SONUUS®

Voluum®
Owner's Manual

**Analogue Volume Effects
Stomp Box for Guitar and Bass**

Version 1.5.0

Safety — read this first!

Important safety information. Read the following information carefully and keep all instructions for future reference.

⚠ Do not open any part of the **Voluum** case other than the battery compartment. There are no user-serviceable parts in the **Voluum**.

⚠ Do not expose the **Voluum** to rain, liquids or moisture of any kind. If this occurs, disconnect the **Voluum** from your computer, power supply, and from your musical instrument and remove any batteries then allow the unit to dry out completely before using it again. If any liquid has entered the unit, it may need to be serviced by a **sonuus** engineer or authorised repair centre.

⚠ When the **Voluum** has been stored in a cold environment (*e.g.,* a car) then exposed to a warmer environment (*e.g.,* a warm room), condensation can form on the outside and inside of the **Voluum**. In such cases the **Voluum** should be allowed to warm up to room temperature before use to ensure any such condensation has evaporated.

⚠ Avoid getting anything, *e.g.,* an instrument cable, trapped under the footpedal—this will cause damage to the **Voluum** footpedal sensor.

⚠ Only use the correct type of power supply (see "Powering the **Voluum**" on page 10). The **Voluum** must never be connected directly to mains electricity.

⚠ Do not drop the **Voluum** or expose it to excessive shock or vibration. This may cause damage to the electronics inside the unit.

⚠ Do not put excessive weight onto the footpedal of the **Voluum**. It is designed to be foot-operated, but not to bear excessive loads. Do not allow your foot to press on the control panel area because this may damage it. The **Voluum** has protection bars to prevent your feet from accidentally pressing this area but this cannot provide complete protection—you must still take reasonable care when using the product.

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Quick start

This manual is a comprehensive guide to the **Voluum**. To start using it as quickly as possible, follow this short guide. Please refer to the rest of the manual for detailed operating instructions.

① Connect your guitar/bass to the IN jack of the **Voluum**.

② Connect your amplifier to the OUT jack of the **Voluum**.

③ Set the **LOCK** switch to the locked position (this lets you select presets without worrying about editing them by mistake).

④ Connect a suitable power supply: 9VDC, USB or batteries (see "Powering the **Voluum**" on page 10).

⑤ Select the first factory preset by pressing the ▼ button until **F00** is shown on the numeric display.

⑥ Tap the footswitch to enable the effect. The footswitch LED will light up.

⑦ Rock the footpedal back and forward while you are playing to obtain a classic volume effect. As you rock the footpedal from the "heel-down" position to the "toe-down" position the output volume is increased.

Next, start exploring other presets using the ▲ and ▼ buttons. There are 40 factory presets labelled **F00**–**F39**, then 100 user presets labelled **P00**–**P99**. If you press and hold ▲ or ▼ you can increment or decrement in steps of 10 so you can quickly select the preset you want.

To get started, we suggest you try the first 10 factory presets:

Preset	Description
F00	Classic volume pedal.
F01	Volume boost: use the pedal to add up to 12 dB of gain to your signal.
F02	Gentle compressor.
F03	Clean sustain compressor.
F04	Pedal-controlled compressor: more compression as pedal is moved toe-down.
F05	Classic tremolo: basic tremolo, use the pedal to change the speed.
F06	Envelope tremolo: speed and character of tremolo depends on signal level.
F07	Pulse tremolo: echo-like sounds as the pulse decays with the signal level.
F08	Kill-switch tremolo: use the pedal to emulate using a kill-switch.
F09	ADSR synth. Combination of all effects to give a synth-like sound.

Welcome

Thank you for purchasing a **sonuus Voluum**. Like all **sonuus** products, the **Voluum** is the culmination of ground-breaking innovation and considerable technical expertise. We are delighted that you have chosen to purchase a **sonuus Voluum** and we anticipate that it will greatly enhance your music making. This manual is a comprehensive guide to the **Voluum** but if you have any questions, we offer attentive customer support via our on-line user forum:

www.sonuus.com/forum

The **Voluum** is an analogue volume effects stomp box. It is packed with innovations from the **sonuus** Research Team.

Analogue signal path with digital control

The **Voluum**'s fully analogue signal path features a high-performance studio-grade voltage-controlled-amplifier (VCA) with low noise and low distortion characteristics. A constant high-voltage analogue power supply gives maximum analogue performance and high headroom to ensure even the loudest signals can be processed without artifacts. This high bandwidth, high dynamic range signal path guarantees the smooth sound of analogue circuitry with no digital artifacts.

Combining the analogue signal path with digital control gives you precision and configurability.

Flexible effects chain

The effects chain comprises five effects (noise gate, compressor, LFO (tremolo), volume control and limiter) which can be used in any combination.

Unique patented InfiniQ pedal sensor

Most volume pedals operate using a potentiometer (a pot) which has two main problems: the pot sucks the tone from your instrument, and it wears out quickly resulting in the effect becoming scratchy. Pots also have mechanical couplings which limit fine control and let dirt inside the unit, so compromising reliability.

Some other volume pedals use optical methods to avoid the limitations of pots, but these are susceptible to dirt and often don't have fine control or fast response.

sonuus' patented InfiniQ position sensor allows fast, super-fine precision control that isn't susceptible to dirt and grease. As a result, the pedal control on the **Voluum** won't get scratchy and will never wear out. Combined with ultra-smooth pedal action with user-adjustable tension, in a rock-solid chassis, the **Voluum** gives you unrivalled signal level control.

For guitar and bass

The **Voluum** is designed from the ground up to be perfect for guitar and bass. We know that many musicians play both instruments and don't want to compromise when an effect is designed for the higher or lower frequencies of specific instrument. Of course, the **Voluum** can also be used on other instruments such as keyboards. You don't need to restrict your creativity to guitar and bass!

Transparent-true-bypass...

True-bypass means that the effect is completely switched out of your signal chain when bypassed to preserve the integrity of your guitar/bass signal. This is typically done by mechanical switches but these cause clicks or pops when switching.

sonuus has designed a silent-switching true-bypass circuit so you get the benefits of true-bypass without the associated switching noise. What's more: if the power to the **Voluum** is interrupted, the unit will automatically switch back to the bypassed state so you don't lose your instrument's signal.

...with the option of buffered-bypass

However, not everyone wants true-bypass. With the **Voluum** you have control over whether you want to use true-bypass, or buffered-bypass. Buffered-bypass keeps the **Voluum** in the signal path at all times, but passes the input signal without modification when the effect is bypassed. This can be useful when using long cables: the buffered output of the **Voluum** means these long cables won't affect your tone, even when the effect is bypassed.

Stage-ready

The **Voluum** is designed to be ideal for gigging on stage:

- Heavy-duty cast aluminium case that will stand up to years of heavy use.
- The pedal won't decide to get scratchy just before a crucial gig!
- Variety of power sources: any polarity 9 V for maximum convenience, USB and high-capacity AA batteries.
- Foot-operated preset selection.
- LOCK switch to prevent accidental changes to settings or presets.

Presets

The **Voluum** comes ready-to-play with factory presets that include traditional volume effects and pedal-controlled compressor effects. Without making any adjustments, the **Voluum** is ready to play, straight out of the box.

The factory presets are just the starting place! By tweaking these presets you can explore different sounds and create your own effects—there are 100 user presets where you can store your own set-ups.

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www.sonuus.com

We recommend that you visit our web site and register your new **Voluum**. This is required for direct warranty support. Once you have registered, you have access to firmware updates, the **Voluum** Desktop Editor Software and you can opt to receive updates and news from **sonuus**:

register.sonuus.com

To get assistance or to share your experiences with other **Voluum** users, register on our user forum:

www.sonuus.com/forum

What can the Voluum do?

Gate/expander

In its simplest form a noise gate cuts the signal when its level falls below a set threshold. The **Voluum** noise gate not only gives you control over the threshold, but also enables fine control over how quickly it reacts and how much the signal should be reduced in level. Combined with a smooth transition from open to closed, the **Voluum** gives you ultra-transparent gating that reduces the noise when you're not playing without introducing any audible artifacts.

Pedal-controlled compressor

Compression is a widely-used effect that compresses the dynamic range of your signal. Essentially, it is used to keep the level of your instrument consistent, regardless of how hard or soft you play. It does this by reducing the level of loud signals, and applying a make-up gain to ensure the apparent loudness stays the same.

The compressor in the **Voluum** features an intelligent make-up gain which means you only need to think about how much compression you want to apply. This also allows dynamic modulation of the compressor. For example, by using the foot pedal you can smoothly vary the amount of compression being applied without affecting your signal level – another unique **sonuus** innovation.

Variable attack and release times let you configure the effect to suit your performance and even these can be pedal-controlled.

While other compressors are either on or off, the **Voluum**'s compressor gives you glitch-free pedal-control to enhance the subtleties of your music.

LFO/tremolo

Tremolo is a classic effect where a low-frequency-oscillator (LFO) modulates the volume of your instrument.

The **Voluum** LFO (tremolo) lets you recreate this effect, while giving you many more options. Smooth tremolo sounds with multiple waveforms featuring envelope-, pedal- and MIDI-controlled speed and depth variation, as well as MIDI-clock sync to keep the tremolo in time with your sequencer.

Duo mode gives you two LFOs to let you get really creative!

Volume—more than a simple volume pedal

A typical volume pedal gives you basic control of your signal level where the pedal replicates the function of the volume knob on your instrument.

The volume effect on the **Voluum** lets you do the same thing, but without compromising your tone. But just doing that would be boring! **Voluum** lets you cut or boost the signal level to any level you desire while providing fine control over the feel of the pedal: how its position maps to the volume change. You can also configure fades where the pedal acts as a switch and the volume fades up or

down smoothly over a chosen time to give you super-smooth fades that are impossible to do by using just foot-control.

In envelope mode, the level change is triggered when you play a new note or strum a new chord. Combine this with built-in ADSR shaping and you can create synth-like tones from your instrument.

Limiter

The high voltage analogue power rails in the **Voluum** give great sonic quality, but it means that high output levels can overdrive other effects in your chain. The limiter can be engaged to soft-limit the signal peaks to keep them within the input range of your other effects to avoid nasty clipping distortion.

The limiter can also limit asymmetrically, which can give overdriven signals a sweeter sound.

Precision tuner, that's super-fast

Tune your instrument faster and with more precision than before. The combination of unique **sonuus** tuning technology and a clear, innovative display ensures you can tune with 0·1 cent precision, and get accurate results even on the lowest notes (*e.g.,* a low B on a bass guitar).

Control

Unlike other analogue stomp boxes, the effects on the **Voluum** are not static, where you adjust the parameters to get the one sound you want

Instead, the **Voluum** has been engineered to make many aspects of each effect controllable so that effect parameters can smoothly go between **hi** and **lo** values that you choose. This modulation can be controlled using the **pedal**, MIDI controllers or the signal **envelope**. (See "Effect control methods" on page 19.)

