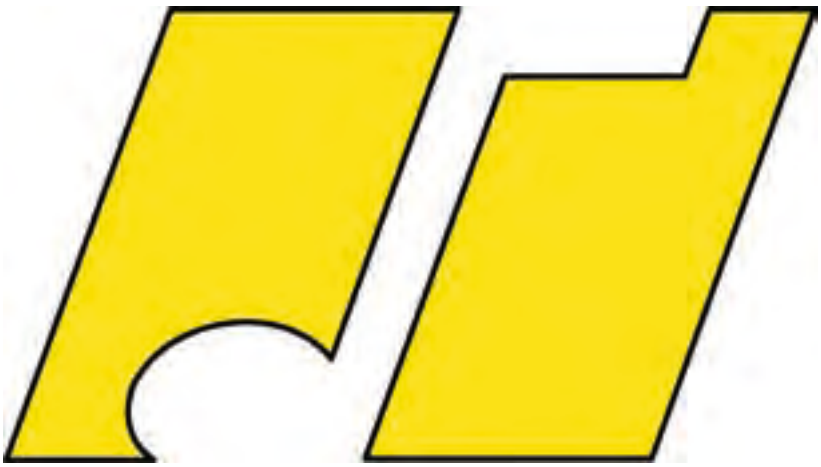
GENERATOR

rhythmic step sequencer

user manual



Introduction

Congratulations on buying the Generator sequencer. Generator is part of the Analogue Solutions range of analogue music equipment. Generator combines all the often needed electronic circuitry to make a powerful music step sequencer in one compact module.

No compromise has been made with the construction of Generator. Cheaper parts have not been used.

- Full rugged steel/aluminium case - no plastic mouldings
- Good quality smooth pots, fully sealed against dust
- Good quality knobs
- Gold plated touch pads
- Analogue step voltages
- Full 16 steps, 3 CV channels, Gate channel
- Designed, built, tested and assembled in the UK
- 6 part Voltage Generator
- So many sockets!

WHAT IS IT !?

Generator is a highly versatile multi channel analogue step sequencer. It provides a fun and intuitive, yet powerful way to create rhythms and melodies with your modular and CV synths. It is perfect for those ‘happy accidents’ when creating cool patterns.

It has been designed with live performance in mind and is a good ‘control surface’ for your modular.

WHY DO I NEED THIS SEQUENCER? WHAT’S SO SPECIAL?

Generator is a very compact and high quality step sequencer. It’s USP is that it is a playable sequencer. You don’t just set up a sequence and leave it looping. The UI is designed in such a way as to make it easy, fun and intuitive to alter the rhythm and to get alternative sequences playing using the real time touch pads.

Generator has plenty of scope for re-patching the signals using CV leads, or via the pre-configured switches.

Generator is super easy to hook up to your analogue synthesisers, Eurorack, and other analogue gear.

Sync to DAW is very easy and solid, using MIDI note 60 (on channel 2). Play that note and the sequencer will step.

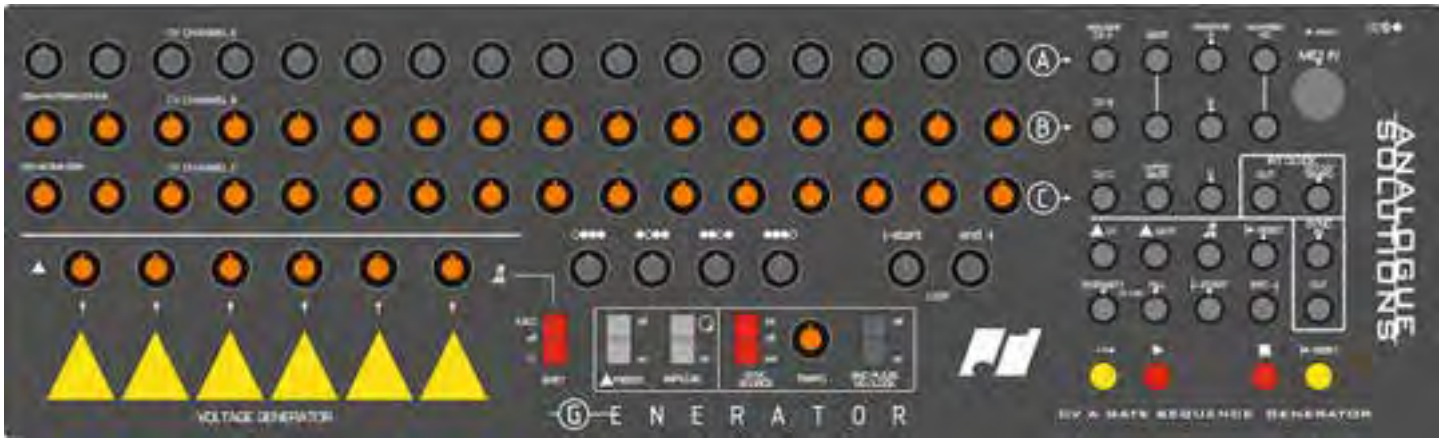
No menus of multi-button pressed. WYSIWYG front panel control.

GENERATOR CAN BE AS COMPLEX OR AS SIMPLE AS YOU WANT IT TO BE

We have given this sequencer a large and diverse number of controls, that along side the patch sockets, will give even the best and experienced electronic musician endless possibilities.

We have presented the controls in a user friendly and familiar sequencer layout that, together with this manual and other resources, enable even the new guy to get great patterns quickly.

