# RM-3270W HD Series

- RM-3270W-HD
- RM-3270W-2HD

## 3RU, 2-Screen, 7" Audio/Video Monitors

User Guide

**Part Number 821041 Revision H**

### Reproduction

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# RM-3270W HD Series
# User Guide

## Introduction

### Overview

The 3RU rack-mounted RM-3270W HD Series monitors set a new standard in LCD monitors for broadcast and professional video applications. It provides two 7", 800 x 480 resolution, anti-glare TFT screens. All video formats are scaled to fit on screen in the highest quality using full, digital processing, precision scaling and gamma correction to produce the best images available.

### Topics

# 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. Install only in accordance with the instructions in the section entitled, "Installation Recommendations" on page 3.

5.  Do not install near any heat source such as a radiator, heat register, amplifier, or stove.

6.  Do not expose the equipment to rain or moisture.

7.  Do not attempt to plug the unit into a two-blade outlet (with only two prongs of equal width).

**IMPORTANT:** By design, these monitors will only plug into a three-prong outlet for your safety. If the plug does not fit into your outlet, contact an electrician to replace the obsolete outlet.

8.  Protect the power cord from being walked on or pinched, particularly at plug's source on the equipment and at the socket.

9.  Use only the attachments/accessories specified by the manufacturer.

10. Unplug the equipment during lightning storms or when unused for long periods of time.

11. Refer all servicing to qualified service personnel. Servicing will be required under all of the following conditions:

    *   The equipment has been damaged in any way, such as when the power-supply cord or plug is damaged.

    *   Liquid had been spilled or objects have fallen onto the equipment.

    *   The equipment has been exposed to rain or moisture.

    *   The equipment does not operate normally.

    *   The equipment has been dropped.

# Installation Recommendations

## Mounting

The unit is designed to install into a standard 19" rack. The unit should be mounted at approximately eye level for optimum visual observation.

## Heat Dissipation

No special physical mounting considerations are necessary regarding heat dissipation except under adverse conditions, provided the ambient temperature inside the mounting enclosure does not exceed 40°C (104°F). Adjacent devices can be rack mounted (or stacked) in proximity to the unit. If the temperature is above 40°C, allow a 1RU (1.75"/44.45mm) space above and below the unit for air circulation.

## DC Power

Connect the unit to its external 100 to 240VAC (50 to 60Hz) to 12VDC power supply (included).

# FCC Compliance

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 his own expense.

# Features

The RM-3270W HD Series audio/video monitors are designed for confidence monitoring of composite video broadcast signal video sources. HD and 2HD models also monitor SDI signals. Input signals are automatically detected and displayed. Four to eight audio channels per screen may be selected for visual monitoring on bar graph style level meters. A headphone jack allows audible stereo monitoring of the left/right channels on all models. Both models have stereo speakers.

Each of the two high-resolution LCD screens display either 4:3 or 16:9 aspect ratio. Parameters are selected and adjusted using an On Screen Display (OSD) MENU. A DB9 connector serves as the interface to the two tally lights on the front panel.

Additional overlays can be added by the operator for safe area and safe title markers, center mark, and display name.

The slim and light weight design provides two screens in a very compact rack-size (3RU) while the chassis only has 2.5 inches of depth.

The feature-rich RM-3270W HD Series monitors provide all of the following:

- Two LCDs, 7" diagonal each

- Selectable 16:9 or 4:3 screen aspects for on screen video

- Rack mount mechanical design with vertical tilt

- Audio level meter display for up to eight channels per display

- Monitor audio source from selected display on stereo headphones

- Visually monitor audio levels on meters assignable to any channel

- Level meters can display VU, PPM (PK) or both with assignable -20db to -18db level

- Local control (via menu operation) for all functions including:
    - Blue gun as mono
    - Safe area
    - Safe title