USB & MIDI interface

The **Voluum** has a USB connection and standard 5-pin MIDI connections. You can send MIDI *to* the **Voluum** to control effects, or send MIDI *from* the **Voluum** to control other MIDI devices.

USB-MIDI allows MIDI messages to be sent straight to a computer, whereas the 5-pin MIDI connections make it easy to connect the **Voluum** to other MIDI equipment.

The USB connection also allows you to use the **Voluum** Desktop Editor Software and to use the **Voluum** as a USB-MIDI interface to connect MIDI gear to your computer.

Desktop Editor Software

Although you can access all of the effect parameters from the **Voluum**'s control panel, to make it faster and even more intuitive, we provide a Desktop Editor Software application that runs on both Microsoft Windows and Apple OSX.

The Desktop Editor Software is available once you register on-line: **register.sonuus.com**

Using the Voluum

In the rest of this manual, we cover everything you need to know about the **Voluum**: from how to connect it to your rig, to how to power it and how to delve in and create your own presets.

Consult the photo of the **Voluum** shown below to familiarise yourself with the controls and displays.

save/cancel button

numeric display

up/down buttons

metering LEDs

active button

effect knob

control button

hi/lo button

footswitch LED

footswitch

footpedal

gate   compressor

EFFECT

active

hi

lo

gate
compress
LFO
volume
limiter

pedal
envelope
MIDI

CONTROL

TRANSPARENT
True Bypass

PURE ANALOGUE
DIGITAL CONTROL

Cancel an edit / selecting preset mode

If you move or press a knob or touch the **active** or **hi/lo** buttons, the **Voluum** will leave Preset Select mode and enter Preset Edit mode. (Now the ▲▼buttons won't let you select presets.)

The button named **save** has dual functionality. When held for 2 s, it acts as a cancel button. This lets you undo any preset editing you have done and takes you back into Preset Select mode.

          Voluum

Connecting the Voluum

The simplest way of connecting the **Voluum** is between your guitar and amp: connect the output of your guitar to the input (IN) of the **Voluum**. Connect the output (OUT) of the **Voluum** to your amp's input.

When using other effects in your signal chain, there is no right or wrong effect order—experiment to see what you can do, and be creative.

Typically, time-based effects such as reverb and delay are placed after the **Voluum** so that these effects are applied to the **Voluum**'s sound.

When using distortion, the effect of connecting this before or after the **Voluum** are different. When distortion is used after the **Voluum**, the intensity of distortion can change as the signal level is modified by the **Voluum**. When distortion is placed before the **Voluum**, the **Voluum** is able to shape the harmonically-rich signal from the distortion without changing the intensity of the distortion.

You can also connect the **Voluum** to the effects loop of your amp: connect the output of your guitar to the input of your amp, then connect the "send" of your amp to the **Voluum** IN, and the OUT of the **Voluum** back to the "return" of your amp. Depending on your amp this can give rise to excessive noise if the signal level in the effects loop is too small. If you try this, it is best to set the effects loop level to +4dBu if you have that option.

MIDI operation using the USB connector or the MIDI IN and MIDI OUT connectors is detailed in "MIDI operation" on page 35.

Powering the Voluum

The **Voluum** can be powered by batteries, by a 9V DC power supply (neither of these is supplied), or by USB. Select one of the following:

- insert 4 AA batteries (alkaline can be used, but we recommend rechargeable NiMH batteries) into the battery compartment in the base of the **Voluum**. WARNING: observe correct polarity!
- plug the output of a 9V DC power supply into the port labelled DC on the back of the **Voluum**. The 9V DC power supply that you use should be capable of providing 500 mA and have a 2·1 mm centre pin connector. Note that the **Voluum** has been designed so that either polarity (tip-positive or tip-negative) can be used.
- plug a USB cable connected to your computer or a USB power supply into the port labelled USB on the back of the **Voluum**. If a USB hub is used, it may need to be a powered hub to ensure it can provide enough current to the **Voluum**. However, sometimes USB power (typically desktop PCs) can be noisy or can cause ground loops, which may increase the noise in your signal. If this happens and you want to use the USB connection, simply connect a 9V DC power supply and the **Voluum** will use that instead of USB power and you won't get these noise problems.

Note that there is no problem if you connect all three power sources at once. The DC supply takes priority, then USB, then the batteries. This ensures your batteries are not drained when they are not needed and allows you to connect via USB without using USB power when a DC supply is present.

> Top Tip: If you are using the **Voluum** on stage, use a DC power supply and batteries. That way, if the DC power supply is pulled out for any reason, the **Voluum** will switch to batteries and you will, in effect, have an un-interruptible power supply.

The **Voluum** is switched on when you connect USB or DC. When running from batteries, the **Voluum** is switched on when an instrument cable is connected to IN. To prolong battery life, disconnect the cable from IN when the **Voluum** is not being used.

LOCK switch

On the back panel of the **Voluum** there is a slide switch labelled **LOCK**. When this switch is in the locked position, the **Voluum** is in Preset Select mode and none of the parameters can be edited or saved: the only thing that you can do is change between presets. If you try to make a change when locked, **LoC** is shown briefly on the numeric display.

LOCK mode is ideal for gigging, when you want to switch from one preset to another but be sure that you won't accidentally make changes to your set-up. When the **LOCK** switch is in the unlocked position, you can tweak the **Voluum** settings and save new presets.

Enabling and bypassing the Voluum

The main footswitch LED shows the status of the **Voluum** effect.

When this LED is off, the effect is completely bypassed and the input (IN) is directly connected to the output (OUT). This connection is known as a true-bypass connection because in this state none of the **Voluum** electronics are connected to the signal: this keeps your original guitar/bass signal as pure as possible. (Unless buffered-bypass mode is enabled, see "Custom settings" on page 37, where the **Voluum** electronics are active, but have minimal effect on your signal.)

When this LED is on, the signal is passed through the **Voluum** and the output (OUT) is the effected signal.

The effect is enabled and disabled by briefly pressing the footswitch. Alternatively, when the footpedal is moved to the toe-down position, the effect will automatically enable. Note that this feature can be changed using the custom settings (page 37).

Note that if the main footswitch LED is flashing, it means the **Voluum** is in foot-operated preset selection mode (see page 13).

Footswitch LED

Off: Effect is completely bypassed (the **Voluum** has no effect on your sound).

On: Effect is active and the **Voluum** will affect your sound.

Flash: Foot-operated preset selection mode is active. The bypassed/enabled state of the **Voluum** does not change in this mode but remains in whichever state it was in before this mode was activated.

True-bypass or buffered-bypass?

Over the years, there has been much discussion about which is better: true-bypass or buffered-bypass. The answer is: it depends.

Buffered-bypass has the advantage that the low-impedance output of the buffer can drive long cable runs without these cables affecting your tone.

True-bypass, on the other hand, ensures the effect has no impact on the instrument signal; useful with large effects rigs where you may want all the pedals to be true-bypass to minimise their impact when bypassed.

Ultimately, you should use whichever bypass setting sounds best in your rig. It depends on your instruments and the other pedals in your chain, and indeed, the order of these pedals.

Selecting a factory preset

The factory presets configure the **Voluum** into a variety of set-ups, from traditional volume to **sonuus**' unique pedal-controlled compressor effects.

The **Voluum** has two modes: Preset Select mode and Preset Edit mode. By default, it is in Preset Select mode and the display alternates between the 3-character preset name and the preset number: either **F00**−**F39** for factory presets 0 to 99 or **P00**−**P99** for user presets 0 to 99.

If the display does not periodically show **F/P00**−**99**, then to enter preset mode do the following.

Enter Preset Select mode

If the display is not showing a factory or user preset (**F00**−**F39** or **P00**−**P99**), the **Voluum** is in Preset Edit mode: exit this mode by pressing and holding the **save** button for 2 s.

Alternatively, slide the **LOCK** switch to the locked position (the **Voluum** is always in Preset Select mode when locked).

Once the **Voluum** is in Preset Select mode, select a preset using the ▲▼ buttons. A single press on either button will increment/decrement the preset number by one. If you press and hold either button, the preset number will increment/decrement in tens.

Your **Voluum** is now ready to play. Select different presets and experiment with the wide variety of sounds that are possible.

Top Tip: Presets can also be selected using the footswitch and footpedal on the **Voluum** (see "Foot-operated preset selection" on page 13) or by connecting external footswitches (see "External footswitch connection" on page 39).

While you are playing, you may accidentally bump a switch or button which will take you into Preset Edit mode. To prevent this, and stay in Preset Select mode, you can slide the **LOCK** switch to the locked position. Alternatively, just re-enter Preset Select mode as described above.

Top Tip: Envelope-controlled presets (including gate and compressor) have been designed for an instrument with a standard output level. If your instrument has an unusually high or low output the presets may not sound correct—either too responsive or not responsive enough. Use the custom **SEn** parameter to adjust the sensitivity of your **Voluum** (see page 37).

Foot-operated preset selection

Preset selection using the ▲▼ buttons and the **save** button was described in "Selecting a factory preset" on page 12. There is an alternative method of preset selection using the footswitch and the footpedal. This has been specially designed to make it easy to change presets when you are gigging. Using this method, you don't have to bend down and select presets using your hands.

Preset selection using the footswitch and footpedal

Enter preset mode by pressing and holding the footswitch until the footswitch LED flashes. The time you have to hold for has a default value of 2 s, however this is a custom parameter that you can change (see "Custom settings" on page 37).

To increase the preset number, put the footpedal in toe down position (the ▲ button LED flashes to show that the preset number will increase) then tap (press and release) the footswitch the desired number of times until you reach the preset number you want. To decrease the preset number, move the footpedal to heel down position (the ▼ button LED now flashes) then tap the footswitch until you reach the preset you want.

When you have reached the preset number you want, you can play and even change presets while playing. However, while in preset select mode you can't enable or bypass the effect: to do this you have to exit preset mode by pressing and holding the footswitch until the footswitch LED stops flashing. The hold time to exit preset mode is the same as the hold time to enter it.

Preset selection with the footpedal in effect on/off mode

When the footpedal is configured to be in effect on/off mode (setting the custom parameter **P.En** to **o.Lo** or **o.hi** — see "Custom settings" on page 37) the method described above is replaced by another method. In this case, the footpedal is not used and foot-operated preset selection is always active. In addition, the footswitch is no longer used to enable/disable the effect.

Like the method described above, the footswitch is used to increment or decrement the preset (the direction being shown by the flashing of the ▲ or ▼ button LEDs). A long press on the footswitch (default press time of 2 s) will toggle the direction of preset selection.

Note 1: In foot-operated preset selection mode, you can only step through the presets one at a time (not in tens as you can if you use the ▲ ▼and **save** buttons). We therefore recommend that for a gig, you make sure that you save the presets you want to use close in number to one another.

Note 2: In foot-operated preset selection mode, you can still use the ▲ ▼ buttons as normal to select presets, and to increment/decrement in 10s if required.

