DONNER ESSENTIAL L1 USER MANUAL_EN_V0.9

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1. INTRODUCTION

ESSENTIAL L1 is an analog monophonic synthesizer inspired by the legendary synthesizer back in the 80s. While providing that familiar warm sound, the characteristic modernization further explores the possibilities in sound and usage scenarios.

2. POWER IT UP

Before powering up, make sure to set the ON/OFF switch on the rear panel to OFF and turn the VOLUME knob counterclockwise to the end.

Always use the power adaptor that comes with the package. Connect one end to the DC socket on the rear panel. Connect the other end to the reliable AC source.

Turn on the ESSENTIAL L1 by switching the ON/OFF switch to ON.

3. MAKE IT SING

Connect a pair of headphones / a monitor to the PHONES / MAIN OUT socket.

Adjust all the knobs and faders to the position illustrated above.

Press the UP (7A) & DOWN (8A) arrow keys to access KBD mode (the indicated LED lights up).

Pressing key 1B~16B while turning the VOLUME knob clockwise to obtain the proper output volume.

4. CONNECTIONS

4.1 FRONT

SYNC IN & OUT: Receive and send analog clock signal.

CV OUT: Send out standard 1V/OCT control voltage.

GATE OUT: Send GATE signal to external gear.

EXT. IN: Recieve external audio signal. The signal will be sent to the low-pass filter for further processing.

PHONES: Connect your headphones here.

4.2 REAR

ON/OFF: Switch for the power.

DC: Connect the power supply here. Please use the power supply that comes with the product.

USB: Connect your computer with this socket to use DONNER CONTROL software and transmit USB MIDI data.

MIDI IN: Connect other MIDI output gears, such as the MIDI keyboard, sequencer, etc. This 3.5mm TRS socket follows the TYPE-A standard. To connect with other MIDI gears, which also use a 3.5mm TYPE-A TRS socket, a single 3.5mm TRS cable can nail the job. For other gears using a 5-pin MIDI DIN socket, a 3.5mm TYPE-A TRS to 5-pin MIDI DIN dongle (sold separately) is needed.

MIDI OUT: Connect other MIDI input devices, such as other synthesizers.

**HOLD**: Connect a sustain pedal. This socket supports the pedal with a 6.35mm TS jack.
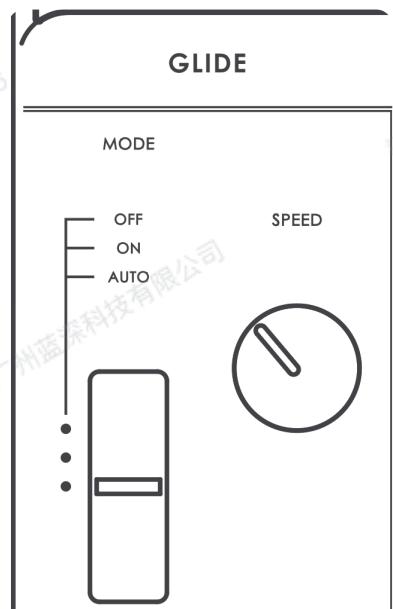
MAIN OUT: Output master audio signal. Connect other devices, such as active monitor, audio interface, etc., using a 6.35mm TS audio cable.

EXT. IN: Recieve external audio signal. The signal will be sent to the low-pass filter for further processing. Using the EXT. IN located on the front panel will bypass this socket.

5. [pending...]SIGNAL DIAGRAM

6. CONTROL PANEL
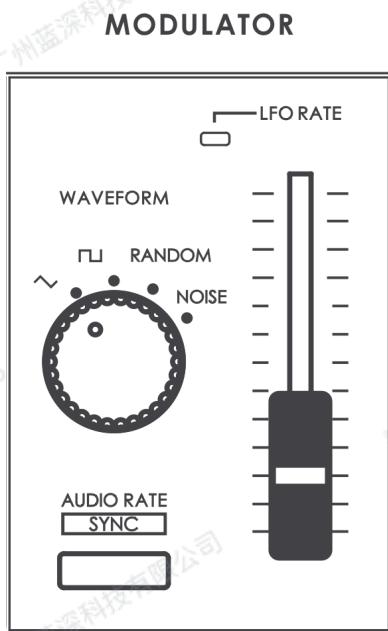
6.1 GLIDE

MODE: Switch between different glide trigger modes.

SPEED: Set the speed of gliding between notes.