Generator Layout



Generator:

MIDI (DAW Use) or CV & Gate?

This unit is is for use with analogue gear that has CV and Gate inputs - that is, vintage synths, modern analogues, and eurorack.

It does not feature a MIDI Out. It is not a MIDI sequencer. It is not a DAW control surface.

But! It does have a MIDI In. This is to allow sync, start, stop, reset, etc control signals to be sent from a MIDI sequencer.

Feature Overview

Analogue Sequencer

Three channels of 16 steps, each providing true analogue CV outputs. These run in parallel. Total pattern length can be changed, or the pattern reset.

Gate Outs

Gate output, with an inverted ‘flipped’ output (positive voltage, but the ‘state’ is inverted. So this output does the opposite of the main Gate output).

Voltage Generator

Six ‘note’ interval voltage generator keyboard. Use to transpose the sequence, reset, start and other things too! Can be clocked by the End Pulse creating a mini-sequence that changes once per bar. Can be used independently as a mini keyboard!

Voltage Controlled Internal Clock

The internal clock is analogue using an analogue LFO. Speed can be changed using CV. The sequencer can also be clocked using a MIDI note or even using an external clock signal from a modular.

Versatile Control

Many controls, switches, and jacks to allow you to alter the way the sequencer steps or behaves.

Intuitive Real Time Gate Control.

Or, IReTiGaC (patent pending). Alter the rhythm in real time using just 4 rotary knobs.

Jack Sockets

So many jacks sockets!

Compact

Slim form factor.

Generator - A great tool for inspiration!

What will it work with?

Generator should work with most, if not all, analogue synths (both vintage and new) and eurorack style products - that have CV and Gate inputs.

Generator outputs 5V positive trigger gates. Which is very (but not entirely!) universal.

CV range is 0-5V, with VG Quantiser output at 1V/Octave.

Remember! Despite what you might think, eurorack is NOT a true standard. There are variations in trigger voltages etc.

There are 300+ manufacturers, and I would guess several thousand different modules available! We test a healthy number of products with this sequencer and all run as expected! But some modules may be way off the mark with the mainstream in terms of ‘standards’ or even build quality.

So if you do run into triggering or other problems it could be:

1 user error or misinterpretation of expected results
2 faulty cables etc
3 the connecting device is at fault or just not as universally interfaceable as you may hope
4 the voltages required on the module or synth just fall outside the typical ‘standards’ most others use
5 other! unknown!

Safety Instructions

PLEASE READ CAREFULLY BEFORE USING:

- Only use the correct power adaptor.
- Never handle the adaptor with wet hands.
- Never excessively bend the adaptor cable or get it trapped or place heavy objects on it. If the adaptor cable becomes damaged, replace the adaptor.
- Ensure the unit is disconnected from the mains before moving or cleaning.
- Always disconnect the unit from the mains if there is lightning in your area.
- Ensure the unit is on a stable surface, and never place heavy objects on top of it.
- Never allow young children, hipsters or animals to operate the unit or adaptor.
- Do not use excessive force when using the controls or inserting cables to the connectors.
- The unit should not be operated in the rain, near water, or in the ocean, and should not be exposed to moisture, for instant in a steam room.
- If the unit is brought from a cold environment to a warm one, the unit should be left to reach the ambient temperature. (Condensation!)
- Keep away from heat sources, such as radiators, ovens, the Earth's core, heaters etc.
- Never allow it to get wet. Do not operate it near water, like pools, sinks, bathrooms etc. Oh, we covered that already.
- Do not place beverages (beer etc) on or near it.
- Don't grow a hipster beard. Ever.
- Never open the case or attempt to make repairs. Refer any servicing to qualified service personnel.

MAINTENANCE INSTRUCTIONS

Any cleaning of the Generator case should be done with a clean lint-free cloth.
DO NOT USE SOLVENTS OR CLEANERS, as this will deteriorate the exterior appearance of the equipment. Do not use a car wash or jet wash to clean this sequencer, and of course don't use a dishwasher or washing machine.

PLACE

Place Generator soundly on a stable surface so it cannot fall off or over, causing it or yourself injury.

POWER

The unit needs a regulated 12V regulated DC supply, minimum 300mA.

Using an unregulated power supply may cause erratic behaviour!

Quick Start

Plug in the power, connect your CV leads, enable internal sync, hit START! More details follow:

If this is the first time you are using this sequencer, and you are not quite sure what you are doing then follow this guide to get something going.

Ensure there are no patch leads plugged in.

Power

Generator comes with a power supply. It uses a power supply with a regulated 12V DC output. Do not use PSUs with a lower or higher voltage. Ensure you use the correct power supply (ideally the one it shipped with).

Use only regulated 12V DC. Centre is positive.

Plug the power lead into the rear of Generator.

Flick the SYNC SOURCE switch up, to use internal clock to play the sequencer.

Ensure the Tempo knob is at a reasonable speed. Try 50%.

Hook up your analogue synth:
Patch Generator ANALOGUE CV A output to the pitch CV input of your synth.
Patch Generator GATE output to the trigger input of your synth.

Turn loop knobs START full left, and STOP full right so you get a full 16 step pattern.

Turn some or all of the Beat knobs so you get some LEDs light up.

Flick the IMPULSE switch up, so sequencer is in loop mode.

Hit Start!

At the very least the sequencer should be playing, looping, and outputting signals!
You should see the Step LEDs run from left to right.

If not, reread the above, and also experiment. Don't give up or instantly resort to GearSlutz - take some time to play around.

