on-Q 717AU100WH Impedance Matching Volume Control Installation Guide

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Introduction

The On-Q/Legrand Speaker Level / Impedance Matching Volume Control, P/N AU0100-WHDM-V1/AU0100-WHLA-V1, is meant to be used in multiple speaker distributed sound systems. These volume controls enable more pairs of speakers to be connected to an amplifier than the amplifier could normally accommodate (due to impedance matching ability). The impedance-matching volume controls mate perfectly with parallel audio distribution devices such as the On-Q 4 Zone Audio Distribution Outlet (P/N 364741-xx-V1). The volume control also has a non impedance matching (speaker level), (1x) option to accommodate a single pair of speakers. When used in this fashion optimum fidelity will be achieved with a single pair of speakers.

Figure 1

Description
The On-Q Speaker Level / Impedance Matching Volume Control occupies a single gang of an electrical box and is offered in white, almond, and light almond in an attractive decorator style. It has wiring blocks that disconnect for easy wiring and offer impedance matching selection via jumpers labeled 1x, 2x, 4x, and 8x, (1x=nonimpedance matching), located on the circuit board. It is recommended to be installed in a low voltage bracket such as the On-Q Single Gang Retrofit Low Voltage Bracket (F9060-01-V9), or an electrical box that is 20 cubic inches or greater in volume.

Installation

Installation of the On-Q Speaker Level / Impedance Matching Volume Control is easily accomplished at multiple times during new construction, at “Rough-in” before the drywall is installed, and at “Trim-out” after the drywall is installed and painted or at any time following similar procedures for a retrofit opportunity.

NOTE: Before connecting the volume control: Make sure that power is not connected to the receiver/amplifier that will be driving audio signals to the volume controls. For instructions on pre-wiring and installing other components of any On-Q Audio System, please see the Instruction Sheets included with those components.

Rough-in” steps

- A single 16/4 speaker wire should be run from the location of the audio distribution device (such as the 4 Zone Audio Distribution Outlet) to a single gang outlet box or low voltage bracket at each Volume Control location.

Distance	Gauge
<10 Feet	18
10-50 Feet	16
>50 Feet	14

Gauge Selection Chart

Figure 2

- A single 16/2 speaker wire should be run from each speaker location to the outlet box or low voltage bracket at the volume control location.

Trim-out" steps

- Strip 3/16ths of an inch from all conductors (feed from distribution and runs to speakers) and insert the wires into the wiring blocks of the volume control.

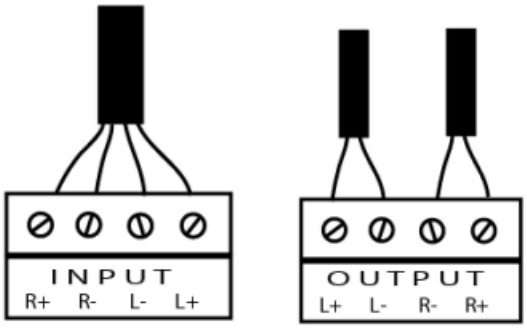


Figure 3

- Tighten screws onto wire and give them a tug to insure they are properly fastened.

NOTE

- Impedance varies with frequency, so in actuality, no load is seen as a constantly stable (8, 4 or 2 ohms), it varies as frequency varies. (This is why some of the higher selections were made in the Multiplier chart.)
- This chart refers to 8 ohm speakers. If the Speakers being used are some other impedance, you must calculate the parallel impedance and multiply it by the appropriate multiplier (X2, X4 or X8), to match the load to the amplifier's capabilities. Nonimpedance matching=X1 (see Figure 5 for the formula to calculate impedance).

Multiplier Settings

Figure 4

Pairs of 8 Ohm Speakers

	Actual Impedance	Multiplier for 8 Ohm Amp	Adjusted Impedance	Multiplier for 4 Ohm Amp	Adjusted Impedance	Multiplier for 2 Ohm Amp	Adjusted Impedance
1 Pair	8 Ω	1	8 Ω	1	8 Ω	1	8 Ω
2 Pair	4 Ω	2	8 Ω	1	4 Ω	1	4 Ω
3 Pair	2.6 Ω	3	10.4 Ω	2	5.2 Ω	1	5.2 Ω
4 Pair	2 Ω	3	8 Ω	2	4 Ω	1	4 Ω
5 Pair	1.6 Ω	4	12.8 Ω	3	6.4 Ω	1	3.2 Ω
6 Pair	1.33 Ω	4	10.6 Ω	3	5.3 Ω	1	2.6 Ω
7 Pair	1.14 Ω	4	9.12 Ω	3	4.5 Ω	1	2.2 Ω
8 Pair	1 Ω	4	8 Ω	3	4 Ω	2	4 Ω
9 Pair	.88 Ω	4	7 Ω	4	7.0 Ω	2	3.5 Ω
10 Pair	.80 Ω	NA	NA	4	6.4 Ω	2	3.2 Ω
11 Pair	.72 Ω	NA	NA	4	5.7 Ω	2	2.8 Ω
12 Pair	.66 Ω	NA	NA	4	5.2 Ω	2	2.6 Ω
13 Pair	.61 Ω	NA	NA	4	4.8 Ω	2	2.4 Ω
14 Pair	.57 Ω	NA	NA	4	4.5 Ω	2	2.2 Ω
15 Pair	.53 Ω	NA	NA	4	4.2 Ω	3	4.2 Ω
16 Pair	.50 Ω	NA	NA	4	4 Ω	3	4 Ω

Multiplier Chart

- Although there are jumpers for each speaker's output, in most cases they will be set exactly the same.

