
Why do I need to use a "DI" Box and what do they do?

The areas separating Professional, Semi Professional and Domestic Audio equipment has become very blurred in recent times.

With the multitude of standards of connectors, nominal operating levels and impedances now being used, and the variety of signal sources being used, signal interface devices (commonly known as DI boxes or Direct Boxes) are becoming ever more important to the audio engineer.

DI Boxes find applications interfacing usually **Unbalanced** (also known as Single Ended) signal sources like: Drum machines, Guitar and Bass instruments and amplifiers, Keyboards, Computers, Samplers, etc to the **Balanced** world of mixing console inputs for live sound, recording and broadcast.

In Electronics terms DI Boxes act as High Impedance active buffers enabling low or high impedance unbalanced equipment or instruments to be connected to low impedance balanced signal lines by providing two output signals of equal amplitude or level but opposite in phase. When these two signals are recombined in a mixing console's **Balanced Microphone input stage**, any Hum or R.F interference which may have been introduced into the preceding cabling is effectively cancelled out or removed from the signal.

Importantly, when used to connect instruments such as Bass Guitars and Keyboards to mixing consoles, **Active DI's** usually have an input impedance of at least 2 Meg Ohms to ensure no detrimental loading to the input which can cause loss of high frequencies due to the loading effect or impedance mismatch usually encountered.

Most units have a **ground lift** switch to isolate the input and output grounds to prevent earth loops, and can be either (or both) **phantom** and **battery** powered. In some cases DI Boxes are also Mains / A.C Powered.
