





Dear Musician!

Thank you for purchasing the **Lehle P-Split II!**

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 II** comprises only the very best components. Every assembly of your **Lehle P-Split II** has been made and tested in Germany.

Your **Lehle P-Split II** 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 II!**

A handwritten signature in blue ink that reads "Burkhard G. Lehle". The signature is fluid and cursive.

Burkhard Georg Lehle

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The **Lehle P-Split II** combines passive splitting with maximum signal fidelity. Its central element is the **Lehle LTHZ** high-end transformer, which electrically isolates the two outputs, eliminating the possibility of ground loops. The **Lehle LTHZ** has been specially designed for use with high-impedance signals, but also splits low-impedance signals with zero loss of sound quality. The signal can be picked off either balanced or unbalanced from the ISO output. A phase inverter switch featuring gold-plated contacts permits inversion of the input signal phase at the ISO output, preventing phase cancellations from impairing signal reproduction. The classical application for the **Lehle P-Split II** is splitting of an input signal to the two outputs, enabling you to connect your instrument to two devices, such as two amplifiers, for example, or an amp and a mixer or recording unit (PC/DAW). Thanks to the facility for also picking off the balanced signal on the ISO output, the **Lehle P-Split II** is eminently suitable for use as a high-quality compact DI box for all types of signals. Another useful application for the **Lehle P-Split II** is as an effective suppressor for undesirable hum. Background noise, generated by ground loops, occurs

again and again when two electronic devices are connected to each other, and the **Lehle P-Split II** provides a simple but extremely effective remedy when installed between the two units. The two devices are electrically isolated when the ISO output is used, eliminating this background noise. And: the **Lehle P-Split II** needs no power supply at all!

### Technical data

Weight:	390 g
Length:	8.8 cm (3.47")
Width:	9.2 cm (3.62")
Overall height:	3.9 cm (1.54")
Max. level:	5.7 V RMS (17 dBU)
Max. Gain:	+16 dBU (<1 % THD @ +16 dBU/ 40 Hz)
Total harmonic distortion:	0.003 % at 0 dBU/ 1 kHz
Frequency range:	20 Hz to 100 kHz -0.1/ +0.4 dB (source 600Ω, load 1MΩ)
Input impedance (transformer impedance load):	min. 2 MΩ at 2 kHz

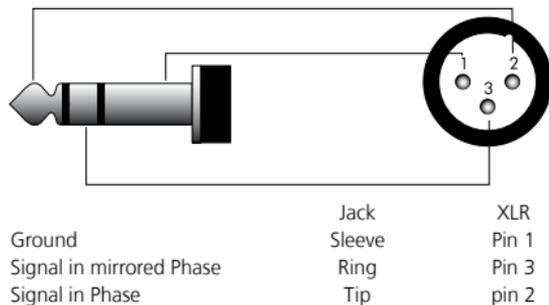
## Signal line types and preconditions for passive splitting

**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.



**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).



### Preconditions for passive splitting:

The **Lehle P-Split II** 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 occurring and with 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 such 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 here 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 relatively 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 the 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-impedance inputs have input impedances of around 600  $\Omega$  to 10 k $\Omega$ .

### **What is possible:**

The **Lehle P-Split II** 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** 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 total 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 II** 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 totally 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**, for example, can be used here.

Input	DIR	ISO	
<b>Hi-Z</b> Passive Guitar	Hi-Z	Hi-Z	✓
	Low-Z	Hi-Z	×
	Hi-Z	Low-Z	×
	Low-Z	Low-Z	×
<b>Low-Z</b> Instrument (active) Line driver output (like Lehle Sunday Driver)	Hi-Z	Hi-Z	✓
	Low-Z	Hi-Z	✓
	Hi-Z	Low-Z	✓
	Low-Z	Low-Z	✓

## General description



## 1. Input socket

■ *Connect your instrument or the output from an effect unit or DAW here.*

The input signal is fed into this socket. The **Lehle P-Split II** 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 LTHZ** transformer is capable of handling both types.

## 2. Output socket for direct signal

■ *Connect the input of an amplifier or effect unit to be connected directly to the **Lehle P-Split II** 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 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. Actuate the ground lift switch to find out for yourself the position in which noise is minimised.

