RMQ-230-3G-TT

23" Audio/Video Quad Split Tabletop Monitor

User Guide

Part Number 821097, Revision B

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Last Update
January 23, 2017

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Introduction

Overview

The RMQ-230-3G-TT Quad Split monitor sets a new standard in LCD monitors for broadcast and professional video applications. The RMQ-230-3G-TT is a tabletop monitor that provides a 23", 8-bit, 1920 x 1080 resolution, 16:9 format, anti-glare IPS LCD screen. It can be used in both single image and Quad Split applications. All video formats are accurately scaled to fit on the screen in the highest quality using 10-bit digital processing, 3D comb filter, de-interlace, precision scaling, gamma correction, and color temperature adjustment to produce the best images possible.

Features

The RMQ-230-3G-TT audio/video monitor is designed for confidence monitoring of up to four 3G/HD/SD-SDI, one HDMI/DVI, or up to four CVBS composite analog video inputs. Input signals are easily selected and displayed. One or four selected inputs can be displayed. Two to sixteen audio channels may be selected for each input for visual monitoring on bar graph style level meters. On screen marker, waveform, and vector displays can be enabled on this full-featured monitor. Stereo speakers provide audio monitoring. A headphone jack and stereo analog audio outputs are also provided for external audio monitoring.

All image and audio monitoring parameters are set individually for each video Input Split, as though each one were a physically separate monitor. Parameters are selected and adjusted using an On Screen Display (OSD) Menu or via a network connection. Monitor settings can also be made with a web browser over Ethernet using the integral web server. This greatly simplifies setup and management, especially when there are a number of RMQ-230-3G monitors in a facility.

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).

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 RMQ-230-3G is designed to be placed on a tabletop or other flat surface. It may be tilted forward or backward for easier viewing. Position it at ear/eye level for best high frequency response and visual observation of the display screen. 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 near other equipment)
0"	Top and Bottom (if no other equipment)

Heat Dissipation

The ambient temperature near the product should not exceed 40° Celsius (104° Fahrenheit). In warm environments, allow an inch of space above and below the unit for air circulation.

Important

To reduce noise, the monitor does not have any fans. As a result, the heat generated by the audio amplifiers, power supplies, and other components is vented by slots in the back of the unit. Therefore, as a safety precaution, you must allow proper ventilation on these surfaces.

Sympathetic Vibration

Sympathetic vibration from other equipment (cables, etc.) in the vicinity 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

The chassis is to be securely attached its table stand. In addition, the chassis is very shallow from front to back. This feature will reduce or eliminate rear bracing requirements in many mobile/portable applications. It can be tilted forward or backward for viewing, if necessary. 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 (90W, 100 to 240 VAC, ±10%, 50/60Hz) through the IEC connector provided on the power supply.

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

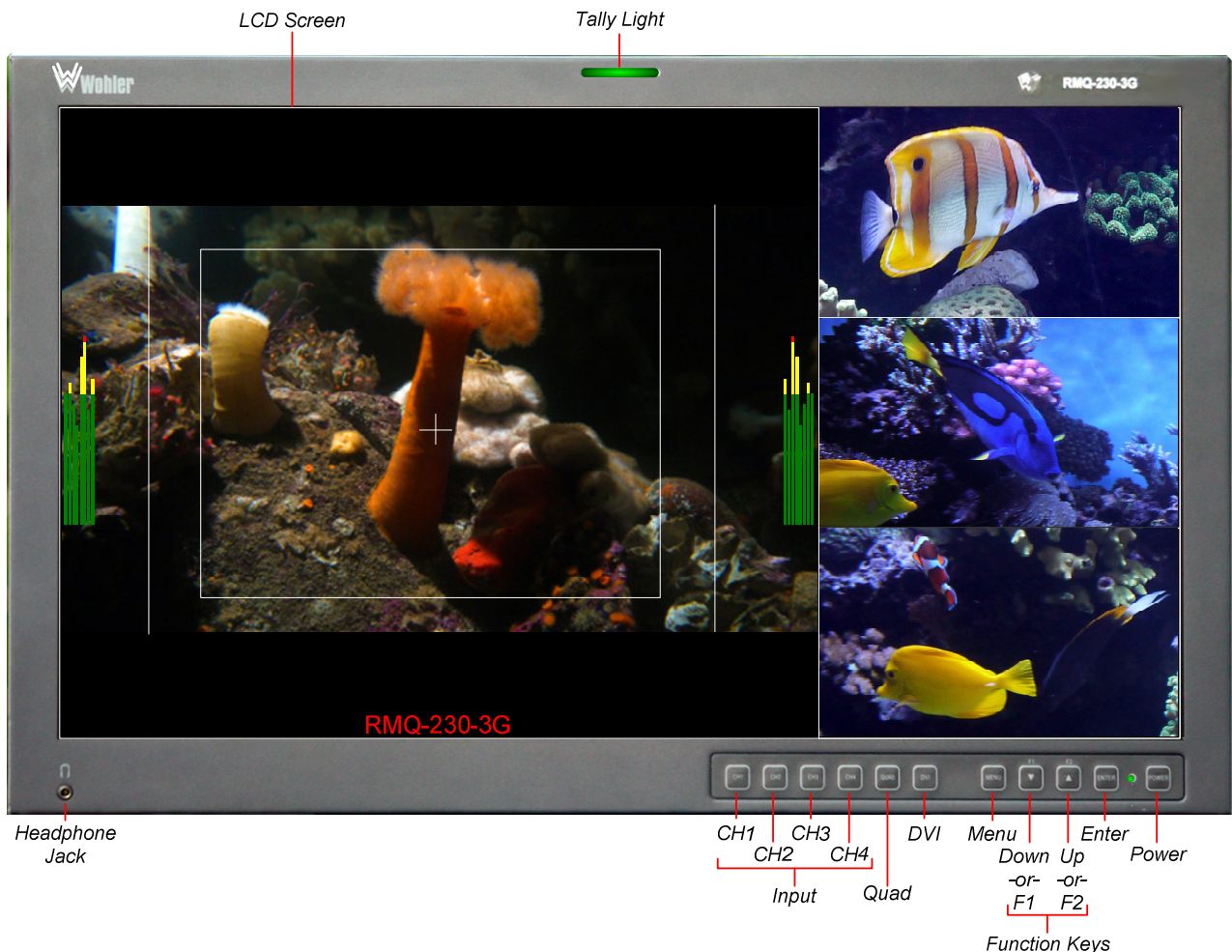This Class A digital apparatus complies with Canadian ICES-003.

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

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CHAPTER 2: Local Operation

The RMQ-230-3G-TT front and rear panels and menus are described in this chapter.

Front Panel

Figure 2–1: Front Panel Layout

1. **Tally Lights**: This tri-color (red/green/amber) light is controlled through a RJ45 connector or through the Tally connector on the rear panel. For details on these connectors, refer to the Rear Panel section of this chapter.

2. **LCD Screen**: The LCD screen displays the audio meters, selected video channel, one of two Quad Split screen layouts, closed captioning, waveform/vector, menus, and OSD features along with the monitored video.

3. **Power**: The **Power** button sets the monitor to On or Standby mode. The adjacent **Power Indicator** glows green to indicate On and red to indicate Standby.

4. **Input CH1, CH2, CH3, CH4**: The **Input** buttons select one of the four video/audio inputs to be displayed full screen from the various connectors on

the rear panel. The selected input source is indicated when one of the **Input** buttons is pressed. These buttons are used to select which audio source will be monitored audibly and also which Input Split window will be adjusted by the OSD Menus. To change the monitored audio to another split while in Quad Split mode, press the **Input** button of the source you want and then press the **Quad** button again.

5. **Quad**: The **Quad** button puts the monitor into Quad Split mode and selects one of two possible Quad Split layouts. Refer to Figure 2-2. Repeated pressing of the **Quad** button alternates between the two layouts.

Figure 2-2: Quad Layouts

Layout 1   Layout 2

6. **DVI**: The **DVI** button alternates between **SDI / CVBS In 1** and **HDMI** for Split window 1.

7. **Function Keys**: When the OSD Menu is not displayed, pressing **F1** or **F2** activates the assigned function. The default assignments are as listed in Table 2-1. The action of each **Function Key** can be selected from a wide variety of actions in the Function Key Menu as described in Table 2-9.

Table 2-1: Default Function Key Actions

Key	Default Action
F1	Scan
F2	Aspect

8. **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.

