

MonitorMAX

Stereo Monitor Controller

USER MANUAL

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MonitorMAX Overview

Stereo Monitor & Cue Control plus Talkback without a Console

The advent of the home studio and DAW challenged the requirement that successful audio productions must be done on large mixing consoles. However, many mixers and digital audio workstations, even when equipped with a mix control surface, are ill equipped for properly handling music recording and postproduction environments, especially when a separate 'live' room is involved for musicians, Foley artists or voice talent.

The center section of large consoles is reserved for the most important function, monitor control. The ability to select between multiple sources, various speakers, and control level while remaining in the sweet spot is essential in determining the quality of your production. And quite possibly an important feature missing from your DAW.

Also, artists need to be able to monitor themselves and others involved in a recording, as well as hear instructions and comments from the engineer or producer. Cue control and talkback is a must for getting the job done when others are involved. Yet many DAWs and small consoles lack the rudimentary functionality required.

Recognizing these needs, Martinsound has developed MonitorMAX, a dual stereo monitor controller that adds stereo source and monitor selection with talkback functions to any studio environment. Designed for integration with DAWs, small mixers, and as an enhancement to surround sound systems utilizing the MultiMAX EX multiformat monitor controller, MonitorMAX provides the essential monitor and talkback functions needed to get the job done.

Stereo Sources and Outputs

The MonitorMAX system comprises a single-space rackmounting unit housing all of the necessary interface connections and electronics, including a talkback microphone preamplifier, plus a remote controller. The remote features Monitor and Cue routing switches for up to 10 stereo sources, talkback, and level controls, plus a LCD window to display levels, mode information, and Setup menus.

Eight professional and two consumer level stereo sources can be connected to MonitorMAX. Sensitivity of the consumer inputs can be adjusted within a setup menu from 6 to 26dB of gain in 0.1dB increments, allowing a wide range of consumer equipment to be interfaced.

MonitorMAX enables independent routing of all 10 stereo sources to the separate Monitor and Cue paths, using two banks of 10 switches. Source selection for either path can be additive or interlocking (canceling the previous selection), so that any number of sources may be selected and monitored in the control room or routed to studio headphones or loudspeakers. The Monitor path includes a stereo output that may be used as a record or meter feed.

Mute, Dim and Mono switches are provided for the Monitor output, together with switch selection of an alternate pair of control room monitors, while the Cue output includes a Mute switch. Separate rotary level controls are included for the Monitor and Cue outputs. The Monitor rotary control is also used when accessing Setup menus.

Talkback

Pressing the large, easy-to-reach Talkback switch dims cue output by 20dB while activating the talkback microphone. The flexibility of the system even allows both monitor paths to be configured as cue feeds with independent talkback level and the Alt Monitor output handling studio loudspeakers. Plus the Talkback switch and twin talkback logic inputs can be individually setup to route talkback just where you want it.

Integration with MultiMAX EX

MultiMAX EX adds the critical monitoring features necessary to handle surround projects in music production, post production, and broadcast environments. MonitorMAX further enhances the power of MultiMAX by providing additional stereo monitor inputs and extra stereo monitor paths to surround production systems. With MultiMAX's Downmix output connected as an input source and MonitorMAX's talkback sense controlling MultiMAX's external dim logic, MonitorMAX readily outputs your surround mix as stereo cue feeds with talkback for the talent or stereo monitoring in other production rooms, making for a very tightly integrated system.

MonitorMax Setup

When unpacking MonitorMax and the Remote Controller, be sure to check for the following items.

1. AC power cable
2. 25ft. SB-9 pin remote controller cable
3. MonitorMax Manual
4. Warranty Card
5. Small bag with 4-40 Jack Screws (to replace installed metric Jack Screws if needed)

Before inserting the AC power cable into the back panel socket, be sure to check that the correct voltage (120V 60Hz or 230V 50Hz) is marked for the installation location.

All of the audio inputs and outputs (except Talkback Mic and inputs 9 & 10) are available via DB-25 connectors formatted to the Tascam analog standard, and are found on the MonitorMax back panel. This makes for an easy and secure connection to custom installed wiring or off-the-shelf patchbays. RCA jacks are provided for unbalanced inputs 9 & 10, and an XLR input for the Talkback mic. DB-9 connectors are used for both the Remote Controller and the Logic I/O port.

