

IM • PLEX • US

[Majella Audio]

Entwined, Interwoven, Enfolded

~ The IMPLEXUS creates enfolded waveforms that are harmonically rich.

IMPORTANT SAFETY INSTRUCTIONS

Please read these instructions before using this product!

The IMPLEXUS should only be used following these basic precautions:

1. Read all 9 IMPORTANT safety instructions and the full user manual before using this product.

2. DO NOT OPEN THE CHASSIS OF IMPLEXUS!



2a. RISK OF ELECTRICAL SHOCK!

The IMPLEXUS uses high voltages inside its casing. These voltage levels can cause injury or death due to electrical shock!!



2b. ESD SENSITIVE!

The printed circuit board of the IMPLEXUS is subject to Electro Static Discharges (ESD). Touching the printed circuit board will damage the electronics inside!



2c. SERVICE BY QUALIFIED PERSONNEL ONLY!

Only MAJELLA AUDIO personnel should service the IMPLEXUS. If servicing is required, please contact us via support@majella-audio.com or visit www.majella-audio.com

3. DO NOT MODIFY THE IMPLEXUS!

3a. PRODUCT CAN BE DAMAGED WHICH MAY RESULT IN UNSAFE SITUATIONS!

The casing and electronics have been carefully designed while focusing on product safety. Modifying the IMPLEXUS will defeat product safety guards and create unsafe conditions.

3b. ESD SENSITIVE!



The printed circuit board of the IMPLEXUS is subject to Electro Static Discharges (ESD). Touching the printed circuit board will damage the electronics and make IMPLEXUS inoperable.

4. THE IMPLEXUS IS NOT A TOY!

4a. CHOKING HAZARD!

The IMPLEXUS contains accessible small parts like screws, rings and knobs that may come loose. Keep away from small children, pets or any individuals who have the tendency to place inedible objects in their mouths.

4b. FOR PROFESSIONAL USE!

The IMPLEXUS is meant for professional use, which means only individuals who know how to safely connect and operate audio equipment should operate it.

5. THE IMPLEXUS IS FOR INDOOR USAGE ONLY!

5a. MOISTURE SENSITIVE DEVICE

Do not use the IMPLEXUS near water and do not use the IMPLEXUS in environments where liquids can be spilled over the IMPLEXUS!

5b. EARTHED WALL PLUG IS A MUST



Power the IMPLEXUS from an grounded (earthed) wall plug and use CE marked cables (within the EU) at all times. Not using an grounded (earthed) wall plug may result in unsafe situations!

5c. UNPLUG WHEN NOT USED!

Unplug the power cable from the IMPLEXUS when not in use.

5d. FIRE HAZARD!

Do not cover the IMPLEXUS while it is turned on to ensure proper ventilation and do not operate the IMPLEXUS in environmental temperatures above 30°C/85°F.

6. PROTECT YOUR EARS!

6a. RISK OF EAR-DAMAGE AND PERMANENT HEARING LOSS

Do not listen to the IMPLEXUS at high sound volume, especially for long periods of time. Listening to the IMPLEXUS at high sound levels can cause inner ear damage resulting in temporary or permanent hearing loss

7. HANDLE WITH CARE!

7a. CONNECT PROPERLY FOR SAFE USE!

- I. Use grounded power cables to connect the IMPLEXUS to a grounded (earthed) wall plug.
- II. Never plug in the power cable when the Fuse Drawer (next to the power connector) is removed!
- III. Do not insert mono jack (TS: Tip/Sleeve) cables to the headphone or balanced outputs.
- IV. If you would like to use the IMPLEXUS outputs unbalanced (not recommended for signal integrity purposes), please use TRS (Tip/Ring/Sleeve) jack cables!
- V. Do not apply voltages to the inputs and outputs of IMPLEXUS that exceed the voltage range of +12V or -12V.
- VI. Do not apply phantom power (48V) to any of the inputs and outputs! This may or will result in damage to your IMPLEXUS!
- VII. See page 6 for instructions on how to correctly connect your IMPLEXUS.
- VIII In Case a FUSE has been blown, replace with 500mA (0.5A) slow blow. In case the FUSE keeps blowing, please contact support@majella-audio.com

7b. IN CASE OF AN ACCIDENT

Turn off the IMPLEXUS, keep the IMPLEXUS unplugged and immediately contact Majella Audio (at support@majella-audio.com) when the following situations has occurred:

- I. Liquid was spilled onto the IMPLEXUS.
- II. The IMPLEXUS was dropped.
- III. The IMPLEXUS is not functioning correctly.
- IV. The IMPLEXUS enclosure was damaged.

8. TAKING CARE OFF IMPLEXUS

- 8a. Wipe the surface with a soft cloth, try to keep the IMPLEXUS free of dust.
- 8b. Don't use damp cloths on the IMPLEXUS panel or wooden side panels.
- 8c. The wooden side panels are finished with oil, and should not wear with normal use. If wear shows one can contact us for maintenance instructions.

9. Please feel free to contact us in case of any questions!

Email: support@majella-audio.com

Visit: www.Majella-Audio.com

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INTRODUCTION

Thank you for purchasing the IMPLEXUS and congratulations on your new musical instrument! IMPLEXUS is an analogue synthesizer that is inspired by West Coast and East Coast synthesis techniques. This user manual will guide you through all the unique features that the IMPLEXUS has to offer you. You will be hearing all the intriguing sounds the analogue signal path of the IMPLEXUS can create!

We will start with the basics and slowly move on to the more “in depth” features. We hope this manual explains everything you will need to know to become creative and get started on making the most beautiful sounds utilizing the IMPLEXUS!

UNPACKING

Please take your time to check the content of your purchase carton. Be careful not to damage the IMPLEXUS during the unpacking process. We recommend saving the IMPLEXUS packaging carton for future travel or shipping.

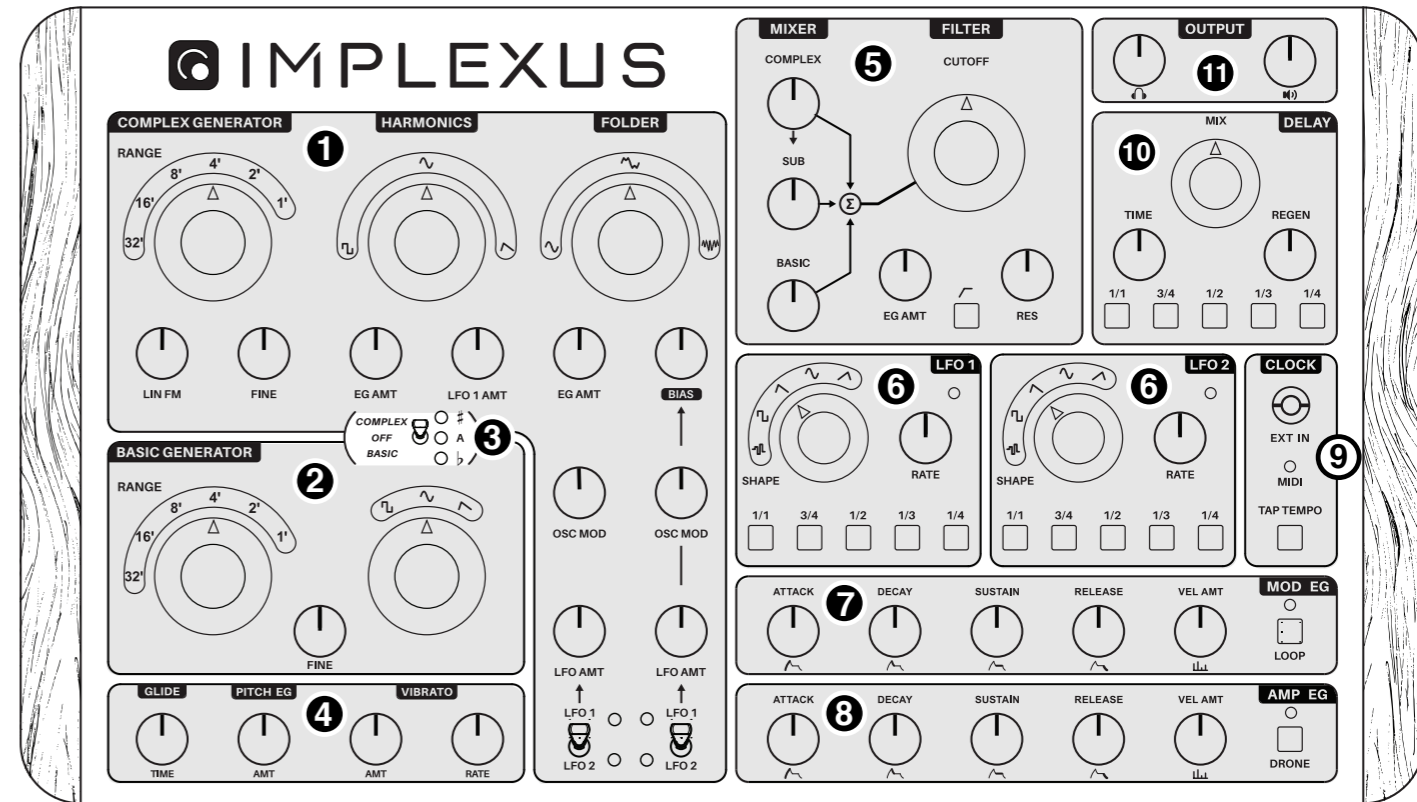
Your IMPLEXUS is shipped including the following items:

1. IMPLEXUS Synthesizer
2. Printed User's Manual

What you will need to hear some sounds:

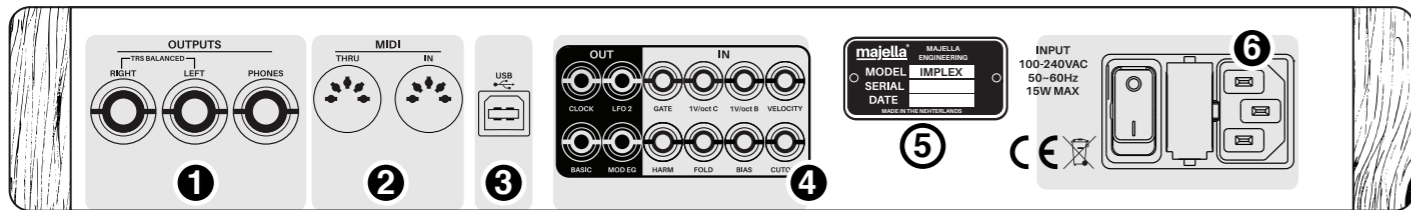
1. Headphones with a 1/4" plug or two 1/4" TRS balanced cables and speakers
2. Earthed AC mains outlet between 110-240VAC 50-60Hz

On the next two pages you will find an overview of all the different sections.



1. Complex Generator
2. Basic Generator
3. Generator tuning
4. Global pitch modulation controls
5. Mixer / Filter
6. LFO 1 and 2

7. Modulation Envelope Generator
8. Amplitude Envelope Generator
9. Clock section
10. Audio Delay
11. Volume control



1. Audio outputs
2. MIDI ports
3. USB MIDI control
4. (Eurorack) External I/O
5. Serial Number plate
6. AC mains input and ON/OFF switch

QUICKSTART

This quick start guide provides the information you need to start tweaking the IMPLEXUS without the need to read into the details. We do suggest you read this manual completely to get the most out of your new instrument, but at least read the important safety instructions on pages 3-5 to operate the IMPLEXUS safely.

Follow these steps to start playing straight away:

1. Plug the power cord into its socket
2. Turn on the IMPLEXUS
3. Connect the audio outputs to your speakers or use a headphone
4. Connect the IMPLEXUS to a MIDI controller/PC or use the DRONE button to get instant sound!
5. Turn the output volume control mid way
6. Start playing and have fun!

ABOUT THE IMPLEXUS

The IMPLEXUS is a high-end analogue synthesizer inspired by two movements within analogue synthesis techniques. On the one hand there is East Coast style synthesis, where one starts with a harmonically rich sounding waveform and filter off harmonics with a Voltage Controlled Filter. This signal is modulated by envelope generators and (Low Frequency) Oscillators. Although East Coast style synthesis techniques might be the most used synthesis techniques today, there is another very interesting set of synthesis techniques which originated at the West Coast of the United States. Here one starts with a sine wave, which is a pure tone with no harmonic overtones. You begin adding harmonic content to the sound by shaping and folding the waveform, while modulating these parameters at audio rate and controlling it with unique interfaces like touch plates.

