

# DOEPFER MUSIKELEKTRONIK GMBH

## DARK ENERGY II

### Additional technical information

The instructions collected in this document are intended only for experienced users who want to modify or expand the functions of **Dark Energy**. For some of the modifications/expansions the warranty may be void ! Therefore we recommend to ask an authorized Doepfer service partner to carry out the modifications. Any damage (mechanical or electrical) caused by inappropriate handling is not covered by warranty and treated as a repair liable to pay costs.

#### Mechanical connection of several Dark Energy's

Two or more Dark Energy's can be mounted together in two ways:

- with wooden side plates between the units
- without wooden side plates between the units

Procedure:

- Remove the bottom cover of the Dark Energy (four crosshead screws at the edges, screw #5 is just used to fix the Midi socket).
- Remove the interface board by solving the 5 nuts of the jack sockets at the rear panel
- Remove the right side plate of Dark Energy #1 and the left side plate of Dark Energy #2 by loosening of the two screws that are used to hold the side plates. Attention ! A suitable short or angled Philips screwdriver is required ! A long screw driver may damage the screws because of the angle between screw and screwdriver.
- If the two Dark Energy have to be mounted together without side plate between the units the two metal cases are mounted together with suitable screws, nuts and washers (e.g. M3x10 screws). For this the holes are used which were used before to mount the side plates.
- If the two Dark Energy have to be mounted together with a wooden side plate between the units one of the disassembled side plates has to be modified: the two small holes have to be drilled up (e.g. by means of a drill with 3-3.5 mm diameter). In addition a larger hole (about 7 mm diameter) may be drilled if the two units have to be linked via Midi out/in (see next paragraph). The position of this additional hole has to be in line with the position of the large hole in the black metal case. Then the two Dark Energy and the wooden side plate are mounted together by suitable screws, nuts and washers (e.g. M3x20-25 screws). For this the holes are used which were used before to mount the side plates.
- Re-install the interface board and mount the bottom cover.

#### Linking of several Dark Energy's via Midi Out/Midi In

Unfortunately there was not sufficient space for a Midi out socket at the rear panel. But it's possible to link two or more Dark Energy's internally via Midi out/Midi in. For this two pin headers (**JP5** and **JP6**) are available at the supply/interface board (that's the board mounted at the rear panel). They are located on top and bottom of the Midi optocoupler PC900. JP5 is the Midi output, JP6 the Midi input. The left pin of both pin headers is GND, the right pin is the "hot" pin (i.e. Midi in or Midi out).