- Center markers

- Monochrome display mode

- Over/underscan

- Display of input format

- Waveform or vectorscope

- Display of up to 10 characters of user-defined text

- Red/green/yellow/white text color

- Built in color bars 75% full field

- User defined configuration

- Auto sets at power up

# Specifications

## Table 1–1    RM-3270W-HD/2HD Specifications

| Specification | HD | 2HD |
|---|---|---|
| Number of Screens | 2 active color matrix amorphous 7" LCD TFT screens | |
| Display | 7" diagonal | |
| Aspect Ratios | 4:3 or 16:9 | |
| Active Viewing Area | 6.2" H x 3.6" V (152.4 mm H x 91.4 mm V) | |
| Screen Treatments | Anti-glare 4H hardness | |
| Viewing Angles (Tilt) | 130°H x 115°V | |
| Screen Colors | 16.7 million | |
| Resolution (Dots, H x V) | 800 x 480 | |
| Dot Pitch (H x V, mm) | 0.204 x 0.217 | |
| Pixel Response (ms) | <30 typical | |
| Luminance | 400 cd/m$^2$ | |
| Contrast | 300:1 | |
| Chromacity | 72% CIE 1931 color gamut | |
| Color Temperature | D65 | |
| Space Required | 3 RU | |

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**Table 1–1          RM-3270W-HD/2HD Specifications**

| Specification | HD | 2HD |
|---|---|---|
| Dimensions (W x H x D) | 19.0″ x 5.2″ x 2.5″ (483 x 132 x 63 mm) | |
| Shipping Weight | 9 lbs. (4.08 kg) | |
| Power Consumption | 12VDC/10 watts (3.8 Amps max) CE & UL power supply | |
| Operating Temperature | 0°C (32°F) to 40°C (104°F) | |
| Video Format | All HD/SD-SDI and CVBS | |
| Inputs (per screen) | 1 HD/SD-SDI, Analog Composite (BNC) <br><br> 1 Pair Analog Audio (RCA) | 2 HD/SD-SDI, Analog Composite (BNC) <br><br> 2 Pair Analog Audio (RCA) |
| Outputs (per screen) | 1 HD/SD-SDI Re-clocked (BNC) <br><br> 1 Pair Analog Audio (RCA) | None |
| Supplied Accessories | AC power adapter | |

