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World Leader of In-Rack, Audio, Video, Data Monitoring, and Closed Captioning Solutions

VMQ-4

1RU Monitor Speaker

User Guide

Part Number 821031, Revision A

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Introduction

Overview

The single-rack space VMQ-4 permits simultaneous monitoring of up to four audio sources with “voice quality” fidelity. Because each channel has its own dedicated power amplifier and speaker, the audio sources remain completely separate from analog input to output. When listening within “Ultra Near Field” distances of 1 to 3 feet, these discrete speaker outputs provide enhanced source distinction when compared to designs with four inputs mixed into a single output.

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Safety Instructions

1. Read, keep, and follow all of these instructions; heed all warnings.
2. Do not use this equipment near water or moisture.
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 6](#).
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, 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.

7. Protect the power cord from being walked on or pinched, particularly at plug's source 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:
 - 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 mounted at eye level for best visual observation of the monitor screens.

Heat Dissipation

Heat dissipated by the speaker amps is conducted directly to the sides of the chassis; no special considerations for cooling are necessary as long as the ambient temperature inside the rack area does not exceed approximately 40°C (104°F).

AC Power

The unit's AC mains connection is via a standard IEC inlet, with safety ground connected directly to the unit's chassis. The universal AC input (100-240VAC, 50/60Hz) switching power supply is a self-resetting sealed type, with automatic over-voltage and over-current shutdown. There is no user-replaceable fuse in either the primary or secondary circuit.

Sympathetic Vibration

Sympathetic vibration from other equipment (cables, etc.), in the rack may be serious enough to interfere with the unit's sound quality out in the listening area. The use of thin card stock and/or felt or foam weather-stripping type materials between adjacent vibrating surfaces, or tying up loose cables, etc., may be required to stop vibrations external to the unit.

Mechanical Bracing

The chassis is securely attached to the front panel at eight points along its surface, not just at the four corners of the chassis ears. 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

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 common is connected to the chassis. In the VMQ-4 (standard analog inputs), unbalanced sources may also be applied to the balanced inputs. For analog input signals, the gain is 6 dB greater with a single-ended source connected across both “hot” terminals than when connected between either input and common. Note that the unused input terminal of a balanced input should be connected to common, rather than being left floating, to insure best immunity to noise.

Magnetic Shielding

We have defined five levels of magnetic shielding. Level One represents the most minimal shielding of the steel chassis compared to the stray field of the speakers without any ferro-magnetic enclosure. Level One typically results in a field strength of two Gauss at a distance of two inches from the enclosure surface. (Because of the inverse square law, such a field is eight Gauss at one inch from the surface!) Because of the purity of color of a CRT display, it is extraordinarily sensitive to magnetic fields making Level One shielding inadequate, even if the CRT is several rackspaces away. (CRT color purity may be disturbed by fields as low as 1/2 Gauss.)

Level Two shielding, specified as two Gauss or less anywhere along the top and bottom surfaces and front panel, was an interim level, and is sometimes the best available for highly customized units, but is satisfactory in many applications.

The VMQ series employs proprietary methods to achieve Level Three shielding, which is specified as one to 1.5 Gauss or less at the surface, anywhere along the top or bottom of the chassis and front panel. (The VMQ has stray field of about 1 Gauss.) For all situations we are aware of, this level has proved to be entirely satisfactory. With Level Three shielding, the unit may be located in the rackspace immediately above, below or to either side of a color monitor, usually without disturbing the purity at all.

Audio Connections

Connection of the audio feeds is straightforward. The system block diagram in [Figure 1-3 on page 9](#) may be referred to for clarification of the general signal paths into and out of the VMQ units.

Please note that the internal circuitry common is connected to the chassis.

The gain is approximately 4dB greater with a single-ended source connected across both "hot" terminals than when connected between either input and common.

Note: Unless otherwise noted, all chassis mounted XLR and BNC connectors are female.

Applications

- Monitoring multiple incoming feeds for news /talk shows
- Confidence/cueing monitoring for D2- , D3- and D5-type VTRs in machine rooms and edit bays
- Monitoring of multiple inputs in TV newsrooms
- Monitoring multiple audio feeds in theme parks, security installations, and teleconferencing systems

Features

- Only ONE rack space high.
- Monitoring of four discrete audio channels in one unit.
- Dedicated input circuitry for each output channel.
- Volume control for each of four channels.

