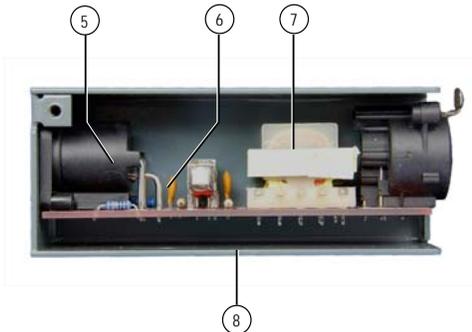


FEATURES



1. **XLR OUT:** Connects to your PA or recording system.
2. **XLR IN:** Connects from the device you would like to isolate.
3. **GROUND LIFT:** Disconnects PIN-1 on the XLR - the audio ground at the outputs to eliminate hum and buzz created by ground loops.
4. **STEEL CASE:** Virtually indestructible steel case for toughness and reliability on the road. Protects the audio circuit from electromagnetic and radio interference. Durable power-coat finish for years of long life.
5. **HD JACKS:** Heavy duty glass reinforced nylon XLR connectors are bolted to the steel case for durability.
6. **RF FILTER:** Passive filter blocks radio frequency interference from bleeding into audio lines.
7. **TRANSFORMER:** Radial Eclipse transformer isolates the audio between the input and output to eliminate hum and buzz.
8. **HEAVY DUTY PCB:** Double sided PCB mounts to a rigid 14-gauge steel L-frame for long life.



RADIAL ICE-CUBE IC-1 SPECIFICATIONS

Audio circuit type:	Passive
Frequency response:	20Hz - 20KHz +/-1 dB
Total harmonic distortion (THD+N):	<0.0006% 1KHz -10dBu Out
Dynamic range:	>135dB
Input impedance:	8.66K With 10K load
Maximum input:	+25dBu
Gain:	+25dB/-5.7dB 10K/600 Ohm Load
Clip level:	+25dBu at output
Output impedance:	600 Ohms
Equivalent input noise:	110dBu
Noise floor:	110dBu
Intermodulation distortion:	0.002% -10dBu out
Common Mode Rejection:	-84dB

To meet the requirements of California Proposition 65, it is our responsibility to inform you of the following:
WARNING: This product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.
 Please take proper care when handling and consult local government regulations before discarding.

RADIAL ENGINEERING 3 YEAR TRANSFERABLE LIMITED WARRANTY

RADIAL ENGINEERING LTD. ("Radial") warrants this product to be free from defects in material and workmanship and will remedy any such defects free of charge according to the terms of this warranty. Radial will repair or replace (at its option) any defective component(s) of this product (excluding finish and wear and tear on components under normal use) for a period of three (3) years from the original date of purchase. In the event that a particular product is no longer available, Radial reserves the right to replace the product with a similar product of equal or greater value. In the unlikely event that a defect is uncovered, please call 604-942-1001 or email service@radialeng.com to obtain a RA number (Return Authorization number) before the 3 year warranty period expires. The product must be returned prepaid in the original shipping container (or equivalent) to Radial or to an authorized Radial repair center and you must assume the risk of loss or damage. A copy of the original invoice showing date of purchase and the dealer name must accompany any request for work to be performed under this limited and transferable warranty. This warranty shall not apply if the product has been damaged due to abuse, misuse, misapplication, accident or as a result of service or modification by any other than an authorized Radial repair center.

THERE ARE NO EXPRESSED WARRANTIES OTHER THAN THOSE ON THE FACE HEREOF AND DESCRIBED ABOVE. NO WARRANTIES WHETHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE SHALL EXTEND BEYOND THE RESPECTIVE WARRANTY PERIOD DESCRIBED ABOVE OF THREE YEARS. RADIAL SHALL NOT BE RESPONSIBLE OR LIABLE FOR ANY SPECIAL, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSS ARISING FROM THE USE OF THIS PRODUCT. THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS, WHICH MAY VARY DEPENDING ON WHERE YOU LIVE AND WHERE THE PRODUCT WAS PURCHASED.

ICE CUBE
IC-1 BALANCED LINE ISOLATOR

Made in Canada



USER GUIDE

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www.radialeng.com

Thank you for purchasing the Radial Ice-Cube IC-1. The Ice-Cube is the perfect problem-solver for the AV technician and audio engineer because it will eliminate hum and buzz caused by ground loops in an audio system by simply inserting it into the signal path. The Ice-Cube IC-1 is fast to deploy and has excellent audio properties that won't introduce harsh distortion, excessive phase shift or limit the bandwidth.

Although the IC-1 is designed to be plug & play easy to use, please take a minute to read this short manual. It will give you insight on how to use the Radial IC-1 to get the most out of it. If you find yourself asking questions after reading the guide we suggest you visit the Ice-Cube FAQ page on the Radial web site. This is where we post questions from users and inform you of updates. If you still do not find what you are looking for, we invite you to send us an email at info@radialeng.com and we will do our very best to answer you in short order.

