

AW-IMP100WV-B

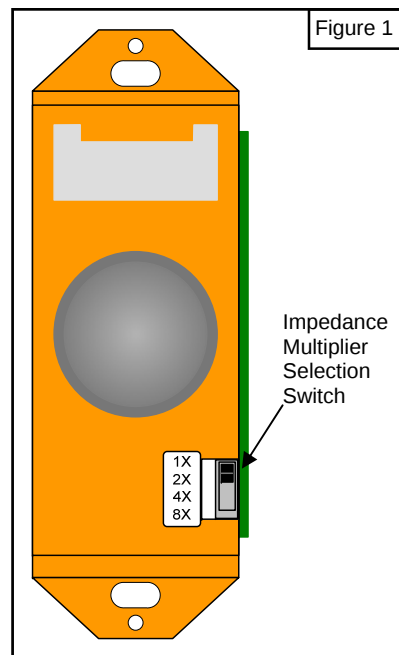
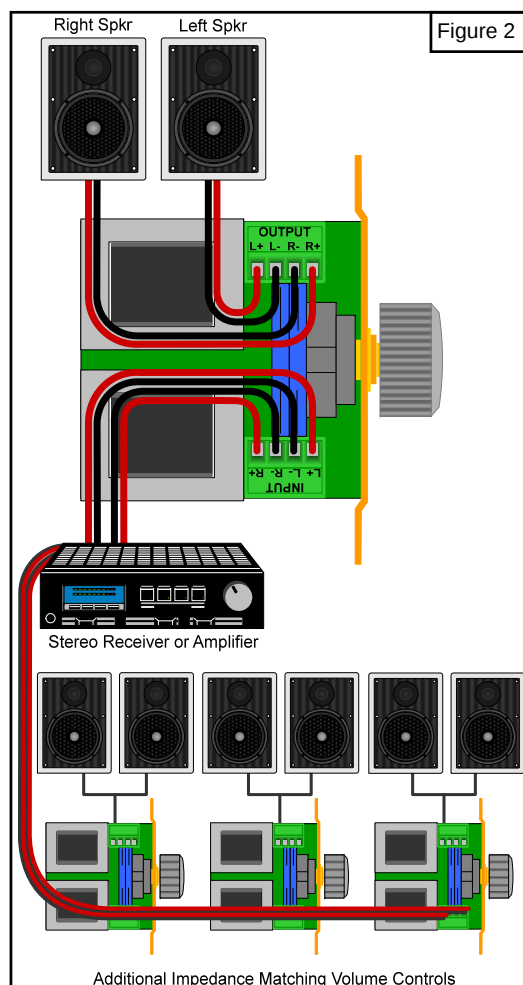
Impedance Matching Volume Control

Specifications:

- 100 Watts RMS Power Handling per channel
- 1X, 2X, 4X, & 8X Impedance Multiplier
- 12 Volume positions including one Off position

Features:

- Protects amplifier by maintaining safe impedance
- 1X position allows use in ordinary applications
- Easy installation with easy-to-read instructions
- Removable Input/Output terminal strip
- Stereo Control (Can be used in Mono Applications.)
- Suitable for residential & commercial applications
- Limited Lifetime Warranty



Introduction

The AW-IMP100WV is an **impedance matching** volume control that is intended to compensate for the decreasing impedance associated with connecting multiple pairs of speakers to a single audio amplifier. It does this by multiplying the impedance of the speakers to match their load to the amplifier

Installation

Determine the desired impedance multiplication. (See "**Impedance Multiplier Selection**" for determining proper position.) To change the multiplier, slide the multiplier switch to the desired position. The switch is located on the front of the control (behind the cover plate if it is attached). (See **Figure 1**) Connect the left & right channel outputs of the amplifier or receiver to the input of the volume control as shown in **Figure 2**. Connect the left & right channel outputs of the volume control to the speaker inputs. Initial testing of the system should be done at low volume settings of both the amplifier and the volume controls.

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Impedance Multiplier Selection:

There are two methods shown below for determining the proper impedance multiplication — Chart Method and Calculated. The chart method is a lookup table and is likely easiest since it doesn't require a calculator. Calculating can be more accurate and is most useful when speakers of different impedance values are combined in a system.