DB9 Pin#	Remote Interface	Logic Interface
1	Digital Ground	Digital Ground
2	V Unregulated	Sense: Mon Mute
3	Tx-	Sense: Mon Dim
4	Rx-	Sense: TB 1
5	Digital Ground	Sense: TB 2
6	LCD Bias	N/C
7	Tx+	N/C
8	Rx+	VCC
9	V Unregulated	TB Active
Shell	Shield	Shield (optional)

Inputs and Outputs

CH #	DB25 Pin#	+4 Inputs 1 – 4	+4 Inputs 5 – 8	+4 Outputs
	13	Not Used	Not Used	Not Used
1	25	Chassis Ground	Chassis Ground	Chassis Ground
	12	Input 1 L–	Input 5 L–	Meter L–
	24	Input 1 L+	Input 5 L+	Meter L+
2	11	Chassis Ground	Chassis Ground	Chassis Ground
	23	Input 1 R–	Input 5 R–	Meter R–
	10	Input 1 R+	Input 5 R+	Meter R+
3	22	Chassis Ground	Chassis Ground	Chassis Ground
	9	Input 2 L–	Input 6 L–	Monitor Main L–
	21	Input 2 L+	Input 6 L+	Monitor Main L+
4	8	Chassis Ground	Chassis Ground	Chassis Ground
	20	Input 2 R–	Input 6 R–	Monitor Main R–
	7	Input 2 R+	Input 6 R–	Monitor Main R+
5	19	Chassis Ground	Chassis Ground	Chassis Ground
	6	Input 3 L–	Input 7 L–	Monitor Alt L–
	18	Input 3 L+	Input 7 L+	Monitor Alt L+
6	5	Chassis Ground	Chassis Ground	Chassis Ground
	17	Input 3 R–	Input 7 R–	Monitor Alt R–
	4	Input 3 R+	Input 7 R+	Monitor Alt R+
7	16	Chassis Ground	Chassis Ground	Chassis Ground
	3	Input 4 L–	Input 8 L–	Cue L–
	15	Input 4 L+	Input 8 L+	Cue L+
8	2	Chassis Ground	Chassis Ground	Chassis Ground
	14	Input 4 R–	Input 8 R–	Cue R–
	1	Input 4 R+	Input 8 R+	Cue R+

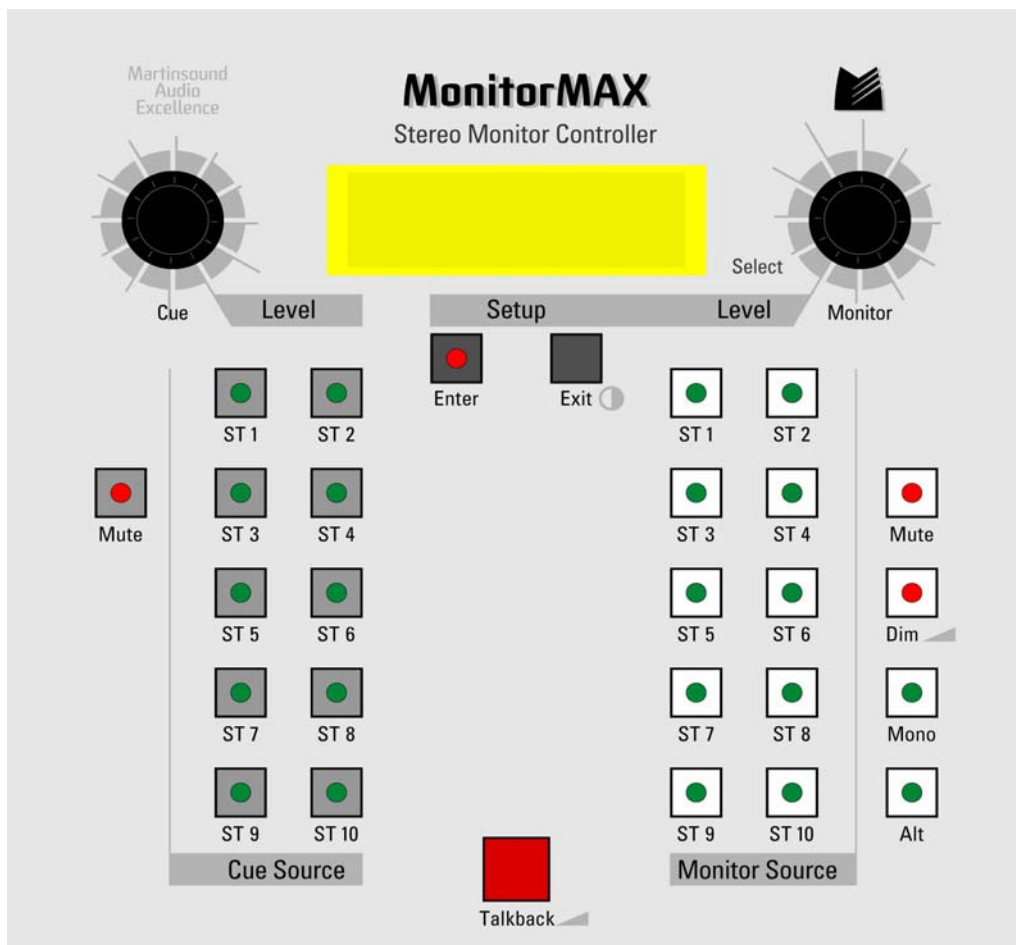
XLR Pin#	Mic Input
1	Chassis Ground
2	Mic In+
3	Mic In–

