



DUAL BAND COMPRESSOR

User Manual

Congratulations!

With the Basswitch Dual Band Compressor you have purchased a high quality piece of musical equipment that allows effective and melodious compression of your bass sound.

When developing the Basswitch Dual Band Compressor we focused on the needs and wishes of the professional musician who is not willing to compromise on either sound or the technical quality of the equipment.

The Basswitch Dual Band Compressor is manufactured, assembled and tested in Germany to the highest quality standards using only the best brand components available to ensure optimal treatment of the electrical signal from your instrument.

The Basswitch Dual Band Compressor offers a highly flexible but easy to handle compressor in pedal size, which is suitable for live performances as well as for studio recordings. Inside the small, robust housing of the Basswitch Dual Band Compressor are two high end compressors, which enable a huge variety of compression settings but never produce pumping or distorted sounds.

Due to its specific design for bass, various parameters could be linked and automatized, resulting in a better overview, and a simple and intuitive operation. The method used for the Basswitch Dual Band Compressor involves the continual and automatic adaption of parameters (control variables) like attack and release times to the bass-signal.

On the Basswitch Dual Band Compressor you will not find controls for “attack”, “decay” or “release”, but instead GAIN, COMP and VOLUME. The frequency bands that are supposed to be processed are assigned to appropriate the compressor via the FREQ pot. For the user this means: instead of operating 11 up to 13 controls, you will only have four parameters to set, while keeping the widest range of options to compress your bass sound. Particularly live on stage this simplification is of great help and increases the fun of playing from the first moment on.

Please take the time to read this manual carefully before operating your Basswitch Dual Band Compressor.

I wish you every success with your RMI Basswitch Dual Band Compressor.

Yours,
Jacques Ruppert

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Introduction

Why a specific compressor for bass?

Audio compressors cut down the peaks or spikes, the loudest parts in a sound pattern, thus reduce the dynamic range and make, depending on the setting, either the amplitude envelope (i.e. the volume changes over time) of the instrument appear more balanced or the tone sound more punchy.

To enable reasonable settings, most audio compressors allow adjusting attack, release, threshold and ratio for each frequency band individually. Apart from this, you can sometimes select between hard knee and soft knee characteristics. Even for a single band compressor this means a collection of controls of at least 5 to 6 knobs, for dual band compressors it goes up to 13 controls.

The design of this very sophisticated compressor setup allows users in spite of the complexity of the bass signal, to adjust only with a few moves a differentiated compression, without pumping or distorting the tone.

We could facilitate the control options - and therefore the amount of control knobs on the device - by dynamically coupling attack and release to the input signal of the bass. The soft knee characteristics we choose cause a soft, very subtle transition from the uncompressed to the compressed tone. In addition, for the Bassswitch Dual Band Compressor we decided to use two high end compressors which process the selected frequency bands separately. The user selects the operating range of the two compressors

Setting up the compressor

1. Turn the FREQ control fully to the left
2. Use the GAIN (top right) to select the point where you want the compressor to start working. At low settings the two compressors work on peak levels only. If the GAIN is set higher, the compressors will be active sooner and for longer periods.
3. With the COMP pot (bottom left) you can now adjust the compression rate ("ratio" -> that is the degree to which the compressor is reducing dynamic range). Low compression rates produce a rather punchy sound; if on the other hand the COMP control is set to max (11 o'clock), the Bassswitch Dual Band Compressor will act similar to a limiter.
4. Via FREQ you can now set the point where the two frequency bands are split and assign them to the two compressors. That is how you can compress the low frequencies (bass) without cutting the trebles, the tone becomes more airy, while keeping the punch in the bass range.
5. Finally adjust the volume via VOL (Volume) to produce an equal loudness, whether or not the compressor is switched on.
6. Simply try the great variety of different settings until you find YOUR very sound!

via the transition frequency (FREQ), whilst COMP and GAIN control the processing of the signal.

This dual band flexibility allows in no time to adjust catchy settings, be it for fast staccato passages or for slapping the bass.

