

EXP-1 v1.3 BuildGuide

Thank you for purchasing this DIY module! Building DIY kits happens on your own risk and we cannot give any support. Please make sure you read this building instructions and the user manual entirely before you start, which both are part of the module and can be downloaded via Exploding Shed. Also make sure that your skills meet the difficulty of the DIY kit and you have a basic knowledge about soldering. Watch soldering tutorials and download the manuals here: www.exploding-shed.com/info

EXP-1 is an expander module for our VCO-1, a voltage controlled oscillator for the Eurorack modular system. VCO-1 is the core module and EXP-1 adds many functions: Sync, lin. FM, LFO, Wave Morphing etc.

DIY Level: Medium / Advanced. A successful assembly is only possible if you have some basic DIY skills, experience and good tools. The success is based on your skills, besides our workshops we don't offer any support. The DIY kit can be assembled by halfway experienced DIYers in about 2-4h. After assembly the LFO's low frequency limited has to be adjusted manually, which is easy. This procedure is described in the user manual which can be downloaded here www.exploding-shed.com/info.

Needed tools: Good soldering iron (min 75W), solder, de-soldering pump, wirecutter, flat-nosed pliers, wirestripper, much light, maybe a multimeter and possibly and a magnifying glass. Recommendations for good tools you can find here www.exploding-shed.com/info and we also sell some tools there (EU only).

Completeness: Despite all care it might happen from time to time, that a part is missing or wrong, because we assemble our kits by hand. In such a case please contact mail@leaf-audio.com or Exploding Shed and we will find a solution.

Power: Like all Eurorack modules, the EPX-1 is running on symmetrical power of +12V, -12V and GND. It is connected via the included ribbon cable, please check the polarity written on the PCB. Usually the red stripe is -12V.

Connecting EXP-1 to VCO-1: To link the two modules, we use an 8-pole ribbon cable, which is included in the EXP-1 DIY kit. Correct polarity is very important here and details about this can be found in the VCO-1 and EXP-1 user manual. Please download and [read before you connect](#) and power up your modules, so nothing gets damaged!

Connectors and Controls:

Controls:	Connectors:
LFO frequency 0-200Hz	LFO CV input
LFO to FM / Ext to FM attenuator	Lin FM input
LFO to PWM / LFO to Morph amount	Morph input
Morph manual offset	Sync input
LFO shape tri/pulse	LFO output
LFO target Morph/PW	Triangle output
Morph mode Tri/Pulse or Tri/Saw	Morphed output

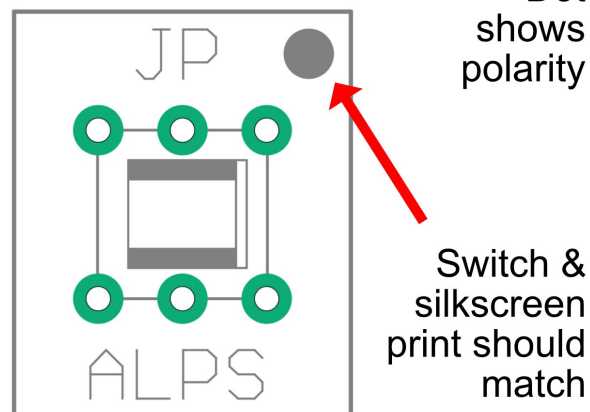
Adjustment of the LFO Low Limit: By the trimmer R8 you can adjust the lowest frequency of the LFO when LFO FREQ is set fully left. You have to do it once after finishing the DIY kit. Please download the user manual, which describes the procedure in detail www.exploding-shed.com/info.

Assembly: For this DIY kit the same rules apply as for any other DIY kit. All the bags with parts are labelled very well, you find all needed info there and on the silkscreen print on the PCB itself. Stuff like polarity of parts etc, all is noted there.

Generally it makes sense to start with the most flat components and then take the next higher ones.

1. Small Resistors
2. Diodes, Resistors, Inductivities
3. Small Capacitors
4. IC holders
5. Transistors
6. Big polarized Capacitors
7. Trimmers
8. Pin Headers for Bus, VCO-1 link and connection to the stacked PCB (placed on the backside)
9. Pin Headers on the stacked PCB are placed on the front side, like all other components
10. Potentiometers and Audio Connectors

SWITCHES:



In the next step, ICs are placed in their holders. They have a polarity, which is marked on the silkscreen print, the holder (notch) and also the IC itself (notch or sometimes a dot).

