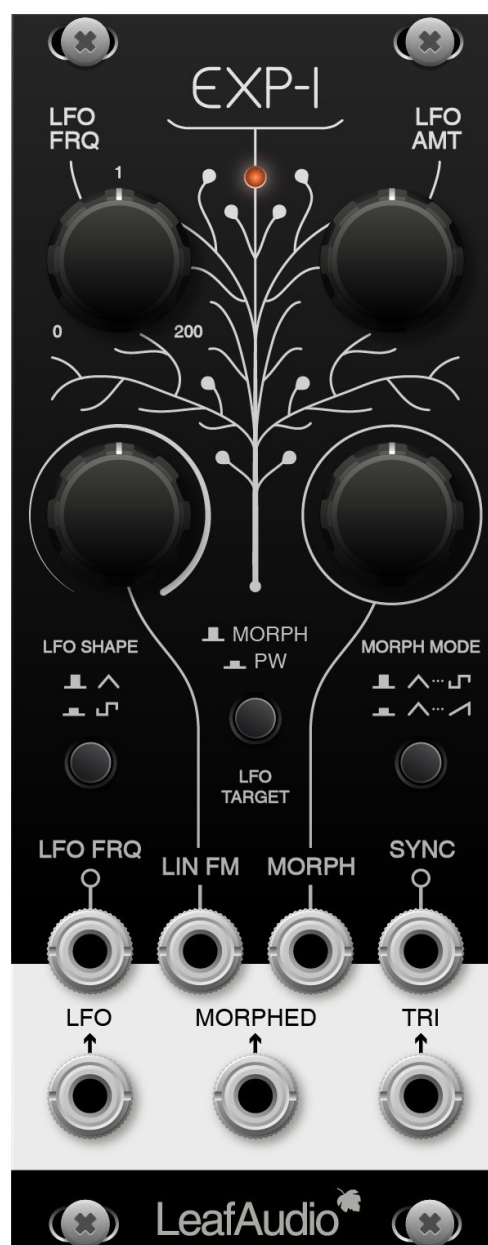# LeafAudio

EXP-1

VCO-1 Expander

Manual

Version 1.3 – KW32'2018

First things first

RTFM

Please do yourself and us a favor and read the manual! If you only spend a tenth of the time we invested in writing, you will be able to operate the device perfectly. In case you are sitting in front of many tiny components: Please read the instructions for the DIY kit first!

Intended Use / Basic Function

The EXP-1 is designed to operate within a modular synthesizer (Eurorack standard). EXP-1 is aan expander module for VCO-1 and is linked to it by an 8-pole ribbon cable.

Safety Instructions

The EXP-1 module is not intended for operation in or under water or at high humidity. Conductive and/or corrosive liquids, gases, aerosols or vapours may damage or destroy the equipment, regardless of its operating condition. The same applies to fires or temperatures above 85°C/185°F. The EXP-1 is designed to operate on a symmetrical DC voltage of +/- 12V.

A suitable power supply unit is absolutely necessary for operation, which provides a safe extra-low voltage that is galvanically isolated from the mains supply.

Avoid mechanical stress, shocks or strong vibrations.

Always use signal sources and destinations for the EXP-1 that meet the levels and requirements of the Eurorack standard. Never connect headphones or consumer hi-fi devices to the module!

Contact / Responsible

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Disposal

For private households: Information on Disposal for Users of WEEE

This symbol (figure on the right) on the product(s) and / or accompanying documents means that used electrical and electronic equipment (WEEE) should not be mixed with general household waste. For proper treatment, recovery and recycling, please take this product(s) to designated collection points where it will be accepted free of charge. Alternatively, in some countries, you may be able to return your products to your local retailer upon purchase of an equivalent new product.

Disposing of this product correctly will help save valuable resources and prevent any potential negative effects on human health and the environment, which could otherwise arise from inappropriate waste handling.

Please contact your local authority for further details of your nearest designated collection point.

Penalties may be applicable for incorrect disposal of this waste, in accordance with you national legislation.

For professional users in the European Union

If you wish to discard electrical and electronic equipment (EEE), please contact your dealer or supplier for further information.

For disposal in countries outside of the European Union

This symbol is only valid in the European Union (EU). If you wish to discard this product please contact your local authorities or dealer and ask for the correct method of disposal.

Please think of our planet! Repair, resale or

upcycling are always better than final disposal.

