



OPERATING INSTRUCTIONS  
LEHLE P-SPLIT STEREO





Dear Musician!

Thank you for purchasing your LEHLE P-SPLIT STEREO!

I have been building units that switch, split and route signals with no technical compromises and with maximum musical fidelity since 1999.

Your new LEHLE P-SPLIT STEREO comprises only the very best components.

Every assembly of your LEHLE P-SPLIT STEREO has been made and tested in Germany.

Your LEHLE P-SPLIT STEREO is of extremely robust design and construction, to make sure that you get absolutely years and years of enjoyment from it. If you should nonetheless have a problem, or simply a question, just mail me or a member of the Lehle team at:

[support@lehle.com](mailto:support@lehle.com)

I wish you the very greatest pleasure and success using your LEHLE P-SPLIT STEREO

A handwritten signature in blue ink, which appears to read "Bertrand G. Lehle".

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The LEHLE P-SPLIT STEREO combines passive intelligent splitting with the highest possible signal fidelity in a double pack.

The classic solution for splitting, eliminating hum, balancing and reamplification in recording applications, now appears in a doubled version and this time adds the passive summing of signals.

The possibilities are reaching far.

Tap the full potential.

Two LEHLE TRANSFORMER HZ are working at the heart of the LEHLE P-SPLIT STEREO, galvanically isolating the particular ISO outputs from each other, eliminating any possibility of ground loops and hum.

The LEHLE TRANSFORMER HZ process both high and low impedance with uncompromising sound quality. At the ISO outputs you can pick off the signal either unbalanced or balanced – regardless of the signal type in the rest of your rig.

Per channel there is a gold plated phase switch and ground switch. This keeps you flexible and your system safe.

A classic application is the isolation of

a stereo signal, enabling you to use two amplifiers in stereo and send the stereo signal to a mixer or the audio interface of your DAW at the same time.

Another useful method for the LEHLE P-SPLIT STEREO can be as an effective hum suppressor.

If you connect two electronic devices, background noise can appear, caused by ground loops.

Here the LEHLE P-SPLIT STEREO provides a simple, but highly effective solution: whilst installed between the two units, this problem solver isolates the input from the output.

Thanks to its ability to pick off balanced signals on the ISO outputs, the LEHLE P-SPLIT STEREO is also eminently suitable for use as a high-quality compact stereo DI box for all types of active signals.

Thus you can run long cable distances in the studio or on stage, of balanced signal type and free of background noise.

According to which sockets are occupied, the LEHLE P-SPLIT STEREO also works as a passive summing box: your effects pedal board can be wired in stereo, but you output in mono if connected to only one amplifier.

If, on the other hand, you connect only one mono signal to the input, the LEHLE P-SPLIT STEREO works as a three-way split for up to three amplifiers. Galvanically isolated, double hum free and passively intelligent splitting

Speaking of passive: the LEHLE P-SPLIT STEREO still doesn't need a power supply.



## TECHNICAL DATA

Weight	614 g
Length	88 mm
Width	152 mm
Overall height	35 mm
Max Level	+20 dBu (THD < 1%, 50 Hz - 20 kHz)
Total harmonic distortion	0.003 % (0 dBu, 1 kHz)
Frequency range	20 Hz – 100 kHz -0.1/ +0.4 dB (source 600 $\Omega$ , load 1 M $\Omega$ )
Input impedance (transformer load impedance)	min. 2 M $\Omega$ at 2 kHz

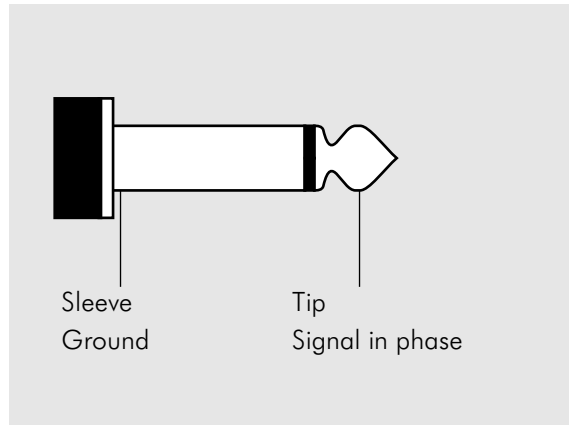
## UNBALANCED SIGNAL ROUTING

Unbalanced signal lines predominate when instruments such as guitars, basses and keyboards are used.