Everyone has a different synth / modular set up, so it's up to you to check the synth / audio side of things. But if you do hear a sequence playing, then, well done!

STEP 1 - BEWARE!

The following fact applies to most, if not all analogue sequencers, right back to the vintage sequencers.

When a sequencer is stopped and at rest, when you press start, or start sending a clock signal, it's the NEXT step that is the first step you will hear play! Not the Current step.

So for a 16 step sequencer, really, it must be resting on step 16. So when you hit Start, the first step that plays (ie the next step after the current step) will be step 1.

So if you hit Reset on most sequencers (when the sequencer is stopped) the first step played after hitting Start is often step 2.

It's difficult for most analogue sequencers to over come this. It's easy for a sequencer that is all digital and MIDI. But they are less fun.

Generator, although the clocking and counting is coded, the main structure and hardware to how the rest of it works is the same as you'd find on a vintage sequencer.

So to get around this 'first step' problem, Generator will only advance one step on the 2nd clock signal it receives after hitting Start.

When you press Stop, the sequencer will remind itself to not advance on the first clock pulse.

This is all a little hard to explain, and to be honest, few people seem to have noticed this weird quirk of analogue sequencers! Maybe it's just not worth worrying about.

If you are using MIDI note as a clock, it is important to hit not only Reset, but also Stop, before restarting your MIDI sequencer or Drum machine (that is if your MIDI sequencer is being restarted from the start!).

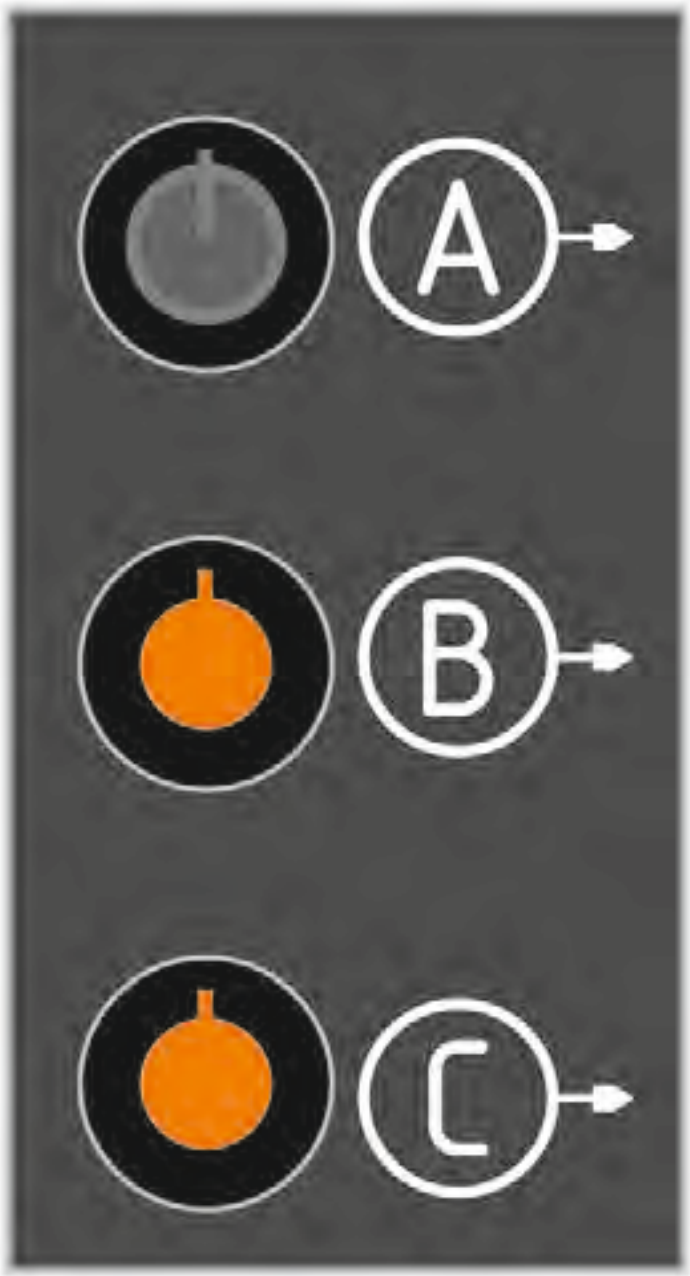
Circuits in Detail

The following section runs through what all the controls, switches and sockets do.

NOTE ABOUT JACK SOCKETS

Generator uses standard 3.5mm mono “minijack” sockets (as you find on most other modular systems like Eurorack).

Inputs sockets are distinguished from output sockets by a dot. This makes it clear and easy to know which sockets are inputs and which are outputs.



CV CHANNEL

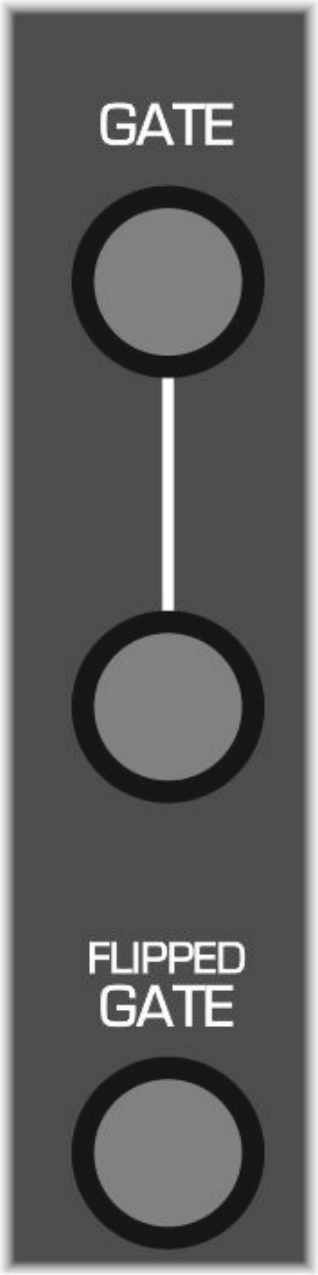
Generator has 3 CV channels up to 16 steps long. They run in parallel.