Functions and applications overview

Additional Features

- Lehle "True Sound Technology" (for details please consult the chapter "Tech Talk").
- Adjustable bypass modes: in True Bypass mode gold plated contacts ensure zero losses; in Buffered Bypass mode the Bassswitch Dual Band Compressor operates as a totally neutral line-driver.
- The higher voltage supply (18V) provides the Bassswitch Dual Band Compressor with a wider dynamic range and thus allows adequate processing of signals from both active and passive basses. A switcher to toggle between variable signal strengths is not necessary.
- Specially designed to protect the controls from damage and to prevent inadvertent changes to the settings.
- The design of the housing permits easy installation: the ultra-flat base and removable rubber feet allow the unit to be securely attached to the pedal board using Velcro or similar.

Setting the bypass mode

In OFF status, the Bassswitch Dual Band Compressor provides two different modes of operation – in True-Bypass mode, the input and output are linked with zero losses to one another via a relay with gold-plated contacts. In Buffered-Bypass mode, on the other hand, the device works as a totally neutral line-driver.

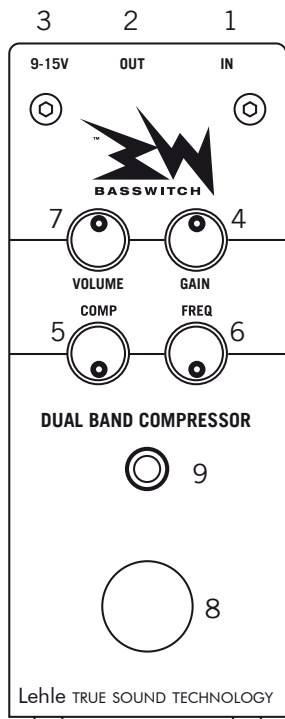
1. Disconnect the Bassswitch Dual Band Compressor from the power supply.
2. Keep the Footswitch / Button pressed.
3. Connect the Bassswitch Dual Band Compressor to the mains supply by plugging the power supply plug into the fitting input jack (9-15V, on the very left).

The LED above the button now flashes a sequence of 2 different flashing signals:

- (flashes 1x) → True-Bypass mode.
- • (flashes 2x) → Buffered-Bypass mode.

Depending on the flashing signal that is shown at the moment you release the button, you choose True-Bypass mode or Buffered-Bypass mode. The selected mode will stay even when you disconnect your Bassswitch Dual Band Compressor from power supply, until you set another operating mode as described above.

General description



1. Input socket

Connect your instrument here.

The Basswitch Dual Band Compressor is built to process signals from both passive and active pickup systems.

2. Output socket

Connect your amp or preamp here.

3. External power supply

Connect your external power supply here (9-15V DC min. 65mA or 7-12V AC with a standard 5.5x2.1mm connector).

For the Basswitch Dual Band Compressor an external power supply is required.

This should provide a minimum of 9 volts and no more than 15 volts DC, but alternatively you can also connect an AC voltage source with more than 7 or up to 12V. The polarity is not relevant. The voltage supplied is internally rectified, filtered, stabilized and then brought to 18V.

Note: To get the best out of your pedal setup we recommend that you use high-quality power supplies with isolated output sections in your setup!

Warning: The Lehle power supply (item no. 7014) with the connector acc. to DIN 45323 is not suitable.

4. GAIN Control

From 0 (bottom left, 7 o'clock) clockwise to 100 % (bottom right, 5 o'clock).

Use the GAIN to select the point where you want the compressor to start working. At low settings the two compressors work on peak levels only. If the GAIN is set higher, the compressors will be active sooner and for longer periods of time. The LED signals when the compressors begin to operate.

5. COMP Control

From 0 (top right, 2 o'clock) clockwise to 100% (top left, 11 o'clock).

With the COMP pot you can adjust the compression rate ("ratio" -> that is the degree to which the compressor is reducing dynamic range). Low compression rates produce a rather punchy sound; if on the other hand, the COMP control is set to max (11 o'clock), the Basswitch Dual Band Compressor will perform/ behave similar to a limiter.

6. FREQ Control

Logarithmically from 250Hz (top right, 2 o'clock) to 12kHz (top left, 11 o'clock) clockwise. Adjust the crossover frequency here.