These signal lines have two conducting cores.

The signal itself is present on the signal conductor and is connected to the tip of the jack plug.

The second core, which is connected to the sleeve of the jack plug, screens the signal conductor and constitutes the signal ground.



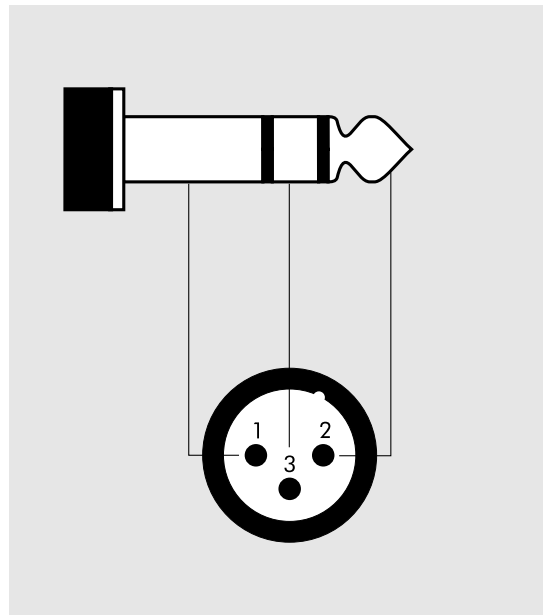
## UNBALANCED SIGNAL ROUTING

JACK	Cable	JACK
Sleeve	Ground	Sleeve
Tip	Signal in phase	Tip

## BALANCED SIGNAL ROUTING

Balanced signal lines are used to cross larger distances without interference. They are generally fitted with XLR connectors or TRS (Tip Ring Sleeve) jack plugs.

Here, three cores are required: there are two signal conductors. In a balanced signal line, the signal is present in phase at the tip, as in the case of an unbalanced signal line (XLR Pin 2). The second signal conductor carries the same signal, but with the opposite polarity or mirror-image phase (Ring, XLR Pin 3). The third conductor is the screening, and again constitutes the signal ground (Sleeve, XLR Pin 1).



## BALANCED SIGNAL ROUTING

JACK	Cable	XLR
Sleeve	Ground	Pin 1
Ring	Signal in mirrored phase	Pin 3
Tip	Signal in phase	Pin 2



## PRECONDITIONS FOR PASSIVE SPLITTING

The LEHLE P-SPLIT STEREO is a passive splitter which can be used to split high-impedance signals to high-impedance inputs. There are certain preconditions which must be met to ensure that this is accomplished without problems and no loss of sound.

### HIGH-IMPEDANCE SIGNAL SOURCES AND INPUTS

Passive magnetic pickups as generally used - in the form of single-coil and humbucker pickups, on electric guitars and basses - supply high-impedance signals. High-impedance signals have an output impedance in a range of 10 k $\Omega$  (10,000  $\Omega$ ); the higher this figure, the more sensitive the signal is to interference.

High-impedance inputs are found on guitar and bass amplifiers, and on sound cards with a "Hi-Z" input; "Z" stands for the impedance, which is the physical expression for the internal resistance of a signal source or a signal input, and thus defines its low/high-impedance performance.

High-impedance signals are generally transmitted unbalanced and are relative-

ly susceptible to interference. Long cable routings audibly attenuate high frequencies. Electromagnetic interference from the environment then becomes more noticeable than in the case of low-impedance and balanced signals. There are, nonetheless, very many musicians who swear by the sound of an electric guitar or bass with passive pickups connected directly to a tube amplifier via a good cable.

The input impedance of high-impedance inputs is generally 1 M $\Omega$  (1,000,000  $\Omega$ ) or more. Here, too, the input becomes more sensitive, the higher this figure is.

### LOW-IMPEDANCE SIGNAL SOURCES AND INPUTS

Keyboards, active pickups, preamp outputs, sound cards and mixers supply low-impedance signals. The output impedance of such signals is typically 100  $\Omega$  to around 600  $\Omega$ .

