



 **MASSIVE X**

Routing

 **NATIVE INSTRUMENTS**

THE FUTURE OF SOUND

1. ROUTING

MASSIVE X is a semi-modular synthesizer with an open architecture. This means you can freely arrange and connect its modules to facilitate a wide range of different synthesis techniques, giving you the freedom to design and explore sounds without constraints.

You can use and combine techniques like wavetable synthesis, phase modulation (PM, also called FM or frequency modulation), subtractive synthesis, physical modelling and various types of wave shaping, or distortion.

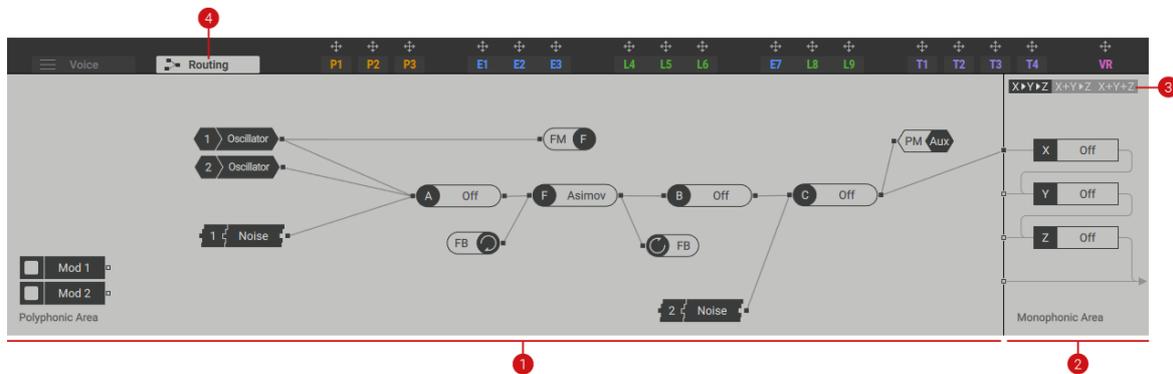
Modules are arranged and connected on the Routing page. Here you can combine all of MASSIVE X's sound generators and processors to create your sound.

2. OVERVIEW OF THE ROUTING PAGE

The following overview shows the Routing page's two main areas, the **Polyphonic Area** and the **Monophonic Area**. The Polyphonic Area is used to define the signal path that is processed independently for every single voice you play. The Monophonic Area contains three Stereo Effects that are globally applied to the sum of all polyphonic voices.



MASSIVE X opens with the preset **Init - Massive X**, which offers a pre-configured routing as shown in the screenshot below (based on subtractive synthesis with Wavetable oscillators). This way you can immediately start creating sounds without having to make connections. Alternatively, you can load the preset **Init - Massive X Blank** to start with a blank routing and make your own connections from scratch.



(1) **Polyphonic Area**: Contains modules that you can use to define the signal path of the polyphonic voices. In order to complete the signal path, one or more module outputs need to be connected to the inputs of the Monophonic Area (2). The following modules can be found in the Polyphonic Area:

- **Generators and processors**: The Oscillators, Noise sources, the Filter, and the Insert Effects are available in the Polyphonic Area. Black modules represent generators, gray modules represent processors. The icons shown on the modules can also be found on the corresponding module panel. For more information, see [Generators and Processors](#).
- **PM Aux bus**: Makes the phase modulation inputs of the Oscillators accessible in the routing. This way you can use any source in the signal path to apply phase modulation to the Wavetable oscillators and experiment with noise, feedback, and effects in this application. For more information, see [PM Aux Bus](#).
- **FB (Feedback) loop**: Makes the global feedback loop accessible in the routing. This way you can create a polyphonic feedback loop around modules to add chaotic and non-linear behavior. This feature is also useful for physical modeling sounds, especially when combined with the Comb filter. For more information, see [Feedback Loop](#).
- **Mod (Modulation) sources**: Any Modulator can be assigned to the Modulation sources by dragging and dropping. This way you can use the Modulators as generators in the signal path. For example, you can use the Switcher LFO in OSC mode as an additional oscillator, or the

Exciter Envelope as an exciter for the Comb filter. For more information, see [Modulation Sources](#).