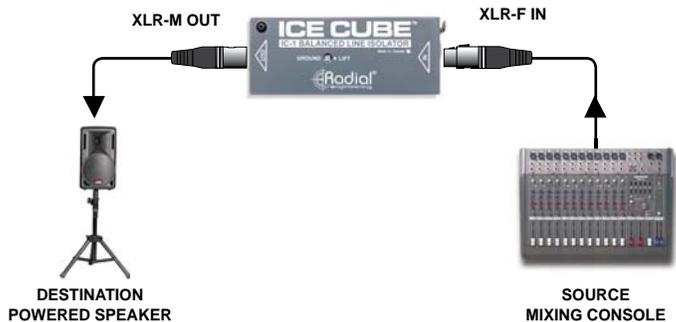
OVERVIEW

The Ice-Cube IC-1 has been designed to provide isolation between two line-level devices such as between mixing consoles, remote speakers, crossovers or amp-racks. Use the Ice-Cube IC-1 anywhere the source and destination devices may cause system noise due to different ground potentials (often referred to as ground loops) and stray DC voltages.

So called ground loops can introduce a 60 cycle hum in the sound system and other noise. Although there are various solutions that can be engineered to eliminate noise, the simplest and most effective is to isolate the source and destination with an audio transformer.

The Ice-Cube IC-1 employs a high-quality Radial Eclipse transformer to isolate the input from the output while blocking stray DC currents that cause hum. The Ice-Cube is engineered to handle any buffered line-level signal up to about +15dB with very low distortion and exceptionally linear frequency response from 20Hz to 18kHz.

The IC-1 is inserted in between a source device (like a mixer) and a destination device (like a powered speaker). The XLR female input accepts a line-level signal from the source device and the XLR male output sends the balanced signal to the destination.

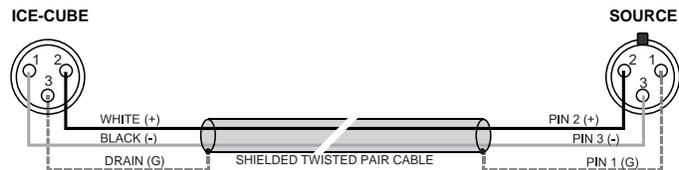


MAKING CONNECTIONS

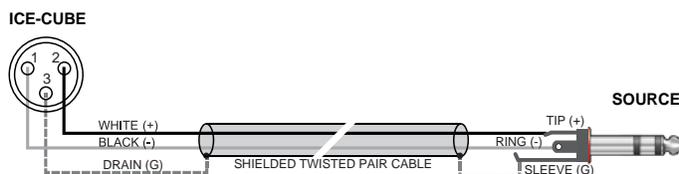
Before inserting the Ice-Cube into your signal chain, make sure all levels are turned down. This will avoid power-on and connection transients that could cause a loud pop in the sound system and damage more sensitive components such as tweeters. The Ice-Cube is a passive device. This means that it does not require an external power source to make it work. As soon as you plug it in, it will spring to life.

BALANCED CABLES

You can connect balanced devices to and from the Ice-Cube using standard XLR cables. The Ice-Cube is wired following the AES convention with pin-1 ground, pin-2 (+), and Pin-3 (-).

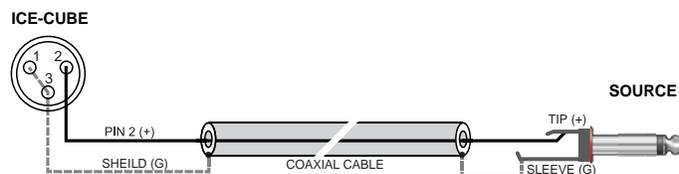


If your source device uses balanced ¼" TRS connectors you can use a balanced TRS to XLR adaptor cable wired as shown in the diagram below.



UNBALANCED CABLES

You can also connect an unbalanced device such as a CD player to the IC-1 using an adapter cable. This will reduce the signal amplitude by roughly 6dB but for high output devices like CD players and DJ mixers this is usually not a problem. Simply increase the gain at the destination mixing console to compensate. The Ice-Cube will convert the signal to balanced and you can use standard XLR cables from the Ice-Cube output to the destination mixing console.



Once the connections are made, slowly increase the volume to test. It is a good idea to always test the audio system at low volumes. This will further prevent system damage should a cable or connection be faulty.

ABOUT TRANSFORMERS

The Ice-Cube IC-1 employs a high performance Radial Eclipse isolation transformer to ensure the best signal transfer. However, not all transformers are of equal quality. At Radial, we take great care in engineering the best transformer for the job and spend hours listening to the results.



Radial Eclipse Transformer

The Eclipse transformer inside the Ice-Cube sounds great and does a superb job at providing isolation from noise caused by ground loops. Note that because the transformer will block all forms of DC, it will also block 48V phantom power coming from the console. Phantom power will not harm the Ice-Cube.

LIFTING THE GROUND

The only control on the Ice-Cube is a GROUND LIFT switch. This switch is recessed to prevent accidental use during operation. Use a small screwdriver to access the switch.



Using the recessed switch

When the switch is set to the outward position, the signal ground from the input to the output is connected via pin-1 at the XLR jacks. When pushed in, the signal ground connection is 'lifted' on both sides by disconnecting pin-1 at the XLR jacks. This further isolates the source and destination devices and generally results in less noise.

If, after connecting, you hear noise such as hum and buzz try pushing the GROUND LIFT switch inward. Lifting the grounds can be useful when the source and destination devices derive their AC power from different circuits of the AC electrical mains leading to a potential ground loop.