Formula for calculating impedance of parallel speakers:

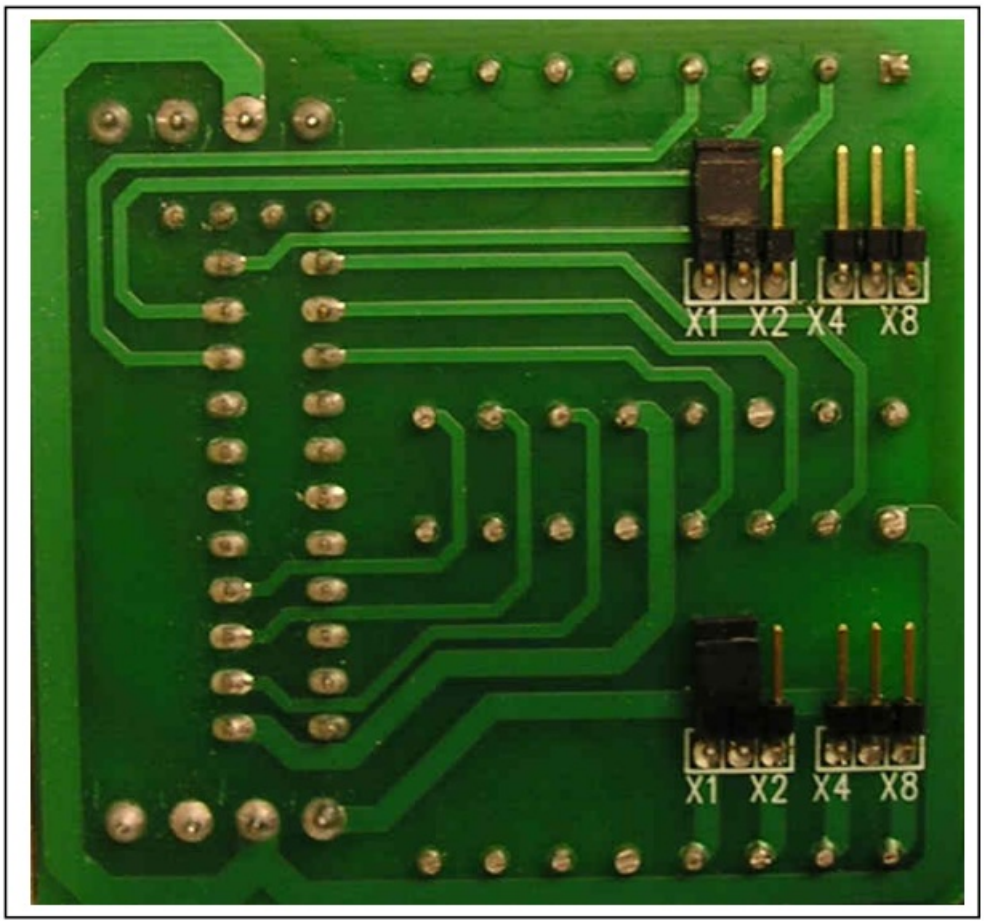
1/x ohms + 1/x ohms = 1/y impedance

1/8 ohms + 1/8 ohms = 2/8 ohms or 1/ 4 ohms
(2 - 8 ohm speakers in parallel exhibit 4 ohms of impedance)

NOTE: Speakers wired in series exhibit purely additive impedance (8+8 + 16).

Figure 5

- Multiplier setting #1 refers to jumper position X1, multiplier setting #2 refers to jumper position X2, multiplier setting #3 refers to jumper position X4 and multiplier setting 4 refers to jumper position X8



To change color:

- Pull off knob.
- Unscrew coverplate.
- Unsnap inner cover.
- Snap on new inner cover.
- Screw on new coverplate.
- Push on new knob.

Documents / Resources

	on-Q 717AU100WH Impedance Matching Volume Control [pdf] Installation Guide 717AU100WH Impedance Matching Volume Control, 717AU100WH, Impedance Matching Volume Control, Matching Volume Control, Volume Control, Control

References

- On-Q®Structured Wiring, Connectivity andSmart HomeSolutions | Legrand

- Legrand US | Delivering and Managing Power, Light, and Data