"Preset-Bypass" mode

Normally when the **Voluum** is bypassed, the sound of your instrument is not modified, allowing you to turn your selected effect on and off. However, preset-bypass mode is a way to select a global preset that becomes active whenever the main effect is bypassed (the Footswitch LED is off).

As described in "Enabling and bypassing the **Voluum**" on page 11, the **Voluum** can operate in true-bypass, or buffered-bypass mode. A third option "preset-bypass" can also be selected (see "Custom settings" on page 37).

In preset-bypass mode, you choose a global preset (one of the existing factory or user presets) that becomes active whenever the **Voluum** is bypassed. This allows you, for example, to use the **Voluum** as a volume pedal or a gentle compressor when bypassed (the effect is off) then switch to any other effect when the effect is enabled.
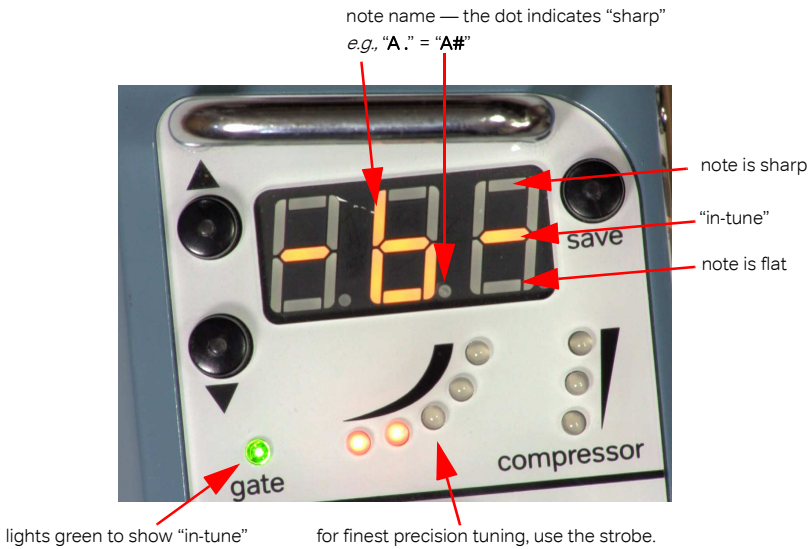
Using Preset-Bypass mode

Preset-bypass mode is only activated when the **LOCK** switch is enabled. When **LOCK** is disabled, the **Voluum** will operate in buffered-bypass mode whenever preset-bypass mode is selected.

The reason for this is to allow you to do A/B comparisons between the bypassed dry signal and the effected signal when you are editing presets (which has to be done with **LOCK** disabled).

Using the Tuner

To enable the built-in precision tuner, press and hold the footswitch until the display shows "**tun**". When you do this, you will first enter foot-operated preset selection mode. You need to keep holding the footswitch until "**tun**" is shown and the tuner is activated. (See "Foot-operated preset selection" on page 13).

Top Tip:	The time you need to hold the footswitch to activate the tuner is twice the time required to enter foot-operated preset selection, or 2 seconds, whichever is longer. The default time is 4 s but you can change this, see "Custom settings" on page 37.

note name — the dot indicates "sharp"
e.g., "**A .**" = "**A#**"

note is sharp

"in-tune"

note is flat

lights green to show "in-tune"   for finest precision tuning, use the strobe.

When you tune, the note being played is shown on the display. The closeness to being in-tune for the note is shown in several ways:

- the display shows bars: central bars indicates "in-tune", top bars means the note is sharp and bottom bars means the note is flat;
- the green **gate** LED lights to show "in-tune" the closer it is to being in-tune, the brighter the LED;
- the volume meter is used as a strobe to give the finest precision for tuning.

Using the strobe for tuning

All of the tuning indications in the **Voluum** will let you tune quickly and accurately. But to get the most precise tuning, the strobe display must be used.

The strobe display moves at a speed that corresponds to how far the note is from being perfectly tuned. If the note is sharp, the strobe moves upwards, and if the note is flat, the strobe moves downwards. When perfectly in-tune, the strobe stops moving.

In reality, the strobe will never stop moving, but will slow down enough to be considered stopped. To get the most accurate tuning, simply tune until the strobe stops moving, or is moving very slowly.

Creating your own presets

You can create and store up to 100 user presets on the **Voluum**. The steps for creating a preset are straight-forward.

Creating and saving a user preset

Ensure that the **LOCK** switch is in the unlocked position. Starting from any preset (factory or user), adjust the **Voluum** settings using the **EFFECT** knob and the **active** and **hi/lo** buttons to get the desired musical effect. These settings are discussed in detail later.

Save the preset. Press the **save** button. Use the ▲▼ buttons to select a user preset number (**P00**–**P99**) where you would like to store your preset. The name of the existing preset (if any) flashes alternately with the preset number to help you select either an unused preset or a preset to overwrite. Press the **save** button again when you have selected your preset number. You can now edit the three-character preset name. Turn the **EFFECT** knob to cycle through A-Z, 0-9 and press the knob to advance to the next of the three characters in the preset name. Finally, press the **save** button to write your preset to the chosen location.

The **save** button flashes while this save process is in progress. To abandon the save at any time, and revert to Preset Select mode, press and hold the **save** button for 2 seconds.

Selecting and changing parameters

When you press or move the **EFFECT** knob, the **Voluum** will enter Preset Edit mode. The flashing LED shows which effect is being edited. Successive presses on the **EFFECT** knob will cycle between editing the parameters for the **gate**, **compressor**, **LFO**, **volume** and **limiter** effects.

To include an effect in the signal chain, press the **active** button. The **active** button and the LED beside the effect will light up to show that the effect is active. The LEDs for other active effects will also be lit, but these will be dimmer and not flashing to show that the effects are active but not being edited.

For each effect that you edit, select the method of control for this effect using the **CONTROL** button. The control methods are none (nothing selected), **pedal**, **envelope** or **MIDI**. Successive presses of the **CONTROL** button cycle round the valid control options for the selected effect. Stop when the LED beside your choice of control for the effect is illuminated. Note that not all control methods are valid for all effects, and each effect (*i.e.,* all the controllable parameters in that effect) can be controlled by only one method.

Cycle round the effect's parameters using the ▲▼ buttons. The name of the parameters is shown on the display to make it clear what is being selected for editing. Turn the knob to change the value of the parameter that is being edited.

For some combinations of effect parameter and control method, the **hi** or **lo** LED will light up to show that the value of the parameter being edited applies to the high or low point of the control. For a pedal-controlled parameter, **hi** corresponds to the "toe-down" position, **lo** to the "heel-down" position. For a MIDI controlled parameter, **hi** and **lo** correspond to the maximum and minimum values of the MIDI controller. And for an envelope-controlled parameter, **hi** and **lo** correspond to the signal becoming louder and quieter. Press the **hi/lo** button to toggle between the **hi** and **lo** values for the parameter being edited.

When you have the value that you want for a parameter, select another parameter to edit. When you have completed your editing, you can save your setup as described previously.

Top Tip: To change the **hi** and **lo** values together so that both the **hi** and **lo** of the parameter are set to the same value, hold the **hi/lo** button down while you turn the knob to set the parameter value. Note that the **hi** and **lo** LEDs will both light when you do this to show that both values are being updated.

Setlists

A setlist is simply a list of presets that you want to use in your "set" during a performance. The setlist feature of the **Voluum** lets you define which presets you want to use and makes all other presets unavailable. This way you can easily move between your desired presets without getting lost (the **Voluum** has a lot of presets!).

To use the setlist feature you must use the Desktop Editor, available free from:

http://software.sonuus.com

There are 6 setlists available (A–F) as well as a built-in demo setlist that you can't edit. Once you have configured a setlist you can make it active using using the **SET** parameter; see "Custom settings" on page 37. The setlist doesn't become active until you lock the **Voluum**.
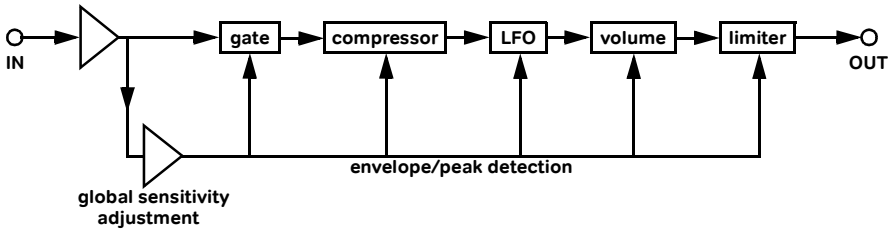

Normally, presets can be selected by MIDI program change messages where the program number matches the preset number. Setlists give you more flexibility, allowing you to choose any program number for any preset (this also selects which program change messages are sent when you select a new preset on the **Voluum**; very useful when controlling other effects from the **Voluum**).

Setlist are a great way to tailor the **Voluum** for your performance without modifying or moving presets. It lets you focus on your performance, knowing that the sounds you need are available when you need them.

Voluum **effects signal chain**

The **Voluum** signal chain comprises five separate effects, as shown below.

```
IN  ▷  →  gate → compressor → LFO → volume → limiter  →  OUT
        ▽
global sensitivity          envelope/peak detection
   adjustment
```

When using individual effects pedals, musicians are careful about the order of the effects chain. One reason for this is because if one effect cuts the signal level, then the next one boosts it to compensate, excess noise can be added to the output signal. Another reason is that often the order of effects can affect the final sound. For example, an envelope-sensitive effect's sound will change when it is placed before or after a compressor. The **Voluum** signal chain does things differently.

The limiter is always the last effect in the chain in order to limit the output of the **Voluum**. But the other effects in the chain can be considered to be in any order—because the effects are all volume-based, and because all of the effects monitor the input signal (IN), the order of the effects in the signal chain (prior to the limiter) is no longer important. This means that, for example, you can apply heavy compression to the signal at the same time as using an envelope-controlled LFO without the compression affecting the touch-sensitivity of the LFO.

Another advantage of the **Voluum** signal chain is that level control for every effect is done by a single analogue circuit (the VCA). This minimises noise and signal distortion, so you don't have to worry about signal quality when you switch in multiple effects.

The effects in the signal chain are described in more detail in the following sections.

Effect control methods

On the **Voluum** effects, some parameters can be controlled (modulated) in real time where the parameter can smoothly go between a **hi** and **lo** value that you choose. This modulation can be controlled using the foot **pedal**, MIDI controllers or the signal **envelope**.

Using the **dB** parameter of the **volume** effect as an example, when the **control** is set to none (no control method is selected), the **dB** parameter simply sets the output level of the volume effect. When the control is set to **pedal**, then the **hi** and **lo** values of the **dB** parameter are the maximum and minimum output levels achieved as the footpedal is rocked from one extreme to the other, and

the **Voluum** acts as a traditional volume effects pedal. However, unique to the **Voluum**, you can also choose to control **dB** using a MIDI controller to remotely-control or automate volume changes.

