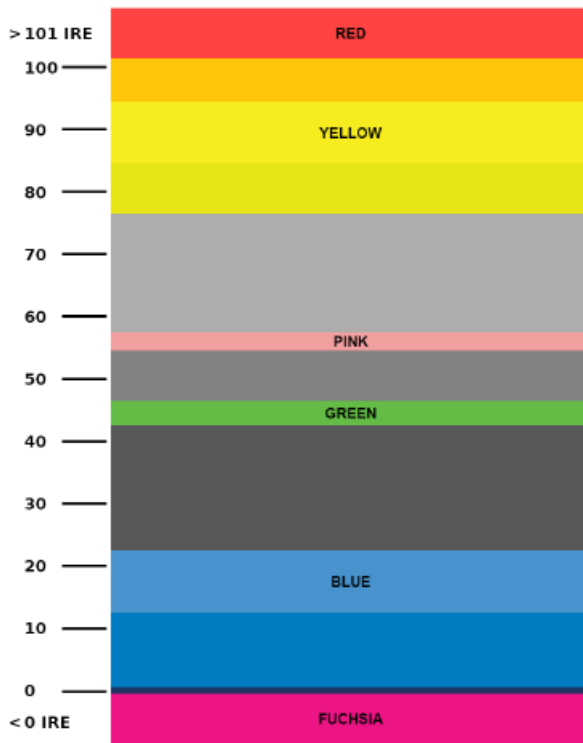
1. Allow the monitor to warm up for at least 5-10 minutes.
2. Display SMPTE split-field color bars on the monitor using an external source.
3. Enable Monochrome mode.
4. Locate the pluge pattern (super black, black, and gray bars) at the lower-right corner of the screen. Adjust the Brightness knob until there is no visible difference between the super black and black bars, but the gray bar is still visible.
5. Adjust the Contrast knob until an even grayscale appears along the top bars.
6. Disable Monochrome mode.
7. Enable Blue Check Field mode and adjust the Color knob so that the outermost bars (white and blue) appear to match in brightness.
8. Disable the Blue Check Field mode.

False Color

The False Color filter will assist with camera exposure settings. As the camera Iris is adjusted, elements of the image color will change based on the luminance or brightness values. This enables proper exposure without the use of costly, complicated external equipment. A good understanding of the color chart below and basic camera exposure knowledge is helpful when adjusting this setting.

When shooting subjects like people, it is common to set the face exposure to approximately 56 IRE. The false color filter will show the color PINK on the monitor. Therefore, when the exposure is increased (open the IRIS), the subject's color will change as indicated on the chart: PINK, then GREY, then a few shades of YELLOW. Over exposed subjects (above 101 IRE) will be RED. Underexposed subjects will be DEEP-BLUE to DARK-BLUE with clipped-blacks displaying a FUCHSIA-like color. Finally, the color GREEN is used to indicate image elements that are approximately 45 IRE. This represents a 'neutral' or 'mid-level' exposure for objects (not people).

False Color Key

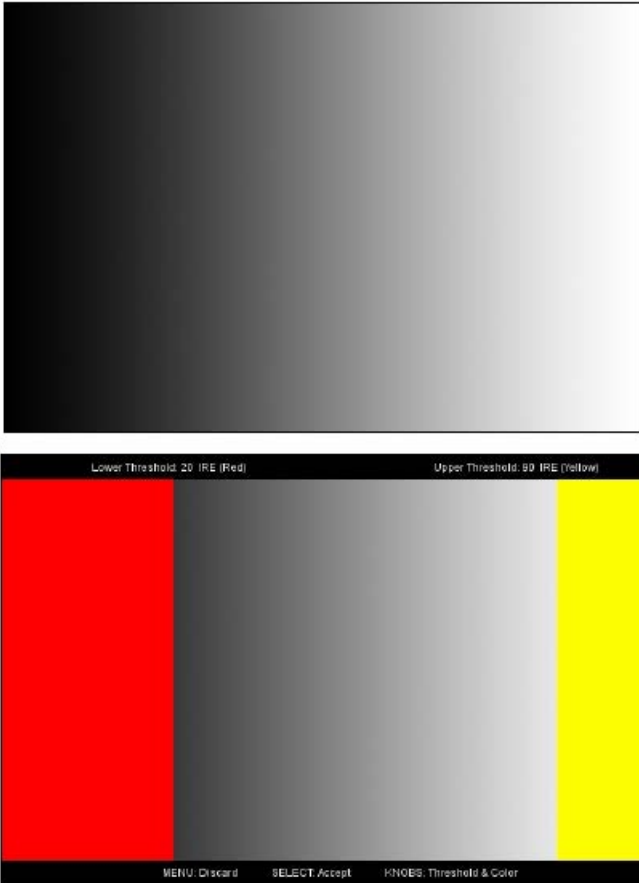


Peaking (Focus Assist)