Side note: If you want to know more about the historical development of East Coast and West Coast synthesis, we recommend watching the documentary “I Dream of Wires”.

For a long time, the two synthesis movements stayed quite separated, but nowadays they are combined more often due to the rise in popularity of modular synthesis. You can now get your hands on any kind of West Coast or East Coast style synthesis module and combine them in a modular system.

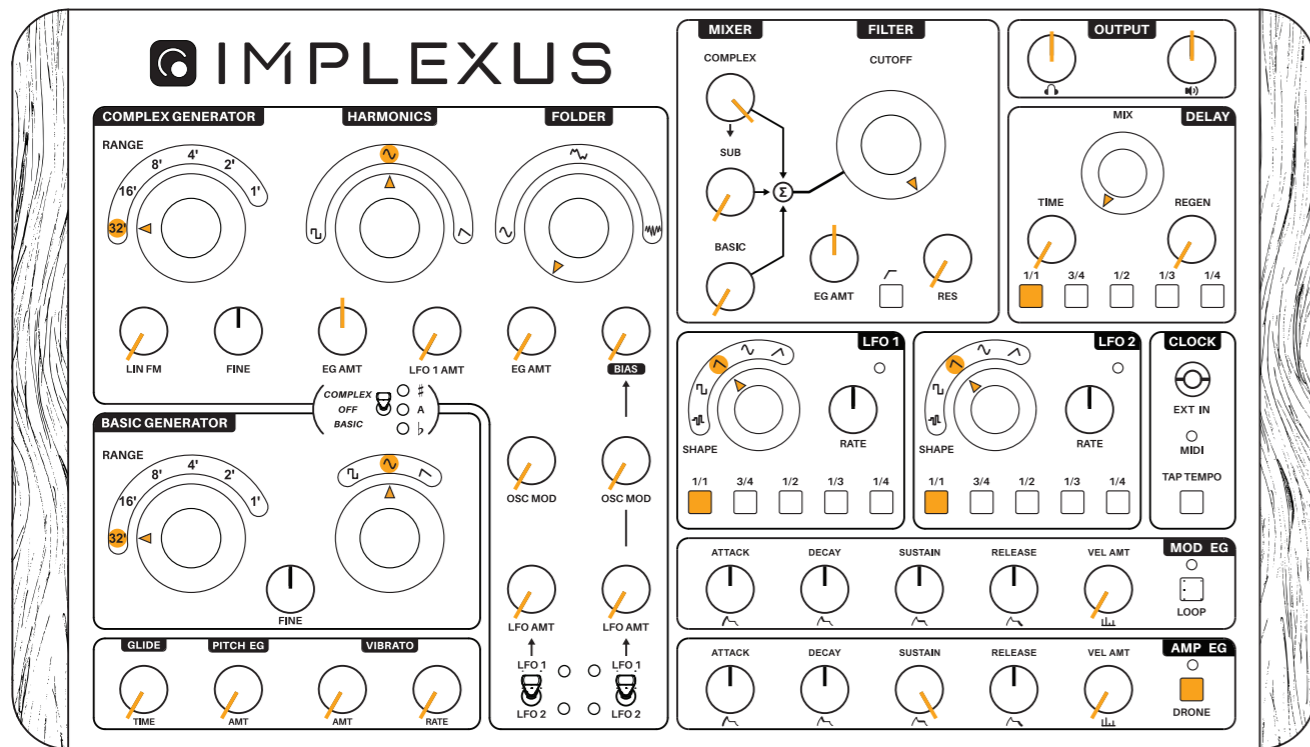
The IMPLEXUS is the result of our exploration of combining West Coast and East Coast style synthesis techniques. We found that combining circuitries is a very delicate, detailed and time consuming process. After lots of prototyping and trail and error problem solving, we finally found a golden combination of both synthesis techniques. The circuit takes a sine wave, shapes it, folds it and then filters it to create the most interesting synthesizer sounds. We then added extended modulation sources like a second VCO, Tap Tempo LFOs, and snappy looping ADSR envelopes with velocity control over the modulation depth.

We think the IMPLEXUS is a great synthesizer that will inspire and intrigue many musicians and synthesizer enthusiasts to create new sounds and music. We hope you will enjoy it as much as we do and we hope it will be your “go to” instrument for a very long time.

Majella Audio

EXPLORING IMPLEXUS

In this chapter, you will be guided through the most basic features whilst exploring the sound of IMPLEXUS. This is helpful when you are new to the world of hardware (West Coast) synthesis, but also if you would like to have a deeper understanding of your new synthesizer! To follow upcoming steps, connect the power cord and your headphones or speakers. Set all controls to the positions shown in the figure below:



Listening to the Complex Generator:

The complex generator is the feature that is the most characteristic for the sound of **IMPLEXUS**. It is a very accurate voltage-controlled oscillator that produces a sine wave. You can shape this sine wave using the harmonics and folder controls.

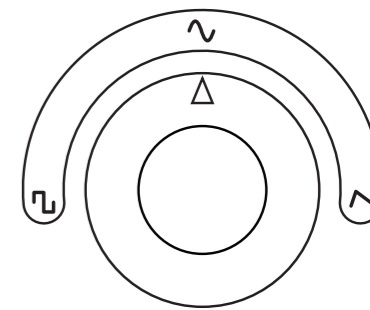
Starting at center position (sine wave), slowly turn the **HARMONICS** knob counterclockwise. You will hear that you are adding odd harmonics, which sounds a bit like opening a low pass filter on a square wave. Slowly turn the **HARMONICS** knob fully clockwise. You will now hear that you are adding even harmonics, which sounds like opening a lowpass filter on a saw wave.

Now turn the **HARMONICS** knob back to its center position (sine wave). This is the part where things get rather interesting! Slowly turn the **FOLDER** knob fully clockwise, the sine wave will now start clipping and folding. While the **FOLDER** knob is fully clockwise you can play with the **HARMONICS** knob. You will hear some interesting growling and phasing sounds.

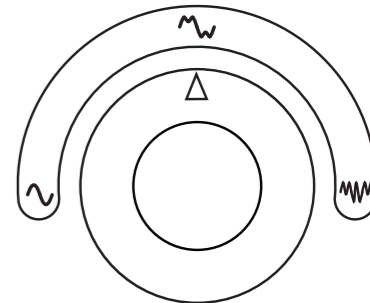
Keep the **FOLDER** knob turned fully clockwise and turn the **HARMONICS** knob back to mid position. Slowly turn the **BIAS** knob fully clockwise and back. **BIAS** causes the sine wave to clip and fold asymmetrically.

You have now explored the very basics of the complex generator. Things get even more fun when you start playing in different octaves and use modulation sources like the **LFOs** and **Envelope Generators (EG)**, to control the **FOLDER**, **HARMONICS** and **BIAS**.

HARMONICS



FOLDER



Listening to the BASIC Generator:

The basic generator contains everything you would expect from a voltage-controlled oscillator. It can produce one of three basic waveforms: sine, square and saw. Let's have a listen!

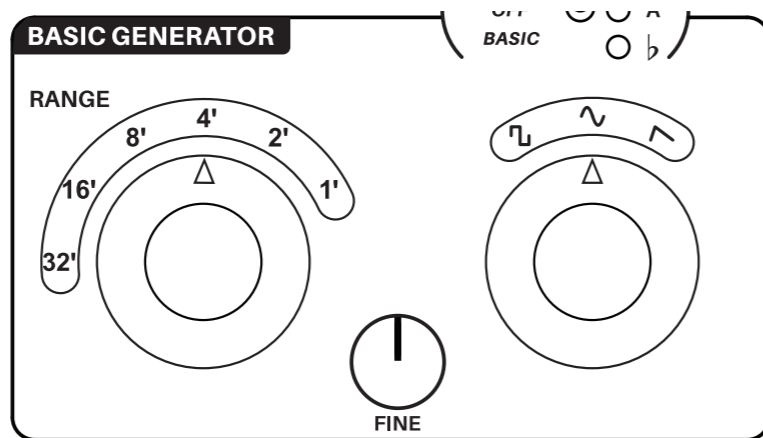
Make sure the **MIXER** section **COMPLEX** and **SUB** knobs are turned fully counterclockwise. Turn the mixer knob of the BASIC generator clockwise. You are now listening to the basic generator. You can use the waveform switch to listen to the three different waveforms.

Select a saw wave and turn the **RES** (**FILTER** section) to a 75% clockwise position. Slowly turn the **CUTOFF** knob counterclockwise and back to fully clockwise.

With this **FILTER** sweep you have now explored the basic principles of the basic generator. The basic generator in combination with the filter can produce a lot of classic analogue sounds and is perfectly suitable for bass lines, arpeggios and more.

Besides creating more standard sounds, the basic generator has a more interesting function on the **IMPLEXUS**. The basic generator can be used as a modulation source for the complex generator. Some of the parameters that can be controlled are **FM**, **FOLD** and **BIAS**.

That's it for the first exploration of the IMPLEXUS sound. We have explored the fundamental features of the IMPLEXUS and listened to some interesting sounds. In the next couple of chapters, we will go in-depth on every parameter so that you can get creative with the many possibilities the IMPLEXUS offers!



PANEL CONTROLS AND FUNCTIONS

In this section of the manual, every control and function is explained in detail.

COMPLEX GENERATOR

The complex generator is an accurate voltage-controlled sine wave generator cascaded by multiple wave shape manipulators to create more complex sounding waveforms.

PITCH CONTROL

The complex generator offers three pitch control knobs: **RANGE**, **FINE** and **LIN FM**. We will detail them one by one:

RANGE:

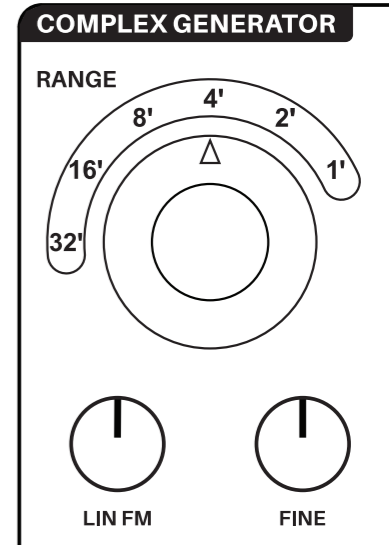
The **RANGE** control selects lowest note for the complex generator in steps of exactly one octave.

FINE:

The **FINE** control tunes the complex generator and is continuous so you can fine-tune its pitch.

LIN FM

The **LIN FM** (linear frequency modulation) controls the amount of modulation the basic generator introduces to the pitch of the complex generator.



WAVESHAPER

The wave shaping section adds even or odd harmonics to the basic sine wave of the complex generator. This section offers three shape controls: **HARMONICS**, **EG AMT** and **LFO 1 AMT**. We will detail them one by one:

HARMONICS

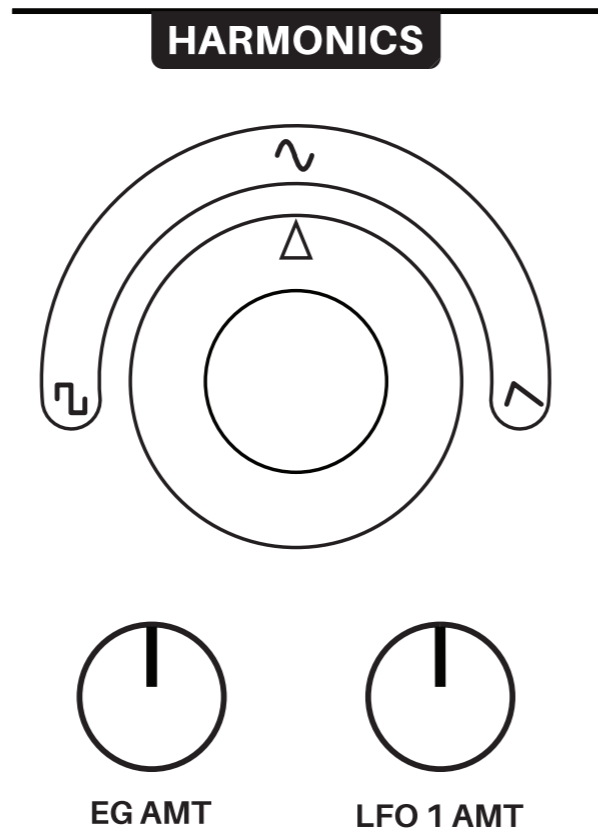
The **HARMONICS** control shapes the sine wave from the complex generator by adding even or odd harmonics. Adding odd harmonics shapes the sine wave to a square wave and adding even harmonics shapes the sine wave to a saw wave.

