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## **RM-2443WS Series**

- RM-2443WS-3G
- RM-2443WS-3G2

**2RU, 4-Screen, 4.3" Audio/Video Monitors  
User Guide**

## **User Guide**

Part Number 821813, Revision A

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# CHAPTER 1: Installation

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## Introduction

### Overview

The 2RU rack-mounted RM-2443WS Series monitors set a new standard in LCD monitors for broadcast and professional video applications. They provide four 4.3", 800 x 400 resolution, 16:9 format, anti-glare IPS LCD screens. All video formats are scaled to fit on screen in the highest quality using fully digital processing, precision scaling and gamma correction to produce the best images possible.

### Features

The RM-2443WS-3G2 and -3G audio/video monitors are designed for confidence monitoring of 3G/HD/SD-SDI digital video and CVBS composite analog video. Input signals are easily selected and displayed. Two to sixteen audio channels per screen may be selected for visual monitoring on bar graph style level meters. On screen markers, waveform, and vector displays can be enabled on this full-featured monitor. A headphone jack allows audible stereo monitoring of the left/right channels on all models. When mounted in a rack, they can tilt upwards or downwards for easy visibility.

Parameters are selected and adjusted using an On Screen Display (OSD) Menu. An RJ45 connector serves as the interface to the four tally lights on the front panel. Monitor settings can also be made with a web browser over Ethernet using the integral web server.

## Safety

### Instructions

1. Read, keep, and follow all of these instructions; heed all warnings.
2. Do not use this equipment near water.
3. Use only a dry cloth to clean the equipment.
4. Do not block any ventilation openings.
5. Do not install near any heat source such as a radiator, heat register, amplifier, or stove.
6. Do not attempt to plug the unit into a two-blade outlet (with only two prongs of equal width).

**Important:**

By design, this monitor will only plug into a three-prong outlet for your safety. If the plug does not fit into the outlet, contact an electrician to replace the obsolete outlet.

7. Protect the power cord from being walked on or pinched, particularly at plug connection on the equipment and at the socket.
8. Use only the attachments/accessories specified by the manufacturer.
9. Unplug the equipment during lightning storms or when unused for long periods of time.
10. Refer all servicing to qualified service personnel. Servicing will be required under all of the following conditions:
  - a. The equipment has been damaged in any way, such as when the power-supply cord or plug is damaged.
  - b. Liquid had been spilled or objects have fallen onto the equipment.
  - c. The equipment has been exposed to rain or moisture.
  - d. The equipment does not operate normally.
  - e. The equipment has been dropped.

## Safety Symbols



The symbol to the left warns of electric shock hazard inside the unit. Disconnect the power cord before removing access panels when installing upgrades. Only qualified service personnel are to operate the equipment with covers removed, and are to exercise caution to avoid personal injury.

## Mounting

The unit is designed for a standard 19" rack. Install it at eye level for best visual observation of the display screens or tilt it toward the user. Please adhere to the following clearances:

Table 1-1: Recommended Clearances

Clearance	Surface
24"	Front
3"	Rear
2"	Sides
1.75"	Top and Bottom (if either radiates heat)
0"	Top and Bottom (if no heat)

## Heat Dissipation

The ambient temperature inside the mounting enclosure should not exceed 40° Celsius (104° Fahrenheit). Adjacent devices can be rack mounted (or stacked) in

proximity to the unit if this temperature is not exceeded. Otherwise, allow a 1RU (1.75"/44.45mm) space above and below the unit for air circulation.

**Important:**

These monitors contain a fan to ventilate the heat generated by the audio amplifiers, video processing circuitry, and other components. The fan opening and other vents must not be blocked. The fan can be optioned to be always on, always off, or automatic. For long product life, it is recommended that the fan not be set to always off.

## Sympathetic Vibration

Sympathetic vibration from other equipment (cables, etc.) in the rack may be serious enough to interfere with the unit's sound quality. If you experience sympathetic vibrations, use thin card stock, felt, foam, or weather-stripping between the vibrating surfaces. Tie loose cables securely with cable ties.

## Mechanical Bracing

The 2RU chassis is securely attached to the front panel. In addition, the chassis has mounting tabs through which you attach it to the rack rail. This feature will reduce or eliminate rear bracing requirements in many mobile/portable applications. The weight of internal components is distributed fairly evenly around the unit.

## Electrical Interference

Be careful to avoid mismatched cable types and other similar causes of undesired reflections in digital signal systems. If severe enough, such reflections can result in corruption of the digital data stream. As with any audio equipment, maximum immunity from electrical interference requires the use of shielded cable; however, satisfactory results can sometimes be obtained without it. The internal circuitry ground is connected to the chassis.

## Power

The unit comes with an external power supply module which connects to an AC mains power source (35W, 100 to 240 VAC,  $\pm 10\%$ , 50/60Hz) through the IEC connector provided on the rear panel of the unit.

When the mains plug or appliance coupler is used as the disconnect device, the disconnect device should remain operable.

## Compliance

### FCC

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can

radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at their own expense.

### ICES-003

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

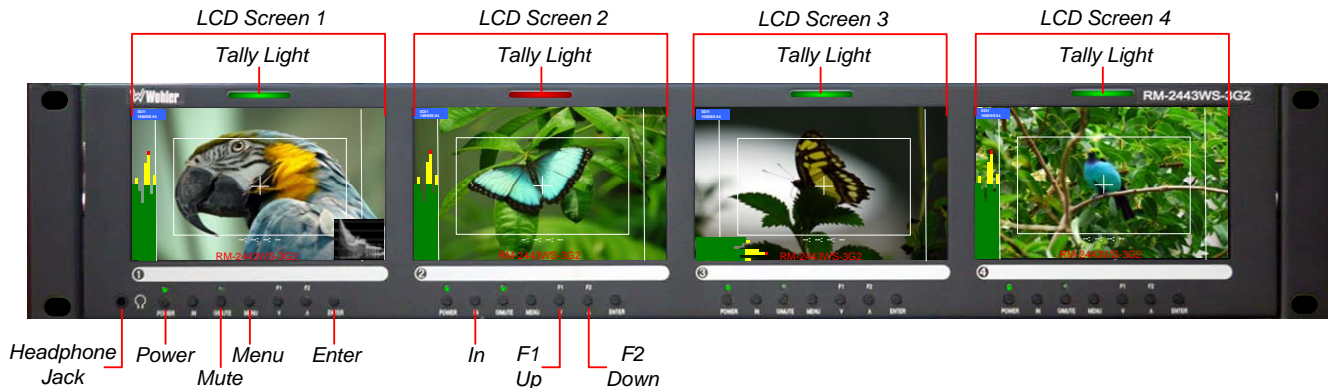


# CHAPTER 2: Local Operation

The RM-2443WS-3G2 and RM-2443WS-3G front and rear panels are described in this chapter.