Each Channel:

CV Controls x16 A // B // C
As the sequencer steps through the sequence, the analogue CV output is set by the corresponding Step control knob.

CV Out A // B // B
Voltage out as set by the active Step. Range approx 0-5V (with no additional CVs applied).

Transpose In A // B // C
Input a CV here to be mixed with the sequence CV. This could be from a CV keyboard, for a LFO, or from one of Generator's own outputs.



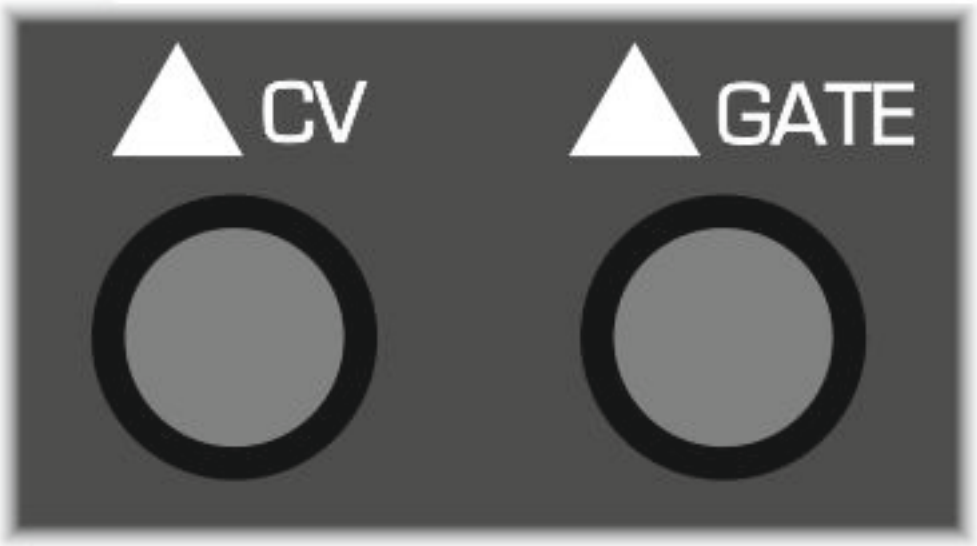
GATE

There are 3 Gate outputs.

Normal Gates
The top two Gates output identical signals. These will output the rhythm set using the Beat controls.

Flipped Gate
The third Gate output is an inverted version of the above 2. So when Normal Gate is On, Flipped Gate is off, and vice versa.
Using both types together with two different synths creates great interplay between them.

VOLTAGE GENERATOR PRESSURE PLATE OUTPUTS



CV

This outputs pressure voltage. If you press any of the plates harder you get a higher voltage.

Use to control clock tempo, Intensity, Fill, Transpose, for example. The pressure uses analogue circuits without the add of DSP - the output can be a little sensitive. It also depends on many factors like how sweaty your fingers are, how big and more besides.

Gate

Each time you press any of the plates, this socket will output a Gate. Use this Gate to clock the sequencer, Reset it, Start it, for example.

Voltage Generator (VG)

This is an output voltage from the VG. It can be patched to alter internal clock speed, or transpose, for example. Use the six knobs to change the level for which ever plate you have pressed.

CONTROL JACKS

Reset

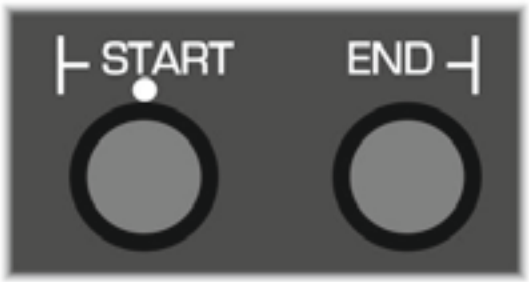
A Gate / Trigger voltage here will reset the sequencer to step 1.

Intensity CV In

Use a CV of approx range 0-5V to alter the intensity of the rhythm. As the voltage increases more beats will be added to the rhythm. Control this from a CV such as sequencer CV, pressure, VG, for example. Range is about 0 to 5v.

Fill CV In

Similar to Intensity CV but only affects the last 4 steps (last quarter note). Use a CV of approx range 0-5V to alter the pattern of notes in the last 4 beats of the sequencer, steps 13, 14, 15, 16. As the CV increases more beats will be added to this bar. Use to create fill variation for your pattern. Control this from a CV such as pressure or VG, for example. Range is about 0 to 5v.



Start In

A gate or trigger in here will start the sequencer. Note, of course, the sequencer has to be receiving a clock signal also. So ensure the Sync switch is set to something useful.

Stop Out

Each time the sequencer loops / reaches the end of the last step, a gate pulse will be sent out here.

QUANTISED VG

As well an pure analogue Voltage Generator outputs, there is also a Quantised VG output. This will quantise the VG voltage to the nearest semi tone (when using 1V / oct synths).

