suonobuono lazer– user manual

Foreword

Suonobuono is my attempt to share innovative products with other music enthusiasts. Managing all aspects of this company, from early design to products manufacturing, from logistics to marketing, has taken me great deals of time and energy. Musicians like you, who care about creativity and support independent realities make it all worth it, THANK YOU!
I hope that you will enjoy your new Lazer and really recommend reading this short manual to get the most out of it.
Stefano Sorrentino, founder, Suonobuono AB

Cleaning and maintenance

It is recommended to cover Lazer when it is not used, so that dust does not deposit on the lens.
If the case becomes dirty, wipe it with a clean, dry cloth. Do not use liquid cleaners such as benzene or thinner, or cleaning compounds or flammable polishes.
Be particularly careful not to scratch the laser optics. You may use a dry soft cotton bud to wipe away dust from the laser lens, using great care to not scratch the lens and to not apply force to the optics.

Product Warranty

The warranty covers all defects in material and workmanship for a period of two years from the date of original purchase. During this time, Suonobuono AB will repair or replace the product without charge for materials or labor, provided the product was first inspected and found faulty by Suonobuono. You must first contact Suonobuono AB by email. Products that were mailed without prior agreement cannot be exchanged or repaired free of charge. The unit must be insured and sent prepared in its original package. Please include a detailed description of the defect. Suonobuono AB reserves the right to upgrade the unit if necessary. This warranty does not cover defects due to abuse, operation under other than specified conditions, or repair by unauthorized persons. The warranty covers only those malfunctions caused by material or workmanship defects that occur during normal operation. Units that have been opened, modified or exposed to unusual stress and conditions are not covered by the warranty.

If you have any questions about your Suonobuono product, feel free to send an email to info (at) suonobuono.net

Precautions

Location: Using the unit in the following locations can result in a malfunction
- In direct sunlight
- Locations of extreme temperature or humidity
- Excessively dusty or dirty locations
- Locations of excessive vibration

Power supply: Lazer is powered from the USB connector. Connect a USB 2.0 compliant power bank or USB host. Do not connect any power source that is not a USB 2.0 compliant power source. Using a different power supply than the recommended one may result in device damage and could cause a breakdown, fire, or electrical shock.
Handling: To avoid breakage, do not apply excessive force to the switches or controls.
Care: Do not open or modify this product, since doing so may result in safety hazards and will automatically invalidate the product guarantee. Installing firmware not officially released by Suonobuono AB on this product will also void the product guarantee and may result in safety hazards.
Keeping foreign matter out of your equipment: Never set any container with liquid in it near this equipment. If liquid gets into the equipment, it could cause a breakdown, fire, or electrical shock. Be careful not to let metal objects get into the equipment. If something does slip into the equipment, unplug the power supply immediately and contact Suonobuono for assistance.
Headphones volume: the PHONES output can deliver very loud sound level on headphones, which may damage hearing. Always set a low Phones Volume level on Lazer before connecting headphones and before wearing them.
Keep this manual: After reading this manual, please keep it for later reference.

Laser safety considerations

This device contains a laser emitter and corresponding drive circuitry. The laser output is designed to remain within Class 1 laser safety limits under all reasonably foreseeable conditions including single faults in compliance with IEC 60825-1:2014 (third edition).
The laser output remains within Class 1 limits as long as the recommended device settings are used and the operating conditions specified in this manual are respected.
The laser output power must not be increased by any means and no optics should be used with the intention of focusing the laser beam.
Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

CLASS 1 LASER PRODUCT

The laser emitter included in this device uses invisible light. Avoid looking directly into the emitter during operation and absolutely avoid using any optics that may focus the laser beam into the eye.
Unauthorized modifications of the firmware, electronics, optics or enclosure of the device may alter the level or duration of laser emissions and generate a safety hazard. Only firmware updates that are officially released by Suonobuono should be used, and no modification of any hardware part of the device should be attempted by anyone not explicitly authorized by Suonobuono.
Suonobuono takes no responsibility for any damage deriving from not following the safety recommendations provided in this manual, or from any modifications to the device.

