DOEPFER MUSIKELEKTRONIK GMBH
DARK ENERGY III

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 III**. 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 (I / II / III)

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 (I / II / III) 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 trough 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 III

Function of the jumpers / pin headers / soldering points (Dark Energy III Voice Board):

Name	Function	Explanation	Factory default
JP1	*Bus Connector*	*16 pin connection to suppy/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)	**installed**
JP3	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	**installed** (lower position)
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	**not installed** (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.	**installed**
JP6	VCF Output	pin header with the filter outputs lowpass (L) - left pin high pass (H) - center pin) band pass (B) - right pin)	*open*
JP7	Socket 7 = LFO1 Reset	Connects socket 7 to the Reset input of LFO1 the left pin is socket 7 the right pin is the Reset input (can be used e.g. to assign another function to socket 7, in this case the printing of the housing is no longer valid)	**installed**
JP8	Socket 8 = LFO2 Reset	Connects socket 8 to the Reset input of LFO2 the left pin is socket 8 the right pin is the Reset input (can be used e.g. to assign another function to socket 8, in this case the printing of the housing is no longer valid)	**installed**
JP9	Socket 2 = PWM	Connects socket 2 to the PWM input of the VCO the lower pin is socket 2 the upper pin is the PWM input (can be used e.g. to assign another function to socket 2, in this case the printing of the housing is no longer valid)	**installed**
JP10	Socket 4 = CV VCA	Connects socket 4 to the CV input of the VCA the upper pin is socket 4 the lower pin is the CV input of the VCA (can be used e.g. to assign another function to socket 2, in this case the printing of the housing is no longer valid)	**installed**
JP11	Gate bus	Connects the Gate line of JP1 to the switching contact of the ADSR Gate socket	**installed**
JP12	*free bus pin -> VCF*	*Connects an unused pin of JP1 to the switching contact the VCF F socket. Not supported by the suppy/interface board.*	***not used***
JP13	LFO1 Triangle	Triangle output of LFO 1	*open*
JP14	LFO1 Rectangle	Rectangle output of LFO 1	*open*
JP15	LFO2 Triangle	Triangle output of LFO 2	*open*
JP16	LFO2 Rectangle	Triangle output of LFO 2	*open*
JP17	ADSR Out	ADSR output	*open*
JP18	Inputs/outputs VCO	JP18A: Linear FM input VCO (left pin) JP18B: Triangle output VCO (center pin) JP18C: Soft Sync input VCO (right pin)	*open*
JP19	Inputs/outputs VCO	JP19A: Sawtooth output (left pin) JP19B: Hard Sync input (center Pin) JP19C: Rectangle output VCO (right pin)	*open*
JP20	Inverter 1	JP20A: Inverter 1 input (left pin) JP20B: Inverter 1 output (right pin)	*open*
JP21	Inverter 2	JP21A: Inverter 2 input (right pin) JP21B: Inverter 2 output (left pin)	*open*

To establish other connections than the ex works defaults suitable cables can be used (so called jumper wires or Dupont wires or Raspberry Pi wires or similar). These are available from electronic shops or Amazon. It is important to order the female-female version of the cables (not male-female or male-male).

JP13...JP17 are just soldering points. If applicable the wire in question has to be soldered directly to the soldering point in question. Instead of this pin headers with one pin can be assembled to JP13...JP17. In this case the female-female cables mentioned above can be used too.

Example: when the JP6 jumper is removed socket #8 can be used for other functions: wiring the left pin of JP8 to JP14 e.g. turns socket #8 into LFO1 rectangle output instead of LFO2 reset input.

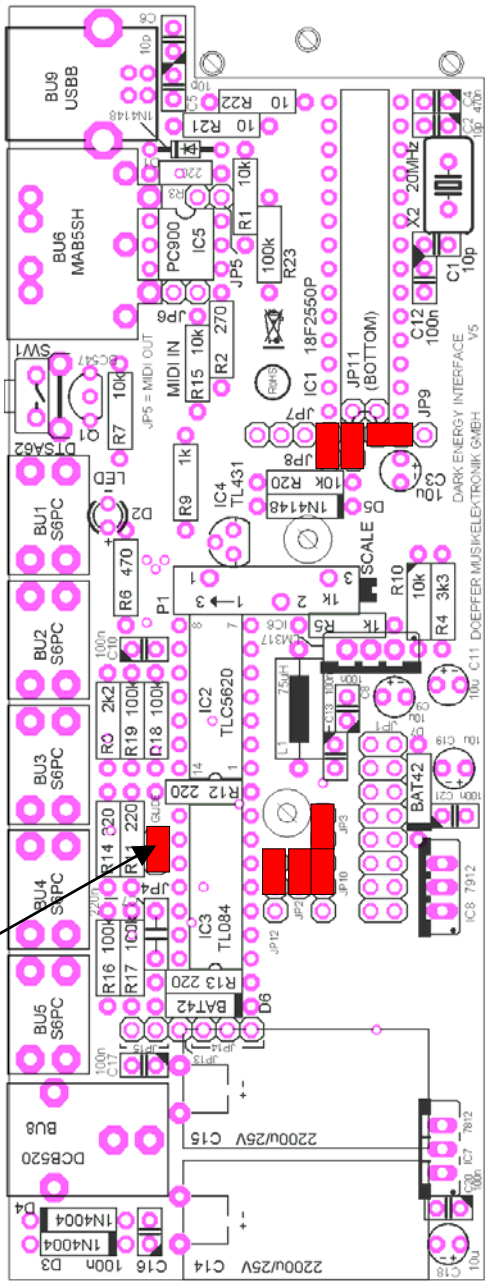
Of course the front panel printing is then no longer valid and a suitable label should be used to indicate the new function of the socket.

Function of the trimming potentiometers (Dark Energy III 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 *Tune* control and *Range* 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 (*Resonance* control fully CW)
P22	VCF Offset	adjusts the VCF frequency offset	~ 10 Hz @ CCW position of the VCF *Frq*. control, VCF in self-oscillation (Resonance control fully CW, all VCF modulations off)

Position and Function of the Jumpers and trimming potentiometers

Supply/Interface Board Dark Energy III



JP4 is used to install the glide option. For this the jumper has to be removed and replaced by the 2-pin female connector of the glide option

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 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 in 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. *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.*	**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: • -12V • GND • +12V max. current 20 mA !	-
JP15	CV2/CV3	CV2/CV3 outputs for optional expansions, from left to right: • CV2 • CV3	-
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)*	