**Note:** All of the specifications listed above are subject to change without notice.

# Front Panel Controls

**Figure 1–1          RM-3270W-HD Front Panel**

Part Number:   Document Title User Guide
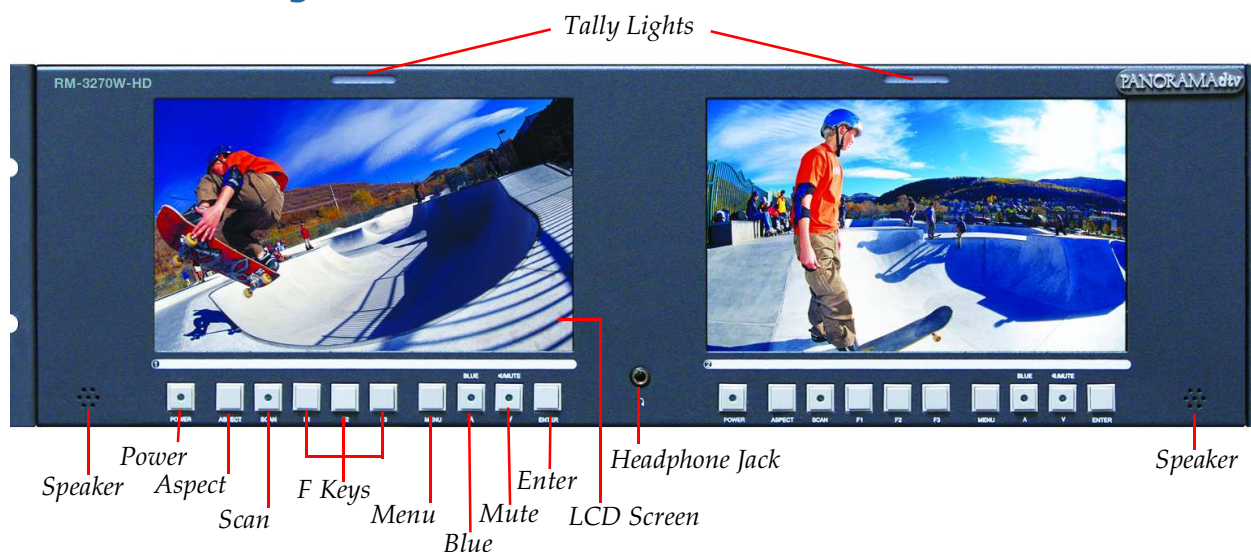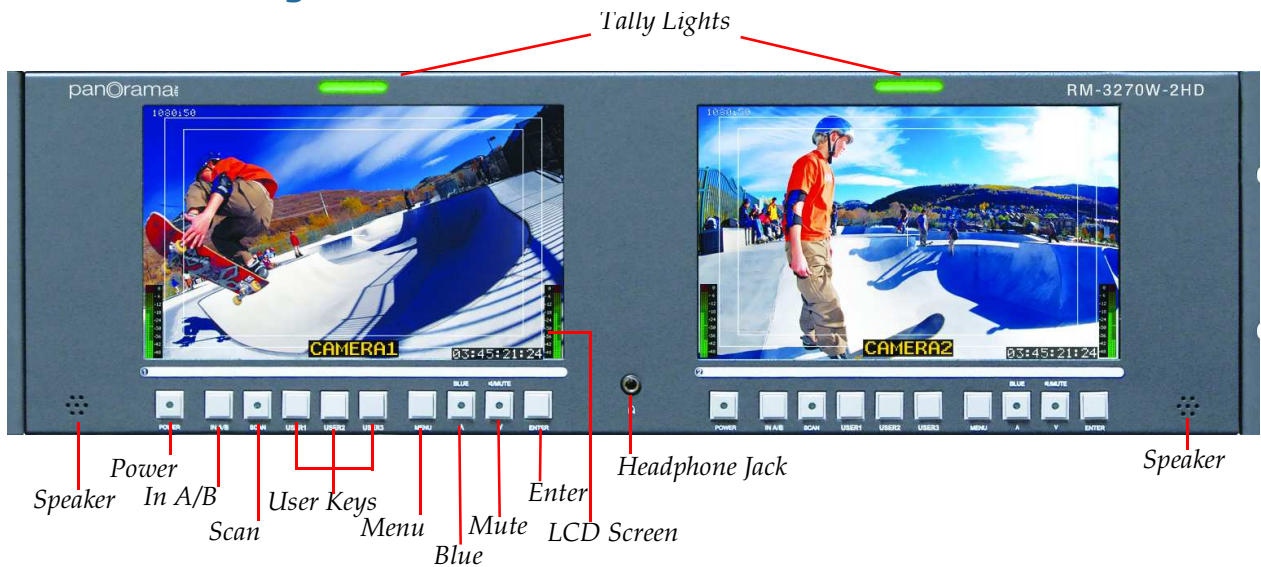© 2013 Wohler Technologies, Inc. All rights reserved.
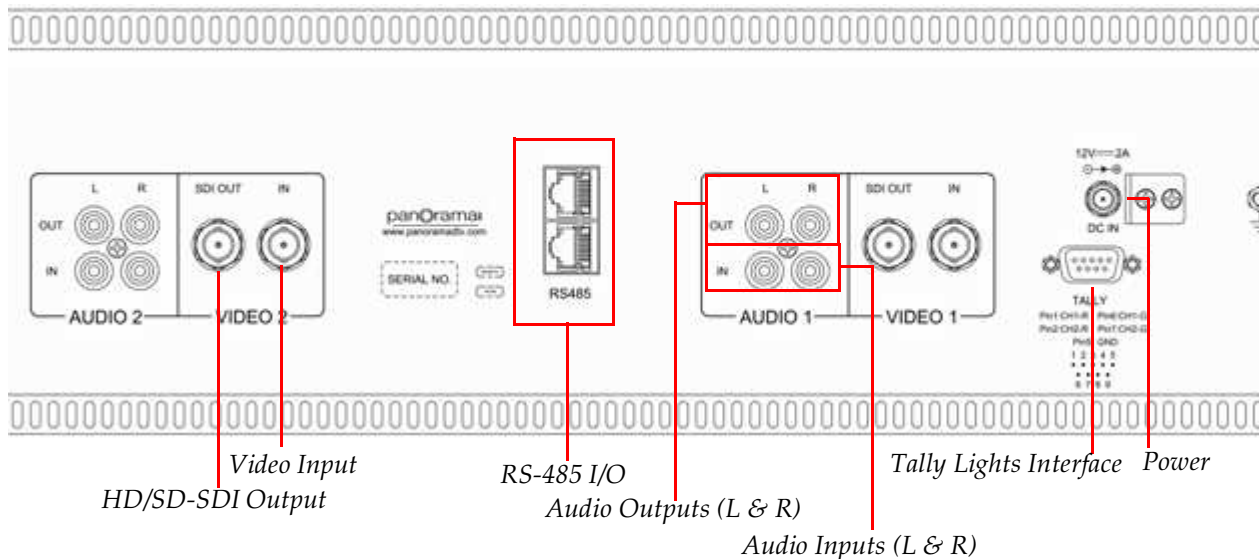
**Figure 1–2      RM-3270W-2HD Front Panel**



- **Tally Lights**: These tri-color (red/green/amber) lights are controlled through a DB9 connector on the rear panel. For more information about the DB9 connector, refer to "Tally Interface Connector" on page 11.