Low-impedance inputs predominate in the line input of mixing desks, power amps and sound cards with no Hi-Z inputs, and also in microphone inputs and in virtually all balanced inputs. Low-im-

pedance inputs have input impedances of around 600 Ω to 10 kΩ.

### WHAT IS POSSIBLE

The LEHLE P-SPLIT STEREO can be used to split the signal from an electric guitar or electric bass with passive magnetic pickups to two amplifiers, each of which has high-impedance inputs. Please use the shortest, best-quality possible cables for this purpose. You will hear the 100% original signal on both amps.

Instead of an amplifier, you can also split the signal to the Hi-Z input of a sound card.

It's important to remember: a high-impedance signal can be passively split if you connect only high-impedance inputs. You can split a low-impedance signal, such as the output from a preamp, e.g. the LEHLE SUNDAY DRIVER II or the output from a sound card, to a tube amp with a high-impedance input and the low-impedance input of a power amp. Since the signal to be split is a low-impedance one, you can connect low-impedance and high-impedance inputs behind this if you wish - there won't be any problems!

### WHAT IS NOT POSSIBLE

Audible sound losses will occur if you use long cable routings from the passive guitar to the splitter and from the splitter to the amps. The sum of all cable lengths to

the splitter and to the amps should generally not be more than 10m.

Your individual taste will ultimately decide, however.

Splitting your high-impedance instrument signal to a low-impedance input, such as the line input of a mixing desk, for example, and to a high-impedance input on a tube amplifier using the LEHLE P-SPLIT STEREO will result in the high-impedance input being attenuated by the low-impedance input of the mixing desk. The signal will become significantly quieter and will lose presence.

Solution: these problems can be effectively eliminated by connecting a preamp or a buffer, which will convert the high-impedance to a low-impedance signal, in the signal path.

The LEHLE SUNDAY DRIVER II, for example, can be used here.

INPUT	DIR	ISO	
Hi-Z	Hi-Z	Hi-Z	✓
Hi-Z	Low-Z	Hi-Z	!
Hi-Z	Hi-Z	Low-Z	!
Hi-Z	Low-Z	Low-Z	!

INPUT	DIR	ISO	
Low-Z	Hi-Z	Hi-Z	✓
Low-Z	Low-Z	Hi-Z	✓
Low-Z	Hi-Z	Low-Z	✓
Low-Z	Low-Z	Low-Z	✓

## GENERAL DESCRIPTION



### 1. INPUT SOCKET



Connect the output of a stereo effects unit, keyboard or DAW here.

The input signal is fed into this socket. The LEHLE P-SPLIT STEREO operates entirely passively.

The input signal remains connected to the ISO and DIR outputs at all times, with no semiconductors or any other active components in the signal path.

Both balanced and unbalanced signals can be split, since the LEHLE TRANSFORMER HZ is capable of handling both types.

If the INPUT SOCKET L is not occupied, the signal of the INPUT SOCKET R will automatically be mirrored.

This way you can split up to three galvanically isolated outputs.



## 2. OUTPUT SOCKET

DIR

Connect the input of an amplifier, mixer or effects unit to be connected directly to the LEHLE P-SPLIT STEREO input here.

The input signal and its ground are present directly on the DIR socket. The signal from the DIR output is always the same which is fed into the input (1).

If the input signal is unbalanced you will have an unbalanced direct signal at this socket. The same will occur with balanced signals.

## 3. PHASE INVERTER SWITCH



The phase of the input signal from the ISO output can be inverted if necessary.

This switch can be used to invert the phase of the input signal from the ISO output socket by 180°.

Splitting signals to two amps may sometimes cause phase cancellations, resulting, for most musicians, in a “thin” sound. Inverting the phase eliminates this problem.

Experiment to find out which position you prefer - as always, your individual taste is what counts!

## 4. GROUND LIFT SWITCH



Connect the grounds of the DIR and ISO output if necessary.

Pressing this switch connects the ground conductors of the ISO and DIR outputs. Connecting the ground conductors of the DIR and ISO outputs can help in some situations, depending on the units connected and on their power supplies.