Using the Chart

Use the charts below to determine the maximum number of speakers that you can connect to your amplifier and for determining the proper impedance multiplication switch position. To use the charts, first select the section that most closely matches the impedance of your speakers. Move down the first column to the row that matches the minimum impedance capability of your amplifier. Move across the row to the column that matches the number of speaker pairs you wish to use. The value shown is the multiplier that should be selected on each volume control in the system. The values in the light gray areas indicate combinations that are a little below the amplifiers minimum impedance but will likely work well*.

Each chart assumes that all the speakers within the system have the same impedance i.e. 8, 6, or 4 ohm. Most installations use 8 ohm speakers. Therefore, the Switch Position Chart for 8 ohm speakers will most often be used. However, if you have a variety of speaker impedance values in your system, then you should calculate the multiplier position or use the chart that corresponds to the most common impedance value of your speakers. In other words, select the 8 ohm chart if your system contains mostly 8 ohm speakers, select the 6 ohm chart if your system contains mostly 6 ohm speakers, and the 4 ohm chart if it contains mostly 4 ohm speakers.

Minimum amplifier impedance capability (Ω)	Multiplier Switch Position Chart for 8 ohm Speakers															
	Number of Speaker Pairs															
	1pr	2pr	3pr	4pr	5pr	6pr	7pr	8pr	9pr	10pr	11pr	12pr	13pr	14pr	15pr	16pr
8 ohms	1X	2X	4X	4X	4X	8X	8X	8X	8X	8X						
6 ohms	1X	2X	2X	4X	4X	4X	8X	8X	8X	8X	8X	8X				
4 ohms	1X	1X	2X	2X	4X	4X	4X	8X	8X	8X	8X	8X	8X	8X	8X	8X
2 ohms	1X	1X	1X	1X	2X	2X	2X	4X	4X	4X	4X	4X	4X	4X	4X	4X

Minimum amplifier impedance capability (Ω)	Multiplier Switch Position Chart for 6 ohm Speakers															
	Number of Speaker Pairs															
	1pr	2pr	3pr	4pr	5pr	6pr	7pr	8pr	9pr	10pr	11pr	12pr	13pr	14pr	15pr	16pr
8 ohms	1X	2X	4X	4X	8X	8X	8X	8X								
6 ohms	1X	2X	4X	4X	4X	8X	8X	8X	8X	8X						
4 ohms	1X	2X	2X	4X	4X	4X	8X	8X	8X	8X	8X	8X	8X	8X	8X	8X
2 ohms	1X	1X	1X	2X	2X	2X	4X	4X	4X	4X	4X	4X	8X	8X	8X	8X

Minimum amplifier impedance capability (Ω)	Multiplier Switch Position Chart for 4 ohm Speakers															
	Number of Speaker Pairs															
	1pr	2pr	3pr	4pr	5pr	6pr	7pr	8pr	9pr	10pr	11pr	12pr	13pr	14pr	15pr	16pr
8 ohms		2X	4X	8X	8X	8X										
6 ohms		2X	4X	4X	8X	8X	8X									
4 ohms	1X	2X	4X	4X	8X	8X	8X	8X	8X	8X						
2 ohms	1X	1X	2X	2X	4X	4X	4X	4X	8X	8X	8X	8X	8X	8X	8X	8X

Calculating the Multiplier Switch Position

- (1) Calculate the net impedance for all your speaker pairs.
- (2) Determine the minimum safe operating impedance for your amplifier. (See amplifier owner's manual.)
- (3) Divide the amplifier's minimum impedance by the net speaker impedance that you calculated. The result is the minimum necessary multiplier value that you will need to select on each volume control in the system.
- (4) The multiplier value you calculated will probably not be exactly 1, 2, 4, or 8 so you will need to round the value you calculated. Round up to the next highest multiplier unless you are within approximately 20% of a multiplier value, as in the example. Below are the formulas for calculating net speaker impedance and the minimum multiplier value along with an example. Z_1 , Z_2 , and so on, are the impedance values of your speakers. The example uses an 8, 6 and 4 ohm speaker connected to a system.