- **Speakers:** Audio may be selected for monitoring through the left and right speakers.

  Note:   The left LCD must be turned on for audio to function from either the left or the right screen, because the audio amplifiers are powered from the left LCD. Therefore, if only one screen is to be used, be certain that it is the left one.

- **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.

- **In A/B:** These two buttons switch between signal inputs.

  Note:   The In A/B buttons are only available on the 2HD.

- **Scan:** The **Scan** button toggles between the full video signal view (underscan mode) to a typical display visible on a customer's monitor (normal mode). The LED glows green to indicate underscan.

- **Aspect:** This button toggles the aspect ratio between 4:3 and 16:9 for the associated LCD screen. It has no affect on HD widescreen formats.

  Note: The **Aspect** button is not available on the RM-3270W-2HD.

- **User 1** through **User 3** or **F1** though **F3:** The **User/F** buttons are programmable as hot keys for parameter adjustments.

- **Menu:** Press this button to display the OSD MENU. See Using the OSD Menu on page 12 for more details.

- **Blue/Down:** The **Down** function is on the same button as the **Blue** function. When the OSD MENU is displayed, this button navigates down through the menu and sub-menu selections. When the OSD MENU is not displayed, pressing this button initiates Blue mode.

- **Mute/Up:** The **Up** function is on the same button as the **Mute** function. When the OSD MENU is displayed, this button navigates up through the menu and sub-menu selections. When the OSD MENU is not displayed, pressing this button controls audio selection.

  Note: The left LCD must be turned on for audio to function from either the left or the right screen, because the audio amplifiers are powered from the left LCD. Therefore, if only one screen is to be used, be certain that it is the left one.

- **Enter:** When the OSD MENU is displayed, pressing this button accepts selections in the menus and sub-menus. When the OSD MENU is not displayed, the button cycles through volume and image controls.

- **Headphone Jack:** Monitor the assigned left/right stereo audio channels with stereo headphones from this mini-stereo connector.

- **LCD Screen:** The LCD screens display the audio meters, menus, and OSD features over the video.

# Rear Panel Connectors

## Rear Panel Connectors for the RM-3270W-HD

**Figure 1–3       RM-3270W-HD Rear Panel**



*Video Input*
*HD/SD-SDI Output*
*RS-485 I/O*
*Audio Outputs (L & R)*
*Audio Inputs (L & R)*
*Tally Lights Interface*  *Power*

- **Video Input**: This auto-detecting, input connector accepts HD/SD-SDI or analog CVBS video signals. The inputs comply with SMPTE259M, SMPTE292M/ITU-R BT601. Composite video inputs comply with SMPTE-170M.

- **HD/SD-SDI Output:** The system re-shapes and re-clocks an HD/SD-SDI signal before outputting it to this female BNC connector.

- **RS-485 I/O (on RJ-45)**:  These two ports are used for system software upgrades and dynamic IMD controls.
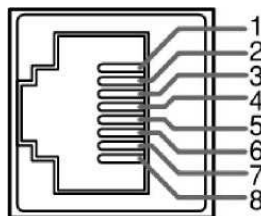
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### Figure 1–4       RS-485 I/O Pin-Out



### Table 1–2       RS-485 Pin-Out

| Pin | RS485 In terminal | RS485 Out Terminal |
|-----|-------------------|--------------------|
| 1, 2 | GND | GND |
| 3 | Tx- | Tx- |
| 4 | Rx+ | Rx+ |
| 5 | Rx- | Rx- |
| 6 | Tx+ | Tx+ |
| 7, 8 | NC | NC |

- **Analog Audio Input:** Input terminals for the analog audio signal. **L:** left audio channel; **R:** right audio channel.

- **Analog Audio Output:** Output terminals of the analog audio signal. **L:** left audio channel; **R:** right audio channel.