## Front Panel

Figure 2–1: Front Panel Layout



1. **Tally Lights:** These tri-color (red/green/amber) lights are controlled through a RJ45 connector on the rear panel. For more information about the RJ45 connector, refer to Figure 2-5 and Table 2-1. When first connected to power, the Tally Lights glow amber until the unit is ready for operation.
2. **LCD Screen:** The LCD screens display the audio meters, closed captioning, waveform/vector, menus, and OSD features over the video.
3. **Headphone Jack:** Monitor the assigned left/right stereo audio channels with stereo headphones from this mini-stereo connector. Control the volume of the headphones using the **Volume** setting in the Quick Menu. Refer to the **Using the Quick Menu and the OSD Menus** section later in this chapter.

### Note:

The left LCD must be turned on for audio to function from any screen, because the audio amplifiers are powered from the left LCD. So, if some of the screens will not be used, be certain that it is the left one is.

4. **Power:** Each of the two **Power** buttons turn the associated LCD screen on and off; the LED glows green to indicate on. When the indicator above the power switch is green then the unit is receiving power. When the indicator is flashing, the unit is in stand-by mode.
5. **Mute:** The **Mute** button enables or disables audio monitoring via the headphone jack, and the light in the button will indicate the status of audio monitoring. When the light is on, the audio can be monitored, and when the light is off, it is mute.

6. **Menu:** Press this button to display the OSD Menu. Refer to the **OSD Menus** section of this chapter for operation and content of these menus.
7. **Enter:** When the OSD Menu is displayed, pressing this button accepts selections in the menus and sub-menus. When the OSD Menu is not being displayed, pressing this button displays the Quick Menu, which cycles through volume and image controls. Refer to the **Quick Menu** section of this chapter.
8. **In:** On the RM-2443WS-3G2, this button switches between the IN1 and IN2. Pressing the **IN** button will display a list of the possible inputs. It should then be pressed repeatedly to select the required input. On the RM-2443WS-3G, there is only one input per screen, so this button is not used.
9. **F1/Down:** The **Down** function is on the same button as the **F1** function. When the OSD Menu or the Quick Menu are displayed, this button navigates down through the menu and sub-menu selections and can be used to adjust the settings. When the OSD Menu is not displayed, pressing this button initiates **F1** function per its Function Key Menu setting. Refer to Table 2-13.
10. **F2/Up:** The **Up** function is on the same button as the **F2** function. When the OSD Menu or the Quick Menu are displayed, this button navigates down through the menu and sub-menu selections and can be used to adjust the settings. When the OSD Menu is not displayed, pressing this button initiates **F2** function per its Function Key Menu setting. Refer to Table 2-13.

## On-Screen Display Features

Functions and parameters can be selected and adjusted using the On Screen Display (OSD) Menu. Refer to the **OSD Menus** section of this chapter.

Overlays can be added by the operator for **Area & Safety Markers**, **Center Marker**, and to display names as **IMD (In Monitor Display)** for identification.

Video effects such as **Monochrome**, **Blue Only**, **Focus Assist**, **H/V Delay** and other features can be used to assist setup.

**Overscan**, **Underscan** and **Native** modes control scaling and size of the video.

**Audio level meter** displays, for up to sixteen channels, can be displayed vertically or horizontally, positioned at various corners of the display. They can show VU, PPM (PK) or both with assignable -20db to -18db reference levels.

**Waveform** (Y or Line) or **Vectorscope** can be small (as shown) or full screen sizes.

**Closed Captions** from CVBS Line 21 (CEA-608) can be decoded and text is displayed across the screen bottom. The 'CC' logo at screen top center indicates captions are present in the SDI stream.

The de-embedded **Timecode** from the HD/SD-SDI source displays on the lower part of the screen. Choose LTC, VITC or D-VITC types in the Display Menu.

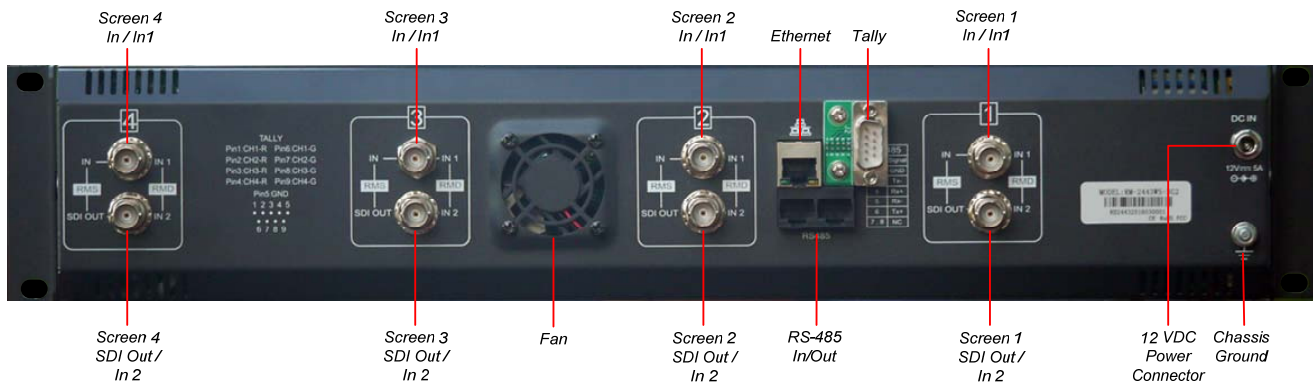
Figure 2-2: Display Features



1. **Input Status:** Displays the selected input and video parameters of vertical active line count, (i)nterlaced or (p)rogressive, and field/frame rate in Hz.
2. **Area Marker:** Used to mark an alternate aspect ratio area of the image. You can set whether to display it, the display brightness, and the matte mode in the Marker Menu.
3. **Safety Marker:** This is used to mark a percentage area, inside of the image, safe for titles to be located. You can set whether to display it, as well as its display mode, in the Marker Menu.
4. **Center marker:** Cross hairs are displayed in the center of the screen, marking the center of the image. You can set whether to display it in the Marker Menu.
5. **IMD:** The OSD Menu provides settings to customize the IMD (In Monitor Display) text area to show a static line of characters, numbers, and some symbols or to receive dynamic messages to display.
6. **Audio Level Meters:** Levels for the audio channels are displayed on up to sixteen meters as left/right pairs. Up to sixteen meters can appear in various selectable positions on the screen. Refer to Table 2-7.
7. **Timecode:** The de-embedded timecode from the HD/SD-SDI source displays on the lower part of the screen.
8. **Waveform/Vectorscope:** This can be displayed only for SDI signal. The waveform and vector of the input signal display are configurable in the Display Menu.
9. **AFD/CC:** SDI **AFD** (Active Format Description) and **CC** (Closed Caption) information will display at the top of the screen as icons.