Use the ground lift switch to find out for yourself the position in which noise is minimised.

## 5. ISO OUTPUT

ISO

Connect your amp or the audio input of a DAW or a mixer here.

The ISO output has an input signal which is isolated by means of the LEHLE TRANSFORMER HZ.

A balanced or an unbalanced signal is possible, irrespective of the type of signal fed from the input.

“Toggle the phase and ground switches, until you have less noise and the best sound.”



Joe B., Guitar player

## 6. BASE AND FIXING

If required, mount the P-SPLIT STEREO to a pedalboard using the mounting kit.

The P-SPLIT STEREO can be mounted to a plate such as a pedalboard using the two holes in the bottom of the pedal.

You can find the optional LEHLE Mounting Kit V3 (order number 100981) online at [www.lehle-components.com](http://www.lehle-components.com).

To mount, undo the four housing screws by using a 2.5 mm Allen Key and detach the cover.

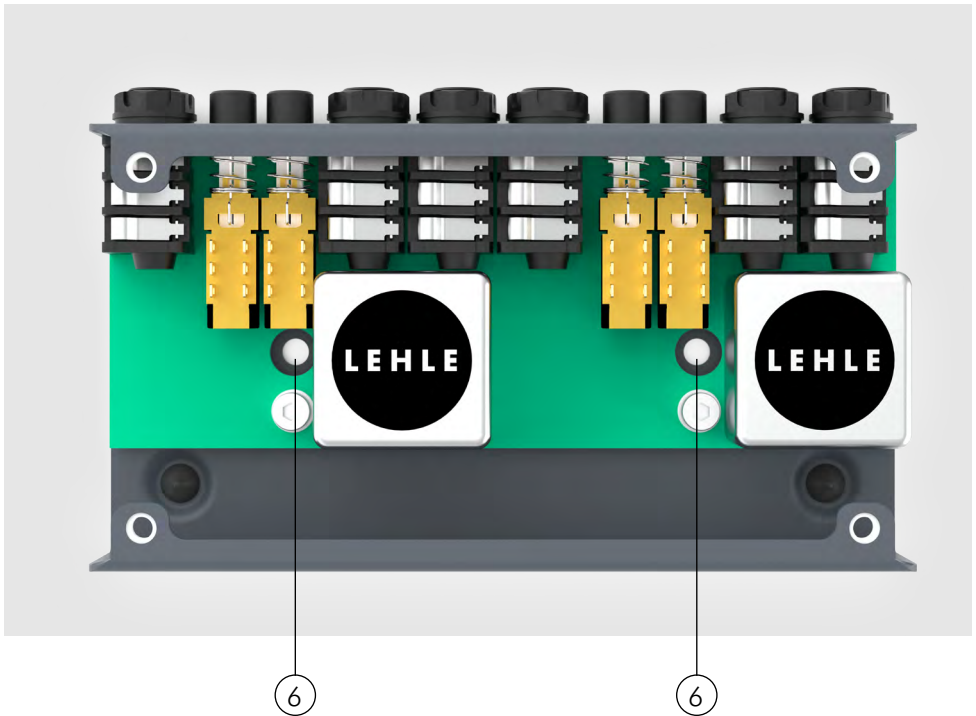
Then fix the device base to a base plate using the two screws, the washers and the

spacers of the Mounting Kit.

Attach the cover and tighten the four housing screws - done!

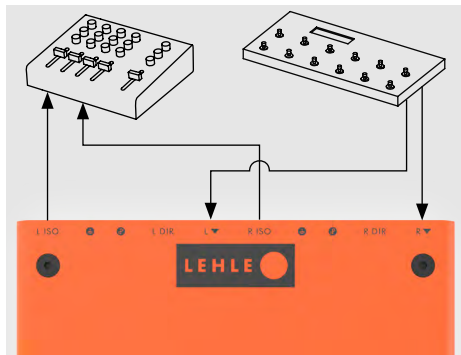
For flexible solutions we recommend using 3M Dual Lock™ instead of Velcro for stability, which you can also find in handy sizes at [www.lehle-components.com](http://www.lehle-components.com)

If you are using the Velcro / Dual Lock™ method, please make a note of the serial number on the bottom of the pedal before you cover it, in case you have a support question for us later and don't fancy dismantling your board!