## Rear Panel Connectors for the RM-3270W-2HD

### Figure 1–5       RM-3270W-2HD Rear Panel



*Audio Inputs*

*Video Inputs*

*RS-485 I/O*

*Power*

*Tally Lights Interface*
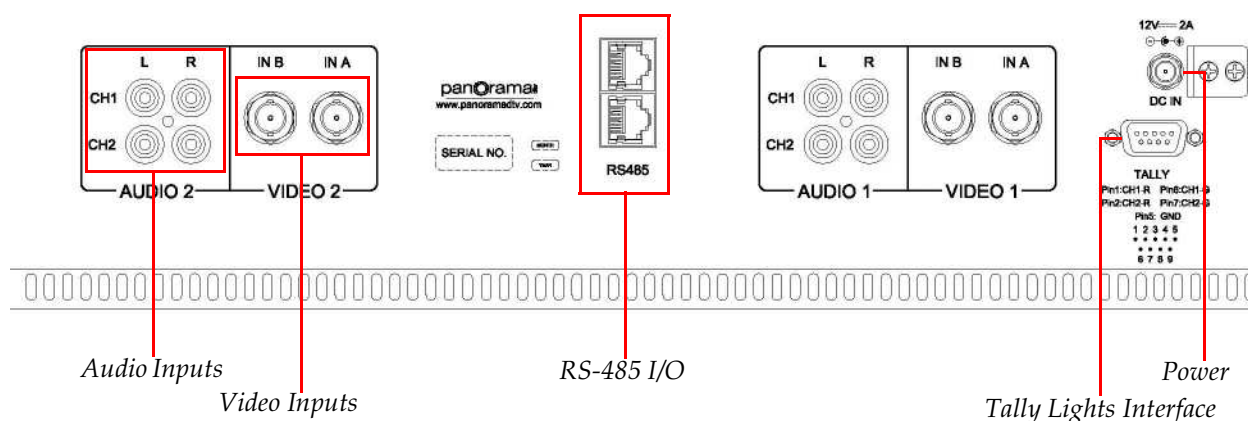
## Common Connectors

- **Power Connector:** To provide power to the unit, attach the supplied 100 to 240VAC to 12VDC power supply to this connector.

- **Tally Interface Connector:** This DB9 connector controls the tally lights on the front panel. Refer to Figure 1–6 below for the pin out.
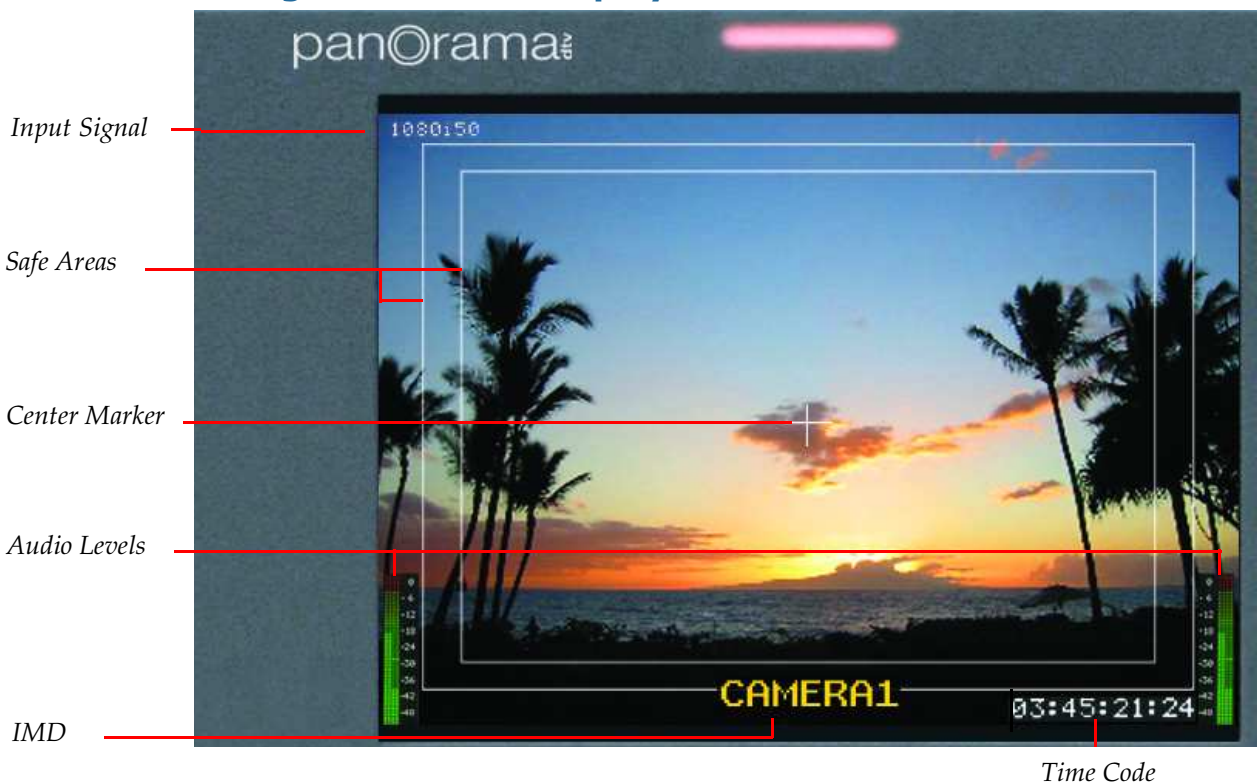
**Figure 1–6      Rear Panel DB9 Connector Pin Out**