# Rear Panel

Figure 2-3: Rear Panel Layout



## Note:

The left LCD must be turned on for audio to function from any screen, because the audio amplifiers are powered from the left LCD. So, if some of the screens will not be used, be certain that it is the left one is.

## Important:



By design, the supplied AC mains power cord will only plug into a three-prong grounded outlet for your safety. If the plug does not fit into the outlet, contact an electrician to replace the obsolete outlet. The symbol to the left warns of electric shock hazard inside or outside the unit. Disconnect the power cord before removing access panels.

## Important:

The monitor and power adapter have been tested as a combined apparatus to verify compliance with applicable safety and electromagnetic compliance standards. Use of another power adapter provided by the user may negate the compliance or not perform properly. Wohler Technologies cannot accept any responsibility for the outcome in such cases.

### 1. RM-2443WS-3G2:

- In 1:** This input connector accepts 3G/HD/SD-SDI video signals. It is compliant with SMPTE 424M, SMPTE 259M, SMPTE292M/ITU-R BT601. This BNC jack also accepts a CVBS signal and automatically detects it.
- In 2:** This second input connector accepts 3G/HD/SD-SDI video signals. It is compliant with SMPTE 424M, SMPTE 259M, SMPTE292M/ITU-R BT601. This BNC jack also accepts a CVBS signal and automatically detects it.

### 2. RM-2443WS-3G:

- In:** This input connector accepts 3G/HD/SD-SDI video signals. It is compliant with SMPTE 424M, SMPTE 259M, SMPTE292M/ITU-R BT601.

This BNC jack also accepts a CVBS signal and automatically detects it.

- b) **SDI Out:** This connector provides a re-shaped and re-clocked duplicate of the SDI In 1 signal. This connection is compliant with SMPTE 424M, SMPTE 259M, SMPTE292M/ITU-R BT601. It is not an output when a CVBS signal is connected to **In**.
- 3. **Power Connector:** The supplied 100 to 240VAC to 12VDC power supply plugs into this coax connector.
- 4. **Ethernet:** The 10/100M Ethernet connector is used to connect with a computer to modify the display settings remotely. CAT5 network cables are recommended for medium distances. CAT6 twisted pair shielded cables are recommended for longer distances.
- 5. **Tally:** This DB9M connector controls the tally lights on the front panel. Refer to Figure 2-4 below for the pinout and Table 2-1 for the terminal connections.
- 6. **RS-485 In/Out:** These RJ-45 jacks are used for dynamic Tally/IMD controls. Two jacks are provided for in & out daisy chain arrangements. They are wired identically. Refer to Figure 2-5 below for the pinout and Table 2-2 for terminal connections. These connections are also used for system software upgrades. Either CAT5 or CAT6 cables may be used for these jacks.
- 7. **Fan:** The fan to ventilates the heat generated by the audio amplifiers, video processing circuitry, and other components. The fan opening and vents must not be blocked. Using the Config Menu, the fan can be optioned to be always on, always off, or automatic. Refer to Table 2.11. For long product life, it is recommended that the fan not be set to always off.

## Rear Panel Connectors

The following figure and tables detail the connections of the Tally and RS-485 connectors on the rear panel. The tables are also silkscreened on the rear panel of the unit for your convenience.

Table 2-1: Tally Input Connections

Pin	Tally Terminal Name
1	CH1-Red
2	CH2-Red
3	CH3-Red
4	CH4-Red
5	Ground
6	CH1-Green
7	CH2-Green
8	CH3-Green
9	CH4-Green

To light a Tally in red, connect pin 1 (2, 3, or 4) to ground. To light a Tally in green, connect pin 6 (7, 8, or 9) to ground. To light a tally in amber, connect both pins 1 and 6 (2 and 7, 3 and 8, or 4 and 9) to ground.

Figure 2-4: Tally Input Pin-Out

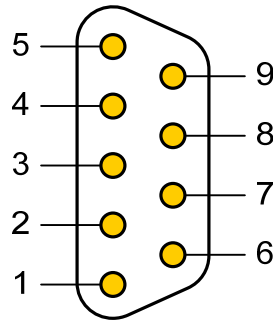


Figure 2-5: RS-485 I/O Pin-Out

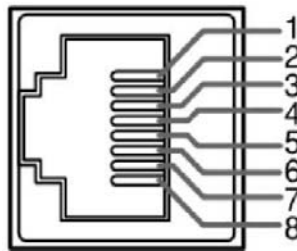


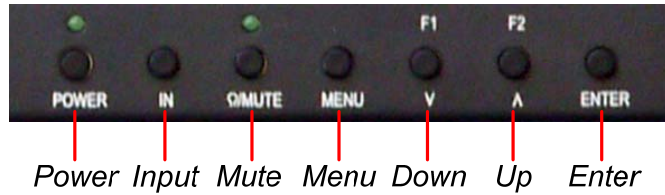
Table 2-2: RS-485 I/O Connections

Pin	RS-485 Terminal Name
1, 2	GND
3	Tx- (pair A)
4	Rx+ (pair B)
5	Rx- (pair B)
6	Tx+ (pair A)
7, 8	NC

## Using the Quick Menu and the OSD Menus

In the following descriptions, refer to Figure 2-6 for the location of the control buttons.

Figure 2-6: Screen Control Buttons



## Quick Menu

The Quick Menu provides quick access to a few commonly used features, as listed in Table 2-3. The Quick Menu appears as shown in Figure 2-7.

Figure 2-7: Quick Menu - Volume Setting



The following is a description of how to use the Quick Menu:

1. Press the **Enter** button to display the Quick Menu and the first item that can be adjusted.
2. Use the **Up** and **Down** buttons to change the value for the item displayed.
3. Press the **Enter** button again to display the next adjustable item.
4. The Quick Menu will time out with no button presses. Alternatively, you may press the **Enter** button repeatedly when finished until the menu disappears.