Declaration of conformity

Important notice: DO NOT MODIFY THE UNIT!
USA:
This product, when installed as indicate in the instructions contained in this manual, meets FCC requirement. Modifications not expressly approved by Suonobuono AB may avoid your authority, granted by the FCC, to use the product.
IMPORTANT: When connecting this product to accessories and/or another product, use only high quality shielded cables. Cable(s) supplied with this product must be used. Follow all installation instructions. Failure to follow instructions could void your FFC authorization to use this product in the USA.
NOTE: This product has been tested and found to comply with the limit for a Class B Digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide a reasonable protection against harmful interference in a residential environment. This equipment generates, uses and radiates radio frequency energy and, if not installed and used according to the instructions found in the user manual, may cause interferences harmful to the operation to other electronic devices. Compliance with FCC regulations does not guarantee that interferences will not occur in all the installations. If this product is found to be the source of interferences, which can be determined by turning the unit "OFF" and "ON", please try to eliminate the problem by using one of the following measures:
- Relocate either this product or the device that is affected by the interference.
- Use power outlets that are on different branch (circuit breaker or fuse) circuits or install AC line filter(s).
- In the case of radio or TV interferences, relocate/ reorient the antenna. If the antenna lead-in is 300 ohm ribbon lead, change the lead-in to coaxial cable.
- If these corrective measures do not bring any satisfied results, please contact Suonobuono AB.

The above statements apply ONLY to those products distributed in the USA.

EUROPE
This product complies with the requirements of European Directive 89/336/EEC This product may not work correctly by the influence of electro-static discharge; if it happens, simply restart the product.

Disposal

You must dispose the product in the correct manner to avoid harm to human health or damage to the environment. Contact your local administrative body for details on the correct disposal method.
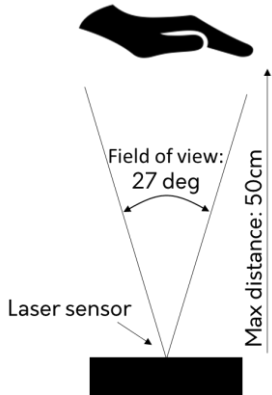
Overview

Lazer measures the distance between your hand and its sensor, and it transforms it into analog (gate/cv), MIDI (DIN and USB) and audio signals. The blue led intensity is proportional to the controlled parameter and it blinks when your hand is beyond the configured **Distance range.** The red led turns on if your hand is within the configured **Distance range**.

For best results, use a wide, flat object, such as your hand palm, and keep it parallel to Lazer, vertically aligned with the sensor. Accuracy degrades with strong ambient light (e.g., in sunlight) and with larger distance. To improve accuracy, you may attach reflex material or reflexive tape to your palm or your finger. For normal indoor use, this should not be necessary.

Field of view: 27 deg

Max distance: 50cm

Laser sensor

The measured distance can be mapped to different types of output:

- **MIDI control change or pitch bend**: map distance to a MIDI message. For example, you can create a slide effect with pitch bend or you can control any MIDI control change-mapped parameter on a synth or effect.
- **MIDI notes**: trigger different notes (with optional pitch bend) on a MIDI instrument
- **MIDI start/stop and MIDI/analog tempo**: control a sequencer with your hand. Change the tempo based on distance.
- **Analog cv/gate**: control cv-controllable parameters on an analog synthesizer. The gate can be used to trigger notes, drums, envelopes and events every time the hand is detected
- **Audio out**: this lo-fi oscillator is primarily intended to provide a reference pitch, but it can even be used as a Theremin-style oscillator or for fx.

Connections

- The **USB** port should be connected to a suitable USB 2.0-compliant power source such as a power bank, a phone charger or a computer. Lazer transmits the same MIDI messages over its MIDI output and its USB port. If you don't need to read MIDI from the USB port, I recommend powering Lazer from a dedicated phone charger or power bank, to avoid potential ground loop noise.
- The **CV** and **GATE** outputs deliver analog signals (0-5V) for controlling analog and modular synthesizers using mono 3.15mm jack cables (not provided).
- The **PHONES** out delivers an audio signal whose MIDI pitch matches the controlled parameter MIDI value. For example, MIDI value 48 corresponds to C3 and 60 to C4. At high volume, the PHONES out can sound very loud on headphones! *Always set a very low volume level on Lazer, before connecting your headphones and then wearing them.*
- The MIDI output needs to be connected to the provided TRS to DIN MIDI cable, and from there to a device MIDI IN.

Menu navigation

The menu shows two rows:
- The first row is the name of the selected menu item
- The second row is the value for the selected menu item

The selected row is highlighted on the display. To switch row, briefly push the +/- buttons together. Use the +/- buttons to adjust values. To scroll values faster, long press + or -.