6.2 MODULATOR
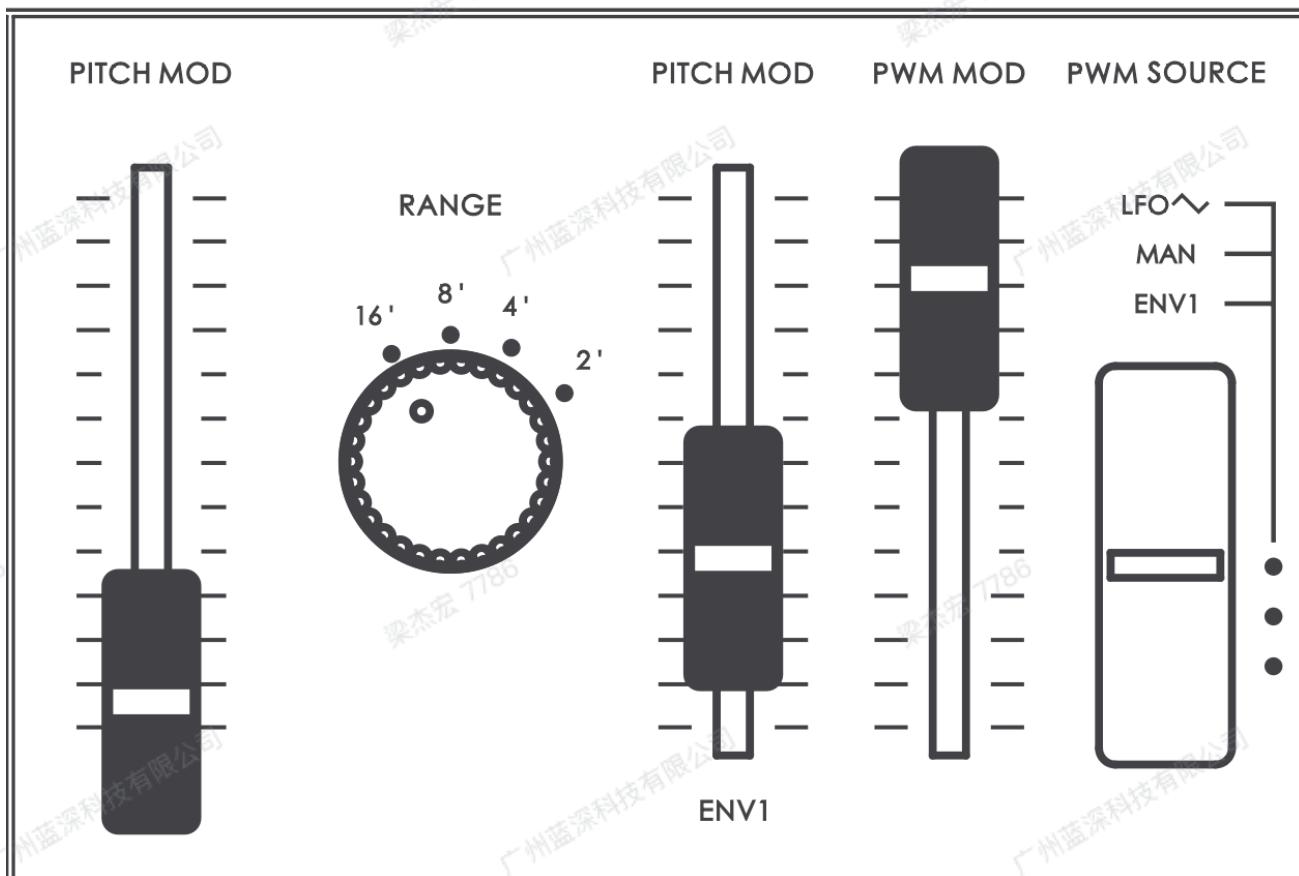
WAVEFORM: Switch the waveform of the Low Frequency Oscillator, LFO (Triangle / Square / Random / Noise).

LFO RATE: Set the frequency of the LFO.

AUDIO RATE (SYNC): Extend the LFO frequency to the audio range when this button lights up in green. Press SHIFT+SYNC to activate synchronization with the clock signal.

6.3 VCO

**PITCH MOD (LFO):** Adjust the depth of the LFO modulating the PITCH of VCO.

**RANGE:** Switch the octave of the oscillator.

PITCH MOD (ENV1): Adjust the depth of the ENV1 modulating the PITCH of the VCO.
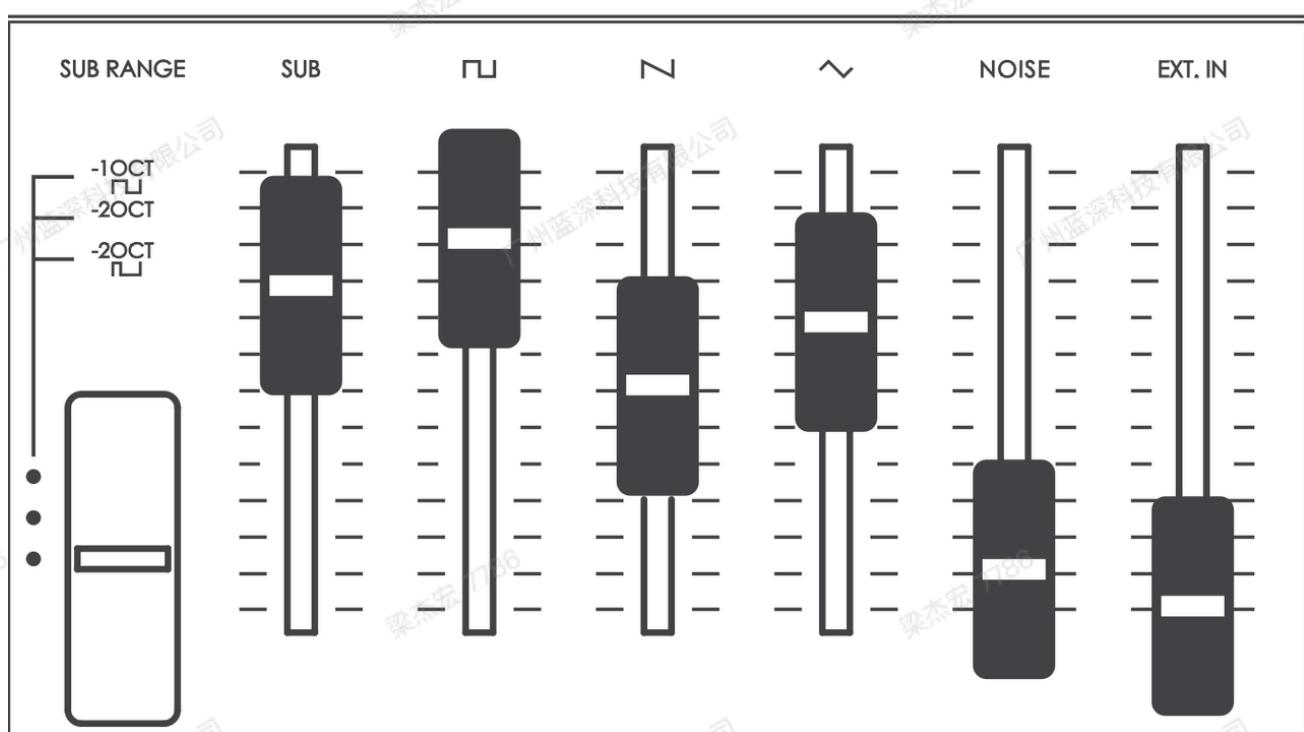
PWM MOD: Adjust the pulse width of the pulse waveform (when PWM SOURCE = MAN). Adjust the depth of the LFO / ENV1 modulating the pulse waveform's PULSE WIDTH (when PWM SOURCE = LFO / ENV1).