- Fully magnetically shielded.
- Signal present LED on each channel output.
- Mute button and LED for each channel.
- Headphone jack

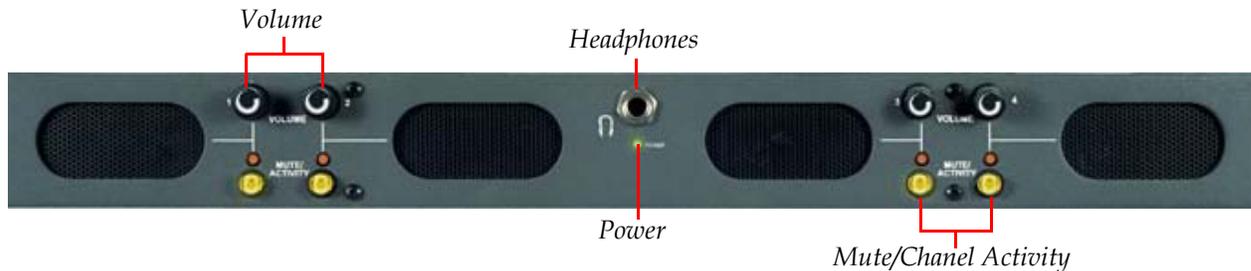
Specifications

Table 1–1 VMQ-4 Specifications

Specification	Value
Input impedance	>100 k Ω balanced >50 k Ω unbalanced
Input level for full output (volume full on)	0 dBv balanced. -12dBv unbalanced Other sensitivity ranges available on request
Hum and noise	Better than -70 dB below full output
Frequency response	300 Hz to 16 kHz (\pm 9dB)
Maximum acoustic output	94 dB SPL at 2 feet
Electrical distortion	Less than 0.2% at any level below limiting threshold
Magnetic shielding	Less than 0.2 Gauss any adjacent surface
Connectors	Balanced: Phoenix (Standard) or XLR (Optional)
Dimensions (HxWxD)	1.75 x 19 x 9.7 in. (44.5 x 483 x 246 mm.)
Weight	7 lbs. (3.2 kg)
Power Supply	Universal AC input (100-240V) UL/CSA approved
Power consumption	20W / 35W (avg. / max)

Front Panel Controls

Figure 1–1 VMQ-4 Front Panel



- **Internal Speakers:** The VMQ internal speaker system is comprised of four separate mid-range speakers. From left to right the speakers correspond to channels 1 through 4; one speaker for each of the four channels.
- **Volume Controls (Rotary Pots):** Each volume control adjusts the loudness of the audio reproduced by the associated internal speakers of the respective channel (or connected headphone). From left to right the volume controls correspond to channels 1 through 4.
- **Headphone Jack (1/4" Phone Plug):** For critical listening or for listening in high noise environments, use the headphone feature rather than the internal speakers. When being monitored by headphones, channels 1 and 2 are summed to the left headphone while channels 3 and 4 are summed to the right. When you plug in headphones, the speakers will mute. This jack accepts the standard 1/4" phone type stereo plug.
- **Channel Mute Indication (Red LED):** There is a Channel Mute Indicator LED for each of four channels and each LED will glow red to indicate the mute feature is being used on the associated channel. From left to right the Channel Mute buttons correspond to Channels 1 through 4.
- **Mute Button / Channel Activity Indication (Push Button/ Amber LED Mute Button):** There is a Mute Button for each of four channels. When depressed, these buttons toggle the mute feature on and off for the associated channel. When a channel is muted, the LED above the associated button will glow red.

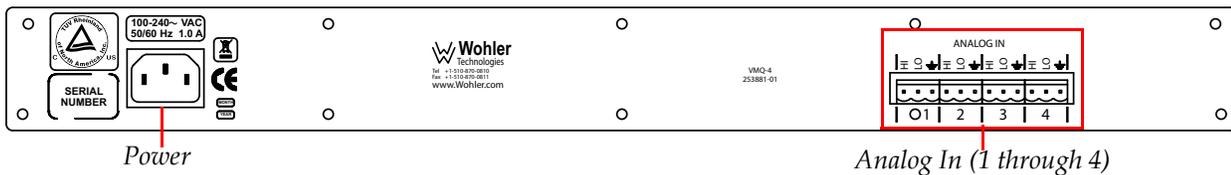
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Rear Panel Connectors

- **Channel Activity Indicator:** Signal activity in any given channel will cause the LED in the associated button for that channel to glow amber.
- **Power Indication (Green LED):** The Power Indicator LED signals the operating condition of the power supply. The LED glows green to indicate the VMQ-4 is connected to mains power and an operation voltage is present.

Rear Panel Connectors

Figure 1–2 VMQ-4 Rear Panel



- **Power:** Attach a standard IEC-320 power cord between this connector and mains power (100 - 250VAC, 50/60 Hz). The front panel power LED will glow green to indicate operating voltages are present.
- **Analog In (1 through 4, Phoenix or XLR):** These four inputs are meant to receive standard analog audio signals and are configured for balanced (100K Ω) connections. Either Phoenix (standard) or XLR (optional) connectors may be specified at the time of ordering the VMQ-4. Inputs are labeled 1 through 4. XLR connectors are 3-pin female and Phoenix connectors are standard 3-pin type. Pin-out information for Phoenix connectors are silk-screened above each connector. XLR pin-outs are:
 - Pin-1 = Common
 - Pin-2 = Low
 - Pin-3 = High

Technical Functional Overview

Figure 1-3 below illustrates the overall functionality of the VMQ-4.

Figure 1-3 VMQ-4 Block Diagram