## TYPICAL USES

### LEHLE P-SPLIT STEREO AS ISOLATOR IN A STEREO SETUP







The LEHLE P-SPLIT STEREO can be used in any scenario to eliminate noise resulting from ground loops or hum.

Ground loops occur when units grounded by a protective earth conductor (“PE conductor”) are connected to each other. The protective earth conductor and the ground connection of the audio signal create a loop which will pick up external interference generated, for example, by coils. Such interference will impair the signal. The LEHLE TRANSFORMER HZ galvanically isolate the ground connection. The hum loop is thus broken at this point.

Both high- and low-impedance signals can be fed, the LEHLE P-SPLIT STEREO has no problems with balanced or unbalanced signals.

#### DEVICE CONNECTION

-  Output signal source right
-  Input mixer right
-  Output signal source left
-  Input mixer left

#### HOW TO DO THIS

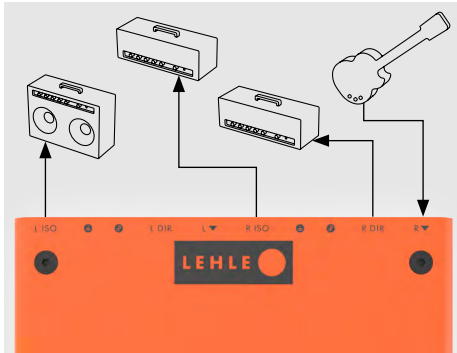
1. Connect the signal source (e.g. an effects device or amp simulation) to the input sockets (1) of the LEHLE P-SPLIT STEREO.
2. Connect the output sockets R ISO and L ISO (5) to the inputs of your mixer.
3. Use the ground lift switch (4) to determine which position eliminates the most background noise.
4. There you go!

If you are using one section of the LEHLE P-SPLIT STEREO only, use the left one.

Using the right section and toggling the phase button, will cause the signal to be muted if the left phase button isn't toggled, too.



## LEHLE P-SPLIT STEREO AS THREE WAY AMP SPLIT



What's better than two amps?

Right: three amps.

If the left input socket is not used, the left section will be fed by the right inputted signal.

This way the LEHLE P-SPLIT STEREO can be used as three way amp split; of course with galvanically isolated outputs and thus hum- and noise-free.

### HOW TO DO THIS

1. Connect your instrument to the right input socket of the LEHLE P-SPLIT STEREO.
2. Connect the first amplifier to the R DIR socket.
3. Connect the second amp to the R ISO socket.
4. Use the L ISO socket to feed your third amp.

### DEVICE CONNECTION


- R ▼ Instrument
- R DIR Input amp 1
- R ISO Input amp 2
- L ISO Input amp 3

5. Use the phase inverter switch (3) to determine which setting you prefer.

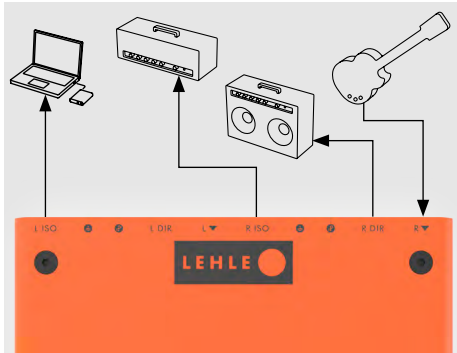
6. Use the ground lift switch (4) to find the position at which noise is minimised.

7. There you go!

Avoid long cable runs and thus loss in signal and treble.

Elsewise we recommend to use a buffer before the split, such as the LEHLE SUNDAY DRIVER II. 

# LEHLE P-SPLIT STEREO AS SPLIT AND DI-BOX IN THE STUDIO



## DEVICE CONNECTION

- R ▼** Instrument
- R DIR** Input amp 1
- R ISO** Input amp 2
- L ISO** Input audio interface

In studio situations it's often useful to record not only the amplifiers, but at the same time a dry, unprocessed signal, too. This signal can then be routed in the mix either to a real amplifier, or to a digital simulation, for editing.