Note, the quantisation is ONLY applied to the VG voltage, not to the CV channels (A, B, C).

The two output jacks output the same signal.

Looping 2 or more Generators

Generators can be daisy chained to allow patterns of 32, 48, etc (multiples of 16!). You could in theory link a continuous circle of sequencers circling the world.

Each sequencer must be set to one shot.

Set each sequencer to External clock. Patch an external clock signal (the square wave from a LFO module will do) into each sequencer's clock in. This becomes your master clock.

Link one sequencer's End Pulse Out to the other's Start Pulse In.
Link it's Start Pulse in to the other's End Pulse. This creates a loop of control signals.

Reset both to step 1, then hit start on either sequencer!

This is a 'standard' configuration, but it could be done in other ways, or you can get creative on how you set up a loop - some crazy creation.

I will add a patch example diagram soon

TRANSPORT SWITCHES

+1 -> Manual Step

Press this to advance the sequencer manually by one step.

When pressing this the Gate output will always trigger even if there is no beat programmed on in that step. This is to allow you to audition your connected synth.

Play

Press to start the sequencer. Note, of course, the sequencer has to be receiving a clock signal also. So ensure the Sync switch is set to something useful.

Stop

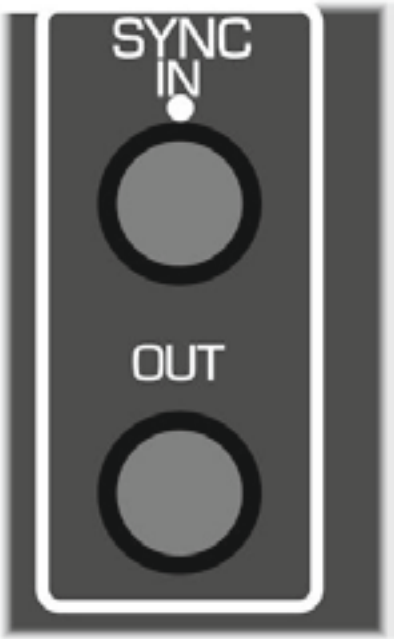
Take a guess….

Reset

Press to reset the sequencer to step 1.

CLOCK & SYNC JACKS

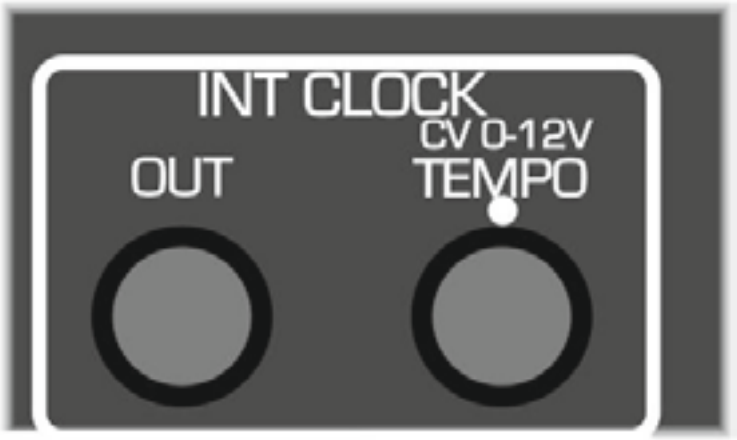
External Sync connections



SYNC IN
Use a gate or trigger, or clock signal here to use as your master clock signal. The Sync switch must be set to EXT(ernal).

SYNC OUT
The sequencer will output the sync sync signal here when running. If the sequencer is not running the output here also stops.

Internal Clock connections



INT CLOCK CV
When using internal clock, a CV here will alter the clock speed. When using this, it is best to set the Tempo knob to a low value, as the external CV is added to the internal CV created by the Tempo knob. Range is approx 0-12V. Try patching Pressure CV into here, or try VG CV.

INT CLOCK OUT
This is a clock output from the internal analogue clock. The signal is continuous, regardless of whether the sequencer is running or not.

MIDI

Generator has;

MIDI In - for sync'ing to a DAW as well as other control such as start, stop, reset. All sync and control are done using MIDI Note numbers. Build up your own custom control MIDI sequences.

Various MIDI notes act as transport controls, and can be used to manipulate your sequencer using your MIDI sequencer.

Channel is set to channel 2 and cannot be changed.

MIDI Control Notes

- C / 60 Step / Clock
- C# / 61 Start
- D / 62 Stop
- D# / 63 Reset

Note, there is no need to 'start' the sequencer when using Note C to 'clock' the sequencer.

The note length of your C MIDI clock will also affect the length of Gate outputs.

To use MIDI note C as a clock, simply program a run of sixteen 32nd notes, Note C, channel 2, into your DAW or hardware sequencer.

A run of 16 notes is the typical way, but of course, you can write any 'note pattern' you like to create unusual stepping on Generator. If your MIDI sequencer has **Shuffle** then you can shuffle the note pattern to make Generator shuffle!

Note: One Shot mode won't appear to work if you are sending continuous MIDI Note clock signals. But, of course, that doesn't matter. Since using MIDI notes as clock signals you just step the sequencer and reset it when ever you want.

One Shot will work though if you are using the sequencer's internal clock as a clock source. Then just send a MIDI Note start message.

How to Sync Generator to your DAW

Generator does not use MIDI Sync. This isn't a flexible sync system. Sync is constant and always at the same tempo. This means with your DAW or hardware sequencer running, Generator will always be running, and at the same speed.