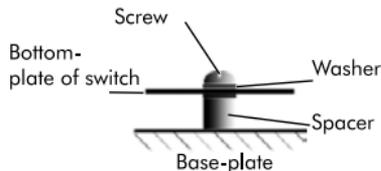
## 5. ISO output

■ *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 LTHZ** high-end transformer. A balanced or an unbalanced signal is possible, irrespective of the type of signal fed from the input.

## 6. Base and fixing

■ You can use the fixing screws supplied with the **Lehle P-Split II** to fix it to a base plate (or to a pedal board, for example).



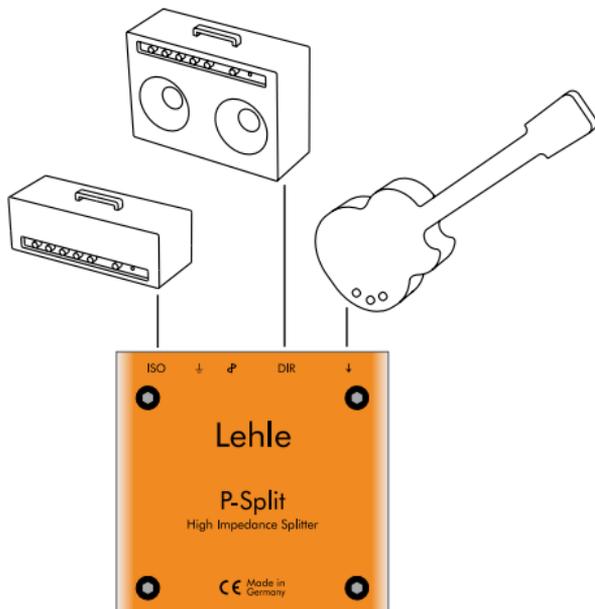
**Tip:** in case you prefer a velcro solution for your pedalboard we recommend to write down the serial number of the pedal before covering it for eventual support matters.

Thanks to its ready-to-go fixing system, the **Lehle P-Split II** can be mounted without difficulty on a base plate. To do this, undo the four housing

screws and detach the cover. Then fix the device base to a base plate using the two screws, the washers and the spacers supplied. Replace the cover and tighten the four housing screws - done!

## Typical uses

### The Lehle P-Split II as a splitter for two amps



The **Lehle P-Split II** operates as a splitter for one instrument to two amps. Use the shortest cables possible to connect instruments with passive pickups to the input of the **Lehle P-Split II**. Most musicians find the sound of two amplifiers working in parallel extremely powerful and simply big.

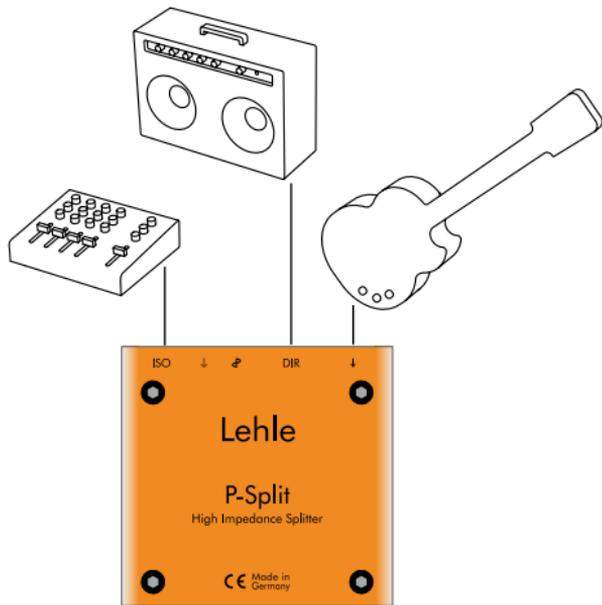
#### Device connection

Input (1) → Instrument  
DIR output (2) → Amp 1  
ISO output (5) → Amp 2

#### What to do:

1. Connect your instrument to the input socket of the **Lehle P-Split II**.
2. Connect the first amplifier to the DIR socket (2).
3. Connect the ISO socket (5) to the input of the second amp.
4. Use the phase inverter switch to determine which setting you prefer.
5. Actuate the ground lift switch to find the position at which noise is minimised.
6. There you go!

## The Lehle P-Split II as a compact passive DI box



The **Lehle P-Split II** can be used as a passive DI box. Balanced or unbalanced signals from the ISO output can be fed. A TRS/XLR adapter will be needed if you want a balanced signal for an XLR

input (please also see “Balanced signal lines” on page 4).