EG AMT

The **EG AMT** (envelope generator amount) control sets the modulation amount/depth of the modulation envelope (**MOD EG**) to the **HARMONICS** parameter. The **EG AMT** is polarized, which means that the modulation amount is zero when the knob is in mid position, negative in counterclockwise position and positive in clockwise position.

LFO 1 AMT

The **LFO 1 AMT** (LFO1 amount) control sets the modulation amount/depth of **LFO 1** to the **HARMONICS** parameter.



WAVEFOLDER

The wavefolder section folds the incoming signal from the **HARMONICS** section. This section offers four fold controls: **FOLD**, **EG AMT**, **OSC MOD** and **LFO AMT**. We will detail them one by one:

FOLD

The **FOLDER** control folds the signal coming from the **HARMONICS** section. The folding effect adds harmonics to the signal, which results in a complex waveform signal.

EG AMT

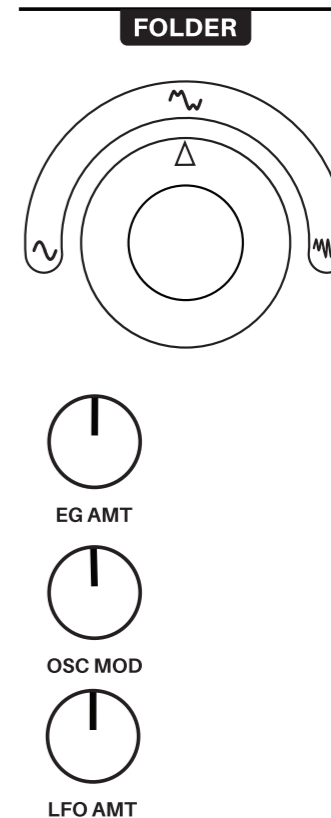
The **EG AMT** (envelope generator amount) control sets the modulation amount/depth of the modulation envelope (**MOD EG**) to the **FOLD** parameter.

OSC MOD

The **OSC MOD** (oscillator modulation) control sets the amount of modulation from the **BASIC GENERATOR** to the **FOLD** parameter.

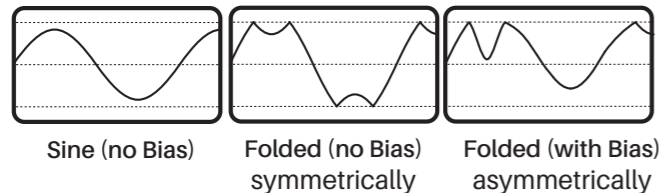
LFO AMT

The **LFO AMT** control sets the modulation amount/depth of **LFO 1/2** to the **FOLD** parameter. The LFO source (**LFO 1** or **LFO 2**) can be selected utilizing the toggle switch.



BIAS

The **BIAS** section allows you to clip and fold the signal asymmetrically. The **BIAS** section offers three bias controls: **BIAS**, **OSC MOD** and **LFO AMT**. We will detail them one by one:



BIAS

The **BIAS** control sets the amount of offset given to the signal coming from the wave-shaper

OSC MOD

The **OSC MOD** (oscillator modulation) control sets the amount of modulation from the **BASIC GENERATOR** to the **BIAS** parameter.

LFO AMT

The **LFO AMT** (low frequency oscillator amount) control sets the modulation amount/depth from one **LFO** to the **BIAS** parameter. The **LFO** source (**LFO 1** or **LFO 2**) can be selected using the toggle switch.



BIAS



OSC MOD



LFO AMT

BASIC GENERATOR

The **BASIC GENERATOR** is a Voltage-Controlled Oscillator, which produces a sine, saw or square wave signal. The **BASIC GENERATOR** offers the following controls:

PITCH CONTROL

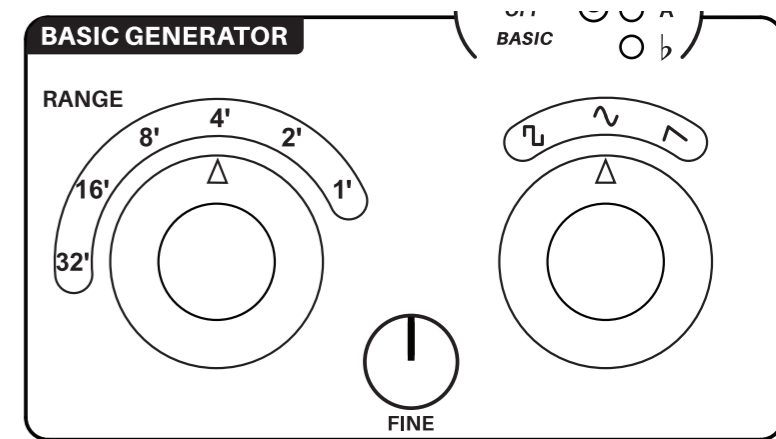
The complex generator offers two pitch control knobs, **RANGE** and **FINE**. We will detail them one by one:

RANGE

The **RANGE** control selects lowest note for the complex generator in steps of exactly one octave.

FINE

The **FINE** control tunes the complex generator and is continuous so you can fine-tune its pitch.



WAVE SELECT

The basic generator offers three selectable waveforms, which can be selected using the three-way rotary switch.

MODULATION SOURCE

The basic generator is a very accurate, but basic voltage-controlled oscillator that can be used in combination with the voltage-controlled filter to create your basic synthesizer sounds. This, however, is not the main purpose of the basic generator in IMPLEXUS. The basic generator can be used as a modulation source for multiple parameters of the complex generator. Modulating these parameters at audio rate in different tunings and octaves will result in interesting and unique sounds.



OSC MOD

TUNER

Voltage Controlled Oscillators tend to detune over time. For example, slight changes in temperature may affect tuning. When the FINE tune knob of a generator is set to mid position the VCO will be somewhere close to an "A". If you want to tune it more precisely there is an on board strobe tuner. To tune one of the generators, follow the next couple of steps:

- Step 1:** Turn off all pitch modulation by turning the knobs (FM, Pitch EG, Vibrato AMT, Lin FM) counter clockwise and take out cables connected to the 1V/oct CV inputs on the back
- Step 2:** Turn on the tuner by selecting the generator you would like to tune, using the mini toggle switch
- Step 3:** Set the octave switch somewhere in the mid range (4' or 8' is great)
- Step 4:** Play an 'A' note on your MIDI keyboard in octave 1.
- Step 5:** Tune the generator using its FINE control. The indicators guide you:
 - # Indicates "too high", slowly turn FINE counterclockwise
 - b Indicates "too low", slowly turn FINE clockwise
 - A (green) indicates an 'A' note
 - A blinking LED means you are playing out of range for the tuner, either too high or too low.



When the 'A' indicator LED is lit (green) the selected generator is tuned to an 'A' (440Hz) note.

ACCURACY

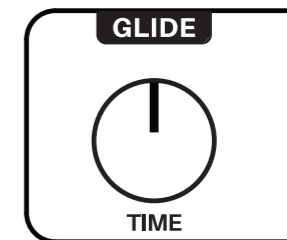
This tuner is a nice tool to quickly tune the analogue generators to an 'A' note. The tuner is not meant for very precise tuning, the green LED indicates an 'A' note, but the actual tuning of the generator can vary up to +10 cents in lower octaves and up to +-25 cents in higher octaves. You can use the octave switch to tune over a couple of octaves for more precision.

GLOBAL PITCH CONTROL

The global pitch control section provides three sections that influence the global pitch (the pitch of the complex generator, basic generator and sub-oscillator). These three parameters are: **GLIDE**, **PITCH EG** and **VIBRATO**. We will detail them one by one:

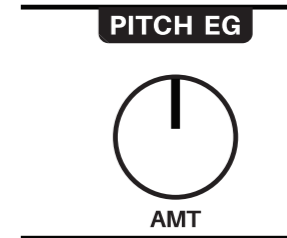
GLIDE

GLIDE allows you to create a slew between two MIDI notes, so that the currently played note "glides" to the next note. The **GLIDE** control sets the slew time where fully counterclockwise means no slew and fully clockwise means a long slew (glide). You will get a clear idea of what this control does by playing alternating octaves over MIDI and slowly turning the TIME knob fully clockwise.



PITCH EG AMT

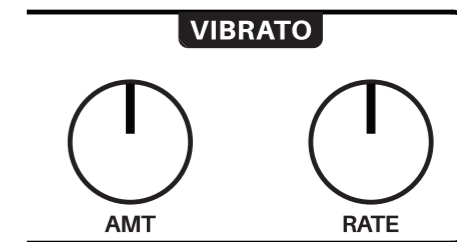
The **PITCH EG** (pitch envelope generator) control sets the modulation amount/depth of the modulation envelope (MOD EG) to the pitch of the complex generator, basic generator and sub-oscillator.



VIBRATO

The **VIBRATO AMT** control sets the modulation amount/depth of the internal triangle wave oscillator, which is dedicated to vibrato. In other words: it sets the vibrato amount/depth.

The **RATE** control sets the rate/frequency of the vibrato oscillator. In other words: it sets the vibrato rate.



MIXER

The **MIXER** section provides three volume controls to control the input volume of three signals. These signals are mixed together before entering the **FILTER** section. The three volume controls are: **COMPLEX**, **SUB** and **BASIC**. We will detail them one by one

COMPLEX

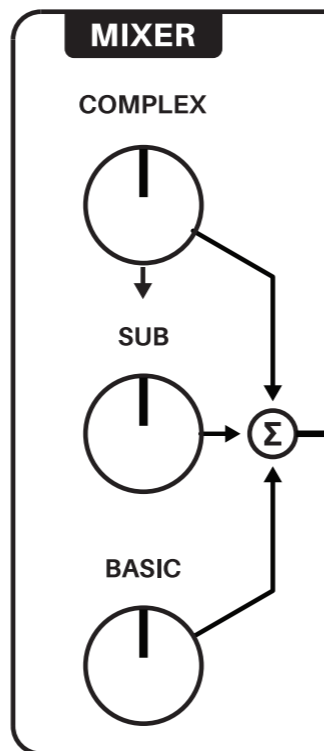
This mixer control sets the volume of the complex generator at the input of the **FILTER** section.

SUB

The **IMPLEXUS** has an internal sub-oscillator that produces a square wave signal exactly one octave below the complex generator. The **SUB** mixer control sets the volume of the sub-oscillator at the input of the **FILTER** section. The sub-oscillator can be used to add some extra low-end to the sound. This might be needed when you have an heavily folded waveform from the Complex Generator.

BASIC

This mixer control sets the volume of the basic generator at the input of the **FILTER** section.



FILTER

The filter section offers two different filter types to filter incoming audio signals from the mixer. The filter is an OTA based 12dB/octave resonant filter that offers four controls: **CUTOFF**, **RESONANCE**, **EG AMT** and **FILTER TYPE** (hi-pass/low-pass). We will detail them one by one:

CUTOFF

The **CUTOFF** control sets the cutoff frequency. Frequencies (harmonics) above (low-pass) or below (hi-pass) the cutoff frequency will be attenuated with a curve of 12dB/oct.

RESONANCE

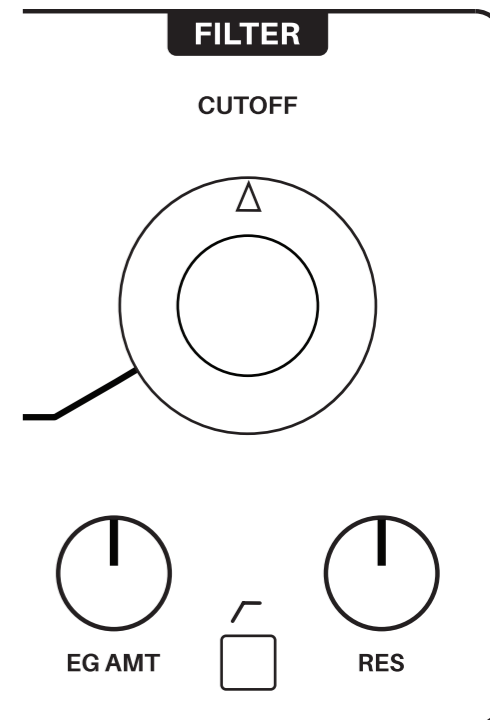
The **RESONANCE** control sets the amount of resonance the filter will produce around the cutoff frequency. It “boosts” the amplitude of harmonics around the cutoff frequency.