9. **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 frequently used volume and image controls. Refer to the **Quick Menu** section of this chapter.

10. **Down**: When the OSD Menu is displayed, the **Down** button navigates down through the menu and sub-menu selections and can be used to adjust the

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settings. It also adjusts the settings in the Quick Menu.

11. **Up**: When the OSD Menu is displayed, the **Up** button navigates down through the menu and sub-menu selections and can be used to adjust the settings. It also adjusts the settings in the Quick Menu.

12. **Headphones**: A standard 1/8" stereo headphone jack is provided. The speakers will mute when a headphone is inserted into this jack. The source is selected by the **CH1 - CH4 Input** buttons. The volume level is adjusted using the Quick Menus.

On-Screen Display Features

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

Overlays can be added by the operator for **Area & Safety Markers**, **Center Marker**, and to display names as **IMD** (**I**n **M**onitor **D**isplay) for identification.

Video effects such as **Monochrome**, **Blue Only**, **H/V Delay**, and other features can be used to assist setup. For convenience and quicker access, these and other features can be assigned to the **Function Keys**.

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

Audio level meter displays, for up to sixteen channels, are displayed vertically, positioned at the left and right of each split window. They can show VU, PPM (PK) or both with assignable -20db to -18db reference levels.

Waveform or **Vectorscope** displays can be shown for the **In 1** and **In 3** input channels. If enabled, this display for the **In 1** video signal will show in place of the **In 2** video input signal, on the second split window. The Waveform or Vectorscope display for the **In 3** video signal will show in place of the **In 4** video input signal, on the fourth split window.

Closed Captions from CVBS Line 21 (CEA-608) can be decoded and text is displayed across the window bottom.

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

Some of the various overlays are shown in Figure 2-3.

Figure 2-3: Display Features
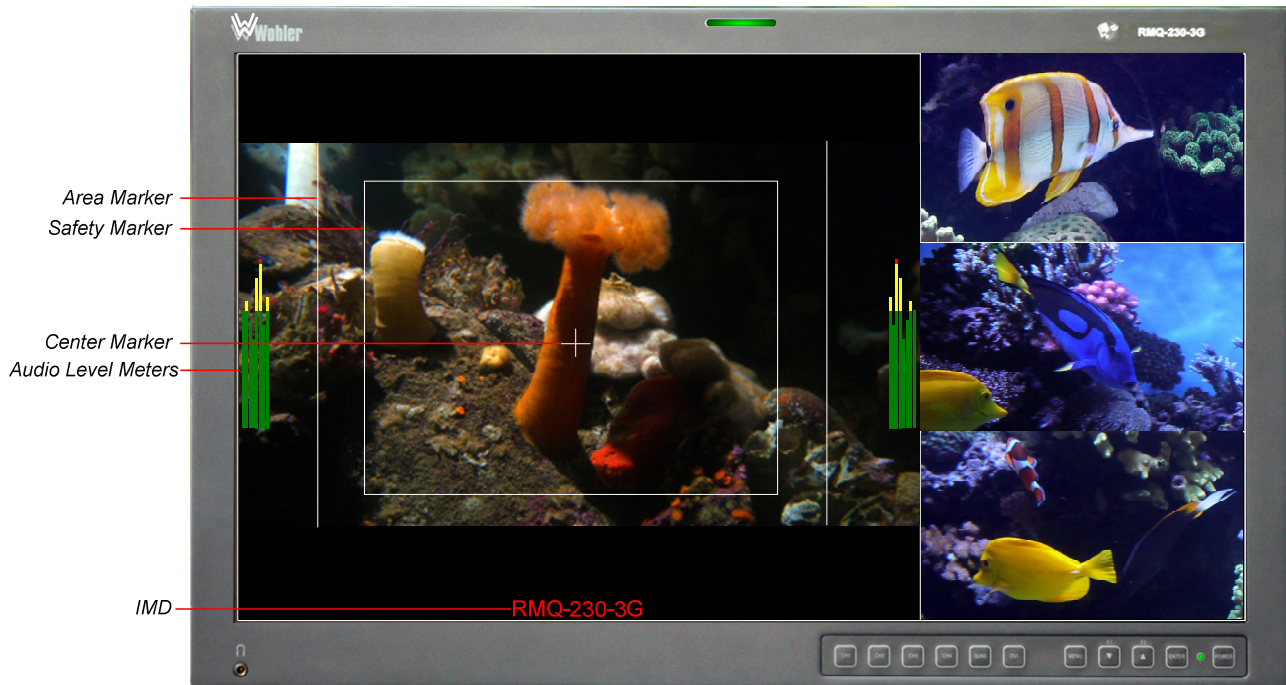
1. **Area Marker**: Used to mark an alternate aspect ratio area of the image. You can set whether to display it, the brightness, and the matte mode in the Marker Menu. Refer to Table 2-7.
2. **Safety Marker**: This is used to mark a percentage area, inside of the image, safe for titles to be located. You can set whether to display it, as well as its display mode, in the Marker Menu. Refer to Table 2-7.
3. **Center marker**: Cross hairs are displayed in the center of the screen, marking the center of the image. You can set whether to display them in the Marker Menu. Refer to Table 2-7.
4. **IMD**: The IMD Menu provides settings to customize the IMD (In Monitor Display) text area to show a static line of characters, numbers, and certain symbols or to receive dynamic messages to be displayed. Refer to Table 2-10.
5. **Audio Level Meters**: Levels for the audio channels are displayed on up to sixteen bar graph meters as left/right pairs. Refer to Table 2-8.

Rear Panel
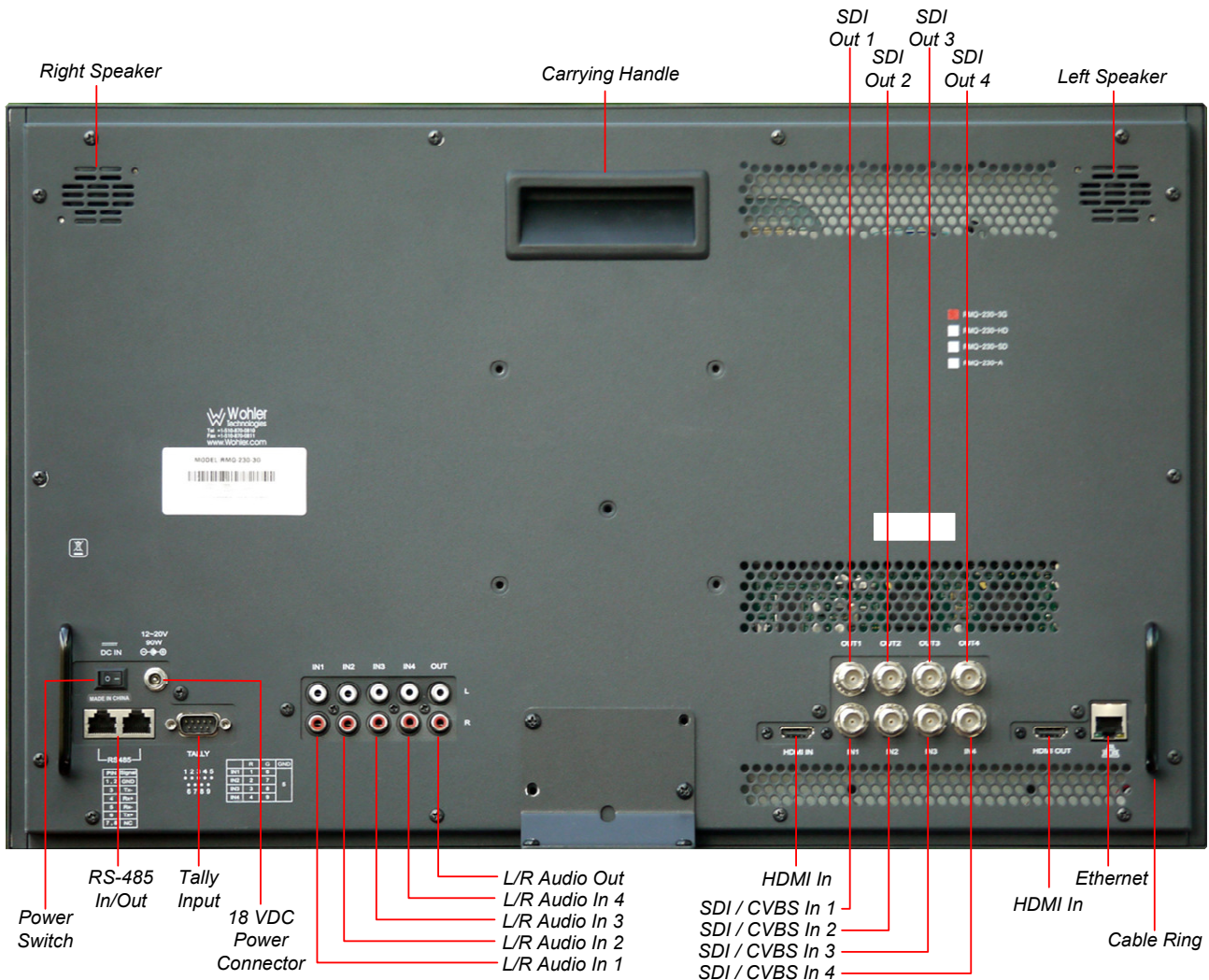
Important:

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. **SDI / CVBS 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 and automatically detects a CVBS signal. It can be viewed as part of the Quad Split or as full screen by pressing the **CH1** button.