Even at the recording of electric bass signals it often makes sense to add the direct signal to the record amp signal. At the L ISO output the signal can be tapped balanced via TRS already.

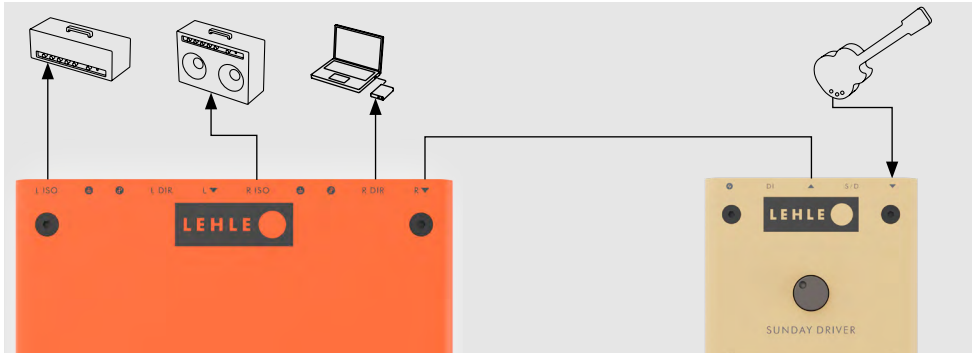
Keep in mind, if you want to use a low impedance and balanced input at your audio interface, the signal needs to be buffered, as shown on page 17.

Otherwise use the Hi-Z input of your interface.





## HOW TO DO THIS

1. Connect your instrument to the right input socket of the LEHLE P-SPLIT STEREO.
2. Connect the first amplifier to the R DIR socket.
3. Connect the second amp to the R ISO socket.
4. Use the L ISO socket to feed your audio interface.
5. Use the phase inverter switch (3) to determine which setting you prefer.
6. Use the ground lift switch (4) to find the position at which noise is minimised.
7. There you go!





## DEVICE CONNECTION LEHLE P-SPLIT STEREO

-  SUNDAY DRIVER II TRS
-  Audio interface TRS
-  Input amplifier 1 TS
-  Input amplifier 2 TS



If your audio interface doesn't have a high impedance input (Hi-Z) or if you want to send the signal through a long distance loss-free and balanced at the same time, we recommend to place a buffer in between your instrument and the LEHLE P-SPLIT STEREO. This buffer changes your high impedance signal to low impedance, such as the LEHLE SUNDAY DRIVER II.

In the example above, the signal line type is balanced (TRS), too.

### HOW TO DO THIS

1. Connect your instrument to the input socket of the LEHLE SUNDAY DRIVER II.
2. Use a TRS-TRS cable to connect the

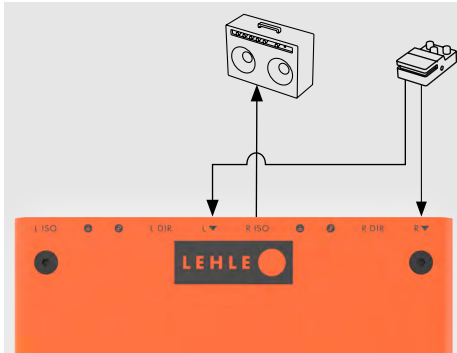
## DEVICE CONNECTION LEHLE SUNDAY DRIVER II

-  Instrument TS
-  P-SPLIT STEREO TRS

output to the input socket of the LEHLE P-SPLIT STEREO.

3. Connect R DIR to the balanced input of your audio interface with a TRS-TRS or TRS-XLR cable.
4. Connect the first amp to the R ISO socket (unbalanced TS-TS).
5. Connect the second amp to the L ISO socket (unbalanced TS-TS).
6. Use the phase inverter switch (3) to determine which setting you prefer.
7. Use the ground lift switch (4) to find the position at which noise is minimised.
8. There you go!

# LEHLE P-SPLIT STEREO AS PASSIVE SUMMING BOX






If you are using a complex pedal board with stereo effects, you sometimes could have the problem that unfortunately there's only one amplifier available and the outputted signal should be therefore mono.

The LEHLE P-SPLIT STEREO can sum inputted stereo signals to mono, once only one amplifier is being connected.