To **load a preset**: select the Preset menu item and switch row. Select the desired preset, then press + for 3 seconds. After releasing, the leds will blink to indicate that the preset has been loaded.

To **save a preset**, long press - for 3 seconds while the target preset is highlighted. Only user presets may be overwritten.

To **turn Lazer off**, long press + and – simultaneously for 3 seconds. Lazer shuts down automatically also when the USB host sends a power off USB command.

To **turn Lazer on** again, press any button. Lazer restarts with the same settings as when it was turned off regularly.

Presets list and using presets

Lazer supports 10 presets, out of which 5 are read-only and factory-delivered, and the remaining ones can be overwritten by the user. The factory presets are intended as templates for common configurations:

- **Param mod up**: send MIDI control change 74 (often associated to cutoff filter) values in range 0-127 and CV in range 0-5V, so that values increase with distance. When the hand is removed, the value corresponding to maximum distance is sent.
- **Param mod down**: same as Param mod up, but values decrease with distance.
- **Pitch bend**: send negative pitch bend values and lower CV when hand is lowered.
- **1 octave Therem**: trigger notes over one octave range with continuous pitch.
- **Seq.Ctrl+cc74**: send start/stop sequencer control MIDI messages, send MIDI clock and send MIDI control change 74.

Parameters and customization

Presets are just a starting point. To get the most out of your Lazer, you should get familiar with all its parameters, it only takes some minutes!

- **2-MIDI/An.Ctrl**: you can send any control change (CC) 0-119, Notes On/Off and Pitch bend. You should select the control change that is associated to the desired parameter on the controlled instrument. For example, CC 74 is often associated to filter cutoff.
- **3-Direction**: decide if the controlled MIDI value and CV should increase or decrease with hand distance.
- **4-MIDI min value**: this is the lowest note or CC value that will be sent
- **5-MIDI max value**: this is the highest note or CC value that will be sent
- **6-Quant level**: this is the level of quantization (0-5) of the MIDI Notes and analog cv output. When set to 0, no quantization is applied and Notes smoothly glide from one to the next one. When set to 10, note pitches are approximated to the nearest semitone. Intermediate values give a "soft" auto-tune.
  - **Important: the MIDI instrument pitch bend range must be set to +/-2 semitones, otherwise the notes will not glide smoothly.**
- **7-Accuracy**: control the trade-off between sensor speed and accuracy. Tips:
  - For triggering drum sounds, select Fast
  - For precisely controlling parameters over a wide range, select Accurate
  - Balanced should be a good compromise in most other situations
- **8-Tempo**: sets the tempo sent by Lazer when **2-MIDI/An.Ctrl is in Seq. mode.**
- **9-MIDI channel**: the channel used for all MIDI transmissions. The receiving device must listen to the same channel.
- **10-Phones volume**: the volume of the PHONES out. This can be loud, so always start from a low value!
  - Tip: if you are using the PHONES output to feed a line input, it is recommended to use a high Phones volume level to maximize audio quality
- **11-Tune**: adjust tuning for the internal audio oscillator
- **12-Dist. Range**: Maximum distance at which the control signals are generated. The full range of values between **Midi min value** and **MIDI max value** happens between 0 and **Dist. Range**.

Some usage examples

Analog/MIDI/USB parameter and pitch bend control
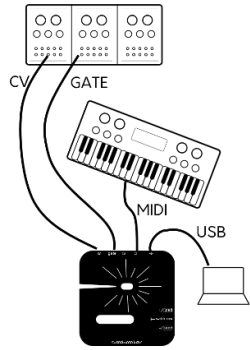
Functionality:
-Adjust analog/MIDI parameters or pitch bend

Connections:
-MIDI out to the instrument or effect MIDI input, using the included TRS to DIN adapter
-USB port to a computer running a DAW
-Analog CV/GATE to analog inputs

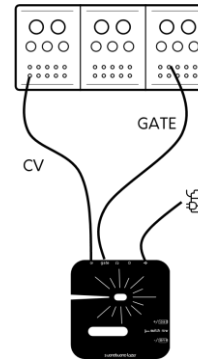Tip! Powering with a phone charger or power bank prevents ground loop noise

Important parameters:
-**Direction**: decide if the parameter should increase or decrease with hand distance
-**Accuracy**: prioritize between latency or distance accuracy
-**MIDI/analog ctrl**: choose between a target Control Change (CC) [1-119] and Pitchbend
-**MIDI min/max value**: adjust the range of MIDI CC values
-**MIDI channel**
-**Dist. range**