Table 2-3: Quick Menu

Parameters	Default Value	Domain Range
VOLUME	16	0 - 31
BRIGHTNESS	50	0 - 100
CONTRAST	50	0 - 100
CHROMA	50	0 - 100

## OSD Menus

The OSD Menus allow you to adjust a wide variety of control parameters for the monitor. Refer to Table 2-4 through Table 2-14 for typical values and domain ranges. The following is a description of how to use the OSD Menu:

1. Press the **Menu** button to display the Main Menu.
2. Use the **Up** and **Down** buttons to navigate through the submenus.
3. Press the **Enter** button to enter the parameter selections in the chosen submenu.
4. Use the **Up** or **Down** buttons to cycle through the submenu selections.

5. When the desired option is highlighted, press the **Enter** button to select it.
6. Use the **Up** or **Down** buttons to adjust the parameter value up or down, make a selection, or turn a function on or off.
7. Press the **Enter** button to accept your parameter change -or- press the **Menu** button to cancel your change.
8. Press the **Menu** button to back out of any submenu, and finally to remove the OSD Menus from the screen.

## OSD Menus

The following tables describe the information and settings available in the OSD Menu system. Use the instructions in the previous section to navigate the menus.

Table 2-4: Status Menu Structure

Status			
Parameters	Default Value	Domain Range	Description
INPUT	SD1	SDI1 SDI2 (RM-2443WS-3G2 only)	Display only for the value of each parameter.
FORMAT	NO SIGNAL		
COLOR TEMP	D65	D32, D93, D65, D56, D50	
SCAN MODE	NORMAL	NORMAL, OVER, UNDER	
FAST MODE	OFF	OFF or ON	
MODEL	RM-2443WS-3G2		
SERIAL NUMBER	-		
IP ADDRESS	192.168.1.86		
COLOR VERSION	-		

Table 2-5: Input Select Menu Structure

Input Select			
Parameters	Default Value	Domain Range	Description
IN1	ON	One ON at a time, the other is OFF	Select which input will be monitored (RM-2443WS-3G2 only).
IN2	OFF		
NTSC SETUP	0	0, 7.5	
NTSC PHASE	0	-50 to 50	



Table 2-6: Marker Menu Structure

Marker			
Parameters	Default Value	Domain Range	Description
MARKER	OFF	ON or OFF	Turn <b>all markers</b> on or off.
AREA MARKER	OFF	If 16:9 aspect ratio: OFF, 4:3, 15:9, 14:9, 13:9, 1.85:1, 2.35:1  If 4:3 aspect ratio: OFF, 16:9	Set area marker size according to the aspect ratio.
CENTER MARKER	OFF	ON or OFF	Turn center marker display on or off.
SAFETY MARKER	OFF	OFF, 80%, 85%, 88%, 90%, 93%, 95%	Set safety marker size according to the aspect ratio and scan mode.
MARKER LEVEL	1	1: 50%, 2: 75%, 3: 100%	Set the luminance of all of the markers.
MARKER MAT	OFF	OFF, HALF ( <i>Background 50%</i> ) BLACK	Set the transparency of the area marker mat.
CROSS HATCH	OFF	ON or OFF	Set whether to enable the cross hatch display.

Figure 2-8: Marker Mat Effect



Marker Mat = OFF



Marker Mat = HALF



Marker Mat = BLACK

Table 2-7: Audio Menu Structure

Audio			
Parameters	Default Value	Domain Range	Description
SPEAK OUT L	EBD CH1	EBD CH1-CH16	Select the left headphone channel source.
SPEAK OUT R	EBD CH2	EBD CH1-CH16	Select the right headphone channel source.
AUDIO METER	OFF	ON or OFF	Set whether to display the audio meters.
METER SELECT	CH1-2	CH1-2, G1, G2, G3, G4, G1+G2, G1+G3, G1+G4, G2+G3, G2+G4, G3+G4, G1-G4	Select channels or SDI groups to display on the meters.
METER DIRECTION	HORIZONTAL	VERTICAL, HORIZONTAL	Select whether you prefer vertical or horizontal meters.
METER POSITION	TOP	If METER DIRECTION is VERTICAL: LEFT, RIGHT If METER DIRECTION is HORIZONTAL: BOTTOM, TOP	For vertical meters, select left or right. For horizontal meters, select bottom or top position.
METER DIS MODE	MODE1	MODE1: meter only MODE2: meter & channel numbers MODE3: meter, channel numbers, and dB value	Select the appearance of the meters.
REF LEVEL	-20DB	-18DB, -20DB	Set the meter reference level (green to yellow transition).
OVER LEVEL	-10DB	-2DB, -4DB, -6DB, -8DB, -10DB	Set the meter over level (yellow to red transition)

Table 2-8: Display Menu Structure

Display			
Parameters	Default Value	Domain Range	Description
STATUS DISPLAY	AUTO	OFF, ON, AUTO	Turn status display off, on, or automatic. If automatic, it will display for 15 seconds after each change.
AFD DISPLAY	OFF	ON, OFF	Turn AFD display on only when status display is set to On or Auto, or else Off.
WFM FORM SIZE	NORMAL	FULL, NORMAL	Set display of waveform to full screen size or normal PiP size.
WFM FORM TYPE	OFF	OFF WAVEFORM VECT75 VECT100	Set the type of waveform / vector display.
LINE WAVE	OFF	ON, OFF	Set whether to display the line wave.
LINE WAVE NUMBER	---	Refer to Table 2-9.	Set the position of the waveform display.
WAVEFORM OVER LIMIT	50	50 to 100	Set the over limit of the waveform.
WAVEFORM UNDER LIMIT	5	0 to 50	Set the under limit of the waveform.
TIME CODE	OFF	OFF, D-VITC, LTC, VITC	Select the mode for the time code display or disable it.