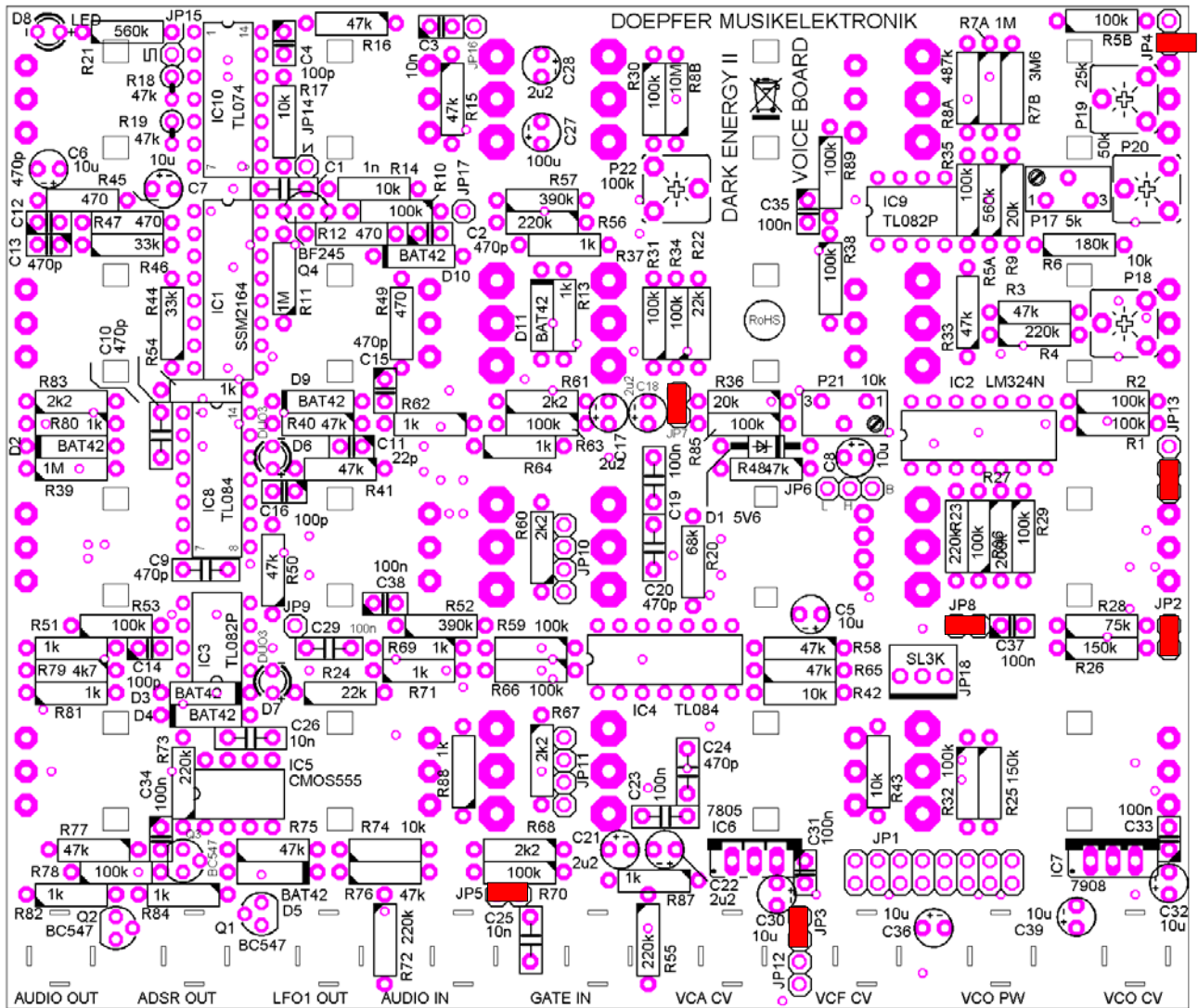
To connect two Dark Energy's via Midi JP5 of the first unit has to be wired to JP6 of the second unit. A suitable link cable is available soon. Pay attention to the correct polarity of the cables (GND → GND and hot pin → hot pin). If the polarity is wrong nothing can be damaged but the link function will not work. The link cable is fed through the holes in the side plates of the case. If a wooden side plate is used between the two units the side plate has to be drilled in addition.

Pay attention that the first unit has to be programmed for **stack mode** . Details in the user's guide.

A suitable link cable is enclosed to each Dark Energy (2 wire cable with black and red wire and a female 2 pin connector on both sides).