With the aid of this control you can change a full-range single band compressor to a dual band compressor with two frequency bands compressed to different degrees. The two compressors in the Basswitch Dual Band Compressor can each be assigned to one frequency band and those will be compressed with different attack- and release-times by the auto-function of the compressors, depending on the input signal of the relevant band.

7. VOLUME Control

From 0 (bottom left, 7 o'clock) to 100% (bottom right, 5 o'clock).

Use this control to adjust the output volume in switched-on and (versus) switched-off state.

Use the Volume Control to produce an equal loudness, whether or not the compressor is switched on.

8. Footswitch

Compression on/off; setting the bypass mode.

Press this switch to activate the compressor function of the Basswitch Dual Band Compressor. It also enables you to change the bypass mode as is described above (setting up the compressor, first paragraph).

This footswitch is used to activate the compressor function or to switch to bypass-mode. If the compressor is on, the LED lights up blue, in bypass-mode the LED is white.

9. Status LED

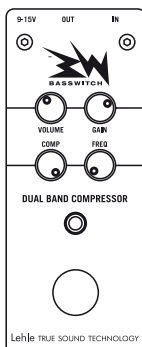
For compression on/off.

The LED turns blue when the compressor function is turned on.

Examples of possible setups

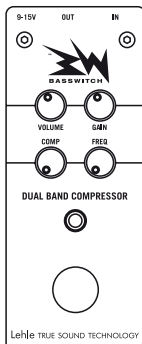
1. Jazz bass setup à la Jaco

Use mainly the bridge pickup of your instrument, add about 10% neck pickup to get about 90% signal from the crispy bridge pickup. In addition, close the tone-control a bit to get a slightly duller sound. The shown setup results in a soft compression over the whole signal, for more effect turn GAIN up a bit.



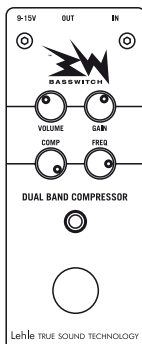
2. Slap Sound

Turn all controls on the Jazz bass to maximum. This setup offers a medium compression for a nice, balanced, slap sound with more contour. For more effect, again simply raise GAIN.



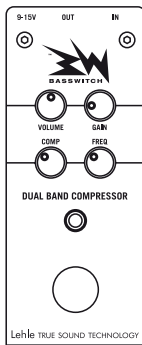
3. Fretless Compression

This is how a soft compression for fretless bass looks. Only the lows are compressed, while the high frequencies stay untouched. This way the dynamics and the “singing” of the bass are kept, nevertheless the bass sounds more defined. This setup is especially suitable for 5-strings, for 4-string basses a slight adjustment of (more) GAIN is recommended to enhance the effect.



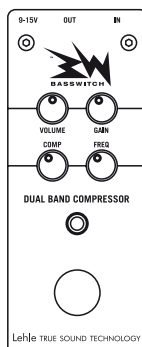
4. Soft Limiter Pino Paladino

Here is a soft limiting setup for fretless basses, that keeps the fretless sound while making not too much effect audible. With a little more GAIN and a chorus effect before the compressor, an 80s Pino Paladino Sound is easy to create.



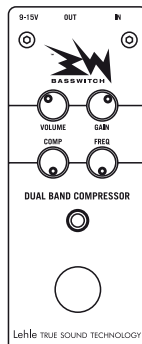
5. Medium Limiter Pop

For a distorted bass played with a plectrum this medium limiter setup produces wonderfully smooth bass lines with a clean attack.



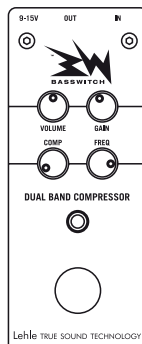
6. More freshness

Played with plectrum or slapped, the bass will be magically revived with this setup. Finger-style players may add a little COMP.



7. Florian's Favourite

Favourite setup of RMI endorser Florian Friedrich (Sugarbabes, Julio Iglesias et al) “This setup does magic on basses with “mother-bucker” pickups (Gibson EB2; EB2D; EB1; EBO; EB3 and the Epiphone equivalents).”