2. **SDI / CVBS In 2**: 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 and automatically detects a CVBS signal. It can be viewed as part of the Quad Split or as full screen by pressing the **CH2** button.

3. **SDI / CVBS In 3**: 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 and automatically detects a CVBS signal. It can be viewed as part of the Quad Split or as full screen by pressing the **CH3** button.

4. **SDI / CVBS In 4**: 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 and automatically detects a CVBS signal. It can be viewed as part of the Quad Split or as full screen by pressing the **CH4** button.

5. **SDI 1 Out**: This connector provides a re-shaped and re-clocked duplicate of the **SDI 1 In** signal. This connection is compliant with SMPTE 424M, SMPTE 259M, SMPTE292M/ITU-R BT601.

6. **SDI 2 Out**: This connector provides a re-shaped and re-clocked duplicate of the **SDI 2 In** signal. This connection is compliant with SMPTE 424M, SMPTE 259M, SMPTE292M/ITU-R BT601.

7. **SDI 3 Out**: This connector provides a re-shaped and re-clocked duplicate of the **SDI 3 In** signal. This connection is compliant with SMPTE 424M, SMPTE 259M, SMPTE292M/ITU-R BT601.

8. **SDI 4 Out**: This connector provides a re-shaped and re-clocked duplicate of the **SDI 4 In** signal. This connection is compliant with SMPTE 424M, SMPTE 259M, SMPTE292M/ITU-R BT601.

9. **HDMI In**: This input supports HDMI and DVI signals. It uses an HDMI Type-A connector. The **DVI** button selects between the SDI 1 In and HDMI signals on Split window 1.

10. **HDMI Out**: This output can be used to display the Quad Split video screen on an external monitor. It uses an HDMI Type-A connector.

11. **Audio In 1**: A pair of analog audio inputs related to the Line 1 video signal is provided on RCA jacks. They have a 47KΩ input impedance and will accept up to a 5dBu signal. These inputs are only active when the corresponding video input is receiving a CVBS signal and are selected when **CH1** is pressed.

12. **Audio In 2**: A pair of analog audio inputs related to the Line 2 video signal is provided on RCA jacks. They have a 47KΩ input impedance and will accept up to a 5dBu signal. These inputs are only active when the corresponding video input is receiving a CVBS signal and are selected when **CH2** is pressed.

13. **Audio In 3**: A pair of analog audio inputs related to the Line 3 video signal is provided on RCA jacks. They have a 47KΩ input impedance and will accept up to a 5dBu signal. These inputs are only active when the corresponding video input is receiving a CVBS signal and are selected when **CH3** is pressed.

14. **Audio In 4**: A pair of analog audio inputs related to the Line 4 video signal is provided on RCA jacks. They have a 47KΩ input impedance and will accept up to a 5dBu signal. These inputs are only active when the corresponding video input is receiving a CVBS signal and are selected when **CH4** is pressed.

15. **Audio Out**: A pair of analog outputs is provided on RCA jacks. They will output the audio from the selected SDI or HDMI video source. If the input source is CVBS, the will output the audio from the corresponding **Audio In** jack. They can be used to source external amplifiers and speakers. They have a 500Ω output impedance and will produce up to a 5dBu signal.

16. **Power Connector**: The supplied 100 to 240VAC to 18VDC power supply plugs into this coax connector. The RMQ-230-3G will operate on 12 to 19VDC at 90W.

17. **Power Switch**: This switch removes all power from the product. Normally, since this switch is on the rear panel, it is left in the **1 (On)** position and the front panel **Power** button is used to start and stop product operation.

18. **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.

19. **Tally**: This DB9 jack controls the tally light on the front panel. Refer to Figure 2-5 below for the pinout and Table 2-2 for the terminal connections.

20. **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 2-6 below for the pinout and to Table 2-3 for terminal connections. These connections are also used for system software upgrades. Either CAT5 or CAT6 cables may be used for these jacks.

21. **Right and Left Speakers**: The audio monitoring speakers are positioned on the rear panel. The source is selected by the **CH1 - CH4 Input** buttons. The volume level is adjusted using the Quick Menus. Refer to the Quick Menu section of this chapter.

22. **Carrying Handle**: A carrying handle is provided so that the monitor can be securely carried from location to location.

23. **Cable Rings**: Rings are provided on the right and left of the rear panel to be used for routing and securing the connecting cables, if desired.

Rear Panel Connectors

The following figures 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 2-2: Tally Input Connections

Input	Red	Green	Ground
1	1	6	
2	2	7	5
3	3	8	
4	4	9	

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.
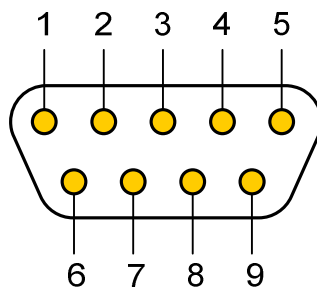
Figure 2-5: Tally Input Pin-Out
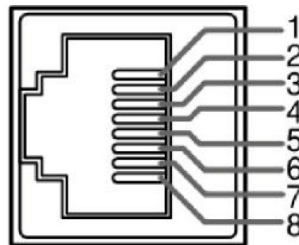

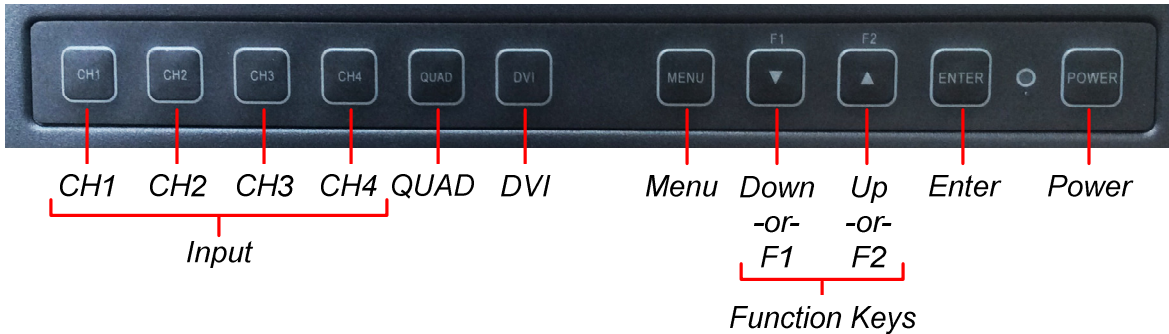Figure 2-6: RS-485 I/O Pin-Out

Table 2-3: 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

Refer to Figure 2-7 for the location of each control button.

CH1 CH2 CH3 CH4 QUAD DVI   Menu Down Up   Enter   Power
                                         -or- -or-
Input   F1   F2

Function Keys

Quick Menu Operation

The Quick Menu provides quick access to a few commonly used features, as listed in Table 2-4. The Quick Menu appears as shown in Figure 2-8.

Figure 2-8: Quick Menu - Volume Setting

| Volume | | 16 |

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

1. The Quick Menu will adjust the volume and picture controls for the currently selected Input Split window. If not selected already, press the **Input** button (**IN1** - **IN4**) which corresponds to the Split for which you would like to view or adjust the parameters. Refer to Figure 2-9.