Operation

MonitorMax has two completely independent monitor paths consisting of the **Cue** section, primarily intended for studio headphone feeds, and the **Monitor** section, that includes all the functions associated with studio control room monitoring.

Stereo input sources (**ST #**) can be selected using the labeled switches on the Cue and Monitor sections of the MonitorMax Controller. Output levels can be adjusted with the Cue and Monitor level knobs. A separate mute is provided for both the Cue and the Monitor section. The Monitor section also includes a level programmable **Dim**, a **Mono** listen mode, and an **Alt** switch for feeding a secondary set of speakers.

The default **Talkback** mode feeds the Cue while dimming the Cue and Monitor sources.



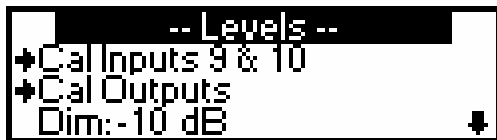
Programmable Functions

Once all the connections have been made, MonitorMax is ready to use with the factory default settings. However many options can be set to customize the operation according to the specific needs of the user.

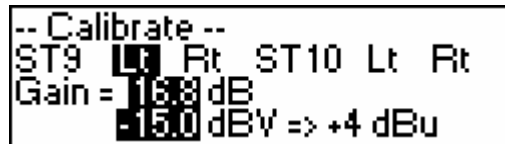
All of the optional programmable settings are found in the Main Menu displayed on the controller LCD window when the **Enter** key is pressed. Scrolling through the Main Menu pages can be done by repeated pressing of the **Enter** key, or by turning the **Monitor** knob while holding the **Enter** key (only when the screen cursor is highlighting one of the up/down page arrows). The menu is arranged in an endless loop, with either direction leading to every page. Turning the **Monitor** knob alone will move the cursor up (CCW) or down (CW), through each programmable page selection and on to the next page. Pressing the **Enter** key, while a selection is highlighted, will either change its value or advance to another menu selection, depending on the page displayed. The **Monitor** knob is also used for changing values, and works in an accelerated mode whenever the **Enter** key is held. Pressing the **Exit** key will always take you back one level until the operation mode screen is reached.

Levels

Press **Enter** to open the program menu, and turn the **Monitor** knob to get to the **Levels** page.



Turn the **Monitor** knob to move the cursor to “Inputs 9 & 10” and press **Enter**.



This page is for setting the gain levels for the unbalanced inputs, raising them to match the levels of the +4dBu balanced inputs. The cursor is located over the first selection, “Lt”, the Left channel of Stereo Input 9. Turning the **Monitor** knob will increase or decrease the gain level, and simultaneously change the reference level. Pressing the **Enter** key will move the cursor to the next selection. The factory default setting is for a gain of 11.8dB and a reference of -10.2dBV, appropriate for consumer equipment designed to this specification.

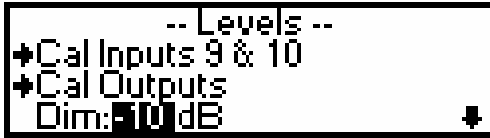
Press the **Exit** key to move back to the **Levels** page. Move the cursor to **Outputs** by turning the **Monitor** knob, and press **Enter**.