# On-Screen Display Features

**Figure 1–7      Display Features**

- **Input Signal:** The input signal is automatically detected as vertical active line count, (i)nterlaced or (p)rogressive, and frame rate in Hz.

- **Audio Levels:** Levels for the audio channels are displayed on up to eight meters as left/right pairs: maximum of four meters on the left side and four on the right.

- **IMD:** The OSD MENU provides settings to customize the IMD (In Monitor Display) text area to show a line of characters, numbers, and some symbols.

- **Time Code:** The de-embedded time code from the HD/SD-SDI source displays in the bottom right corner.

# Using the OSD Menu

A description of how to use the OSD MENU follows. Also refer to Table 1–3 on page 13 for typical values and domain ranges.

1. Press the Menu button to display the menu.

   **Note:** If you do not press another button for approximately 30 seconds, the menu will disappear from the screen.

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 **Menu** button to back out of a parameter or submenu. Press the **Menu** button again to remove the menu from the screen.

**Table 1–3      RM-3270W-HD and RM-3270W-2HD OSD Menu Structure**

| Menu | Parameters | Default Value | Domain Range |
|------|-----------|---------------|--------------|
| STATUS | FORMAT | N/A | Not configurable, signal dependent |
| | COLOR TEMP | D65 | |
| | MON SOURCE | N/A | |
| | SCAN | UNDER SCAN | |
| | SD ASPECT | 4:3 | |
| | MODEL | RM-3270W-HD | |
| VIDEO | BRIGHTNESS | 000 | -116 through 139 |
| | CONTRAST | | -128 through 127 |
| | SATURATION | | |
| | SHARPNESS | | 000 through -15 |
| | HUE | | -032 through 031 |
| | RESET | YES | Loads system defaults |
| | COLOR TEMP | D65 | • D65<br>• D56<br>• D95<br>• USR |
| | R GAIN | 128 | 0 through 255 |
| | G GAIN | | |
| | B GAIN | | |
| | R OFFSET | | |
| | G OFFSET | | |
| | B OFFSET | | |
| | RESET | YES | Loads system defaults |

**Table 1–3      RM-3270W-HD and RM-3270W-2HD OSD Menu Structure  (Continued)**

| Menu | Parameters | Default Value | Domain Range |
|---|---|---|---|
| AUDIO | AUDIO MON | ON | ON |
| | MON SOURCE | MET 1 | • MET 1<br>• MET 2<br>• MET 3<br>• MET 4 |
| | VOLUME | -30db | -30 db through 0 db |
| | METER SIZE | SMALL | Not Configurable |
| | METER H POS L | 000 | 000 through 255 |
| | METER H POS R | | |
| | TEST LEV | -20 DB | -20DB or -18DB |
| | IN A:MET 1 | VU+PK | • VU<br>• PK<br>• VU+PK<br>• NONE |
| | IN A:MET 2 | | |
| | IN A:MET 3 | | |
| | IN A:MET 4 | | |