2. Press the **Enter** button to display the Quick Menu and the first item that can be adjusted.

3. Use the **Up** and **Down** buttons to change the value for the item displayed.

4. Press the **Enter** button again to display the next adjustable item.

5. 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 2-4: Quick Menu

Parameters	Default Value	Domain Range
VOLUME	16	0 - 30
BRIGHTNESS	50	0 - 100
CONTRAST	50	0 - 100
CHROMA	50	0 - 100

OSD Menu Operation

The OSD Menus allow you to adjust a wide variety of control parameters for each Input Split. Refer to Table 2-5 through Table 2-11 for typical values and domain ranges. The following is a description of how to use the OSD Menus:

1. Press the **Input** button (**IN1** - **IN4**) which corresponds to the Input Split for which you would like to view or adjust the parameters. Refer to Figure 2-9. Each Input Split window has fully separate adjustments.

2. Press the **Menu** button to display the Main Menu.

3. Use the **Up** and **Down** buttons to navigate through the submenus.

4. Press the **Enter** button to enter the parameter selections in the chosen submenu.

5. Use the **Up** or **Down** buttons to cycle through the submenu selections.

6. When the desired option is highlighted, press the **Enter** button to select it.

7. Use the **Up** or **Down** buttons to adjust the parameter value up or down, make a selection, or turn a function on or off.

8. Press the **Enter** button to accept your parameter change -or- press the **Menu** button to cancel your change.

9. Press the **Menu** button to back out of any submenu, and finally to remove the OSD Menus from the screen.

Figure 2-9: Input Map to Split Screens

Layout 1	Layout 2
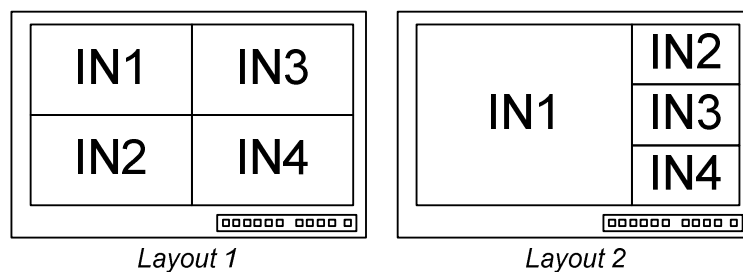
OSD Menus

The tables on the following pages describe the information and settings available in the OSD Menu system. Except where noted, the settings in the OSD Menus affect only the Input Split window that was selected before the OSD Menus were entered. This allows each Input Split window to be adjusted separately, as though it would a physically separate monitor. The number of this Input Split window is shown as the **CH** parameter in the **Status** menu. Use the instructions in the OSD Menu Operation section to navigate the menus.

Table 2-5: Status Menu Structure

Status			
Parameters	**Default Value**	**Domain Range**	**Description**
CH	Input Split number (IN1 to IN4) that you have selected to view or adjust.		
COLOR TEMP	D65	D32, D93, D65, D56, D50	
ASPECT MODE	NONE		
SCAN MODE	NORMAL	NORMAL, OVER, UNDER	Display only. Cannot be changed in this menu
IP ADDRESS	192.168.1.56		
SUBNET MASK	255.255.255.0		
SERIAL NUMBER	-		
MODEL	RMQ-230-3G		

Table 2-6: Color Temp Menu Structure

Color Temp			
Parameters	**Default Value**	**Domain Range**	**Description**
COLOR TEMP	D65	D56, D65, D93, USER	Set the color temperature.
RED GAIN*	128	0 to 256	Set the gain for each color.
GREEN GAIN*			
BLUE GAIN*			
RED BIAS*	32	0 to 64	Set the offset for each color.
GREEN BIAS*			
BLUE BIAS*			
RESET*	Resets Gain and Offset to Factory Default		

*** Note**: These items can only be selected if COLOR TEMP is set to USER.

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Table 2-7: Marker Menu Structure

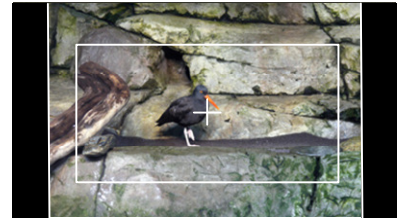| Marker			
Parameters	**Default Value**	**Domain Range**	**Description**
AREA MARKER	OFF	OFF (close area marker), 4:3, 13:9, 14:9, 15:9, 16:9, 1.85:1, 2.35:1	Set area marker size.
CENTER MARKER	OFF	OFF, ON	Turn center marker display on or off.
SAFETY MARKER	85%	OFF, 80%, 85%, 88%, 90%, 93%, 95%	Set safety marker size.
MARKER LEVEL	1	1: 50%, 2: 75%, 3: 100%	Set the luminance of all of the markers.
MARKER MAT	HALF	OFF, HALF (*Background 50%*) BLACK	Set the transparency of the area marker mat.

Figure 2-10: Marker Mat Effect
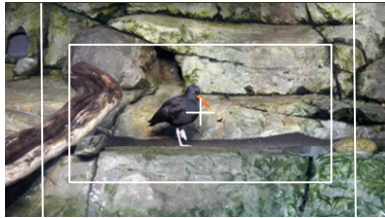
Marker Mat = OFF
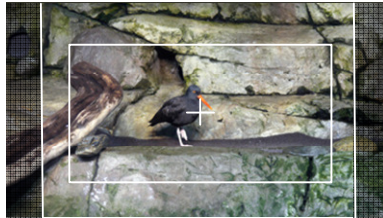
Marker Mat = HALF

Marker Mat = BLACK

Table 2-8: Audio Configuration Menu Structure

Audio Config			
Parameters	**Default Value**	**Domain Range**	**Description**
AUDIO SOURCE	EBD	OFF EXT: Analog Inputs EBD: SDI & HDMI Inputs	Select the audio source among the available signals.
SPEAKER L	OFF	OFF, CH1 to CH16	Select the input channel for the left speaker, headphone, or analog audio out.
SPEAKER R	OFF		Select the input channel for the right speaker, headphone, or analog audio out.
ACTIVE ONLY	OFF	OFF, ON	Only display audio meters for the selected video split that is being heard.
METER DISP	16CH	OFF, 2CH, 4CH, 6CH, 8CH, 10CH, 12CH, 14CH, 16CH	Set how many audio meters to display.
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)

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Table 2-9: User Config Menu Structure

User Config			
Parameters	**Default Value**	**Domain Range**	**Description**
B. LIGHT	15	0* to 30	Set the backlight brightness.***
LANGUAGE	ENGLISH	ENGLISH, CHINESE	Set the menu language. ***
PHASE	50	0 to 100	Color adjustment for NTSC images.
APERTURE	8	0 to 100	Set picture sharpness.
F1 BUTTON	SCAN	NONE MARKER AUD METER WAVEFORM H/V DELAY	Select the action of the F1 Function button.
F2 BUTTON	ASPECT	NATIVE BLUE ONLY MONO ASPECT SCAN	Select the action of the F2 Function button.
LAYOUT 2 MODE	16:9	16:9, 4:3	Set the format of the Layout 2 Quad Split. ***
LOCK NUMBER**	-	Up to 8 numbers and letters.	Set the lock number. ***

* Note: Use caution when setting the Backlight to a very low number. Setting the Backlight to 0 or a low number may make it impossible to see the menus to correct the situation.

** Note: Use caution when setting a lock number. Make a careful note of the lock number you choose so that you don't forget what it is.

*** Note: These parameters are not per individual Input Split window, but rather for the whole monitor.

Table 2-10: OSD Configuration Menu Structure (Page 1)

OSD Config Menu (Page 1)			
Parameters	**Default Value**	**Domain Range**	**Description**
NEXT PAGE			Proceed to Page 2 of the OSD Config Menu.
IMD DISPLAY	ON	OFF, ON	Turns the IMD Char text on or off.
IMD COLOR	RED	RED GREEN BLUE WHITE	Set the color of the IMD Char text.
IMD CHAR	RMQ-230-3G	Up to 16 characters	Set the IMD text to be displayed at the bottom of the screen.*
TC DISPLAY	ON	OFF, ON	Set whether to display time code, if available.
WAVE FORM	OFF	OFF WAVEFORM VECTOR 75 VECTOR 100	Set waveform/vector display preference.
WAVEFORM OVER LIMIT	90	50 to 100	Set the over limit of the waveform.
WAVEFORM UNDER LIMIT	10	0 to 100	Set the under limit of the waveform.
FORMAT DISPLAY	AUTO	OFF AUTO ON	Set how the input signal format is displayed.
CC	OFF	OFF CC1 CC2 CC3 CC4 TEXT1 TEXT2 TEXT3 TEXT4 XDS	Set the Closed Caption control.

