

New Active DI Box with Extended Dynamic Range from Klark Teknik



The DN100 has become an established favourite amongst both engineers and musicians alike. With its high headroom, dynamic response and sonic clarity, DN100 faithfully reproduces the character of electric and acoustic instruments and allows far more of the detail of musical performances to be captured. DN100 is intended for professional applications where +48 V phantom power is a standard feature on all mixing consoles, and its innovative design results in a significantly higher clipping point than many other active DI Boxes, providing +10 dBu output into a 2 k Ω load. This increased headroom means that much higher level input signals can be accommodated without the need for an attenuating pad. Combined with a very low noise input circuit topology, DN100 offers a very wide dynamic range, and only requires a single -30 dB pad for use when connecting directly to instrument amplifier outputs.

DN100 is built to handle the rigours of life on the road, a thick aluminium extrusion protects the electronics, and in turn is covered by a tough silicone rubber sleeve.

Exhaustive listening tests using a wide variety of active and passive bass guitars, electro-acoustic guitars and electronic musical instruments were carried out to select the components for DN100 to achieve the best musical sound. Not only was the choice of the audio transformer particularly important in achieving this goal, but the impedances of the surrounding components were also highly critical in getting the best possible performance out of the audio transformer. The line-driving

characteristics of the transformer output were carefully optimised to provide the best frequency and phase responses for short and long cables and widely differing line and termination impedances.

Care was taken in the design of the DN100 to avoid audio transformer core saturation and a fixed high pass filter has been included in the signal path to roll off frequencies below those that are musically important. The lowest note on a 5- or 6-string bass guitar is B0 with a frequency of 30.87 Hz, and the lowest note on an 88-key piano keyboard is A0 with a frequency of 27.50 Hz. DN100 still maintains a frequency response of ± 0.5 dB at these lowest musical notes.

As well as the transformer in the signal path, DN100 also has a transformer to isolate the power rails to the input circuit from the phantom power supply sourced from the output XLR connector. When used in conjunction with the Earth Lift switch, this full galvanic isolation of input and output interfaces ensures that any risk of earth loops is avoided when taking a direct feed from stage backline equipment.



A custom instrumentation-grade input circuit was designed for the DN100 using advanced analogue design techniques to create the very high input impedance required by passive guitar and bass pickups, whilst keeping the actual component values low to minimise noise. This innovative approach to circuit design produces a very low noise floor, which combined with the high clipping point creates an unrivalled dynamic range in a +48 V phantom powered DI Box.

DN100 features one parallel-connected XLR and two $\frac{1}{4}$ " TRS inputs, one which may also be used a link output for connection to a guitar or bass amplifier. When connecting to the XLR input only, the input impedance is 20 k Ω , ideal for line level equipment and offering even lower noise performance. This input impedance is far too low for guitar and bass pickups and is removed from the circuit when a jack plug is inserted into a $\frac{1}{4}$ " TRS input, resulting in a nominal 1 M Ω input impedance, ideal for passive electric pickups.



DN100 features illuminated Pad and Earth Lift switches, which along with the +48V phantom power indicator LED, provide 'at a glance' status display, even at wide distances and viewing angles.

The Earth Lift switch separates the input and output grounds, useful in eliminating earth loops between equipment on different mains electricity supplies.

Featuring a tough aluminium extrusion, the DN100 is designed for the rigours of live concert touring. The protective rubber corners also insulate the DN100 chassis to further enhance its electrical isolation. Premium Neutrik XLR connectors are used to ensure reliable audio connections, night after night.

Technical Specifications

Inputs

- Connectors: 2 x 1/4" TRS and 3-pin XLR linked in parallel
- Impedance: 1 MO nominal, balanced or unbalanced, 20 kO (XLR only)
- Max input level: 35 dBu (with pad enabled)
- Attenuator: 20 dB pad

Outputs

- Connector: 3-pin XLR
- Impedance: 50 O
- Max output level: 15 dBu with 10 kO load
- Min load: 600 O
- System Noise: -103 dBu, 22 Hz to 22 kHz unweighted, with input terminated by 10 kO resistor
- Frequency response: 20 Hz to 20 kHz, ± 1 dB, 10 kO load
- Distortion (THD + N): Typically $<0.005\%$ @ 1 kHz, +10 dBu

Power Requirement

- Voltage: +48 V phantom
- Current consumption: <10 mA

Physical

- Dimensions: 118 x 63 x 112 mm (4.7 x 2.5 x 4.4")
- Weight: (4.7 x 2.5 x 4.4") Weight 0

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