This page is used when the MonitorMax output is to be calibrated using a pink noise generator and SPL meter. The procedure involves inserting a +4dBu pink noise source into one input, and trimming one output until the SPL meter reading matches the target SPL level on the MonitorMax display. The procedure is repeated for each speaker.

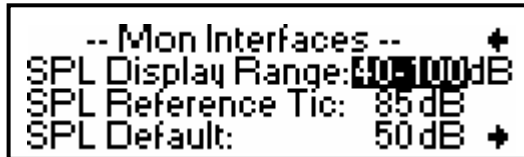
The cursor is located over the first selection; the Left channel of the Main speaker output. Turning the **Monitor** knob will increase or decrease the attenuation level in 0.1dB increments. Holding the **Enter** key while turning the **Monitor** knob will change the setting in 1dB increments. Pressing the **Enter** key will move the cursor to the next selection.

Press the **Exit** key twice to return to operation mode.



Turn the **Monitor** knob and select, Dim. This sets the amount of level attenuation of the Monitor speakers when the Dim switch is engaged. Turn the **Monitor** knob while holding the **Enter** key to change this level to a minimum of -1dB and maximum of 30dB. This same function can be accessed from the operation screen by holding the **Dim** key and turning the **Monitor** knob.

Mon SPL

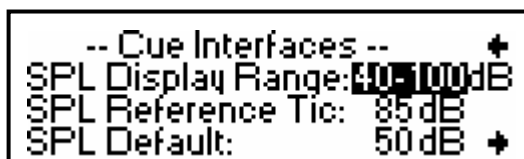


Press the **Enter** key and turn the **Monitor** knob to get to the **Mon Interfaces** page. Turn the **Monitor** knob to select the first item, “SPL Display Range”. This setting is used in conjunction with the SPL calibration procedure (see Calibration/Outputs). It sets the SPL display range (minimum and maximum) for the Monitor level control. This setting has no electrical function other than to change the display reference. The actual change takes place when the speaker trims are adjusted so that the SPL measured matches the MonitorMax display. Pressing the **Enter** key will toggle through the 5 possible range selections of 25-85dB, 30-90dB, 35-95dB, 40-100dB, and 45-105dB. The factory default range is 40-100 dB.

Turn the **Monitor** knob to select “SPL Reference Tic”. The only function of this feature is to move the reference Tic on the Monitor bar meter on the MonitorMax LCD. Turn the **Monitor** knob while holding the **Enter** key to increase or decrease the setting to a minimum of 25 and a maximum of 105. The Tic will reflect changes of the SPL Display Range and will disappear at extreme settings. The factory default is 85dB.

Turn the **Monitor** knob to select “SPL Default”. This sets the user preferred level for the Monitor control when MonitorMax is powered up. Turn the **Monitor** knob while holding the **Enter** key to change the level from the minimum to maximum setting allowable within the currently selected SPL Display Range. The factory default setting is 50. Press **Exit** to return to operation mode.

Cue SPL

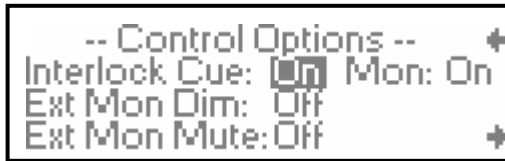


Press the **Enter** key and turn the **Monitor** knob to get to the **Cue Interfaces** page. Turn the **Monitor** knob to select the first item, “SPL Display Range”. This setting is used in conjunction with the SPL calibration procedure (see Calibration/Outputs). It sets the SPL display range (minimum and maximum) for the Cue level control. This setting has no electrical function other than to change the display reference. The actual change takes place when the speaker trims are adjusted so that the SPL measured matches the MonitorMax display. Pressing the **Enter** key will toggle through the 5 possible range selections of 25-85dB, 30-90dB, 35-95dB, 40-100dB, and 45-105dB. The factory default range is 40-100 dB.

Turn the **Monitor** knob to select “SPL Reference Tic”. The only function of this feature is to move the reference Tic on the Cue bar meter on the MonitorMax LCD. Turn the **Monitor** knob while holding the **Enter** key to increase or decrease the setting to a minimum of 25 and a maximum of 105. The Tic will reflect changes of the SPL Display Range and will disappear at extreme settings. The factory default is 85dB.