This way your pedal board stays wired but still ready for the „small gig“.

## DEVICE CONNECTION

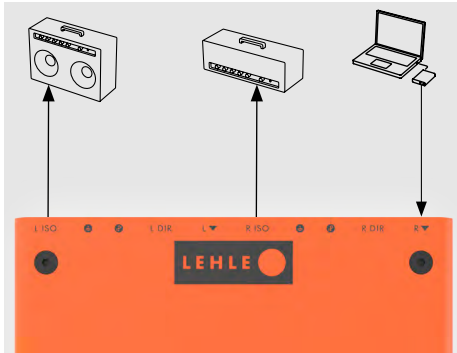
-  Effects output right
-  Input amplifier
-  Effects output left

## HOW TO DO THIS

1. Connect the outputs of your last stereo effect to the input sockets L and R (1).
2. Connect the output socket R ISO to the amplifier.
3. Use the phase switch (3) to find out which setting sounds better to you.
4. Use the ground lift switch (4) to determine which position eliminates the most background noise.
5. There you go!

If you are using kind of a patchbay on your pedalboard, keep in mind that the L ISO socket needs to be unplugged or otherwise the passive summing won't work. 

## LEHLE P-SPLIT STEREO AS REAMPLIFICATION BOX



### DEVICE CONNECTION

- R ▼** Output audio interface
- R ISO** Input amplifier 1
- L ISO** Input amplifier 2

Once you've recorded the dry signal, it can be fed through an amplifier during mixing; connecting the amp to the sound card or DAW will almost certainly generate a ground loop, causing undesirable noise.

This problem can be effectively eliminated using the LEHLE P-SPLIT STEREO.

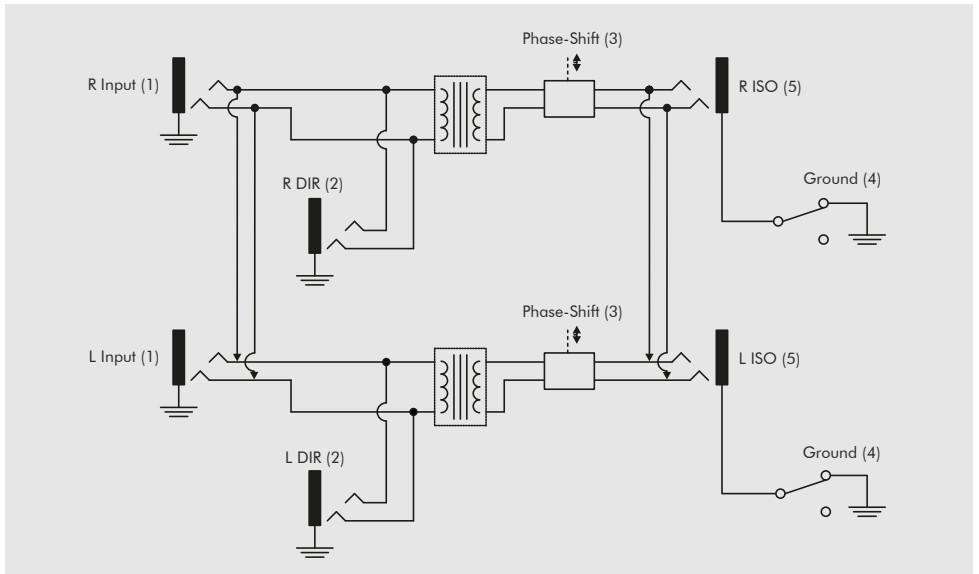
The built-in LEHLE TRANSFORMER HZ galvanically isolate the ground connections, and function perfectly with both balanced and unbalanced signals from a sound card or a DAW.

By means of the LEHLE P-SPLIT STEREO it's now possible to use two amplifiers at the same.

### HOW TO DO THIS

1. Connect the output of your audio interface to the input socket R of the LEHLE P-SPLIT STEREO.
2. Connect the R ISO socket to the input of your first amp.
3. Connect the L ISO socket to the input of your second amp.
4. Use the ground lift switch (4) to determine which position eliminates the most background noise.
5. There you go!

# LEHLE P-SPLIT STEREO SIGNAL FLOW DIAGRAM





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