# Position and Function of the Jumpers and trimming potentiometers

## Voice Board Dark Energy II



## Function of the Jumpers (Dark Energy II Voice Board):

Name	Function	Explanation	Factory default
JP1	Bus Connector	16 pin connection to supply/interface board (compatible to A-100 bus)	connected to supply/interface board via ribbon cable
JP2	CV1 Bus	Connects the CV line of JP1 to the VCO frequency control voltage input (works in addition to the VCO F socket)	<b>installed</b>
JP3	Gate bus	Connects the Gate line of JP1 to the switching contact of the ADSR Gate socket	<b>installed</b>
JP4	VCO tune range	Adjusts the range of the VCO tune control: installed → tune range about ± 2.5 octaves not installed → tune range about ± 6 semitones	<b>not installed</b> (put on one pin only)
JP5	Audio → Bus/+5V	Connects the audio output of the voice board to an auxiliary pin of JP1. Required if socket CV4 is used as audio output.	<b>installed</b>
JP6	VCF Output	pin header with the filter outputs lowpass (L), band pass (B), high pass (H)	- (no jumper)
JP7	Inverter input	Connects LFO1 output to the internal inverter upper pin of JP7 = LFO1 output lower pin of JP7 = inverter input	<b>installed</b>
JP8	Inverter output	Connects the output of the internal inverter to the socket /LFO1 "/" means inverted, i.e. the factory default is inverted LFO1, can be used for other applications (e.g. inverted ADSR or LFO2 output in combination with JP9 or JP10, or direct output of LFO1 or LFO2 without inverting) right pin of JP8 = inverter output left pin of JP8 = socket LFO1 at the front panel	<b>installed</b>
JP9	ADSR out	Internal ADSR output	- (no jumper)
JP10	LFO1	multifunctional LFO1 connector <u>from top to bottom:</u> <ul style="list-style-type: none"> <li>• triangle output (capacitor terminal #1)</li> <li>• reset (capacitor terminal #2)</li> <li>• direction</li> <li>• rectangle output</li> </ul>	- (no jumper)
JP11	LFO2	multifunctional LFO2 connector <u>from bottom to top:</u> <ul style="list-style-type: none"> <li>• triangle output (capacitor terminal #1)</li> <li>• reset (capacitor terminal #2)</li> <li>• direction</li> <li>• rectangle output</li> </ul>	- (no jumper)
JP12	free bus pin → VCF	Connects an unused pin of JP1 to the switching contact the VCF F socket. Not supported by the supply/interface board.	<b>not used</b>
JP13	VCF tracking source	Selects the CV source for VCF tracking (can be turned on / off / half by means of the Track switch): Upper position: VCF tracking controlled by the VCO F socket Lower position: VCF tracking controlled by the CV line of JP1	<b>installed</b> (lower position)
JP14	VCO saw	VCO sawtooth output (not buffered)	- (no jumper)
JP15	VCO rectangle	VCO rectangle output (not buffered)	- (no jumper)
JP16	VCO sync	VCO Hard Sync input	- (no jumper)
JP17	VCO lin FM	VCO linear FM input	- (no jumper)
JP18	Heater	connector for VCO oven	connected to the heater board

## Function of the trimming potentiometers (Dark Energy II Voice Board):

Name	Function	Explanation	Factory default
P17	VCO Scale	adjusts the 1V/octave characteristics of the socket "VCO F" or the bus CV	adjusted to 1.00V/octave
P18	VCO Offset	adjusts the VCO frequency offset	64 Hz @ center position of the VCO <i>Tune</i> control and <i>Range</i> switch in center position
P19	VCO Octave Switch +	adjusts the upper position of the VCO range switch (+ 1 octave)	adjusted to +1 octave
P20	VCO Octave Switch -	adjusts the lower position of the VCO range switch (- 1 octave)	adjusted to -1 octave
P21	VCF Scale	adjusts the 1V/octave characteristics of the socket "VCF F" or bus CV (if the tracking switch is in the lower position "full")	adjusted to 1V/octave, VCF in self-oscillation ( <i>Resonance</i> control fully CW)
P22	VCF Offset	adjusts the VCF frequency offset	~ 10 Hz @ CCW position of the VCF <i>Freq.</i> control, VCF in self-oscillation ( <i>Resonance</i> control fully CW, all VCF modulations off)