* To enter the characters for the IMD CHARACTER setting, 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.

Table 2-11: OSD Configuration Menu Structure (Page 2)

OSD Config Menu (Page 2)			
Parameters	**Default Value**	**Domain Range**	**Description**
NEXT PAGE			Return to Page 1 of the OSD Config Menu.
IMD PROTOCOL	LOCAL	LOCAL TSL3.1 TSL4.0 IMAGE VIDEO (1510 protocol) UDP	Select an IMD protocol. *******
IMD ID	2	0 to 255 (unit ID number for Dynamic IMD/Tally)	Set the ID number for the IMD.
IMD NAME	M00000	Up to 16 characters	Set the ID Name for dynamic IMD/Tally.*
BAUD RATE	19200	9600 19200 38400	Set the BAUD rate for RS-485 communication. *******
OSD TLY MODE	RG	OFF RG GR RGY	Set OSD Tally option.
IMD TLY MODE	T1	T1 T2 T1T2 T2T1 T1- T2- T1T2- T2T1-	Select the IMD tally mode for Image Video.
TLY SOURCE	STANDARD	STANDARD (rear Tally connector) IMAGE VIDEO HW IMAGE VIDEO 422 STANDARD+IM422 TSL	Set the Tally Source.

* To enter the characters for the IMD NAME setting, 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.

*** Note: These parameters are not per individual Input Split window, but rather for the whole monitor.

CHAPTER 3: Technical Info

Table 3–1: Specifications

Specification	Values/Domains
Power requirements	100 V to 240 VAC ± 10%, 50/60Hz
Power consumption	90 Watts
RMQ-230-3G with tabletop stand	14.5" H x 22.0" W x 6.3" D 369 mm H x 560 mm W x 160 mm D
Weight with stand	17.3 lbs. (7.85 kg)
Supplied Accessories	Power Adapter, AC Power Cord
Display Type	IPS-LCD with LED Backlight
Number of Displays	1 (Quad Split)
Screen Size	23" diagonal per screen
Screen Resolution	1920(H) x 1080(V)
Aspect ratio	16:9, 4:3
Display Area (mm)	509(H) x 286(V)
Viewing Angle	178°(H) x 178° (V)
Color Depth	16.7M colors
Contrast Ratio	1000:1
Brightness	250 cd/m^2, typical
Backlight	White LED
Response Time	15 ms, typical
Video Inputs	CVBS: PAL/NTSC
	SD-SDI: SMPTE 259M, ITU-R BT.656
	HD-SDI: SMPTE 292M/274M/296M
	3G-SDI: SMPTE 425-Level A
	DVI/HDMI: 1.3a
Video Input Impedance	SDI and CVBS: 75Ω
Audio Inputs	4 Stereo Pairs; Analog on RCA
Audio Input Impedance	20kΩ
Audio Outputs	1 Selected Pair; 1/8" Headphone jack and Analog on RCA
Speakers	5W x 2 (Stereo)
Dynamic Tally/IMD	RS-485; TSL/ImageVideo on RJ-45
Network Setup/Control	10/100M Ethernet; Web Server on RJ-45

Figure 3–1: RMQ-230-3G Block Diagram

Figure 3–1: RMQ-230-3G Block Diagram
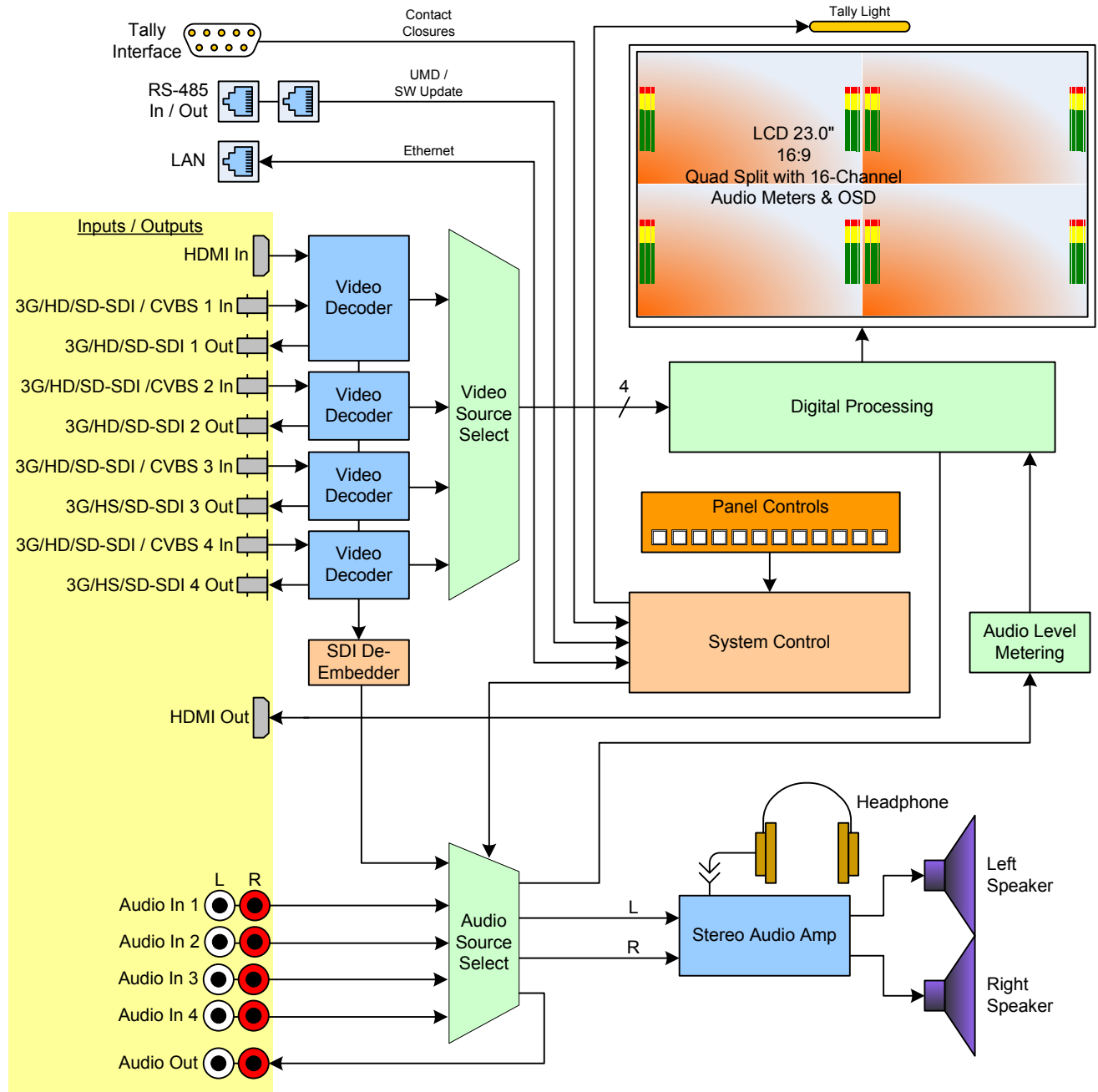
Supported Video Formats

The RMQ-230-3G monitor will display the video formats listed in Table 3-2.

Table 3-2: Video Formats

Format	3G/HD/ SD-SDI	CVBS	HDMI
PAL		X	
NTSC		X	
480i60/59.94	X		X
576i50	X		X
720p50	X		X
720p60/59.94	X		X
1035i60/59.94	X		X
1080i50	X		X
1080i60/59.94	X		X
1080p50	X		X
1080p60/59.94	X		X

CHAPTER 4: Using Network Control

The RMQ-230-3G 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 RMQ-230-3G in its default configuration or if you only make configuration changes using the OSD menus. However, the RMQ-230-3G Web GUI network control is ideal for configuring difficult to access 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 RMQ-230-3G 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 RMQ-230-3G operates with a static (fixed) IPv4 address. The address will be **192.168.1.56** 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.