Table 2-9: Line Wave Number vs. Input Signal

Input Signal	Default Value	Domain Range
576i50	310	23 - 623
480i60	261	22 - 524
720p	386	26 - 745
1080i50	560	21 - 1123
1080i60/59.94		
1080sf23/23.97		
1035i60	557	41 - 1120
1080p	561	42 - 1121

Table 2-10: Closed Caption Menu Structure

Closed Caption			
Parameters	Default Value	Domain Range	Description
CLOSED CAPTION	CC1	OFF CC1 CC2 CC3 CC4 TEXT1 TEXT2 TEXT3 TEXT4	Set type of CVBS caption to display, or turn it off.
SDI CC LOG	OFF	(‘CC’ Logo) ON or OFF	Set whether to display SDI closed caption information

Table 2-11: Config Menu Structure

Config			
Parameters	Default Value	Domain Range	Description
FAST MODE	OFF	ON or OFF	Enable or disable fast mode.
FILM MODE DETECT	OFF	ON or OFF	Enable or disable film mode detection.
BACK LIGHT	15	0* to 30	Set backlight timeout.
AUTO STANDBY	OFF	ON or OFF	Enable or disable auto standby mode.
APERTURE	0	0 to 24	Set picture sharpness.
LOCK NUMBER	-		Set lock number.
LANGUAGE	ENGLISH	ENGLISH, CHINESE	Set the menu language.
FAN	AUTO	AUTO, ON, OFF	AUTO will turn on the fan only when needed. ON will allow the fan to run all of the time. OFF will never allow the fan to run.**

\* **Note:** Use caution when setting the Back light to a very low number. Setting the Back Light to 0 or a low number may make it impossible to see the menus to

correct the situation.

**\*\* Note:** Setting the Fan to AUTO or ON can prolong the life of the product.

Table 2-12: Color Temp Menu Structure

Color Temp			
Parameters	Default Value	Domain Range	Description
COLOR TEMP	D65	D32, D50, D56, D65, D93, USER1, USER2	Set the color temperature.
RED GAIN	128	0 to 256	Set the gain for each color.
GREEN GAIN			
BLUE GAIN			
RED BIAS	0	-127 to +127	Set the offset for each color.
GREEN BIAS			
BLUE BIAS			
COPY FROM	D93	D32, D50, D56, D65, D93	Copies this set of color parameters to USER.
RESET	Resets Gain and Offset to Factory Default		
COLOR SPACE	AUTO	OFF, EBU, SMPTE-C, ITU-709, AUTO	Select the color matrix.

Table 2-13: Function Key Menu Structure

Function Key			
Parameters	Default Value	Domain Range	Description
F1	SCAN	SCAN NATIVE ASPECT BLUE ONLY MONO MARKER H/V DELAY AUDIO METER FAST MODE	Set up the F1 Function key action.
F2	NATIVE	TC IMD MUTE CC FREEZE UNDEF (none)	Set up the F2 Function key action.

Table 2-14: IMD Menu Structure

IMD Menu			
Parameters	Default Value	Domain Range	Description
IMD DISPLAY	ON	ON or OFF	Set whether to enable the IMD.
IMD COLOR	RED	RED, GREEN, YELLOW, WHITE	Set the color of the IMD characters.
IMD CHARACTER	RM-2443WS-3G2	(Up to 16 characters of text for static LOCAL display)	Set the IMD message.*
IMD PROTOCOL	LOCAL	LOCAL TSL3.1, TSL4.0, TSL5.0 IMAGE VIDEO (1510 protocol) NETWORK	Select an IMD protocol.
IMD ID	0	0 to 255 (unit ID number for Dynamic IMD/Tally)	Set the ID number for the IMD.
IMD NAME	-	(Up to 16 characters of text for the IMD Name)	Set the ID Name for dynamic IMD/Tally.*
BAUD RATE	115200	2400, 4800, 9600, 19200, 38400, 57600, 115200	Set the BAUD rate for RS-485 communication.
LED TALLY	ON	ON or OFF	Enable / disable the Tally light.
OSD TALLY MODE	RG	OFF, RG: Red/Green, GR: Green only, RGY: Red/Green/Yellow	Select the OSD tally mode.
IMD TALLY MODE	T1	T1, T2, T1T2, T2T1, T1-, T2-, T1T2-, T2T1-	Select the IMD tally mode for Image Video.
TALLY SOURCE	STANDARD	STANDARD (rear Tally connector), IMAGE VIDEO, TSL	Select the tally source.

\* To enter the characters for the IMD CHARACTER or IMD NAME SETTINGS, navigate to the setting and press **Enter**. Press **Up** or **Down** repeatedly to locate the first character and press **Enter** to move to the next character. Press **Up** or **Down** again repeatedly to locate the second character and press **Enter**. Repeat this process until all of the characters (up to 16) have been entered. Then press **Menu** to exit.

# CHAPTER 3: Technical Info

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Table 3–1: Specifications

Specification	Values/Domains
Power requirements	100 V to 240 VAC $\pm$ 10%, 50/60Hz
Power consumption	35 Watts
Dimensions; inches H x W x D (mm)	3.5" x 19" x 2.4" (90mm x 484mm x 61mm)
Weight	5 lbs. (2.25 kg)
Space Required	2RU in a standard 19" rack
Supplied Accessories	Power Adapter, AC Power Cord
Display Type	IPS-LCD with LED Backlight
Number of Displays	4
Screen Size	4.3" diagonal per screen
Screen Resolution	800(H) x 480(V)
Aspect ratio	16:9
Display Area (mm)	92.8(H) x 56.2(V)
Viewing Angle	170°(H) x 170° (V)
Color Depth	16.7M colors
Contrast Ratio	400:1
Brightness	300 cd/m <sup>2</sup> , typical
Response Time	25 ms, typical
Video Inputs: 4 x 3G/HD/SD-SDI or CVBS (RM-2443WS-3G) 8 x 3G/HD/SD-SDI or CVBS (RM-2443WS-3G2)	CVBS: PAL/NTSC
	SD-SDI: SMPTE 259M, ITU-R BT.656
	HD-SDI: SMPTE 292M/274M/296M
	3G-SDI: SMPTE 425-Level A
Video Input Impedance	SDI and CVBS: 75 $\Omega$
Video Outputs	4 x 3G/HD/SD-SDI on BNC (RM-2443WS-3G2 only)
Headphones	Stereo; on 3.5mm jack
Dynamic Tally/IMD	RS-485; TSL/ImageVideo on RJ-45
Network Setup/Control	10/100M Ethernet; Web Server on RJ-45