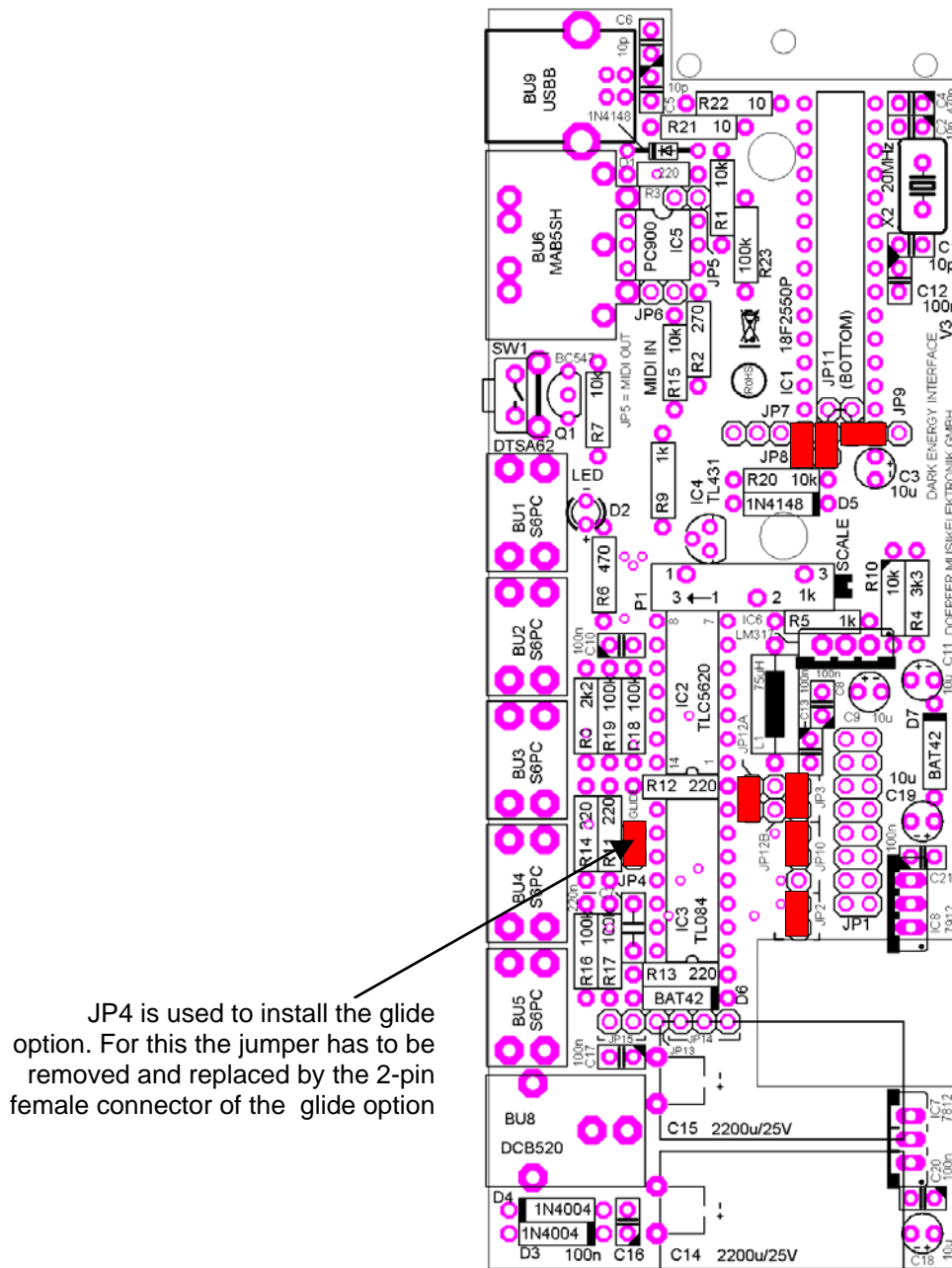
### Notes concerning the adjustment of trimming potentiometer P17 (VCO Scale):

The corresponding trimming potentiometer for the 1V/Oct scale is P17. You have to wait about 20 minutes before you do the readjustment. This is the recommended procedure:

- (1) Remove the 4 screws of the bottom plate, but leave the plate at it's position (i.e. the case is still closed at the bottom)
- (2) wait about 20 minutes
- (3) remove the bottom plate and the readjust P17 until the scale is correct (e.g. playing octaves on the controlling keyboard)
- (4) add the bottom plate still without installing the screws
- (5) wait about 10 minutes and check if the scale is still OK
- (6) if yes: mount the bottom plate with the 4 screws
- (7) if no: go back to step 3

If you are not able to do the adjustment please return the unit to the dealer where you purchased it for readjustment.