### Device connection

- Input (1) → Instrument (active)
- DIR output (2) → Amp
- ISO output (5) → Input mixer, stage box

### How to do this:

1. Connect your instrument or the output from a preamp or buffer to the input (1) of the **Lehle P-Split II**.
2. Connect your amp to the DIR output socket (2).
3. Connect the ISO socket (5) to the input of your mixer or stage box.
4. Actuate the phase switch to find out which setting sounds better to you.
5. Use the ground lift switch to determine which position eliminates the most background noise.
6. There you go!

### Note:

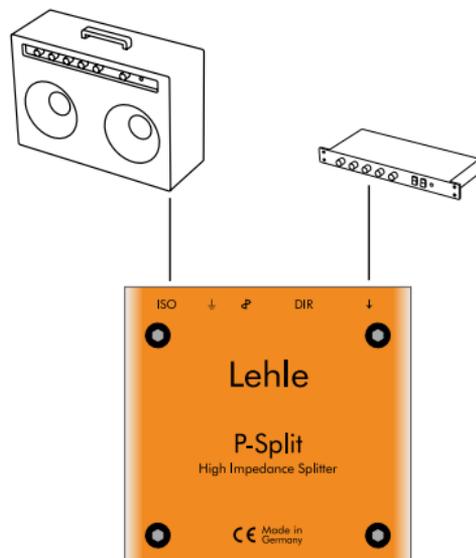
The signal from a passive pickup cannot be split to an amp or mixer without negative effects on

your sound, since balanced inputs are usually low impedance.

The **Lehle P-Split II** functions excellently as a neutral splitter and as a high-quality DI box with instruments which have active pickups, and/or when another buffer, such as the **Lehle Sunday Driver** is positioned between the instrument and the input of the **Lehle P-Split II**.

### The Lehle P-Split II as a line isolator – the universal cure for hum loops

The **Lehle P-Split II** 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 LTHZ** transformer included in the **Lehle P-Split II** electrically isolates 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 II** has no problems with balanced or unbalanced signals.

#### Device connection

- Input (1) → Signal source
- DIR output (2) → -
- ISO output (5) → Signal input

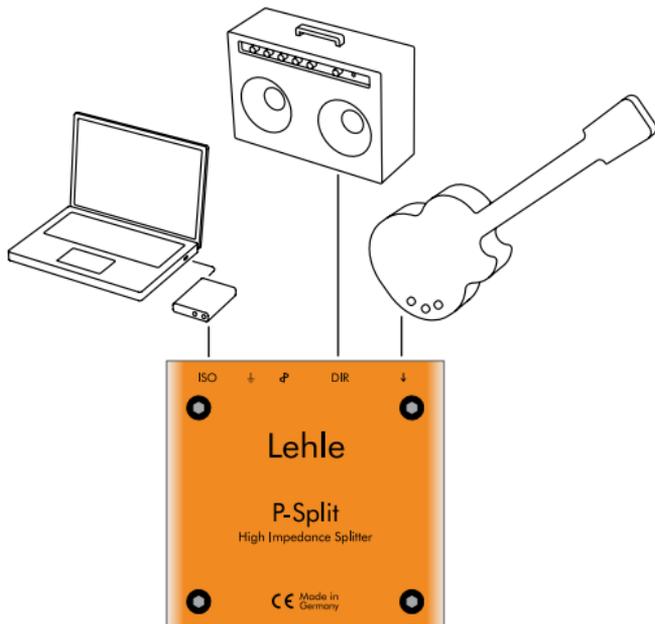
### What to do:

1. Connect the signal source to the input (1) of the **Lehle P-Split II**.
2. Do not use the DIR socket (2).
3. Connect the ISO socket (5) to the signal input.
4. Use the ground lift switch to determine which position eliminates the most background noise.
5. There you go!

### Note:

In the above scenario, the **Lehle P-Split II** is grounded via the signal source input. In some cases, it may be a good idea to connect the ground to the other side, in order to eliminate even more interference. To do this, simply swap the input (1) and the ISO output (5).

### The Lehle P-Split II as a recording splitter



It can be very useful, when recording guitar or bass, to record not only the amplified signal, but also the dry (unprocessed) signal. This signal can then be routed in the mix either to a real ampli-

fier, or to a digital emulator, for editing. It's also helpful to be able to hear your accustomed sound from an amp while recording the dry signal. In this configuration, the **Lehle P-Split II** again functions as a neutral splitter.