EG AMT

The **EG AMT** control sets the modulation amount/depth of the modulation envelope (**MOD EG**) to the **CUTOFF** parameter. The **EG AMT** is polarized, which means that the modulation amount is zero when the knob is in mid position, negative in counterclockwise position and positive in clockwise position.

TYPE

The filter type switch, switches between low-pass and hi-pass mode. In low-pass mode the harmonics above the cutoff frequency are filtered off. In hi-pass mode the harmonics below the cutoff frequency are filtered off.



DELAY

The delay section is a digital stereo audio delay with a 16bit resolution at 48kHz sample rate. The delay time goes up to one second and can be synchronized to MIDI or external clock. The delay has three controllable parameters: **MIX**, **TIME** and **REGEN**. We will detail them one by one:

MIX

The **MIX** control sets the amount of delayed signal (wet) that is blended with the original signal (dry). When the **MIX** control is fully clockwise the delayed signal is around the same audio level as the original signal.

TIME

The delay time can be manually set using the **TIME** control knob. When the **TIME** control is turned fully counterclockwise the delay time is shortest. When this control is turned fully clockwise the delay time is longest.

The delay time can also be synchronized to three different clock sources: Tap tempo, MIDI and external (Eurorack) clock. This can be achieved using the division buttons. You can undo the synchronization by pressing the blinking division button again.

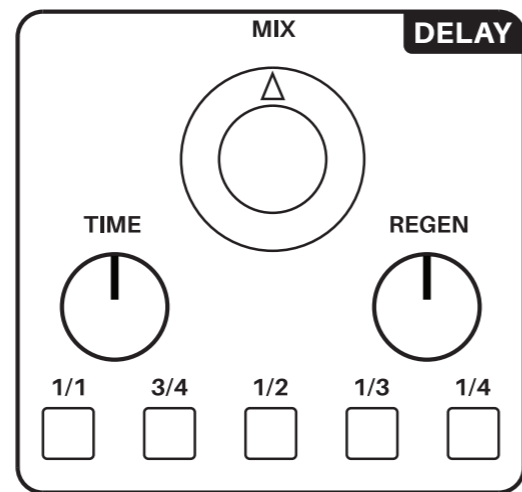
REGEN

REGEN is an abbreviation for "regeneration". This control sets the volume of the delayed signal that is fed

back (feedback) into the delay input. When the **REGEN** control is fully counterclockwise there is no feedback at all and you will hear the delayed signal only once. When this control is fully clockwise there is a lot of feedback and you will hear the delayed signal repeating itself for a long period of time.

NOTE:

There is a tiny bit of delay time modulation to emulate a tape delay/echo effect. The modulation rate differs between the left and right output channel of the delay. This creates a stereo widening effect best heard when listening to the delay in a stereo setup.



CLOCK

The IMPLEXUS offers three clock synchronization sources for the audio delay and the low frequency oscillators. These three sources are: Tap Tempo (internal clock), External clock (Eurorack) and MIDI clock. We will detail them one by one:

TAP TEMPO

The **TAP TEMPO** button sets the (internal) clock tempo by pressing it twice. The time between these two "taps" becomes the new master clock tempo.

EXT IN

The **EXT IN** (external) mini jack input allows you to connect your Eurorack or any kind of clock source that produces pulses in the range of 0-8V. The time between two pulses becomes the master clock tempo.

MIDI clock

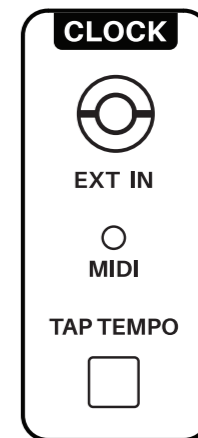
When a MIDI clock is being received by IMPLEXUS via USB/DIN, the time between 24 MIDI pulses (MIDI sends 24 pulses per quarter note) becomes the new masterclock tempo. Note that when a MIDI clock is being received by the IMPLEXUS, the TAP TEMPO button and external input are completely ignored.

NOTES:

-The LED from the **TAP TEMPO** button indicates the clock tempo (also for MIDI clock synchronisation). The MIDI LED indicates MIDI note ON/OFF.

-When a MIDI clock is being received by the IMPLEXUS, the Tap Tempo button and external input are completely ignored.

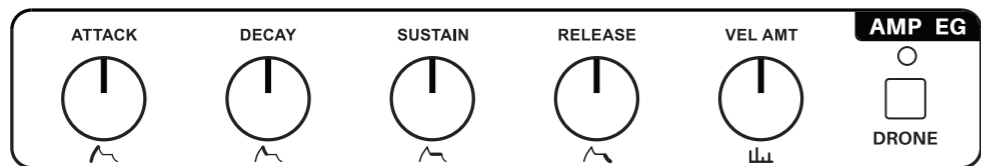
-The maximum clock period is one second. When the IMPLEXUS receives a clock with a longer period than one second between taps or pulses, it will simply ignore it and the clock period stays the same.



ENVELOPE GENERATORS

The IMPLEXUS offers two envelope generators each with their own possibilities and purpose. The two envelope generators are: **MOD EG** and **AMP EG**. We will detail them one by one, but first we will go through the common envelope generator controls.

ABOUT ENVELOPES IN GENERAL: an envelope generator produces a varying control voltage signal with four time specific curves: **ATTACK**, **DECAY**, **SUSTAIN** and **RELEASE**. The envelope generator is turned on by a gate signal, which is generated when playing a MIDI note, for example.



ADSR

The **IMPLEXUS** envelope generators are both generating an ADSR slope/curve:

ATTACK

The **ATTACK** control sets the rise time of the envelope curve.

DECAY

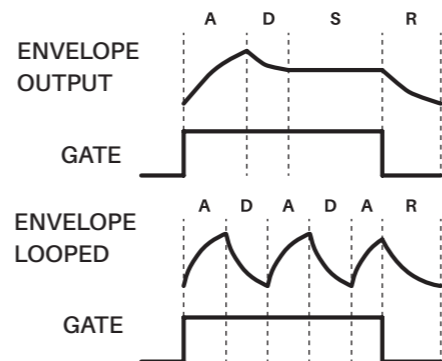
The **DECAY** control sets the fall time from the end of the **ATTACK** curve to reach the **SUSTAIN** level.

SUSTAIN

The **SUSTAIN** control sets the **SUSTAIN** level. When the **ATTACK** and **DECAY** curve period is over, the envelope generator signal will stay at **SUSTAIN** level for as long as the gate signal is high (for as long as a note is being held).

RELEASE

The **RELEASE** control sets the fall time, from the moment the gate is turned off (note was released). The **RELEASE** curve will fall from any point in the **ATTACK**, **DECAY** or **SUSTAIN** curve.



VELOCITY SENSITIVE

The envelope generators are “velocity sensitive”, which means the maximum envelope signal level is set by velocity level from MIDI. The amount of influence the velocity level has on the envelope generator its output can be set individually for each envelope generator using the **VEL AMT** control.

VEL AMT

The **VEL AMT** (velocity amount) control sets the amount of influence the velocity level has on the envelope generator. When the **VEL AMT** control is fully counterclockwise, velocity does not influence the envelope generator output at all. When the **VEL AMT** control is fully clockwise, you will experience full velocity control. Velocity can be used for amplitude: the softer you press a key (play a note), the lower the audio volume and the harder you press a key (play a note), the higher the audio volume. Velocity can also be used for modulation depth: the harder you press a key (play a note) the higher the depth of modulation.

NOTE:

Velocity is originally a MIDI parameter, but on the IMPLEXUS it is also a voltage-controlled parameter. There is a CV input for Eurorack, which allows you to do amplitude modulation, for example.

MOD EG

The **MOD EG** (modulation envelope generator) can be used for modulation purposes. It can modulate multiple destination parameters: **GLOBAL PITCH**, **HARMONICS**, **FOLD** and **CUTOFF**. The modulation envelope also has a CV output on the back of the IMPLEXUS that can be patched to any CV input.

The modulation envelope has a loop mode, so that it can behave as an **LFO** triggered when gate is high. The **LFO** period and curve is set using the **ATTACK** and **DECAY** controls.

AMPEG

The **AMP EG** (amplifier envelope generator) controls the VCA (voltage controlled amplifier) amplitude of the IMPLEXUS. The amplifier envelope has a drone function that sets the gate signal of this envelope generator to “always high/on” so you will have instant sound when the **SUSTAIN** control is fully clockwise.

LOW FREQUENCY OSCILLATORS

The IMPLEXUS offers two low frequency oscillators (**LFOs**) with a frequency range from 0.1 Hz to 100 Hz. Both **LFOs** can be used to modulate **HARMONICS**, **FOLD** and **BIAS**. **LFO 2** also has a CV output on the back of the IMPLEXUS, so you can patch it to any CV input. The **LFOs** have **SHAPE** and **RATE** controls. We will detail them one by one:

SHAPE

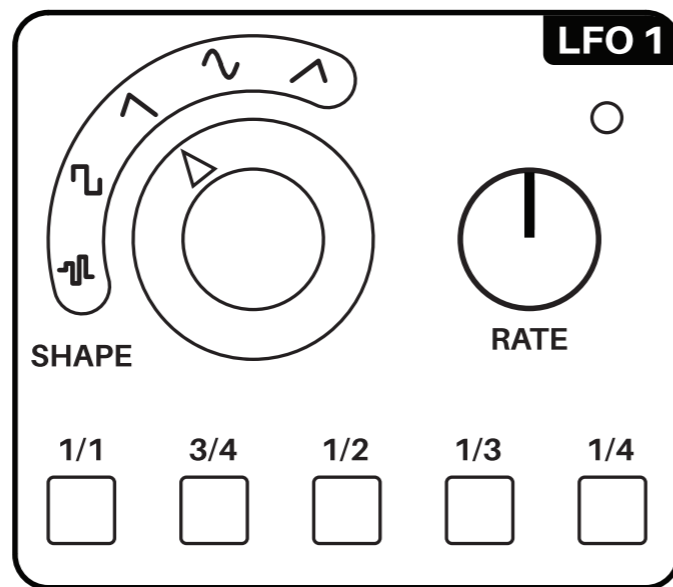
The **SHAPE** control is a rotary switch that selects the LFO output waveform. You can select the following waveforms:

- RANDOM
- SQUARE
- SAW
- SINE
- RAMP

RATE

The **LFO RATE** can be set manually using the **RATE** control. This control knob sets the LFO frequency between 0.1 and 100Hz.

The **LFO RATE** can also be synchronized to three different clock sources: Tap tempo, MIDI and external (Eurorack) clock. This can be achieved using the division buttons. You can undo the synchronization by pressing the blinking division button again.



OUTPUTS

The audio output section of the IMPLEXUS offers two audio outputs, each with their own volume control: stereo balanced (Line) output and stereo headphone output. We will detail them one by one:

IMPORTANT NOTE: Listening to the IMPLEXUS at high sound volume can damage your hearing and cause temporary or even permanent hearing loss. In addition, modulations can cause unexpected spikes in frequency and/or volume.

STEREO BALANCED LINE OUTPUT

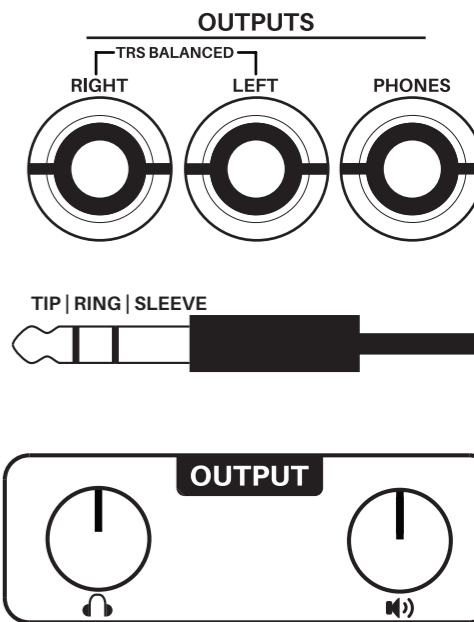
The two 1/4" TRS (TIP, RING, SLEEVE) line level output jacks allow you to record mono/stereo audio from the IMPLEXUS, over long cables without signal loss. A TRS jack cable is "balanced" and rejects noise common with unbalanced TS mono jack cables. Because the OUTPUTS are TRS Balanced, use TRS cables when connecting to mono inputs like audio interfaces or mixers. For example, if you want one channel mono output, connect one TRS (see image on the left) cable from Output Left to Audio Interface Channel 1, For stereo output (Delay effect), connect a second TRS cable from Output Right to Channel 2. (This follows video convention of Left/Ch 1, Right/ Ch 2.)