Not all control methods are available for all effects, for example, the gate and compressor are inherently envelope-controlled effects, so there is no additional **envelope** control method for these effects. The control methods available for each effect are shown below.

Effect	Control Methods			
	none	pedal	envelope	MIDI
gate	✓	✗	✗	✗
compressor	✓	✓	✗	✓
LFO	✓	✓	✓	✓
volume	✓	✓	✓	✓
limiter	✓	✓	✓	✓

When a control method is selected for an effect, this applies to all controllable parameters within that effect. Not all parameters are controllable (it simply doesn't make sense for some parameters to be controllable), but for those that are, the same control method is used for each. Note that the **Voluum** allows you to use different control methods for different effects.

When you have enabled a control method for an effect, controllable parameters are easily identified because the **hi** or **lo** LED will light to show you which value (**hi** or **lo**) of the parameter is currently selected. For example, if you are editing the **dB** parameter of the **volume** effect and have selected **pedal** control, then when the **hi** LED is illuminated you are setting the output level (in dB) for when the foot pedal is in toe-down position, and when the **lo** LED is illuminated, you are setting the output level for when the foot pedal is in heel-down position. You toggle between editing the **hi** and **lo** parameter values by pressing the **hi/lo** button.

> Top Tip: To change the **hi** and **lo** values together so that both the **hi** and **lo** of the parameter are set to the same value, hold the **hi/lo** button down while you turn the knob to set the parameter value. Note that the **hi** and **lo** LEDs will both light when you do this to show that both values are being updated.

Control via MIDI can be used to replicate pedal control remotely and to automate the effect. The controller's minimum value corresponds to the pedal in the heel-down position, and the controller's maximum position corresponds to the pedal in the toe-down position. You can choose a different MIDI controller for each effect using the **CtL** parameter.

> Top Tip:　If **CtL** is set to one of the coarse (MSB) 14-bit MIDI controllers (controller # 0–31), the **Voluum** can be controlled using the full 14-bits of the controller to ensure the smoothest response. (Of course, you need to ensure the fine (LSB) part of the MIDI controller (controller # 32–63) is also being sent to the **Voluum** for this to work.)

envelope control similarly varies the controllable parameters between their **hi** and **lo** values in response to changes of the input signal level. You can adjust how sensitive this response is by using the **SEn** (sensitivity) parameter.

> Top Tip:　If you often switch between instruments with different output levels, rather than change the **SEn** effect parameter (which is stored presets), use the custom **SEn** parameter to adjust the global sensitivity of your **Voluum** (see page 37).

Metering

The real-time meters on the **Voluum** are clear and simple. You will find the meters invaluable when setting up the gate and compressor effects, as well as letting you see what's going on when the effects are active.

When using the **Voluum** as a volume pedal effect, the volume meter can be used as a visual indication of the position of the pedal (*i.e.,* the current volume) before enabling the effect.

volume — shows the real-time effect volume scaled to the currently set **hi** and **lo** values. This monitors both the **volume** effect and the **LFO** effect (when these effects are active).
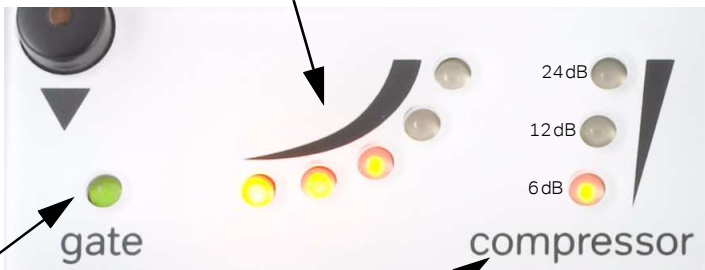
noise gate — lights to show when the gate is closing. The brighter the LED, the more the gate has closed.

compressor — shows the amount of gain reduction being applied (see scale in dB above).

You can think of this as the amount of signal compression: the more LEDs lit, the higher the compression.

Adjusting the gate

The gate effect on the **Voluum** is a noise gate/expander. A noise gate is used to suppress unwanted noise when the signal falls to a low level. It works by allowing signals that are above the gate threshold to pass through unchanged, but reduces signals that are below the gate threshold. The **Voluum** gate effect allows you to configure the threshold (**thr**), and the amount of reduction (**rEd**): the greater the reduction, the more noticeable the effect and the more of the low-level signal (and hence noise) you lose. The **Voluum** implements a smooth transition around the threshold so that no artificial artifacts are introduced into your sound. When the signal is below the threshold, we say that the gate is closing, and the "closed-ness" of the gate is indicated by the intensity of the gate LED. When the signal is above the threshold and the gate is open, the gate LED is not lit.

The graph below shows the difference between high and low reduction. The expander knee is the smooth transition between the signal above and below the threshold. In the **Voluum**, the knee is harder for high reduction and softer for low reduction values.
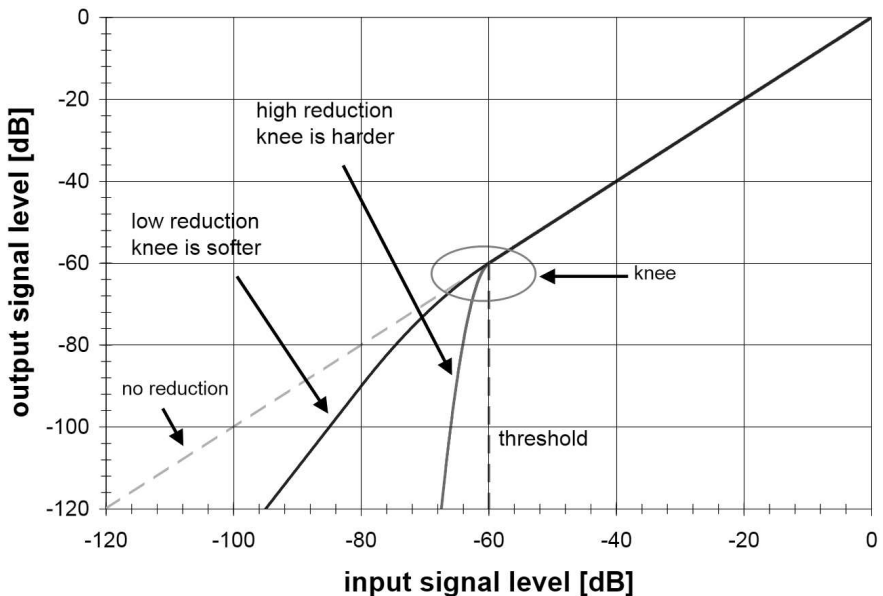
The gate is also controlled by the attack (**Att**) and release (**rEL**) parameters. The attack is the amount of time for the gate to fully open when the signal exceeds the threshold, and the release is the amount of time for the gate to fully close when the signal falls below the threshold.

 Voluum

The gate parameters are shown in the table below.

Parameter	Controllable	Range	Description
rEd	no	0–100	Signal level reduction. 0 is subtle and transparent (soft-knee, low ratio), 100 is more aggressive (hard-knee, high ratio).
thr	no	−90–20	Threshold in dB.
Att	no	0·00–6·00	Attack time in seconds for the gate to open.
rEL	no	0·01–6·00	Release time in seconds for the gate to close.

The gate effect can be configured to be very subtle by setting a low reduction and low threshold, or to add a distinct character to your sound with a higher threshold and higher reduction. Similarly, a slow **rEL** time, will allow the gate to close subtly, whereas a fast **rEL** time can be sudden and more obvious. Typically, the **Att** time is set fast to ensure transients aren't lost when the gate opens.

Adjusting the compressor

The compression effect is used to even out the level of your playing. For example, the sound level from the lower strings of your guitar is different from the higher strings—this is particularly pronounced for bass guitar. The compressor is used to smooth out this difference. It can also be used to add clean sustain or to boost the overall loudness of your sound (quieter notes will sound as loud as the loudest notes) or to enhance the transients of notes.

A compressor works by apply a gain reduction to the signal when the signal level is above a threshold. On its own this would compress the signal, but also cause a general drop in signal level. To compensate for this, a make-up gain is applied to bring the average signal level back to where it was before. The **Voluum**'s compressor features an intelligent make-up gain, so you don't need to worry about setting this.

The graph below shows the effect on the output signal of applying high compression and low compression. Below the threshold, the signal passes through the compressor unchanged. The transition around the threshold, the signal knee, is smooth. Above the knee, a constant gain-reduction (ratio) is applied to the signal level. Note that the shape (sharpness) of the **Voluum** compressor's knee varies as the amount of compression is changed.
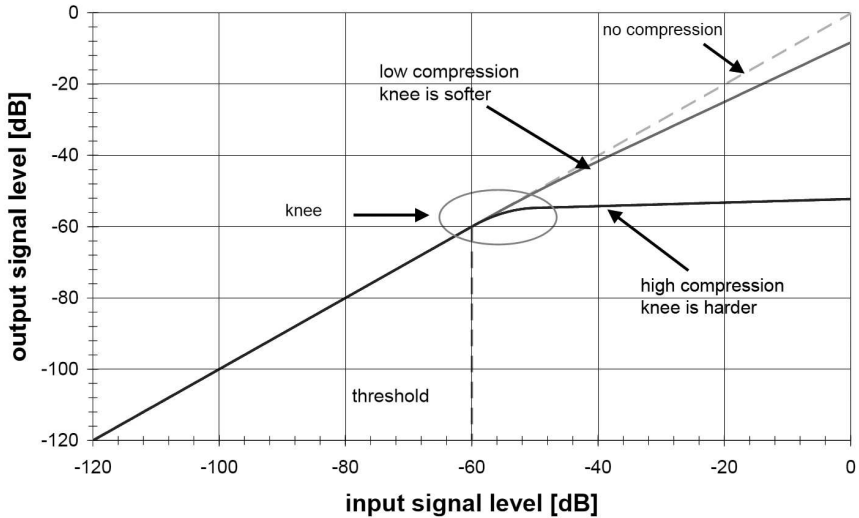
The parameters are shown in the table below:

Parameter	Controllable	Range	Description
CPr	yes	0–100	Compression amount. 0 is subtle (soft-knee, low ratio), 100 is maximum compression (hard-knee, high ratio).
thr	yes	−60−20	Threshold in dB.
Att	yes	0–100	Attack time in milliseconds.
rEL	yes	0·10−6·00	Release time in seconds.
LvL	no	−24−24	Level trim in dB. Use this to keep the signal level the same regardless of the amount of compression being applied.
CtL	no	0–127	MIDI controller for **compress**. Only available if MIDI control is selected for the compressor effect.

The compressor effect can be a subtle smoothing-out of your sound (**CPr** set to a low value, and **thr** set to a high value), or can be used to add a distinct "compressed sound" to your playing (set **CPr** to a high value and **thr** to a low value).

The attack parameter (**Att**) is the time in milliseconds that it takes the compressor to respond to a signal that exceeds the threshold. A fast attack (**Att** time is small) can compress short transients,

whereas a slow attack (**Att** time is large) often sounds more natural and can preserve the "pop" and "slap" of bass guitar playing.