#### Device connection

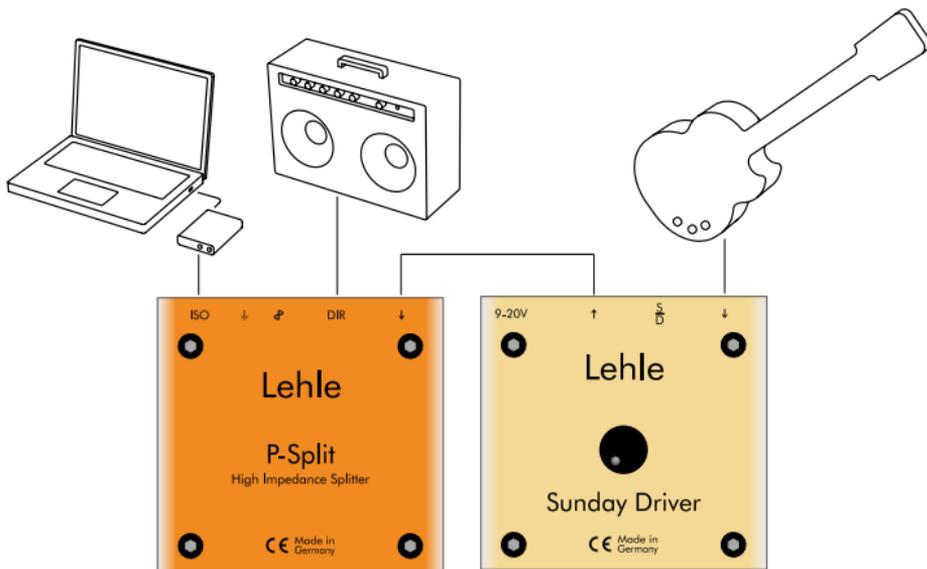
Input (1) → Instrument (active)  
DIR output (2) → Amp  
ISO output (5) → Soundcard, DAW  
(with Hi-Z input)

#### What to do:

1. Connect your instrument to the input (1) of the **Lehle P-Split II**.
2. Connect your amp to the DIR output socket (2).
3. Connect the ISO socket (5) to the Hi-Z input of a soundcard or DAW.
4. Use the ground lift switch to determine which position eliminates the most background noise.
5. There you go!

#### Note:

We recommend the use of a buffer between the instrument and the input of the **Lehle P-Split II** to convert the high-impedance instrument signal to a low-impedance signal in cases in which your soundcard or DAW has no high-impedance input (Hi-Z) and you wish to record the dry signal from your passive pickups. The **Lehle Sunday Driver** is the perfect solution for this task. You can, of course, also use a balanced input on your soundcard or DAW to record the dry signal. In this case, it's a good idea to take a balanced signal from the ISO output of the **Lehle P-Split II** (please also see "Balanced signal lines", page 4).



### Device connection:

#### **P-Split II**

Input (1) → **Lehle Sunday Driver** output  
 DIR output (2) → Amp  
 ISO output (5) → Soundcard / DAW  
 (with no Hi-Z input)

#### **Sunday Driver**

Input → Instrument  
 (with passive pickups)  
 Output → **Lehle P-Split II** input (1)

## The Lehle P-Split II as a re-amplification isolator



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

eliminated using the **Lehle P-Split II**. The built-in **Lehle LTHZ** transformer electrically isolates the ground connections, and functions perfectly with both balanced and unbalanced signals from a soundcard or a DAW.

### Device connection

Input (1) → Soundcard / DAW  
DIR output (2) → -  
ISO output (5) → Amp

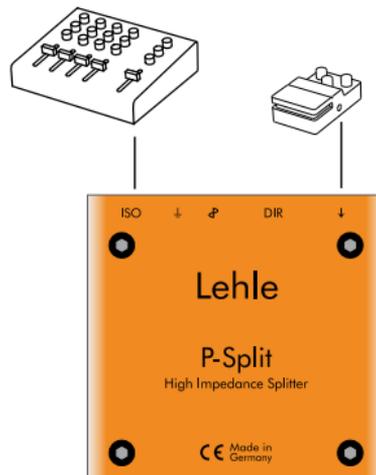
### What to do:

1. Connect your soundcard or DAW to the input socket (1) of the **Lehle P-Split II**.
2. Do not use the DIR socket (2).
3. Connect the ISO socket (5) to the input of your amp.
4. Use the ground lift switch to determine which position eliminates the most background noise.
5. There you go!