# Position and Function of the Jumpers and trimming potentiometers Supply/Interface Board Dark Energy II



## Function of the Jumpers and Trimming Potentiometers (Dark Energy II - Interface/Supply Board):

Name	Function	Explanation	Factory default
JP1	Bus Connector	16 pin connection to voice board (compatible to A-100 bus)	connected to voice board via ribbon cable
JP2	Gate bus	Connects the Gate line of JP1 to the gate output of the USB/Midi interface	installed
JP3	CV1 bus	Connects the CV line of JP1 to the CV1 output of the USB/Midi interface	installed
JP4	Glide Option	This pin header can be used to install the glide option instead of the jumper. For this a rotary potentiometer (1M log) has to be connected to the two pins. The glide option is available from your local representative or dealer. It consists of a 1M potentiometer with Dark Energy style knob and nut, 2-wire cable and 2-pin connector. All parts are assembled, no soldering required.	installed
JP5	Midi Out	This two pin connector is a Midi Output and can be used to daisy-chain two DARK ENERGY via Midi Out/Midi In. For this the Midi Out of the first device has to be connected to Midi In of the second device via a suitable two wire cable. The first unit has to be set into the "Stack Mode" (details in the user's guide). The left pin of JP5 is GND, the right pin is Midi Out	open
JP6	Midi In	This two pin connector is a Midi Input and can be used to daisy-chain two DARK ENERGY via Midi Out/Midi In. For this the Midi Out of the first device has to be connected to Midi In of the second device via a suitable two wire cable. The left pin of JP6 is GND, the right pin is Midi In.	open
JP7/ JP8	Firmware Update	To these single row pin headers several jumpers can be installed in different ways. In the standard mode two jumpers have to be installed as shown in the sketch. <i>Only if the firmware of the device has to be updated the positions of the jumpers have to be changed. As soon as a new firmware is available the corresponding information will be published.</i>	two jumpers installed as shown in the sketch
JP9	Reset/Program	This jumper is used only during the programming in the factory. It has to remain always in the position shown in the sketch !	installed (left position)
JP10	Function of socket CV4	With this jumper one can select if the socket labelled "CV4" outputs really CV4 or if it is used as a second audio output (in parallel to the audio output socket at the front panel). In the upper position it works as CV4 (factory setting), in the lower position as audio output.	installed (upper position)
JP11	not used	this pin header is not assembled (it would be on the bottom side of the pcb)	not used
JP12 A/B	Voltage range of CV2 (pitch bend)	These jumpers are used to define the output voltage range of CV2 (pitch bend): JP12A installed: CV2 range ~ -2.5...+2.5V (symmetrical around 0V) JP12B installed: CV2 range ~ 0...+5V (only positive voltage) Only one of two jumpers has to be installed, never both !	JP12A installed (-2,5...+2,5V)
JP13	Gate	Gate output of the interface for optional expansions	-
JP14	Power Supply	power supply connector for optional expansions, from left to right: <ul style="list-style-type: none"> <li>• -12V</li> <li>• GND</li> <li>• +12V</li> </ul> max. current 20 mA !	-
JP15	CV2/CV3	CV2/CV3 outputs for optional expansions, from left to right: <ul style="list-style-type: none"> <li>• CV2</li> <li>• CV3</li> </ul>	-
P1	CV1 Scale	adjusts the 1V/octave characteristics of CV1	adjusted to 1.00V/octave
P2	Glide	optional rotary potentiometer for glide function (portamento) of CV1, is connected to JP4 (instead of the jumper), recommended value: 1M logarithmic (A1M)	not installed