Tech Talk

True-Bypass, Buffered-Bypass and True Sound

Today more and more effects pedals feature true bypass switching to completely bypass the pedal in the signal routing when the pedal is switched off. The target of this design is to ensure that the pedal does not affect the electrical signal when it is switched off. This way the sound is left unaltered – in theory. In practice, however, connecting several pedals featuring a true bypass design in series does not improve the sound or keep it unaltered at all. Long runs of cable and multiple connections lead to a weak and lifeless sound. On large pedal boards the overall length of the cable is enough for the capacitance of the cable to have a negative effect on the sound. The capacitance of the cable acts as a low-pass filter (= the low frequencies pass through the filter while the high frequencies are filtered out). The price and quality of the cable you are using will not change this physical phenomenon. A solution would be to use only devices with buffered bypass design instead of true bypass. This, however, is only a good solution if the buffer is of very high quality. If several units with buffered bypass are connected in series it only needs one buffer to be noisy, to cut the dynamics of the sound signal or to negatively affect the sound in any other way for the sound of the whole effects chain to be spoiled. As the saying goes: “a chain is only as strong as its weakest link.” In addition, the noise of the individual buffers adds up to produce audible noise. It is a fact that every buffer produces some noise, even if it cannot be heard when only a single buffer is used. The ideal solution is to have a very high-quality buffer like the Basswitch Dual Band Compressor in Buffered-Bypass mode at the beginning of the chain that brings the signal down to a very low impedance.

This makes the signal insensitive to the length of the cable. It is important, however, that this buffer is of the highest quality with the dynamic range and headroom necessary to ensure that all the details of the bass signal stay unaltered. The effects pedals in the downstream should then ideally have true bypass so that they will not have a negative effect on the now buffered signal, as the true bypass design does not reduce dynamics and headroom or produce any noise.

The solution: change the bypass-mode as required. The bypass mode option enables the Basswitch Dual Band Compressor to integrate ideally to any setup.

By operating the device in Buffered-Bypass mode, it acts as a buffer, but without corrupting the signal in any way. At this, the Basswitch Dual Band Compressor serves a totally neutral line-driver, which has proved as the ideal solution for long cables and complex effect board configurations.

True-Bypass mode is the best option for a small setup with short cable routings and for when a treble-booster or a classical fuzz pedal is looped in after the Basswitch Dual Band Compressor.

What is Lehle True Sound Technology?

Lehle True Sound Technology is a combination of several electrical design measures with only one aim in view: to transmit the sound and the character of the instrument without altering it. The voltage supplied to the Basswitch Dual Band Compressor is internally rectified, filtered and stabilized and then brought to almost 18 V. This gives enough headroom to guarantee an open and dynamic sound in all situations without losing any detail, even when confronted with pickup power peaks from plus 7 to minus 7 volts.

The buffers are designed to effortlessly handle signals reaching the megahertz range. At the output, the frequency bandwidth is limited to the audible frequency range to prevent HF interference, disturbing the electronic circuitry. This guarantees optimal transient response by the circuitry and is key to obtaining a sound that is transparent and, above all, cuts through.

For switching, Lehle True Sound Technology uses exclusively gold-plated contact relays and/or gold-plated switches. The decaying signal from a string is so weak that contact materials with lower conductivity have a negative impact on the sound. Ordinary footswitches use contact materials developed to switch high voltages (e.g. electrical power tools) as this is their main field of application. This can be heard, for example, when, after a switch has been in use for some time, a decaying tone starts to break off abruptly. Relays and switches with gold-plated contacts do not have this problem and even the smallest electrical signals can be transmitted for years without being negatively affected. In addition, the relays used in the Basswitch Dual Band Compressor have a lifetime about 100 times as long as those used in ordinary footswitches.

In addition, the noise of the individual buffers adds up to produce audible noise. It is a fact that every buffer produces some noise, even if it cannot be heard when only a single buffer is used. The ideal solution is to have a very high-quality buffer like the Basswitch Dual Band Compressor in Buffered-Bypass mode at the beginning of the chain that brings the signal down to a very low impedance.