**Note:**

In this case, the **Lehle P-Split II** is grounded via the output of the soundcard or DAW.

It may, in some cases, be a good idea to connect the ground to the other side, to eliminate interference noise. To do this, simply swap the input (1) and the ISO output (5).

**The Lehle P-Split II as a balanced-to-unbalanced signal converter****Device connection**

Input (1) → Signal source (balanced or unbalanced)

DIR output (2) → -

ISO output (5) → Signal input (balanced or unbalanced)

Some units feature only balanced inputs and outputs, whereas others have only unbalanced inputs and outputs. A **Lehle P-Split II** can be used to connect these, also enabling you to separate the ground connection (see “Types of signal line”, page 4).

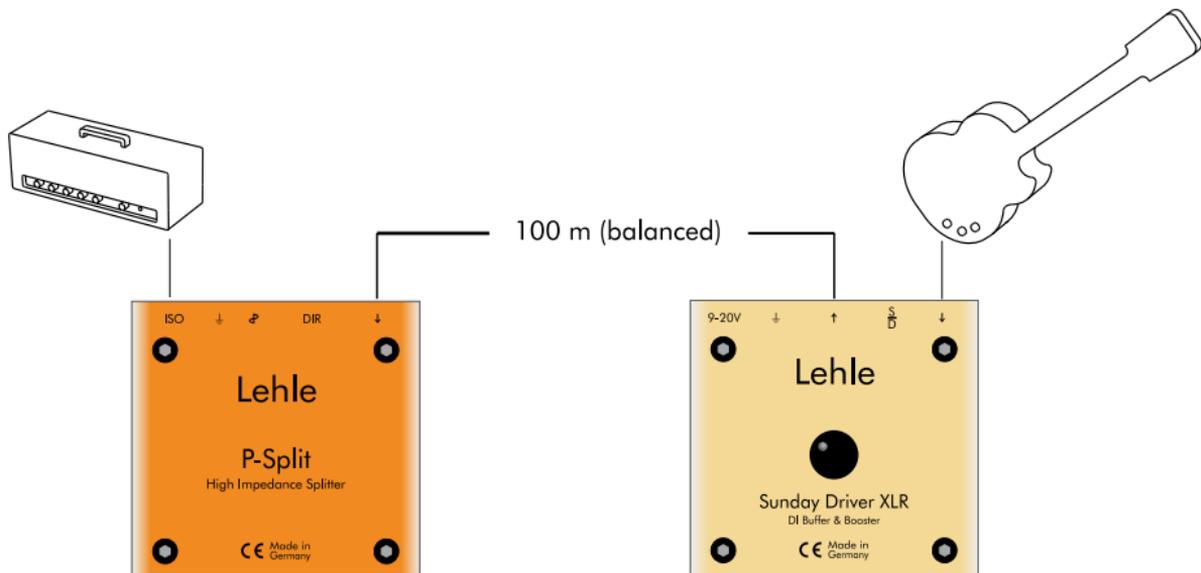
### What to do:

1. Connect the balanced or unbalanced signal source to the input socket (1) of the **Lehle P-Split II**.
2. Do not use the DIR socket (2).
3. Connect the balanced or unbalanced signal input to the ISO socket (5).
4. Use the ground lift switch to determine the position in which the most background noise is eliminated.
5. There you go!

### Note:

Unbalanced setups often include long cable runs from a pedal board to an amp which, on large stages, can be some distance away. Recording in a mixing room via an amp located in a separate

soundproof booth will also necessitate long cable runs. Long distances like these should be bridged using balanced lines, in order to keep interference as low as possible. The solution is simple: use the **Lehle Sunday Driver XLR** to convert the unbalanced instrument signal to a balanced signal. Up to 100m of cable can be connected to the XLR output socket. The **Lehle P-Split II** can be used at the end of the line to convert the balanced signal back to an unbalanced signal for input to your amp. This system makes it possible to convey the signal across great distances without signal losses.



### Device connection:

#### Lehle P-Split II:

Input (1) → **Lehle Sunday Driver XLR** output

DIR output (2) → -

ISO output (5) → Amp

#### Lehle Sunday Driver XLR:

Input → Instrument

(with passive pickups)

XLR output → **Lehle P-Split II** input (1)

### Signal flow chart for the Lehle P-Split II