* IMPORTANT:

Do not use mono (TS) jack cables with IMPLEXUS outputs! Always use TRS jacks, even for unbalanced unbalanced mono single channel recording. Using a mono (TS unbalanced) jack cable may damage your IMPLEXUS over the long term.

HEADPHONE OUT

The stereo headphone output allows you to listen to the IMPLEXUS over headphones. Just plug in your headphones and start playing!



MIDI

SETTING MIDI CHANNEL

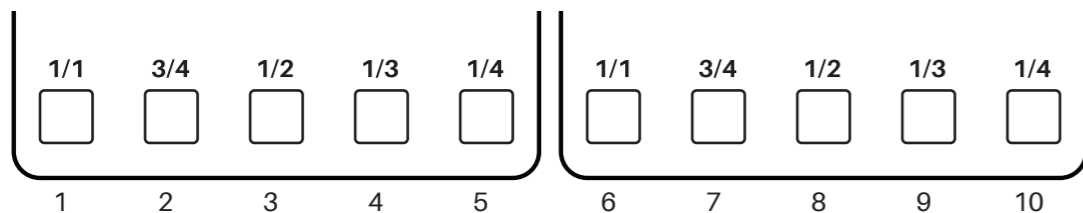
The MIDI channel of the IMPLEXUS can be set at start up. When a channel is set, the IMPLEXUS will only listen to this particular MIDI channel. From the factory the MIDI channel is set to channel 1. If you would to set a new MIDI channel, these are the steps to follow:

Step 1:

Set the MIDI channel of IMPLEXUS you need to power on (or restart) while holding the **TAP TEMPO** button. You will notice that the IMPLEXUS does not start up with blinking LEDs like it normally does.

Step 2:

You can now select the MIDI channel from 1-10 using the LFO division buttons:



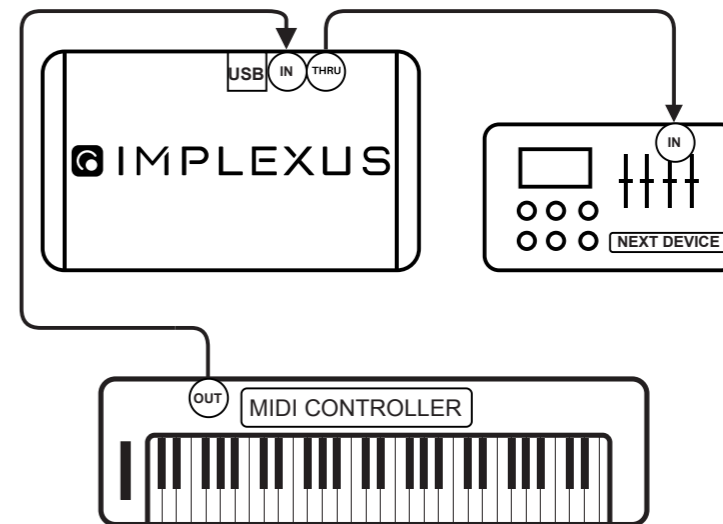
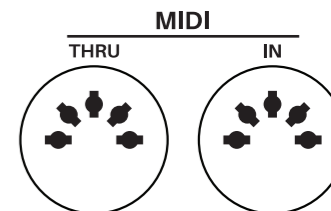
When a MIDI channel is selected the IMPLEXUS will continue its normal start up procedure. The MIDI channel is stored in the IMPLEXUS memory, so next time you will power on the IMPLEXUS it will listen to the last selected MIDI channel.

CONNECTING THE IMPLEXUS VIA MIDI

The IMPLEXUS can be connected via DIN or USB. When the USB cable is connected, DIN MIDI will be ignored (MIDI THRU will still work though!). We will detail each MIDI connection option:

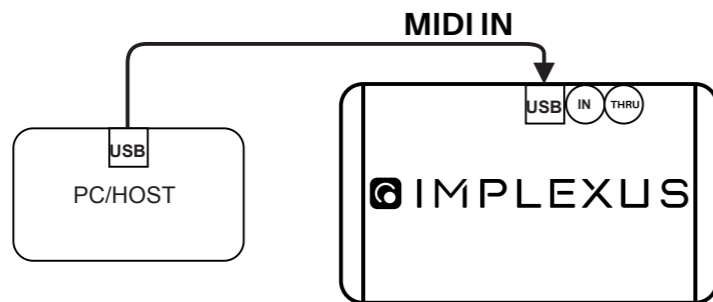
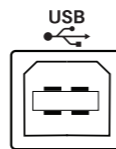
DIN MIDI

The IMPLEXUS can be connected to a MIDI interface/controller via the DIN MIDI input by simply connecting a MIDI cable to the MIDI IN connector on the back of the IMPLEXUS. The IMPLEXUS can be chained using the MIDI THRU connector. A schematic overview of these connections can be seen in the picture below:



USB MIDI

The IMPLEXUS can be connected to a PC/HOST using the **USB** connection on the back of the IMPLEXUS. When the USB cable is connected, the DIN input is completely ignored (**MIDI THRU** will still work). A schematic overview of these connections can be seen in the picture below:



MIDI CONTROLS

The MIDI controlled parameters of the IMPLEXUS are:

- Pitch (MIDI note range: 36-84)
- Gate (note on/off)
- Velocity
- Pitch Bend
- Modulation CC1 (FOLD)
- Clock (24 pulses per quarter note)

MIDI CLOCK SYNCHRONIZATION

When a MIDI clock is being received by the IMPLEXUS via USB / DIN, the time between 24 MIDI pulses (MIDI sends 24 pulses per quarter note) becomes the new master clock tempo. Note that when a MIDI clock is being received by the IMPLEXUS, the **TAP TEMPO** button and external input are completely ignored.

EXTERNAL INPUTS

The IMPLEXUS offers external inputs and outputs in the form of a Eurorack (mini jack) patch bay. It is located on the back of the IMPLEXUS. You can control the IMPLEXUS via Eurorack, but you can also patch an IMPLEXUS output to an IMPLEXUS input. One example is patching the LFO 2 output to the VCF cutoff input. We will detail the inputs and outputs one by one, but first there is an important note to remember when you are connecting external devices to the IMPLEXUS:

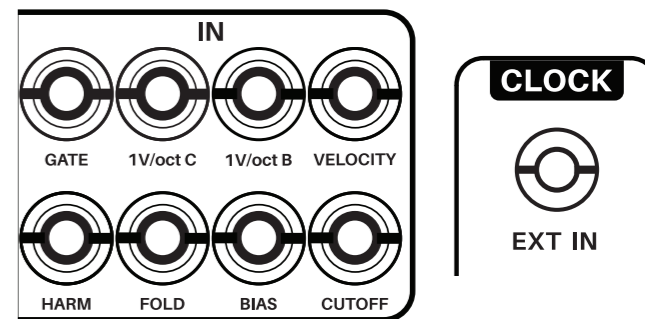
IMPORTANT NOTE:

The external inputs and outputs of IMPLEXUS are protected against patch errors, but it is good practice to avoid creating patch errors, so here are some basic important rules:

- Do not patch an output into another output!
In general, signal flows by connecting the output to input (or input to output) with a patch cable (mono mini jack cable.)
- Only use signals within the Eurorack range of -12V to +12V!
Exceeding these limits will damage your IMPLEXUS.

External INPUTS

- | | | |
|----|-----------|--------------------------|
| 1. | GATE: | Gate / note on |
| 2. | 1V/oct C: | Global pitch CV |
| 3. | 1V/oct B: | Basic generator pitch CV |
| 4. | VELOCITY: | Velocity CV |
| 5. | HARM: | Harmonics CV |
| 6. | FOLD: | Fold CV |
| 7. | BIAS: | Bias CV |
| 8. | CUTOFF: | VCF cut-off CV |
| 9. | EXT IN | External clock input |



1V/OCT C (GLOBAL PITCH CV)

The 1V/oct C input, controls the pitch of both the **COMPLEX** and the **BASIC GENERATOR**. The input CV is added up to the internal MIDI pitch CV and pitch bend CV, so it can also be used it as a pitch modulation input.

When a mini jack cable is inserted to the **1V/OCT B** input, the **1V/OCT C** input will only controls the pitch of the **COMPLEX GENERATOR**.

1V/OCT B (BASIC GENERATOR PITCH CV)

The 1V/oct B input, controls the pitch of the **BASIC GENERATOR**. The input CV is added up to the internal MIDI pitch CV and pitch bend CV, so it can also be used it as a pitch modulation input.

When a mini jack cable is inserted into the **1V/OCT B** input, the **1V/OCT C** input only controls the pitch of the **COMPLEX GENERATOR**.

TIP:

Try modulating the pitch of the **BASIC GENERATOR** by patching the **LFO 2** output to the **1V/OCT B** input, while the **OSC MOD** control for **BIAS** or **FOLDER** is fully clockwise.

GATE

The **GATE** input allows you to trigger the envelope generators, which is basically what a MIDI note **ON / OFF** does. A DC voltage of 0V represents a **NOTE OFF** and

3.3V or higher represents **NOTE ON**. When a cable is inserted to the **GATE** input, the MIDI NOTE ON / OFF is ignored.

TIP:

Try synchronizing the envelope generators to the IMPLEXUS clock by patching the **CLOCK** output to the **GATE** input. You can also patch **LFO 2** (Saw / Square) output to the **GATE** input. This way you can synchronize the envelope generator and use the division buttons of **LFO 2** to set the clock division. For random triggers, set **LFO 2** to random wave output.

VELOCITY

The VELOCITY input allows you to control the modulation depth of both the envelope generators with an external voltage (0V = very low velocity, 5V or higher = maximum velocity). The VEL AMT control knobs sets the amount of VELOCITY modulation.

When a cable is inserted to the **VELOCITY** input, the **MIDI** velocity is ignored.

TIP:

Patching an **LFO** or generator signal into the **VELOCITY** input creates interesting results. If you put the **AMP EG** in **DRONE** mode and turn **SUSTAIN** fully clockwise, you are basically controlling the **VCA** amplitude, which allows you to do amplitude modulation!

CUTOFF

The **CUTOFF** input allows you to modulate the filter cutoff, using an external voltage.

TIP:

The **CUTOFF** input allows you to modulate the filter with an **LFO**. You can patch the **LFO 2** output to the **CUTOFF** input or patch an external **LFO** output to it and modulate the **FILTER CUTOFF**.

FOLD

The FOLD input allows you to modulate the amount of folding, using an external voltage.

BIAS

The BIAS input allows you to modulate the amount of bias, using an external voltage.

TIP:

The **BIAS** input allows you to modulate the bias using the modulation envelope, by patching the **MOD EG** output to the **BIAS** input. You can even use it in loop mode to create some interesting organic sounds.

HARM

The **HARMONICS** input allows you to modulate the amount of folding, using an external voltage.

TIP:

The **HARMONICS** input allows you to modulate the harmonics parameter at audio rate, using the **BASIC GENERATOR**. You can patch the **BASIC** output to the **HARM** input

EXT IN (CLOCK)

The **EXT IN** (external clock input) allows you to synchronize the IMPLEXUS to an external clock signal. It behaves like tap tempo, but instead of measuring time between taps on the button, it measures time between pulses.

TIP:

An unstable external clock source will make the **DELAY** and **LFOs** of IMPLEXUS “glitch”, because it will have a hard time tracking the tempo and will keep adjusting to the unstable input. Especially the delay will create audible glitches in pitch, which might be unwanted. Having said that, using an unstable/varying external clock source can also result in interesting sounds!