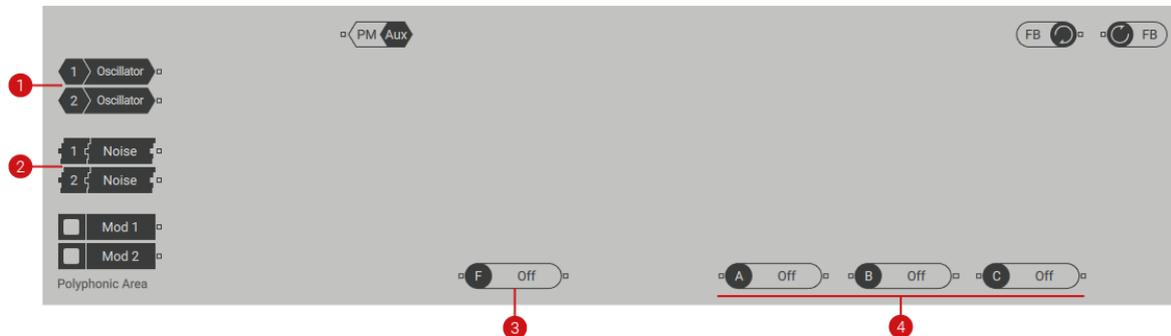
(2) **Monophonic Area:** Sums the polyphonic voices and applies the three Stereo Effects X, Y, and Z before sending the output signal to the host. The Monophonic Area provides four inputs, one for each Stereo Effect as well as a single input that is directly sent to the host.

(3) **Routing Options:** Three different routing options define the order of the effects in the signal path: **X > Y > Z** chains the three effects, **X + Y > Z** sends the sum of the X and Y effects to the Z effect, and **X + Y + Z** sums all three effects.

(4) **Routing:** Opens the Routing page in the editor.

3. GENERATORS AND PROCESSORS

The generators and processors available in the Polyphonic Area of the Routing page are the basic components you can use to build your sound. They consist of the Oscillators, Noise sources, the Filter, and the Insert Effects.



(1) **Oscillators:** The Wavetable oscillators 1 and 2 are generators that each feature a single output. They can be connected to the processors and buses in the Polyphonic Area, or directly to an input of the Monophonic Area.

(2) **Noise sources:** The Noise sources 1 and 2 are generators that each feature a single output. They can be connected to the processors and buses in the Polyphonic Area, or directly to an input of the Monophonic Area.

(3) **Filter:** The Filter is a processor that features a single input and a single output. It can be connected to the generators, processors, and buses in the Polyphonic Area, or directly to an input of the Monophonic Area. The Filter types Asimov, Blue Monark, Groian, Scanner feature a special FM bus in the routing:



You can connect any source in the signal path here to apply audio rate modulation to the filter frequency, also called filter FM (frequency modulation). Filter FM produces rich harmonics and distortion effects.

(4) The three Insert Effects A, B, and C are processors that each feature a single input and an single output. They can be connected to the generators, processors, and buses in the Polyphonic Area, or directly to an input of the Monophonic Area. By selecting OSC or PM OSC for the Insert Effects, you can also use them as generators.

4. PM AUX BUS

The PM Aux bus makes it possible to use any source in the signal path to apply phase modulation to the Wavetable oscillators. For example, you can experiment with noise, feedback, and effects in this context.

The PM Aux bus has a dedicated module in the Polyphonic Area of the Routing page and additional controls on the panel of the Wavetable oscillators:



(1) **Aux assignment:** Assigns the signals received at the input of the PM Aux bus in the Polyphonic Area of the Routing page to the corresponding Wavetable oscillator.