Figure 3-1: RM-2443WS-3G Block Diagram

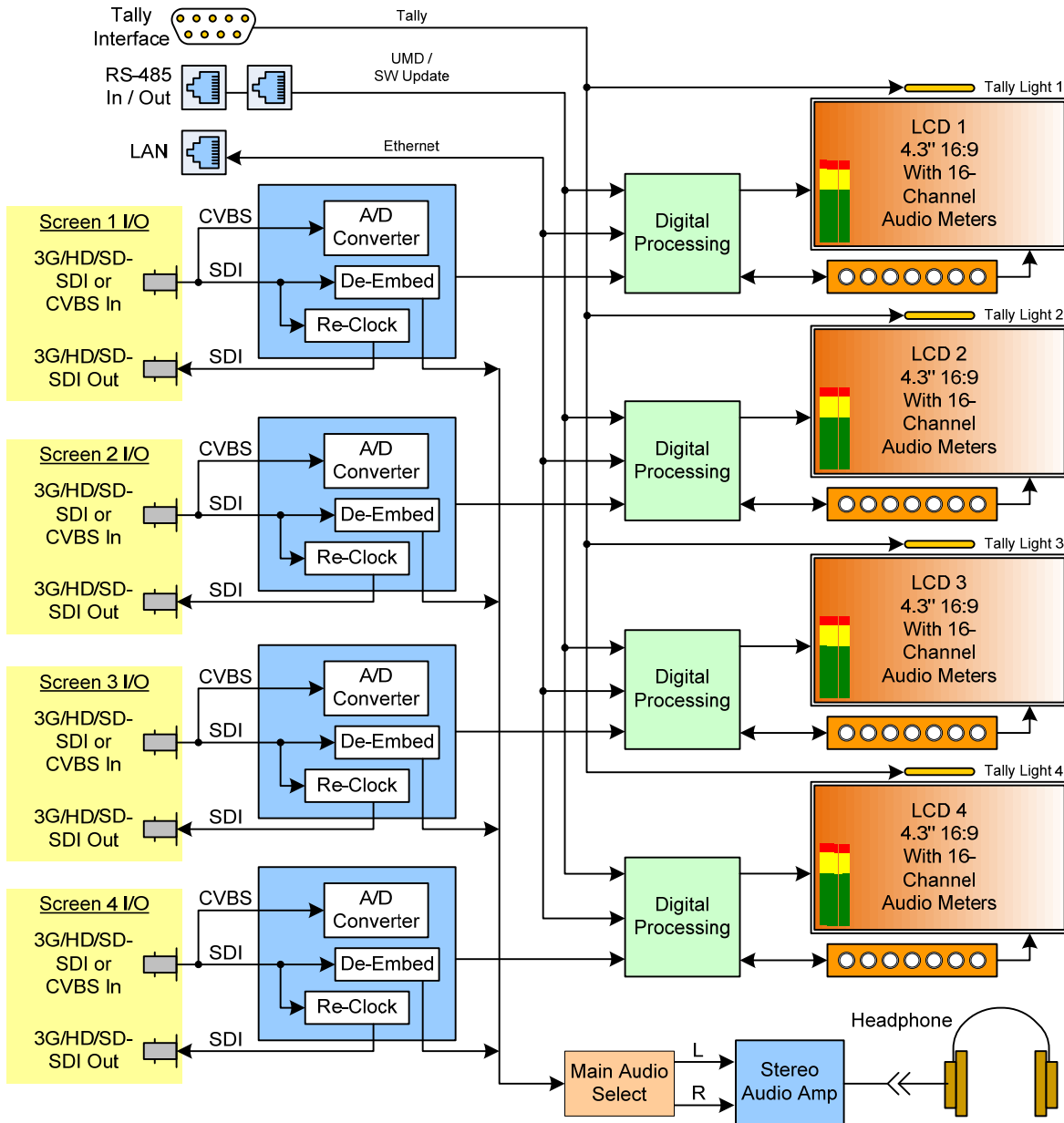
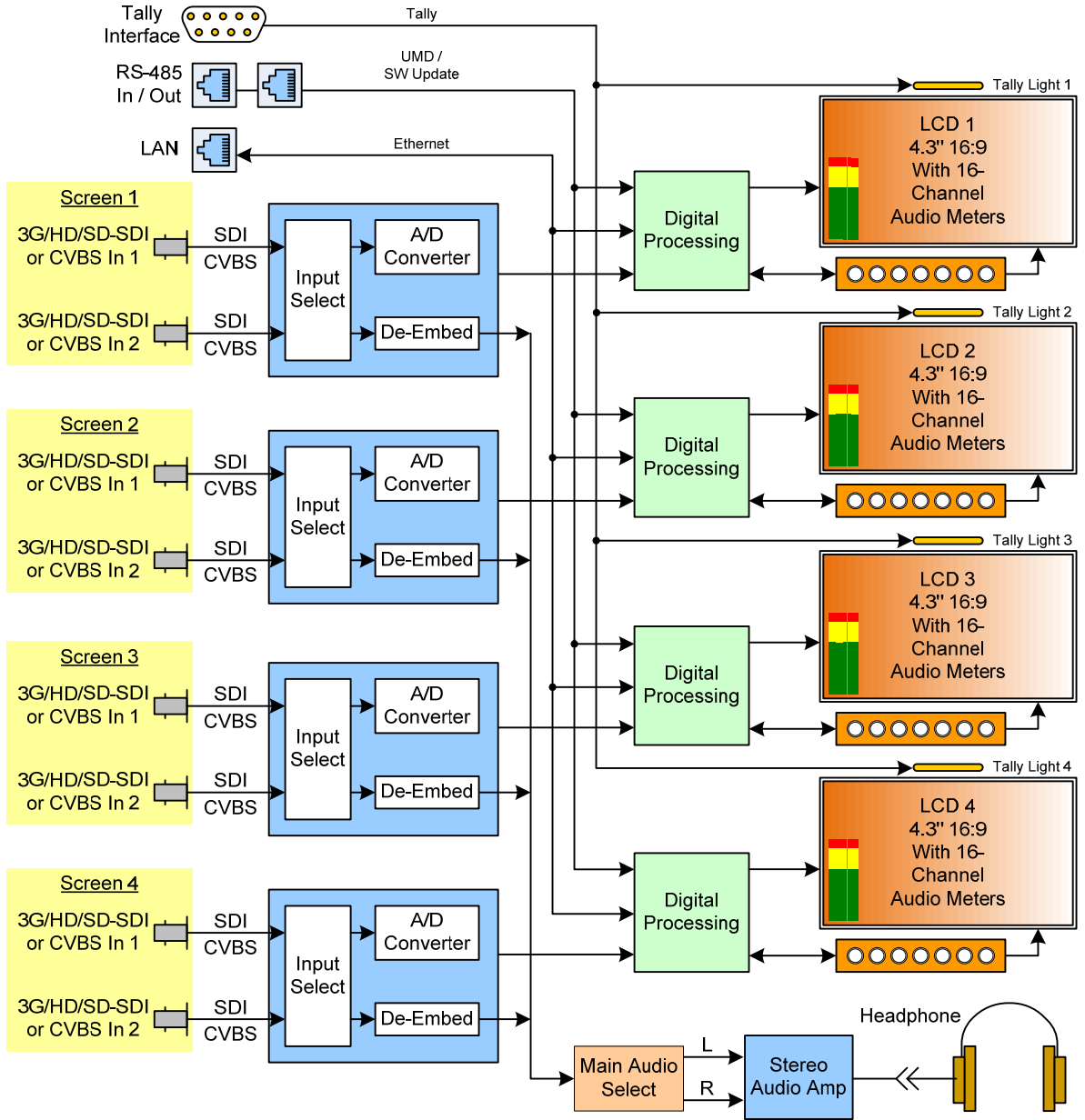