EXTERNAL OUTPUTS

Next to to the external INPUTS the IMPLEXUS is equipped with 4 external OUTPUTS :

1. CLOCK: IMPLEXUS clock output
2. LFO 2: LFO 2 output
3. BASIC: BASIC GENERATOR output
4. MOD EG: Modulation Envelope output

CLOCK

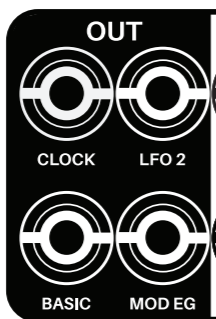
The **CLOCK** output allows you to synchronize other gear to the **IMPLEXUS** internal clock. The clock tempo can be set using **TAP TEMPO**, **MIDI** clock or **EXT IN** clock input.

TIP

In **DRONE** mode, the **MOD EG** (modulation envelope generator) can be triggered by **CLOCK** output, using a single patch cable. Patch the **CLOCK** output to the **GATE** input.

LFO 2

The **LFO 2** output allows you to modulate external gear or IMPLEXUS parameters using **LFO 2**. This low frequency oscillator signal is in the range of +5V. The output waveform and frequency can be set using the **LFO 2** controls.



TIP

The **LFO 2** random waveform can be used for random pitch modulation or random modulation of parameters like **FILTER CUTOFF** and **VELOCITY**. You can also use the random wave output to trigger the **GATE** at random times, by patching **LFO 2** output to **GATE** input, using a single patch cable.

BASIC

BASIC outputs the voltage-controlled oscillator signal from the **BASIC GENERATOR**. This analog audio signal can be sent to external filters and other gear to shape the sound. You can also use the **BASIC** output as a modulation source for **IMPLEXUS INPUT** patch points.

TIP

The **BASIC GENERATOR** output can be used to modulate **VELOCITY** and **FILTER CUTOFF**, using a single patch cable.

MOD EG

The **MODULATION ENVELOPE GENERATOR** output, outputs the envelope signal from the **MOD EG**. It basically offers you a snappy, looping, analogue envelope generator with velocity control over modulation depth. The output envelope signal can be set using the **MOD EG** controls.

PATCH EXAMPLES

In this section, we will show you some patch examples. There are some creative tips and tricks described, which can be helpful when exploring the sound of IMPLEXUS and its capabilities. Lets patch, push, turn and tweak some knobs to create a couple of nice sounds!

NOTE: for some of these examples you will need one or more (mono) mini jack patch cables.

PATCH: "Rhythmical manoeuvres"

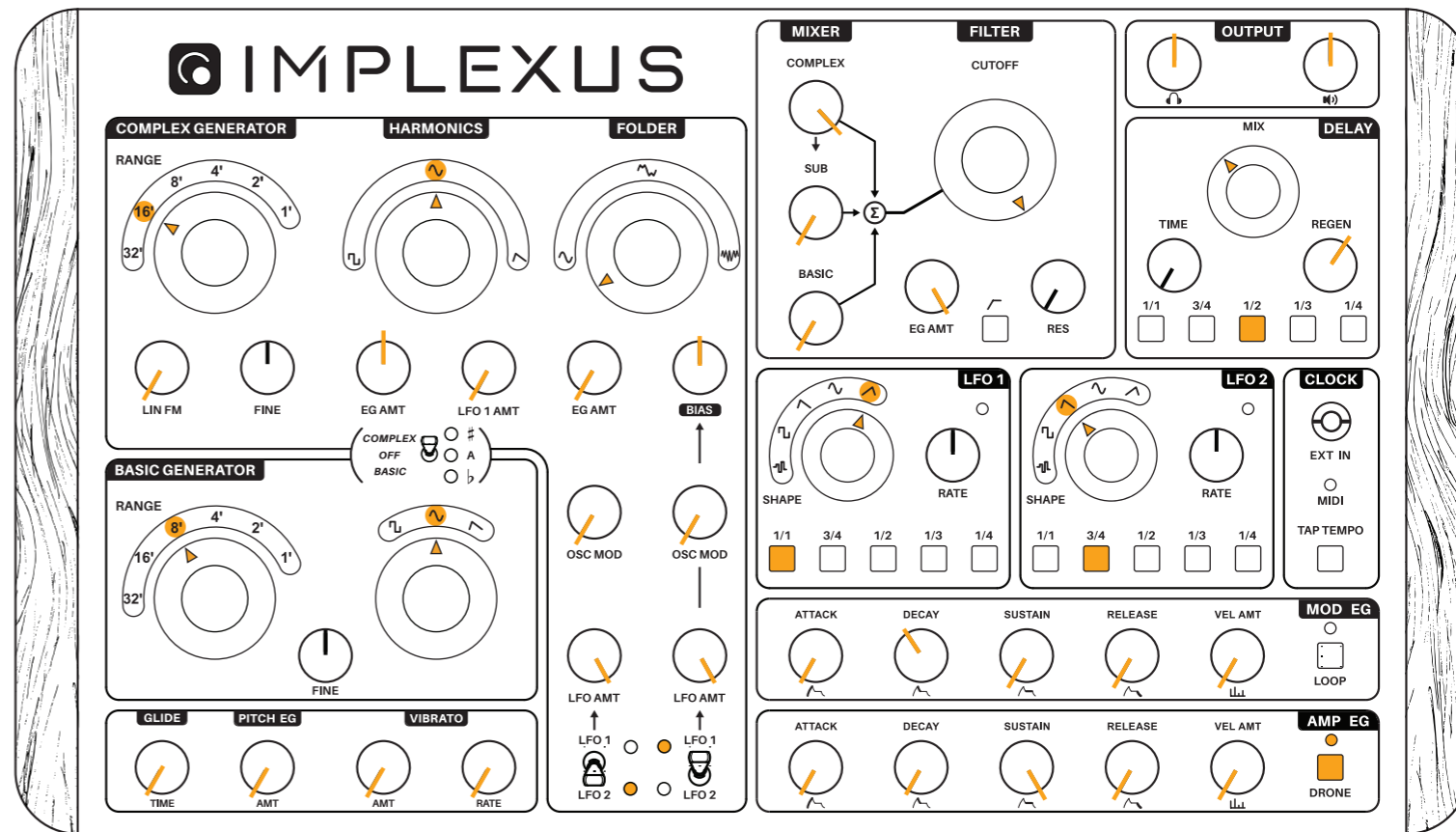
In this example we will play with both **LFOs** at different clock divisions to create some "rhythmical manoeuvres".

Set the internal clock to a "slow" tempo by pressing the **TAP TEMPO** button twice. An interval of roughly 1 second between the taps is fine. Don't forget to turn on **DRONE** mode and turn the **SUSTAIN** control of **AMP EG** fully clockwise.

Now set all controls as shown in image on the next page.

You will hear some "rubber" like synth sounds, with a beating rhythm caused by the difference in **LFO** divisions. The **DELAY** can be synchronized to the internal (**TAP TEMPO**) clock in different clock divisions. This will create even more interesting rhythmic manoeuvres!

When you have found a nice rhythmic sound you could try turning the **LFO 1 AMT** of the **HARMONICS** section. Start from a counterclockwise position, slowly turning it fully clockwise. You could also experiment with the **FOLDER** knob changing the sound from a "rubber" sound to something more "vocal" like.



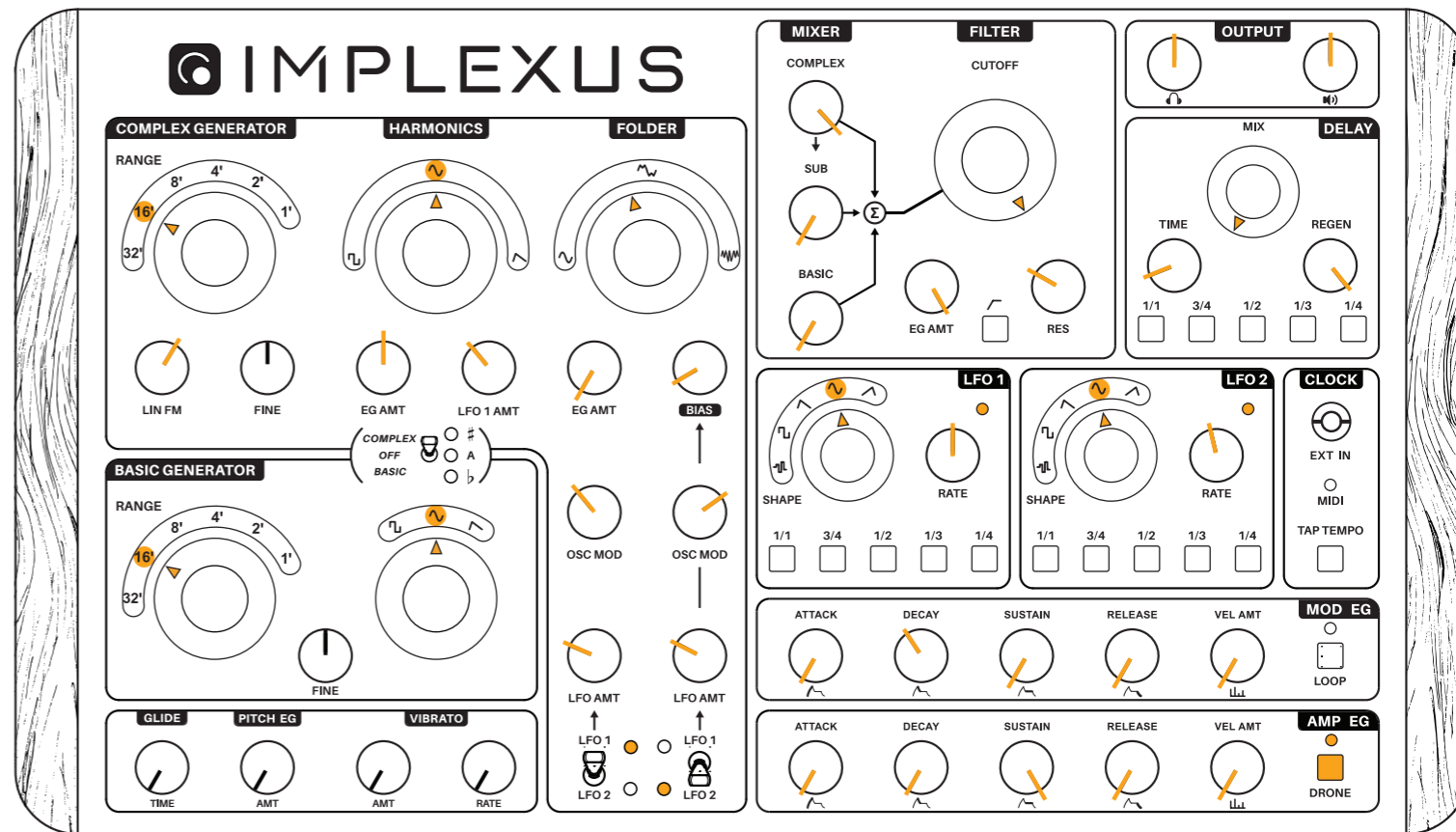
PATCH: "Didgeridrone"

In this patch example we will play with audio rate modulations to create a "didgeridoo" like drone.

Tune the **COMPLEX GENERATOR** and the **BASIC GENERATOR** to an 'A' note in **RANGE 16'**. For this you can use the onboard tuner. Don't forget to turn on **DRONE** mode and turn the **SUSTAIN** control of **AMP EG** fully clockwise.

Now set all controls as shown in the image on the right.

Try to tune the **BASIC GENERATOR** as close as possible to the **COMPLEX GENERATOR**. Play a bit with the tuning of the **BASIC GENERATOR** to create some nice (beating) sounding modulations. You could set the delay as shown in the image on the right. Turn the **MIX** control fully clockwise to create a stereo phazing like effect. One could also try to play with the **FINE**, **RANGE** and **WAVE SELECT** controls of the **BASIC GENERATOR** for different modulation results.