Turn the **Monitor** knob to select “SPL Default”. This sets the user preferred level for the Cue control when MonitorMax is powered up. Turn the **Monitor** knob while holding the **Enter** key to change the level from the minimum to maximum setting allowable within the currently selected SPL Display Range. The factory default setting is 50. Press **Exit** to return to operation mode.

Control Options



Press the **Enter** key and turn the **Monitor** knob to reach the **Control Options** page. Continue to turn the **Monitor** knob and select the first item, “Interlock Cue”. Interlock determines whether input sources are summed when selected (off), or a previously selected source is turned off when a new selection is made (on). Pressing the **Enter** key toggles between on/off. The setting for Monitor is identical to Cue. The factory default for both Cue and Monitor is on.

This setting determines if the Monitor Dim will be engaged when an external switch wired through the SB-9 Logic I/O port (see pinouts) is activated. Pressing the **Enter** key toggles between on/off. The setting for Monitor Mute is identical to Monitor Dim. The factory default setting is off for both. Press **Exit** to return to operation mode.

Revision



Press the **Enter** key and turn the **Monitor** knob to get to the **Revision** page. This page shows the current firmware revision installed in MonitorMax. To reset all programmed settings to the factory defaults, turn the **Monitor** knob to select “Set Factory Defaults”, press **Enter**, and another page will appear.

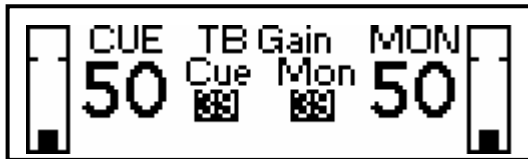


Follow the instructions on the screen to complete the operation. The numbers will count down as you press Enter. Press **Exit** twice to return to operation mode.

Non-Menu Programmable Items

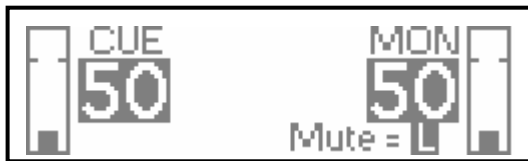
The following functions can be accessed at any time while MonitorMax is in operation mode.

Talkback Level



The Talkback Microphone gain level can be set independently for the Cue and Monitor. When the **Talkback** switch is pressed and held, the gain levels will be shown in the LCD window. By turning the **Cue** knob while the **Talkback** switch is held, the gain level of the Cue Talkback can be adjusted. Likewise the Monitor Talkback can be adjusted with **Monitor** knob. The range of adjustment is from 27dB to 65dB of gain. The factory default is 39 dB.

Mute Left / Right



Pressing the Monitor **Mute** switch normally mutes the Main or Alt speakers, however by pressing and holding the **Mute** switch, either the Left or Right speaker can be muted alone. When the Monitor **Mute** switch is held, the speaker being muted will be shown in the LCD window and the Enter key LED will be flashing. Pressing the **Enter** key while holding the **Mute** switch will cause the speaker muted to toggle between Left and Right.

LCD Contrast



When the **Exit** key is pressed and held, the word "Contrast" will appear in the LCD window. The Contrast level of the LCD can be adjusted by turning the **Monitor** knob while holding the **Exit** key.

Calibrating MonitorMAX

The default SPL displayed on MonitorMAX comes set to 50dB on power up. However, this is not the intended operating level, but only a safe starting point. Once the unit has been set up, a new default SPL can be programmed by the user. When MonitorMAX has been properly calibrated, the display will indicate the actual SPL reference as adjusted by the Monitor level control in 1dB increments. Since 85dB SPL is the accepted working standard for film mixing stages, this reference is normally used as the target to calibrate MonitorMAX.

To achieve the cleanest audio path with the best signal-to-noise ratio, it is recommended to run all signals at line level (+4dBu nominal) and take as much attenuation at the end of the audio chain (e.g. the speaker amplifier inputs) as necessary to achieve the desired SPL. When MonitorMAX is set to the default display range of 40 to 100dB, a Monitor level setting of 85dB SPL reflects 15dB of attenuation to the outputs. Likewise, a Monitor level setting of 100dB reflects unity gain from inputs to outputs. When calibrated to this setting, MonitorMAX will provide a wide range of level control with a maximum SPL of 122dB (if the speakers will handle it) while maintaining a good signal-to-noise balance.