Reference presets:
-**Param mod up, Param mod down, Pitch bend**

Analog instruments control

Functionality:
-Adjust parameters
-Trigger events whenever your hand is detected

Connections:
-CV and/or GATE to analog inputs on a modular synthesizer

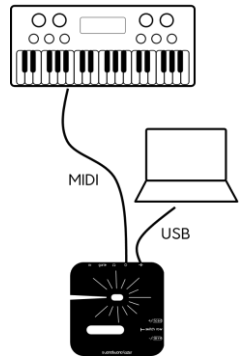Tip! Powering with a phone charger or power bank prevents ground loop noise

Important parameters:
-**Direction**: decide if the CV should increase or decrease with hand distance
-**Accuracy**: prioritize between latency or distance accuracy
-**Dist. range**

Reference presets:
-**Param mod up, Param mod down**

MIDI and USB-MIDI parameter/pitch bend control

Functionality:
-Adjust MIDI parameters or pitch bend

Connections:
-MIDI out to the instrument or effect MIDI input, using the included TRS to DIN adapter
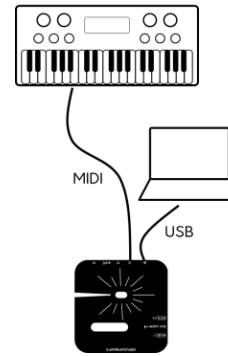-USB port to a computer running a DAW

Important parameters:
-**Direction**: decide if the parameter should increase or decrease with hand distance
-**Accuracy**: prioritize between latency or distance accuracy
-**MIDI/analog ctrl**: choose between a target Control Change (CC) [1-119] and Pitchbend
-**MIDI min/max value**: adjust the range of MIDI CC values
-**MIDI channel**
-**Dist. range**

Reference presets:
-**Param mod up, Param mod down, Pitch bend**

Continuous pitch (Theremin-like)

Functionality:
-Trigger notes with continuous pitch variations

Connections:
-MIDI, USB, CV/GATE, whatever your synth requires

Important! The synth must be set to Monophonic or Legato with pitch bend range +/-2semitones
Tip 1: Limit the notes range (**MIDI min/max value**) to 1 or 2 octaves, e.g., from 48 to 60
Tip 2: Use a flat envelope sound (no attack, max sustain) to get a sound similar to a Theremin
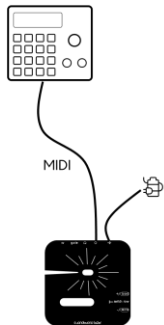
Important parameters:
-**Direction**: decide if the parameter should increase or decrease with hand distance
-**Accuracy**: "Accurate" recommended
-**MIDI/analog ctrl**: Note+Pitchbend
-**MIDI min/max value**: adjust the notes range (MIDI notes number)
-**Quant level:** optional semitones quantization
-**MIDI channel**
-**Dist. range**

Reference presets:
-**1 octave Therem**

Trigger a sequencer/drum machine with MIDI

Functionality:
-Start/stop the sequencer and control a MIDI parameter
-Adjust tempo

Connections:
-MIDI

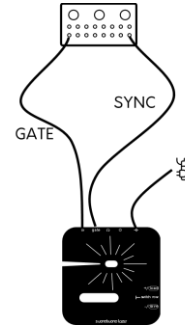Important! The sequencer/drum machine must follow external MIDI sync and start/stop events

Important parameters:
-**Accuracy**: "Fast" recommended
-**MIDI/analog ctrl** : Those starting with "Seq"
-**Tempo:** base tempo
-**MIDI min/max value**: adjust the tempo variation range (only used in Seq+an.ck+tempo mode)
-**MIDI channel**
-**Dist. range**

Reference presets:
-**Seq.ctrl+cc74**

Control an analog sequencer

Functionality:
-Start/stop the sequencer Adjust tempo

Connections:
-CV/GATE

Important! Analog sync is transmitted from the GATE port.

The CV port acts as a binary gate.

Important parameters:
-**Accuracy**: "Fast" recommended
-**MIDI/analog ctrl**: Those starting with "Seq+an.ck" or "Seq+an.ck+tempo"
-**Tempo:** base tempo
-**MIDI min/max value**: adjust the tempo variation range (only used in Seq+an.ck+tempo mode)
-**Dist. range**