

# The Volume Control explained



## 1. Two types of volume controls

There are two types of volume controls in audio equipment: **analogue** and **digital**.

- **Analogue volume control** is usually either a potentiometer or a stepper. The stepper version is usually more expensive.
- **Digital volume control** is usually built into the DAC chipset itself.



## 2. Pros and Cons

	Digital Volume Control	Analogue Volume Control
		
<b>Sound Quality</b>	<b>Low</b>	<b>High<sup>1</sup></b>
<b>Reduced Audio Resolution</b>	<b>Yes<sup>2</sup></b>	<b>No</b>
<b>Size</b>	<b>Small</b>	<b>Large</b>
<b>Cost</b>	<b>Nil<sup>3</sup></b>	<b>High</b>

Note 1: The sound quality of most decent analogue volume controls is a major step up from digital ones (see Note 2 below). However, low-quality analogue volume controls can sound worse than a digital one.

Note 2: Every 6dB volume decrease will reduce the resolution by 1-Bit, i.e. 16-Bit audio source will become 15-Bit. With normal systems, listening at -10dB to -30dB volume is normal. Hence, with a digital volume control, CD (16-Bit) suddenly becomes a low-resolution 11-Bit source, even a 24-Bit *HD* file becomes only 19-Bit.

Note 3: The digital volume control is normally built into the DAC chipset at no extra cost.

### Comments

- All analogue volume controls exhibit a small amount of channel imbalance at very low volume settings (below 10 o'clock).
- An analogue volume control (stepper version) will also have finite steps (24-64 steps) over the whole range. Hence at very low volume settings (below 10 o'clock), where the steps are larger, one will hear volume change in larger steps.

If normal listening is performed at 9 o'clock (should be 12 o'clock or beyond), the IEM/headphone is likely to be too sensitive for the iDSD/iCAN.

There are two solutions:

1. Attenuator – to reduce the line output from the iDSD.
2. Select an alternative IEM/headphone to match the iDSD.