Before you power up the module, please check all solder joints if they look clean, good contact and no short circuits. Additionally you can use a multimeter to check for short circuits between the plus and minus and GND pins on the power connector. Also check the polarity of parts again.

If you are sure that everything was done correctly, you are ready to power it up for testing. Check if it generates audio and all controls work as intended.

If it works, you can mount it behind the panel now and go on with

1. adjusting the Low Limit of the LFO

Please read the user manual, where this steps are explained in detail. You can download it here www.exploding-shed.com/info.

Part	Name	Value	#	Notes	Info
ICs					
OTA	IC1	LM13700	1	Polarity!	
OP Amp	IC2, IC3	TL064	2	Polarity!	
IC Holder	Holder IC1	DIL16	1	Polarity!	
IC Holder	Holder IC2, IC3	DIL14	2	Polarity!	
Voltage Regulator	IC4	uA78L09	1	Polarity!	
Voltage Regulator	IC5	uA79L09	1	Polarity!	
Capacitors					
Film Capacitor	C1	470nF	1	No polarity	Red, Wima MKS-2
Ceramic Disc	C2	4,7nF	1	No polarity	Grid 2,5mm
Elko, axial	C3	10uF	1	Polarity!	
Ceramic Disc	C4	33pF	1	No polarity	Grid 2,5mm
Elko, Low ESR	C5, C10	180µF	2	Polarity!	Red, Würth
X7R Ceramic	C6, C7, C8, C9, C11, C12 C13, C14	100nF	8	No polarity	Grid 2,5mm
Resistors					
Resistor (Mini)	R1, R6, R11, R16, R17 R20, R22, R29	10kΩ	8	No polarity	
Resistor (Mini)	R2, R10, R12, R14, R19 R23, R24, R25, R26	1kΩ	9	No polarity	
Resistor (Trimmer)	R8	2kΩ	1	Polarity!	Type 64Z
Resistor (Mini)	R9	9,1kΩ	1	No polarity	
Resistor (Mini)	R13, R38, R39	100Ω	3	No polarity	

Resistor (Mini)	R18, R28, R31, R33, R36	100kΩ	5	No polarity	
Resistor (Big)	R21	8,2MΩ	1	No polarity	
Resistor	R27	82kΩ	1	No polarity	
Resistor (Mini)	R30	5,1kΩ	1	No polarity	
Resistor (Mini)	R32, R34, R35	68kΩ	3	No polarity	
Resistor (Mini)	R37	33kΩ	1	No polarity	
Potentiometers					
Potentiometer	R3, R4, R5, R15	10kΩ linear	3	Polarity!	ALPS RK09L1140
Nuts, Washers	for R3, R4, R5		3		
Diodes					
Diode	D1, D2	1N4148	2	Polarity!	Ring!
Diode	D3, D4	1N5059	2	Polarity!	Ring!
Zener Diode	ZD3, ZD4	5v1	2	Polarity!	Ring!
Zener Diode	ZD1, ZD2	5v6	2	Polarity!	Ring!
Zener Diode	ZD5	6v2	1	Polarity!	Ring!
LED, bi-color	LED1	red/green	1	Polarity!	2mm LED
Transistors					
	T1, T2	BC556	2	Polarity!	See flat side!
Switches					
Switch	SW1, SW3, SW3	DPDT	3	Polarity!	
Cap for Switch	for SW1, SW3, SW3	White	3		
Diverse					
Inductor Ferrite	L1, L2	10μH / 1,7Ω	2	No polarity	
Audio Connector	X1-X6, X8	Thonkiconn	7	Polarity!	
Nuts (knurled)	for X1-X6, X8		7		
Conector, Male	X13	5-Pin, Double	1	Power Bus	Straight
Conector, Male	X7	4-Pin, Double	1	Link to VCO	Straight
Conector, Male	X12	4-Pin, Single	1		Straight
Conector, Female	X11	4-Pin, Single	1		Straight
Conector, Male	X9	6-Pin, Single	1		Straight
Conector, Female	X10	6-Pin, Single	1		Straight
Conector, Male	X14	7-Pin, Single	1		Straight
Conector, Female	X15	7-Pin, Single	1		Straight
Collet Knob	for R3, R4, R5, R15	15mm, Black	4		
Ribbon Cable	10/16-Pole, 25cm	For Power	1		
Ribbon Cable	8-Pole, 15cm	VCO Link	1		Read additional info before power up!!!
Screws	M3x6		4		

This module was made by:

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