> Top Tip: The compressor, even at fastest attack (**Att** = 0) may not react quickly enough to block all transients. However, you can still do this by using the limiter in combination with the compressor to tame the fastest, largest, transients.

The compressor release (**rEL**) is the time in seconds that it takes for the compressor gain reduction to recover when the signal falls below the threshold. Slower release times tend to smooth out the signal. However, if the release is set too long, the gain will remain turned down for a while after the loud sound has ended. This may cause any quiet sounds that occur between loud sounds to be turned down as well. Conversely, too-fast release times will make the compression effect too obvious to the point where you can hear a very unnatural "pumping" or "breathing" sound as the signal level goes up and down. In general, the release should be set fast enough to recover in time to process the next transient.

The **Voluum** has an intelligent automatic make-up gain which maintains the subjective loudness of the signal. The aim of the make-up gain is to ensure that the signal loudness is the same with and without compression. However, if you have a particularly high output or low output instrument, you may find that the automatic gain make-up cannot do sufficient compensation for your instrument. If this is the case, you can adjust the value of the level trim parameter (**LvL**) until you balance the output with and without the compressor.

> Top Tip: If you often switch between instruments with different output levels, rather than change the **LvL** parameter (which is saved in presets), use the custom **SEn** parameter to adjust the global sensitivity of your **Voluum** (see page 37).

The amount of compression being applied to your signal is displayed on the compressor metering LEDs on the control panel of the **Voluum**. The more LEDs that are lit, and the brighter they are, the more compression (gain reduction) is being applied. It is very useful to watch this meter when setting up the compressor parameters.

Adjusting the LFO

The LFO in the **Voluum** is used to create a tremolo effect. It is highly configurable using the parameters in the table below. The speed of the LFO can be controlled precisely and can even be synchronised to a sequencer using MIDI ("MIDI operation" on page 35).

Parameter	Controllable	Range	Description
tyP	no	**tPo** **tAP** **Syn**	Type of LFO clock: tempo in bpm pedal is used to tap a tempo sync'd to MIDI clock
LvL	no	−15–15	Level trim in dB. Use this to balance the effected and bypassed signal level.
bPM	yes	10·0–999	Sets LFO tempo in bpm. Only available if **tyP** is set to **tPo**.
oPt	no	**oFF**, on	Enables optical tremolo emulation.
FAS	no	**oFF**, on	Enables fast LFO mode (**div** is 16x faster)
duo	no	**oFF**, on	Enables duo mode: two LFOs rather than a single LFO.
LFo	no	1, 2	Selects the LFO to be edited when **duo** mode is enabled.
rtG	no	**oFF**, on	Retrigger the **LFO** each time a new note is detected.
dLy	no	**oFF**, 0·1–25·0	Delay in seconds over which the LFO "grows" after the LFO is retrigged. Only available if **rtG** is **on**.
r.Ph	no	0–63	Phase after retriggering. Only available if **rtG** is **on** and for LFO1 only.
PhA	no	0–63	Phase of LFO2 relative to LFO1. Only available when **duo** mode is enabled and when LFO2 is selected for editing.
div	yes	16, 8, 6, 4, 3, 2, 1, $^1/_2$, $^1/_4$, $^1/_8$, $^1/_{16}$	Clock multiplier. For example, if the clock is 120 bpm and **div** is set to $^1/_2$, the LFO clock will run at 60 bpm.
ShP	no	**Sin** **tri** **Sqr** **S.uP** **S.dn** **trP** **rnd** **CLA**	Shape of LFO waveform: sinusoid triangle square saw up saw down trapezoid random classic
r.uP	no	0–100	Ramp up: only available for trapezoid. See below for details on how trapezoids are set up.
r.dn	no	0–100	Ramp down: only available for trapezoid.

Parameter	Controllable	Range	Description
dty	yes	0–100	Duty cycle of square or classic LFO waveform..
StE	yes	**oFF**, 1–64	Step: quantizes the LFO output to this number of steps.
dB	yes	−99–40	LFO depth in dB. The LFO oscillates between 0dB and this level.
SEn	no	−30–30·0	Envelope sensitivity in dB. Only available with **envelope** control.
CtL	no	0–127	MIDI controller for **LFO**. Only available with **MIDI** control.

The diagram below shows examples of the different shapes of waveforms, selected using the **ShP** parameter. The random waveform takes a different random value every cycle (the cycle is defined by the **bPM** and **div** parameters).

sinusoid

triangular

square

saw up

saw down

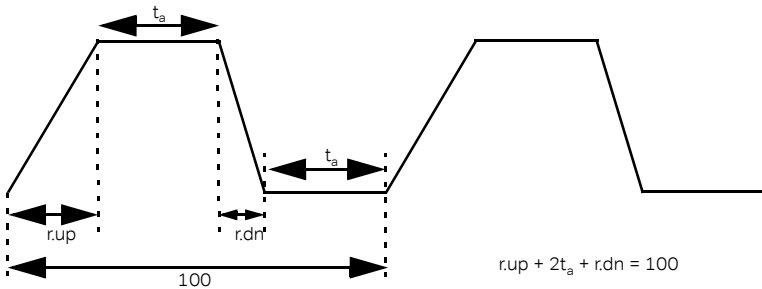trapezoid

example of random
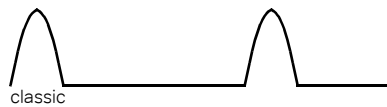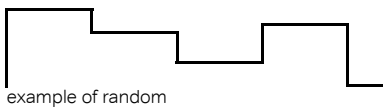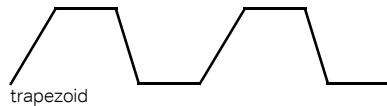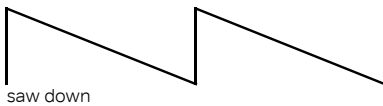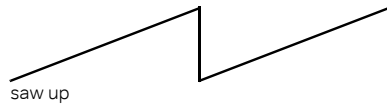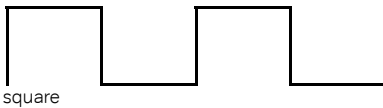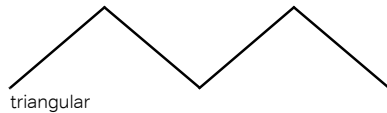
classic

Sinusoid (sine) waveforms are well-suited to tremolo effects, and often result in the most natural sound, and is usually the best starting point for exploring the LFO effect.

For a more vintage sound, the classic waveform can be used. The duty cycle (**dty**) of this waveform can be adjusted to further vary the character of the sound, allowing you to emulate many classic tremolos.

To replicate the sound of optical-based tremolos (many vintage tremolos used a light-sensitive resistor in the volume control circuit), you need to enable **oPt**. This modifies the response of the tremolo circuit to faithfully reproduce the character of these optical tremolos. This works particularly well with the classic waveform, but can be used with any waveform you choose.

The square waveform has a variable duty cycle (**dty**), or pulse-width, which sets how long the waveform remains at its maximum value compared to its minimum value. When **dty** is 50, the waveform is symmetrical (square), whereas at its limits the waveform is always at its minimum (**dty** = 0) or maximum (**dty** = 100) value. This can be used to emulate the sound of a kill-switch, particularly when you control **dty** using the pedal.

The trapezoidal waveform is highly configurable: examples of trapezoidal waveforms are shown below. In the **Voluum**, the shape of the trapezoid is controlled by the parameters ramp up (**r.uP**) and ramp down (**r.dn**), referring to the left and right sides of the waveforms shown. One cycle of the trapezoid waveform is represented by 100 time units. The sum of ramp up and ramp down cannot exceed 100. If the sum of ramp up and ramp down is less than 100, the remaining time has no ramp, shown as t_a below.
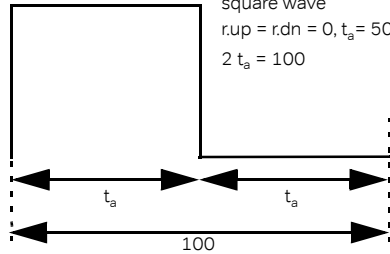

$$r.up + 2t_a + r.dn = 100$$

Using the trapezoid waveform, you can generate a square wave (ramp up = ramp down = 0), a triangular wave (ramp up = ramp down = 50), a saw-up wave (ramp up = 100, ramp down = 0) and a saw-down wave (ramp up = 0, ramp down = 100) in addition to trapezoidal waveforms.
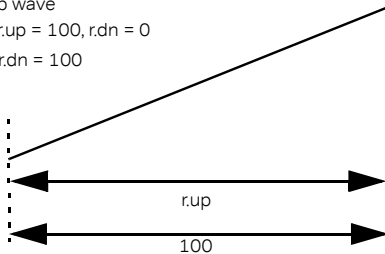
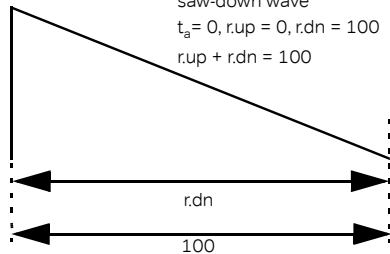triangular wave
$t_a = 0$, r.up = r.dn = 50
r.up + r.dn = 100

r.up   r.dn

100
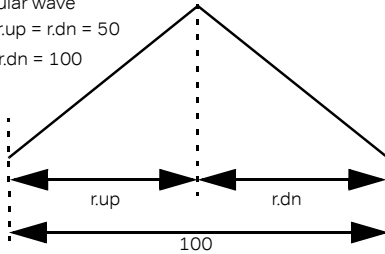
square wave
r.up = r.dn = 0, $t_a = 50$
$2\,t_a = 100$

t_a t_a

100

saw-up wave
$t_a = 0$, r.up = 100, r.dn = 0
r.up + r.dn = 100

r.up

100

saw-down wave
$t_a = 0$, r.up = 0, r.dn = 100
r.up + r.dn = 100

r.dn

100

The parameter **tyP**, lets you select the LFO clock type. The options for the clock are: it can be set as a tempo (**tPo**) using the **bPM** parameter; tempo can be tapped using the footpedal (**tAP**); or the clock can be sycn'd (**Syn**) to external MIDI clock.

The tempo is in beats per minute, bpm. The **bPM** parameter has a range of 10 to 999. To achieve slower and faster tempos, the **div** parameter multiplies the value of the tempo set by the **tyP** clock source. As an example, if **tyP** is **tPo**, **bPM** is 120 bpm and **div** is 2, then tempo has a value of 240 bpm.

The effect on volume of the LFO is controlled by the depth (**dB**) parameter. When this is positive, the LFO increases (boosts) the signal level from 0 dB (no change) to the **dB** value. When this is negative, the LFO decreases (cuts) the signal level from 0 dB (no change) to the **dB** value. Tremolo effects traditionally cut the signal level, so a negative **dB** would be chosen to emulate this.