The Peaking Filter assists with finding the sharpest possible picture. Threshold and Color can be modified with the Adjust Function. Use the BRIGHT knob to adjust the Threshold; higher values force the Peaking algorithm to react quicker to objects that are in focus. Use the COLOR knob to adjust the Color. Options are Red (default), Yellow, Pink, Green and Blue.

Clip

The Clip function is used to visually filter data with a Lower or Upper Threshold. This data can be filtered with a custom color.

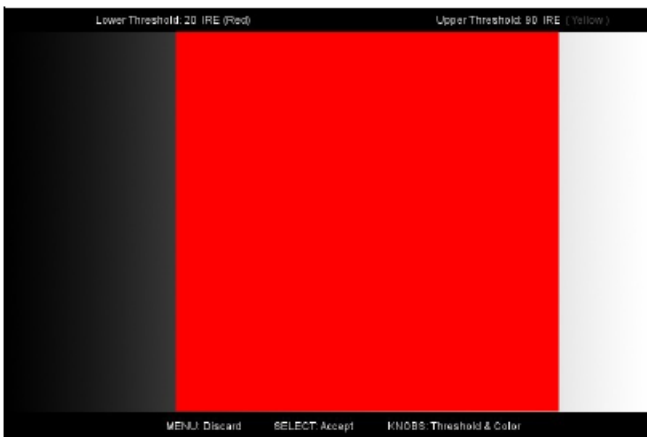


The Lower Threshold numerical value and color can be adjusted using the BRIGHT and COLOR knob, respectively. The Upper Threshold can be adjusted using the CONTRAST and USER knob, respectively.

The Lower Threshold in the image above has been set to 20 IRE (Red) which means that any part of the image UNDER 20 IRE will be shown in RED. The Upper Threshold in the image above has been set to 90 IRE (Yellow) which means that any part of the image OVER 90 IRE will be shown in YELLOW.

Invert

The Clip function can also be inverted to filter the area between the Upper and Lower Threshold. The color selected for the Lower Threshold acts as the color for all inverted Clip data.



The Lower Threshold in the image above is set to 20 IRE and the Upper Threshold is set to 90 IRE. The Clip Invert will filter all data in between 20 IRE and 90 IRE and display in RED.

Enabling Monochrome in the Clip Filter will convert all video to monochrome first, and then apply the Clip Filter. This filtered data will visually stand out from the standard video.

Apply To Waveform

Applying to the Waveform will show luminance as well as warn the user for out-of-range conditions such as overexposure or “blacker-than-black” errors with user-adjustable warning limits.

4.5 Audio Configuration Submenu



ITEMS	OPTIONS
Audio Configuration	
Volume	Levels from 0-31
Mute	Off, On
Channels	1&2, 3&4, 5&6, 7&8

Volume

Use this function adjust the volume of the Headphone Jack audio signal.

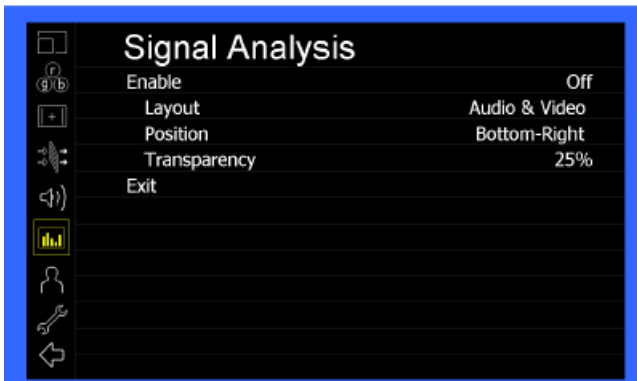
Mute

Use this function to Mute (ON) or Unmute (OFF) the audio output from the Headphone Jack.