Simply stated, proper calibration is when a +4dBu input signal (ideally wide band pink noise) produces an 85dB reading on an SPL meter at the listening position, when the MonitorMAX level control is set to 85dB.

The best way to accomplish this is to first set the input controls on your power amplifiers to the lowest level (most attenuation) and set the MonitorMAX level control so the display reads 85.

Note: If using Powered Monitors or amplifiers that do not provide a wide range of input attenuation, it may be necessary to use the internal trim adjustments on the MonitorMAX “Levels” menu to obtain the required amount of attenuation. Again, for best results take as much attenuation as possible at the amplifier inputs.

Select a Monitor Input (1 – 8) and feed a +4dBu pink noise test tone into either side (L or R). A metering device can be connected to the Meter outputs (1-2) of MonitorMAX to confirm the +4dBu reading. Place an SPL meter (Radio Shack model or equivalent, C weighted, slow response) in the listening position and adjust the corresponding amplifier input control until approximately 85 dB is read on the SPL meter. Repeat the procedure for other speakers.

Note: It may be necessary to use the internal speaker trims on the MonitorMAX “Levels” menu to obtain precise adjustments for each speaker including Cue and Alt L & R. These trims provide up to 20dB of attenuation in 0.1dB increments.

In addition to the default SPL range of 40 –100dB, 4 other SPL display ranges are included in the “Mon Interfaces” menu. Changing the range does not effect the electrical signal path, but determines where the calibration target (85dB) lies in relation to the top of the display range. This will effect the way the unit is calibrated, in that *more or less* attenuation will have to be taken elsewhere (trims or amplifier inputs) to compensate for *more or less* attenuation taken in the Monitor Level control. The object is to obtain the best signal-to-noise ratio while retaining adequate SPL headroom.

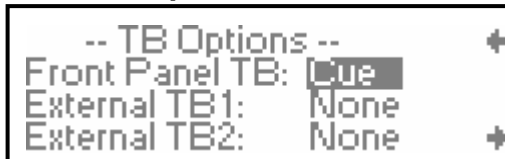
If an SPL meter and pink noise source is not available, the unit should be set up by ear. First set the MonitorMAX Level control to 85dB and then adjust the amplifier input levels to a comfortable working level. This should be adequate for many applications where the SPL reference is not critical.

Setting Up MonitorMAX Talkback

External Talkback Switch

MonitorMAX provides for 2 separate external talkback switches with independently assignable functions. The implementation of either switch requires only two wires (digital ground and sense TB1 or TB2) from the Logic DB-9 connector. Talkback is activated when either external TB sense is switched to ground. The switch functions are determined by the program menu settings shown below.

Talkback Options



Press **Enter** to open the program menu, and turn the **Monitor** knob to get to the **TB Options** page. Continue to turn the **Monitor** knob and select the first item, "Front Panel TB". The factory default is for the talkback to be sent to Cue when the Talkback switch on the MonitorMax controller is pressed. Pressing the **Enter** key will toggle through the 4 possible selections (Cue, Mon, Both, or None).

Turn the Monitor knob to select "External TB1" or "External TB2". These represent optional external talkback switches connected through the DB-9 Logic I/O port on the MonitorMax back panel (see pinout). These settings specify where the talkback will be routed when the external switches are activated. Pressing the **Enter** key will toggle through the 5 possible selections (Cue, Mon, Both, Alt only, or None). Press the **Exit** key to return to operation mode.