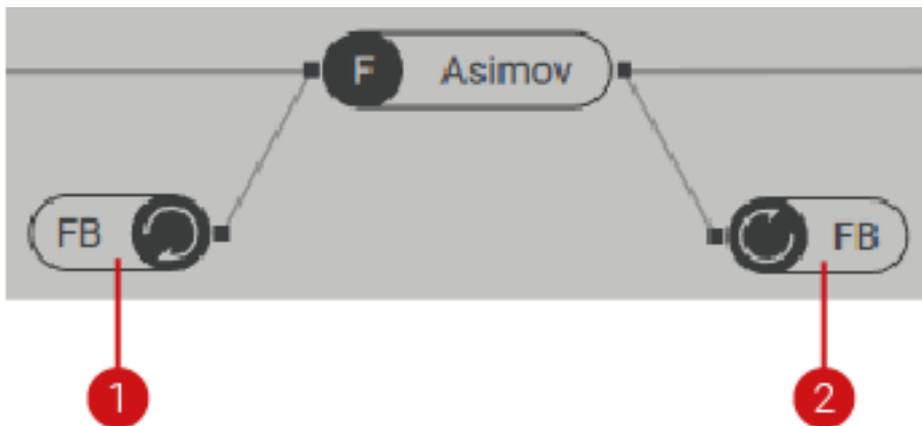
(2) **Aux modulation amount:** Adjusts the amount of phase modulation applied from the PM Aux bus to the Wavetable oscillators.

(3) **PM Aux bus:** This bus features a single input that sends signals to the phase modulation function of the Wavetable oscillators. It can be connected to the generators and processors in the Polyphonic Area.

5. FEEDBACK LOOP

The Feedback loop in the Polyphonic Area of the Routing page facilitates a connection from an output of a module to its input. Any number of modules can be chained in the feedback loop. This way you can add chaotic and non-linear behavior to the sound. The Feedback loop is also useful for physical modeling sounds, especially when combined with the Comb filter. Note that the Feedback loop is polyphonic, meaning it is processed independently for every single voice you play. This way you can play chords and overlapping notes with your feedback sounds.

The Feedback loop can be freely connected in the Polyphonic Area of the Routing page by using the two **FB** modules:



(1) FB (feedback) loop output: This bus features a single output that receives signals from the Feedback loop input. It can be connected to the generators, processors, and buses in the Polyphonic Area.

(2) FB (feedback) loop input: This bus features a single input that sends signals to the Feedback loop output. It can be connected to the generators and processors in the Polyphonic Area.

In the example above, the output of the Asimov filter is connected to the **FB** input (**2**), and the **FB** output (**1**) is connected to the input of the Asimov filter. This creates a feedback loop around the filter, making it sound distorted and behave in unexpected yet interesting ways.

5.1. Feedback Level Control

To control the amount of feedback, you can use the **FB** level control in the Amplifier module panel:



(1) **FB (feedback) level:** Adjusts the level, or volume of the Feedback loop. This way you can control the chaotic behavior and distortion produced by the feedback.