Channels

Use this function to select audio channel pairings. HDMI options are stereo pairs 1-8. Modular are stereo pairs 1-16.

4.6 Signal Analysis Configuration Submenu



ITEMS	OPTIONS
Signal Analysis Configuration	
Enable	Off, On
Layout	Audio, Video, Audio & Video
Position	Bottom-Right, Bottom-Left, Top-Right, Top-Left
Transparency	0%, 25%, 50%, 75%

Enable

Use this setting to enable the Signal Analysis instruments selected in the Layout mode.

Layout

Select which Signal Analysis instruments to display on screen. Options: Audio Meter (Audio), Waveform Monitor (Video) or both Audio and Video can be displayed.

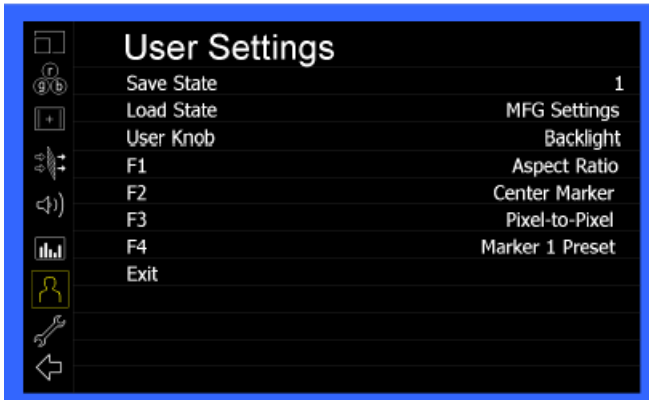
Position

Select the location of the Signal Analysis instruments on the screen. Options: Bottom-Right, Bottom-Left, Top-Left and Top-Right.

Transparency

Adjust the transparency of the Signal Analysis instruments on the screen. Options: 0% (opaque hiding background video), 25% (default), 50% and 75%.

4.7 User Settings Configuration Submenu



ITEMS	OPTIONS
User Settings Configuration	
Save State	1-6 States
Load State	1-6 or MFG
User Knob	Volume, Backlight, Peaking Threshold, Sharpness
F1, F2, F3, F4	See Below

The User Settings submenu can customize User Settings and Function buttons on the monitor's keypad for easy access to frequently used features.

Save State

Use this setting to save the state of 1 through 6 available monitor slots.

Load State

Use to load a previously configured monitor state. The Manufacturer Default state (MFG Settings) can be used as well.

User Knob

Use this setting to select the function of the USER knob on the monitor's rotary encoder section. Choose between Volume (default), Backlight, Peaking Threshold (used with the Peaking function) and Sharpness.

F1, F2, F3, F4 Custom Buttons

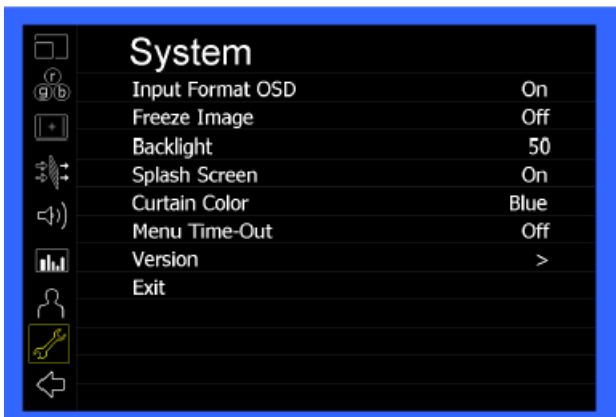
Use this setting to customize the F1-F4 buttons on the monitor's keypad. Choose between the following options:

- Aspect Ratio Toggle through Aspect Ratio Settings
- Pixel to Pixel Enable/Disable Pixel to Pixel
- DSLR Preset Toggle through DSLR Preset Settings
- Color Temperature Toggle through Color Temperature Presets
- Gamma Toggle through Gamma Settings
- Color Space Switch between YCbCr and RGB Color Space (HDMI ONLY)
- Marker Enable Enable/Disable On-Screen Markers
- Center Marker Enable/Disable the Center Marker
- Marker Select Toggle between two different On-Screen Markers
- Marker Preset Toggle through On-Screen Markers
- Marker Width Toggle through On-Screen Marker Widths
- Marker Color Toggle through On-Screen Marker Colors