Top Tip: If you want the LFO to oscillate between, say, +6dB and −12 dB, set the LFO **dB** to −18 and set the level trim (**LvL**) to +6.

To create more elaborate LFO effects, two LFOs can be combined when **duo** mode is enabled. Both LFOs are driven from the same clock (so are controlled by the same **bPM**) but each can have a different waveform, depth and division, and a phase offset can be applied to LFO2 (relative to LFO1). By modulating the LFOS' parameters you can easily create complex, smoothly evolving textures.

Adjusting the volume

The **Voluum** lets you configure how your volume effect sounds and how it feels to play. The parameters to set it up are in the table below.

| Parameter	Controllable	Range	Description
dB	yes	−99−40	Volume level in dB. 0dB means there is no change in signal level.
Cur	no	**Lo9–Lo1**, **Lin**, **hi1–hi9**, **Lh1–Lh9**, **hL1–hL9**	Curve: sets how the volume control (**pedal** or MIDI) is mapped onto the volume effect output. This also affects the shape of the volume change in **FAd** and **envelope** (ADSR) modes.
Mut	no	**oFF, on**	Mute mode on or off. When enabled, signal is muted iwhen the pedal is in the heel-down pedal position, regardless of the setting of **dB**.
FAd	no	**oFF, on**	Fade mode on or off. Only available with **pedal** and MIDI control.
tiM	no	0·1−99·9	Fade time in seconds, for fade mode.
Att	yes	0·00−9·99	Attack time in seconds (ADSR). **Att** is pedal controlled. Only available with **envelope** control.
dEC	no	0·00−9·99	Decay time in seconds (ADSR). Only available with **envelope** control.
SuS	no	−99−40	Sustain in dB, relative to **hi** value of **dB** (ADSR). Only available with **envelope** control.
rEL	no	0·00−9·99	Release in seconds (ADSR). Only available with **envelope** control.
thr	no	−80−0	The signal level drop (threshold) in dB required to trigger the ADSR release. Only available with **envelope** control.
CtL	no	0−127	MIDI controller for **volume**. Only available with MIDI control.

The volume level can be set to a single value using the **dB** parameter. However, to set-up a traditional volume pedal effect, select **pedal** control for the **volume** effect and then set a low value for the **lo dB** parameter and a high one for the **hi dB** parameter. Now when you rock the footpedal from heel-down to toe-down, the volume increases.

Changing the curve (**Cur** parameter) lets you adjust the "feel" of the footpedal, from the default linear (**lin**) setting through to extreme settings where most movement happens at the heel-down (**hi9**) or toe-down position (**lo9**).
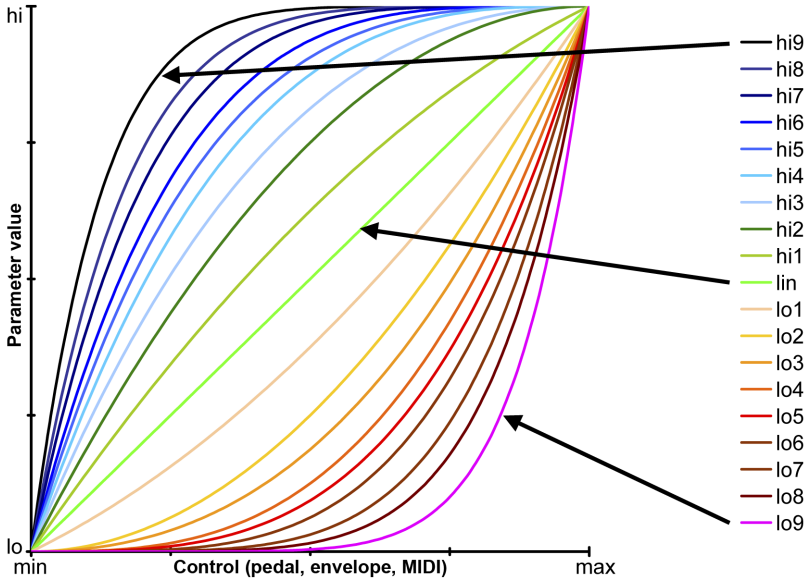
If this seems a little complicated, the best way of remembering how **lo** and **hi** work is that a **lo** curve spends more time near the **lo** value of **volume**, while a **hi** curve spends more time near the **hi** value. The higher the number *i.e.,* **Lo9** rather than **Lo1**, the more pronounced the effect.

To get even more control, these curves can be combined so that the curve starts as a "lo" curve, but ends as a "hi" curve (**Lh-**), and vice-versa (**hL-**). The **Lh-** curves are particularly useful for volume fades: note how the change starts and ends smoothly at both ends. These curves, also known as sigmoid curves, allow the most natural-sounding fades to be achieved.
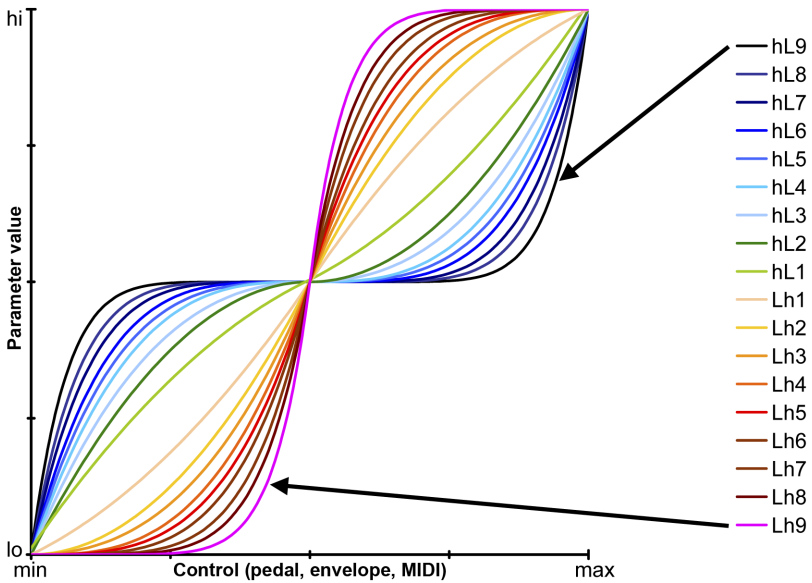
The **Voluum** lets you do super-smooth volume fades that would be impossible to achieve using a simple volume pedal: enable **FAd** (set to **on**) and set a fade time using the **tiM** parameter. When the footpedal is moved to the toe-down position, the volume will fade from **lo** to **hi**. Conversely, when the footpedal is moved to the heel-down position, the volume will fade from **hi** to **lo**. You can use this to make a signal fade quickly or very slowly to get the effect that you like.

When you select **envelope** control for the volume effect, a level-triggered ADSR (attack-decay-sustain-release) volume envelope is applied to the signal which gives you automatic volume swells and lets you create synth-like sounds. The ADSR envelope parameters attack (**Att**), decay (**dEC**), sustain (**SuS**), release (**rEL**) and threshold (**thr**) control the ADSR volume envelope. They are shown in the figure below.
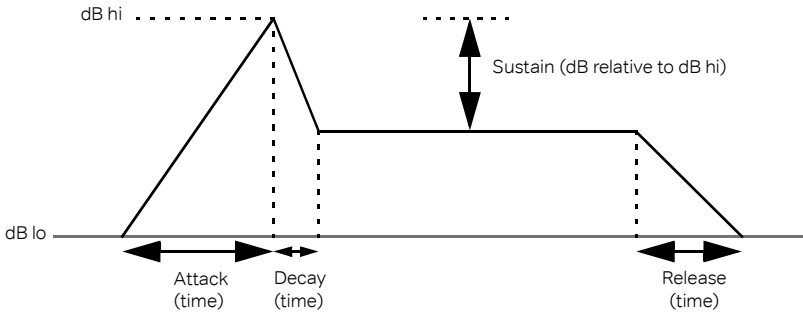
When triggered by a new note or chord, the volume increases from **lo** to **hi** (attack). Once complete, the volume then decreases (decay) to the sustain level (sustain). Once the input signal falls below the threshold (it drops in level by **thr** dB compared to the signal level at the start of the attack) the release phase is entered and the volume falls back to its **lo** value.

Using this ADSR shaping, you can achieve sounds reminiscent of other instruments by emulating the characteristic shape of their envelopes. For example, a slow attack can be used to emulate bowed stringed instruments.

> Top Tip: For simplicity, we described how curves affect the footpedal, but they also affect how the volume changes in fade mode, under MIDI control and in **envelope** mode. Don't worry too much about this — simply adjust **Cur** to get the sound you want!

Adjusting the limiter

The limiter is used to limit the range of the output signal in order to prevent the potential overload of any downstream equipment with limited headroom, such as a digital processor. Unlike the compressor, the limiter always reacts instantly and so can prevent overload caused by very fast transients that the compressor could miss.

Parameter	Controllable	Range	Description
dBu	yes	−5·2–20·0	The nominal level at which the limiter clips, in dBu.
SyM	yes	−99–99	The limiter symmetry in percent — 0 is symmetric. Positive values allow the positive part of the signal to be larger than the negative part.

Parameter	Controllable	Range	Description
SEn	no	−30·0–30·0	Envelope sensitivity in dB. Only available if **envelope** control is enabled.
CtL	no	0–127	MIDI controller for the **limiter**. Only available if MIDI control is enabled.

A large signal entering an effect with limited headroom will often cause hard-clipping where the tops of the signal are simply chopped off. Generally, this doesn't sound good. To prevent this, the limiter soft-clips the signal to reduce the audible artifacts caused by clipping, and for small overloads the effect can be inaudible.

The nominal signal level at which the limiter clips is set using the **dBu** parameter. The symmetry of clipping can be adjusted using the **SyM** parameter.

The difference between hard clipping and soft limiting is shown below, along with the effect of changing the symmetry of the limiting.

hard clipping   soft clipping   asymmetric soft clipping
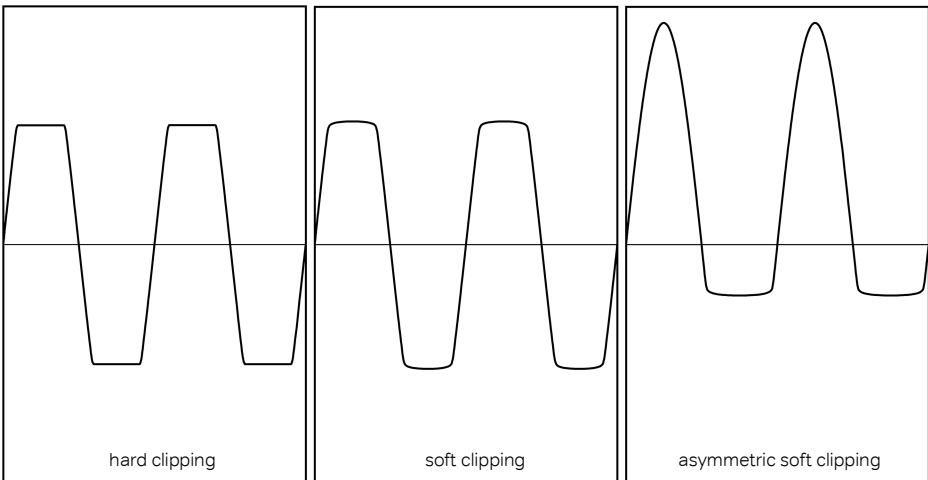
The harmonic distortion (overdrive) achieved with symmetric limiting introduces odd harmonics into the output signal. However, by using the **SyM** parameter to set-up asymmetric limiting, the output sound can be changed because this introduces even harmonics into the output signal. This effect can be subtle, but we know that it matters to some of you and the **SyM** parameter gives you the flexibility to achieve it. Don't worry too much about the details of the harmonics—just set-up the

symmetry so that you like the sound. Note, however, that the symmetry control will have less effect the closer **dBu** is set to its minimum value: at maximum limiting only symmetric limiting is possible.