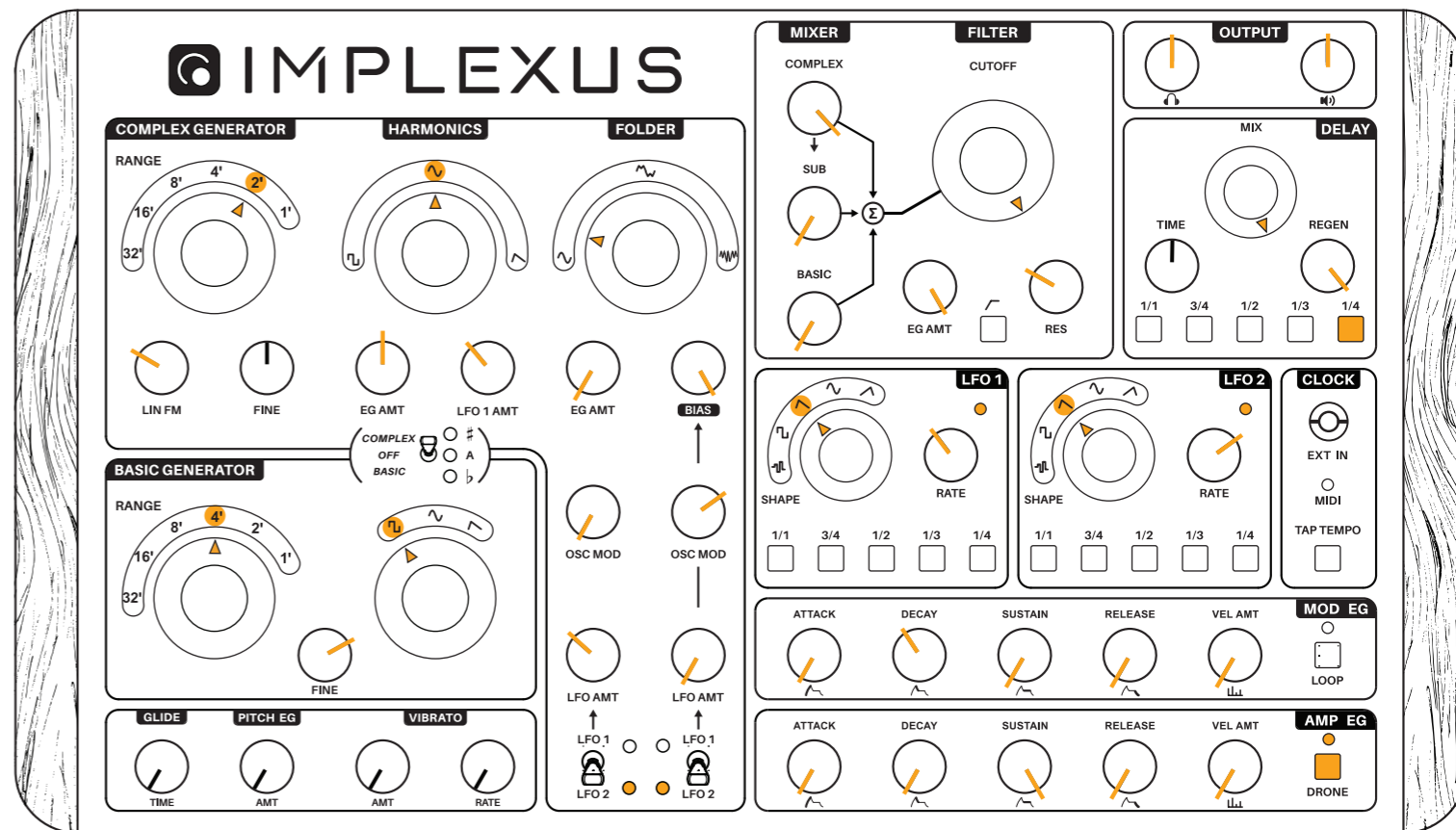
PATCH: "Haunting metals"

In this example we will play with some modulation and the delay to create a "haunting" drone of metallic sounds that would be good sound design for a horror movie.

Don't forget to turn on **DRONE** mode and turn the **SUSTAIN** control of **AMP EG** fully clockwise.

Now set all controls as shown in the image on the right.

One could try to play with the **RANGE** control of the **COMPLEX GENERATOR** and try tapping in some different tempos using the **TAP TEMPO** button. You could also use a MIDI controller to play different notes!

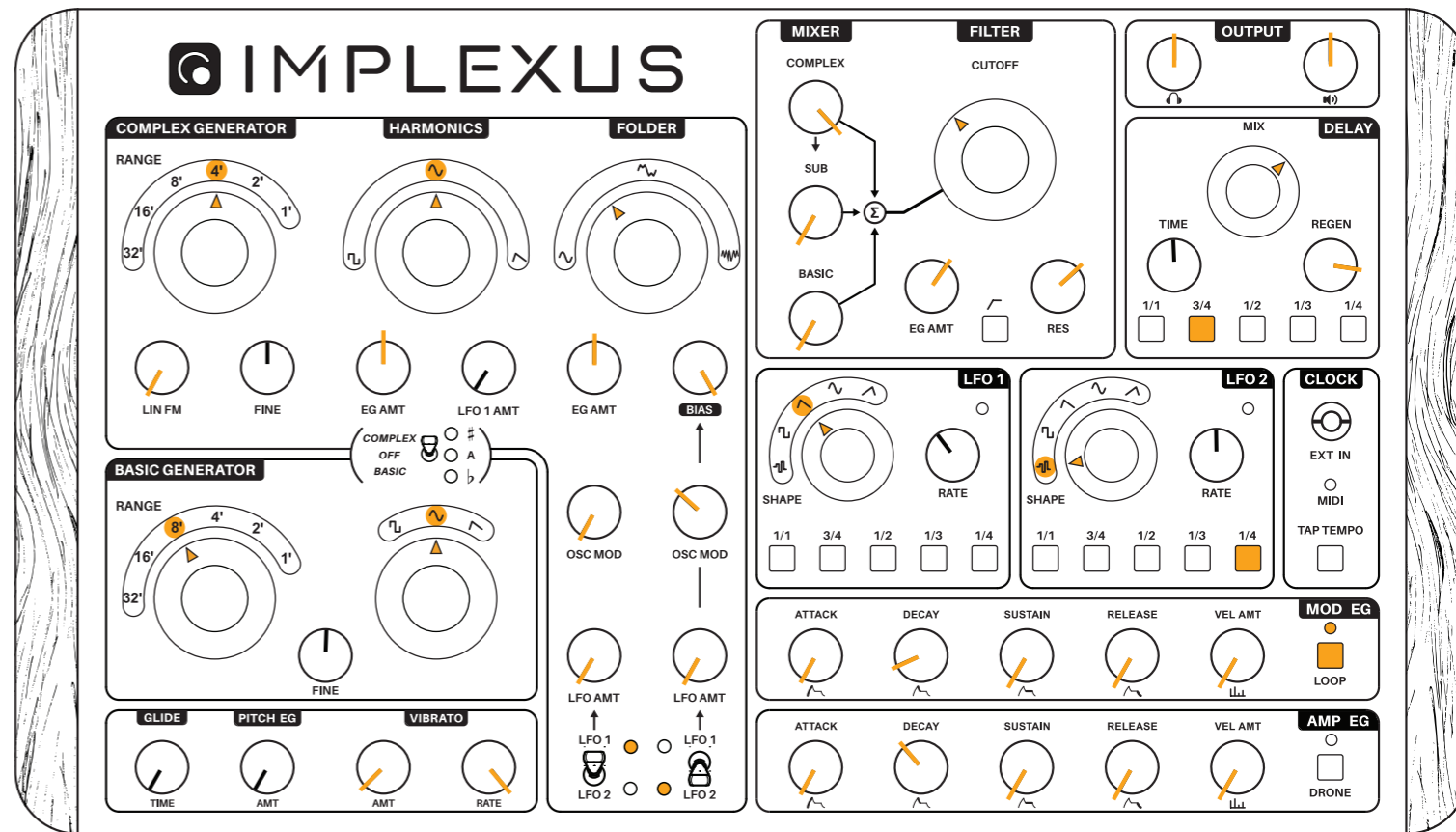
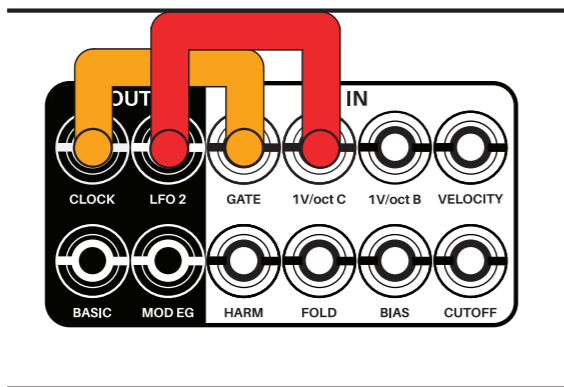


PATCH: "Wonky sequences"

In this example we will use two extra patch cables to create a clock synchronized random sequence.

Now set all controls as shown in the image on the right and connect two patch cables as shown in the image below.

Because the **CLOCK** output triggers the envelopes via the **GATE** input, we don't need the **DRONE** mode to be activated to create sound. The clock synchronized **LFO 2** is set to **RANDOM** waveform so that it sends random values to the **1V/OCT C** (Global pitch) input. The **TAP TEMPO** now controls the speed of the random sequence.

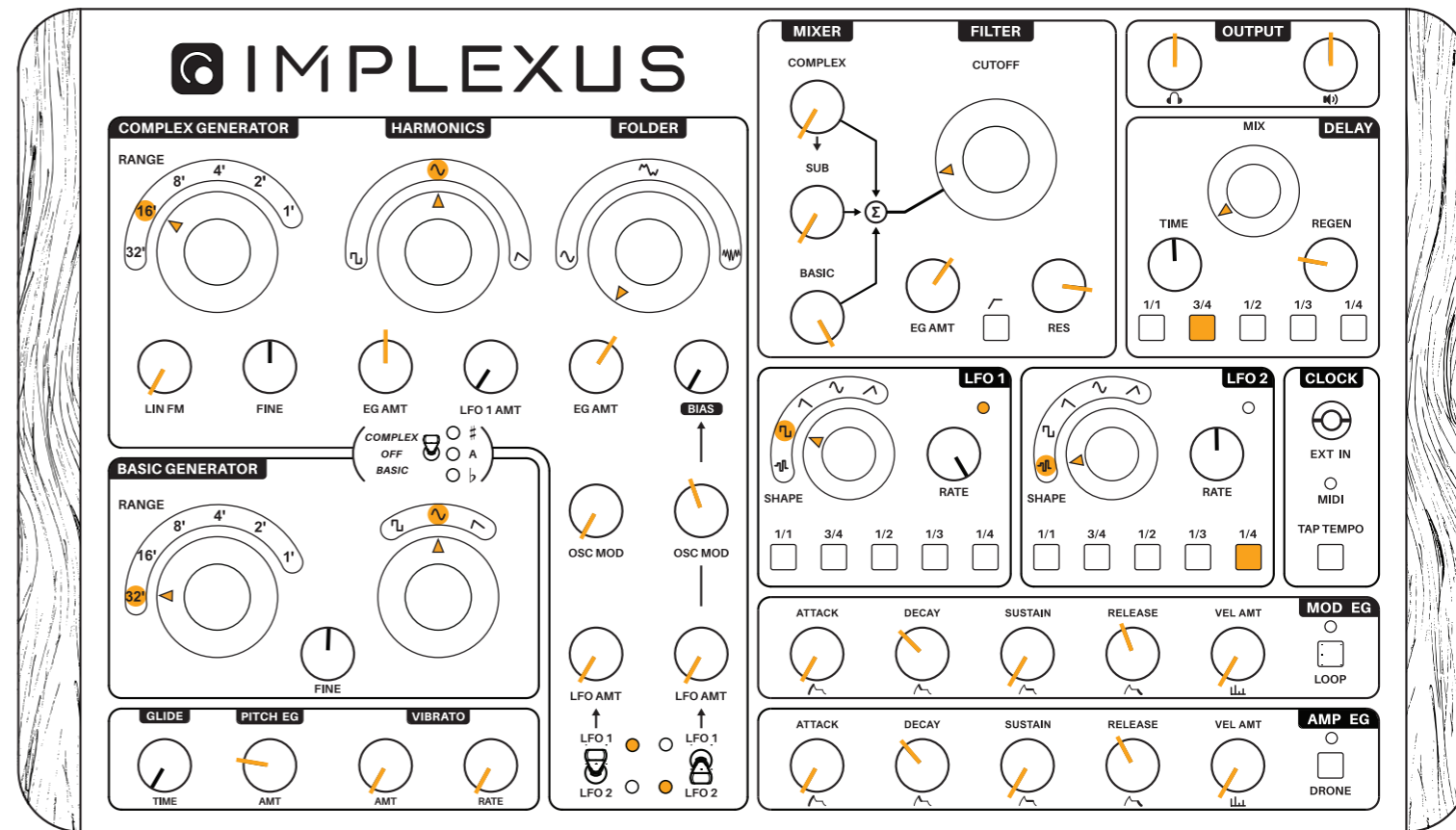
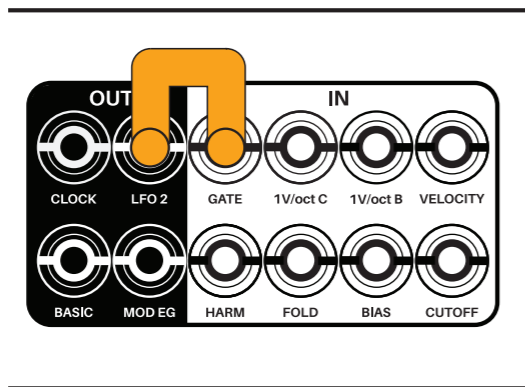


PATCH: "Random kicks"

In this example we will use a patch cable to create kick drum sounds at random moments.