Specifications:

Width:	10 HP/TE, w/4 Schroff-Holes
Depth:	35mm (1,38"), Two stacked PCBs
Weight:	165g (5,82oz)
Power demand:	+12V rail: 16mA -12V rail: 18mA
LFO:	0,0Hz – 200Hz with bi-polar LED Triangle or Pulse
Waveforms:	Triangle Morph Tri/Saw or Tri/Pulse with VCO-1
Controls:	LFO frequency 0-200Hz LFO to FM / Ext to FM attenuator LFO to PWM / LFO to Morph amount Morph manual offset LFO shape tri/pulse LFO target Morph/PW Morph mode Tri/Pulse or Tri/Saw
I/Os:	LFO CV input, Lin FM input, Morph input, Sync input LFO output, Triangle output, Morphed output

Thanks

THANKS for purchasing the EXP-1 and supporting us!

A few words about our philosophy: In contrast to many other DIY manufacturers, we produce our front panels and printed circuit boards in Germany. Local companies pay local people salaries and comply with the high local environmental regulations. We see this as a contribution to the environment and the economy - locally and globally. Furthermore, we only use high-quality materials and durable parts. Practices such as planned obsolescence are absolutely out of the question for us. We hope that our customers will appreciate this and support us in doing so, even if it costs us and them slightly more.

Installation

For connecting EXP-1 to VCO-1 via link cable, please make sure you read the note at the very end of the manual! Right polarity is extremely important here!

But before we start: Safety first! Please disconnect your Modular System from mains power.

Secondly, ensure your bus board complies with the Eurorack standard (connector pinout and voltage) and the power supply has sufficient power.

Double check the polarity of the ribbon cable and its proper connection (direction and offset). The red stripe must be attached to the -12V rail, both on the bus board and on the module side!

The module has a protective circuit (crowbar) which protects the module from polarity reversal for a short time.

After you connected everything, double checked it and closed your system so no power lines can be touched by your hand, turn on your system and test the module.

We do not accept any responsibility for damage to the module or system caused by improper installation.

Usage

EXP-1 is linked to VCO-1 by an 8-pole ribbon cable. Both modules can exchange signals then and work as one complex oscillator unit. The LFO can modulate VCO-1's frequency or pulsewidth for example. Or external sound sources can sync VCO-1 via EXP-1's sync circuit etc. Most of this functions should be quite familiar to modular users and need no further explanation. So hopefully the picture below will do the job.