PWM SOURCE: Set the modulation source of pulse width modulation. LFO = using the LFO (triangle waveform) to modulate the pulse width. MAN = control the pulse width using the PWM MOD fader directly. ENV1 = using the ENV1 to modulate the pulse width.

6.4 SOURCE MIXER

SUB RANGE: Switch the octave and the waveform of SUB.

SUB: Adjust the volume of the SUB.

PULSE: Adjust the volume of the PULSE.

SAW: Adjust the volume of the SAW.
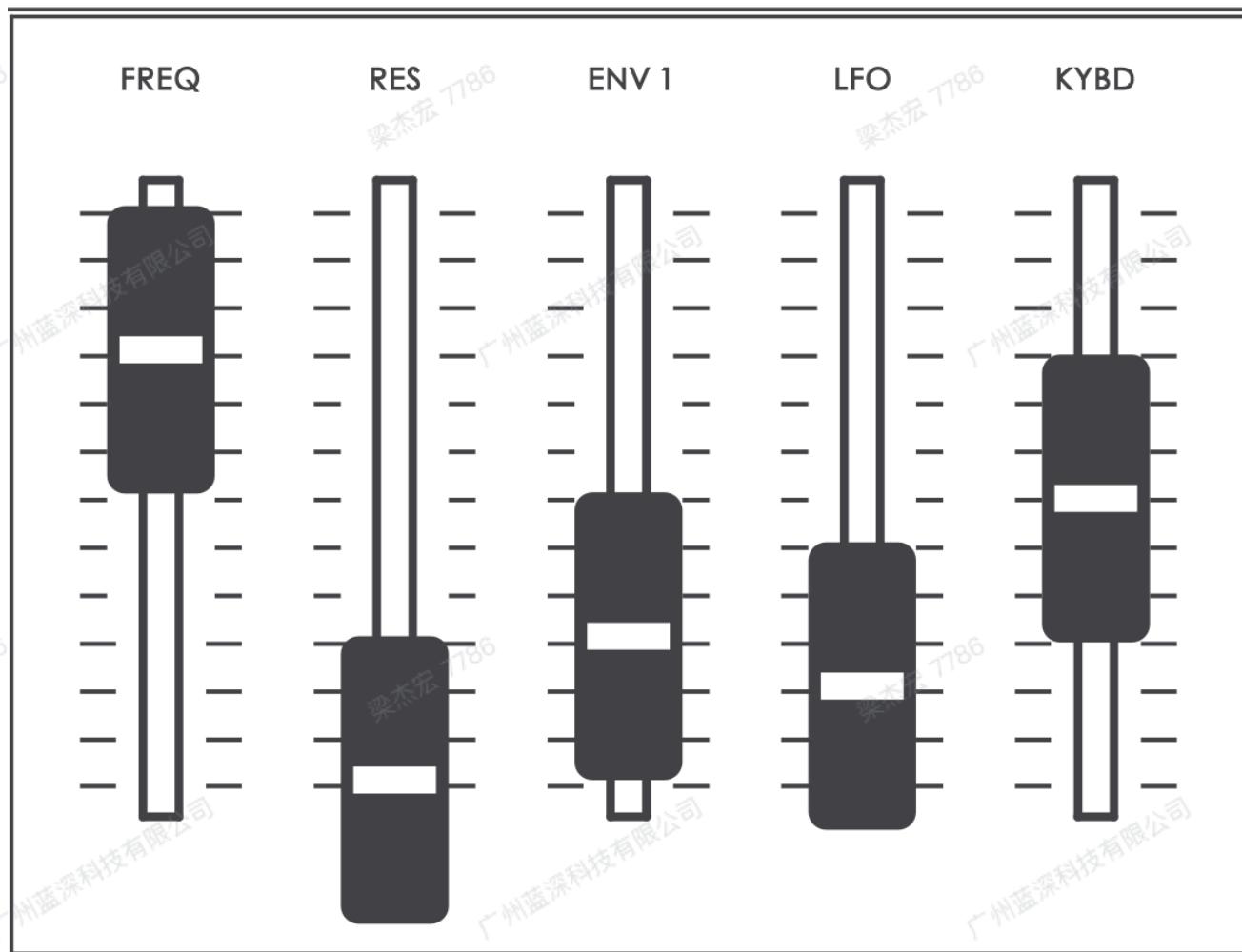
TRIANGLE: Adjust the volume of the TRIANGLE.