Talkback Active

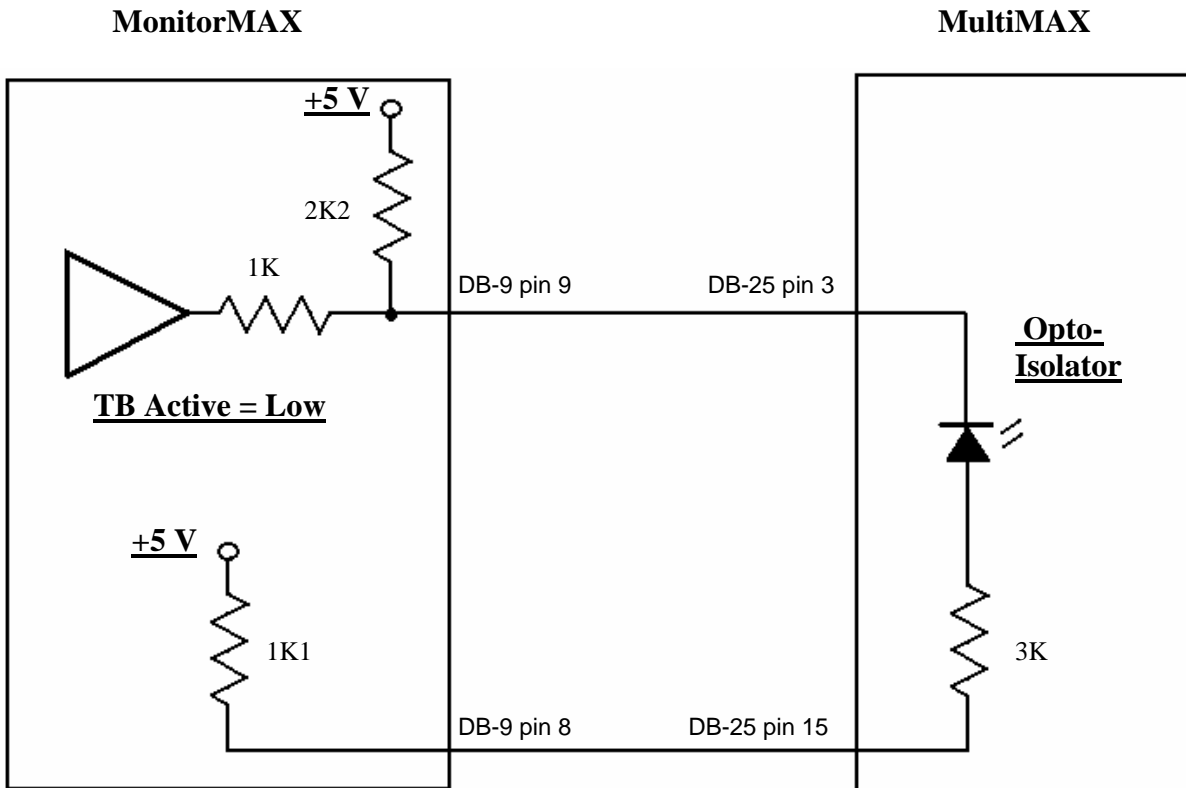
External functions can be activated when the front panel talkback switch on MonitorMAX is pressed. A +5 Volt logic high is present on pin 9 of the DB-9 Logic connector until the Talkback switch is pressed, it then goes to logic low until the switch is released.

A +5 Volt power source (VCC) for powering opto-isolated logic inputs (such as with MultiMAX) is provided on pin 8 to work in conjunction with Talkback Active.

Dim and Mute

Both Dim and Mute functions can be switched externally in the same way as TB1 and TB2, using a simple switch closure to logic ground.

Talkback Dim Logic with MultiMAX



4:2:4 Sends & Downmix Outs

MonitorMax Audio Specifications

Inputs

Stereo Inputs 1 – 8

Impedance: 20K Balanced
Level: +4dBu nominal, +26dBu maximum

Stereo Inputs 9 – 10

Impedance: 10K Unbalanced
Level: -10dBV nominal, +20dBu maximum

TB Mic Input

Impedance: 20K Balanced
Gain: 27 – 65dB

Outputs

All Outputs (Monitor, Cue, Alt, & Meter)

Impedance: 50/50 Ohm Balanced
Level: +4dBu nominal, +26dBu maximum

Frequency Response

All Audio Paths

Bandwidth: 20Hz to 20KHz +/- 0.1dB

Distortion

All Audio Paths

1KHz at 0dB Typical reading < .007% THD+N

AC Power

115 Volt Units

115 VAC +/- 10% 50 – 60Hz
20 VA maximum
Mains fuse T.315A 250V (5x20mm format)

230 Volt Units

230 VAC +/- 10% 50 – 60Hz
20 VA maximum
Mains fuse T.315A 250V (5x20mm format)

Physical

Dimensions

Rack Mount Unit: 19" x 1 ¾" x 10 ½"
Remote Controller: 6 3/8" x 6 ¾" x 2 5/8"

Weight

Rack Mount Unit: 7 lbs.
Remote Controller: 2 lbs.