- Marker Transparency Toggle through Marker Background Transparency Settings
- Check Field Toggle through Check Field Options
- False Color Enable/Disable False Color Filter
- Peaking Filter Enable/Disable Peaking Filter
- Clip Filter Enable/Disable the Clip Filter
- Clip: Invert Enable/Disable the Clip Invert Feature
- Clip: Monochrome Enable/Disable the Clip Monochrome Feature
- Waveform Clip Enable/Disable the Clip Filter on the Waveform Monitor
- Audio Mute Enable/Disable the Audio Mute Feature
- Audio Channels Toggle through the Available Audio Channels
- Signal Analysis Enable/Disable the Signal Analysis Feature
- Analyzer Layout Toggle through Analyzer Layout Setup (audio, video or both)
- Analyzer Position Toggle through Analyzer On-Screen Locations
- Analyzer Transparency Toggle through Analyzer Transparency Settings
- Input Format OSD Toggle through Input Format OSD On-Screen Time
- Freeze Image Enable/Disable the Freeze Image Feature
- Splash Screen Enable/Disable the Splash Screen on Monitor Startup
- Curtain Color Toggle through Different Curtain Colors
- Menu Time Out Toggle through Menu Time-Out Settings
- Input Crop Enable/Disable the Input Crop Feature

All F (function) buttons can be used as Function Hot Keys. To assign a function to an F Key, simply highlight a function in the menu and press the desired “F” key, then press again to confirm the setting. If the function is not available, a notification will be displayed on the screen.

4.8 System Configuration Submenu



ITEMS	OPTIONS
System Configuration	
Input Format OSD	Off, On, 5 sec
Freeze Image	Off, On
Backlight	Levels from 1-100
Splash Screen	Off, On
Curtain Color	Blue, Green, Black
Menu Time-Out	Off, 10 sec, 15 sec, 20 sec, 25 sec, 30 sec
Version	System, FPGA, Keypad, Module

Use the System Submenu Settings to modify general monitor settings.

Input Format OSD

Use to modify the appearance of the Input Format OSD. Options: OFF, ON (always on), or 5 Seconds.

Freeze Image

Use to Freeze the incoming image display.

Backlight

Use to adjust the brightness of the Backlight Panel. Values range from 0 (lowest) to 100 (highest); increments of 2.

*Higher backlight value will increase the brightness of monitor but will reduce the battery time.

Splash Screen

Use to save the enable the “Marshall Electronics, Inc.” splash screen on monitor power up.

Curtain Color

Use this setting to select the Curtain Color. Options: Blue, Black or Green.

Menu Time-Out

Use this to set the Menu Time-Out Length. Options: 10-30 seconds (5 second increments). OFF will disable the Automatic Menu Time-Out.

Version

Use this function to view the current Firmware versions of all monitor components.

5. Monitor Care

Screen Cleaning

Periodically clean the screen surface using ammonia-free cleaning wipes (Marshall Part No. V-HWPK). A clean micro-fiber cloth can also be used with non-abrasive and ammonia-free cleaning agents. Do not use paper towels. Paper towel fibers are coarse and may scratch the surface of the polycarbonate faceplate or leave streaks on the surface. Antistatic and fingerprint resistant cleaning agents are recommended. Do not apply excessive pressure to the screen to avoid damaging the LCD.

Faceplate Dusting

Dust the unit with a soft, damp cloth or chamois. Dry or abrasive cloths may cause electrostatic charge on the surface, attracting dust particles. Neutralize static electricity effects by using the recommended cleaning and polishing practice.

6. Warranty

Marshall Electronics, Inc. warrants to the first consumer that this **V-MD1012 Dual Monitor** will, under normal use, be free from defects in workmanship and materials, when received in its original container, for a period of one year from the purchase date. This warranty is extended to the first consumer only, and proof of purchase is necessary to honor the warranty. If there is no proof of purchase provided with a warranty claim, Marshall Electronics, Inc. reserves the right not to honor the warranty set forth above. Therefore, labor and parts may be charged to the consumer. This warranty does not apply to the product exterior or cosmetics. Misuse, abnormal handling, alterations or modifications in design or construction void this warranty. No sales personnel of the seller or any other person is authorized to make any warranties other than those described above, or to extend the duration of any warranties on behalf of Marshall Electronics Inc., beyond the time period described above.

Note: Due to constant effort to improve products and product features, specifications may change without prior notice.

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