NOISE: Adjust the volume of the NOISE.

EXT.IN: Adjust the volume of the external audio input signal.

6.5 VCF

VCF

FREQ   RES   ENV 1   LFO   KYBD

FREQ: Adjust the cutoff frequency of the low-pass filter. The higher the parameter set, the brighter the sound you get.
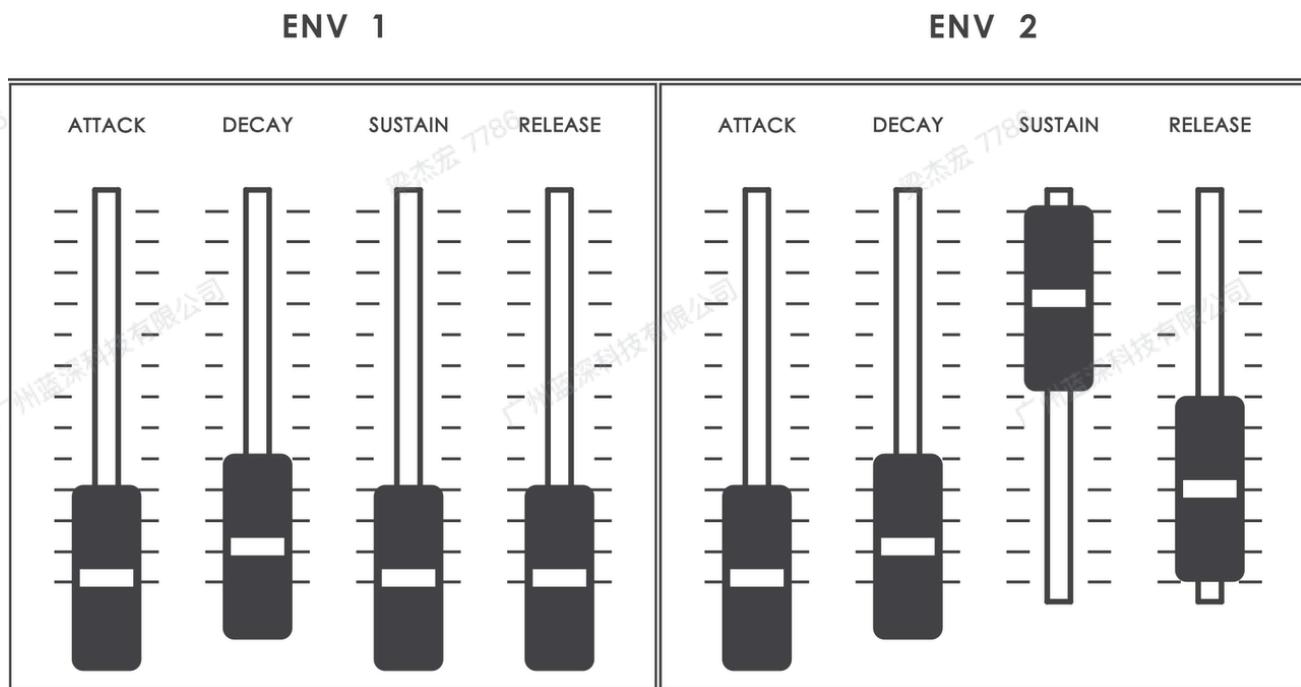
RES: Adjust the resonance volume of the filter.

ENV1: Control the depth of Envelope 1 modulating the filter's cutoff frequency.

LFO: Control the depth of LFO modulating the filter's cutoff frequency.

KYBD: Control the depth of the keyboard pitch signal modulating the filter's cutoff frequency.

6.6 ENV1 & ENV2

ATTACK: Adjust the attack time where the envelope signal goes from 0 to the highest point.

DECAY: Adjust the decay time where the envelope signal falls from the highest point to the sustain level.

SUSTAIN: Adjust the sustain level. After the attack and decay stages, the envelope will stay in the sustain phase if the key keeps pressing down.