The limiter level and symmetry is controllable using the **hi** and **lo** values of the **dBu** and **SyM** parameters when a control method is selected.

MIDI operation

It is possible to control the **Voluum** with MIDI input and to use the **Voluum** as a MIDI controller. For example, by default the footpedal sends 14-bit volume controller messages on MIDI channel 1 so you can use the **Voluum** to control synthesizers. MIDI can also be used to synchronise the LFO to your sequencer to ensure its tempo matches that of your song, or to automate preset selection.

The **Voluum** can send and receive MIDI messages using dedicated MIDI connections or using USB-MIDI.

To use USB-MIDI, connect the USB port of the **Voluum** to a USB port of your computer (OSX, Windows, Linux) via a USB cable. The necessary drivers are part of the operating system so your computer will automatically configure itself to work with the **Voluum**. Once this is done, new MIDI-in and MIDI-out ports will appear, named "`Voluum`". To send MIDI messages to the **Voluum**, connect your software to the "`Voluum`" MIDI-out port. To receive MIDI messages from the **Voluum**, connect your software to the "`Voluum`" MIDI-in port.

To use dedicated MIDI, connect your MIDI-enabled device to the MIDI-in and MIDI-out connectors on the **Voluum**.

The following standard MIDI messages are supported.

MIDI output (from Voluum to computer or MIDI device)

MIDI message			Chan	Description
Program Change				
Program Change			Ch. o[a]	Sent when a new preset is selected on the **Voluum**. Bank Select messages are sent when the current preset changes between factory and user presets.
Controllers	MSB	LSB		
Bank Select	#0	#32	Ch. o	Factory (0) or user (1) preset bank. (Factory: #0=0, #32=0. User: #0=0, #32=1.)
Volume	#7	#39	Ch. o	Always sent whenever the footpedal is moved.

a.   MIDI output channel, **Ch.o,** selected in custom parameters.

MIDI input (from computer or MIDI device to Voluum)

MIDI message			Chan	Description
MIDI sync				
MIDI clock			N/A	Used when LFO is in MIDI sync (**Syn**) mode.
Song position				
Program Change				
Program Change			Ch. i [a]	Selects the preset to be used. Operates on the currently selected bank (factory or user). Use Bank Select controller message to switch between factory and user banks.
Controllers	MSB	LSB		
Bank Select	#0	#32	Ch. i	Selects factory (0) or user (1) preset bank. (Factory: #0=0, #32=0. User: #0=0, #32=1.)
compressor	#11	#43	Ch. i	This is the default (expression). It can be changed in the compress parameters.
LFO	#1	#33	Ch. i	This is the default (modwheel). It can be changed in the LFO parameters.
volume	#7	#39	Ch. i	This is the default (volume). It can be changed in the volume parameters.
limiter	#12	#44	Ch. i	This is the default (effect control 1). It can be changed in the limiter parameters.

a. MIDI input channel, **Ch.i,** selected in custom parameters.

The **Voluum** can also be used as a USB-MIDI interface, allowing you to send MIDI between your computer and other MIDI gear. When the **Voluum** is connected to your computer via USB, any MIDI messages sent to the **Voluum** over USB will also be sent out the 5-pin MIDI output. Similarly, MIDI received on the 5-pin MIDI input will be sent over USB to your computer.

Top Tip: Using the **Voluum** Desktop Editor, you can configure more MIDI options that can be done on the **Voluum** itself. For example, you can remotely enable and disable individual effects using MIDI controllers assigned as "effect-enable controllers".

Custom settings

Further configurability of the **Voluum** is possible through **custom**. This lets you change the setup of the **Voluum** to suit your own instruments or personal preferences. For example, you can adjust the display LED brightness to a very low level to prolong battery life or to suit working in a darkened studio.

The custom settings are different from all of the other parameters: they affect the **Voluum**'s set-up, not the set-up of the current preset *i.e.,* they are global settings. The custom settings are not stored in a preset, they are stored in the **Voluum** itself. They take effect from when they are changed. They are not changed by switching from one preset to another.

To make changes to the custom parameters, enter **custom** mode by pressing and holding the **EFFECT** knob for 2 s.

Parameter	Default	Range	Description
LEd	40	1–100	LED brightness: 1 is minimum, 100 maximum. Reducing the LED brightness is useful for dark environments and for battery saving.
int	**Gtr**		Instrument (optimises note-retriggering for LFO and ADSR and optimises envelope tracking)
		Gtr	guitar (perfect for guitar, but also good for 4-string bass. Use this unless you experience problems with the lowest notes)
		bA4	4-string bass (best to track the lowest notes of 4-string bass, but also works well with 5-string bass)
		bA5	5-string bass (best to track the lowest notes of 5-string bass)
SEn	0	−36–36	Applies a global adjustment for **envelope** mode sensitivity (**SEn**) to compensate for instruments with different output levels. Gives a range of ±36 dB.
byP	**tru**	**tru**, **buF**, **PrE**	Allows you to select true-bypass (**tru**), buffered-bypass (**buF**) or preset-bypass (**PrE**)
NuM	**F00**	**F00–P99**	Selects the preset to be used when the effect is bypassed (only available when **byP**=**PrE**)
tun	440	420–460	Sets the A440 reference frequency (in Hz) for the tuner. Standard tuning uses 440Hz as the frequency for A4.

Parameter	Default	Range	Description
P.En	**on**	**oFF**	Pedal enable. Allows you to enable the effect by moving the footpedal. If set to **oFF** then this feature is disabled.
		on	The effect is enabled when the footpedal is pressed to the toe-down position. The effect must be turned off using the footswitch.
		o.Lo	On/off low (heel): the effect is enabled when the footpedal is in the heel-down position, and is deactivated when the footpedal returns to this position (after a time set by "pedal effect off time").
		o.hi	On/off high (toe): the effect is enabled when the footpedal is in the toe-down position, and is deactivated when the footpedal returns to this position (after a time set by "pedal effect off time"). Setting **P.En** to **o.Lo** or **o.hi** affects how footpedal preset selection works—see "Foot-operated preset selection" on page 13.
P.ti	0·1	0·1–20·0	Pedal effect time off. Only available if **P.En** is set to **o.Lo**, or **o.hi**. When **P.En** is set to **o.Lo**, or **o.hi**, this sets the time (in seconds) that the footpedal must be in the "off" position before the effect is turned off.
FS.t	4 (2s)	**oFF**, 1–8	Footswitch time. Time in 500ms steps that footswitch is held to enter and exit foot-operated preset selection mode. Note that this also sets the time required to enable the tuner which will be twice the footswitch time, or 2 seconds, whichever is longer.
Po.t	**oFF**	**oFF**, 1–240	Power-save timeout. This sets the time to enter a lower-power state (display goes off) to prolong battery life when the effect isn't enabled.
PoS	**oFF**	**oFF**, on	Show footpedal position. When set to **on**, **=00**−**=99** is displayed when the footpedal is moved. This can be used to position the footpedal in a particular position before enabling the effect.
Ch.i	1	**Any**, 1–16	Sets the MIDI input channel used to receive MIDI messages. If set to **Any**, MIDI messages on any channel will be accepted (omni mode).
Ch.o	1	**oFF**, 1–16	Sets the MIDI output channel used to send MIDI messages. If set to **oFF**, no MIDI messages will be sent.
SET	**oFF**	**oFF**, dEM	"Setlist". Allows selection of demo mode and user-defined setlists. When enabled, and the unit is locked, only certain presets are available, making it easier to use the **Voluum** live or for demonstrating its capabilities. See "Setlists" on page 18.

External footswitch connection

Although it is easy to select presets using your foot with the **Voluum**'s footswitch and footpedal (see "Foot-operated preset selection" on page 13), it can sometimes be more convenient to have dedicated footswitches for this, freeing up the **Voluum**'s foot controls to be used exclusively for enabling/bypassing the effect and for pedal-control.

The **Voluum** allows two external footswitches to be connected: one acting as up (increment preset), and one acting as down (decrement preset). This is done by using spare pins on the MIDI out connector, as shown in the diagram below. With basic soldering skills, it is possible to make a simple adapter which allows two footswitches to be connected, and allows the MIDI out to pass through unaffected so it can still be used.

▼ Down footswitch　　　▲ Up footswitch
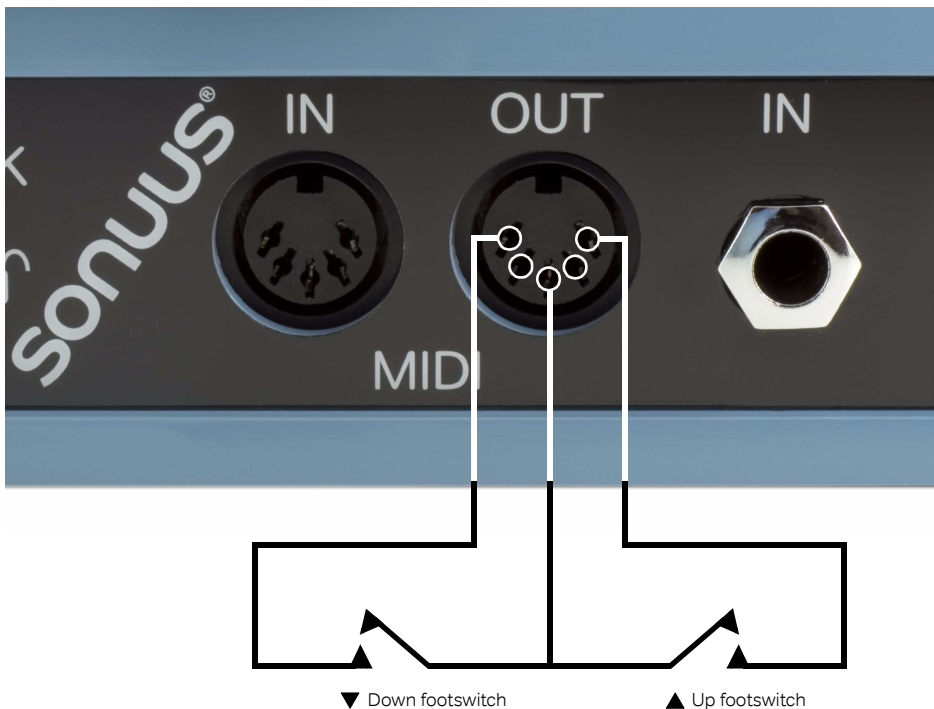
User modifications of the Voluum

For the avoidance of doubt, opening any part of the **Voluum** other than the battery compartment will always cause your warranty to be invalid, unless you obtain prior authorisation from **sonuus**.