Figure 3-2: RM-2443WS-3G2 Block Diagram



# CHAPTER 4: Using Network Control

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The RM-2443WS Web GUI allows you to customize the monitor configuration to perfectly suit your needs. The following setup steps are not necessary if you intend to use the RM-2443WS in its default configuration or if you only make configuration changes using the OSD Menus. However, the RM-2443WS Web GUI network control is ideal for configuring difficult to reach wall-mounted monitors.

## Web Browser / Control Device

Any web browser application running on any networked device such as desktop or laptop computer, tablet, or smart phone can be used with the RM-2443WS Web GUI.

If a tablet without a physical network connector is to be used, it needs to be linked to a copper LAN through a Wi-Fi adaptor.

Phones are not recommended due to their smaller screen size, which would require more scrolling.

The Chrome® web browser is recommended for speed and compatibility.

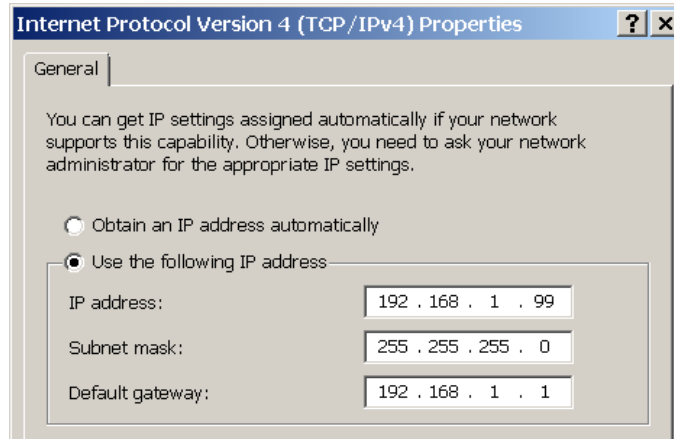
## First Time- IP Assignments

The RM-2443WS operates with a static (fixed) IPv4 address. The address will be **192.168.1.86** when received from the factory or when reset at the front panel. This is shown in Figure 4-2. The IP address will need to be changed to some other address to be compatible with the customer's network address assignments. Go to [System setup](#), immediately after this host setup is done, to change the unit's address.

The surest way to do this, free of possible network conflicts, is to establish a direct peer-to-peer connection between the setup computer and the RM-2443WS. A 10/100/1000 MHz Ethernet switch may be used in between, but is not required.

Figure 4-1 shows an example of suitable address settings for the host computer in a Windows 7 control panel.

Figure 4–1: Host IP Settings



After making an IP address change such as this, close the control panel and reboot the host computer to be sure the change takes effect.

Make the final address, mask and gateway changes in the RM-2443WS [System setup](#) page.

## Status Page

The full network control browser window is shown in Figure 4-2. Enter the monitor's IP Address into the browser's address bar and press the Enter key to access the web server.

Select whether **Monitor 1** or **Monitor 2** settings are to be changed in the upper left bar, or check the **Apply To All** box for global control.

Throughout the Web GUI, other pages are one click away in the menu at the left side of the screen. The currently selected page is highlighted in yellow.

Note that the IN1 and IN2 video input selection, which is present only on the RM-2443WS-3G2, only switches the input and does not create a separate setup for each input.

Figure 4-2: Status Page

IP Address

The screenshot shows a web browser window with the URL 192.168.1.86. The page header displays the 'Wohler' logo. Below the logo, there are radio buttons for 'Monitor 1' and 'Monitor 2', and 'IN1' and 'IN2'. An 'Apply to All' button is located on the right. A vertical navigation menu on the left lists various settings: STATUS, ADJUST, VIDEO DISPLAY, INPUT SETUP, MARKER, AUDIO, DISPLAY, CLOSE CAPTION, CONFIG, COLOR TEMPERATURE, FUNCTION KEY, IMD, and SYSTEM. The 'STATUS' option is selected, and its details are shown in a table.

STATUS	
INPUT	CVBS 1
COLOR TEMPERATURE	D65
SCAN	NORMAL
MODEL	RM-2443WS-3G2
SERIAL NUMBER	R3270D2015100034

# Adjust Page

An (S) icon following a parameter name indicates that the parameter is only local for the currently selected monitor screen. Otherwise, the parameter is global and the setting applies to both screens.

Click the **SET** button to change a parameter value.

Figure 4-3: Adjust Page

ADJUST	
CONTRAST (S)	50 <input type="text"/> SET
BRIGHT (S)	50 <input type="text"/> SET
CHROMA (S)	50 <input type="text"/> SET
ASPECT	<input checked="" type="radio"/> 4:3 <input type="radio"/> 16:9
BLUE ONLY	<input checked="" type="radio"/> NORMAL <input type="radio"/> BLUE
MONO	<input checked="" type="radio"/> NORMAL <input type="radio"/> MONO
H/V DELAY	OFF <input type="text"/> ▼ SET
MUTE	<input checked="" type="radio"/> Current Audio Level <input type="radio"/> MUTE
FREEZE	<input checked="" type="radio"/> OFF <input type="radio"/> ON
AUDIO MONITOR	<input checked="" type="radio"/> OFF <input type="radio"/> ON
WIN SOURCE	<input checked="" type="radio"/> MAIN <input type="radio"/> SUB
VOLUME (S)	16 <input type="text"/> SET

# Video Display Page

Figure 4-4: Video Display Page

VIDEO DISPLAY	
SCAN	<input type="text" value="NORMAL"/> ▾ SET
NATIVE	<input checked="" type="radio"/> OFF <input type="radio"/> ON

# Input Setup Page

Figure 4-5: Input Setup Page

INPUT SETUP	
IN 1	<input type="text" value="SDI1"/> ▾ SET
IN 2	<input type="text" value="SDI2"/> ▾ SET
NTSC SETUP	<input type="radio"/> 0 <input checked="" type="radio"/> 75
NTSC PHASE	<input type="text" value="0"/> SET
INPUT SELECT	<input checked="" type="radio"/> IN 1 <input type="radio"/> IN 2

# Marker Page

The **MARKER OFF/ON** setting enables or disables the visibility of all markers on the screen. The settings of each marker are retained as the last change made from either the OSD Menu or this Network Control Page.