RELEASE: Adjust the release time where the envelope signal falls from the sustain level to 0 after the key is released.
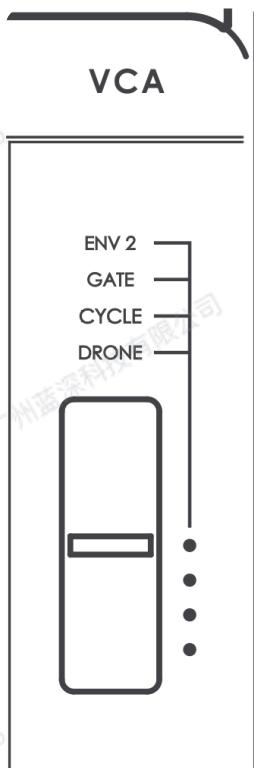
6.6.1 ENV MENU

Press the MENU button and select ENV to access the ENV MENU. Parameters under this menu are as follows:

- **ENV MERGE**: When this option is set to ON, the ENV1 parameters follow those of ENV2, making the ESSENTIAL L1 behave more like the classic model, which has only a single envelope.

- **ENV1 RETRIG**: When this option is set to ON, the ENV1 reacts to the trigger signal. In this case, the envelope will re-trigger every time a new key is pressed. When set to OFF, ENV1 reacts to the gate signal, re-triggering only when a key is pressed after all previous keys have been released.

- **ENV1 VEL**: This switch defines whether the velocity message affects the envelope output.

- **ENV2 RETRIG**: When this option is set to ON, the ENV2 reacts to the trigger signal. In this case, the envelope will re-trigger every time a new key is pressed. When set to OFF, ENV2 reacts to the gate signal, re-triggering only when a key is pressed after all previous keys have been released.

- **ENV2 VEL**: This switch defines whether the velocity message affects the envelope output.

- **LFO RETRIG**: When set to ON, the LFO reacts to the trigger signal. In this case, the LFO will re-trigger every time a new key is pressed. When set to OFF, LFO reacts to the gate signal, re-triggering only when a key is pressed after all previous keys have been released. When set to FREE, the LFO keeps running without being affected by any trigger or gate signal.

6.7 VCA
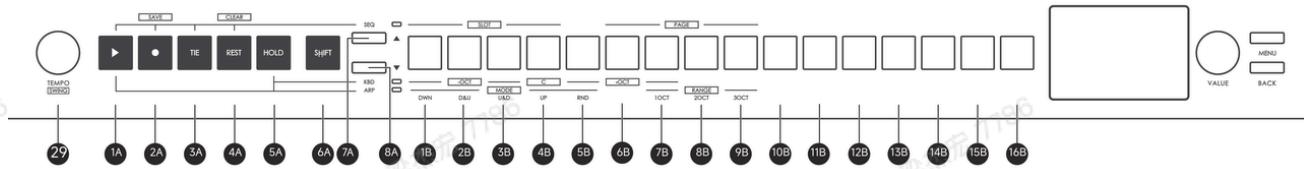
MODE: Select the modulation source of the Voltage Controlled Amplifier (VCA). Switch between ENV2 / GATE / CYCLE / DRONE. CYCLE triggers the ENV2 with the LFO, and DRONE bypasses the VCA, which is useful when creating ambient sound.

VOLUME: Control the master volume. Both MAIN OUT and PHONES are affected by this knob.

6.8 SEQ | KBD | ARP

According to the function selected, the buttons in this section (1A ~ 8A, 1B ~ 16B) control the internal step sequencer and arpeggiator and act as a built-in keyboard when no external keyboard is connected. Please refer to the sections below for more detailed instructions.
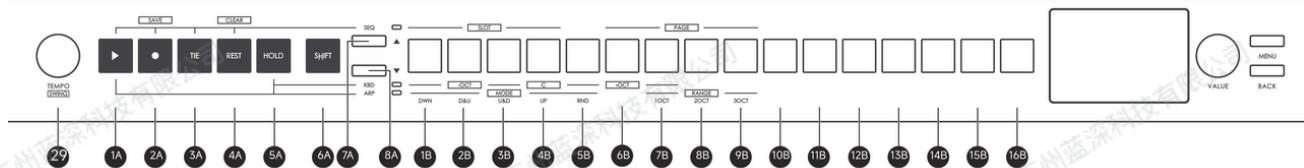
6.9 VALUE | MENU | BACK

Controls located in this area are used for menu navigation and parameter setting. Please refer to the sections below for more detailed instructions.

7. KBD MODE

The KBD mode on the ESSENTIAL L1 converts buttons 1B through 16B into a basic keyboard. You can use it to play the internal synthesis engine, edit the step sequencer, and trigger the onboard arpeggiator.
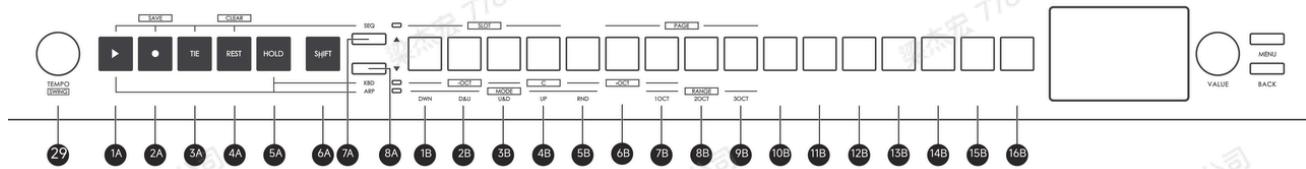
Press the up (7A) and down (8A) arrow buttons to switch to the KBD mode (KBD indicator lights up). The 16 buttons (1B ~ 16B) on the right act as a basic keyboard. Buttons with the lights on represent white keys, while others act as black keys. Button 4B is the C key, which is indicated by the label "C" underneath.