$$\text{Net Spkr Imp.} = \frac{1}{\frac{1}{Z_1} + \frac{1}{Z_2} + \frac{1}{Z_3} + \dots} \quad \text{Example: Net Spkr Imp.} = \frac{1}{\frac{1}{8\Omega} + \frac{1}{6\Omega} + \frac{1}{4\Omega}} = \frac{1}{0.125 + 0.167 + 0.25} = \frac{1}{0.542} = 1.85\Omega$$

$$\text{Multiplier Value} = \frac{\text{Minimum Amplifier Impedance}}{\text{Net Speaker Impedance}} \quad \text{Example: } \frac{8\Omega}{1.85\Omega} = 4.32 \approx 4$$

*OEM assumes no liability for damage to any audio or electrical equipment due to improper setup, improper connection, or a volume control malfunction.

Impedance Multiplier Selection:

There are two methods shown below for determining the proper impedance multiplication — Chart Method and Calculated. The chart method is a lookup table and is likely easiest since it doesn't require a calculator. Calculating can be more accurate and is most useful when speakers of different impedance values are combined in a system.

Using the Chart

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Each chart assumes that all the speakers within the system have the same impedance i.e. 8, 6, or 4 ohm. Most installations use 8 ohm speakers. Therefore, the Switch Position Chart for 8 ohm speakers will most often be used. However, if you have a variety of speaker impedance values in your system, then you should calculate the multiplier position or use the chart that corresponds to the most common impedance value of your speakers. In other words, select the 8 ohm chart if your system contains mostly 8 ohm speakers, select the 6 ohm chart if your system contains mostly 6 ohm speakers, and the 4 ohm chart if it contains mostly 4 ohm speakers.

Minimum amplifier impedance capability (Ω)	Multiplier Switch Position Chart for 8 ohm Speakers															
	Number of Speaker Pairs															
	1pr	2pr	3pr	4pr	5pr	6pr	7pr	8pr	9pr	10pr	11pr	12pr	13pr	14pr	15pr	16pr
8 ohms	1X	2X	4X	4X	4X	8X	8X	8X	8X	8X						
6 ohms	1X	2X	2X	4X	4X	4X	4X	8X	8X	8X	8X	8X				
4 ohms	1X	1X	2X	2X	4X	4X	4X	8X	8X	8X	8X	8X	8X	8X	8X	8X
2 ohms	1X	1X	1X	1X	2X	2X	2X	2X	4X	4X	4X	4X	4X	4X	4X	4X

Minimum amplifier impedance capability (Ω)	Multiplier Switch Position Chart for 6 ohm Speakers															
	Number of Speaker Pairs															
	1pr	2pr	3pr	4pr	5pr	6pr	7pr	8pr	9pr	10pr	11pr	12pr	13pr	14pr	15pr	16pr
8 ohms	1X	2X	4X	4X	8X	8X	8X	8X								
6 ohms	1X	2X	4X	4X	4X	8X	8X	8X	8X							
4 ohms	1X	2X	2X	4X	4X	4X	8X	8X	8X	8X	8X	8X	8X	8X		
2 ohms	1X	1X	1X	2X	2X	2X	4X	4X	4X	4X	4X	4X	8X	8X	8X	8X

Minimum amplifier impedance capability (Ω)	Multiplier Switch Position Chart for 4 ohm Speakers															
	Number of Speaker Pairs															
	1pr	2pr	3pr	4pr	5pr	6pr	7pr	8pr	9pr	10pr	11pr	12pr	13pr	14pr	15pr	16pr
8 ohms	2X	4X	8X	8X	8X											
6 ohms	2X	4X	4X	8X	8X	8X	8X									
4 ohms	1X	2X	4X	4X	8X	8X	8X	8X	8X	8X						
2 ohms	1X	1X	2X	2X	4X	4X	4X	8X	8X	8X	8X	8X	8X	8X	8X	8X

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$$\text{Multiplier Value} = \frac{\text{Minimum Amplifier Impedance}}{\text{Net Speaker Impedance}} \quad \text{Example: } \frac{8\Omega}{1.85\Omega} = 4.32 \approx 4$$

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