Figure 4–6: Marker Page

MARKER	
MARKER	<input type="radio"/> OFF <input checked="" type="radio"/> ON
AREA MARKER	1.85:1 <input type="button" value="SET"/>
AREA MARKER	<input type="radio"/> OFF <input checked="" type="radio"/> 16:9
CENTER MARKER	<input type="radio"/> OFF <input checked="" type="radio"/> ON
SAFETY MARKER	90% <input type="button" value="SET"/>
MARKER LEVEL	2 <input type="button" value="SET"/>
MARKER MAT	HALF <input type="button" value="SET"/>
CROSS HATCH	<input type="radio"/> OFF <input type="radio"/> ON

# Audio Page

First select the **AUDIO SOURCE**. Then select **SPEAK OUT** selections for **LEFT** and **RIGHT** channels. These apply to the headphone jack output.

**METER SELECT** controls which and how many channels are metered, independently of the **SPEAK OUT** selections.

An **(S)** icon following a parameter name indicates that the parameter is only local for the current selected monitor. Otherwise, the parameter is global and the setting applies to both screens.

Figure 4-7: Audio Page

AUDIO	
AUDIO SOURCE (S)	EBD ▼ SET
SPEAK OUT LEFT (S)	EBD CH15 ▼ SET
SPEAK OUT RIGHT (S)	EBD CH16 ▼ SET
AUDIO METER	<input type="radio"/> OFF <input checked="" type="radio"/> ON
METER SELECT	CH1-2 ▼ SET
REF LEVEL	<input checked="" type="radio"/> -20dB <input type="radio"/> -18dB
OVER LEVEL	-10dB ▼ SET
METER DIRECTION	<input checked="" type="radio"/> VERTICAL <input type="radio"/> HORIZONTAL
METER POSITION	BOT LEFT ▼ SET
METER DIS MODE	<input type="radio"/> MODE1 <input checked="" type="radio"/> MODE2



# Close Caption Page

Figure 4–8: Close Caption Page

CLOSE CAPTION	
CLOSE CAPTION	CC1 <input type="button" value="SET"/>
SDI CC LOG	<input type="radio"/> OFF <input checked="" type="radio"/> ON

# Config Page

An (S) icon following a parameter name indicates that the parameter is only local for the current selected monitor. Otherwise, the parameter is global and the setting applies to both screens.

Figure 4–9: Config Page

CONFIG	
FAST MODE (S)	<input type="radio"/> OFF <input type="radio"/> ON
FILM MODE DET (S)	<input type="radio"/> OFF <input type="radio"/> ON
BACKLIGHT	15 <input type="button" value="SET"/>
AUTO STANDBY	<input type="radio"/> OFF <input checked="" type="radio"/> ON
APPERTURE (S)	0 <input type="button" value="SET"/>
LANGUAGE	<input type="radio"/> ENGLISH <input type="radio"/> 中文

# Color Temperature Page

As with the OSD Color Temp Menu, **COPY FROM** specifies a USER profile is to be made from it. The USER color profile can be modified as desired from within the OSD Menu.

In Figure 4-10, Color Space has been expanded to show the choices available.

Figure 4-10: Color Temperature Page

COLOR TEMPERATURE	
COLOR TEMPERATURE	D65 ▼ SET
COPY FROM	D65 ▼ SET
RESET	RESET
COLOR SPACE	AUTO ▼ SET
	OFF
	EBU
	SMPTE-C
	ITU-709
	AUTO

# Function Key Page

In Figure 4-11, F2 is shown expanded to see choices available for either function key's assignment. Some functions, such as FREEZE, can only be initiated by a function key if there is no menu setting for enabling the function.

Figure 4-11: Function Key Page

FUNCTION KEY	
F1	SCAN <input type="button" value="SET"/>
F2	NATIVE <input type="button" value="SET"/> UNDEF SCAN NATIVE ASPECT BLUE ONLY MONO MARKER HW DELAY AUDIO METER FASTMODE TC IMD MUTE CC FREEZE

# IMD Page

There are two ways to enter static IMD character strings, via the network with this page, or with the OSD IMD Menu. Both are retained in the monitor's memory, and **IMD PROTOCOL** settings of **LOCAL** vs. **NETWORK** decides which one is displayed.

In Figure 4-12, Tally Source has been expanded to show the available choices.

Figure 4-12: IMD Page

IMD	
IMD DISPLAY	<input type="radio"/> OFF <input checked="" type="radio"/> ON
IMD COLOR	WHITE ▼ SET
IMD CHARACTER	SET
IMD PROTOCOL	NETWORK ▼ SET
IMD ID	0 SET
IMD NAME	XXXXXXXXXXXXXXXXXX SET
BAUD RATE	115200 ▼ SET
LED TALLY	<input type="radio"/> OFF <input checked="" type="radio"/> ON
OSD TALLY MODE	RG ▼ SET
IMD TALLY MODE	T1 ▼ SET
TALLY SOURCE	STANDARD ▼ SET STANDARD IMAGE VIDEO TSL

# System Page

Set a unique **IP ADDRESS** for each RM-2443WS monitor to be used in a local area network (LAN).

The **MASK** is usually set as shown, but can be altered to suit your IT configuration and administration needs.

The first three **GATEWAY** number blocks usually match the first three number blocks of the IP ADDRESS, and the last number is usually 1.

The **LOCK NUMBER** is only needed in certain software installation situations. Do not change it unless instructed by Wohler Customer Service.

Version numbers are additional information that may be useful when consulting with Wohler Customer Service.

Figure 4–13: System Page

SYSTEM	
IP ADDRESS	<input type="text" value="192.168.1.86"/> SET
MASK	<input type="text" value="255.255.255.0"/> SET
GATEWAY	<input type="text" value="192.168.1.1"/> SET
LOCK NUMBER	<input type="text"/> SET
32626 Version	5
FPGA Version	2
F107 Version	7