When you press and hold the SHIFT button, buttons 1B ~ 7B are used to switch the octave of the internal keyboard. With octave transpose, you can access all 88 keys on the piano.

8. SEQUENCER

ESSENTIAL L1 features a 64-step sequencer with song mode support. There are four sequence slots within one song. Each slot can load one of the 128 onboard sequences. You can store up to 32 songs on the ESSENTIAL L1.

8.1 ENTER SEQ MODE

Press the up (7A) and down (8A) arrow buttons til the SEQ light up to access the step sequencer.

8.2 SONG MENU

Press the MENU button and select SONG to access the song menu. Parameters under this menu are as follows:

- **LOAD**: Load one of the 32 songs in the ESSENTIAL L1.
- **SAVE**: Save the current loaded song to one of the 32 locations. This will also save all of the loaded sequence(s). You can also rename the song in the naming window.
- **PLAYMODE**: When set to MANUAL, the sequencer continues playing the current slot until you manually switch to a different slot. When set to AUTO, the sequencer chains all available slots and automatically switches to the next slot. By setting it to AUTO, you can access up to a 256-step sequence.
- **TEMPO SYNC**: When it is OFF, each loaded sequence plays at its original BPM. When set to ON, all sequences run under the global BPM defined by the GLOB BPM.
- **GLOB BPM**: This BPM only works when TEMPO SYNC is set to ON.

8.3 SWITCH BETWEEN SLOTS

In SEQ MODE, press SHIFT + 1B / 2B / 3B / 4B to access SLOT A / B / C / D. When the sequencer is playing, it will wait for the previous slot to finish playing before switching to the new slot. It won't switch to the deactivated slot or the slot that loads an empty sequence while the sequencer is playing.

8.4 LOAD A SEQUENCE

In SEQ mode, press the VALUE encoder to open the sequence browser. You can browse these 128 sequences by rotating the encoder, and load one of them by pressing down the encoder again. You can also press the BACK button to exit the sequence browser.

You can deactivate the SLOT by selecting the OFF option in the sequence browser. SLOT A will always be active, so there is no OFF option when you enter the sequence browser from SLOT A.

8.5 PLAY THE SEQUENCE

Press the PLAY (1A) button to play the loaded sequence. Press the button again to stop the sequence. The PLAY (1A) button light indicates the sequencer status. If you load an empty sequence that only contains a REST on the first step, it will not play the sequence when you press the PLAY button.

8.6 EDIT THE SEQUENCE

When the sequence is not playing, press the REC (2A) button to edit the sequence.

8.6.1 Step Select

In the SEQ EDIT, each of the buttons from 1B to 16B represents a step. You can press one of the buttons to select the specific step. If the sequence contains more than 16 active steps, you can press SHIFT + 6B / 7B / 8B / 9B to switch the sequence page.

You can also go through the sequence by rotating the VALUE encoder.

8.6.2 Note Input

There are three ways to input the notes.

1. **KBD MODE**: Using the internal KBD mode to input notes to the sequence. While in the SEQ EDIT, press the down (8A) button to access the KBD mode (both SEQ and KBD indicators light up).

2. **KB-32M / EXTERNAL MIDI**: If you connect the KB-32M or other external MIDI devices, you can use them to input notes just like the onboard KBD mode.

3. **VALUE ENCODER**:

    You can also use the VALUE encoder to edit the note. This is helpful when you need to edit a specific step.

    Rotate the encoder to select the step you want to edit.

    Press the encoder to enter step edit mode. You should notice that there is an underline below the note information, indicating you are editing the note of the selected step.

    Rotate the encoder to edit the step note. Holding SHIFT and rotating the encoder can edit the step velocity.

    Press the encoder again to confirm the edit and advance to the next step.

8.6.3 Note Tie

Press the TIE (3A) button to connect the current step to the previous one, allowing for a longer note. If the selected step is empty, it will follow the previous step setting to double the note length. If the chosen step has its note setting and differs from the previous step, you will achieve the legato effect. The gliding speed is controlled by the SPEED knob located in the GLIDE section.

8.6.4 Note Rest

Press the REST (4A) button to set the current step to rest.

8.6.5 Note Clear
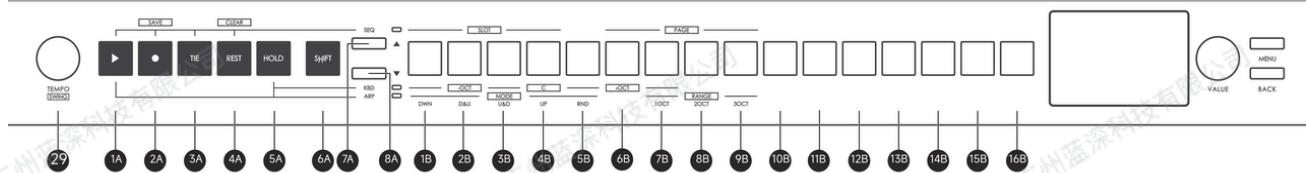
Press SHIFT + REST (4A) once to delete the last step of the sequence. Hold SHIFT + REST (4A) for 3 seconds to clear the whole sequence.