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 RMQ-230-3G. 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
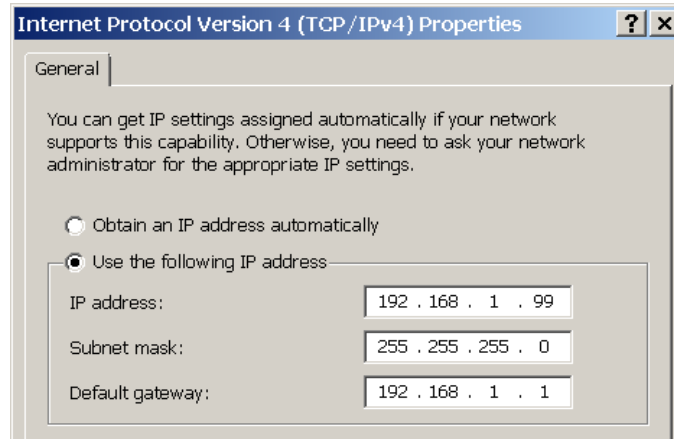
After making an IP address change such as this, close the control panel and reboot the host computer to be sure the change takes effect. Open your browser and enter the address of the RMQ-230-3G, which will be **192.168.1.56** from the factory. You should see the Initial Screen of the Web GUI, as shown in Figure 4-2.

Figure 4–2: Initial Screen
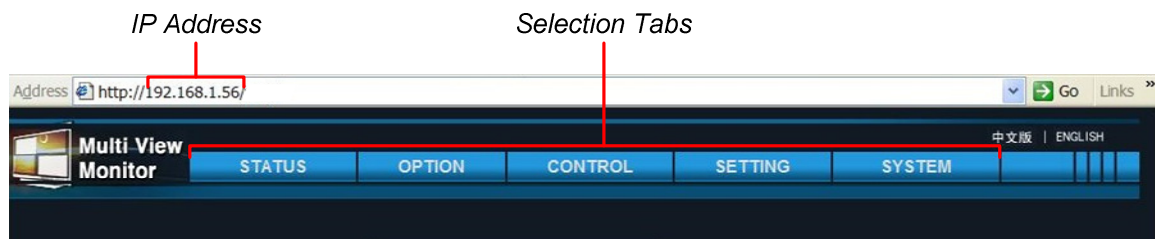
Immediately after this connection is made, click the **Setting** tab. The Setting Screen is shown in Figure 4-3. If needed, make the final address, mask and gateway changes and click **Apply**.

Figure 4–3: Setting Screen

Set a unique **IP ADDRESS** for each RMQ-230-3G 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.
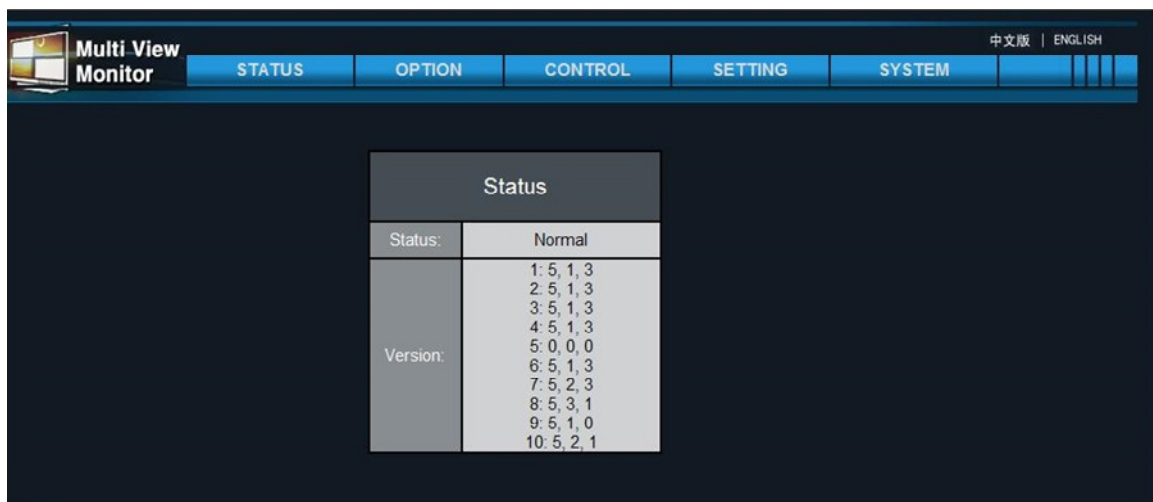
Initial Screen

The initial network control browser window is shown in Figure 4-2. The various menu pages of settings are quickly selected by clicking one of the 5 Selector Tabs arranged horizontally at the top. On some Tabs, there will be additional menu buttons listed vertically at the left to narrow down the topic. After selecting a Selector Tab, select a Menu button. The various screens are described in the following sections.

Status Menu

The Status Menu does not contain any settable options. It simply lists firmware version numbers within the RMQ-230-3G. Version numbers are additional information that may be useful when consulting with Wohler Customer Service.

Figure 4-4: Status Menu

Option - Video Adjustment Menu

Click the **Option** tab and then the **Adjustment** button under the Video heading. The settings in this menu are made individually for each of the four Quad Split windows. The **Refresh** button will retrieve the settings from the RMQ-230-3G, although this is done automatically when the network connection is made. The **+** and **-** buttons may be used to make incremental setting changes. After making each change, click the **Set** button to put it into effect, saving it to the RMQ-230-3G. Changes to one Quad Split window can be copied to other windows using the **Copy** and **Paste** buttons. The **Paste** to all button will copy the changes from one window to all of the windows. To copy the change to all of the other Quad Splits, click the **Paste to all** button.

Figure 4–5: Video Adjustment Menu
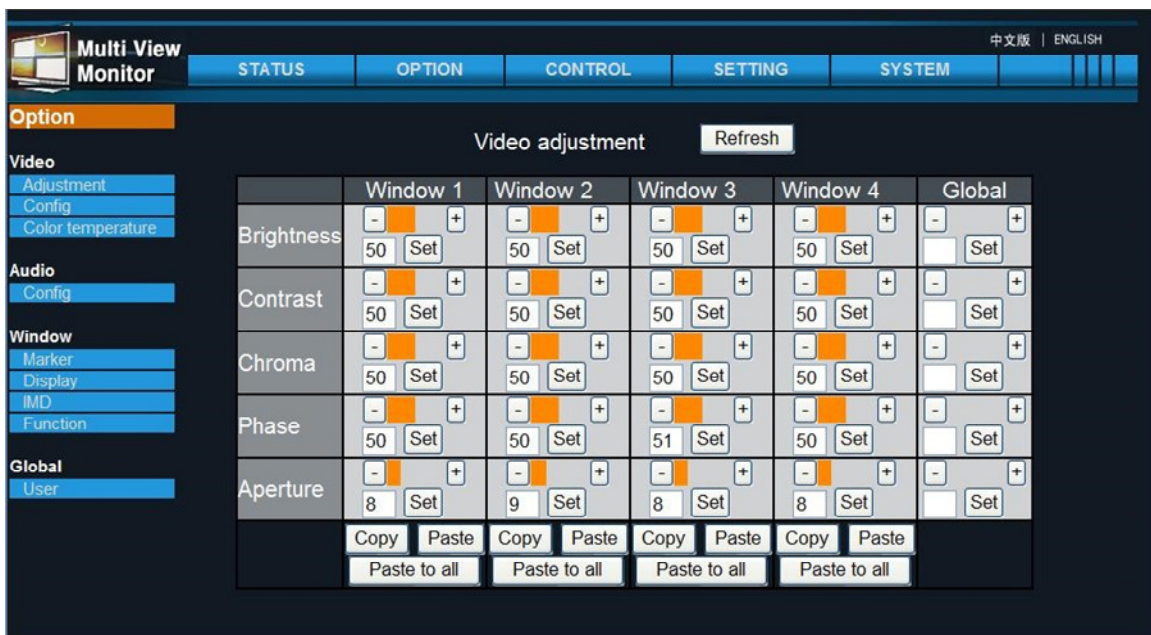
Option - Video Config Menu

Click the **Option** tab and then the **Config** button under the Video heading. The settings in this menu are made either individually for each of the four Quad Split windows or globally for all the windows. The **Refresh** button will retrieve the settings from the RMQ-230-3G, although this is done automatically when the network connection is made. Changes to one Quad Split window can be copied to other windows using the **Copy** and **Paste** buttons. The **Paste** to all button will copy the changes from one window to all of the windows. To copy the change to all of the other Quad Splits, click the **Paste to all** button.