Using MIDI Note, you can program in your own 'clock pattern'. This can run to clock Generator at the same tempo.

Or you can halve the number of notes to run Generator at half tempo.

Double the number of notes to run at double tempo.

You can mute the clock note pattern in your middle 8, for example, to silence Generator. Unmute the clock pattern to get it running again.

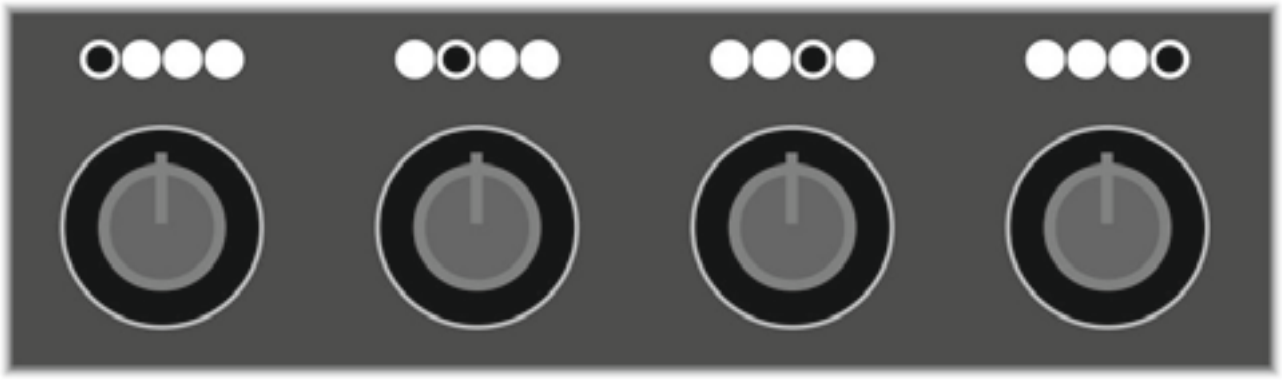
You can even create a rhythmic pattern to make Generator syncopate with your DAW patterns.

Way more fun and creative than just using MIDI Sync.

BEAT

Generator uses 4 controls to alter the rhythm of beats for the pattern playing. They set which of the 16 steps of the sequence will produce gates. There is a gate pattern output, and an inverted ‘flipped’ copy.

Slowly rotating each control will add more beats in specific places increasing the intensity of the rhythm. It’s easier just to see what happens than try and explain it! But it’s very intuitive and effective.

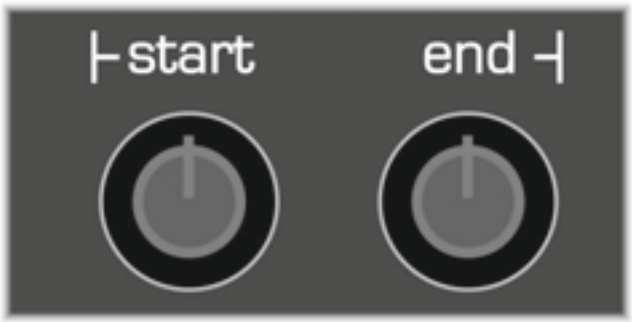


LOOP POINT

You can alter the length of the pattern using the Start and End loop point controls.

It’s possible for Start and End to be at opposite ends of the sequencer for really interesting patterns!

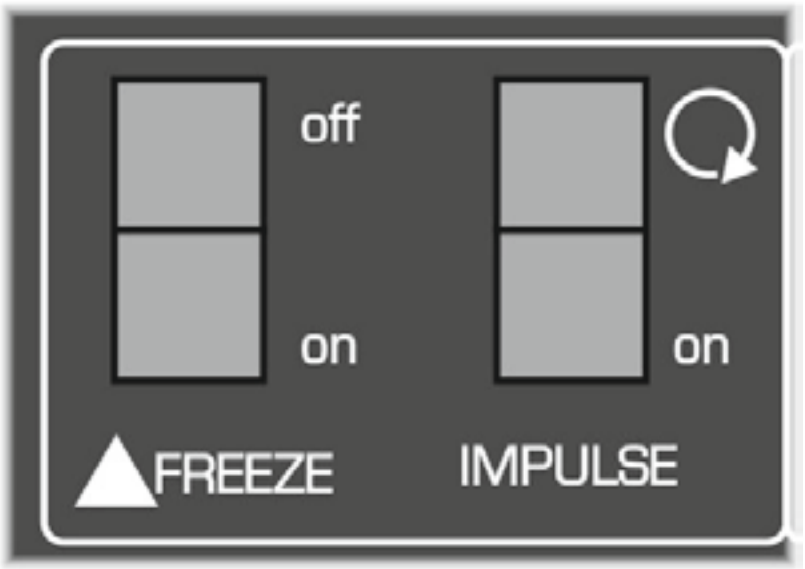
The loop start and end points are dimly lit on the Pattern LED row of LEDs.



FILL IN!

If you set the sequencer to loop steps 9 to 16, then you can leave 1-8 as a fill in pattern. Every time you reset the sequencer it will jump to step 1 playing your fill pattern!

SWITCHES



Pressure Freeze Switch

With this switch on, when you press any pressure plate the sequencer will freeze / loop around the single step that was active when you pressed the plate.

If you freeze the sequencer on a step that has an ON Gate, then that gate will retrigger as long as the sequence is frozen.

Impulse One Shot Switch

This turns off sequencer looping. When the last step is played the sequencer will stop. Great for CV modulation effects!