8.7 SAVE THE SEQUENCE

After editing the sequence, press SHIFT + REC (2A) to save the sequence. You can choose where to save and edit the sequence name using the VALUE encoder.

9. ARPEGGIATOR

The ESSENTIAL L1 features a 5-mode arpeggiator with the capability of trigger edit. With three octave range options, it provides up to 15 kinds of patterns.

9.1 ENTER ARP MODE

Press the up (7A) and down (8A) arrow buttons til the ARP light up to access the step sequencer.

9.2 PLAY THE ARP

When in ARP mode, any MIDI Note message will trigger the arpeggiator. You can play it with the KB-32M and other external MIDI devices that send MIDI notes. However, it is also possible to play the arpeggiator using the KBD mode.

To trigger the arpeggiator with KBD mode, press the PLAY (1A) button to activate the arpeggiator first. Then press the up (7A) arrow button to access the KBD mode, and you can play the arpeggiator with buttons 1B through 16B.

9.3 SELECT ARP MODE AND OCT RANGE

When in ARP mode, holding the SHIFT button will convert buttons 1B through 5B to the mode select for the arpeggiator, and turn buttons 7B through 9B into the octave range select. The current mode and range are displayed on the OLED screen. The following is the description of the arpeggiator mode:

1. **DWN**: Arpeggiato from high to low.
2. **D&U**: Short for "down and up", where the arpeggiato goes from high to low, then goes back to the high note.
3. **U&D**: Short for "up and down", where the arpeggiato goes from low to high, then goes back to the low note.
4. **UP**: Arpeggiato from low to high.
5. **RND**: Abbreviation for "random". Arpeggiato in a random manner.

9.4 TRIGGER EDIT

While in ARP mode, each of the buttons from 1B to 16B represents a 1/16 note trigger. You can activate and deactivate the triggers to obtain a new arpeggiato even with the same notes, mode, and range. The button light indicates the trigger status, where an active trigger has the light on and an inactive trigger does not.

10. GLOBAL MENU

Press the MENU button, and select the GLOBAL option to access the GLOBAL MENU. Here you can find all the global settings for the ESSENTIAL L1.

10.1 CALIBRATE

Run the calibration process manually with this option. It's recommended to warm up the synthesizer for 30 minutes before the calibration.

10.2 TUNING

The ESSENTIAL L1 offers two tuning options, A442 and A440. Switching this parameter will automatically trigger the calibration process.

10.3 FINE PITCH

Adjust this parameter to fine-tune the ESSENTIAL L1 from -50 cents to +50 cents.

10.4 LOCAL SW

The Local Control Switch is helpful when you encounter a MIDI loopback issue. When the local control switch is turned ON, both the KB-32M and the internal keyboard send MIDI messages to the synthesis engine. When the local control is set to OFF, the KB-32M and the internal keyboard will bypass the synthesis engine and only send MIDI messages to the external devices through the USB and MIDI OUT ports.

10.5 PB RANGE

The Pitch Bend Range defines how the ESSENTIAL L1's VCO reacts to the MIDI Pitch Bend Change message. You can select from 2ST, 7ST, 12ST, and even 24ST. When set to 2ST, the pitch bend controls the VCO pitch in a range of ±2 semitones.

10.6 KBD MODE

The Keyboard Mode switch determines whether to skip the KBD or not when switching between SEQ, KBD, and ARP using the up (7A) and down (8A) arrow buttons.

When connected with the KB-32M, the ESSENTIAL L1 will skip the KBD mode, no matter what value is set for this parameter.

10.7 KBD VEL

The Keyboard Velocity is used to set the velocity value when the internal KBD mode is used. You can set it between 1 and 127.

10.8 KEY PRIO

The Key Priority sets the rule that which key the synthesis engine should produce when multiple keys are pressed down.

- **LAST**: The engine always responds to the last key pressed.
- **FIRST**: The engine reacts to the first key it receives.
- **LOW**: The engine always reacts to the lowest note.
- **HIGH**: The engine reacts to the highest note it receives.

10.9 PEDAL POL

When you encounter a reversed pedal, switching this parameter will solve the problem.

10.10 MIDI SECTION

This section outlines how the ESSENTIAL L1 handles MIDI messages.

10.10.1 PORT

Use this parameter to decide the MIDI port. By default, it is BOTH, which means the ESSENTIAL L1 will react to MIDI messages from both the USB and MIDI ports.

If you want the ESSENTIAL L1 to only send and receive MIDI messages from the USB port, set this parameter to USB. If you wish to use the 3.5mm MIDI ports as the only ports that send and receive MIDI messages, then choose DIN.

10.10.2 IN CH

Use this parameter to set the MIDI IN channel. When set to OMNI, the ESSENTIAL L1 receives all 16 channels of MIDI messages. If you want the ESSENTIAL L1 to only react to specific channels, set it to the corresponding value.

10.10.3 IN FILTER

By default, the ESSENTIAL L1 receives five types of MIDI messages: NOTE, CLK, PGC, PB, and CC. In this sub-menu, you can ask the ESSENTIAL L1 not to respond to a specific type of MIDI message by clicking the checkbox.

10.10.4 OUT CH

Use this parameter to set the MIDI OUT channel. If you want the ESSENTIAL L1 only to send MIDI messages to specific channels, set it to the corresponding value.