Figure 4–6: Video Config Menu

Option - Video Color Temperature Menu

Click the **Option** tab and then the **Color Temperature** button under the Video heading. The settings in this menu are made either individually for each of the four Quad Split windows or globally for all the windows. The **Refresh** button will retrieve the settings from the RMQ-230-3G, although this is done automatically when the network connection is made. The **+** and **-** buttons may be used to make incremental setting changes. After making each change, click the **Set** button to put it into effect, saving it to the RMQ-230-3G. Changes to one Quad Split window can be copied to other windows using the **Copy** and **Paste** buttons. The **Paste** to all button will copy the changes from one window to all of the windows. To copy the change to all of the other Quad Splits, click the **Paste to all** button.

<div align="center">Figure 4−7: Video Color Temperature Menu</div>

Option - Audio Config Menu

Click the **Option** tab and then the **Config** button under the Audio heading. The settings in this menu are made either individually for each of the four Quad Split windows or globally for all the windows. The **Refresh** button will retrieve the settings from the RMQ-230-3G, although this is done automatically when the network connection is made. Changes to one Quad Split window can be copied to other windows using the **Copy** and **Paste** buttons. The **Paste** to all button will copy the changes from one window to all of the windows. To copy the change to all of the other Quad Splits, click the **Paste to all** button.
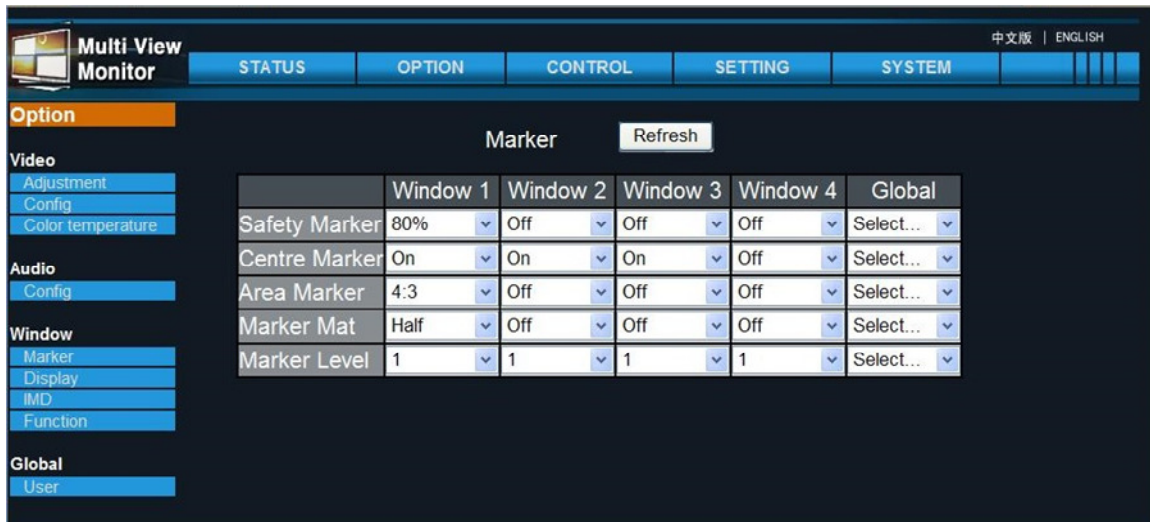
Figure 4–8: Audio Config Menu
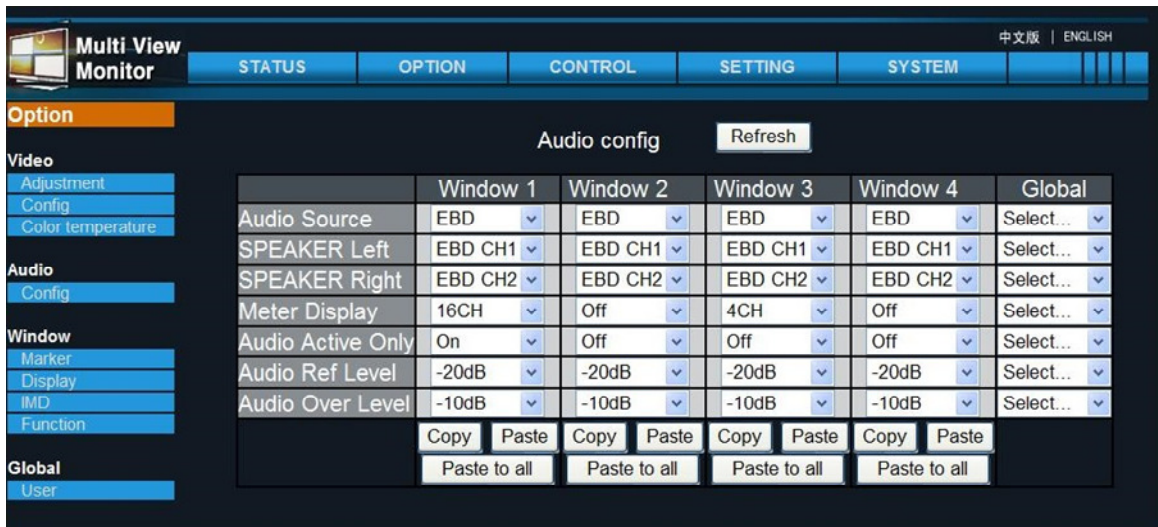
Option - Window Marker Menu

Click the **Option** tab and then the **Marker** button under the Window heading. The settings in this menu are made either individually for each of the four Quad Split windows or globally for all the windows. The **Refresh** button will retrieve the settings from the RMQ-230-3G, although this is done automatically when the network connection is made.
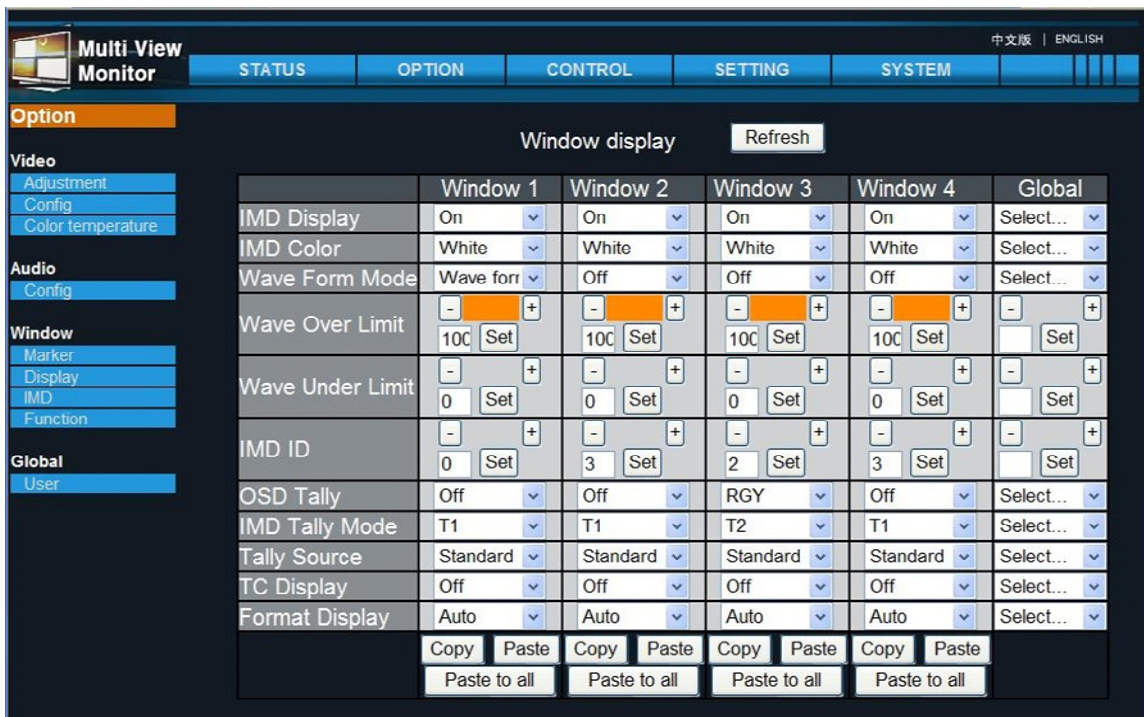
Figure 4–9: Window Marker Menu