Some things were important to us, as we are also musicians ourselves: We scaled the LFO Frequency knob in a way, that 50% of the knob's way cover 0Hz to 1Hz and the other 50% cover 1Hz to 200Hz. So you are able to adjust the lower frequencies very precise, this is what makes it very musical. Another thing is high quality switches, potentiometers, knobs and the size of 10 HP per module instead of shrinking it down. We wanted a module which is sounding great, but also fast and flexible to use and a real joy to work with instead of fiddly. There are some internal routings and possibilities, but at the same time it is easy to use.
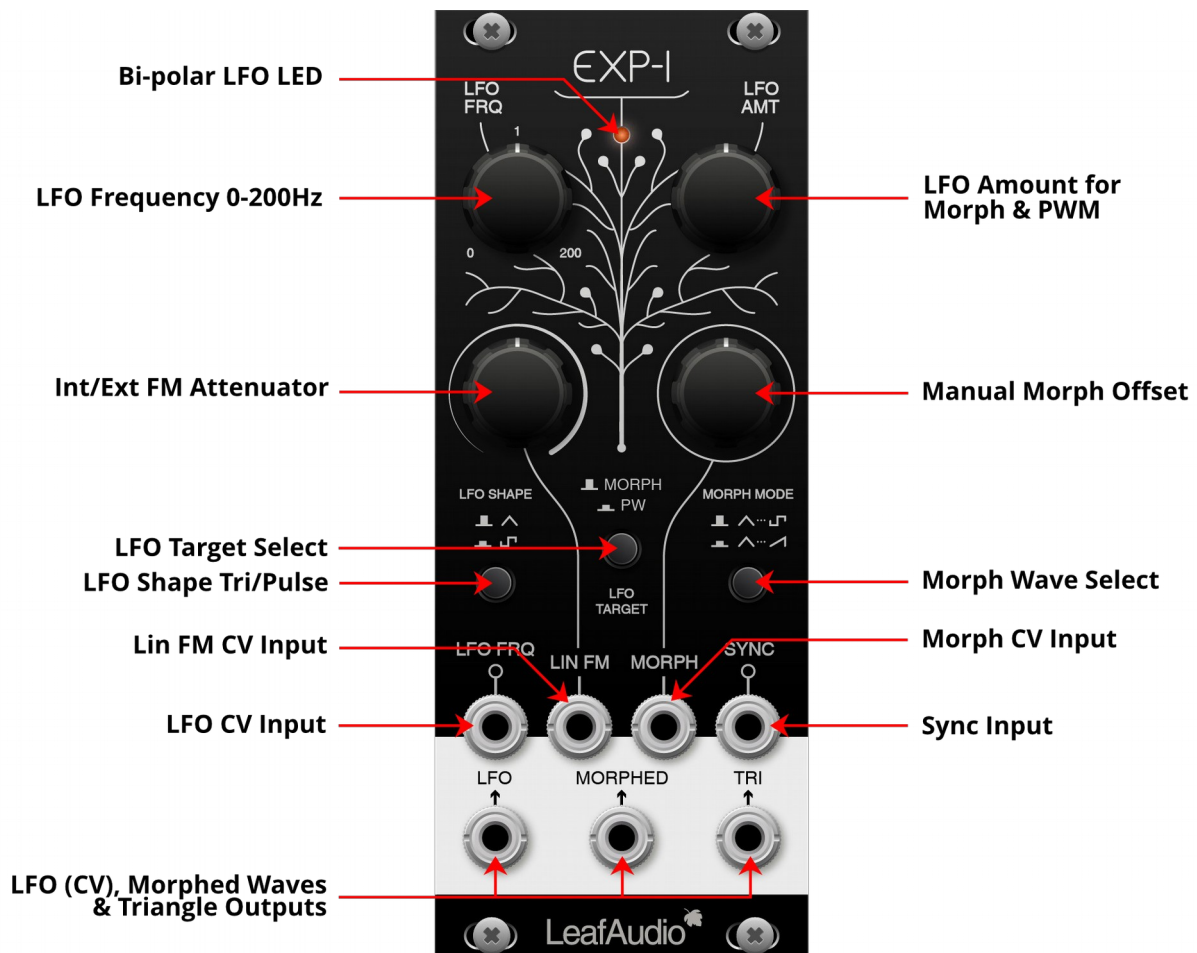
Adjusting the LFO Low Limit

By the trimmer R8 you can adjust the lowest frequency of the LFO when LFO FREQ is set fully left. You have to do it once after finishing the DIY kit.

You can adjust it to your taste, but it also affects the frequency which the LFO generated when LFO FREQ is set at the 1Hz mark. Turn LFO FREQ fully left and adjust the trimmer with a small screwdriver while watching the LED. You can set the low limit to something like 0,1Hz or really go down until it stops.

For connecting your VCO-1 to EXP-1, please read

the info on the next side!

Please read the following info for connecting your VCO-1 to EXP-1:

EXP-1 v1.3 is released at the same time as VCO v1.4, but also works with older VCO-1 versions.

If the conection is reversed, some components might blow up. But even that can be repaired quite easily then.

VCO-1 v1.4 and EXP-1 v1.3: The link connectors on both PCBs show a mark on the silk screen print at one corner of the connector. It is kind of a bracket around one corner. This is where the red stripe of the link cable sits on both modules. See the pictures on the right, please.
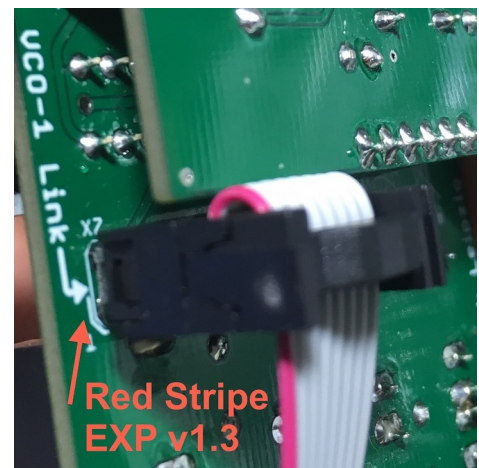
VCO-1 lower than v1.4 with an EXP-1: On the EXP side it's the same as above. On VCO-1 v1.0a and v1.1 red stripe faces south- or downwards, regardless which signs or numbers are written there! Check the compass rose to identify „south".