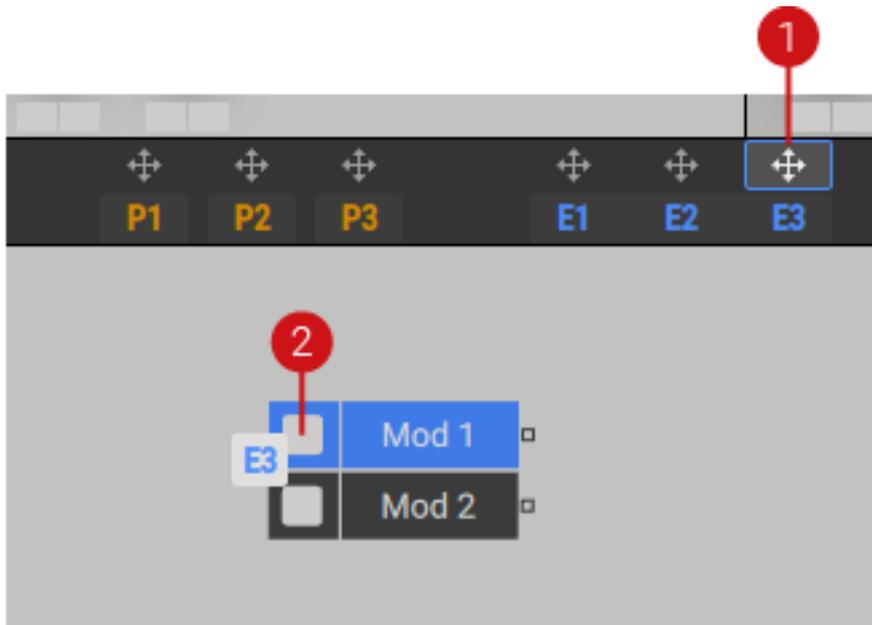
(2) **High-pass filter:** Enables a high-pass filter that cuts low frequency content in the Feedback loop. When activated, you can avoid overloading the Feedback loop with excessive bass.

6. MODULATION SOURCES

The Modulation sources in the Polyphonic Area of the Routing page make it possible to use any of MASSIVE X's Modulators as generators in the signal path. For example, you can use the Switcher LFO in OSC mode as an additional oscillator, or the Exciter Envelope as an exciter for the Comb filter.

To assign a Modulator to a Modulation source in the Polyphonic Area:

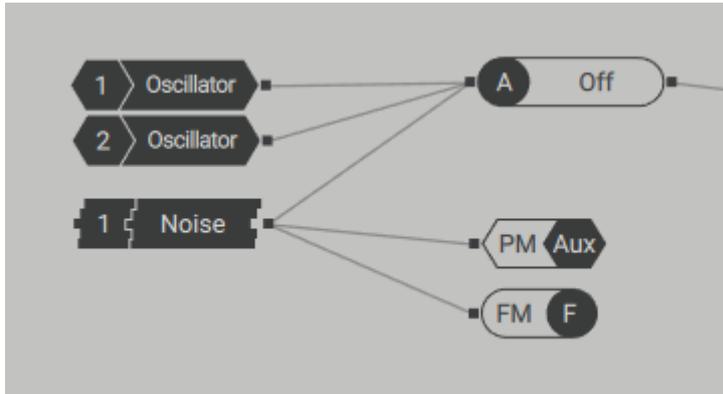
1. Click the Modulator's arrow icon (1) to select it, then click on the Modulation source slot (2) in the Polyphonic Area to assign it.



The signal produced by the Modulator is now sent from the Modulation source's output and can be used anywhere in the signal path.

7. USING THE ROUTING PAGE

On the Routing page, you arrange and connect the individual building blocks, or modules, that make up the synthesizer. Connections between the modules' inputs and outputs are established using wires. Outputs can be connected to any number of inputs and vice versa. This way you can distribute signals to multiple destinations or mix multiple outputs into the same input:



7.1. Routing Workflows

To make a connection between modules:

1. Click on an output to show all available inputs it can be connected to.
2. Click on the input you want to connect the output to.



Alternatively, you can click and drag from an output to an input to connect them.

To make an exclusive connection to an input, meaning that all existing connections to the input will be removed:

1. Click on an output to show all available inputs it can be connected to.
2. Right-click on the input you want to connect the output to exclusively.

To delete a wire:

- Double-click the wire you want to remove.

To delete all connections from a module:

- Double-click the module that you want to remove all connections from.

You can also disable, or bypass any number of modules directly on the Routing page. This provides a quick way of listening to the effect a generator or processor is having on the sound.

To bypass a module while keeping its connections intact:

- Right-click the module you want to bypass.

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