Option - Window Display Menu

Click the **Option** tab and then the **Display** button under the Window heading. The settings in this menu are made either individually for each of the four Quad Split windows or globally for all the windows. The **Refresh** button will retrieve the settings from the RMQ-230-3G, although this is done automatically when the network connection is made. The **+** and **-** buttons may be used to make incremental setting changes. After making each change, click the **Set** button to put it into effect, saving it to the RMQ-230-3G. Changes to one Quad Split window can be copied to other windows using the **Copy** and **Paste** buttons. The **Paste** to all button will copy the changes from one window to all of the windows. To copy the change to all of the other Quad Splits, click the **Paste to all** button.
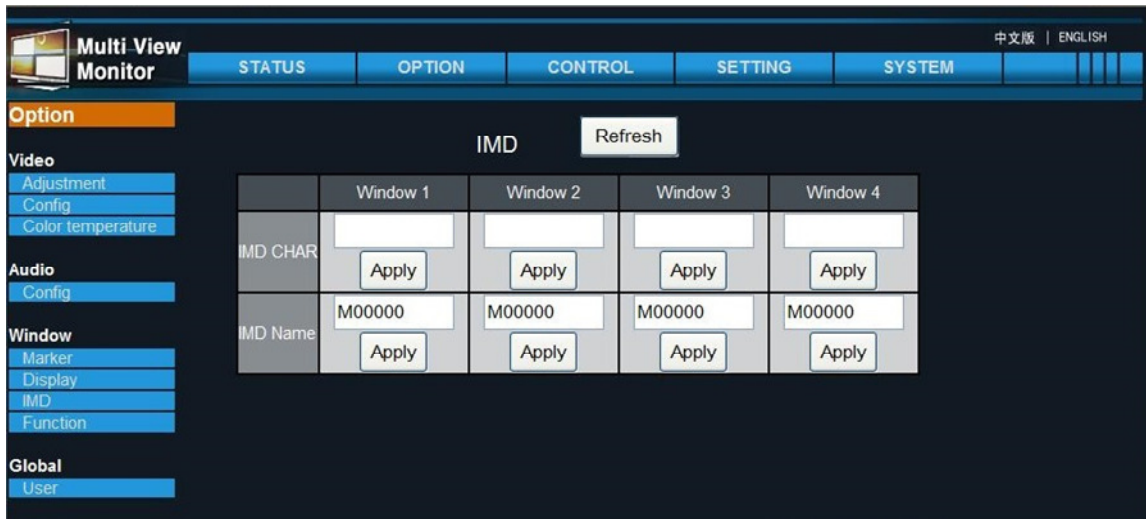
Figure 4–10: Window Display Menu

Option - Window IMD Menu

Click the **Option** tab and then the **IMD** button under the Window heading. The settings in this menu are made individually for each of the four Quad Split windows. The **Refresh** button will retrieve the settings from the RMQ-230-3G, although this is done automatically when the network connection is made. After making each change, click the **Apply** button to put it into effect, saving it to the RMQ-230-3G.

<p align="center">Figure 4–11: Window IMD Menu</p>

Option - Window Function Menu

Click the **Option** tab and then the **Function** button under the Window heading. The settings in this menu are made individually for each of the four Quad Split windows. The **Refresh** button will retrieve the settings from the RMQ-230-3G, although this is done automatically when the network connection is made.

The effect that each of the two function keys has can be set in this page. The available functions are:

NONE	MARKER	AUD METER
WAVEFORM	H/V DELAY	NATIVE
BLUE ONLY	MONO	ASPECT
SCAN		

Figure 4–12: Window Function Menu
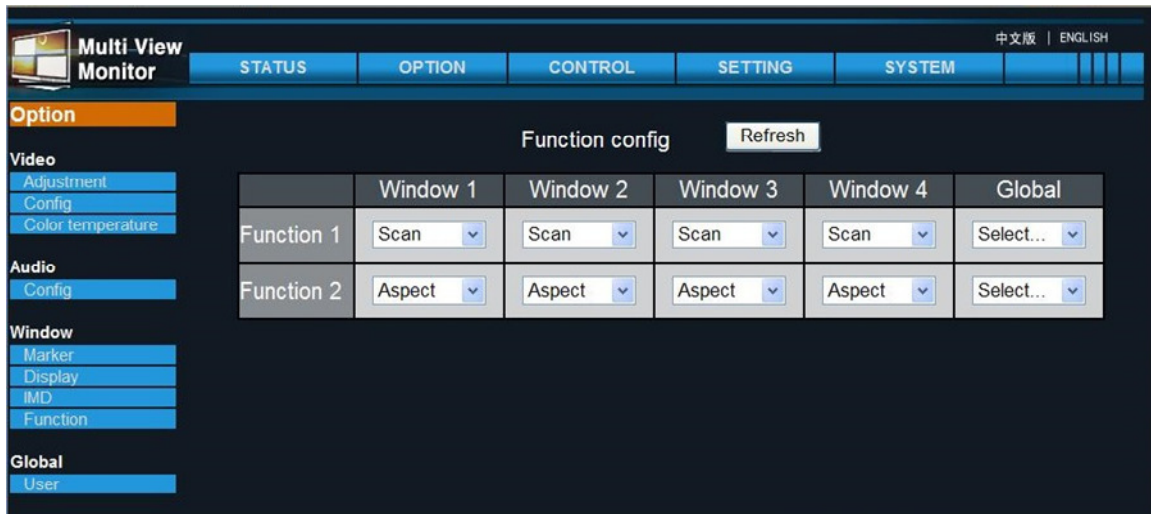
Option - Global User Menu

Click the **Option** tab and then the **User** button under the Global heading. The settings in this menu are made globally for all the windows. The **Refresh** button will retrieve the settings from the RMQ-230-3G, although this is done automatically when the network connection is made. The **+** and **-** buttons may be used to make incremental setting changes. After making a Backlight or Volume change, click the **Set** button to put it into effect, saving it to the RMQ-230-3G.

Figure 4–13 Global User Menu

Control - Global Menu

Click the **Control** tab and then the **Global** button. The settings in this menu are made globally for all the windows. The changes made in this menu take place immediately in the RMQ-230-3G.

Figure 4–14: Global Menu

Control - Window Menu

Click the **Control** tab and then the **Global** button. The settings in this menu are made globally for all the windows. The **Refresh** button will retrieve the settings from the RMQ-230-3G, although this is done automatically when the network connection is made. The changes made in this menu take place immediately in the RMQ-230-3G.
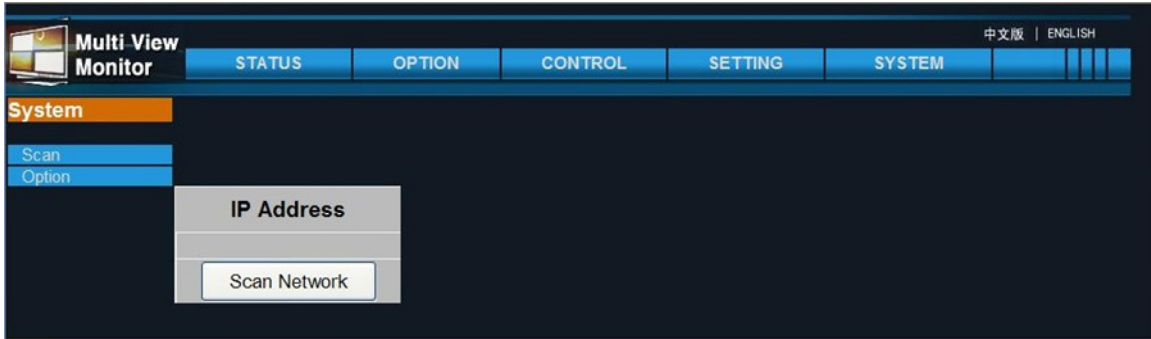
Figure 4–15: Window Menu

System - Scan Menu

Click the **System** tab and then the **Scan** button. Clicking the Scan Network button will locate the IP Addresses of other RMQ-230-3G monitors on the network.

Figure 4–16: Scan Menu

System - Option Menu

Click the **System** tab and then the **Option** button. This menu allows management of all of the RMQ-230-3G monitors you may have in your system. It can save time when setting up the monitors, because the settings carefully set into one monitor can be copied to others in the network. Just enter the Source and Destination IP addresses, check the setting categories you would like to copy and then click the **Copy** button.

Figure 4–17: Option Menu