Together with typical Lehle electronic circuitry to reduce the switching pop of relays, the combination of the above design features represents today's state-of-the-art solution for an uncompromising preservation of the signal and hence the sound and character of the instrument.

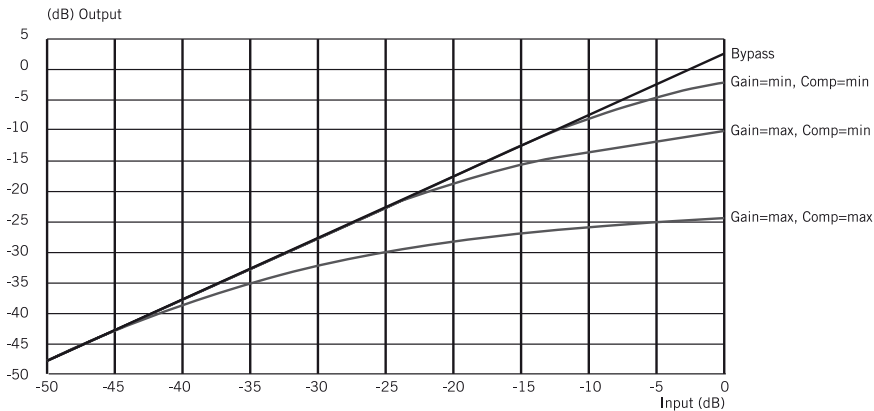
Working principle of the Basswitch Dual Band Compressor footswitches

Footswitches are pressed thousands of times during their long lifetimes – sometimes sensitively but sometimes more brutally depending on the situation and the musician's temperament. An ordinary footswitch will switch up to 20,000 times before wearing out mechanically or electrically, which means that either it will stop working altogether or the signal will start to lose transparency and dynamics.

The Basswitch Dual Band Compressor is equipped with high-quality Lehle footswitches. Here the foot of the musician does not press an ordinary footswitch but an actuator button that activates a pushbutton inside the Basswitch Dual Band Compressor via a metal lever. Because the actuator button and the internal pushbutton are not directly connected, the load exerted by the foot is absorbed by the actuator button and the housing, preserving the circuit board from mechanical stress. The design is as robust as possible and the actuator button mounted in a special socket making for easy and silent operation.

Inside the Basswitch Dual Band Compressor the impulse from the pushbutton activates special gold-plated relays via discrete logic circuitry. This way the switching is done only via high-quality relays and thus guaranteeing absolutely reliable and loss-free switching of very sensitive signals. The switching technology and the gold-plated relays in the Basswitch Dual Band Compressor are designed to operate for up to two million switching cycles!

Compressor Curve Chart



Technical data:

Weight:	400 g
Dimensions:	145 × 60 × 45 mm (Length x Width x Height)
Supply Voltage:	9-15 V AC/DC
Current Consumption:	max. 100 mA at 9 V DC; max. 110 mA at 12 V DC
Crossover Frequency:	250 Hz to 12 kHz
THD+N:	< 0,5% (max. gains, frequency and compression, -10 dBu input)
Residual Noise:	< 80 dBu, 22 Hz - 22 kHz, unweighted, Output Gain = +6 dB
Input Impedance:	2.8 MegaOhm, 1 kHz
Output Impedance:	100 Ohm, 1 kHz
Maximum Input Level:	+14 dBu, < 1% THD, 100 Hz
Maximum Output Level:	+14 dBu, < 1% THD, 100 Hz
Input Gain:	+/- 12 dB
Output Gain:	+/- 28 dB
Compression	
Attack Time:	signal dependent
...Low Band:	20 ms to 40 ms
...High Band:	2.5 ms to 5 ms
Release Time:	
...Low Band:	100 ms to 200 ms
...High Band:	10 ms to 20 ms
Threshold Range:	-38 dBu to -8 dBu
Compression Ratio:	1:1 to 10:1
Crossover Frequency:	250 Hz to 12 kHz
Gain Cell:	VCA
Compression characteristics:	soft knee
Compressor design:	rms, feedforward



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