Now set all controls as shown in the image on the right and connect the patch cables as shown in the image below.

The **LFO 2** output signal will output from random values every 1/16 note. Because the **LFO 2** output is patched to the **GATE** input, Kick sounds will occur only when the random value of **LFO 2** is high enough to trigger the envelope generators.

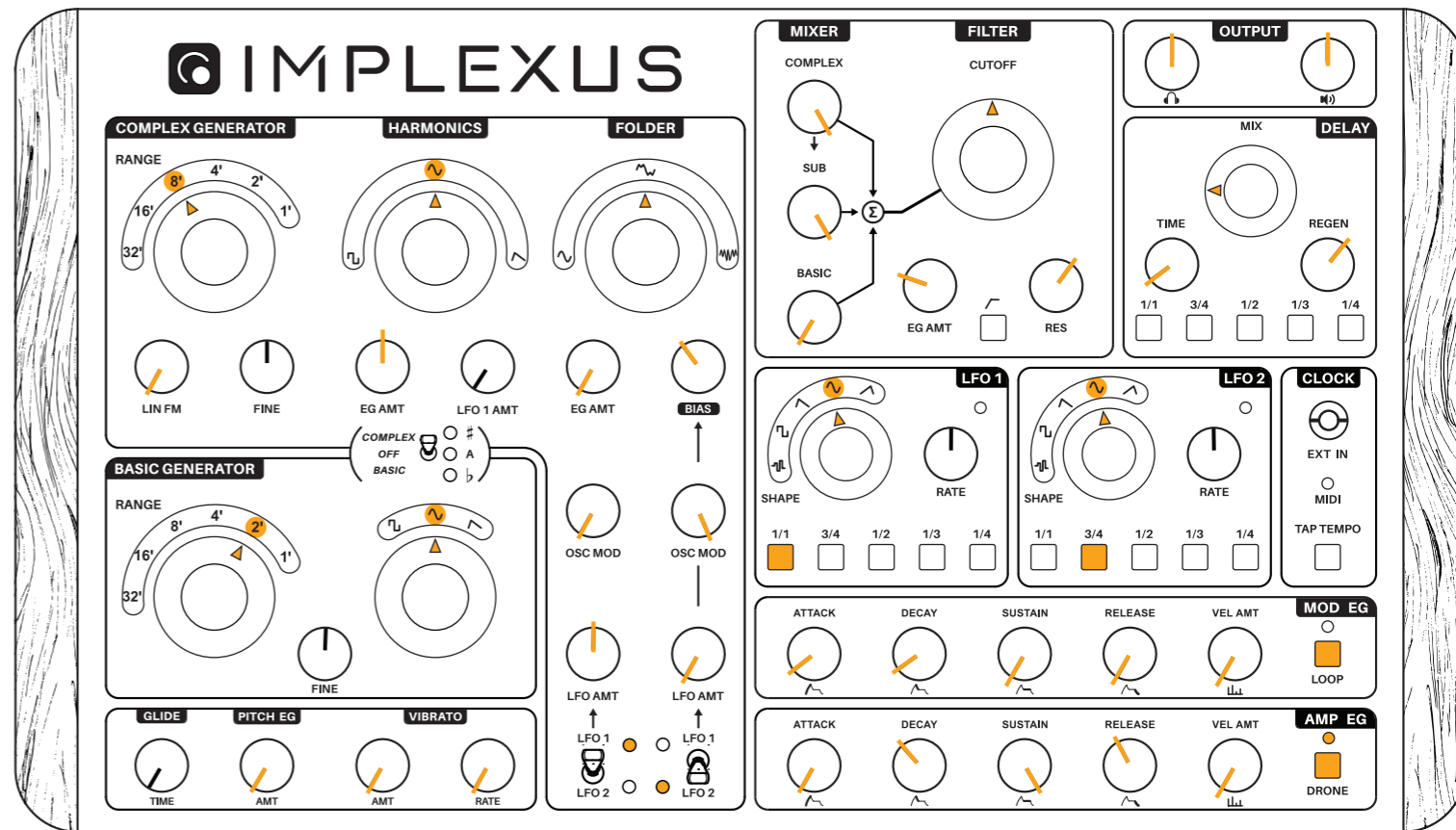
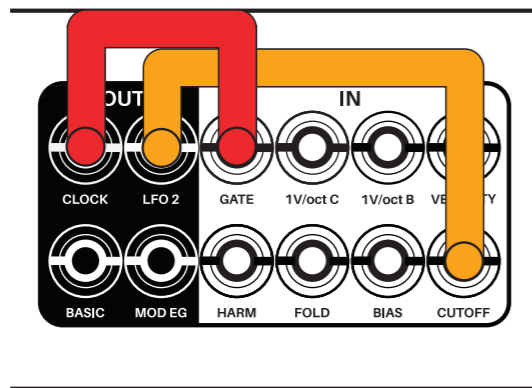


PATCH: "Robotic wobble"

In this example we will use two patch cables to create a robotic wobble sound.

Now set all controls as shown in the image on the right and connect two patch cables as shown in the image below.

The **LFO 2** output is patched to the **VCF CUTOFF** input. Both **LFO 2** and **MOD EG** can now control the **VCF CUTOFF**. Having **MOD EG** in **LOOP** mode, causes the **MOD EG** to behave as an **LFO**. This creates a more complex modulation signal, because the **LFO 2** and **MOD EG** signals are adding up



FIRMWARE UPDATE PROCEDURE

The firmware of the IMPLEXUS can be updated via MIDI system exclusive (SysEx) messages. To do so, you can use either the DIN or USB MIDI input connection, but we recommend using the USB connection.

SYSTEM EXCLUSIVE MIDI MESSAGES

To update the IMPLEXUS firmware you will need a way to send MIDI SysEx messages to the IMPLEXUS. The simplest way is to install a MIDI utility applications on your PC and use the USB connection to send the SysEx file. There are multiple free PC applications that can do this. We can recommend using "Snoize - SysEx Librarian", "C6 - SysEx manager" or "MIDIox - SysEx manager", but basically any program that can be used to send large¹ SysEx files should do the job!

PERFORMING A FIRMWARE UPDATE

The steps to perform a firmware update are as follow:

Step 1: Download the latest IMPLEXUS firmware from www.majella-audio.com

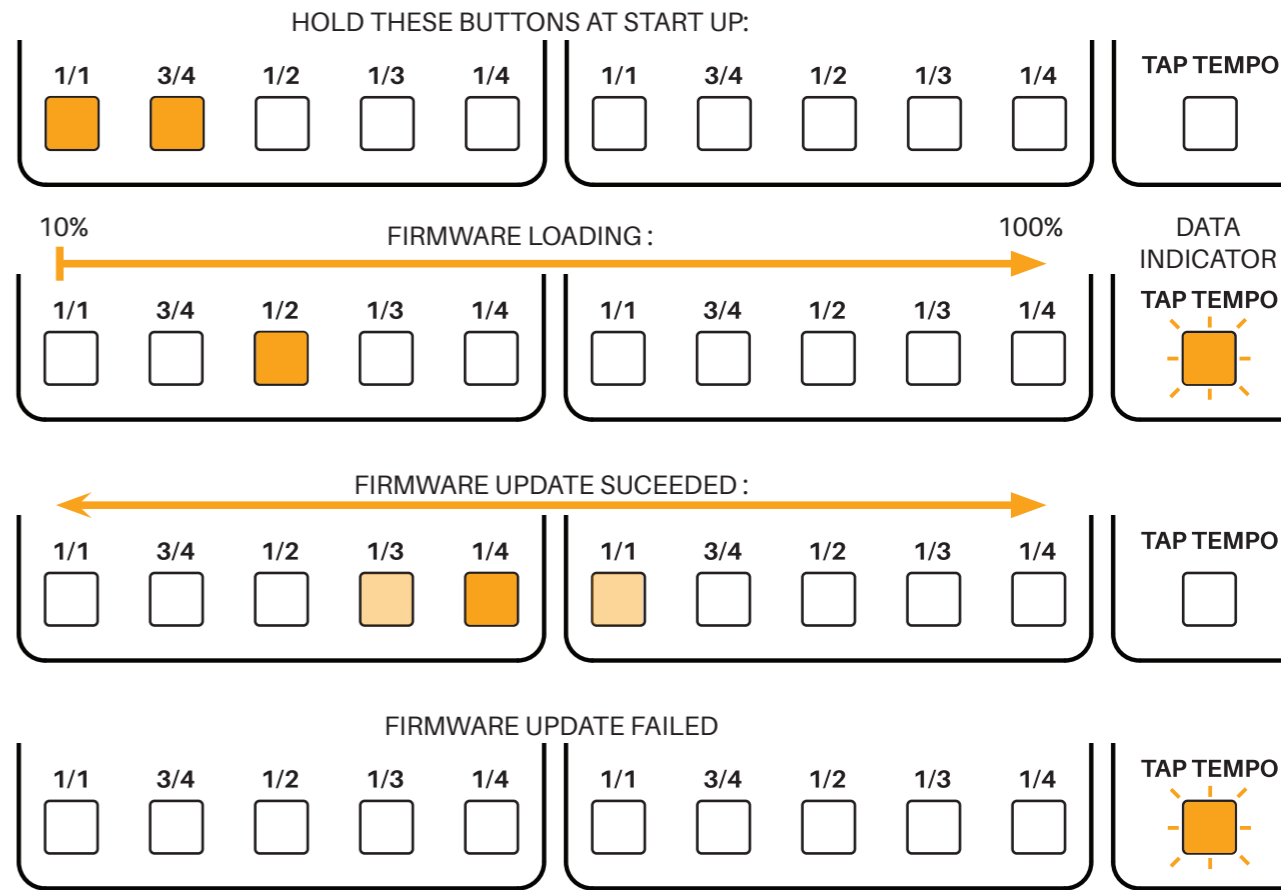
Step 2: Power on the IMPLEXUS while holding the 1/1 and 3/4 buttons of LFO 1. The IMPLEXUS should now start up without blinking LEDs. This indicated the IMPLEXUS is ready to receive messages.

Step 3: Connect the USB cable or MIDI cable to the device (Host) sending the SysEx file.

Step 4: Send the IMPLEXUS firmware via MIDI to the IMPLEXUS. The Tap Tempo button will indicate incoming data and the LFO division buttons will indicate the progress in steps of 10%.

Step 5: Success: When the firmware update is successfully completed the LFO buttons will do a running light sequence.

Failed: In case the update routine failed, the Tap Tempo will blink with a constant period. In this case IMPLEXUS will go back to the old Firmware version. You can retry the firmware update² starting at step 1. For extra tips, see page 54.



¹ Some applications / devices do not allow you to send large SysEx files (sometimes they will even end the data transmission without any notification/warning). Make sure your application / device is capable of doing so.

Some applications / devices allow you to decrease the data transmission speed within the application. Reducing the data transmission speed might help with a stable firmware updating routine in case of one or more failed attempts.

² In case of one or multiple failed attempts, please check the cable connections and make sure that they are connecting properly. If every connection seems to be fine, you might want to use a different software and a different cable.

If the above does not work, please contact: support@majella-audio.com and we will help you out!

majella

Music is to be heard and to be experienced. Sound design is part of that experience. The “imperfections” of analogue electrical instruments result in lively, organic and unexpected sounds. Our mission is to control these imperfections musically, to create instruments that keep inspiring you to make music.

~Majella Audio~

Majella Audio | the Netherlands | Website: www.majella-audio.com | email: support@majella-audio.com