Sync Source Switch

INT(ernal)
Uses the internal clock as a sync source

Centre is OFF - The sequencer will not play.

EXT(ternal)
The clock signal patched into the Clock In jack is used as a sync source.

Tempo Control

Sets the sequencer speed when using internal clock as a sync source. This will have no effect if you are using MIDI or an external clock as a sync source.

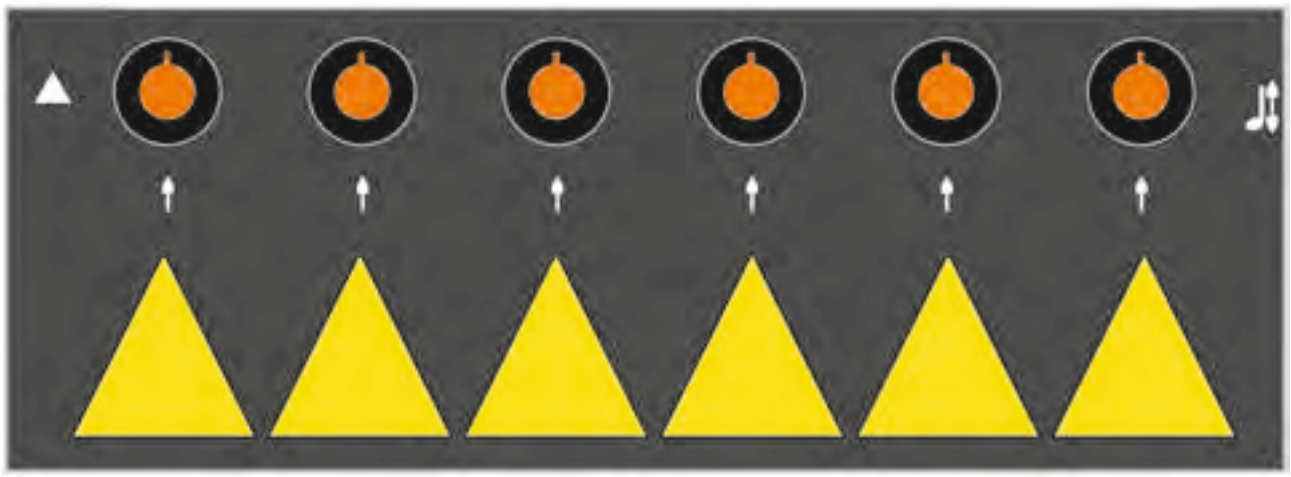
End Pulse VG Clock Switch

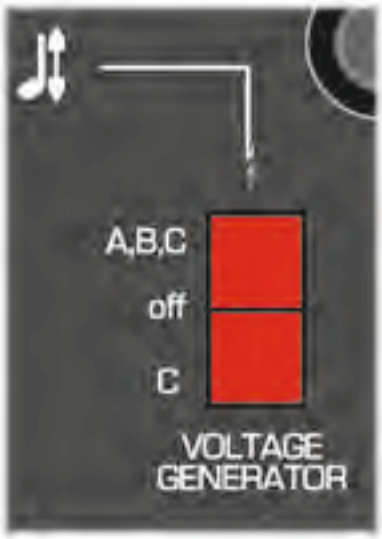
When on, this will clock the VG each time the end of the pattern is played.
That means for each bar / loop of the pattern, the VG will advance one. It can be used to transpose the sequencer for each bar.
Only the first 4 VG slots are used, looping in turn.
The last 2 VG slots can still be manual activated and used as fill in transpositions.

Voltage Generator

This is a special kind of transposer / CV generator.

There are 6 slots. Each one is activated using its own gold plated pressure plate.
The corresponding knob above is used to set the control voltage output of the VG and the range is approx 0-5V.
You can send the output straight to and mixed with the step CV outputs A, B, C





Switch Up:

VG is mixed with A, B, C CVs

Centre is off.

Switch Down:
VG is only mixed with channel C.

VG CV is also always available on its own CV output, where you can patch it back somewhere else, or even to an external synth / modular.

Here are some things you can do with the VG

- Use it as a standalone ‘CV keyboard’ to directly play an external CV synth, such as Treadstone.
- Use the Gate or Pressure out to start the sequencer.
- Use the Gate or Pressure out to reset the sequencer.
- Use the Pressure control Pitch or Cutoff.
- Use the Key voltage to transpose your sequence.
- Use the Key voltage to alter clock speed.
- Use Key voltage to alter the Gate pattern or Gate Fill.

Many more patches are possible, and of course endless external patches too.

No Signal?

It's a sequencer. Really what were you expecting? Though you can use Generator to generate custom audio waveforms if you clock it at high enough frequencies (see below).

Audio Waveform Generator

If the sequencer is clocked at high audio frequencies, then you can use the Gate or CV outputs as audio signals.

Use audio from a VCO module, and patch this into the external clock input of Generator.
Set the Sync switch to External and hit Start.

You can create higher pitches by shortening the sequence loop length. Play around with the CV level pots to 'draw' your waveform. Or, if you are using Gates as your audio output, turn different gates on or off to also alter the sound.