**Table 1–3      RM-3270W-HD and RM-3270W-2HD OSD Menu Structure  (Continued)**

| Menu | Parameters | Default Value | Domain Range |
|---|---|---|---|
| AUDIO (Continued) | IN A:MET 1-L | CH 1 | EBD1 through EBD16 |
| | IN A:MET 1-R | CH 2 | |
| | IN A:MET 2-L | CH 3 | |
| | IN A:MET 2-R | CH 4 | |
| | IN A:MET 3-L | CH 5 | |
| | IN A:MET 3-R | CH 6 | |
| | IN A:MET 4-L | CH 7 | |
| | IN A:MET 4-R | CH 8 | |
| | **Note: The IN B options are only available on the 2HD model.** | | |
| | IN B:MET 1 | VU+PK | • VU<br>• PK<br>• VU+PK<br>• NONE |
| | IN B:MET 2 | | |
| | IN B:MET 3 | | |
| | IN B:MET 4 | | |
| | IN B:MET 1-L | CH 1 | EBD1 through EBD16 |
| | IN B:MET 1-R | CH 2 | |
| | IN B:MET 2-L | CH 3 | |
| | IN B:MET 2-R | CH 4 | |
| | IN B:MET 3-L | CH 5 | |
| | IN B:MET 3-R | CH 6 | |
| | IN B:MET 4-L | CH 7 | |
| | IN B:MET 4-R | CH 8 | |

**Table 1–3     RM-3270W-HD and RM-3270W-2HD OSD Menu Structure  (Continued)**

| Menu | Parameters | Default Value | Domain Range |
|---|---|---|---|
| MARKER | SAFE MARKER | OFF | ON or OFF; toggles audio enable between the two monitors, (i.e., enabling the ON selection on one turns the other OFF). |
| | CENTER | OFF | ON or OFF |
| | 90% | OFF | |
| | 80% | OFF | |
| Marker (Continued) | AREA MARKER | OFF | • 2.35:1<br>• 1.85:1<br>• 15:9<br>• 14:9<br>• 13:9<br>• 4:3<br>• OFF |
| OSD | STD DISP | OFF | • AUTO OFF<br>• ON<br>• OFF |
| | WFM/VT DISP | | • VECTOR<br>• WFM<br>• OFF |
| | TC DISP | | ON or OFF |
| | UMD (IMD: In Monitor Display) DISP | | |
| | OSD TLY DISP | ON | ON or OFF |
| | OSD TLY MODE | RGY | • RG<br>• GR<br>• RGY<br>• T1T2<br>• T2T1<br>• T1-<br>• T2- |
| | LED TLY DISP | ON | ON or OFF |

**Table 1–3      RM-3270W-HD and RM-3270W-2HD OSD Menu Structure  (Continued)**

| Menu | Parameters | Default Value | Domain Range |
|---|---|---|---|
| | **UMD FIXED SET UP** | | |
| | — | N/A | A user-definable input string of up to 16 alphanumeric characters (also includes some symbols) |
| | COLOR | WHITE | • RED<br>• GREEN<br>• YELLOW<br>• WHITE |
| | ALIGN | CENTER | • LEFT<br>• CENTER<br>• RIGHT |
| | **UMD PROTOCOL** | | |
| | — | | • LOCAL<br>• IMAGE VIDEO<br>• TSL V4.0<br>• TSL V3.1, |
| OSD (Continued) | UMD ID | 000 | 000 through 255 |
| | **UMD NAME (S/N)** | | |
| | — | N/A | A user-definable input string of up to 16 alphanumeric characters (also includes some symbols) |
| | UMD TLY MODE | T1T2 | • T2<br>• T1<br>• T2T1-<br>• T1T2- |
| | **UMD BAUD RATE** | | |
| | — | N/A | • 2400<br>• 4800<br>• 9600<br>• 19200<br>• 38400<br>• 57600<br>• 115200 |

**Table 1–3 RM-3270W-HD and RM-3270W-2HD OSD Menu Structure (Continued)**

| Menu | Parameters | Default Value | Domain Range |
|---|---|---|---|
| | | TALLY SOURCE | |
| OSD (Continued) | — | N/A | • STANDARD<br>• TSL<br>• STANDARD+IV422<br>• IMAGE VIDEO 422<br>• IMAGE VIDEO HW |
| USER CONTROL | SCAN | NORMAL | NORMAL or UNDER SCAN |
| | SD ASPECT | 4:3 | 4:3 or 16:9 |
| | H/V DELAY | OFF | • OFF<br>• H<br>• V<br>• H/V |
| | COLOR BAR | DISABLE | DISABLE or "ON" |
| USER CONFIG | VECTOR REF | 75% CB | 75% CB or 100% CB |
| | OSD CONTROL | ON | ON or OFF |
| | WFM/VT MODE | SOLID | • SOLID<br>• 75%<br>• 50%<br>• 25% |
| | USER1 | H/V DELAY | • MON SOURCE<br>• OSD CONTROL<br>• AREA MARKER<br>• SAFE MARKER<br>• WFM DISPLAY<br>• SD ASPECT<br>• H/V DELAY |
| | USER2 | SD ASPECT | |
| | USER3 | WFM DIS-PLAY | |