10.10.5 OUT FILTER

The ESSENTIAL L1 sends out two types of MIDI messages: NOTE and CLK. In this sub-menu, you can ask the ESSENTIAL L1 not to send a specific type of MIDI message by clicking the checkbox.

10.11 CLOCK SECTION

Parameters that related to the clock are located under this section.

10.11.1 CLK SRC

Select the clock source using this option.

- **AUTO**: The ESSENTIAL L1 switches to different clock sources accordingly.
- **INT.**: The ESSENTIAL L1 only follows the internal clock.
- **USB**: The ESSENTIAL L1 only reacts to the clock signal received from the USB port.
- **DIN**: The ESSENTIAL L1 only gets the clock signal from the 3.5mm MIDI port on the rear panel.
- **SYNC**: The ESSENTIAL L1 takes the clock signal from the 3.5mm SYNC I/O located on the front panel.

10.11.2 SYNC DIV

Use this parameter to set the division of the pulse signal that is sent and received from the SYNC I/O.

- **1PPS**: One pulse per step. Every time a pulse is received from the SYNC port, the sequencer or arpeggiator advances a step. This equals four pulses per quarter note (4PPQN).
- **2PPQN**: Two pulses per quarter note.
- **24PPQN**: Twenty-four pulses per quarter note.
- **48PPQN**: Forty-eight pulses per quarter note.

10.11.3 SYNC POLA

This parameter defines the polarity of the clock pulses.

10.12 BRIGHTNESS

This controls the brightness of the screen and pads.

10.13 KB-32M SECTION

The ESSENTIAL L1 saves a preference profile for the KB-32M keyboard. Every time you connect the KB-32M to the ESSENTIAL L1, it sends the parameters to the keyboard. Thus, you don't need to worry about modifying the parameters you saved while using the standalone KB-32M.

10.13.1 VEL. CURVE

Choose one of the four velocity curves for the KB-32M.

- **LOG**: Logarithm curve.
- **LIN**: Linear curve.
- **EXP**: Exponential curve.
- **FIX**: Fixed value.

10.13.2 VEL. TOUCH

Choose one of the four touch options for the KB-32M.

- **LIGHT** (Light)
- **NORM** (Normal)
- **HARD** (Hard)
- **FIX AT**: When the velocity curve is set to FIX, this parameter defines the output velocity, ranging from 1 to 127.

10.14 FIRMWARE SECTION

10.14.1 VER.

This indicates the current firmware version of the ESSENTIAL L1.

10.14.2 RESTORE

This restores all the user parameters (except for the SEQ data) to their default status.

11. SPECIFICATION

Voltage Controlled Oscillator, VCO	
Chipset	3340
Range	16' / 8' / 4' / 2'

Output Waveforms	Sub (-1 Oct Square / -2 Oct Square / -2 Oct Pulse), Pulse, Saw, Triangle, Noise
PWM Mod Source	LFO (Triangle) / Manual / ENV 1
Pitch Mod Source	LFO & ENV 1
Source Mixer	
Channels	6 (Sub, Pulse, Saw, Triangle, Noise, Ext. In)
Voltage Controlled Filter, VCF	
Chipset	3109
Type	Low-pass, self-oscillate capable
Cutoff Frequency	10Hz to 20kHz @ KYBD set to maximum
Mod Source	ENV 1, LFO & KYBD (Keyboard Tracking)
Envelope Generator, ENV 1 & ENV 2	
Controls	Attack, Decay, Sustain, Release
Velocity Sensitive	Yes
Re-triggerable	Yes
Mod Destinations	ENV1 - VCO Pitch, PWM, VCF Freq ENV2 - VCA
Voltage Controlled Amplifier, VCA	
Chipset	662
Trigger Modes	4 (ENV 2 / GATE / CYCLE / DRONE)
Modulator, Low-Frequency Oscillator, LFO	
Output Waveforms	Triangle / Square / Random (Sample & Hold) / Noise

Rate	0.1Hz to 30Hz / 0.1Hz to 200Hz @AUDIO RATE = ON / Sync with Clock
Glide	
Modes	3 (OFF / ON / AUTO)
Speed	0 to 5 seconds
Sequencer, SEQ	
Steps per Sequence	64
Sequence Memory	128
Song Mode	load up to 4 sequences at once, switch manually or automatically.
Song Memory	32
Arpeggiator, ARP	
Modes	5 (Down / Down & Up / Up & Down / Up / Random)
Range	1OCT / 2OCT / 3OCT
Trigger Edit	Yes
Connections	
EXT. IN	6.35mm (1/4") TS 3.5mm (1/8") TS
MAIN OUT	6.35mm (1/4") TS
HOLD	6.35mm (1/4") TS
MIDI IN & OUT	3.5mm (1/8") TRS, Type-A
USB	Type-C
DC	9V1A, center positive

SYNC IN & OUT	3.5mm (1/8") TS
CV OUT	3.5mm (1/8") TS, 0V to 8V, 1V/OCT
GATE OUT	3.5mm (1/8") TS
PHONES	3.5mm (1/8") TRS
Dimensions and Weight	
Length	450mm
Width	120mm
Depth	30mm (excl. caps) / 46mm (incl. caps)
Weight	858g