However, we realise that musicians sometimes make the minor modification of reducing the footpedal travel by sticking a piece of rubber under the front (heel position) of the footpedal. If you do this, you will need to follow the pedal calibration procedure below. Any damage caused to the **Voluum** deemed by **sonuus** to be caused directly or indirectly by this (or any other) modification will not be covered by the warranty.

The rubber stop at the back of the footpedal (under the toe position) should never be modified to avoid damage to the pedal sensor.

Pedal calibration

Pedal calibration lets you configure the how much of the travel of the footpedal controls the effect. Normally you won't need to do this but if you make modifications such as limiting the travel of the **Voluum** by sticking a rubber stop under the front of the footpedal, then this calibration will be useful.

Enter calibration mode by simultaneously pressing and holding the **CONTROL** button and the **active** button for 4 s until **CAL** is displayed. Rock the footpedal from one extreme to the other a few times. Save this calibration and exit calibration mode by pressing the **save** button or with another simultaneous press of the **CONTROL** button and the **active** button.

If you enter calibration mode accidentally and want to exit without saving, press and hold the **save** button to cancel.

Warranty

The **Voluum** is supported by a limited warranty for a period of one year from the date of purchase. During this period, any faults due to defective materials or workmanship will be rectified (by repair or replacement) free of charge. A unit under warranty may be replaced with a reconditioned unit.

The warranty excludes damage caused by deliberate or accidental misuse or modification. It is the user's responsibility to ensure fitness for purpose in any particular application. The warranty is limited to the original purchaser, and excludes any consequential damage or loss.

Proof of purchase date is required for any claim under this warranty.

Warranty claims must be made through the retailer from whom the original purchase was made.

Firmware updating

To support new features and to make it future-proof, firmware (internal software) of the **Voluum** can be upgraded.

To update the **Voluum** firmware you will need to download the latest firmware file (`.sfu`) and Firmware Updater software (which includes an instruction manual). The updater software is available for both OSX and Windows. To access these files, you need to register and create a user account at the following web site:

register.sonuus.com

To update firmware on the Voluum

① While powering-on the **Voluum**, press and hold: **active** + ▲.

②The numeric display now shows **UPd** to indicate firmware update mode is active.

③Connect the **Voluum** to your computer via USB (if not already done during power-on).

④Follow the steps in the Firmware Updater manual you have downloaded.

Note: if the **Voluum** detects that your firmware is corrupt, it will boot straight into update mode to let you update the firmware.

Battery monitoring

When the battery level is getting low, **bAt** will periodically appear on the display to warn you.

To see the estimated percentage of battery life remaining, simultaneously press and hold the **active** button and the ▲ button. When using batteries, it is a good idea to check the remaining battery capacity before a performance so that you can replace/recharge the batteries if required.

Note that when DC or USB power are available, the displayed battery level will not show the correct value, but will instead show a value related to the available supply voltage. This is because when an alternative power supply is available, the batteries are disconnected to prolong their life.

Special key presses

Mode	Key Presses
Pedal calibration: enter save and exit cancel and exit	Simultaneously press and hold **active** button + CONTROL button for 4 s until **CAL** is displayed. Press **save**. Press and hold **save** to cancel.
Battery monitoring	Simultaneously press and hold **active** + ▲ to display % battery charge.
Firmware update mode: enter exit	Simultaneously press and hold **active** + ▲ when powering-on the **Voluum**. Restart the **Voluum**.
Cancel edit (enter Preset Select mode)	Press and hold **save** for 2 s.
Foot-operated preset mode enter/exit	Press and hold footswitch until footswitch LED starts/stops flashing.
Display firmware version	Press and hold **save** on power-on (version number is shown until you release the **save** button).

Adjusting pedal tension

The tension (stiffness) of the foot pedal can be adjusted using the 5 mm Allen key supplied. Insert the Allen key into the bolt on the side of the pedal and adjust the tension to get the feel you want. Turn clockwise to increase the pedal resistance, turn anti-clockwise to reduce the pedal resistance, ensuring that you don't loosen the bolt too much. Only small adjustments are required to make changes to the pedal tension.
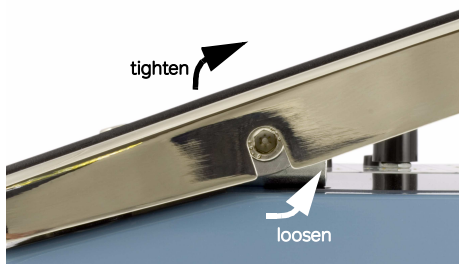
Factory presets

The **Voluum** is able to store up to 100 factory presets, but not all of these slots are utilised in the current firmware version. Additional factory presets will be included in future firmware updates.

Preset	Short Name	Long Name	Notes
F00–F09: A quick selection of what's possible with the **Voluum**			
F00	voL	Volume Pedal Std	Classic volume pedal. Cuts level by 48dB.
F01	bSt	Volume Boost 12dB	Volume booster. Boost level by 12dB.
F02	gEn	Compressor Gentle	Some gentle compression.
F03	SuS	Compressor Sustain	A compressor to add lots of clean sustain.
F04	c.pd	Compressor Pedal	Pedal-controller compressor: more compression as pedal is moved toe-down.
F05	trE	Classic Tremolo	Classic tremolo: use the pedal to change the speed.
F06	t.En	Tremolo Envelope	Envelope-controlled tremolo: speed and character of tremolo depends on signal level.
F07	pul	Tremolo Pulse	Pulse tremolo: echo-like sounds as the pulse decays with the signal level.
F08	kil	Tremolo Killswitch	Kill-switch tremolo: use the pedal to emulate using a kill-switch.
F09	syn	ADSR synth	ADSR synth. Combination of all effects to give a synth-like sound.
F10 –F19: Pedal-based tremolo effects			
F10	opt	Optical Style Trem	Optical-style tremolo. Pedal controls speed.
F11	mor	Morphing Tremolo	Pedal morphs LFO shape.
F12	LtB	Late Bloomer	Long delay on tremolo so it "blooms" late. Pedal controls the tremolo depth.
F13	t.pd	Pedal Depth Tremolo	Pedal-controlled tremolo depth
F14	t.pS	Pedal Speed Tremolo	Pedal-controlled tremolo speed
F15	t.dy	Pedal Delay Tremolo	Pedal controls speed. Fade-in delay.
F16	t.du	Dual Tremolo	Dual-LFO tremolo. Pedal-controlled div change.
F17	t.vd	Vari Dual Trem	Pedal-controlled speed dual-LFO tremolo
F18	t.db	Trem Doubler	Pedal controls div to switch tremolo to double-speed.
F19	sAw	Tremolo Fast	Saw Pedal-controlled div (x1 to x4), with sawtooth waveshape. Can get quite fast.

Preset	Short Name	Long Name	Notes
F20 – F29: Envelope-based tremolo effects		
F20	E.St	Envelope Speed Trem	Envelope-controlled tremolo speed. Slows down as signal decays.
F21	E.Su	Env Speed-up Trem	Envelope-controlled tremolo speed. Speeds up as signal decays.
F22	E.dt	Envelope Delay Trem	Envelope-controlled tremolo with retrigger delay. Slows down as signal decays.
F23	E.Sd	Env Slow-Dn Trem	Envelope-controlled slow-down tremolo with retrigger delay. Significantly slows down as signal decays.
F24	E.u2	Env Del-up Trem	Envelope-controlled speed-up tremolo with retrigger delay. Significantly speeds up as signal decays.
F25	E.t2	Envelope Trem 2x	Envelope-controlled tremolo speed. Div changes by 2x.
F26	E.t3	Envelope Trem 3x	Envelope-controlled tremolo speed. Div changes by 3x.
F27	t.Sw	Swing Tremolo	Dual-LFO gives a swing feel to tremolo. Slows down as signal decays.
F28	Stu	Stuttered fade out	Signal seems to stutter as it fades.
F29	gAL	Tremolo Gallop	Somewhat like a galloping horse.
F30 – F39: More "effecty" sounds		
F30	AbF	Amp Boost Fader	Designed for overdriving the front-end of a valve amp.
F31	SwL	Dirty Swell	Fades in, then fades in again to add much more gain. Compression maintains signal level.
F32	SPh	Sonuus Phone	Captures only the attack of the note; very staccato!
F33	dyg	Dirty Grains	
F34	ogr	Organ Grinder	Organ Grinder (no control).
F35	og.P	Organ Grinder Pedal	Organ Grinder (pedal control).
F36	rob	Robot Ballads	Echo-like ballad-y sound (for robots!).
F37	SoS	Southern Sauce	
F38	u2	You Two!	
F39	tbL	Trem Boost Lead	A boosted tremolo for guitar solos.

 Voluum

Specification

Physical & Electrical	
Size	171 mm × 192 mm × 76 mm
Power	9 VDC (any polarity), 4 × AA batteries, USB (500 mA max)
Audio Input	6·35 mm (¼") mono jack | 2 MΩ impedance +18 dBu nominal maximum input level
Audio Output	6·35 mm (¼") mono jack | 1 kΩ impedance +21 dBu nominal maximum output level
Audio Bandwidth (−3 dB)	17 Hz – 121 kHz (0 dB gain) 17 Hz – 22 kHz (40 dB gain) 17 Hz – 35 kHz (40 dB attenuation)
MIDI Input	Standard 5-pin MIDI DIN
MIDI Output	Standard 5-pin MIDI DIN | Pin 1 and pin 3 allow external footswitch connection
External Footswitches	Two footswitches can be connected to MIDI out, used as up and down buttons
Computer	Standard Type B USB socket
Effect	
Signal switching	Transparent-True-Bypass | Buffered Bypass (selectable)
Presets	40 Factory | 100 user
LFO types	Sine, square, triangle, saw-up, saw-down, trapezoid, random, classic
Control methods	Pedal, envelope, MIDI, none
Tuner	
Tuner note range	A0 – A6
Reference Frequency	420 Hz – 460 Hz
Tuner accuracy	0·1 cent
Computer	
Drivers	Class-compliant HID/USB Audio (built into operating system)
Computer (Editor)	Windows XP, Vista, 7 and above Apple OSX 10·5 and above (Intel Mac only)
Computer (MIDI)	Windows XP, Vista, 7 and above Apple OSX 10·3·9 and above