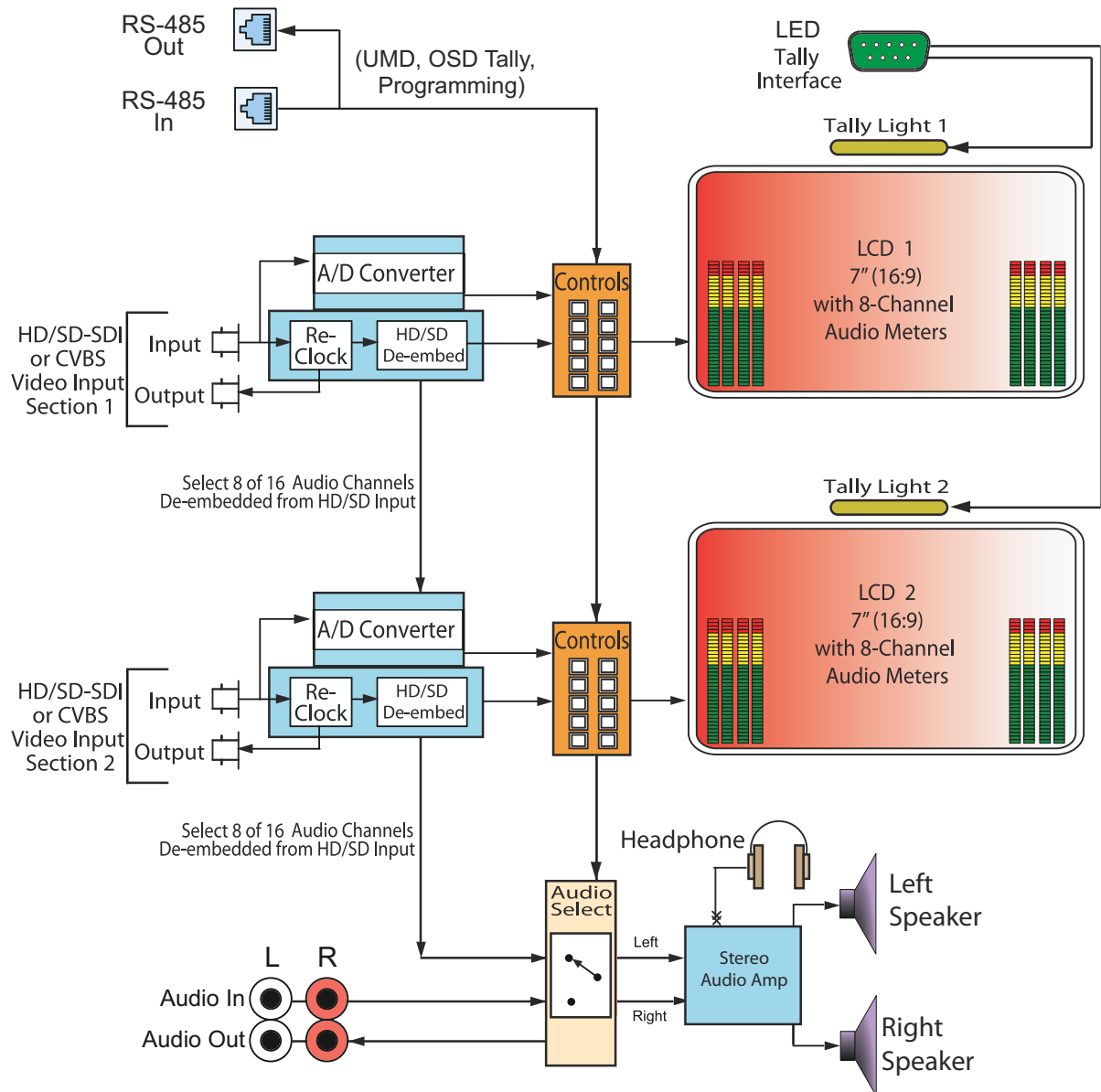# Technical Functional Overview

**Figure 1–8      RM-3270W-HD Block Diagram**

## Figure 1–9        RM-3270W-2HD Block Diagram