Patch Examples

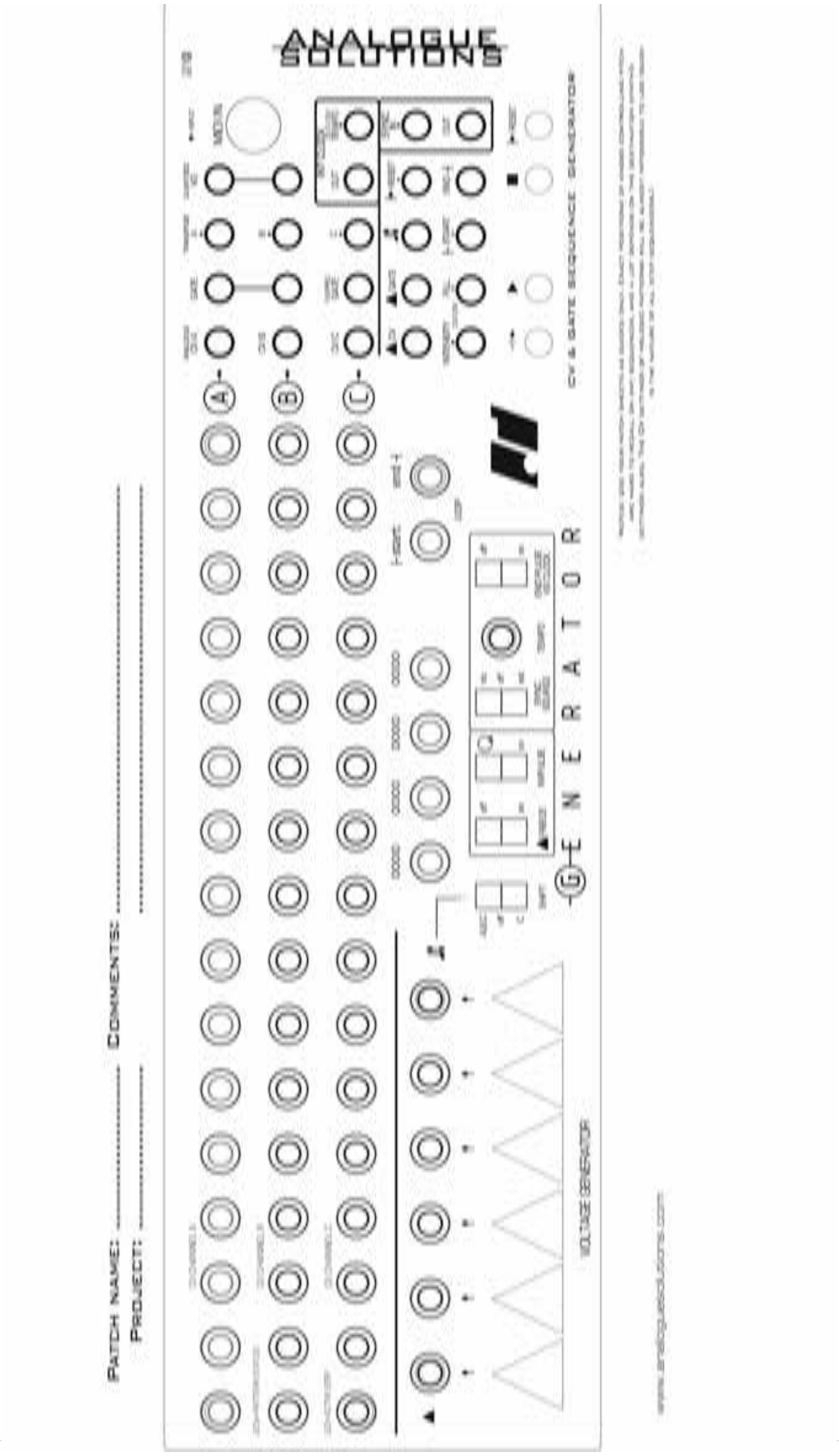
Generator is already incredible flexible using the preconfigure patches available using the on board switches and knobs. But the fun doesn't stop there! Signals can be rematched using patch cables. And of course, patched externally too to external synths and modular.

Over the next few pages are some cool and essential patch examples. These show some physical patches you can do with patch cables to do 'interesting stuff' to the way the sequencer performs. The patches don't show every control position - so play around here. These are just meant to give you ideas or show you new things.

The following page features a blank patch sheet you can print off.

VCO audio out to clock in/
Audio out from Gate.
Using start, end and gate pattern get awesome waveforms.
Clock VG for more fun

Odd patterns
CV A to intensity.
Clock VG
Patch Gate to XP in for odd coolness.
Then add another CV to clock CV in


ANALOGUE
SOLUTIONS
PATCH NAME:
PROJECT:
COMMENTS:
CV & GATE SEQUENCE GENERATOR
GENERATOR

Specification

Weight:
1700g

Weight boxed:

Module version:
1200g

Size:
430 x 130 x 55mm

Size boxed:

Module version:
PCB depth: 25mm
84HP Eurorack width.

Power:

regulated 12V DC output
2.1mm plug
300mA

Module current draw:
Only 12V required.
160mA

All jack sockets are 3.5mm mono, unbalanced.

Warranty

Generator comes with a 1 year (from purchase date) back to base warranty, (i.e. customer must arrange and pay for carriage to and from Analogue Solutions or the dealer from which purchased).

This warranty shall not apply where the product has been subject to alteration, misuse accident, neglect (such as extremes of temperature and/or moisture) or to wear resulting from normal use.

At the sole discretion of Analogue Solutions, the warranty is deemed to be void should the unit be or considered to have been opened or any other modifications or tampering be carried out by unauthorised parties.

CE COMPLIANCE

This unit complies with EU Directives 73/23/EEC and 89/336/EEC.
Standards: EN55103-1, EN55103-2, EN60065

CE